

Ophiuroidea

Contours

-1000 m

-2000 m

-3000 m

Australian EEZ

Cummulative probability

High : 100.000000

Low : 0.000

Species rec

Dr Tim O'Hara
Museum Victoria



Tropical Deep Sea Benthos
fête ses 40 ans

0 125 250 500 Kilometers

Gifford
Seamount

Britannia
Seamount

Norfolk Is

Taupo
Seamount

Lord Howe Is

Ophiuroids (Brittle-stars)



Ophiohamus georgemartini
(SMIB 5)



Ophioleptoplax ?
(EXBODI)



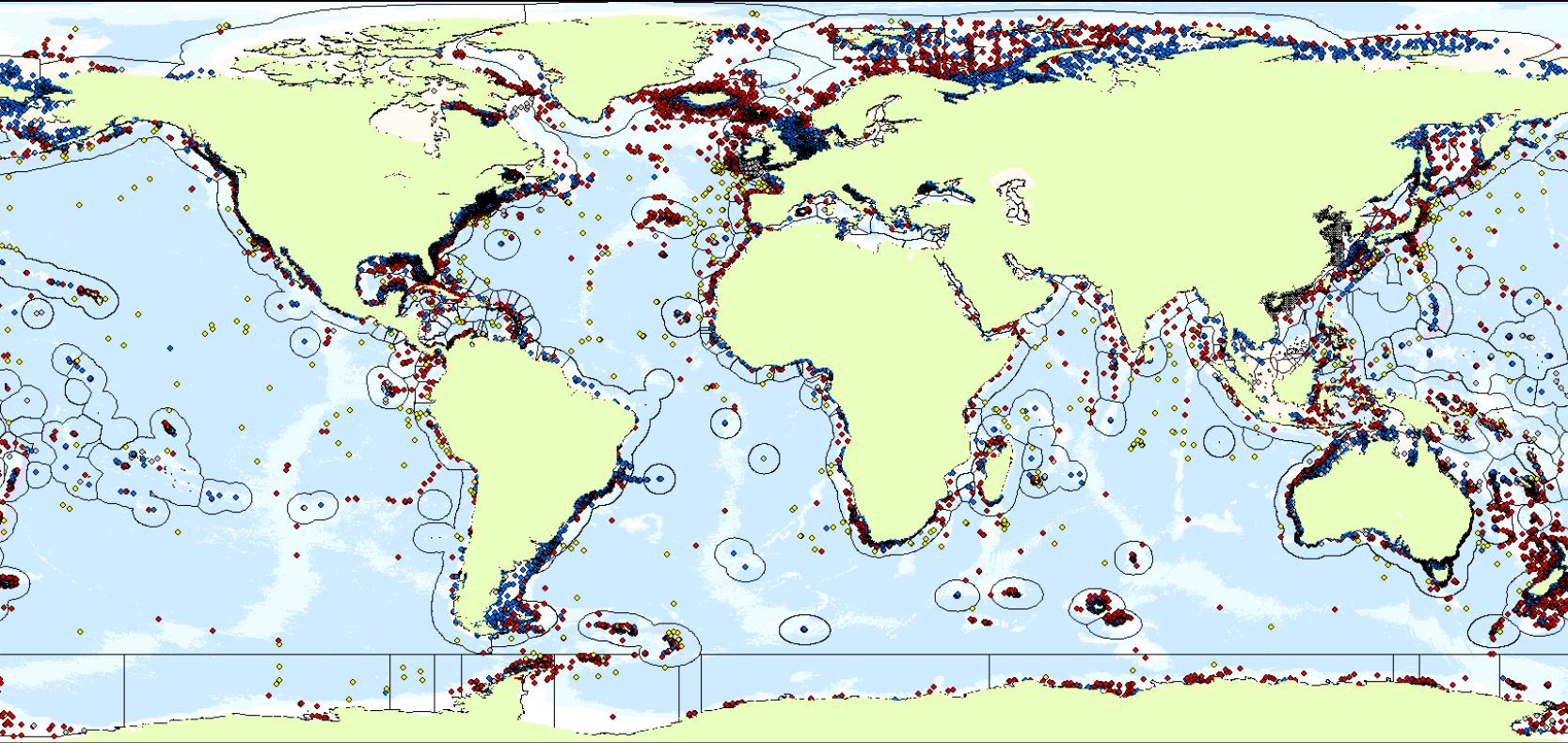
Amphipholis linopneustei
(BIOCAL)



Actinozonella sp nov
(Musorstom 5)



Astrogymnotes hamisia
(CHALCAL 2)

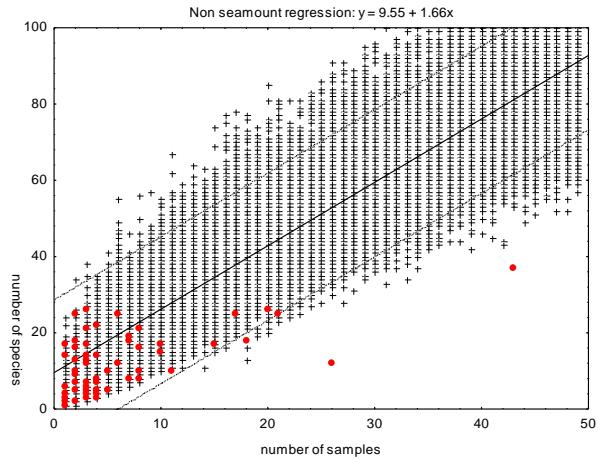


- Total: 147k lots, 2400 spp, 3m specimens
- MNHN lots: 10k, 53k specimens
(>20k if all identified and registered)
- 9 months in MNHN over the past 16 years
- 3-4 weeks to identify a large TDSB survey

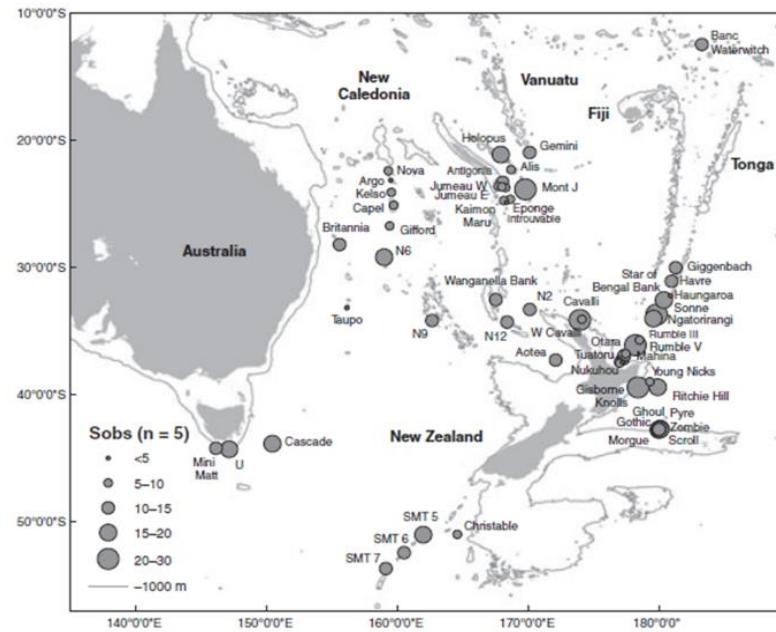


MUSÉUM
NATIONAL D'HISTOIRE NATURELLE

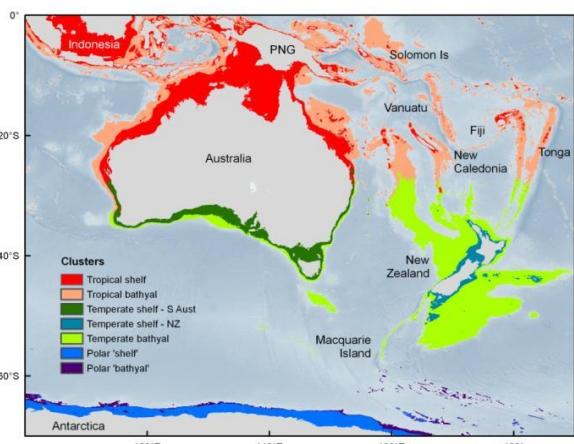
Macro-ecology



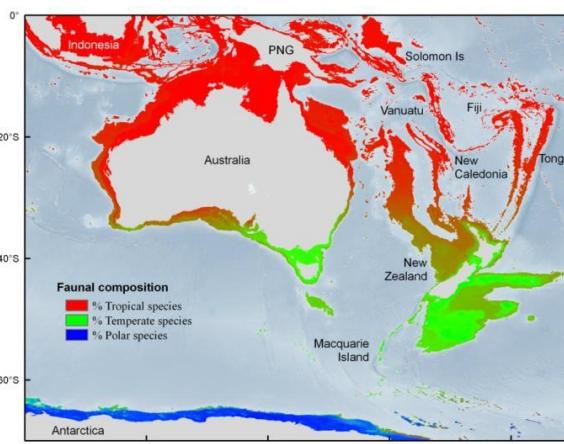
O'Hara (2007) Global Biog Ecol 16



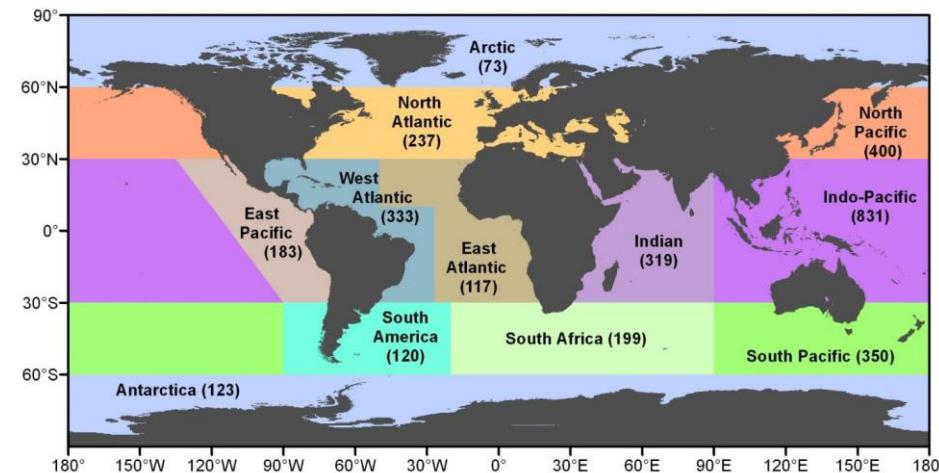
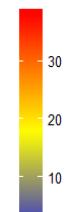
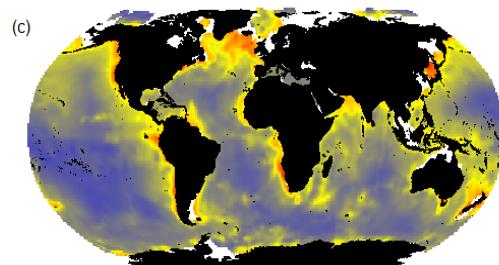
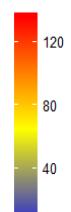
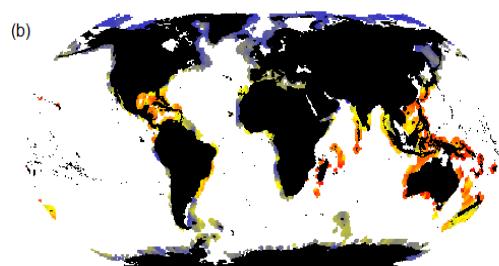
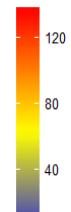
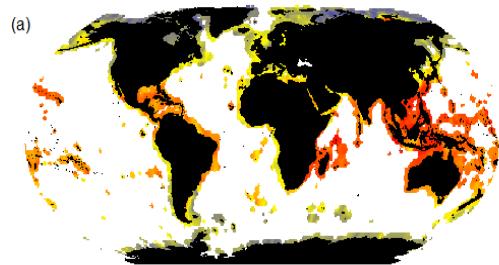
O'Hara & Tittensor (2010) Marine Ecology 31



O'Hara et al. (2011) Current Biology 21



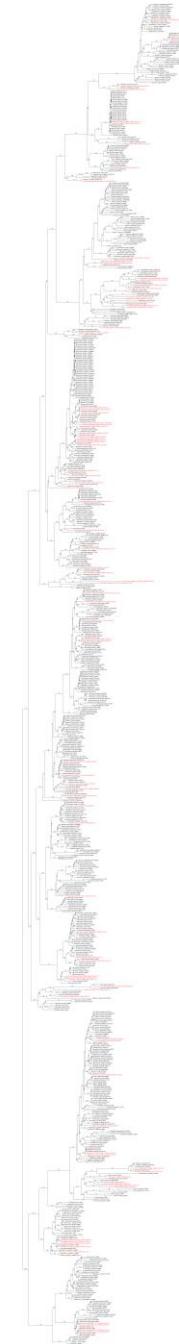
Global extent



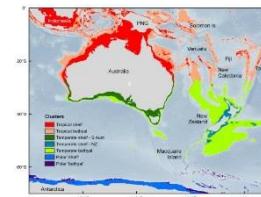
Stöhr, O'Hara & Thuy (2012) PlosOne 7(3): e31940

Woolley et al. (2016) Nature 533: 393-6

DNA



+



The big questions

1. Where and when did the deep-sea fauna originate?
2. What is the relationship between the faunal regions?
3. Does evolution proceed differently in cold or deep environments

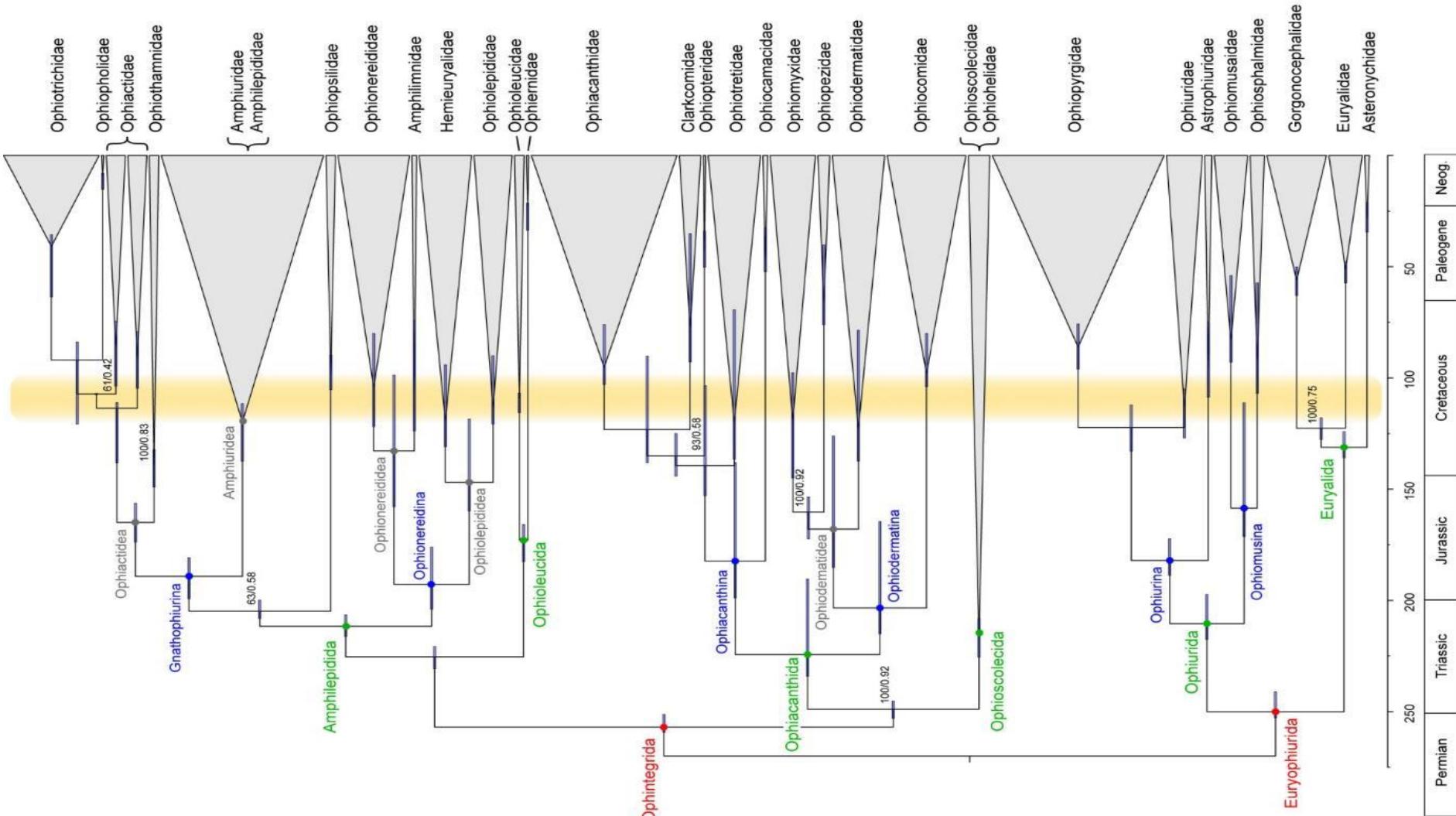
A phylogeny in 3 stages

1. Transcriptomes – create the phylogenetic backbone
O'Hara et al. (2014) Current Biology
2. Exon capture – 1500 exons, 275kbp
Hugall et al. (2015) Mol Biol Ecol
3. Legacy COI data where necessary

977 samples
20% MNHN
(BIOPAPUA, EXBODI,
EBISCO, ATIMO VATAI,
CEAMARC)

The Ophiuroid phylogeny is about to change ...

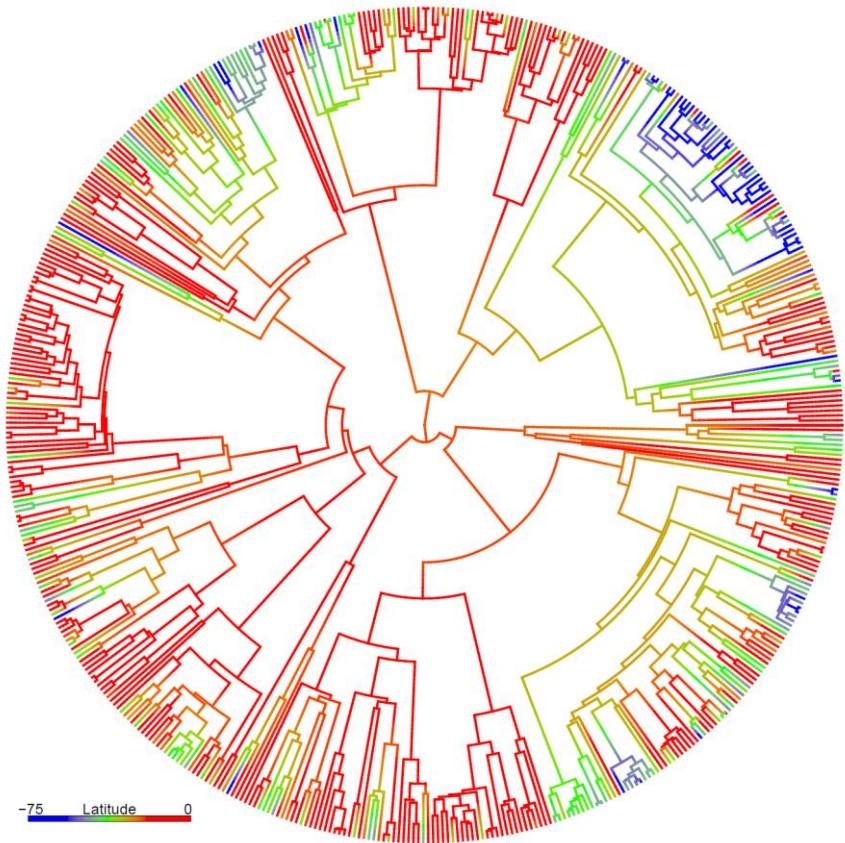
576 species and 416 genes (1484 exons, 273kbp)



O'Hara, Hugall, Thuy, Stöhr & Martynov (in review) MPE

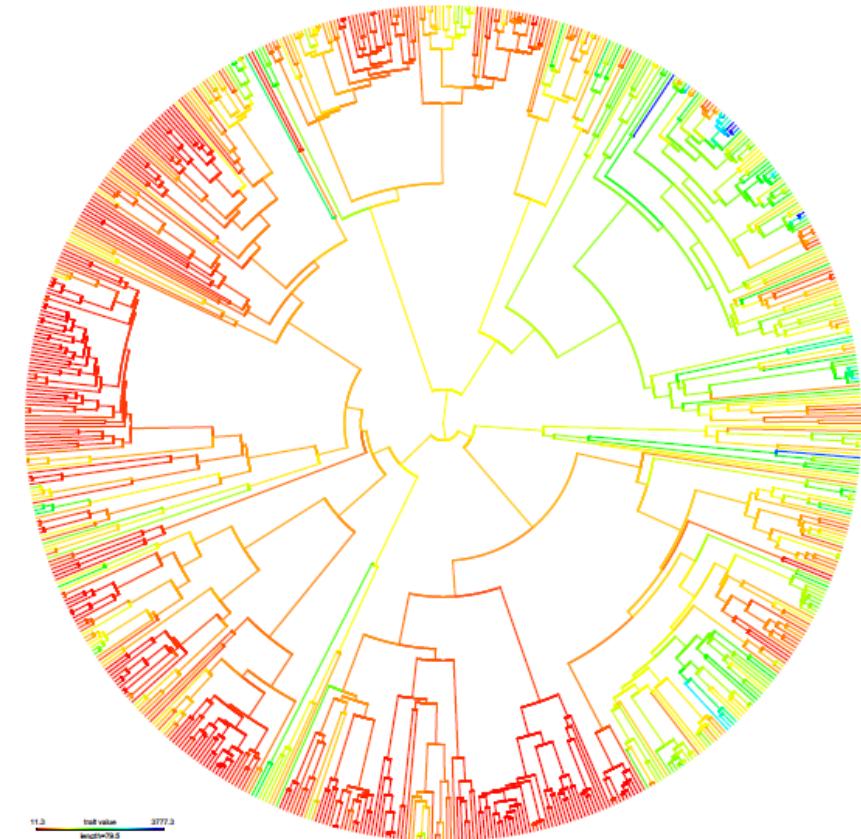
Conservation of biogeographic traits

Guadalupe Bibiesca-Contreras



Latitude
(Antarctica = blue)

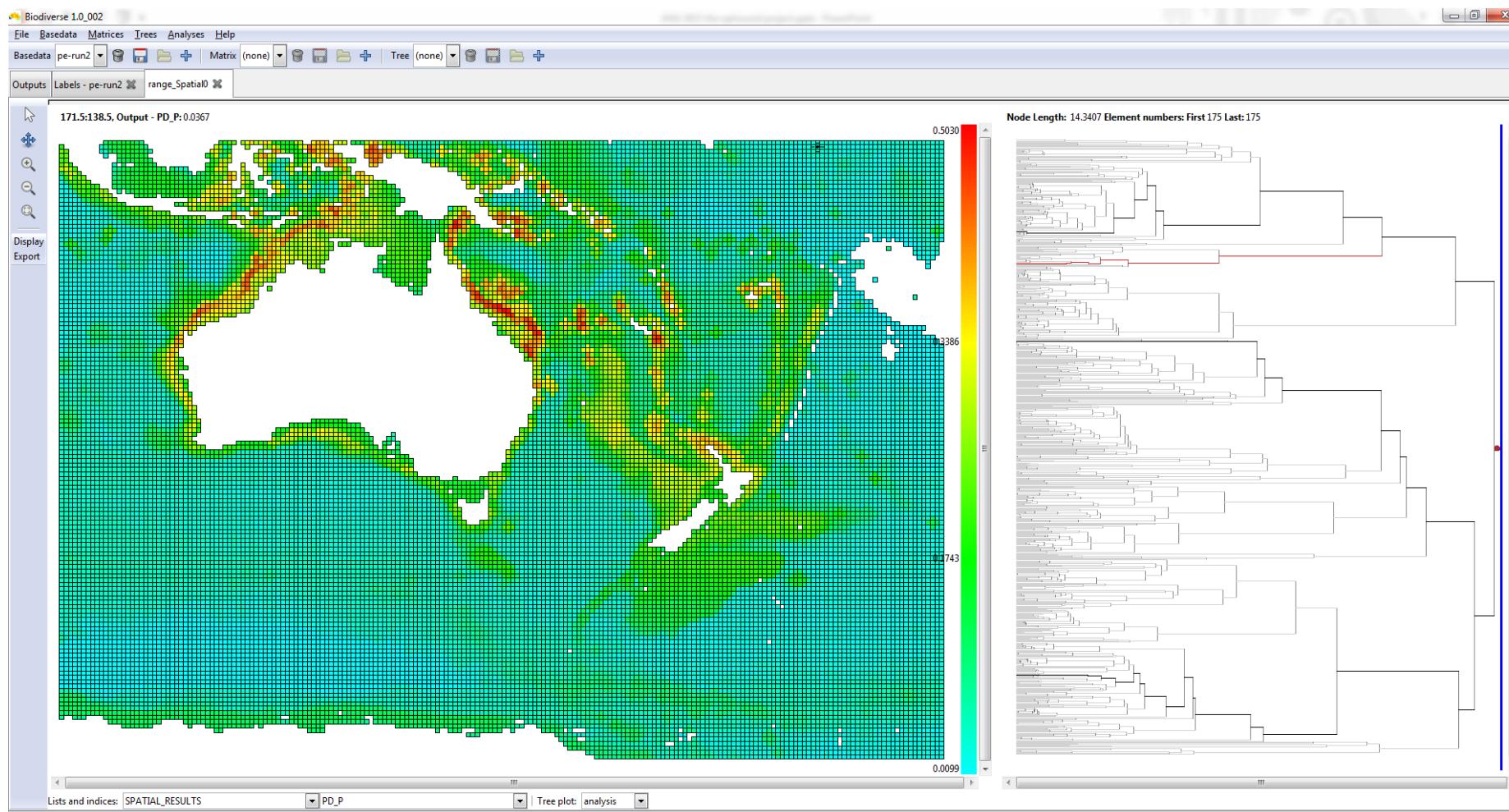
698 species
1498 exons & COI



Depth
(abyss = blue)

Phylogenetic diversity

PD greatest along tropical upper slope
- a habitat not emphasised in marine conservation



Acknowledgments

- Funding Agencies

- NERP/NESP Australian marine biodiversity hubs
- Census of Marine Life
- INDEEP
- MNHN

- Access to museum collections at MNHN

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- Cyndie Dupoux
- Juliette Delavenne
- Sarah Samadi

