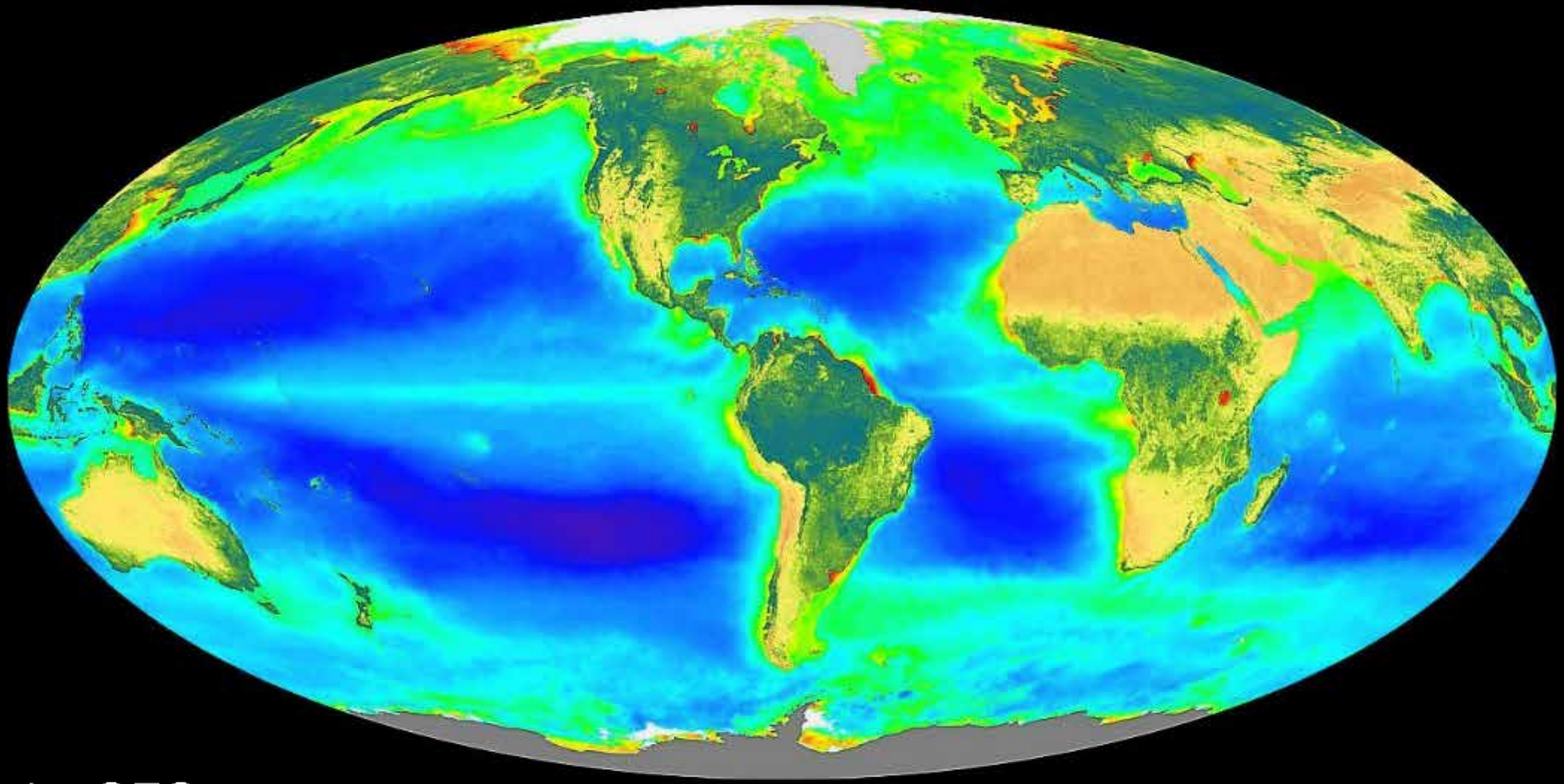
Ocean Bitemap:

A global, collaborative analysis linking biodiversity and marine predation intensity using standardized methods

Matt Whalen, Ross Whippo, Emmett Duffy,
and approximately 55 partners (give or take …)

MarineGEO
THE TENNENBAUM MARINE OBSERVATORIES NETWORK
Smithsonian Institution

Physics drives the earth and ocean system



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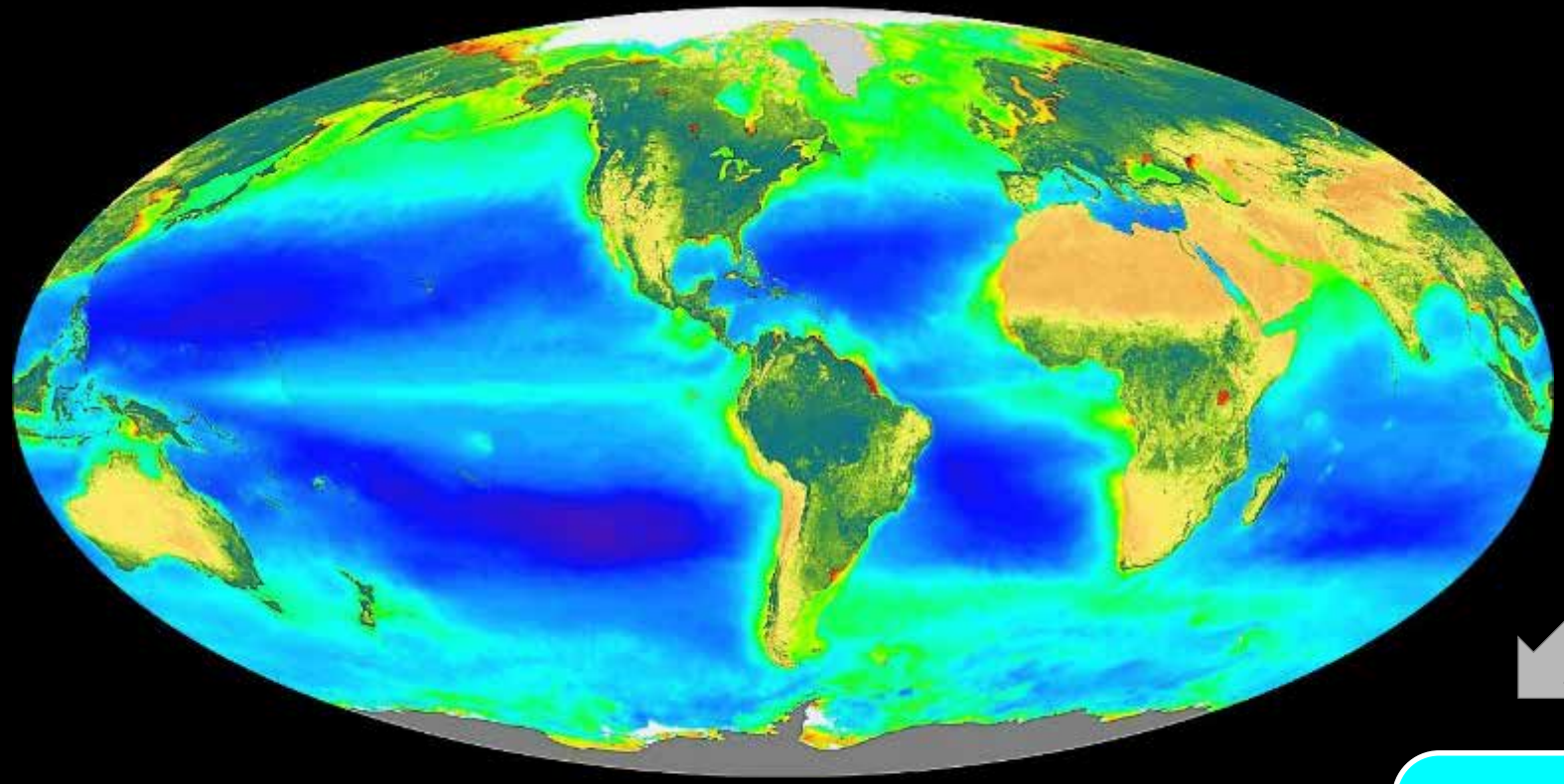
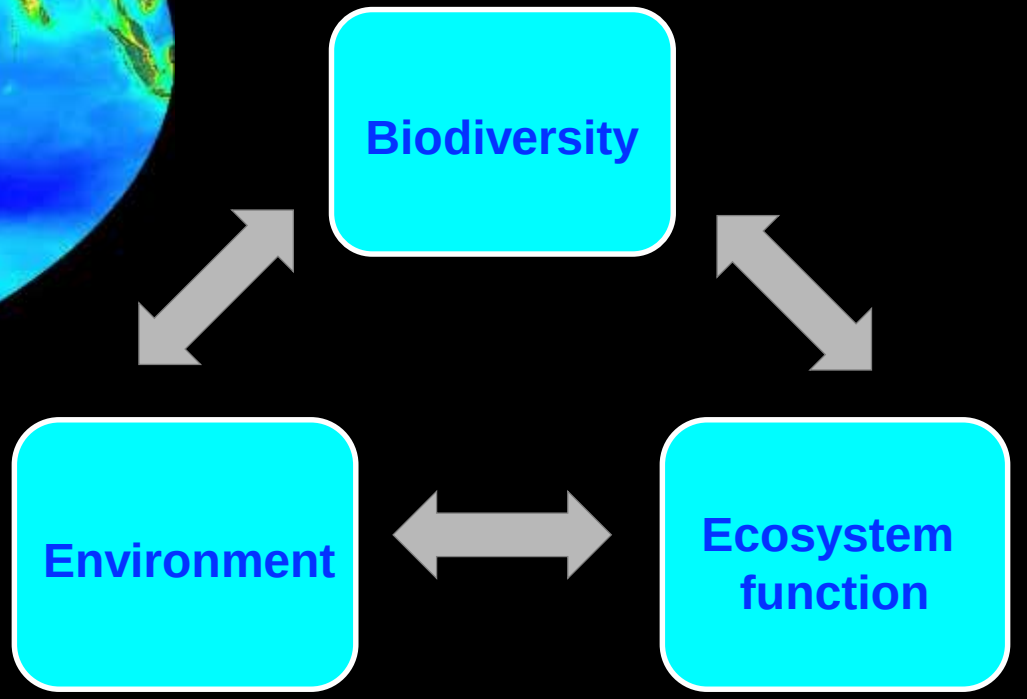
We don’t have a map of top-down forcing





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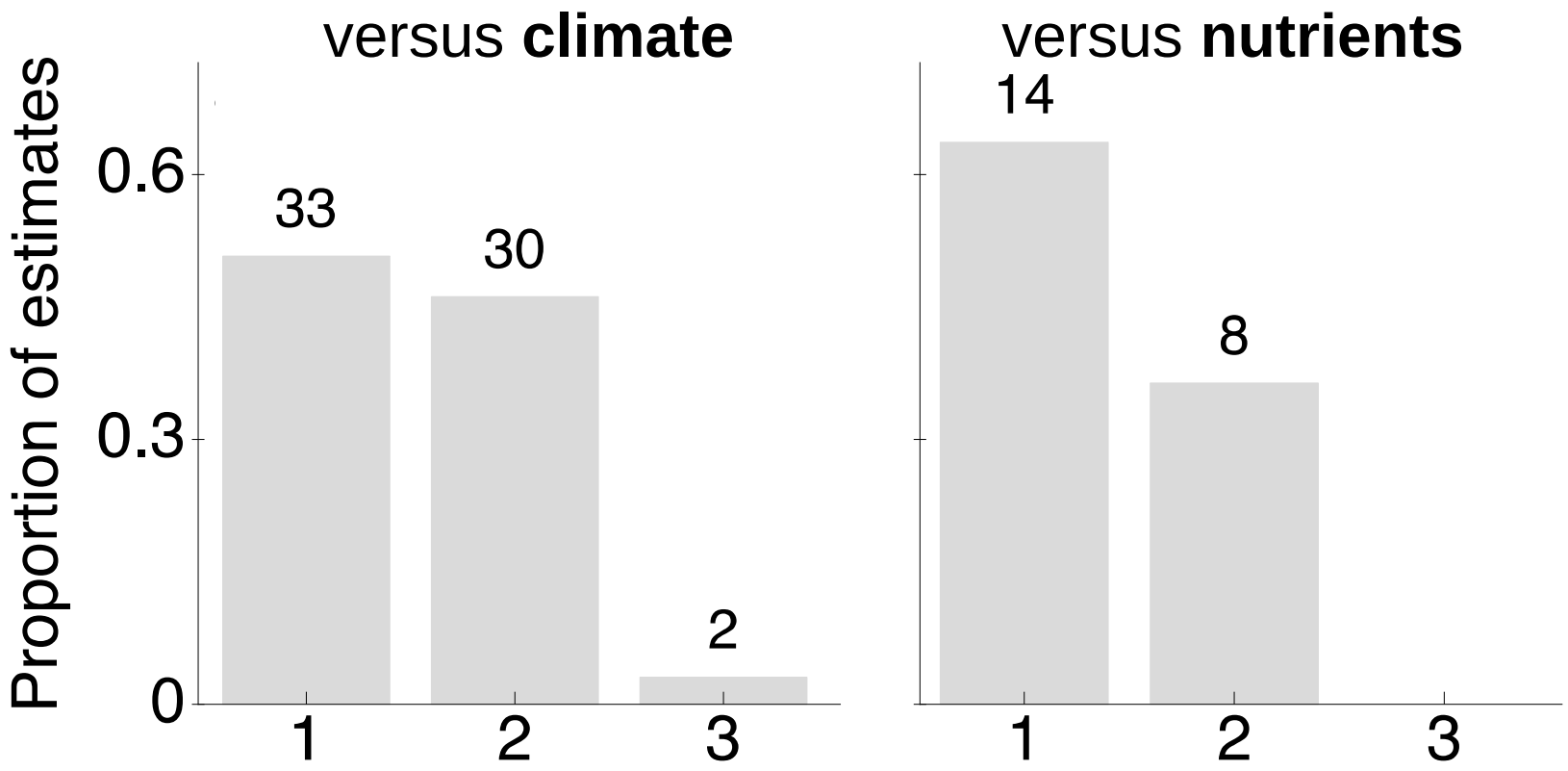
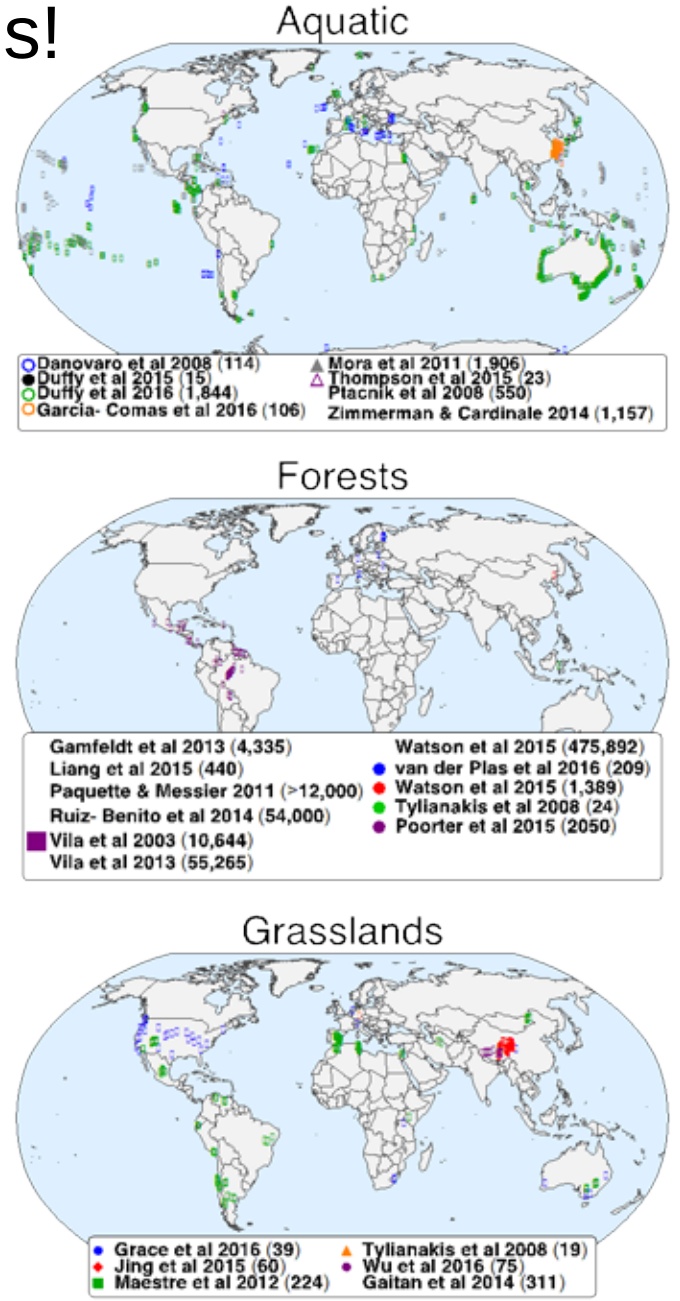
Biodiversity is as important as climate to ecosystems!





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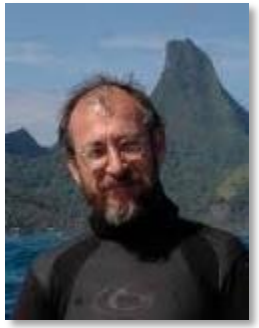
Duffy, J.E., C.M. Godwin, B.J. Cardinale. 2017. Nature 549:261-264.

We’re building the library of marine biodiversity

Matt Whalen
Monday 1600,
524C

The 2017 Hakai-MarineGEO BioBlitz: A new gold standard approach to inventorying and understanding marine biodiversity

Gustav Paulay
Wednesday 1030,
524C



Mare incognita - how little we know about coastal biodiversity and how to change that

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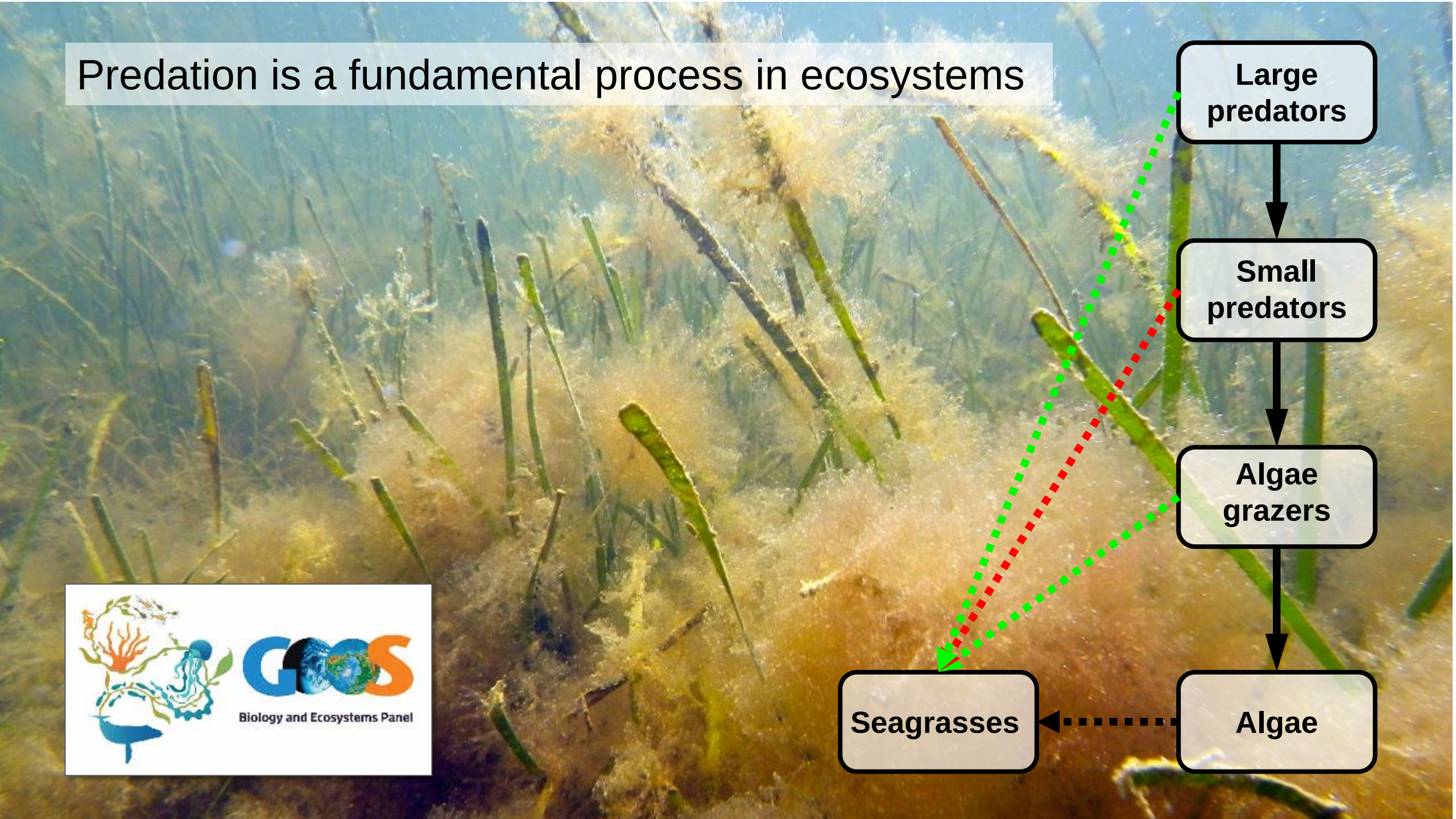
Hakai

Predation is a fundamental process in ecosystems



Biology and Ecosystems Panel

Ocean Bitemap: a global map of top-down control

Alaska –W Raymond
Baja California – C Hereu, P Jorgensen
British Columbia – M Hessing-Lewis, Z. Montieth
Belize – D Janiak
Brazil – A Flores
California 1 – K Hovel, M Yeager
California 2 – J O'Leary
California 3 – B Hughes
Chile – M Thiel
Croatia – C Kruschel
Delaware – D Dixon, L Johnston
Florida – D Janiak
France – F Rossi
India – E D'Souza
Ireland – N O'Connor
Italy – L Benedetti-Cecchi, F Bulleri
Korea – K-S Lee
Massachusetts – R Hughes, T Hanley
North Carolina 1 – S Ziegler, J Fodrie
North Carolina 2 – B Silliman, L Gaskins
Norway – K Sieben
New South Wales 1 – A Poore
New South Wales 2 – B Lanham
New South Wales 3 – A Vergés
New South Wales 4 – B Kelaher
Oregon – A Galloway

Panamá – J Seeman
Québec – M Cusson
Queensland 1 – P York
Queensland 2 – C Henderson
Queensland 3 – R Connolly
Queensland 4 – M Rasheed
Texas – M Diskin, L Smee, C Patrick

Virginia 1 – PG Ross
Virginia 2 – J Lefcheck
Victoria – H Janes
Washington 1 – K Hultgren
Washington 2 – O Graham?
Wales – R Unsworth, M Robinson?
Yucatán 1 – B van Tussenbroek
Yucatán 2 – E Lozano Ílvarez

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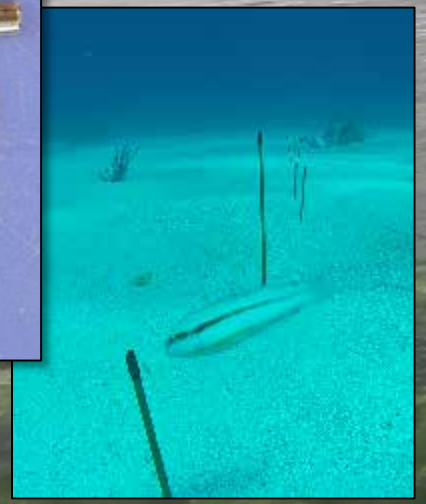
We measured predation & fish communities worldwide



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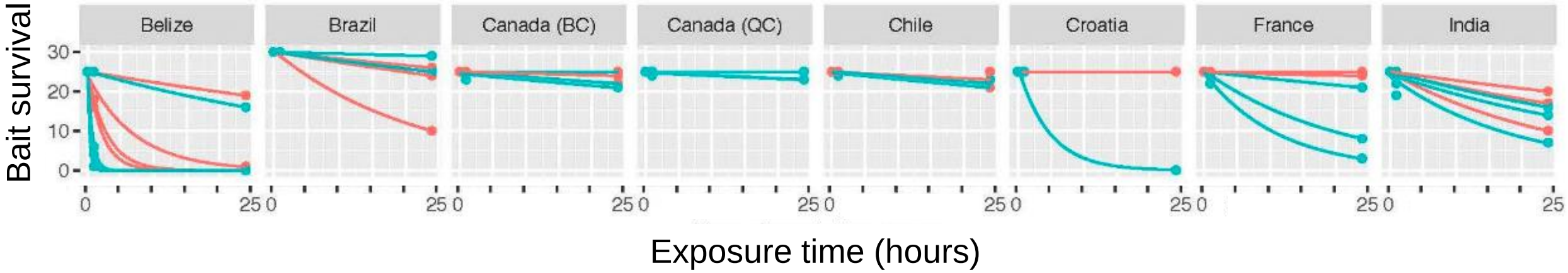
We estimated predation as the exponential decay rate of bait



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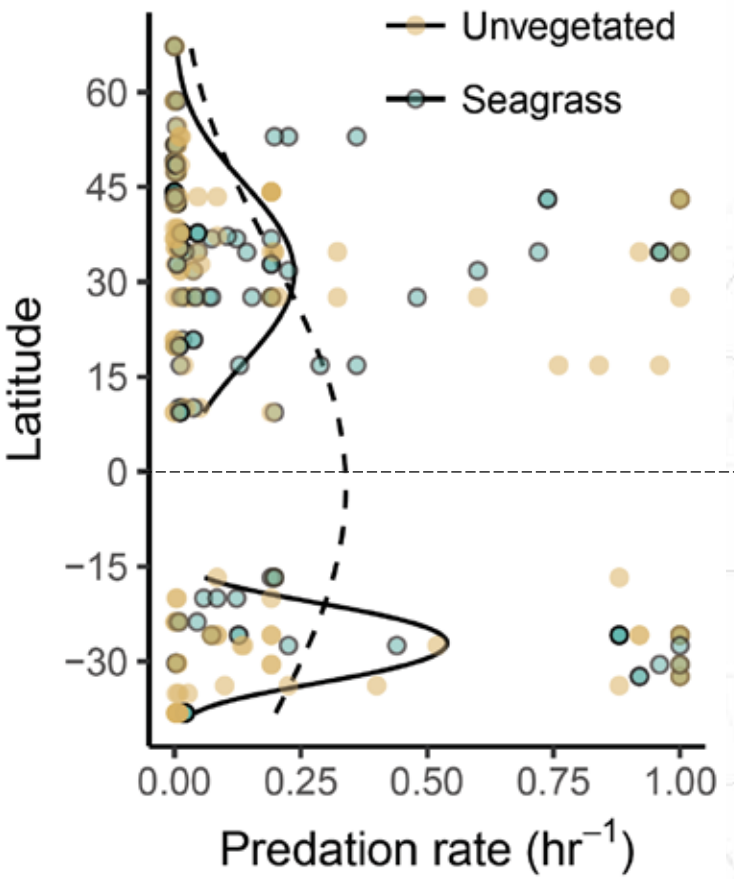
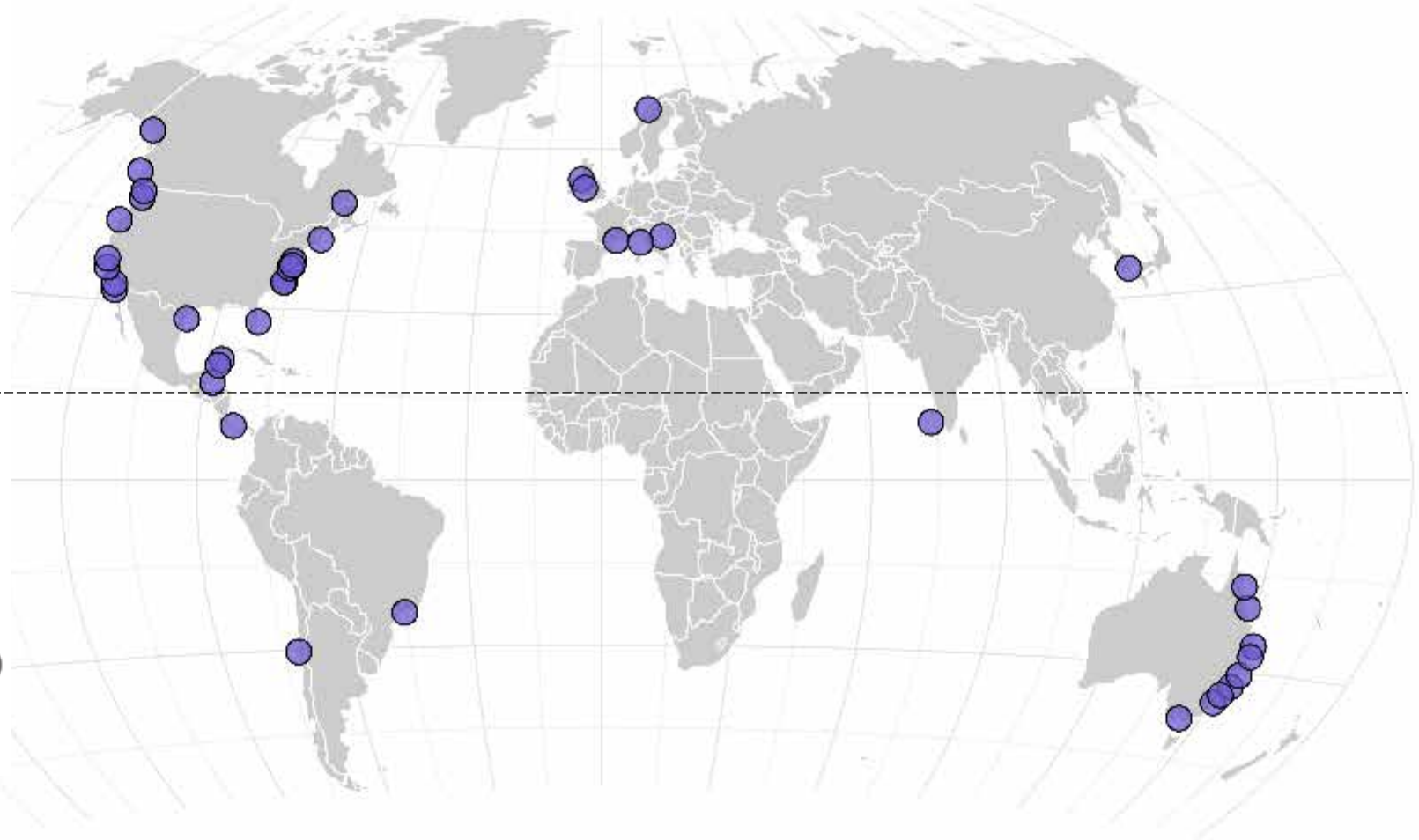
Predation was highest at mid latitudes





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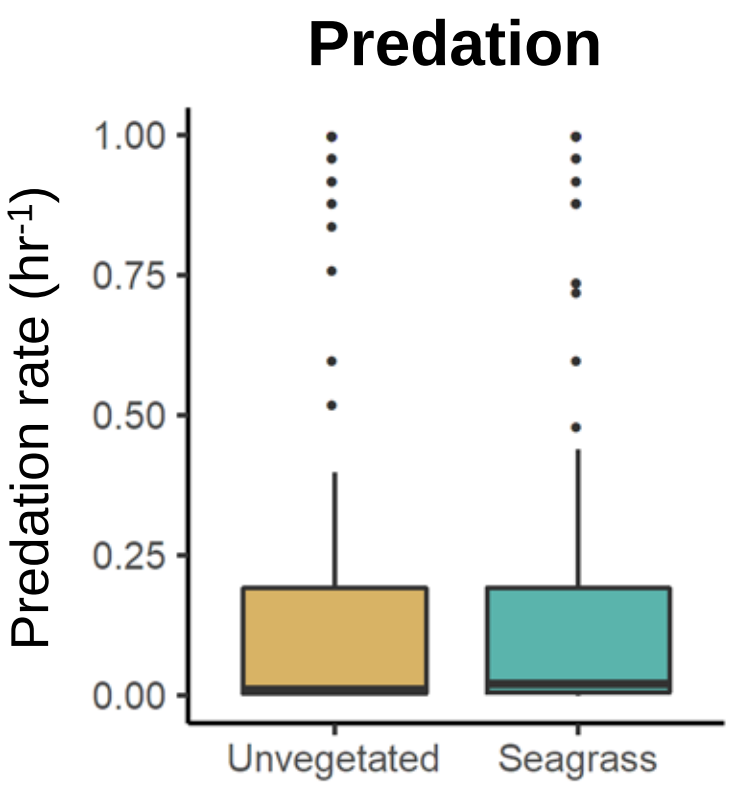
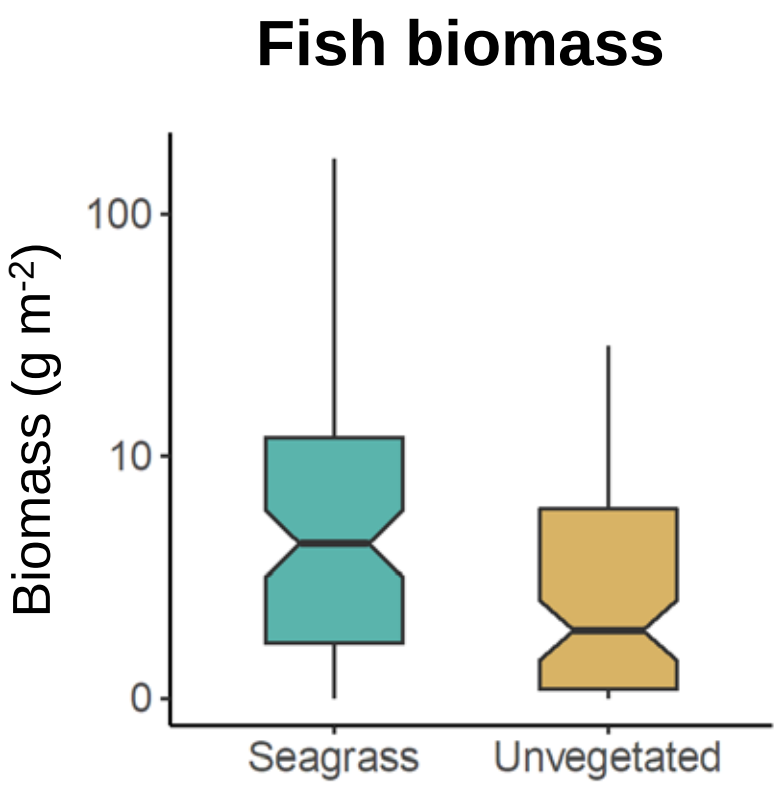
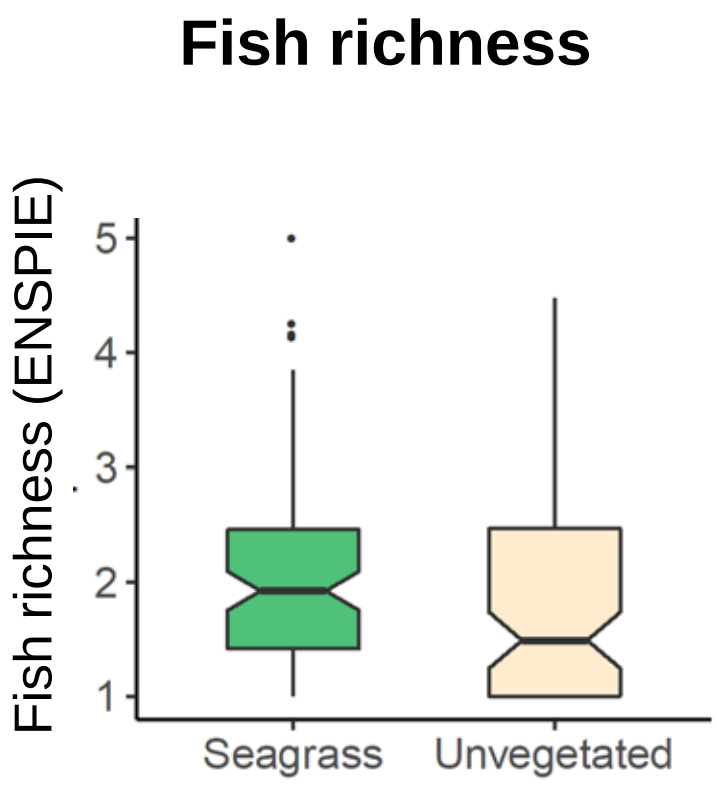
Habitat did not explain much







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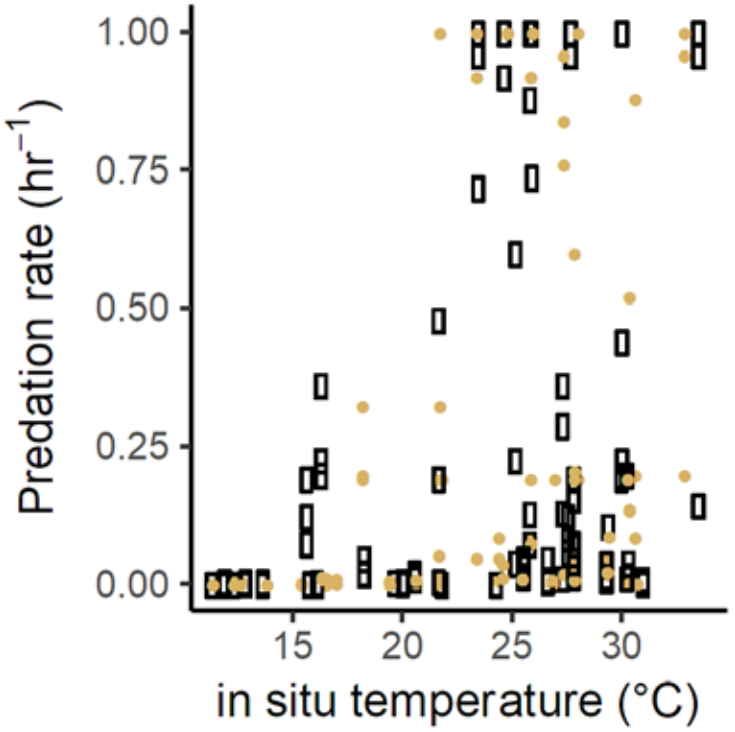
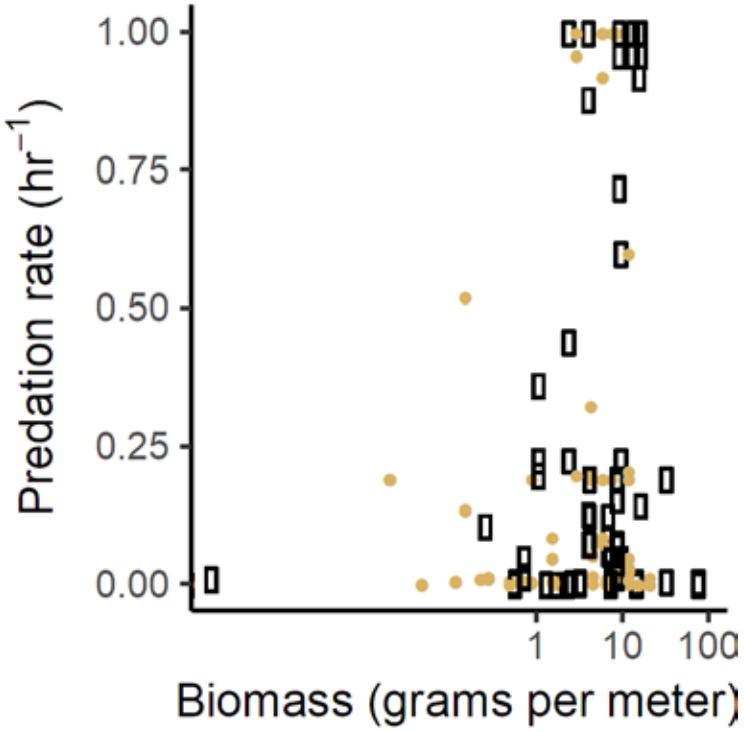
Predation loss increases with temperature, fish biomass, & richness

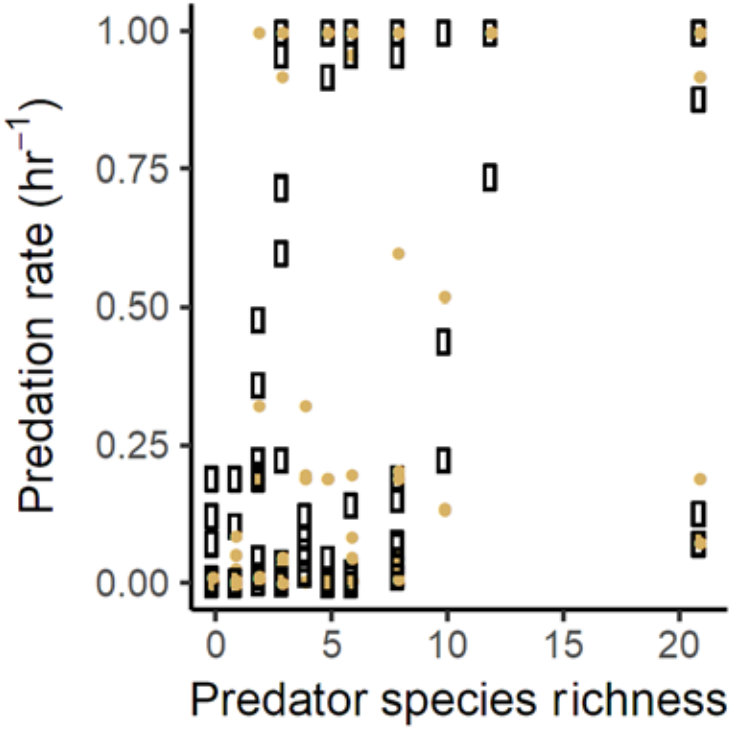
Temperature



Fish biomass



Fish diversity



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Globally, predation rises with temperature, fish biomass, & diversity

Model	DAIC
Predation ~ temp + log B*richness	**0.0**
Predation ~ temp + log B + richness	**0.5**
Predation ~ temp + log B	**1.1**
Predation ~ temp + richness	3.7
Predation ~ temp (in situ)	4.0
Predation ~ temp + habitat	4.6

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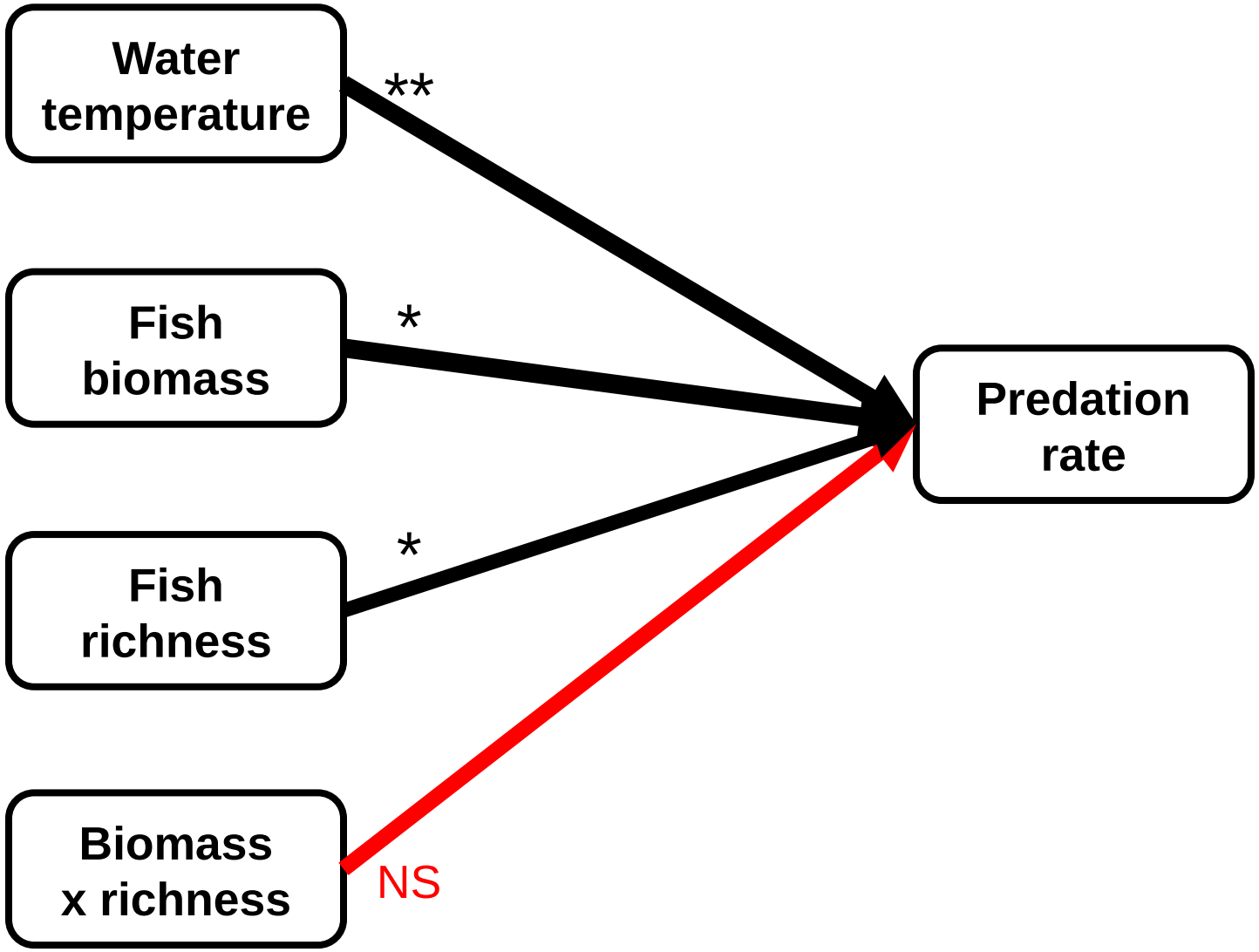
Globally, predation rises with temperature, fish biomass, & diversity



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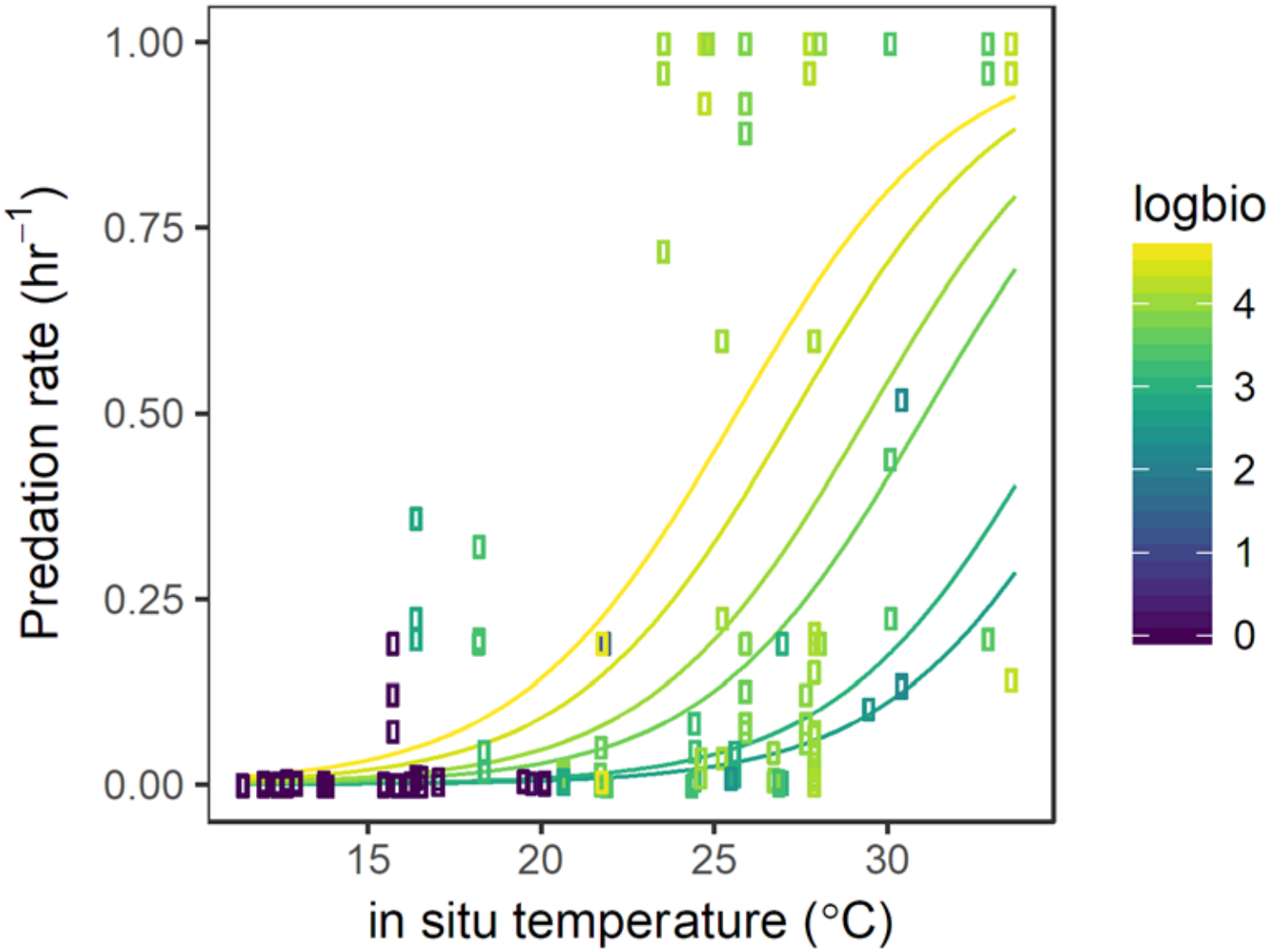
Globally, predation rises with temperature, fish biomass, & diversity



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Next: Let’s increase global coverage!

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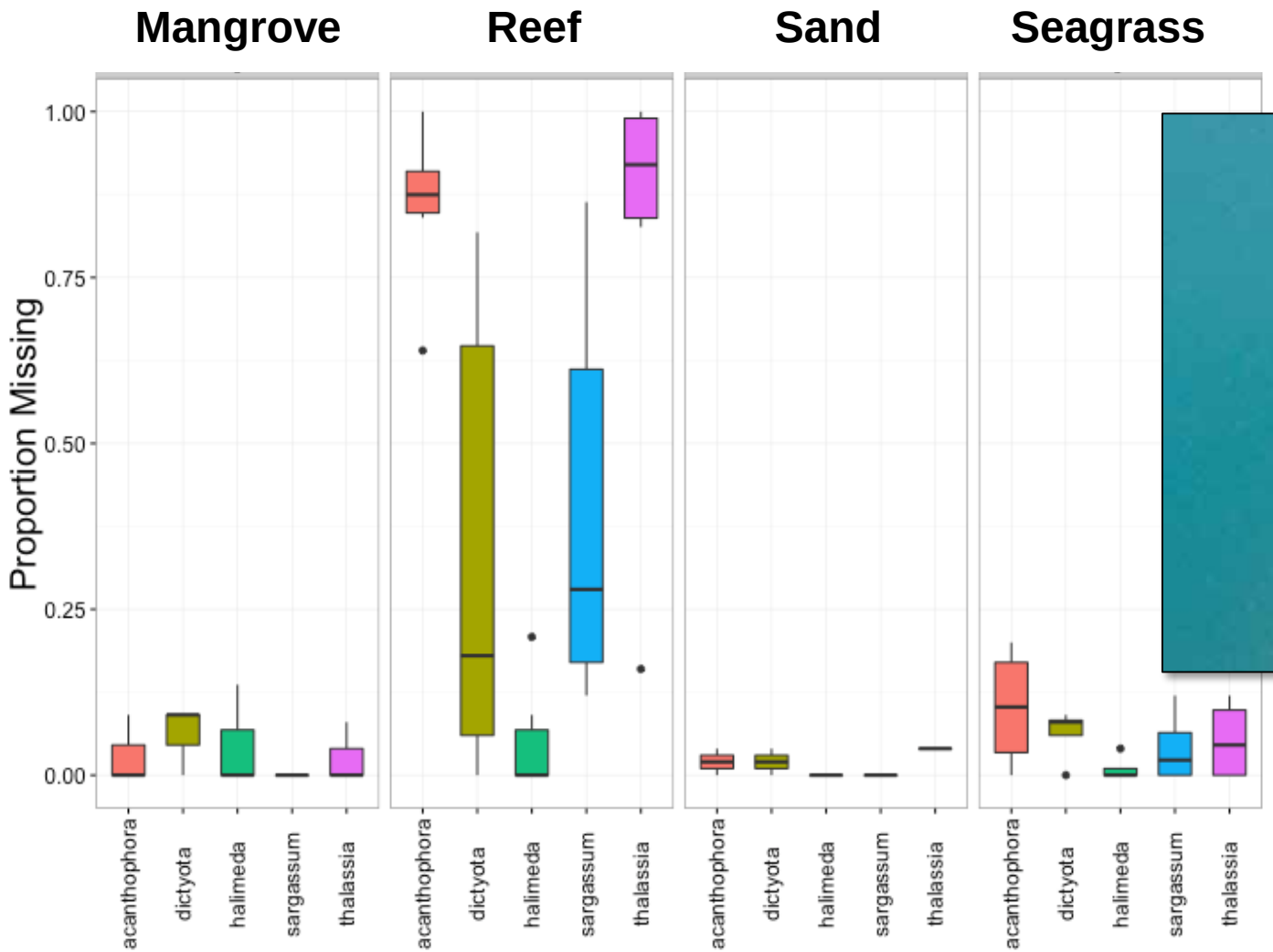
Next: *Weedpops*!



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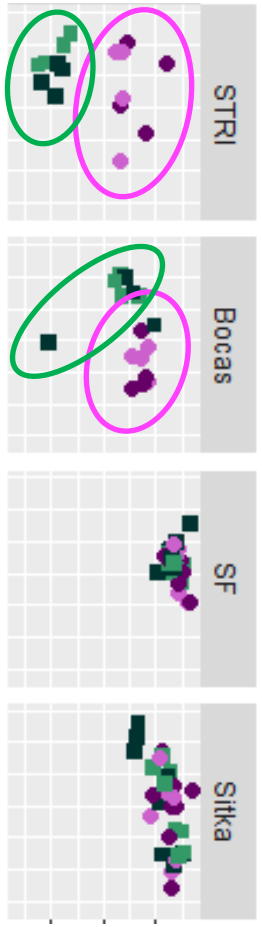
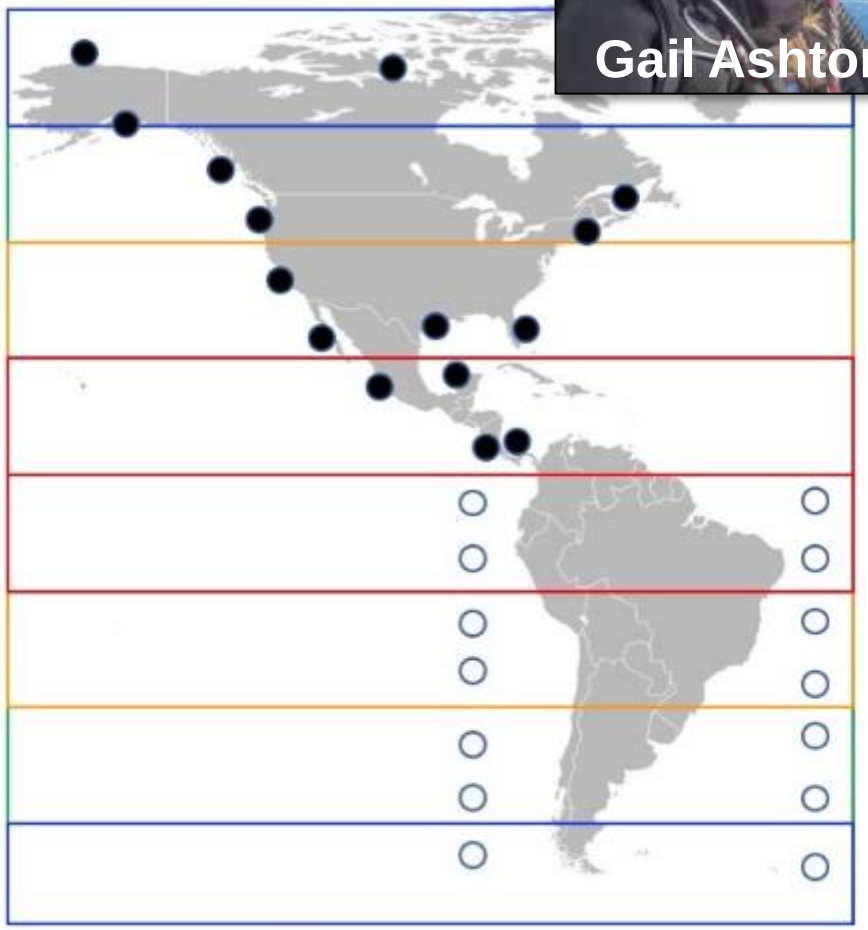
Next: How does predation change communities?





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Des questions?


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