DR JOSEPH DIBATTISTA GRIFFITH UNIVERSITY

GENETIC TOOLS AND CITIZEN SCIENCE TO TRACK BIODIVERSITY WITHIN ESTUARIES

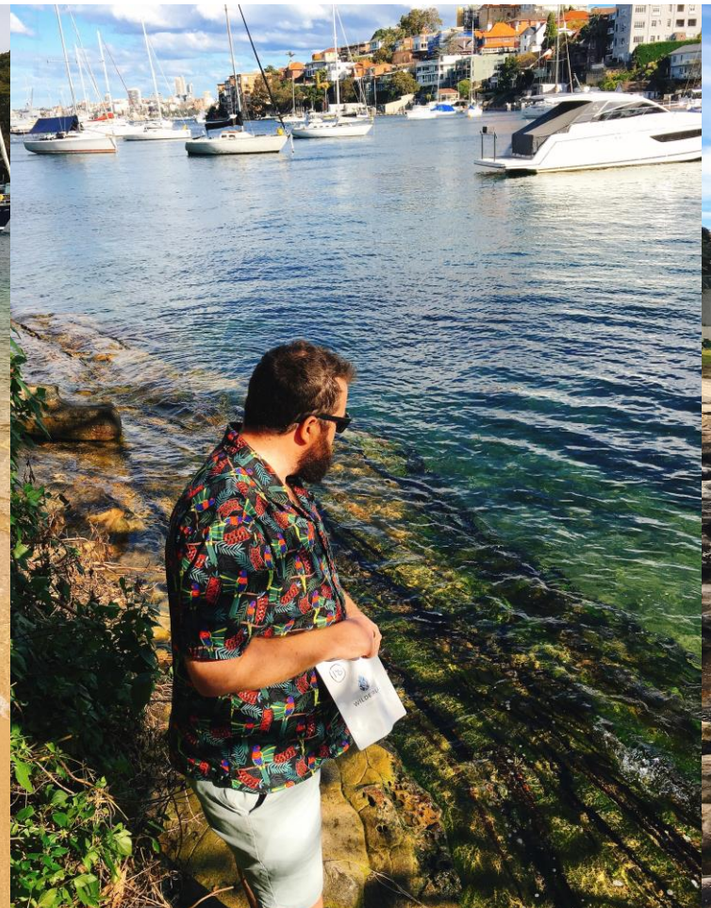
BLUE WORLD
OCEAN PROTECTION

Griffith
UNIVERSITY
Queensland, Australia

WILDERLAB

“TREE OF LIFE” METABARCODING AS AN ESTUARINE MONITORING APPROACH

- Pilot Trial “Tree of Life” metabarcoding - eDNA sampling with Wilderlab Minikits in Sydney Harbour - completed Winter 2022
- Simple design intended for general use and public interface/website
- “Comprehensive Sequencing Package”: multispecies analyses for fish, birds, crustaceans, molluscs, plants, algae, bacteria, and marine invasive pests



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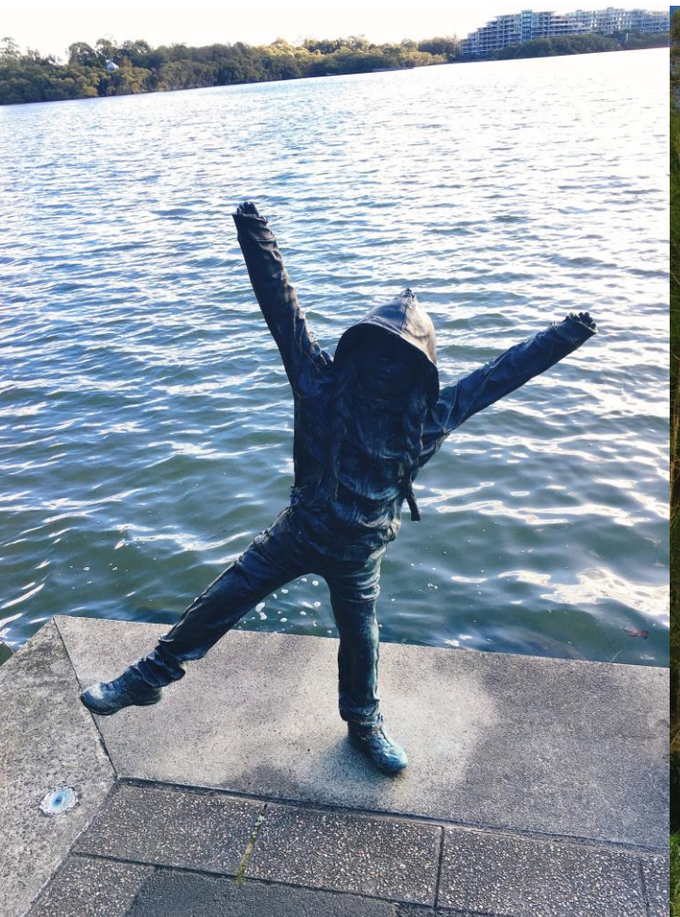
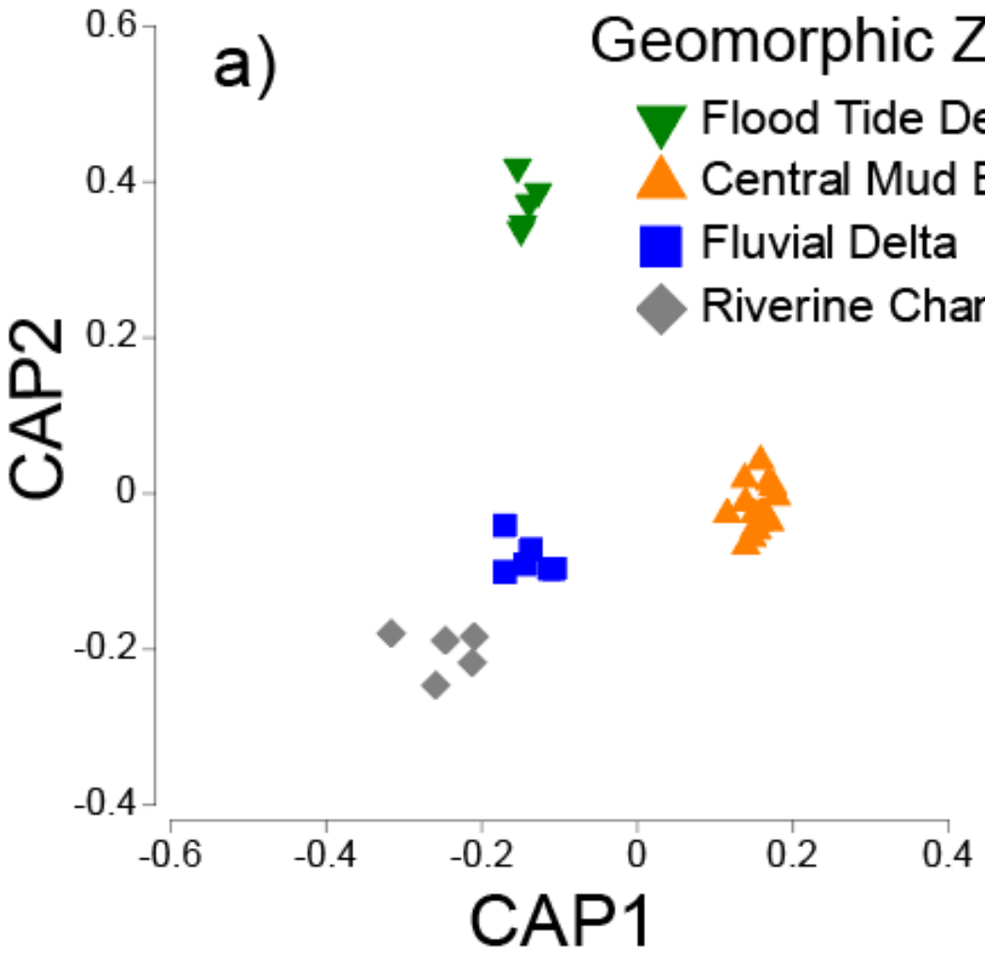
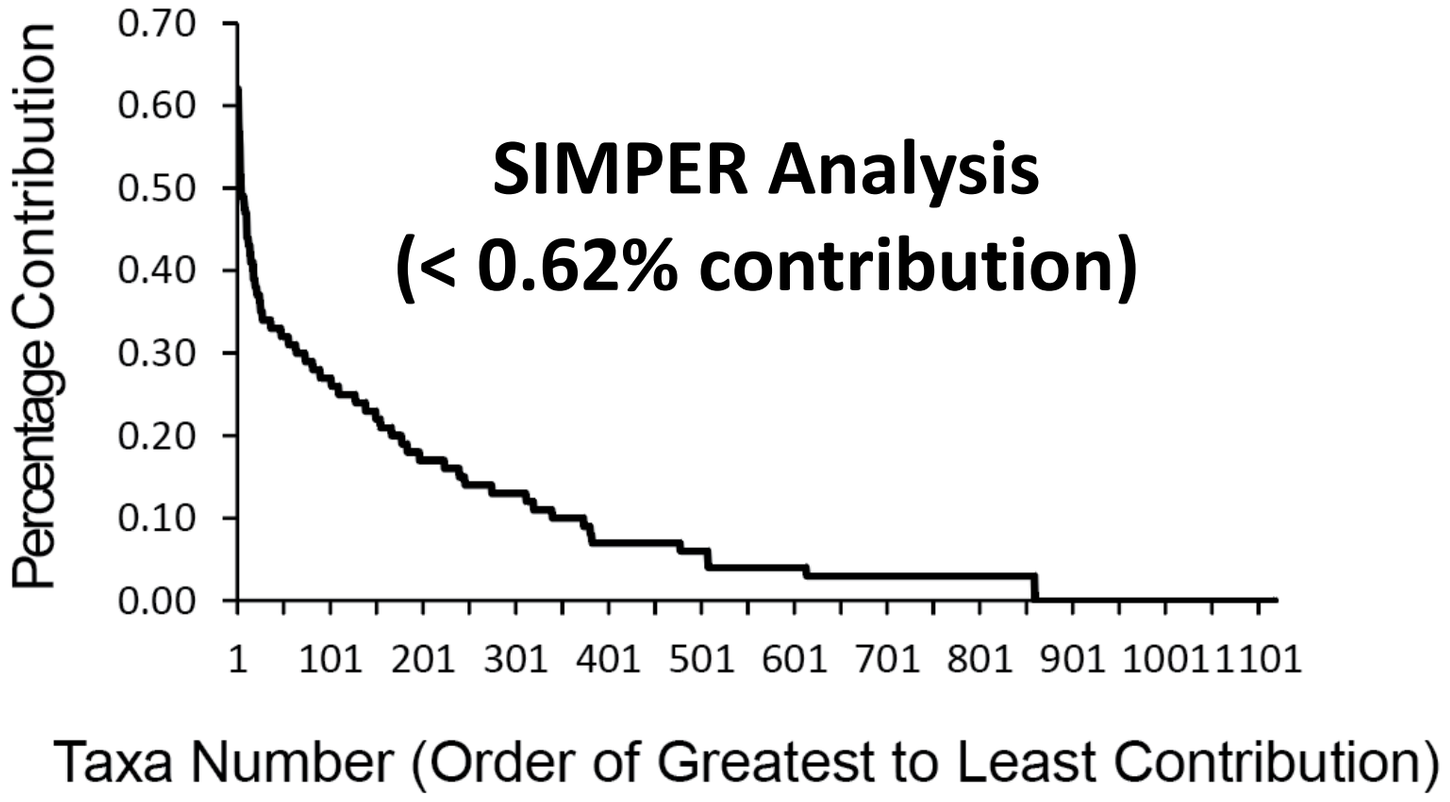


WILDERLAB

“TREE OF LIFE” METABARCODING AS AN ESTUARINE MONITORING APPROACH

- Statistical differences between habitat zones irrespective of distance, no singular taxa explained communities across Sydney Harbour



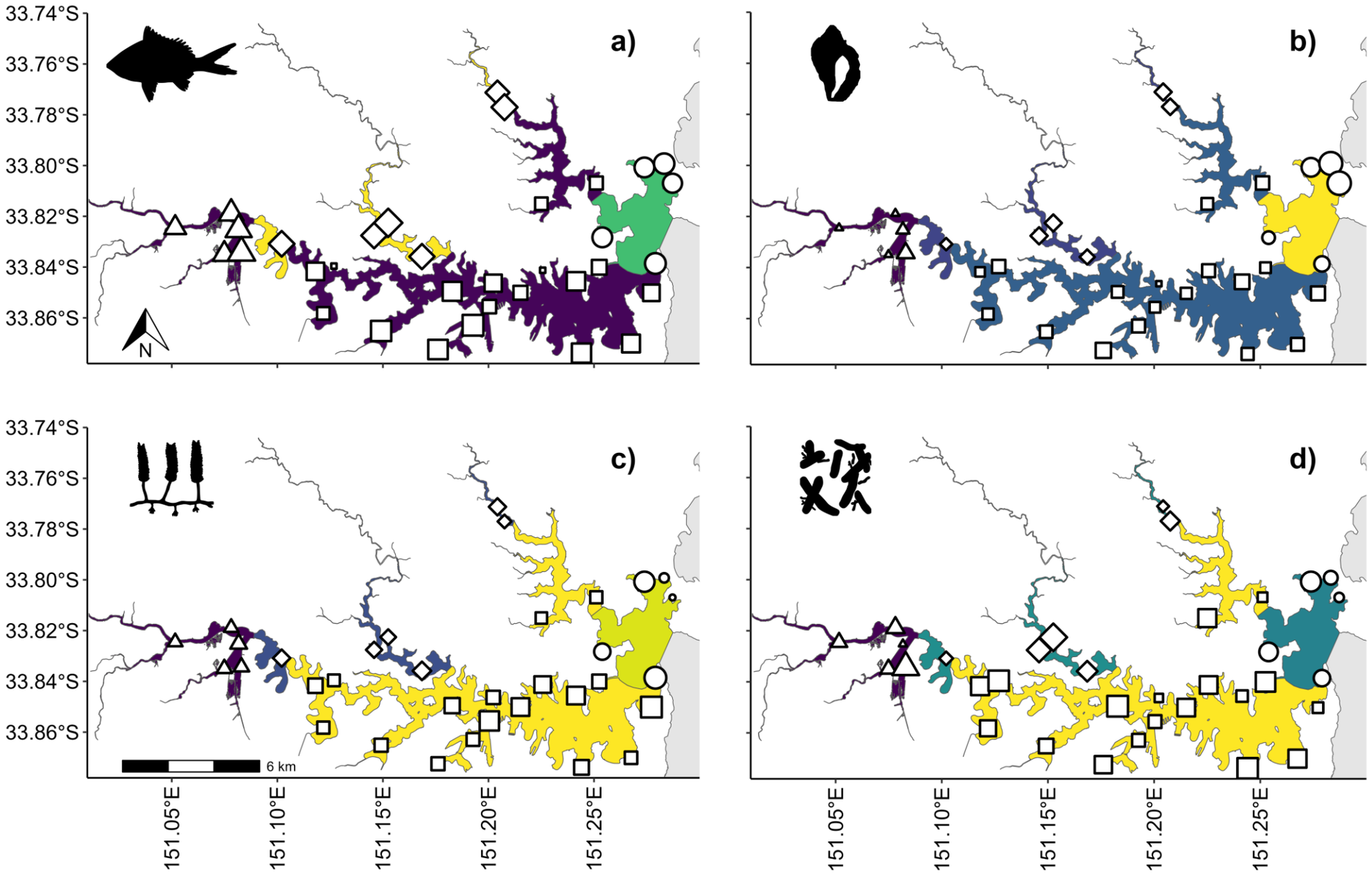


SIMPER Analysis
(< 0.62% contribution)

DiBattista et al. 2024, *Env. Res.*

“TREE OF LIFE” METABARCODING AS AN ESTUARINE MONITORING APPROACH

- Patterns across taxonomic subgroups related to habitat availability



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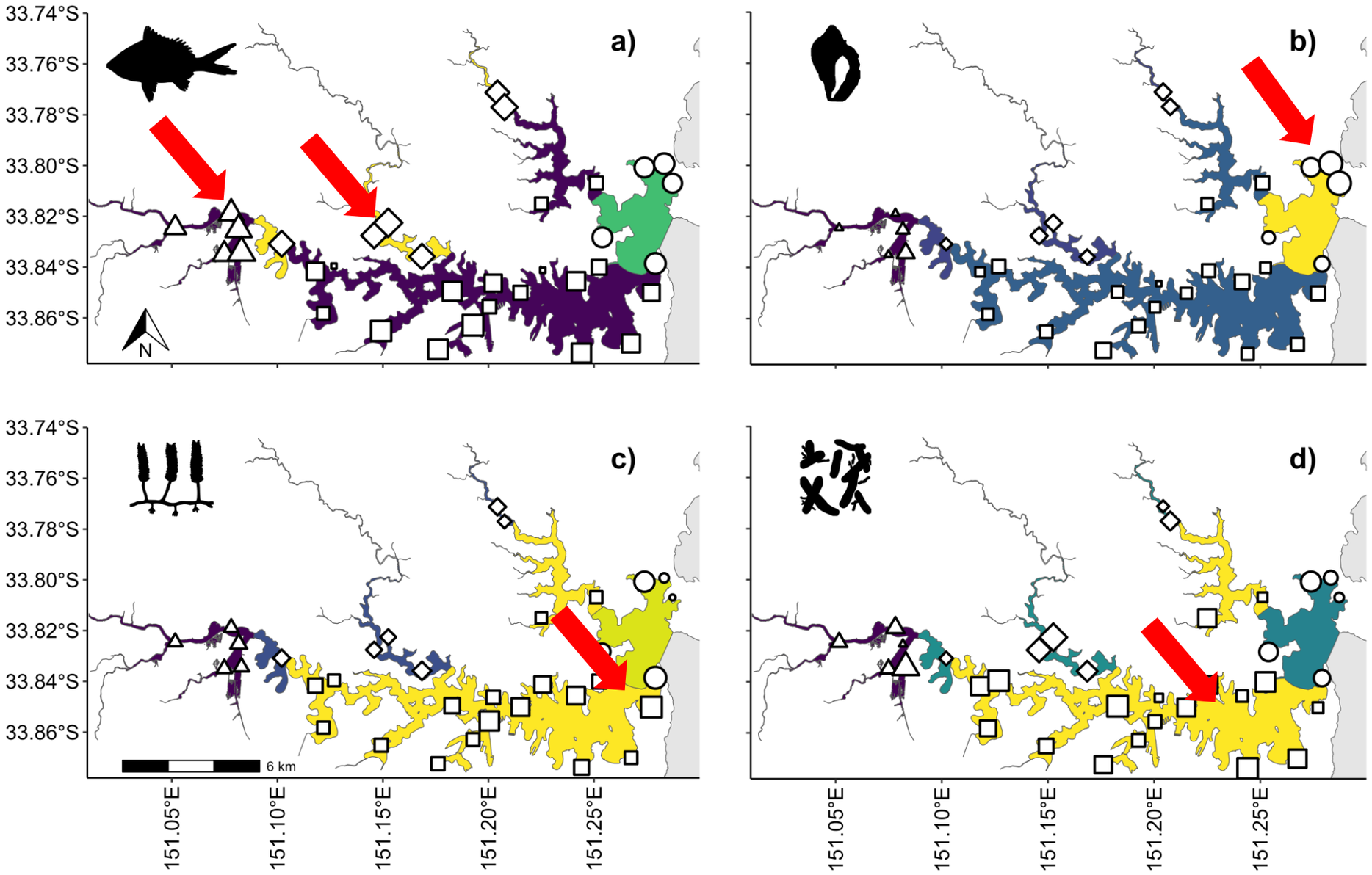

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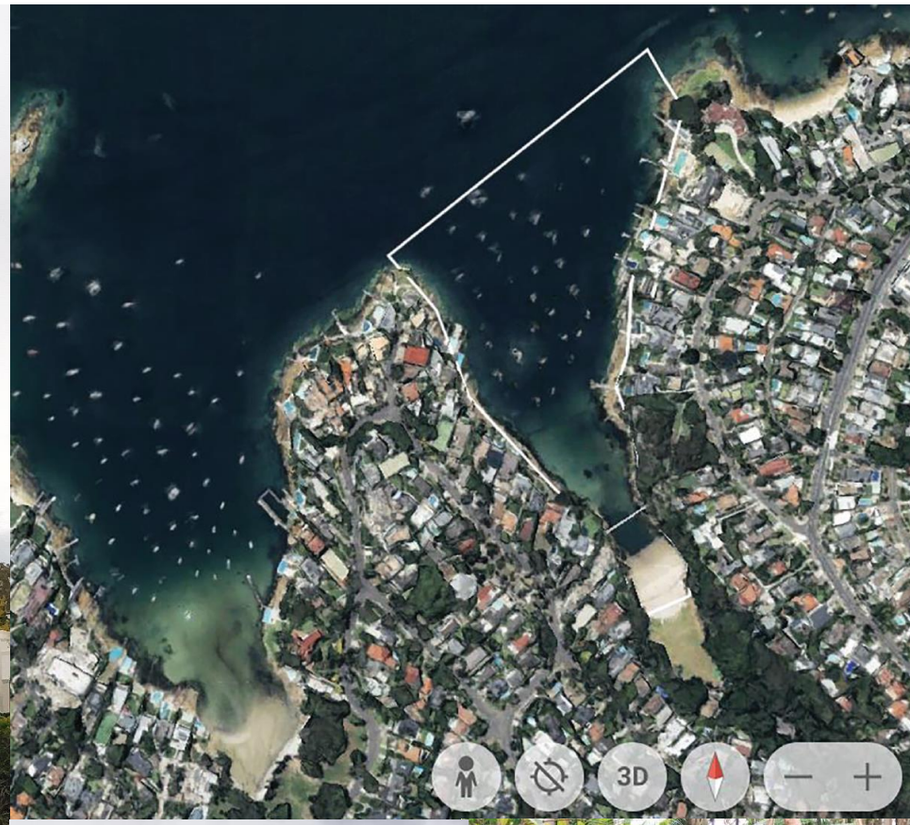
“TREE OF LIFE” METABARCODING FOR LONG-TERM MONITORING PURPOSES?

- Monthly seawater sampling at reference site, Parsley Bay (2.5 years…)



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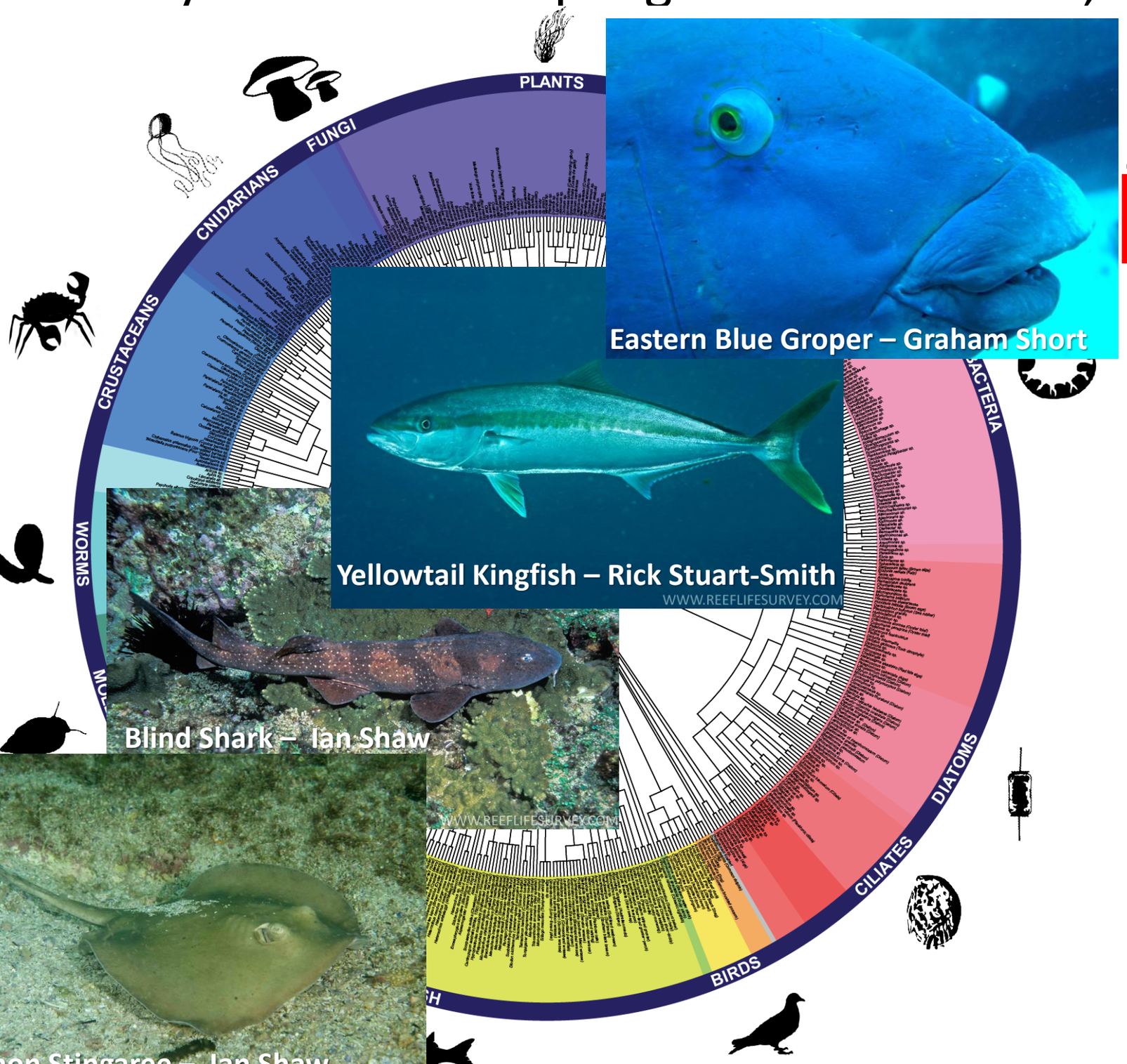

Parsley Bay Audit

178 Fishes 26%

4 Echinoderms 2%

42 Worms 14%

62 Crustaceans 11%

51 Molluscs 6%

Dolphins, Sea Birds, Bryozoans, **Kelp**, **Sponges**, Cnidarians, Tunicates, **Eelgrass**

And So Much More!

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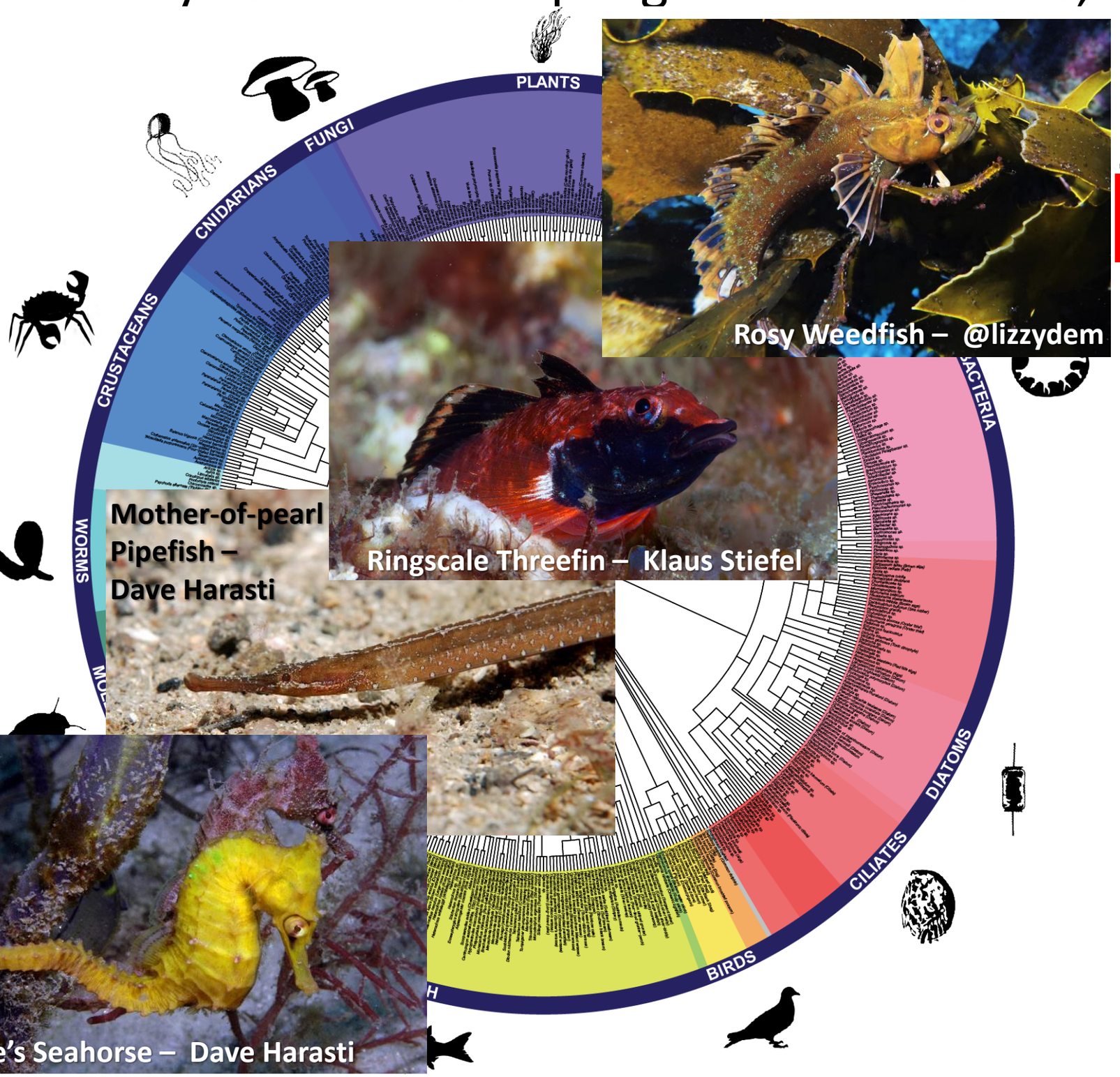

Rosy Weedfish – @lizzydem

Ringscale Threefin – Klaus Stiefel

Mother-of-pearl Pipefish – Dave Harasti


White’s Seahorse – Dave Harasti

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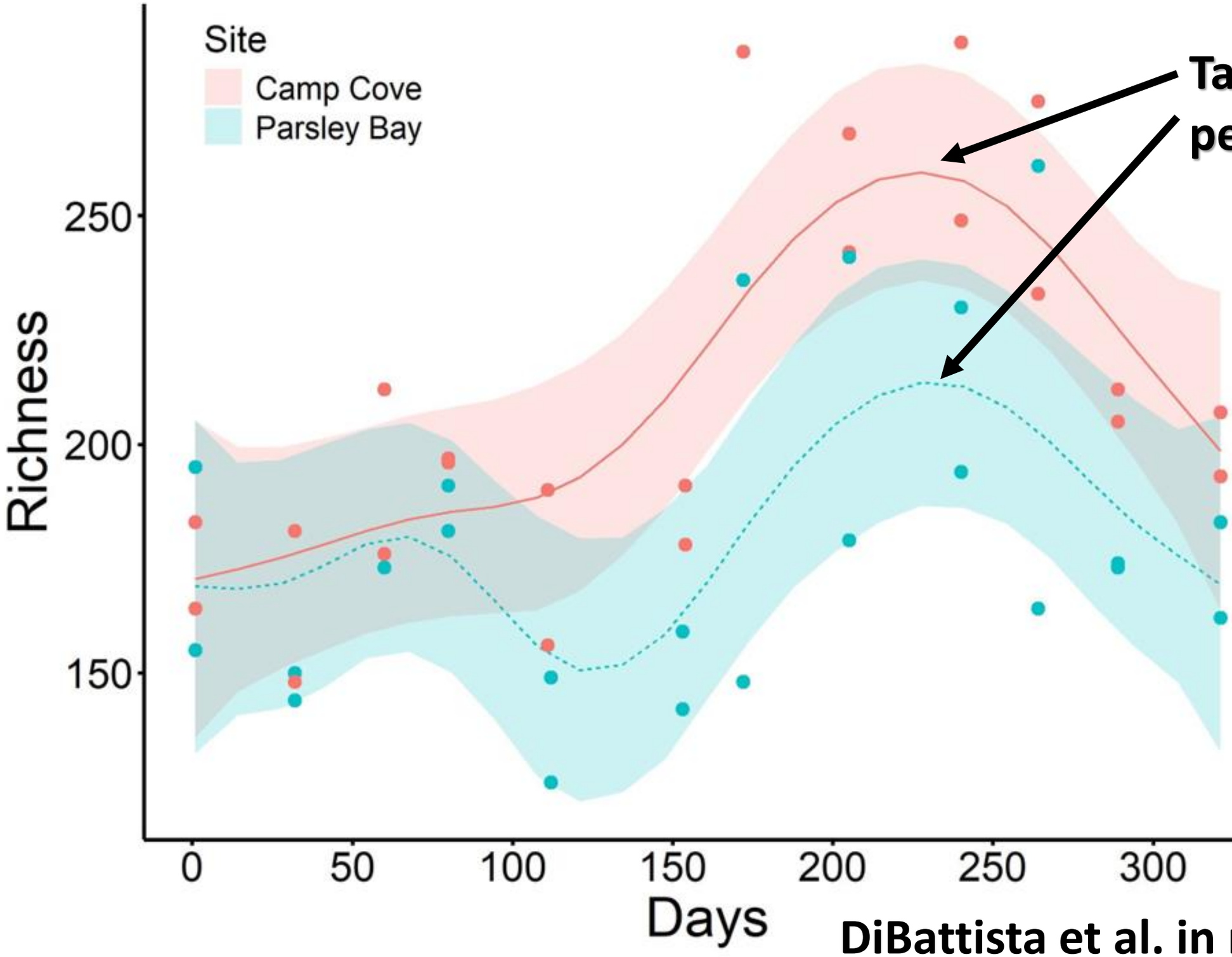
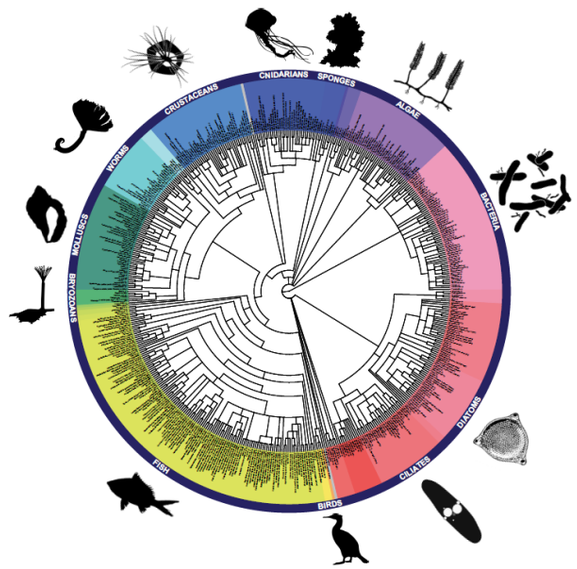
IS "TREE OF LIFE" METABARCODING A ROBUST MONITORING APPROACH?

- Temporal patterns in taxonomic richness (summer versus winter)

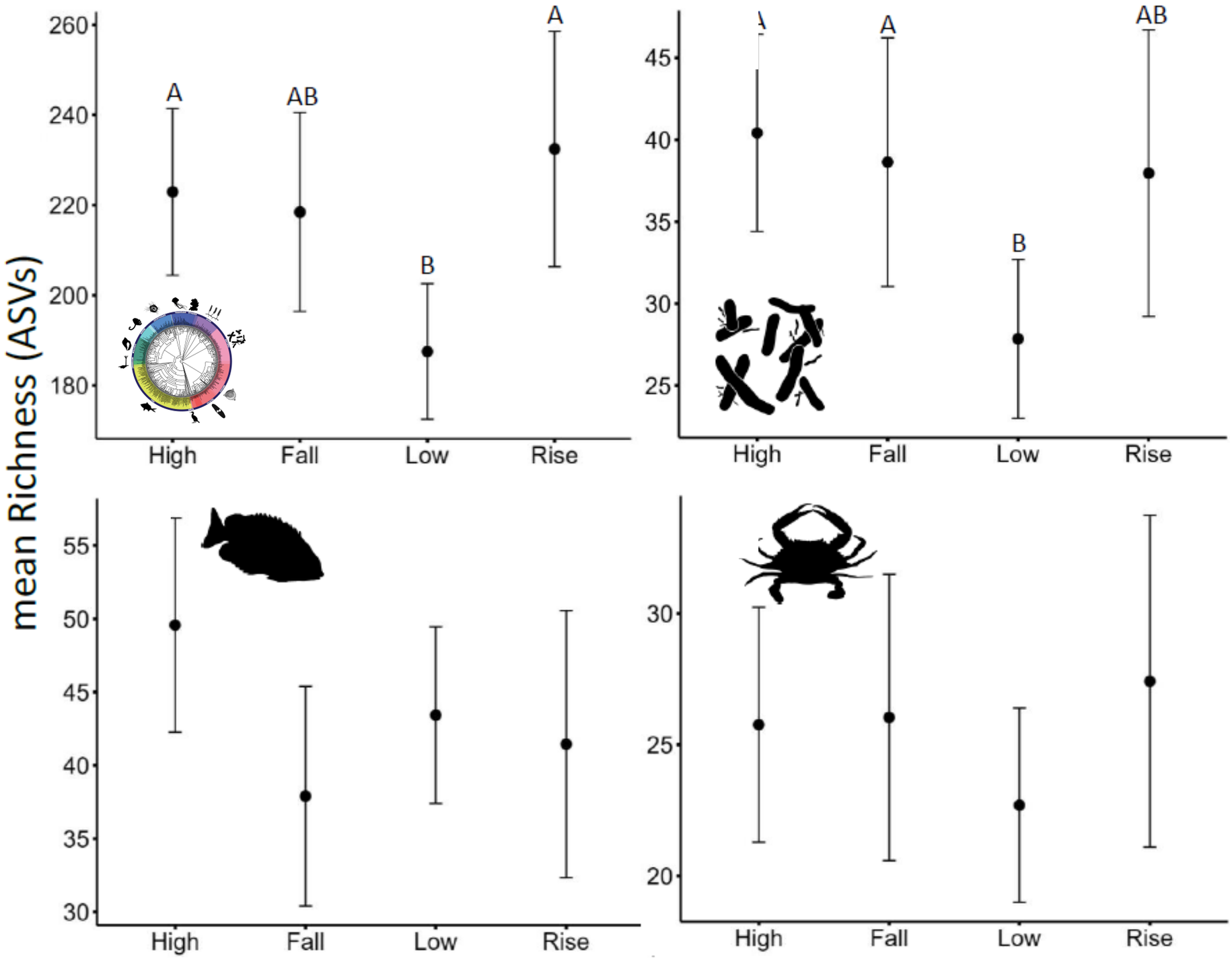




DiBattista et al. in review, Biol. Cons.

“TREE OF LIFE” METABARCODING IS A ROBUST MONITORING APPROACH

- Temporal patterns in taxonomic richness (and composition) across all the tidal stages



DiBattista et al. in review, Biol. Cons.

WHAT OTHER APPROACHES CAN WE USE TO RECORD BIODIVERSITY?

iNaturalist Explore Community More

About

Members 34

The purpose of this Blue World (http://www.blueworld.net.au/about/) and Australian Museum (https://australian.museum/) sponsored project, as part of the Valerie Taylor City East Prize, is to increase biological records at Parsley Bay, Camp Cove, and Shark Beach in southern Sydney

Read More ›

Project Journal

Overview | 2,143 OBSERVATIONS | 443 SPECIES | 303 IDENTIFIERS | 87 OBSERVERS | Stats

dcb

Sydney Dive Charters®

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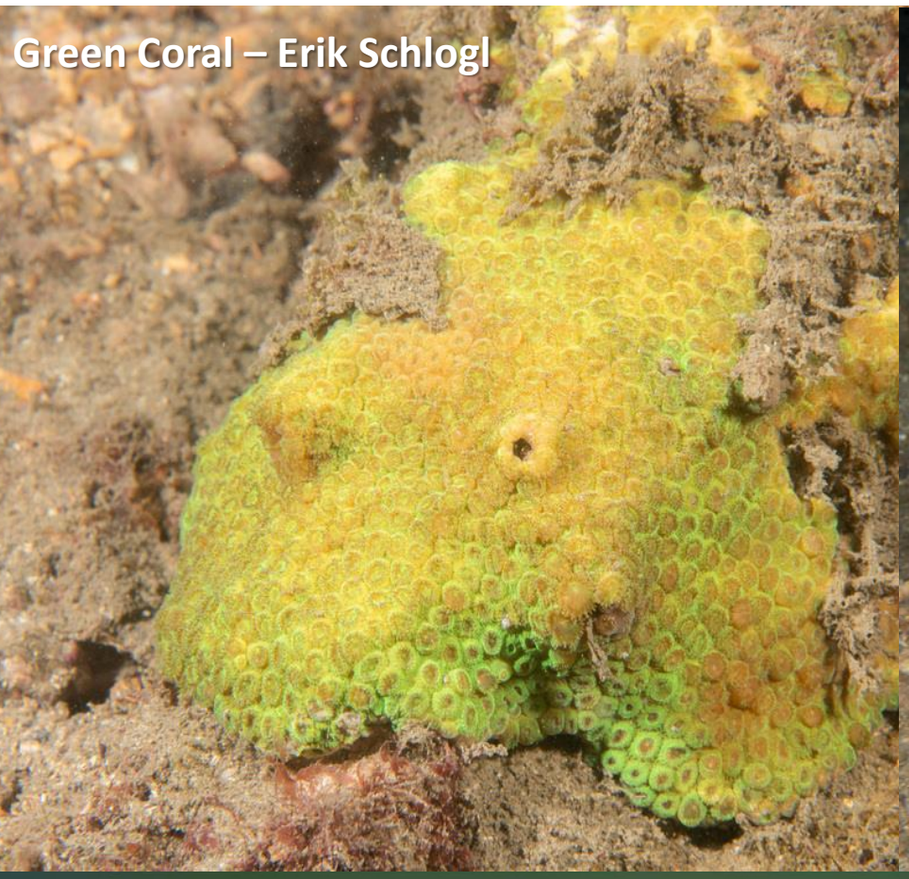
clove lane MODERN BISTRO

WHAT OTHER APPROACHES ARE WE USING TO RECORD BIODIVERSITY?



Sydney

our Membership

Project Journal

Overview

1,360 OBSERVATIONS

365 SPECIES

228 IDENTIFIERS

66 OBSERVERS

Stats

WHAT OTHER APPROACHES ARE WE USING TO RECORD BIODIVERSITY?

Juvenile Eastern Blue Groper – Joseph DiBattista

hlogI

nmer01

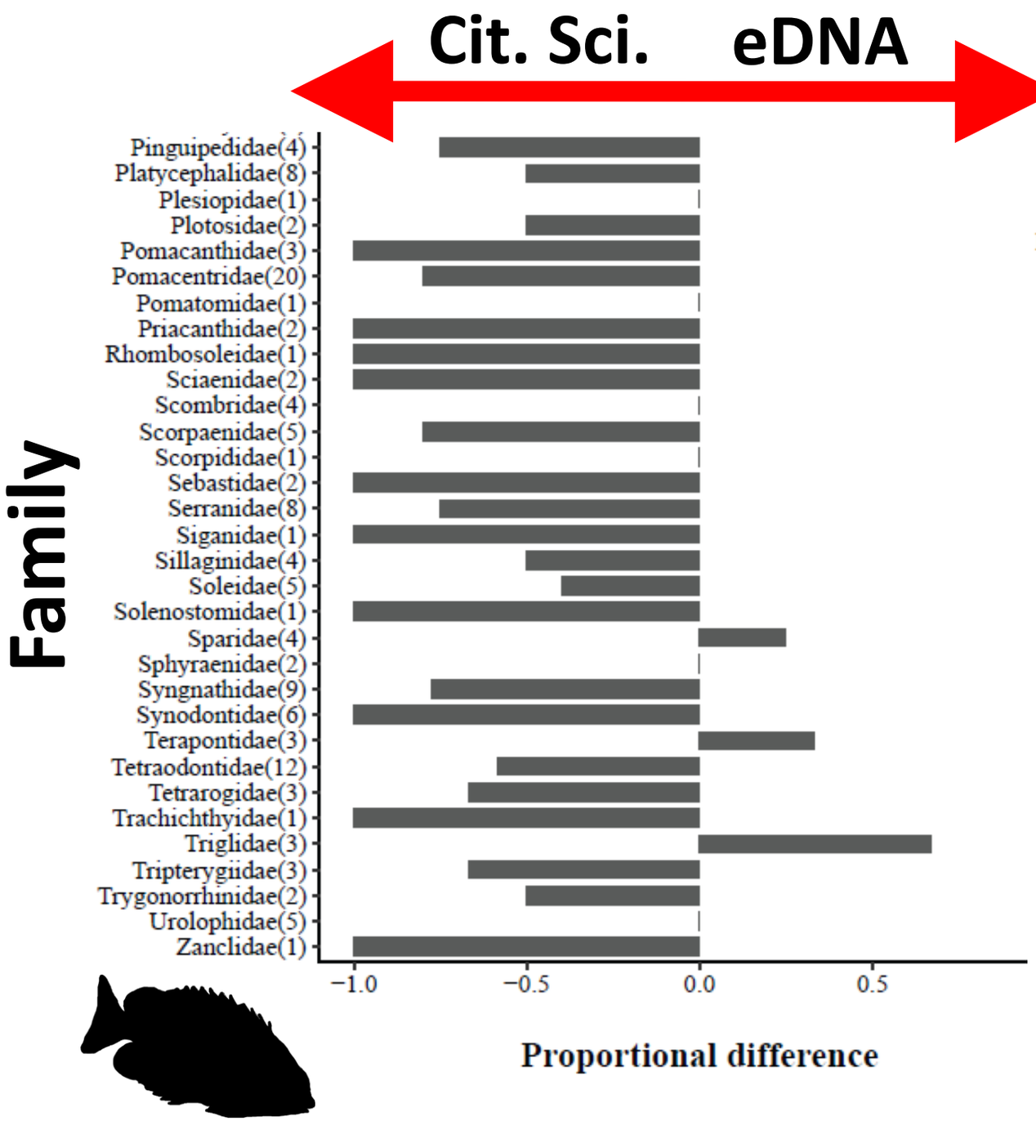
1iner

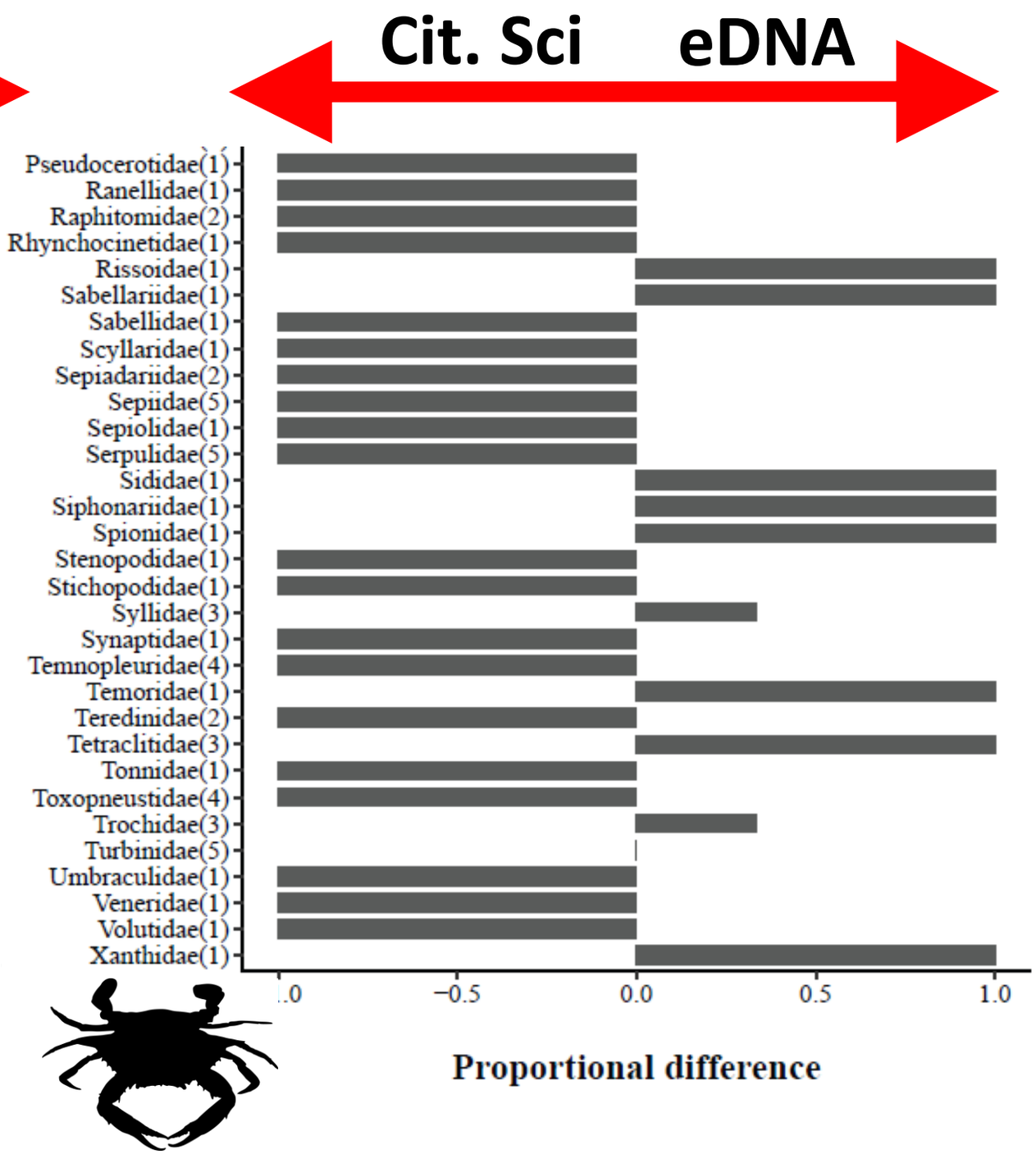
bbard

love lane
MODERN BISTRO

DIGITISED 20+ YEARS OF FISH AND MACROINVERTEBRATE OBSERVATIONS

WHAT OTHER APPROACHES ARE WE USING TO RECORD BIODIVERSITY?





TAKEAWAY POINTS IN ESTUARIES

- Habitat type matters, mud, muck, sand, seagrass, saltmarsh, mangroves, rocky reef, oyster reef
- Tide matters, sampling at higher tides can maximize snapshot biodiversity
- A lot of different taxa have a small effect on spatial and temporal variation in biodiversity
- Monthly sampling best due to daily stochasticity and annual consistency in estuaries
- Citizen science programs can supplement eDNA data with complementary biological records

THANK YOU!

Twitter @joey_squishfish

Woollahra Municipal Council

SAVE PARSLEY BAY

PRO DIVE
EST. 1969
Experience

BLUE WORLD
OCEAN PROTECTION

NATIONAL PARKS ASSOCIATION OF NSW
protecting nature through community action

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