



NOPSEMA

Australia's offshore
energy regulator

NOPSEMA Research Strategy





As Australia's independent regulator for offshore energy operations in Commonwealth waters, NOPSEMA uses balanced and quality research outputs to support our ability to effectively fulfill our role.

Currently, proponents commission monitoring and research to suit individual projects as it is needed and at times take a collaborative approach where it is warranted. There is an opportunity for industry to take a more collaborative and transparent approach to addressing common research priorities across a broader range of industry activities and scientific disciplines in order to utilise its resources more effectively, meet the needs of a broader suite of end-users and more effectively tailor research outputs to support offshore activity management and regulatory approvals processes.

While NOPSEMA does not carry out, or commission research, it is in a unique position to identify key research gaps and priorities (related to science and research) across industry that lead to uncertainty in risk and impact assessments and activity management.

In response, NOPSEMA has been promoting industry-wide collaborative approaches using fit-for-purpose data in addressing key research priorities in recent years, and have now formalised our approach in the NOPSEMA Research Strategy.

The strategy aims to provide industry with a clear vision for enhanced research outcomes and includes NOPSEMA's goals and role in supporting that vision. The Research Strategy will be accompanied by a regularly updated list of research priorities, based on current and emerging issues and industry activities, to help guide industry and the research community funding and design decisions.

For more information or to initiate a discussion about the Research Strategy or priorities, please contact environment@nopsema.gov.au.

A group of whales swimming in clear blue water. One large whale is in the foreground, swimming towards the right. Two smaller whales are swimming above it, and another is further away in the background. The water is a deep, clear blue.

NOPSEMA Vision

Industry take a collaborative approach to prioritising, funding and designing research that will deliver outputs to enhance confidence in the management of offshore energy projects

Improved understanding of species, processes, places and other industry activities to support improved impact and risk assessments and offshore energy activity management.

Industry and the research community address identified research priorities in a timely, collaborative and coordinated way.

Varied, balanced and transparent research outputs with clear pathways to adoption in risk and impact assessment, regulatory decision-making, and activity monitoring and management.

NOPSEMA Goals

Enhanced uptake of relevant research products into national databases, national mapping systems, standards, best practice documents and national policy and management documents.

Greater use of science and research on a balanced portfolio of study types to improve links between industry performance, outcomes and reporting at regional and national levels.

Improved stakeholder confidence in ecologically sustainable development outcomes.

NOPSEMA Actions

Engage directly with industry and Government agencies to identify needs and options for collaborative research framework(s) in Australia.

Promote best practice options for collaborative research frameworks and funding models for Australia's framework.

Utilise intelligence from regulatory activities, research outputs and relevant external forums to maintain and publish a list of industry related research gaps and priorities.

Monitor industry and regulatory uptake of research outputs and environmental outcomes to inform future regulatory priorities and national reporting.

Engage directly with industry, Government and research organisations to promote research priorities and principles for planning and design of research to meet end-user needs.

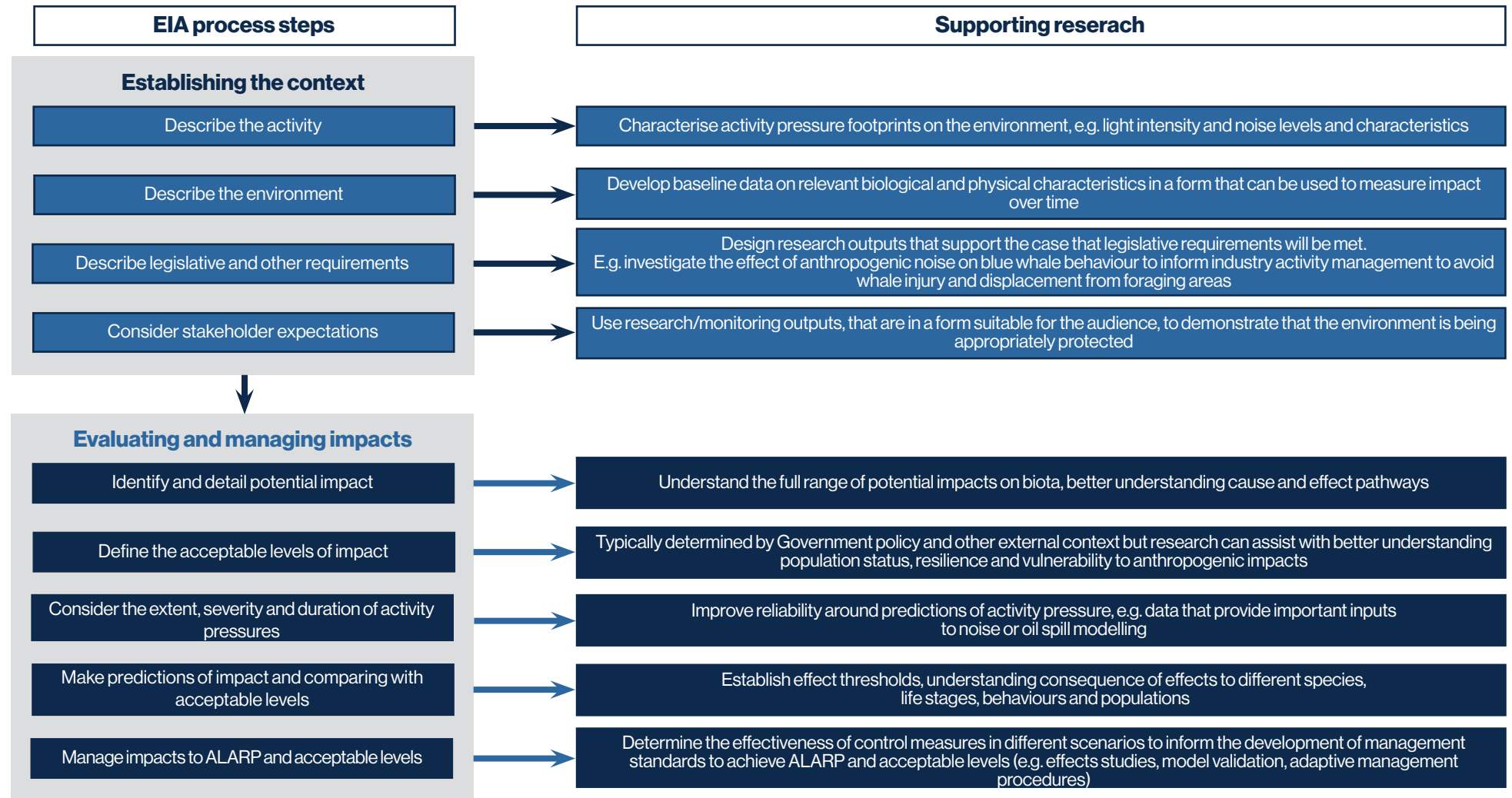
Implement institutional structures to retain and develop technically competent staff with relevant expertise in research and impact assessment, in a regulatory setting.

Use communication tools to clarify that NOPSEMA does not have a role in conducting or funding research but is a research end-user.

Collaborate with Government agencies to agree research needed to support implementation of relevant policies and facilitate uptake of contemporary research into centralised databases.

Utilise regulatory processes and broader communication channels to address inaccurate interpretations or misuse of relevant science.

Environmental Impact Assessment (EIA) related research



Environmental Research Priorities 2022-2025



Current and emerging industry activities and environmental values that may be affected

GOAL

Improved understanding of species, processes, places and other industry activities to support improved impact assessments and offshore energy activity environmental management

Map shows indicative locations of multi-use overlap (current and future activities) with environmental values at highest risk of impact from those uses in Commonwealth waters



Species focused research

- Zooplankton productivity and its relationship with habitat utilisation by threatened species, e.g. whale foraging
- Dynamics of fish eggs and larvae movement in the plankton, particularly for commercially and ecologically important species to inform potential consequences from underwater noise impacts
- Species distribution, abundance, population health, demographics and utilisation of important habitats that overlap with oil and gas, carbon capture and storage and renewables activities;
 - Southern right whales
 - Pygmy blue whales
 - Marine turtles
 - Seabirds
 - Migratory shorebirds





Underwater noise related research and mitigation measures

- Including chronic and acute noise from seismic, pile driving, drilling, operational noise, dynamic positioning vessels, cutting, blasting
 - Blue whales, southern right whales: behavioural responses to underwater noise and implications for feeding, fitness and breeding success in the context of species recovery requirements
 - Best practice and innovative measures for detection of whales and mitigation of impacts from noise
 - Commercially important fish and invertebrate species: impacts from noise to fish and fisheries (reproduction, catchability)
 - Planktonic life stages for commercially important species (e.g. rock lobster): impacts from underwater noise and population consequences
 - Marine turtles: behavioural and physiological responses to underwater noise and implications for feeding, fitness and breeding success in the context of species recovery potential

Decommissioning related research, monitoring and mitigation

- Timeframes for breakdown/corrosion of infrastructure and potential release of contaminants and pollutants if decommissioned at sea
- Fate and consequence of released contaminants and pollutants in the environment
- Identification of thresholds describing the impacts of contaminants around decommissioned infrastructure and advice for their use in predicting and monitoring impacts
- Impacts and benefits of removal of infrastructure as well as impacts and benefits of disposal at sea (on or off title) in the context of current legal requirements and government policy positions
- Condition of communities associated with infrastructure over time (inc contamination of edible species)
- Importance of offshore infrastructure for ecological connectivity and implications of removal (including potential spread of invasive marine species)
- Increased productivity of fish communities due to offshore infrastructure vs aggregating fish from other locations
- Understanding of impacts and risks that infrastructure left in-situ may have on future human activities/industries (e.g. trawl fishing)
- Best practice and innovative methods for environmentally safe remediation of seabed contamination during decommissioning (when and how to remediate)
- Best practice techniques for monitoring of seabed contamination and associated consequences for ecological integrity, biodiversity, and/or human uses



Wind farms monitoring and mitigation

- Baseline condition and understanding of ecosystems, migratory pathways, feeding grounds and populations suitable for informing environmental impact assessments, impact monitoring and ongoing activity management
- Local and regional seabird species - collision risk and barrier effects, potential consequences on population, health and viability
- Migratory shorebirds and landbirds that migrate over the ocean - collision risk and barrier effects, consequences for local populations, the ecological character and biodiversity value of Ramsar wetlands and obligations under international agreements
- Best practice wind farm and turbine design to monitor for and mitigate impacts to birds and fisheries
- Best practice offshore windfarm installation techniques to mitigate noise impact
- In-field monitoring techniques to effectively monitor bird collisions with turbines over time to inform adaptive management
- Cause effect pathway for noise and electromagnetic field impacts to sharks, rays, fish, invertebrates and other migratory species
- Benthic habitat restoration and creation potential associated with wind farms using international case studies where relevant
- Wind farm, aquaculture and fishing industry potential synergies – maximising cooperative coexistence

Light related research, monitoring and mitigation

- Impact of light and other attractants from offshore structures on behaviour, breeding and feeding ecology of seabirds
- Impact of light from offshore structures on migratory behaviour of seabirds and shorebirds
- Best practice methods for lighting wind farm turbines to reduce night time collision risk for birds without compromising navigation and vessel safety
- Best practice methods for deterring seabirds from roosting and nesting on offshore structures (including consideration of light and other attractants)
- Best practice techniques for monitoring and management of 'light trapped' birds
- Best practice methods and instrumentation for measuring light to assess its effect on birds and marine turtles
- Light impact thresholds (relevant to offshore environments) for assessing the level of artificial light that may be tolerated without disrupting biologically important behaviour of nesting adult marine turtles (including neophytes), seafinding hatchlings and dispersing hatchlings
- Cumulative impact assessment techniques for predicting the impact of multiple light sources on marine turtles within the same nesting stock
- Methods for monitoring and detecting changes in marine turtle stock trends following the introduction of artificial light sources in offshore nesting habitats
- Continuous improvement in best practice techniques for reducing light on offshore structures to minimise impacts on marine turtles and other receptors



Greenhouse gas emissions (GHG) and climate change

- Feasibility for conversion of petroleum infrastructure (including wells) for use in carbon capture and storage (CCS) activities
- Best practice techniques for reducing GHG emissions from offshore production facilities
- Enhancing feasibility and cost effectiveness of CCS as a means of supporting climate change mitigation
- Best practice techniques for low environmental impact GHG formation monitoring techniques that are also compatible with other sea uses e.g. windfarms
- Best practice fugitive emissions management including methane reduction technologies in the offshore sector
- Potential for clean energy as a source of power to reduce GHG emissions on offshore facilities
- Potential for compressed natural gas (CNG) to export excess associated gas to a close proximity gas market/gas distribution/pipeline grid to reduce gas flaring.