



National Environmental Science Program

National Environmental Science Program

Marine and Coastal Hub annual progress
report 1 January to 31 December 2022



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Acknowledgement of Country

The Marine and Coastal (MaC) Hub acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Letter from the Hub Leaders

During the 2022 reporting period the MaC Hub has continued to deliver on Research Plan 2021 (RP 2021) and 2022 (RP 2022) projects and research-user engagement, and finalised submission of RP 2022 in March and RP 2023 in September. The reporting period also included delivery of the 2021 Annual Progress Report (APR) in April and continued engagement with the new Department of Climate Change, Energy, the Environment and Water (DCCEEW).

In particular, the Hub has invested considerable effort to understand the specific needs and priorities of the Department's numerous sections with responsibility for marine and coastal environments. Hub leaders, with the aim of addressing the key research outcomes defined in the funding agreement, have continued to engage with DCCEEW during 2022 to ensure projects continued to align with research-users needs following Machinery of Government changes and changing priorities. This included numerous workshops associated with RP2021 scoping projects, engagement with specific teams, and a series of face-to-face meetings with key line areas in Canberra in November 2022.

Work of the Hub in 2022 also continued to focus on building awareness of the MaC Hub, its goals, outputs and outcomes within DCCEEW, broader research-user communities and research partners through knowledge brokering and communication. This includes increasing the awareness of NESP research and impact at a local, regional and national scale by building and establishing partnerships and engagement with relevant networks.

RP 2022 was approved by DCCEEW in May and includes 7 projects that deliver to a range of priority needs identified by research-users, including mapping of temperate shelf habitats, advancing national best practice standards, developing tools for knowledge transfer to support Australian Marine Parks, examining waste-water discharges into marine environments, evaluating recreational fisher behaviours, mapping Australian sea lion habitats, and population surveys of southern right whales. Many of these projects built on research conducted within RP 2021 projects to fill priority knowledge gaps required to support management decisions.

The 2022 reporting period also included a second research plan (RP 2023), which includes 19 projects that were co-designed with research-users in the second half of the year, and which was submitted for approval in late September. The portfolio of projects reflects the high priority research needs identified through engagement between Hub research partners and research-users in RP 2021 projects, particularly scoping projects, or other relevant research-user input. The projects are also those that; could deliver an outcome to address the high priority needs; included co-design to address research-user needs; and address National Environmental Science Program (NESP) project assessment criteria.

During the year the Hub also worked with the Steering Committee to develop and endorse a shorter, focused Hub 'narrative' that illustrates the Hub's Vision; integrating i) natural capital supporting economic and social values, ii) improving Indigenous futures (through engagement and participation), and iii) innovations in monitoring and decision-making. There was also a commitment that projects should aim to include at least two if not all three components of the narrative, and that there needs to be a mix of applied and strategic projects. There is also an agreed position that projects should aim to add value, leverage additional resources, and be innovative where possible. They should also be co-designed to ensure clear pathways to influence policy and decision making.

In an operational context, the two node teams are continuing to work well together and rising to the challenges of the Hub, which includes 30 institutional partners spread across all regions and the key national research agencies.

In the course of 2023, the Hub will continue to engage closely with research-user and partners, and a showcase event will be held in Canberra in March 2023 to bring together researchers and research

users to discuss the Hubs strategic direction, key research outcomes, and planning for future investments.

Management

The NESP is a long-term commitment by the Australian Government. The program funds environmental and climate research. The second phase of NESP builds on the foundations of past work, and funds 4 research hubs from 2020–21 to 2026–2027.

The Hub completed a broad range of management activities in 2022, which involved continuation of the overall program Steering Committee and Hub Executive Team within the University of Tasmania (UTAS), Reef and Rainforest Research Centre (RRRC and James Cook University (JCU) (including Hub leaders, executive officers, knowledge brokers, communications officers, data wranglers, Indigenous facilitators and administrative support). Support for the implementation of the Hub's Protected Place Management Initiative also continued, with fractional positions in both northern and southern nodes.

The RP 2022 was developed and accepted by the Department (milestones 8 and 9 in the Funding Agreement). The 2021 APR was delivered and accepted by the Department (milestones 10 and 11), and the RP 2023 was developed and accepted by the Department (milestones 12 and 13). Seven projects in RP 2022 and 19 projects in RP 2023 were collaboratively developed with the Hub's research partners, research-users and Indigenous organisations.

The Hub's knowledge brokers have been coordinating evaluation processes for the Hub's strategies, and are working closely with the Hub leaders, Indigenous facilitators, communication managers and data wranglers to progress the evaluations. Evaluation processes include the following parts:

- Determine if the Hub has/has not implemented the commitments outlined in the strategies and the current status of each commitment
- Provide insights about where the Hub needs to make improvements for implementing commitments in strategies
- Provide a summary of evaluation findings and recommendations to improve strategy outcomes.

The Hub has informed DCCEEW about our evaluation processes, and the department is interested in the processes and outcomes of our evaluations, in particular with regard to how our work may complement their efforts to evaluate program performance in the four strategy areas. Preliminary insights from the evaluations will be provided to the Hub's Steering Committee at their meeting in March 2023.

Research

NESP hubs deliver world-class, practical, evidence-based research to inform decisions. This investment helps build adaptation capacity and resilience in our natural environment and communities.

NESP research has real impact through partnerships and collaboration between researchers and research-users, including policy-makers, to deliver proven outcomes. Environmental decision-makers are key partners and are encouraged to articulate their needs to researchers; provide feedback on the quality and usefulness of the research outputs; and be engaged in the communication of how this information has informed policy.

NESP research listens to and prioritises the research needs of Indigenous land and sea managers, weaves together Indigenous and western environmental knowledge systems and celebrates Indigenous-led approaches to strengthening and sharing knowledge.

New and existing NESP research findings are available to use and accessible at Australian Government and hub websites.

Progress towards research delivery

The portfolio of projects in RP 2022 reflects the high priority research needs identified through engagement between Hub research partners and research-users in RP2021 projects, particularly scoping projects, or other relevant research-user input. The projects are also those that could address the high priority needs within the timeframe and available budget, had capacity for co-design with research-users, and more broadly addressed the defined NESP project assessment criteria.

Across the seven projects in RP 2022, the expected high-level outcomes include:

- Improved management of marine park continental shelf assets by enabling managers to target their monitoring priorities to inform condition assessments and the effect of management interventions
- Best practice approaches to collecting, analysing, managing and reporting marine data
- An integrated national approach to Australian Marine Park data and data products to allow the condition of park values to be evaluated with the latest available data/knowledge
- Improved access to information on natural assets and pressures
- Provision of knowledge of nutrients and contaminants (i.e. chemicals of emerging concern, antimicrobials and microplastics) to inform assessments of risk into the marine environment
- Improving a considered, longer-term approach to voluntary compliance with marine parks through implementation and evaluation of the use of behavioural change interventions with recreational boaters and fishers
- Improved understanding of habitats dependency and key threats to Australian sea lion populations required to support future conservation actions to recover the species
- Information on population trends required to assess the Conservation Management Plan for Southern Right Whales (2011-21) and development of future management plans.

The nineteen projects in Research Plan 2023 have also detailed the proposed high-level outcomes within their individual project plans, and have been developed to address priority needs of research-users.

In order to continue to build capacity and understand Indigenous needs, the Hub continued the success of past Indigenous workshops and symposia by coordinating the 2022 Indigenous symposia *Better Together*, and the Australian Marine Science Association Indigenous workshop at the annual conference in Cairns in July. The Hub has also been successful in their bid to host a similar symposium – *Better Together - genuine Indigenous partnerships in 2023* at the 2023 AMSA conference in Gold Coast in July, and continues to provide support for the 2023 Indigenous workshop. For RP 2023 the Hub Indigenous Facilitators assisted in the review of Indigenous engagement categorisation and helped in the consideration of appropriate Indigenous engagement within each of the projects.

The Hub continues to contribute to the National Marine Science Committee (NMSC), and the significance of this contribution is reflected in Hub executive co-authorship of two NMSC working group reports that were released in early March. These are part of the National Marine Science Plan 2015-25 deliverables, and include:

- Establishing and supporting a national marine baselines and monitoring program
- Implementing Integrated Ecosystem Assessments (IEAs)

In addition, MaCI Hub project leaders have engaged with line areas within DCCEEW relevant to their project, including contribution to workshops, meetings and one-on-one engagement to discuss knowledge gaps and priority needs. These discussions have also involved contributions from Commonwealth R&D corporations (e.g. Fisheries Research and Development Corporation (FRDC)), authorities (e.g. Australian Fisheries Management Authority, National Offshore Petroleum Safety and Environmental Management Authority), and key marine agencies (e.g. Australian Hydrographic Office). Hub research have also consulted with numerous community and industry partners and research end-users from both State and local government to better understand need and potential research impact.

The Protected Places Management Initiative has been an important activity focus for the Hub during the reporting period, and for more information on the Initiative see the Research section above and Cross-cutting initiatives below.

Research projects

Attachment A lists the projects funded under the MaC Hub and provides information on the project status, information on outputs and links to products for all projects (where available). Exceptions to the *NESP data and information guidelines* are also noted there.

A total of 39 projects are assessed in Attachment A across RP 2021 and 2022. Overall, a total of 29 RP 2021 projects are completed, with a further 3 currently undergoing review of their final reports. Several RP 2022 projects have had minor delays in commencement, either due to contracting delays across projects with a large number of Hub partners, or supply chain issues with field equipment. There are no significant difficulties and/or risks emerging due to these delays. There are no 'amber' projects where there are real or potential difficulties and risks to project delivery.

The Hub has also been successful in generating cash co-investment for our research projects in RP 2022 and RP 2023. On top of in-kind contributions >\$14.5M, >\$3.8M cash was also contributed towards our research. This included major contributions of >\$1M towards our dugong project (Project 3.10) and \$519,000 from FRDC towards our sawfish project (Project 3.19). These contributions indicate the support for our work from relevant partners.

Cross-cutting initiatives

During 2022 the Hub continued to advance the Protected Places Initiative, with the support of two Initiative co-leads, one in each of the Hub's nodes. As part of the Initiative, Hub staff engaged extensively with research-users (including numerous relevant sections in the Department), research partners and stakeholders to collaboratively advance a co-design approach to the Initiative during the reporting period.

Several projects that support the Protected Places Initiative were included in both RP 2022 and RP 2023. Projects include developing a deeper understanding about the Initiatives focus areas, vision, activities and outcomes, with three co-designed research project proposals developed to advance the Initiative in RP 2022 (projects 2.1, 2.2 and 2.3).

The Hub has worked collaboratively with other Hubs during the reporting period to advance all four NESP cross-cutting Initiatives. All Initiative leaders are meeting monthly to promote a collaborative, cross-Hub approach to the initiatives. The Hub co-leads and knowledge brokers also continued to meet with Initiative leaders to promote a cross-Hub approaches. The Hub has met with Initiative leads in other Hub's to explore and advance approaches for waste management (e.g. Release and impact of chemicals, antimicrobials and microplastics into the marine environment), climate adaptation and protection of the assets in the coastal zone, and conservation planning for threatened and migratory marine species and ecological communities (e.g. southern right whales, sawfish, Maugean skates). These advances have instigated important discussions that will advance in 2023 and 2024.

Emerging priorities

The Hub does not have an approved emerging priorities project within RP 2022 or the version of RP 2023 submitted in September 2022. Following an approach from DCCEE staff members in late 2022, the Hub has worked to develop an emerging priority project on Indigenous engagement with blue carbon across Australia. This is titled *A National Approach to Indigenous Engagement in Australia's Blue Carbon and Environmental Markets* and will be submitted in early 2023 for assessment.

Performance against milestones

Performance against funding agreement milestones

All milestones for the reporting period and to date have been met as per the funding agreement (Milestones 1 to 12).

Performance against the research plan milestones

Information on project progress and performance is provided in Attachment A.

Measuring success

Hub outcomes and outputs

Build awareness of the Marine and Coastal Hub, its goals, outputs and outcomes: The Hub has continued to build shared understanding about the Hub goals, outputs and outcomes with relevant research-users and its researcher partners. Targeted knowledge brokering, communication and Indigenous facilitation continued over the course of the reporting period, particularly with regard to research priorities and research planning processes. The second and third research plan built on the foundational outputs developed in RP 2021 that were key to building shared understanding.

Work with the Department to increase the awareness of NESP research and impact at a local, regional and national scale: The Hub continued to prioritise engagement with DCCEE in the reporting period to establish a clear understanding of the Australian Government research needs, priorities and links with other research-users at local, regional and national scales. This has included developing working relationships with new DCCEE staff following the agency re-structure and staff movements. The Hub has increased awareness of the NESP research across the key Divisions of the Department, including how best to engage with the Hub to co-create and co-design research proposals. This has included delivery and promotion through the Hub website, media releases, social media and national presentations to research users.

Re-establish and build partnerships and relationships with previous and new networks to co-design and co-deliver research projects: Hub leaders, Initiative leaders, knowledge brokers and the Indigenous facilitator have built a broad range of partnerships critical to co-create, co-design and co-delivery of research during the reporting period. This has included a focus in 2022 on building on partnerships among the Hub's 30 research partners, research-users outside of the Department such as the FRDC, and including Indigenous organisations (e.g. NAILSMA, Malgana Aboriginal Corporation and Kimberley Land Council), State and territory governments and non government organisations (NGOs) (e.g. The Nature Conservancy and Ozfish).

Deliver priority research areas and questions to be addressed in future Research Plans. Shared understanding among research partners and research-users in developing projects in RP 2022 and RP 2023 in the reporting period continued to build on the co-design and co-delivery of projects, many

of which were informed by the Hub research scoping projects. This included insights to priority research areas and questions that were used to identify 7 priority research topics to be advanced in RP2022, and 19 priority research topics to be advanced in RP 2023. These formed the basis of the portfolio of research projects developed and approved within RP 2022 and RP 2023.

The Hub continued implementation of its Data Management Strategy to generate shared understanding among research partners and research-users about expectations and requirements for availability and access to the outputs and products. The data managers have met with all project leaders to agree on data requirements and responsibilities at the project level. The foundational outputs for the Hub (i.e. RP 2022 and 2023, project plans, research summaries and Hub strategies) are available to the public on the Hub's website.

The Marine and Coastal Hub has delivered a large and diverse range of outputs during 2022, including 27 technical reports, 2 published manuscripts, 13 information sheets, 7 media releases, 56 metadata records, 25 published datasets, 2 web applications, 1 programming code, and 4 videos/films. The key outputs relate to the technical reports arising from projects in Research Plan 2021, which cover a broad range of thematic topic areas including:

- Australian Marine Park management effectiveness, natural values and survey planning
- Roadmaps and frameworks to support coastal and marine restoration
- Mapping of key coastal and marine natural values across northern Australia
- Threatened species studies across a range of taxa groups and regions
- Improving knowledge on microplastics in south-eastern Australian coastal waters
- Scoping projects that covered issues such as wetlands, protected places, northern Australian regional planning, nutrients and chemicals, and socio-economic values

These outputs were important in helping prioritisation of further investment in Research Plans 2022 and 2023. A number of projects have extended their reporting into 2023 and will be available to inform the development of projects in Research Plan 2024.

The outputs extended into the publication of a large number of metadata records which are fundamental to the ongoing coordinated management and delivery of research data through a range of national marine data portals.

Short- to medium-term outcomes – quantitative measures

Table A: Quantitative performance measures (short- to medium-term outcomes)

Notes: Reporting period means the calendar year preceding the Annual Progress Report. For the second year of NESP 2 hubs, the reporting period is January to December 2022. Unless specified otherwise, the term ‘research-user’ refers to departmental and/or external users. The data below will ideally provide numbers derived from routine Hub monitoring and reporting. Where an estimate is provided, please explain how it was determined.

No.	Performance measure	Result for reporting period (numerical only)	Explanation, if any
1	Proportion of projects (active or completed in the reporting period) for which there is a research-user actively engaged in the project: a) co-design b) research delivery c) use and research uptake	a) 39/39 b) 39/39 c) 39/39	
2	Research outputs in the reporting period provided to research-users on time and as identified in the approved research plans: d) total number e) proportion	d) 98 (in total) e) 86% (on time)	Technical reports (27), information sheets (13), Published manuscripts (2), metadata records (56)
3	Proportion of completed research projects that are confirmed to meet the needs of departmental research-users as identified at project co-design stage	100%	Self-assessment identified that all approved projects were scoped with primary research users. The Hub also engages identified research users in the development, and review of research outputs
4	Number of projects that: a) are Indigenous-led b) meet research and management priorities of Indigenous stakeholders c) are Indigenous-led projects that also meet research and management priorities of Indigenous stakeholders.	a) 5 b) 17 c) 5	
5	Number of peer-reviewed, NESP-funded publications during the reporting period	29	Technical reports (27), Journal papers (2)
6	Number of NESP research citations in other researchers’ publications during the reporting period	0	There has been insufficient time for Hub outputs to be cited in following publications

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No.	Performance measure	Result for reporting period (numerical only)	Explanation, if any
7	Number of completed NESP products, research publications, datasets and metadata that are discoverable and accessible in accordance with <i>NESP data and information guidelines</i> and the funding agreement	137	Technical reports (27), Published manuscripts (2) information sheets (13), media releases (7), metadata records (56), published datasets (25), web applications (2), programming code (1), video/film (4)
8	<p>a) The number of datasets and management tools produced by Hub research and made public.</p> <p>b) The number of other datasets and management tools that benefitted from hub research and outcomes.</p> <p>Management tools include but are not limited to monitoring systems; web-based decision support systems; environmental management tools for Indigenous communities, waters and land management; plans of management for Indigenous Protected Areas (IPAs), co/jointly managed parks, marine park plans of management, conservation agreements.</p>	<p>a) 18 datasets, 2 management tools</p> <p>b) 4</p>	<p>a) AusSeabed Survey Coordination Tool: https://www.ausseabed.gov.au/survey-coordination-tool</p> <p>Living shorelines database: https://livingshorelines.com.au/projects/</p> <p>b) Seamap Australia, SRW relative abundance; habitat mapping spatial data, National Outfall Database</p>
9	<p>Number (full-time equivalents) during the reporting period of:</p> <p>a) PhD students</p> <p>b) post-doc and early-career researchers</p> <p>c) mid-career researchers</p> <p>d) Indigenous researchers</p> <p>e) individual volunteers (total)</p> <p>f) individual Indigenous volunteers (total)</p> <p>g) Indigenous sub-contractors</p>	<p>a) 1</p> <p>b) 18</p> <p>c) 38</p> <p>d) 2</p> <p>e) 30</p> <p>f) 20</p> <p>g) 5</p>	The number of PhD students is expected to increase significantly as 3 year projects are developed in RP 2024 that extend through to 2026.
10	<p>Number of knowledge-sharing and communication events and activities held or shared:</p> <p>a) with on-ground managers (general)</p> <p>b) jointly with Indigenous researchers and Traditional Custodians</p> <p>c) that are Indigenous-led</p>	<p>a) 294</p> <p>b) 9</p> <p>c) 4</p>	
11	<p>Proportion of hub staff and researchers who have completed:</p> <p>a) Indigenous cultural capability training</p>	a) 30%	

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No.	Performance measure	Result for reporting period (numerical only)	Explanation, if any
	<ul style="list-style-type: none"> b) Indigenous cultural and intellectual property training c) both Indigenous cultural capability training and Indigenous cultural and intellectual property training 	<ul style="list-style-type: none"> b) 15 c) 1 	
12	<p>Proportion of hub projects overall that fall within the categories of the Three-category approach:</p> <ul style="list-style-type: none"> • Category 1 • Category 2 • Category 3 	<ul style="list-style-type: none"> • Category 1 - 7 • Category 2 - 8 • Category 3 - 24 	<p>The details of the categories are provided with the research plans</p>
13	<p>Proportion of hub projects that have been developed in consultation with the hub Indigenous facilitator or the Indigenous Facilitation Network</p>	10	
14	<p>Number of guidelines about best-practice that the hub has produced or co-produced in the reporting period, for:</p> <ul style="list-style-type: none"> a) knowledge brokering (e.g. https://www.nespthreatenedspecies.edu.au/publications-and-tools/connecting-research-with-policy-guide-to-writing-for-policy-makers) b) Indigenous partnerships and products (including design of flagship engagement activities e.g. <i>Our Knowledge Our Way; Three Category Approach</i>) c) environment and climate management within the scope of the hub's research (e.g. <i>Guidelines for the translocation of threatened plants in Australia, Third Edition</i>; https://www.nespmarine.edu.au/project/project-d2-standard-operating-procedures-survey-design-condition-assessment-and-trend) 	<ul style="list-style-type: none"> a) 1 b) 2 c) 8 	<ul style="list-style-type: none"> a) Knowledge brokering strategy b) Indigenous Partnerships Strategy; AMSA 2022 Indigenous Workshops c) NAOI portal for survey mapping, Guidelines for a universal approach to marine and coastal restoration monitoring in Australia, Hub data Management Framework for 2023; Guidelines for expanding the community-based 'Seeds for Snapper' seagrass restoration program coordinated by OzFish, Roadmap, O& G Infrastructure, Blue Carbon, Nth Aust regional Planning

Longer-term outcomes – qualitative measures

The expected outcomes of the NESP are to produce research that:

- enhances our understanding of Australia’s environment, climate and weather;
- is communicated clearly to relevant stakeholders and the public;
- is discoverable and accessible; and
- informs decision-making and addresses environmental priorities.

It is too early to fully evaluate the outcomes achieved from the Hub’s research. All Hub projects involve extensive end-user engagement and involvement. All have some degree of Indigenous engagement and several are Indigenous-led. The scoping studies that were part of RP 2021 ensured wider end-user engagement and input and have now led to more detailed multi-year research projects that are better defined and more widely supported because of the scoping studies they emerged from. The scoping studies themselves have also led to synthesis outputs of data. For example, the consolidation of all seagrass mapping for northern Australia and the consolidation of all dugong population surveys ever conducted in Australia, both of which are now collated and with publicly available reports and underlying datasets. The seagrass dataset was utilised in the development and publication of an Environmental Account for blue carbon, undertaken by DCCEEW. This environmental account assessment required GIS format datasets which the Hub was able to provide.

Our successful engagement of >100 Indigenous leaders from across the country at the AMSA Indigenous workshop in Cairns in July 2022 enabled us to generate and receive the widespread support to underpin the creation of a project to scope the development of a National Environmental Research Network. This was subsequently developed into a project in RP 2023 and is part of the approved plan. We believe this will be a major milestone in advancing national coordination of Indigenous environmental interests.

Early signs of qualitative measures of longer-term outcomes are evident in the Hub’s impact stories (see next section on NESP impact stories).

NESP impact stories

NESP impact stories are provided at Attachment B. These stories showcase the contribution of NESP -funded research beyond contributions to academia, including to the environment, the economy, society, culture, public policy and quality of life.

Three impact stories have been collated around the three key outcome areas that represent the Hub ‘narrative’. These three key outcomes areas were developed with the steering committee during 2022, and are identified as:

- natural capital supporting economic and social values
- improving Indigenous futures
- innovations in monitoring and decision-making.

Collaboration and partnerships

NESP encourages a collaborative, multi-disciplinary approach to environmental and climate research. Key to the success of the hub will be the capacity to foster partnerships across hubs and with a wide range of decision-makers across the Australian community, including Indigenous communities, to achieve positive environmental, social and economic outcomes.

Knowledge brokering

The Hub's approach to knowledge brokering during the reporting period has focused on advancing the first five objectives of the Knowledge Brokering Strategy. The primary focus has been on establishing networks of research partners and research-users. Three Regional Reference Groups have been formed to establish networks of both partners and key research-users across temperate Australia. A network of relevant staff in the Department has also been established to facilitate knowledge exchange between the Hub and the Department. The Hub has generated shared understanding about research-user needs and priorities, and actively engaged research-users in co-design and co-delivery of scoping projects designed to define questions to be answered by applied science. Significant effort has been invested to understand the needs of the Australian Government and how these relate to the needs and interests of State and territory governments and industry. Knowledge brokers provided all project leaders with tailored advice about meeting the engagement expectations of the Department; a particularly challenging task given the extensive list of departmental research-users included in project plans. The Knowledge Brokering Strategy is being reviewed in 2023.

Communication

During this reporting period hub communication officers worked with researchers, knowledge brokers and Indigenous facilitators to identify and respond to communication priorities, in accordance with NESP guidelines. A website was developed and populated with program information, research plans, fact sheets, project summaries, media releases and project reports. The website was reviewed and an upgrade was initiated to provide increased functionality. A communication schedule was developed to document communication priorities and activities. Social media profiles were further developed in Facebook, LinkedIn and Twitter. Articles were contributed to NESP News and hub communication officers joined NESP hub communicator meetings. The Hub has instigated a quarterly external newsletter (The Blue Drummer), that will provide both partners and research-users regular updates of Hub outputs, projects and research planning processes and timelines. The Communication Strategy is being reviewed in 2023.

Indigenous partnerships

The Hub's approach to Indigenous partnerships has included a range of activities. The appointment of a second Indigenous Facilitator (Southern Node) was a pivotal development for implementing the Hub's Indigenous Partnerships Strategy and contributing to the NESP Indigenous Facilitators Network during the reporting period. The Indigenous Facilitators worked with the Hub's Steering Committee and Leadership team to consider the 2021 APR and the Research Plan for 2023. The Indigenous Facilitators worked with project leaders to promote Indigenous science partnerships in research projects. Project 1.31, a national-scale project, was delivered with the primary focus of promoting Indigenous participation in the Hub's research and identifying Indigenous research needs to inform RP 2023. A number of smaller-scale projects with Indigenous collaboration and engagement were advanced during the reporting period. The Indigenous Partnerships Strategy is being reviewed in 2023.

Data management

The Hub's approach to data management during the reporting period has focused on ensuring research project plans are consistent with the Hub's strategy, including clear articulation of project outputs and consistency with the FAIR (findable, accessible, interoperable and reusable) data principles. The Data Wranglers met with project leaders to agree on a data management plan for their projects. A data delivery schedule has also been established specific to the new set of research projects enabling Data Managers to proactively engage with project teams on data discovery and accessibility. The Data Management Strategy is scheduled to be reviewed in 2023.

Hub-level risk management

All risks identified in the hub's risk management plan are being actively managed. The Hub maintains an ongoing risk register which is reviewed, and if required, updated, at every Hub Steering Committee meeting. The four identified key risk areas are:

1. Co-led, two-Node model – risk of divergent strategy and process across Nodes, inability to deal with different needs across north and south, duplication/omission across Nodes.
2. NESP a long-term commitment – risk of being too reactive to operational needs and failing to 'shift the dial' over the longer term
3. Co-design – risk it's not achieved
4. Indigenous participation – risk it's not achieved

Below is a table representing the Steering Committee's risk status and mitigation.

At the last Steering Committee meeting, Risk 2 was considered to be increasing (vs stable) based on the fact that we have a relatively new Australian Government/Environment Minister whose priorities are emerging.

Risk	Mitigation	Status
<p>1. There is a possibility that the co-led, two- Node model Hub will not</p> <ul style="list-style-type: none"> • deliver an integrated national program • respond to differing research needs across northern and southern Australia • coordinate effectively across other Government initiatives to avoid duplication and omission 	<ul style="list-style-type: none"> • Single, effective steering committee • Clear strategy identifying where the Hub will engage, where it will lead or partner • Joint process for project approval • Focus on national priorities, even where implementation is regional • Joint planning and budgeting for indigenous partnerships, knowledge brokering, data management, and communication • Project development and approval driven by user and stakeholder needs 	Stable
<p>2. Given the Hub's broad user and stakeholder base there is a risk of being reactive to issues highlighted by those most involved rather than being genuinely responsive to national priorities</p>	<ul style="list-style-type: none"> • Focus on national priorities, even where implementation is regional projects • Project development and approval driven by user and stakeholder needs 	Increasing
<p>3. The Hub aspires to co-design its project portfolio with research users to ensure research has relevance and impact. There is a risk that the Hub will not devote the time, resources, and focus on cultural change required to do this well.</p>	<ul style="list-style-type: none"> • Well-designed, well-led, well-resourced scoping studies to set the tone • Review mechanisms to monitor progress • Strong research user engagement via the steering committee 	Stable
<p>4. The Hub aspires to go beyond current levels of indigenous engagement to enable meaningful indigenous participation in its research program. There is a risk that the Hub will not devote the time, resources, and focus on cultural change required to do this well.</p>	<ul style="list-style-type: none"> • Well-designed, well-led, well-resourced scoping studies to set the tone • Review mechanisms to monitor progress • Strong Traditional Owner engagement via the steering committee 	Stable

