Networking marine harmful algal bloom monitoring and response in Australia

A satellite workshop to AMSA 2026 conference (Canberra), 30 August 2026

Co-convened and co-chaired by Dr Jeff Cosgrove (DBCA, WA) and Dr Kate Ollerhead (DNRE, TAS)[1]

Executive Summary

The harmful algal bloom (HAB) event that affected South Australia during 2025 highlighted the potential for prolonged, large-scale marine incidents to create significant environmental, social and economic impacts across multiple sectors. It also exposed limitations in existing preparedness, coordination and response arrangements, particularly where events extend beyond traditional public health and shellfish management frameworks. In response, this workshop brought together government representatives, technical specialists, researchers and national stakeholders to share experience, identify priorities and explore opportunities for strengthening marine HAB preparedness and response in Australia.

Workshop discussions and the pre-workshop survey demonstrated that Australia possesses substantial HAB expertise, infrastructure and scientific capability. However, these capabilities are distributed across jurisdictions, agencies, research institutions and industries, and are often not well connected or visible beyond local networks. Participants consistently identified coordination, communication and capability sharing as key opportunities to improve national preparedness and maximise the value of existing investments.

While jurisdictions reported progress in governance, monitoring, forecasting, laboratory capability and incident management, significant challenges remain. Limited routine phytoplankton monitoring, insufficient baseline information, uneven access to specialist expertise and analytical services, and limited forecasting and early warning capability were identified as common constraints. Data sharing and information management were also highlighted as areas requiring further development.

There was strong convergence around **six strategic priorities for future action**:

1. Governance and preparedness;

[1] Acknowledgement also goes to Camilla Crockart (DNRE, TAS) for her early efforts as co-convenor before handing over to Kate Ollerhead.

2. Collaboration, knowledge exchange and capability sharing;
3. Monitoring, surveillance and forecasting;
4. Laboratory and analytical capability;
5. Communication and information management; and
6. Sustainable capacity and workforce development.

The workshop supported nationally coordinated approaches that improve consistency, preparedness and access to expertise while maintaining jurisdictional responsibility for incident management and response. Priorities identified included development of a national HAB capability inventory and practitioner network, nationally consistent guidance and preparedness frameworks, improved data sharing, coordinated research investment, laboratory intercalibration, and better access to specialist expertise.

A particularly strong theme throughout the workshop was the importance of communication and information management. Participants noted that public understanding of HAB events is often limited, while expectations of government response can be high during prolonged environmental incidents. Consistent messaging across jurisdictions, clear communication of uncertainty, and ready access to trusted information were identified as critical components of future preparedness arrangements. Participants considered that **a more coordinated national approach to public communication could deliver significant benefits**, both in building community preparedness before major events and supporting effective engagement during future HAB responses.

The workshop highlighted a significant opportunity to **strengthen Australia's readiness by building stronger connections** between existing capabilities, improving access to information and expertise, and establishing more consistent approaches to preparedness across jurisdictions.

The outcomes of this workshop, together with complementary initiatives currently underway through the National Environmental Science Program and intergovernmental processes, as well as initiatives of the Australian and New Zealand Marine Harmful Algal Bloom Network (ANZHABNet), provide an important foundation for development of a coordinated national approach to marine HAB preparedness and response.

Background

The devastating harmful algal bloom (HAB) in South Australia (SA) highlighted issues, at both state and national levels, regarding preparedness and response to large-scale natural marine disasters such as HABs.

Recognising this, and to progress action to a more informed, coordinated and collaborative approach to preparing for, and responding to, future HAB events: Dr Jeff Cosgrove (DBCA) submitted a proposal to the AMSA2026 Scientific Committee for this workshop on 5 December 2025. This proposal was developed in consultation with members of the Australian & New Zealand Marine Harmful Algal Bloom Network's (ANZHABNet) interim committee (Dr Ruth Erikson & Dr Michaela Larrson).

Between 5 December 2025 and 30 August 2026, some other initiatives to address issues and identify learnings from the SA HAB took place:

- NESP project 5.15, *National assessment of harmful algal bloom preparedness and future needs*, was funded and quickly commenced action to identify gaps in Australia's HAB preparedness and provide recommendations to build strong science capability to respond to future events. Aims to provide,
    - a summary of existing science capability and future needs to manage HAB events;
    - a summary of existing vulnerabilities in the coordination and preparedness for HAB events across Australia; and
    - a conceptual framework for improved national preparedness that prioritises sustained investment in research and risk management capability.

    Due for delivery in November 2026.

- Delivering on requirements of the 8th Environmental Ministers Meeting in March 2026, South Australia's Department of Environment and Water hosted an intergovernmental HAB preparedness workshop. This executive-level event presented key learnings from the SA HAB response and identified a number of broader preparedness considerations. Existing frameworks were generally considered sufficient for relatively straightforward events, but challenges can arise where events cut across multiple portfolios, creating uncertainty in governance, roles and responsibilities. Some key preparedness needs identified included:
    - building and maintaining relationships across government, industry and other key stakeholders;
    - establishing mechanisms to enable rapid access to substantial emergency funding; and

- incorporating appropriate mental health and wellbeing support within response arrangements for operational personnel, senior officials and affected communities, including frontline groups such as surf lifesavers.

A report on the outcomes of this event is due from the South Australian Department of Environment and Water.

The AMSA 2026 satellite workshop, held at the Australian National University as a hybrid event on Sunday 30 August, aimed to bring senior managers and technical experts from each state/territory together, along with key national partners DCCEEW, CSIRO and ANZHABNet, to:

- facilitate sharing of key activities, capabilities, priorities and risk, and
- Identify opportunities for strategic and coordinated action to strengthen marine HAB monitoring, response, and management nationally.

Workshop synopsis

Survey[2]

The pre-workshop survey detailed significant expertise in Australia, but participants highlighted that these capabilities remain dispersed across jurisdictions and sectors. Importantly, inter-jurisdictional (and sometimes intra-jurisdictional) knowledge of these capabilities/resources was limited. **Our true capability can be more fully realised by moving to a more coordinated and collaborative approach**.

The SA HAB event exposed the need for preparedness and response arrangements capable of managing prolonged, cross-sector, potentially ecosystem-scale marine emergencies. Most jurisdictions are at various stages of updating their governance and plans to address this, with TAS and QLD planning multi-agency scenario exercises to test their updated governance and response framework. NT is the only jurisdiction without a formal preparedness and response plan for HABs outside of the shellfish quality assurance program framework[3].

Most commonly listed genera of concern were *Karenia* and *Pseudo-nitzschia*, followed by *Alexandrium, Dinophysis* and then *Karlodinium*. Cyanobacteria such as *Trichodesmium, Nodularia* and *Lyngbya* were also listed as a concern in coastal environments including estuaries, where conditions may be brackish.

* There was comment in the workshop regarding WA and SA industry having closures based on *Pseudo-nitzschia* detections but all cases being negative for biotoxins. Prof. Shauna Murray provided context that, on the east coast, amnesic shellfish toxins have only ever been associated with *Pseudo-nitzschia cuspidata*.

Current routine environmental monitoring for phytoplankton

Current coastal phytoplankton monitoring in each state is largely driven by industry shellfish quality assurance requirements. Outside this, routine sampling techniques vary (Table)

State/Terr.	WA	VIC	TAS	NSW	QLD	NT
Technique	LM, M	LM, S, Sa	LM, S	(chl-a)	M	none

LM = Light microscopy, M = Molecular techniques, S = Sentinel species, Sa = Satellite remote sensing.
SA didn't respond to the pre-workshop survey; this should not be interpreted as an absence of capability.
NSW indicated no state-based routine environmental sampling for phytoplankton beyond Chl-a, however some local councils such as Hornsby Shire Council carry out phytoplankton sampling.

Lack of routine monitoring data from coastal marine waters (outside of estuaries) was identified as one of the biggest capability gaps affecting HAB preparedness and

[2] *n*=15 (14 govt., 1 academia. No South Australian representation and a single response from Northern Territory).
[3] ACT is not considered as it has no coastal waters.

response. If we don't know what is there, how can we know potential risks and impacts in order to plan for them. Baseline information is also important for defining 'original' state.

Previous experience – what was missing/limiting

1. Funding was limited and/or not quickly accessible
2. Interagency coordination[4], decision making and differing priorities
3. Fit for use protocol detailing roles and responsibilities
4. Fast turnaround for biotoxin analysis and rapid toxin testing kits
5. Experience and facilities to identify novel toxins
6. Adequate broadscale remote sensing capacity
7. Capacity to coordinate sampling, processing and analysis of other species (e.g. crabs, lobsters).

Capacity

Representatives rated their current capacity across a range of areas in terms of response to a large HAB event. **The capacity for early warning and forecasting was rated as weakest**, followed by data sharing and access. Interestingly, taxonomy and phycology expertise was most favourably rated.

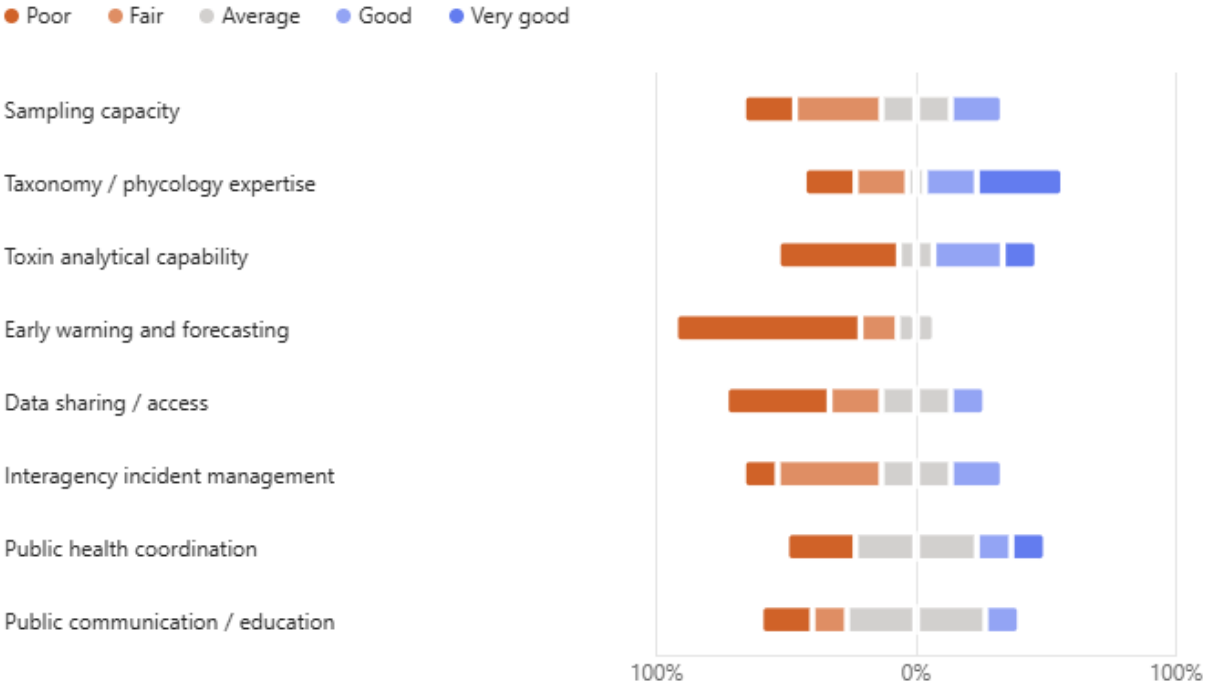


Figure 1: Perceived capacity (all jurisdictions) across aspects of response to a large HAB event. Note: no data from SA.

- Sampling capacity was considered weakest in NT, followed by WA and VIC. TAS was consistently rated as having 'good' sampling capacity.

[4] This was something that was also listed by some as something that worked well.

- Perceived capacity for taxonomy / phycology expertise was often well rated but variable ratings within jurisdiction did occur. NT and WA were the only jurisdictions with representatives assigning a 'poor' rating.
- TAS and NSW were best placed for toxin analysis.
- TAS was best placed for early warning and forecasting.
- Feedback was mixed, even within jurisdictions, for data sharing/access; with TAS and WA the only states with a respondent rating of 'good'.
- TAS and WA were also the only ones perceived as 'good' for interagency incident management (for which VIC had the lowest rating).
- Public health coordination was rated best in NSW and TAS and worst in VIC and WA.
- Public communication/education capacity was generally considered fair to average.

What is needed?

There was strong convergence on six common needs:

1. **Stronger governance and coordination**

   Establish clear roles, responsibilities and decision-making arrangements before major events occur. A shared overarching preparedness framework would help jurisdictions respond work more effectively to support each other in response to large, cross-sector HAB incidents.

2. **Collaboration, knowledge exchange and capability sharing**

   Strengthen connections between jurisdictions, agencies, researchers and industry to improve access to expertise, lessons learned and specialist knowledge. National collaboration can help ensure that existing capability is visible, connected and available when needed.

3. **Monitoring, Surveillance and Forecasting**

   Improve the ability to detect, track and anticipate HAB events through coordinated monitoring, data integration and forecasting systems. Enhanced situational awareness can support earlier intervention, better risk assessment and more informed decision-making.

4. **Laboratory and Analytical Capability**

   Maintain and develop the specialised technical infrastructure required to identify HAB species, detect toxins and assess risks. This includes analytical laboratories, diagnostic methods, reference materials, culture collections and specialist testing services.

5. **Communication and Information Management**

   Develop mechanisms to support consistent information sharing between agencies, stakeholders and the community. Effective communication is critical for managing uncertainty, maintaining public confidence and supporting coordinated responses during significant events.

6. **Sustainable Capacity and Workforce Development**

   Invest in the people, skills and resources required to maintain long-term preparedness. This includes supporting taxonomic expertise, training, succession planning, monitoring programs and the capability needed to respond to prolonged or large-scale events.

When asked which single capability improvement would make the biggest difference nationally in the next 12 months, **the most common call was for improved national coordination** followed by improved communication and inter-jurisdictional data sharing.

It is important to highlight that national control or coordination of incidents was not supported. Support was for national coordination toward consistent planning and preparedness (shared frameworks and common approaches).

The most cited realistic first steps toward improved national coordination were:

- Build a national HAB capability inventory and practitioner network,
- Identify or create, and resource, a national coordination mechanism, and
- Develop nationally agreed guidance, terminology and preparedness frameworks.

There was strong support for national initiatives to improve research coordination and develop shared communications approaches. Calls for shared facility arrangements were also commonly supported.

Jurisdictional lightning updates

QLD

Glenn McGregor (DETSI) detailed that a HAB response plan was developed in 2002 following several years of blooms causing issues along the coast.

- Covers Marine waters, coastal systems such as estuaries, and freshwater systems.
- 2 parts: HAB Plan and Operational Procedure. The first, identifies the responsible agencies and has a flow chart showing who takes the lead depending on the situation, the second provides guidance on response actions, what labs to use, how to communicate, how to get rid of waste etc.
- Documents are updated regularly following government changes. Most recent HAB Response Plan and Operational Procedures have just been finalised, with plans to test via running an emergency scenario.
    - Want to see where weaknesses lie, and how those can be prepared for; and
    - test/establish action thresholds, when things are escalated, and required surge capacity.
- Ciguatera is not really considered in this framework, currently. Will need to consider how this might fall under this HAB response plan.

Phil Choi (QLD health) indicated they have lost a lot of corporate experience due to retirement and that Queensland Health have limited experience responding to large-scale marine blooms.

NSW

Hazel Farrell (NSW DPIRD/NSW Food Authority) outlined NSW agencies involved in HAB response (at least 5 agencies plus stakeholders if cross-cutting impacts similar to SA) and the role of the Regional Algal Coordinating Committee's (RACC's).

- There is a complex set of documents and legislation
    - RACC Plan was updated in 2021.
- The relevant RACC within Water NSW coordinates government HAB response and media updates.

Key considerations remain around defining when to escalate.

Top priorities are strengthening capacity for brevetoxin testing and understanding *Karenia* diversity in NSW (molecular analyses of historical and new shellfish program samples), supporting efforts to build capacity, coordination and preparedness.

Major group causing issues of late has been *Alexandrium*. Majority of biotoxin detects has shifted from DSTs to PSTs since about 2019. PSTs were detected over the regulatory

limit in crabs and lobsters during an *A. pacificum* event in 2022. A large *A. minutum* bloom (~2 million cells/L) was detected in environmental monitoring samples during an investigation into the collapse of a grain silo and subsequent grain spill into Shoalhaven River in late 2024.

VIC

Kimberley Macdonald (DEECA) outlined that the current focus is on freshwater (blue-green) algae emergencies – marine emergencies specifically excluded from this.

Several frameworks exist for biotoxins, shellfish safety, fish incidents;

- A lot of agencies involved, depending on the location and type of bloom, and they come together on an 'as needs' basis.
- Currently exploring opportunities for better preparedness and response plans.

There is limited routine monitoring, lab capabilities and expertise.

- VIC has limited cyanotoxin testing capability – this is one of the most significant concerns at the moment and there is a government priority to improve on this front.
- *Nodularia* blooms have impacted fisheries in the Gippsland lakes. There is a current FRDC project to undertake toxicological assessment to determine safe limits for nodularin in seafood.

The diversity of HAB species is increasing, including previously undetected species.

Gippsland Lakes and Port Phillip Bay have, historically, been the concern areas.

In terms of research, there is currently work being done at Monash to investigate nutrient use by dinoflagellates and what conditions stimulate blooms.

TAS

Edward Forbes (Dept. NRE) indicated a HAB response plan has recently been developed through the Marine Stressors Response Plan (includes HABs, fish kills, mass mortality, disease, heat waves)

- outlines how government agencies will work together;
- a marine emergency event scenario exercise has been conducted;
- research is currently being done through the Tasmanian Behavioural Lab about how we can make people aware of blooms, with better understanding of how individuals and communities might respond in the event of a major bloom.

TAS has an important aquaculture and marine resources industry and has experienced major issues due to *Gymnodinium*- and *Alexandrium*-related biotoxin events (such

events have been occurring since the 1980s), so now have good expertise and systems in place.

Current risks are perceived as gaps in testing locations as well as emerging toxins and species.

SA

Michael Steer (PIRSA-SARDI) presented some key learnings from the SA event, rather than repeating what has been said in previous fora.

1. **Data management**
   »Massive amount of data coming in from multiple agencies, facilities, communities and many different types of data – **needed an integrated system to allow them to work together** and be integrated fast enough to make decisions. Still working on it but remains an issue.
2. **Monitoring**
   »Historical baselines were not adequate.
   »Not possible to satisfy demand for monitoring. Need to be strategic on many fronts, including lab capacities/capabilities.
   »There will be temporal mismatch between latest monitoring data and current conditions (can change faster than sampling) and need to learn how to deal with / communicate that.
   »Community input was helpful but hard to quantify.
3. **Communication**
   »Data quality, uncertainty and unknowns need to be communicated to decision makers and public.
   »Satellite products were good for communication but were constrained.
   »Need to tailor language and wording and *be consistent*.
   »As much as possible, limit to one source of *integrated* information to decision-makers.

Synthesis of all components was the hardest part: where the bloom was, what the impact was and who was being impacted, what actions were being taken and why.

Office for Algal Bloom Research

The Office for Algal Bloom Research (OABR) was established within SARDI in South Australia through a $3.2 million joint Commonwealth and South Australian Government investment and opened in July 2026. It forms part of the broader jointly funded science, research and monitoring response to the 2025 South Australian HAB event.

The OABR provides a dedicated mechanism to strengthen and coordinate harmful algal bloom research, monitoring and applied science in South Australia. Its role is to identify priority knowledge gaps, improve integration across monitoring, modelling, molecular

diagnostics and ecological research, support collaboration between research organisations, government and industry, and accelerate the translation of scientific information into practical advice for management and decision-making.

The Office is intended to build enduring capability beyond the immediate response, including stronger research partnerships, improved access to infrastructure and expertise, and a more coordinated approach to attracting and directing investment towards priority research needs.

While based in South Australia, the OABR is intended to complement, connect and leverage existing national capability rather than duplicate it. Its role includes supporting coordinated research priorities, partnerships and investment, and translating science to improve detection, prediction and response across South Australia and beyond.

The OABR welcomes opportunities to collaborate with research institutions, governments, industry, and other partners where there is clear alignment with priority harmful algal bloom research and management needs.

WA

DWER

Malcolm Robb (DWER) highlighted that a Western Australian Algal Bloom Response Framework for Recreational Waters has recently been finalised.

- There are divided responsibilities across the state depending on location and type of impact etc.

The state is in the early stages of developing a State Natural Marine Emergency Response Plan for regional scale events. This will include marine heatwaves etc.

Most (known) marine algal bloom events in WA are within estuaries/embayments. Nutrients from the adjoining catchment(s) is seen as the primary driver. This is a key target of the Health Estuaries WA program.

WA has a huge coastline and limited monitoring, so there is a risk of new/novel species coming in.

Phoslock clay was developed by DWER in partnership with CSIRO. Current work is being done on development of a new nanoclay for bloom mitigation.

DWER has a Phytoplankton Ecology Unit with 4 experienced taxonomists. Other taxonomists are available through local consultancies.

DBCA

Jeff Cosgrove explained that DBCA takes the lead responding to algal blooms in the Swan Canning Riverpark and also has responsibility in marine park areas (however lead agency may vary depending on impact).

- Have a local Algal Bloom Incident Response Protocol for the Swan Canning, with management triggers for key species developed through experience with managing impacts of those species, as well as scientific literature. Triggers are reviewed annually by a working group including representatives from other agencies. Incident response management teams are implemented where higher tier triggers are exceeded. For *Alexandrium*, these are multi-agency.
    - Sampling and analyses plans exist for *Alexandrium* and *Karlodinium* and are implemented when triggers defined in the Incident Response Protocol are exceeded.
- Where significant fish kills occur, protocols are in place for phytoplankton sampling in the affected area.

There has been some work done investigating clays as a potential option for bloom mitigation, through university collaborations. This has been done with *Karlodinium* and *Alexandrium minutum* as the target species. Results are species specific. Further work to progress this is commencing.

There is a project starting up, in collaboration with CSIRO (Joseph Perkins) and DWER (Michaela Larsson) to apply molecular techniques to investigate dynamics of HAB species across three WA estuaries.

NT

There was no NT representative at the workshop, however it was noted that the key issue in NT was likely ciguatera.

National initiatives & key stakeholder updates

NESP Project 5.15

Presenter: Michele Burford (Griffith University)

Principle directive of the project is to deliver a national, science and research-focused assessment of Australia's preparedness for marine HAB events.

Results were presented, highlighting organisational vulnerabilities and HAB-related challenges.

There were varied scales of support for potential national initiatives, but across all responses (n=67) there was good support for:

- A national HAB database
- Laboratory proficiency testing / intercalibration (taxonomy); and
- A national reporting framework.

Exercised to map how capability gaps might be addressed had variable results however some initiatives commonly mapped as needed to commence in the shorter term included: building capacity by training in microalgal taxonomy and research, research on emerging HABs and toxins, creation of a national HAB database and reporting framework.

A straw-person option for what a national HAB program might look like was presented.

Further discussion with project team should be directed to emailed to isobel.lerpiniere@sims.org.au or discussed with the project team.

ANZHABNet

Presenter: Shauna Murray (UTS)

The Australian and New Zealand Marine Harmful Algal Bloom network was formed in 2025 in response to the SA HAB event.

Its core purpose is to:

1. Promote and foster research and training on Australian and New Zealand harmful algae and to facilitate collaborative networks at the regional, national, and international level; and
2. Disseminate information on marine HABs to ensure that relevant, expert knowledge is applied HAB events

ANZHABNet held a training event and symposium in Sydney (December 2025) and entered a submission to the national senate inquiry into algal blooms in South Australia.

A further training event and symposium are planned to be held in Hobart in November 2026.

Currently the network has ~240 members, with a good mix of government, university/research and industry/private members across a diverse range of disciplines. Now have an active directory of members on the website.

Looking to incorporation and constitution is prepared, but funding is required to do this.

CSIRO

Australian National Algal Culture Collection

Presenter: Anusuya Willis (Director & Research Scientist)

Located in Hobart, the ANACC is a significant resource holding ~1,200 living cultures (400 species) of both micro- and macro-algae. (22 marine HAB spp.)

- Supports research and industry across Australia via three core strategies:
  - To understand Australia's unique algae,
  - Grow and improve the collection
  - Apply our algae to industry (both commercial and environmental)
- Also house significant knowledge and expertise in algal diversity and taxonomy, physiology, as well as isolation and culturing.
  - We can supply knowledge and data as well as cultures!

Services provided by CSIRO-ANACC include:

- ✓ Culture supply
- ✓ Strain isolation and accessioning
- ✓ Genomic analysis
- ✓ Algal characterisation
- ✓ Microscopy
- ✓ Cryopreservation
- ✓ Culture handling expertise

Can undertake small format growth tests for characterising preferred environmental parameters a strain will grow in. E.g. 2-45°C temperature gradient table → optimal growth temperatures over 7-10 days (can do this for ~$2k)

CSIRO Aquawatch

Presented by: Nagur Cherukuru

The team is deeply involved in developing an integrated coastal monitoring and forecasting system for South Australia.

- *Insitu* sensing: Monitoring buoys (including 6 fitted with HydraSpectra instruments) and routine monitoring.
- Satellite remote sensing: Have assessed MODIS and VIIRS (both 1km pixels) for derivation of Tchl-a, TSS, CDOM and Kd products and now moving to Sentinel 3A

and 3B (300m pixels). LandSat-8 for SST (100m) and Tchl-a (30m) provides good resolution for estuaries, coastal waters and aquaculture sites.

- Spatial reporting and forecasting: Application of advanced Machine Learning models to produce near real-time water quality maps, single point forecasts and regional water quality forecasts.

A new model has been developed to retrieve TSS, DOC and Tchl-a from HydraSpectra remote sensing reflectance across multiple regions, with quite good results. Next iteration will include CDOM, Kd and HAB index.

A new AI-model is in development for time-series forecasting of water quality at buoy locations. Will include *uncertainty* of the forecasting and what is driving the prediction.

Satellite (Sentinel 2) derived prototype *Karenia*-HAB index was presented. Need for further validation but there are some promising results.

DCCEEW

Presenter: Patty McMahon

The SA HAB event highlighted a gap in national frameworks, with:

- slow onset events being ineligible for disaster funding, and
- the event remaining below thresholds for a 'national emergency'.

There is recognition that we need to be better prepared for marine events (marine heatwaves, coral bleaching, HABs etc.), including improved coordination and collaboration, nationally.

Australia's Sustainable Ocean Plan will be supported by a:

- National Ocean Steering Committee (cross-jurisdictional); and a
- National Ocean Advisory Group (multi-sector)

An early consideration of the steering committee will be how to coordinate nationally on marine event preparedness and response, including HABs. Jurisdictions will be invited to nominate representatives.

National collaboration elements we see value in exploring include:

1. Guidance for event response
2. Preparedness and resilience strategy (including consideration of future climate induced changes to the ocean)
3. National marine science capability assessment of readiness for future events.

Mapping session

General

- We collected extensive data from workshop participants and those who couldn't attend but had valuable insight into resources and expertise
- The provided information was compiled to provide a resource of current facilities, capabilities, programs and contact points in each jurisdiction

Capability Area	National	SA	WA	NSW	VIC	TAS	QLD	NT
Monitoring & Surveillance		✓	✓	✓	✓	✓		
Phytoplankton Taxonomy	✓	✓	✓		Limited	✓		
Molecular Methods (qPCR/eDNA)	✓	✓	✓	Limited		Limited		
Biotoxin Testing		✓	✓	External	External	✓		
Modelling & Forecasting	✓	✓	✓	Limited		Limited		
Seafood Safety Programs		✓	✓	✓	✓	✓		
Incident Response Coordination		✓	✓	✓	✓	✓		
Mitigation / Treatment Research		✓	✓					

Note: Data for QLD and NT were not received prior to the workshop and thus those columns should be interpreted as 'lack of data' not 'lack of capability'.

- This document will be cleaned and refined prior to being distributed.
- There is no current capacity or scheme to maintain this document on an ongoing basis
    - We are exploring the possibility that information about key members or facilities (?) can be housed within the ANZHABNet platform directory (Directory | The Australian And N) on an ongoing basis to provide a valuable resource within the HAB community.

Research[5]

Karenia research is being conducted in SA, TAS, NSW and as a component of work being done in WA. Most of these are looking at identifying what species/strains are

[5] Content represents the research discussed and does not represent the full amount of research going on within each jurisdiction.

present where and when, with some looking at what conditions are favourable or biotoxin production. SA work includes a stronger focus on bloom triggers. Via CSIRO, there is also a lot of information being collected on biooptics of *Karenia*.

Alexandrium related research has been a focus at UTS in NSW and currently there is a student looking at *Alexandrium pacificum* strains from around Australia. In WA, 3 state departments (Health, DBCA and DPIRD) collaborated with Murdoch University to better characterise *A. minutum* in the Swan Canning, toxin uptake in *Portunus pelagicus* (blue swimmer crab) and potential toxin mobilisation during cooking.

Gambierdiscus is a strong research focus at UTS in NSW. There is a current PhD looking at gene expression to try to understand triggers for ciguatoxin production.

Cyanobacteria research is the primary focus in both QLD and VIC. QLD's focus in the *Lyngbya majuscula* complex, while VIC has an FRDC project on Nodularins, as this is a big issue in the Gippsland Lakes (impacting fisheries).

Clay-based mitigation techniques are being assessed/trialled in WA (both DWER and DBCA) and have been assessed in SA.

Ecological impacts and **recovery research** is a significant focus of SA efforts, including investigating how artificial reed formation can help, or interventions such as moving cephalopod egg-casings under threat.

Kay Critchell (Deakin University) is leading a new project that will look at **modelling large-scale spatial risk across jurisdictions**. A key aim is to understand what to do with risk information and how to communicate it to the public and managers. There is funding to support these conversations about risk/preparedness and network over the next few years (Funded via Ian Potter Foundation, collaboration with The Great Southern Reef Foundation).

Focus session

Objective: Identify some of the key areas that would provide benefit in the short term and come to some agreement on actioning.

Table 1: Identified opportunities for science/management meetings

Leading body	Event, location	Dates
Australasian Society for Phycology and Aquatic Botany	40th Annual Meeting, Hobart	23-24 November 2026
Australian & New Zealand Marine Harmful Algal Bloom Network	2nd Technical workshop and symposium*, Hobart	25-26 November 2026
Water Research Australia	ANZ Cyanobacteria Workshop, Adelaide	3-4 August 2027
Australian Marine Sciences Association	Annual conference, Adelaide	July 2027
International Society for Applied Phycology	9th ISAP Congress, Perth; Murdoch Uni	21-26 November 2027

* Also planned inaugural ANZHABNet Annual General Meeting.

There was some discussion of potential for an annual meeting of government representatives and key stakeholders to facilitate updates, coordination and collaboration. This could tie in with another event or simply be online.

Other models that could be drawn from to create a marine HAB preparedness and response framework were briefly mentioned: ASQAAC/ASQAP, the U.S. HAB model, Water Research Australia.

Emphasis was given to the fact that many other countries face similar challenges, and that state and federal agencies need to integrate international information and best practice into updated HAB preparedness and response in Australia. This includes being aware of, and making use of, organisations and information sources such as the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms (IPHAB) and the International Society for the Study of Harmful Algae (ISSHA), as well as the Global Harmful Algal Blooms (GlobalHAB) Program – an international scientific program providing knowledge for policy and decision-making to manage and mitigate HAB impacts.

Funding for research and innovation was also discussed as a key issue.

- It was highlighted again that funding for phycological research projects is very low[6].

[6] A presentation by Rob Harcourt within the AMSA2026 conference presented information from *Guénard et al. PNAS 2025* estimating that fungi and algae combined receive <0.2% of global conservation funding. See publication for algae-specific values. Note this publication focused on 'conservation' projects.

- Is the competitive funding model working? Some comments both ways, but essentially the funding programs need to see the importance of this research beyond just the fishing/aquaculture industry.
- Institutional research priorities are not always the same as government. Coordinated prioritisation needs to take place via complementary mechanisms including the national framework, ANZHABNet (cross-sector), and other national and jurisdictional capability such as the SA Office of Algal Bloom Research.

A key item highlighted in this session, where there was **perhaps the greatest common concern, was the importance of communication both in preparedness and response components**.

- Being proactive rather than reactive and retrospective
    - While it might not change the bloom outcome, it could have a large impact on public perception and response.
- Set up community expectations for what a "good HAB response" looks like. Define the process using accessible language, including how uncertainty works into it and is addressed.
- *Should we set up a working group to coordinate nationally on public communications and messaging?*
    - Having a centralised portal for the public to refer to, removed from any particular jurisdiction, may help to address trust issues.

Next steps

Explore options to:

- maintain an open, collaborative and more coordinated network of marine HAB/stressor government representatives, researchers and industry stakeholders to support information exchange, coordination and collaboration (e.g. support ANZHABNet);
- establish a working group or other mechanism to improve stakeholder and public communication, including nationally consistent messaging, proactive education and the feasibility of a central public HAB information portal;
- improve coordination and prioritisation of HAB-related research and investment; and
- promote and support progress toward nationally consistent guidance, terminology and preparedness approaches.

Participant List

	NAME	ORGANISATION	ROLE
FEDERAL	Patty McMahon	DCCEEW – International Environment, reef & Ocean Division – Ocean & Wildlife Branch – Domestic Ocean Policy	Director
	Matt Barwick	DCCEEW – International Environment, reef & Ocean Division – Ocean & Wildlife Branch – Reef Restoration & Partnerships	Director
	Nagur Cherukuru	CSIRO – Data61	Principal Research Scientist
	Anusuya Willis	CSIRO - ANACC	Director
SA	Michael Steer	Office of Algal Bloom Research	Director
WA	Jeffrey Cosgrove	DBCA – Rivers and Estuaries Science	Senior Research Scientist, ANZHABNet founding member.
	Kerry Trayler	DBCA – Rivers and Estuaries Science	Principal Scientist
	Malcolm Robb	DWER – Aquatic Science	Manager, Chief Estuaries Officer
	Amanda Charles	DWER – Phytoplankton Ecology Unit	Manager
	Michaela Larsson	DWER – Aquatic Science	Senior Environmental Officer, ANZHABNet interim committee member
QLD	Glenn McGregor	DETSI – Water Planning Ecology, Science Division	Science Leader
	Phil Choi	QLD Health – Health Protection and Regulation Branch	Advanced Environmental Health Scientist
NSW	Hazel Farrell	DPIRD – Biosecurity & Food Safety	Shellfish Operations Officer NSW Shellfish Program, ANZHABNet interim committee member
VIC	Kimberley Macdonald	DEECA - Land and Biodiversity Policy Division	Team Leader, Marine Biodiversity
	Tim Lewis	VIC Fisheries Authority	Aquaculture Officer
	Randall Lee	EPA – Centre for Applied Sciences Deakin University (IMOS)	Senior Marine Scientist, IMOS sub-facility leader for Ships of Opportunity.
TAS	Kate Ollerhead	DNRE - ShellMAP	Senior Officer (biotoxins)
	Edward Forbes	DNRE - ShellMAP	Program Manager
ACADEMIC	Shauna Murray	UTS / ANZHABNet	Professor, Panel member IOC-IPHAB, Interim founding President of ANZHABNet
	Michele Burford	Griffith University – Australian Rivers Institute	Professor, Panel member IOC-IPHAB, NESP 5.15 project presenter.
	Kay Kritchell	Deakin University – Deakin Centre for Marine Science	Senior Lecturer, Project Lead: *Harmful algal blooms – where to act and what to do*.

General links

- https://www.nhmrc.gov.au/about-us/publications/guidelines-managing-risks-recreational-water

    There was brief mention in the workshop of the draft updates to the water quality guidelines.

- https://www.phfscience.nz/media/4e1cysks/esr-cawthron-health-managing-algal-blooms-recreational-settings-new-zealand.pdf

- https://www.anzhabnet.com (note the new HAB Projects page)

- https://www.marinespecies.org/hab/ (IOC-UNESCO taxonomic reference list of harmful microalgae)