



36th Annual Australasian Society for Phycology and Aquatic Botany Conference

November 28-29th 2022
Boorloo (Perth) WA

Get excited! Our in-person 36th conference is fast approaching, and we can't wait to hang out with all you fellow phycologists and aquatic botanists on Whadjuk Noongar land in Boorloo (Perth) for the first time in 12 years. The conference will be held at the Department of Biodiversity, Conservation and Attractions, home of the Western Australian Herbarium, in Kensington.

ASPAB2022 REGISTRATION IS NOW OPEN!

Registration Fees (in-person only, no on-line presence)

Registration type	Member		Non-member [^]	
	\$AU	\$NZ	\$AU	\$NZ
Waged	\$ 250	\$285	\$300	\$335
Student [#]	\$ 150	\$170	\$175	\$195

[^]Note fee includes membership. Join [here](#).
[#]or unwaged/retired

* **Proof of student status:** With your registration, attach picture of current student card or signed letter from your supervisor verifying your student status.

Important Closing Dates 2022

Registration by: November 11th

Abstract submission by: October 14th

Early bird abstract submissions by: September 30th go into a draw for a signed copy of *Marine Plants of Australia* by John Huisman. No bookshelf is complete without one!

Registration Entitlements

Member Registration includes:	Non-member Registration includes:
<ul style="list-style-type: none">• Attendance at all conference sessions (Monday 28th and Tuesday 29th November)• Icebreaker (Sunday 27th November)• Morning tea, lunch, afternoon tea on conference days (Monday 28th and Tuesday 29th November)• Conference dinner (Monday 28th November)	<ul style="list-style-type: none">• All entitlements as per member registration on left• Membership, but you must fill in the form here and indicate that you have paid the non-member registration fee in an email to (AUS) c.biancacci@deakin.edu.au or (NZ) daniel.pritchard@otago.ac.nz and cc'd to ASPABPerth2022@gmail.com Subject line: Membership

Conference Venue

Department of Biodiversity Conservation and Attractions (DBCA), 17 Dick Perry Avenue, Kensington (see attached Map for location).

Keiran McNamara Conservation Science Centre, Ningaloo/Purnululu conference rooms (see attached Map for location of rooms).

Conference Dinner

Zephyr Room, Windsor Hotel, 112 Mill Point Rd, South Perth, from 6pm.

Environmental stewardship (minimising climate impacts and reducing waste)

Conference Materials: A conference abstract book and program will be provided digitally to all registered attendees approximately 1 week prior to the conference. Please bring your own bag/paper/pens if needed.

Travel within Perth:

End of trip facilities available at DBCA, Kensington: bike racks, showers.

Major bus/train stations nearby: Perth Station/Busport, Canning Bridge Station/Busport, Carlisle Station. Accommodation near any of these will mean about a 30-40 minute journey by public transport. See the Transperth Journey Planner [here](#). Buses 33, 284 drop you closest to the building at the Hayman Rd before Thelma St bus stop 11265 or after Thelma St Bus stop 11258, depending on which direction you are travelling. Other stops nearby are a short walk ~10-15 min.

Note there is an error in the Transperth Journey Planner website (they were notified of this 7/9/2022) such that it is better to enter the destination as the bus stop numbers mentioned above, rather than the name or address of the site or building. Google maps is fine.

Electric vehicle charging bay: available at DBCA Kensington (highlighted on attached map of site/building details).

Parking: Parking is free on site, see attached map of DBCA site/building details, Kensington.

Beverage containers: Please bring your own refillable water bottles and reusable cups so that we can avoid single use cups/bottles for refreshments.

Terms and Conditions

We hope that you will not have to cancel your registration, however, should this be necessary cancellations must be notified by email to the Conference Secretariat ASPABPerth2022@gmail.com
Subject line: Cancellation.

Cancellations received prior to 30th October 2022 will receive a full refund less Administration charge.

If you are unable to attend, a substitute is welcome at no extra charge. Please advise the Conference Secretariat of the details of the substitute delegate via email ASPABPerth2022@gmail.com Subject line: Substitute delegate.

We recommend delegates take out travel insurance.

Privacy

Information collected as part of the conference registration process will not be provided to any third party.

Covid Safety Policy

We will adhere to WA government policies at the time of the conference. Hand sanitiser will be provided and masks may be worn at your discretion.

Contact Us

Your Conference Secretariat: John Huisman, Di Walker, Kieryn Kilminster, Frances D'Souza and Michaela Larsson can be reached on the following email address:

ASPABPerth2022@gmail.com

Twitter hashtag:

#ASPABPerth2022

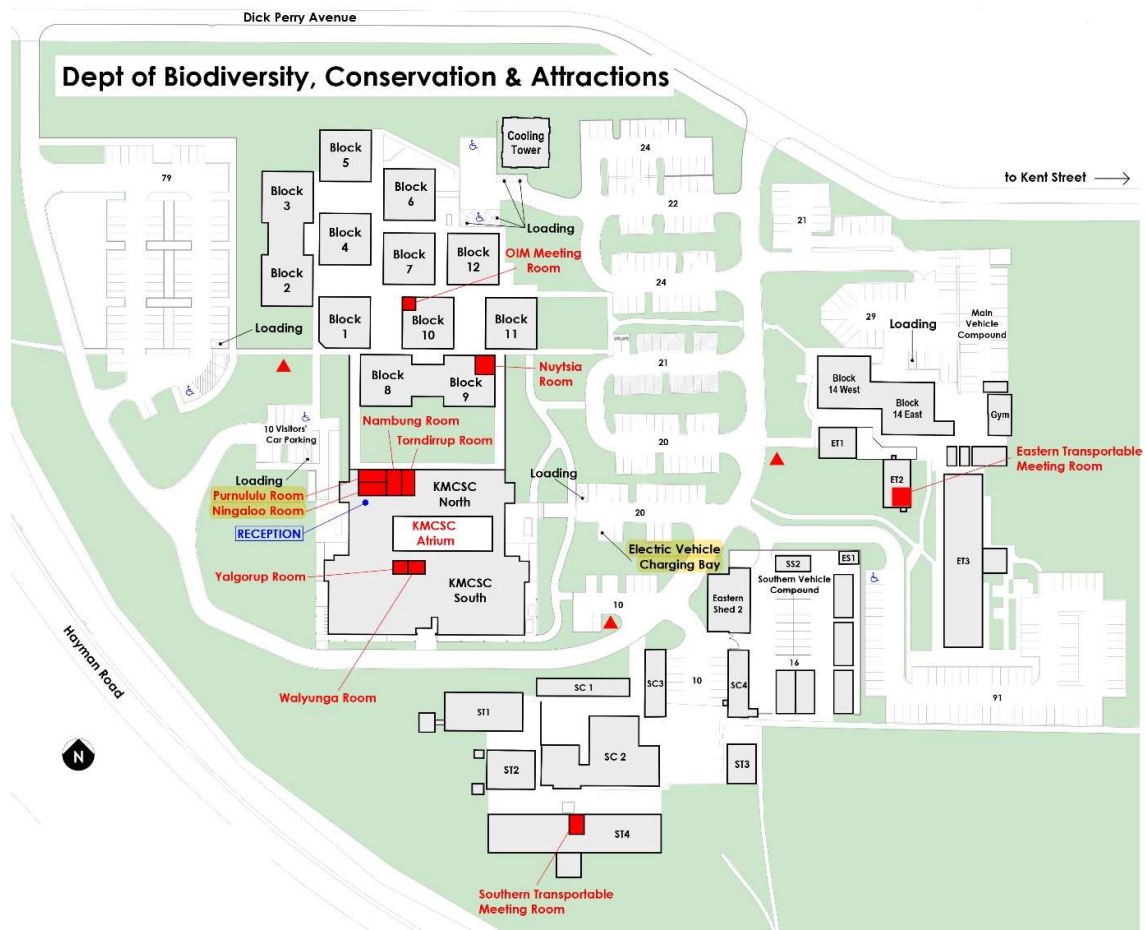
Accommodation

If you would like to share accommodation to reduce costs, let us know by email (ASPABPerth2022@gmail.com Subject line: Accommodation share). We will put you in touch with other attendees who desire the same and you can work it out together.

Accommodation options in no order (none from personal experience, all within short drive or public transport distance, others can be found via a browser search).

- **Victoria Park Lodge** (*cheapest*) 65 Leonard St, Victoria Park WA 6100•0412 113 583
- **Comfort Apartments South Perth** 281 Mill Point Rd, South Perth WA 6151•(08) 9474 0200
- **Metro Hotel Perth** 61 Canning Hwy, South Perth WA 6151•(08) 9367 6122
- **Broadwater Resort Como** 137 Melville Parade, Como WA 6152•(08) 9474 4222
- **Windsor Lodge Como** 3 Preston St, Como WA 6152•(08) 9367 9177

- **Pagoda Resort & Spa** 112 Melville Parade, Como WA 6152 • (08) 9367 0300



Plenaries

Shark Bay Research: Past Present and Future directions in seagrass and seaweed research.

Professor Gary Kendrick

School of Biological Science and Oceans Institute, The University of Western Australia, Crawley, Western Australia.



Abstract

Thank you for the opportunity to present on the evolution of research into seagrasses and seaweeds in Gathaagudu - Shark Bay. Gathaagudu is the home of the Malgana who recently obtained determination of all land terrestrial and marine in the Shark Bay region (2018).

The work of Di Walker (1981-1984) and others set the scene for Gathaagudu – Shark Bay being declared both a World Heritage Site in 1991 and a marine park in 2013. Also, at Monkey Mia fundamental internationally-led research on dolphin behaviour started in the 1980s and continues today. Since the 1980s, research focused on the cyanobacteria of Hamelin Pool and the dynamics of the development of stromatolites and seagrass-dominated sills and banks have been led by Lindsay Collins (Curtin) and researchers from ANU and UNSW among others. A US-led research group, under the leadership of Mike Heithaus (FIU) and others, studied the relationships between Tiger Sharks, Dugongs and Turtles in seagrass landscapes. This program has produced a clear understanding of the connections both in ecosystem and behavioural dynamics between second order consumers and the primary producers at the base of the food web. Jim Fourqurean (FIU) brought seagrass ecosystem dynamics to these studies in the early 2010s. In 2011, a UWA-CSIRO led study of the potential impacts of climate change to the Faure Sill and Hamelin Pool coordinated by Di Walker and others was there (on-site) for the 2010-2011 extreme heatwave. The losses to *Amphibolis antarctica* and

Posidonia australis meadows were bay-wide with research from FIU recording seagrass collapses in the Freycinet Estuary, Monkey Mia and Peron Peninsula and the UWA-CSIRO study documenting loss on Wooramel Bank and Faure Sill. This led to a flurry of collaborations across research teams, including a strong collaboration between FIU, ECU, CSIC and UWA researchers that led to the documentation of the collapse of the seagrass ecosystem across the whole bay. Mapping and modelling of seagrass losses indicated approximately 1,000 ha, predominantly *Amphibolis antarctica*, was lost from Gathaagudu – Shark Bay from the heat-wave and in the subsequent years due to increased turbidity, associated with detrital breakdown and sediment mobility. The predicted remineralisation and release of CO₂ into the atmosphere associated with these losses over the next three years was 4-21% of the Australian Annual CO₂ release from terrestrial sources only. Subsequent research has been aimed at documenting the extent of the ecosystem collapse across the food web and in search of signals of recovery. Research led by Matthew Fraser has led to deeper understanding of the role of rhizosphere microbiota in remineralizing nutrients and carbon for seagrass and macroalgae growth in nutrient poor carbonate systems, basically answering a question Di Walker asked in the early 1980s: How do seagrasses grow so far into the hypersaline waters of Shark Bay, where P concentrations are below detection limits? Since 2012 John Statton has been actively experimenting with seagrass restoration methods at Useless Loop and I am writing this abstract at Useless Loop while attempting a 1 ha demonstration seagrass recovery program. In 2018, a workshop on the impacts of the 2011 extreme heat wave in the seagrass-dominated ecosystem of Gathaagudu – Shark Bay led to a WAMSI-led study of past science and needed priority science into the future. Also, with land determination the Malgana Aboriginal Corporation through the Malgana Ranger program have both directed and co-delivered valuable research into seagrass restoration through the National Environmental Research Program – DAWE (2018-present). This funding through the NESP Marine Biodiversity Hub enabled Liz Sinclair to conduct a genomic diversity assessment of *P. australis* and *A. antarctica* to guide restoration/assist recovery of damaged meadows.

So where is the future of seaweed and seagrass research in Gathaagudu – Shark Bay? Firstly, all research in Gathaagudu – Shark Bay needs to seek collaboration from the Malgana. Due to the enforced diaspora/ dispersal/displacement of the 1920s-1970s in Western Australia many indigenous groups have been spread across the landscape and now are restoring links to their families and country and their place as traditional custodians. Our role as scientists is to listen and design research that is more culturally appropriate and offers true research partnerships with aboriginal elders. Secondly, a WAMSI Shark Bay Science Plan is close to public release and outlines the important areas of research that need to be funded through the next decade. Areas of high priority for the TOs and local community is the maintenance of the Shark Bay seagrass-dominated ecosystem into the future under increased threats of extreme climate change events. Maintaining the seagrass ecosystem is also perceived as tantamount/ fundamental to living and growing the regional economy. This includes assisting recovery (restoration) of seagrasses after extreme events. The recreational and commercial fisheries industries and tourism sector also need targeted climate change research to maintain sustainable catches, while giving visitors the rich tourism experience Shark Bay provides. Finally, this year a seminal paper was published describing a 4,500-year-old, 180-km long, single polyploid clone (tetraploid) of *Posidonia australis* that covers most of the metahaline waters of the bay. Yes, that is right, a single individual. This giant clone shows little response to temperatures 1.5 degrees warmer than ambient and shows little stress at 5.5 degrees warmer. Adapted to extreme environments this clone and potentially other as yet undiscovered surprises

point us as researchers to novel research into the diversity of plant response to climate change and Gathaagudu offers a wealth of opportunity for these new discoveries.

Biography

Gary is a marine plant ecologist who is passionate about understanding how we both can protect and use our rich marine environments. His long-term research goal has been to develop a predictive framework for understanding the spatial and temporal dynamics between marine species distributions, their biology and the physical environment.

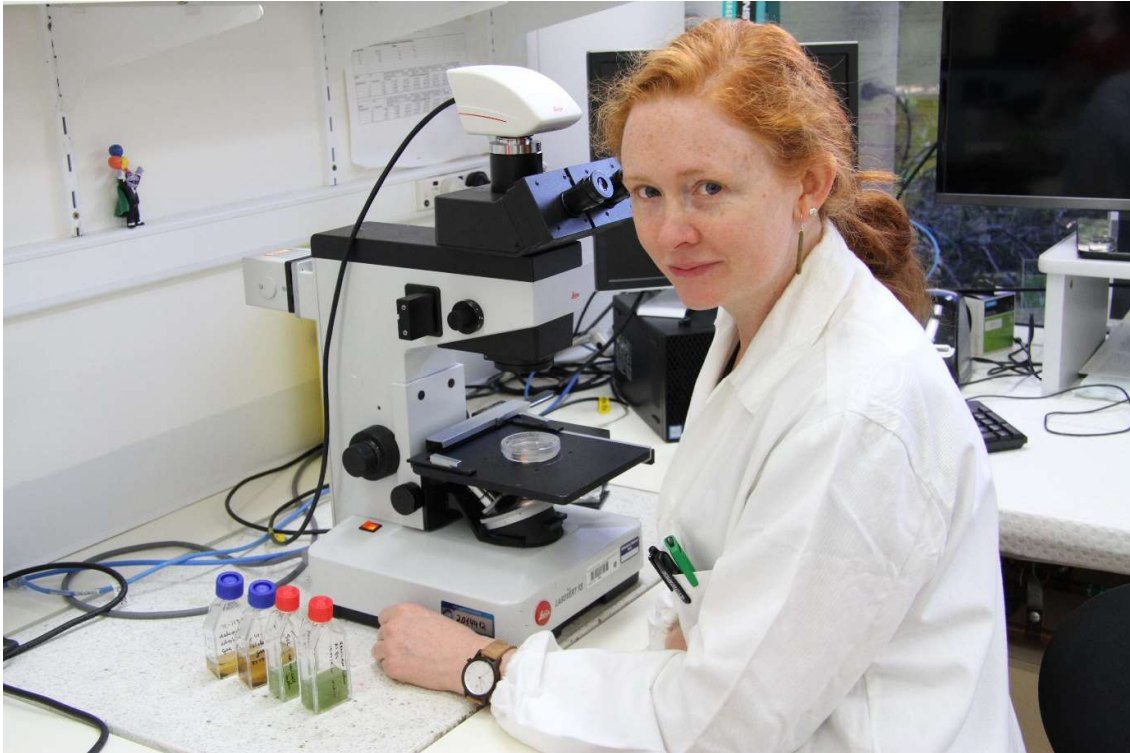
Supporting this research goal, he has multiple interests including understanding biodiversity and ecology of temperate and tropical seagrass meadows and reefs, conservation and restoration of marine foundation species, and educating people about coastal and marine ecosystems.

Gary's experimental work on the ecology of seagrass meadows, kelp and *Sargassum* beds includes understanding the role of seagrasses and kelps in structuring communities, herbivory in seagrass meadows and reefs, and the effect of ocean warming and human impacts on the resilience of seagrasses and macroalgae. Gary has recently focussed on dispersal and recruitment ecology, and genetics of seagrasses, has measured and modelled the dispersal of seagrass seeds and documented seedling survival.

Insights into intraspecific diversity from the global pangenome of a toxic cyanobacterium

Dr Anusuya Willis

Australian National Algae Culture Collection ANACC, National Research Collections Australia, CSIRO National Collections and Marine Infrastructure, Hobart, Tasmania.



Abstract

Cyanobacteria (i.e. blue-green algae) were the first oxygenic photosynthesizers, evolving ~3.5 bya, they have since radiated into one of the most diverse and widely distributed phyla of bacteria. Cyanobacteria occur globally, from the tropics to the poles, in marine, freshwater and extreme environments, playing important roles as primary producers and in global carbon and nitrogen cycles. Some species are notorious as the cause of harmful algae blooms (HABs), with blooms releasing toxins into freshwater ecosystems making them dangerous for mammals, recreational use, or drinking water, as well as leading to ecological damaging fish kills and loss of biodiversity.

Several harmful cyanobacteria species occur globally, however, rapid adaptation to new environments can lead to unique physiology and local risk profiles. One such global species is *Raphidiopsis raciborskii*, a tropical freshwater species, whose range has recently expanded into temperate regions. Local scale studies have shown high physiological and genomic diversity between strains of *R. raciborskii*, suggesting a highly variable species. To investigate the global genomic diversity and local adaptations of *R. raciborskii* we sequenced the full genomes of ~90 strains from 22 countries, spanning the continents Africa, America, Asia, Australia, and Europe.

This presentation will discuss the results of this study and the insights comparative genomics offers into genome evolution and the mechanisms behind rapid adaptation, which provide resilience to environmental changes.

Biography

Dr Anusuya Willis is a modern phycologist, combining molecular biology and physiology of algae to understand their diversity. Her research encompasses phylogenetics, comparative genomics, physiology and ecology. To understand the links between functional genomics, physiology and ecology; environmental adaptation under changing conditions; and diversity within and between species.

Dr Willis obtained her PhD in 2009 jointly from the University of Melbourne and the Université de Paris XI, with Professor Rick Wetherbee and Professor Chris Bowler. This was followed by postdoc positions at Georgia Institute of Technology, USA, with Dr Nils Kroger, and at the Australian Rivers Institute, Griffith University, Australia, with Professor Michele Burford. In 2018, Dr Willis joined the Australian National Algae Culture Collection, CSIRO, as a research scientist.