

# Policy-driven research on *RV Investigator*

## FACILITATING COLLABORATION BETWEEN SCIENTISTS AND USERS OF THEIR RESEARCH

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A summary of 2 workshops to connect end-users with researchers interested in applying for Marine National Facility sea time, to discuss end-user needs, researchers' solutions, and to consider co-design of proposals.

**APRIL 2021**



Photo: Owen Foley



## THE MARINE NATIONAL FACILITY

**The Marine National Facility (MNF) awards grants of sea time (fully funded by the Australian government) for marine and atmospheric research through a competitive application process.**

The MNF comprises:

- the ocean-class Research Vessel (RV) *Investigator*
- advanced multidisciplinary scientific equipment and instrumentation
- a repository of marine data collected since the MNF's inception in 1984
- operational and technical personnel with the expertise required to manage an ocean-going research platform and support vessel users.

RV *Investigator* can flexibly and safely cater for diverse and multi-disciplinary research needs that rely on a range of capabilities, including:

- oceanographic (surface to deep-sea salinity, temperature, oxygen, carbon and trace metal equipment)
- biological (shallow to deep echo-sounding, towed bodies, grabs, sleds and biomass, chlorophyll and dissolved organic matter equipment)
- atmospheric (facilities for weather balloon release and sonde profiling, instruments for sunlight, aerosol, cloud and other component measurements and the world's first Global Atmosphere Watch regional mobile station capability)
- geophysical survey and mapping (dredging, coring and silent operation capability, geophysical, gravity, magnetic and seismic profiling equipment and high-resolution multibeam echosounder mapping capability).

## Informing national policy

**As an enabler of Australian marine research, the MNF facilitates the delivery of national benefit through support of research that explicitly requires the unique capabilities it can provide in addressing the nation's marine sector policy priorities.**

Accordingly, one stream of grants in the 2021 application round is dedicated to research projects that directly inform, influence and address a national policy-driven priority. Applicants must demonstrate that they have engaged and worked with end-users to ensure their research project will generate information of value.

One priority area is for the management and protection of Australian Marine Parks – with Parks Australia the end-user – and the other is improving Australia's Earth system modelling capability – with the Bureau of Meteorology (BoM) the end-user.

The MNF is allocating up to 120 days of sea time to policy-driven research proposals. At around \$100,000 per day, this represents a significant investment on behalf of the nation. Successful proposals are given access to ship time and the instrumentation that is on board. While RV *Investigator* is equipped with extensive technology, researchers are encouraged to request any necessary additional equipment and work with the MNF to interface user-supplied instruments with the vessel.

This brochure summarises 2 workshops organised by the MNF in April 2021 to connect researchers interested in applying for sea time with end-users, to discuss end-user needs, researchers' solutions and to consider co-design of proposals.



Photo: CSIRO

# End-user science priorities

## PARKS AUSTRALIA

**Parks Australia manages 58 Australian marine parks that cover vast areas and include a variety of ecosystems. Access to sea time under the MNF's policy-driven research stream provides an opportunity for scientists to collaborate and fill priority knowledge gaps.**

These priorities include:

- systematic monitoring and establishing of baselines
- understanding biodiversity in remote or threatened marine parks
- improving the understanding and management of pressures in marine parks.

Parks Australia is particularly interested in improving data on:

- natural values (habitats, communities and species), especially the population dynamics for threatened species that reside or have important aggregation areas in marine parks
- seafloor features.

Parks Australia seeks to understand how well their management zoning techniques are working by monitoring the condition of benthic habitats, communities and species. They are interested in data to improve understanding of management science and managing pressures in marine parks. Benthic research and research into ecological communities would contribute to this priority. While the primary focus is marine parks, the organisation has an interest in research conducted between marine parks and the zones outside them, as comparing these zones can measure the effectiveness of the Parks Australia zoning technique.

Re-sampling sites that were sampled 10 to 12 years ago would be of interest, as changes are important to track, especially if the initial measurement period was before marine parks were established. Such measurements help to identify impacts associated with management decisions and actions.

Parks Australia seeks to protect benthic habitats and species by developing better ways to mitigate the pressure on these areas or to build resilience of these areas to:

- impacts of ongoing fishing activities
- impacts of climate change on ecosystems at depths between 30 and 2000 m
- connectivity between populations.

Parks Australia will consider baseline information, risk and cost-effectiveness when selecting monitoring priorities. They also prioritise developing time- and cost-effective methods to research marine environments in ways that have low impact on ecosystems.

It is important to involve Indigenous people early in the research project proposal process. Applicants should allow Indigenous people to choose the level of involvement they have.

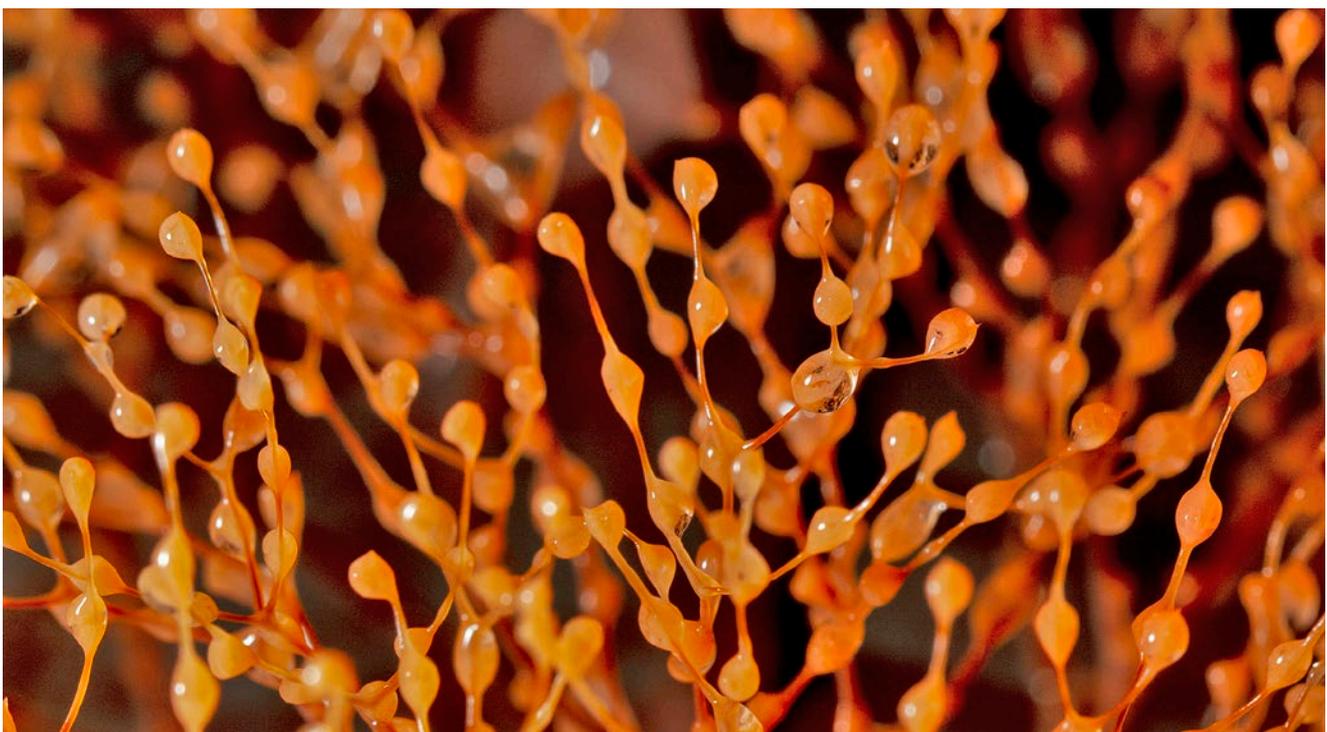


Photo: Fraser Johnston

# End-user science priorities

## BUREAU OF METEOROLOGY

**The Bureau of Meteorology (BoM) is integral to providing Australia with reliable weather and climate forecasts. Access to sea time under the MNF's policy-driven research stream provides an opportunity for scientists to collaborate and address priority research areas.**

These priorities include:

- supporting the integration of atmosphere, ocean, sea-ice and hydrology models
- improving understanding, informed by observations, of fundamental Southern Ocean atmospheric processes, including a focus on the Antarctic marginal ice zone.

The BoM is particularly interested in proposals that address an Earth system prediction capability. To align with the MNF and BoM's priorities, scientists are encouraged to pursue research with a focus on improving modelling systems that link data from, and support the integration of, atmosphere, ocean, sea-ice and hydrology models.

Such research, together with measurements of the Antarctic marginal ice zone, will provide benefit to Australia by supporting defence, maritime safety, sea ice forecasting, and forecasting weather to seasonal scales, which will enable more advanced warning for extreme events and multi-hazard events.

*RV Investigator* can work from the tropics to 70 degrees south, and can sail within all Australian waters, so tropical areas are within the scope for applications, provided the research aligns clearly with the BoM's priorities. While the Indian Ocean is important for science, it is not a priority for the MNF's policy-driven research stream, so research in this area is better proposed under the discipline-driven access stream.



Photo: Francis Chui

# Scientists' research ideas

At the workshops, there was clear alignment between scientists' research ideas, interests and plans, and end-user priorities.

## MARINE PARKS

**Key areas of interest from represented research agencies included:**

- conducting an ecosystem survey to determine what has changed in the southeast marine ecosystem hotspot over the past 25 years
- co-designing a benthic survey in the Coral Sea to generate more baseline data
- conducting surveys in areas that have not been surveyed for 10 years or so, to gain insights into cultural and biodiversity values
- engaging with Indigenous communities
- improving seafloor mapping across Australia's marine estate
- focusing on deep-water seagrass and macroalgae as benthic refugia habitats
- long-term monitoring of fish and recruitment
- identifying drivers and barriers to ecological function in the Tasmanid Seamounts
- targeting areas such as the seafloor for specimen-based research
- researching seagrass and algae in the Great Barrier Reef
- investigating deep-water seagrass in Torres Strait.

In co-designing proposals, it is important to be aware that Parks Australia and scientists may have different foci and perspectives. Parks Australia has a more strategic focus, whereas researchers often concentrate on a particular research issue. Nonetheless, several research suggestions during the workshops aligned well with Parks Australia priorities.

Researchers participating in the workshop discussed a range of potential projects relating to marine park end-users' priorities.

Research to generate long-term data directly addresses Parks Australia's priority to create better baselines and undertake systematic monitoring, and will help to measure and manage park performance. Benthic surveys to collect data to better manage pressures on this habitat will help build its resilience. Comparing data with previous surveys will help to gauge the effectiveness of marine park establishment and zoning. Seafloor mapping and characterisation will help to improve marine modelling capabilities. Long-term fish monitoring and research into barriers and drivers of ecological function will support Parks Australia's priorities of monitoring ongoing fishing activities, assessing the impacts of climate change and understanding the connectivity between populations within marine parks.



Photo: CSIRO

## CLIMATE MODELLING

**Key areas of interest from represented research agencies included:**

- focussing on Southern Ocean clouds and radiation, particularly processes close to the Antarctic coast to increase understanding of the connection between clouds and coastlines
- identifying observation gaps and biases in Southern Ocean-atmosphere interactions, including direct measurements of ocean fluxes and changes in ocean ice-shelf interactions to improve climate models
- understanding the similarities and differences of atmospheric processes, especially cloud and precipitation processes between the mid- and high-latitudes and at the north and south of ocean fronts
- understanding boundary layer processes, air-sea interactions and sub-Antarctic mesoscale cyclones
- focussing on air-sea interactions, particularly wave forecasting and interactions with sea-ice
- calibrating and validating Surface Water and Ocean Topography (SWOT) satellite observations
- improving climate forecasting.

Researchers discussed potential collaborations, including on East Australian Current eddies and East Coast Lows, and potential SWOT satellite calibration and validation activity collaboration off southwestern Australia.



Photo: Max McGuire

## Next steps

**The MNF has adopted a flexible approach to scheduling to better support applicants. To maximise the potential for support and flexibility during the January 2023 to June 2024 schedule applicants should begin discussions with both the MNF and end-users as early as possible.**

Communication is critical for a successful application. It is important to work with end-users to ensure research is directly relevant and useful, and that data will be freely available.

Timing is important when seeking collaboration or a letter of support from end-users. Both Parks Australia and the BoM require at least 3 weeks before the application due date to prepare a letter of support for applications.

Research proposals requiring funding from Parks Australia must state this requirement at the outset. If it is not possible to work directly with the BoM, then partnering with a consortium that is delivering the BoM's goals is permissible, such as the UK Met Office.

The MNF encourages applications to the policy-driven stream with the knowledge that a project can be selected for a primary voyage without having to fill the whole ship or have multiple projects. The application should build a case on what can be achieved on the ship within the applicant's research area, the primary mission of the project, and the strategic priority driver.

The MNF recommends that researchers pursue collaborative

projects for the primary application call. Later, to address multiple research priorities, there is the possibility of a supplementary project proposal call. Researchers may then be offered berths on the vessel and a small allocation of sea time during the voyage, with the ability to direct the vessel or, alternatively, a piggy-back project with no opportunity to direct the vessel. After the primary applications have been approved and scheduled, there will be a call for supplementary applications and, if there is space, the MNF will also offer piggy-back projects. The MNF is currently creating a digital tool – the Marine and Application Planning System – for applications across the primary-supplementary-piggy-back project spectrum.

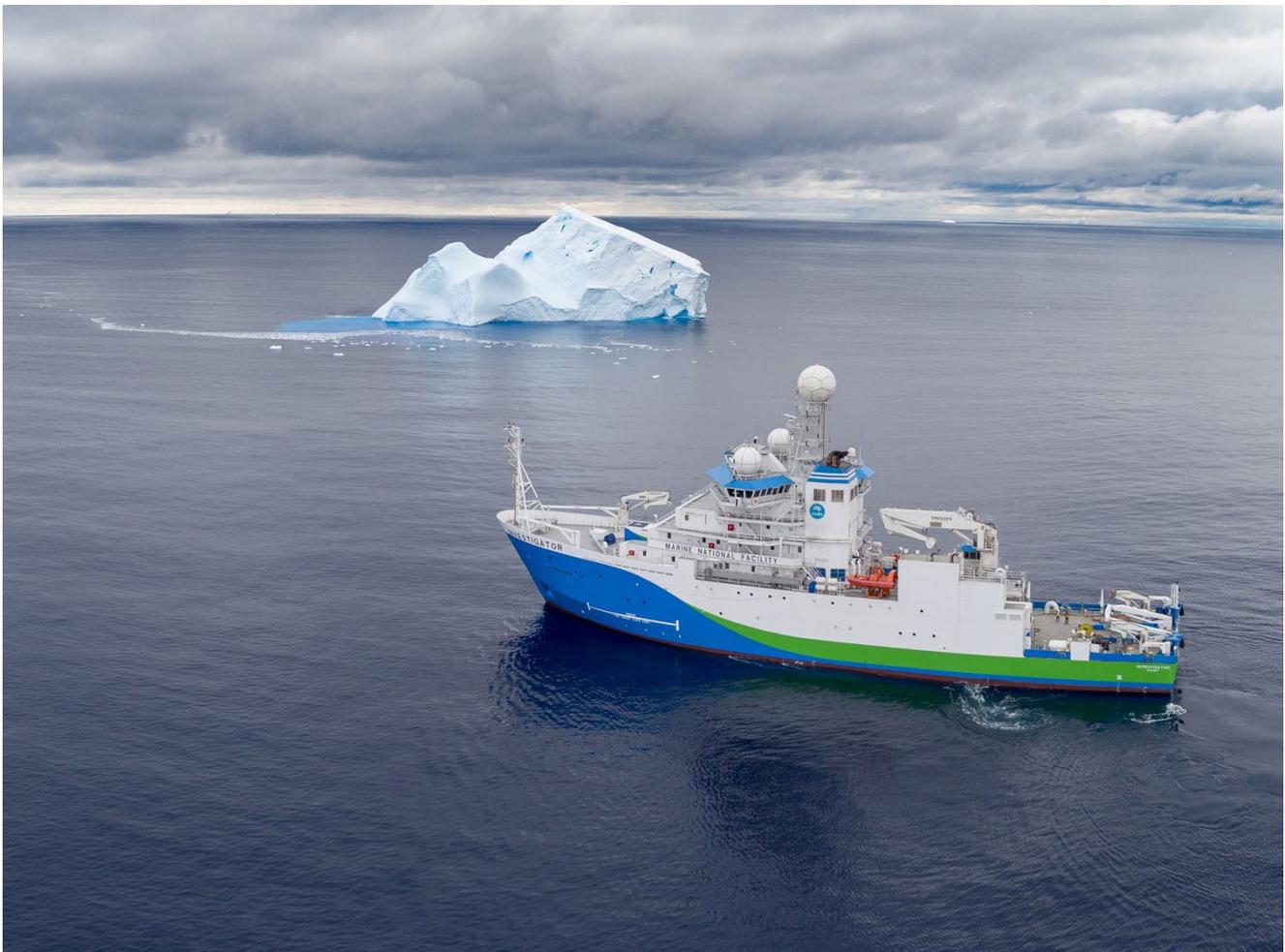


Photo: CSIRO

Scientell and the MNF acknowledge the Traditional Owners of the land, sea and waters of the area that we live and work in across Australia. We acknowledge their continuing connection to their culture, and we pay our respects to their Elders past and present.

The MNF is a national facility for marine research funded by the Australian Government and owned and operated by CSIRO on behalf of the nation.

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The information contained in this publication comprises general statements based on workshop discussions. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert advice.

#### FOR FURTHER INFORMATION

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Photo: Susan Wijffels

