WAMSI Westport Marine Science Program

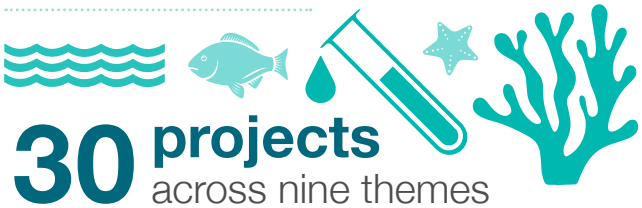
GOVERNMENT OF WESTERN AUSTRALIA

WESTPORT

Westport has established a three-year partnership with the Western Australian Marine Science Institution (WAMSI) to deliver a research program of Kwinana's Cockburn Sound, the location of WA's future terminal.

$13.5M
research partnership

More than
100 scientists
and researchers



30 projects
across nine themes

The WAMSI Westport Marine Science Program will progress environmental and social research and modelling such as:

- Create a comprehensive environmental baseline soundscape to understand underwater noise in Cockburn Sound.
- Develop hydrodynamic modelling to understand how water quality and circulation may change due to Westport.
- Identify the critical species, habitats and ecological processes that underpin the environmental and social values of the Sound.

Research findings will help Westport make considered, science-based decisions as design progresses, and inform effective, long-term mitigation strategies so that ecosystem health is maintained for future generations.

WESTERN AUSTRALIAN MARINE SCIENCE INSTITUTION

Evolution of the Science Program

The WAMSI Westport Science Plan is a culmination of years of planning and consultation with a wide range of stakeholders ensuring it is fit for purpose, robust and innovative.

The program focuses on nine research themes, which were established through a series of 16 expert workshops involving scientists, key stakeholders, and community representatives.

Timeline

April 2018	The Westport Environmental Work Stream (EWS) is established with 30 plus members from across government, industry, port authorities, environmental organisations, and community interest groups
Aug 2018	Preliminary risk assessment Identifies 33 key marine values to be investigated by Westport's science program
Dec 2019	Westport and its partner agencies develop Westport's environmental work plan and budget
Early 2020	Westport's environmental work plan refined based on discussions with key stakeholders
Mid 2020	Draft WAMSI Westport Marine Science Program (WWMSP) scope developed
March 2021	Westport and WAMSI formalise collaborative agreement
May 2021	WAMSI workshops commence to develop the science program for nine key themes
Sep 2021	Westport funds $13.5m WAMSI Science Program to conduct 30 well-defined scientific studies
Nov/Dec 2021	First science projects commence
July 2022	WAMSI Westport Science Plan released

Themes and Projects

Theme	Objective	Projects
Ecosystem modelling	To develop an ecosystem model to understand how water quality and habitats may change under various possible future senarios.	**1.1** Integrated ecosystem model platform. **1.2** Pathways to productivity: Development of a water quality response model for Cockburn Sound. **1.3** Characterise the trophic structure, ecosystem attributes and functioning of Cockburn Sound, using conceptual, qualitative, and quantitative ecosystem models.
Benthic habitats and communities	To improve our understanding of benthic communities and processes, with a focus on seagrass rehabilitation and restoration.	**2.1** Benthic Habitat mapping. **2.2** Pressure-response relationships, building resilience and future proofing seagrass meadows. **2.3** Seagrass restoration program. **2.4** Benthic communities in soft-sediment and hard substrates (baseline data, pressure-response relationships of key biota for Environmental Impact Assessment (EIA), and mitigation strategies for artificial reefs.

Project 2.3 will result in a significant expansion of the Seeds for Snapper program. This will include funding for:

- Volunteer coordinator training camps.
- SCUBA and free diving coordinator manager.
- Two researchers to work with volunteers on technical aspects.
- Increasing collections to 1,000,000 seeds in 2023.

These resources will increase the capacity to collect, process and deliver seeds, and expand the program in terms of activity, number of seeds and number of species.

In the long-term, outcomes from Project 2.3 will provide a better understanding of the most effective ways to collect, process and distribute seeds.

Projects 2.4 and 4.5 will investigate the settlement of native and introduced species on a set of different substrates, under different conditions and at different locations.

Understanding how to improve the effectiveness of substrate in a concentrated area will allow for the development of successful, large-scale initiatives.

In Westport Stage 4, subject to approvals, Westport will work with key stakeholders to design, plan and implement an artificial habitat informed by this research.

Theme	Objective	Projects
Water and sediment quality	To develop a comprehensive environmental baseline and understand contaminants, nutrient sources and recycling.	**3.1** Water and sediment quality monitoring. **3.2** Processes governing nutrient and contaminant cycling in Cockburn Sound. **3.3** Elements of the groundwater/surface water flux into Cockburn Sound.

Theme	Objective	Projects
Fisheries and aquatic resources	To understand seasonal movements of key species, the habitats they seek out and the food they rely on.	4.1 Snapper connectivity and evaluation of juvenile stocking. 4.2.1 Spatial distribution and temporal variability in life stages of key fish species in Cockburn Sound. 4.2.2 Zooplankton in Cockburn Sound. 4.2.3 Trophic pathways and food web structure. 4.3 Investigating effects of climate change on biota in Cockburn Sound. 4.4 Effects of total suspended solids on key fish species. 4.5 Investigating effect of Westport Development on invasive species risks to Cockburn Sound.
Hydrodynamic modelling	To understand how water quality and circulation in Cockburn Sound may change due to Westport and climate change.	5.1 Hydrodynamic modelling.
Social	To identify and understand the community values connected to Cockburn Sound.	6.1 Community values for changes in environmental conditions. 6.2 Opportunities and impacts for recreational fishing from the Westport development. 6.3 Recreation, amenity and aesthetic values. 6.4 Benefit-cost framework for environmental port design features.

Project 6.1 will use an independent research agency to recruit around 1000 people, statistically representative if demographics across the Perth metro area.

Project 6.2 will seek participation from recreational fishers and members of fishing clubs in the Cockburn Sound area

Project 6.3 will seek input from all recreational users of Cockburn Sound.

Theme	Objective	Projects
Noise	To develop current and future underwater 'soundscapes' of Cockburn Sound to understand, and manage, the potential effects of underwater noise.	7.1 Baseline soundscape, sound sources and transmission. 7.2 Hearing sensitivity of Australian sea lions, little penguins, and fish. 7.3 Behavioural response of fish to noise.

Theme	Objective	Projects
Apex predators and iconic species	To improve our understanding of the distribution and seasonal movements of conservation-significant and iconic species, the habitats they seek out and the food sources they rely on.	**8.1** Determining the diet, causes of mortality, foraging habitat and home range of little penguins using Cockburn Sound. **8.2** Investigate the abundance, movement, habitat use and diet of Australian sea lions in the Perth Metropolitan area. **8.3** Spatio-temporal distribution of key habitat-uses and key prey species for Indo-Pacific bottlenose dolphins in Owen Anchorage and Cockburn Sound, including a fine-scale understanding of the use of the habitats in the Kwinana Shelf. **8.4** Spatio-temporal distribution of syngnathids (e.g., seahorses) in Cockburn Sound.
Coastal processes	To better understand patterns and drivers of sediment transport and the processes of beach accretion and erosion in Cockburn Sound and Owen Anchorage.	**9.1** Coastal processes and sediment movement in Cockburn Sound and Owen Anchorage.

List of the Science Themes and projects current as of June 2022

About WAMSI

The State Government established the Western Australian Marine Science Institution (WAMSI) more than 15 years ago as a collaborative marine science research partnership to benefit all Western Australians.

Comprising 11 partners, WAMSI is an independent collaboration of state and federal government and academic science organisations working together to provide independent marine research for the benefit of the environment, community and to encourage better stewardship of our ocean.

Contact WAMSI www.wamsi.org.au info@wamsi.org.au (08) 6488 4570

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About Westport

The Westport Program is the State Government's long-term program to investigate, plan and build a future port in Kwinana with integrated road and rail transport networks.

Westport takes its environmental obligations very seriously, particularly in and around Cockburn Sound. Westport's ultimate vision is to plan, build and operate the most sustainable port in Australia, targeting a carbon neutral supply chain.

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