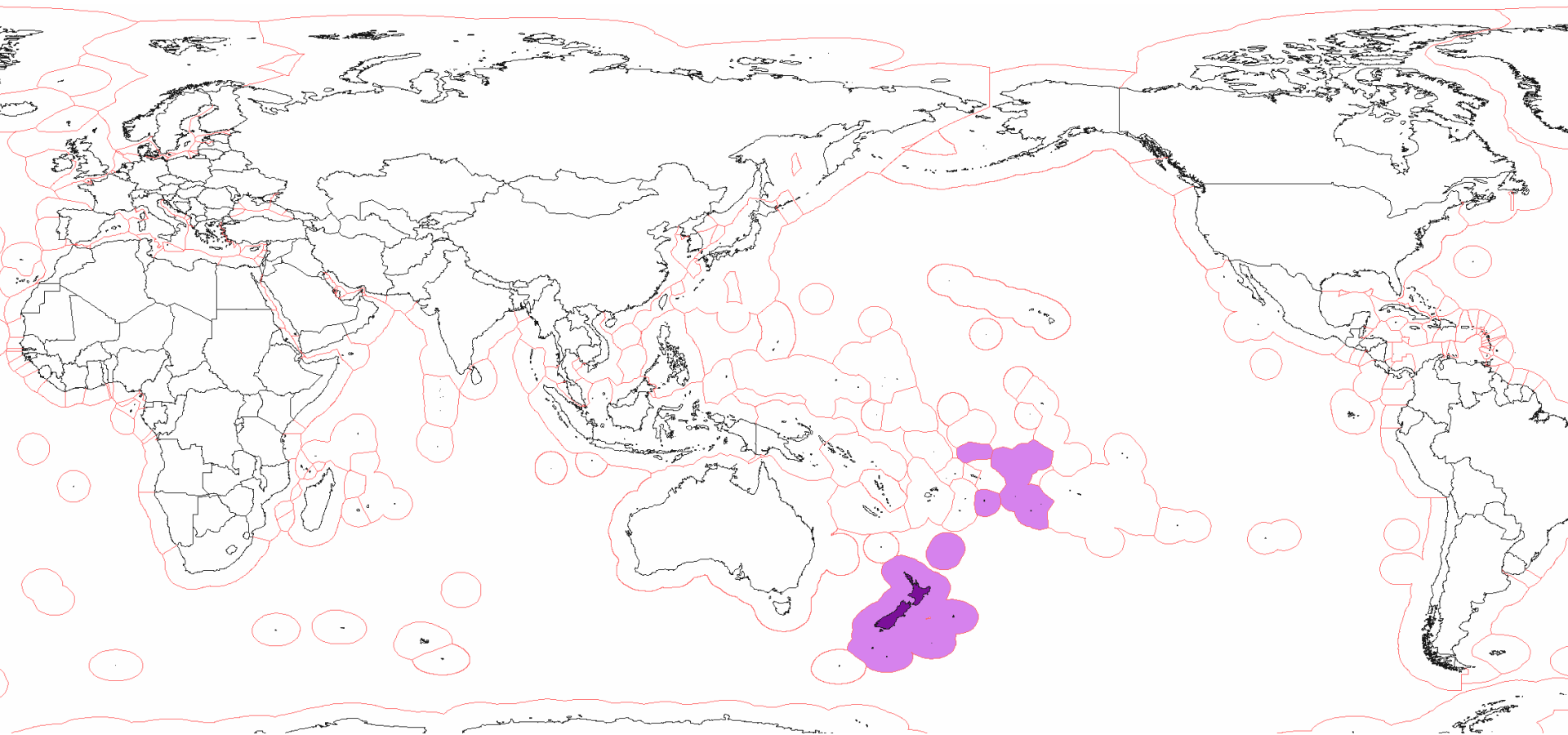
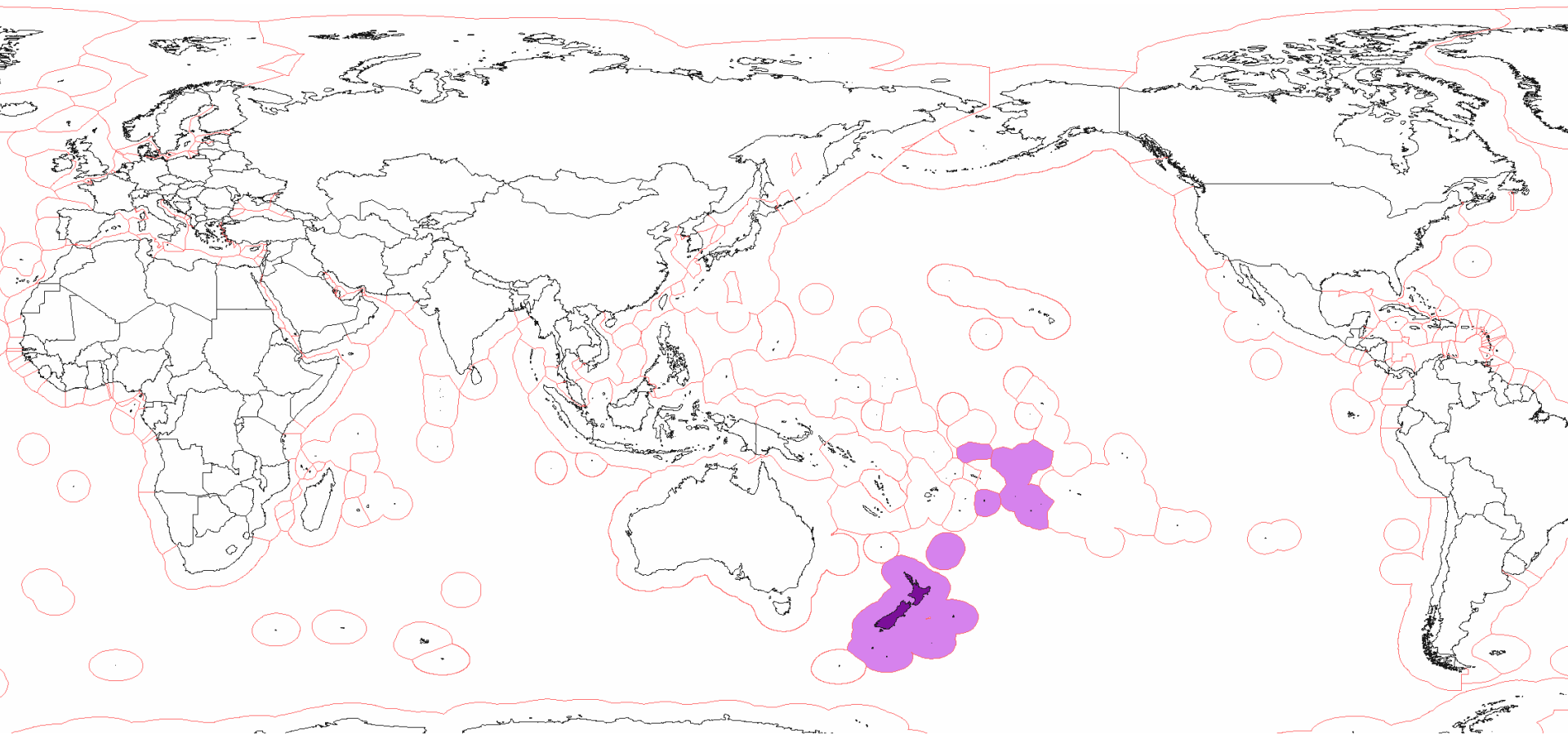


# Managed Seas Programme Lead: Chris Cornelisen





*“truth ... is much too complicated to allow anything but approximations”*

John von Neumann, 1947

*“Essentially, all models are wrong, but some are useful”*

George Box, 1987



# Managed Seas

**Aim:** Deliver innovative and effective decision support tools that integrate the knowledge generated by the Challenge to support ecosystem-based management, ensuring sustainable utilisation of our marine resources

## PROJECT LEADS

**Ian Tuck** (NIWA, University of Auckland)

**Matt Dunn** (NIWA)

**Carolyn Lundquist** (NIWA, University of Auckland)

**Graeme Inglis** (NIWA)

**Ross Vennell** (Cawthron, University of Otago)

**David Thompson** (NIWA)



# So what is Managed Seas all about?

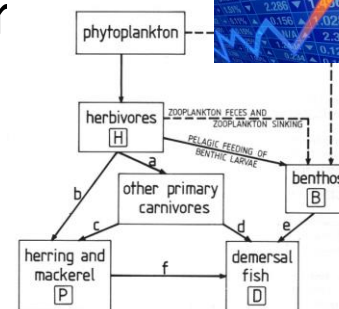
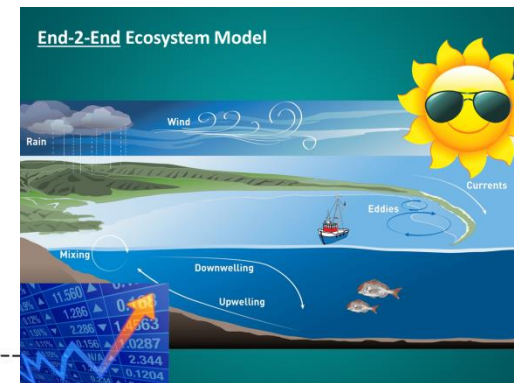
- Identifying and developing effective tools for use in EBM
- Making the complex accessible and practical
- Providing the means to explore 'what if' scenarios
- Addressing the issue/challenge of managing resources amidst high levels of uncertainty
- Embracing technology and developing interfaces that encourage and facilitate participation
- Close involvement of Māori and stakeholders in tool development and implementation
- Increasing understanding and developing trust in model use

# Projects

## 5.1.1 Ecosystem models

**Aim:** Develop, test & compare a range of “end to end” ecosystem models to assist in decision making

- Atlantis model for Tasman and Golden Bays
- Alternative ecosystem models, and the implications of their assumptions
- Validate and compare approaches to determine most appropriate / useful for particular situations

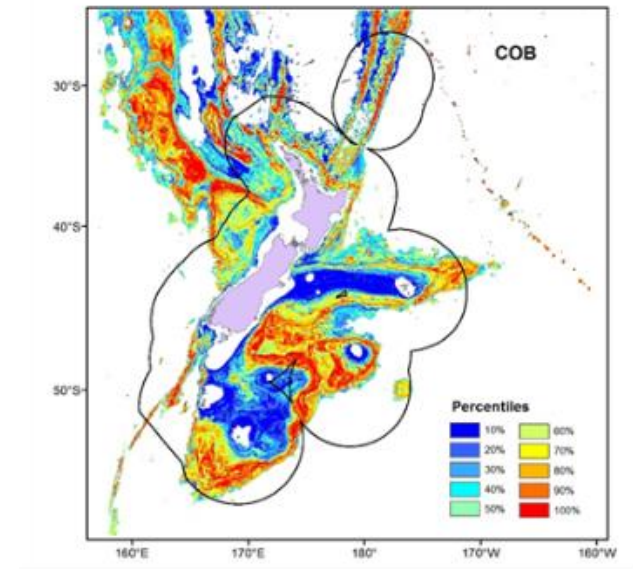
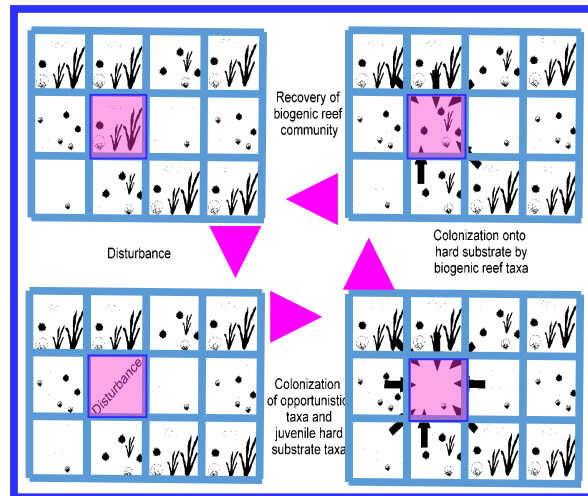


# Projects

## 5.1.2 Spatially explicit decision support tools

**Aim:** Compare management scenario results across a range of modelling tools, including cost-effectiveness of simple versus complex tools

- Prioritisation and trade-off models
- Disturbance and recovery models



# Projects

## 5.1.3 Risk and uncertainty

**Aim:** improve our abilities to incorporate risk and uncertainty into decision making. The project will review and adapt methods to:

- Estimate the likelihood of highly uncertain transitions such as “tipping points”
- Assess risks from multiple stressors
- Quantify bounds in uncertainty



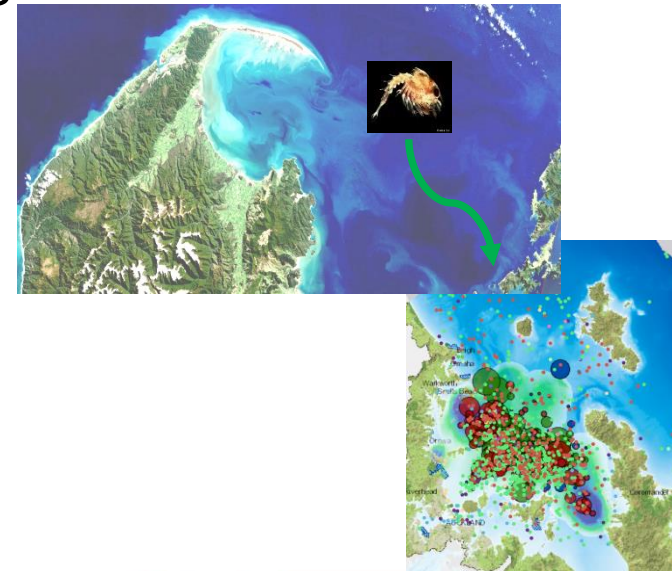
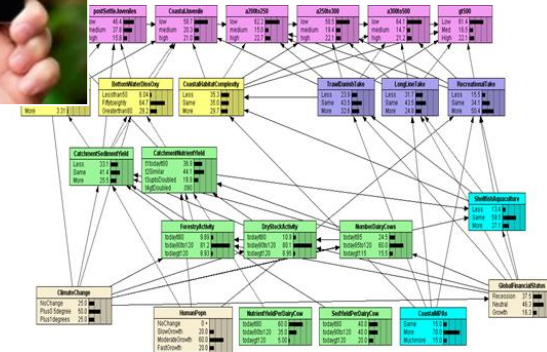


# Four primary projects

## 5.1.4 Participatory tools

**Aim:** create novel interfaces that encourage wide participation within the Managed Seas programme and other projects across the challenge

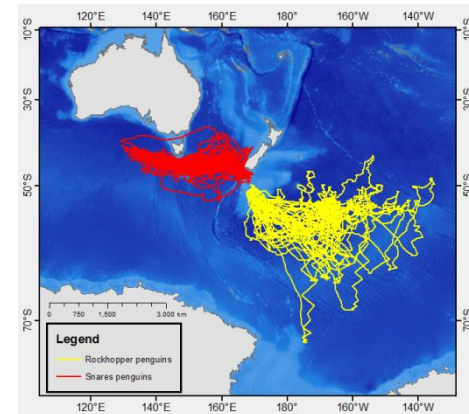
- Develop engaging interfaces for interacting with tools that help in decision making (Bayesian Networks)
- Develop web-enabled applications for facilitating two-way exchange of data and knowledge (e.g. information capture, visualisation, citizen science)



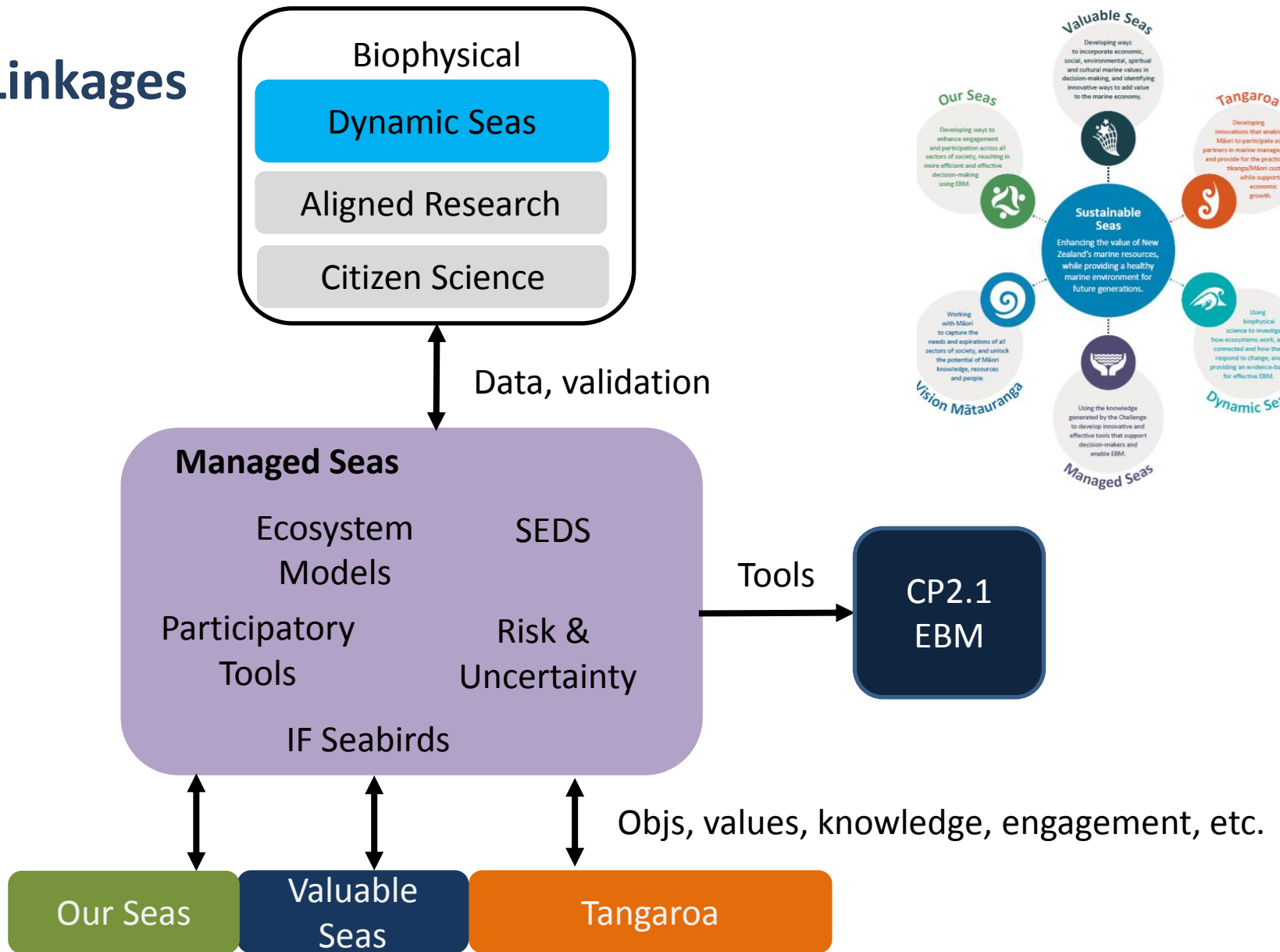
# Innovation fund project

David Thompson, Kim Goetz (NIWA)

Can we define marine habitat use by seabirds without costly at-sea observational data?



# Key Linkages





# Guiding development of ecosystem-based management tools

A Sustainable Seas workshop in the Tasman and Golden Bays case study area  
1 March 2017 in Nelson



**Workshop purpose:** Obtain iwi and stakeholder input and guidance into the development of tools within the Managed Seas programme. The workshop provided an opportunity to:

- share issues of concern in the case study area
- learn about tools that can assist in managing our marine environment
- assist in identifying scenarios to develop within decision support tools



Doba Martin (Māori) and Andy Karulua (Nelson Forests)

**Who attended?** Iwi and stakeholders in the region, and researchers from across the challenge



Te Rūnanga o Toa Rangitira  
Ngāti Tama, Te Ātiawa  
Ngāti Rārua  
Tiakina te Taiao Ltd  
Nelson City Council  
Tasman District Council  
Marlborough District Council  
Ministry for Primary Industries  
Department of Conservation  
Marine Farming Association / Sanford  
Forrest and Bird  
Friends of Nelson Haven & Tasman Bay  
Nelson Forests  
University of Auckland  
Cawthron  
NIWA

**Outcome:** A wide range of views on what people value and understand about the marine environment were shared. Three questions helped generate knowledge and perspectives that will guide development of decision support tools and future decision scenarios. Below are some examples.

## What issues or concerns are front of mind?

Where are the key habits for biodiversity?      Biosecurity risk  
State of the scallop fishery  
What condition are key habitats in and how can we protect and restore these?  
Lack of Marine protection      Managing conflicting uses  
Ki uta ki tai - influences from the land affecting the sea  
Future engagement of iwi in decision making  
Climate change effects (positive and negative)  
Increases in sedimentation and impact on marine life      Kaitiakitanga – Tino rangatiratanga  
Iwi are partners but don't have rangitiratanga  
Depleted species (incl. seabirds)      Availability/cost of information to inform models  
How do we build resilience into the ecosystem?  
Waste Management along the Coastline  
Right won by iwi through settlement protected  
Willingness of Stakeholders to compromise to achieve goal  
Lack of coordinated management/responsibility

## How will you know if the marine environment is being managed well?

Locals tell positive stories about the management of the environment and its status  
Validity in decision making      Social and economic values and opportunities identified.  
Economic values/waste are optimised/minimised      Community respects our seas  
Iwi role as kaitiaki and tangata whenua acknowledged and respected  
Non-commercial species thriving      Land management controls re rivers  
Kaitiakitanga      Personal/individual responsibility demonstrated  
Thriving shellfish beds and seagrass in estuaries      Benthic environments are restored in both bays  
More marine reserves/protected areas      Co-governance of an area + decision making  
Active participation – decision makers      Indicators show that habitat is restored  
Healthy/productive fisheries  
Climate change – resilience built into ecosystems  
Benthic environments restored      Marked improvement in cultural indicators  
Legislative & regulatory authorities integrated, enabling collective decision making

## If you were in charge of marine management in Tasman & Golden Bays, what would you do?

Make decision makers accountable      Align key decision makers  
Taiapure (research implemented)  
Require reporting of catch      Give people a timeframe to implement  
Support fishing methods that are less destructive      Iwi are in co –governance agreements  
Establish historic baseline      Support for compliance  
Register fisheries + boats      Establish marine reserves      Describe what "good" looks like  
Marine spatial planning      Find and protect remaining biogenic communities  
Reduction in resource conflicts  
Close fishery      Foster culture of positivity + change (social responsibility)  
Strong accord over the science      Change of fishing methods  
Key decision makers on board – define goals, focused mandate  
Education in the tikanga      Reduce/remove rubbish inputs to/from coast  
Relocate treatment plant (wastewater) from water (now) to land-based