Australian Archaeological Association
Annual Conference Conference 2019
Gold Coast • 10 - 13 December 2019

DISRUPTING PARADISE:
The Archaeology of the Driest Inhabited Continent on Earth
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On behalf of the AAA National Executive and AAA Conference Organising Sub-Committee it is my pleasure to welcome you to the 41st Australian Archaeological Association Annual Conference at (hopefully) sunny Surfers Paradise, on the Gold Coast!

I would also like to express our sincere thanks to all of our sponsors this year especially our platinum sponsors Rio Tinto and BHP, and gold sponsors Biosis, Everick Foundation, Griffith University, Monash University, ARC Centre of Excellence for Australian Biodiversity and Heritage (CABAH), University of Western Australia, and Scarp Archaeology. It is through their generous support that we also welcome a huge contingent of Indigenous representatives, and students from as far away as the Kimberley and Northern Territory.

The theme for this year’s conference is ‘Disrupting Paradise: The Archaeology of the Driest Inhabited Continent on Earth’. Surfers Paradise and the Glitter Strip are famed for their sun, surf and sandy beaches along with a seamy underbelly after the sun goes down. But as Australia’s largest non-capital city, the Gold Coast arguably presents one of the clearest examples of complete terraforming and resurfacing of cultural and natural landscapes. We also take the opportunity to reflect on how archaeology has developed as a discipline and as a community in the 50 years since John Mulvaney published his landmark Prehistory of Australia. How has archaeology disrupted and continued to disrupt understandings of the past and ourselves? How have our understandings of people and transformation in Australia changed in the last 50 years?

The venue for this year is the Mantra on View, Gold Coast (hopefully you are sitting reading this in the right place), with a Welcome reception right on the beach at the Surfers Paradise Surf Lifesaving Supporters Club, and the Conference Dinner Friday night at the Mantra.

Have a great time at AAA41, we hope you learn some new things, meet some old things, and don’t disrupt Paradise too much in the process …

Michael Slack
President
Australian Archaeological Association
ACKNOWLEDGEMENT OF TRADITIONAL OWNERS

The Conference Organisers acknowledge the Traditional Owners of the lands and waters on which we meet. We express our appreciation to the representatives of these communities for their participation in the Conference.

We acknowledge Aboriginal and Torres Strait Islander peoples as the first people of this country. We pay our respects to the Traditional Owners and Elders past, present and emerging of the lands on which we meet and from where we have travelled. In the spirit of reconciliation, we acknowledge the enormous contribution that Aboriginal and Torres Strait Islander people make to our communities.

CONFERENCE ORGANISING COMMITTEE

Conference Convenors:
Michael Slack, Annie Ross, Sean Ulm
AAA Prizes and Awards Chair: Peter Veth
Conference Manager: Julie Jerbic

VOLUNTEERS

The Conference Organising Committee gratefully acknowledges the time, energy and enthusiasm of the following student volunteers:
Olivia Arnold
Lisa Boyle
Kylie Carroll
Ethan Clark-Kistowski
Adelia Gower
Connor McBrien
Georgia Rolls
SPONSORS

The Conference Organising Committee acknowledges with gratitude the following companies and organisations that have provided sponsorship for this Conference.

Platinum Sponsors

Australian Archaeological Association  BHP  Rio Tinto

Gold Sponsors

biosis  Eeverick Foundation  Griffith University  Monash University  Australian Research Council Centre of Excellence for Australian Biodiversity and Heritage  Scarp Archaeology

Silver Sponsors

niché Environment and Heritage  Austral Archaeology  Ecology & Heritage Partners  AACAI

Bronze Sponsor

Flinders University
We also acknowledge the following delegates who donated funds to help support students and Indigenous delegate attendance:

Sandra Bowdler, The University of Western Australia
Joseph Brooke, Unearthed Heritage Australia Pty Ltd
Chris Clarkson, The University of Queensland
Joanna Freslov, Joanna Freslov Heritage Consulting / Gunaikurnai Land and Waters Corp.
Catherine Frieman, Australian National University
Michael Green, Eco Logical Australia
Paul Greenfeld, Deep Woods Surveys
Shoshanna Grounds, NGH
Balazs Hansel, Urbis
Tiina Manne, The University of Queensland
John Marrell, Gavin Jackson CHM
Sarah Martin, Heritage NSW
Anne McConnell, Archaeology and Cultural Heritage Management
Jo McDonald, The University of Western Australia
Ian McNiven, Monash University
Ken Mulvaney, Rio Tinto
Martin Porr, The University of Western Australia
Amy Roberts, Flinders University
Georgia Roberts, Monash University / Australian National University
Keryn Simons, University of Southern Queensland
Caroline Spry, La Trobe University / Ochre Imprints
Jacqui Tumney, Andrew Long and Associates / La Trobe University
Beth White, Beth White Archaeology
Peter White, University of Sydney
Shelley Woodrow
LOCAL INFORMATION & MAP

Transfers from Gold Coast Airport

For visitors arriving at the Gold Coast’s local airport in Coolangatta, the following transfer options are available:

**Shuttle Bus:**

Gold Coast Tourist Shuttle
Pre-booking is recommended and can be done online at the website below.
One way or return coach transfers between your hotel & the Gold Coast Airport are available.

- Website: www.gcshuttle.com.au/airport-transfers | Phone: 1300 655 655
- Cost (approx.): $21.00 one way, $41.00 return

**Taxi:**

Gold Coast Cabs - From Gold Coast Airport to the Conference venue (Mantra on View, Surfers Paradise) the approximate cost is $80.00 one way.

- Website: www.gccabs.com.au | Phone: 131 008

Public Transport on the Gold Coast

**Trams**

The new G-Link: light rail system operates from 5am to midnight on weekdays and throughout weekends.
The route links Helensvale, Gold Coast University Hospital, Southport, Main Beach, Surfers Paradise and Broadbeach with a 7.5 minute service between 7am and 7pm weekdays.
Cypress Avenue Station is the closest stop to the Mantra on View, Surfers Paradise and is located in Zone 5.

- Website: https://translink.com.au

**Buses**

Some bus services finish at the G-Link: where you can transfer onto a connecting tram to complete your journey. There are more than 60 bus routes in the city including turn up and go services, 700, 704, 705, 709, 740, 750 and 777 that operate every 15 minutes or better, seven days a week.

- Website: https://www.queenslandrail.com.au

**Trains**

Queensland Rail trains connect major centres on the Gold Coast including Helensvale, Nerang, Robina and Varsity Lakes and also serve Ormeau and Coomera. Trains run at regular intervals to and from Brisbane with bus connections to Surfers Paradise, Southport and Broadbeach. Timetable information is available through TransLink.

- Website: https://www.queenslandrail.com.au
Taxis
There are designated taxi ranks on Cavill Avenue and Orchard Avenue, Surfers Paradise. Gold Coast cabs can also be hailed kerbside or booked directly.

Website: www.gccabs.com.au | Phone: 131 008

For comprehensive and up to date information about things to see and do on the Gold Coast, please see

Website: https://www.destinationgoldcoast.com
or visit Surfers Paradise Visitor Information and Booking Centre:

2 Cavill Ave (Cavill Mall) Surfers Paradise Qld 4217
T: 1300 309 440
CONFERENCE INFORMATION

Venue
The Conference will be held at Mantra on View, View Street, Surfers Paradise, Queensland.

<table>
<thead>
<tr>
<th>Registration Desk Opening Times</th>
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<td><strong>Tuesday 10 December:</strong></td>
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<td><strong>Friday 13 December:</strong></td>
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Conference Opening
The first session of the Conference will commence at 8:30am on Wednesday 11 December in the Boulevard Ballroom, located on the Level 2 of Mantra on View. The Registration Desk will be open from 7:30am.

Concurrent Sessions
Concurrent Sessions will be held in Boulevard 1, Boulevard 2, Boulevard 3 and Palm 1. Boulevard Rooms are located on Level 2 and the Palm Room is located on Level 4, accessible via a lift and stairs.

Conference Closing
The Conference will finish with the Conference Dinner and After Party on Friday 13 December.

Refreshments
Morning and afternoon tea and lunches are included in the Conference registration fee. Catering is served on the Level 2 and Level 4 lobbies.

Special Diets
If you have indicated a special dietary requirement on your registration form, please identify yourself to the Registration Desk and they will be pleased to assist.

Name Badges
All delegates will be provided with a name badge, which must be worn at all times within the Conference venue, particularly at catering breaks.

Satchels
All delegates will receive a Conference satchel upon registration. Your satchel will include materials provided by sponsors as well as the Conference program.
VENUE FLOOR PLAN

Level 2

Level 4

Restaurant
Paradise 3
Paradise 2
Paradise 1
Boulevard Terrace
Boulevard 3
Boulevard 2
Boulevard 1
Pre-function
Stairwell
Toilets
Atrium
Boulevard
Terrace
Terrace
Paradise 1
Paradise 2
Paradise 3
Restaurant
Piazza
Toilets
Toilets
Toilets
Toilets
Palm Lobby
Day Spa
Kitchen
Studio
Gym
Palm 1
Garden Terrace
Swimming
Pool
Pool Bar
North Terrace
INSTRUCTIONS FOR SESSION CHAIRS

Each presentation timeslot is 20 minutes, including 5 minutes for discussion.

You will be provided with 5-minute and 1-minute time cards for use during each presentation.

To facilitate movement between sessions and to ensure the program runs to schedule, please adhere strictly to the program as provided. If a presenter does not arrive for their slot, please do not move other presenters forward, but rather wait until the scheduled time to begin the next presentation.

We suggest you occupy the spare slot with facilitated discussion.

INSTRUCTIONS FOR PRESENTERS

Each presentation timeslot is 20 minutes, including 5 minutes for discussion.

Please be in your session room 10 minutes early to assist all sessions to run on time. Your Session Convenor will brief you about the format of your session before the commencement of presentations.

If using a PowerPoint presentation, please bring your file on a USB to the room of your presentation during the break before your session, or 20 minutes before the start of the day’s proceedings. Videos must be embedded in the PowerPoint, and also provided as a separate file on your USB. A volunteer will assist with uploading your presentation.

INSTRUCTIONS FOR POSTER PRESENTERS

Posters should be a maximum of ISO A0 size in portrait format and be printed on high quality paper (please try to avoid material posters).

Posters will be displayed from Wednesday 11 – Friday 13 December in the Palm Lobby on the Level 4.

Please hand-deliver your poster to the Registration Desk before morning tea on Wednesday 11 December. The conference staff will arrange the hanging of your poster.

Poster presenters are expected to be present during the Poster Session on Friday 13 December from 4:00 - 5:00pm.

Posters are to be dismantled immediately following the Poster Session. Dismantling of posters is the responsibility of the presenter and no responsibility can be accepted by the organisers for the collection or safekeeping of posters. Posters not collected by 10.00am on Saturday 14 December will be discarded.

Best Poster Awards will be presented at the Conference Dinner on Friday 13 December.
CODE OF CONDUCT

The Australian Archaeological Association (AAA) promotes a harassment-free experience for all participants at our events.

Each year AAA hosts a major conference intended for professional networking and collaboration in the archaeological community. AAA also runs, sponsors and supports other events throughout the year.

We encourage the open exchange of ideas and insist on an environment that recognises the inherent worth of every person and group attending the conference, in an inclusive space, free of harassment, and that encourages interaction among diverse groups. We want AAA to be welcoming, and the conference to encourage participants to be involved.

We are publishing a Code of Conduct to clarify our expectations of acceptable behaviour and to promote high standards of professional practice. It also provides a benchmark for self-evaluation and acts as a vehicle for the identity of the community and organisation. If you have general questions about codes of conduct, a good place to start is the code of conduct FAQ (link on the AAA website).

This Code of Conduct applies to any participant at our annual conference or any other event convened by AAA, including but not limited to:

1. delegates in meetings and teleconferences, vendors, staff, and volunteers.
2. behaviour at AAA events, even if outside event spaces or behaviour towards people who are not part of the AAA conference.

This Code of Conduct applies to conference and other events endorsed by AAA. Note that this code supports rather than replaces legal rights and obligations pertaining to any particular situation.

General Responsibilities

We have a responsibility to prevent harassment, discrimination, and bullying. Accordingly, everyone who attends AAA events is responsible for ensuring that they:

1. are familiar with this policy;
2. comply with this policy;
3. take all reasonable steps to ensure that our events are free from unacceptable behaviour

Expected Behaviour

All event participants are expected to behave in accordance with professional standards, as outlined in both this Code of Conduct as well as their respective employer’s policies governing appropriate workplace behaviour, and all applicable laws.
Unacceptable Behaviour

Harassment, including discrimination and bullying will not be tolerated in any form, including but not limited to what a reasonable person would see as:

- Offensive comments related to gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, age, religion or any other status protected by laws in the jurisdiction in which the conference or program is being held.
- Unwelcome comments regarding a person’s lifestyle choices and practices, including those related to food, health, parenting, drugs, and employment.
- Deliberate misgendering or use of ‘dead’ or rejected names.
- Gratuitous or off-topic sexual images or behaviour in spaces where they are not appropriate.
- Physical contact and simulated physical contact (e.g. textual descriptions like “hug” or “backrub”) without consent or after a request to stop.
- Threats of violence.
- Incitement of violence towards any individual, including encouraging a person to commit suicide or to engage in self-harm.
- Deliberate intimidation.
- Stalking or following.
- Harassing photography or recording, including logging online activity for harassment purposes.
- Inappropriate staring.
- Sustained disruption of discussion.
- Unwelcome sexual attention.
- Pattern of inappropriate social contact, such as requesting/assuming inappropriate levels of intimacy with others.
- Deliberate “outing” of any aspect of a person's identity without their consent except as necessary to protect vulnerable people from intentional abuse.
- Publication of non-harassing private communication

Harassment in online channels

Participants at AAA events or activities may also participate online (see below).

This Code of Conduct also covers communication and interaction that is deemed to be unacceptable behaviour online and it applies to attendance at the annual conference, all events convened by AAA and to all AAA online platforms (e.g. Twitter, Slack, Facebook, WhatsApp, Gitter, LinkedIn, Telegram).

Please use these additional guidelines where engaging in AAA on-line activities/platforms:

- Avoid using overtly sexual or offensive usernames or profile photos which might detract from a safe and inclusive environment for all.
- Do not publish text/screenshots of anything shared in a private communication channels without explicit consent from the author. This includes screenshots of private messages to public channels, as well as conversations on public channels to anywhere outside the event.
What To Do If You Witness or Are Subject To Unacceptable Behaviour

If you are being harassed, notice that someone else is being harassed, or have any other concerns relating to harassment, please refer the matter to an AAA Contact Officer or Security Officer or an organiser who can be found at the event registration counter at any time.

We provide different avenues to address any concerns about breach of this policy.

They are:

1. We support openness and transparency, so if you believe that you are experiencing unacceptable behaviour at AAA 2019, in the first instance, we encourage you to raise it directly with the person involved. This should help to ensure that the other person is fully aware that their behaviour is unwelcome, or that you believe it is unacceptable. This approach may resolve the issue quickly and effectively; or

2. However, if it does not resolve your concerns, or if you are not comfortable with raising it directly with the other person, or if it involves a serious breach of this policy you should raise it with an authorised Contact Officer of AAA event staff.

The option you prefer will depend on your level of comfort with the option as well as the seriousness and nature of the allegation. Our Contact Officers will work with you to:

a. resolve your issue or complaint in a manner appropriate to the seriousness and nature of it

b. refer the issue or complaint for further investigation.

Confidentiality

Only the people involved in the attempted resolution or the investigation of an issue or complaint will have access to information about it for use in the resolution process. Anyone found to have engaged in a breach of confidentiality, gossip or innuendo or victimisation about an issue or complaint is at risk of disciplinary action by the AAA.

Respect & Procedural Fairness

Each party will have an opportunity to tell their side of the story and will be treated in a fair and impartial manner. Everyone involved in an issue or complaint raised under this policy will be treated with respect and provided procedural fairness throughout the complaint process. Similarly, everyone involved in an issue or complaint is required to treat each other person with respect, even if they feel aggrieved by a situation. All issues and complaints will be dealt with as quickly as possible.

We reserve the right to reject any report we believe to have been

1. made in bad faith.
2. intended to silence legitimate debate or criticism.

Outcomes of any referral

We will take action we consider appropriate on any complaint.
Substantiated complaints

If a complaint is substantiated we will take appropriate action for both parties. For the person referring a complaint, this may involve support to victims, including, but not limited to:

• Providing an escort
• Contacting hotel/venue security or local law enforcement
• Briefing key event staff for response/victim assistance
• And otherwise assisting those experiencing harassment to ensure that they feel safe for the duration of the conference.

For a person found to have breached this policy, you may be subject to appropriate disciplinary action, which may include

1. issuing a warning
2. expulsion from the conference or AAA event with no refund, depending on the circumstances
3. excluding any person found to be engaging in harassing behaviour from participating in any further AAA events, trainings or other activities based on their past behaviour, including behaviour at annual conferences

Malicious or false complaints.

If you are found to have raised a malicious or false complaint against another person in order to bring prejudice against that person, you may also be subject to appropriate disciplinary action, which may include preventing you from any further attendance at AAA events.

Pre-Event Concerns

If you are planning to attend an upcoming event, and have concerns regarding the past conduct of another individual who may be present, please contact the AAA National Executive at president@australianarchaeology.com. We will consider appropriate precautions to ensure the inclusion and safety of all participants including, but not limited to: providing an escort, prepping onsite event staff, separation during the same talks/social events, and providing onsite contact mobile phone numbers for immediate contact. In extreme cases, we may take action to prevent the harasser from attending the conference.

Policy Review

Date of last review: 11 November 2019

AAA Contact Officers:

Michael Slack 0413 807 229
Sean Ulm 0417 792 191
Annie Ross 0408 773 252
EAP Assist supports employees with confidential telephone counselling throughout Australia & overseas. We recognize that one of the most important aspects of effective counselling is for it to be provided as quickly as possible via your company's Helpline number.

The aim of counselling is to help resolve both workplace & personal issues before they adversely impact an employee's personal well-being & work performance.

Common issues include workplace conflict, bullying, stress, trauma & critical incidents, termination matters as well as personal issues such as depression, anxiety, alcohol & substance abuse, gambling, relationship issues & domestic violence.

These issues can cause work based difficulties such as absenteeism, poor productivity, high staff turnover, reduced performance & low job satisfaction & may subsequently affect the employee's health & well-being including their ability to cope with the demands of everyday life.

EAP Assist counsellors are all highly experienced & will initially ask for your name as well as that of your employer in order to confirm eligibility for services. Information obtained during counselling is confidential & will not generally be released to the employer without prior consent.

Telephone counselling is available 9.00 am - 5.00 pm Monday to Friday AEST or 24 hours per day 7 days per week by requesting a preferred call back time via your company's dedicated Helpline number, 0407086000 or text or use our online Booking Form or by completing the online employee Wellbeing Check Up Form or email: support@eapassist.com.au

(Services Valid to 30-10-20)
SOCIAL MEDIA GUIDE

Wi-Fi
Complimentary Wi-Fi internet is available at the Conference venue for delegates. Check the notice board near the Registration Desk for login details.

Mobile Phone/Recording Devices
While we appreciate that you might want to use your phone during the Conference, as a courtesy to presenters and those around you, put it on silent and do not use the flash to take photos during sessions.

For Presenters
Individuals may wish to record or photograph your presentation and/or slides on personal devices. If you have sensitive material in your presentation that you do not want recorded or you simply do not wish to be recorded or photographed, please make an announcement to this effect at the beginning of your presentation; e.g. ‘Please do not record or photograph this presentation’. Contact AAA’s Social Media Managers via FB or Twitter or your Session Convenor if there is any violation of your wishes not to have your presentation recorded or made public online in any form.

For Delegates
If you are planning to record or photograph presentations and/or slides, please be respectful if a presenter requests that you do not do so. Any recordings or photographs should be for your personal use only and not for uploading to any social media or other online platforms without the presenter’s express permission, which you must request personally and prior to publishing.

Facebook
AAA is active on Facebook and we also have a dedicated event page for the Conference. We will be posting updates, reminders and photos on Facebook throughout the Conference.
AAA Homepage: https://www.facebook.com/AustralianArchaeologyAssoc

Twitter
The official Conference hashtag is #AAA41 – chosen to commemorate the fact that this is the 41st annual AAA Conference. If you want to tweet about the Conference, please include this hashtag so that others interested in the Conference can find your tweets. If you are a Session Convenor and want to create a specific hashtag for your session please feel free do so, and let us know by tweeting it to the AAA Twitter account via @AustArchaeology so we can help promote its use for your session.
AAA’s Twitter username is AustArchaeology, you can tweet to us by putting @AustArchaeology in your tweet and our homepage is twitter.com/AustArchaeology.
Live-Tweeting at AAA 2019

We encourage live-tweeting during the Conference using the official hashtag, with the following caveats and suggestions for best practice:

◆ Do not post photos of people, presentation slides, photo competition entries or posters without the prior and express permission of the individual/s or author/s.

◆ Respect the wishes of presenters if they do not want their paper to be tweeted and presenters please make it clear if this is your wish. Remember that many people present unpublished work at conferences and you should use your best judgement when putting other people’s research into the public sphere.

◆ Correctly attributing information is vital. If tweeting be sure to give the name of the presenter and be clear when you are directly quoting someone. Presenters: if you are on Twitter and are happy for people to tweet about your paper, you can put your Twitter username on your opening slide so the audience can accurately cite you online. Delegates: if you start your tweet with a username make sure you put a “.” before the “@” so people other than that user can see it, e.g. “.@AustArchaeology Conference is being held on the Gold Coast 11-13 December 2019”.

◆ Do your best not to misrepresent other people’s views (even if you disagree with them) and post corrections if you slip up or someone misunderstands your tweet – ultimately, the message for live-tweeters is that you need to take seriously how you represent someone else’s hard work and intellectual property online.

◆ There is no need to tweet everything a presenter says, a few take-home messages to capture what you personally found interesting/significant about their presentation is generally sufficient.

◆ Remember that Twitter is a public forum, so think twice when posting comments about the more social aspects of the Conference; the general rule is to be collegial and respectful.

◆ Finally, enjoy it. Live-tweeting can be a great way to increase engagement and widen participation at a conference.

Important Reminder about Conference Awards

Everything you post on Twitter using the Conference hashtag and on the AAA Facebook pages during the Conference is public and can/will get you nominated for the Small Boy/Big Man awards. You have been warned…

For More Information about Social Media and Live-Tweeting

AAA Website and Social Media Policies: https://www.australianarchaeologicalassociation.com.au/about/website-social-media-policies/

For a current list of Australian archaeologists on Twitter go here: https://twitter.com/AAAS Students/lists/ozarch-twitterati.

For a run-down of key Twitter terms, there is a glossary available here: https://support.twitter.com/articles/166337?lang=en

This guide was compiled by Jacq Matthews, @archaeo_jacq and Lorna Cooper, @lornacooperarch.
PRE-CONFERENCE WORKSHOP
Students and Indigenous Representatives Archaeological Skills Beginners Workshop

Date:    Tuesday 10 December 2019
Venue:  Greenheart Reserve, Merrimac
Time:    12:20pm – 4:30pm

Pre-registration essential

The joint AAA / Jabree Ltd Student and Indigenous Representatives Archaeological Skills Beginners Workshop will be held at Greenheart Reserve, Merrimac. Greenheart Reserve features a significant cultural landscape for the Traditional Owners including important ochre sources.

The afternoon will feature a variety of practical skills training by volunteers with an introduction to the cultural heritage of this significant area, stories of connections to the landscape, practical workshops on the use of differential GPS, ground penetrating radar, and XRF analysis.

Participants are asked to meet at the coach at 12.20pm on Tuesday afternoon outside the Mantra on View. We will drive to the site and work on practical skills training until about 4pm, when we will return to the Mantra. The workshop is self-catering so please be sure and bring a small backpack with everything you need for the afternoon (sunscreen, hat, water and drinks, snacks) and wear long pants and suitable boots / runners for walking across paddocks.
MEETINGS

Australian Association of Consulting Archaeologists Inc (AACAI) Annual General Meeting
The AACAI Annual General Meeting will be held on Wednesday 11 December from 6:00 – 7:00pm in Boulevard 2. All members are requested to attend.

Australian Archaeological Association (AAA) Annual General Meeting
The AAA Annual General Meeting will be held on Thursday 12 December from 6:00 – 8:00pm in the Boulevard 2. All members are requested to attend.

Reconciliation Action Plan (RAP) Meeting
The RAP Meeting will be held on Wednesday 11 December from 1:00 - 2:00pm in the Boulevard 1. Lunch can be brought into the room.

Australian Indigenous Archaeologists’ Association (AIAA) Meeting
The Australian Indigenous Archaeologists Association Meeting will be held on Thursday 12 December from 1.00 – 2.00pm in Paradise 2. Lunch can be brought into the room.

Archaeology in Oceania (AO) Editorial Board Meeting
The Archaeology in Oceania Editorial Board Meeting will be held on Thursday 12 December from 1.00 – 2.00pm in Paradise 3. Lunch can be brought into the room.

The Australia ICOMOS National Scientific Committee on Rock Art Australia (NSCRAA) Annual Meeting
The Australia ICOMOS National Scientific Committee on Rock Art Australia Annual Meeting will be held on Friday 13 December from 1.00-2.00pm in Paradise 2. Lunch can be brought into the room.

Australian National Committee for Archaeology Teaching and Learning (ANCATL) Meeting
The Australian National Committee for Archaeology Teaching and Learning Meeting will be held on Friday 13 December from 1.00 – 2.00pm in Paradise 3. Lunch can be brought into the room.
SOCIAL FUNCTIONS

Welcome Reception
The Welcome Reception will be held at the Surfers Paradise Surf Lifesaving Supporters Club, cnr Hanlan Street and The Esplanade Surfers Paradise on Tuesday 10 December from 5.30 – 7.30pm. Canapés and beverages will be served. This is a great opportunity to catch up with old and new acquaintances. The Welcome Drinks are included in your registration fee.

AAA Careers Night
The annual event (formerly known as Meet the Graduates) will be held on Wednesday 11 December from 7.00 – 9.00pm in the Palm Lobby. The event is free of charge for pre-registered students and recent graduates. The event is jointly hosted by the Australian Archaeological Association (AAA) and the ARC Centre of Excellence for Australian Biodiversity and Heritage (CABAH). The evening is a wonderful opportunity for recent graduates to network in a relaxed environment with potential employers from the consulting, industry, heritage, government and education sectors. Representatives from industry sponsors will be on hand to talk to and answer questions from participants. Light refreshments will be served.

Poster Session
The Poster Session will be held on Friday 13 December from 4.00 – 5.00pm in the Palm Lobby. Poster presenters will be in attendance to discuss their posters.

Conference Dinner
The Conference Dinner will be held in the Boulevard Ballroom on Friday 13 December from 7.00 - 11.00pm. The dinner will consist of a 3-course dinner and all beverages (beer, wine, soft drinks and juice). There will be an awards ceremony, a live band and dancing. Conference Dinner tickets must be pre-purchased at a cost of $90.00 per delegate and $110 per guest.

After-Dinner Party
For those wishing to kick on after dinner, the party continues from 11.00pm - 2.00am with a DJ and dancing. Entry is free to dinner attendees and a cash bar will be operating.
AWARDS AND PRIZES

The following awards and prizes will be presented at the Conference Dinner on Friday 13 December:

Rhys Jones Medal for Outstanding Contribution to Australian Archaeology

The Rhys Jones Medal is the highest award offered by the Australian Archaeological Association Inc. It was established in honour of Rhys Jones (1941-2001) to mark his enormous contribution to the development and promotion of archaeology in Australia. The Medal is presented annually to an individual who has made an outstanding and sustained contribution to the field. Established in 2002, previous winners include Isabel McBryde (2003), John Mulvaney (2004), Sharon Sullivan (2005), Mike Smith (2006), Jeremy Green (2007), Harry Lourandos (2009), Iain Davidson (2010), Sue O'Connor (2011), Mike Morwood (2012), Richard Wright (2013), Peter Veth (2014), David Frankel (2015), Jo McDonald and Paul Taçon (joint winners in 2016), Sean Ulm (2017) and Harry Allen (2018).

John Mulvaney Book Award

The Award was established in honour of John Mulvaney and his contribution and commitment to Australian archaeology over a lifetime of professional service. It acknowledges the significant contribution of individual or co-authored publications to the archaeology of the continent of Australia, the Pacific, Papua New Guinea and South East Asia, either as general knowledge or as specialist publications. Nominations are considered annually for books that cover both academic pursuits and public interest, reflecting the philosophy of John Mulvaney’s life work. Established in 2004, previous winners include Val Attenbrow for *Sydney’s Aboriginal Past* (2004), Rodney Harrison for *Shared Landscapes* (2006), Mike Morwood and Penny van Oosterzee for *The Discovery of the Hobbit* (2007), Peter Hiscock for *The Archaeology of Ancient Australia* (2008), Denis Byrne for *Surface Collection* (2007), Jane Lydon for *Fantastic Dreaming* (2010), Annie Ross et al. for *Indigenous Peoples and the Collaborative Stewardship of Nature* (2011), Mike Smith for *The Archaeology of Australia’s Deserts* (2013) and Billy Griffiths for *Deep Time Dreaming: Uncovering Ancient Australia* (2018).

The Bruce Veitch Award for Excellence in Indigenous Engagement

This Award celebrates the important contribution that Bruce Veitch (1957-2005) made to the practice and ethics of archaeology in Australia. In particular, the award honours Bruce’s close collaboration with Traditional Owners on whose country he worked. It is awarded annually to any individual or group who has had long-standing and sustained engagement with Indigenous communities during archaeological or cultural heritage projects which have produced significant outcomes for Indigenous interests. Established in 2005, previous winners include Richard Fullagar (2006), Bruno David (2007), Annie Ross (2008), Luke Godwin (2009), Peter Veth (2010), Ken Mulvaney (2011), Ian McNiven (2012), Daryl Wesley (2013), Sean Ulm and Amy Roberts (joint winners in 2014), Colin Pardoe (2016), Melissa Marshall (2017) and Jo McDonald (2018).

Life Membership for Outstanding Contribution to the Australian Archaeological Association Inc.

The Ulm-Ross Prize for Best Paper in Australian Archaeology

The Ulm-Ross Prize was established to honour the outstanding editorial contributions to Australian Archaeology (AA) of Sean Ulm and Annie Ross (AA Editors 2006–2011). The Prize will be offered to the author(s) of the best paper published in the preceding two volumes of AA. Papers are judged by a panel of Australian and international experts based on four relatively simple criteria: (1) novelty/originality (opening new avenues for research); (2) clarity of expression; (3) contribution to substantive debate and/or the ‘big picture’ of the discipline; and (4) contribution to research more generally. Previous winners include Adam Brumm and Mark Moore (2012), Ben Gunn, Ray Whear and Leigh Douglas (2013), Jo McDonald and Peter Veth (2014), Daryl Wesley and Mirani Litster (2015), Ian J McNiven, Joe Crouch, Thomas Richards, Kale Sniderman, Nic Dolby and Gunditj Mirring Traditional Owners Aboriginal Owners Corporation; and Meg Travers and June Ross (joint winners in 2016), David W. Zeanah, Brian Codding, Rebecca Bliege Bird and Douglas Bird (2017).

The Daryl West Prize

The Daryl West Prize is named in honour of Tasmanian Aboriginal man Daryl West who had a long history of working in archaeology and cultural heritage management. It is awarded annually to the best conference presentation by an Indigenous presenter. Previous winners include Sharon Hodgetts (2011), Phil Hudson and Mick McKenzie (2012), Steve Free (2013), Shirley Gilbert (2014), Lorraine Tomlinson (2015), Kadeem May (2016), Nathan Woolford (2017) and Jacinta Koolmatrie and Sharon Hodgetts (joint winners in 2018).

The Laila Haglund AACAI Prize for Consulting Archaeology

AACAI is the major body for the accreditation and promotion of consultants who work in the allied subdisciplines of Indigenous, historic, industrial and maritime archaeology throughout Australia. It actively seeks to maintain and further develop high standards of consultancy performance. Towards this end it has contributed a prize for the best contribution on consultancy archaeology to the AAA Conference.

Best Paper Presented by Victorian AACAI Member

The Victorian Chapter of AACAI is presenting a prize for the best paper presented at the 2019 AAA Conference by a Victorian AACAI Member. The paper must be presented by a current financial Victorian AACAI member, and can be on any topic of their choosing and presented in any session of the Conference. Victorian AACAI members who are presenting a paper must make themselves known to AACAI via email to Andrea Murphy (andream@tardisenterprises.com.au).

Poster Prizes

Best Overall Poster
Best Student Poster
Best Runner-Up Student Poster
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**Papers and Posters**

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PLENARY ABSTRACTS

Beyond the (Pre) History of Australia

Convenor:
Michael Slack, President, Australian Archaeological Association

This session takes the opportunity to reflect on how archaeology has developed as a discipline and as a community in the 50 years since John Mulvaney published his landmark *Prehistory of Australia*. How has archaeology disrupted and continued to disrupt understandings of the past and ourselves? How have our understandings of people and transformation in Australia changed in the last 50 years? How has archaeology disrupted our dominant paradigms in archaeological method and theory? How has the culture of archaeological practice changed?

Six invited papers will cover the key themes of the *Prehistory of Australia*:

- the past uncovered and ownership
- dating the past
- changing landscapes
- stone tool innovations
- rock art
- summary paper

#MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology

Convenors:
Peta Straiton, Flinders University
Alice Gorman, Flinders University

The #MeToo movement is about more than sexual harassment. The movement carries lessons for all industries and organisations, big and small, on the necessity of dealing effectively with workplace misconduct which serves to reinforce traditional power hierarchies. Archaeology in Australia is not immune to occurrences such as those revealed by the #MeToo movement, and all professionals have a responsibility to be aware of these issues so they can work together to improve conditions. In this session we build on the ground breaking work which commenced with the Women in Archaeology conferences in the 1990s. These conferences generated a dialogue around how power, gender and race structured archaeological investigations and industry practices. Papers in this session respond to this movement by exploring gendered and intersectional negotiations of everyday lives and politics in the everyday places we work, visit and experience, as well as those that examine and discuss methods of moving forward to create safe working and learning environments for all. We welcome participation from students and professionals of all genders and backgrounds.
SESSION ABSTRACTS

A River is More than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Convenors:
Doug Williams, Griffith University / Access Archaeology and Heritage Pty Ltd
Michael Westaway, The University of Queensland
Matthew Barber, NGH Environmental Pty Ltd
Badger Bates, Barkindji Elder

“A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it”. Oliver Wendell Holmes Jr. 1931

“When they take the water from a Barkandji person, they take our blood. They’re killing us... our elders are giving up and dying. Then our young people are committing suicide and it’s hurting, because of the river”. William ‘Badger’ Bates, 2017.

The devastating fish kills of summer 2018-19 in the Darling River caused an outpouring of anger and anguish from a wide spectrum of the community and the attention of the nation has been drawn to the inland rivers and our interaction with them. This massive natural system in operation for millennia is seemingly on the brink of collapse barely a century since the commencement of irrigated agriculture in Australia. On the driest inhabited continent on earth, where rivers must surely be treasures, what is archaeology telling us about the interaction of people and rivers and/or between people who need them? While presentations with a focus on western NSW and/or its river systems are especially encouraged, this session seeks a broad range of papers with rivers and associated landscapes as their common thread.

After ‘Archaeology in Practice’: Student Research in Archaeology and Management

Convenors:
Clara Rose Santilli, Flinders University
Daryl Wesley, Flinders University

An extraordinary and excitingly diverse range of research topics are pursued by students in archaeology and cultural heritage management. Disseminate your research results to an audience of archaeologists at Australia’s annual conference. This session focusses on student research and provides an opportunity to speak alongside a group of your peers. We support and encourage student researchers at all levels to present a paper on their research in any area of archaeology and cultural heritage management from national and international contexts. Presenting in this forum allows you to develop important skills at communicating your research results. Presentations will be a maximum of 10 minutes with 5 minutes for questions.
Arriving in Sahul: Old Questions and New Approaches

Convenors:
Rosemary Helen Farr, University of Southampton
Sean Ulm, James Cook University

Over the last 50 years, there has been much speculation about the people, technologies and conditions that featured in the movement of people from Sunda through Wallacea to Sahul more than 50,000 years ago. With some of the earliest evidence for seafaring in world history, the peopling of Sahul in deep time involved maritime technology, skills and knowledge. As we piece together the fragmentary archaeological data on land and now seek submerged sites, furthering understandings of the maritime activities involved requires new approaches. Over the last decade researchers in a variety of fields from archaeology, oceanography, genetics, geology and modelling have investigated the nature of arrival on the continent, the routes, timings, marine and palaeocoastal environments encountered, and the potential risks involved. This session aims to address the myriad ways in which we can progress discussions and better understand the nature of these earliest arrivals.

Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

Convenors:
Melissa Marshall, The University of Notre Dame Australia
Benjamin Smith, The University of Western Australia

Rock art provides a tangible link to the past for all humanity, evidencing an ongoing connection directly for Indigenous peoples worldwide. These amazing sites and creative legacies imbued with cultural meaning, draw visitors by the thousands as they seek to witness the wonder of the magnificent masterpieces. The management of visitors to these locations, and mitigation of associated impacts to protect and preserve the integrity of both the tangible fabric and intangible importance of sites is a challenge that has faced many over the decades. 35 years ago, Hilary Sullivan released her formative work on visitor management built on experiences opening up Kakadu National Park to tourists. This framed much of what was to come with Gale and Jacobs following later that decade and Franklin in more recent times.

Here we explore the changing approaches developing in Australia and other countries in the southern continents with similar environmental conditions and management issues – of particular interest are the Indigenous-led collaborative and sustainable initiatives emerging as outstanding examples of visitor management strategies. These endeavors herald transformative times, suggesting that these efforts will have an important influence on the implementation of visitor management and cultural tourism initiatives into the future.
Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country

Convenors:
Emma St Pierre, Virtus Heritage
Lawrence Conyers, University of Denver
Jason Jia, Mapoon Land and Sea Rangers

Indigenous unmarked graves and cemeteries have very little records if any or formal boundaries and fencing and protecting the resting places of the ‘old people’ is an ongoing concern for many recent generations of Indigenous families. The legacy of colonialism has led to many communities’ loss of or partial loss of knowledge of their ‘traditional’ burial grounds and post-contact burials and cemeteries, as well as the locations of massacre sites. Some Indigenous communities have looked to science to provide culturally appropriate tools, that are non-invasive such as ground-penetrating radar (GPR) and magnetometry to assist with mapping and identifying graves and cemeteries. The purpose of this session will be to provide examples in Australia of the use of culturally appropriate science to assist Indigenous communities with continuing cultural law and practices and protecting their old people’s resting places, drawing on examples from different areas of Australia. A focus will be on which tools are most appropriate for what types of ground and burial conditions. In particular the use of multiple methods will be stressed, and the production of models from known graves that can be used to identify those elsewhere where there are no surface markers present.

Culturally Modified Trees in the Archaeological Record

Convenors:
David Tutchener, Bunurong Land Council Aboriginal Corporation
Alice Buhrich, TROPX

Culturally Modified Trees (CMTs) have often played a secondary role to other place types in the interpretation of cultural landscapes. However, as cultural marks on living entities, CMTs contain unique bio-cultural values that also face destruction from development, fire, animals, rot and a range of other natural factors. Consequently, CMTs are shorter lived in the archaeological record and our chance to record and interpret these places is rapidly disappearing.

This session aims to provide a platform for researchers from various regions to discuss the importance of CMTs within Indigenous lifeways. The broad nature of this session creates a space for the discussion of CMTs that were recorded within academia, Aboriginal land management and cultural heritage sectors in order to facilitate a greater understanding of these places during both our pre-colonial and colonial past.

We are asking for people to present anything they have regarding CMTs, as there is much unpublished in this area. We are encouraging submissions regarding community perspectives, recording methods, landscape use, project results, consulting reports and related studies of material culture. The breadth of this session will hopefully facilitate not only a greater understanding of this place type but also create a network of people interested in this study area.
Depicting Paradise: How Rock Art has Disrupted the Dominant Archaeological Paradigms of Our Time

Convenors:
Jo McDonald, The University of Western Australia
Sam Harper, The University of Western Australia

Comparing the index of John Mulvaney’s landmark Prehistory of Australia (1969) with its sequel (co-authored with Johan Kamminga) sees “rock art” references expanding from zero in 1969 (it is subsumed in “art, Aboriginal”) through to a plethora in 1999. Mulvaney and Kamminga recognised that the disciple had “expanded and diversified practically beyond recognition” in this 30 year time-frame. In the twenty years since then, the volume of rock art research being undertaken and its publication has continued exponentially. We have moved well beyond using the word “prehistory” as well as the early pan-continental rock art sequences first suggested by D.S. Davidson, Fred McCarthy and Lesley Maynard. Rock art has moved into new theoretical niches and away from the margins into a more mainstream discourse which challenges disciplinary paradigms (such as the conservative desert culture and art for art’s sake). Collaborative research with Indigenous partners and a concomitant increase in scientific techniques to contextualise the age and materiality of rock art have changed the questions we ask about rock art. This session brings together rock art researchers to reflect on what we now know and how rock art has developed over the last 50 years as an archaeological discipline and community. The papers in this session will demonstrates how rock art provides more nuanced ways of understanding Australia’s past.

Developments in Coastal Archaeology

Convenors:
Michael Rowland, James Cook University
Richard Robins, Everick Heritage Consultants

This session covers aspects of coastal archaeology from Indonesia to northern New South Wales and includes a diversity of approaches and recent developments.
Disrupting Materiality: Archaeology and Heritage Seen Through the Mind’s Eye

Convenors:
Jordan Ralph, Flinders University
Alice Gorman, Flinders University

Representations of material objects and places in film, photography, literature and art, where the creator depicts material culture to project familiar (human) messages about universal but personal experiences, often have a disrupting impact on audiences. The creative process uses visual, auditory, and imaginary senses to bring other worlds into existence. We invite contributions that explore the entanglement of humans and material culture as depicted in various media. We are particularly interested in papers that provide nuanced perspectives on human experiences by drawing upon representations of materiality outside the archaeological community. How is the entanglement of humans and things portrayed in various media? These representations can bring out different aspects of material culture which network with webs of metaphor, metonymy and meaning. In methodological approaches to the contemporary past, these representations can serve to disrupt more traditional interpretations of archaeological evidence, and can enrich our understanding of the contemporary human experience. For example, what role does the material world play in mediating human experiences within those depictions, particularly with regard to human emotion? Or, how do we infuse unspoken ideas into the material world, and what are the consequences of that?

Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry

Convenors:
Georgia Roberts, Monash University/The Australian National University
Melissa Marshall, The University of Notre Dame Australia

An ensuing discussion has dominated in recent decades within Australian archaeology, centred on the profession’s perceived inability to train both well-rounded researchers and industry-ready professionals. Largely, these debates have remained unchanged, at their core focussed on the need to balance the teaching of theoretical knowledge of our discipline and those vocational skills required for its practice. As a community, it is essential that we begin to disrupt this scholarship dystopia and move towards an integrated learning ecosystem capable of fulfilling the needs of a wide range of professional outcomes. In this session, we invite papers which aim to explore and develop overarching strategies focussed on solidifying strategic ongoing relationships between education providers, industry, government and the broader community.

Disruptive or Invisible: Children and the Archaeological Record

Convenor:
Michelle Langley, Griffith University

Children have always made up a significant proportion of any population. Despite this fact, archaeologists have ignored examining the role of children in the deep past owing to two commonly held ideas: (1) that children are not really important because their activities do not make significant contributions to communities, and (2) that children are unknowable in non-mortuary contexts as their behaviour leaves few material traces. Furthermore, children are frequently seen as disrupting the ‘true’ (adult) archaeological record of changing economies, technologies, and ideologies. This session seeks new approaches to finding children in the archaeological record and explores how children could have impacted technological and cultural development throughout the human past.
Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Convenors:
Fiona Hook, The University of Western Australia
Carly Monks, The University of Western Australia
Jillian Garvey, La Trobe University

With high diversity and regional endemism of our flora and fauna, archaeologists working in Australia have developed world leading approaches to the analysis of organic material cultural remains. Archaeologists routinely ‘disrupt paradise’ by imposing inherent Eurocentric biases in analysing this unique record. The depth of time and the vast expanse of Australia, combined with the relatively low number of studies, has meant that the majority of botanical and zoological research often produces discrete regional results. This session will explore the current state of research into the fields of Australian zooarchaeology and archaeobotany. A significant part of such research involves experimental and experiential archaeology.

From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes

Convenors:
Mary-Jean Sutton, Virtus Heritage
Robert Appo, Tweed Byron Local Aboriginal Land Council
Leweena Williams, Tweed Byron Local Aboriginal Land Council

Counter mapping has evolved in Australia from Peluso’s (1995) early study of forests in Indonesia to Byrne and Nugent (2004)’s post contact heritage study of Manning Valley with Biripi people as a form of mapping social and cultural values of Indigenous communities which challenges and can undermine existing power structures of “social and political geographies” (Harrison 2011). In Australian, interactive GIS maps and cultural heritage management plans and studies (often for local government) have been developed by Indigenous communities and archaeologists and other specialists/Councils to map oral histories, cultural knowledge and stories, historical archival information and tangible archaeological sites as well as natural features and vistas of cultural values (for example, Tweed Shire Council’s Aboriginal Cultural Heritage Management Plan (2018); GHD and Virtus Heritage, 2018; Thomas, E. J. and A. Ross. 2018). Counter mapping has become more wide stream in archaeological and cultural heritage discourse over the last decade, and in this session we reflect on how cultural mapping has changed archaeological discourse and also the challenges and benefits it has provided for Indigenous collaborators, instigators of these mapping projects and broader communities. In this session, are inviting presenters to share and discuss examples of counter mapping (cultural mapping projects), their experiences, knowledge, tools and management plans and studies, through papers, and end the session with an interactive panel discussion with invited Elders and academicians to assist with steering the discussion.
Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

**Convenors:**

Darran Jordan, AECOM Australia Pty Ltd  
Andrew McLaren, AECOM Australia Pty Ltd  
Luke Wolfe, AECOM Australia Pty Ltd  
Chris Lewczak, AECOM Australia Pty Ltd  
Julia Atkinson, AECOM Australia Pty Ltd  
Geordie Oakes, AECOM Australia Pty Ltd  
Ameera Mahmood, AECOM Australia Pty Ltd  
Andrew Costello, Jacobs Australia Pty Ltd

As a continually growing sector with increasing demands, CHM generates pressure for work to be completed at a fast pace, often without opportunity to reflect on how things could be disrupted, done better, or for innovations to be introduced. Accelerating development pressures have been an CHM issue in Western Sydney since the 1980s, leading to thousands of compliance-based Aboriginal and historical archaeological assessments, but comparatively few academic publications or conference presentations.

In particular, the Cumberland Plain is one of the most intensively investigated archaeological regions in Australia. The impetus for much of this investigation has been the residential and commercial growth across the region, necessitating a matching growth of infrastructure, from water pipelines to electrical cables and roads.

These commercial pressures associated with development can result in ethical, environmental and compliance concerns regarding climate change, community engagement, communication and interpretation, diversity, safety, client demands and the Traditional Owners rightful concerns about the destruction of their heritage. These issues can challenge archaeological consultants in their role as researchers, investigators and communicators.

This session presents the opportunities and challenges that increasing development and growing populations gives to archaeological and heritage investigations.
No Paradise Road: Conflict Archaeology in Australasia and Beyond

Convenors:
John Adeney
Sven Ouzman, The University of Western Australia
Daryl Wesley, Flinders University

Conflict or ‘battlefield’ archaeology is an under-researched but growing enquiry that is providing evidence-based findings about human conflict throughout history from hunter-gatherer societies to modern global scale conflicts. This is a multi-scalar endeavour, covering lengthy global conflicts to very personal and individual accounts of actions that occurred in the briefest of moments. In Australasia there were conflicts among Indigenous individuals and groups; Frontier Wars (still unrecognised as an ‘Australian’ war), Maori wars, world wars, Vietnam, Afghanistan, potentially ‘wars on terror’ and so on. Methodologically, this is more than simply finding relics of war at specific sites of conflict, landscapes, urban centres, maritime situations, and home fronts. Conflict archaeology utilises inter-disciplinary techniques to contextualise conflict in terms of individual experience, military groups, social elites, gendered divisions and engagements home and away. Theoretically, insights are drawn from the domains of absence, healing, loss, violence in addition to mainstream archaeological thinking on how to find, identify and interpret what are often physically ephemeral sites. We seek papers that explore conflict in human society through how it manifests in the archaeological record, and what the implications for our understanding of human responses to conflict are.

Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

Convenors:
Rachel Wood, The Australian National University
Jillian Huntley, Griffith University

The diverse, remote and often extreme environments which make up the geographically large and geophysically varied Australian continent create challenges for the application of scientific techniques. For example, organic preservation is often poor hindering extraction of DNA and proteins, and isoscapes, and more broadly physicochemical characterization of variation in landscape features, are not yet fully understood. Australia has the privilege of hosting the longest continuing cultural traditions on the planet, with archaeological materials inseparably intertwined in continuing cultural practice and custodial responsibilities, often leading to a pressing requirement for non- or minimally-destructive sampling.

The majority of archaeological science work has been undertaken in the temperate regions of Europe and North America, and so many scientific techniques are not appropriate for Australian environments, landscapes and communities. As a result, new scientific techniques may need to be developed, or existing techniques modified. This session will explore how the challenges in Australian archaeological science are being faced, outlining exciting developments in techniques, and explore the wealth of indigenous knowledge about the Australian environment that provides a globally exceptional opportunity for two way learning.
Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Convenors:
Alex Mackay, University of Wollongong
Peter Veth, The University of Western Australia

In the erosional landscapes that prevail across much of Australia, surface assemblages of archaeological material are common. Yet such assemblages are often viewed as palimpsests with low information potential, a perspective which has encouraged an emphasis on rock shelters and the more readily resolved sequences they preserve. This approach generates several issues. First, rock shelters are not common in all areas. Second, even in areas where rock shelters occur, they account for a tiny portion of the landscapes across which people lived. Third, we cannot assume that rock shelters were occupied evenly through time, nor that a full range of past activities were undertaken within them. Understanding the past requires that we engage with the diversity of the record as it exists, rather than a selected and potentially non-representative fraction of it. In this session we bring together researchers working on open sites in Australia and beyond. Recent advances in data capture, processing and modelling increasingly allow us to extract and comprehend greater quantities of data, moving beyond the ‘low information potential’ problem. The papers in this session will discuss novel methods for dealing with open site data, and the contributions of recent work to disrupting prevailing narratives of the past.

Remote Sensing, Data Management, GIS, and the Integration of Spatial Technologies

Convenors:
Claire Reeler, University of Sydney
Katherine Thomas, La Trobe University
Kelsey Lowe, The University of Queensland

Computer Applications and Quantitative Methods in Archaeology, Australasia (CAAA).

The integration of information technology into cultural heritage management and archaeological research is a significant disruptive change to the discipline. New ways to visualise the past, including non-invasive alternatives to excavation, have revolutionised the theory and practice of archaeology. In addition, the ease with which we can store, process and share data in archaeology has undergone an enormous shift in recent decades. Improvements in data warehousing and accessibility have had the disruptive effects of higher levels of accountability for data integrity, a need to incorporate multiple views, and a growing awareness of the importance of data sovereignty. Improvements in the spheres of data visualisation and display have had the knock-on disruptive effects of UXD (User Experience Design) being a required deliverable for all stakeholders. The session aims to discuss the impact of information technology as both a unifying and disruptive force within archaeology. Corollary to this main aim is the subsidiary session focus on best practice case studies for integrating spatial and aspatial datasets from archaeological projects.
The History of Archaeology in the Driest Continent and its Relationships with (Less Dry) Adjacent Regions

Convenors:

**Hilary Howes**, *The Australian National University*
**Tristen Jones**, *The Australian National University*
**Eve Haddow**, *The Australian National University*

Australia's unique natural environment has posed particular challenges to archaeologists seeking to shed light on the history of human settlement in the driest inhabited continent on earth. Archaeological models and theories developed in other parts of the world have largely been found to be unsuitable to the Australian context. Changing understandings of the permanence of geological features such as continental plates and land bridges, as well as changing understandings of human biological and cultural diversity, have led to reinterpretations of archaeological finds.

Environmental conditions in the Pacific Islands and Island Southeast Asia are very different. However, there are numerous historical connections between archaeology in Australia and its adjacent regions. Many archaeologists were active in both Australia and the wider region, and archaeological finds have been used to support a diverse range of theories about migration, settlement, and cultural change throughout Australasia and the wider Pacific. Histories of archaeology with a national focus risk overlooking such connections. We welcome papers on all aspects of the history of archaeology in Australia, the Pacific Islands and Island Southeast Asia, especially those considering historical connections between archaeology in these regions.

Transformation in Aboriginal Heritage Legislation Across Australia

Convenors:

**Laura Dafter**, *NSW Office of Environment and Heritage*
**Andrew Costello**, *Jacobs Australia Pty Ltd*
**Harry Webber**, *Aboriginal Victoria*

In 1996 the Hon Elizabeth Evatt, AC reviewed the Aboriginal and Torres Strait Islander Heritage Protection Act 1984. The breadth of matters covered in that review established a baseline for governments and practitioners when reviewing legislative regimes, and pushed us all to re-examine the protection and management of Aboriginal cultural heritage. Some of the recommendations of that review have come to fruition in different states, some priorities have changed, and new ideas have also emerged. But it does seem clear, following the first wave of heritage protections in the 1970’s, that the Evatt review preceded a new wave of heritage reforms that are slowly moving across the States.

This session aims to bring together regulators, policy makers, Traditional Owners, archaeologists and cultural heritage managers. We propose examining where each of the States are positioned in ‘riding the new wave’ of Aboriginal heritage legislation reform, and looking at what the Commonwealth is doing with the Act that the review was all about. Importantly, we hope to reflect on the opportunities that are presented by the current Aboriginal heritage legislation reform processes underway in several states.
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<td><strong>Tuesday 10 December 2019</strong></td>
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| 12.20 - 16.00 | Pre-Conference Workshop: Students and Indigenous Representatives Archaeological Skills Beginners Workshop  
Greenheart Reserve, Merrimac                      |
| 17.30 - 19.30 | Welcome Reception  
Surfers Paradise Surf Life Saving Supporters Club                              |
| **Wednesday 11 December 2019**                                                                 |
| 8.30 - 10:30  | Conference Opening and Plenary Session: Beyond the (Pre) History of Australia  |
| 10.30 - 11.00 | Morning Tea                                                        |
| 11.00 - 13.00 | Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond  
Disruptive or Invisible: Children and the Archaeological Record  
Recent Research in Coastal Archaeology  
Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry |
| 13.00 - 14.00 | Lunch and RAP Meeting                                                                 |
| 14.00 - 16.00 | Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond  
Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality  
After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management  
The History of Archaeology in the Driest Continent and Its Relationships with (Less Dry) Adjacent Regions |
| 16.00 - 16.30 | Afternoon Tea                                                        |
| 16.30 - 17.30 | Disrupting Materiality: Archaeology and Heritage Seen Through the Mind's Eye  
Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality  
After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management |
| 17.00 - 19.00 | AACAI Annual General Meeting                                          |
| 19.00 - 21.00 | AAA Careers Night                                                    |
| **Thursday 12 December 2019**                                                                 |
| 8.30 - 10:30  | Plenary Session:  
#MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space and Place in Australian Archaeology |
| 10.30 - 11.00 | Morning Tea                                                        |
| 11.00 - 13.00 | Transformation in Aboriginal Heritage Legislation Across Australia  
Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country  
Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere  
Exploring the Zooarchaeological and Archaeobotanical Record in Australia through Space and Time |
### Thursday 12 December 2017 continued

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<td>From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes</td>
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<td>Remote Sensing, GIS and the Integration of Spatial Technologies and Data Management in Archaeology</td>
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<td>16.00 - 17.00</td>
<td>Afternoon Tea and Poster Session</td>
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<td>19.00 - 23.00</td>
<td>Conference Dinner and Awards Ceremony</td>
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<td>23.00 - 2.00</td>
<td>After-Party</td>
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### DETAILED PROGRAM

#### Tuesday 10 December 2019

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| 12:20 - 16:00  | **Pre-Conference Workshop:** Students and Indigenous Representatives Archaeological Skills Beginners Workshop  
Greenheart Reserve, Merrimac (buses depart Mantra on View at 12.20pm) |
| 14:00 - 16:00  | **Pre-Conference Registration**  
Mantra on View, View Street, Surfers Paradise  
Room: Boulevard Lobby |
| 17:30 - 19:30  | **Welcome Reception**  
Surfers Paradise Surf Life Saving Supporters Club, Cnr Hanlan St & The Esplanade, Surfers Paradise |

#### Wednesday 11 December 2019

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| 7:30 - 8:30    | **Registration with arrival Tea & Coffee**  
Room: Boulevard Lobby |
| 8:30 - 8:50    | **Welcome Address** – Michael Slack, AAA President  
**Welcome to Country** – Wesley Aird, Jabree Ltd, Registered Cultural Heritage Body for the Gold Coast Region  
Room: Boulevard Ballroom |
| 8:50 - 9:05    | **Plenary Session: Beyond the (Pre) History of Australia**  
Room: Boulevard Ballroom |
| 8:50 - 9:05    | **Collaborative Archaeology: 50 Years On**  
Sharon Hodgetts and Annie Ross |
| 9:05 - 9:20    | **Landscape Archaeology**  
Bruno David |
| 9:20 - 9:35    | **Dating the Past: Insights from the Last 50 years**  
Zenobia Jacobs |
| 9:35 - 9:50    | **Australian Lithics 50 Years On**  
Chris Clarkson |
| 9:50 - 10:05   | **Beyond “Art, Aboriginal”: How Rock Art Entered the Lexicon of Australian Archaeological Practice**  
Jo McDonald |
| 10:05 - 10:15  | **Discussant**  
Lynley Wallis |
| 10:15 - 10:25  | **Discussant**  
Peter White |
| 10:30 - 11:00  | **Morning Tea**  
Room: Palm Lobby |
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<td>11:00 - 11:20</td>
<td>Getting it out in the Open: Residue Reveals of Past Resource Use</td>
<td>Boulevard 1</td>
<td>Learner-Driven, Bottom-Up Innovation in the Stone Tool Technology of Early Homo Sapiens</td>
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<td>Birgitta Stephenson</td>
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<td>Hsiu-Ying Yang</td>
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<td>11:20 - 11:40</td>
<td>Berribee Quarry: A Dated Silcrete Extraction Site in the Central Murray River Valley of North Western Victoria</td>
<td>Boulevard 2</td>
<td>Space to Play: Identifying Children's Sites in the Pleistocene Archaeological Record</td>
<td>Boulevard 3</td>
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<td>Rebekah Kurpiel</td>
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<td>Michelle Langley</td>
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<td>11:40 - 12:00</td>
<td>Archaeological Landscape Dynamics: A Surface Scatter Pilot Study in the Inland Pilbara</td>
<td>Boulevard 3</td>
<td>Results and Implications of Test Excavations in Pleistocene Sand Dunes at Cobaki, North Eastern NSW</td>
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<td></td>
<td>Norma Richardson</td>
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<td>Sally May</td>
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<td>12:00 - 12:20</td>
<td>Waste Not Want Not: A Whole of Assemblage Approach to Open Site Analysis</td>
<td>Boulevard 4</td>
<td>Searching for the Juvenile in Convictism: A Network Study of Convict Children in Colonial Archaeology</td>
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<td>Norma Richardson</td>
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<td>Caitlin D’Glayas</td>
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<td>12:20 - 12:40</td>
<td>Lateral Stratigraphy: Open-Site Archaeology Around Lake Woods (Jigiaya), Northern Territory</td>
<td>Boulevard 5</td>
<td>Ravenswood Minors: Identifying Children on a 1860s Queensland Goldfield</td>
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<td>Carl Shipton</td>
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<td>12:40 - 13:00</td>
<td>A Palimpsest Approach to Open Sites</td>
<td>Boulevard 6</td>
<td>‘Becoming Woppaburra’: The Dilemma of Insularity/Connectivity</td>
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<td>Beth White</td>
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<td>13:00 - 14:00</td>
<td>Lunch</td>
<td>Boulevard 7</td>
<td>Carbs, Clans and Country</td>
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<td>Reconciliation Action Plan Meeting</td>
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<td>Eleanor Crosby</td>
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<td>The Performance of Heritage in Late Capitalism: Ancient Trees, Doof and the Limits of Materiality</td>
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<td>16:50 - 17:10</td>
<td>The Art of Listening: The Inclusion of Archaeoaoustics in Archaeological Field Research</td>
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<td>Disrupting the Fibre Narrative: Rock Art and the Complexities of Fibre Objects</td>
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<td>Fighting Archaeology's Colonial Legacy</td>
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<td>Why I Left</td>
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<td>Sexual Harassment and Discrimination in Australian Archaeology: The Presence and Prevalence</td>
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<td>Nothing to to See Here?: Results of an online Survey of Bullying in Australian Archaeology and Consulting by the Australian Association of Consulting Archaeologists Inc.</td>
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<td>Western Australia's Aboriginal Heritage Act 1972: The Challenge of Reform</td>
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<td>A Critique on the Effectiveness of the Queensland Aboriginal and Torres Strait Islander Cultural Heritage Acts</td>
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<td>RPA Photogrammetry to Assist in the Recording, Maintenance and Management of Culturally Sensitive Sites</td>
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<td>It Is Our Land: We Will Look After It</td>
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<td>Queensland's Holocene Indigenous Fisheries: A Zooarchaeological Meta-Analysis</td>
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<td>15:20 - 15:40</td>
<td><strong>Shape-Shifting Sahul: Aboriginal Arrival and Migration Narratives</strong></td>
<td>Madeleine Fowler</td>
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<td><strong>The Life and Death of a Yalanji Dendroglyph</strong></td>
<td>Alice Buhrich</td>
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<td><strong>Using Radiocarbon-Dated Mud Wasp Nests to Estimate the Age of Rock Art Styles</strong></td>
<td>Damien Finch</td>
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<td><strong>The Archaeology of Ancestor Trackways: The Walet Project in Western and Eastern Torres Strait</strong></td>
<td>Duncan Wright</td>
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<td>15:40 - 16:00</td>
<td><strong>In Search of Lost Sediments: Trace Stratigraphy on Cave Walls</strong></td>
<td>Kim Newman</td>
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<td><strong>Culturally Modified Boab Trees in the Kimberley, WA</strong></td>
<td>Sue O'Connor</td>
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<td><strong>Unravelling Manifold Identities in the Early Nomadic Rock Art of East Siberia: Disrupting an Australia-Centred Conversation</strong></td>
<td>Irina Ponomareva</td>
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<td>16:00 - 16:30</td>
<td><strong>Afternoon Tea</strong></td>
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<td><strong>Arriving in Sahul: Old Questions and New Approaches</strong></td>
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<td><strong>Culturally Modified Trees in the Archaeological Record</strong></td>
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<td>16:30 - 16:50</td>
<td><strong>Survey and Preliminary Findings from Major Bottleneck Islands on the Northern and Southern Route to Sahul</strong></td>
<td>Kasih Norman</td>
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<td><strong>The Discovery and Conservation of a Mortuary Tree in Koamu Country</strong></td>
<td>Ross Mitchell</td>
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<td>16:50 - 17:10</td>
<td><strong>Sailing into the Desert</strong></td>
<td>Peter Veth</td>
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<td><strong>Hallowed Hollowed Trees as Invisible Cultural Features</strong></td>
<td>Heather Buijth</td>
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<td>17:10 - 17:30</td>
<td><strong>Rapid Early Peopling of Sahul</strong></td>
<td>Corey Bradshaw</td>
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<td><strong>Cultural Heritage in a Digital World</strong></td>
<td>Nicholas Hadnutt</td>
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<td>18:00 - 20:00</td>
<td><strong>AAA Annual General Meeting</strong></td>
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<td>8:30 - 9:00</td>
<td><strong>Boulevard Lobby</strong></td>
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<td>Mick de Ruyter</td>
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<td>8:30 - 8:50</td>
<td><strong>Melanesian Fighting Craft on Australian Shores: Contact Rock Art from Ambilobe, Ambrewa</strong></td>
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<td><strong>Alice in Wonderworld: Cultural Mapping of the Duncan-Kemp Archive on Mithaka Country</strong></td>
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<td><strong>The History and State of Play of the WA Defence of West Australia Hill During the South African War (1899-1902): An Archaeological Assessment</strong></td>
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<td>John Adeney, Tony Pagels</td>
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<td><strong>How Rivers Shaped Ancient Philippine Landscapes</strong></td>
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<td>Amy Roberts and Lynley Wallis</td>
<td>Earth Mounds, Billabongs and Typha: A Potential Example of a Niche Production Strategy within the Context of Environmental Niche Construction</td>
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<td>Emily Dilon and Craig Wastell</td>
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<td>Amanda Askren</td>
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**Room:** Boulevard 2

**Room:** Boulevard 3

**Room:** Palm Lobby

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**General Session**

**Room:** Boulevard 1 - 11:00 - 12:00

- Connection, Trespass, Swaraka’s and Identity, Mark-Making at Pirlangimpi Rockshelter No. 1, South Australia - Amy Roberts and Lynley Wallis
- Earth Mounds, Billabongs and Typha: A Potential Example of a Niche Production Strategy within the Context of Environmental Niche Construction - Craig Wastell and Robert Jones
- Navigating a Taphonomic Nightmare: Soil Chemistry, Sediment Chemistry, and the Evolution of Sediment-Environmental Interactions for the Central Murray River Corridor in South Australia - Emily Dilon and Craig Wastell
- Collaborative Research and New Dates at Lake Victoria, NSW - Amanda Askren
- Not Just Cotton: The Effects of Large-Scale Farming and Water Allocations on Cultural Heritage - Amanda Askren

**Room:** Boulevard 2 - 11:00 - 12:00

- Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney - Jordan Conolly
- Uneven Playing Fields: Mirrar Experiences in Archaeology and Cultural Heritage Agreement Making - Lynley Wallis
- Earth Mounds, Billabongs and Typha: A Potential Example of a Niche Production Strategy within the Context of Environmental Niche Construction - Craig Wastell and Robert Jones
- Navigating a Taphonomic Nightmare: Soil Chemistry, Sediment Chemistry, and the Evolution of Sediment-Environmental Interactions for the Central Murray River Corridor in South Australia - Emily Dilon and Craig Wastell
- Not Just Cotton: The Effects of Large-Scale Farming and Water Allocations on Cultural Heritage - Amanda Askren

**Room:** Boulevard 3 - 11:00 - 12:00

- A New Engraved Site in South East Queensland: Conservation Challenges and Opportunities for Intergenerational Relevancy - Marka Gorgi
- What Age is That?: Dating Buried Soils and Features Near Artesian Springs in the Northwest Murray-Darling Basin, Australia - Jordan Conolly
- The Way It Was, The Way It Is... - Jordan Conolly
- Earth Mounds, Billabongs and Typha: A Potential Example of a Niche Production Strategy within the Context of Environmental Niche Construction - Craig Wastell and Robert Jones
- Not Just Cotton: The Effects of Large-Scale Farming and Water Allocations on Cultural Heritage - Amanda Askren

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**Ancillary Meetings**

**Room:** Paradise 2 - 13:00 - 14:00

- NCSCRAA Meeting - Emily Dillon
- Open Site Archaeology in the NSW Alpine Region: Excavation Results of a Middle Holocene Site at East Jindabyne - Tonya Gooley

**Room:** Paradise 3 - 13:00 - 14:00

- ANCATL Meeting - Ryan Crawford
- Archaeological Remnants: Japanese Occupation of Christmas Island, Indian Ocean During WWII - Jo van der Reydt

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**Lunch**

**Room:** Palm Lobby - 13:00 - 14:00

- Discussion at Lunch - Duncan Keenan-Jones
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<td>Aboriginal Occupation of Channel Country, for South West Queensland</td>
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<td>Douglas Williams</td>
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<td>Investigating the Record for Food Production and Villages in Channel Country, Western Qld</td>
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<td>Michael Westaway</td>
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<td>At the Confluence of the Past and Present: Kurnu-Baakandji and the Toorale Water Infrastructure</td>
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<td>Samantha Keats</td>
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<td>Villages of the Barkandji and Conservation on the Barka</td>
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<td>Colin Pando</td>
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<td>Looking Deeper into Wilcannia Barkandji Twenty First Century Interactions with the Barka (Darling</td>
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<td>Sarah Martin</td>
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<td>Kaakutji, the Whitewood Tree and the Barka, our Ancestors Come Back to Show us the Path</td>
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<td>William (Badger) Bates</td>
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<td>16:00 - 17:00</td>
<td>Afternoon Tea and Poster Session</td>
<td>Palm Lobby</td>
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<td>19:00 - 23:00</td>
<td>Conference Dinner and Awards Ceremony</td>
<td>Boulevard Ballroom</td>
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<td>Amanda Atkinson</td>
<td>Not Just Cotton: The Effects of Large-Scale Farming Water Allocations on Cultural Heritage</td>
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<td>Lachlan Clark</td>
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<td>Tessa Dux</td>
<td>Ignored or Invisible? Why Don’t we Find Thylacine-Based Material Culture in the Archaeological Record?</td>
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<td>Laura Jacobs</td>
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<td>Genevieve Jones</td>
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<td>Jayne Wilkins</td>
<td>Humans and Environment At Ga-Mohana Hill North Rockshelter, Southern Kalahari, South Africa</td>
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The Defence of West Australia Hill During the South African War (1899-1902): An Archaeological Assessment

John Adeney

The defence of West Australia Hill was a day-long encounter between 30 West Australians and 300-400 Boers during the South African War (1899–1902). The tactical superiority by the West Australians suggested by the written record was examined in an archaeological context. An archaeological survey using metal detectors and GPS was conducted over 60 hectares to locate the firing locations of the West Australians and the Boers. This information was combined with archival evidence to determine how the hill was successfully defended.

Battlefield Patterning Analysis (BPA) as pioneered by Scott and Fox on the Custer battlefield, USA was used to assess how effective the use of terrain and fire was by the combatants. The limited number of ammunition finds hindered the application of BPA but showed that the method has application on 19th and 20th century battlefields. The concept of Dynamic Patterning, a component of BPA was developed further by the introduction of two innovative methods of recording ammunition characteristics: off-centeredness of firing pin indentations, and marks within firing pin indentations on the headstamps of fired cartridges. These methods validated the locations of the combatants during the day-long defence.

This archaeological investigation was the first time that metal detection in conjunction with GPS had been completed on a South African Boer War (South African War) battlefield.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Using GIS and Spatial Statistics to Decipher Large, Multi-Component Open Sites Along the Doring River (Western Cape, South Africa)

Christopher Ames, University of Wollongong
Matthew Shaw, University of Wollongong
Natasha Phillips, University of Wollongong
Sherrie Chambers, University of Wollongong
Brian Jones, University of Wollongong
Alex Mackay, University of Wollongong

Large surface artefact distributions occur across a series of actively eroding sediment bodies flanking the Doring River in South Africa’s Western Cape Province. Over two field seasons in 2018-2019, the Doring River Archaeological Project (DRAP) conducted full coverage survey of six of these localities. All cores and retouched implements, as well as pottery, glass, and ochre fragments were point located and analysed in situ for techno-typological attributes using a custom-designed mobile GIS recording system. The resulting dataset contains nearly 25,000 artefacts spanning the past 500,000 years or more, including diagnostic artefacts from the Early, Middle, and Later Stone Age, as well as evidence of historic occupation. In conjunction with mapped surface exposures and detailed terrain models produced with UAV imagery, this study uses point pattern analyses and ecological neighbourhood statistics to evaluate artefact distribution in light of landscape geomorphology. The results indicate highly variable spatial patterns across different prehistoric periods. Although clearly intertwined with landscape formation, this variability cannot wholly be accounted for by natural processes. Taking a GIS and spatial statistics approach to open sites allows us to disentangle the complex chrono-spatial patterning of large artefact accumulations, extract behaviourally relevant information, and inform our understanding of site formation.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Archaeology and the Cumberland Plain

Julia Atkinson, AECOM Australia Pty Ltd
Darran Jordan, AECOM Australia Pty Ltd
Andrew McLaren, AECOM Australia Pty Ltd

The Cumberland Basin, or Cumberland Plain as it is more commonly known, has been intensively investigated by multiple archaeologists and heritage specialists due to long term and ongoing development pressures. The results of archaeological investigations tell a compelling narrative, but so too do the investigations themselves. This paper looks at how the two intertwine to form a unique story of investigation and discovery, across this unique and changing geographical area of Australia.

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

Not Just Cotton: The Effects of Large-Scale Farming Water Allocations on Cultural Heritage

Amanda Atkinson, Austral Archaeology

The Murray River system has provided economic and cultural support for Aboriginal people for centuries; this is evidenced by the abundance and
variety of Aboriginal heritage sites located along the banks and tributaries of the system. Since non-Indigenous settlement, the region of south-western New South Wales and north-western Victoria has been heavily farmed, impacting on both heritage sites and the lifeways of Aboriginal people. However, recent developments have brought a new challenge on a scale not seen before; large-scale farming by international corporations. Water allocations which take thousands of megalitres each day from the water system are still being approved. This poster looks at the physical and emotional impact on Aboriginal culture and heritage from taking excessive amounts of water from the Murray River system to support large-scale farming.

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This paper looks at the physical and emotional impact on Aboriginal culture and heritage from taking excessive amounts of water from the Murray River system to support large-scale farming. It looks specifically at the number of heritage sites impacted by changes to the river’s flow regime and also at accounts from Aboriginal people about how changing flow affects their life and health. This paper will show that it is not just cotton, but all large-scale farming projects have a heavy impact on all aspects of Aboriginal culture.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

The Archaeology of the ‘Secret War’: The Material Evidence of Conflict on the Queensland Frontier 1849–1901

Bryce Barker, University of Southern Queensland
Lynley Wallis, The University of Notre Dame Australia
Heather Burke, Flinders University
Noelene Cole, James Cook University
Kelsey Lowe, University of Southern Queensland
Leanne Bateman, University of Southern Queensland
Ursula Artym, Flinders University
Anthony Pagels, Flinders University

The historical, primary source data on the Native Mounted Police (NMP) and their role in colonial
Queensland (Qld) is well documented, having been comprehensively explored by numerous historical scholars (e.g. Bottoms 2013; Evans et al. 1975; Loos 1982; Orsted-Jensen 2011; Reynolds 1981; Richards 2005, 2007, 2008; Skinner 1975). These sources outline the systematic use of a paramilitary force to 'subdue' Aboriginal resistance to European incursions on their land for a period of over 50 years, resulting in massacres, reprisals and extra-judicial executions. But what of the physical evidence of this well documented frontier violence? This paper presents some of preliminary results of the 'Archaeology of the Queensland Native Mounted Police Project' - the first comprehensive account of this site type in Australia. Canvassing the physical imprint of frontier conflict across Qld between 1849 and 1904, we focus specifically on the activities and camp sites of the NMP, outlining what information the archaeology of these sites can provide.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

They Answered the Call: An Archaeology of the WWII Australian Women's Army Service Camp, Bibra Lake, Western Australia

Jillian Barteaux, The University of Western Australia
Sven Ouzman, The University of Western Australia

Conflict archaeology differs from battlefield archaeology in going beyond the sites of physical conflict to investigate the larger circuit of sites and people involved in any given conflict. In this spirit we examine both an under-examined issue - gender - and place - Perth - as a forgotten World War II conflict site. Between 1943 and 1944 between 50-150 female personnel - many of whom were transported on open cattle trucks across the Nullarbor in summer - were stationed at Bibra Lake, 16 km south of Perth, as the Australian Woman's Army Service (AWAS) contingent running the 66th searchlight Battery. This site never saw military action, but it is hard today fully to understand the widespread fear of a Japanese invasion that occasioned this camp and an extensive network of observation, naval and other sites across Western Australia. Brought to our attention by a committed member of the public, in 2017 UWA held its undergraduate fieldschool at the site to uncover information on women's experiences of the war and to mitigate against the threat of the now-abandoned Roe 8 highway development. The site is also adjacent to significant known Aboriginal archaeological and ethnographic sites. Combining field survey and excavation with records such as war diaries, newspaper reports, photographs, memoirs and anecdotal local memories, we were able to piece together a picture of a regimented but generally humdrum life enlivened by occasional incidents such as a male soldier catching on fire and being saved by an AWAS member rolling him in the sand. Tellingly, that has left almost no artefactual trace as materials were salvaged upon its closure. But we do have an extensive feature record. We present the findings of this work as well as the after effects of the fieldschool, in which the site has become reimagined as a site of memory for the surrounding community, and a spur to local council level heritage management.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Rapid Early Peopling of Sahul

Corey Bradshaw, Flinders University

The entry point into, and subsequent spread of the first humans across Sahul (New Guinea and Australia) is still uncertain owing to incomplete sampling and the event's antiquity (50-65 ka, or possibly earlier). Modelling the plausible ecological mechanisms of this rapidly expanding population could reveal how one of the earliest ex-Africa migrations occurred. We developed a stochastic, cellular-automaton
model incorporating generationally scaled human population dynamics based. We inferred spatially explicit dynamic carrying capacity from net primary productivity hindcasted using the LOVECLIM Earth-system model at 1000-year intervals during the period of initial entry. The model includes both nearest-neighbour immigration and emigration conditioned on relative carrying capacity and landscape rugosity, and a finite probability of long-distance dispersal conditioned on carrying capacity and landscape productivity. Scenarios compared to Signor-Lipps-and spatial bias-corrected map layers inferred from existing archaeological data lend relatively more support for a dominant entry into Sahul from the southern route via the Sahul Shelf, and date of first entry consistent with either 75 or 50 ka, and a nonlinear relationship between human carrying capacity and net primary production. The peopling of the entire continent of Sahul occurred within approximately 180-250 generations (~ 5000-7000 years) from initial entry, with dominant movement pathways initially southwards following the west coast and the eastern region, and then easterly along the southern coast of Australia. Our model demonstrates for the first time the ecological mechanisms driving movement of ancient humans across continental landscapes, with important implications for understanding the processes operating during the ex-Africa Homo sapiens diaspora.

### Session: Arriving in Sahul: Old Questions and New Approaches

### Lithic Technologies from Matja Kuru 2, Timor-Leste

**Tierney Brennan, The University of Queensland**

The stone technologies which currently define the Wallacea are a seemingly enduring and informal tool kit. With the increase in attention to Wallacean archaeology, the growing record is allowing for deeper insight into the technologies, technological organisation and adaptation of this region. In Timor-Leste, with evidence of long-term use of osseous materials being used for complex technologies, questions still remain regarding the nature of the stone technologies and how they fit into the overall technological organisation of Timor-Leste. This poster presents the lithic analysis of Matja Kuru 2 (MK2), an inland lacustrine site in Timor-Leste’s eastern end with occupation dating back around 40,000 years. With the absence of formal tool types, and the aide of replicative knapping experiments, it was found that the MK2 assemblage is comprised of a raw material conserving, expedient tool kit throughout all occupation phases, with an increase in raw material variability into Holocene occupation of the site. With more Timor-Leste assemblages now becoming available from differing ecosystems we can now situate MK2 within a wider comparative analysis to tease out minute differences temporally and ecologically. This pattern seen at MK2 broadly mimics what is also seen at the coastal sites of Jerimalai and Lene Hara on the eastern coast of the island. But how well does this pattern hold up to a more comprehensive analysis of reduction processes and technological organisation across Timor-Leste?

### Long Distance Relationships: South Sulawesi in the Story of Ancient Australia

**Adam Brumm, Griffith University**

This year marks the 50th anniversary of John Mulvaney’s 1969 archaeological expedition to South Sulawesi, the southwestern portion of the Indonesian island widely known then as Celebes. This historic venture co-led by Indonesian archaeologist R.P. Soejono was the first effort to apply radiocarbon dating to the prehistoric record in Indonesia. A particular aim was to investigate the possibility of ancient cultural diffusion between South Sulawesi and northern Australia, an old notion based on stone tool typology that had long intrigued Australian prehistorians. Among them was lithic doyen Fred McCarthy, whose theories about the external origins of Kimberley points and microliths drew him to South Sulawesi in the late 1930s. In fact, according to Campbell Macknight (a member of the 1969 team), archaeological research in South Sulawesi constitutes the oldest and most enduring connection between the scientific worlds of Australia and Indonesia. Here, I consider the background and outcomes of the 1969 field campaign and the history of Australian-Indonesian archaeological research in South Sulawesi since this time. In recent years, new findings have emerged that confirm this region’s importance in the Australian story and the wider narrative of human evolution, including the discovery that the limestone karsts of Maros, where much of the 1969 fieldwork was concentrated – and follow-up excavations by another team member, Ian Glover - harbour some of the earliest known rock art on earth. However, key questions underpinning the Mulvaney-Soejono expedition remain unanswered. Of particular note is the century-old enigma of the identity and origin of the Holocene hunter-gatherers known as ‘Toaleans’ and their connection, if any, with major changes in the past history of Aboriginal Australia, including the arrival of dingoes, the proliferation of microliths, and the emergence and spread of the Pama-Nyungan language family.

### Session: The History of Archaeology in the Driest Continent and its Relationships with (Less Dry) Adjacent Regions
Ewamian Archaeology in the Undara Lava Tubes

Alice Buhrich, TropX
Nick Roberts, James Cook University
Asa Ferrier, La Trobe University
Nichola B. Winn, Archaeologist
Stephen Wargent, Ewamian Aboriginal Corporation
Michell Kapteyn, Ewamian Aboriginal Corporation
Owen Ray, James Cook University

The Ewamian Aboriginal Corporation (EAC) manages an estate in the Gulf savannah of Queensland that is over half the size of Tasmania. EAC conduct primarily reactive (responding to development), but also grassroots heritage projects in partnership with archaeologists. Within the EAC estate are the Undara lava tubes, which have generally been considered places the Ewamian people avoided in the past.

In 2019, the Ewamian Rangers identified several stone arrangements, stone artefacts, faunal remains and charcoal in the opening of a lava tube. The EAC invited a team of archaeologists to work with Ewamian Rangers to excavate a small area to determine if the lava tube held evidence of past Aboriginal use or occupation. One test pit (1m x 1.5m) was excavated in the tube entrance revealing a range of stone artefacts in various stages of production, extensive faunal remains, charcoal and a possible hearth. One small piece of charcoal was found on a ledge in the tube entrance and cultural materials extended 10m into the tube at the edge of the ‘dark zone’. A second piece of burnt or oxidised wood was found on a ledge inside the ‘dark zone’ 80m from the entrance.

Although preliminary, results provide evidence of Aboriginal use of the lava tube. The project is a successful case study of archaeologists to work with Ewamian Rangers to excavate a small area to determine if the lava tube held evidence of past Aboriginal use or occupation. One test pit (1m x 1.5m) was excavated in the tube entrance revealing a range of stone artefacts in various stages of production, extensive faunal remains, charcoal and a possible hearth. One small piece of charcoal was found on a ledge in the tube entrance and cultural materials extended 10m into the tube at the edge of the ‘dark zone’. A second piece of burnt or oxidised wood was found on a ledge inside the ‘dark zone’ 80m from the entrance.

Hallowed Hollowed Trees as Invisible Cultural Features

Heather Builth, Puutu Kunti Kurrama and Pinikura Aboriginal Corporation

Large hollowed CMTs occur as an integral part of Aboriginal cultural landscapes wherever large Eucalypts have grown and provided this resource. They are often identified as Ancestor or Spirit trees. They perform different functions as activity spaces for Traditional Owners - especially where shelter is required due to inclement weather. My doctoral research in 1999 provided the evidence that old and often large E. viminalis trees across the Budj Bim landscape of SW Victoria had been culturally modified by enlarging hollows in order to perform specific gender-related functions and thereby enabling a thriving economy based on eel aquaculture.

Such hollowed CMTs are currently in the path of the Western Highway re-routing development near Ararat in Victoria, but these have failed to be recognised and supported as hallowed cultural features by archaeologists and the Victorian State Government department responsible for protection of Aboriginal Heritage. Is it because these CMTs provide the evidence for a cultural landscape that they have been denied individual site recognition? Such recognition could be inconvenient when destruction of landscape and construction of a highway is sought. It could also be possible that their individual invisibility as a Djab wurrung cultural feature has to date protected them.

How can it be so difficult to identify and protect CMTs such as these for the archaeological record?

And why are archaeologists reluctant to enter into this debate?
I provide:

• results of previous research into CMTs of this type;
• details of the situation that has occurred on the Western Highway, Victoria, which includes Djab wurrung appealing for protection of this cultural landscape via the Commonwealth Heritage Act due to the lack of support from Aboriginal Heritage Victoria;
• criteria and characteristics to identify these CMTs in the landscape for future protection.

Session: Culturally Modified Trees in the Archaeological Record

Ravenswood Minors: Identifying Children on a 1860s Queensland Goldfield

Xavier Carah, Niche Environment and Heritage
Kevin Rains, Niche Environment and Heritage

The analysis of artefacts from the Ravenswood Mining Landscape and Chinese Settlement Area (QHR 650038) highlights the presence of children on the Ravenswood goldfield. However, this assemblage does not date to the earliest years of non-Indigenous settlement in Ravenswood. The only evidence of the first years of Ravenswood settlement, so far identified, are the burials of sixteen individuals at the Ravenswood Original Cemetery (1868-1873).

The ROC was re-discovered and excavated in 2017 as part of the Ravenswood Extension Project (REP). Sixteen individual burials, nine adults and seven children, were excavated and removed for skeletal analysis before reinterment at the current Ravenswood Cemetery. The ROC provides us with the only evidence of children on the gold field within the earliest years of its existence. Their presence is represented by their physical remains. Very few artefacts are associated with the child burials. Those artefacts that are present are the utilitarian remains of coffins and shrouds – copper wire ties, nails, and wood fragments.

While the late 19th and 20th Century artefacts of the RMLCSA indicate children’s leisure and learning - dolls and slate - the ROC burials demonstrate their presence in Ravenswood from its earliest years. The child burials provide an insight into life and death on the gold field for minors who would have otherwise remained invisible until much later in the Ravenswood story.

Session: Disruptive or Invisible: Children and the Archaeological Record

1000 Years of Tuna (Scombridae: Thunnini) Exploitation at Sabazan, Carriacou, West Indies: Size Reconstruction as a Method for Detecting Sustainability

Karene Chambers, Australian National University
Christina Giovas, Simon Fraser University

The zooarchaeological assemblage of the pre-Columbian site of Sabazan on Carriacou contains a large number of tuna (Scombridae: Thunnini) throughout its AD 400 – AD 1400 occupation, particularly for a site in the West Indies. The large assemblage (NISP = 1692, MNI = 54) presents a unique opportunity to investigate the sustainability of tuna exploitation at the site by testing for predation-driven changes in abundance and size, based on foraging theory and ecological models. Modern reference collections of tuna from four genera (Auxis, Katsuwonus, Thunnus and Euthynnus) were used to identify archaeological specimens and to develop new regression models for estimating fish total length and weight based on vertebral measurements. No significant change in abundance or size composition was observed, except for Thunnus NISP, which increased through time. These results suggest that tuna exploitation at the Sabazan site was sustainable, as expected. The initial size regression models created for the study appear robust and demonstrate strong correlation between fish size and vertebrae size, even at the family level. Future studies should further develop the models by incorporating larger sample sizes and developing models for other genera.

It Is Our Land: We Will Look After It

Patrick Churnside, Murujuga Aboriginal Corporation
Ken Mulvaney, Rio Tinto

Murujuga National Park (MNP), declared in 2013, is Western Australia’s 100th National Park and covers 49.1km² of Burringup Peninsula. It is the only National Park owned and managed by its Traditional Owners. Murujuga Aboriginal Corporation (MAC) represents the Ngarda-ngarli, the people comprising the three Native Title groups, Ngarluma-Yindjibarndi, Yaburara-Mardudhunera and Wong-Goo-Tt-Oo. MAC is governed by a board, comprising elected members of the Ngarda-ngarli, it employs staff including Park Rangers, with much of the cultural functions managed through the ‘Circle of Elders’.

The MNP is situated on Burringup Peninsula, the largest island in a group of forty-two which comprise the Dampier Archipelago, situated on the north-west coast of Australian. The rugged, rocky landscape presents a unique natural landscape that also contains the
world’s greatest concentration of petroglyphs, along with other cultural features. Impacting on all this is that of Industry, which first came to Murujuga in the 1960s, now a commercial hub for petrochemical processing and is one of Australians largest bulk commodities export ports, chiefly iron ore.

This place is a culturally rich and spiritually sacred land and seascape which presents specific management issues for the Traditional Owners and Aboriginal Rangers. MAC has developed a mechanism of governance and management processors which are culturally acceptable and ensuring the protection and running of the place. Negotiating with government departments and industry to ensure that the Ngadangarli way is how all relate to the management of the place.

Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

The Bunuba Cultural Caretakers Project: Maintaining Rock Art Through Healthy Country Processes

Lachlan Clark, Bush Heritage Australia
Shannon Shaw, Department of Biodiversity, Conservation and Attractions
Mary Aiken, Bunuba Dawangarri Aboriginal Corporation
Jonil Brooking, Bunuba Rangers
Melissa Marshall, The University of Notre Dame Australia

Bunuba Muwayi (Country) in the heart of the Fitzroy Valley in the Central Kimberley is characterised by Winamu (Sandstone) and Balili (Limestone) ranges, Galanganyja (Black-soil plains), and the mighty Bandaral Ngarri (Fitzroy River). Importantly, it is also the home of the Bunuba People. Archaeological evidence shows that Bunuba people have been living on country for over 46,000 years, and their memories and knowledges are alive in the rock paintings and engravings found across Bunuba country (Bunuba HCP, 2018). To maintain not only our sites but our associated cultural practices, we commenced our ‘Bunuba Cultural Caretakers’ Project’ in 2018 following a pilot program the year before.

The project focuses on Indigenous-led cultural heritage management and involves Traditional Owners visiting rock art sites with local rock art specialists; recording and storing cultural information; and carrying out site assessments of the various environmental and human-induced risks to each site, resulting in a site management plan which is implemented by the Bunuba Rangers. The Bunuba Cultural Caretakers Project encompasses the vision of the Jalangurru Muwayi Bunuba Healthy Country plan and is a central element of the first stage of its implementation. In particular, the foundational work of this project, during which sites are identified and information is recorded, before monitoring, maintenance and management activities are conducted. This is all done ‘on Country’ with multiple generations of Bunuba people, enabling cultural work while importantly and simultaneously, facilitating intergenerational knowledge transfer. Subsequent stages of the project concentrate on storing the recorded information in secure databases, to use for future cultural knowledge transfer activities, and maintaining these significant sites.

This paper explores the development and early findings of the Bunuba Cultural Caretakers Project, a collaboration between the Bunuba Cultural Caretakers Project, a collaboration between the Bunuba Cultural Caretakers Project, Aboriginal Traditional Owners and the Nulungu Research Institute at the University of Notre Dame Australia.

Plenary
Australian Lithics 50 Years On
Chris Clarkson, The University of Queensland

Challenging global narratives and the meaning of major cultural transitions, Australian stone artefacts are ubiquitous, distinctive and unique. Archaeologists in this country have typically embraced ethnoarchaeology and eschewed Old World typology in the search for the meaning encoded in assemblage variability. Fifty years on from John Mulvaney’s ground-breaking book, I take the opportunity here to assess where we are at in Australian lithic studies, what we have discovered so far, and the tremendous potential lithics offer in better understanding the past of this remarkable continent.

Session: Beyond the (Pre) History of Australia

Cooktown Ironwoods in the Frontier War: Archaeology of a Unique Assemblage of Culturally Modified Trees at Boralga Native Mounted Police Camp, Cape York Peninsula

Noelene Cole, James Cook University
Lynley Wallis, The University of Notre Dame Australia
Heather Burke, Flinders University
Bryce Barker, University of Southern Queensland
Les Harrigan, Rinyirru Land Trust

As a longstanding base for Queensland’s frontier war on Cape York Peninsula (CYP), the Boralga Native Mounted Police (NMP) camp (1876–1894) on Rinyirru National Park retains a mixed archaeological record of structural remains, European items and Aboriginal cultural materials. This study focuses on one of the
site’s most striking cultural features: an assemblage of culturally modified *Erythrophleum chlorostachys* (Cooktown ironwood or red ironwood) trees. Detailed contextual analysis was conducted on attributes and tool marks of 38 cultural scars on the trunks of 31 trees. Analysis of tool marks suggests that wood was removed (variously) by stone tools, tomahawks and long handled axes. Sugarbag scars and woomera scars at Boralga have attributes typical of Aboriginal cultural scars recorded on Cooktown ironwoods elsewhere in CYP. As historical documents record that Aboriginal use of steel pre-dated the 1873 Palmer goldrush, scars made with steel blades to create woomeras (Aboriginal weapons) are likely to have been made before the establishment of the police camp. Thirteen trees have large, invasive, multi-panelled ‘slab’ scars which appear to represent a previously undocumented style of wood procurement, in this case associated with hybrid practices of the NMP. The spatial distribution of the cultural modifications and types of technology indicated, reveals an unfolding scenario of nineteenth century history and land use, the main theme being the supplanting of sustainable Aboriginal land use of prime waterfront land by the establishment of the police camp. By integrating historical, cultural, ethnographic, spatial, typological, and botanical data this study sheds light on profound socio-economic changes within a war setting. It addresses gaps in records of the frontier war and highlights the urgency of documenting unique aspects of the cultural record – Cooktown ironwood trees of advanced age and their fragile, deteriorating cultural modifications.

**Session: Culturally Modified Trees in the Archaeological Record**

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**What Age is That? Dating Buried Soils and Features Near Artesian Springs in the Northwest Murray-Darling Basin, Australia**

Malcolm Connolly, Cambridge University
Richard Robins, Everick Heritage Consultants

This paper considers the question: When did Aboriginal people arrive in the upper extremities of the Murray Darling Basin (MDB)? To do this, we present Optically Stimulated Luminescence (OSL) ages for buried soil features near artesian springs in the northwest MDB recently obtained by Connelly. This question provides opportunities to investigate the timing of people’s arrival and probable route(s) to this remote region, by considering connections between people and permanent water sources, particularly springs, that flowed from at least 800,000 years to the present or recent past. OSL samples collected from five locations and processed using the Single Aliquot Regenerative-dose method provide dates ranging from the before the Last Glacial Maximum at 25.2 ± 2.6 ka to the Late Holocene at 4.6 ± 0.4 ka. This spread of dates, complements and expands on a series of TL and carbon dates obtained previously by Robins from sites associated with spring and freshwater lake related sites in this region. This evidence provides insights into links between people and permanent water sources over long periods of time in an arid area, and contributes to a better understanding human mobility across the continent (Sahul). These preliminary results also offer opportunities to explore questions about site formation processes and the use of geoarchaeological methods and principles to better understand Aboriginal people’s use of Australia’s inland. This research forms part of the lead author’s in progress PhD research.

**Session: General**

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**Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country, with Examples from New South Wales and Queensland**

Lawrence Conyers, University of Denver
Emma St Pierre, Virtus Heritage

Indigenous unmarked graves and cemeteries have very little records if any or formal boundaries and fencing and protecting the resting places of the ‘old people’ is an ongoing concern for many recent generations of Indigenous families. The legacy of colonialism has led to many communities’ loss of or partial loss of knowledge of their ‘traditional’ burial grounds and post-contact burials and cemeteries, as well as the locations of massacre sites. Some Indigenous communities have looked to science to provide culturally appropriate tools, that are non-invasive such as ground-penetrating radar (GPR) and magnetometry to assist with mapping and identifying graves and cemeteries. This paper will explore these issues and provide examples from New South Wales and Queensland where culturally appropriate science has been used to assist Indigenous communities with continuing cultural law and practices and protecting their old people’s resting places.

**Session: Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country**

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**Linking the Past with the Present: Exploring Ethno-Archaeology and Sharing Stories in Weipa, Cape York, Queensland**

Helen Cooke, Australian National University

This research was part of the ARC Project ‘Enhancing..."
cultural heritage management for mining operations: a multi-disciplinary approach' with archaeologists and environmental researchers from several universities either side of the Tasman sea and industry partner Rio Tinto Alcan Weipa. My archaeology project included recording historic and current camps site formation, oral history and living practices in Wathayn country to test if these activities have any resonance with the older shell and earth mound sites studied by my colleagues. Oral history brought these camps to life, explaining the layout and some of the activities that leave evidence and those that may not, and the connections between camps and resource areas.

We developed a cultural map for my edification and it turned into a teaching aid for Mrs Beatrice Gordon, the traditional knowledge holder who worked with me. I also addressed the issue of communicating research results to traditional owners in a meaningful way that may help with future cultural heritage management practices, cultural transmission and tourism opportunities, experimenting with videos and booklets.

This may contribute in some small way to RTA's cultural heritage management program.

Another Way to Motorway: M12 Archaeological and Heritage Interpretation

Andrew Costello, Jacobs Group (Australia) Pty Ltd
Jamie Eastwood, Darug Aboriginal Custodians

Collaborative archaeology and heritage projects are now commonplace across Australia with First Nations’ voices being included in the design and interpretation of the archaeological investigation process. Yet, while there is a growing global acknowledgement of the power of the First Nations’ knowledge for enriched place-making, however this is not yet visible in major public projects in Australia.

The M12 Motorway Project has been an inclusive consultation and investigation process which has provided a genuine opportunity for the Western Sydney Aboriginal community to provide their local story to input into the fabric of the road design. An extensive archaeological test excavation across a 16 km linear transect has provided an assemblage that underpins a broader consultation and inclusion process that is being translated into tangible symbols for landscape interpretation.

This paper describes the initial results of the archaeological investigation of the M12 Motorway and the process by which local Aboriginal voices were invited, heard and considered in the early stages of the Project.

Testimony, Transformation and Trial: The History and State of Play of the WA Aboriginal Heritage Act Review

Ryan Crawford, Extent Heritage
Annabelle Davis, Extent Heritage

The Western Australian Aboriginal Heritage Act, enacted in 1972 has been the subject of numerous legislative reviews over many years and yet very little of the AHA has ever changed.

In this paper we shall examine the history and cycle of legislative review in WA and what drives this change. Why did these reviews fail and why did nothing transform?

We will then consider how trials and tribulations in both the legal sense as well as from the Aboriginal community and archaeological perspective feed into the current review.

Does the new journey of legislative review in WA really provide the opportunity for transformation?

Carbs, Clans and Country

Eleanor Crosby, Griffith University

This paper investigates the roles that high carbohydrate food sources and the population size of Aboriginal self-governing social groups play in determining territorial areas amongst the Bandjalangic clans located between the Logan and Tweed Rivers who use Mibiny for ‘person’.

The first part considers Aboriginal diets, long-term carbohydrate (CHO) needs, and CHO availability across the various local environments. The next examines the historical anthropology record for information about how Mibiny socio/political clan structure controlled day-to-day governance. The third part shows how these two main factors affected clan territory.

Extending the argument, speculation about the role of CHO sources on isolated islands may arise.
The Performance of Heritage in Late Capitalism: Ancient Trees, Doof and the Limits of Materiality

Dan Cummins, Aboriginal Victoria, Department of Premier and Cabinet

Victoria's Aboriginal Heritage Act 2006 has driven an unprecedented level of archaeological inquiry in Victoria, often considered an example of best practice, requiring thorough investigation and collaborative management of cultural heritage resources. However, this has also resulted in a rise in the ‘valuation’ of material Aboriginal heritage, which has led in some instances to (amongst other outcomes) non-artefacts being registered as sites, and large-scale artefact recovery without archaeological methods or analysis. As a mechanism for the commercial management of Aboriginal heritage, at the vast frontiers of Melbourne’s suburbia and in the building of new infrastructure, the Act has succeeded in cementing an archaeological industry; and is a key mechanism for achieving the State’s express aim of Traditional Owners generating economic opportunities from the management of their heritage. Yet heritage is far more than just the objects of the past. This paper explores several instances where heritage values have emerged outside this industry and entered public discourse. In each of these examples, the primacy of objects as heritage was called into question, and each, arguably, evolved into an act of resistance against the commodification of the indigenous past. This paper explores the genesis of these situations and suggests heritage in Late Capitalism is performed beyond the structures of materiality; presenting new challenges for the regulation of an Aboriginal past produced not from materials, but from ephemeral intersections of authenticity, experience and improvisation.

Session: Disrupting Materiality: Archaeology and Heritage Seen Through the Minds Eye


Julia Cusack, The University of Queensland

Aboriginal burnt earth mounds and burnt clay nodules are common archaeological features on flood plain and wetland environments in the Murray-Darling basin. The history of mound research demonstrates that after an initial phase of investigation starting in the 1970s, very little has been done to advance our understanding of the attributes and formation processes associated with this site type. The lack of information limits the correct identification and the implementation of effective management strategies in a modern land management context.

Attributes used to define mounds include burnt soil, clay heat retainers and native faunal remains deposited by Aboriginal people during past food preparation activities. A proportion are also known to contain burials, and these are particularly common on the eastern side of the Riverine Plain in southern NSW, making them highly significant to Traditional Owners and in need of long-term preservation.

Research undertaken for my PhD involving intensive archaeological surveys on farmland across the
eastern side of the Riverine Plain demonstrated that burnt surface soil and clay commonly associated with Aboriginal mounds may also be present on mounds formed by natural processes and agricultural practices. This made it difficult to distinguish between Aboriginal and other mound types during landscape surveys. Geophysical surveys undertaken on a sample of these mound types provided clear evidence of morphological differences.

This poster presents further research involving sedimentary, chemical and mineral profiles of mound soils and burnt clays to understand the depositional and post depositional processes involved in the formation of different mound types.

**Methodology Development for Documentation, Salvage, and Relocation of Native Grinding Marks**

Luc Daigle, Strata Control Technologies

Grinding stone by the native people of Australia has left markings on outcrops and boulders throughout Australia. The act of shaping and polishing of stones for hand tools and food preparation have left durable long-lasting marks that record long past activity. These features are often found in creek beds with exposures of sandstone and associated with permanent waterholes, intermittent water sources and reservoirs. The occurrence of such sites is frequent as these represent daily life activities that would be required near any encampment or hunting and foraging expedition.

Eastern Australia has seen a huge expansion of the coal mining industry over the past 20 years, these activities disrupt the landscape in various ways, the archaeological record is being encroached and placed at risk. Regulations are in place to manage the interaction between heritage and modern activities with government departments, archaeologists, native representatives and industry representatives all seeking to document, manage, and protect our culture. If grinding features are located within an area that is at risk from modern activities, it may be required that further investigation and salvage of a site is deemed necessary. Hosted on stone, such sites require specialized skills in geology and rock mechanics to describe their nature.

Investigations completed have evolved over time as experience, technologies, and expectations have changed. The following is the systematic approach we used when participating in management of a site:

1. Site geotechnical investigation and detailed photogrammetry.
2. Laboratory analysis of geotechnical samples.
3. 3D image analysis and documentation of the site.
4. Design proposals for site management, salvage and relocation.
5. Salvage and relocation methods.

Methods of site investigation and documentation, development of strategy and plans for management of sites and if necessary, the salvage and relocation are discussed here. As modern life encroaches archaeological sites, salvage and relocation of stone hosted sites is becoming a frequent disruption.

**A Living Archive: Local Reponses to Colonial Settlement**

Mia Dardengo, Flinders University
Amy Roberts, Flinders University
Mick Morrison, Flinders University
River Murray Mallee Aboriginal Corporation

The myriad of colonial processes that arose after European colonisation of Australia have long been a focus of archaeological inquiry, though there is a need to continue to find new ways to interrogate and explore the impact of those colonial encounters. Culturally modified trees (CMTs) are a rich archaeological data source that can provide significant insight into the continuity and adaption of Aboriginal lifeways in a dynamic landscape. This paper explores the CMTs of Calperum Station to provide new understandings about local Aboriginal responses to European settlement. During a purposive archaeological survey, 89 CMTs featuring 99 scars were analysed on both red gum and black box tree species., which can now be monitored and protected for the future. Attributes of both the CMTs and scars were recorded, including the trees health, girth and context, and a scars dimensions, regrowth and location. An analysis of these attributes and more, expose tree species-specific trends in the data that tell a distinctive local narrative of bark use in the Riverland. When these trends are combined with compiled ethnohistorical records, they reveal active decision-making in navigating culture and lifeways in the changing physical and social landscape of the Riverland region.

**Landscape Archaeology**

Bruno David, Monash University

‘Landscape archaeology’ has featured prominently since the early years of professional archaeology in
Australia and PNG. Yet how “landscape” has been approached has been varied and multidisciplinary from the onset. In this presentation, Bruno David will discuss some of the early, and influential, approaches as a springboard by which to explore recent and developing examples of landscape archaeology in Australia.

Session: Beyond the (Pre) History of Australia

From Consultation to Collaboration to Cultural Ownership the Journey of CHM on Western Kangoulu Country

Annabelle Davis, Extent Heritage
Jonathon Malone, Lumburra Bimbi
Hedley Henningsen, Lumburra Bimbi
Karen Broome, Lumburra Bimbi
Cynthia Broome, Lumburra Bimbi

With numerous pressures from coal mining and infrastructure development, Western Kangoulu are constantly managing various impacts to cultural heritage on their country.

In this paper we shall look at the journey of cultural heritage management for the Western Kangoulu and how heritage management has emerged to no longer being just about consultation and recording and managing artefacts to a much bigger negotiation for collaboration and engagement on not only heritage but business development and indigenous employment.

We shall examine how collaboration, transformative change, cultural awareness and cultural ownership is critical to managing a vast and diverse cultural landscape that despite its various developmental and agricultural impacts is still rich in both culture and archaeology.

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

The Murujuga National Heritage Listing: Identifying Values in Industrial-Zoned Lands

Sarah de Koning, The University of Western Australia
Jo McDonald, The University of Western Australia
Peter Jeffries, Murujuga Aboriginal Corporation

The Dampier Archipelago, known as Murujuga to its Aboriginal traditional custodians, was placed on the National Heritage List in 2007 for its visually spectacular rock art with demonstrated scientific values. The rock art and stone features meet five of the eight national heritage criteria defined by the EPBC Act. Murujuga National Park is the 100th National Park in Western Australia and covers roughly 50% of NHL-listed land on Murujuga. It is surrounded by undisturbed industrially-zoned lands which were mapped as having National Heritage Values. The National Park is owned by Murujuga Aboriginal Corporation (MAC) and leased back to, and co-managed with, the State. The annual UWA rock art field-school with funding provided by Rio Tinto’s Commonwealth Conservation Agreement, has specifically targeted previously undocumented landscapes outside the conservation estate to scientifically document its National Heritage Values. After seven years of collaboration between UWA, MAC and Rio Tinto we can demonstrate that there are numerous sites and landscapes with National Heritage values in the industrial zoned lands of Murujuga. We discuss the Aboriginal cultural values and the scientific values that this collaborative work is documenting and the implications for continued expansion of industry.

Session: Depicting Paradise: How Rock Art has Disrupted the Dominant Archaeological Paradigms of our Time

Moluccan Fighting Craft on Australian Shores: Contact Rock Art from Awunbarna, Arnhem Land

Mick de Ruyter, Flinders University
Daryl Wesley, Flinders University
Darrell Lewis, Independent Researcher
Iain Johnston, AIATSIS
Wendy van Duivenvoorde, Flinders University

In this paper we consider the origins and significance of two similar watercraft depicted in rock art at Awunbarna, Arnhem Land. The craft are unlike the Macassan prahu and Western craft shown at other contact sites in northern Australia but are sufficiently detailed to offer evidence by which to identify them. Both craft appear to display triangular flags, pennants and prow adornments—prominent decorated prow boards in both cases and a ‘sun wheel’ in one. By comparing the shape, proportions, configuration and detail of these two craft with historically recorded watercraft from the region, this study shows the probable origin to have been eastern Maluku Tenggara in Indonesia, and possibly Tanimbar in particular. The rock art depictions are representative of ceremonially decorated fighting craft used to lead trading voyages and raids from Tanimbar, Aru and Kei to neighbouring islands. The detailed illustration suggests a degree of intimate knowledge of the craft themselves through long or close observation, or from actually voyaging in them. The underlying purpose of why Moluccan fighting craft are found along the Arnhem Land coast
in north Australia is likely to be linked to trade, fishing, resource exploitation, or slavery. The presence of such fighting craft implies either a physically violent context, or conversely a benign projection of power. This potentially unique identification of Moluccan watercraft in Australia offers evidence of the ‘elusive encounters’ between the Indigenous people of northern Australia and people from the archipelagos to the north, evidence with which to expand both the nature and context of Australia’s contact narrative.

**Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond**

**Searching for the Juvenile in Convictionism: A Network Study of Convict Children in Colonial Archaeology**

Caitlin D’Gluyas, University of New England

Although they represented a significant proportion of the convict population, juvenile criminals are difficult to isolate in a colonial setting due to a lack of distinct material culture, complex age definitions and poorly understood economic and labour value. Historically, juvenile convict systems were messy and ambiguous; colonial policies in child criminal management changed frequently and were never implemented as intended. Despite this, the flow of children – from transport ships, to assignment, training and other systems of industry and reform – is a network that can be mapped at various scales utilising archaeological and historical evidence. This paper examines such sources to build an understanding of the network of male convict children that existed in colonial Australia and its evolution over time. It asks how juvenile convicts fitted into colonial practices of labour and punishment and why they have been almost invisible in the historical archaeology of convictism.

Point Puer was an institutional reformatory for criminal boys and a microcosm of the isolated penal colony of Port Arthur. Its operation correlates with a period of increased specialisation of juvenile convict management that occurred throughout the early nineteenth century. Due to its unusually specific purpose, Point Puer allows for a deeper examination of the intended systems of managing convict children and the reality of disordered colonial practices in juvenile management. The archaeological site presents as a tension between a place embodying an ideological framework of juvenile reform and one of haphazard change and failed implementation. It is used here as a case study for characterising the archaeological evidence of male juvenile convicts in Australia. The challenge lies in mapping and interrogating juvenile convict networks on multiple scales while maintaining the complexity of imperfect convict systems.

**Session: Disruptive or Invisible: Children and the Archaeological Record**

**People-Plant Relationships During the Mid- to Late Holocene: An Examination of Macrobotanical Assemblages from Archaeological Sites in the Kimberley**

India Ella Dilkes-Hall, The University of Western Australia

Jane Balme, The University of Western Australia

Sue O’Connor, Australian National University

Emilie Dotte-Sarout, The University of Western Australia

The mid- to late Holocene is associated with major environmental fluctuations that are associated with technological and social change in Australian Aboriginal lifeways. In the Kimberley region of northwest, Western Australia, these changes are most observable in technological records, with little comparative research on plant and animal exploitation during this time. A model of localised and regional patterns of economic plant use during the mid- to late Holocene was developed by comparing macrobotanical records from nine excavated sites with improved palaeoenvironmental records for the region. This study contributes novel information on the important role of plants in Aboriginal lifeways and resource patterning across the Kimberley during the Holocene. Our research suggests resilience of important economic species and associated subsistence strategies during a climatically variable period.

**Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time**

**Collaborative Research and New Dates at Lake Victoria, NSW**

Emily Dillon, NGH Pty Ltd

Lake Victoria located near the border of New South Wales, Victoria and South Australia and is a regulated Lake system fed by waters from the River Murray via Frenchmans Creek. Prior to regulation however, it was a natural lake basin around which Aboriginal people have lived for generations. Evidence of this occupation is alive in living memory but is also scattered throughout the landscape and concentrated within the lunette that bounds the eastern lake shore. The lunette not only holds evidence of day to day occupation by people but is also an extensive burial ground, with hundreds of individuals preserved within the dune. Collaboration between the MDBA, NSW DPIE, SA Water and the Barkindji Maraura Elders Council (BMEC) has seen the area managed for protection of cultural heritage and significant efforts have gone into preserving and protecting the many
burials currently known. Recently, archaeologists and members of the BMEC identified a burial eroding from an older stratigraphic unit with associated shell midden material. The BMEC decided that they would like to date the material to better understand the antiquity of their ancestors occupation of the Lake. This paper therefore presents the outcomes of this investigation and demonstrates the potential for multi organisational approaches to better understand and recognise the longevity of Aboriginal occupation of the Lake Victoria area.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Djenj Mankarre: Bininj Fishing Past, Present and Future

Morgan Disspain, Niche Environment and Heritage
Lynley Wallis, Wallis Heritage Consulting
Tiina Manne, The University of Queensland
Clarry Nadjamerrek, Djurrubu Rangers
Cuisak Nango, Djurrubu Rangers
Axel Nadjamerrek, Djurrubu Rangers
Mia Dardengo, Wallis Heritage Consulting
Andrew Schaefer, Wallis Heritage Consulting

The cultural, social, environmental, spiritual, and economic connections of Bininj (Aboriginal) people to water sources and djenj (fish) in Kakadu / West Arnhem Land are extremely significant. During the excavations at the site of Madjedbebe in 2012, large quantities of djenj bones, including otoliths (ear bones) were recovered. This was a catalyst for the emergence of The Djenj Project, a community-led project based on two-way knowledge sharing about djenj between Bininj and Balanda (Europeans).

The project is focused in the north-eastern part of Kakadu National Park and adjacent Aboriginal Land Trust lands in West Arnhem Land, and is being undertaken jointly by Djurrubu Rangers, Njanjma Rangers, Gunbalanya School, and Jabiru Area School, with the support of Gundjeihmi Aboriginal Corporation, Njanjma Aboriginal Corporation, and ERA. The Djenj Project places Bininj people at the heart of interpreting the archaeological djenj assemblage from Madjedbebe and in doing so reinforces the rights of Bininj to control cultural knowledge and respects their intellectual property.

This project brings together scientific and traditional ecological knowledge through classroom and field-based activities, with Aboriginal rangers developing their cultural and technical knowledge and practice and Bininj students developing their literacy and numeracy skills through culture. Key outcomes have included sharing of cultural knowledge about fishing practices, the creation of a modern djenj skeleton reference collection for validation of archaeological samples, interpretation of archaeological djenj skeletal remains, experiential fish trap making, and experimental gorge making. Importantly, for Bininj the project has demonstrated the value of scientific inquiry where it sincerely engages with, responds to, and benefits the local community. In critical ways, the Djenj Project provides a new measure of genuinely ethical community engagement against which future research projects may be judged.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Archaeological Landscape Dynamics: A Surface Scatter Pilot Study in the Inland Pilbara

Kane Ditchfield, The University of Western Australia
Wendy Reynen, The University of Western Australia

In north-west Australian archaeology, open site artefact scatters dominate the archaeological record but rockshelters are privileged as research targets because of their potential to address change over-time. By comparison, surface artefact scatters are often only described, salvaged and stored in sea containers where little published research has addressed such assemblages. As a result, the Pilbara open site record can often appear largely uniform: scatters of stone made from different materials with some retouched tools. This means that it remains difficult to assess the significance of the open site record, which is critically important for building a more comprehensive and complete understanding of Pilbara archaeological landscapes. To address this problem, in partnership with Rio Tinto and the Puutu Kunti Kurrama and Pinikura Aboriginal Corporation and its members, this pilot project analysed a series of quarry and surface scatter stone artefact assemblages from the Pilbara using a comprehensive suite of analytical techniques designed to examine assemblage formation. Petrological and geochemical analyses were also used to quantitatively define raw material diversity and contribute towards establishing raw material source locations as part of expanding a north-western sourcing database. The results obtained from this pilot research provide a greater understanding of Aboriginal open site use as part of a wider dynamic landscape and contribute towards improving heritage methods for open site significance assessment.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond
Recording the War that Never Came: World War II Defences in Hobart, Tasmania

Samuel Dix, Independent Researcher

The outbreak of World War II resulted in a global response to defend areas of strategic value to the war effort against the threat of invasion. The town of Hobart in Tasmania, Australia, being one of the most strategic in the southern hemisphere, was not exempt from this, and measures were quickly put in place to defend the city. With the vast majority of those able-bodied already fighting battles across the globe, local defence relied on a volunteer corps of World War I veterans or those unable to fight in a fulltime capacity taking charge of the defences of Hobart. This resulted in the construction of defensive pillboxes and other military installations built in strategic locations along the coast of the Derwent River, and the outer lying suburbs of South Arm and Lauderdale.

Since World War II, many of these sites were left abandoned and, in some cases, forgotten. The identification, recording and future protection of these sites are vital in understanding Australia’s reaction to global conflict, and those that were left in charge of home front defence. This presentation will detail the recent discovery of a lost military installation, as well as argue that the military landscape, even if it was not used in physical conflict, is an important part of the history of Australia, and archaeology in these regions.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Traditional Places of Conflict: Ritidian, Guam

Boyd Dixon, Search
Andrea Jalandoni, Griffith University

The term Traditional Places of Conflict as used here does not mean that pre-Contact Period village sites on the island of Guam were ever deliberately constructed to be settings of such animosity. Rather, such traditional places assumed that role on more than one occasion as Spanish and American colonial forces imposed their will upon the resident Chamorro population. This paper will explore the Spanish colonial roots of this first conflict at the site of Ritidian and then the WWII and post-war conflict again in modern Ritidian. We will offer reflections on similarities and differences in impacts to the site and compare responses by the Chamorro community in over four centuries of conflict. It should be noted that the site is still one of the most idyllic and peaceful settings on the island today.

Historical accounts and archaeological evidence from the period of European contact with Guam in the Mariana Islands, from the early 16th to late 17th centuries, document bellicose interaction between Spanish military and Chamorro civilians beginning with the first visit to the island by Ferdinand Magellan in 1521. After settlement of the island in 1668 by Spanish clergy and soldiers from the Philippines and Mexico, initial curiosity and good will were transformed into a largely confrontational relationship within a decade of native resistance to Spanish demands to abandon traditional culture and adopt imposed beliefs and behaviour. Small churches built in existing Chamorro villages at desirable beach settings often became flashpoints of conflict by the 1680s. These events culminated during La Reduccion circa 1700, when northern Guam populations were removed to a few southern villages to enforce order and acculturation.

Ritidian (or Litekyan), a large village situated on the northwestern coast of Guam, became one such Traditional Place of Conflict at Spanish contact, and was only repopulated as a rural ranch setting in the 1800s. Conflict again manifested itself on the island a century later with WWII, and Ritidian once again became a flashpoint of conflict by the 1960s.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Highways to the Interior - Riverine Cultural Landscapes: Investigating the Archaeology and Social History of Australia’s River Systems

Brad Duncan, Heritage NSW
Martin Gibbs, University of New England

In the 1990s Sarah Kenderdine and Bill Jeffery introduced the concept of maritime cultural landscapes to the Australian maritime archaeological profession when they applied it to their investigation of the Murray Darling River system. Their ground-breaking work recognised the potential for maritime archaeological investigation to not only investigate shipwreck sites in a non-oceanic context, but it also recognised the complex relationships that existed between terrestrial and submerged sites. Although Kenderdine’s study set a much lauded benchmark for future studies of riverine environments, interest in these types of sites gradually waned in favour of more glamorous offshore wreck sites.

In many Australian states, rivers were the initially the only means of transport, both from the sea to the interior, but also within the vast network of inland waterways. The use of many of these river systems pioneered the historical exploration and eventual settlement of interior areas of Australia, long before the road and rail networks crisscrossed the land and eventually laid waste to the river transport systems. In this paper we examine the scope for a
revived focus on the maritime cultural landscapes of Australia’s inland waterways during the historical period. We argue that given their significance for the exploration, colonisation/ settlement and utilisation/ industrialisation of the interior, investigations of these diverse river systems requires a coordinated national approach.

This paper outlines the ongoing results of over a decade of investigating the people, technologies and industries contained within NSW rivers systems. We propose several modes of enquiry that might be adopted to enhance the way we view these often neglected backwaters, and the often highly significant sites and cultural landscapes of the communities that are contained within them.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Ignored or Invisible? Why do we not Find Thylacine-Based Material Culture in the Archaeological Record?

Tessa Dux, Griffith University
Michelle Langley, Griffith University

There is a distinct lack of information regarding interactions between thylacines and Aboriginal Australians. Their depiction in Australian rock art, particularly in the northwest region, is a frequent occurrence, yet there is currently only one recorded example of thylacine remains being utilised as part of the Indigenous material culture repertoire. The absence of thylacine is conspicuous as the raw materials such a large mammal would provide could be seen as useful, and thus their depiction in art but absence from ‘things’ appears significant. This study will demonstrate that it was not a lack of opportunity for First Australian’s to utilise the materials thylacines provide, but must instead involve social or cultural decisions. To demonstrate that significant opportunities existed for exploitation of thylacines, both spatially and temporally, the location of known paleontological, archaeological and rock art sites are mapped. Dated sites are compared to create an overall picture of overlap between thylacine habitat and human territories. It is shown that there was a significant period where interaction between this enigmatic animal and First Australians occurred, and therefore, a lack of interaction is not the reason for the near total absence of thylacine bones, teeth, and other materials being excluded from Indigenous material culture.

Seascapes, Seafaring and Stories in Deep Time

Helen Farr, University of Southampton

With a number of approaches to studying seafaring to Sahul in deep time, including analysis of seismic, hydrodynamic and genetic data, the ACROSS project has faced traditional dilemmas surrounding multidisciplinary research and the interweaving of multiple, and significantly different, data sets. This paper will introduce the project and its preliminary work, and the multiple stories that are emerging from the integration of onshore and offshore data.

Session: Arriving in Sahul: Old Questions and New Approaches

Archaeological Engagement with Virtual Reality: Past, Present and Future

Calum Farrar, The University of Queensland

This honours project investigates the application of Virtual Reality (VR) technologies in archaeological and cultural heritage management. The rapidly developing VR industry has created new opportunities to better facilitate communication within archaeological and cultural heritage practice. Effective translation of information between differing knowledge systems is a critical aspect of archaeology, especially given the scrutiny archaeologists receive from stakeholders and the general public. VR incorporates a variety of technologies, methodological approaches and communication techniques, offering an exciting toolbox for engaging non-archaeologists and archaeologists alike in the transfer of both tangible and intangible aspects of our shared cultural heritage. Since the late-1950s archaeologists have been exploring the possibilities of the virtual reality medium with mixed results. With the ever-expanding range of VR technologies being used in archaeology, it is critical that the history of archaeology’s engagement with VR be assessed systematically. To conduct a systematic and analytical analysis of this engagement, this project uses the AIP framework as the basis for a new way of quantifying and identifying the primary components of VR technologies. Through analysing the relationships of these three components, Autonomy, Interaction and Presence, direct relationships between technology, design and application in archaeological research have been established. Additionally, this project investigates how other disciplines have designed and utilised VR to their advantage. In doing so, new approaches can be established for how VR is used in archaeology and cultural heritage management. To further contextualise these new approaches, elements of communication theory and game design theory have been incorporated into
their development. This presentation of the research project will be accompanied by a demo version of a VR application, the development of which was informed by the new understanding provided by the AIP based methodology.

**Session: After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management**

**Plenary**

**#MeToo Introduction**

*Elissa Farrow, About Your Transition*

#MeToo is similar to other social justice and empowerment movements based upon breaking silence. The purpose of “Me Too”, is to empower through empathy and strength in numbers, especially young and vulnerable women and men, by visibly demonstrating how many women and men have survived sexual assault and harassment, especially in the workplace. Sexual harassment is unwelcome sexual behaviour that’s offensive, humiliating or intimidating. It can be written, verbal or physical, and can happen in person or online. Both men and women can experience sexual harassment or discrimination. But there is hope and there is assistance available.

Elissa Farrow from About Your Transition is the independent moderator for this plenary session. Elissa will provide context for the plenary by outlining the history behind the global #MeToo movement as well as what is sexual harassment and discrimination and what you can do to support yourself or others.

**Session: #MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology**

**Insights from the Daily Grind: Examining Grinding Tools from Late Lapita Settlement on Tongatapu, Kingdom of Tonga**

*Redbird Ferguson, James Cook University*  
*Christian Reepmeyer, James Cook University*  
*Nina Kononenko, Australia Museum*  
*Geoffrey Clark, Australian National University*  
*Frederique Valentin, CNRS*

This paper presents the results from the first in-depth study of Late Lapita aged grinding tools from the Talasiu burial and shell midden site, Kingdom of Tonga. The study showed that grinding tools are highly curated objects used for a wide range of applications from food processing to artefact production of shell and bone artefacts, and the manufacture and maintenance of other stone tools. All grinding tools are made from imported igneous and plutonic rocks types assumed to have arrived through local inter-archipelago exchange systems. Petrological analysis has established that many come from further afield, indicating a continuity of exchange systems once thought to diminish with the Lapita pottery. Lithic artefacts are one of the most archaeologically durable remnants of past human activities, which makes them one of the key artefact classes to understanding prehistoric lifeways. Among these artefacts are grinding tools which have been documented at numerous sites throughout the Pacific. Unfortunately, grinding tools are often grouped into generalised categories of artefacts. This obscures the fact that they are tools with the potential to provide insights into technological change associated with changing subsistence practices, shifting raw material exploitation, evidence of tool curation and translocation of plants. Additionally, Lapita non-ceramic assemblages are noted to be generally less susceptible to change than ceramics. This perceived stability provides a point of continuity in the transformation of Lapita to post-Lapita societies in times of increasing regionalisation. Grinding tools offer an opportunity to investigate new questions about lifeways, extending beyond a typological framework of cultural sequencing.

**Planning for the Management and Conversation of Biodiversity and Cultural Heritage at Urumbal Pocket on Koombooloomba Dam, Far North Queensland**

*Asa Ferrier, La Trobe University*  
*Andrew Ford, CSIRO*  
*Liam Roberts, Wabubadda Aboriginal Corporation*  
*Tim Daniel, Wilderness Expeditions*  
*Katherine Thomas, La Trobe University*

This poster presents preliminary outcomes from a collaborative pilot project that aims to construct a long-term management plan for the ongoing protection and management of a significant natural and cultural landscape in far north Queensland’s Wet Tropics region. Recommendations presented in this management plan will be used in future discussions on how to protect biodiversity across the Wet Tropics region.

The focus of the project is on Urumbal Pocket, located on the flooded section of the Upper Tully River that is now part of Koombooloomba Dam, one of few surviving wet sclerophyll pockets within tropical rainforest in traditional Jirrbal country. The pocket is associated with an open archaeological site that has produced significant information on pre-European Aboriginal rainforest occupation and use of rainforest resources.

A group of Jirrbal field officers and Elders worked
side-by-side with a team of specialists during a one-week field trip to Urumbal Pocket. The collection of important baseline data was combined with training in natural and cultural resource management for the Jirrbal field officers. This grassroots community project resulted in the collection of significant new information on Urumbal Pocket’s natural and cultural resources.

Data collected in the field was analysed by the specialists and field officers during a 3-day in-house workshop. The project team is currently drafting a management plan that will outline measures on how best to protect Urumbal Pocket’s cultural and natural properties into the future and how results from this pilot study can be applied to other pockets in the area and elsewhere in the Wet Tropics Bioregion.

Using Radiocarbon-Dated Mud Wasp Nests to Estimate the Age of Rock Art Styles

Damien Finch, University of Melbourne
Andrew Gleadow, University of Melbourne
Janet Hergt, University of Melbourne
Vladimir Levchenko, ANSTO

The development of scientific dating techniques has been a major focus of efforts to integrate rock art into the full archaeological context. While great progress has been made in establishing the relative age of different rock art styles in the major art regions of northern Australia, there remains little evidence to securely position these styles on an absolute timescale. It has long been proposed that some of these older styles are of Pleistocene antiquity, but the lack of dated motifs means that this has not been confirmed, nor do we know the timespan over which motifs in a given style were produced.

The development of radiocarbon dating of remnant mud wasp nests has provided a dataset of 75 age estimates for nests either under- or overlying rock art motifs from the Kimberley region in Western Australia. With the prospect of further dates from this method in future years, the question arises as to how these data can be used to estimate the timespan of a particular rock art style. A novel approach is proposed, and part of the initial Kimberley dataset is used as an example of how minimum and maximum age constraints can be employed to determine the likely age span for an older rock art style.

Australia’s Earliest Rock Art and its Worldwide Affiliations

Josephine Flood, Australian National University

The First Australians’ Pleistocene journey from Africa through India and S.E. Asia to Australia can be traced through rock art, especially cupules. Cupules are anthropic, non-utilitarian, hemispherical percussion petroglyphs, rarely exceeding 10 cm. in diameter and occurring on horizontal or vertical rock surfaces. Also called dots or cup marks, they are the most common and oldest motif in the world’s rock art, found from the Lower Palaeolithic to modern times. Long ago Andree Rosenfeld and I agreed that the term rock markings would be more appropriate as they are in no sense art for art’s sake. Australian ethnography documents their production as a by-product of ceremonies for increase of food and fertility, universal needs applicable to hunter-gatherers everywhere.

Cupules are found right along the route of the First Australians out of Africa and through the Sudan. They are numerous in caves associated with Middle Palaeolithic chopping tools in South India, where the population also has DNA links with Australia. Pleistocene cupules occur in Tasmania and in mainland Australia at sites such as Sandy Creek in Cape York and are frequently found in early Panaramitee sites in northern and Central Australia. Their distribution is related to relative rock types, being scarce on hard rocks such as those of Kakadu, but their distribution nevertheless reflects the migration routes of Indigenous Australians down from the north of the continent into the Centre and eventually Tasmania.

Developing Archaeobotany in Australia: A Case Study from Madjedbebe, Mirarr Country, Western Arnhem Land

Stephanie Florin, The University of Queensland
Andrew S. Fairbairn, The University of Queensland
Chris Clarkson, The University of Queensland
May Nango, Gundjeihmi Aboriginal Corporation
Djaykuk Djandjomerr, Gundjeihmi Aboriginal Corporation
Cuisak Nango, Djurrabi Rangers

A rockshelter occupied for 65,000 years by largely hunter-gatherer populations in tropical Australia is a far cry from the Fertile Crescent and the hunt for the origins of Near Eastern agriculture where archaeobotany was first developed and practiced. However, despite underlying theoretical and practical
differences between these two settings, the base questions that archaeobotany poses: What plants did people eat? How did they obtain and process these foods? How did they interact with and, even, manage their environment? And, how do these foods intertwine with their culture? are important in both settings. This paper uses the case study of Madjedbebe, a rock shelter on Mirrar Country in western Arnhem Land, to explore the difficulties and advantages of applying archaeobotanical methods within Australian archaeology. It will present results from the 65,000 year sequence at Madjedbebe, discussing tropical preservation environments, the developments in methodology required to practice archaeobotany in this continent and the possibilities provided by joint ethnobotanical research with the traditional owners of Madjedbebe.

Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

Late Pleistocene Palaeo Environment Reconstruction from 3D Seismic Data, NW Australia: The ACROSS Project (Australasian Colonisation Research: Origins of Seafaring to Sahul)

Anthony Fogg, University of Southampton
Justin Dix, University of Southampton
Helen Farr, University of Southampton (presenter)

The earliest [anatomically modern] human migration from Sunda (South-East Asian archipelago) to Sahul (Australia and New Guinea) is still heavily debated with proposed timings between c. 65-45kaBP depending on the evidence base and interpretation of the data. As part of the EU funded ACROSS project, focused on the mode and route of early migration into SAHUL, we are undertaking an integrated interpretative study of the evolving submerged landscapes for the Late Pleistocene of the NW Australian Shelf. 3D and 2D seismic data, with some core/borehole data, are being used to determine lowstand palaeo-environments and shoreline positions.

The seismic that is being interpreted is supplemented by using time-slices on relative impedance inverted post-stack data. Layer stripping, seismic geomorphology, sequence boundary and depth analysis are being applied to datasets in the Bonaparte Basin, Kimberley Shelf and Arafura regions of Australia’s North-West Shelf area. Interpretation of the seismic data is constrained by dated stratigraphy in shallow cores with lower bounds determined from oil/gas well bores. MIS stages 1-4 are identified, however, the seismic response is a composite of time periods due to varying sedimentation rates, non-depositional hiatuses and minimal vertical seismic travel time covering this interval which limits the analysis to the top 50ms TWT (c. 40-45 m) of events below the seabed. Data examples will be presented showing the geomorphological characteristics (river channels, avulsions, levees, drainage channels, dunes and near shore carbonate reefs) of the lowstand and transgressive landscapes during this period. Palaeo-reconstructions are now being developed from the interpreted seismic geomorphology to inform analysis of human seaborne travel in terms of emergent landscapes and likely terrestrial and littoral environments at particular periods.

Shape-Shifting Sahul: Aboriginal Arrival and Migration Narratives

Madeline Fowler, University of Southampton

One thing that most scientific western narratives about global human origins appear to have in common is that they are well removed from Indigenous worldviews and knowledge systems. The scientific view reconstructs the first arrival of humans in Sahul as having occurred during a specific period in the past. Yet many Indigenous Australians fold time to join past and present. Recognising the need to bring other knowledge bases to bear on the scientific evidence of the peopling of Australia, ACROSS ‘Australasian Colonisation Research, Origins of Seafaring to Sahul’ research has collated Aboriginal oral traditions of arrival by sea from existing ethnographies. This collection of narratives concerning deep time, while necessarily coarse-grained, is publicly available online through the digital storytelling media of ArcGIS StoryMaps and provides a greater appreciation of Indigenous views of landscapes. Presenting these oral traditions allows us to acknowledge the differences, silences and dynamism of diverse knowledge systems, but also to appreciate their confluences. We are only just commencing this dialogue in response to marine and palaeocoastal environmental reconstructions, however further critical textual analysis of these oral traditions may reveal long-term cultural memory and become effective tools in animating deep time. This project has received funding from the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme (grant agreement No. 759677).

Session: Arriving in Sahul: Old Questions and New Approaches

Learning from Learners: Three Case Studies of the Application of Innovative Teaching Techniques in Archaeology (and Related Disciplines)

Catherine Frieman, Australian National University
Sofia Samper Carro, Australian National University
The introduction of alternative teaching practices (such as project-based learning) in and outside the classroom can sometimes prove to be challenging, due to differences in student engagement and participation (affected by their prior academic experiences and education), established course curricula, or lack of time and planning. Moreover, the implementation of more interactive activities, where students participation is required, can produce unexpected positive and negative results.

This paper presents the students and academics experience and feedback obtained after the development of three different teaching practices. First, a project aimed at commencing the digitisation of the osteological reference collection hosted in the ANU School of Archaeology and Anthropology, which was turned into an assignment for digital humanities students at the ANU Centre for Digital Humanities Research. Second, three domestic and international archaeological field schools, which introduced a “skills passport assessment scheme” to promote student self-assessment while tracking the field school practices. Third, a mock conference designed for an archaeological course including undergraduate and postgraduate students, to test the benefits and challenges of work integrated learning practices. Students feedback and academics reports were recorded to assess the feasibility of these teaching techniques for formal archaeological teaching at universities.

In this paper, we present the case studies, highlighting the design, practical tasks and results obtained. Based on students experience and academic comments, we will recount lesson learnt from and during these case studies; discuss the challenges encountered; and make suggestions for methods and approaches to improve student experience and class participation in the future.

Session: Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry

The Artefacts of the Drysdale Bypass

Stephanie Frydas, Wathaurung Aboriginal Corporation
Ilya Berelov, Wathaurung Aboriginal Corporation

The construction, by Major Road Projects Authority, of the Drysdale Bypass on the Bellarine Peninsula, prompted an assessment of Aboriginal heritage and a large-scale salvage of Aboriginal cultural materials from within the project area. This salvage work resulted in the recovery of approximately 120,000 artefacts across 5 separate locations from what has become one of the most significant Aboriginal places in this area of Victoria. The artefact assemblage is currently being catalogued and analysed. This paper discusses the salvage methodology and the process of negotiation and collaboration between the Wathaurung Aboriginal Corporation, Major Road Projects Authority, Archaeological Excavations and Christine Williamson Heritage Consultants. In addition, some preliminary results and interpretations will be presented as well as the results of the radiometric dating that has been undertaken in conjunction with the salvage works.

Excavating the Drysdale Bypass: The Wadawurrung Methodology

Stephanie Frydas, Wathaurung Aboriginal Corporation
Ilya Berelov, Wathaurung Aboriginal Corporation

The construction, by Major Road Projects Authority, of the Drysdale Bypass on the Bellarine Peninsula, prompted an assessment of Aboriginal heritage and a large-scale salvage of Aboriginal cultural materials from within the project area. This salvage work resulted in the recovery of approximately 120,000 artefacts across 5 separate locations from what has become one of the most significant Aboriginal places in this area of Victoria. The artefact assemblage is currently being catalogued and analysed. This paper discusses the salvage methodology and the process of negotiation and collaboration between the Wathaurung Aboriginal Corporation, Major Road Projects Authority, Archaeological Excavations and Christine Williamson Heritage Consultants. In addition, some preliminary results and interpretations will be presented as well as the results of the radiometric dating that has been undertaken in conjunction with the salvage works.

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

Experimental Archaeology in Australia

Jillian Garvey, La Trobe University
Fiona Hook, The University of Western Australia

Experimental archaeology has played an important role in Australian archaeology for a long time, especially in areas such as stone knapping and animal butchery. In recent times the discipline in Australia has changed from the more traditional emphasis of researchers trying to replicate what they see in the archaeological record, to one where Traditional Owners frequently
lead this process in trying to re-establish their own cultural practises following the devastating effects of colonisation. This ensures a very different emphasis on the current role of experimental archaeology.

Earlier this year, we had the opportunity to present the 11th Experimental Archaeology Conference EAC11 in Trento, Italy. In doing so we understand that we were the first Australian archaeologists to attend an EAC meeting. It was obvious that people were very interested in the kinds of experimental archaeology we undertake in Australia, and the tangible connection played by our First Nation people. It became apparent that here we usually undertake experiments based upon specific questions raised through our research, while for many European colleagues they appear more focused on the actual experiment, and then try to find an archaeological example. It also seems that whilst many Australian archaeologists include experiment archaeology in their research, we often don’t refer to it as a specific discipline, rather it is incorporated into our general research.

This introductory paper, in the Exploring the zooarchaeological and archaeobotanical record in Australia through space and time session will address some of these issues and is designed to raise questions and start people thinking about our unique Australian approach to experimental archaeology. We will introduce the concept of ‘generationally-linked archaeology’ as an alternative to the standard ‘experimental archaeology’ currently being used.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

A ‘New’ Engraved Site in South East Queensland: Conservation Challenges and Opportunities for Intergenerational Relevancy

Marisa Giorgi, Griffith University

There is a scarcity of engraved rock art evidence in the region of south east Queensland, Australia. Evidence is limited to Chalawong and some rapidly deteriorating scattered engravings and axe grinding groove sites. In fact, the closest significant rock engraving site, apart from Chalawong, is the Burnett river site in the South Bay Burnett region of Queensland, some 400 kms away. As such, a small new site found twenty kilometres outside of Brisbane with engraved prints and at least two anthropomorph images, represents significant new information and may indicate stylistic and cultural elements specific to the area. Stylistically the engravings denote at least two different anthropomorph forms with distinct engraved motifs associated with them and a range of schematic motifs. However, this new site requires site specific conservation strategies due to its location. Both water and flooding events have a major impact on the site and thus influence the site management plan. Importantly, this site also enables the local Indigenous community to reconnect with culturally significant engravings. Furthermore, it has a potential for creating relevancy for younger generations through the use of art projects, 3D technologies and digital storytelling platforms. This paper will focus on two main aspects of this site, the conservation challenges and the tools for creating relevancy for younger generations.

Session: General

Pathways: People, Landscape, and Rock Art in Djok Country, NT

Joakim Goldhahn, Linnæus University
Jeffrey Lee, Djok Clan
Kadeem May, Parks Australia

This paper presents the structure, content, and some of the results of the project “Pathways: people, landscape, and rock art in Djok Country,” situated in western Arnhem Land, within today’s Kakadu National Park. It aims to highlight some of the benefits of Indigenous-led collaborative research projects. The project is a collaboration between Senior Traditional Owner Mr. Jeffrey Lee and other clan members, Parks Australia, and researchers from Griffith University, University of Notre Dame, Linnæus University, and the Australian Institute of Aboriginal and Torres Strait Islander Studies. Among other things, the project explores issues relating to the history, management, and conservation of rock art in Kakadu National Park in general and in Djok Country in particular, traditional walking routes in this area, as well as the life and legacy of known rock art artists. Our presentation will also highlight Senior Traditional Owner Jeffrey Lee’s pursuit to protect rock art in a culturally sensitive way.

Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

Open Site Archaeology in the NSW Alpine Region: Excavation Results of a Middle Holocene Site at East Jindabyne

Taryn Gooley, Biosis Pty Ltd
Ashleigh Keevers-Eastman, Biosis Pty Ltd

Biosis undertook a program of archaeological salvage excavations for AHIMS site 62-1-0286, at East Jindabyne, NSW between 2017 and 2018. The salvage excavations identified a high density, silcrete dominant, middle Holocene Aboriginal camp site, which exhibits evidence of intensive, long-
term occupation. The results of the excavations also provide evidence indicating backed artefact manufacturing activities, food processing activities and other activities such as woodworking and hide working were occurring at the site.

Previous archaeological excavations within the NSW Alpine region have predominantly identified quartz dominant archaeological assemblages, with very few instances of backed artefact technology present. The salvage excavations for AHIMS site 62-1-0286 have therefore contributed significantly to our understanding of mid Holocene Aboriginal camp sites in the Alpine region of NSW, potentially disrupting prevailing narratives of Aboriginal open site patterning in the region.

This presentation will discuss how the salvage excavation results contribute to our current understanding of occupational patterns, raw material procurement, and artefact production within the Jindabyne area.

**Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney**

**Alice in Wonderland: Cultural Mapping of the Duncan-Kemp Archive on Mithaka Country**

**Josh Gorringe,** Mithaka Aboriginal Corporation  
**Michael Westaway,** The University of Queensland  
**Doug Williams,** Griffith University  

Alice Duncan-Kemp (ADK) produced an enormous archive of the cultural and natural history of Mithaka country, including five published books. She also made a significant collection of ethnographic objects from around her home on Mooraberrie Station and was regarded by the first Director of the Anthropology Museum at the University of Queensland as his best informant on the anthropology of Aboriginal Queensland. Importantly ADK also described a large number of cultural places and their significance to the ancestors of the Mithaka people. Curiously her research has been rarely referred to by archaeologists.

ADK’s archive is now carefully curated by her daughter-in-law Ms Dawn Duncan-Kemp and the University of Queensland Anthropology Museum. The Mithaka have recently been funded through the Queensland State Government’s Looking After Country grant scheme to integrate the landscape with the ADK archive, and in turn, reconnect the Mithaka with a number of cultural and historically significant places. In a workshop held earlier this year between the Mithaka, Duncan-Kemp family, and researchers from UQ and ANU fourteen sites have been identified for investigation, ranging from sites of spiritual significance to an important site of reconciliation dating to the 1870s. We present the results of field research identifying several of these important new sites.

**Session: From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes**

**Collaboration at the Creek: The Barongarook Creek Bridge Burial, Colac, Victoria**

**Michael Green,** Eco Logical Australia  
**John Clarke,** Maar Aboriginal Corporation  
**Matt Grigg,** Major Road Projects Victoria  
**Matt Mooney,** Department of Transport  
**John Tunn,** Department of Transport  

This paper describes the circumstances of discovery and subsequent investigation of Aboriginal ancestral remains identified below an existing roadway during works for the construction of a new bridge crossing over Barongarook Creek in Colac, south-west Victoria. The paper focuses on the processes that were required during initial reporting of the discovery, the resolution of jurisdictional matters and identification of relevant stakeholders, and the steps that were followed during consultation and subsequent decision-making as to whether the ancestral remains should be left in situ or removed and repatriated at a later date.

Critical to the successful resolution of these matters was the seamless implementation of reporting processes required by Aboriginal Victoria under relevant provisions of the Aboriginal Heritage Act 2006 (Vic), the provision of clear advice from the Victorian Aboriginal Heritage Council regarding the identification of relevant Traditional Owner groups, and a willingness by the project manager (Major Road Projects Victoria), the Traditional Owners (Eastern Maar Aboriginal Corporation) and the constructor (VEC Civil Engineering) to work collaboratively in order to achieve an outcome that met all stakeholders’ needs.

**Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney**

**The Pitfalls in Dating Rock Art Associated Mineral Accretions: Challenges and Possibilities from a Study in Australia’s Kimberley Region**

**Helen Green,** The University of Melbourne  
**John Hellstrom,** The University of Melbourne  
**Andrew Gleadow,** The University of Melbourne
In regions lacking organic pigments, direct dating of rock art is impossible and instead, research has focused on rock art associated materials with the potential to provide bracketing ages. In Limestone environments, uranium-series dating of secondary calcium carbonate accretions forming over pigment, has produced minimum age estimates rendering the underlying rock art the oldest in the world at sites in both Europe and south east Asia (Aubert et al., 2014; Hoffman et al., 2018; Pike et al., 2012). However, finding sufficient, suitable material with an unquestionable relationship to rock art in these environments is difficult and these studies are often heavily criticized (Bednarik, 2012; Pike et al., 2017; Pons-Branchu et al., 2014; Sauvet et al., 2017). In sandstone dominated environments, dating rock art presents a further challenge, with the mineral accretions forming in association with ochre based pigment, composed of mineral species to which uranium-series dating methods have not previously been applied. The exploration of the dating potential of these accretions has uncovered many challenges in the production of reliable ages, many of which are faced in both sandstone dominated settings and limestone rock art provinces elsewhere in the world. This study highlights the pitfalls and possibilities surrounding the radiogenic dating of rock art associated accretions using samples collected in Australia’s Kimberley region to identify measures required to overcome these challenges, relevant to the global rock art research community.

**Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality**

**The Voyce-O’Reilly Collaboration in Solomon Islands Prehistory: A Case Study in Transnational History Approaches to the Development of Pacific Archaeology**

Eve Haddow, Australian National University
Emilie Dotte-Sarout, Australian National University

This paper explores the artefact collections excavated in north Solomon Islands (now officially the Autonomous Region of Bougainville) by Hobart born Methodist missionary Reverend A.H. Voyce (1899-1984). In 1934, Voyce gave part of the collection to Father P. O’Reilly, a French Catholic priest who was in the region fulfilling an ethnographic mission for the Musée d’Ethnographie du Trocadéro in Paris, France. Understanding the context of their encounter, through international missionary networks, and the subsequent curation and interpretation of the artefacts in multiple countries and according to different academic traditions requires an approach that transcends traditional, nationally-framed histories. Voyce and O’Reilly came from diverse socio-cultural and religious backgrounds, deeply inscribed in different national histories. Yet were nodes

**Session: History of Archaeology in the Driest Continent and Its Relationships with (Less Dry) Adjacent Regions**

**Cultural Heritage in a Digital World**

Nicholas Hadnutt, Queensland Museum
Alice Buhrich, TROPX
Scott Hocknull, Queensland Museum
Johnny Murison, Western Yalanji Aboriginal Corporation
Peter Waddington, Queensland Museum

In May 2019, a project team, supervised by the Western Yalanji Aboriginal Corporation, travelled to record a dendroglyph on the Mt Windsor Plateau in Far North Queensland. Photogrammetry of the dendroglyph was conducted along with the creation of a physical fibreglass peel, providing two unique recordings of this significant cultural modification. The authors provide a summary of the two methodologies along with an analysis of the benefits and costs of both. This paper also explores the further opportunities generated through the creation of digital cultural heritage.

**Session: Culturally Modified Trees in the Archaeological Record**

**Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSIHP Act)**

Mark Hall, Australian Government Department of the Environment and Energy

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSIHP Act) started its life as an ‘interim’ act of ‘last resort’. Against the odds it has persisted through more than thirty years of Indigenous heritage reform in state government legislation and the introduction of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999
and steam locomotion filling pumps from the West Footscray works in Victoria, this rail line represents an extraordinary snapshot of the complex relations between people, places and things during a time of global conflict.

**Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond**

**Cross-Cultural Conflict and the ‘Burial’ of Metal Objects in the Northern Kimberley**

Sam Harper, The University of Western Australia

This paper looks at conflict resulting from the introduction of pastoralism and other land uses in the Northern Kimberley, to Kwini and Balanggarra people, as evidenced by the burial or caching of metal objects in bark burial bundles. Paperbark bundle burials in the Northern Kimberley are largely associated with human burials, however this paper discusses the adaptation of this practice with post-invasion material culture. Site ‘DRY252’ on Kwini and Balanggarra country includes a cache of modified metal objects, balls of resin, and a wooden spear shaft, arranged within a (largely deteriorated) bark bundle and stone ring burial, on an inner shelf of a small, low-elevation rockshelter. The ‘burial’ of these materials is mirrored in scant known examples of the burial of other non-skeletal (human or other animal) remains (Love 1936). These ‘buried’ objects modify introduced or ‘new’ materials i.e. metal, using traditional techniques, for example a ground edge metal ‘hatchet’, and metal rods sharpened into spears. This burial, or cache, was located in close proximity to other rockshelters with rich, multi-phase rock art, however this shelter had no visible art, whilst having available canvasses, consequently the spatial setting of this rockshelter will be discussed. This site will be contextualised within the contact, and particularly pastoral, history of this region, exploring the movement of individuals through this landscape, post-invasion. This paper explores identity and conflict at an individual level, and the impacts of cross-cultural encounters on material objects and cultural practices.

**Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond**

**Changing Places: Site Formation at Windsor, Western Sydney, NSW**

Rebekah Hawkins, Extent Heritage

Significant differences have been widely acknowledged between late Pleistocene/early Holocene (>4ka)
and mid/late Holocene (<4ka) assemblages in the Cumberland Plain. These differences are reflected in the assemblage composition, raw material types, core reduction and tool use.

Recent archaeological excavations along the Hawkesbury-Nepean River in Windsor, western Sydney, NSW produced a substantial lithic assemblage recovered from an intact sand body dated to late Pleistocene/early Holocene and a disturbed colonial drain deposit with a mid/late Holocene assemblage. The rarity of pre-Bondaian sites with deep stratigraphy in the Cumberland plain increases the significance of this site and enables the application of White's (2017) confidence interval framework to explore assemblage differences in the proportions of cortical-plus-plain platforms, faceted platforms, elongate flakes and backed artefacts. This is followed by the application of Shott's (1989) notion of discard processes to gain new insights into the behaviours which contributed to the formation of these assemblages. The results reveal different discard behaviours in each phase of occupation and provides some insight of why these differences occurred. While results are applicable to assemblages across the Cumberland plain, they are also relevant to assemblages across Australia.

Plenary

Collaborative Archaeology: 50 Years On

Sharon Hodgetts, Foresty Commission of NSW
Annie Ross, The University of Queensland

On Tuesday 1 October 2019, the Calga Aboriginal Cultural Landscape was officially listed on the New South Wales Heritage Register. The listing was primarily in recognition of the outstanding social significance of one site and its cultural landscape setting, although the archaeological significance of the site and the landscape was also acknowledged.

In 1969, when Mulvaney wrote the first edition of The Prehistory of Australia, he included a chapter entitled “Landscape and people”. But the chapter does not engage with the concept of cultural landscapes. The emphasis is on physical landscapes and Aboriginal responses to environmental changes, as seen in the archaeological record. There is no inclusion of Indigenous voice anywhere in the book. This is not a criticism of Mulvaney. The paradigms in the book were signs of the times.

Fifty years after The Prehistory of Australia, Aboriginal engagement with archaeology, collaborative research approaches, and consequent positive outcomes for the protection of significant archaeological sites and heritage places, is very different from archaeological practice in 1969. In this paper we use the story of the battle to protect the Calga cultural landscape as an example of how present-day archaeological research practice, and the routine incorporation of Aboriginal voice, produce a very different archaeology to that documented by Mulvaney in 1969.

Session: Beyond the (Pre) History of Australia

Pilbara Scaphopod Shell Bead Necklaces: Historical and Ethnographic Evidence

Fiona Hook, The University of Western Australia

Archaeologically, scaphopod shell beads are rare in the Pilbara, Western Australian. They are also unknown in the Pilbara ethnographic literature. Until very recently no examples necklaces made from scaphopod shell beads were thought to exist for this region of Western Australia. Scaphopod shell bead necklaces, however, are very common from the Kimberley region further to the north and large numbers are held in museum collections.

This paper discusses the results of the recent recording of six scaphopod shell bead necklaces that were collect from the Pilbara in the late 19th and early 20th century. Five of these necklaces are held in British museums and one in the Western Australian Museum. The results of the recording is then compared to the scaphopod shell beads from Barrow Island, off the Pilbara coast, and necklaces from the Kimberley.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

'Some People Thought that the River was Frozen': Historical Records of Mass Fish Deaths in Australian Rivers

Jeannette Hope, River Junction Research

‘Some people thought that the river was frozen’ because the dead fish were ‘so thick that it appeared as if a white sheet had been drawn across the water’. That was 1915, on the lower Murray.

In early 2019 mass fish deaths in the Darling River at Menindee made headlines and drew attention to the deterioration of the Darling River. There were claims that the extent of these fish kills was unprecedented, but mass fish deaths have occurred historically in the major rivers of the Murray-Darling system, the Murray, Murrumbidgee and Darling and in their tributaries. The phenomenon has also been recorded historically in coastal Australian rivers, and elsewhere in the world. This paper reviews the historical accounts, and speculates on how we might recognise past mass fish kills in the palaeontological and perhaps also the archaeological record.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth
The Enduring Fascination of the Stone Age: German-Language Studies of Melanesian Lithics and Megaliths, 1930-1970

Hilary Howes, Australian National University

Large-scale German scientific expeditions to the Pacific virtually ceased after WWI, with the Treaty of Versailles bringing to an end Germany’s brief period as a Pacific colonial power. However, individual German-speakers continued to engage with Pacific archaeology through field collections and armchair studies. This paper investigates German-speakers’ studies of stone tools and megalithic structures in Melanesia in the mid-twentieth century, considering particularly their reasons for prioritising these topics over others, and the conclusions they reached. Works discussed include missionary-ethnographer Georg Höltker’s paper ‘Stone clubs and stone axes in New Guinea’ (1940-41), physical anthropologist Alphonse Riesenfeld’s major monograph The Megalithic Culture of Melanesia (1950), and ethnologist Carl A. Schmitz’s study of a missionary collection, ‘Stone mortars, pestles and bird figures from Central New Guinea’ (1966).

Session: The History of Archaeology in the Driest Continent and its Relationships with (Less Dry) Adjacent Regions

Exploring the Potential of Oxalate Glazes at Rock Art Sites in Kimberley, Western Australia

Jenna Hoy, The University of Melbourne
Helen Green, The University of Melbourne
Andrew Gleadow, The University of Melbourne

Dating the Kimberley rock art has challenged researchers for decades. Here, iron oxides dominate pigments, resulting in insufficient original organic material in the paint for direct dating methods. Furthermore, the Kimberley geology is sandstone-dominated, resulting in a lack of calcium carbonate accretions associated with rock art, used globally as a dating crucial tool. Consequently, current dating methods must be adapted to new rock art associated materials, to constrain the age of one of the world’s most significant bodies of rock art.

Kimberley rock art is found in shelters, with a range of different mineral coatings forming on rock surfaces. Previous work in the Kimberley has characterised a range of different mineral systems, identifying one as forming dark, glossy, glaze-like accretions which regularly occur on semi-horizontal surfaces within the rock shelter drip-line. The glazes are ubiquitous across the region and are occasionally symbolically engraved or associated with rock art. The glazes are dominated by a combination of sulphates (gypsum and anhydrite) and carbon-bearing oxalate (whewellite) minerals. The glazes contain detailed internal layering forming over extensive timeframes. Consequently, they provide opportunities for radiocarbon dating of oxalate rich layers and the development of records from their internal stratigraphies that may yield information about past environmental variation.

Here, a range of suite of analytical methods are used to provide crucial insight into the potential of these unique archives. Thus, providing not only radiocarbon dating potential but also detailed information about the environments experienced by the Kimberley’s first people.

Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

A Multi-Technique Approach to Contextualising Painted Rock Art in the Central Pilbara of Western Australia

Jillian Huntley, Griffith University
Lynley Wallis, The University of Notre Dame Australia
Birgitta Stephenson, In the Groove Analysis Pty Ltd
Karlika Nyiyaparli Aboriginal Corporation
Annabelle Davis, Extent Heritage

For close to 70 years scientific techniques have been routinely applied in archaeological research. Yet some artefacts hold such cultural significance that sampling is inappropriate, restricting the methods that can be brought to bear in their analysis, especially where research is directed by the indigenous peoples who have stewardship over not only the site fabric, but its inseparable cultural context. Here we report a multi-technique program of in-field and laboratory-based analyses to describe the materiality of a painted rock art site in Nyiyaparli country, in the Central Pilbara region of Western Australia. The relationship between the rock art, nearby potential pigment sources and evidence for ochre processing was investigated using in situ portable X-Ray Fluorescence and optical microscopy, with interpretations aided by field and laboratory-based residue analysis of grinding related stone artefacts and X-Ray Powder Diffraction of potential ochre sources. Our findings provide an example of the nuanced interpretations that scientific analyses can add to rock art investigations. Our work suggests that local materials were used in the production of painted art and that ochre processing was ubiquitous at the site and other nearby rockshelters. Combined with the placement of rock art in a hidden context within the site, we believe the panels at BBH15-01 were part of in-group activities and that art and ochre processing in the Baby Hope
Interpreting the History of Mangarrayi Management of the Roper River (NT)

Sue Jackson, Griffith University
Marcus Barber, CSIRO

Archaeological and historical evidence for Aboriginal manipulation of water flows has been located for a number of Australian sites, notably at Lake Condah in Victoria and Brewarrina in NSW. This paper examines Aboriginal dam and weir construction along the Roper River at Elsey Station in the wet-dry tropics of the Northern Territory. By combining previously scattered historical, legal, and ethnographic sources, we show how Mungarrayi-speaking people built structures to intercept and divert water to sustain shallow lagoons during the late dry season, and how these structures have been repurposed and reinterpreted over time by Aboriginal and non-Aboriginal protagonists. This major and distinctive instance of water management was documented extensively in a 1946 court case, where the customary practice was judged unlawful in the context of settler colonial water rights. The Mungarrayi continued to build weirs well into the contemporary era as local water management strategies shifted to encompass erosion control and land management. The Roper case represents the first legal engagement by an Australian court with Aboriginal water rights and it contributes to ongoing debates about Aboriginal people acting as purposeful environmental managers and as agents of environmental change.

Characterization of Rock Art Pigments in the Northern Territory of Australia: Chemistry at the Service of Archaeology and Anthropology

Laura Jacobs, Université Laval / Griffith University
Jillian Huntley, Griffith University (presenter)

Kakadu National Park’s traditional owners requested that a painting at Burrungkuy, in the rock shelter of Anbangbang, be characterized by in-field portable X-Ray Fluorescence Spectroscopy which was undertaken in the dry season of 2018. By doing so, traditional owners hope we could determine if the artists used industrial paints rather than traditional pigments. No evidence for heavy metals from the production of industrial paints was found, with analysis revealing the pigments were calcium-based. This analysis provided a better understanding of the relationship between Aboriginal people and colonizers in the 1960s, a moment of intense intercultural tension.

Dating the Past: Insights from the Last 50 Years

Zenobia Jacobs, University of Wollongong

The basic questions in Australian Archaeology have not changed much over the last 50 years since publication of the Prehistory of Australia in 1969 by John Mulvaney. We continue to vehemently debate when and where Australia and its now-arid interior were first occupied, and how Aboriginal and Torres Strait Islander people have adapted to changing climates and environments through time. Chronology forms the backbone of many of these questions and much of archaeology. In 1971, Mulvaney remarked that “Man’s concept of time and his means of measuring it are crucial determinants both of his understanding of his origins and of his status in nature”. When Mulvaney first made these remarks about 50 years ago, the mere ability to determine the age of archaeological deposits and objects was prodigious. Fifty years later, very few archaeological excavations will proceed without independent proof of the age of the site; it has become standard practice.

Advances in both technologies and procedures over the last 5 decades have had a shared goal in mind – to improve the accuracy and precision with which ages can be estimated, so that the sequence of past events can be determined. If ages are not on a common timescale or comparable between different sites and locations, then much of the resolution required to determine the order of events, will be lost. Without a stringent chronology, one might be able to look at the relative timing of events at a specific site or in a local area. To connect sites and answer the ‘big questions’ or write the ‘big narratives’, however, requires a common time-scale. In this presentation, we will follow the last 5 decades of progress in dating the Australian Past and discuss current initiatives and future directions.

Rock Art as Microtopography: An Innovative Method for Enhancing Engraved Surfaces

Andrea Jalandoni, Griffith University

Previous rock art recording techniques, such as manual tracings on plastic or paper sheets, are often tedious, error-prone, and potentially damaging to the
rock art. The advent of Structure-from-Motion (SfM) photogrammetry has disrupted the old methods by democratizing 3D modelling. 3D models allow for recordings to be more cost-effective in the field, contain fewer errors, and are non-invasive. As a result, SfM is rapidly becoming the standard of rock art recording. However, 3D models are not just an end-product for quick visualization, they are the data with which to conduct further analyses.

Geographic information systems (GIS) are widely used among rock art researchers to interpret the spatial distribution of sites in a landscape but their capability for advancing rock art research has been underutilized. Combining SfM and GIS resulted in an innovative method for enhancing engraved rock art that has now been tested in numerous sites in the Philippines, Australia, and New Zealand. Natural discolorations of the rock can obfuscate engravings rendering traditional recording methods ineffective. By enhancing engravings that are undetected in the field misinterpretations can be avoided, leading to a digitally traced record with a higher level of confidence than a manual recording.

Using GIS software to digitally trace rock art also allows for a pioneering way to digitally trace and classify motifs, to produce a spatially-linked database. The introduction of intra-site spatial information into rock art research has the potential to ultimately improve interpretation of the rock art. Finally, the applications are not limited to rock art. By identifying the surface of sites and artifacts as microtopography, the method should work in any context with a difference in elevation, for example, numismatics, tattooology, and ichnology. The combination of SfM photogrammetry and GIS is a cost-efficient solution to effectively enhance, document, and analyse engraved surfaces.

Session: Remote Sensing, Data Management, GIS, and the Integration of Spatial Technologies

Plenary

Nothing to See Here? Results of an Online Survey of Bullying in Australian Archaeology and Consulting by the Australian Association of Consulting Archaeologists Inc

Robyn Jenkins, Rio Tinto
Diana Neuweger, Australian Association of Consulting Archaeologists Inc
Lynley Wallis, Wallis Heritage Consulting
Andrew Costello, Jacobs Group (Australia) Pty Ltd

Since mid-2017 the #MeToo movement has gathered momentum around the world. Although focused primarily on sexual harassment, the movement more broadly encompasses workplace misconduct which serves to reinforce traditional power hierarchies, typically disadvantaging women disproportionately (though we recognise that men are also often victims). The Australian Human Rights Commission defines bullying as “verbal, physical, social or psychological abuse by your employer (or manager), another person or group of people at work”, at the heart of which is the misuse and abuse of unequal power relationships. In early 2018 AACAI carried out an online, nationwide survey designed to gain an understanding of the extent of bullying in the archaeological discipline and cultural heritage industry in Australia. The results were staggering and cause for serious concern. Of 126 respondents, 110 (87.3%) answered “yes” to the question “Have you experienced bullying in the course of your work?”. In this paper we present further results from the survey and consider what we can do, both as individuals and collectively, to address this issue.

Session: #MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology

Community Perspective on the Use of GPR to Identify Our Family Burials in Mapoon

Jason Jia, Mapoon Land and Sea
Diane Nicholls, Tjungundji

Mapoon families and Elders have collaborated with archaeologists since 2010, after hearing about the GPR method on a popular TV show. Our Elders wanted to protect the remains of our ancestors at our cemeteries and burial sites and saw this method as a way of identifying unmarked graves within the cemeteries and other graves only known from memory. Since our collaborations began with archaeologists, we have been introduced to a number of other culturally appropriate ways to identify and explore the nature of our ancestors resting places, including magnetometry, GPR, geomorphic analysis, LiDAR and drone surveying. These methods can help us to protect unrecorded burials within Mapoon Aboriginal Lands.

This paper will discuss the GPR Project from the Traditional Owner and Cultural Heritage Officer’s perspective, in regards to the use of GPR, the magnitude of unmarked graves and burial mounds, future management, discoveries of past burial practices and the local, national and international interest.

Session: Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country

Yaroomba Beach Village Alongside the Legendary Mount Coolum: Big-Time
Changes to Town Planning without any Cultural Heritage Study

Kerry Jones, Kabi Kabi First Nation
Genevieve Jones, Flinders University

Yaroomba Beach surfing village is located near Mount Coolum on the Sunshine Coast 140km north of Brisbane. These are the traditional lands of Kabi Kabi First Nation. Mount Coolum is viewed by many as the ‘Uluru’ of the Sunshine Coast, while Yaroomba Beach is a recorded contact site and has been in use by Kabi Kabi since before colonisation. Yaroomba is being subject to substantial development pressure on beach-front land just south from Point Arkwright. Proposals incorporate building high-rise of 800 units. The first stage includes a seven-story beachfront hotel, and ultimately will double the population of the area. The Japanese developer, Sekesui House was unsuccessful with a similar proposal in 2015. Despite around 9300 written objections in 2018, council has given approval to the development by a 6 to 5 council vote. It is intended for the Sekesui development to sit directly between the scenic Mount Coolum and Yaroomba Beach. The outlook from Point Arkwright and from the surfer’s ocean view, of the now undeveloped area will be obscured substantially. The most recent cultural heritage assessment for this development site dates back to 2004, which was produced for the construction of the nearby Hyatt Resort and golf course, now owned by Clive Palmer. Despite the close proximity of the development proposal to Mount Coolum, a place having one of the most well-known Aboriginal legends along the Sunshine Coast, Sekesui House have not taken the initiative to conduct a review of cultural heritage values with the Aboriginal Party. Best practice would see a cultural heritage study (CHS) implemented within the guidelines of the Queensland Government’s Aboriginal Cultural Heritage Act 2003. This study proposes a plan on why and how Kabi Kabi intend to push for a CHS of the Yaroomba Beach and Mount Coolum area in response to land-use changes.

Yaroomba and Point Arkwright’s Landform Character and Endangered Waves (a Significant Place with everything but a Heritage Listing): What Next for the Community?

Genevieve Jones, Flinders University

Yaroomba and Point Arkwright are located on coastal lowlands of the Sunshine Coast 140km north of Brisbane. This region is defined by its geology and a broad palette of local climates and ecosystems. These are the traditional lands and law grounds of Kabi Kabi First Nation. Mount Coolum, nearby, is popularly distinguished as the ‘Uluru’ of the Sunshine Coast, while Yaroomba Beach and Eurungunder Hill, are recorded contact sites in association with historic shipwrecks.

The headland of Point Arkwright, having high dune systems of the Pleistocene period, neighbours the Yaroomba (Holocene) parabolic dune. High sand dunes with Pleistocene origins are of research interest due to their potential to hold archaeological material dating back to initial or deep-time Indigenous settlement. Eurungunder Hill (just north west of Point Arkwright), while providing a substantial freshwater resource, is of the Triassic Age and is a small inlier of Mount Coolum, a volcanic dome from the Pleistocene. Yaroomba is being subject to substantial development pressure on beach-front land just south from Point Arkwright. Proposals incorporate building high-rise of 800 units. The first stage includes a seven-story beachfront hotel, and ultimately will double the population of the area. Despite around 9300 written objections in 2018, council has given approval to the development by a 6 to 5 council vote. The array of geological and coastal landforms on offer, in and around Yaroomba Beach and Point Arkwright, have been a tourism drawcard and place of respite since the 1890’s. The surfing experience and bushland walks around Yaroomba offer a panoramic view of Mount Coolum and the Point Arkwright high dunes and headland. This study delves into these specific landforms, having been subject recently, to an extra-ordinary degree of social and environmental activism and discusses a number of heritage listing options that could be pursued by the community.

Session: After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management

‘Counter-Mapping’ the Intangible Heritage of Resistance: Recording the Coolum Road Reserve 1852 Conflict Site

Genevieve Jones, Flinders University
Kerry Jones, Kabi Kabi First Nation

An inadvertent case of ‘counter-mapping’ recently occurred at a significant conflict site, after disturbance by road construction in late 2017. Coolum Road Reserve about 140km north of Brisbane sits within the lands of Kabi Kabi First Nation (KKFN). This State controlled road corridor is managed by Queensland Government’s Department of Transport and Main Roads, Sunshine Coast Council and Coolum & North Shore Coast Care. In 1852, the barque “Thomas King” was ship-wrecked further north, and a party of five, being crew and passengers, including Captain Walker, attempting to reach Brisbane were ambushed here by Kabi Kabi. Sitting amongst elevated Araucarian rainforest and water-holes, the site is well-documented in historical publications. During construction, contractors were informed
about the Aboriginal site at the start of the works, yet continued to clear without stopping to check ‘Duty of Care’ obligations. Before construction, difficulties were experienced by residents, in communicating their concerns to government agencies, as to the significance of the site due to the seemingly obscure nature and intangibility of this historical event. Despite early and all attempts at awareness raising by community, ‘Duty of Care’ failed to be exercised by the contractor and the developer. After the site disturbance, action was taken, with help from Kabi Kabi, to formally record the site on the Queensland Government’s database, maintained by the Cultural Heritage Unit. The difficulties and obstacles of understanding, assessing and managing the values of sites offering significant intangible cultural heritage, are well-demonstrated in the dealings with this site. KKFN have flagged in their submission to the 2019 review of the Aboriginal Cultural Heritage Act 2003, support for a process that promotes greater consultation and over-view with Traditional Owners, rather than risk self-assessment by proponents. Increasing Aboriginal Ranger programs would provide agency to traditional owners and facilitate recording, monitoring and management practices.

**Earth Mounds, Billabongs and Typha: A Potential Example of a Niche Production Strategy within a Context of Environmental Niche Construction**

**Robert Jones**, Flinders University

Recent preliminary research at Calperum, near Renmark in South Australia, provides a potential context for an evaluation for the application of Niche Construction Theory (NCT) as a useful framework for the consideration of the use of floodplain environments by Aboriginal people, in the Murray Darling Basin (MDB). This encompasses the broadening of local diets during the mid to late Holocene and a potential association with the expression of evolutionary effects, in local populations, in response to back-ground environmental, social and demographic stressors.

NCT was first formulated as a new paradigm in biology, and subsequently applied in hunter-gatherer studies; linking organisms and their environment in a form of co-evolution. NCT is grounded in a ‘macro-evolutionary’ approach that recognises complex hierarchical processes and views the relationships between organisms as critical to their development over time. The hypothesis has become recognised as a useful framework for research related to the concept of a transition in human subsistence that occurred in the northern hemisphere during the terminal phase of the last glaciation, which was first advanced in 1969 by Flannery. This was labelled ‘the broad-spectrum revolution’ (BSR). It has been argued that a similar transformation occurred in Australia, but at a later time than occurred elsewhere.

The intensive management and cooking of rhizomes from Typha spp., in earth ovens, for carbohydrate and fibre by Aboriginal populations in the MDB, has been documented in a number of provinces. Typha spp. supplied dietary carbohydrate and fibre for the manufacture of nets used for the procurement of fish, birds and animals. The repetitive use of earth ovens in association with seasonally available resources in the MDB since at least the mid-Holocene, were integral and essential to this subsistence activity and is potentially representative of the establishment of wider niche production strategies and the introduction of broader diets in local populations.

**Disturbance and Absence in the North West Growth Centre**

**Darran Jordan**, AECOM Australia Pty Ltd

As residential development across the greater Western Sydney area continues, additional services are required to meet the demands of the projected future population. One of these essential services is the provision of water, with pipelines proposed to generally follow natural contours and the existing alignments of natural waterways. The widespread archaeological investigations required to ascertain if these works would cause damage to subsurface artefact bearing deposits provided an opportunity for an assessment of the relationship between Aboriginal sites and waterways in the North West Growth Centre area. The findings of these works further delineated landscape change and the impacts of past disturbance (natural and human-made) on the presence or absence of Aboriginal sites in the contemporary environment.

**Least-Cost Pathway Models of Human Dispersal from Sunda to Sahul, ca. 70-50 Thousand Years Ago**

**Shimona Kealy**, Australian National University

**Julien Louys**, Griffith University

**Sue O’Connor**, Australian National University

Stretching between the continental shelves of Sunda (mainland Southeast Asia) and Sahul (Australia-New Guinea) is the biogeographic region of Wallacea. Notable for their continued isolation from both
At the Confluence of the Past and Present: Kurnu-Baakandji and the Toorale Water Infrastructure Project

Samantha Keats, Biosis Pty Ltd

Biosis has been involved in the assessment of cultural heritage at Toorale National Park and State Conservation Area NSW since 2016 as part of the Toorale Water Infrastructure Project. The primary objective of the project is to return water flow to the Darling River and re-establish connectivity between the Warrego and Darling Rivers and their floodplains. Toorale Station was purchased in 2008 for its outstanding natural and cultural values, and to secure the property’s water entitlements. Toorale is jointly managed by the Kurnu-Baakandji and National Parks and Wildlife Service (NPWS) to protect and conserve Toorale’s important cultural values.

Toorale is situated around the junction of the Warrego and Darling rivers and has extensive evidence of Aboriginal occupation and activity. Over 750 Aboriginal sites have been recorded within Toorale and includes artefact scatters, quarries, modified trees, earth ovens, middens, stone arrangements, burials and contact sites. The National Cultural Flows Research Project (2019) states that “Aboriginal people have a strong spiritual obligation to care for country. When the country is suffering, the people’s cultural, spiritual and economic health suffers too”. Toorale is an important part of Country for Kurnu-Baakandji people and the cooperative management of the park offers unique opportunities to maintain their connection to the river while allowing their cultural practices to continue.

This presentation will explore the connection between the archaeological evidence of Toorale and the desire for current members of the JMC and the Kurnu-Baakandji community to protect their cultural heritage and continue their connection to Country through their involvement in the Toorale Water Infrastructure Project. This will be achieved through a combination of site type analysis, ethnographic accounts and consultation with the Kurnu-Baakandji community and members of the JMC to show how they interact with archaeology of Toorale and the Warrego River to maintain their culture.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Climate and Agriculture During Rome’s Rise

Duncan Keenan-Jones, The University of Queensland

Russell Drysdale, University of Melbourne

Recently, climatic reconstructions have started to become available at sufficiently fine resolution to allow their detailed comparison with the historical record (e.g. Cook et al., 2015; Sigl et al., 2015). Some, such as Harper (2017), have argued strongly that favourable climatic conditions fostered Rome’s expansion through improved agricultural yields, while others are less certain (Haldon et al., 2018). Detailed climatic reconstructions of Central and Southern Italy are lacking, however. This paper will relate an up-to-date synthesis of climate in Central/Southern Italy over the first millennium BCE to agriculture in the region. It will test the hypothesis that favourable climate during the 6th-3rd centuries BCE in the territories of Rome and neighbouring/allied communities may have made smallholdings more viable, boosting the area’s carrying capacity, and hence the manpower available during conflict. It will also explore possible links between rainfall and flooding variability and drainage and reclamation works carried out by Etruscans and Romans.

References


Harper, K., 2017. The Fate of Rome: Climate, Disease,


Session: General

Samoan Archipelago in World War II, Defensive Preparations, Departure, and Social Impact

Joel Klenck, National University of Samoa
Mohammed Sahib, National University of Samoa
Monalisa Malietoa, National University of Samoa

Review of manuals, orders, and preparations by Japanese and Western militaries are described in the defense of the Samoan Archipelago during World War II. In addition, unrecorded deployments of military units and war activities in Upolu, Savaii, and Manu’a are assessed from Samoan cultural histories including turning off or covering all lights, even during times of birth. Also discussed is the social impact of relationships between Western persons and Samoans, especially after the departure and casualties from Guadalcanal and subsequent battles.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Plenary

Why I left

Jacinta Koolmatrie, South Australian Museum

Enrolling in an archaeology degree as an Indigenous person is exciting. There are few degrees that allow Indigenous people to engage and protect their heritage in the way that an archaeology degree can. Archaeology is also a dangerous place for Indigenous people because of the ever-present racism exhibited by those outside of the discipline, those studying it, and those teaching it. The worst outcome of this racism is the departure of those students who were so willing to learn.

The #MeToo movement brought forth discussions that men claimed they were unaware of. Their actions justified by a system that enabled them to do so. Indigenous students often go throughout their degree silenced in the same way that women in the #MeToo movement were silenced. The foundations of archaeology have enabled racism to continue. This paper will look at how racism is displayed and exercised in archaeology at universities across Australia. It will draw from the experiences of Indigenous students to open the discussion around why Indigenous students leave and what universities can do to help them stay.

Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

Characterising Fire Technologies on Kaidill Country Using Satellite Data

Anna Kreij, James Cook University
Seann Ulm, James Cook University
Christian Reepmeyer, James Cook University
Rebecca Bleie Bird, Pennstate University
Simon Haberle, Australian National University

Burning is a key Aboriginal landscape management technology that has shaped Australian biodiversity...
over millennia. In northern Australia, traditional Aboriginal burning technologies are characterised as a patchwork of small-scaled, low-intensity fires lit across the landscape throughout the dry season. However, most records of Aboriginal fire technologies originate from Arnhem Land, Kakadu and the Kimberley region, and therefore, do not provide a nuanced representation of Aboriginal fire technologies across northern Australia. To extend the current view of Aboriginal fire technologies, we investigate burning practices on Kaiadilt country in the South Wellesley Islands, Gulf of Carpentaria, northern Australia. We focus on the use of satellite data to extract information about past fire events. Spectral signatures of known fire events are used to assess techniques for identifying burnt areas, or fire scars, on Kaiadilt country. Open-access web-based tools and satellite imagery composites are tested against a validation dataset in GIS to determine a reliable, efficient desktop method of classifying burning signatures. The savanna island environment, with a known human history, allows us to establish a method of fire scar identification suited for a local analysis, as well as explore the intricacies of Kaiadilt fire practices. We demonstrate how remote sensing techniques can provide a non-invasive alternative to observe past land management techniques, monitor current land management practices and support research, cultural heritage management and carbon farming initiatives.

**The Role of Open Ocean and Coastal Tidal Currents in the Maritime Migration to Sahul**

Eveline Kiki Kuijjer, University of Southampton  
Robert Marsh, University of Southampton  
Ivan D. Haigh, University of Southampton  
Rosemary Helen Farr, University of Southampton

The colonisation of Sahul represents some of the earliest conclusive evidence for early seafaring worldwide. As seafaring requires forward planning and a detailed understanding of the maritime environment, the migration to Sahul gives important insights into human behaviour, technology, and skills. But despite its significance in the deep human past, the timing and nature of the colonisation process are debated.

Multidisciplinary approaches to studying the maritime environment are providing new insights into this process. Here, dynamic effects of the maritime environment on seafaring are explored with computer models of open ocean and coastal tidal circulation. A particle-tracking algorithm is used to calculate large ensembles of simulated ocean drifts in a General Circulation Model. These are analysed to determine probable timescales and trajectories of movement through Wallacea, in present-day circumstances. In addition, changes in tidal currents at lower sea levels are investigated, using a barotropic hydrodynamic model of the Australian coast.

The results of the modelling experiments indicate a strong but variable influence of open ocean and tidal currents on movement to Sahul. Familiarity with these currents would have been advantageous to early seafarers. By using oceanographic research methods to explore an archaeological issue, new perspectives are gained on the maritime migration that ensured the near-global dispersal of humans over 50,000 years ago.

**Berribee Quarry: A Dated Silcrete Extraction Site in the Central Murray River Valley of Northwestern Victoria**

Rebekah Kurpiel, La Trobe University  
Jillian Garvey, La Trobe University  
Nathan Jankowski, University of Wollongong  
Paul Penzo-Kajewski, La Trobe University  
Darren Perry, First People of the Milawa-Mallee Aboriginal Corporation  
Tinawin (Norman) Wilson, First People of the Milawa-Mallee Aboriginal Corporation  
Emmy Frost, La Trobe University  
Bengi Selvi, University of Melbourne  
Austen Graham, Melbourne Water  
Zenobia Jacobs, University of Wollongong

Aboriginal quarry sites exemplify many of the challenges that have been identified for studies of other types of open sites. Typically, they lack stratigraphy, the potential for dating is limited, and they are characterised by an abundance of cultural material that is likely to have accumulated over long time periods. As surface assemblages, they are especially prone to post-depositional disturbance. Often, it is difficult to determine whether the activity traces relate exclusively to Aboriginal resource use because stone from some Aboriginal quarries was also extracted during colonial times and used to construct buildings and related infrastructure. Developing appropriate approaches for characterising the activities undertaken at quarry sites, which commonly exhibit vast quantities of stone knapping debris, is a challenge.

Berribee Quarry, near the Lindsay River in the central Murray River Valley of northwestern Victoria, was a source of relatively high-quality silcrete for Aboriginal people. Initially described by Mark Grist, Berribee Quarry appears to be the only source of tool stone in the region. This source is unusual in that it is a
subsurface deposit of silcrete that has been accessed via extraction pits rather than collected from an outcrop or other exposed source. This paper details the preliminary results of ongoing research as part of the ARC funded Neds Corner Archaeology Project, which aims to understand the activities that were undertaken at Berribee Quarry, as well as the distribution and use of the material that people transported away from it. Drone and foot surveys of the quarry indicate that it comprises a complex series of extraction pits and spoil heaps distributed over an area of approximately 12 ha. Recently obtained optically stimulated luminescence age estimates derived from one of the quarry spoil heaps indicate that Berribee Quarry was used by Aboriginal people long before European arrival and Traditional Owner accounts indicate that it was used up until the relatively recent past.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Queensland’s Holocene Indigenous Fisheries: A Zooarchaeological Meta-Analysis

Ariana Lambrides, James Cook University
Ian McNiven, Monash University
Sean Ulm, James Cook University

Marine fisheries have been a critical part of Aboriginal and Torres Strait Islander people’s connection to land and sea country in Queensland for millennia. Data from 44 archaeological sites along the eastern Queensland coast were synthesised to explore geographic variability in the role of fish within subsistence regimes and changes in targeted fish species through time. Results indicate the occurrence of mixed species fisheries, which were locally and regionally variable in terms of the fish species captured and habitats exploited. In some cases, an increase through time in the range of fish species targeted was reported. While resource selection was likely mediated by local ecological knowledge and cultural preferences, these outcomes importantly support existing models for the region, such as the documented shift in subsistence regimes during the mid-to-late Holocene, including increased reliance on marine resources and expansion in diet breadth. Future research will target the islands of the Great Barrier Reef and implement globally recognised ichthyoarchaeological quantification and identification protocols. This will enhance regional models of long-term subsistence change and examinations of the dynamic role of fish and fishing practices throughout the Holocene in this region.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Space to Play: Identifying Children’s Sites in the Pleistocene Archaeological Record

Michelle Langley, Griffith University

Identifying the residues of children’s activities in deep time contexts is essential if we are to build a comprehensive understanding of human cognitive and cultural transmission and development. Despite the importance of such data to human evolution studies, archaeologists are only just beginning to look for and identify children’s material culture items, and the identification of children’s spaces is completely absent. This paper draws together sociological and historical data regarding the need of children for ‘secret’ or ‘special’ places - places away from parental control - and demonstrates that this universal behaviour can be identified in prehistoric sites.

Session: Disruptive or Invisible: Children and the Archaeological Record

Remapping the Cultural Heritage Management Landscape: An Aboriginal Community’s Perspective on Commercial Archaeological Practices in the Greater Newcastle, Lake Macquarie and Central Coast Regions of NSW

Peter Leven, Awabakal Descendants Traditional Owner Aboriginal Corporation
Tracey Howie, Wannangini Pty Ltd
Peter Saad, Scribe CRM

The Awabakal and Guringai people of the Newcastle, Lake Macquarie and Central Coast regions of NSW have witnessed a steady decline in the way consulting archaeology has been practiced in our traditional Country. Significant contributing factors in this decline are the bureaucratic drive by State government agencies to streamline development processes and the reductive mapping of our cultural and social values. These processes reduce both community consultation requirements and archaeological practices to overly simplistic, prescriptive models that are rarely tailored to individual archaeological sites, or to the needs of individual communities. The commercial nature of Aboriginal cultural heritage management is central to the decline in consulting archaeological practice in NSW. The minimum requirements detailed in the State’s streamlined development processes are now utilised by many consultants to focus on facilitating development outcomes for proponents rather than investigating the archaeological record and documenting significance. The activities of this lucrative heritage industry, combined with poor regulatory practices, inadequate community consultation requirements and a prescriptive approach...
Managing NSW State Government Infrastructure in a Culturally Sensitive Landscape: An Aboriginal Cultural Heritage Mapping Project

Elle Lillis, Virtus Heritage
Claire Turrell, Department of Planning Industry and Environment, Hunter Valley Flood Mitigation Scheme

This poster presents a cultural mapping project for the NSW Government Hunter Valley Flood Mitigation Scheme (scheme), incorporating a geomorphic assessment, oral history project and surveys on country in collaboration with Aboriginal community representatives to identify Aboriginal cultural heritage values within the scheme and support development of an Aboriginal Cultural Heritage Management Strategy.

The scheme is NSW Government, state owned infrastructure, designed to improve protection from flooding for community and commercial interests in the lower Hunter Valley, NSW. The function of the infrastructure is to reduce the potential damage to life and property by controlling floodwaters. Valued at more than $860 million and consisting of 1280 assets, the scheme is the largest integrated flood mitigation scheme in NSW. Changing climatic conditions, catchment land use and community expectations will affect how the scheme is managed into the future. Whilst investigating management options through the review of the scheme, the need for contemporary floodplain management techniques was identified - including mapping of infrastructure, integrated asset management systems and effective community engagement.

Particularly challenging to the maintenance of infrastructure, is the proximity to the Hunter River and its tributaries. The regularly maintained and updated assets are located in a high culturally sensitive landform with high cultural values. This project was undertaken due to the high cultural value of the project area. The project aimed to achieve better conservation outcomes for Aboriginal cultural heritage and support communication and collaboration between NSW Government and the local Aboriginal community with regard to management of, including identifying and mitigating the impacts of scheme maintenance to, Aboriginal cultural heritage values.

This poster outlines the methodology used and outcomes achieved for the Aboriginal community, the scheme and the Aboriginal cultural heritage values of the project area.
Developing Chronological Transparency Approaches Through Metadata Analysis

Lauren Linnenlucke, James Cook University
Fiona Petchey, University of Waikato
Ian McNiven, Monash University
Sean Ulm, James Cook University

Method development within archaeology requires shifting the parameters by which we collate and interpret data. These changes are evident in the historical development and application of chronological metadata analyses. New chronometric transparency approaches build on traditional chronometric hygiene methods which incorporated quality rating systems based on sample pretreatment, depositional context, and archaeological information. Chronometric transparency strives towards full reporting of metadata to assist with future archaeological investigations. These metadata are central to the development of robust quality-assured approaches to chronological interpretation. By assessing the strengths and limitations of previous approaches to metadata analysis we can shift our focus from straightforward removal and ranking of metadata, to new approaches which embrace complexity. Regional-scale chronological evaluations should benefit from models built with metadata that incorporate a wider range of chronometric information. A Torres Strait case study is used to explore how chronological databases can assist in providing support for future metadata analysis and improving confidence in temporal models.

Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

A Faunal Analysis of Wallen Wallen Creek, Including Collagen Fingerprinting (ZooMS) of Marine Turtles

India Logan, The University of Queensland

This poster presents analyses of the faunal remains recovered from the archaeological site of Wallen Wallen Creek, South-east QLD. Wallen Wallen Creek is still the oldest known site of late Pleistocene occupation in southeast Queensland. Although excavated in 1985 by Rob Neal, this is the first comprehensive analysis of the Holocene faunal assemblage to date. Taphonomic analyses, as well as traditional identifications, were carried out on the faunal assemblage, alongside ZooMS analysis of sea turtle specimens at the site. This is a first attempt at using the relatively new technique of collagen fingerprinting (ZooMS) on marine turtle remains. If successful, ZooMS will provide a useful technique for identifying turtle remains to a higher taxonomic level, as due to the fragmentary nature of archaeological turtle remains, they can frequently only be identified as Chelonioidea. In addition to ZooMS results, this poster will detail the identifiable faunal assemblage from Wallen Wallen Creek, as well as taphonomic processes that have impacted the assemblage. Preliminary results indicate that, unlike initial reports by Neal & Stock (1986), there is no appreciable shift from terrestrial to marine fauna during late Holocene occupation. Instead, people engaged in the exploitation of a broad-based economy of marine and terrestrial fauna for the last ~4,000 of occupation at Wallen Wallen Creek.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Modeling Erosional Sensitivities in Open Sites on the Doring River: Methods and Implications for Research Prioritisation

Alex Mackay, University of Wollongong
Sherrie Chambers, University of Wollongong
Christopher Ames, University of Wollongong
Matthew Shaw, University of Wollongong
Natasha Phillips, University of Wollongong
Brian Jones, University of Wollongong

Open sites in arid and semi-arid landscapes are often subject to prolonged periods of exposure and episodes of erosion that can lead to the redistribution of artefacts and the loss of behaviourally significant spatial information. This is notably true on the Doring River, South Africa, where archaeologically-rich sediment stacks with records exceeding 200 000 years are undergoing increasingly rapid erosion in response to modern climatic conditions and landuse practices. Our past research demonstrates how rapidly artefacts can be redistributed, and ultimately lost, under these conditions. In this paper, we present an erosional sensitivity modelling approach for evaluating the susceptibility of open-air assemblages to disaggregation and the loss of behaviourally significant spatial information. We use low-elevation aerial imagery captured by a UAV to develop a high resolution local DEM for the Kleinhoek 1 locality, and quantify the potential for soil loss using the Revised Universal Soil-Loss Equation (RUSLE). We then compare the landscape erosional sensitivity to the distribution of artefacts of different ages in order to assess cluster integrity and guide future research priorities. We find that some groups of artefacts are already displaced, while others retain spatial integrity but are under no immediate threat. Most importantly, we identify artefact clusters with spatial integrity that are acutely and imminently susceptible to redistribution and disaggregation.
Confirmation of a Railway Construction Camp South of Duchess, North West Queensland, Using Non-Invasive Investigation and Diagnostic Artefacts

Elspeth Mackenzie, ERM Australia
Robin Twaddle, ERM Australia

A scatter of historical artefacts had been observed on the ground surface adjacent to the road and former railway south of Duchess in North West Queensland. Preliminary historical research suggested this open site may be associated with three events which occurred during the early 20th century: the construction of the rabbit proof fence (1902-1904), construction of the railway line (1914-1915) or activities associated with the formation or gazettal of the road as a main road (1930s-1948). A non-invasive archaeological investigation recording the distribution, type and condition of artefacts was undertaken, and subsequent research identified diagnostic artefacts which determined that the likely deposition date was a narrow window of only one decade (1913-1920s). This analysis, together with other historical research, provided justification for the confirmation of the site as a railway construction camp. This project provided a rare example of the dating results of artefact analysis corresponding remarkably precisely with a documented historical event.

Prey Choice in Riwi, Northern Australia

Tiina Manne, The University of Queensland
Jane Balme, The University of Western Australia
Sue O'Connor, Australian National University

Although archaeofaunal assemblages from northern Australia are limited, records indicate an early adoption of “broad-spectrum” diets. Key prey items consist of small- to medium-sized mammals and reptiles, with large kangaroos exploited less frequently. The faunal assemblage at Riwi in northwest Australia, however, presents a slightly different pattern. Although a focus on small to medium prey is evident at initial occupation, a clear shift to larger macropods is evident between 34 and 22 ka BP. Published ethnographic data from the Western Desert has previously noted that prey size does not adequately predict rank, and that pursuit costs appear to play a more important role. In fact, large kangaroos were considered a high-risk enterprise, especially if the right technology had been left at home. In this paper, we examine the data from the archaeological site of Riwi in northwest Australia, and suggest how animal behaviour may have affected prey rank at this locality.

Recent Public Archaeology Investigations on Marilina Creek, Pilbara Region of WA

Michael Marsh, Black Wattle Archaeology

The regulatory processes and commercial pressures of CHM often result in heritage places not realising their capacity to contribute to timely archaeological research before they are destroyed. Competing interests between Traditional Owners regarding the protection of their heritage and detailed archaeological investigation can further limit opportunities. This environment is challenging for consultant archaeologists, as their ability to undertake substantial research is diminished through this model. The broader educational values of heritage places are now rarely considered when assessed by consultants, Traditional Owners or regulators in CHM. Investigating the past through heritage places can enrich the lives of people and help the wider public appreciate archaeology, Aboriginal culture and ultimately our shared human experience.

Public archaeology can provide consultant archaeologists their opportunity to undertake substantial research projects, in an environment which facilitates Traditional Owners rights and responsibilities. Such projects can provide education, training and promotion of archaeology and Aboriginal cultural heritage to members of our communities and their importance to the wider public.

This paper presents two cases studies of community based projects undertaken in the Pilbara region of WA at the BHP Yandi Mine on the traditional country of the Banjima People. The projects were a collaboration between BHP Iron Ore’s Heritage Team, Black Wattle Archaeology and the Banjima People undertaken during NAIDOC weeks in 2016 and 2017.

The projects were used to provide education and promotion of archaeology and Banjima cultural heritage to BHP mining staff. The projects provided the Banjima People the opportunity to engage with mining staff regarding the importance of their cultural heritage. Archaeologically the projects were able to deliver research outcomes regarding the Yandi local and Hamersley regional occupation sequences and technological and subsistence strategies used by people at open and rock shelter sites on Marilina Creek.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney
Panel Discussion: Disrupting the Learning Dystopia

Melissa Marshall, The University of Notre Dame Australia
Georgia Roberts, Monash University / Australian National University

The panel discussion will provide an opportunity for the audience to interact with the contributions we have heard from the various perspectives presented in the ANCATL session - ‘Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry’. Presentations will have discussed the disruption to the scholarship dystopia and the move towards an integrated learning ecosystem capable of fulfilling the needs of a wide range of professional outcomes. The panel will involve presenters from this session in discussion with the audience and include perspectives from ANCATL itself on the introduction of the Australian Archaeological Skills Passport; those involved in the benchmarking research; in addition to perspectives from Aboriginal communities, students and industry. This will provide a welcome opportunity for discussion and feedback from the broader AAA community on this new initiative.

Looking Deeper into Wilcannia Barkandji Twentieth Century Interactions with the Barka (Darling River) and Implications for Earlier Time Periods

Sarah Martin, NSW Department of Premier and Cabinet

Barkandji people living at Wilcannia, Western NSW, hold intimate cultural knowledge of the interconnected Barka (Darling River), floodplain and aquifers at the centre of the Barkandji world. A recent community project has captured some of the tangible and intangible evidence of this complex understanding and its past-present fluidity. A matrix of preferences for Twentieth Century camp location introduces the archaeologist to possibilities that might be otherwise elusive, such as the fact that Barkandji “know”, “feel” and “see” the shallow underground aquifers through their ancestor’s history and utilise this for practical purposes as well as the spiritual. Such information provides archaeologists with insight into the recent interactions with the riverine landscape and raises new possibilities for the interpretation of archaeological occupation patterns over a longer time period. It also “suggests landscape organising principles or structures that may have great antiquity and an archaeological signature” (Tacon 1999:77 quoted in Lydon 2019:6).

Mapping previously recorded traditional sites at Wilcannia beside newly recorded sites suggests that the remembered camp location preferences assist in formulating testable theories of earlier occupation patterning. Barkandji embrace archaeology for providing an additional and complementary form of evidence of time depth, ecological diversity and long-term sustainable occupation that may help turn around recent political decisions that have emptied their river, dried the floodplains and may soon drain the aquifers.

Reference


Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Considering the Social Context of Rock Art Creation: A Case Study from Western Arnhem Land

Sally K. May, Griffith University
Joakim Goldhahn, Linnæus University
Josie Maralingurra, Injalak Arts
Jeffrey Lee, Parks Australia

In this paper I explore the social context of rock art creation through the lens of one woman’s childhood experiences in, what is now, Kakadu National Park. I reflect upon oral history interviews conducted over the last two years and her childhood spent walking country with family. As an active participant in the creation of rock art and witness to vast numbers of other rock paintings being produced, her memories provide unique insights into the social context of rock art created during the mid-20th century. Such personal experiences provide further evidence for the educational role that rock art played across the region.

Session: Disruptive or Invisible: Children and the Archaeological Record

The Art of Listening: The Inclusion of Archaeoacoustics in Archaeological Field Research

Sarah McCann, Independent Researcher

Archaeoaoustics is a growing field of examination into the vacuum of silence that Archaeology fails to represent through a hegemonic paradigm of Western knowledge based systems and institutions. It has been argued within the Archaeological community that Archaeoaoustics is a pseudo-science however
the field work and consequent investigations of sonic phenomena within Archaeological sites adds multidisciplinary dimensions to historical contexts of Archaeological research.

Across cultures, distance and timelines, sound plays an integral role in the human experience. The International Society for the Study of Archaeoacoustics has developed global parameters of Acoustic Measurement Data to provide further insight into the study of ancient and contemporary spaces. Global and local field studies of the acoustic properties of sites have uncovered correlations between natural amphitheatres, Rock Art placements, resonance frequencies that produce large amplitude oscillations and the effect on the brain and the presence of iconography of sonic symbology. This research supports the intentionality of the use of sound within Archaeological sites.

Archaeoacoustic properties of sites are already known to First Nations peoples worldwide; predominantly dynamic living cultures with an Oral tradition. Whilst sound is intangible, the discipline of Archaeoacoustics seeks to reconstruct, recreate and re-imagine the universal global languages of our ancestors; to redefine the study of sites from an objective, disconnected othering of our historical past into a connected, collaborative space.

Session: Disrupting Materiality: Archaeology and Heritage Seen Through the Minds Eye

Public Maps and Protecting Data Sovereignty

Fiona McConachie, Wurundjeri Corporation
Renee McAlister, Heritage Insight

Protecting cultural knowledge data as digital information is one important part of an information management system. Another, often overlooked, part is the management of cultural data as information and data in maps. As digital data gathering becomes more sophisticated and spatial data collection increases in accuracy it is important to consider the implications of spatial data use on maps as it applies to Traditional Owner Data Sovereignty. The accessibility of maps containing cultural places, knowledge, and values has concerning implications for Traditional Owners and the quest for Indigenous Data Sovereignty. In this presentation we look at the creation, use, and distribution of maps containing cultural information, as well as discuss some of the legal and ethical discussions for people involves with research and consulting across a range of different user groups.

Session: Transformation in Aboriginal Heritage Legislation Across Australia

Disruptions to Coastal Desert Open Sites: Or, Why We Haven’t Found the Earliest Occupation Evidence for Pleistocene Rock Art Production at Murujuga

Jo McDonald, The University of Western Australia

Ideas from the Arid Zone of Australia: Some Potential New Approaches in Recognising Cultural Heritage Values in Legislation

Anne McConnell, Consultant

Large in its extent, but not in terms of its economic and political standing, the arid zone of Australia presents a paradox of geographic centrality, and social, political and economic marginality from the point of view of Australia’s coastal urban population concentrations. To focus on the desert is to reverse the dominant perspective of the urban capital cities which face out to sea with arid lands at their back. The Australian arid zone is also an interesting place and space in which to reflect on the adequacy of current cultural heritage legislation, in particular in relation to Aboriginal cultural heritage, and how this might be modified to provide better protection for cultural heritage. It is also an important region to consider given that the Arid Zone comprises some 70% or Australia’s current landmass.

This paper explores some potential new approaches as to how Indigenous (and also historic) cultural heritage might be treated within the framework of the present-day legislation, particularly in relation to the Environmental and Biodiversity Protection and Conservation Act 1999. The ideas presented are derived from a recent study of Australia’s desert Indigenous and historic heritage places of outstanding value to the nation undertaken by the authors and commissioned by the Australian Heritage Council and Department of Environment and Energy. The new approaches relate specifically to the listing of places, the primary statutory mechanism that provides for cultural heritage protection in Australia today. Ideas explored are how Indigenous and historic cultural heritage can be considered within a unified historical narrative in assessing historical importance; expansions on the scope and definition of place in relation to listing (eg, to incorporate new types of place and better incorporate single extensive places and serial sites); and the use of cultural landscapes to not only allow the inclusion of suites of related site types in context, but to better reflect Aboriginal people’s desert lifeways since cultural landscapes as places can represent different
Murujuga (the Dampier Archipelago) on the Pilbara coast is a land and seascape comprising 42 islands with some of the world’s most abundant and diverse rock art. On Australia’s National Heritage List, Murujuga is widely recognized for its culturally and scientifically significant rock art. This landscape has extraordinarily high densities of archaeological evidence including stone artefact scatters, quarries, stone arrangements and shell middens as well as a rock art sequence with extreme stylistic diversity which documents the dynamically changing Abydos coastal landscape over 50,000 years. The Murujuga: Dynamics of the Dreaming project aimed to investigate the earliest archaeological evidence from this landscape, to contextualise its deep time rock art sequence. Murujuga Rockshelter confirmed an LGM occupation of this Pilbara refugium, but the 14 open site locations tested have only revealed Early Holocene onset of occupation. This paper discussed why we are unlikely to find a 50,000 year old occupation sequence on Murujuga, at least on land!

**Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond**

**Plenary**

**Beyond “Art, Aboriginal”: How Rock Art Entered the Lexicon of Australian Archaeological Practice**

Jo McDonald, The University of Western Australia

The index of John Mulvaney’s landmark Prehistory of Australia (1969) does not mention “rock art” but it does have multiple references to “art, Aboriginal”. Rock art is described in a six page section within the chapter on Field Archaeology and is shown both centrally or peripherally in 18 out of 81 of the Plates. Mulvaney’s brief account of rock art includes many prescient observations: rock art is not “art for art’s sake”; ‘artistic influences’ (styles) extend over vast distances (requiring more detailed survey before defining culture-provinces); rock art and other symbolic behaviours had both sacred and secular import; and, importantly, that art in archaeological context had to potential to demonstrate the “the remarkable antiquity of Aboriginal art”, which he had no doubt was Pleistocene in age. Thirty years later, Prehistory’s sequel (co-authored with Johan Kamminga) recognised that the discipline had “expanded and diversified practically beyond recognition”. And the last two decades have seen rock art move into new theoretical niches and away from the margins into a more mainstream discourse which has on occasion challenged disciplinary paradigms. Collaborative research with Indigenous partners and increasingly sophisticated scientific techniques have allowed us to contextualise the age and materiality of rock art, which has changed the questions we can ask about rock art. This paper will profile how rock art research has developed over the last 50 years within and outside the mainstream archaeological discipline to provide a more nuanced understanding of Australia’s deep and more recent pasts.

**Session: Beyond the (Pre) History of Australia**

**Sahul, Lemuria and David Unaipon**

Ann McGrath, Australian National University

In his collection of Australian Legends, David Unaipon wrote of the arrival of a people who travelled via an ancient continent which he referred to as ‘Lemuria’. On the journey, Aboriginal people encountered another, distinctly different group of people described as ‘the ant people’. Lemuria is a European name to describe a lost continent sometimes understood as featuring a land bridge from India. When scientists learnt more about tectonic plates, the theory was discredited, but the belief in such a land was taken up with gusto by theosophists in the late 19th Century. I ask whether Unaipon’s translation of the concept for a white Australian audience was referring not so much to Lemuria’s imagined geography but to the ancient continent that we now describe as Sahul? In English translation, such narratives inevitably address contemporary European concepts. But we can also ask to what extent they may record more ancient narratives based upon oral transmission. If so, perhaps we should look more closely at arrival and migration stories told by Indigenous people, for they could contain useful clues or suggest additional theories that might be tested. Could Indigenous ‘ancient memory’ narratives shed additional light on first Aboriginal arrivals in Sahul? Commonly the protagonists in origin and arrival stories are superhuman, mythical creatures like the rainbow serpent or the seven sisters. But not always. Sometimes the first shapers of the landscape were described as human - as the Aboriginal people themselves.

**Session: Arriving in Sahul: Old Questions and New Approaches**

**Mid-to-Late Holocene Aboriginal Flaked Stone Artefact Technology on the Cumberland Plain**

Andrew McLaren, AECOM Australia Pty Ltd

Recent archaeological salvage excavations across Woorong Park Residual Rise 1, an open air Aboriginal archaeological site situated in the South Creek catchment of Sydney’s Cumberland Plain, in southeastern New South Wales, Australia, yielded sizeable assemblages of flaked stone artefacts. Here we present and discuss the results of a technological analysis of the cultural lithic assemblage recovered from one of these excavations, a 120 square metre
open plan excavation designated as WPRR1 OA1. The stone technology represented by this assemblage is characterised through descriptions of observed raw materials, reduction techniques and methods, flake attributes, tool types and discard patterning. The broader behavioural significance of the WPRR1 OA1 assemblage with respect to mid-to-late Holocene Aboriginal occupation of the South Creek valley and Cumberland Plain more broadly is also considered.

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

RPA Photogrammetry to Assist in the Recording, Maintenance and Management of Culturally Sensitive Sites
Roger Mehr, NSW Department of Planning, Industry and Environment
Wendy Beck, University of New England
Colin Ahoy, University of New England

Although this session focusses mainly on the role of geophysical tools for burials, non-invasive identification and recording techniques are also proving invaluable in the culturally appropriate recording and management of many other site types. The role of digital technology (e.g. remote sensing, laser scanning, GIS, total stations etc.) in archaeology has grown hugely in the last two decades in Australia. Much of the application of the digital technology of drones and photogrammetry has been applied to recording shipwrecks, art sites, artefacts and historical contexts, rather than surface sites (e.g. Kowlessar et. al. 2019). This paper investigates a novel case study showing how we can best protect and interpret surface grinding groove sites in northern NSW using culturally appropriate digital methods. As well as using traditional analogue methods of measuring and recording the site, a drone is used to take digital photos of the grinding groove site and a photogrammetric model is subsequently created. This model is an accurate representation of the 3D nature of the grinding grooves and enables spatial relationships and geological features to be documented more easily than with traditional methods. 3D modelling is useful because it gives access to a wider group of people than just those who can visit the site (e.g. overseas/ interstate/educational providers etc.), provides a facsimile (and the potential for physical models) of the site which is better than analogue photos for comparing and appreciating site, and provides a tool for monitoring impacts on places in 3D over time. Using digital photogrammetry with drones to construct a 3D model, provides a non-invasive, cost-effective and efficient way of recording, analysing and managing a large axe grinding groove site. This project can add to the practice of data capture and can help facilitate Aboriginal communities to better protect Country.

Session: Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country

Aboriginal fibre objects represent culture, history, innovation, and are often overlooked as an art form in Australia. In their varying forms - from bags and baskets to mats and breast girdles - these objects played a practical, economic and ceremonial role in society. Fibre is still being used as a medium for Aboriginal artists to express their culture and identity today. Depictions of fibre objects in other mediums - such as rock art - provide archaeologists with an alternative way of viewing this particular type of material culture. In western Arnhem Land, such rock art depictions reveal how deeply fibre objects are entangled in the cultural beliefs of the Aboriginal people of the area. Rock art is one medium in which fibre plays a key role in communicating messages about life, love, and culture. In this paper I use case studies from western Arnhem Land to disrupt the standard narrative of fibre objects as practical, mundane, and utilitarian. These case studies illustrate the ways in which fibre objects are used and manipulated to communicate complex messages to different audiences across time and space.

Session: Disrupting Materiality: Archaeology and Heritage Seen Through the Minds Eye

Who Goes There?! Managing Rock Art and Heritage in Balanggarra Country, East Kimberley, Australia
Gerald Mills, Balanggarra Aboriginal Corporation
Sven Ouzman, The University of Western Australia

Australia’s Kimberley is rightly famous for its Aboriginal rock art and cultural heritage. Indeed, rock art should be a central part of an Australian identity and more people should know about this heritage. But therein lies a conundrum – the more people visit rock art sites, the greater the potential physical and cultural damage to these sites and their custodians. Balanggarra Aboriginal Corporation has rock art as a central part of its Healthy Country plan and has partnered with UWA to address the following challenges:

• Unauthorised visitor access to cultural sites
• Protecting sites from natural and anthropogenic damage (fire, feral animals, dust)
• Developing select sites as models for visitation
• Integrating sites into local school syllabi
• Producing information packs for schools, tourism, commercial usage
• Image use and Intellectual Property issues (media, social media)
• Ranger training and certification
• Advising State government on policy

We present recent case studies from the east Kimberley that describe the evolving management strategy, focusing on a particular integrated case study that combines an important rock art site, coastal and helicopter visitation, a Ranger base and capacity issues. We welcome all comments and suggestions and will present this work as part of a conversation rather than a formal presentation.

Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

The Discovery and Conservation of a Mortuary Tree in Koamu Country

Ross Mitchell, Kooma
Michael Westaway, The University of Queensland

Mortuary trees are well represented in the ethnohistoric literature but very few have been documented by cultural heritage officers and archaeologists. No mortuary trees are recorded on the Queensland site register, and the only other known example from Victoria investigated by Aboriginal cultural officers and archaeologists (Richards et al 2012) was destroyed by bush fire.

Here we report the discovery of a mortuary tree west of St George in southern Queensland, and describe the Kooma peoples investigation and conservation of the tree in partnership with the University of Queensland. We also outline the process of how this important and rare traditional site type will be conserved for future generations of Kooma people.

Session: Culturally Modified Trees in the Archaeological Record

What Could Treaties Mean for Aboriginal Cultural Heritage Management?

Jamin Moon, La Trobe University

The gradual decolonisation of Western authority structures in Australia and in Victoria in particular has led to the stage where treaties between the Victorian Government and Aboriginal Victorians are becoming a reality. Lest people be under any misconception, there is no doubt that Aboriginal cultural heritage management and protection will be a key component of future treaties in Victoria. It is a feature of all modern British Columbia treaties and all modern Waitangi settlements. Cultural heritage management is a primary concern for Traditional Owner corporations in Victoria, for cultural, political, economic and even existential reasons.

Should treaties begin to incorporate cultural heritage management objectives and priorities effectively, existing Aboriginal cultural heritage management laws would become redundant. This is potentially the case in British Columbia, where the modern treaty process can result in new Aboriginal-determined cultural heritage laws and processes overriding provincial heritage legislation. It is also potentially the case in a future Victoria under negotiated treaties. If not separate cultural heritage laws pertaining to different Traditional Owner country, the alternative is that treaties will force changes to existing Victorian Aboriginal cultural heritage legislation. This would result in a significant displacement of Victorian legislation as it moves further to accommodate Aboriginal cultural heritage management priorities.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Going Feral: Colonialism and the Zooarchaeology of European Faunal Introductions in Australia

Carly Monks, The University of Western Australia

European colonisation of Australia has involved not only the prolonged and ongoing subjugation and displacement of Aboriginal and Torres Strait Islander peoples, but also the disruption of and irreversible damage to ecosystems across the continent. As (predominantly British) colonists sought to recreate familiar environments and economies during the 18th and 19th centuries, they introduced a range of European mammals into Australia; cats, foxes, dogs, rabbits, and ungulate livestock were initially deliberately translocated by settlers, while rodents were likely inadvertent additions to the colonial faunal suite. In less than a century, settlers succeeded in disrupting ecosystems that had grown with Aboriginal cultural practices for tens of millennia.

Previous assessments of these introductions have typically focused on historic records or individual species. This paper reviews the zooarchaeological evidence and investigates potential archaeological contributions to our understanding of the timing, nature, and lasting cultural and ecological impacts of colonial faunal introductions across the continent.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time
What could treaties mean for cultural heritage management in Australia? What are the implications for governments, consultants, industry and academia today? This paper looks at some of the evidence for existing arrangements under modern treaty and settlement systems and poses some answers and challenges for today’s cultural heritage management stakeholders.

Session: Transformation in Aboriginal Heritage Legislation Across Australia

Exploring the Archaeological Implications of Submerged Indigenous Heritage in Flying Foam Passage, the Dampier Archipelago

Patrick Morrison, The University of Western Australia
Jo McDonald, The University of Western Australia
Mick O’Leary, The University of Western Australia

Sea level rise following the Last Glacial Maximum submerged a third of the Australian continent. While it has been long recognised that archaeological sites likely exist on the drowned continental shelf, they have proven very elusive in this part of the world. In 2018, a stone artefact scatter was identified in the intertidal zone of Dolphin Island, in the Dampier Archipelago. The Dampier Archipelago is on the National heritage List for its significant rock art and stone features; less well recognised is the extensive archaeological evidence which contextualises this inscribed landscape. Preliminary investigation in the intertidal zone suggested this site was the first documented evidence for a submerged Aboriginal site in Australian marine waters. As part of my Honours thesis, I further investigated the site, with a focus on systematic terrestrial and intertidal recording.

Here we report on the techniques used to reconstruct and visualise the landscape. By a combination of drone imaging, photogrammetry, sediment coring, pXRF and airborne LiDAR we have contextualised and recorded artefacts in the intertidal, beach and terrestrial contexts.

This Honour’s research project has explored the implications of the archaeological and landscape evidence for other potential submerged sites. It has tested a predictive model, and discusses the cultural heritage management implications for the regulation of offshore resource projects in this highly significant heritage landscape.

Session: After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management

A Pictorial History of the Rocketry in Germany During Weimer Republic: 1919-1933

Bhaskar Mukherjee, Sydney University

On 28 June 1919 the WWI formally ended with the ratification of Versailles-Treaty. The humiliating defeat of German military had followed the cessation of German empire of Kaiser Wilhelm II. On August 1919 the “Weimarer Republik”, the first German democratic government was formed. The defeat in WWI inflicted devastating effects on moral, social and economic life of Germany. Central political power was stripped off, large part of national territory dismantled, major industrial assets confiscated and large repatriation payment enforced by the victorious powers. It also imposed a total ban on acquisition of submarines, research development and manufacture of artilleries, tanks and military aircrafts. Ironically, the victory powers were unaware of the future significance of rocket-technology, hence they spared the inclusion of rocketry related R&D program in the list of prohibited activities. This initiated a chain of rocket related activities albeit of amateurish nature, infused in the flourishing cultural activities of the era of “Goldene Zwanziger Jahre” (The Golden 20s) of Germany. Rocket associations (clubs); Verein fuer Raumschiffahrt eV operating own testing laboratory and rocket-launching ground were founded. The popular science fiction film “Frau im Mond” (Woman in moon) was made by renowned film director Fritz Lang. Professor Hermann Oberth (1894-1989) known as the father of German space research published his famous treatise “Wege zur Raumschifffahrt” (A guide to space travel). He influenced and mentored highly enthusiastic young engineers, in particular his “Lehrling” (apprentice) named Werner von Braun. The team pioneered many vital aspects rocketry related R&D, which ushered today’s space science and technology. This presentation highlights the timeline of the achievements in Rocketry by German pioneers during (1920-1933). Materials were collected from Bibliographic Information Centre of German National Library and Historical Archives of Technische Universitaet Berlin, Bhaskar Mukherjee’s alma mater.

Classification of Archaeological Artefacts Using an AI Based Vector Analysis Technique

Bhaskar Mukherjee, Sydney University

Archaeological artefacts broadly belong to following categories: Pottery shreds, Lithics, Lava remnants, Meteors, Metal objects, Figurines, Jewelleries, Metallurgical residue, Mineral grains, Glass objects (bead, amulet), Human and animal remains
(mummies), Fabrics (cotton, jute, silk, wool), Food remains, Manuscript pages (paper, parchment, leather) and Seals. Classification and chronological dating of archaeological artefacts are vital to data management and heritage conservation related tasks. This report highlights a novel method of artefact classification by analysing the surface texture (colour) by Cosine Distance (CD) method. The CD is an Artificial Intelligence (AI) based technique commonly used for “Face Recognition” purpose by forensic experts. Author received 20 small arrowheads (Lithic) from Nicholson Museum of Sydney University. The samples were scanned using a common flatbed scanner and jpeg images (410 dpi) constructed. An open source image analysis package “Image J” was used to split the jpeg images into R (red), G (green) and B (blue) colour vectors. Cosine distance between the colour vector \((r_x, r_y, r_z)\) relevant to the sample of interest and reference vector \((r_0, g_0, b_0)\), i.e. white background was calculated. An AI based “Global Categorization Criterion” (GCC) was developed to classify the images in the light of “similarity” i.e. the inverse of CD form the reference (white background). The data was recorded in an interactive (Microsoft Excel) spreadsheet environment. The method described (demonstrated) in this report is most suitable for archaeological data management related to a large number of small artefacts.

Session: Remote Sensing, Data Management, GIS, and the Integration of Spatial Technologies

Stories from the Stone
Ken Mulvaney, Rio Tinto

As the Murujuga Aboriginal Corporation logo states “Stories from the Stone”, indeed we know more about the prehistory of the Dampier Archipelago from its rock art than derived from other, more traditional, archaeological approaches. It is a prehistory that has contemporary significance; the landscape, not just the petroglyphs are scared and profound. Indigenous knowledge working with scientific process does not set one way above the other; it enhances understanding-both ways. Rock art studies have been carried out on Murujuga for as long as the Prehistory of Australia has been out. As the book’s content has expanded so too has that of the way we work, collaboration rather than overlooking, respecting the cultural connection. Murujuga rock art reveals patterns of rising seas, changing landscapes, species domicile and ritual practices; aspects which are within the stories that have been passed on from generation to generation. The journey has gone from a western paradigm of scientific heritage to that of Indigenous knowledge and heritage as of value to the world.

Session: Depicting Paradise: How Rock Art has Disrupted the Dominant Archaeological Paradigms of our Time

Western Australia’s Aboriginal Heritage Act 1972: The Challenge of Reform
Angela Murphy, Department of Planning Lands and Heritage

At the time of its commencement in 1972, Western Australia’s Aboriginal Heritage Act (AHA) was regarded as the most comprehensive piece of Aboriginal heritage legislation in Australia, affording automatic (or blanket) protection to places and objects important to Aboriginal people. The AHA’s core has remained untouched since, apart from minor amendments made in response to perceived administration issues. Reviews conducted in 1984, 1991, 1995, 1996 and 2011 either did not result in proposed legislation or Bills that did not pass.

In 2018, the West Australian Government initiated a fresh AHA review through a process designed to involve stakeholders at every phase. Phase One commenced in March 2018 with the release of a Consultation Paper, which sought views on how the AHA should be improved. This was supported by statewide workshops for Aboriginal people and the wider community. Over 550 people participated in these workshops and more than 130 written submissions were received by the closing date. This feedback informed proposals for a new Act, which were released in a Discussion Paper in March 2019. Further statewide consultation workshops were held, attended by more than 100 people, and more than 70 written submissions were received.

Should the project proceed to the next stage, draft legislation will be prepared and released in 2020 for another round of consultation.

Any new legislation must respond to the challenges of balancing:

- Aboriginal people’s aspirations for control over their heritage against Government regulatory oversight.
- Recognised native title rights and interests in heritage with interests in some heritage places born out of deep, historical connections.
- The need for efficient land access against culturally appropriate processes.

This paper will describe Western Australia’s current review process and outcomes to date in pursuit of this balance.

Session: Transformation in Aboriginal Heritage Legislation Across Australia
The State of the Rock Art Indigenous Management in the Warddeken IPA

Rosemary Nabulwad, Warddeken Land Management Ltd
Elizabeth Nabarlambarl, Warddeken Land Management Ltd
Claudia Cialone, Warddeken Land Management Ltd
Sarah Bilis, Warddeken Land Management Ltd

This poster describes an Indigenous-led sustainable rock art land management project conducted in the Warddeken Indigenous Protected Area – an expanse of land stretching over 14,000 km² in Western Arnhem. Warddeken innovative approach to access, control and manage rock art reflects the strive to reconnect people to their land, to conserve their art and their history.

The project prioritizes extensive periods of consultation with landowners who identify and decide on consent to survey priority rock art occupation sites based on their lore and motivation.

Following consultations surveys are conducted through a joined effort of a team of rangers, landowners and project officer using a state-of-the-art methodological apparatus - the result of a two-toolbox of traditional lore and Western science. Rock art discovery is led by the rangers intuition and memories while walking through country, facilitated by a pre-mapping of the consulted areas displayed on tablets. All tracks and positions of the sites are marked and recorded using GPS. At each site the rangers take photographs of the art - the context, the panels and the motifs (where possible), using professional digital cameras and IFRAO scales.

Both cultural and physical conservation information is recorded. This includes respectively audiovisual recordings of elders’ knowledge of the land and details of threats and/or damage to the art. Data collection at each site is facilitated by a geomapped tablet application with a flexible design developed by the rangers also in the local language – Bininj Kunwok (or kunwinjku).

Physical conservation information is necessary to Warddeken to plan and implement management actions; cultural information allows the creation of cultural resources and provides guidance for the organization of intergenerational cultural events on-site. Rangers archive rock art information into their dedicated cloud database called Bidwern so the lore, as well as the physical paintings, can stay ‘carved in stone’ forever.

Engineered Seascapes Documented Using Airborne Photogrammetry Platforms: Kaidadilt Aboriginal Stone-Walled Intertidal Fish Traps, Gulf of Carpentaria

Texas Nagel, James Cook University
Anna Kreij, James Cook University
Jason Scriffignano, Dynamic Spatial Solutions
Michael Boland, Unmanned Aerial Vehicle Services
Daniel Rosendahl, Willandra Lakes Region World Heritage Centre / James Cook University
Jorg Hacker, Airborne Research Australia
Sean Ulm, James Cook University

A systematic, accurate and replicable method for documenting Kaidadilt Aboriginal stone-walled intertidal fish traps is developed for the South Wellesley Islands, Gulf of Carpentaria. Best practice unmanned aerial vehicle (UAV) and light aircraft aerial survey techniques are deployed in this study in conjunction with photogrammetry, LIDAR and novel GIS applications. UAVs equipped with a digital camera provide a low cost, operationally flexible and high-resolution alternative to conventional forms of remote sensing such as satellite imagery. Airborne photogrammetry platforms can be employed to document areas that are isolated or inaccessible with centimeter accuracy, and serve as an alternative to traditional methods of pedestrian theodolite survey. Close range aerial photogrammetry and LIDAR outputs produce high resolution orthoimagery and digital elevation models that provide new insights into the physical extent of stone structures and their relationship to topography and hydrology in the intertidal zone and adjacent terrestrial environment. Understanding the extent and context of fish traps is key to investigating their function and impacts on intertidal hydrology, in addition to improving our understanding of modified intertidal areas and human-engineered landscapes.

Digital Reconciliation: Re-discovering Indigenous Cultural Material from History and Expeditions to the Gulf of Carpentaria, Northern Territory

Kerry-Lynn Nancarrow, Flinders University

Throughout the 19th and 20th centuries, archaeologists, anthropologists, scientists, photographers, and an array of other professionals, conducted expeditions, or travelled to the Gulf of Carpentaria region of the Northern Territory, where they collected and recorded the lifeways of the Aboriginal communities of the area. The Northern Territory has provided the world
with a vast amount of information on the Australian Aboriginal people’s cultural ways, much of Arnhem Land and Kakadu has been explored and publicised from earlier expeditions and today’s archaeological explorations. Nonetheless, the Lower Gulf region being on a smaller scale of research with minimal attention on the Limmen National Park region - between the Roper and McArthur Rivers.

The research focuses on the rediscovery of collections from the Roper River region which are housed within storage institutions throughout Australia, Europe, America and other chosen areas and distinguishing the methodologies of the past in comparison with today’s technology. In addition, the investigation of digital repatriation as a form of understanding of the collections affiliation to the communities by establishing an access pathway for the communities. Two cultural rock art sites within the Limmen National Park will be explored from past and present anthropological and archaeological research, - Mountain Creek / ‘Yurlurinji’ situated within the former St Vidgeon Station and Queensland Crossing / ‘Yawarra’ on the Hodgson River off Roper River. The primary emphasis of the research being placed on the cultural material of the Marra language peoples, - the Indigenous Traditional owners and custodians of the lands and seas in and near Limmen Bight in the southwest end of the Gulf of Carpentaria, Northern Territory.

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In Search of Lost Sediments: Trace Stratigraphy on Cave Walls

Kim Newman, Griffith University

The limestone karsts of south Sulawesi contain a deep archaeological record indicating modern humans have been on the island for more than 50,000 years. Located in Wallacea, Sulawesi is at the axis of human migration between the super-continents of Sunda and Sahul. From the earliest settlement, to the arrival of the dingo, and Makassan trepangers the island has persistently been associated with the movement of people to Australia.

The karst environment produces unique challenges to researchers in this region. Frequently disturbed through erosion, sinkholes and digging the cave deposits of south Sulawesi contain multiple depositional phases and discontinuities. Few Pleistocene sites have been excavated in this region, with the majority of research focused on the Holocene Toalean period. Part of the difficulty in researching these older time periods is there appears to be no continuity within excavated assemblages with deposits dating to between c.20,000–7,000 years ago largely missing from sites. Cemented archaeological deposits adhering to cave walls may prove the solution for researchers interested in such missing time periods. Samples taken from these deposits for radiocarbon dating have shown that they contain material dating to these missing periods of time. Future investigations into the the geomorphology of these archaeological breccias may reveal a range of information which can be used to reconstruct the formation and removal of these lost sediments. This can answer local questions relating to connections between the Pleistocene and Holocene archaeology in south Sulawesi. It can also inform wider research strategies which may lead to the identification and investigation of more Pleistocene sites and may allow us to better understand how people have lived and moved through these islands in the past.
Survey and Preliminary Findings from Major Bottleneck Islands on the Northern and Southern Route to Sahul

Kasih Norman, University of Wollongong
Thomas Sutikna, University of Wollongong
Kelsey Lowe, The University of Queensland
Sam Lin, University of Wollongong
Tim Cohen, University of Wollongong
Zenobia Jacobs, University of Wollongong
Richard Roberts, University of Wollongong

Wallacea is a vast and biogeographically unique archipelago colonised by multiple hominins over the last million years. The peopling of Wallacea by anatomically modern humans was an important stage in their maritime migration from Sunda (Pleistocene mainland Asia) to Sahul (Pleistocene Australia and New Guinea). This journey required multiple island crossings, and likely involved purposeful seafaring and a maritime economy. Evidence for a modern human presence by c. 60-70 ka exists on Sumatra to the west of Wallacea and in Australia to its east. However, at present no definitively modern human Pleistocene archaeological sites older than c. 45 ka exist in Wallacea, with the region currently missing 5-20 ka of modern human prehistory. Closing the gap in the chronology of modern human occupation between Sunda and Sahul is therefore important to understanding the expansion of modern humans into the region. This event was possible through two migration corridors through northern and southern Wallacea along strings of stepping-stone islands terminating at New Guinea (the northern gateway) and northwest Australia (the southern gateway). Major islands adjacent to these two regions include Seram, Timor and Rote Islands. This paper will present findings from recent survey field seasons on each island and range finder luminescence ages and preliminary archaeological results from new cave sites.

Session: Arriving in Sahul: Old Questions and New Approaches

Looking After Rock Art on Ngarinyin Country

Lloyd Nulgit, Wilinggin Aboriginal Corporation
Robin Dann, Wilinggin Aboriginal Corporation
Leeanne Bear, Wilinggin Aboriginal Corporation
Melissa Marshall, The University of Notre Dame Australia

Rock art, it is one of our main cultural sites... where they painted it, that's where they stayed. They didn’t paint it 'cause they felt like painting, they dreamt it... with the painting comes song and dance too – it’s not just the painting on the wall... (Lloyd Nulgit)

For Ngarinyin people, the Wanjina Wunggurr Wilinggin Traditional Owners in the Kimberley region of Western Australia, looking after rock art is not just something you do by going to a site to look at impacts. For us, we’re the keepers of the country, the keepers of the land. We look after the sites in our own way, taking our old people who are left out bush to teach everyone – us as the next generation of knowledge holders, our kids and grandkids. We do this any way we can in this remote region. We have collaborative projects we do with people like Mel, that help us to get out on Country and look at the rock art within its cultural landscape – we look after it with both our traditional practices and science together, helping to look after the Wanjina and Gwion Gwions. Sometimes this is about right way fire, sometimes it’s about putting up a fence to stop feral animals or divert traffic away from special places.

We have a cultural obligation to look after sites that’s irreplaceable and priceless (Robin Dann).

Working together with the Rangers and on our Indigenous Protected Area (IPA) means that we are able to achieve this in ways our old people sometimes wondered if it was ever possible. We make the most of every opportunity to get out on Country – through collaborations with the Mowanjum Arts and Culture Centre, our Junba Project or even heritage surveys, we make the most of every opportunity to get people on Country. We want to share these experiences with you all through this paper.

For this is our culture, this is our heritage – we the next generation to look after it (LeeAnne Bear).

Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

Culturally Modified Boab Trees in the Kimberley, WA

Sue O’Connor, Australian National University
Jane Balme, The University of Western Australia
Ursula Frederick, Australian National University
Melissa Marshall, The University of Notre Dame Australia

The boab (Adansonia gregorii), a mysterious tree that is relatively closely related to the baobabs of Madagascar, is found only in the Kimberley region of northern Western Australia, and in adjacent parts of the Northern Territory. Carvings on boab trees were first reported in the mid 19th C by the explorer George Grey, and a selection of them were recorded by Ian Crawford in the 1960s in the area between Wyndham and Derby. Crawford noted that the carvings include representations of rays, crocodiles, anthropomorphic figures, snakes and the markings of mythological
animals. As well as these traditional motifs, people living on missions and stations inscribed boabs with names and markings referencing their occupations, interests or identity. The antiquity of the practice of boab carving is unknown. While boab trees are long lived, many of the trees recorded by Crawford had massive girths suggesting that they were hundreds of years old at the time he recorded them. No inventory of the trees has been carried out since this time. There is now some urgency to carry out survey and recording of Kimberley modified boabs. Here we discuss the known distribution and associations of a selection of Kimberley modified boabs.

Session: Culturally Modified Trees in the Archaeological Record

Cultural and Ecological Resilience of Indigenous Communities and Their Territory Traditional Ecological Knowledge Associated with Mammals, Landscape and Culture

Marcela Ortega, Griffith University

Rock art and associated Traditional Ecological Knowledge (hereafter TEK) have faced a progressive lost, which in turn, affects the well-being and cultural survival of indigenous communities and the conservation of their natural resources. This research aims to contribute to the conservation of rock art and associated TEK. The research is focused on an exploration of the TEK associated with specific mammal depictions in rock art, and related landscape and cultural aspects. Following this analysis of the relationship between rock art and TEK, this research seeks to reveal insights about the role of rock art as a reservoir of TEK and as a mechanism to increase the socioecological resilience of Australian Indigenous communities and their territory and the correlation between them. An interdisciplinary approach is used to analyse archaeological and ethnographic data related to rock art as the main source of information. When pertinent, archaeozoological, ethnobiological, ecological, palaeontological and/or palaeoecological data will be integrated. There will be three regional Aboriginal Australian cases analysed, with a focus on western Arnhem Land (Northern Territory), and two further case studies, based in East Cape York Peninsula (Queensland) and the greater Sydney region (New South Wales).

One of the most important forms of knowledge for the survivorship and well-being of indigenous communities is the ecological knowledge of the resources that they use, as it encode the rules that allow the management of their world. Aboriginal communities, in absence of writing, used oral transmission and rock art as ways of preserving their ecological knowledge. Through the colonization process, both have been negatively affected, oral histories and rock art have been diminished on lost, and with them the traditional ecological knowledge. This loss affects well-being, not only of indigenous communities and their territory but also in terms of tangible and intangible human heritage.

The Rights of Rock Art

Sven Ouzman, The University of Western Australia

Work on the geomicrobiology of Kimberley rock art and rock art sites has identified a community of active and ‘alive’ chemical and organic activities and reactions under, in and on rock paintings. This ‘western’ research is a powerful vehicle that bring us in conversation with Aboriginal knowledge that some, if not all, rock art is ‘living’. The scientific finding also does important philosophical work in cross-cultural knowledge construction and communication. Going even further, and drawing on feminism and post-humanism, this research also raises important and not always comfortable questions about what our responsibilities to rock art as a sentient entity rather than simply an artefact are. Put another way, we need to consider what the ‘rights’ of rock art might be and how a sentient status changes human actions in relation to rock art.

Session: Depicting Paradise: How Rock Art has Disrupted the Dominant Archaeological Paradigms of our Time

Weapons of the Queensland Native Mounted Police

Tony Pagels, Flinders University
Heather Burke, Flinders University
Lynley Wallis, The University of Notre Dame Australia
Bryce Barker, University of Southern Queensland
Noelene Cole, James Cook University

Investigating archaeological evidence for ‘dispersals’ carried out by the Queensland Native Mounted Police (NMP) can be problematic, although the presence of ammunition and other weapons-related artefacts is one line of evidence that may indicate NMP activity in certain locations. There were a multitude of weapons produced and available to the Queensland government and private citizens during the latter half of the nineteenth century. A challenge therefore lies in defining exactly what weapons and ammunition were utilised by the NMP over the 50 years of its operation. Drawing on primary and secondary source material, along with an examination of weapons held in museum
and private collections, we have established the arms issued to the NMP between 1848 and 1904. In addition, fieldwork was conducted from 2016–2018 at four NMP camps in Queensland, yielding approximately 400 ammunition and weapons-related artefacts that were analysed and matched to weapons.

We found that the Qld colonial Government was in fact extremely slow to supply the NMP with newly developed modern weapons, suggesting that NMP 'dispersals' could have been even more devastating than they were. Six arms were issued to the NMP, including the Snider artillery carbine, Westley Richards & Co 20g pinfire carbine and the Webley & Son RIC revolver. Ammunition artefacts from these three weapons are well represented in the archaeological record at the four NMP camp study sites. The spatial analysis of ammunition distribution patterns at these sites provides one means to interpret site arrangement and activity areas. This, in turn, provides evidence for NMP organisation on a broader scale and may assist to identify unknown NMP sites.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Villages of the Barkandji and Conservation on the Barka
Colin Pardoe, Colin Pardoe Bio-Anthropology & Archaeology

Large settlements are to be seen beside rivers in the Murray-Darling Basin. Those of the Barapa on the Mille or Murray River result from capitalising on the flush of resources generated by spring floods. In contrast, the villages of the Barkandji on the Barka or Darling River appear to result from an increasingly tight tethering through the summer, as back country water sources dry out.

The recent confluence of drought and upstream water diversion has conspired to bring the Barka to a state that may not support fish along much of its length. Small-bodied fish are at particular risk. Waterholes are drying, with some below 4 m. Loss of genetic diversity, extirpation and possibly extinction might be averted with emergency measures guided by the Barkandji archaeological record - a distillation of traditional practice spanning several thousand years.

Session: No Paradise Road: Conflict Archaeology in Australasia and Beyond

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

A Field School in Professional Practice: The ANU Oaks Estate Project
Bec Parkes, Lantern Heritage

There is a well-known gap between professional and academic archaeology which archaeologists on both sides of the divide have long bemoaned. This takes the form of a gap in skills related to specific archaeological subfields (Mate and Ulm 2016; Ulm et al. 2013; Ulm et al. 2005) as well as a dearth in knowledge of key professional skills, like report writing and project management. Over the last several years, the ANU has centred fieldwork training within its undergraduate and MA programs, and in 2019 we are launching a new experimental course in professional practice and archaeological fieldwork. This course has been designed collaboratively between academic and professional archaeologists and is designed to give students an introduction to a wide range of professional skills—from finds identification to project design and WHS—as well as introduction to fieldwork methods. The course is designed around a small-scale excavation in Oaks Estate, a village on the edge of the ACT, which aims to illuminate elements of the early history of Canberra. Both in the classroom and the field, the teaching is shared between academic and consultant archaeologists, and students are encouraged to seek answers and support from both lecturers and consultants. This course will run for the first time in Nov 2019, and we hope to use our presentation at AAA to reflect on how well we achieved these aims and how we might continue to develop this sort of collaborative teaching in future.


Session: Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry

Two Men Yarning: Risks and Benefits for Mapoon Families from a Cultural and Planning Perspective for Cultural Mapping of Unmarked Graves and Cemeteries Within the Mapoon Aboriginal Lands
Simon Pearce, GHD
Peter Guivarra, Mapoon Aboriginal Shire Council

Caring for country and looking after the final resting places of our old people are the responsibilities of
current generations within Indigenous custom and law in Mapoon. Peter Guivarra has been undertaking this responsibility for Mapoon families since he worked in Mapoon Council, as Mayor for over 20 years and now as Deputy Mayor/Councillor, and been a champion for managing these resting places and for protection of cultural heritage in Mapoon Lands. Peter will be sharing his perspectives on the risks and benefits of cultural mapping of unmarked graves and Cemeteries within Mapoon Lands. Simon Pearce is one of the consultants who has worked in partnership with Peter, since 2016 on the Mapoon unmarked graves and Cemeteries project, preparing management strategies and cultural heritage management plans. Simon has over 25 years experience managing complex environmental projects that are State and Nationally significant, including various disciplines, of which cultural heritage is one of many. Simon will be sharing his perspectives on how solutions were developed to counter some of these risks for Mapoon people and also discuss his perspectives as an environmental manager on how this project may have transformed and challenged his other experiences with managing cultural heritage as a consultant.

**Session:** From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes

**Between Worlds: A Brief History of Archaeological Research in Wallacean South Sulawesi, Indonesia**

Yinika Perston, Griffith University
Basran, Freelance Archaeologist

Sulawesi lies between the Asian and Australian supercontinents, isolated by deep oceanic barriers that hampered faunal dispersal and resulted in a unique and bizarre local biota. In an effort to explore the effect of this isolation on human migrations, archaeological excavations have been conducted in the region since the early 20th Century, and have produced notable finds including some of the world's oldest dated rock art and stone tools dating to 118-194 kyr. This paper provides a brief summary of this work and the way it has shaped our understanding of the region and of human movement to Australia, and includes a summary of the latest Indonesian-language publications that may not otherwise be accessible to most Australian researchers. These works also reflect a changing shift from the world of Dutch-European colonial research, to Australia-Indonesian collaborations, into the recent proliferation in Indonesian-led publications.

**Session:** The History of Archaeology in the Driest Continent and its Relationships with (Less Dry) Adjacent Regions

**Science Can Help Care for Country:** Tweed Byron Aboriginal Land Council

Warren Phillips, Tweed Byron Local Aboriginal Land Council
Maurice Gannon, Tweed Byron Local Aboriginal Land Council
Leweena Williams, Tweed Byron Local Aboriginal Land Council

Tweed Byron Local Aboriginal Land Council was incorporated in 1984 under the New South Wales Aboriginal Land Rights Act 1983 (ALRA). We are 1 of 13 Land Councils of the Far North Coast region and 1 of 119 Land Councils across the state of NSW. Our LALC is actively committed to the advancement and protection of Aboriginal people, land, heritage, spirituality and culture. The Cultural Heritage Unit (CHU) was established as a result of the Tweed Shire Council Aboriginal Cultural Heritage Mapping Project/Plan (ACHMP) and actively, assess, manage and protect cultural heritage for our community. As part of our Unit’s capabilities and to care for country which is part of our cultural law, we have been appropriating scientific tools such as drone and ground-penetrating radar to identify, map and protect our cultural heritage sites and cultural landscapes. Our paper talks about some of our recent projects using these tools including Hastings Point Headland Aboriginal Cultural Heritage Management Plan and Fingal Head Cemetery and we look forward to sharing our experiences in this session on the benefits and challenges of these tools from a cultural and LALC perspective.

**Session:** Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country

**Chasing the Heat: Using Fluxgate Gradiometry to Identify Heated Features at Aboriginal Sites in NSW**

Sam Player, Geoprospection
Tim Owen, GML Heritage

Heated clay features occurring on Aboriginal archaeological sites have undergone comparatively little investigation in NSW. The situation is largely pragmatic; standard methods of test excavation are generally effective in assessing the distribution of Aboriginal stone objects, but heated clay features that may be associated with those objects tend to be much less frequent and not identified. We present our use of fluxgate gradiometry (with consequent archaeological excavation of the results) for the identification of heated clay features on three Aboriginal archaeological cultural landscapes, located in the Sydney and Illawarra regions. Our
investigations are presented in order of work, so as to illustrate our learning process and the adjustment of our methodology over time. Although burials were not discovered at our sites, heated features are known to occur in association with Aboriginal burials in other regions, e.g. see Owen and Pate, 2014. We argue that fluxgate gradiometry survey should be applied regularly to large scale Aboriginal assessments in NSW where ground conditions are suitable to enable the consistent identification of heated features.

Owen, TD and Pate, DF 2014 A Kaurna burial, Salisbury, South Australia: Further evidence for complex late Holocene Aboriginal social systems in the Adelaide region. Australian Archaeology 79: 45-53.

Session: Culturally Appropriate Science: The Use of Geophysical Tools to Assist Indigenous Communities with Protecting Country

Unravelling Manifold Identities in the Early Nomadic Rock Art of East Siberia (Disrupting an Australia-Centred Conversation)

Irina Ponomareva, Griffith University

In Trans-Baikal, East Siberia, a large body of rock art is related to the early nomadic cultures of the 2nd-1st Millennia BC. Previously, rock art traditions present there were considered as homogeneous and persistent during this long period of time. This paper will explore the manifold nature of these traditions related to turbulent social and ethno-cultural processes that occurred in the Steppes of Eurasia. Several waves of alien influences were distinguished in the rock art implying that the history was more complicated than as seen from archaeological record available today. Such intense cross-cultural relationship could have influenced the evolution of ethno-cultural identities the phenomenon of which may explain the emergence of some motifs which were not brought by newcomers but developed locally as a response to a threat to social and cultural continuity. This paper will reflect on how rock art research disrupts dominant paradigms in Siberian archaeology which recently appeared within a field of enquiry of Australian rock art research.

Session: Depicting Paradise: How Rock Art has Disrupted the Dominant Archaeological Paradigms of our Time

Managing a Cultural Landscape as Part of an Interconnected Cultural Highway at Gracevale in Central Queensland: Connecting the Seven Sisters Songline Across Country Through Rock Art and Cultural Practices

Faye Prideaux, Department of Transport & Main Roads
Michael Williams, George Bourne & Associates
Suzanne Thompson, Australian Native Food & Botanicals

Through investigation of the rock art at Gracevale, traditional custodians have been able to revitalise cultural connections, practices, and Songlines with other traditional groups across the country due to the Seven Sisters star system that is depicted at Gracevale. This has been only one of many positive outcomes of the collaboration by Traditional Owners, the Indigenous Land and Sea Corporation, NGOs, and CH practitioners, which has enabled the Central West QLD property of Gracevale to be managed exclusively by Indigenous custodians.

Through continual collaboration, these parties have begun recording and planning the protection of cultural values such as rock art, stone artefacts, story places, and dreaming stories that will culminate in

The Darling River catchment was once home to a wide range of large-bodied vertebrates colloquially known as the ‘megafauna’. On a continental scale, the palaeo-catchment is hyper-diverse and its unique fossil record includes a mix of fauna typical of both southern and northern latitudes, so represents somewhat of a ‘mixing pot’ of Quaternary Ice Age species. The catchment also contains one of the oldest fossil records of now-extinct megafauna on the continent. In addition to megafaunal records, recent work has demonstrated an increasingly complex mix of Quaternary ecosystems in the catchment, including evidence of extensive palaeo-mammal migratory corridors, akin to those of the Serengeti of the modern East Africa. Research in southeast Queensland, at the headwaters of the catchment, has demonstrated these mammal migratory corridors were in-place at least until 280 ka. Progressive declines in palaeo-diversity through the late Pleistocene occurred in the period leading up to the time of earliest human arrival. Unpublished data demonstrates that some megafaunal taxa were extant for at least 25 thousand years after the time of earliest arrival of humans on the continent. Future research is currently being planned to extend these study approaches to other parts of the Darling River Catchment.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Diprotodon and the Darling: Faunal Change and Ecological Collapse Through the Late Quaternary

Gilbert Price, The University of Queensland
the creation of a CH Mapping and Management Plan to assist further archaeological investigation and protection measures, with the aim to bring new life, knowledge, respect, and protection for CH values vulnerable to deterioration and/or being forgotten. This collaboration has also provided employment opportunities for Indigenous people to learn and teach traditional knowledge, practice cultural heritage management on country, and participate in the creation and delivery of tourism products and services.

This paper will present some of the CH values identified at Gracevale thus far, and the network of sites within the immediate and neighbouring region, e.g. Blacks Palace, Carnarvon Gorge, and many nearby properties. We'll then describe the significance of Gracevale and neighbouring sites’ CH Landscape within the Seven Sisters Songline that spans across the country from Cape York, Uluru, the Kimberley region, and beyond. The paper will also talk about Gracevale’s ability to provide a hub for Indigenous employment, tourism, archaeological research, and more. The authors will end the presentation by opening up a discussion to identify potential future endeavours such as: site recording, preservation, CH management, and additional collaboration from organisations such as Universities, museums, archaeological organisations, etc.

### Using Heurist to Manage Cultural Heritage Data: An Example from Saibai Island

**Claire Reeler**, Catalyst IT Australia  
**Alistair Harvey**, University of Queensland

Collections of cultural heritage data are challenging to manage - many of these challenges are familiar to the management of any type of collection. The information needs to be well organised, accessible, kept current and able to be used for analysis, research, curation and potential display or knowledge sharing. However, cultural heritage collections often have additional requirements and the disruptions enabled by the digitisation of this data have increased the challenges, as well as the possibilities. In this paper we discuss some of these issues, including data sovereignty and data colonialism, “ownership” of data and differential access requirements, as well as the potential for controlling future dissemination of the information. We discuss how using Heurist as a tool for managing the data can facilitate both academic and community expectations for the collection.

The Saibai Island Language and Cultural Knowledge project in part aims to identify, document and add to the Saibai Island corpora of Kalaw Kawaw Ya language oral histories and cultural knowledge resources that are located within libraries and archival institutions around Australia. New video recordings of traditional stories, descriptions of cultural activities, oral histories and personal anecdotes have also been produced adding to the corpora. A key issue identified through the project is the lack of Saibai Island cultural metadata which would contextualise existing resources within the cultural framework of Saibai Islanders. Compounding the problem is the scattered nature of the corpora of Saibai Island archived material which in turn is reflective of the diasporic nature of Saibai Islanders. Due to historical circumstances the majority of Saibaians now reside away from their traditional homeland. Heurist as a tool offers a unique way to manage the data that would both facilitate Saibai Island language and culture preservation and provide a framework from which other communities can benefit.

### Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

### Session: Remote Sensing, Data Management, GIS, and the Integration of Spatial Technologies

### Shining a Light on Luminescence Dating

**Norma Richardson**, Australian National University  
**Philip Hughes**, Flinders University  
**Marjorie Sullivan**, HEH Pty Ltd  
**Nigel Spooner**, University of Adelaide  
**Jim Feathers**, University of Washington

Geomorphological and archaeological analysis combined with luminescence dating of sediments and burnt stone was used to examine the depositional history, assemblage integrity, age of sediments and timing of burning events in a cultural deposit within the Pitt Town sand body in Sydney. Single grain OSL dating demonstrated that the sediments are steadily increasing in age with depth on average, but each level has multiple populations which reflect both mixing downwards and mixing upwards of sand grains. Refitted artefact reduction sequences and conjoined broken artefacts and heat-fractured stone revealed movement of cultural material up to 30cm but supported the presence of discrete upper and lower depositional units. They also indicate the nature of single events and facilitate an estimate of the original depositional context of that event, to provide high value, high resolution data on prehistoric human behaviour irrespective of vertical and horizontal displacement. Patterns in the vertical distribution of different raw material types and clusters of heat-fractured cobbles suggest moderate stratigraphic integrity. The likely causes of both sand grain and artefact movement are surface disturbance during occupation followed by post-depositional invertebrate bioturbation and tree root impacts. The low precision of the OSL dating of sediments combined with some
vertical movement of cultural material precludes high resolution dating of artefacts found at any level in the deposit. A solution is the direct dating of burnt artefacts and other stone material using luminescence techniques. These enable determination of the timing of individual burning events, and for the lower levels, provide evidence of in situ heating more likely to be from human actions rather than natural bush fires.

‘Waste Not Want Not’: A Whole of Assemblage Approach to Open Site Analysis

Norma Richardson, Australian National University

Low-resolution bulk recovery strategies and/or failure to retain all cultural material and relevant natural components salvaged from open sites constrain the range of future analysis. Selective artefact analysis that focuses on cores, retouched flakes, and implements without considering material categorised as waste or debitage are incomplete records of an assemblage. Waste can also refer to items such as heat-shatter derived from flaked artefacts and heat-fractured imported cobbles. Archaeologists discarding heat-shattered pieces at the excavation create a biased sample of the original site contents. Statistical analysis of only unbroken artefacts may be rendered invalid if the degree of this occupational and post-depositional transformation is not calculated. Research using unretouched flakes of all sizes, broken artefacts, heat-shatter and manuports has shown that these aid in the identification of individual behaviour events, assessments of site formation processes and dating. Refitted sequences using both macro and micro-artefacts and conjoined broken artefacts, heat-shatter and manuports provide evidence of raw material import, artefact production, use and recycling of artefacts. Refits and conjoins facilitate assessments of stratigraphic integrity. Microdebitage such as backing flakes, distal ends of backed artefacts, platform preparation flakes and eraillure flakes can provide critical evidence of artefact production and use. Size classes and characteristics of heat-shatter can indicate the nature and number of heating events. Dating artefacts in open sites is problematic due to poor preservation of charcoal and site formation processes; however burnt artefacts and manuports dated using luminescence techniques can provide a chronology of heating activities and site use. Assemblages should be recovered and documented to facilitate high-resolution analysis irrespective of disturbance or breakage.

A Reinterpretation of Prey Choice and Human Movement in Late Pleistocene Tasmania

Georgia Roberts, Australian National University/ Monash Indigenous Studies Centre
Jillian Garvey, La Trobe University
Richard Cosgrove, La Trobe University
Chris Silvester, La Trobe University
Scott Carver, University of Tasmania
Alynn Martin, US Geological Survey

The correlation between economic yield and the representation of specific prey species within archaeological faunal assemblages has become an underpinning theory of zooarchaeological investigations. First considered by Theodore White in the 1950s and later developed by Lewis Binford, this approach ultimately led to the development of utility indices – the quantification of the value of different tissue types within an individual prey animal. While this model can encompass a range of products, discussions continue to be dominated by the quantity of edible components.

Very few studies have advanced this model by considering the interplay between the quantity and quality of different tissue types. Australian researchers have been at the forefront of this shift, developing nutritional utility data for a range of native terrestrial and aquatic fauna. Here, we present the next advance in the modelling of economic utility data – the consideration of seasonal variability of the nutritional quantitative and qualitative value of different tissue types. Through a longitudinal study of changes in the body composition, body condition and nutritional value of the Tasmanian bare-nosed wombat, these data are ultimately used in a reinterpretation of prey choice and human movement in late Pleistocene Tasmania.

Teaching and Learning in Australian Archaeology: Developments in Resolving the Discord Between Education and Industry

Georgia Roberts, Australian National University/ Monash Indigenous Studies Centre
Melissa Marshall, The University of Notre Dame Australia

Within the profession of archaeology, teaching and learning has been a source of dissatisfaction centred on our apparent inability to train both well-rounded...
researchers and industry-ready professionals. This poster outlines new and ongoing initiatives by the Australian National Committee for Archaeology Teaching and Learning (ANCATL) which are aimed at building a stable learning ecosystem, aspiring to solidify strategic ongoing relationships between education providers, industry, government, Indigenous communities and the broader public.

One initiative is the Australian Archaeological Skills Passport, based on the highly successful UK model which has been designed to incorporate specific skills identified through the longitudinal Profiling the Profession surveys (Ulm, Nichols and Dalley, 2005; Ulm et al. 2013; Mate and Ulm, 2016). The passport provides opportunity for the documentation of skills experience, presenting a way of focusing professional development to meet current skills shortages. A further critical outcome of the passport will be to facilitate non-traditional pathways into the discipline by capturing skills experience outside of taught environments. The passport will complement a fully revised and updated edition of the national benchmarks for archaeology degrees in Australian universities (Beck and Clarke 2008), ensuring a link between experience requirements and taught content.

Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry

Georgia Roberts, Australian National University/ Monash Indigenous Studies Centre
Melissa Marshall, The University of Notre Dame Australia

An ensuing discussion has dominated in recent decades within Australian archaeology, centred on the profession's perceived inability to train both well-rounded researchers and industry-ready professionals. Largely, these debates have remained unchanged, at their core focused on the need to balance the teaching of theoretical knowledge of our discipline and those vocational skills required for its practice. As a community, it is essential that we begin to disrupt this scholarship dystopia and move towards an integrated learning ecosystem capable of fulfilling the needs of a wide range of professional outcomes. In this session, we invite papers which aim to explore and develop overarching strategies focused on solidifying strategic ongoing relationships between education providers, industry, government and the broader community.

Session: Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry

Connection, Trespass, Swastikas and Identity: Mark-making at Pudjinuk Rockshelter No. 1, South Australia
Amy Roberts, Flinders University
Heather Burke, Flinders University
Catherine Morton, Flinders University

River Murray and Mallee Aboriginal Corporation

Pudjinuk Rockshelter No. 1 is one of two small, adjacent shelters located in the soft limestone cliffs of the River Murray Gorge, South Australia. This area forms part of the country (land and waters) of the River Murray and Mallee Aboriginal Corporation (RMMAC). While both rockshelters represent a crucial node in the cultural landscape of the region, Pudjinuk No. 1 is significant for its remnant pre-contact rock art and the substantial body of historical inscriptions (engravings) it contains, dating from the frontier conflict period in the early 1840s until the present. Site surveys in 2016, 2017 and 2018 recorded 188 motifs, only one of which was identified as pre-contact, indicating that the ‘graffiti’ has almost entirely erased a body of earlier, Aboriginal petroglyphs. Detailed historical research to identify the post-contact engravers shows the inscriptions to be largely the work of members of frontier conflict/punitive expeditions, local European settlers and settler-descendants and a non-local Aboriginal man. Of the 20 motifs that can be confidently attributed to German and other European settlers (and their descendants) from settlements in the immediate or adjacent districts, one is a swastika, probably engraved in 1932. Other graffiti celebrates several generations of local families, as well as the visits of couples and groups of friends to the site, signalling an ongoing ‘conversation’ between local residents. The engraved corpus at Pudjinuk Rockshelter No. 1 is thus multi-layered and represents deep Aboriginal connection, colonial entanglements as well as powerful ruptures within the space arising from adjacent motifs produced as a result of invasion, settlement and troubling global events.

Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Results and Implications of Test Excavations in Pleistocene Sand Dunes at Cobaki, North-Eastern NSW

Richard Robins, Everick Heritage
Errol Stock, Tripple-E-Consultants
Justine Kemp, Griffith University

The paucity of glacial-age (Pleistocene) coastal sites in eastern Australia has been interpreted as an absence of people on the notion that coastal environments
were unattractive and their resources uncertain during times of falling or lower sea levels. However, a recent re-interpretation of one of site (Wallen Wallen) on the west coast of North Stradbroke Island by Stock and Robins provides sound archaeological evidence for at least 20,000 years of Aboriginal occupation.

Recently, extensive preliminary excavations were required at Cobaki Lakes, 5 km south-west of the Gold Coast airport, as part of a heritage assessment prior to the construction of a residential development. The dune sands at Cobaki are recognised as remnants of the Pleistocene Inner Barrier deposits found at numerous locations from Bribie Island, Moreton Bay, the Gold Coast and along the north coast of New South Wales. One outcome of the investigations at Cobaki was the discovery of artefacts in the sandy sediments at depths of up to 1.5 metres. Two dates, one, an OSL age at >30,000 yr BP and one, a TL age at 40,000 yr BP, were associated with the artefacts. Further investigation will be undertaken to confirm these results and to identify other potential sites in these dune systems.

The late Pleistocene sites at Wallen Wallen and Cobaki were formed under very different geomorphological conditions and they deserve greater attention. They have the potential not only to firmly establish early Aboriginal occupation in the Southern Moreton Region, but also to suggest wider possibilities for identifying human occupation in other Pleistocene sandy terrain of the east coast.

The study of mollusc remains from archaeological sites can yield important information regarding human foraging and also facilitate palaeoenvironmental reconstructions. Marine molluscs are highly diverse in size, anatomical structure, behaviour, and habitat. They occur on a large variety of substrates including rocky shores, coral reefs, mud flats, and sandy beaches and the morphology of their shells are known to reflect their habitat and mode of life (e.g. mobility, method of feeding). The north windward coast of Moloka‘i, Hawaiian Islands, is mostly formed of smooth basalt boulders or eolianite (limestone) shorelines, both of which support abundant intertidal rocky shore resources. These contrasting littoral shore substrates may influence the composition of the intertidal mollusc populations and also shell shape (i.e. form and dimensions) within particular species. To investigate these differences, modern mollusc populations were sampled on basalt and eolianite coastlines and the results were compared to species composition and shape in late prehistoric (approximately A.D.1500-1700) archaeological middens adjacent to the sampled areas, with particular focus on the ubiquitous Hawaiian limpet (Cellana exarata, C. sandwicensis, and C. talcosa). Results demonstrate that modern limpet shell shape (and likely archaeological limpet assemblages) correlates to harvesting areas such as tidal level, substrate, and coastline thus providing new insights into prehistoric Hawaiian foraging practices.

A Geophysical Analysis of Aboriginal Earth Mounds in the Murray River Valley, South Australia

Dave Ross, Flinders University
Michael Morrison, Flinders University

Earth mounds are common archaeological features in some regions of Australia, particularly within the Murray-Darling Basin. These features are generally considered to have formed via the repeated use of earth oven cookery methods employed by Aboriginal people during the mid- to late Holocene. This study assesses the relative effectiveness of key geophysical methods including magnetometry, ground penetrating radar (GPR) and electrical resistivity tomography (ERT) in mapping, and determining stratigraphy, of earth mound sites. Three earth mounds adjacent to Hunchee Creek, on Calperum Station in South Australia’s Riverland region, were chosen to conduct a comparative trial of these methods. This research demonstrated that geophysics can be used to both locate mounds and provide information as to deposit thickness and size. Individual ovens within mounds can also be located. This suggests a greater potential role for geophysics in understanding the Holocene archaeological record in Australia.

Shape of Limpets (Cellana spp.) is Correlated with Basalt or Eolianite Coastlines: Implications for Prehistoric Marine Foraging Studies in the Hawaiian Islands

Ashleigh Rogers, The University of Queensland
Marshall Weisler, The University of Queensland

The concept of ‘counter-mapping’ in cultural heritage management has been around for well over two decades, and there have been a number of initiatives reported in heritage literature that have aimed to incorporate alternatives to cartographic mapping of heritage places. However most of these
efforts still involve representing place as space in a two-dimensional frame. Apart from Jaydeyn Thomas’ ‘maps that move’ - which use animation to represent archaeological data, intangible heritage, and Aboriginal narrative - most counter maps are still some form of map. In this paper I reflect on the opportunities to represent heritage places and their associated intangible living heritage elements as counter maps that avoid the limiting frameworks of cartographic hegemony, using examples from Australia and overseas.

Session: From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes

‘Becoming Woppaburra’: The Dilemma of Insularity/Connectivity

Michael Rowland, James Cook University
Harry van Issum, Griffith University
Christine Hansen-Doherty, Darlutta Elder of Woppaburra

In 1997 Jared Diamond described Australia as ‘by far the driest, smallest, flattest, most infertile, climatically most unpredictable, and biologically most impoverished continent’. Diamonds view while broadly accurate overlooks many rainforest, coastal and island areas of great richness and diversity. Fifty years ago in The Prehistory of Australia (1969) John Mulvaney made no mention of the offshore islands of Queensland since archaeological investigations on the islands had not begun. Around the same time Robert MacArthur and Edward Wilson published their The Theory of Island Biogeography (1967) which greatly influenced the authors thinking. Today islands of the Queensland coast are the focus of considerable attention. In this paper we return to the Keppel Islands which supported a distinct population on a small island with rich coastal resources. In particular, we address the continuing dilemma as to the extent and timing of Woppaburra insularity from or connectivity with mainland groups. The Woppaburra were isolated ‘to some degree’ by the water barrier separating them from the mainland. Importantly, however, the water barrier was only partly responsible for the process of ‘becoming Woppaburra’. Today insularity has been replaced by connectivity with many groups. However, the Woppaburra continue to live in two worlds - an ancestral world and a modern world where we continue to struggle to keep our culture alive. As our ancestors did before us we face the challenge of adapting to environmental and social change. We address these issues in this paper. In the last 50 years archaeology has had to incorporate new concepts of island biogeography, multidisciplinary approaches, anthropological approaches, native title procedures and Woppaburra community concerns in addressing these issues.

Session: Developments in Coastal Archaeology

Ritual or Feast? Exploring Two Dugong Mounds in Woedul Island (Western Torres Strait) Through Taphonomy

Sofia Samper Carro, Australian National University
Iona Claringbold, Australian National University
Duncan Wright, Australian National University

In 2016, excavations in Woedul island, an islet near Mabuiag, explored the archaeological record in the Widul (or Woedul) kod, a sacred meeting and initiation area for members of the Waiat fraternity in Western Torres Strait. Among the several cultural features identified, two dugong bone mounds were recognized and excavated. Although the initial observations indicate that the deposit was unstructured, and therefore indicative of a subsistence midden instead of a ritual mound based on McNiven’s classification, some of the bones and shell showed structured grouping. To assess the meaning behind these mounds, two test pits were excavated, collecting every bone and bringing them back to the ANU for further analysis.

Here we present the zooarchaeological and taphonomical analysis of these assemblages. Quantitative and qualitative units, in association with radiocarbon dating results, allow us to make inferences regarding the deposition time span. The recovery of neonate bones suggests hunting practices targeting pregnant females, corroborating the information provided by some of the community members. Bone modifications inform about butchery practices, as well as the tools that may have been used for dugong processing. Finally, the skeletal profiles documented have been described to identify the ritual or subsistence character of these mounds.

Our results build into previous anthropological and archaeological research on dugong hunting by Torres Strait communities, while providing new data to assess the significance of some of these accumulations.

Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia Through Space and Time

Indiana No! Building a Culture of Emotional Resilience and a Mentally Literate Workforce in Australian Archaeology

Clara Rose Santilli, Flinders University

This presentation explores the work I undertook as part of a directed study as part of my masters degree research to evaluate several different archaeological veteran recovery and rehabilitation projects and what can we learn as a profession from the psychological approach to this sort of community archaeology in our own practice as a profession and academic discipline. I evaluated several different approaches by different archaeological veteran recovery initiatives and got to take part in a dig as an active participant onset in the UK in July. I will also look at the theoretical approaches that drive these projects and how they fit within into Australian archaeological practice and how the resilience of veteran participation projects can teach archaeologists valuable lessons among increasing levels of mental illness and disability in Australian society.

Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney

A Critique on the Effectiveness of the Queensland Aboriginal and Torres Strait Islander Cultural Heritage Acts

John Schiavo, Department of Aboriginal and Torres Strait Islander Partnerships
Stephen Nichols, Department of Aboriginal and Torres Strait Islander Partnerships

This presentation will consider the effectiveness of Queensland's Aboriginal and Torres Strait Islander cultural heritage legislation which commenced in April 2004 amidst much fanfare and broad political support across many stakeholder groups.

The Queensland legislation was heralded for its break from the orthodox approach to cultural heritage assessment and management by placing the responsibility for determining the significance of a place or object in the hands of Traditional Owners. By enshrining Traditional Owners as the knowledge holders, guardians and keepers of Aboriginal and Torres Strait Islander cultural heritage, the legislation consciously differentiated between cultural heritage and archaeology and set the path for other jurisdictions to follow.

The main purpose of the Acts however remained orthodox - to provide effective recognition, protection and conservation of Aboriginal and Torres Strait Islander cultural heritage.

At the core of this new approach to cultural heritage management was a compliance framework that established a duty of care on all land users to avoid harming cultural heritage when conducting activities. It sought to balance the protection of heritage and the role of Traditional Owners in these processes with the stated objective of establishing timely and efficient processes for managing activities that may harm cultural heritage.

Central to this framework is a ‘government lite’ approach seeking to reduce the regulatory burden on land users while at the same time encouraging direct engagement between proponents and Traditional Owners. This lack of regulatory oversight has drawn much criticism from some quarters by entrusting the responsibility for protecting cultural heritage on land users and creating a ‘David and Goliath’ struggle for Traditional Owners seeking to protect land and seas country.

This presentation will consider the divergent views expressed by stakeholders regarding the effectiveness of Queensland’s Aboriginal and Torres Strait Islander cultural heritage legislation after 15 years of operation.

Session: Transformation in Aboriginal Heritage Legislation Across Australia

Tethered Technology? Water Security Strategies from Open-Air Assemblages in the Semi-Arid Southern Kalahari, South Africa

Benjamin Schoville, The University of Queensland

A looming water shortage represents one of humanity's biggest challenges. However, our species likely evolved in environments that regularly dealt with significant rainfall variability. Obtaining water security ensures sufficient and reliable access to water to maintain healthy populations. How humans adapted to changes in water availability over the course of our evolutionary history are instructive for understanding the timing of subsequent migrations and settlement outside of Africa and ultimately into Australia. For the last two years my research team has completed survey, excavation, and sampling on the largest private game reserve in South Africa, the Tswalu Kalahari Reserve, located in the southern Kalahari. This project focuses on the role semi-arid interior environments may have played for the origins of modern humans, and whether behavioural flexibility aided in early human responses to changing water availability. In this talk, I will present an overview of current fieldwork, preliminary results, and strategies to answer these challenging questions from open-air assemblages.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Potluck: A Comparative Study of Ceramics from The Chinese Brick Kiln, Bendigo
Caroline Seawright, Jacobs Group (Australia) Pty Ltd
The assemblage of the Bendigo Chinese brick kiln and market garden dumpsite (Victorian Heritage Inventory H7724-0600) in Victoria, dating from 1859-1884 and 1884-c.1950 respectively, has remained unpublished since it was first excavated in 2005. This talk presents results of the site’s ceramics analysis, carried out as part of a Bachelor of Archaeology (Honours) thesis in 2016.

Comprising one of several satellite sites associated with the historic Ironbark Chinese camp (1855-1930s), the brick kiln dumpsite was situated at the Thunder Street entrance to the camp, and was used by the camp inhabitants to dump domestic waste. As the camp itself has not survived, evidence such as the brick kiln’s ceramic assemblage, particularly the foodware items, provides important insights into the camp’s trade networks and daily lives of its inhabitants. Dating from the mid-1800s to early 1900s, the assemblage includes both Chinese and British storageware, kitchenware, and tableware. A comparative analysis of the assemblage with those from nine contemporary Chinese camp sites in Victoria and New South Wales was undertaken to investigate consumption and discard patterns.

The talk will illustrate the results of the analysis, which suggest that these Chinese communities were able to maintain links with their Chinese homeland while supplementing their diet with food and foodwares from Britain via the transpacific trading network that connected the settlements to mainland China and Europe. The results also reveal local Chinese-Bendigonian cultural adaptations in cultural norms associated with food and consumption habits. The identified patterns at the Ironbark camp reveals a wide range of Chinese and local foods being imported, which were consumed on an elective mix of Chinese and European tablewares, and, despite some fluidity between Ironbark and Bendigo merchants and traders, camp residents remained conservative with the discard of foodwares, indicative of their socio-economic standing within Australian post-goldrush society.

**Session: After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management**

Geraldine Jacobsen, ANSTO
When modern humans colonised Sahul 50-65,000 years ago they were confronted with a range of ecosystems which were relatively unfamiliar to them. However, the adaptive plasticity afforded by cultural systems enabled our species to move across this continent into a range of otherwise marginal environments. The small, fragmented islands of the Massim region on the eastern margins of northern Sahul (New Guinea) presented some of the most challenging landscapes for settlement because of their diminished biodiversity and unstable coastlines. Recent excavations (in 2018) have demonstrated that these islands, which had never been connected to Sahul, were colonised during the Late Pleistocene. This talk outlines the latest findings concerning the technological and behavioural adaptations of humans to this island region which had dramatically changed in size since the Last Glacial Maximum. These findings are placed into a broader context of Pleistocene aged island settlement.

**Session: Arriving in Sahul: Old Questions and New Approaches**

Fran Sheldon, Griffith University
Flow is a key driver regulating processes in dryland rivers and diversity across a range of temporal and spatial scales. Variability in the timing and scale of floods has specific ecological significance, playing a major role in sustaining biotic diversity across the river-floodplain mosaic. However, longitudinal effects of floods are equally important, delivering water downstream through channels and wetland complexes. Interaction among spatially distributed wetlands, their connecting channel and floodplain geomorphology and the temporally variable flow events not only creates the spatial complexity in dryland rivers but also determines temporal persistence of wetlands. These act as hydrological ‘sponges’, absorbing water from upstream and needing to fill before releasing water downstream. Sequential high flow events are essential for the ecological persistence of riverine wetlands and the transmission of flows further downstream through the channel network. Modified flow regimes and water diversion (e.g. irrigation), significantly reduces the opportunity for wetland replenishment. As a result, the benefits of sequential flooding to the wetland sponges and their biotic communities will be lost. This paper outlines the important roles played by waterholes as aquatic refugia in arid landscapes and explores the changes river regulation has had on the ecology of dryland rivers.

**Session: Inland Rivers and Hydrological Variability in Australia’s Inland Rivers**
**Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth**

**Lateral Stratigraphy: Open-Site Archaeology Around Lake Woods (Jigiaya), Northern Territory**

Ceri Shipton, Australian National University  
Aara Welz, University of Wollongong  
Tim Cohen, University of Wollongong  
Matt Forbes, University of Wollongong  
Fabian Boesl, University of Wollongong  
Will Reynolds, University of Wollongong

Lake Woods is a critical area for understanding human occupation in Sahul as it is a large freshwater body in arid central Australia. It lies at the juncture of the Tanamai desert to the west and south, the Barkly Tableland to the east, and the wooded Sturt Plateau to the north. Building on the work of Mike Smith in the 1980s, two recent seasons of fieldwork around the lake with Mudbarra and Jingali Traditional Owners have identified several new archaeological sites. These are typically associated with sediments deposited during lake high stands, with test excavations at three sites producing stratified material. We propose a four-phase occupation history for the region based on artefact typology, the association of material with different geomorphic formations, and provisional OSL dates. Frequent grinding stones in all four phases testify to the long-term attractiveness of the lake for its plant food resources. Similarities in the stone artefacts with central arid Australia in the early phase of occupation gives way to connections with the north in the later phases. We offer this work as a case study on using surface collections to compare stone artefact traditions, and for constructing occupational histories in the absence of deeply stratified sites.

**Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond**

**Access, Control and Sustainable Management of Rock Art in Africa**

Benjamin Smith, The University of Western Australia

As in Australia, questions of which rock art sites to open to the public, in what way and by whom, are of major concern to heritage managers across Africa. Relations between management authorities and local communities remain fraught in many areas. There is also a growing appreciation of the practical challenges of creating truly sustainable business models for rock art site developments. This paper will review the shift towards Indigenous led rock art tourism in Africa and will discuss the benefits of this as well as some of the major current challenges.

**Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere**

**A (Preliminary) Historical Ecology Model of Mid to Late Holocene Subsistence and Settlement in Coastal Southeast Queensland**

Tam Smith, The University of Queensland

A (preliminary) historical ecology model of mid to late Holocene subsistence and settlement in coastal southeast Queensland.

The coastal southeast Queensland archaeological region stretches from Fraser Island in the north to the border of northern New South Wales in the south. It possesses one of the best documented and most intensively scrutinised coastal archaeological records in Australia, with an estimated 2000 midden sites recorded, although comparatively very few have been dated. The area was a major focus from the late 1970s when the Moreton Regional Archaeological Project, a long-term multi-stage regional project, was established at The University of Queensland by Jay Hall. Initial studies provided the basis for a regional chronology, as well as models of settlement and subsistence based on the exploitation of the area’s rich marine resources. There is a significant increase in the numbers of coastal sites established within the last 1000 years, and previous models suggest this reflects a re-ordering of land use. Restricted mainland movement westward as a result of the land space there being “filled” in a traditional socio-economic organisational sense, led to increased use of the coastal zone and migration onto the offshore islands as well as more intensified exploitation of estuarine resources. These models are closely tied to an increase in the development of mudflats; there has also been a tendency to lump the molluscan remains together as ‘estuarine species’ without consideration of individual ecology or habitat preferences. Are the sites and their environs really homogeneous? Do the site assemblages actually reflect more intensified resource exploitation through time? This paper presents the results of recent research, employing an historical ecology approach, and proposes a model of continuous, low intensity occupation in the southeast Queensland region, with low-level impacts on the marine environment throughout the mid to late Holocene.

**Session: Developments in Coastal Archaeology**
Lapita: History of a Name, its Terminologies and Influences
Matthew Spriggs, Australian National University
The term ‘Lapita culture’ is so well known in Pacific archaeology that we seldom reflect that it must itself have a history, as does the term ‘dentate-stamped’ to describe the pottery that is its most distinctive feature. The history of Lapita pottery discovery begins long before the term itself was coined, our earliest references going back to discoveries made in 1902 at what later became the eponymous site in New Caledonia. When was the first mapping of Lapita sites as a cultural phenomenon? And when were illustrations of Lapita pottery first published and by whom? When did Lapita site and radiocarbon date lists begin? When was the first stylistic analysis of Lapita pottery? Modern Pacific artists using postage stamps and other media have reproduced and re-used Lapita designs, but when did that start? There are even businesses that are using the Lapita name, most recently a large hotel in Dubai. If we are to understand the archaeological phenomenon that is Lapita, we need to understand how it came to be conceptualised in all its aspects and how it has now evaded the archaeologists and escaped into popular culture to be adopted as art icon, national symbol, and even as standing for an ersatz Polynesian themed holiday experience in the Middle East.

Session: The History of Archaeology in the Driest Continent and its Relationships with (Less Dry) Adjacent Regions

Getting it Out in the Open: Residue Reveals of Past Resource Use
Birgitta Stephenson, In the Groove Analysis Pty Ltd
Open context sites have generally been considered problematic for residue preservation especially when compared to rock shelters with dry, stable in-situ deposits. This presentation disrupts and challenges these views by utilising conventional use-wear and novel biochemical residue staining applications to examine artefacts from two vastly different Australian geographic locations and geomorphic open contexts. The approach allows for the identification of a wide range of past resource use, with residues linked to subsistence, medicinal and ceremonial practises. As well as providing a broader understanding of past open context landscape use, the findings allow for insights into the timing of people on the landscape and cultural innovations. The residue identifications have been facilitated by a suite of specially developed biochemical stains designed to highlight degraded and damaged archaeological residues. The first study documents investigations carried out on open context ground stone material from a desert arid plain area near Serpent’s Glen in the Western Desert of Western Australia. The second study examines residues associated with ground and flaked stone artefacts from an open context Holocene site in the Western volcanic plains area of Victoria. The results further disrupt the uncritical use of artefact morphology to assume function and demonstrate the value of analytical residue techniques and biochemical staining approaches to understand wide-ranging practises across open context sites. Residues provide a visual link for the stories that have been passed down through generations of Aboriginal people and can act as triggers for memory and personal recollection. With respect to residues, it’s time to turn the page and re-evaluate open context sites and associated previous negative reservations. Biochemical residue staining approaches are revealing open context sites to be open books which contain chapters brimming with thousands of years of information.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Wala-Gaay Guwingal: An Unusual Culturally Modified Tree with a Stone Tool Embedded in a Scar
Caroline Spry, La Trobe University
Orange Local Aboriginal Land Council
Lisa Paton, Orange Local Aboriginal Land Council
Richard Fullagar, University of Wollongong
Elspeth Hayes, University of Wollongong
Kathryn Allen, University of Melbourne
Quan Hua, ANSTO
Andrew Long, Andrew Long + Associates
Brian Armstrong, La Trobe University
The first foray by European surveyors across the Blue Mountains in NSW, in 1813 marked the beginning of the upheaval of the Wiradjuri way of life. While documentary sources trace the continuation of Wiradjuri traditional knowledge and practice until the mid-1950s, little is recorded about the continuation of culture beyond this time. Here we present the results of a collaborative study investigating an unusual culturally modified tree with a stone tool embedded in a scar, with radiocarbon dates suggesting an origin during the second half of the twentieth century. The results together with documentary and oral evidence suggest that Aboriginal people quarried the stone and embedded it in the tree, although the origins of the scar and its relationship with the stone tool remain unclear. The results provide a rare glimpse into continuation of Wiradjuri cultural practices and knowledge transmission during the second half of the twentieth century.

Session: Culturally Modified Trees in the Archaeological Record
Generating Behavioural Information from Activity Traces Preserved in a Laterally Extensive Landform with Complex, Four-dimensional Stratigraphy: An Example from the Lake Mungo Lunette

Nicola Stern, La Trobe University
Caroline Spry, La Trobe University

Traces of past human activity preserved within or on the landforms that make up contemporary landscapes seem to elicit one of two responses: wariness about their potential for generating meaningful behavioural information or didactic statements about the methods required to generate useful information from them. Archaeological traces in ‘open’ settings often have high temporal resolution and acuity and considerable behavioural integrity. To generate meaningful information from them requires first, an understanding of the depositional setting in which the archaeological traces are found and second, an assessment of how the geomorphic processes that operated in that setting impacted on the density, clustering and characteristics of the material remains preserved there. The way in which these understandings are achieved depends on the characteristics of the depositional system and of the archaeological traces under investigation. These principles are illustrated by a study of late Pleistocene to early Holocene artefact assemblages preserved in the Lake Mungo lunette, which is a laterally extensive landform with a complex, 4-dimensional stratigraphy.

Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond

Plenary
Understanding Today for an Inclusive Tomorrow: Panel Discussion

Peta Straiton, Flinders University
Alice Gorman, Flinders University
TJ Harding, Queensland Department of Transport and Main Roads
Jo McDonald, The University of Western Australia

Sexual harassment, discrimination, and bullying are no longer acceptable in Australian workplaces. However, while larger obvious incidences of these behaviours are noticeable, being identified and corrected, there remains smaller ‘everyday’ occurrences which can have significant impacts on people’s working professional lives. These often go unnoticed even by those who consider themselves advocates for safe, and fair working environments for all. This panel discussion will focus on bringing some of these smaller ‘everyday’ occurrences to light, while providing helpful advice, solutions, and small behavioural changes that everyone can make to help all Australian archaeologists feel more accepted, comfortable, and safe in the workplace.

Attendees at this session are advised that while tweeting is encouraged, the Chatham House Rules apply to any communication outside of this session. Information disclosed during a meeting may be reported by those present, but the source of that information may not be explicitly or implicitly identified.

Session: #MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology

Plenary
Sexual Harassment and Discrimination in Australian Archaeology: The Presence and Prevalence

Peta Straiton, Flinders University

Verbal and written accounts of sexual harassment and discrimination have been present within the discipline of archaeology for a long time. Until recently, however, little quantitative data existed on the nature and frequency of harassment and discrimination archaeologists face while at work. Online social media movements like #MeToo have brought the discussion of harassment and discrimination to the forefront of social interest, and while some of it can be controversial, one thing is clear; archaeology as a field can no longer ignore it. Together, we must confront the spectre of sexual harassment and discrimination to create safer, more inclusive workplaces in the future, to champion the humanism that is the core of our discipline today, and to heal the wounds of past transgressions. Though the road is long and arduous, it must begin with a single step – a simple acknowledgement of fact – and this paper aims to be that step, though it is not the only one.

Across the world people have begun moving forward, and an increasing number of research projects, theses, and conference sessions now openly discuss sexual harassment and discrimination in an attempt to confront it. Similarly, this paper will provide attendees with an initial analysis of data gathered from the recent ‘Sexual Harassment and Discrimination in Australian Archaeology’ study. Its aim is to provide us with a foundational understanding of how Australian archaeology compares to its international contemporaries regarding the presence of prevalence of sexual harassment and discrimination. Using the 2018 Australian Human Rights Commission survey into workplace sexual harassment as its framework, the presentation will expand on the basic statistical data gathered and discuss the finer details of how people and organisations cope with harassment and discrimination when it is reported.

Session: #MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology
Late Glacial and Holocene Bird Remains from Creag nan Uamh, Scotland

Chloe Stringer, The University of Sheffield

The Creag nan Uamh ‘Bone caves’, located in Sutherland, Scotland, contain layers dating from the Middle Devensian to the Holocene. While theories of human presence at the site during the Late Glacial period have since been refuted, Creag nan Uamh remains significant due to the completeness of its Late Glacial faunal assemblage. This research has aimed to produce a catalogue of the bird remains from this assemblage, which is now housed in the National Museum of Scotland. The aim was to contribute to our understanding of the kind of birds late Glacial and early Holocene communities were likely to encounter. The assemblage was divided into four different groups based on context, following previous research on the site’s fauna. A diagnostic zone approach was taken to record the assemblage. Species identification was achieved through comparison with modern avifaunal collections at The University of Sheffield Zooarchaeology Lab and the Natural History Museum at Tring, as well as through the application of morphological and metrical analysis. Additional information about preservation, age, modification and sex of each specimen was also recorded. Once the catalogue was created, the known habitat of each taxa was analysed to gain an understanding of the environment surrounding the cave over these periods. Both the Late Glacial and Holocene levels presented evidence of taxa which prefer open environments, and others which are found predominantly in forested areas. The Late Glacial taxa from Creag nan Uamh also reflected those found in other British assemblages from this period. It is hoped that this catalogue can be used as a comparison for any future Late Glacial and Holocene assemblages found in Scotland.

The Aftermath of Fire Damage to Important Rock Art at Baloon Cave, Carnarvon Gorge, Queensland

Paul Tacon, Griffith University
Dale Harding, Griffith University

In December 2018, fire destroyed a boardwalk and viewing platform at Baloon Cave, Carnarvon Gorge, Queensland, severely damaging the rock shelter and the most important rock art. Initially access to Baloon Cave was via a stone and soil walking track, with low handrails separating visitors from art panels. However, some vandalism occurred with lines and letters scratched over and into stencils. To facilitate better access and to better protect the rock art a large viewing platform and walkway was installed at Baloon Cave in 2014 by the Queensland Parks and Wildlife Service. In order to be environmentally proactive REPLAS Enduroplank recycled plastic products were used with composite fibre structural components. It was believed to be fire retardant but actually created an extreme fire risk. The First Nations people associated with the site have been extremely upset about what occurred but have been working toward healing by way of positive outcomes. These include warning others not to use recycled plastic or any material at a rock art site that could put the art at risk, new relationships to better look after cultural heritage, finding a new purpose for Baloon Cave, and establishing a Rock Art Protection Strategy.

Session: Changing Approaches to Access, Control and Sustainable Management of Rock Art: Indigenous Community Collaborations Across the Southern Hemisphere

“… but archaeology’s not political”: Legislative Reform and the Advocacy Journey in Western Australia

Jo Thomson, The University of Western Australia
Robin Stevens, Stevens Heritage Services
Joe Dortch, The University of Western Australia
JJ McDermott, Gavin Jackson Cultural Resource Management
Emma Beckett, The University of Western Australia

The last ten years has been a tumultuous time for Aboriginal heritage in Western Australia. Since 2009 two vastly different legislative and administrative reform proposals have had significant impact on the protection and management of Aboriginal heritage in Western Australia. The fallout from the Avery Review (2009-2015), including the active exclusion of heritage practitioners from the reform proposal, highlighted the need for increased and proactive engagement with political processes. As a result, Western Australian heritage practitioners have sought to develop a more sophisticated understanding of the political mechanisms that lie behind these processes and a greater awareness of their roles as heritage consultants and members of a professional association in influencing and effecting positive change.

This paper examines the Aboriginal heritage legislation reform journey in WA over the last ten years from the perspective of heritage consultants, members of the Australian Association of Consulting Archaeologists Incorporated (WA Chapter) and the AHA Reform Collective. We discuss the aftermath of the Avery Review, what we learned in that process and how it fed into our approach to the current AHA Reform process (2018-2020). We also present the central elements of our strategy, overview some of the tools we have used and assess the effectiveness of our approach to date. We share our insights and learnings from this journey to inform and aid other heritage practitioners engaging with legislative reform processes in other states.

Session: Transformation in Aboriginal Heritage Legislation Across Australia
Kokatha Experiences of Cultural Mapping in Cultural Heritage Management Contexts

Joanne Thredgold, Australian Heritage Services
Janice Wingfield, Kokatha Aboriginal Corporation
Sonja Gaston, Kokatha Aboriginal Corporation

Kokatha country, in the far north of South Australia, is a country of salt lakes and claypans, red sand dunes, stony gibber uplands and mallee woodlands. It is also a country of rich mineral resources, which has resulted in increasing interest and activity from mining ventures within this area. The Kokatha people received their native title determination in 2014, and have been heavily involved in cultural heritage management (CHM) projects associated with mining and infrastructure developments over the last decade.

In this paper we recount some of Kokatha people’s experiences of incorporating elements of cultural mapping into commercial CHM surveys, and the outcomes and benefits of these processes for Kokatha people. We will examine the opportunities it has presented for cultural education and sharing, and protection and understanding of tangible cultural heritage. One example will be senior Kokatha woman Eileen Wingfield’s history of sharing cultural knowledge with less senior Kokatha people during field surveys. This practice of intergenerational transmission of knowledge has continued since Mrs Wingfield passed away and others have stepped into the role of Elder. By continuing to include Elders and younger community members in field surveys, Kokatha people incorporate traditional practices of knowledge sharing as part of the CHM process.

Another example will be a comparison of the CHM surveys carried out for the Roxby Downs to Port Augusta power line. Surveys for the original power line were conducted in the late 1970s/early 1980s. A new power line is about to be constructed running almost parallel to the original, and a new round of cultural heritage surveys have been conducted. Kokatha had significantly more control and input during this recent survey, and as a result, a more complex picture of regional land use has emerged and protection for sites is stronger.

In these examples, we demonstrate how traditional owners use cultural heritage field surveys to consolidate their community’s understanding of the cultural map of their country.

Session: From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes

Plenary

Fighting Archaeology’s Colonial Legacy

Jade Turner, South Australian Museum

Jacinta Koolmatrie, South Australian Museum

As Indigenous people we inherit the strength, connection and responsibility to country, from our ancestors. Archaeology is a unique field that allows us to exercise our responsibilities to country. Despite the benefits associated with working in this field, there is a colonial legacy of eurocentric dominated behaviours and methodologies being imposed on Indigenous people. This legacy is an expression of a significant power imbalance between Indigenous people and non-Indigenous practitioners. These differences have oppressed us in all areas; whether that be as a cultural consultant, academic, student or professional. It is particularly difficult for Indigenous women in these spaces, as enforced colonial notions of gender result in disempowerment and misrepresentation. This discussion will draw from our perspectives and experiences as Indigenous women and how our resilience can be a lesson of overcoming and building respect more broadly.

Session: #MeToo: Protecting Diversity and Exploring Everyday Negotiations of Gender, Race, Space, and Place in Australian Archaeology

The Production and Spatial Analysis of Culturally Modified Trees Within the Pianamu Cultural Landscape

David Tutchener, Bunurong Land Council Aboriginal Corporation / Flinders University
David Claudie, Chuulangun Aboriginal Corporation

This presentation outlines the analysis of culturally modified trees within the Pianamu cultural landscape of the Cape York Peninsula. The data for this study was collected during the dry seasons of 2014-2016. The following analysis focuses on the spatial patterning of culturally modified trees as a proxy for understanding cross-cultural interaction and landscape use. Importantly, the culturally modified trees recorded during this study contributes to the Chuulangun Aboriginal Corporation’s management plans and cultural heritage database. These culturally modified trees were analysed in two different ways: firstly by measuring the proximity and frequency of this place type to centres of European economic control and secondly through the analysis of density mapping. These analysis are combined with the historical and ethnohistorical sources for the region and indicate that there are a series of concentrations of CMTs that were produced throughout the landscape during likely periods of time. Crucially, these concentrations of culturally modified trees demonstrate that there were complex population movements, cross-cultural trade, the continuation of pre-colonial lifeways and the use of natural landscape features as social barriers within the colonial Pianamu Cultural Landscape.

Session: Culturally Modified Trees in the Archaeological Record
But Christmas Island experienced another invasion on a research and baiting program at huge expense. To controlling or eliminating this invasive species through the Commonwealth Government is committed to revealing the full story before the yellow crazy ant invasion destroys this legacy too.

The Crazy Yellow Ant is considered one of the most destructive and invasive species on the planet and arrived on Christmas Island sometime between 1915 and 1916. The story of the occupation has been sporadically documented, including by Neale (1988), but no systematic archaeological work has been undertaken to expand the story of the only Australian territory occupied by a WWII antagonist. It is entirely possible that this legacy will become a mere footnote, yet it has the potential to tell a special and unique story in Australian wartime history.

This research, undertaken through archival research and survey on Christmas Island in July 2018 is the start of the archaeological investigation necessary to bring to light the story still only partially known by the Christmas Islanders and the wider Australian community. The result of the research is preliminary recordings of extant and deteriorating sites, including their current state and precise locations, and recommendations for the next stages needed to reveal the full story before the yellow crazy ant invasion destroys this legacy too.

## Legacy of Invasion

**Helena van der Riet**, The University of Western Australia

**Jane Fyfe**, The University of Western Australia

The crazy yellow ant is considered one of the most destructive and invasive species on the planet and arrived on Christmas Island sometime between 1915 and 1916. The legacy of this invasion and occupation is ongoing and impacts negatively on the ecology of the Christmas Island. The Commonwealth Government is committed to controlling or eliminating this invasive species through research and baiting program at huge expense.

But Christmas Island experienced another invasion on 31 March 1942 by the Japanese Imperial Army. The Japanese occupied the island for three years and the legacy of their invasion is almost lost in the mists of time and the faint physical traces are now hidden in tropical jungle. The story of the occupation has been sporadically documented, including by Neale (1988), but no systematic archaeological work has been undertaken to expand the story of the only Australian territory occupied by a WWII antagonist. It is entirely possible that this legacy will become a mere footnote, yet it has the potential to tell a special and unique story in Australian wartime history.

This research, undertaken through archival research and survey on Christmas Island in July 2018 is the start of the archaeological investigation necessary to bring to light the story still only partially known by the Christmas Islanders and the wider Australian community. The result of the research is preliminary recordings of extant and deteriorating sites, including their current state and precise locations, and recommendations for the next stages needed to reveal the full story before the yellow crazy ant invasion destroys this legacy too.
**Sailing into the Desert**

**Peter Veth**, The University of Western Australia

North-west Sahul hosts up to 10 occupation records dated to between c. 51 - 46 ka. These records come from cave, rockshelter and open sites situated in a variety of geological contexts. No other part of Sahul hosts this kind of consistently early record. My paper will consider the nature of this early northern adaptation, which appears to been characterised by the rapid movement of people with purposeful voyaging, mixed maritime-terrestrial diets and complex symbolic behaviours. The dynamics of the Indo-Australian Summer Monsoon during this time period will be discussed as will the novel landscapes encountered by tropically-adapted peoples moving south, metaphorically ‘sailing’ in to the great deserts of Australia.

**Session: Arriving in Sahul: Old Questions and New Approaches**

**Uneven Playing Fields: Mirarr Experiences in Archaeology and Cultural Heritage Agreement Making**

**Lynley Wallis**, The University of Notre Dame Australia  
**Susan O’Sullivan**, Gundjeihmi Aboriginal Corporation  
**Corben Mudjandi**, Gundjeihmi Aboriginal Corporation  
**Clarry Nadjamerre**, Gundjeihmi Aboriginal Corporation  
**Axel Nadjamerre**, Gundjeihmi Aboriginal Corporation

Gundjeihmi Aboriginal Corporation (GAC) represents Aboriginal traditional owners of the Mirarr clan estate located in Kakadu National Park and adjacent Aboriginal Land Trust lands in West Arnhem Land. As an Aboriginal corporation involved in a broad range of activities, GAC has entered into formal agreements with research organisations on behalf of traditional owners, including relating to rock art surveys, heritage management and archaeological excavations. Those agreements have attempted to ensure that the expectations and rights of the Bininj (Aboriginal) community are well understood and properly respected in the research process and that demonstrable genuine community benefit arises from the research. The purpose and effect of research or other management expertise should be improved management and knowledge in the hands of the community that has cultural authority over the sites of concern. Here we present the community perspective on how challenging it is for Indigenous communities to manage engagement with researchers, especially where there are multiple institutions across multiple disciplines involved. GAC’s experience is that institutions and researchers that wish to engage with communities must acknowledge these challenges and re-think their approach to both the form of research agreements as well as the practical processes used to engage communities. GAC’s experience is that this requires institutions to go beyond questions of customary ethical consent and to better understand what practical measures need to be embedded from the outset of any proposed research project.

**Session: Learning from the Past, Looking Towards the Future: Disruption and Innovation in Cultural Heritage Management, with a Focus on Urban Growth on the Cumberland Plain, Western Sydney**

**Disrupting the Discord Between Learning and Practice: Student Perspectives on a Nation-Wide Skills Passport**

**Jenna Walsh**, Flinders University  
**Lauren Gribble**, Flinders University

Archaeological learning delivers few opportunities for students to gain practical, industry-relevant skills. While teamwork, research and writing skills are developed at all university levels, the opportunity to gain onsite, ‘real-life’ experience is largely only afforded to students that have financial access to overseas field school opportunities, ample volunteering time, or are able to forge strong ties with their professors, tutors or HDR students. Additionally, many institutions no longer offer field or equipment training as part of their undergraduate archaeology program. Some archaeology departments, such as that of Flinders University, offer a logbook for students to record their field work and volunteering activities; however, this is generally an in-house, topic-focussed record of achievement which has little relevance to later employment. These logbooks do not offer guidance on what practical skills and proficiencies students should be striving for, nor do they provide opportunities for professional references that students may use to gain employment in the industry.

In order to address this discord between learning and practicing archaeology, ANCATL have proposed a nationally-applicable Archaeology Skills Passport, based on the highly successful UK model. In this paper, students from Flinders University and the National Archaeology Student Conference 2019 will examine the need for this skills passport, and report on a recent road-test at a pre-conference field school. We will reflect on the student experience of teaching and learning Australian archaeology, and address how this passport may assist in preparing students for entry into the workforce.

**Session: Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry**
We present results from the first interdisciplinary study in Australia to incorporate aDNA, isotopes, bioarchaeology and new archaeological excavations in order to provide important insights into the question of island exploitation and contact with Melanesian populations in Cape York. We reveal information that provides insights into gene flow from the north, but note that the pattern is complex. Equally complex is the mortuary record as revealed through isotopes, reflecting accounts that are documented in the ethnographic record. Also of interest is the pattern of pathology from the people who were interred on Flinders Island, and we compare this to groups in similar ecological contexts in Melanesia.

Interdisciplinary approaches employing a range of techniques commonly applied in archaeology elsewhere in the world can only be possible in Australia when undertaken in close collaboration and partnership with Traditional Owners. By reproducing the past by incorporating the stories from the people themselves, and not just the artefacts and material culture they left behind, we have the potential to provide very important and new insights into the stories from Aboriginal Australia.

**Assigning Identity to the Dead**

Anna Weisse, The University of Queensland

Identity is, in many ways, a self-determined status based on social experience, relationships and the physical space and place of these interactions. Identity continually evolves and changes throughout life; affected by social and familial connections, as well as spiritual and cultural influences. These built and inherited identity traits ensure the uniqueness of each individual throughout his/her lifetime.

An individual's identity, however, does not immediately cease to exist following death. Through memory, the individual's identity continues to evolve. This is demonstrated through the funerary rites enacted for the deceased, and in the continued remembrance of ancestors by succeeding generations long after death. Of course, for many people, communities and cultures, the dead do not simply cease to exist; the spirit continues in a form of afterlife, often believed to be connected spiritually with the person's physical remains.

Today, many human remains are held in museums and institutions worldwide, despite significant repatriation efforts from some collecting institutions. Many of these human remains have poor provenance whereby their place of origin and personal history is unknown. Removal from their original context has disrupted the connection to their identity and rendered the human remains anonymous. With a focus on Aboriginal ancestral remains, this presentation explores how identity can be (re)institated to poorly provenanced...
ancient remains are held in collecting institutions and the significance of this process for present and future descendants as well as for the ancestral spirit.

Session: After Archaeology in Practice: Student Research in Archaeology and Cultural Heritage Management

Investigating the Record for Food Production and Villages in Channel Country, Western Qld

Michael Westaway, The University of Queensland
Josh Gorringe, Mithaka Aboriginal Corporation
Doug Williams, Griffith University
Kelsey Lowe, The University of Queensland
Nathan Wright, University of Nottingham

In ecological terms, the desert channels stretching between Windorah and Birdsville in Far Western Queensland (known as the Channel Country) is today recognised as classic boom and bust country. It is one of the world's few remaining desert channel systems that have not been molested through large scale regulation and irrigation systems. Marked by seasons of great aridity, and semi-annual episodes of ecological abundance, the economy of the Mithaka people in the past appears to have been well adapted to these dramatic environmental shifts. The ethnographic record of the Channel Country has played a prominent role in the development of Aboriginal historian Bruce Pascoe's Dark Emu hypothesis, that argues some Aboriginal economic systems should be classified as agriculture.

In a large environmental archaeology and cultural heritage project funded through the ARC and Qld State Government Looking after Country grant scheme, we have initiated research that aims to investigate the Mithaka landscape associated with this rich ethnographic record. In this presentation we will consider the food production system of the Mithaka and the accounts of village sites, and discuss our available archaeological results in the context of the Dark Emu hypothesis. We conclude by arguing that understanding how the Mithaka managed the landscape in the past will undoubtedly have implications for understanding its future management.

A Palimpsest Approach to Open Sites

Beth White, Beth White Archaeology

It is often thought that artefact scatters within shallow soils have limited chronological information. As a consequence, studies tend to focus on patterns which relate to landscape variables, such as distance from stone quarries, or association with water supplies or food resources. However, I argue that embracing the palimpsest concept for open sites provides new opportunities for the recognition of archaeological patterns and their interpretation. A palimpsest approach to stone artefact assemblages from open sites on the Cumberland Plain of Western Sydney has recently identified patterns relating to the time span (historical phases) during which artefacts accumulated. The results are relevant to that region in particular, but the study highlights a number of methodological issues which will be relevant to palimpsest research in other regions. Methodological issues include the need for multiple spatial samples and large sample sizes (thousands of artefacts) so that time-averaged assemblage signatures can be developed. Geo-archaeological investigations, excavating deposits in spits (even shallow deposits)
and age determinations should seek to understand the age of landforms on which sites occur and the time span/ages of encasing sediments. Artefact analyses need to be designed which are sensitive to change over time as well as enabling the detection and explanation of other archaeological patterns.

**Session: Open Site Archaeology: New Empirical and Methodological Contributions from Australia and Beyond**

**Humans and Environment at Ga-Mohana Hill North Rockshelter, southern Kalahari, South Africa**

Jayne Wilkins, Griffith University  
Benjamin Schoville, The University of Queensland  
Robyn Pickering, University of Cape Town  
Luke Gliganic, University of Innsbruck  
Benjamin Collins, University of Manitoba  
Kyle Brown, University of Cape Town  
Emma Loftus, University of Cambridge  
Jessica von der Meden, University of Cape Town  
Alexander Blackwood, La Trobe University  
Simangaliso Makalima, University of Cape Town  
Sechaba Maape, University of the Witwatersrand

The southern African Middle Stone Age (MSA) archaeological record is transforming our understanding of Homo sapiens origins and evolution, but the intensity of research on coastal and near-coastal MSA records has outweighed that of the deep interior. As a multidisciplinary investigation of human evolution in the southern Kalahari Basin, South Africa, the North of Kuruman Palaeoarchaeology Project was initiated to help correct this bias. Here, we report results from our survey program and the excavation of new archaeological sites. At Ga-Mohana Hill North Rockshelter (GHN) we have recovered stratified MSA deposits. We show that the deposits are in good context with minimal disturbance based on stratigraphy, artifact density distribution, and fabric analyses. The lowest deposit provides early evidence for the use of symbolic resources and liquid storage containers. Optically stimulated luminescence analysis is providing high-resolution age estimates for the archaeological deposits. Uranium-series dating of extensive carbonate deposits is producing a record of past environments. This ongoing collaborative work is generating a diachronic record of MSA human-environment interaction in the Kalahari Basin that will allow us to assess the competing hypotheses about the origins and evolution of our species.

**Learner-Driven, Bottom-up Innovation in the Stone Tool Technology of Early Homo Sapiens**

Jayne Wilkins, Griffith University

Current perspectives of stone tool technology tend to emphasize homogeneity in tool forms and core reduction strategies across time and space. This homogeneity is understood, usually implicitly, to represent shared cultural traditions that are passed down through the generations from parents to children and teachers to pupils. However, just as bottom-up processes driven by children and youth influence technological innovation today, they are likely to have played a role in the past. This paper considers evidence from the archaeological record of early Homo sapiens’ lithic technology in southern Africa that attests to our long history of learner-driven, bottom-up innovation. This evidence includes the role of emulative social learning in generating assemblages with diverse reduction strategies, the high-degree of technological fragmentation across southern Africa through MIS 3, and the evidence for technological convergence through the Pleistocene. Counter to some perspectives on the uniqueness of our species, our ability to learn independently, to ‘break the rules’, and to play, rather than to conform to top-down influences, may account for our technological success. New approaches to analysing and interpreting stone tool technology that emphasize diversity at smaller spatial and temporal scales will help to further understand this aspect of human innovativeness.

**Session: Disruptive or Invisible: Children and the Archaeological Record**

**Aboriginal Occupation of Channel Country, for South West Queensland**

Douglas Williams, Griffith University  
Michael Westaway, The University of Queensland

Channel country incorporates the Georgina and Diamantina Rivers and Cooper Creek Catchments and form one of the last great unregulated river systems in the world. The overflow from these rivers created vast grasslands which provided both pulses of abundance for short periods and permanent water in places over the longer term. Aboriginal people who lived in this region were intimately tied to the river system. This paper presents new data from research in channel country that contributes to our understanding of Aboriginal occupation, use of and trade across the eastern deserts, and channel country in particular.
Session: A River is More Than an Amenity, it is a Treasure: People and Rivers in the Driest Inhabited Continent on Earth

Caring for Country: Cultural Perspectives on Aboriginal Cultural Heritage Managements Plans and Cultural Mapping from Bundjalung people

Leweena Williams, Tweed Byron Local Aboriginal Land Council
Des Williams, Tweed Byron Local Aboriginal Land Council
Rob Appo, Tweed Byron Local Aboriginal Land Council

Tweed Byron Local Aboriginal Land Council was incorporated in 1984 under the New South Wales Aboriginal Land Rights Act 1983 (ALRA). We are 1 of 13 Land Councils of the Far North Coast region and 1 of 119 Land Councils across the state of NSW. Our LALC is actively committed to the advancement and protection of Aboriginal people, land, heritage, spirituality and culture. The Cultural Heritage Unit (CHU) was established as a result of the Tweed Shire Council Aboriginal Cultural Heritage Mapping Project/Plan (ACHMP). The ACHMP was adopted by Tweed Shire Council in July 2018 and requires proponents to obtain an Aboriginal Cultural Heritage (ACH) assessment from the Tweed Byron Local Aboriginal Land Council (Tweed Byron LALC) as part of the Council’s Development Application (DA) process. The CHU provides proponents with a written ACH assessment report which is then submitted to the Tweed Shire Council as part of their proposal. Tweed Byron LALC played a pivotal role in the creation and completion of the ACHMP. Tweed Byron LALC worked alongside the Tweed Shire Council Aboriginal Advisory Committee as well as cultural knowledge holders of the local Aboriginal community. We believe that by cooperatively combining our insights, knowledge and aspirations we have together developed a Plan that may well set a new benchmark for the management of ACH. Our paper is talking about our experiences, challenges and the benefits for our community undertaking cultural mapping and working on ACHMPs.

Session: From the Mountains to the Sea: Indigenous and Archaeological Experiences of Cultural (Counter) Mapping and Managing Cultural Landscapes

Towards a Pretreatment for Radiocarbon Dating Tooth Enamel

Rachel Wood, Australian National University
Stephanie August, Australian National University
Andre Fleury, Australian National University

Stephen Craven, Macquarie University
Stewart Fallon, Australian National University

Radiocarbon dating bone that is more than a few thousand years old in tropical and arid regions is hampered by the rapid degradation of the protein normally targeted for dating. Sometimes, a few bones with a little protein can be found after screening large numbers of bones. However, we often find that no collagen remains. This can result in low quality chronologies where the only samples available for radiocarbon dating are poorly associated with the event of interest, such as charcoal from burial contexts. Tooth enamel may provide an alternative skeletal material to radiocarbon date. Unfortunately, relatively little work has examined how enamel degrades, or how carbonate contaminants can be removed. Dates are rarely accurate: typically at least 5-10% of the carbon in enamel is a contaminant after routine pretreatment. This causes a sample of >50 ka to appear 20 ka.

This presentation will explore new methods to clean tooth enamel based on a more thorough understanding of enamel diagenesis. It will show that ages on tooth enamel can be drastically improved, but that accurate dates are not yet obtained. Typically the equivalent of around 1% of the carbon in enamel is modern in age after the most successful pretreatment attempted.

By comparison to the radiocarbon data, it will also demonstrate that stable carbon isotopes are also affected by contamination, often causing isotopic values to be erroneous by around 2 ‰. Whilst this is insignificant for some applications of stable isotopes, it is important for questions where small isotopic offsets are investigated, for example canopy effects.

Session: Novel Method Development in Australian Archaeological Science: Disrupting the One-Size-Fits-All Mentality

Decolonising the Disruption

Nathan Woolford, BHP
Chloe D'Souza, BHP
Benjamin Proudfoot, BHP
Eleanor Guymer, BHP
Tim Knox, BHP
Allan Ewen, BHP

Decolonising the disruption is about centring Indigenous peoples perspectives and knowledge about their heritage within archaeological training. There can be no easy balance between archaeology and Aboriginal heritage until this is the case. The paths into Indigenous heritage are multiple, but the paths for Indigenous people into archaeology remain limited. The call for an integrated learning ecosystem to train industry ready archaeologists to work within Aboriginal heritage cannot succeed without this greater engagement with Indigenous Australians, on
Indigenous Australians’ terms. This paper explores these issues by presenting the experiences of five Indigenous people and their paths into Indigenous heritage as well as BHP’s recent work to empower Traditional Owners in the Pilbara through a skills training program and experiences more broadly in working across Australia.

**Session: Disrupting the Learning Dystopia: Resolving the Discord Between Education and Industry**

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**The Archaeology of Ancestor Trackways: The Waiet Project in Western and Eastern Torres Strait**

Duncan Wright, Australian National University

Alo Tapim, Mer PBC

Archaeological research in Torres Strait does not fit comfortably within studies of mainland Australia or Papua New Guinea. Torres Strait archaeology provides little direct evidence for extensive exchange networks recorded ethno-historically. In addition, contemporary Islanders appear to possess “their own cultural ways, neither Aboriginal nor Melanesian, yet with features reminiscent of both” (Donlon and David 2010:199). Insights into Islander interactions and socio-technological and ceremonial change may be preserved, however, in deeply engrained cosmologies relating to shared cultural heroes. The wandering routes taken by these Ancestors cross the Coral Sea Corridor, reinforced and emplaced in the past through annual ceremonies and song. Building on previous studies, this paper explores Torres Strait’s role as bridge or barrier. Specifically, we assess the antiquity and materiality of the Waiet Ancestor trackways (and mortuary rituals associated with this cultural hero) across Torres Strait through archaeological and ethnographic research on Mabuiag, Waier and Dauar. We explore the feasibility of historicising ancestor and/or Dreaming trackways within an Australian context.

**Session: Developments in Coastal Archaeology**

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**The Identification of Archaeological Non-Molluscan Marine Invertebrate Remains at Golo Cave, Northern Moluccas, Indonesia**

Hsiu-Ying Yang, University of Wollongong

Non-molluscan marine invertebrate, such as crustaceans and echinoderms, are common elements of the intertidal zone on rocky coastlines. They also constitute faunal remains associated with human livelihoods. Invertebrate faunal remains have been documented in other regions, such as Europe and the Americas, but similar studies have rarely been carried out in the tropical Indo-Pacific. This is due to a lack of accurate archaeological records and comparative reference materials. Furthermore, preservation is particularly poor in tropical areas, and there is a greater variety of species in tropical compared with temperate environments. In many cases, non-molluscan invertebrates recovered from archaeological contexts in the region are often neglected or regarded to be irrelevant faunal remains due to difficulties in their identification. In this study, I provide an overview of the crustacean and echinoderm remains recovered in the Golo Cave site, Northern Moluccas, Indonesia. These remains have been dated to the Late Pleistocene to Neolithic Period, between 34,000 and 2,000 years BP. They are important in developing a more robust understanding of the interaction between human foragers and these non-molluscan remains as food, tools and decoration, as well as providing evidence of human behavioural change through time.

**Session: Exploring the Zooarchaeological and Archaeobotanical Record in Australia through Space and Time**
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Crafting Country
Aboriginal Archaeology in the Eastern Chichester Ranges, North-West Australia
Caroline Bird and James W. Rhodes

Based on ten years of surveys and excavations in Nyiyaparli country in the eastern Chichester Range, Crafting Country provides a unique synthesis of the Holocene archaeology of the Pilbara region. This study reconsiders the evidence at the level of artefact, site, locality, and region to show how Aboriginal people interacted with the land and made their mark on it.

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