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ABSTRACTS

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Reshaping heritage management: Murujuga cultural landscape

Session: 1A

Session: Reshaping heritage management: Murujuga cultural landscape

Heritage management through the use of fire at Murujuga

Jade Churnside, Murujuga Aboriginal Corporation

For as long as anyone on Country can remember, fire has always been a tool our ancestors used to rejuvenate and manage this Country, to make it stronger and healthier for the next generation of Traditional Owners. The topic I will be discussing is fire's invaluable use in heritage management and my own experiences in working with fire management.

Modern day fire management on Country can come in many different forms and with many different purposes. The uses range from things such as bush fire mitigation in order to control the fuel load for fire and reduce the risk of dangerous bush fires, native vegetation and seedling regrowth and germination, fauna surveying in burn scar areas and its surrounds, and finally the preservation of cultural sites, artefacts and rock art on Murujuga.

All of these practices tie back into managing and taking care of Country through the long passed-down knowledge and traditions from our old people, continuing to keep this part of our culture alive.

Session: Reshaping heritage management: Murujuga cultural landscape

Monitoring Country, protecting heritage: Indigenous ranger leadership in environmental risk management at Murujuga

Glen Aubrey, Murujuga Aboriginal Corporation

Co-Authors:
Kasziem Bin Sali, Murujuga Aboriginal Corporation
Chloe Ramirez, Murujuga Aboriginal Corporation

At Murujuga, heritage is not an artefact of the past, but a living tradition rooted in daily cultural practice, environmental custodianship, and ongoing connection to Country. This presentation highlights the role of Murujuga's Indigenous rangers in leading an environmental monitoring program designed to assess and respond to the risks industrial emissions pose to rock art located in this sacred cultural landscape.

The Murujuga Rock Art Monitoring Program (MRAMP) is a best-practice, large-scale monitoring and analysis program targeted at providing reliable information on changes and trends in condition of rock art and assessing if the rock art is showing signs of accelerated change. Results from the program will guide management and protection of rock art.

Developed in close collaboration between Murujuga Aboriginal Corporation (MAC), scientific advisors, and regulatory partners, the program represents a powerful expression of Indigenous leadership in managing Country. Grounded in Ngarda-Ngarli values and responsibilities, it blends cultural knowledges with technical methodologies to develop a robust system of air quality monitoring that will inform heritage protection strategies.

This paper explores how rangers exercise agency in shaping monitoring protocols and assert authority in heritage governance processes. Beyond measuring environmental change, the program is also a platform for succession, supporting younger rangers in learning through doing, on-Country, as they carry forward knowledge and responsibility.

Session: Reshaping heritage management: Murujuga cultural landscape

Living systems, digital tools: Supporting Ngarda-Ngarli knowledge

Jordan Churnside, Murujuga Aboriginal Corporation

Murujuga is a complex, living cultural landscape with over 50,000 years of continuous significance. Thus, many intricate relationships exist—between people, Country, knowledge systems, and even the micro-organisms on ancient rock art. These relationships are not static but are ongoing responsibilities for Murujuga Traditional Owners and Custodians (Ngarda-Ngarli).

To support this living heritage, Murujuga Aboriginal Corporation has developed a Cultural Heritage Management System (CHMS). The CHMS is a digital tool that preserves cultural information by storing a wide range of data and capturing the deep interconnections and relationships that underpin Ngarda-Ngarli stewardship. However, this system must support—not replace—the daily cultural work done by rangers and communities. In the process of managing Country every day, Ngarda-Ngarli rangers generate significant volumes of information. The CHMS is the repository for records of these daily acts of care, observation, and teaching on Country.

For too long, heritage has been defined through non-Indigenous lenses: academic, archaeological, and policy-driven approaches. While these perspectives are valuable, they often fail to fully incorporate the lived, spiritual, and relational essence of heritage as experienced by those who are part of it. The Ngarda-Ngarli do not merely contribute to heritage management, they lead it.

True protection of Murujuga is not achieved by extracting data from communities, but by embedding cultural care, context, and continuity into every system. Ngarda-Ngarli knowledge is not supplementary, it is foundational.

As we build digital systems to safeguard cultural knowledge, we must also reshape how heritage itself is understood and valued. Indigenous leadership must be central—not as a stakeholder voice, but as the source of authority. When archaeologists go home, it is the Ngarda-Ngarli rangers who remain, protecting Murujuga not just for now, but for all time.

Session: Reshaping heritage management: Murujuga cultural landscape

Building strength from within: Capacity building for sustainable cultural leadership at Murujuga

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Chloe Ramirez, Murujuga Aboriginal Corporation

Sustainable heritage management at Murujuga depends not only on monitoring and protection but also on strengthening the capabilities of those entrusted with caring for Country. This presentation explores Murujuga Aboriginal Corporation's (MAC) approach to building enduring leadership and management capacity among its staff and ranger team, ensuring cultural governance, community agency, and operational resilience are embedded for the long term.

MAC's capacity-building initiatives are founded on Ngarda-Ngarli principles of succession, knowledge-sharing, and deep connection to Country. The paper discusses the development of culturally grounded governance frameworks, formal and informal learning pathways, and mentoring programs designed to support emerging leaders within the organisation. Key strategies include targeted skills development in areas such as environmental science, heritage, safety and project management, while simultaneously reinforcing cultural responsibilities and custodial values.

This presentation highlights how MAC navigates institutional demands while maintaining on-Country priorities, and reframes capacity building not as an external intervention but as a process of cultural continuity and autonomy.

In positioning Indigenous people as both the stewards and strategists of heritage futures, it offers a powerful model for what self-determination looks like when embedded in everyday management practice.

Session: Reshaping heritage management: Murujuga cultural landscape

Protecting heritage sites through education and visitor management at Murujuga

Sarah Hicks, Murujuga Aboriginal Corporation

This presentation explores the role of education and visitor management in safeguarding the Murujuga Cultural Landscape, highlighting the practice-based work of Traditional Owners and Custodians (Ngarda-Ngarli). Beyond statutory processes, heritage protection at Murujuga is a daily, lived responsibility: one carried out through guided rock art site tours, cultural awareness inductions, school outreach, and active on-Country patrols. Ngarda-Ngarli rangers engage directly with the public, often intervening when visitors unknowingly or wilfully disrespect cultural sites. Trained in verbal judo, a conflict resolution technique, rangers navigate these situations with cultural sensitivity and authority, promoting understanding while preventing harm. By centring Indigenous-led heritage management, the presentation reflects on how education, public engagement, and relational conflict management can work in tandem to protect sacred places and uphold living cultural practice.

Session: Reshaping heritage management: Murujuga cultural landscape

Caring for Murujuga sea Country

Malik Churnside, Murujuga Aboriginal Corporation

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Murujuga is a land steeped in stories and ancient knowledge. Here, the desert meets the sea, and the history of our people is written in the rocks and carried on the winds. We are the custodians of this land, and it's our responsibility to protect it, not just for ourselves, but for future generations. Our connection to this place is deeper than roots: it's in our bones; it's in our blood.

To look after Murujuga is to understand both its land and its waters. Over the years, we've learned to read the land, to read the currents, and to listen to the whispers of the sea.

The rangers' vast acquisition of new skills gives them the ability to navigate these waters safely and securely while also performing other marine tasks. One such task consists of diving, exploring the now-submerged landscape our ancestors walked on before the seas rose, to help gain an understanding of the stories and rich culture that has come before us.

These skills aren't just about keeping safe on the water. They're about having the power to care for our land and sea Country. When we navigate these waters, we safeguard the fragile ecosystems that are home to our sea life and protect sacred sites from damage and destruction.

Each petroglyph carved into the rocks tells a story: a story that connects us to our ancestors. But these stories are vulnerable. Erosion, development, and climate change threaten to erase them. But with these new skills, we can monitor and protect these sites. Diving allows us to access submerged heritage sites, where old shell middens lie beneath the surface.

We are the keepers of this place. And we will continue to care for Murujuga, together, for as long as the tide flows.

Embedding ethical practice and Indigenous voice in consulting archaeology

Sessions: 1B, 2B and 3B

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Encrypted bias? The neocolonial enigma of ethical and legislative codes of practice in Australian Archaeology: A New South Wales Hunter Valley case study

Maria Cotter, University of New England

'The area is all important to us. We can't break it up for each mine. That is how they are getting away with destroying so much of our culture. They don't know how it all links together, so it doesn't seem as important when you look at this little bit or that little bit. That is how they are breaking up our community too. The mines mention money and that starts fights. The mines want the fights, as they get to keep what they are doing if the community is distracted'.*

The Hunter Valley of New South Wales, and especially its coal mining precinct centred around the towns of Muswellbrook and Singleton, has a reputation for contention and disputation over the assessment, protection and management of Aboriginal cultural heritage. Over the past twenty years I have witnessed this contestation from a diversity of vantage points including as a regulator of Aboriginal heritage for the NSW State Government, as a heritage management consultant and expert witness in the NSW Land and Environment Court, and as an advisor to Native Title Claimants. In this paper I outline some of the implicit, complicit and explicit practices of the Aboriginal cultural heritage management Industry in the Hunter Valley—including adherence to ethical and legislative codes of practices—that have and continue to exploit and marginalise Aboriginal people and their cultural heritage. Problematised as a neocolonial enigma in the practice of Aboriginal cultural management in the Hunter Valley, the paper points towards the need for the Australian archaeological profession, and especially those working with Aboriginal heritage, to adopt a self-reflexive humility and to re-frame and/or reconsider what it is to be ethical as an archaeological practitioner in the twenty-first century.

* Statement made by the late Barbara 'Aunty Barb' Foot in conversation with NSW Office of Environment and Heritage Staff, Singleton, April 2011 - used with permission of Maria Foot, daughter of Aunty Barb.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

From between the hammer and the anvil: Understanding proponent-based practice in heritage management

Mitch Cleghorn, Australia ICOMOS

Australia's archaeological and heritage management practices have developed over the past decades, guided by organisations like AACAI, AAA, AIMA and ICOMOS and the best practice standards they produce. Academia is also responsible for influencing commercial archaeological and heritage management practice through education and training, and by developing and introducing new theoretical and methodological modes of practice. With the award of Native Title and the formation of PBCs/RAPs, and their growing capacity for taking heritage management inhouse, the landscape of heritage management practice can be described, at least until the next major legislative or regulatory reform. An area of archaeological and heritage management practice that is seldom discussed, but has emerged alongside these other aspects, is proponent-based practice. Understanding and incorporating these proponent-based roles into broader understanding of heritage management is essential to realising industry best practice.

To draw attention to this developed, but under-explored and understood aspect of consulting archaeology, critical relationship pathways are explored in detail, and a thorough description of proponent-based practice is presented. As a mode of operation, it has its own specific challenges that include navigating complex relationships, communicating information between stakeholders without subject matter expertise, and advocating for positive outcomes.

Only through understanding these challenges and opening discussion can our discipline move to make practice guidance notes and improve heritage management practice in this area. By shedding light on these aspects, I hope to begin a constructive dialogue that can, in time, integrate proponent-based practice into the common lexicon of heritage management, and work toward improving industry understanding of how these roles might be beneficial to achieving a common aim of heritage protection with the development of practice standards and guidelines.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Putting the culture back into cultural heritage management

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At its best, Australian archaeology can be intensely collaborative, working with Traditional Owners to empower community and to tell relevant and amazing stories. At its worst it can be a system that trades the destruction of cultural heritage for minimal economic gains.

In this paper we talk about the elephant in the room, addressing many of the issues around consulting archaeology (with a focus primarily on Victoria) and ask the question, how can we add cultural value to the commercial heritage management process? How can we work with Traditional Owners to protect their cultural heritage within the constraints of the legislation and the Cultural Heritage Management Plan (CHMP) process?

This paper is intended to facilitate an ongoing discussion around some of the fundamental issues with the Cultural Heritage Management Plan (CHMP) process and the unintended negative results. We present a review of some of the common issues in commercial heritage management and present options and suggestions for writing better CHMPs, getting more positive outcomes for cultural heritage and creating a more culturally safe work environment.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

The Heritage Plan: A novel alternative approach to Aboriginal cultural heritage management

Connor Sweetwood, Yamatji Marlpa Aboriginal Corporation

Yamatji Marlpa Aboriginal Corporation (YMAC) is the Native Title Representative Body (NTRB) for the Pilbara, Mid West, Murchison, and Gascoyne regions of Western Australia. Run by a First Nations board of directors, YMAC services include native title and compensation claims and future acts representations; heritage services; PBC executive office support; and natural resource management. In complex issues of Aboriginal cultural heritage, YMAC's Heritage Team provides post-determination support via intricate legal documents called Heritage Agreements, extensive negotiations with proponents and First Nations groups, the use of heritage consultants, and a dedicated process for obtaining free, prior, and informed consent before project implementation.

When one of YMAC's PBC clients was simultaneously presented with multiple project negotiations of national-level importance and substantial heritage values, the YMAC Legal and Heritage teams developed a new, streamlined process for heritage management that keeps all parties invested—and collaborating—towards a shared outcome. This concept, dubbed the 'Heritage Plan', implements several novel design ideas that have proven undeniably effective. This ethical framework enables streamlined archaeological and anthropological consultation with Traditional Owner groups without sacrificing any depth of consultation, and helps provide more efficient free, prior, and informed consent through technical communication of complicated legal matters as negotiations progress. In doing so, YMAC has designed an effective tool for embedding First Nations voices into the legal agreements that are instrumental in protecting their Country and cultural heritage.

With several new industries emerging in Western Australia requiring consideration of cultural heritage in negotiations, and State legislation offering limited heritage protection, YMAC's intention has been to set the highest standards through a unique approach that enables ongoing dialogue and greater certainty for both parties.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

In the footsteps of ancestors: The importance of low density artefact distributions on Wurundjeri Woi-wurrung Country in Victoria, southeast Australia

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In accordance with s.168 of the *Aboriginal Heritage Act 2006* [Vic] ('the Act'), Aboriginal places across Victoria are registered via the Aboriginal Cultural Heritage Registry and Information System. A commonly registered place type is the Low Density Artefact Distribution (LDAD). LDADs are defined as deposits of culturally modified stone tools identified in low densities (i.e. less than 10 in a 10 x 10m area). These sites are often interpreted as representing random artefact discard and are assigned lower scientific significance than their higher-density counterparts. The management of LDADs, and other Aboriginal Places, on Wurundjeri Woi-wurrung Country (south-central Victoria) is the statutory responsibility of the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC). A Registered Aboriginal Party under the Act, WWCHAC represents the contemporary Wurundjeri Woi-wurrung community and preserves the knowledge, cultural practices, and archaeological record of that community. The Elders of the Wurundjeri Woi-wurrung bear the responsibility passed to them by their Ancestors to care for the beings, land, sky, and water, that is their Country.

The Cultural Heritage Unit Elders have long understood LDADs to be physical manifestations of the footprints of their Ancestors, connecting Country between waterways, occupational and ceremonial sites. Spatial analysis, braided with the knowledge of the Elders, reveals the deep significance of these seemingly randomly deposited artefacts. The analysis undertaken in consultation with Wurundjeri Woi-wurrung Traditional Owners reveals the research potential of LDADs and the depth of knowledge associated with them. It is, therefore, our hope that these site types may be viewed as important places and studied further to support Wurundjeri Woi-wurrung people in connecting with their Country, community, and traditional knowledge.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Low impact is still an impact: Managing 'low impact' activities on PKKP Country

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The Pilbara is a resource-rich cultural landscape. Every square inch of PKKP Country is subject to some form of mining or pastoral tenure and impacts to Country occur on a daily basis. Physical 'impacts' range from localized ground disturbance, such as rock chipping and soil sampling through to large scale land clearing and pit mining. Impacts to intangible values can include Traditional Owner access to Country, visual amenity, and sense of place.

There is a real risk that important heritage places may be impacted if not managed properly. Proponents often seek exemptions from approvals where their activities are deemed (often by them) to be low impact. These requests often fail to take into account the risk of impacting an as yet unrecorded site and cumulative impacts. These risks are unacceptable to PKKP Traditional Owners unless managed properly.

In this paper, representatives of the PKKP Aboriginal Corporation present the methods they are using to try to control the risk of inadvertent impacts to heritage by proponents and their so-called low-impact activities. We draw upon some examples that have shaped our thinking and approaches to addressing this problem, both for the PKKP community and industry who work on PKKP Country.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Reconsidering traditional approaches to mining compliance and Section 16 excavations at the Hardey Syncline

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The Hardey Syncline is a geologically significant natural feature of the Hamersley Plateau. Located on the southern margin of the Hamersley Plateau, the Syncline preserves the only complete stratigraphic record of the Great Oxidation Event and Huronian glaciations in Australia. Fossilized raindrop imprints are also found in sedimentary rock layers dating back to the Palaeoproterozoic Era, which spans from 2.5 to 1.6 billion years ago.

The Hardey Syncline is also an important part of Yinhawangka Country. The cultural values of the Country surrounding the Hardey Syncline contain a rich mosaic of Yinhawangka cultural history, from the more recent pastoral and colonial times then stretching back through deep time to cultural traditions and stories of the Yinhawangka people.

In 2023, Black Wattle Archaeology on behalf of the Yinhawangka Aboriginal Corporation undertook a series of Section 16 rockshelter investigations for API Management (APIM) as the manager of assets owned by the Australian Premium Iron Joint Venture (APIJV) mining development at the Hardey Syncline.

The primary research aims for the project were driven by the Yinhawangka Aboriginal Corporation, in consolation with API Management and the participating archaeological consultants. Through the consultation process, the participating archaeological consultants were able to adapt traditional excavation and reporting methodologies to address the perspectives and priorities of the Yinhawangka people.

The thorough consultation process employed between the Aboriginal Corporation, the proponent and the consultant enabled the project to move beyond the typical Pilbara compliance-driven paradigm towards a culturally appropriate collaborative effort which addressed the heritage concerns of the Yinhawangka People, provided further archaeological and cultural knowledge, and met the compliance requirements of the development.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Cultural mapping in the Fitgerald River National Park: A Noongar-led initiative along the south coast of Western Australia

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The Mamang Mambakoort Cultural Mapping Project presents a case study in how embedding Indigenous leadership in all stages of the project provides a model for successfully decolonizing the practice of consulting archaeology. This project required complete faith in the vision and leadership of the Noongar Elders who initiated it, and the results were spectacular. It was commissioned by Wagyl Kaip Southern Noongar Aboriginal Corporation and the WA Department of Biodiversity, Conservation and Attractions. The brief was mysterious, and the goals were vague. The journey that unfolded was both enlightening and incredibly fun. Ultimately the results illuminated the Elders' vision for these lands and seascapes … a vision of Noongar custodianship forever.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Time to more readily preserve and celebrate cultural heritage: Establishing a cultural precinct on Nyamal Country

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At the edge of the Pilbara and the Great Sandy Desert, on Nyamal Country, lies a rich and diverse cultural heritage landscape. Recent heritage assessments in this area were carried out in collaboration with Nyamal People, consultant archaeologists and anthropologists, and other specialists, as part of Fortescue Limited's proposed Pilbara Energy Generation Hub project.

During these assessments, Nyamal representatives identified a specific area within the broader landscape as a 'cultural precinct': a designation reflecting the presence of numerous rock art sites, grinding patches, quarries, and artefact scatters. This area holds exceptional cultural and spiritual significance for the Nyamal People, who are committed to its protection and preservation for future generations.

This presentation explores the steps taken to formally recognise and document the 'cultural precinct', highlighting the collaborative efforts of Traditional Owners, heritage consultants, and resource company representatives. It also demonstrates how shared goals and respectful partnerships can lead to meaningful and celebratory outcomes in cultural heritage management.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Kartajirri landscapes: A cultural and spatial analysis of four rock art sites on Kurrama Country, Pilbara, Western Australia

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Kurrama Country in the Pilbara is home to a diverse archaeological landscape. Years of consulting archaeology work provide a detailed record of how people in the past lived in this arid environment. While it is not always possible to spend time on Country doing research, detailed recording allows us to undertake further analyses off Country. In collaboration with Puutu Kunti Kurrama Traditional Owners, we weave together two ways of reading the landscape: archaeological and Indigenous.

People have lived in and travelled through the general landscape near Kartajirri (Duck Creek) on the Hamersley Plateau for at least 40,000 years. Prior excavations in rockshelters on Kurrama Country have shown episodic occupation from the Pleistocene, during the LGM, through the Holocene. This occupation record continues in the living memory of Kurrama people.

For this paper, we focus on four sites along and close to seasonal creeks close to Kartajirri. These sites contain rock art, grinding, and stone artefacts. We look at what activities people undertook at these sites and compare the archaeological features. We also contextualise these sites in the local and regional landscape and situate them in the Kurrama cultural landscape. Kartajirri and its tributaries are highly significant waterways for Kurrama Traditional Owners; Kartajirri is often referred to in heritage surveys in the local landscape. By looking not only at site contents, but also where these sites are located, and their relationship to other important places in the local area for Kurrama Traditional Owners, we aim to gain further understanding of their relationship with Kartajirri and its tributaries, both in the past and in the present. This will help to further understand the role that these sites played in Kurrama social networks, the relationships between people and the spaces they lived in and how these are embedded in Country.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Caring for Country, caring for each other: Mental health in consulting archaeology

Stefania Aquilino, Terra Rosa Consulting

In consulting archaeology, the emotional toll of remote fieldwork, ethical tension, cultural responsibility, and client-driven deadlines often goes unspoken. These pressures affect everyone in the field—from graduates to senior staff, from Traditional Owners to consultants—and are too often normalised as part of the job.

This presentation breaks that silence.

Mental health and neurodivergence remain marginal in industry conversations, despite being central to wellbeing and workplace safety. The structural nature of burnout, disconnection, and emotional fatigue reflects not individual weakness, but systemic gaps in how our profession is managed and valued.

As a neurodivergent migrant woman working in heritage consulting, I've seen how easily vulnerability is masked under productivity. But I've also seen the strength in community, in cultural knowledge, and in care. Traditional Owners often speak about Country as something alive, something that cares for people as much as we care for it. That same principle should apply to how we look after each other on Country, especially in spaces where trauma, grief, and ethical compromise intersect.

This talk calls for employers, proponents, and practitioners to recognise mental health as a core part of ethical, culturally safe practice, not a personal issue to be dealt with in private. Through lived experience and collective reflection, this presentation offers a starting point for creating more humane, trauma-aware systems in consulting archaeology.

If we are trusted to care for Country, we must also care for the people walking it. Together.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Heritage as relations: Disaster resilience, mitigation, and caring for Country on Iman and Butchulla Country

Tom Dooley, The University of Queensland

In navigating changes in climate, in Country, and in heritage, communities work according to remembered pasts and envisioned futures. As Indigenous representative bodies increasingly assert roles for themselves in management of environmental change, the place of the past in the future begins to look very different from what we've come to expect from the received top-down priorities of dominant institutional approaches. In southeast/central Queensland, communities are repurposing opportunities provided by climate crisis, disaster resilience, and caring for Country programs to further land and sea management in pursuit of aspirations for the future. My research details interview and participant observation with members of the Iman and Butchulla peoples, conducting community-led heritage initiatives, exploring the heritage futures they envision and work towards, through the course of the many changes they face on Country. As archaeologists increasingly find themselves brought into discourses of the environment, practitioners and researchers alike must engage with community conceptualisations of how study and management of the past can contribute to Indigenous futures. Doing so raises long-contested questions of self-determination, heritage-making, and environmental justice, and prompts us to reflect on to what extent environmental crises can be separated from the original crisis of colonisation. This research documents the factors that participants testify most strongly as affecting the relations they are able to maintain and grow with their heritage and considers how approaches to heritage management that draw express focus on those relations may contribute to ongoing critical reform of our discipline.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Deep sand dilemmas: Diggy McDigFace and the terrible, horrible, no good, very bad CHMP conditions

Jen Burch, Jem Archaeology

In recent years, the use of mechanical excavators for archaeological investigations in Victoria has become preferred by many Registered Aboriginal Parties (RAPs) for complex assessments and salvage excavations. Mechanical excavation has obvious benefits; however, the practical aspects of undertaking large-scale, open area mechanical salvage excavations in deep sand deposits can be highly problematic. These methodological issues are too commonly misunderstood, poorly considered, or entirely unconsidered in the establishment of Cultural Heritage Management Plan (CHMP) conditions. Using a case study of a 900m2 mechanical salvage excavation undertaken on Bunurong Country, this presentation seeks to provide an assessment regarding a variety of practical matters that must be considered when formulating methodologies for mechanical salvage excavations in deep sand deposits. These include, but are not limited to, proper consideration of soil types and depth of excavation together with excavator size/ weight/ reach and trench collapse management. By sharing the challenges and learnings encountered on the project, this presentation aims to encourage the industry to consider these practical issues when formulating mechanical salvage methodologies in CHMP conditions.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

The rock art of Snake Rock: A major Wiradjuri cultural place in central NSW

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Snake Rock is a singular and major Wiradjuri rock art site in central New South Wales, Australia. Along with other rock art sites in the region, it has not been previously published. Local Wiradjuri tradition describes the site as a highly important congregation place for regional meetings and ceremonies. Detailed recording of Snake Rock documented 96 images in a repertoire of figurative and non-figurative paintings and drawings, and hand prints. The multi-layered art does not conform to surrounding regional repertoires of southeast Australia, making it both a cultural and archaeologically significant place.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Indigenous perspectives on the ABM Project, southeast Cape York Peninsula

Josh Sabatino, Laura Rangers

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Fred Bramwell, Laura Rangers
Chrissy Musgrave, Laura Rangers
Sye Marsh, Laura Rangers

The Laura Rangers are responsible for looking after Quinkan Country in southeast Cape York Peninsula, a rich rock art province first brought to the attention of the outside world through the work of Percy Trezise and Noelene Cole. Designed to assist with site recording, management and training, the ARC Linkage funded Aygarr Bamangay Milbi project has been a focus of cultural heritage attention for the rangers over the past five years. As that project now draws to a close, Laura rangers reflect on learnings from the project. They discuss the range of new skills they have developed through the project, including using spatial data techniques, site recording, and data management. The skill and experience they have gained have provided them with much greater confidence in identifying, recording and managing their cultural heritage. The ABM project is a strong example of the benefits of co-designed research, with real-life outcomes of value beyond predominantly academia.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

Foods and fibres: An extensive late Holocene macrobotanical assemblage from Windmill Way, southeast Cape York Peninsula

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Sam Lowdown, Laura Rangers
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Large macrobotanical assemblages are rare in Australian archaeology, with only a few examples known. The late Holocene aged Windmill Way site in southeast Cape York Peninsula is remarkable for its extensive organic remains, which include more than 500 pieces of string and dozens of wooden objects. In addition to those specific artefacts, Windmill Way has an extensive macrobotanic collection. While some of the assemblage is likely to represent natural accumulation processes, we argue that the bulk of it is culturally derived. Amongst the assemblage are remains that represent the entire fibre production process, from baste removal, stripping, retting, pulverising, and string manufacturing. Other macrobotanics that are clearly cultural include abundant desiccated tuber fragments and seeds, of which there are at least 15 species in abundance. This assemblage provides an unprecedented snapshot into organic material culture and subsistence practices in this region.

Session: Embedding ethical practice and Indigenous voice in consulting archaeology

'That's super neat': Wooden artefacts across Quinkan Country, southeast Cape York Peninsula

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In this paper we describe the remarkable wooden artefacts recorded in rockshelters across Quinkan Country in southeast Cape York Peninsula over the past five years. Although sandstone is rarely considered conducive to organic preservation, our findings challenge this assumption, with a wealth of wooden artefacts observed. These range from burial wrappings, cut wood, boomerangs, fighting sticks, points and slabs. In addition, wooden objects such as spears, stone axe handles and boomerangs are often stencilled in the art assemblages of rockshelters. Direct dating of some of these objects indicate they range in age from the contact period back to 1300 years ago, revealing insights into organic material culture rarely seen archaeologically.

Queering the field:
A timely discussion?

Session: 1C

Session: Queering the field: A timely discussion?

Queering the field and an inclusivity and respect statement

Steve Brown, University of Canberra

Co-Authors:
Ursula Frederick, University of Canberra
Madeleine Kelly, Flinders University
Clay Law, Heritage Advisor

In this introduction to the 'Queering the Field' session, we outline the aims of the session, talk to an 'Inclusivity and Respect Statement' (provided below), and describe what is intended by 'queering' when applied to archaeology. As the first ever session on queer archaeology at an Australian archaeology conference, our objective is to explore the extent to which gender and sexually diverse individuals and groups are—and can be—made visible in the structures, interpretation and work of Australian archaeology.

Queer theory is a reaction to the notion that there is a 'standard' identity that frames social, cultural, economic and political processes—it allows one to see the world more broadly. Thus, while queer (as an adjective) archaeology focusses on visibility in the archaeological record and the recognition of queer workers and their experiences, queering (as a verb) is wider. Queering archaeology emphasises the importance of looking beyond the archaeo-normative and recognises reliance on conventional constructs as a form of violence that narrows down, eclipses, or even erases different ways of seeing the world.

Inclusivity and Respect Statement:
In this session, the queer participants and our ally colleagues are committed to fostering a welcoming and inclusive environment where everyone feels respected and valued. We believe that diversity of thought, background, and experience strengthens the work of Australian archaeology. We encourage open dialogue, mutual respect, and active participation from all individuals, regardless of their race, ethnicity, gender, sexual orientation, ability, religion, or socio-economic background. Participants are responsible for creating a safe and respectful environment for all by:
(1) Making no assumptions about the identities, experiences, or opinions of others;
(2) Speaking from one's own experience without generalising;
(3) Listening with respect and without judgement; and
(4) Doing one's best to use inclusive and respectful language.

Session: Queering the field: A timely discussion?

Archaeological intimacies: Excavating experiences in poetry

Madeleine Kelly, Flinders University

This paper delves into a sensory experience of archaeology in the field. Through two short poems and their accompanying explanations, I reflect on the dialogic relationship between the material traces of the past and archaeologists' engagements with them in the present, as notably highlighted by Christopher Tilley in his 1989 paper 'Excavation as theatre'. The poems compose a love letter to archaeological fieldwork and excavation, evoking the sensorial and intellectual experiences that emerge through the process of collaboratively uncovering layers of the past; the questions we ask together; and the stories we tell. While the poems are not explicitly queer, my amateur practice of poetry emerged in the complexity and vulnerability of queer love, friendship, and community. Thus, it is through a queer lens—and one not obvious or overt in an archaeo-normative context—that this story of archaeology is told.

Session: Queering the field: A timely discussion?

In the spirit of queerness: Applications of queer theory in archaeology

Clay Law, Independent Scholar

Co-Authors:
Kiri Hatzipantelis, Independent Scholar
Tobias Fulton, University of Newcastle

Queer is a deliberately ambiguous term that is simultaneously a way of naming, describing, doing, and being. At its most familiar, the term is an umbrella term for marginalised sexualities and gender identities. Yet, at the same time it is often used to describe a pluralistic and polyvocal theoretical model, known as Queer Theory, that represents an amalgamation of critical theories, such as feminist, critical race, decolonial and postcolonial theories, all of which critique systems of power and privilege. Such an intersectional theory, at its core, is a theory of disruption, where its strength rests in its ability to disrupt all normative or assumed practices, not just those related to sex, sexuality, and gender. Queer theory advocates for resistances to universalism, rigid definitions, hegemony and categorisation. It relies on the intersecting voices, perspectives and knowledge systems of the many, rather than the few.

In this paper, the authors advocate for the adoption of Queer Theory in archaeological practice, and demonstrate that anyone can think queerly, regardless of their gender identity or sexual orientation. By using lived experience and practical examples, this paper showcases the ways in which Queer Theory can be applied to archaeology, such as:

- What it means to look for queerness in the archaeological record

- How to queer one's own practice, whether in the field, classroom, museum, or academic work

- How to recognise one's own positionality, biases and agendas, and their impact on interpreting the past

These examples display various ways one can work with, in, and alongside 'the spirit of queerness'. Moreover, adopting this spirit allows for archaeologists to challenge assumptions set by previous scholarship, ask new questions, embrace possibilities between and beyond the norm, challenge systems of power, and empower different types of knowledge creation by sharing inside and outside the discipline.

Session: Queering the field: A timely discussion?

Queering the history of archaeology? Feminist historiography and the ethics of gender ascription

Emilie Dotte-Sarout, The University of Western Australia

In this talk, I raise some questions I have been confronted by—and hopefully get to hear from and engage with colleagues who might have some answers—while working on the history of women in Pacific archaeology. While acknowledging the important debates in the field of women and gender studies about the use of 'women' as a category of analysis, I followed feminist history's perspectives considering that 'women' and 'men', however historically and socio-culturally contingent categories that encapsulate a diversity of realities, still act as real groupings universally structuring the world and personal experiences. The main point is that a large majority of societies throughout history, especially in regard to the nineteenth and twentieth centuries realm of Western science, have used gender categorisations that rely on the binary grouping of 'men' vs 'women' (including when they recognised non-cisgender or non-binary/queer gender roles). Hence, the first archaeologists of the Pacific all had their lived experience and historical placement strongly influenced by their positioning in either the category of 'women' or 'men', whatever their own gender identity. The difficulty for me has been to recognise that I dealt with assigned gender rather than gender identity or even expression: one ascribed to persons either in the sources or as perceived by me in these sources; but rarely stated by the historical agents themselves, especially in the case of perceived queer identity. In such cases, I have been wondering: should I be queering the history of the field by discussing these ascribed identities and the impact it seems to have had on their career or recognition? Who am I to decide on the gender identity of these persons? Am I imposing a presentist view of gender identity and diversity on these historical actors? What is the ethics of gender assignation in the history of science? Please help!

Session: Queering the field: A timely discussion?

'It will be between us only': Queer emotional practices in the underfloor archaeology of Fremantle Prison, Western Australia, 1855-1991

Meg Drummond-Wilson, The University of Western Australia

Co-Author:
Martin Porr, The University of Western Australia

The experience of queerness in single-sex total institutions is a topic often overshadowed by assumptions and stereotype. Gibson and Henley (2013) have posited that unique sexual cultures form within total institutions such as prisons, leading to the emergence of identities that do not easily map onto the accepted categories of the 'outside world'. This social constructivist viewpoint aligns neatly with recent intersectional archaeologies of sexuality that explore how material culture creates, reinforces, and challenges identities. In this presentation, I draw upon my PhD thesis to present evidence of queer/gay practices from Fremantle Prison, a Western Australian maximum-security prison that operated from 1855 to 1991. This includes two letters found in between-floor archaeological deposits from prison cells—one dated to the Second World War and another to the late twentieth century—and prisoner testimony from the 1898 Jameson Royal Commission. In particular, I focus on what these artefacts and historical moments can tell us about the emotional experiences and practices of incarcerated queer lives, and suggest that, where possible, emotion is a useful analytical tool for archaeologists attempting to better comprehend past sexual identities through material culture. I posit that viewing Scheer's (2012) concept of 'emotional practices' through a queer lens can open up powerful avenues of analysis and understanding for archaeologists concerned with incarcerated identities.

Session: Queering the field: A timely discussion?

Queering remains: Sex determination and the bioarchaeological imaginary

Jamie Horrigan, Australian National University

Co-Author:
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Development in skeletal sex determination has advanced in the last few decades, leading to an increased certainty in how human remains can be categorised across a sex binary. This has led to some revolutionary new understandings around same-sex attraction and gender non-conformity in past populations, in turn increasing appreciation of the presence and complexity of past queer lives.

Drawing on our personal experiences as queer, non-binary folks, we suggest that this focus on developing more sophisticated methodological approaches to sex determination may have unintended consequences of limiting theoretical openness in bioarchaeology. We argue that a priori assumptions around the innateness and importance of binary sex remain in bioarchaeological interpretation, that these assumptions are inbuilt into our very site recording architecture, and that these acquire a conceptual stickiness that travels with human remains towards laboratory analysis.

We support this stance with a recent reassessment of the primary causes of osteoporosis in human remains across three populations. Osteoporosis' reputation as a 'women's disease' has led to an uncritical acceptance in bioarchaeology that sex differences are an innate and significant factor in the development of the disease in past populations. This in turn dictates analysis and interpretation, which may reinforce these beliefs. In this paper, we present the results of a meta-analysis of the impact of numerous skeletal analysis determinations on bone mineral density, where sex determination is consciously treated as but one co-determined factor. This conceptually open approach has led to a surprising reinterpretation into the likely causes of osteoporosis in these three populations.

Session: Queering the field: A timely discussion?

Queer yesterdays, gone today?: Finding LGBTQI+ narratives in historical archaeological assemblages in Australia

Ryan Buhagiar, Ecology and Heritage Partners

Studies in historical archaeology in Australia have been shaped by normative assumptions about gender, sexuality and identity, often defaulting to heteronormative and binary frameworks when interpreting past lives. Sites and artefacts are still often read through lenses that assume clear-cut roles and relationships: husband/wife, male/female, public/private. Lived experience, past and present, resists such containment. Conventional interpretations may unintentionally erase or flatten queerness through gendered typologies of objects, rigid assumptions about household composition and the prioritisation of heterosexuality as the default social structure.

This presentation explores what it means to find and foreground queer narratives in historical archaeological assemblages and questions the limitations of traditional interpretations in recognising the complexity of lived experience. Drawing partly on queer theory, critical archaeology and renewed interest in LGBTQI+ figures in Australian history, this paper reconsiders the material traces of individuals and communities who may have lived outside, or in tension with, dominant gender and sexual norms in nineteenth- and early twentieth- century Australia. By examining artefacts, archaeological studies and historical records through a queer lens, this presentation considers how a 'queer assemblage' might be identified—not as a definitive category, but as a method of interpretation that resists closure and embraces multiplicity, fluidity and ambiguity.

Considered too are the implications of queering historical archaeology in the Australian context. How might queer readings disrupt settler narratives of propriety, morality and family? What responsibilities do we have in representing the diversity of past lives, particularly those marginalised in both their time and ours? Through case studies and reflection, this discussion encourages the adoption of a queer methodology in Australian historical archaeology—one that questions the taken-for-granted, foregrounds difference and opens space for new and inclusive narratives.

Sealinks: Australia's global connections revealed through archaeology

Sessions: 1D and 2D

Session: Sealinks: Australia's global connections revealed through archaeology

'The Maritime Outback': Early nineteenth century trade, culture contact and global connections on Australia's Southern Ocean colonial frontier

Ross Anderson, Western Australian Museum

The 'Maritime Outback' describes the European exploration and colonization of Australia's vast coastline and islands, where remote informal and formal colonial settlements were interlinked by shipping. This maritime network included a hybrid of local, regional and First Nations economies, and in some cases connected Australasian colonial outposts directly to world markets. With no official monetary currency, First Nations peoples and foreigners interacted to create labour, trade and exchange mechanisms. First Nations peoples suffered from colonial violence and exploitation but also demonstrated agency in participating in these new economies. The hybrid economic nature and significance of this maritime network to Australia's early development have gone largely unrecognized in mainstream narratives of Australia's economic development and history. This paper presents a case study from the south coast of Western Australia, bringing together historical research and findings from coastal and underwater archaeological sites to present a new perspective on the development of early local maritime economies with global connections.

Session: Sealinks: Australia's global connections revealed through archaeology

Tracing connections and transforming value: Examining the trajectories of the *Zuytdorp* hoedjesschelling

Jessica Buckton, Australian National Maritime Museum

Coins have long been objects that move between different cultures and societies. They leave traces through their usage, connecting, transmitting, and bringing together diverse peoples and cultures. Coins found on shipwrecks provide material evidence of these movements. This paper examines the hoedjesschelling of the Dutch shipwreck, *Zuytdorp*. These coins are payementen, small change ordered by the Vereenigde Oostindische Compagnie (VOC) and minted in 1711. Brought aboard *Zuytdorp* as a consignment, these coins never made it to their destination and were lost off the coast of Western Australia in 1712. But the coins have become a defining part of *Zuytdorp's* archaeological assemblage—part of the 'carpet of silver' that allowed the wreck to be more positively identified. They are a large part of the artefact assemblage, but have not been analysed in much depth. This paper examines the hoedjesschelling holistically. It details the emergence of these coins, first minted in 1672, to their connections with human and non-human things at the bottom of the Indian Ocean in 1712, and beyond. The analysis focusses on the iconography, text and materiality of these objects and how such attributes changed as the coins made new connections. Through time, *Zuytdorp's* hoedjesschelling moved from acting as a form of media, to being considered bullion, shipwreck coinage, historical artefacts and then museum objects. In each of these contexts they were transformed based on new connections. As a result, their agency, and perceived 'value' were likewise transformed. Examining these changes provides new insight into the connections that these coins have facilitated between Australia, the former Dutch East Indies, and the Dutch Republic. As material agents of exchange, their journey is far from over three centuries after being minted.

Session: Sealinks: Australia's global connections revealed through archaeology

Who were they and how did they die?: The interdisciplinary research of the victims associated with the wrecking of the *Batavia*

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Wendy van Duivenvoorde, Flinders University
Corioli Souter, Western Australian Museum
Susan Broomhall, Australian Catholic University
Alistair Paterson, The University of Western Australia

Various disciplines contribute to the ongoing narrative of the disaster with the *Batavia* in 1629 CE, which led to the events that caused the death of so many people. Interconnected here are mainly the archival and archaeological records, the forensic data and isotopic analysis. This paper explores the relevance of interdisciplinary research into the cause and manner of death, as every field of expertise has its potential and flaws.

The *Batavia* was wrecked in 1629 CE on Morning Reef in the Houtman Abrolhos archipelago off the coast of western Australia. This occasion marks the first time non-indigenous people were marooned on Australian soil. Archives indicate a mixed population on board, with officers and civilians of various social and economic standards, as well as soldiers and crew, the latter from different regions in northwestern Europe. This diversity is hypothetically associated with specific lifestyles, like the quality of the diet and related health. Testimonies of the survivors describe what happened during the voyage and the months thereafter, with the massacre of c. 125 men, women and children by mutineers.

Excavations have yielded the skeletal remains of 21 individuals from single and multiple burials and a mass grave. It appears that some were buried with consideration. Others were seemingly dumped. The majority of the deceased consisted of men, but also some women and children were represented. Pathological features indicate a violent cause of death for some, but mostly the cause of death cannot be detected on the bones. The isotope analysis addresses the individual life histories. The question is, how far is the variation in lifestyle and provenance and the lack of nutrition during the last period of life reflected in the isotopic data? The interrelation of the above disciplines is crucial in unravelling the narrative of these victims.

Session: Sealinks: Australia's global connections revealed through archaeology

Mobilising the wreck: VOC artefacts and new global stories from Australia's shore

Jette Linaa, Aarhus University

This paper explores how material culture from Dutch East India Company (VOC) shipwrecks off the Western Australian coast reveals connections to global networks of trade, migration, and cultural encounter. The paper investigates how these material remains reflect Australia's place in early global entanglements, especially through comparison with VOC assemblages from Northern Europe.

Focusing on artefacts from *Batavia* (1629), *Vergulde Draeck* (1656), *Zuytdorp* (1712), and *Zeewijk* (1726), the paper considers how these wrecks act as submerged archives that preserve traces of ambition, everyday mobility, and cultural exchange. Particular attention is given to ceramics, personal items and exotic goods found in shipboard contexts. These are compared with assemblages from VOC-related sites, especially harbour quarters and domestic contexts, in the Netherlands, Germany and especially in Denmark, where similar patterns of use, adaptation and value emerge.

The analysis draws on typological and contextual comparison across maritime and settlement assemblages. By situating Australian shipwreck finds in a wider network of VOC activity—spanning the Indian Ocean world and Northern Europe—the paper seeks to illuminate how material culture embodies both structural connections and personal experiences across early modern global systems.

The paper forms part of Mobilising VOC Collections for New Global Stories (MOBVOC). By tracing the circulation of VOC objects beyond Asia, the paper challenges national narratives and foregrounds Australia's material role in early global systems.

Session: Sealinks: Australia's global connections revealed through archaeology

Discovering the 'informal migration' of Norwegian mariners to Australia from the 18th to early 20th centuries

Adele Millard, The University of Western Australia

Norwegian maritime history in Australia is a niche domain compared to other better-known fields of research, such as Australian, British or French seafaring exploits. Most historical studies on Norwegian mariners here are concerned with the sealing and whaling industries. Little has been published in Australia or Norway on the broader range of Norwegian mariners who came to this country, and lesser still on those who 'jumped ship' here. Yet Norwegian crew were aboard the earliest Dutch East India vessels to travel our waters in the eighteenth century; and, in the nineteenth century, Australia ranked second among countries to which Norwegian mariners absconded from their posts. Who were these people? Where did they come from? Where did they go? What did they do? What social and material cultural impacts did they leave behind for us to discover? While undertaking research in Australia and as a guest researcher at Norsk Maritime Museum and Stiftelsen Norsk Folkemuseum in Norway, I have begun to address these questions. Using a preliminary sample range from 1855 to 1905, I am searching archival records and undertaking oral history interviews in both countries to map and document the individual and collective travels and experiences of Norwegian mariners who 'informally migrated' to Australia. This period captures sailing ships and steamers, and includes crew who were able seamen, ordinary seamen, carpenters, bosuns, mates, lascars, cooks, stewards, engineers, and cabin boys. They range in age from 13 to 70, and include at least one woman. Just as the Australian descendants of these people have oral histories of their forebears, so too do the descendants of families that these mariners left behind. In addition to transnational social history, there is also finding material culture: heirlooms, remittances, shipwrecks and architectural legacies. This paper summarises my research findings to date and identifies potential interdisciplinary and transnational research collaborations with maritime and historical archaeologists in Australia and Norway.

Session: Sealinks: Australia's global connections revealed through archaeology

Encounters in Kaju Jawi: The implications of archaeological discoveries in Napier Broome Bay, northern Kimberley

Alistair Paterson, The University of Western Australia

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Corioli Souter, Western Australian Museum
Ian Waina, Kwini Traditional Owner
Bernadette Waina, Kwini Traditional Owner
Dorothy Djanghara, Kwini Traditional Owner

Archaeological sites in Napier Broome Bay, northern Kimberley, Australia—characterised by cultural features associated with the entrepreneurial maritime Southeast Asian trepang (sea cucumber) processing industry—have recently been radiometrically dated for the first time. As a result, it appears that seasonal industrial extraction of maritime resources along the Kimberley (in Malay, Kaju Jawi) coast resulted in cross-cultural encounters from the seventeenth century AD onwards: contemporary with Arnhem Land (Marege). Working in collaboration with Kimberley Traditional Owners, we use archaeological evidence alongside linguistics and historical evidence to consider the possible cross-cultural histories in the northern Kimberley after c.1600AD, a period when Europeans also arrived and northern Australia emerged onto northern hemisphere cartography for the first time.

Session: Sealinks: Australia's global connections revealed through archaeology

Storylines and sealinks: The global connections across time in Gathaagudu, the Shark Bay World Heritage Area

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This presentation looks at how the many stories across both land and sea have enabled the rich expanse of global connections in Gathaagudu, a UNESCO world heritage area. Today, many people flood to the area because of its natural values, however the cultural values that link a global economy tells just as an amazing narrative and showcases the cultural exchange and storytelling through many of the encounters across millennia. The area is littered with a rich cultural history which includes more than 30,000 years of Aboriginal sites, knowledge and stories, many of which are directly linked to the area's natural values and changing environments and peoples. But the area also contains evidence of the earliest encounters that represent Australia's first shared history, including the visits to Dirk Hartog Island by the Dutch in 1616 and to Peron Peninsula by the French in the early 1800s, the more recent visits and settlements of the Chinese and Malays in search of pearls, and the influence of effects of World War battles, and more recently World Heritage Tourism. The archaeological evidence is equally as fascinating as the material culture lays side by side, absent of time, across the landscape linking the intrinsic value of preservation for present and future generations. The protection of these shared cultural heritage sites that aim to showcase the deeper understanding of the global connection also provide an instrumental contribution to tourism in the area and supports Australian shared understanding of its history. Equally these global experiences and colonial realities have influenced Gathaagudu to identify a way of life making it a vibrant, multicultural, inclusive and socially cohesive community. Malgana Ngurra Gathaaguduni. Ngali wangga thudarru ngarnija mandarrinu. Nyinda wula wujarnu. Nyinda yajala. Jinamanah baraja. Barranga waranni. (Our Malgana home/a place of two waters. We eat sing laugh, dance. If you come visit us, you come a stranger. You leave a friend. Tread lightly on Malgana land and come back soon).

Session: Sealinks: Australia's global connections revealed through archaeology

Strategic interpretive mapping of 'Southland' encounters with the VOC

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Alistair Paterson, The University of Western Australia

The ARC Linkage Project 'Mobilising Dutch East India Company collections for new global stories' (LP210300960) is spatially and temporally mapping the accounts of the first Dutch encounters with Australia in the seventeenth and eighteenth centuries. It has long been recognised that the earliest European impressions of the Australian coast in the e seventeenth and eighteenth centuries were captured in the Dutch East India Company archives; some of these instances are found and translated in volumes such as *The Part Borne by the Dutch in the Discovery of Australia 1606-1765* (Heeres 1899). Analysis of these records to date has largely focused on the text content and the individual episodes. Using the Nodegoat relational database research environment developed by LAB1100, based in the Hague, we are temporally and spatially mapping the instances of events of encounter, including the places, peoples, vessels, and 'things' involved, to both primary and secondary source material. Nodegoat will enable us to represent and analyse the network of relationships surrounding VOC shipwrecks and encounters, and to record the wider cultural and historical contexts of these events across time and space. In this way, we aim to produce a new and critical overview of instances of 'encounter' and perspectives of the 'Southland' in the e seventeenth and eighteenth centuries.

This presentation will report on the first stage of this project, which has focused on the historic sources, such as manuscript maps and archives. We will also outline the planned extension of this into the modern period, mapping the ongoing instances and legacies of encounter with the VOC, such as through shipwreck and maritime artefacts, providing a deeper understanding of the ways in which these instances of historical coastal encounter continue to link Australia to the globe.

Session: Sealinks: Australia's global connections revealed through archaeology

Multiple isotope data provide new insights into the origins, diets, and lifeways of individuals from the *Batavia* Shipwreck

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Alistair Paterson, The University of Western Australia

We present the results of an isotopic investigation of individuals recovered from 'Batavia's graveyard' on Beacon Island off the west coast of Australia. These individuals represent survivors of the shipwreck of the VOC ship *Batavia* (in 1629). Their study holds special significance for understanding one of the earliest European encounters with Australia. We applied strontium, oxygen, and carbon isotope analyses of dental enamel (n=9 individuals), and carbon and nitrogen isotope analyses of bone collagen and incremental dentine collagen (n=14 individuals) to investigate different aspects of individual lifeways. The sampling strategy, involving multiple samples per individual, was specifically designed to assess variation in individual origins and diets, as well as potential changes in diet and nutrition during the last period of life. The stable isotope values were consistent with diets predominated by terrestrial protein but with smaller, yet substantial, contributions of marine protein for some individuals. Adult males appear to have consumed higher quantities of marine foods than adult females or children. For several individuals there is a pronounced increase in nitrogen isotope values between bone samples, representing long term dietary intake, and apical dentine samples reflecting short term diet (during the last ~several months before death). This pattern is consistent with an increased input of seafood after their departure from Europe, during and subsequent to the voyage of *Batavia*. The diversity of strontium and oxygen isotope values indicate that the individuals do not share the same geographic origins. For example, individuals from single graves possess more similar (combined) isotope values consistent with origins in the Netherlands, whereas individuals from the mass grave tend to have strontium or oxygen isotope values (or both) suggesting origins from elsewhere in Europe. In summary, the multiple isotope approach has shed new light on the lifeways of individuals recovered from Beacon Island.

Session: Sealinks: Australia's global connections revealed through archaeology

Tracing cross-cultural encounters through fire: The anthracology of Makassan sites on Yanyuwa Country

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Australia's First Nations people and mariners from Island Southeast Asia share a centuries-long history of dynamic and complex interaction along northern Australia's coastline. Voyaging seafarers known as the Makassans engaged with Aboriginal communities in a network of seasonal encounters centred around the harvest and trade of trepang or sea cucumber (a valued commodity in the Chinese market). Alongside this exchange of goods, there emerged enduring intangible exchanges of cultural knowledge and connection. However, the richness of these engagements has at times been overlooked in historical and archaeological narratives, particularly the involvement of Yanyuwa people and their Country in the Gulf of Carpentaria (the southernmost extent of regular Makassan travel). Consequently, substantial gaps remain in our understanding of Makassan presence and influence in this region.

Here, we present an anthracological (wood charcoal analysis) study of two Makassan trepang processing sites in the Gulf of Carpentaria dating from the eighteenth to nineteenth century. These sites are located on two islands: Jalabuwaja (aka Harney Island) and Vanderlin Island, of the Sir Edward Pellew group. The sites were excavated in 2024 by a team from Monash University, the li-Anthawirriyarra Sea Ranger Unit and Yanyuwa Families. We comparatively assess the charcoal assemblages from stone-lined hearths at these places to offer insight into what types of wood were used as fuel and whether they are ecologically representative of the surrounding environment. The taxa present and potential cultural knowledge associated with the charcoal, will be examined, integrating Yanyuwa perspectives to reveal which considerations influenced wood selection, and how access to and use of Country was negotiated. As the first anthracological study of its kind, this pilot project contributes to broader understandings of pre-colonial interaction, environmental engagement, and cultural entanglement.

Session: Sealinks: Australia's global connections revealed through archaeology

Considering the archaeological evidence for survivors from the 1656 wreck of the *Vergulde Draeck*

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The fate of the 68 survivors of 1656 wreck of the *Vergulde Draeck* (Gilt Dragon), a Dutch East India Company (Verenigde Oostindische Compagnie or VOC) vessel, lost off the coast of Western Australia, remains one of the most compelling unsolved maritime mysteries in Australian history. Despite several seventeenth century VOC search expeditions—some of which also suffered losses along the coastline—no definitive evidence of the survivors' fate was ever found. The wreck site itself was discovered in 1963 on a reef approximately 5.6 km offshore between the modern towns of Seabird and Ledge Point. While excavation of the wreck yielded important maritime archaeological data, it provided little insight into what happened to the castaways. Scattered VOC-era material has occasionally been reported on the adjacent mainland coast, suggesting post-wreck activity, but these finds have remained isolated and inconclusive. This paper presents the results of archaeological fieldwork targeting a limestone cave system several kilometres south of the wreck aimed at identifying new evidence of the survivors' presence along the coast. The findings offer fresh perspectives on how the survivors may have interacted with the coastal environment and inform broader discussions about early European contact, survival strategies, and maritime mobility in remote Australia.

Session: Sealinks: Australia's global connections revealed through archaeology

Using best practice methods, archaeological evidence is developed to reveal the historic connections between the Derbarl Yerrigan/Swan and Djarlgarra/Canning Rivers and the development of the Swan River colony

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The Derbarl Yerrigan/Swan and Djarlgarra/Canning Rivers, from the earliest period of European settlement, have reflected the connections of the Swan River colony to the world. Until 1897, the limestone bar at the Derbarl Yerrigan/Swan River entrance at Fremantle restricted international and coastal vessels from discharging their cargoes of goods, migrants and convicts upriver at Perth. These final journeys, and the social and economic development during the early settlement period, relied upon the river system as the primary means of transport as inland roads consisted of nearly impassable sandy tracks. By necessity, from the 1830s onwards, locally constructed vessels consisting of flats (flat-bottomed barges), double-ended lighters, sailing barges, ferries and other small vessels plied the river waters between Fremantle and inland locations. They transported people, goods and merchandise, as well as construction materials, necessary for the growth of the colony. Travel along the length of these waterways was sometimes hazardous, resulting in a maritime archaeological record that is currently being explored.

This paper presents interpretations from the non-invasive sub-bottom profiler (SBP) studies undertaken on two of the oldest of these vessels lost on the Derbarl Yerrigan/Swan River—recently discovered, mostly buried and undisturbed—and a third vessel in the Djarlgarra/Canning River which may have been locally built in the district, with convict labour, to support river dredging works and the pioneering timber trade. Consistent with the 2001 *UNESCO Convention on the Protection of the Underwater Cultural Heritage* best practice methods approach, the SBP studies reveal key vessel and cargo characteristics that today remain buried, and together with contemporaneous records, assist WA Museum staff to confirm the identity of these historic vessels. Interpretation of in situ subsurface conditions also provides guidance for management planning, community engagement, education and the safeguarding of the value of these sites for future generations.

The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Sessions: 2A and 3A

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

The Pilbara: from Juukan

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This paper examines the archaeological record of the Hamersley Plateau and how it relates to the greater West Australian arid zone through the lens of the Juukan 2 site. Detailed analysis of the excavations of this significant place have revealed a remarkable human record spanning over 50,000 years, that endured through climatic hardships, and includes a rarely preserved organic component.

The ancestors of the Puutu Kunti Kurrama people arrived at Juukan with expert understanding of desert landscapes and a deep and sophisticated knowledge of Country. The record at Juukan 2 provides a comprehensive material culture assemblage by which archaeologists are now able to construct a robust foundation for reconstructing the long-term human occupation of the Pilbara region. This, in turn, enables more informed interpretation of other sites across the arid zone where the archaeological record is less well preserved.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Tracking faunal change in the Pilbara: Quaternary sub-fossil evidence from Juukan Gorge

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Recent excavations at the Juukan Gorge archaeological site in the Pilbara region of Western Australia, Puutu Kunti Kurrama and Pinikura Country, have uncovered a remarkably rich sub-fossil assemblage of both large and small vertebrates. This assemblage represents a significant addition to the late Quaternary faunal record of the region, which has previously lacked material of this scale and resolution. Preliminary zooarchaeological analyses reveal a dynamic history of faunal turnover spanning the last ~50,000 years, reflecting long-term environmental change and human-animal interactions. The small vertebrate component, in particular, offers critical insights into past arid-zone ecosystems, including the presence of species no longer extant in the Pilbara. These findings underscore the vital role of zooarchaeological research in Australian archaeological contexts, providing high-resolution ecological and environmental reconstructions that enrich interpretations of site formation and human occupation.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Energised crowding, megasites and villages: The emerging archaeological narrative from Mithaka Country

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Mithaka Country is revealing an archaeological landscape that does not seem to have an obvious ethnographic analogue. Ethnohistoric accounts discuss village sites, but provide scant detail on quarries, including those that fall within the category 'megasite'. Sr isotope studies of ancestral remains indicate populations were sedentary, and evidence of plant exploitation and fishing provide insights into a diverse economy that linked into a transcontinental trade and exchange network crossing the Country. Stone arrangements provide insights into the ceremonial structure of Mithaka society, with important insights obtained through historical accounts by Alice Duncan Kemp.

We provide a summary of research on Mithaka Country and how the archaeology is providing important insights into the complexity of Mithaka society; a society that appears to be marked by large settlements, intensive harvesting and riverine resource exploitation, and mining of sandstone to support an important arid zone economy.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Integrating geophysical remote sensing, drone survey, and Indigenous traditional knowledge systems: A multi-method approach to prospection of inland aquatic cultural heritage on Mithaka Country, SW Queensland

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This study presents a novel, integrative approach to archaeological prospection in inland waterways in Australia by combining underwater remote sensing, aerial drone survey, terrestrial ground-truthing, and Indigenous Traditional Knowledge. Conducted on Mithaka Country in the Channel Country of southwest Queensland, the research focused on three significant permanent waterholes: King Creek, Mackhara Waterhole, Stony Crossing, and one seasonal: Brumbrie Waterhole (adjacent to Stony Crossing). The study aimed to identify submerged and semi-submerged archaeological features, particularly those associated with Indigenous fish trapping and water management systems.

Methodologically, high-resolution sonar imaging was employed from onboard a small vessel to detect potential stone fish pens, weirs, and submerged structures. Aerial drone photogrammetry provided complementary data on topographic and geomorphological patterns, revealing potential anthropogenic modifications along waterhole peripheries and in dry creek beds. Terrestrial ground-truthing, following both drone and underwater geophysical surveys, helped verify sonar and drone anomalies and recorded key features such as stone alignments, possible weirs, and fish-holding areas. The integration of Mithaka Traditional Knowledge was critical in interpreting the hydrological and ecological use of these waterholes, allowing for culturally appropriate and community-driven research outcomes.

The findings confirm the presence of possible Indigenous water management features, including submerged stone fish traps and modified riverbanks, which align with historical accounts and local oral traditions. Our study demonstrates that combining multiple prospection techniques and deeply-rooted engagement with Indigenous Knowledge Systems enhances detection accuracy and site interpretation. This research has significant implications for the non-invasive study of inland aquatic cultural landscapes, contributing to both archaeological methodology and Indigenous heritage management.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Current connections: Interpreting regional variability from investigations across a 900 km transmission corridor

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The archaeological record in the Murray-Darling Basin can provide rich insights into subsistence and settlements strategies across the region. Most previous archaeological studies have focused on site-specific or local scales. However, due to the vast size of the basin, these focused studies are limited in their ability to provide meaningful analysis on how these strategies may have adapted across bioregional boundaries. This is largely due to the scale of the basin, which, though hydrologically connected, encompasses highly diverse environmental conditions and cultural landscapes. While this focused approach is valuable, it leaves gaps in our understanding of transitional zones and the extent of interaction between neighbouring regions. Our study addresses this limitation by presenting the results from archaeological investigations along a 900 km transect across central and western New South Wales, from the temperate southwest slopes near Wagga Wagga to the semi-arid Murray-Darling Depression near Mildura. Drawing on a dataset of over 100 surface and sub-surface habitation sites and accompanying lithic assemblages, we explore the patterns that present themselves in the lithic assemblages across a vast geographic scale. Particular attention is given to the relationships between site location, raw material availability, and proximity to water. By moving beyond site-specific interpretation, this study aims to identify and model broader patterns of occupation that extend beyond localized behaviour. This approach tests whether prevailing assumptions about occupation in the Murray-Darling Basin hold consistent across the study transect, or whether the archaeological record reveals a more complex and variable pattern of land use.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Living Country, living knowledge: Cultural mapping in arid landscapes

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Water holds profound cultural, spiritual, and practical significance in desert landscapes. It is embedded in ancestral narratives, guides cultural responsibilities, and supports contemporary on-Country practices. Perspectives on water are diverse, reflecting different social, historical, and economic experiences, yet all recognise its central role in sustaining people and Country.

In arid regions, water availability has always been shaped by natural variability, with major storms and long dry periods driving cycles of abundance and scarcity. Climate change is intensifying these extremes, altering rainfall patterns, raising temperatures, and drying soils—factors that place increasing pressure on both cultural and environmental systems, as well as on industries dependent on water.

This paper reflects on a collaborative cultural mapping project that documented living relationships with water in desert landscapes. Drawing on on-Country engagement and community knowledge-sharing, the project demonstrates how participatory methodologies can support Traditional Custodians to articulate their priorities for water management and cultural governance.

By bridging community knowledge and formal planning processes, cultural mapping offers a way to reposition heritage as a forward-looking practice. This approach recognises the resilience and custodianship of Aboriginal peoples while addressing contemporary challenges of water management under changing environmental conditions.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Yindjibarndi Rangers working with archaeologists on cultural landscapes

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The Yindjibarndi Aboriginal Rangers work over a large area of the Pilbara covering 13,000 km^2 including parts of the Hamersley Ranges (*Gambulanha*), Chichester Ranges (*Birditha*), and aquifers in the Millstream Chichester National Park (*Jirndawurrunha*). These features are of immense cultural significance. In 2023 the rangers started collaborative work with the ARC Desert People Project focusing on the archaeology of two large rockshelter sites (*Bangkangarra*) located on the north of the Ranges in the Kangeenarina Creek/Gorge (*Ganyjingarringunha Wurndu)*. In 2025 the team shifted focus to occupation and quarry sites around Millstream (*Yirranghunha*), as well as carrying out environmental coring of the wetlands. Both the excavations and environmental cores were the first to be carried on their Country (*ngurra*) for research and heritage management, rather than mitigation of mining impacts. In this talk the rangers discuss how these places are part of larger cultural landscapes, are ethnographically significant, and discuss how such collaborative heritage work is an expression of their rights and responsibilities to look after Country.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

By the waters of Bangkangarra: Deep-time Yindjibarndi occupation in the inland Pilbara, northwestern Australia

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Two critical questions for Australian archaeology include the timing of occupation of the arid zone and the response of groups to increasingly cold and arid conditions during the Last Glacial Maximum (LGM). Whilst the role of refugia of different scales during periods of climate change has long been explored, few early sites located near permanent water sources have been analysed. In this paper we provide multiple lines of evidence for occupation of a large rockshelter in the Hamersley Gorge of the Pilbara uplands by c.45 ka. The site is located close to a culturally important spring-fed pool with a waterfall, and the locality is referred to by Yindjibarndi Traditional Owners as Bangkangarra, an ethnographic site associated with the sand goanna. The rockshelter itself is known as Yamararra Ganyjingarringunha Rockshelter 2 (or YG02). YG02 is significant due to evidence for very early site visits, continued visitation during the LGM and more recent interactions with the coast, some 170 km away. Pre-excavation passive seismometer readings accurately determined depth of deposits before excavation within a 10% error range. The site's depth and sediment profile allowed for high resolution OSL dating through paired sampling and multiple dosimetry points. Detailed assemblage analyses are complemented by contextual studies including phytoliths, magnetic susceptibility, micromorphology, elemental and mineralogical analyses. Such methods help characterise occupation where preservation of macro-organics is marginal. Together, these findings position Bangkangarra as a key inland refugium during climatic extremes and a place of long-term cultural significance for Yindjibarndi people.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

'Transcendent Space': How did First Australians respect, manage and sustain homeostasis over at least 51,000 years, to create the 'Biggest (most enduring) Polity on Earth'?

Philip Davies, Yindjibarndi Nation

Borrowing from the title of Bill Gammage's 2011 epic, T*he Biggest Estate on Earth: How Aborigines made Australia*, this presentation discusses how First Australians created and lived in a relatively stable political, religious and cultural environment for at least 51,000 years, which could be labelled as a 'golden age'. Stanner said of First Australians, '[they] do not fight over land. There are no wars or invasions to seize territory. They do not enslave each other. There is no master-servant relation. There is no class division. There is no property or income inequality. The result is a homeostasis, far-reaching and stable ...'.

Colonised Australia is a foreign hegemonic concept, one that introduced military conquest, genocide, capitalism, and Eurocentric notions of social arrogance and racial superiority. It replaced an Aboriginal and Torres Strait Islander polity estimated to contain 250 nations, each separated by custom, law, language, biodiversity and intimate knowledge and responsibility for specific tracts of Country.

This discussion will explore some of the factors that influenced and maintained homeostasis, including patterns of religious, moral and societal governance, and the view that each nation persisted within a unique transcendent space, producing an outcome which avoided regime overthrows, catastrophic war and the development of weapons of mass destruction. Instead, Indigenous Australians successfully conducted national trade networks, widespread relational affinities and alliances, and embraced emissaries, politicians and ambassadors, having had them in place, as the Yindjibarndi would say, since Ngurra Nyjunggamu (when the world was soft) ...

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Shifting desert coasts: Preliminary results from recent intensive survey and excavations on the Nyinggulu (Ningaloo) Coast in Cape Range, northwestern Australia

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Outside of Africa, relatively little is known about the occupation of Pleistocene coastal occupation, and this is particularly the case for the occupation of arid coastlines. In Australia, recent research has suggested that, despite an almost continental-wide lack of evidence, Pleistocene coasts were widely occupied and productive. Much of this evidence comes from the Nyinggulu (Ningaloo) Coast on the western side of Cape Range in northwestern Australia. The environment is semi-arid/ arid, with most rainfall occurring as the result of episodic cyclonic activity. This paper reports on recent excavations and survey work from the western coast and central Cape Range in collaboration with Department of Biodiversity, Conservation and Attractions (DBCA) as well as the Nyinggulu Coast Joint Management Body. The sites profiled include Mandu Mandu Creek South Rockshelter 8, Winderabarndi Rockshelter, and Joorla Marngooda. However, these sites also represent a continued trend of excavating near-coastal rockshelters in the western face of the limestone range systems in Cape Range. It's about time some of the regional gaps in archaeology were addressed, such as an excavation within the range itself and some intensive work on the middens which line the coast of Cape Range. To this end, we also present the preliminary results of an excavation at one cave site in the central range, Goolyoo, as well as highlighting some of the intensive work underway at one midden site, Patjarkurru.

Session: The everywhen in Australian deserts: Shifting time narratives from the Australian arid zone

Why do we still distrust OSL dating?: Building and interpreting chronologies from the sediment up

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Optically Stimulated Luminescence (OSL) dating has become a vital tool in the archaeological toolkit of Australian researchers. Despite its growing use, a general scepticism that OSL chronologies are inherently inaccurate, while radiocarbon ages are held to be faultlessly 'accurate', lingers in the community. This apparent dichotomy is not only fictional but can result in erroneous interpretations of both site formation and patterns of human activity within them. To better understand and evaluate the chronological framework of a site requires that collectors/users of geochronological data understand the dating methods themselves, as well as the sedimentary environment from which the dating samples were collected.

OSL and radiocarbon are providing chronological control in two very different ways. While OSL directly dates the timing of sediment deposition of individual sand grains, radiocarbon samples—unless locked into their primary depositional setting, i.e. an intact hearth—behave in the same way as any other clastic material in the site. As such, organic material (e.g. charcoal, shell, etc.) can be reworked both throughout the sedimentary column, in the site itself, and translocated from the external sedimentary catchment. As such, the interpretation and evaluation of site chronologies is predicated upon a detailed understanding of the interplay between pre-, syn- and post- depositional processes that equally affect both radiocarbon and OSL chronologies. Viewed this way, even diachronous chronologies can provide valid results that can often be explained by the comprehensive evaluation of site formation processes and, critically, the (re)framing of the chronological questions being asked of the site.

We illustrate these points using case studies from various locations investigated by the Desert People Project, as well as other arid and semi-arid regions across Australia. These examples highlight the importance of integrating a robust geoarchaeological framework with the chronological data to construct reliable and meaningful chronologies.

Artefacts and archaeologists: Understanding the past through material evidence

Session: 2C

Session: Artefacts and archaeologists: Understanding the past through material evidence

Observations from the Superintendent's Cottage, Point Nepean Quarantine Station

Talia Green, Jem Archaeology

Point Nepean Quarantine Station, the first and one of the largest such facilities in Victoria, was established in 1854 to control and prevent the spread of disease carried by new arrivals into the Colony. Recent archaeological excavations of the former Superintendent's Cottage and the subsequent analysis of the historical assemblage recovered from the study area has allowed for an understanding of the lives of the inhabitants of the Cottage. This paper will discuss the dietary preferences, personal interests, entertainment and leisure preferences, resource availability, socioeconomic status, and occupations of those who inhabited the site through various stages of occupation. An analysis of the faunal remains in the assemblage was also carried out, with a particular focus on butchery patterns, enabling a partial reconstruction of the dietary preferences of those who inhabited the site and a subsequent comparative analysis to other Colonial-era sites across the wider landscape. Additionally, the assemblage enabled a broad analysis of the lives of the wider population, including of their cost of living, entertainment options, property prices, and employment opportunities.

Session: Artefacts and archaeologists: Understanding the past through material evidence

Preliminary data from an archaeological salvage on Bunurong Country, Victoria

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Jem Archaeology has been excavating a large-scale salvage on Bunurong County in Victoria for three years. Initial excavations at Wedge Road, Skye, indicated that this was a significant place for the Bunurong people. These findings have been borne out in the salvage excavations with a deep stratigraphic profile of sand and clear phases of occupation across the landscape. These preliminary findings demonstrate a dense occupation that extended across a wide temporal and spatial landscape. Use of the land can be tracked through time using optically stimulated luminescence and radiocarbon C14 dating which have both been employed to understand the extensive occupation of this Aboriginal place. OSL dates of deep artefact bearing deposits indicate an occupation that dates back to earlier than 35,000 years BP. To date, over 200,000 artefacts have been salvaged, with a wide variety of raw materials, tool types, and hearths present. In situ artefacts and features are plotted using a total station, modelling their horizontal and vertical distribution. 3D modelling techniques can be paired with radiometric dating to recreate knapping floors and hearths to illustrate behaviour from both the Pleistocene and the Holocene on Bunurong Country.

Session: Artefacts and archaeologists: Understanding the past through material evidence

By the river: An overview of the last three millennia by the King George riverbank through stone tools

Marine Benoit, The University of Western Australia

Oomarri (KGR037) is an open-air occupation site by the King George River in the north-eastern Kimberley. It was excavated in 2016 and 2018 in the framework of Kimberley Visions: Rock Art Provinces of Northern Australia research project (ARC LP 150100490). This site, surrounded by rock art indicating a late Pleistocene and Holocene occupation of the area, delivered well-preserved late Holocene occupation layers with several hearths. This presentation reviews the results of the lithic assemblage analysis from these late Holocene occupation layers that suggest changes in lithic technology, site use and mobility.

Changes in lithic technology and mobility during the mid- and late Holocene in the Kimberley have often been interpreted in economic terms. This analysis, however, proposes new understandings of the changes happening in the late Holocene in the north-eastern part of the region. Using a chaîne opératoire approach to study the stone tools, this presentation will provide an in-depth description of the changes in the technological organisation of the people living at Oomarri that reveal socio-cultural connection through three millennia. It will also reflect on the story of Oomarri and its occupants through time.

Session: Artefacts and archaeologists: Understanding the past through material evidence

Charting Perth's maritime heritage: Connecting past, present and future with modern technology

Ian Warne, Maritime Archaeological Association of Western Australia

Perth's maritime history is a critical component of Western Australia's colonial and post-contact development, yet much of its riverine heritage remains under-documented. *Charting Perth's Maritime Heritage: Connecting Past, Present and Future with Modern Technology* is a collaborative initiative that applies contemporary documentation techniques to investigate, record, and communicate the maritime archaeology and history of the Swan and Canning Rivers.

Utilising UAV (drone) photogrammetry, underwater videography, and geospatial mapping, the project captures both terrestrial and submerged cultural heritage features with high spatial accuracy. Shoreline infrastructure such as jetties, boat ramps, and historic buildings are recorded alongside submerged artefacts and potential wreck sites using GoPro systems and diver-led surveys. These data are integrated into a digital database, providing both spatial analysis capabilities and an accessible public interface.

A key outcome is the creation of a web-based archival system incorporating historical imagery, site reports, and interpretive material, enabling ongoing community engagement and educational outreach while supporting heritage management. The integration of modern recording tools not only enhances documentation accuracy, but also broadens interdisciplinary collaboration between archaeologists, community historians, divers, and digital technologists.

By combining traditional maritime archaeological practices with emerging technologies, the project contributes to best-practice models for surveying and interpreting riverine heritage sites. Minister for Culture and the Arts and Heritage, David Templeman MLA, launched this new Swan River Heritage Project at the WA Maritime Museum on 24th November 2024. It is available at: https://swanriverheritage.com.

This presentation highlights methodological approaches, project outcomes, and the implications of digital documentation for site interpretation, preservation, and public history. It offers a case study in how modern technology can support sustainable heritage stewardship.

Session: Artefacts and archaeologists: Understanding the past through material evidence

Imaging the wrecks of the Wadjemup Kepawirn scuttle ground

Alex Aberle-Leeming, WreckSploration Inc

The Wadjemup Kepawirn Scuttle Ground lies south-west of Rottnest Island, Western Australia and is home to over 50 historically significant shipwrecks following its use as a scuttling ground for disused vessels from 1910-1994. The Scuttle Ground lies in unprotected waters ranging from 50 - 200 m depth with strong currents and unpredictable weather conditions, presenting a significant challenge to explorers.

By conducting technical dives to investigate magnetic anomalies, the WreckSploration team has extended the area in which wrecks have been sunk by over 10 miles. The team has discovered four new wrecks, including the historically significant submarine *HNLMS KXI*, and produced 3D photogrammetry models of 14 shipwreck sites in the area.

This paper outlines the historical and newly defined boundaries of the Wadjemup Kepawirn Scuttle Ground, the relationship between magnetometer surveys and wreck discoveries, and presents the 3D photogrammetry model of several sites including *HNLMS KXI*.

Session: Artefacts and archaeologists: Understanding the past through material evidence

The myth of the archaeologist

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Various representations of the archaeologist as a figure in popular culture, academic publication and historical records have resulted in the accumulation through time of the figure's own mythological qualities. This presentation is a creative response to the various facets of that mythology, as filtered through the life of the author as an archaeologist. The resulting performative piece will be a personal autobiographical exploration as well as a presentation of the myth of the archaeologist through time.

Understanding indigeneity in the maritime culture of southeast Asia

Session: 3C

Session: Understanding indigeneity in the maritime culture of southeast Asia

Claiming the sea: Legal geographies of Indigenous heritage in Southeast Asia

Anais Mattez, Harvard University

This paper examines the legal category of 'indigeneity' in maritime Southeast Asia, a region shaped by coastal ecologies, mobile geographies, seasonal rhythms, and maritime adaptation. Definitions of indigeneity are often inherited from the Anglo settler colonial model characterised by Indigenous primo-occupation in North America, Australia and New Zealand. However, Southeast Asian identities are more fluid and human settlements more complex. Moreover, defining indigeneity or Indigenous heritage in the region is particularly challenging because many Indigenous groups have remained partially nomadic. While being Indigenous to the Indian Ocean, some have only recently settled on specific islands of the Archipelago. Indeed, the successive waves of human settlement complicate narratives of primo-occupation. Yet the stakes of labelling indigeneity remain high. This recognition determines access to cultural protection and political representation. For instance, the 2007 *UN Declaration on the Rights of Indigenous Peoples* (UNDRIP) recognises the need to respect Indigenous cultures and spiritual traditions, the right to territories, and resources. This paper argues that law plays a significant role in characterising indigeneity. I propose a functional framework for defining indigeneity as referring to groups which remain underrepresented in formal governance, whose cultures are excluded from national state-building narratives, and which do not fully benefit from citizenship rights. I propose a definition of indigeneity not as a fixed historical settlement, but rooted in legal relations of state and periphery. In doing so, I highlight the potential for law not only to protect heritage in vulnerable communities but also to frame heritage in dynamic, plural societies.

Session: Understanding indigeneity in the maritime culture of southeast Asia

Built by memory: Ancestral inheritance in Southeast Asian boatbuilding

Abhirada Komoot, Kyoto University

Traditional boatbuilding is a highly sophisticated form of craftsmanship that relies not on blueprints but on experience, intuition, and an uncompromising pursuit of precision, where each plank is shaped for a perfect fit. Shipbuilding traditions have deep-rooted connections between craft knowledge, cultural identity, and regional maritime environments, illustrating that traditional shipbuilding is not merely a technical endeavour, but a living heritage shaped by social and ecological values. This paper presents findings from both fieldwork and literature-based surveys of traditional ships in Southeast Asia, with the aim of highlighting the enduring legacy and continued relevance of ancestral shipbuilding techniques. Drawing on ethnographic observations, interviews with local boatbuilders, and analyses of historical and archaeological records, the study explores how these maritime traditions have been preserved, adapted, and transmitted across generations. The results reveal the remnants of ancestral knowledge that have endured through the constant evolution of nautical technology. Ultimately, this study sheds light on the resilience, ingenuity, and cultural continuity embodied in the region's shipbuilding traditions, emphasising their capacity to evolve while remaining grounded in time-honoured principles.

Session: Understanding indigeneity in the maritime culture of southeast Asia

Stone tidal weirs (atob) in the Gigantes Islands, Philippines: Integrating Indigenous knowledge and interdisciplinary survey techniques for coastal heritage preservation

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Stone tidal weirs, or atob as they are known in the Philippines, are stone or coral structures built to trap fish in intertidal zones at low tide. The atob found along the coast of the Gigantes Islands (Philippines) demonstrate intergenerational local ecological knowledge through their construction and continued use. A recent ethnographic study which employed snorkel survey and remote sensing techniques reveals weirs that are well-adapted to the intertidal environment and managed through customary rules of ownership, stewardship, and communal space. While many of the atob in Gigantes are actively being used and maintained, drone photogrammetry and satellite imagery provided novel ways of recording these features and their condition, including atob that have been abandoned. This raises questions about when the use of atob on Gigantes began, and whether remote sensing can detect more atob from around the country and provide clues regarding their temporality and geographical scope.

Stone tidal weirs represent adaptive indigenous technologies for sustainable marine harvesting, requiring knowledge of ecological cycles, marine species behaviour, and territorial knowledge systems. This paper presents the results of the interdisciplinary study with the aim of further examining how the stone tidal weirs of Gigantes can better inform future studies of this shared heritage found across the Philippines and the Southeast Asian region, while contributing to the discourse on policy, planning, coastal heritage protection, and indigenous maritime traditions.

Session: Understanding indigeneity in the maritime culture of southeast Asia

From bakad to permanence: Spatial organisation of Urak Lawoi vernacular architecture through settlement typologies

Kullaphut Seneevong Na Ayudhaya, Silpakorn University

This study investigates the spatial organizational patterns of Urak Lawoi vernacular houses, focusing on the distinctive settlement culture of this maritime Indigenous group in Southeast Asia. The research examines 44 residential structures across six communities: Ko Bulon Don (16 houses), Ko Lipe (12 houses), Ko Jum (4 houses), Loh Lana Bay community at Phi Phi Island (5 houses), Ma Leh Bay community at Ko Lanta Yai (3 houses), and Tok Balew community at Ko Lanta Yai (4 houses).

The primary objective is to conduct a comparative analysis of spatial arrangements in Urak Lawoi vernacular architecture across three distinct settlement contexts: (1) permanent settlements on islands permitted by national park authorities, (2) settlements on tourism-oriented islands, and (3) temporary shelters constructed according to the traditional rotational subsistence practice known as 'Bakad'.

This qualitative research employs field surveys, architectural documentation, and comparative analysis of spatial utilization patterns and arrangements across different dwelling types. The study aims to reveal the relationships between vernacular architectural forms and ways of maritime life, environmental contexts, and adaptations to socio-economic changes in Urak Lawoi communities.

The findings are expected to show how traditional ways of organizing space reflect maritime people's adaptability, highlighting the connection between their cultural identity, environmental challenges, and modern influences. This research explores the maritime cultural dimensions of Southeast Asia and offers insights into Indigenous architectural wisdom that embodies the unique identity of sea-nomadic communities in the region.

This investigation enhances scholarly discourse on vernacular architecture in maritime contexts and provides documentation of spatial practices that may inform contemporary approaches to culturally sensitive development and heritage conservation in coastal communities.

Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

Session: 3D

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

Tourism and heritage: Exploring Australian perspectives

Martin Porr, The University of Western Australia

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This paper introduces the session 'Between nostalgia, education and social justice: Recalibrating heritage, history and tourism' and the AAA/AIMA 2025 conference. The presentation discusses significant developments in the field of cultural tourism in Australia, which has become one of the most significant areas of economic development and growth. The latter equally encompasses European or colonial heritage as well as Aboriginal tourism. The latter, in particular, is often presented as a key strategy for economic development and social improvement for disadvantaged communities and regions. The paper will present several issues that need to be addressed in relation to the intersection of heritage and tourism. Among these is the question of the relationship between the recent growth of cultural tourism and ideas surrounding a romanticised, revisionist, and nostalgic past. In relation to Aboriginal tourism experiences, such understandings might be related to problematic notions of the preservation of an untouched deep past, which have an impact on aspects of social justice and community well-being. Digital and AI technologies continue to have a growing impact on the fields of heritage and tourism. Questions surrounding preservation and authenticity are being redefined in these contexts and new challenges as well as new chances are emerging. Particularly in Australia, questions need to be asked about the coexistence of heritage tourism and the importance of extractive industries and developments with significant impacts on cultural landscapes and sites. Prominent examples are the conflicts over the UNESCO World Heritage listings of Murujuga and Cape York, but similar cases exist in different parts of the country with different challenges and solutions. The critical analysis and understanding of these themes must be the basis for a sustainable calibration of the intellectual and socio-economic relationships between Western scientific, popular, and Indigenous narratives and practices in the context of cultural tourism in Australia.

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

The Derby Prison Boab: A dark tourism drawcard in the Kimberley, WA

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The colonial dark history of northwest Australia now constitutes a major tourist drawcard with heritage sites visited by tens of thousands of people each year. The Derby Prison Boab Tree, near the Western Australian town of Derby, is one such site. The trunk of the Derby Prison Boab is hollow and is said to have been used to incarcerate Aboriginal prisoners in the early years of colonial settlement in the Kimberley. However, its role as a prison has recently been disputed by several historians who argue that this idea has been deliberately promulgated to meet the public's thirst for dark tourism sites. Despite this reappraisal, other historians and some senior members of the Nyikina community maintain that the tree was used as a prison. Here we delve into the contested history of the Derby Prison Boab, and its continuing role as a symbol of the colonial punitive landscape. We argue that a more nuanced reading of the tree's history, and one that pays greater attention to and representation of First Nations perspectives is warranted.

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

Driving through deep time: 4WD and bus tourism in the Kimberley

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Over the past two decades, 4WD and bus tourism in the Kimberley has increased in popularity as drive adventures have been marketed as the perfect way to experience this rugged and spectacular region. These experiences are typically designed to appeal to visitors who desire to travel off the beaten path and to immerse themselves in ancient landscapes and remote wilderness with fellow, like-minded travellers. Yet behind these romanticised notions lies a persistent colonial conceptualisation of both tourism and landscape: one that marginalises Indigenous presence, ownership and self-determination. This paper analyses how drive adventure tourism frames the Kimberley with a focus on the Gibb River Road.

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

Art or advocacy?: The evolving role of the Indigenous Art Centre in Australia

Rebecca Corps, The University of Western Australia

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At the intersection of education, tourism, heritage and art, Indigenous art centres have become mainstays in remote Australian communities. This paper will examine the evolution of Indigenous art centres from community sheds in the outback to museum spaces and hubs for cultural tourism. With an increasing pressure to provide Indigenous tourism experiences as well as economic and educational means to support communities, the diversification of remote art centres presents new challenges that now include cultural heritage and preservation. Initially set up to provide an in-person tourism experience, these centres are now not only online, but many act as a type of visitor centre and 'brand' for larger regions. This digital branding of culture has created new narratives and therefore cultural 'products' that are open to misappropriation and misrepresentation. Recent conflicts over the use of Wanjina images by non-indigenous artists is being advocated by the Mowanjum Art Centre in Derby as it represents an ongoing issue that is connected also to the rock art images in the region. Having now entered the realm of cultural tourism and heritage preservation, art centres have joined a new conversation in which the narratives must be re-examined in this context. This paper will present a critical analysis of the way forward in determining these voices, current pressures on art centres, and the relationships needed for a sustainable future.

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

The oldest public policy tradition in the world: Integrating Indigenous cultural processes and values into wider public policy

Kate Clark, Western Sydney University

In their response to the Juukan Gorge inquiry, AIATSIS argued that: 'The major challenge in Australia is to integrate appropriate Indigenous cultural processes and values into all public policies, decision-making mechanisms and developmental practices'.

Dave Johnston-Pitt's call for an Indigenous Heritage Commission is a welcome and necessary initiative to address the failure of white heritage processes to adequately address Indigenous cultural heritage, but it is only part of the solution.

Leading policy scholar and Dhunghutti man, Craig Ritchie, reminds us that all public policy making is a cultural endeavour, and that by claiming to be rational and systematic it denies or sets aside the cultural and historic context in which it sits.

In the longer term, integrating or mainstreaming Indigenous cultural processes and values also requires something else– genuinely integrating those cultural processes and values into wider public policy rather than 'othering' them.

This paper argues that the bigger challenge will be to recognize that all public policy making (including policy for heritage) is shaped by cultural values, and that it is vital to interrogate those values and biases.

Governments in Australia and around the world are moving beyond GDP as a measure of value to embrace ideas of wellbeing. Yet cultural heritage is often absent from that narrative, let alone the lessons from First Nations thinking about holistic approaches to people, culture and Country.

In a world facing an uncertain future, this paper argues that it is time to recognize a more inclusive approach to public policy making that goes beyond neo-liberal models of economic growth to genuinely integrate lessons and values from the oldest public policy tradition in the world.

Session: Between nostalgia, education and social justice: Recalibrating heritage, history and tourism

Between Moksha and market: Cultural tourism, heritage nostalgia, and the living traditions of Varanasi's burning ghats

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Frequently referred to as the spiritual capital of India, Varanasi is witnessing a remarkable transformation with the recent surge of cultural tourism driven by government-sponsored heritage initiatives alongside international fascination with its ritual landscape. Central to this change are the burning ghats, especially Manikarnika, where the sacred cremation ritual is performed every day. This paper analyses the intersection of nostalgia, religious faith, and state-sponsored heritage discourse to construct the tourism experience in Varanasi.

The focus of this research is on the Dom community of Kashi, the hereditary cremation workers who, over the years, have been the caretakers of the city's death rituals and are regarded as some of its first residents. Through the lens of tourism, the Dom community's culture and rituals have, for better or worse, received attention because of growing interest in cremation rituals. The age-old belief that death in Kashi ensures moksha (liberation) draws numerous Hindu pilgrims and spiritually inclined visitors, sustaining not only the spiritual economy but also fostering cultural tourism development in the city.

In addition, the Ganga Aarti, puja ceremonies, and even the paid heritage walks have evolved into devotional activities and sources of income turning into avenues for employment and self-employment for priests, boatmen, and flower vendors. While this increasing economic activity is positive, it brings to the forefront issues such as the lack of critical local narration, the ethical framing of death as a spectacle, alongside displacement due to gentrified development projects, for example, the Kashi Vishwanath Corridor.

Through field insights, cultural mapping, and discourse analysis, this paper interrogates how the burning ghats function simultaneously as sacred space, economic zone, and tourist destination, and how the narratives of moksha and heritage are being recalibrated in modern India.

Layered lives:
Seeing human time in the deep record

Session: 4A

Session: Layered lives: Seeing human time in the deep record

Contours of time: Mapping water accessibility across Muntulgura Guruma Country

Victoria Campbell, Yulur Heritage

The arid character of the Pilbara has shaped much of the archaeological interpretation and heritage management conducted in the region. A site's proximity to a reliable water source has long influenced its attributed scientific and cultural significance and often results in reinforcing assumptions about marginal occupation and resource scarcity.

This presentation outlines the development of a spatial model designed to reframe how we understand water accessibility and movement across the Eastern Guruma native title determination area. The analysis draws on a unique cultural dataset held by the Wintawari Guruma Aboriginal Corporation, on behalf of the Muntulgura Guruma Traditional Owners, and models human movement in space and time, represented via isochrones, as well as least cost path routes using GIS software.

The findings challenge long-held assumptions about the use and function of cultural places in arid zones. Rather than indicating isolated or marginal activity in areas without reliable water sources, the results point to a well-connected, actively used, and navigable cultural landscape. By modelling movement in terms of time and linear distance, this research contributes to broader archaeological understandings of mobility, land use, and water availability in semi-arid Australia. It also reflects the importance of cultural knowledge in shaping how people efficiently moved through and understood Country.

Session: Layered lives: Seeing human time in the deep record

Seeing ancestral decision-making in the built structures of the Weelumurra Cultural Catchment

Callum Forsey, Yulur Heritage

Co-Author:
Rebecca Stewart, Yulur Heritage

This paper evaluates how the variety of rockshelter built structures located in the Weelumurra Cultural Catchment of the Eastern Guruma Native Title Determination, provide insight into the nature of cultural practices and individual expression which influenced ancestral peoples' modification of place.

Research into built structures and stone arrangements in the Pilbara has been increasing in the last ten years, including development of classification systems, and targeted research to date their construction.

This paper reviews built structure data sets recorded during the past 50 years of heritage surveys in Weelumurra, to compare their forms with previous published typologies and explore their potential functions in accordance with knowledge shared by Muntulgura Guruma survey participants. The nature of built structure variability is examined to inform regional, local and human-scale patterns of behaviour.

Following this, future research directions are proposed for built structure recording and analysis in the Weelumurra Cultural Catchment.

Session: Layered lives: Seeing human time in the deep record

An exploratory study of visibility, light, and choreography of open-air engraved motifs at Ngardang

Oscar Beighton, Yulur Heritage

The open-air engravings at Ngardang in Muntulgura Guruma Country—particularly the 'fat-tailed macropod' motifs—have been the subject of several studies exploring morphology, spatial distribution, and relative chronology, resulting in a valuable contextualisation of the motifs within the broader corpus of western First Nations rock art. The foundations laid by these studies now give space to explore the cultural role and social value of these engravings with increased granularity via a methodological framework aimed at probing more subjective impacts of these engravings. In targeting an understanding of subjective value, there is scope to further see the people who created and engaged with the motifs and to build towards a human-oriented interpretation.

Using Reflectance Transformation Imaging (RTI) to explore different lighting conditions in a virtual setting, this pilot study seeks to investigate the potential for interplay between light, perception, and reception of a subset of the engravings in an effort to reconstruct their experiential and interactive potential. Virtual relighting allows these features to be considered under a range of simulated natural and artificial lighting conditions, enabling exploration of the perceptual effects of different static and dynamic lighting.

This study aims, via qualitative assessment, to investigate whether visual reception of these works was influenced by lighting, making them time- and context- dependent, and in so doing to understand whether their cultural significance extends beyond their creation to include their subsequent reception. Through this approach, the human relationship with these engravings is foregrounded, treating them not as passive objects of study but rather active subjects in cultural, social, narrative, or perhaps even performative practices. This contributes to a human-centred understanding of their role in past social contexts.

Session: Layered lives: Seeing human time in the deep record

Bone whistles at Amarna?: First identification of bone whistle-use in Dynastic Egypt

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Here the authors present the identification of a bone whistle recovered from the Eighteenth Dynasty (late fourteenth century BC) city of Akhetaten (modern Amarna) located in Middle Egypt. This site is unique in being occupied for only a single generation—some 15 years—before being abandoned. As such, Amarna provides a snapshot of Egyptian life during a unique period without being muddied by subsequent human activity. The artefact described was found at the Stone Village, a peripheral workers' settlement, and fits with ideas that this community was heavily policed owing to their proximity to the royal cemetery and likely connection to work on the royal tombs. Furthermore, this single artefact provides insights into the ad hoc crafting individuals were enacting to undertake their work. Significantly, this object is the first of its kind identified in a Dynastic context and demonstrates the potential insights that wait to be gained from intensive examination of ancient Egypt's largely ignored osseous technologies.

Session: Layered lives: Seeing human time in the deep record

A deep dive into millstones in an Eastern Guruma rockshelter: How their examination informed perceptions of Ancestral individuals 240 years ago and considerations about cultural assemblage preservation

Rebecca Stewart, Yulur Heritage

In the Pilbara uplands of Eastern Guruma Country, millstones in rockshelters are a common occurrence and examination can reveal valued cultural evidence and perspectives of Ancestral peoples. During a cultural investigation of an Eastern Guruma rockshelter, two banded ironstone formation slabs suspected to be face-down millstones were identified and opportunistically targeted for deeper investigation. Through examination, it was confirmed that both were millstones with moderate use purposely set in their current positions by past people.

This paper considers millstones in rockshelters for their capacity to pinpoint snapshots of the decisions, practices and mentalities of Ancestral individuals, and how such artefacts can contribute human-scale perspectives on the archaeological record. The two millstones under examination elicit thinking of human circumstance during the time they were placed and convey a mindset of upholding the millstone integrity during a period of planned disuse and a prospect of re-use someday.

Initial residue screening conducted on one of the millstones indicates promising findings for preservation of culturally derived residues and offers a starting point for understanding how people chose to utilise them prior to being overturned.

Paired dating samples were also recovered from directly beneath each millstone, including charcoal and sediment for OSL. Comparable ages are indicated by both forms of dating which suggest Ancestral individual/s opted to overturn the millstones in the rockshelter approximately 240 years ago.

A surface assemblage of small, flaked artefacts was also identified directly beneath each millstone. This is of interest as stone artefacts were not observed on the surrounding floor surface, opening speculation about functional roles millstones, and slabs in rockshelters generally, may have had in preserving ‘pocket’ assemblages of in situ cultural values and datable material beneath them. Further exploration is warranted to determine if this finding is in isolation.

Yirra: 50,000 years of occupation in Pilbara uplands

Session: 4B

Session: Yirra: 50,000 years of occupation in Pilbara uplands

Yirra: A Story of our ancestors, our Country

Darren Injie, Yinhawangka Aboriginal Corporation

Co-Authors:
Peter Veth, The University of Western Australia
Fiona Hook, Archae-aus
Marlon Cooke, Yinhawangka Aboriginal Corporation

We are proud to welcome you to this session about Yirra, a powerful place on Yinhawangka Country, in the southern Hamersley Plateau of the Pilbara. Yirra holds the stories of our Ancestors who lived here for 50,000 years, stopping here, making tools, lighting fires, and passing on knowledge.

In 2021, we worked together with archaeologists to return to Yirra and learn more about what our old people left behind. We found hearths, stone tools, and plant and wood processing traces that show how people lived even during the hardest times, like the last ice age. These findings are now part of a series of scientific studies which we will hear about today. Before we start, we would like to introduce Yirra to you and our connection to this place.

Session: Yirra: 50,000 years of occupation in Pilbara uplands

The chronological significance of Yirra in the context of early arid zone occupation

Peter Veth, The University of Western Australia

Co-Authors:
Fiona Hook, The University of Western Australia
Kane Ditchfield, The University of Western Australia
Caroline Bird, The University of Western Australia
Zenobia Jacobs, University of Wollongong
Fiona Petchey, Waikato University

Recent excavations at Yirra in the Pilbara have yielded a well-stratified archaeological sequence with secure evidence for occupation from approximately 50,000 years ago. A comprehensive and integrated dating program over the last three years, comprising coupled single-grain optically stimulated luminescence samples and accelerator mass spectrometry radiocarbon dating, has produced a robust chronological framework with highly correlated C14 and OSL ages. A combination of Bayesian modelling, artefact refitting, and sedimentary analyses suggest a high degree of stratigraphic integrity. Yirra's sequence exhibits recurrent occupation from 50 kyr, including during the Last Glacial Maximum (LGM)--a period often characterised by reduced archaeological visibility in the arid zone. We argue the shelter's persistent use during the LGM and increased use during the terminal Pleistocene demonstrates persistence and flexibility in land-use strategies in arid upland settings.

The dated sequence from Yirra will be compared to other early sites from the arid northwest and wider Australian arid zone. The emerging patterns from the arid zone can directly address recent controversies about the timing of the settlement of Sahul and the use of archaeological and genetic evidence.

Session: Yirra: 50,000 years of occupation in Pilbara uplands

Yirra: The stone artefacts

Caroline Bird, Archae-aus

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The exceptionally high chronological resolution and stratigraphic integrity of the Yirra sequence provide a fine-grained picture of stone flaking and use at the site. The stone artefacts show strong continuity through time in both technology and in raw material use. There are few cores, and flaking techniques show largely expedient flaking of local BIF and cherts in similar proportions throughout the sequence. While the overall impression is one of local continuity, Yirra offers intriguing glimpses of individual episodes of stone tool use and manufacture through refits, and analysis of use wear and residues. Use wear analysis shows that processing both hard and soft plant materials was the primary activity at Yirra. There is evidence for a shift in site function at the end of the LGM from a relatively diverse range of tasks to a strong focus on woodworking. Worked notches are common and show intriguing patterns of use wear focused sometimes on the notch and sometimes elsewhere on the tool. The comprehensive dating at Yirra means that the rare formal tool types are particularly well-dated, as is evidence for hafting.

Session: Yirra: 50,000 years of occupation in Pilbara uplands

Sedimentological and pedological analysis of the Yirra excavation samples, WA

Matthias Leopold, The University of Western Australia

Sediment samples were collected inside and outside the Yirra rock shelter to compare physical and chemical properties. While both areas share some similarities—such as elemental composition, particle size, and mineralogy, which suggest that sediments inside the shelter are likely to have originated nearby—there are key differences. The interior samples show signs of different environmental conditions and potential human activity.

Outside samples are less acidic due to active soil processes, while inside samples have a lower pH (~4), favourable for preserving charcoal but typically destructive to bone. Yet, small bone fragments were found, suggesting prolonged dry conditions that limited bone dissolution. High salinity inside also supports a dry, protected environment, as limited rainfall reduces salt flushing.

A major difference was observed in magnetic susceptibility (MS) values. Though BIF-based soils naturally show high MS, elevated values inside the shelter suggest strong human activity, particularly repeated fires. The presence of multiple hearths and mineralogical confirmation of maghemite (a high-MS mineral formed by burning wood) in all inside samples (up to 3%)—compared to only minor traces outside—supports this. The abundance of charcoal, visible both macroscopically and in thin sections, further indicates frequent human occupation.

Micromorphological analysis of thin sections revealed horizontal sediment layering, uniform pH and EC values, and consistent mineral distribution, all suggesting good sediment integrity. However, physical and chemical proxies like texture, MS, and total carbon suggest weaker signs of early occupation in the lowest layers compared to more intensive, younger activity in upper layers.

Session: Yirra: 50,000 years of occupation in Pilbara uplands

Deepening the dialogue: Anthracology, traditional knowledge, and Yirra rockshelter

Stuart Ingie Jnr, Yinhawangka Aboriginal Corporation

Co-Author:
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This paper revisits anthracological research from Yirra Rockshelter, diving deeply into species diversities and plant use through the lens of Traditional Knowledge. Spanning 50,000 years to the present, the study explores the long-term relationship between people and plants in the region, which continues today. The findings contribute to our understanding of changing environmental conditions, cultural practices, and the enduring importance of plant resources in northwestern Australia.

Session: Yirra: 50,000 years of occupation in Pilbara uplands

Yirra: Discussion

Marlon Cooke, Yinhawangka Aboriginal Corporation

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Fiona Hook, Archae-aus
Peter Veth, The University of Western Australia

Yirra is now confirmed as one of the oldest sites in the Australian desert, with first occupation around 50,000 years ago. The evidence shows increased occupation during the last ice age and afterwards, with evidence of fire use, plant and wood processing, and early resin hafting. These findings make Yirra important not only for Yinhawangka people, but for understanding how our ancestors survived and adapted to climate change which is important to understand globally.

As we conclude this session on Yirra, we invite you into a conversation led by Yinhawangka Elders, together with Fiona Hook and Peter Veth the directors of the 2021 excavation and the team of specialists who completed the analyses.

The present in the past and the past in the present

Sessions: 4C and 5C

Session: The present in the past and the past in the present

What if ancient legends weren't just stories but echoes of forgotten reality waiting to be unearthed?

Galiina Ellwood, Bama Gadja Heritage

Stories about time in Aboriginal cosmology demonstrate that time is not linear. Time is related to Creation, as stories from the Crater Lakes west of Cairns show. The descriptions in these stories tell of volcanic eruptions that relate to scientific knowledge of these mountains. The stories also tell of the time of grasslands, again supported by scientific assessment of changing vegetation in the past. In the Aboriginal stories, volcanic eruptions coincide with fire knowledge. This is just one of a number of stories that tell of deep time events and how these old stories are memorialised in the present. In this paper I demonstrate that stories are not just myths or legends, they are actually scientific knowledge, expressed as narrative. These intangible ways of knowing are a vital part of Indigenous knowledges.

Session: The present in the past and the past in the present

Gulamada Project: Utilising digital archaeology for rock art research and management in the Blue Mountains—looking at the past from the present

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The Blue Mountains consists of a vast network of sites within a cultural landscape, including rockshelter sites with pigment art and platforms with rock engravings. It is a difficult and vast area to traverse due to thick bush and steep terrain. It is an area that is prone to bushfires; therefore, it is important to have an accurate assessment and inventory of cultural sites. Cultural features and assets can be managed appropriately by taking a holistic approach, involving the Aboriginal community, scientists, professionals, and local stakeholders in tandem, working together.

The Gulamada Project emphasizes a collaboration of science and culture by utilizing scientific and digital technologies to address cultural concerns. We are building an accessible, online geospatial data collection and management system named the 'Coolamon' in partnership with local Aboriginal groups. The system will ultimately be managed by the local custodians for use in ongoing research and management. We are looking into deep time from a contemporary perspective.

The presentation will also include a summary of discoveries at Dargan Rock Shelter, a 20,000-year-old occupation site in the Blue Mountains NSW.

Session: The present in the past and the past in the present

Adelaide region archaeology and the traditional Kaurna toolkit

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Kaurna people traditionally used a wide variety of tools and weapons made from timber, plant fibres and resins, stone, and animal products such as sinew and hide. Most of these materials do not survive in the archaeological record. Most of the artefacts that survive in the archaeological record are tools made from stone.

The raw materials most commonly available in the Adelaide region for Kaurna people traditionally to manufacture stone tools were quartz and quartzite. Stone artefacts were most often tools that were made to manufacture other tools and weapons (e.g. from timber, animal bone, hide and sinew), as cutting or piecing components of composite tools (e.g. spears, awls, adzes and chisels), or tools used to process food.

Stone artefacts made from imported stone, mostly varieties of silcrete, provide a robust record of inter-regional trade and travel, and intertribal ceremonial, social and economic interaction.

In the early years of colonisation beginning in 1836, a rich ethnographic and historical record began to be documented, continuing through knowledgeable Aboriginal Elders into the twentieth century, and with some of those skills continuing and reviving in the present.

When the information contained in the archaeological and ethnographic records are combined and supplemented by knowledge gained from the broader Australian context and from lithic technology and experimental archaeology research, a detailed blueprint emerges for the traditional toolkits of the Kaurna people and their neighbors.

This combined knowledge base allows for a more detailed interpretation of the traditional Kaurna toolkit and the associated cultural practices and cultural landscapes represented by the stone tools that are the most enduring record of traditional lifeways.

Session: The present in the past and the past in the present

More than just circles and tracks: The social meanings of rock engravings on Arabana Country, far north South Australia

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The Panaramittee rock art tradition is recognised by archaeologists as a homogenous art tradition found across the Australian arid interior. Typically, archaeologists have viewed the Panaramittee rock art as an indicator of human-land interaction in the arid zone across time at a broad scale. Understanding Panaramittee rock art, however, has been historically hampered by a lack of engagement with the art's original custodians. In this study, the meaning and complexity of the so-called 'Panaramitee tradition' is reconsidered from the perspective of two sites in the Arabana Native Title determination area—Marna-ngurrunha (Levi Springs) and Callanna—and the incorporation of traditional Arabana knowledge about those sites, including their Ularaka, or Dreaming. This combination of archaeological research with traditional knowledge at two discrete sites provides an opportunity to reshape the generalist Panaramitee rock art narrative and further explore the interconnection of Country and kinship, from a contemporary Arabana perspective.

Session: The present in the past and the past in the present

Juukan: Intertwining archaeobotany and Indigenous knowledge to bridge past, present, and future

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Juukan, an archaeological site located in the Pilbara region of Western Australia on Puutu Kunti Kurruma (PKK) land, is renowned for the exceptional preservation of organic remains, including numerous intact hearths. With occupation dating back 50,000 years, Juukan is among the oldest arid-zone sites in Australia. Australian archaeobotanical research has tended to focus of the tropical and subtropical zones, consequently very little is known archaeologically about how Indigenous Australians adapted their plant use strategies to the arid zones of Australia. Juukan provides a unique opportunity to explore the evolution of plant-use strategies in the semi-arid zone. For the PKK people, Juukan is far more than a site of scientific intrigue; it is a place of profound cultural importance, deeply connected to their ancestors. The involvement of PKK senior Traditional Ecological Knowledge holders in ongoing research is critical. Elders' expertise in plant foods and medicines enriches the archaeobotanical research, infusing plant identifications with knowledge that has been passed down through generations. This talk will explore preliminary evidence from the archaeobotanical research at Juukan and highlight the importance of cross-cultural collaboration in advancing our understanding of past human-plant interaction.

Session: The present in the past and the past in the present

Ethnohistory and Songlines lead the way: Travel pathways of the Gummingurru and Bunya Mountains social and cultural landscape

Bunya Cultural Landscape, Gummingurru Stone Arrangement Site and **Annie Ross**, The University of Queensland

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Conrad Bauwens, Gummingurru Aboriginal Corporation
Jaydeyn Thomas, The University of Queensland

Country is the lead author on this paper because Country has shown the way in research and reconnection to place over the past 25 years. The Gummingurru stone arrangement site and the Bunya Mountains are connected by powerful Dreaming Tracks and Songlines. In this paper we demonstrate how stories resurrected over the past decade, and archaeological research informed by these stories, have helped to identify a complex web of relationships between places, kinship, and language through story and Songlines. We focus on the story of the Rainbow Serpent as the principal journeying narrative for this Country. The Songline provides a metaphor for our knowledge journey, with the destination being The Pathways Project which follows the Songline from Gummingurru to the Bunyas.

Session: The present in the past and the past in the present

Remembering the *Booya*

Ryan Crough-Heaton, Northern Territory Government

On Christmas Eve 1974, Cyclone Tracy hit Darwin, destroying the city. The result was devasting not only for those on land, but also for those trapped on the water. Fifty three vessels were lost during Cyclone Tracy. Among them was the *Booya*, which went down with five souls aboard. Their fate remained a mystery until 22 October 2003, when the wreck was finally discovered and formally identified. In recent years, as part of Cyclone Tracy commemoration events, some family members of those aboard the *Booya* gather to remember.

The story of the *Booya* is deeply intertwined with that of Cyclone Tracy, but the vessel's history extends far beyond that singular event. Originally bearing a different name and serving varied roles over its 57-year lifespan, the *Booya* experienced many transformations. Like many historic vessels, public memory tends to focus on one defining chapter, overshadowing other significant parts of its journey.

This paper seeks to explore not only the wrecking event of the *Booya*, but also the lesser-known aspects of its working life, and how these layered histories continue to resonate in the present.

Session: The present in the past and the past in the present

Linear hydrologies and spiral chronologies

Colin Pardoe, Colin Pardoe Bio-Anthropology & Archaeology

Where people lived and how they organised themselves on the Murray River floodplain has been the subject of ongoing studies whose main focus was habitat conservation: 'Archaeology in the service of Conservation' (Hutton et al. 2025; Pardoe and Hutton 2020). The distribution of earth mounds around local wetland water bodies demonstrated Barapa social organisation as village life during the summer months following spring floods. The use of this archaeological record as an environmental and hydrological proxy has contributed to some of the best conservation and regeneration outcomes on the Murray River. The distribution of these mounds is a distillation of 3,500 years of Barapa traditional knowledge of land and water stewardship practices.

Nestled amongst these villages defined by earth mounds are ponds dug into small channels in what might be described as a capillary bed of channels. These features have not been recognised or described previously in Australia, or indeed among hunter gatherers.

We think of waterways as being essentially linear, but waters on a floodplain crossing some of the flattest country on earth do not necessarily behave. Barapa and neighbouring nations made small modifications to the hydrology with rather larger effects resulting in effective water storage near housing and increasing the number and availability of small bodied fish. This has had implications not only for the distribution of those fishes, but also for our interpretations of village life.

Session: The present in the past and the past in the present

Experimenting with the past in the present: Ritual by fire and raffia

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Experimental archaeology (EA), by definition, is the replication of methods and activities used in the past in order to enhance our present understanding of how and why the archaeological record was formed. A permeating belief observed amongst new archaeology students is that the past is separate and isolated from the present, i.e. that certain groups of people (for example, in ancient Rome or Egypt, or in the deep past of Indigenous Australia) did certain things at certain times, in certain places, and that these are very definitely things that occurred in 'the past'. The linear trajectory of technology and human development is often conceived to be straightforward and quantifiable; but archaeology is the study of humans, and humans are not easily 'measured': by nature we subscribe to myth, magic, ritual, and individual expressions of identity as part of daily routine.

Over a period of four years, our teaching team has developed and delivered an experimental archaeology unit to first year, first-semester students in the Bachelor of Archaeology at Flinders University. The first three years were based on Neolithic firing experiments performed in the northern hemisphere (e.g., Sidoroff). Students were introduced to archaeological fieldwork, critical theory, and case studies from sites permeated with myth, magic, and ritual before creating clay artefacts which were then fired and 'excavated'. This exploration of technology, science, and archaeology through the qualitative lenses of phenomenology and meaning, helps to inspire deep understandings of the complex behaviour of societies and individuals, and dispels the myth that the past is a narrative very different from now. We present here the results of the first three years, and preliminary observations from our newest EA unit in 2025 which highlights and explores Australian Indigenous knowledges through the practice of weaving.

Session: The present in the past and the past in the present

Digging into the data: Two decades of change in Australian archaeology

Sean Ulm, ARC Centre of Excellence for Indigenous and Environmental Histories and Futures

Co-Author:
Geraldine Mate, Queensland Museum

In 2025, we conducted the fifth iteration of the 'Australian Archaeology in Profile: A Survey of Working Archaeologists' marking two decades of longitudinal data collection. This rich dataset offers a rare and revealing glimpse into how the archaeological profession in Australia has transformed, mirroring broader social, economic, and disciplinary shifts.

This paper presents fresh insights from the 2025 survey and charts the trajectory of change across 20 years. We unpack evolving demographics, shifting employment conditions, and the changing landscape of professional skills, highlighting what today's archaeologists need and value most. We also reflect on how these trends are reshaping approaches to teaching and learning in archaeology, and what that means for the future of the discipline.

Join us as we explore the pulse of Australian archaeology: where it's been, where it's heading, and what it tells us about the profession's place in a changing world.

Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Sessions: 4D and 5D

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Field methods for integrating Indigenous knowledge and digital archaeology on Injalak Hill, western Arnhem Land

Andrea Jalandoni, Griffith University

Co-Authors:
Joey Nganjmirra, Injalak Arts
Ben Dyson, Griffith University
Calum Farrar, Griffith University

The aims of this project are to use digital archaeology techniques on Injalak Hill to understand rock art placement and to make the cultural heritage accessible to the Aboriginal community of Gunbalanya. In this presentation we will focus on the field methods involved in achieving these ambitious aims.

Many past projects have been limited by a single spatial scale, therefore they only focused on panels, sites, or a sampling of sites. This project documents the whole hill in 3D (sometimes 4D) and integrates all levels of spatial analysis using drones and GNSS receivers (Mavic3M, Emlid RS2), laser scanners (BLK360, GeoSlam Zeb Horizon), and DSLR cameras (Canon 6D, Nikon D850). Advancements in Agisoft Metashape have made the process of combining different point cloud data and historic images seamless. Furthermore, a key element has been the contributions of Joey Nganjmirra, a prominent Injalak Arts artist and Indigenous knowledge holder. He has traced the majority of the rock art in the field and classified it according to his ontology. He has shared knowledge about what the rock art is, its cultural significance, and how to interpret it. Other archaeotech used have been a pair of smartglasses (Meta Rayban) for video recordings, a 360° camera (Insta360 Pro 2) for gaussian splats, a mobile application (QField) for field data collection and management, and a tablet (iPad) with stylus for tracing.

The multi-scalar approach allows for more data to be collected along with innovative tools for analyses; combined with Indigenous knowledge this leads to a holistic interpretation of rock art. This research is a replicable methodological model that can be applied to other rock art complexes in Australia and worldwide. More importantly, we hope this archaeotech enables new ways for the community to access and interact with their cultural heritage.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Reframing the past: Aligning historical photographs to contemporary 3D models at Injalak Hill

Ben Dyson, Griffith University

Co-Author:
Andrea Jalandoni, Griffith University

The conservation and monitoring of rock art require high-quality recording to be effective, yet change in rock art remains particularly difficult to discern. Sometimes we think rock art has changed but an examination of past photographs reveals our memories were faulty. Other times the change is obvious and undeniable, but it is difficult to align a present photograph with ones in the past so that the exact areas match up in order to communicate the change. We present a method that automatically aligns historic and future photographs to the contemporary 3D model by reconstructing camera parameters using structure-from-motion techniques.

Long-term, systematic monitoring is rare across Australia. Recent research has highlighted the rapid degradation of post-contact rock art in northern Australia, creating an urgent need to better understand the nature, extent, and causes of this damage. Traditional monitoring has relied on visual comparisons of pigment condition, which is effective at small scales but difficult to replicate or scale up.

For our project the entirety of Injalak Hill, west Arnhem Land, NT, has been recorded as a high-resolution 3D model with motif tracings. Injalak Hill has a rich research history and cultural significance for the nearby Gunbalanya community, with photographs dating from 1913, excavations in the 1950s, and ongoing study since.

Projecting these images onto the 3D model extends Injalak's digital twin into the fourth dimension—time—enabling scalable, pixel-level comparisons of change. This challenges previous monitoring orthodoxy by providing a reproducible, accessible workflow that lowers barriers for local communities, rangers, and tourists to actively participate. By requiring only a single, high-resolution 3D model acquisition, this method simplifies future monitoring while transforming 3D models from static visualisations into dynamic, engaging tools for conservation outreach and stakeholder engagement.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

The challenges and potential of 360-degree imagery for Gaussian splatting and photogrammetry in digital rock art documentation: An Injalak Hill case study

Calum Farrar, Griffith University

Co-Author:
Andrea Jalandoni, Griffith University

Modern 360° cameras capture spherical views of their entire surrounds by combining images taken from 2 or more cameras on the same device simultaneously. The Insta360 Pro 2 uses 6 cameras to produce accurate, context rich, high resolution (8k) 2D media of archaeological sites and their surroundings. These kinds of 360° still images and videos have long been embedded into webhosts like Facebook and YouTube or placed on virtual reality headsets for more immersive experiences. Recent advances in digital photogrammetry and other novel 3D view generation methods like Gaussian Splatting enable 360° imagery to contribute to the 3D recording and visualisation of archaeological sites.

This paper presents a case study from Injalak Hill in west Arnhem Land for how 360° imagery can be integrated into a digital archaeological workflow for rock art. It considers three different use cases. First, the use of 360° imagery to act as a dataset for the Gaussian Splatting 3D novel view generation method, which works by stretching out or 'splatting' the point cloud created from aligning a photo collection. Second, it examines how 360° imagery can be combined with standard single camera photogrammetry collections to increase model coverage. Last, the potential of 360° cameras as a low-cost stand-in for terrestrial laser scanners like the BLK360 is highlighted.

In covering these use cases, clear workflows/dataflows are outlined so that others can reproduce and test the methodology for their own use cases. Furthermore, applications for these novel 3D views are explored, including 4D rendering methods such as time-of-day simulation and combining temporally disparate photography datasets.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

From pixels to petroglyphs: UAV prospection for rock art

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Jo McDonald, The University of Western Australia

This study evaluates the effectiveness of Unmanned Aerial Vehicles (UAVs, drones) to capture rock art (petroglyphs) across the culturally significant landscape of Murujuga, in northwest Australia. While drones are increasingly used for archaeological documentation, their use for rock art prospection remains limited. Here we explore the potential of drone imagery in (1) petroglyph prospection, (2) database development and (3) the potential of machine learning models for automated rock art search and detection.

Drone surveys were conducted across the study area to assess the visibility of petroglyphs under varying technical (e.g. altitude, resolution) and environmental conditions (e.g. lighting, rock angle). A multi-person experiment was developed to test experts and non-experts' abilities to identify petroglyphs in the drone imagery. It found that there is little difference between what an expert and non-expert could identify in the experiment. This may open the possibility of using this approach to support more targeted archaeological ground surveys, and the opportunity for community involvement in remotely sensed rock art detection.

Significantly, petroglyphs are visible from varying orthographic angles in 2D and 3D, and the most effective workflow was not necessarily the lowest altitude height nor the highest resolution. Instead, the local environment greatly impacted the quality of the drone survey and visibility, suggesting a high degree of site specificity influence. The experiment found that subjectiveness in detection is unavoidable, concluding that cross-validation with multiple experts is required for database construction.

This research highlights the potential for UAV rock art surveys to provide industry and academic researchers with a tool to better design and target pedestrian rock art surveys. The study also highlights the potential for tapping into citizen science to grow rock art spatial databases, which can both enrich cultural experiences and fuel the documentation and thus preservation potential of the rock art.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Deus ex Machina 2 mm: AI intervention in archaeological sorting

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Archaeological excavations at Juukan Gorge have yielded vast quantities of fine-grained sediment, rich in cultural and environmental materials such as charcoal, lithics, and bone. The post-excavation process of sorting these materials, especially the 2 mm sieve residues, is notoriously time intensive and labour demanding. This creates a significant bottleneck in the broader archaeological workflow, limiting both the speed and scale of data analysis.

To address this challenge, we are piloting the use of Artificial Intelligence (AI) to assistwith the identification and categorization of micro-materials recovered from these residues. This paper presents the early development of our AI-assisted sorting methodology, detailing the steps taken to train and test machine learning models on known reference datasets. We offer initial observations on accuracy, efficiency, and workflow integration.

While still in its infancy, this project aims to evaluate whether AI can meaningfully supplement—or in some cases replace—manual sorting practices in microarchaeological analysis. We reflect on both the practical advantages and limitations of AI-based approaches, and explore their future potential in improving the consistency, scalability, and accessibility of post-excavation data processing in Australian archaeology.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Mapping and managing fishtraps across Wellesley Islands Sea Country

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Wellesley Islands Land Sea Social Economic Development Pty Ltd
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The Wellesley Islands region in the southern Gulf of Carpentaria is home to one of Australia's largest concentrations of stone-walled intertidal fishtraps. On Lardil, Kaiadilt, Yangkaal, and Gangalidda Sea Country, over 420 fishtraps have been recorded so far, with more known and yet to be recorded across other islands in the archipelago and adjacent mainland. This paper outlines the development of an Indigenous-led project designed in response to community aspirations to investigate stone-walled fishtrap construction, use, condition, and futures in the Wellesley Islands region. This project shows how digital archaeology tools—specifically GIS software, remote sensing, and 3D modelling—can be applied to record, quantify, analyse, and visualise the centrality of the fishtraps within Sea Country, and their significance as part of local seascapes.

This project employs a combination of remote sensing techniques, including LiDAR, aerial imagery and drone imagery, to capture the scale and condition of the fishtraps across approximately 2,500 km of Sea Country. These data have been explored through GIS software to develop a geospatial database of fishtraps across the region, digitising and quantifying their elements for monitoring and management by the communities. 3D modelling has been used to illustrate both the physical structure of fishtraps and the spatial and temporal dynamics of their construction, use and ongoing conservation status. Analysis has already revealed significant patterns in fishtrap construction and indications of past maintenance and management. The ability to visualise these changes through these technologies has offered new insights into the adaptability and resilience of these systems.

The integration of these tools and technologies has not only improved the efficiency and accuracy of data collection, but also provides an opportunity for ongoing engagement between community and Sea Country, and a sustainable approach to fishtrap monitoring, management and conservation efforts.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Tides of change: Hunter-gatherer-fisher strategies in a dynamic coastal landscape of southern Sri Lanka

Madeline Robinson, The University of Sydney

Growing multidisciplinary interest is shedding new light on mid- to late-Holocene human adaptation along Sri Lanka's southern coastal strip, particularly concerning subsistence strategies, diet, and site selection. For several decades, archaeological research in Sri Lanka has largely focused on the inland rainforests, where sites have yielded invaluable evidence of early human settlement and adaptation. Recent research, however, into the Dry Zone scrubland shores of Bundala and the greater Hambantota region is beginning to transform our understanding of Holocene coastal adaptation in South Asia. These coastal sites offer insight into how humans responded to dynamic environmental conditions, including oscillating sea levels and the mosaic of terrestrial, estuarine, and marine ecosystems that characterise the region. Faunal and lithic evidence from these sites indicates a broad range of adaptive strategies, including deep-sea fishing, intertidal and estuarine foraging, and scrub forest hunting. Viewed alongside emerging palaeoclimatic and sea-level data, this evidence offers a clearer picture of the practices and priorities of Holocene hunter-gatherer-fisher communities.

This paper presents findings from the first two years of a PhD project that reviews and integrates previously siloed archaeological research in the Hambantota region to establish a foundation for investigating patterns of site selection, food procurement, and resource use. Using GIS, remote sensing, and satellite imagery, the project reconstructs sea-level changes, models past habitat distributions across the Bundala landscape, and critically re-examines faunal assemblages from major excavations. These datasets inform the development of a Suitability Model to forecast zones of potential Holocene occupation and subsistence activity. By exploring how past communities prioritised particular environments, this research contributes to understandings of coastal adaptation and resilience in dynamic environments, where occupation may have been seasonal, permanent, or somewhere in between.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

The *Key Biscayne*: A photogrammetry survey of a sunken oil rig off Western Australia

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The *Key Biscayne* is a well-known dive site off the coast of Lancelin, Western Australia. A jack-up oil rig lost in 1983, it rests inverted at 41 m on the sandy seabed. Despite its prominence among divers, detailed documentation of the wreck has remained limited. In 2024, the WreckSploration team led a photogrammetry survey of the *Key Biscayne* using technical diving techniques, rebreathers, diver propulsion vehicles (DPVs), and custom-built camera rigs. The resulting 3D model provides new insights into the wreck's collapse and current state while demonstrating how citizen science can contribute to maritime heritage. This paper outlines the site's context, the challenges of surveying large artificial structures, photogrammetry techniques and equipment used by the team, and the practical outcomes of the project in both academic and public engagement settings.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

From real estate to site biographies: 360 camera use and digital archaeology conducted at the Garden Island Ships' Graveyard, South Australia

Kathryn Pearson, Flinders University

Over the years, digital techniques have been introduced both in the field of archaeology and from interdisciplinary applications that were repurposed for archaeological study. Many of these techniques include photogrammetry, aerial surveys, virtual reconstructions and 360° captures that have been used in the study of both terrestrial and maritime sites. Located north of Port Adelaide, South Australia, the Garden Island Ships' Graveyard is a coastal site containing abandoned vessels dating back to the mid-nineteenth century. Digital survey was conducted at the Garden Island Ships' Graveyard with a focus on utilising a 360° camera to create a virtual tour of the site. The tour would aid in the creation of a virtual site biography with individual object biographies of the various abandoned vessels. The data were collected and processed using Matterport, a virtual tour system popularised in real estate use, with the intent to analyse the effectiveness of Matterport and 360° virtual tours as a digital tool. This presentation discusses the results of the digital survey conducted on the Garden Island Ships' Graveyard and the potential benefits of 360° cameras and Matterports as tools in digital archaeology.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Drones down under: Rethinking UUVs for the future of Australia's maritime archaeology

Robbie Manovel, The University of Sydney

Since the turn of the century, there has been a growing push for the use of underwater drones or unmanned underwater vehicles (UUV), to survey, record, map and digitise submerged sites-while ensuring minimal impact on the sites and surrounding environments. While UUV technology has been increasingly adopted and integrated into archaeological practice in European contexts, its usage in Australian maritime archaeology has been largely limited to interdisciplinary collaborations or contracts with private companies specialising in the technology. As a result, the adoption of this technology has been confined to a select number of sites across Australia, with implications for the future preservation and conservation of our country's rich cultural and historical maritime past. This presentation draws attention to the underutilisation of UUV technology in Australian maritime archaeology, drawing on survey and interview data from specialists and archaeologists across the country. These data offer valuable insights into the current state of the technology nationwide, revealing a range of factors—technical, institutional and logistical—that have limited their broader adoption. Despite these limitations, comparative examples from both Australian and European contexts suggest they are not insurmountable. By recognising the importance of practice and how UUV technology is integrated into archaeological workflows, this presentation proposes that broader and more consistent integration is both possible and desirable. As such, this research highlights the need to incorporate UUV technology into maritime archaeological practice more frequently, not only to ensure the protection and understanding of these sites, but also to engage critically with the limitations of this technology and how limitations may be acknowledged and managed.

Session: Getting with the times: Embracing digital archaeology workflows to quantify change and visualise time

Enduring Indigenous cultural landscapes in the colonial palimpsest of Gimuy (Cairns), Queensland, Australia

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Urban Indigenous heritage in Australia is often overshadowed by colonial narratives and legal frameworks, prioritising architectural conservation of Aboriginal connections to Country. This study is part of a co-designed project with the Gimuy Walubara Yidinji, the tribal authority of Gimuy (Cairns), Queensland. Focussing on Gimuy (Cairns) this study explores how tangible and intangible heritage persists within the layered fabric of the colonial city, a combined palimpsest. In partnership with the Gimuy Walubara Yidinji rangers we documented the culturally significant sites such as sacred springs, culturally modified trees, massacre locations, storytelling places, and artefacts. We analysed the spatial relationships of the tangible cultural heritage to the grey, green, and blue infrastructure. We found that 80% of sites are within natural features, the blue-green infrastructure of the city. We have co-developed a framework for recognising the combined palimpsest and persistence of cultural heritage within the urbanised environment, highlighting the resilience of the cultural landscape and illustrating the need for innovative approaches to recognise, protect, and include Indigenous heritage into planning and cultural heritage management frameworks.

Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Sessions: 5A and 6A

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

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‘It’s about bringing the Traditional Owners to the conversation from the very start, not at the end or halfway through when you know all the management recommendations have been done anyway as a tokenistic approach’ (Jake Goodes at the Gariwerd Rock Art Management Forum, 2023).

Since 2023, the Gariwerd Rock Art Management Initiative (GRAMI) has sought to provide a platform for Aboriginal and Torres Strait Islander peoples to engage with and share Indigenous worldviews of looking after rock art and heritage through self-determined ownership and collaborative efforts. This year as the AAA conference considers the theme ‘It’s About Time’ and the voices that have been silenced and/or marginalised through archaeology and maritime archaeology, the GRAMI collective will once again look to provide a forum for the agency, authority, rights and responsibilities of Australia’s First Peoples to reclaim the narrative, showcasing and celebrating strengths-based approaches and innovative opportunities to continuing challenges. Responding to the Call to Action developed collectively by participants at the Gariwerd Rock Art Management Forum, this will be the third year that the partners have come together to ensure community voices are amplified to explore archaeology in all forms through biocultural interconnections of Country, sea and sky.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Decolonisation of educational institutions with Taungurung Cultural and Archaeological Field School

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Taungurung Land and Waters Council has started a program that will decolonise the current educational institutions by providing opportunities for learning archaeology outside of mainstream universities. Outside, and on Country, Indigenous Knowledge Systems provide the real context for learning about the traces left from the circles of life. On Country, Two-Way learning models teach students that placemakings are cultural acts and not just artefact scatters.

The vision is simple, but the Field School is beginning to change the system for the better, with a shift to real understandings of interactions of people with land, water, and sky. This talk will cover the development of the field school, referencing educational models and the vision. Following this, the outcomes from the two pilot field schools will be discussed. The last section of the talk will focus on future visions to decolonise educational models, with the solidifying of the Taungurung community as cultural authorities, recognising the existing Taungurung-led Ancestral education system, formally. Country and Community combined are university: it is time the system was changed to recognise this with equitable access to government funding for research and educational grants to empower Traditional Owners to led teaching of their culture on their homelands.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Connections through time: Travelling routes across Yindjibarndi Ngurra

Ricky Sandy, Yindjibarndi Ngurra Aboriginal Corporation

Co-Author:
Cat Morgan, Yindjibarndi Ngurra Aboriginal Corporation

The Ngarda-Ngarli (Yindjibarndi people) have been travelling across their Ngurra (Country/homelands) for countless generations. When European settlers invaded and disrupted their way of life, Ngarda-ngarli were forced off their Ngurra into missions and reserves. In the nineteenth and twentieth centuries, many Ngarda-ngarli were taken to Ieramugadu (Roebourne), though they continued to travel to and live on Yindjibarndi Ngurra where and when they could.

In this project we are mapping pathways the Ngarda-Ngarli followed in the twentieth century when travelling from Ieramugadu through Yindjibarndi Ngurra, where many families lived and worked on pastoral leases and mine sites. Here we present a case study, mapping one such route that was traversed using motor vehicles from Ieramugadu to Wittenoom, where families stopped and camped along the way in stands of Marr (Snakewood trees, *Acacia xiphophylla*). These trees were and still are important for Ngarda-Ngarli, providing shade, firewood, and materials (wood, leaves and sap) to create tools, as well as opportunities for hunting. While we know these places were used in the twentieth century, we also often find stone artefacts and grinding stones indicating the importance and use of these places by the Ngarda-ngarli before colonisation. For the Ngarda-ngarli, the cultural material and places where they remain are embedded with an intellectual and spiritual code left by the Old People. The dead reside at these places, and as dictated by Galharra (skin groups) they must provide for the living thus creating a link between the past and present.

This Yindjibarndi-led project uses a combination of archaeology from pre- and post- colonisation, oral histories, ethnohistoric accounts and Yindjibarndi knowledge to map these pathways across time and space. The continued use of these places well into the twentieth and twenty-first centuries demonstrates the persistence of Yindjibarndi law, culture and knowledge, despite the continued disruption of colonisation.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Wangayarta: Reclaiming time, place and ancestors through Indigenous-led design, justice and sovereignty

Jeffrey Newchurch, Kaurna and Narungga Elder

Co-Authors:
Allan Sumner, ACA Studios
Neale Draper, Neale Draper & Associates / Flinders University

Wangayarta is a landmark project on Kaurna Yerta that reclaims both time and place through the repatriation and dignified reburial of Kaurna Old People. Emerging from deep cultural authority and community-led vision, Wangayarta interrupts the colonial timelines and institutional practices that have long displaced Aboriginal Ancestors. Through architecture, landscape, and ceremony, it asserts Kaurna sovereignty and embodies a living connection to Country, Ancestors, and continuing responsibility.

Guided by Kaurna knowledge systems, Wangayarta resists the objectification and museumification of Ancestors, instead centring cultural protocols, healing and truth-telling. In this space, design becomes more than form; it is a decolonising act, a form of cultural continuity that honours the past while creating futures grounded in Indigenous agency.

This paper reframes repatriation and burial not as heritage management outcomes, but as expressions of time-honoured responsibility and self-determination. It invites archaeologists and heritage professionals to reimagine their roles: not as neutral observers, but as respectful collaborators working under the guidance of Traditional Owners from the outset. Wangayarta stands as a call to action, a sovereign site that reclaims narrative, place and time on unceded land.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

A sacred journey: Community-driven repatriation of Eastern Maar ancestors

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Emily Corris, Eastern Maar Aboriginal Corporation

On 26 January 2024, Eastern Maar Aboriginal Corporation planned a reburial ceremony for Ancestral Remains uncovered five years earlier during bridge construction in Colac. The day before the ceremony, additional Burial Grounds were identified during railway upgrades in Warrnambool. These incidents highlight a persistent reality: given the long and unbroken Aboriginal occupation of this land, Ancestral Remains and burial grounds are frequently disturbed by Western activities, from amateur collectors and scientists driven by social Darwinist ideologies, to modern agricultural, infrastructure, and construction projects. The fates of these remains have varied widely: some were left in situ, others sold, and many were sent to national and international museums where they remain displaced. Likewise, burial sites have been treated inconsistently; some have been protected as sacred, while others have suffered complete desecration. This presentation examines the treatment of Eastern Maar Ancestral Remains and burial grounds under Western practices, exploring historical and contemporary examples. It highlights that a community-driven approach to discovery, repatriation, and reburial can strengthen cultural and spiritual connections, upheld by honouring the sacredness to restore the dignity of Ancestral Remains to return back to County. Through community-designed cultural protocols, spiritual connections and revitalisation of ceremony, Eastern Maar is fully prepared and culturally equipped to honour the sacredness of future ancestors returning home. It is time for them to come home.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Sustaining daluk (women) knowledges and contemporary identities in Warddeken's rock art management in west Arnhem Land

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Chester Clarke, Warddeken Land Management
Nawarddeken families living in west Arnhem Land.

The bim (rock art) project at Warddeken Land Management operates within 14,000 sq km of the kunwarddewardde (stone Country), bordering east of Kakadu national park. It is home to Nawarddeken people, who belong to over 30 clans of the Bininj Kunwok language groups. This area has potential to yield thousands of bim sites within its boundaries. The project aims to protect and record these places and has been designed to give complete ownership and control to Bininj (Indigenous) landowners. A central focus of the project is to empower daluk rangers as knowledge-holders and leaders in their communities to look after these places. Historically, the discipline of archaeology has contributed to the marginalisation and erasure of knowledges surrounding daluk cultural identities, stories and traditions in western academia. The project has dedicated daluk positions in part time and casual capacities across three ranger bases in Warddeken's Indigenous Protected Area (IPA). This paper highlights the important roles and experiences of daluk rangers in the project as a way of sustaining daluk-centric knowledge systems and contemporary cultural identities in the management of Country.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Wudjari ancient coastlines: Self-determination in biocultural mapping, landscape archaeology and applied research

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Zoe Bullen, Esperance Tjaltjraak Native Title Aboriginal Corporation
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This presentation provides an overview of a decades-long trajectory to document submerged, ancient Wudjari cultural corridors. The program is a First Nations-led, collaborative approach in research design, logistics, and strategic operations: Wudjari Ancient Coastlines (WAC), led by Esperance Tjaltjraak Native Title Aboriginal Corporation (ETNTAC). The project is supported by local and international researchers. High-resolution marine survey, seafloor and habitat mapping, sedimentary analysis of past wetland and coastal deposits, including drowned forests, and investigation of contemporary coastal wetlands and cultural sites are integrated to provide critical insights into submerged cultural places and landscapes. The project directly supports the skills development of the Tjaltjraak Healthy Land and Sea Country Program team, under a cultural leadership model of applied research. This is a long-held aspiration of this community–coming together in the operational structures of ETNTAC, and together with new partners and technology, and a model of research and applied management that has national and international relevance at several levels.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Weeyn in the Budj bim world heritage listed landscape

Billy Bell, Gunditj Mirring Traditional Owners Aboriginal Corporation

Co-Authors:
Regan Malseed, Gunditj Mirring Traditional Owners Aboriginal Corporation
Jai Secombe, Gunditj Mirring Traditional Owners Aboriginal Corporation
Jakobe Walker, Gunditj Mirring Traditional Owners Aboriginal Corporation
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Weeyn (fire) has long been central to Gunditjmara cultural practices within the Budj Bim landscape in southwest Victoria. Rather than a destructive force, Weeyn is understood as a life-giving element, used for thousands of years to shape Country, manage vegetation, and maintain the health of ecosystems. In the Budj Bim lava flow region—home to one of the world's oldest aquaculture systems—fire was used deliberately to clear excess vegetation, promote native grass growth, and enhance habitat for key species such as kooyang (short-finned eel). This traditional ecological knowledge presents a powerful, place-based response to the modern threat of bushfire. As climate change drives more frequent and intense bushfires, integrating Indigenous fire practices such as cultural burning offers a sustainable approach to land and risk management. Gunditjmara's revival of cultural fire in the Budj Bim landscape is not only an act of environmental care but also of cultural resilience, restoring deep relationships with Country. This abstract explores the role of Weeyn in shaping Budj Bim and how its respectful use can inform broader responses to bushfire across Australia, demonstrating the enduring relevance of Indigenous knowledge systems in today's environmental challenges.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

The role of cool burns in Western Yalanji Country: A sustainable approach to land management and heritage protection

David Boyle, Western Yalanji Aboriginal Corporation

Co-Author:
Brad Logan, Western Yalanji Aboriginal Corporation

In Western Yalanji Country, located in Cape York Peninsula, the application of the right fire is crucial for maintaining ecological balance and cultural heritage. Historically, pastoralism and prospecting have introduced detrimental hot burns that occur at the end of summer. These high-intensity fires damage ecosystems, kill trees, and cause spalling of rockshelters. In contrast, cool burns, which are low-intensity fires that move slowly through the understorey, are essential for the health of the savannah. Conducted during the winter months, cool burns manage flammable vegetation, preventing the hot fires later in the year. This practice not only reduces fire hazards at rockshelters, which house our precious rock art, but also encourages fresh growth that sustains native wildlife and supports a fire-resilient landscape. Moreover, cultural burns provide younger Western Yalanji with opportunities to explore their Country and heritage under the guidance of Elders.

Since 2021, the Western Yalanji Aboriginal Corporation has partnered with the Aboriginal Carbon Foundation to develop a carbon credits scheme. This initiative is informed by cultural knowledge, overseen by Elders and implemented by Western Yalanji Rangers. The carbon project has fostered partnerships with pastoralists, such as Palmerville Station, and aims to re-establish our rights and responsibilities for land management while building a sustainable economic model for the community. This approach not only protects cultural heritage but also contributes to the healing of the Country. The integration of traditional fire management practices with the carbon credit schemes represents a holistic and sustainable approach to land management and heritage protection in Western Yalanji Country.

Session: Reclaiming the narrative: Indigenous ways of time, and managing Country, sea and sky

Cultural connections: Country, kids and storytelling

Gordon Smith Jnr, Wilinggin Aboriginal Corporation

Co-Authors:
Robin Dann, Wilinggin Aboriginal Corporation
Kyra Edwards, Walalakoo Aboriginal Corporation
Helen Jane Edwards, Walalakoo Aboriginal Corporation
Lloyd Pigram, University of Notre Dame Australia
Melissa Marshall, University of Notre Dame Australia

‘When you go to teach, when you go to learn, you can’t be boxed in. The teachings are out there, our senses need to be inspired and inspire … this deeper choreography and orchestration, of our knowledges and understandings, are what is our academy’ (Gordon Smith Jnr 2025).

In the far north of Western Australia, the Kimberley region is home to more than 34 culturally-nuanced Aboriginal language groups, interwoven with cultural practice and processes, resilient to radical change post-colonisation through dynamic and self-determined activism. The archaeology of the region, particularly the rock imagery of the Wandjina and Gwion Gwion figures, continue to illustrate and inherently communicate the biocultural interconnections of Country, sea and sky. The teaching of this is importantly shared through storytelling, the handing down of authority and responsibility to the next generation: without the kids, there is no process. To repatriate, reinvigorate, reconnect with Country is foundational for the continuation of First Law, the continuation of culture in practice. Through wunan (law), we are taught. We are taken there, we are given stories, we are given Country to look after for the rest of our lives. This is part of our liyan (spirit). Through wunan, we engage in transactions of approval, the Old People tell us when this starts and you must follow.

In this presentation we will share a series of conversations about cultural connections across the region. Shared by a group of custodians, cultural practitioners and allies, we explore the cultural contexts of teachings and learnings through storytelling on Country through wunan and liyan, and how this can inform, transform and shape archaeology in the future.

From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Sessions: 5B and 6B

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Waterways and the Waagyl

Terry Morich, Whadjuk People

I grew up in Tambellup, in the Great Southern region of Western Australia, my Mother's Country. My Father's Country is Whadjuk Country, with my ancestors being from the Beeloo clan. I learned from my father about the bush and where to find food and how to hunt. My father showed me artefacts whenever he found them—how they were made, and how the stone was different from other stone lying nearby. He talked about his younger days when he used to go out to the freshwater lakes. All the old people used to talk about how the rivers and lakes were fresh and provided food.

The rivers, lakes and springs and all the animals were made by the Waagyl as he moved across the land. With the water came plants to feed the animals and everything that was needed for people to survive. Yams and other plant foods were plentiful along the river and game was easy to hunt.

The Waagyl's biggest creation was the Derbarl Yerrigan in Boorloo. He formed the winding path of the river down to Melville Water where some say he met another Waagyl. There was a great commotion which left a large area of open water in the river. The Waagyl then made the Djalgarro (Canning River) and made his way up over the hills and back east. The other Waagyl headed north and made lakes and springs along the way.

After farms were cleared in many areas, the lakes dried up and went salty. The rivers became choked with silt and weeds and they too became salty. All the foods in those rivers and lakes disappeared. The Waagyl was not happy and all the work he had done was being undone.

Today, if we wish to look after Whadjuk Country, we need to understand what it was like before these changes.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

The deep history of Perth: An archaeological case study from Perth Airport

Joe Dortch, Dortch Cuthbert

Co-Authors:
Michael Thorpe, Dortch Cuthbert
Matthias Leopold, Independent

Recent excavations at Perth Airport demonstrate the potential of the Swan Coastal Plain to provide some of Australia's longest occupation sequences. The region features numerous lakes, wetlands, rivers, and alluvial deposits crossing Pleistocene and Holocene dune systems. Although impacted by urban sprawl and clearing for agriculture, all these contexts preserve places of heritage significance, revealing long histories of use, even in the heart of the Perth metropolitan region. In 2022, as part of planning for Perth Airport's new runway development, a team of Noongar people and archaeologists identified and investigated three intact Pleistocene deposits around Munday Swamp, 12 km from the city's CBD. Occupation began more than 41,000 years ago and may have intensified in the Holocene. The recent Noongar history of the location centred on its importance as a refugium in colonial times, and Noongar people still visit Munday Swamp today to connect with this heritage. The archaeological investigations, including lithic analyses, extensive OSL dating, and geomorphological studies of dune stratigraphy, in concert with regional vegetation and climate histories, reveal intensive and prolonged occupation over a long period of regional environmental stability. This archaeological record affirms the enduring importance of Munday Swamp and other wetlands in the deep history of Noongar people and indicates the potential for an integrated approach to research and cultural heritage management of dune deposits around wetlands across the region.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Lake Walliabup and Lake Coolbellup: 10,000 years of landscape use

Fiona Hook, Archae-aus

Co-Authors:
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Joe Dortch, Dortch Cuthbert

The site of Bibra Lake North (DPLH ID 4107) was deregistered prior to works beginning for the Roe 8 highway extension in 2017. Shovel testing near the site in 2017 revealed a substantial sub-surface record of archaeological material. The election of the Labor state government resulted in the cancellation of Roe 8. In 2020, a program of shovel test pitting and excavation was conducted in the area. This confirmed the presence of subsurface material and showed that the site boundaries as recorded in the Site Register are a poor guide to the actual distribution of archaeological material. Test excavations showed that use of this landscape extends back at least 10,000 years. The Walliabup-Coolbellup Lakes are culturally significant to Noongar people today and historical sources show that Lake Walliabup was a key node in the network of paths in what is now the Perth Metropolitan Area. Bibra Lake North is one of a number of other sites associated with the lakes and the whole complex should be considered a single landscape. This study has important implications for the assessment and management of sites in the Metropolitan Area.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Isn't it about time we started excavating open-air sites in WA?

Nikolajs Svede, Everick Heritage

Despite 40,000+ years of documented Aboriginal occupation across the Perth region, systematic excavation of open-air sites in WA remains remarkably limited. While WA hosts some of Australia's oldest archaeological sites, excavation practice has become almost exclusively focused on northern rockshelters, leaving significant gaps in our understanding of Noongar lifeways across diverse landscapes.

What about the rest of the state? The southwest's more stable environmental conditions should theoretically support better preservation of subsurface deposits than many regions where open-air excavation is standard practice. Yet while archaeologists in NSW and Victoria routinely excavate open-air sites at similar latitudes, WA practitioners have largely abandoned this approach, despite negative depositional processes being primarily a northern concern. Why is this and how did it come about?

It wasn’t always this way and previously excavation of open-air sites was frequently practised in WA. This research investigates how this disciplinary shift occurred, through analysis of PhD theses and journal articles, review of contemporary consultancy reports, and interviews with heritage practitioners. The study traces evolution from early open-air excavations in the 1960s-1980s to the current rockshelter-dominated paradigm, questioning the methodological assumptions that drove this shift.

The implications are significant: by avoiding excavation in a region seemingly ideal for it, we may be missing fundamental archaeological data about past occupation across the Swan Coastal Plain and the broader southwest. As urban development pressures intensify, it's time to reconsider whether our current excavation practices are serving collaborative research with Noongar communities and comprehensive understanding of landscape use.

The research evaluates the evidence for renewed open-air archaeology as essential for understanding the complete archaeological record of this culturally significant region, asking ‘Isn't it about time we started excavating more open-air sites in WA’?

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Evaluating the deep time archaeological potential of the submerged Rottnest (Wadjemup) Shelf, southwestern Australia

Marcel Teschendorff, Archae-aus

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Mick O'Leary, The University of Western Australia

During the peak of the last glacial maximum the Swan Coastal Plain would have extended more than twice its current width past what is now Rottnest Island (Wadjemup). This emergent coastal plain would have been inhabited by people. Where cultural material has survived on this submerged landscape, now the Rottnest (Wadjemup) Shelf, it has the potential to address significant archaeological questions relating to the arrival of humans in southwest Australia and past strategies of occupation and resource usage. Offshore from the Swan Coastal Plain, as with much of the Australian continental shelf, we are faced with the following significant questions: First, where were the human occupation or cultural sites located in what is now the continental shelf? Second, to what extent would these inundated cultural sites have been preserved underwater, and could they be available for archaeological study? Regional scale assessments, incorporating the modern physical environment and subaerial archaeological record, have proven to be invaluable frameworks for the investigation and management of submerged archaeological landscapes in many northern hemisphere locations and, more recently, in Western Australia's Dampier Archipelago (Murujuga).

In this paper, we adopt a regional approach and use terrestrial analogy as the basis for a Geographic Information Systems predictive model to identify areas of higher preservation potential for submerged Aboriginal archaeological sites on the Rottnest (Wadjemup) Shelf. This research provides a platform for the refinement of regional models of submerged site prospection on the Rottnest (Wadjemup) Shelf and the development of submerged landscape studies around the continent.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Navigating the nature-culture divide: Aboriginal heritage management at Perth Airport

Sally Burgess, Perth Airport

Co-Author:
Rod Garlett, Perth Airport

The division between nature and culture in archaeology faces scrutiny as contemporary research increasingly underscores the interconnectedness of these domains. In this paper, the implications of this blurring of boundaries are considered for heritage management at Perth Airport, particularly regarding the culturally significant Munday Swamp, an Aboriginal heritage site recognised as one of the most important in Whadjuk Noongar Country.

Despite existing management frameworks that delineate nature from culture, we argue that a more integrated perspective is necessary, acknowledging human-environment relationships as fundamentally intertwined, extending beyond causation for settlement patterns or explanations of adaptive processes of the Anthropocene.

By drawing on the unique cultural landscape surrounding Perth Airport, we consider a re-evaluation of heritage values beyond conventional site definitions and management approaches through the perspective of Rod Garlett as a Traditional Owner and the application of findings from Sally Burgess's 2024 Honours Thesis, which utilises Geographic Information Systems (GIS) to map environmental indicators of cultural significance. Moodjar trees are considered as alternative expressions of heritage values, alongside other environmental features characteristic of the Swan Coastal Plain that serve as indicators of the more typical heritage sites of this region. Taking this one step further, an Indigenous-led cultural mapping approach shows how landscapes convey cultural narratives and values, thereby challenging existing legal frameworks that separate natural and cultural heritage.

This presentation emphasises the necessity for a holistic understanding of landscapes in the context of colonisation and urbanisation, advocating for heritage management practices that reflect the intertwined identities of culture and nature. Our work underscores the importance of re-envisioning heritage values to promote an inclusive and comprehensive approach to understanding the Aboriginal cultural heritage that surrounds us here on Whadjuk Noongar Boodjar.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Wadjemup Ngaartch-Jool Kaart-Daa-Djin: Wadjemup truth knowledge. An archaeology of Wadjemup/Rottnest Island, Western Australia

Richenda Prall, Rottnest Island Authority

Co-Authors:
Brendan Moore, Whadjuk Traditional Owner
Clive Smith, Whadjuk Traditional Owner
Sven Ouzman, The University of Western Australia
Joe Dortch, Dortch Cuthbert
Fiona Hook, Archae-aus

Content Warning: Aboriginal and Torres Strait Island people may find this content distressing. Our deepest respects and condolences go to all families and kin affected by trauma and injustice.

Wadjemup (Rottnest Island) was an active Aboriginal landscape for 90% of the history of Aboriginal people in Australia. Traces of the ordinary and extra-ordinary business of the Noongar ancestors are found in the form of stone artefacts identified in ancient soil and limestone layers formed 17,000-27,000 years ago. Around 6,000 years ago, rising sea levels caused Wadjemup to become an island, which people no longer visited, but maintained in Tradition and Lore. The name Wadjemup, referring to 'place across the water where the spirits are', ominously foreshadowed its colonial history as a prison for approximately 4,000 Aboriginal men and boys from across Western Australia between 1838 to 1931.

In 2021, Rottnest Island Authority, guided by the Whadjuk Traditional Owners and The University of Western Australia and consulting firms Dortch Cuthbert and Archae-aus, initiated further research and systematic investigations of the Island's heritage. To date this work on heritage sites has discovered previously unknown evidence of the agency of Aboriginal prisoners through the use of glass artefacts, placement of activity areas and unexpected material cultures. This work has informed updates to the Island Museum and can be viewed during the conference excursion to Wadjemup.

Session: From Wadjemup to the scarp: 40,000+ years of archaeological evidence of unique Noongar lifeways

Truth-telling and archaeology: The Wadjemup Project Quod excavations

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Richenda Prall, Rottnest Island Authority
Joe Dortch, Dortch Cuthbert Heritage Futures
Michael Thorpe, Dortch Cuthbert Heritage Futures
Sean Winter, Dortch Cuthbert Heritage Futures

‘To remember our people who were here in the past, in what became a bad place, and what we are going to do to lay their spirits to rest’ - Wadjemup Project Steering Group, 2024.

Formidable in construction and prominence in Wadjemup / Rottnest Island’s main settlement, the Quod was a place of cruelty and remains today as the most recognisable symbol of the island’s Aboriginal prison history, which spanned from 1838 to 1931.

The Wadjemup Project was initiated in 2020 to reconcile the history of Aboriginal people’s imprisonment on Wadjemup, and is one of the first large-scale and genuine acts of recognition of the impact of colonisation on Aboriginal people. In 2024, as part of Stage Two of the Wadjemup Project, archaeological excavations were undertaken in the Quod by Whadjuk Traditional Owners, Dortch Cuthbert and the Rottnest Island Authority. This was the first systematic archaeological excavation in the Quod since the building ceased its use as tourist accommodation in 2018. The archaeological investigations identified a range of nineteenth century material which revealed personal Aboriginal prisoner lifeways and culture. These archaeological works contributed to the programming of Quod conservation works, the 2024 Aboriginal statewide consultation on the Quod’s future use, cultural processes, and the Island’s truth-telling strategy.

Simply the best: In loving memory of Dr Tim Ryan Maloney

Session: 7A

Session: Simply the best: In loving memory of Dr Tim Ryan Maloney

Funky feet to thylacine: Connecting with rock art in the southern Kimberley

Jane Fyfe, Coongan

In southern Kimberley the Bunuba and Gooniyandi people are connected to one another by language and marriage. It might be expected that rock art links them too, but some of the findings of my research suggest that connections between them may be more recent than a shared language suggests and more variable, and at times individualistic, than marriage alliances.

This paper explores these connections and disconnections in the context of a couple of long seasons in the southern Kimberley with Captain K (aka Tim) and the Lifeways of the First Australians team as we started our PhDs where everything and everyone had a nickname and 70s and 80s Australian rock and roll was de rigueur.

Session: Simply the best: In loving memory of Dr Tim Ryan Maloney

Ancient apocalypse now: Lessons from pseudoscience in the Pacific

Michelle J. Richards, The University of Melbourne

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Andrea Ballesteros, Griffith University
Hilary Howes, Australian National University
Tristen Jones, The University of Sydney
Guillaume Molle, University of French Polynesia

It is impossible to escape from pseudoarchaeology when studying the history of archaeology in the Pacific, as became clear very early on in our work as part of the CBAP research project (ANU 2015-2020). From ancient Egyptians and/or ancient aliens at Nan Madol and Rapa Nui to the blaringly obvious location for the lost city of Atlantis or the continent of Mu/Lemuria, the Pacific features heavily in mainstream pop-culture fictional and conspiracy narratives. In combination with racist, imperial or colonialist agendas, pseudo-archaeological claims disrupt the accuracy of historical records, framing Pacific societies as primitive or influenced by external forces. In this paper we draw inspiration from Tim's myth-busting 2015 presentation at AAA (attended by our newly formed CBAP team!) engaging with the fringe—not as a waste of time, but rather as an important stance against the long-term detrimental impacts such narratives can have for Indigenous archaeology in general and more specifically here, the archaeological past of Pasifika people.

Session: Simply the best: In loving memory of Dr Tim Ryan Maloney

Timeless rainbow serpents and other large Ancestral creatures from the deep blue sea of northwest Arnhem Land: A tribute to Tim Maloney

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Charlie Mungulda, Davidson's Arnhemland Safaris

The Rainbow Serpent is the essence of timelessness, an Ancestral Being from the most ancient era of the Dreamtime that continues to manifest itself in the present. Rainbow Serpents can fold time back on themselves so that the Dreamtime is not only in the past but also ever present, continuing to express itself, but often in new ways. Change has always been an essential feature of both Rainbow Serpent stories and the Dreamtime as changing landscapes, seascapes and climate resulted in transformations of other Ancestral Beings, animals, plants and people. Some Ancestors were turned into stone, providing generations of people with a resource for making stone tools and shelters for rock painting. Learning to accept, cope with and perhaps control change is one of the lessons/laws in many traditional tales and social learning is a key aspect of Rainbow Serpent stories. In this paper, recently documented Rainbow Serpent rock paintings and a unique Rainbow Serpent stone arrangement from Awunbana, northwest Arnhem Land, are explored along with stories of creation and destruction. This is the tail end of a forty-year Rainbow Serpent journey that began for lead author Taçon in 1985 and resulted in 'From Rainbow Serpents to X-ray Fish' (1989), 'Birth of the Rainbow Serpent in Arnhem Land Rock Art and Oral History' (1996), 'Rainbow Colour and Power among the Waanyi of northwest Queensland' (2008) and many other publications. We are presenting in this session because of Tim Maloney's love of Indigenous Australian archaeology, social leaning, all things stone, tales of fantastic creatures, fishing, and his early fieldwork in northwest Arnhem Land in 2008.

Session: Simply the best: In loving memory of Dr Tim Ryan Maloney

Rethinking boundaries: Tula adzes on Marra Country and the northern reach of a Holocene innovation

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The boundaries of Holocene Australian lithic technologies, particularly the distribution of the tula adze, have long been treated as fixed and familiar, represented in spatial models reproduced across decades of archaeological research that strongly associated these tools with arid/semi-arid environments. The recent discovery of tula adzes in the diverse tropical savannah woodlands of Marra Country, Limmen National Park, Northern Territory, challenges some of these entrenched assumptions about distributions and the environmental contexts of technological adoption and risk. These findings contribute to a renewed perspective on tula distribution, beyond its originally accepted boundaries and across the Gulf of Carpentaria region, at the intersection between arid/semi-arid zones and the tropical, culturally distinctive, Top End. Drawing inspiration from the work of Tim Maloney and India Ella Dilkes-Hall, whose 2020 critical reassessment of tula adze diffusion in the southern Kimberley revealed a more gradual, regionally mediated uptake than previously believed, this paper explores the technological and cultural implications of these new tula occurrences. We reconsider what constitutes 'boundaries' in archaeological terms: are they rigid lines we trace on a modern distribution map, or do they reflect more fluid zones of interaction, transmission, and adaptation inscribed in long-term temporal dimensions and linking diverse cultural and environmental regions? In this paper, we aim to place the Marra Country tulas within broader Holocene models of risk minimisation, mobility, and technological information flow, while also considering the relationship highlighted by Maloney and Dilkes-Hall between tulas and hardwood availability/craft production. This offers a reassessment of lithic technological variability in the Top End and raises important questions about the social and environmental factors that shape innovation and persistence in stone tool traditions.

Session: Simply the best: In loving memory of Dr Tim Ryan Maloney

The world's greatest archaeologist

India Ella Dilkes-Hall, Griffith University

It was thanks to the Australian Research Council Lifeways of the First Australians Linkage Project spearheaded by Professors Jane Balme and Sue O'Connor that I first met Tim in July of 2012. He arrived at Windjana Gorge, Bunuba Country, having driven Sue's 4WD from Canberra to continue his PhD research. We connected quickly over a mutual love of horror, science fiction, the Simpsons, and country music, forming a strong bond that is often born from remote fieldwork. It was a trip that ignited my passion for archaeology and was foundational in setting the course of my own career in no small part due to Tim's friendship, influence, and encouragement. Across the twelve hilarity-filled years that followed, Tim and I spent close to a year and a half on fieldwork, excavating nine archaeological sites in three different countries. It's not often you get to do what you love with your best friend, but we were lucky. One of Tim's finest qualities was that he was a gentle leader. He was fiercely loyal, a protector, a supporter, an advocate, and was the biggest cheerleader for the underdog. He was one after all. His confidence made him near invincible to critique and he used it to bolster those around him and lend courage so needed to survive the dog-eat-dog world of academia. Tim didn't pull up the ladder, he used his opportunities to benefit others. Many in this discipline would do well to learn from Tim. He fostered care through considerate and compassionate leadership and his legacy lives on through the people whose lives he changed and his remarkable impact on archaeology. His quick-witted intelligence, indefatigable thirst for knowledge, and insatiable quest to make you laugh made him the perfect research partner. Admittedly often self-proclaimed, Tim was the world's greatest archaeologist because of all these attributes. This paper presents snapshots from fieldworks culminating in the final years which saw us shift to the tropical rainforests of East Kalimantan uncovering what would come to be our career defining moment.

From the desert to the sea: Managing rock art, country and culture

Sessions: 8A and 9A

Session: From the desert to the sea: Managing rock art, country and culture

Inscriptions and graffiti: The most recent phase in a deep time signalling practice

Jo McDonald, The University of Western Australia

The Desert to the Sea project has been revisiting Country with custodians, to ensure that legacy records are correct, and to provide Rangers with heritage training. These on-Country trips have engaged with a number of historic inscriptions and more recent graffiti to demonstrate an ongoing engagement of people with place in the desert. Rock art management requires continual assessment of a range of human impacts and reveals an ongoing dilemma of managing relevance. Where is the line between vandalism and historic interest? While not a new question, the presence of known protagonists on historic expeditions, and in the building of the Canning Stock Route in deep time rock art landscapes, provides a different perspective on marking place through time.

Session: From the desert to the sea: Managing rock art, country and culture

Painting through time: Visualising Martu rock art with hyperspectral imaging

Antonia Papasergio, The University of Melbourne

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Karen Thompson, The University of Melbourne
Gabriele Marini, The University of Melbourne
Jo McDonald, The University of Western Australia
Rachel Popelka-Filcoff, The University of Melbourne

Across deep time and into the present, ochre and other mineral pigments, such as red iron oxides, yellow iron hydroxides, black carbon, and white aluminosilicate clays, have been used on Country in pigmented rock art. The use of pigment encodes rich histories of practice and meaning. However, the study of pigments on rock surfaces remains a significant challenge, as motifs are often faded, superimposed, and visually indistinct from another and rock substrates. Widely used image enhancement tools, such as DStretch®, are limited by their reliance on qualitative colour data from photography, often falling short when lighting is sub-optimal and materials are degraded or visually similar.

This project explores the potential of hyperspectral imaging (HSI) to expand the toolkit for quantitative spectral and mineralogical analysis of pigments in rock art on Country. As a non-invasive, non-destructive and highly portable technique, HSI captures images with rich spectral information beyond the visible spectrum across hundreds of spectral bands, revealing invisible features, detecting subtle pigment variations, identifying weathering products, and has potential to 'virtually untangle' superimposed paintings. However, unlocking the full potential of HSI data requires complex analytical approaches.

In collaboration with data specialists from the Melbourne Data Analytics Platform (MDAP), cutting-edge spectral analysis models are being developed to handle this complex spectral unmixing and 'virtual untangling' of pigment layers. During recent visits to Martu Country, a series of hyperspectral images were collected using a Specim IQ camera to develop a proof of concept for hyperspectral imaging of rock art in remote locations. Here, preliminary outcomes from the application of cutting-edge analytical models to the images collected on Country are presented. The work contributes to new tools for visualizing the histories of rock art and aims to inform protocols for portable HSI capture and pigment analysis methods, supporting applications both on Country and globally.

Session: From the desert to the sea: Managing rock art, country and culture

Plant exudates: Binding pigments, objects and Country across time in Martu Country

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Anneliese Carson, Western Australian Museum
Jo McDonald, The University of Western Australia

Plant exudates such as resins and gums, including from spinifex, have been used by Martu people across generations, including as hafting adhesives for spear throwers and paint binders. Far fewer Australian plant exudates and related cultural heritage materials have been thoroughly characterized as compared to related international exudate examples. In partnership with Martu people, this study uses a novel combination of synchrotron-based X-ray Raman scattering (XRS) spectroscopy, Fourier-transform infrared spectroscopy (FTIR), and pyrolysis-gas chromatography-mass spectrometry (py-GC-MS) to characterize the composition of plant exudates. A unique collection of century-old Australian plant exudates of different species and chemistries alongside modern samples from Martu Country have been used to build a reference database towards the distinction of different genera and identification of exudates in cultural heritage objects from the early twentieth century to the present. Through the ARC Linkage Project 'From the Desert to the Sea: Managing Rock Art, Country and Culture' with university, Indigenous, and industry partners, a set of artefacts from the Western Australia Museum, including resin cakes and adhesive on spear throwers, were chemically characterised. Use of complementary analytical approaches and the reference data confirmed the artefact adhesives were composed of spinifex (*Triodia*) resin. Combining these analyses with Indigenous knowledge will further our understanding of the fundamental chemistry and usage of culturally important native Australian plant exudates in the archaeological past and across time.

Session: From the desert to the sea: Managing rock art, country and culture

Reconnecting off the Talawana Track: Managing rock art on Martu Country

Sam Harper, The University of Western Australia

As part of Desert to the Sea fieldwork with Martu and Jamukurnu-Yapalikurnu Aboriginal Corporation (JYAC), the research team was invited to document a cultural landscape identified through potential mining-related impact survey. Located between Karlamilyi NP and the Talawana Track in the Great Sandy Desert, this area sits between a series of other well-known rock art provinces that have previously been recorded by team members as part of Native Title land claims and other collaborative research projects (i.e. the Canning Stock Route project), but itself was previously unknown. This place is rich in cultural material including densely concentrated grindstones and other stone artefacts, and rock art, with very low levels of industry or tourism-related impacts.

This paper will explore how this engraved and painted rock art fits within the cultural landscape, and more broadly, to regional rock art marking across Country, how it documents visual stories and jukurrpa through time as indicated by technique and changing subjects, with discussion of management implications in collaboration with Martu and JYAC.

Session: From the desert to the sea: Managing rock art, country and culture

Integrating remote sensing, historical records and Indigenous Knowledge to understand water persistence in Australia's Western Desert

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Australia's Western Desert is often conceptualized by the colonial settler community as water deficient. However, Aboriginal custodians hold extensive Indigenous Knowledge (IK) of water distributions and persistence within these landscapes developed over tens of thousands of years. Maps generated during historical incursions into these landscapes by colonial settlers over the last ~150 years provide further evidence of water distributions. Here we present the results of integrating these knowledges with remotely sensed data to understand persistent water on Martu Country. Sentinel-2 imagery was used to assess vegetative greenness as a proxy for plant available water, either at surface or in the near subsurface. Results show a strong correlation between areas of elevated, low deviation interannual vegetation greenness and named Indigenous water places, including soaks, springs, and Dreaming tracks. Some Indigenous water sites that align with geologic palaeovalley systems have low variability, indicating the role of shallow groundwater on the distribution of drought-resilient surface water. Other sites coincide within exposed sandstone ranges where unique hydraulic conductivities, compared to surrounding dunes and sandsheets, may support localized vegetation persistence and possible surface water access. Conversely areas with high vegetation variability, indicative of low interannual water persistence, align with cyclonic runoff systems where surface water is present only during episodic rainfall events. This work represents the most comprehensive mapping of surface water indicators in the Western Desert and provides new insight into the intersection of IK, hydrogeologic function, and groundwater-surface water interactions in arid Australia. As calls to include IK in hydrogeological research grow, we centre the priorities and knowledge of our Aboriginal partners in this inquiry. This subverts Western scientific interest in surface water resources to follow, not precede, the cultural and heritage values of these Indigenous water assets on Country.

Session: From the desert to the sea: Managing rock art, country and culture

Drones, stones and spatial distributions of Aboriginal grinding/pounding implements

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Grinding and pounding implements provide evidence for a range of social and domestic activities. Bedrock grinding patches, often associated with rockshelters, are forms of fixed site furniture. Large grinding stones and mortars also indicate processing activities and potentially mark a residential kitchen area if not a larger settlement or village. One or two heavy-duty slabs/mortars (often quartzite or ironstone) are commonly recorded on the surface inside Pilbara rockshelters, and sandstone seed-grinding dishes are occasionally concentrated outside on open flat ground but grinding/pounding stones are rare in the older excavated deposits. At what time scale can we assume contemporaneity of artefacts across the surface of sites? Understanding the range and portability of implements present at a site helps unpick the complex sociocultural activities taking place across space and through time. To do this, a detailed recording of the spatial distribution of artefacts in these sites is needed. This can be difficult, particularly when there are also time constraints on recording. High-resolution orthorectified imagery provides a powerful and efficient way for the spatial distribution of mortars, mullers, hammers, and other grinding/pounding implements to be examined. We discuss the potential strengths and limitations of this approach, as well as other ways to study distributions of the main classes of ground stone implements that have accumulated around these sites.

Session: From the desert to the sea: Managing rock art, country and culture

Indigenous ranger training, functional studies, new methodologies, and another look at grinding stones in the Desert to Sea project

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One of the projected outcomes of the Desert to Sea project was to 'identify contemporary Indigenous knowledge systems about food choices, and link these to the past through functional analyses of stone tools and grinding patches'. Studies of plant use, in this case starchy foods and other important plants, is fundamental to learning about how, when and where people moved and settled in various environments. Grinding stones can reveal not only how plants were processed (pounded/ground), but also the key plant species targeted. Two-way science principles were important in the knowledge exchange of this project, during which time Indigenous rangers participated in the identification, documentation and sampling of grinding surfaces to understand their place in these landscapes. The outcomes to date have included the collection of various starchy seeds and roots for a comparative reference collection, the sampling of ground surfaces for further characterization of use-related residues, and the implementation of new sample collection methods, all of which will be described in this presentation. Collaborations with Murujuga Aboriginal Corporation, Jamukurnu-Yapalikurnu Aboriginal Corporation and Mungarlu Ngurrarankatja Rirraunkaja and their Indigenous rangers were central to this project.

Session: From the desert to the sea: Managing rock art, country and culture

Tree and fire legacies: Exploring ethnobotanical knowledge and taphonomic signatures relating to fire, trees and Martu people

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Despite the crucial role of reference collections, traditional knowledge, and community engagement in Australian archaeobotany, taphonomic uncertainties persist. This paper presents preliminary findings from experimental charcoal studies on modern wood samples, specifically addressing taphonomic signatures relevant to Martu Country in the Western Desert. Do taphonomic signatures in the charcoal hold the potential to provide stories about fire function and the types of wood people were collecting? For example, green wood vs. dry, branch vs. trunk? Can features in the charcoal provide hints to fire reuse? The responses to these questions, provided in this paper, aim to weave together modern reference data, IEK, and the complexities of archaeological charcoal assemblages.

Session: From the desert to the sea: Managing rock art, country and culture

Interpretative accountability: A gender guided anthracology of people, plant and fire at Wirrili shelter

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This paper presents a gender-guided anthracological analysis of two mid-Holocene combustion features from Wirrili Shelter, located on Martu Country in the Western Desert. Through anthracological analysis, this study explores how fire-related behaviours reflect gendered ecological labour, plant knowledge, and mobility strategies. Feature 1 may reflect relational, domestic fire use involving repeated wood gathering and multi-tasking, while Feature 2 may relate to singular, task-specific activity.

Rather than relying on efficiency-based models, this research builds upon these well-known theories to apply social and cultural behaviour theories interwoven with feminist and gender theories. It employs standpoint theory, ecofeminism, and Indigenous relational ontologies to position charcoal as evidence of care, memory, and custodianship. Combustion features are reframed as embodied material expressions of social life, rather than residues of behaviour modelled solely on efficiency or proximity.

This study contributes methodologically to the development of anthracology in arid Australia through reference collection expansion. Theoretically, it underscores the need for interpretative accountability by centring the often-overlooked fire-related labour of women and children. It argues that gendered relations and ecological expertise are foundational, and not peripheral, to understanding fire use in desert archaeological contexts.

Session: From the desert to the sea: Managing rock art, country and culture

The de Graaf Collections: Exploring Country and culture through snapshots in time

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When Anthropologist Mark de Graaf passed away, his extensive personal archive of artefacts, annotated topographic maps, photographs, cine and audio recordings, and manuscripts, were deposited with archaeologists at The University of Western Australia and the Western Australian Museum for safekeeping, research and repatriation. The collection reveals de Graaf's lifelong interest in, and dedication to, Aboriginal communities of the Western Desert, sparked during his time as Headmaster at Warburton Ranges School in the early 1960s. In the decades that followed, de Graaf focused much of his time exploring the Canning Stock Route and surrounding areas with community leaders.

In this paper we present work undertaken to date as part of 'From the Desert to the Sea', to document, digitize and 'excavate' de Graaf's life, and in collaboration with Aboriginal knowledge holders, explore the emerging significance and impact of his career.

Session: From the desert to the sea: Managing rock art, country and culture

From desert to deluge: Managing data repatriation across large research projects

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This paper discusses approaches that make data collected across current and legacy research projects accessible and useful for researchers and the communities we work with. The Desert to the Sea Project highlights the importance of communication, good digital infrastructure, live datasets and iterative development of collection methods during an active research project. We discuss how we are mobilizing highly specific legacy collections (archaeological, ethnographic and environmental) to make them more broadly useful, and the challenges of trying to reconcile the flexibility of notebook recordings with the benefits of rapidly available and comparable datasets. Although the process is iterative and ongoing, we have already overcome significant hurdles to streamline our collection and repatriation process. Further development is needed to have live and useful datasets available in the unique environments we work in, as well as maintaining a focus on Indigenous Cultural and Intellectual Property (ICIP). Ideally this is a starting place for how collaborative research data can be transformed from static records into valuable resources that empower communities and strengthen collaborative relationships.

Session: From the desert to the sea: Managing rock art, country and culture

Community outreach in Desert Country: Creating opportunities for remote schools in research

Emily Grey, The University of Western Australia

One of the underscoring principles of the Desert to the Sea project is collaborating with remote communities to create opportunities for On-Country and intergenerational sharing. Through an exploration of recent On-Country trips with Martu schools and communities in the Western Desert region, this paper explores how On-Country learning can be integrated into major research projects, creating opportunities for Aboriginal children and communities to be a guiding force in research on their Country; and how two-way learning can enable researchers to meaningfully give back to the communities with which they work.

Time to excel for Australian archaeological science

Sessions: 8B and 9B

Session: Time to excel for Australian archaeological science

Testing the efficacy of molluscan quantification protocols using archaeomalacological assemblages from Jiigurru (Lizard Island Group), Great Barrier Reef

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The ways in which archaeologists have investigated and reported on (in)vertebrate zooarchaeological remains have changed significantly over the course of the past century, shifting from purely qualitative descriptions to comprehensive quantitative studies of weight, number of identified specimens (NISP), and minimum number of individuals (MNI). Although the concept of quantification is one of the core pillars of the zooarchaeological discipline, the advantages and drawbacks of different quantification protocols remain the subject of debate.

The island group of Jiigurru (also known as the Lizard Island Group) is located in the northern section of the Great Barrier Reef. The archaeological assemblages of two sites excavated on Jiigurru—Freshwater Bay Midden and Mangrove Beach Headland Midden—show occupation dating to the Late Holocene with an abundance of molluscan material found throughout both sequences.

A quantification protocol, tailored to Australian coral reef molluscan assemblages, was created using a diverse range of non-repetitive elements. Using the archaeomalacological assemblages from the two sites on Jiigurru, the results of the new methodology and traditional protocols are compared to investigate the impact quantification protocols have on our interpretations and subsequent understanding of the past. Results highlight the importance of quantification protocols for assessing chronological trends in foraging strategies and people-mollusc interactions.

Session: Time to excel for Australian archaeological science

Environmental forensics: Distinct geochemical fingerprints in contextually similar lakes

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Unprecedented climate change is rapidly transforming Earth's physical landscape, placing both known and undocumented coastal archaeological sites at risk of submersion. As a result, alternative archives such as lake sediments are becoming increasingly valuable for investigating past human mobility and environmental impact. High-resolution, multi-proxy sediment records enable comprehensive reconstructions of environmental change and the identification of key driving processes. While most geochemical studies of lake sediments have focused on temperate and polar continental regions, this research presents new findings from two lakes in Western Micronesia, located ~18 km apart and sharing similar geological, climatic, and ecological contexts. Despite these similarities, distinct geochemical signatures between the sites underscore the importance of site-specific proxy validation for accurate environmental interpretation. These records reveal that the Holocene was marked by significant climate instability in the Tropical West Pacific, offering critical insight into regional environmental dynamics and informing broader discussions on past human-environment interactions.

Session: Time to excel for Australian archaeological science

Survival in the sandstone: Residue analysis of grinding patches and grinding hollows at Stencilled Dolls, Quinkan Country, Queensland

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While residue analysis has become routine in both research and consulting contexts, it remains the case that it is often limited to portable artefacts. Studies of in situ, non-portable grinding features remain relatively rare, especially in the tropical north. The Stencilled Dolls site in Quinkan Country, Queensland, contains dozens of grinding features, including hollows (small circular features with shallow depth) and patches (larger circular features with no depth). A total of 35 of these were subject to preliminary visual inspection using a portable digital microscope. Subsequent residue extractions were stained and examined back in the lab using high-powered microscopic techniques. Despite its location in the tropics, residue preservation at Stencilled Dolls was remarkable, with abundant plant, animal and mineral residues surviving. Thirty-three of the samples were viable, and appear to demonstrate functional differences between hollows and patches. Interestingly, despite the abundant rock art in the site, relatively few of the features were seemingly used for ochre processing.

Session: Time to excel for Australian archaeological science

Making food products visible in the archaeological record through near infrared spectroscopy

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Archaeobotany, as the study of archaeological plant matters, offers insights into human-plant interactions. However, traditional microscopy-based methods are limited by the preservation of identifiable plant features, and as plants are processed into consumable food, these features are lost (Heiss et al. 2021). Therefore, processed food products, despite being commonly found through archaeobotanical recovery (González Carretero et al, 2017), are rarely studied due to the difficulty of identification. Thus they are functionally invisible in the archaeological record due to a lack of understanding.

Processed plant products represent food; they are individual meals incorporated into the archaeological record at point of consumption, likely due to spillage during the cooking process or disposal using fire. They allow archaeologists to bridge the gap between subsistence and food. Without research into processed plant products there can be no investigation into cuisine, cooking traditions, and food culture (Fuller and González Carretero 2018; Sherratt 1990).

This paper presents the preliminary results in making processed food products research accessible. Using near infra-red spectroscopy, this project is developing a way to make identification of ingredients in these food products faster and easier. As a chemical technique, this method does not rely on the preservation of distinctive visual features, a breakthrough in processed plant product research. This project is of particular importance to AAA as the majority of research on processed food products is currently occurring in Europe and West Asia, meaning Australasian research is limited by both a lack of expertise and a lack of reference resources. It is also a non-destructive method that can be made portable, making this project well-suited for on-Country research into past food traditions.

Session: Time to excel for Australian archaeological science

Three little pigs: Applying shotgun proteomics to distinguish suid species in zooarchaeological assemblages from Island Southeast Asia and Pacific Islands

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Genetic evidence on Asian modern suids indicates that pigs were likely to have translocated from the mainland across Island Southeast Asia (ISEA) and out into the Pacific. Although it is relatively straightforward to identify pig introductions on islands that were devoid of native/endemic species on the arrival of Neolithic populations, it has proven much more difficult to identify the arrival of domestic pigs on islands where endemic pig species were present before human arrival. Hence the status of some early records of pig introductions in ISEA is difficult to confirm, due to limited means of differentiating the bones of domestic pigs from wild boar or endemic species.

Here we present the first collagen and non-collagen protein sequences assembled for two key species in the region: *Babyrousa celebensis* and *Sus celebensis*. Through a combination of manual and automated collagen extraction protocols and posterior manual validation of denovo peptides, we conducted a blind test on modern specimens to determine whether shotgun proteomics is a valid technique for distinguishing between these suid species. Predicted sequences were further tested on significant archaeological material from Timor-Leste, Sulawesi and Pacific Islands to evaluate the taxonomic resolution of our results.

Session: Time to excel for Australian archaeological science

It's time for a deep time perspective on sourcing in Sahul

Emily Nutman, Australian National University

Geochemical characterisation and sourcing techniques have been underutilised in both Australia and New Guinea. The studies that have been undertaken have overwhelmingly focused on ethnographic artefacts in museum collections, and on recent Holocene material. This has limited our understanding of human movement and raw material selection in the Pleistocene and earlier Holocene, and made it harder to identify exchange, cultural interaction, and patterns of continuity and change in the deep past.

This presentation discusses and synthesises the geochemical characterisation and sourcing results from the following stratified sites: Widgingarri shelter 1, in northwest Australia; Nombe rockshelter, in the central highlands of Papua New Guinea; Dargan shelter and Kings Table shelter, in southeast Australia's Blue Mountains; and Ormi, in the eastern Torres Strait. With the exception of Ormi, all these sites demonstrate both Pleistocene and Holocene occupation, and all these sites can provide insight into how people adapted to major ecological and cultural shifts in the distant and more recent pasts.

Session: Time to excel for Australian archaeological science

The cultural implications, curiosities and applications of luminescence rock surface dating: A perspective from the Yuggera Ugarapul people

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Luminescence Rock Surface Dating is an emergent dating technique that, for the first time, allows Traditional Owners, archaeologists, and heritage specialists to directly date when a lithic artefact was discarded in the landscape and buried. With the abundant nature of lithic cultural material across Australia, Rock Surface Dating has the potential to provide a new perspective on archaeological research and heritage management. It is imperative, however, that this research follows cultural protocols and is conducted with respect, since Rock Surface Dating physically impacts the artefacts. This presentation will discuss the initial reactions and experiences of the Yuggera Ugarapul People to the use of Rock Surface Dating of cultural material, and how it is being used to improve management outcomes. Preliminary dating results of artefacts collected by the Yuggera Ugarapul People will be discussed and how these results can help us better understand ancestral land use and occupation of sites on Country, even in areas that have been subject to historical development. Finally, we discuss how the Yuggera Ugarapul People's guidance can help establish clear pathways for Free, Prior and Informed Consent and respectful sharing of findings to support wider, culturally-safe use of Rock Surface Dating.

Session: Time to excel for Australian archaeological science

Tracing origins: Assessing the potential of microbial profiles for provenancing Australian ochres

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Despite ochre being an important component of many archaeological assemblages, the assignment of provenance to ochre remains a challenge due to its variable mineral composition and formation. While previous characterisations utilising elemental, chemical, and magnetic measurements have proven successful to provenance ochre, genomic strategies to date have been under-explored. This project analysed the microbial profile of culturally significant ochre collected in partnership with Aboriginal Traditional Owners. Sites investigated included Overland Corner (SA) and Tom Price (WA). This project investigated if genetic material from the associated microbes could be obtained from ochre sources from different environments and context. Additionally, the project explored whether the associated microbial genetic signal was sufficient for genetic profiling, and if the profiles were distinct enough for ochre provenance.

Genetic material was isolated from ochre samples via solid-phase extraction and 16S rRNA next-generation sequencing. The subsequent bacterial profiles were then processed though the DADA2 pipeline for statistical analysis preparation.

While the iron content in ochre degrades the quality of the DNA sequence reads, the overall genetic profiles were sufficient for microbial analysis. Additionally, the resulting genetic profiles showed promise for the associated microbial provenancing of archaeological materials. This protocol can complement elemental and isotopic provenance analyses by adding more evidence to the ochre characterisation ‘fingerprint’.

Session: Time to excel for Australian archaeological science

Characterising formation pathways of oxalate accretions: Implications for radiocarbon dating rock art

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Rock art has been associated with oxalate mineral accretions in rockshelters globally, and while these accretions have often been attributed to geological weathering or biological processes, the precise formation mechanism remains largely unknown. Despite this ambiguity surrounding their origin, oxalate accretions containing carbon have been radiocarbon dated and used to establish chronological sequences associated with rock art. However, the uncertainty of the carbon source has raised concerns regarding the accuracy of such dating. This research, facilitated by the Agayrr Bamangay Milbi (ABM) project, investigates oxalate mineral accretions from rockshelters in southeast Cape York Peninsula, Australia, characterising the formation pathways of these accretions and evaluating their suitability for radiocarbon dating. Here we present the results of gene sequencing of microorganisms found within oxalate accretions to assess the validity of the proposed biogenic pathway. In addition, we evaluate various pretreatment methods to determine whether a particular approach can minimise contamination and improve the reliability of these dating techniques.

Session: Time to excel for Australian archaeological science

The Australian Microarchaeology and Palaeosciences Facility: Collaborative microanalytical science in Australia and beyond

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This paper provides an overview of the new Australian Microarchaeology and Palaeosciences Facility (AusMAP) which aims to advance micro-contextualised archaeological research in Australia and abroad. AusMAP will employ cutting-edge, micro-contextualised analytical techniques to characterise and improve understandings of archaeological stratigraphy, artefacts and fossils. Novel techniques such as laboratory based micro-excavation and sampling will facilitate contextualised sampling for areas including palaeogenomics, palaeoproteomics, high-resolution geochemistry and sediment micromorphology. The facility aims to embed these advances in micro-analytical science in collaborative projects (both nationally and internationally) that are grounded in robust ethical practices and employ the highest standards of data management. Indeed, through AusMAP, we seek to ensure that micro-analytical science supports community goals and respects cultural protocols. This presentation introduces the vision and scope of AusMAP and argues for the importance of integrating micro-analytical techniques in community-led, culturally grounded archaeological research across Australia and beyond.

Session: Time to excel for Australian archaeological science

Whale spotted: Shotgun proteomics and the hidden role of marine mammals in Pacific subsistence

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Species identification is a longstanding and complex issue faced by zooarchaeologists in Oceania. When bones are misidentified or taxonomic identifications do not reach species level, the stories of many species can be skewed or remain absent from human histories.

So far, traditional macroscopic identification of Hane Dune's (Marquesas Islands, French Polynesia) zooarchaeological assemblage reveals that marine mammals played a significant role in ancient subsistence; despite previously being thought to be insignificant or event absent from island economies. However, highly fragmented assemblages and limited access to comparative osteological material means that taxonomic identifications rarely reach species-level, preventing in-depth knowledge about the ecological and cultural patterns that make up human-environment relationships.

Our results from the Hane Dune zooarchaeological assemblage show that much more needs to be done to address our lack of knowledge about Cetaceans in many Oceanic societies. So far, findings from Hane Dune introduce additional complexity into local and regional subsistence models, raising the question of how similar oversights may have impacted the rest of the Pacific.

To overcome this limitation, here we present a pilot study aimed at the application of shotgun proteomics to identify marine mammal species present at the site, to be later applied to other Pacific contexts. Our workflow proposes the prediction of collagen sequences through bioinformatic methods, followed by sequence validation through the analysis of modern reference specimens using tandem mass spectrometry. Selected samples from Hane Dune were then tested for collagen preservation and taxonomical resolution based on peptide identifications. We primarily aim to test the viability and replicability of these methods with hopes to expand them to a wider range of species and archaeological settings.

Session: Time to excel for Australian archaeological science

Can I date this rock?: Testing the feasibility of various lithologies for luminescence Rock Surface Dating

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Direct dating of lithic artefacts has long been a challenge in archaeological science. While luminescence dating has provided robust chronologies for sediments enclosing archaeological materials, these ages are only indirectly linked to the artefacts themselves. Luminescence Rock Surface Dating (RSD) offers a promising new approach by measuring the time since a lithic artefact's surface was last exposed to sunlight, potentially allowing direct determination of when it was discarded and buried. However, one critical challenge is the wide variety of rock types used to make lithic artefacts in the past. Different lithologies exhibit considerable variability in their transparency, bleachability, luminescence behaviour, signal stability, and dose saturation characteristics; factors that directly affect the feasibility and reliability of RSD.

In this presentation, we explore the potential and limitations of luminescence RSD across a range of common lithologies, including quartzites, silcretes, cherts, basalts, sandstones, and granites. We present experimental results that characterise how these rock types are bleached and then accumulate and retain luminescence signals under burial conditions. These insights provide critical guidance for archaeologists and heritage practitioners considering RSD as part of integrated dating programs, particularly for open-air sites where conventional chronologies are often sparse or indirect and sites have questionable stratigraphic integrity.

Session: Time to excel for Australian archaeological science

Fibre craft and its uses at Windmill Way, southeast Cape York Peninsula

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Windmill Way contains the largest fibre craft assemblage known from an archaeological site in Australia. Dating to the late Holocene, it contains hundreds of fragments of dillybags, nets, string, and tassel skirts. After initial categorisation of this assemblage, focus has shifted to detailed analysis to ascertain the species of plants used and to better inform functional interpretations. Methods have included high powered light microscopy, FTIR, LCMS and SEM. Results indicate six main plants were used for fibre production, with several species being apparent. Some trends have emerged regarding the different purposes of the various plants found. Large numbers of the fibres are associated with hairs, feathers and resin, which are helping refine functional interpretations. Some feathers are intertwined with the fibre indicating they had a decorative purpose, while others appear to have been deposited through use. The hair is animal in origin, mostly from small to medium-sized mammals, including bats. There are at least two types of resins present, some of which are functional, and some are incidental, along with fatty deposits. This assemblage is unrivalled for its abundance, state of preservation and the variability of materials present, revealing a vibrant fibre craft practice in this region.

Session: Time to excel for Australian archaeological science

Assemblage first: Using provenance methods to understand a 38,000 year ochre record from Gledswood Shelter 1, Woolgar Country (northwest Queensland)

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Like stone artefacts, ochres (earth mineral pigments) survive from deep time archaeological contexts across the globe, leaving lasting records of the lifeways of those people who gathered and used them. Unlike stone tools, differences between ochres are not always obvious. Ochres that look the same in colour and texture may have been gathered from distinct or disparate locations. Scientific analyses (such as trace element chemistry) are therefore required to be able to differentiate ochre sources, providing insights into the interactions of past peoples with their landscapes and each other. Most ochre provenance investigations have extrapolated archaeological patterns from the physicochemical analysis of few artefacts (especially in Australia). Here, we describe patterns of ochre use through the 38,000-year occupation sequence at Gledswood Shelter 1 in Woolgar Country (what is now northwest Queensland). Using an analytic mainstay of sourcing studies, neutron activation analysis, we were able to geochemically characterise all suitable ochre artefacts, analysing 61% of the assemblage to define patterns in procurement and use from prior to and throughout the Last Glacial Maximum, up until the recent past. Our findings demonstrate that valuable, otherwise unattainable, archaeological insights are generated through the application of provenance methods to archaeological ochre assemblages, regardless of their comparison to known or potential raw source materials. Ochre procurement and use at Gledswood Shelter 1 are discussed in the context of models of Pleistocene human population dispersal and Holocene social reorganisation in semi-arid, tropical northern Australia.

Session: Time to excel for Australian archaeological science

Underwater cultural heritage investigations on Menang Country, Western Australia

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The Binalup Rangers (Albany area, Western Australia) have recently undertaken AIMA/NAS training activities in collaboration with the WA Museum and Winwell Foundation, to progress the investigation of important UCH sites on Menang Country at Madfish Bay and the Upper Kalgan River. Madfish Bay is a submerged landscape site on the Southern Ocean coast with evidence of surviving peat layers and timber tree stumps preserved under a sand bar/ tombola. The Upper Kalgan River fish traps are stone structures, associated with the earliest dated terrestrial archaeological site in the Albany area Kalgan Hall (18,850BP), on the Upper Kalgan River. Innovative approaches combining drone photography and the use of remotely controlled MBES and SBP platforms on an unmanned surface vessel are investigated to enhance mapping and interpretation of these complex and access-limited underwater sites. This collaborative training and research project meets the aspirations of the Binalup Rangers, and wider Menang and Noongar community, to record and preserve these culturally significant sites.

Session: Time to excel for Australian archaeological science

A spotlight on carbon: Combining spectroscopic techniques to identify radiocarbon-dateable layers in oxalate-rich accretions associated with rock art

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Helen Green, The University of Melbourne

Rock art provides a unique window into the past, serving as a visual record that provides valuable insight into the lives, environments and cultures of its creators. Determining the age and global distribution of rock art is therefore critical to unravelling human migration and the cognitive evolution of our species. However, to unlock this information, rock art must be anchored in an accurate and reliable absolute chronology.

Dating rock art is challenging, especially where direct dating is not possible. In Australia, most Indigenous rock art is composed of (ochre and binding) materials that contain little to no dateable carbon, necessitating the use of 'indirect' dating methods such as motif superimpositions, stylistic analysis and radiocarbon dating of associated, carbon-rich materials. Among these, calcium oxalate-rich accretions have been successfully used to date rock art globally. In the Kimberley region of Western Australia, these accretions, known as 'glazes', demonstrate high calcium oxalate contents and detailed internal stratigraphies.

Accurately and reliably dating these deposits requires both pinpointing the location of calcium oxalate minerals and understanding the origin of their associated carbon. Previous studies have employed laser ablation inductively coupled with plasma mass spectrometry (LA-ICPMS), to map elemental distributions within alternating dark and light laminae, identifying layers with elevated calcium and lower sulphur content as indicative of calcium oxalate. However, direct mapping of carbon has remained challenging, limiting the precision of targeted dating approaches.

Here, we present a novel application of light-induced breakdown spectroscopy (LIBS) on oxalate-rich accretions as a complementary technique for identifying carbon-rich layers within these complex accretions. Further, we demonstrate the potential of LIBS to identify anions within these accretions that support biomineralisation of calcium oxalate as a reliable source of carbon.

Session: Time to excel for Australian archaeological science

Evaluating protein preservation in tropical archaeological bone through ATR-FTIR and proteomics

Aleksandra Biskup, Australian National University

Co-Author:
Sofia Samper Carro, Australian National University

With palaeoproteomics becoming a popular technique among biomolecular archaeology projects, the analysis of proteins from archaeological material in tropical and subtropical settings has direct implications for the successful application of this technique in Island Southeast Asia. While protein preservation is more predictable in temperate regions, tropical climates posit a complex environment for the preservation of organic bone components, with temperature, humidity and other biochemical processes accelerating the degradation of biomolecules. Additionally, open systems, like bone, are more susceptible to degradation as environmental conditions including pH and microbial activity, impact protein decay rates.

Here we present a pilot study, aiming to investigate protein preservation in archaeological bone samples from three sites in Timor-Leste: Matju Kuru 1, Matju Kuru 2 and Asitau Kuru. Collagen preservation potential was assessed using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR-FTIR), a minimally destructive screening method, combined with multivariate statistics. Based on results from this assessment, the best practice for protein extraction from tropical samples was tested by comparing three laboratory protocols, including the first attempt at automating sample preparation of archaeological bone material. Samples were then analysed through liquid chromatography-tandem mass spectrometry (LC-MS/MS) to evaluate variations in protein recovery rates related to each protein extraction method tested. Our results offer unique insights to assess the reliability of ATR-FTIR as a screening tool for collagen preservation and to identify best practices on protein extraction and purification techniques applicable in tropical palaeoproteomic contexts. These findings make a significant contribution to optimise ancient protein recovery from environmentally challenging regions while minimising destructive analysis.

Culturally modified trees: A tangible link to deep time, historical and contemporary cultural practices

Session: 8C

Culturally modified trees, bark/wooden material culture items and wood sampling from Yagara Country

Kate Greenwood, Greenwood Consultancy / Flinders University

Co-Authors:
Caroline Cartwright, British Museum
Madonna Thomson, Jagera Daran
James Bonner, Jagera Daran

In 2024 Kate Greenwood viewed bark/wooden material culture items in the British Museum as part of her PhD with research partners Jagera Daran Aboriginal Cultural Heritage Body. It was essential to visit the items in the United Kingdom due to the fact that most were removed from Country early in the colonial period, so there are only a few of these items left in Australia from the region. Visiting and viewing the bark/wooden material culture items was undertaken to achieve the aim of matching up material culture items with the tree species from which they came. For this to occur, it is crucial that wood sampling and identification is carried out with a professional wood anatomist, Dr Caroline Cartwright, who has long-standing expertise in the identification of Australian wood species. To date, this research has not been undertaken on any bark or wooden material culture items from southeast Queensland. Once this work is completed, it will assist in a predictive model of culturally modified trees, which can lead to protection of these vulnerable Aboriginal cultural heritage sites.

Session: Culturally modified trees: A tangible link to deep time, historical and contemporary cultural practices

Goori women and bark uses, southeast Queensland

Madonna Thomson, Jagera Daran

Co-Author:
Kate Greenwood, Greenwood Consultancy / Flinders University

This paper explores the diverse and culturally rich uses of tree bark by Goori (Aboriginal) women in southeast Queensland, highlighting its significance in traditional practices, material culture and the passing down of knowledge between generations. Drawing on oral histories, ethnobotanical records and community-based insights, we look at how Goori women have traditionally used bark for practical, ceremonial and medicinal purposes, including making string, containers, medicines, and dyes. This work focuses on Goori women's roles as keepers of ecological knowledge and cultural strength, building a better understanding of Aboriginal women's relationships with the environment and their importance in protecting and revitalising Goori cultural practices.

Session: Culturally modified trees: A tangible link to deep time, historical and contemporary cultural practices

From the field to the screen: Finding new ways to contemplate culturally modified boab trees on Nyikina and Mangala Country

Ursula Frederick, University of Canberra

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Will Andrews, Heritage Spatial
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Melissa Marshall, University of Notre Dame Australia
Mark Coles Smith, Bad Bilby Productions
Sue O'Connor, Australian National University
Jane Balme, The University of Western Australia

One challenge of contemporary archaeological, cultural and heritage research is to generate work that has impact beyond our scholarly disciplines. How do we communicate ideas, knowledge and the outcomes of our research in a manner that is accessible to a broader audience, whilst retaining relevance within our field? Is it possible to provoke ideas and make pretty pictures? We suggest that interdisciplinary practice-led research across creative art, digital media, and archaeology may be one way of meeting this challenge. In this paper we discuss the process of making a short film based on 3D modelling of carved Kimberley boab trees, generated during our research project: Archives in Bark.

Session: Culturally modified trees: A tangible link to deep time, historical and contemporary cultural practices

Culturally modified trees as a proxy for heritage management on Wiradjuri Country

Talei Holm, Flinders University

Culturally Modified Trees (CMTs) are significant and vulnerable expressions of Aboriginal cultural heritage across Australia. This paper presents an investigation of CMTs on Wiradjuri Country, undertaken in close collaboration with the Young Local Aboriginal Land Council. Within their managed area, CMTs comprise nearly half of sites registered in the Aboriginal Heritage Information Management System, positioning them as a strong proxy for assessing regional heritage management in the role of stakeholders in documentation, conservation, and cultural revitalisation.

With examples from a survey which forms the case study, the paper explores how CMTs serve as enduring markers of cultural knowledge, environmental relationships, and deep connection to Country. Drawing upon GIS spatial analysis, and Aboriginal knowledge systems, the project documents a range of CMT types such as scarred trees, dendroglyphs and ring trees, while piloting a context-sensitive recording framework that acknowledges lesser-studied forms. The findings contribute to understanding how CMTs reflect cultural adaptation and continuity and provide a tangible means for Wiradjuri peoples to (re)connect with Country.

Furthermore, this research critically examines limitations in the current NSW legislative framework and highlights the challenges posed by climate change, agricultural land use, and uneven recognition of CMT significance. The research reflects the sentience of previous scholars who call for increased accountability and culturally responsive management protocols to protect at-risk heritage sites. By advocating for community priorities and co-designed research questions, the project challenges extractive modes of archaeological inquiry and contributes to a growing body of Indigenous-led, ethically grounded scholarship in heritage conservation. The study outlines culturally grounded strategies for recording CMTs and supports sustained, community-led heritage practice and echoes the need to reframe archaeological practice through decolonising methodologies and relational accountability.

Session: Culturally modified trees: A tangible link to deep time, historical and contemporary cultural practices

Marking the landscape: Cultural practices reflected in the trees of the Kimberley

Kyra Edwards, Walalakoo Aboriginal Corporation

Co-Authors:
Melissa Marshall, University of Notre Dame Australia
Helen Jane Edwards, Walalakoo Aboriginal Corporation
Gordon Smith Jnr, Wilinggin Aboriginal Corporation
Robin Dann, Wilinggin Aboriginal Corporation
Lloyd Pigram, University of Notre Dame Australia

'Walking through the bush as a kid on the shoulders of my mother and the women of our group, the men out hunting with boomerangs, spears and firesticks, this memory burns bright. The women would mark the trees, releasing fragrant chemicals into the air, doing it to extract the essence of the tree to encourage the small animals, drawing in then the larger animals interacting with their scent. A cultural feast would result with different sizes and portions for everyone' (Gordon Smith Jnr 2025).

Culturally valuable trees intersperse the landscape of the Kimberley, holding innate power and story from bookarrikarra and wunggurr (Dreamtime) through to today. Their significant roles manifest as the caretakers of Country (maladji) as equally as the giver of life. Be it to provide bush medicine salves the likes of bandarakoorl (iron wood), the spirit cleansing smoking properties of koongarra paired with librarr (white gum); bush tucker itself in the form of honey drawn from jikal (bauhinia), or sugarbag itself; alongside the ability to assist with hunting as illustrated above and through the production of wooden artefacts themselves; the living cultural landscape leaves marks on trees (both physical and spiritual). To know this, to understand the complexities, is something that archaeologists are beginning to understand. These cultural practices endure with vitality, living on in the lives of today's youth as they learn from the Elders. To share the connected cultural contexts of the intangible and the tangible woven through time, this presentation will be delivered as a collective reflection by Nyikina, Ngarinyin and Yawuru people (from the west Kimberley) in collaborative conversation with allies.

Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

Session: 8D

Session: Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

Connections across Wurnmarrinh, Bunurong Barripbarrip (Sea Country): From deep time to today

Caroline Hubschmann, Bunurong Land Council Aboriginal Corporation

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Wurnmarrinh (Western Port Bay in Victoria) is a highly significant part of Bunurong Barripbarrip (Sea Country). Bunurong peoples have lived on this Country, and the landscapes associated with it, for thousands of years. Today it is an extensive tidal bay enclosing two large islands, Bilamarrinh (French Island) and Milowl (Phillip Island), but in the past it was a major alluvial system flowing from the swamplands of Koo wee rup. Rising sea levels approximately 10,000 years ago transformed Bunurong Country, and Bunurong peoples were forced to adapt to Wurnmarrinh's changing nature.

Guided by Bunurong Elders, knowledge holders and community members, Bunurong Land Council Aboriginal Corporation has undertaken a multi-disciplinary study of Wurnmarrinh that incorporates ethnohistorical, astronomical, ecological, anthropological, biocultural and linguistic knowledge. This presentation discusses how the research team at Bunurong Land Council Aboriginal Corporation incorporates deep time connections with Wurnmarrinh into an overarching bank of knowledge that includes cultural values mapping, Dreaming stories, cyclical astronomical knowledge, biocultural values, and tangible and intangible heritage. In one example, this research was used to develop the Barripbarrip (Sea Country) calendar that maps the periodic markers of change on Wurnmarrinh Country at multiple scales and across millennia.

Session: Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

Community engagement with submerged landscapes through virtual and direct engagement

John McCarthy, Flinders University

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This talk explores the challenges of engaging both the general public and more specific audiences with the emerging field of submerged landscape archaeology. Despite the vast extent of Pleistocene and Early Holocene landscapes now submerged around the coasts of Australia and many other parts of the world, their former existence and the archaeological evidence they preserve remains little known outside specialist maritime archaeology and Traditional Owner communities.

The limited visibility of this type of archaeology, and unfounded speculation on the possibility of survival of in situ archaeological remains underwater, has hindered recognition and management of these sites in Australia until recently. Effective science communication has been crucial in recent years in advancing research and protection in this field.

We present a range of digital and analogue strategies developed by our research team to address these issues. These include documentaries, digital animations, virtual dives, and diver training programs for Indigenous communities. All of these methods have proven effective in supporting shared stewardship of Sea Country and raising awareness of this threatened heritage.

Session: Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

Reframing the continental shelf as a cultural space in Torres Strait through palaeolandscape modelling

Georgina Skelly, James Cook University

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Alana Grech, James Cook University

Archaeological finds in terrestrial environments of Australia and New Guinea provide a glimpse into cultural practices on the Sahul continent for several millennia prior to rising seas creating cultural seascapes during the Late Pleistocene. The now-submerged landscapes of northeast Australia have the potential to fill gaps in our understanding of how present-day cultural seascapes came to be. As a former land bridge connecting Australia and New Guinea, Torres Strait is a key area for investigating these deep-time histories.

This paper presents results from palaeolandscape modelling in Torres Strait that aim to understand how sea-level rise transformed these once inhabited landscapes. The methods developed integrate geomorphological data with archaeological questions to identify areas in the submerged landscape with potential for past human activity. Beyond identifying potential archaeological sites, the modelling provides a foundation for exploring how people interacted with dynamic terrestrial-submerged landscapes over time. The results offer opportunities to re-centre Indigenous voices and experiences in conversations about Sea Country, both past and present. Results also have implications for cultural heritage management in Torres Strait, where landscapes continue to hold cultural meaning regardless of sea-level, and where communities are again facing the challenges of a rising sea-level. By reframing the continental shelf as a cultural space rather than a blank one, this research supports the ongoing connection between people and place. This paper aims to encourage discussion focusing on the intersection between Indigenous-led management of present-day Sea Country and archaeological practice, bringing submerged human histories back to the surface.

Session: Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

Cycles of time, sea, and people: Repeopling submerged palaeolandscape studies through offshore development

Hanna Steyne, Wessex Archaeology

Co-Author:
Miranda Gronow, Extent Heritage

Changing regulatory frameworks and development of the Offshore Wind sector in Australia has seen a number of major projects take off in the past few years, including assessments of submerged palaeolandscapes on the continental shelf. Each of these projects is enormous in scale, covering tens of square kilometres of seabed in a range of environments, and every project is adding significantly to the total knowledge we have about the offshore Quaternary geology around Australia, and the survivability of submerged former terrestrial landscapes and deposits. While early phases of this work are grounded in the archaeological assessment of datasets collected primarily for engineering purposes, these offshore development projects are dramatically changing our understandings of the potential for landscape features, archaeological and palaeoenvironmental material to survive offshore. While the technical side of these assessments reconstructs landscapes, our holistic approach is grounded in principles that centre the voices of Traditional Owners, and ensures that the people of these former landscapes are not lost in the data.

Session: Cycles of time and sea: Exploring people's interaction with water and land through cycles of sea-level change

The Haven (Scraggy Point) Hinchinbrook Island fish trap: Its age relative to sea level change

Mike Rowland, James Cook University

Co-Authors:
Shantel Creed, Department of Environment, Tourism, Science and Innovation
Meredith Roe, The University of Queensland

In 2024/2025, with the support of Queensland National Parks and Wildlife Service and the Girringun Aboriginal Corporation, Munamudanamy Working Group (MWG), I conducted a review and update of a conservation management plan prepared by Andrew Border in 1996 for the stone fish traps at The Haven (Scraggy Point), Hinchinbrook Island. Significant issues of recording and management emerged which I have addressed in a 200 page report.

It this presentation, I focus on John Campbell's (1979, 1982) claim that the 'trap systems belong to a number of different ages and stages of development, probably at least three … The youngest is of course generally best preserved and is still heavily cemented by rock oysters … The oldest system extends mostly below present low water and at least one spot runs stratigraphically below the youngest'. He also proposed that some of the older walls may date from as much as 6,000 to 8,000 radiocarbon years BP.

The main body of my 2024 report, informed by desk-based research, led me to question Campbell's characterisation of the site in terms of the age of particular structures. A field visit to the site in May 2025 further substantiated these doubts as both myself and the MWG observed that the fish trap appears to be a single, integrated structure with minor modifications over time. Changes could not be related to sea level change but minor changes might relate to small shifts in tidal range.

The 2025 site visit raised a number of other significant points. The fish trap is so heavily buried under sediments in parts that it is now dysfunctional but ironically these sediments have been colonised by mangroves which are protecting some of the walls. Given the extensive nature of the site, future efforts to enhance understanding of the site include undertaking detailed drone surveys.

Understanding, critiquing, and communicating time in archaeology and beyond

Session: 9C

Session: Understanding, critiquing, and communicating time in archaeology and beyond

It's about time!': Teaching deep time and the study of First Nations Australians to young people through archaeology

Liz Taylor, Nerang State High School

The Australian Curriculum, released in May 2022, identified, 'that all young Australians should be taught, regardless of their background and where they live' (ACARA 2025), the continuous connection that Aboriginal and Torres Strait Islanders have to this Country. Teachers of Year 7 students are negotiating the unit titled *Deep Time History of Australia*. While the title is problematic, as 'history' is loaded with colonial connotations, it's about time an effort was made to nurture an understanding of the extraordinary past of this place. A component of the sub-strand is the teaching of archaeology and the opportunity to create a visual and practical understanding of time. We can re-wire understanding of our deep past in young Australians.

I have designed a practical unit for our Year 7 students at Nerang State High School, that aims to have 12-year-olds understand the concept of time with stratigraphy. As a student of archaeology, I have created a practical excavation experience, where mock Indigenous artefacts are buried in strata beneath 'colonial' artefacts so the students can identify a general idea of time through superposition. They love this activity. Even the most normally disengaged students participate with extreme enthusiasm. They are required to record their findings and then create historical questions related to the presence of First Nations Australians before colonial contact. Some students are amazed that archaeology is a profession and with the collaboration of our local Indigenous community they are exposed to valuable knowledge that many of their parents do not have.

I have no doubt that the introduction of teaching Australia's deep past will develop a future of recognition of the rich culture of First Nations peoples and perhaps a new breed of archaeologists.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

The multifaceted concept of time, archaeology in the museum context

Alana Colbert, The University of Western Australia

Co-Author:
Rebecca Richards, The University of Western Australia

The Berndt Museum is an Indigenous-led institution at The University of Western Australia, holding one of the most significant collections of Aboriginal and Torres Strait Islander cultural material globally. This paper will explore the multifaceted concept of time in the museum context, highlighting its pivotal role in shaping our understanding of objects and the complex narratives they embody. We investigate the following:

1. The critical distinction between the chronological date of an object and its date of collection, highlighting how this differentiation can profoundly influence interpretations of these objects.

2. The potential for museums to forge meaningful connections between their collections, archives, and artworks by thoughtfully considering the significance of time in their narratives.

3. Using Indigenous concepts of time offers museums and archaeologists a unique opportunity to enhance and diversify their representations. However, archaeologists must approach this inclusion with caution to avoid oversimplifying or whitewashing Indigenous temporal frameworks.

A considerable challenge in cataloguing museum collections lies in the difficulty of situating certain objects in a linear historical timeline. Many items come from third-party collectors, lack comprehensive documentation, or are part of surface collections—such as stone tools—making it challenging to establish their chronological context. Addressing this issue mandates a careful definition of provenance and an exploration of its implications for how museums interpret time.

Museums have the potential to create interconnected narratives by emphasizing the significance of time as a thematic lens. However, an excessive focus on temporal frameworks can risk oversimplifying the rich tapestry of narratives tied to culture, history, and spiritual belief systems that artefacts represent. This narrow emphasis may inadvertently obscure the unique stories that Indigenous material culture conveys on their own, independent of a chronological ordering.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

Can time heal all negative portrayals?

Jonah Honeysett, Taungurung Land and Waters Council

Co-Authors:
Michelle Richards, The University of Melbourne
Uncle Shane Monk, Taungurung Land and Waters Council
Daniel Young, Taungurung Land and Waters Council
Christopher Antonopoulos, Taungurung Land and Waters Council
Jack Honeysett, Taungurung Land and Waters Council
Katherine Thomas, Taungurung Land and Waters Council
Janelle Stevenson, Australian National University

Eighteenth and nineteenth century archaeological studies of stone artefacts in Australia were part of colonial pursuits that categorized Aboriginal people as 'stone-age'. In this paper we examine the history of archaeology in Australia to expose and expel such negative portrayals and focus on changing narratives which centre on Indigenous communities working with researchers to revisit archaeological collections with new approaches. We consider how archaeology may sometimes compliment and contrast with Indigenous knowledges especially for understanding the past greenstone axe exchange systems of Victoria's Traditional Owners. Here we share our story of re-connection driven by collaborative research in which the Taungurung community have begun to conduct new archaeological science and re-visited colonial museum collections. We also contextualise our work alongside current debates over Indigenous cultural heritage and knowledge sharing in Australia.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

Time and the other: Anticolonial frameworks in ethnographic writing

Gretchen Stolte, The University of Western Australia

In 1983, the anthropologist Johannes Fabian challenged anthropology's use of time as a distancing mechanism that Others the very cultures researchers were studying. Written during the post-modern turn that repositioned disciplines across the academy to be more critical about the researcher as a neutral lens or disconnected observer, Fabian's ideas posited understandings of time beyond a cultural realm. Fabian's point about anthropological time is not how different cultures conceptualise the temporal, but how anthropology has weaponized the temporal in creating their object of study. This key aspect of the anthropological endeavour has impacted many academic disciplines and public discourses, including archaeology and heritage studies. In critically discussing how uncritical usages of time can uphold colonial categories and hierarchies, this paper will unpack how these usages can create spaces for more collaborative research practices and communication approaches.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

Deep time to shallow time: Archaeology as translating tool

Sven Ouzman, The University of Western Australia

Archaeology has had a varied relationship with Indigenous people. Initially an agent of imperial and colonial dominance, archaeology has more recently tried to reconcile both this history and to seek meaningful engagements with the people whose histories it presumes to study. Burdened still by neo-liberal and similar apparatus, archaeology's ability to manufacture 'dates' is a particularly productive node to negotiate to understand different conceptions of time, agency and being; as well as looking forward to consider what the temporality of collective human futures might look like. For example, in Australia, the 'discovery' of a 65,000 year-old date for 'first colonisation' of Australia/Sahul is almost instantaneously mobilized by Indigenous media, corporations and individuals. But it also contradicts many Indigenous views of a sui generis Aboriginality that always has been. Indeed, archaeology has an impressive array of techno-scientific methods of dating, but lacks adequate theorization of time and change. Only by meaningfully engaging with Indigenous origin and other narratives can this change. Ultimately, archaeology is really a translation exercise for non-Indigenous people to understand what Indigenous people have always known. I will use case studies from Western Australia's Kimberley and southern Africa to illustrate how time is negotiated.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

Communicating historical linguistics findings: Beyond the 'oldest and deepest' agenda

Luisa Miceli, The University of Western Australia

When historical linguistics attracts media attention it is often due to a newly published study fitting into what may be referred to as the 'oldest and deepest agenda'—the fascination with investigating language relationships beyond what is confidently demonstrable via universally accepted methodology and argumentation. My first direct experience with this phenomenon was in 2013 when I was asked by a journalist writing for *Scientific American* to comment on a study claiming to have evidence, in the form of 'ultra-conserved words', for a 15,000 year old Eurasiatic language super-family. The findings of this publication were reported by multiple media sources, and there were even links to recordings illustrating the sounds of these 'ancient' words. More recently, Australian languages have attracted media attention following publications that propose new evidence for a Proto-Australian language, the language from which all Australian Indigenous languages are hypothesised to have descended. I could point to many other examples of such deep time proposals that have fascinated the media and, as a result, the general public, over the years.

In this presentation I don't want to question the fascination with the 'oldest and deepest' agenda, but I do want to argue that as experts in a historical field it is our responsibility to get across a clear message of the degree of confidence in these proposals, and why not all such proposals are comparable. More importantly though, I want to consider why it is that we are failing to make other novel findings in historical linguistics, not linked to deep time proposals, appealing, and how we could change the way we communicate these findings, to ensure that the fascinating knowledge preserved in languages as living human artefacts can be shared with a broader audience.

Session: Understanding, critiquing, and communicating time in archaeology and beyond

Archaeology and the periodization of Indian Ocean maritime history

Peter Ridgway, Australian Association for Maritime History

This paper invites archaeologists to consider a maritime periodization scheme when developing research questions and reporting the results of their work for the Indian Ocean region. Frustrated with the popular use of inappropriate periodization schemes largely borrowed from Europe, I proposed a scheme in 2021 identifying distinct patterns and commonalities for the maritime history of the Indian Ocean. The paper highlights the role of archaeology in the construction of the periodization scheme, some of the challenges in accessing and using archaeological sources, and the use of publicly available Artificial Intelligence (AI) tools.

The periodization of the past is frequently used to provide a quick frame of reference for categorizing and comparing events in named blocks of time. It is a handy tool for scholars and the public but prone to be inappropriately used or become obsolete. For example, European schemes that refer to medieval, late antiquity, feudal and the dark ages do not line up with the emerging knowledge we have of the maritime history of the Indian Ocean.

Periodisation schemes for the Indian Ocean, and indeed Australian maritime history generally, are in their infancy. They are time consuming to construct. Their novelty may not meet the needs of scholars and the public who may prefer established schemes, however inappropriate they may be. AI offers a short-cut to obtaining a scheme specific to a region of interest for scholars and the public. However, the AI product is only as good as the sources it can reach, and any preference that may be built in the software for the sources.

Posters

Session: Poster

Nganin Nganitj (bat-led pathways): Using biocultural/TEK and archaeological approaches to protect Lakorra Murrkal Dja

Kelly Ann Blake, La Trobe University

Nganin Nganitj (Bat-Led Pathways) explores how bats guide us through Lakorra Murrkal Dja (Dark Sky Country) on Wadawurrung Country, using biocultural values, Traditional Ecological Knowledge (TEK), and Western archaeological perspectives. As nocturnal messengers, and protectors of Dark Sky County, Balyang (Grey-headed Flying Fox / Pteropus poliocephalus) is a nocturnal creator being and Ancestor in Wadawurrung culture who is law/lore keeper and protector of our Dark Sky Country. Nganin Nganitj (Bat in bat form) explores the cultural and ecological role of Balyang who oversights law/lore, connects memory places, offers seasonal indicators, and shares sky-based cultural practices.

This poster illustrates Wadawurrung ecological knowledge, having regard to archaeological evidence, highlighting the role of Dark Sky places as living cultural landscapes. By protecting cultural sites/memory places, intangible heritage associations, such as songlines, teachings, and Dark Sky Country connected ecologies from light pollution, development, and climate impacts. This project reawakens the significance of Lakorra Murrkal Dja and how Nganin Nganitj can remind and teach us of Wadawurrung ways of knowing, being, and caring for Country under a blanket of stars.

Session: Poster

A late Holocene Aboriginal workshop on the banks of Ropes Creek, Cumberland Plain: A critical node in the movement of silcrete across the Sydney Basin

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Alan Williams, EMM Consulting

The Cumberland Plain in western Sydney has been the subject of over 80 years of academic and cultural heritage management investigation. These studies have suggested that the bioregion was primarily used only in the late Holocene, and saw a focus on the extraction and exploitation of high quality silcrete from Riverstone and Plumpton Ridge in the northwest. This raw material played a critical role in the development of increasingly complex stone tool technologies, likely to have been driven by heightened hunting pressures linked to population growth and the emergence of more defined sociopolitical boundaries. To date, the expansion of urban development in the southwest and subsequent archaeological investigations has found limited archaeological materials, and the extent of the distance this silcrete was transported or traded across the region remains uncertain. In advance of residential development, EMM and Darug Traditional Owners undertook a compliance-based archaeological program on the banks of Ropes Creek at Luddenham in the southern portion of the bioregion. An excavation totalling 133m^2 recovered some 5,358 artefacts in a shallow disturbed duplex soil profile. Eight OSL ages suggest at least two major phases of short-term repeated site use over the last 1,500 years, potentially extending into early twentieth century. The assemblage was dominated by silcrete raw materials sourced from northwest Sydney and reflected evidence of substantive heat treatment, early core testing and refining, as well as exhausted tools. These all suggest that the site formed an important node as part of a distribution network of silcrete into southwest Sydney. It is hoped that identifying this node will provide greater insight into the timing and movement of silcrete into southwest Sydney and further contribute to understanding the region's comparatively limited archaeological visibility compared with other parts of the Cumberland Plain.

Session: Poster

Rock varnish at Hickman Impact Crater: Potential key to understanding the age of rock art production in the Pilbara in the late Pleistocene and Holocene

John Fairweather, The University of Western Australia

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Jo McDonald, The University of Western Australia

Rock varnish is a dark, thin coating that forms on exposed rock surfaces in arid and semi-arid regions. It typically consists of alternating micron-scale layers enriched in manganese (Mn), iron (Fe), and phyllosilicates, and can record environmental changes over time. High Mn:Fe ratios in varnish layers are often linked to wetter climatic periods. If varnish layers are formed on surfaces of known age, their composition can serve as a semi-calibrated proxy for past climate and can potentially be used to date surfaces such as rock art panels.

In the Pilbara region of Western Australia, Murujuga (Burrup Peninsula) contains thousands of rock art sites, many of which have superimposed rock varnish. This creates an opportunity to establish a regional varnish-based dating framework. However, the method first requires calibration using surfaces of known age. The Hickman impact crater, estimated to have formed 10,000 and 100,000 years ago, provides such a surface. The ejecta and crater rim materials were buried before the impact, so any varnish must have formed afterwards. This makes Hickman crater an ideal site to study varnish formation within a timeframe relevant to human occupation in the region.

An interdisciplinary team conducted fieldwork at Hickman crater in April 2025. They collected varnish, rock, and soil samples from the rim and ejecta for various dating methods, including Ar-Ar, (U-Th)/He Fe-oxide, cosmogenic nuclide, and Optically Stimulated Luminescence dating. Varnish micro-stratigraphy will be studied through ultra-thin sectioning and analysed using optical and electron microscopy, alongside chemical and mineralogical techniques.

The study aims to tie varnish formation to a dated impact event, helping to reconstruct Holocene-Pleistocene climate patterns in arid Western Australia. This will provide a new tool for understanding environmental change and surface stability in a region with sparse chronological data.

Session: Poster

Using digital archaeology and machine learning to determine sex in finger flutings

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One of the earliest and most enigmatic forms of rock art are finger flutings and previous methods of studying them relied on biometric finger ratios from modern populations to make assumptions about the people who left the flutings, which is theoretically and methodologically problematic. This work is a proof-of-concept for a paradigm shift away from error-prone human measurements and controversial theories to computational digital archaeology methods for an innovative experimental design using a tactile, virtual, and machine learning approach. We propose a digital archaeology experiment using a tactile and virtual approach based on multiple samples from 96 participants, mostly from the Australian Archaeology Association Conference 2023. We trained a machine learning model on the known data to determine the sex of the person who made the fluting. While the virtual dataset did not provide sufficiently distinct features for reliable sex classification, the tactile experiment results showed potential for the identification of the sex of fluting artists, but more samples are needed to make any generalization. The significant contribution of this study is the development of a foundational set of methods and materials. We provide a novel digital archaeology approach for data creation, data collection, and analysis that makes the experiment replicable, scalable, and quantifiable.

Session: Poster

Taking the lab to the field: A new method for collecting residue samples in remote locations

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Over the years we have been faced with the dilemma of sampling artefactual material, such as grinding stones or grinding patches in remote areas. Our previous in-field methods have provided limited results, mainly because of the very small sample sizes and therefore effectiveness of recovery. In contrast, laboratory-based sampling with an ultrasonic bath has yielded samples with high recovery rates. To address this problem, and as part of the Desert to Sea program, we invested in an ultrasonic probe, effectively inverting the laboratory method. The in-field sampling has increased our flexibility, increased our sampling size and has allowed us to sample in situ, thus expanding our sampling set and recovery potential. Furthermore, we can demonstrate to our collaborative partners the methods we use to collect samples that were previously seen as that 'black box' of laboratory methods.

Session: Poster

The oldest continuing culture: Reframing western teleology through archaeological evidence of plant-centric motifs in rock art

Elizabeth Fowler, University of New England

Western teleology of historical progress is centred upon linearity, implying that civilisations and peoples move through progressive phases of advancement to an end goal of technological, social, cultural and economic complexity. This idea excludes non-Western conceptualisations of time and progress, like that of Aboriginal Australian spirituality. In ancient Aboriginal culture, time was conceived as being agential, cyclical, and non-linear, as opposed to being 'linear, colonized and constrained' (Poelina et al., 2022, p. 401). For Aboriginal Australians, the multiplicity of cultures, Nations and communities that have co-existed with Country for thousands of years creates a continuous relationship between them, place and time, transmitting cultural knowledge systems across temporality (Poelina et al., 2022). The past remains an interactive agent with the present, informing cultures, traditions and knowledge.

This poster will explore the archaeological evidence that attests to the continuously evolving and extremely complex nature of ancient Aboriginal Australian societies. The Kimberley region will be used as the case study, focusing on the development of unique rock art phases, stone tools, and the area's unique relationality to plants and Country to demonstrate these complex relationships. Evidence from rock art will form the primary basis of the evidence analysed as it purveys the complex social, economic and cultural relationships as well as holds the knowledge systems of Traditional Owners. Rock art that contains plant-centric motifs is demonstrative of the complex relationship between people, land and plants. The role of plants in the economic, social and symbolic lives of the earliest Aboriginal Australians should be understood beyond the confines of subsistence or foraging. The Kimberley demonstrates that Aboriginal cultures are, indeed, the longest living cultures in existence; but this existence was temporally and spatially unique to different groups, rather than a continent-wide homogenous state of being.

Session: Poster

Exploring the cultural landscape of Red Hill, Western Australia

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This poster explores the cultural landscape of Red Hill, a site of significance to the Noongar community situated near Perth, Western Australia. The site is located along Susannah Brook, which flows into the Swan River northeast of Perth, and is a highly significant component of the Whadjuk Noongar cultural landscape containing places sacred to men and women, forming part of a known travel route connecting the coastal plain, hills, and inland areas as well as being a historically described camping place reported by George Fletcher Moore in the 1830s.

Cultural mapping undertaken in 2022 and 2023 by Noongar community representatives and Aboriginal Land Services heritage consultants recorded numerous archaeological features and objects including a grinding stone, quartz flakes, dolerite cores, a painting, a scarred tree, lizard traps, and a rockshelter. Key ethnographic features include the Owl Stone, the nearby Owl Chick stones, and burial places. It is highly likely that further exploration will reveal more cultural material, especially in light of recent bushfire activity that has increased surface visibility.

Despite this, Red Hill is under threat from nearby quarrying activities and is not widely known. This poster highlights the results of this community-directed cultural mapping project, which enriches our understanding of this place and the wider cultural landscape of the Perth hills, and demonstrates the importance of protection of an area often overlooked in terms of cultural significance.

Session: Poster

Unpacking coloniality through a narrative inquiry of contact period rock art motifs on the Canning Stock Route

Roy Muroyi, Terra Rosa Consulting

This research examines contact period rock art motifs with an eye to understanding Martu epistemic connections with rock art and colonial experiences. Contact-period rock art refers to rock art created by Indigenous Australians during or after first encounter with Europeans, which commonly occurred in the late eighteenth century and later. Contact rock art has evolved as an important topic of study in global rock art studies, providing new perspectives on cross-cultural contacts. Contact rock art has received little attention in the context of the Canning Stock Route; studies have generally focused on more traditional subject matter (cultural-historical perspectives) and formal (westernised/scientific) analysis. This is due in part to the perception of 'friendly' relations between Europeans and Aboriginal communities. Clandestine violence (poisonings, forced removals, sexual exploitation, and sickness) and structural violence (the compartmentalisation of Aboriginal people through systems of race, government, and labour) were in fact a daily routine on the Canning Stock Route. Power systems, inequality, dispossession, and racism all contributed to these developments. Some of the rock art exhibited along the Canning Stock Route has been classified as resistance rock art. While many such studies have been conducted both in Australia and overseas, there has recently been an increasing focus on Indigenous ontological and epistemological approaches to rock art. This article analyses the practical consequences of a decolonial approach and, more importantly, uses narrative inquiry to interpret contact period rock art along the Canning Stock Route as an example of innovative heritage management methods. It should be underlined that Aboriginal groups' interpretations of contact period rock art are critical and there is an urgent need to re-evaluate Western historical sources, which frequently glorify the colonial frontier and exaggerate European bravery, ignoring the fact that early colonial businesses relied on Aboriginal knowledge and labour to succeed.

Session: Poster

A vision for leading practice for cultural heritage: The role of the Dhawura Ngilan in business as defined by Indigenous Australians

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The Dhawura Ngilan (DWN) is a vision for how Aboriginal and Torres Strait Islander cultural heritage is recognised, managed, cared for, and engaged with by the next generations of Australians. Developed through extensive consultation with First Nations stakeholders, peak representative bodies, advisory councils, and committees, the DWN has been endorsed by the Heritage Chairs of Australia and New Zealand. Much like the Burra Charter, it represents a collective agreement of best practice and while it is not legislated, aims to inform policy and guide industry.

The release of the DWN represents an exciting opportunity for industries to review practices and align to best practice standards. This is particularly true of industries whose core business activities have ongoing and lasting impacts on cultural heritage values: industries like mining and other resource extraction enterprises. For these businesses that may have profound footprints on the landscape and thousands of touchpoints with community, the embedding of DWN principles through frameworks, guidelines, and policies presents both a substantial challenge and an opportunity to take greater accountability and responsibility. While some components of the DWN are often placed at the forefront of mining, such as the physical management of cultural heritage and Free, Prior and Informed Consent (FPIC), other aspects are too frequently shied away from, for example Truth Telling.

In this poster we aim to view the DWN through a resource industry lens, highlighting the bright spots as well as the challenges faced by those who are seeking to embed these key principles in complex business contexts that contain a variety of challenging priorities. We also aim to open the discussion in and across industries to promote collaboration and the sharing of ideas to improve industry standards and expectations.

Session: Poster

Archaeology and Aboriginal sovereignty: Approaching time, radiometric dating and the deep past

Martin Porr, The University of Western Australia

Archaeology has a long history of entanglement with colonialist thought and practices. The field developed during the height of European global political, economic, and intellectual dominance in the nineteenth and early twentieth centuries. It has been characterized as an expression of Western, positivist thinking and a linear understanding of time and history. However, in recent decades, archaeology has transformed itself into a much more diverse discipline under the influence of Indigenous rights and self-determination movements. The field has also been embraced by many Indigenous communities, and its results are often used concerning questions of Indigenous sovereignty. This recognition acknowledges archaeology's potential to make visible traces of past human actions beyond written records and human memory. The ability of modern radiometric techniques to date past actions across hundreds of thousands of years has often provided enhancements to Indigenous authority. While these developments allow archaeology a more positive position in the relationships with Indigenous communities, they generally underestimate the complexities of radiometric dating techniques in archaeological reasoning and the generally undertheorized treatment of time in the field. In this paper, I explore the vexed issue of the relationship between modern archaeological notions of time and the integration of the latter into debates about Indigenous sovereignty. The insights presented have important consequences for future debates about humanity's deep past and Indigenous sovereignty. Indigenous communities need to be cautious about embracing archaeological notions of time, and archaeological practitioners must be mindful of the complex assumptions on which their treatment of time rests. However, because of archaeology's multidisciplinary strengths and its positioning across the humanities/science divide, the discipline has great potential to support Aboriginal sovereignty and the aspirations of Aboriginal people in an informed and responsible fashion.

Session: Poster

Tortuga a la llauna: 45,000+ years old direct evidence of Neanderthal cooking techniques

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During the last 20 years, research on the ability of Neanderthals to exploit slow- and fast- moving small vertebrates has increased exponentially. From a traditional narrative, where Neanderthal were characterized as unable to acquire this type of prey, we can now suggest how Neanderthals' hunting ability was more advanced than previously thought. Evidence of lagomorphs (i.e. rabbits and hares) exploitation is emerging in several sites, where detailed taphonomic analysis of small prey assemblages indicates the accumulator agent responsible for these accumulations. In addition to lagomorphs, capturing birds and tortoises/turtles has been long demonstrated. Nevertheless, how these preys were processed is still open for debate in many cases. Our research in the Iberian Southeastern Pre-pyrenees comprises, among other topics, a focus on Neanderthal' processing strategies of these ubiquitous but sometimes elusive prey.

La Roca dels Bous is one of these sites in the Pre-pyrennes, where systematic and fine-grained archaeostratigraphic recording of artefacts and features allow us to understand Neanderthals' subsistence strategies from 50,000 years ago until their disappearance (around 40,000 years ago). It comprises a unique site, where overlapping hearths in discrete archaeological units indicate short term but repeated visits to the rockshelter.

In the 25 years of systematic excavations at Roca dels Bous, we found evidence of lagomorphs, birds and turtle exploitation. However, it was not until 2024 that we found direct evidence of the methods that Neanderthals used to cook turtles. Located directly on a clearly defined hearth, the recovery of a complete turtle shell during last year's excavations allows us to provide insights into Neanderthals' cooking practices, activity areas and intra-site spatial distributions years before their disappearance, contributing the debates about their resilience and lifeways.

Session: Poster

Yinuma: The archaeological story

Stevie Skitmore, Australian National University

Yumaduwaya (stingray), Mangwarra (hammerhead shark) and Yugwurrirrindangwa (sawfish) begin their journey on the east coast of Arnhem Land and travel to Groote Eylandt. They stop at Bickerton Island and change from humans into sea creatures. They decide to travel to the centre of Groote Eylandt via the north, but Yugwurrirrindangwa decides to take a short cut to the centre of the island. He starts off alone, and is followed by a crowd of small stingrays.

Yugwurrirrindangwa cuts his way through the island, using his teeth and nose, throwing earth aside and letting the water in. He makes Yinuma (the Angurugu River), and arrives at the centre of the island, where he creates Central Hill (Yandarrnga).

The Yinuma songline is strong: connecting families and land, sung and painted, travelled and storied. Its path is a link from Arnhem Land to the east side of Groote Eylandt, crossing land and water. It tells, amongst other things, of the right way to be.

This community archaeology collaboration between Anindilyakwa and Canberra-based researchers looks to add to current understandings of Yinuma. We think that archaeological ways of thinking can offer something meaningful to existing knowledge about creation, kinship, boundedness and strength on Groote Eylandt. This project is as much about the present and the future as it is about the past.

In 2025, we offer a visual, textural and auditory interpretation of Yinuma, and how our own journey towards the centre of the island has unfolded so far. Knowledge is held in our senses, and so we invite you to explore Yinuma with yours.

Session: Poster

Hunting game and poking fire: Combining traditional cultural knowledge and functional analysis to investigate the life history of a non-returning wangim (boomerang) from Wurundjeri Woi-wurrung Country, southeastern Australia

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Boomerangs are part of a suite of Australian throwing sticks which are specialised wooden implements of purposeful design, with aerodynamic properties, that are used as projectiles. While throwing sticks are known to have been used throughout Australia, they are less commonly found in excavated contexts. In this paper, we report on a single wangim (boomerang) recovered from a reported burial mound at Yarra Junction, Wurundjeri Woi-wurrung Country, Victoria. Analysis of morphometrics (shape, size), wear traces and residues, combined with traditional cultural knowledge, indicate that the wangim was primarily made using a variety of metal tools in the nineteenth or twentieth century. The presence of impact traces, right-handed grip marks, blood, and charcoal indicate that the wangim was used as a hunting weapon, for disarticulating (breaking up) game, and for managing campfires. The shape, symmetry and cross-section of the wangim appear to be distinct from other Wurundjeri Woi-wurrung wangim housed at Museums Victoria and elsewhere. The manufacture (and maintenance) steps required to craft this wangim, along with evidence for its continuous use for multiple activities (throwing, hacking, fire management) and its association with a reported burial, suggest that it held some form of prestige to its owner, who may have formed a strong personal attachment to it.

Session: Poster

Insights into stone: Approaching artefact biographies from Jiigurru (Lizard Island Group)

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This study, in collaboration with Waalmbar Aboriginal Corporation RNTCB and Nguurruumungu Indigenous Corporation, explores stone artefact biographies, currently identified and yet to be discovered, associated with sea Country of the Great Barrier Reef region. The poster outlines the unique physical and epistemological identities associated with three Ground Stone Ancestors (GSA) recovered from an intertidal context at Mangrove Beach in 2012. Here, the artefacts revealed themselves to archaeologists during a field research season on Jiigurru, colloquially known as Lizard Island.

After 2012, some of this previously recovered cultural material was transferred, with consent, under the stewardship of the Lizard Island Archaeological Project at JCU. Themes of this study relate to the burgeoning field of submerged cultural landscapes and the cultural specificities of ground edge artefact analysis. Using a mixed methodology, we have sought to embed agency and embodied personhood as core principles in our assessment of the Ancestors while also experimenting with non-invasive Portable Xray Fluorescence (pXRF). The study couples an Indigenised practice with trace element analysis as a direct contrast to the current typological discourse in Australian archaeology, while affirming the position of mixed methodology in capacity building for ethical community engagement.

Session: Poster

Knowing Country: Co-designing the scientific discovery of Marlinyu Ghoorlie Barna

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The Marlinyu Ghoorlie Native Title Claim in Western Australia's Goldfields and Central Wheatbelt covers nearly 90,000 km^2, an area larger than the island of Ireland. Representing the Kapurn Traditional Owners, it is also a highly active part of Australia's resources sector, home to both Kalgoorlie's Super Pit and between a third and half of all of Australia's future acts at any one time. Unlike similarly positioned regions such as the Pilbara, very little archaeological research has been conducted in the region. Radiocarbon dates are known to have been collected from a single location—a rockshelter on the southwest side of Lake Barlee. The four samples are spread across 3,780 - 412 years BP, demonstrating occupation of the area from the later middle Holocene. This scientific neglect hamstrings the ability to properly gauge the scientific significance of places of Aboriginal cultural heritage and generates more questions than answers in terms of chronology and occupation patterns in the claim area.

The Marlinyu Ghoorlie Knowledge Project seeks to advocate for a more robust scientific understanding of Marlinyu Ghoorlie Claim Area through the principles of collaborative co-design and Free, Prior, and Informed Consent (FPIC). Marlinyu Ghoorlie Traditional Owners and Terra Rosa archaeologists are working together to navigate the narrow legislative guidelines to develop an understanding of deep time in the claim area. This will aid the Marlinyu Ghoorlie Native Title Claimants protecting their heritage and managing Country more effectively.

In collaboration with the Marlinyu Ghoorlie Traditional Owners, several sites have been identified within the Claim area that are suitable for targeted research. Alongside this, extensive desktop research is being undertaken to identify any historical research conducted in the area. The authors also call for any information known to the audience to be brought forward that could contribute to the Project.

Session: Poster

The tools for the job: Curating a lithic collection for Marlinyu Ghoorlie Aboriginal Corporation

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Kora Seats, Terra Rosa Consulting

Over the past year, Marlinyu Ghoorlie Aboriginal Corporation (MGAC), who represents the Kapurn Traditional Owners, has amassed a collection of artefacts through heritage surveys conducted on Kapurn Traditional Country. These artefacts were isolated finds that were recorded and brought back to the MGAC office, for protection from the proposed work in the area. Terra Rosa and MGAC recognize that this collection could be a useful asset for Marlinyu Ghoorlie representatives to use for reference and training. With the help and approval from MGAC, Marlinyu Ghoorlie representative Aikysha Papertalk and Terra Rosa consultants Kora Seats, Luc Wehlisch and Lucy Clark will be curating the collection of artefacts together.

The aim of this poster is to showcase the creation and organisation of the lithic collection housed at the MGAC office. The poster will feature the start-to-finish process of identifying different but common artefact types, discerning their rock types, organizing and labelling them, and presenting them in a useful approach. Terra Rosa will be working in conjunction with Marlinyu Ghoorlie representatives to find the most effective way to organize and present the artefacts.

The intent of this collection is to merge the traditional and practical knowledge of the Traditional Owners with knowledge provided by heritage consultants to create a comprehensive training tool with practical applications for heritage surveys.

It should be noted that the collection does not aim at being scientifically representative. The goal is to create a hands-on training opportunity to visualize and demonstrate artefacts that are commonly encountered during surveys.

The collection will stay at the MGAC office where Marlinyu Ghoorlie representatives will be able to see and reference the artefacts whenever needed and in the long term, it will be an ongoing resource to access. Having this collection as a training resource would allow for more purposeful heritage management for members and consultants by providing a region-specific knowledge base.

Session: Poster

I wouldn't buy an ice cream on the way out: Preliminary results of user studies evaluating technology use in museums

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This presentation covers the preliminary results of user trials regarding immersive technology use in underwater cultural heritage museum exhibits. This study is part of a larger project focusing on the photogrammetry of the wrecks of HMAS *Sydney* (II) and HSK *Kormoran* and its use in museum exhibits. As a part of that project, the use of virtual and immersive technology in museums is being evaluated, with particular focus on emotional connection, visitor experience, and visitor preferences.

The preliminary results come from a user study utilising three different experiences at two locations with two delivery methods: traditional information panels, a 3D movie, and a virtual 3D experience on a cylindrical 180-degree screen at the Curtin University HIVE, with the same experience on a VR headset at the Museum of Geraldton. Participants were asked to answer survey questions pertaining to their thoughts after each experience regarding how they felt about the use of technology and how its use impacted their connection and interest in the content. Participants then took part in a guided focus group where they could further explain how they felt about each experience. The results are then coded and analysed to look for patterns and common themes.

The preliminary results were largely positive in the participants reactions to the use of technology. Although some found aspects of the technology distracting, many found that the use of technology was helpful for immersion and connection. Participants found that each experience had different strengths and weaknesses, and in this instance the three experiences worked well together with each exhibit providing key elements of the story, in a way that the experiences may not have worked as well separately.

Further research is ongoing, including interviews with professionals, both working within museums as well as from outside stakeholder groups. The end goal of this project is to provide museums with a toolkit to aid in creating a better visitor experience that allows participants to connect with the material in an exciting way that is not distracting and help museums find common ground with visitor expectations and museum preferences.