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GenAI Supported Marine Ecosystem Modelling

Scott Spillias · CSIRO Environment · PICES · 2026



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When We move (because of climate change)...
...Our Conservation AREa moves with us!
that's what I call flexible MSP!
stop! Protection AREA!
Aqua tourism Zone
Aqua farm
So, now we finaly Have this new Route...
...thanks to the melting Polar...
...at a sudden everybody shows up HERE!

MOSAIC

Forbes

EDITORS' PICK

Open
'Mille
Credi

October 6, 2026 | 3 min read Add Us On Google

OpenAI unl
results upd

A month after resol
the company says it
without the multim

BY JOSEPH HOWLETT EDITE

A Severe Misalignment
of AI

Published 11 S

Over the last
dramatically
fields of mat
problems as

News

Summarize with AI

Google Gemini 4 Argon Advances Fusion Research Mathematical Models

Google's Gemini 4 Argon model accelerates fusion research by developing new mathematical solutions for magnetic field models in experimental reactors.

Ender Öztürk October 20, 2026

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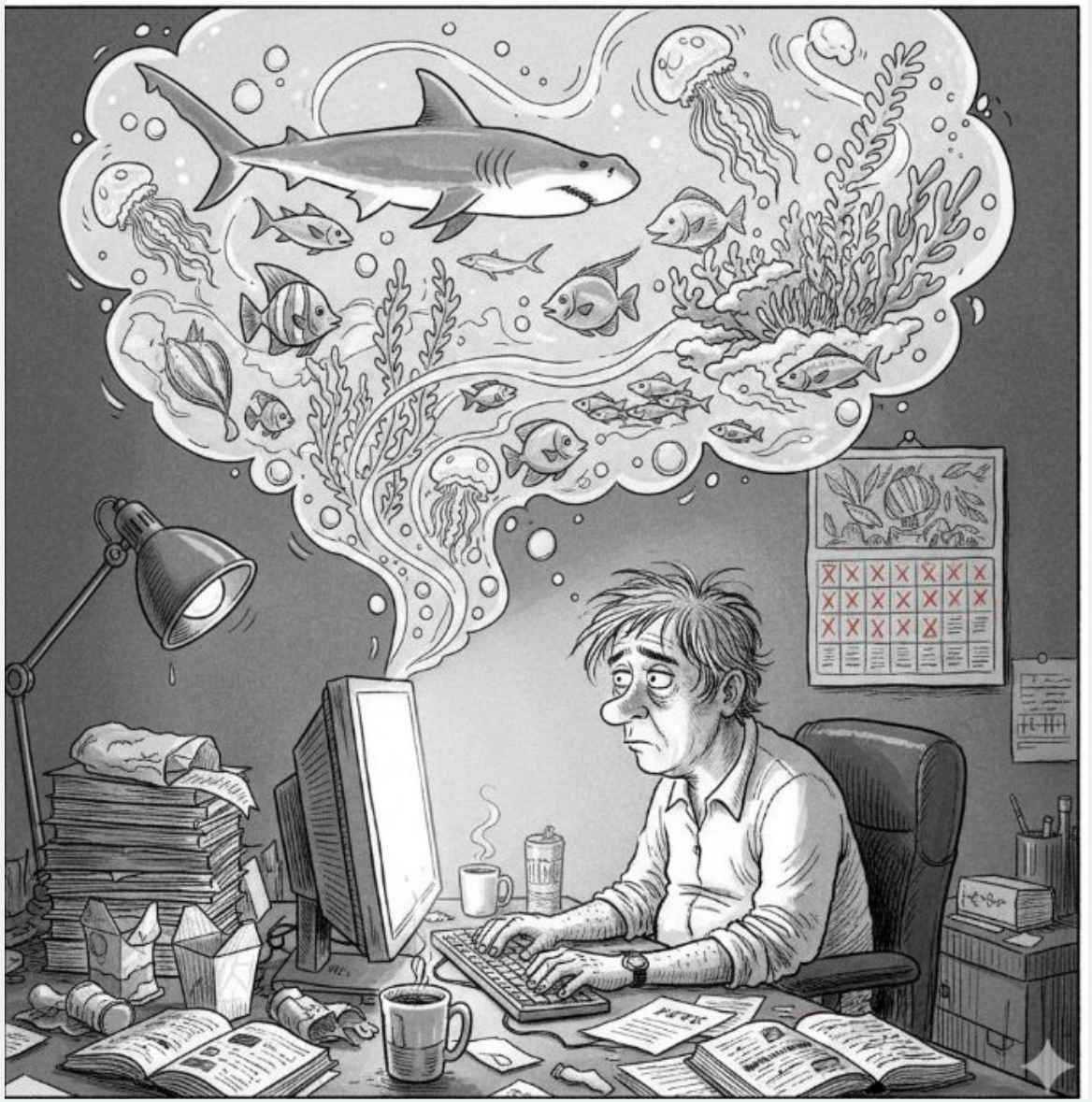
Ecosystem modelling is Hard

- **Slow** to build models
- **Opaque** to decision-makers and the public
- **Bespoke** and non-standardised



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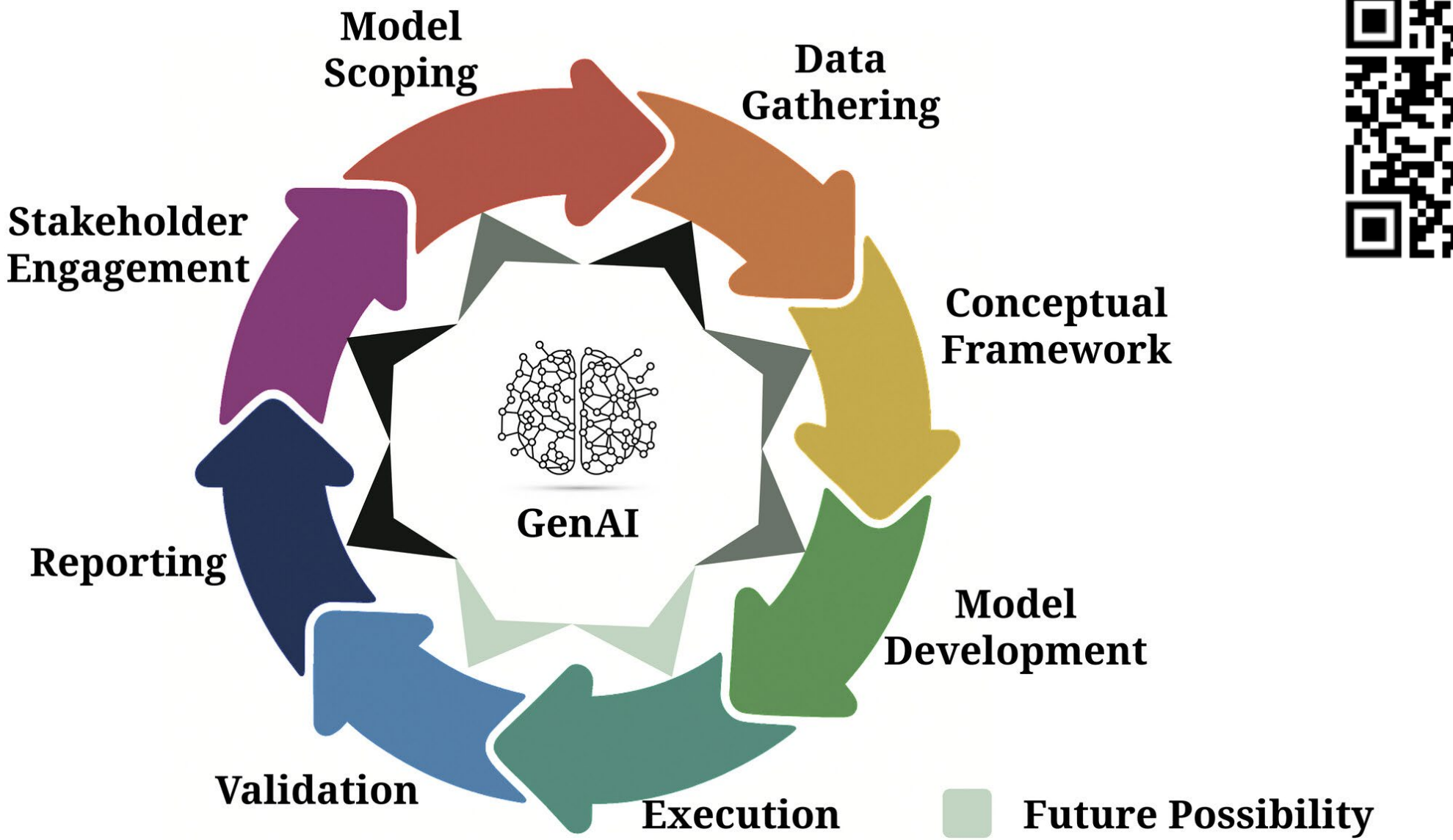
Fish and Fisheries



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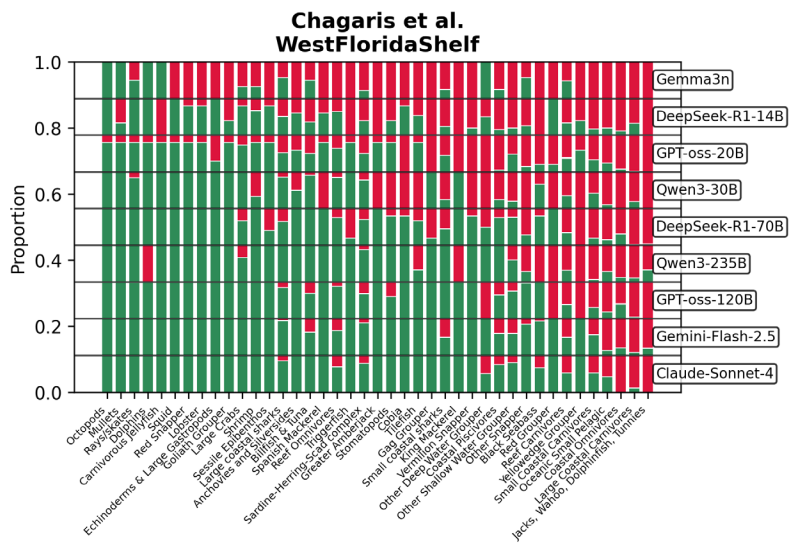
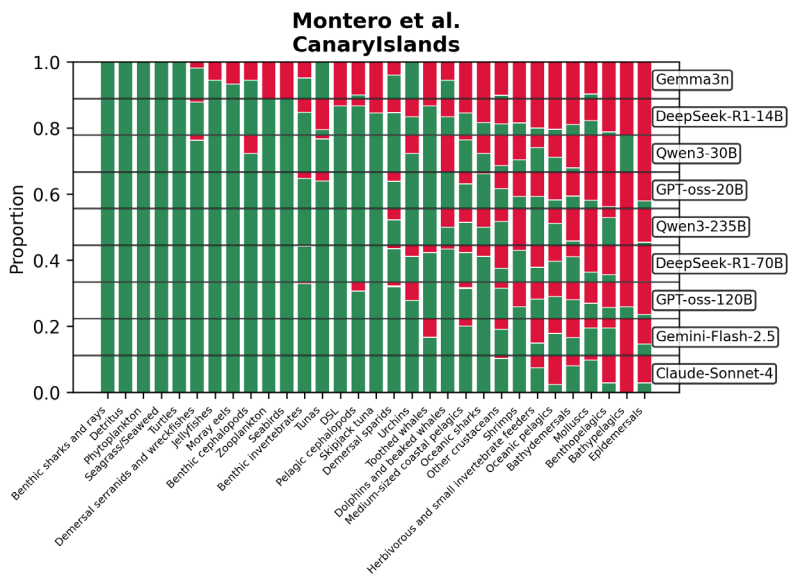
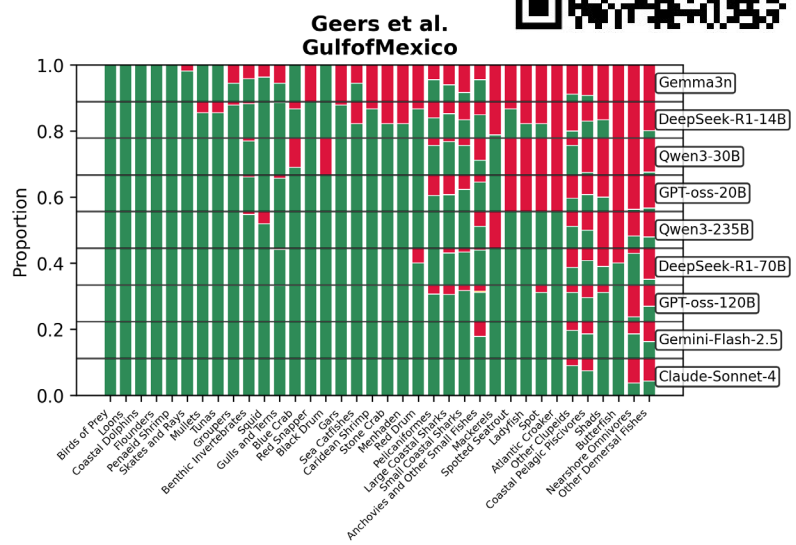
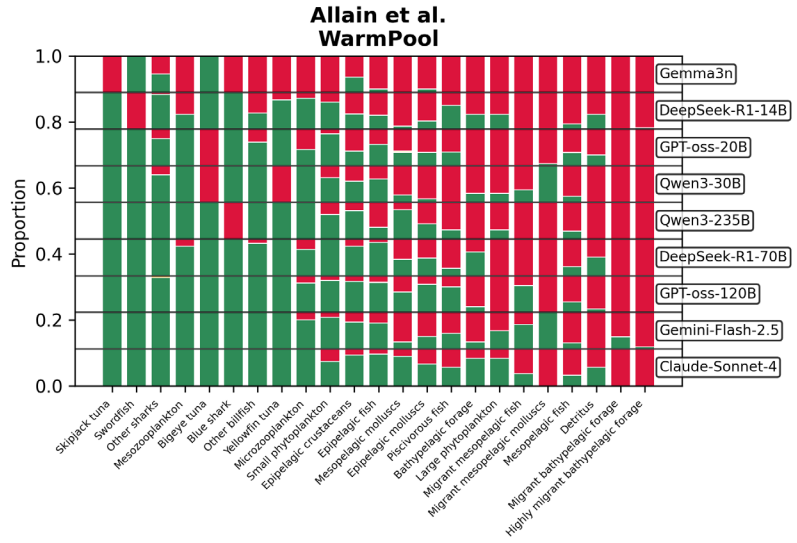
LLM-Enabled Functional Grouping

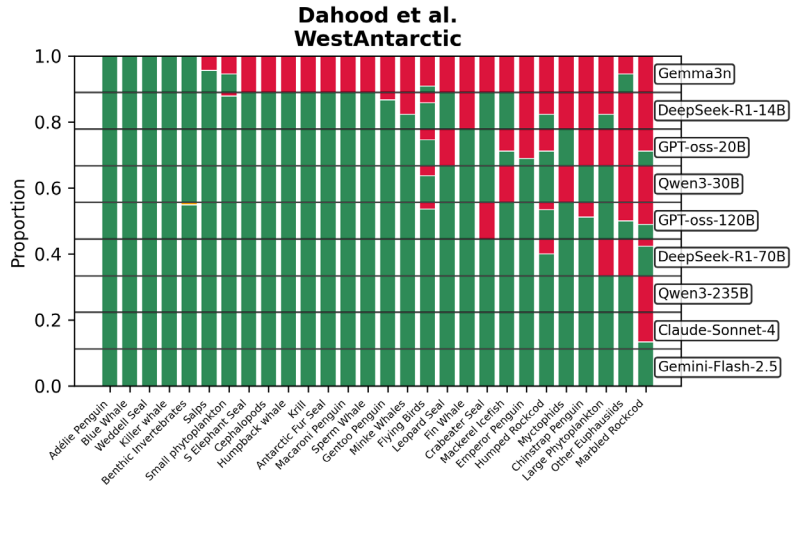
SSRN Preprint

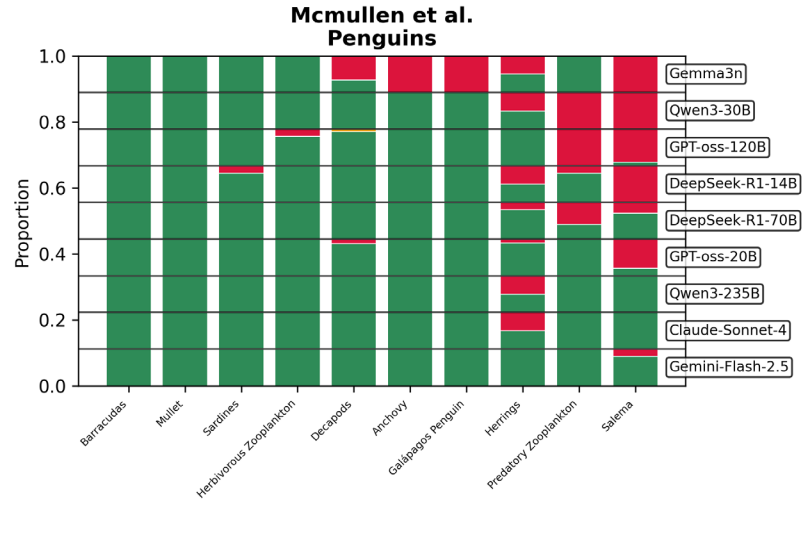












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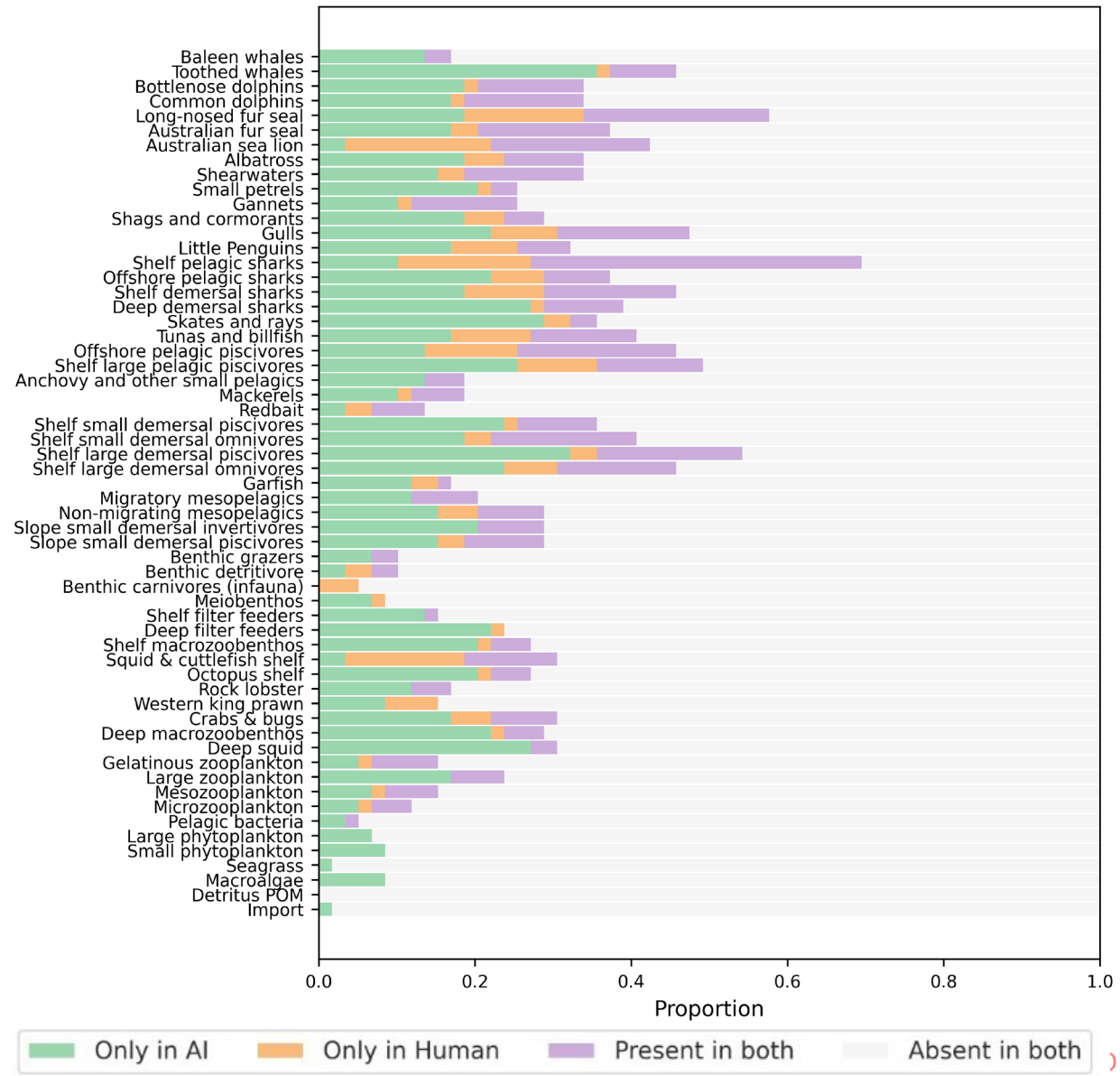
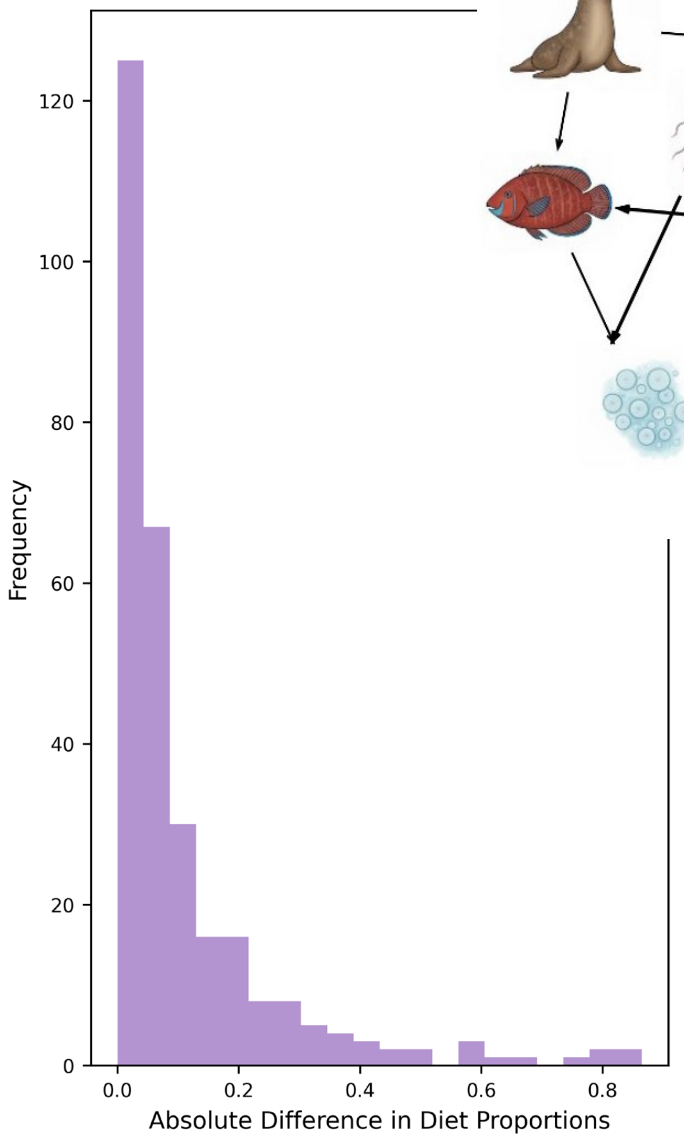
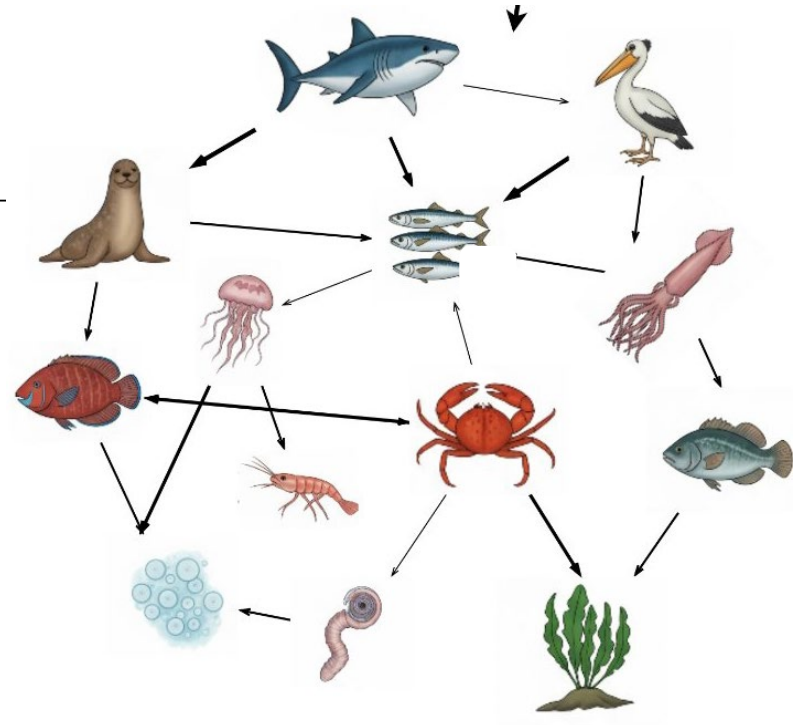
Comparing Human and AI Food Webs







ENVSOFT

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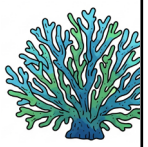
LLM-Enabled Mechanistic Modelling for Analysis (LEMMA)









MEE

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MOSAIC

Modular **O**cean **S**imulator with **A**rtificial **I**ntelligence **C**ollaboration

- User Interface
- API tools
- LLM Assistant
- Modular Component Protocol
- Facilitates FAIR Ecosystem Models



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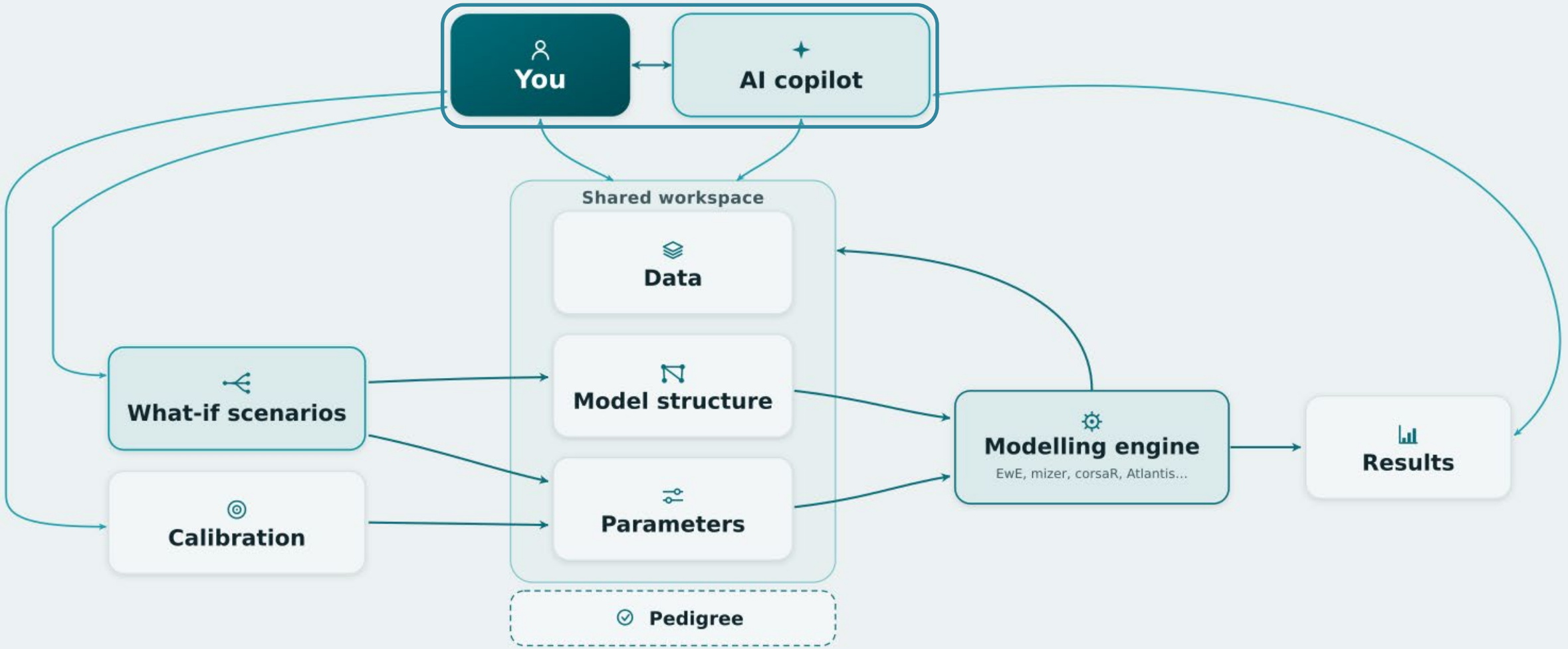
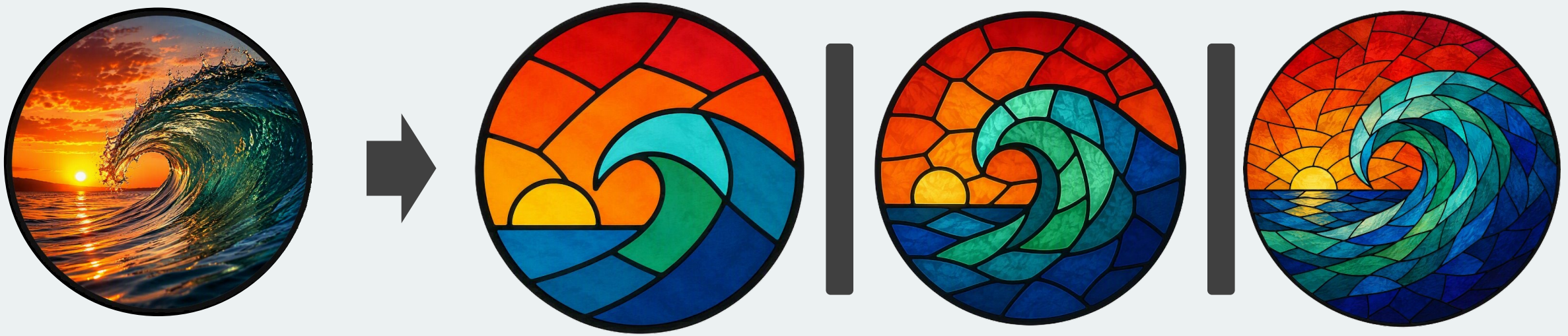
How MOSAIC works



The same ecosystem in different frameworks



`Ecopath with Ecosim`

who eats whom

`mizer`

body size

`corsaR`

space & habitat

`SIEBA-MIMES`

spatial & socio-economics

`Atlantis`

whole system

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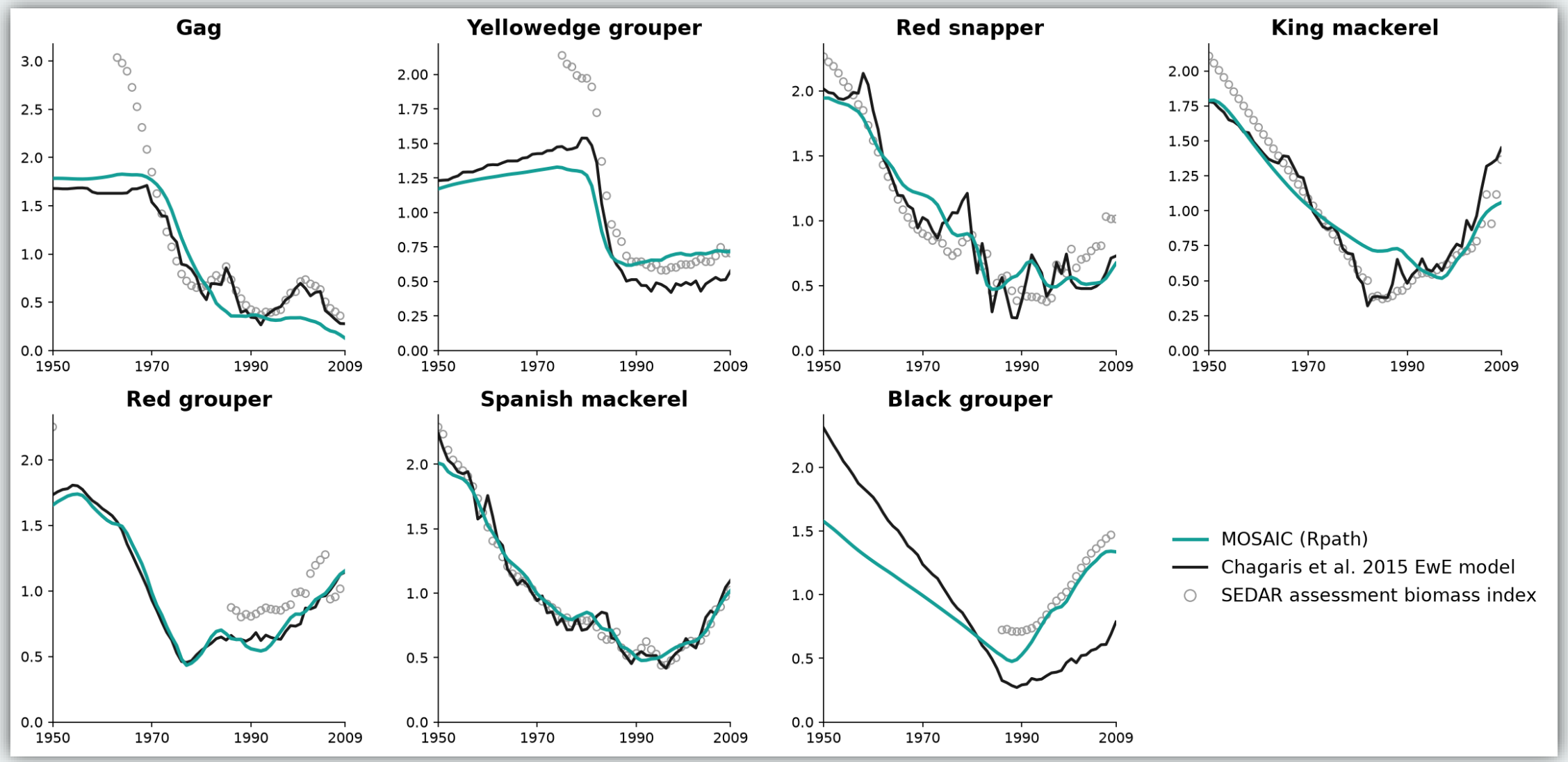
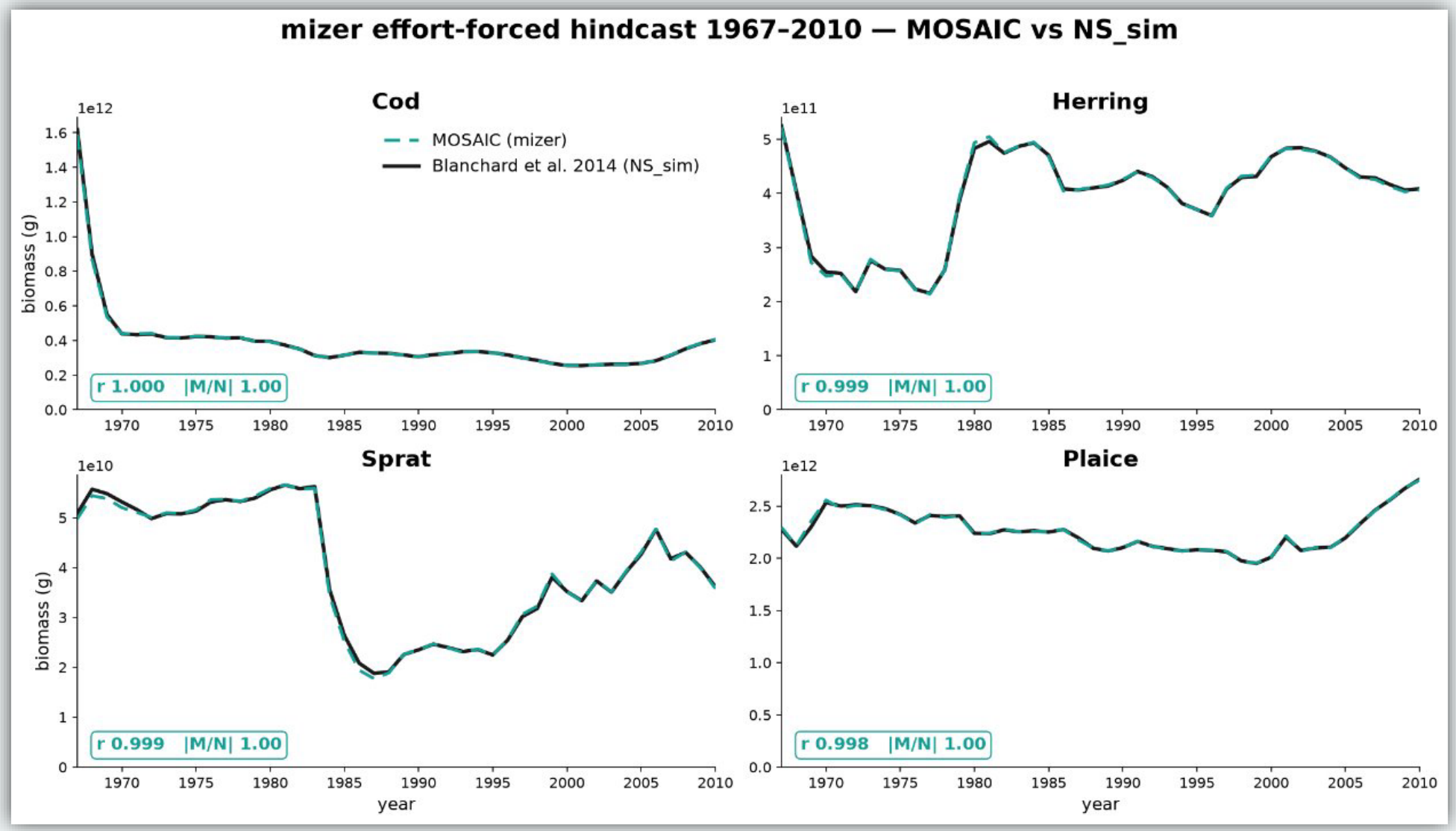
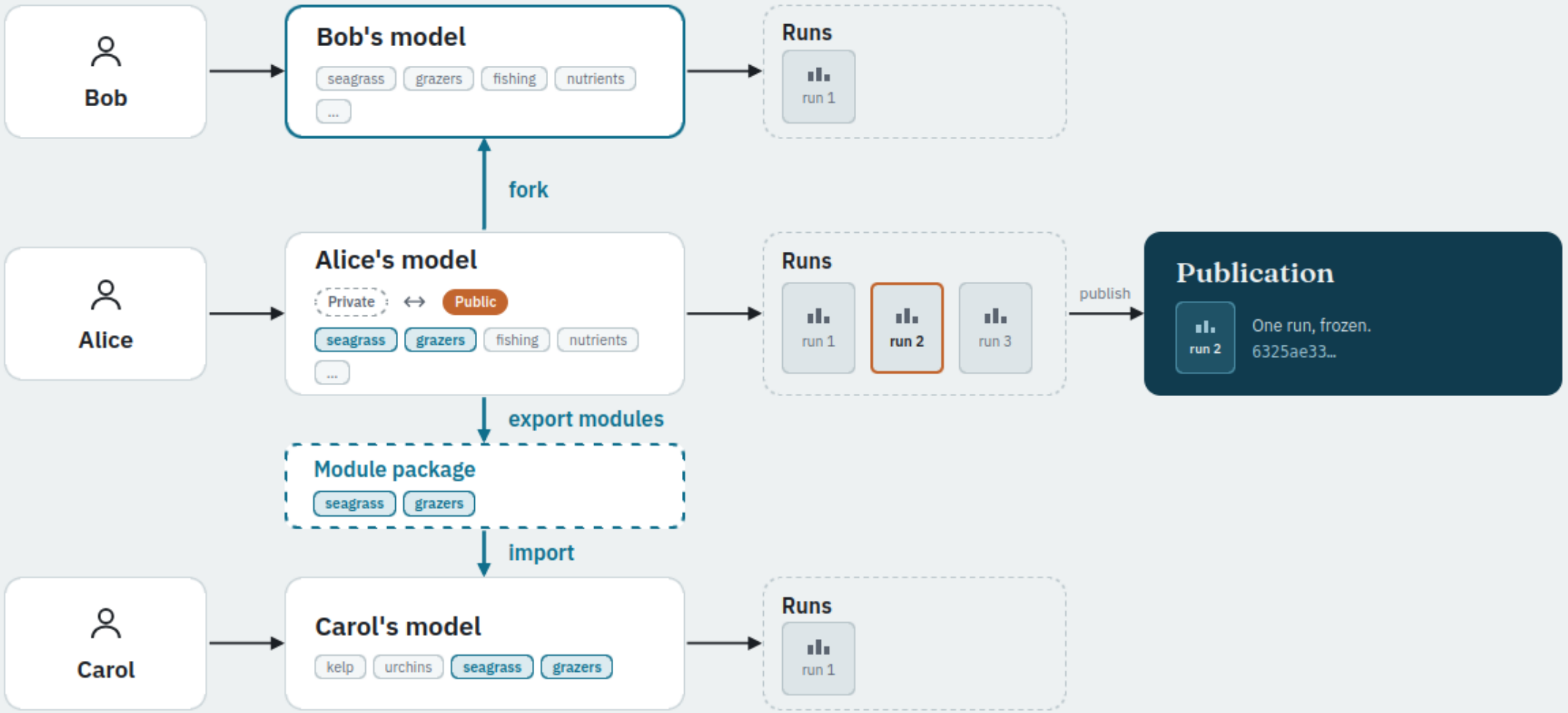
Ecopath with Ecosim in the West Florida Shelf



mizer in the North Sea



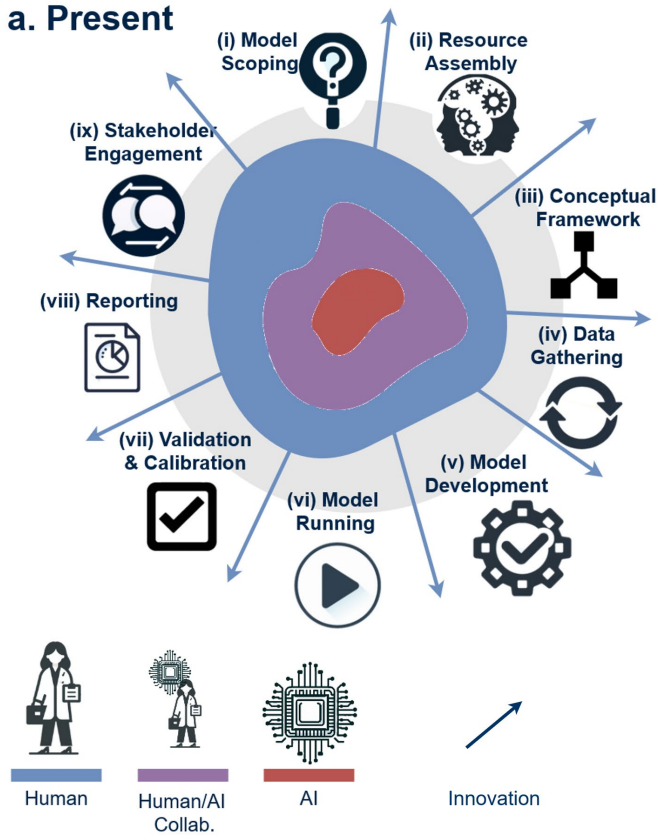
Making Ecosystem Models FAIR...



BioScience

The Future of Artificial Intelligence in Ecosystem Modelling





Thoughts Going Forward

- Aspiring to generate model ensembles rapidly
- Identifying best practices AI-collaboration
- Need to ensure ease-of-use does not trade-off with rigour

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Get Involved!



Thank you.

scott.spillias@csiro.au · CSIRO Environment

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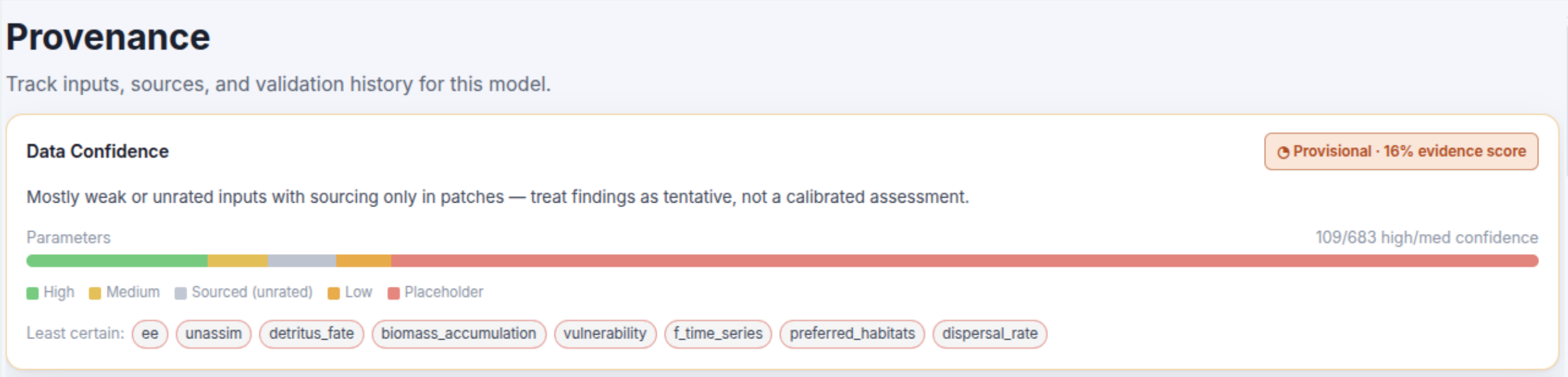
CMS
CENTRE FOR MARINE SOCIOECOLOGY

Provenance/Pedigree and data confidence



Influence Diagram | Food Web | ✨ Module Assistant | ⇝ Mediation

Custom | Custom Ready | Run ▸

Search modules | Re-layout | Reset view

Save preset | Export | Import | + Add Group

Show validation



HUMAN ACTIVITIES

- Coastal pelagic fishery
- Groundfish trawl fishery
- Salmon & HMS fishery

ENVIRONMENTAL PRESSURES

- Background resource
- Ocean temperature forcing
- Model settings
- Benthic invertebrates
- Zooplankton (copepods/euphausiids)

FISH

- Albacore tuna
- Northern anchovy
- Arrowtooth flounder
- Spiny dogfish
- Flatfish complex

Browse Modules 0

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