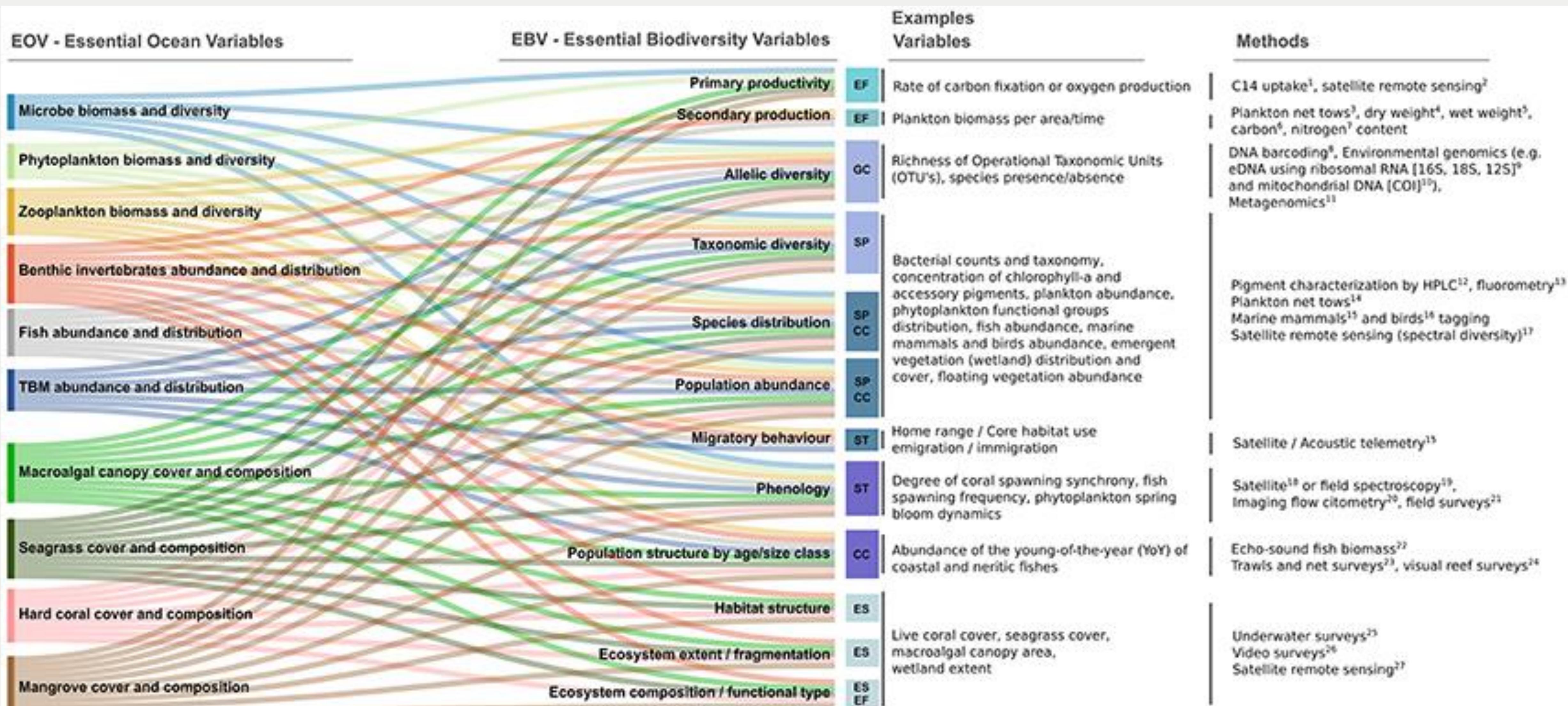


IMAGEOV: Développer et modéliser des Variables Essentielles de Biodiversité pour les poissons et les habitats benthiques à partir de données d'imagerie sous-marine

Developing and modeling Essential Biodiversity Variables for fish and benthic habitats from underwater imaging data

Elizabeth Hasan

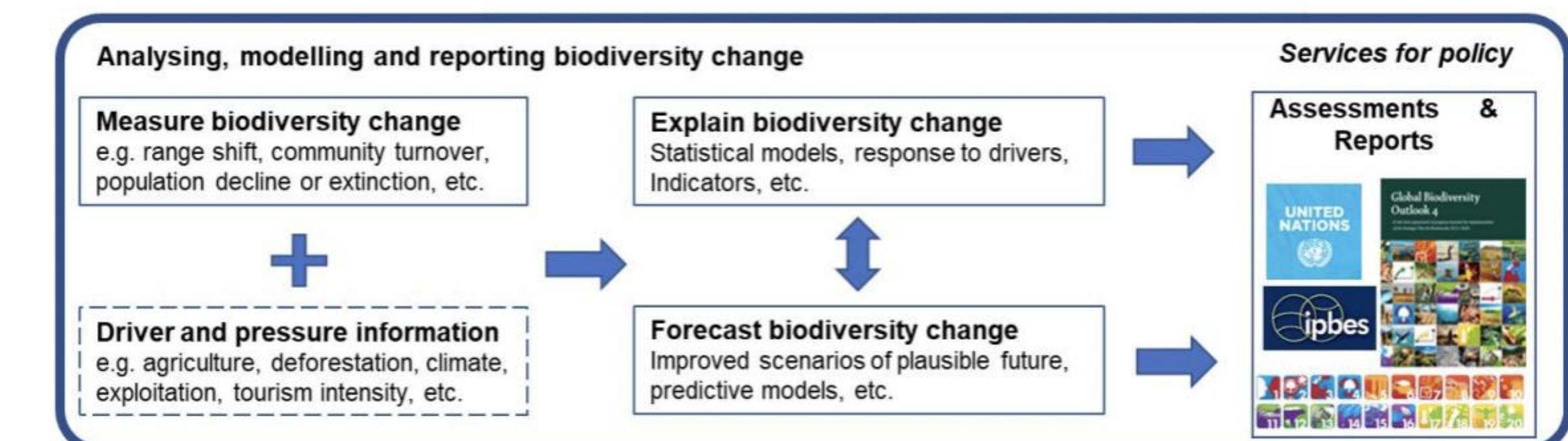
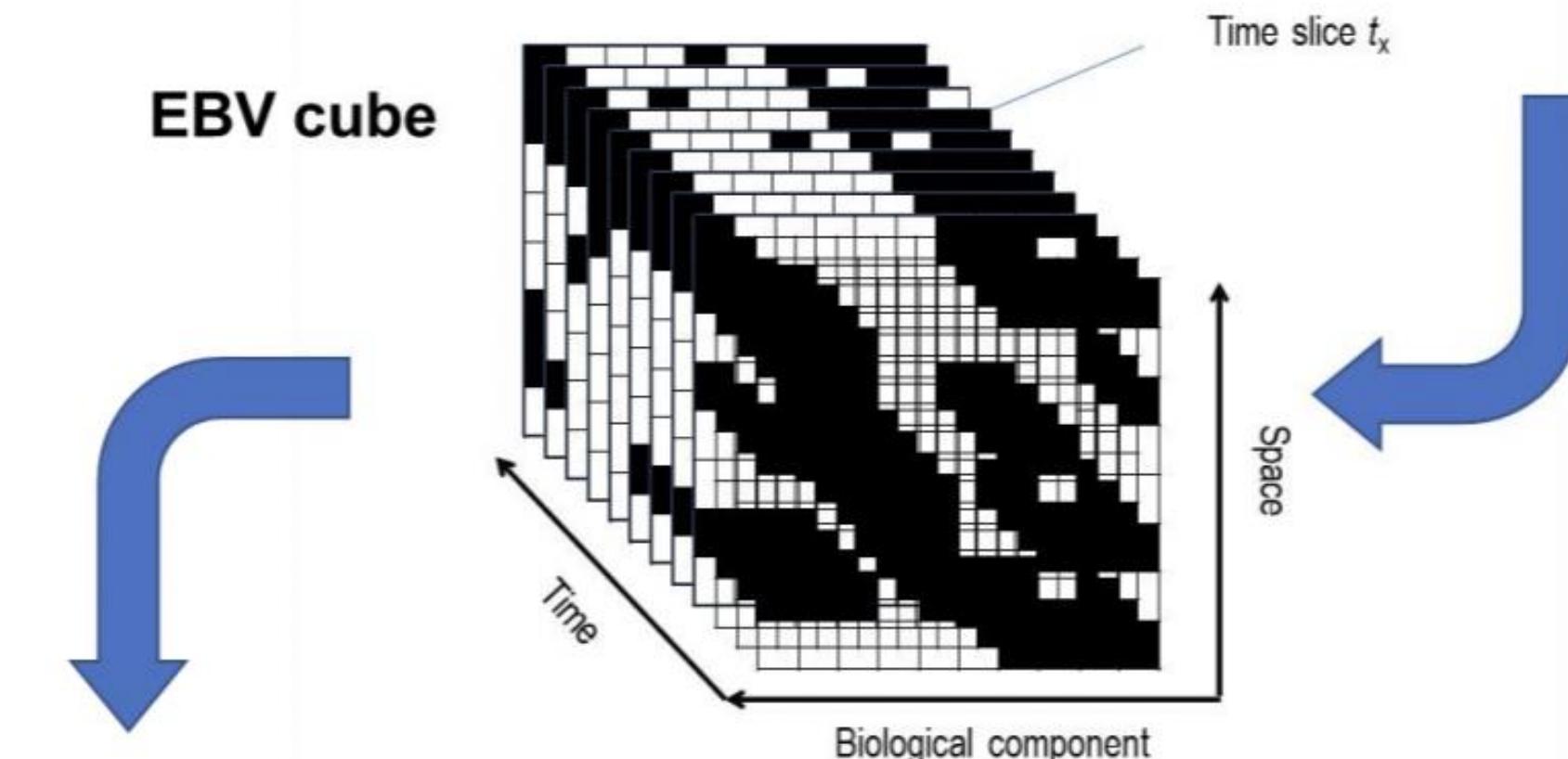
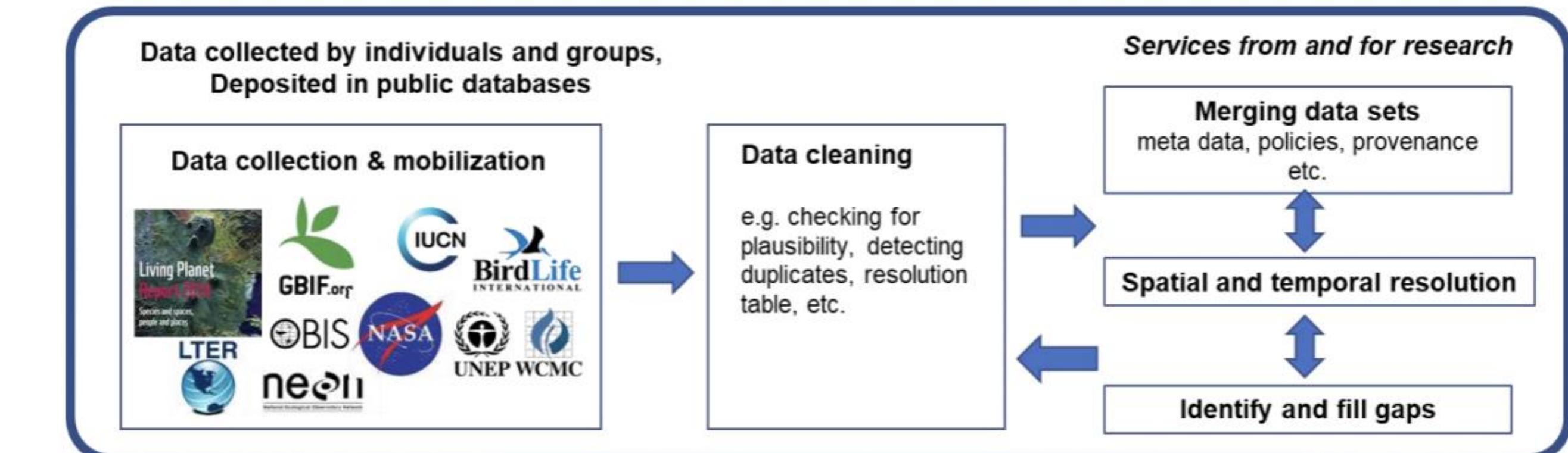
Dr. Dominique Pelletier (IFREMER), Dr. Jacquomo Monk (UTAS), Dr. Neville Barrett (UTAS), Dr. Ben Scoulding (CSIRO)



Source: Muller-Karger et al. 2018

Overall Aim

Develop and assess the performance of EOVs and EBVs obtained from benthic imagery across survey platforms and ecosystems



Source: GEOBON; adapted from Schmeller et al. 2017

Chapter 1

Synthesis of studies using benthic imagery for fishes, invertebrates and habitats

O-O-O AUFRANDE



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PLOS ONE

RESEARCH ARTICLE
Monitoring the resilience of a no-take marine reserve to a range extending species using benthic imagery
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Data Availability:

the IMAS data

[utahs.edu.au/](https://imass.utas.edu.au/)

DOI: <https://doi.org/10.1371/journal.pone.0237257>

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Abstract

Global climate change is driving the redistribution of marine species and thereby potentially restructuring endemic communities. Understanding how localised conservation measures such as protection from additional human pressures can confer resilience to ecosystems is therefore an important area of research. Here, we examine the resilience of a no-take marine reserve (NTR) to the establishment of urchin barrens habitat. The barrens habitat is created through overgrazing of kelp by an invading urchin species that is expanding its range within a hotspot of rapid climate change. In our study region, a multi-year monitoring program provides a unique time-series of benthic imagery collected by an Autonomous Underwater Vehicle (AUV) within an NTR and nearby reference areas. We use a Bayesian hierarchical spatio-temporal modelling approach to estimate whether the NTR is associated with the important environmental covariates of depth and habitat complexity.

— derived from multibeam sonar mapping), as well as spatial and temporal covariates for the NTR conferring resilience with a strong

— reference to the establishment of barrens. Our analysis shows that increasing barrens cover in both the reference and NTR regions is associated with the establishment of

— also

— body length, displaying conspecific behaviour or occupying uniform habitats.

— proportion of individuals detected, or recall of 0.94, 0.79 and 0.75 for

— sea turtles, respectively); (2) simultaneously delineating the fine-scale movement trajectories of multiple sea turtles at a fish cleaning station.

— For all species, the algorithm performed best at detecting individuals of similar

— body length, displaying conspecific behaviour or occupying uniform habitats.

— overall precision: 0.74). For seals, accuracy was improved by 0.05% for

— seals (adults and pups), spacing (huddling and dimorphism), and body size.

— performance was impacted by 1.0% for

— sea turtle (adults and pups), and body size.

— were estimated by 0.02% for

— demersal fish.

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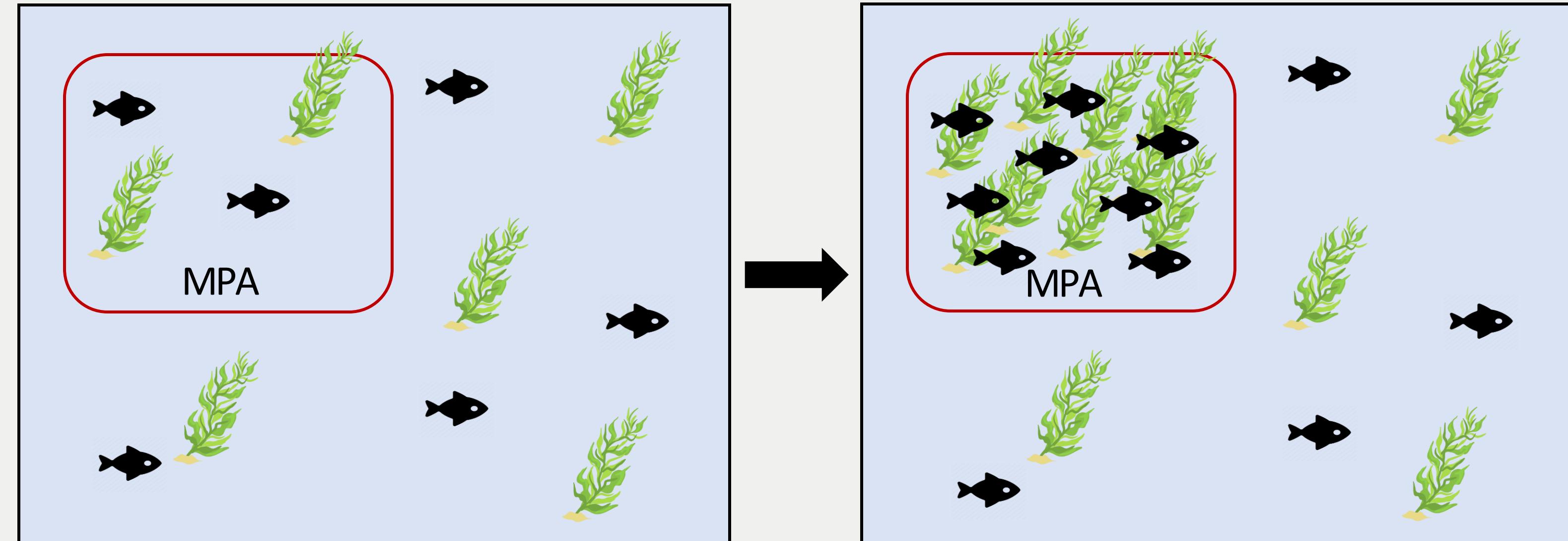
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Chapter 2

Assessing the ability of
image-based EOVS/EBVs to
capture temporal changes
in fish communities in
relation to fishing and
MPAs across regions and
contexts



STAVIRO



Dominique Pelletier

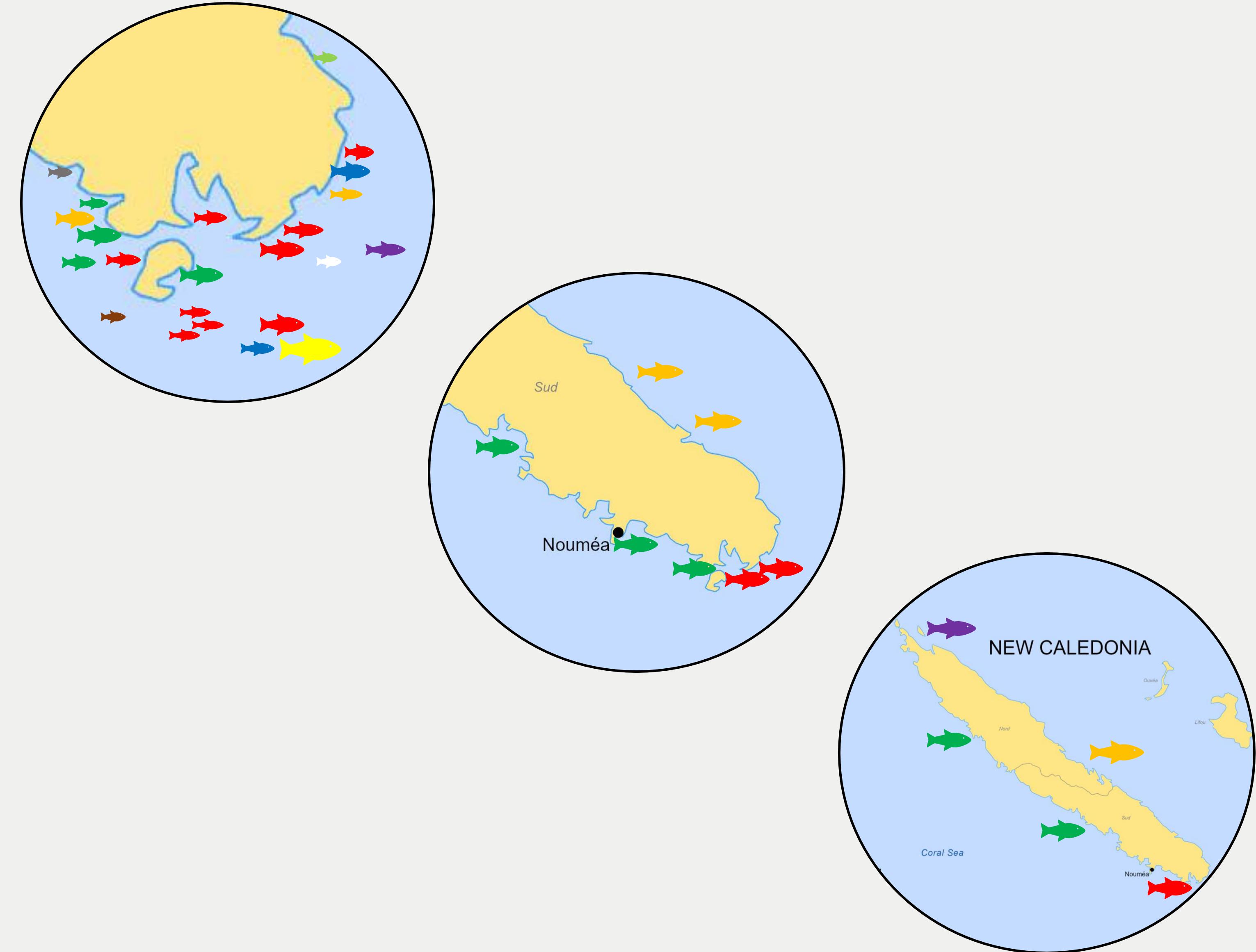
BRUV



Perkins et al. 2024

Chapter 3

Scalability and spatial consistency of image-derived EOV/EBVs: Do metrics extracted from benthic imagery data retain the same spatial signals when scaled?



Thank you for your attention!