Searching for Living Fossils: GIS and Niche Modeling

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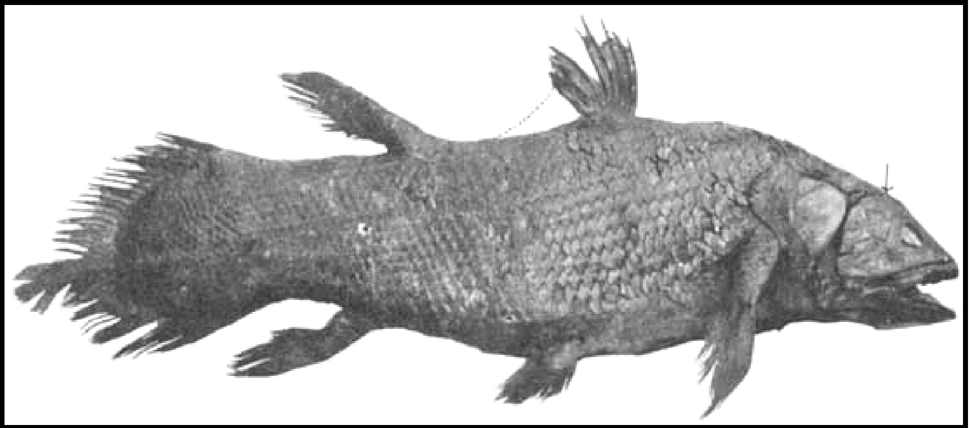
Introduction

- Coelacanths
  - Discoveries
  - Rare and reclusive



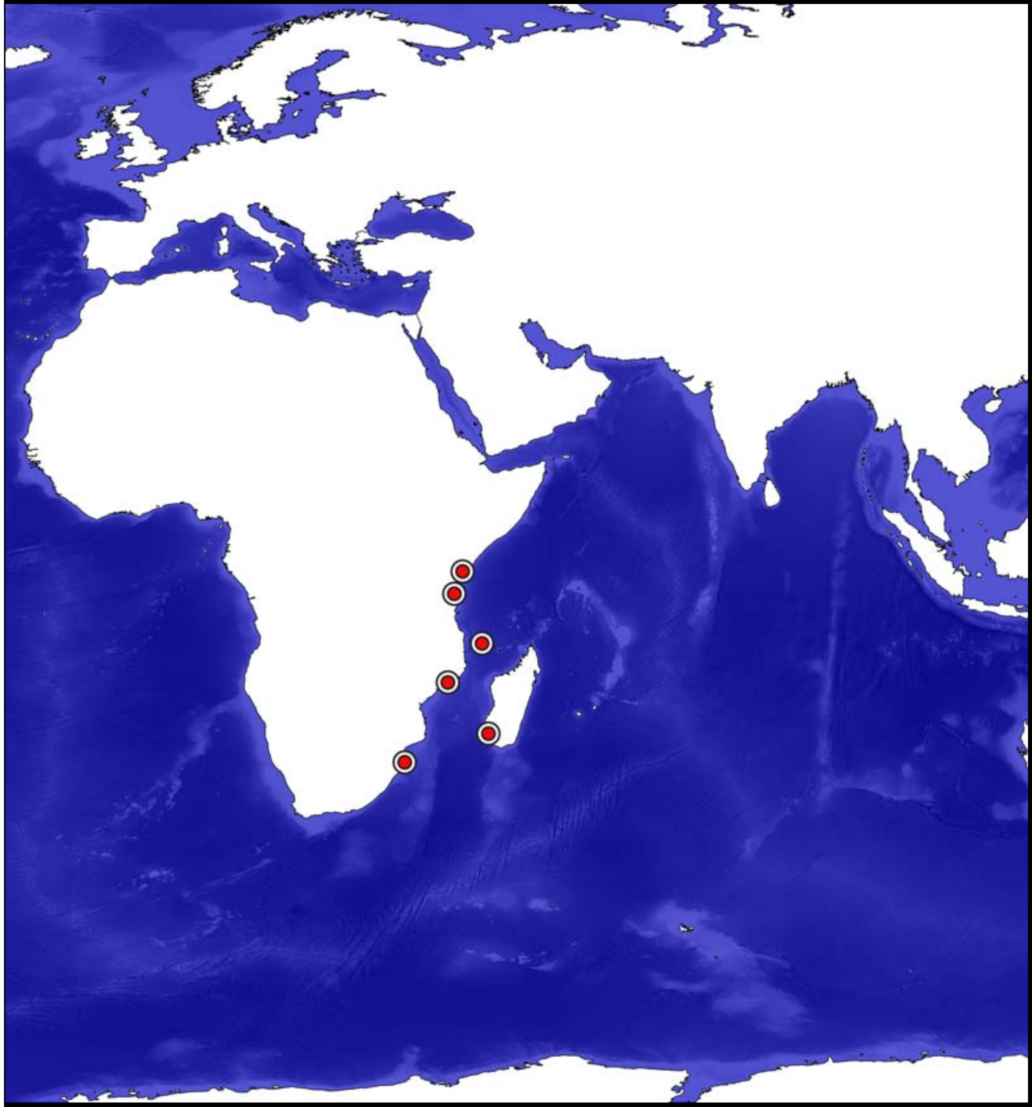
- Ecological Niche Modeling
  - Rare species
  - New species

Goals

- Niche model for *Latimeria chalumnae*
- Investigate ability to anticipate *L. menadoensis*
- Predict additional suitable habitat

http://www.dinofish.com/cimages/jago2.jpg

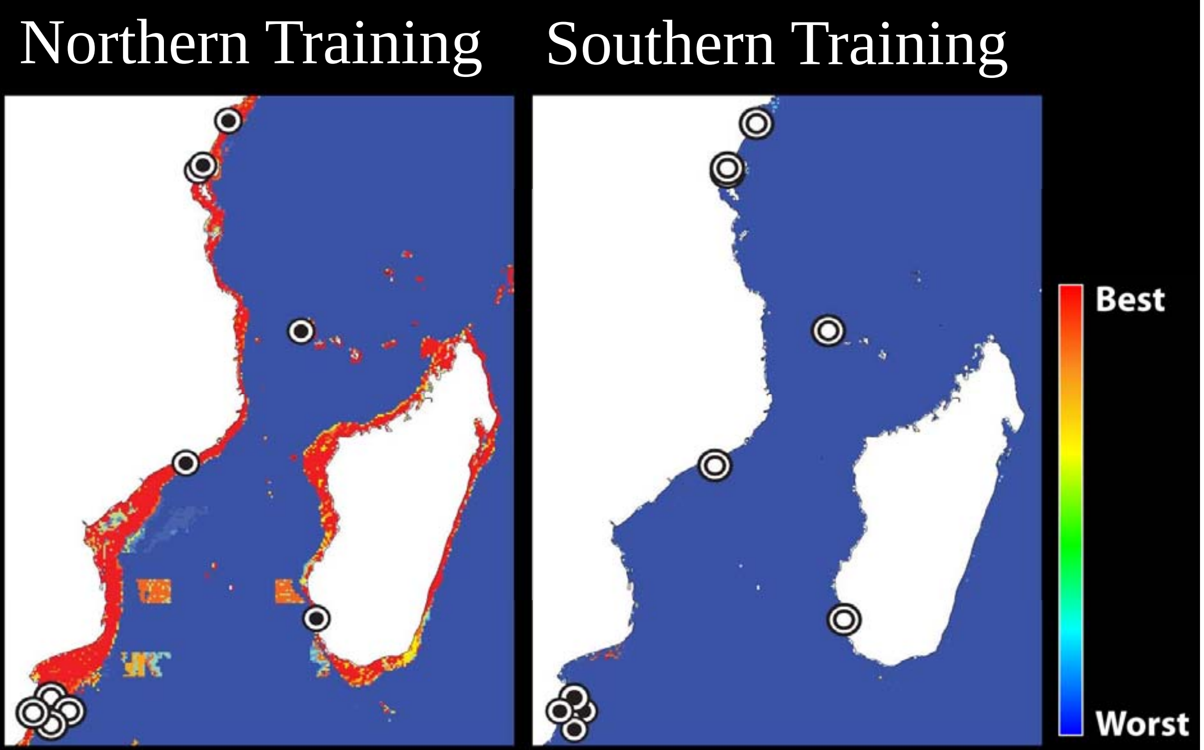
Data and Analysis



- Localities
- Data layers
  - Bathymetry
  - Slope, aspect
  - World Ocean Atlas
  - Sediment depth
- Maxent and GARP

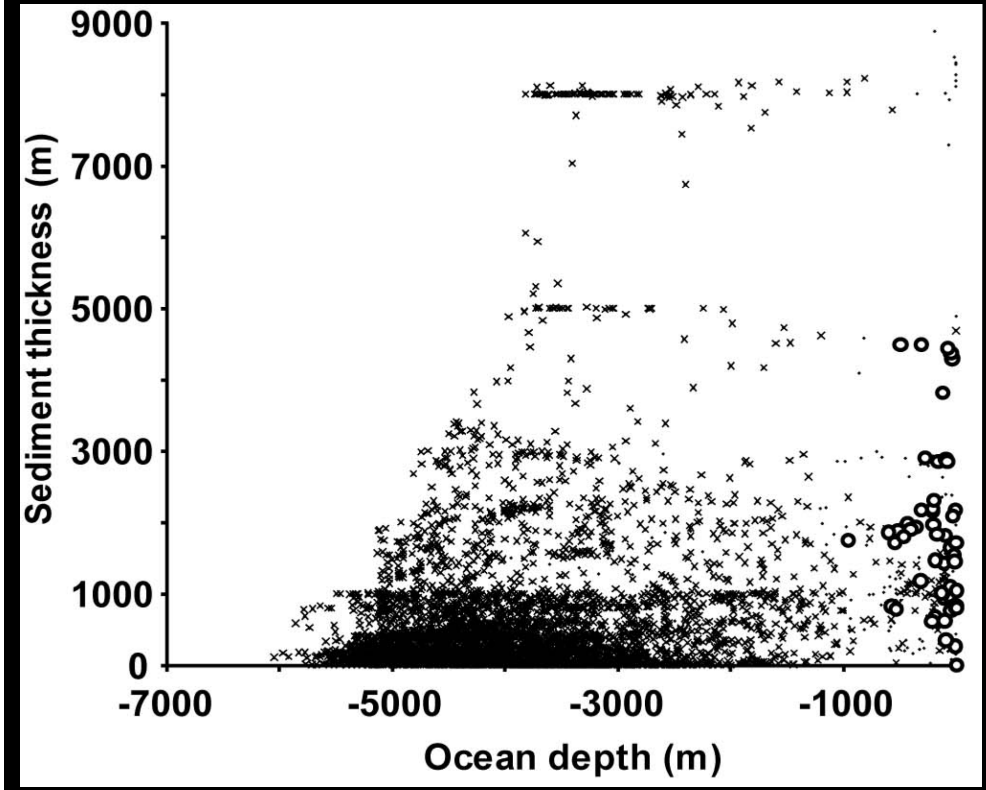
Model Validation

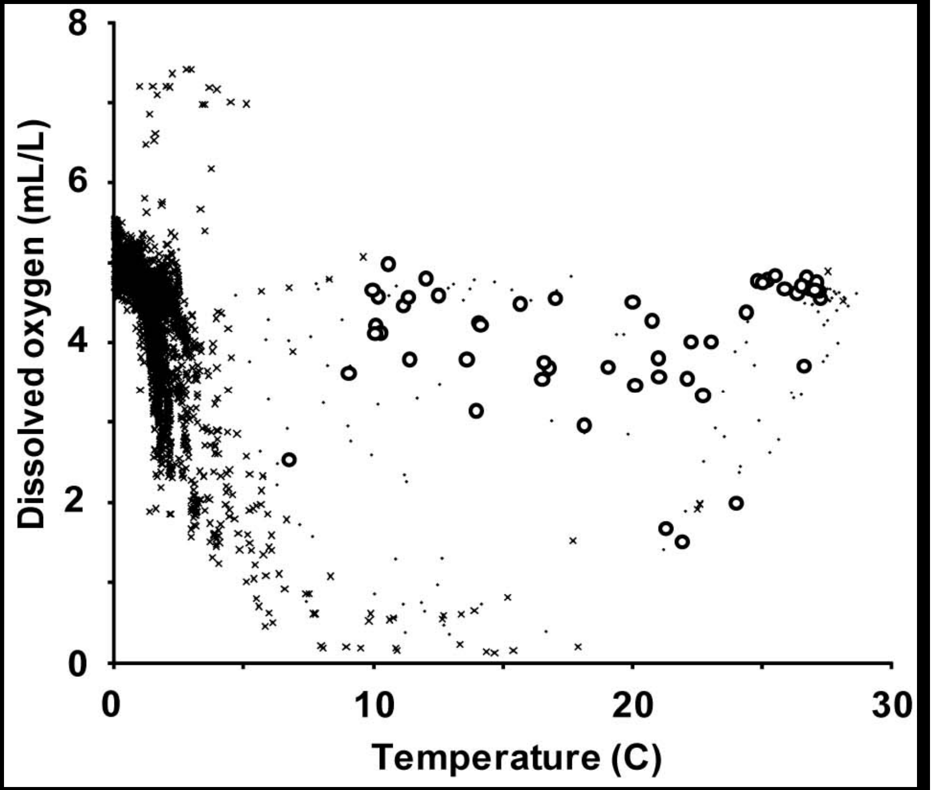
- Partial ROC
  - E= 0.125
- GARP and Maxent
- Northern training
  - $P < 0.001$
- Southern training
  - $P > 0.05$



GARP Results

Niche Visualization

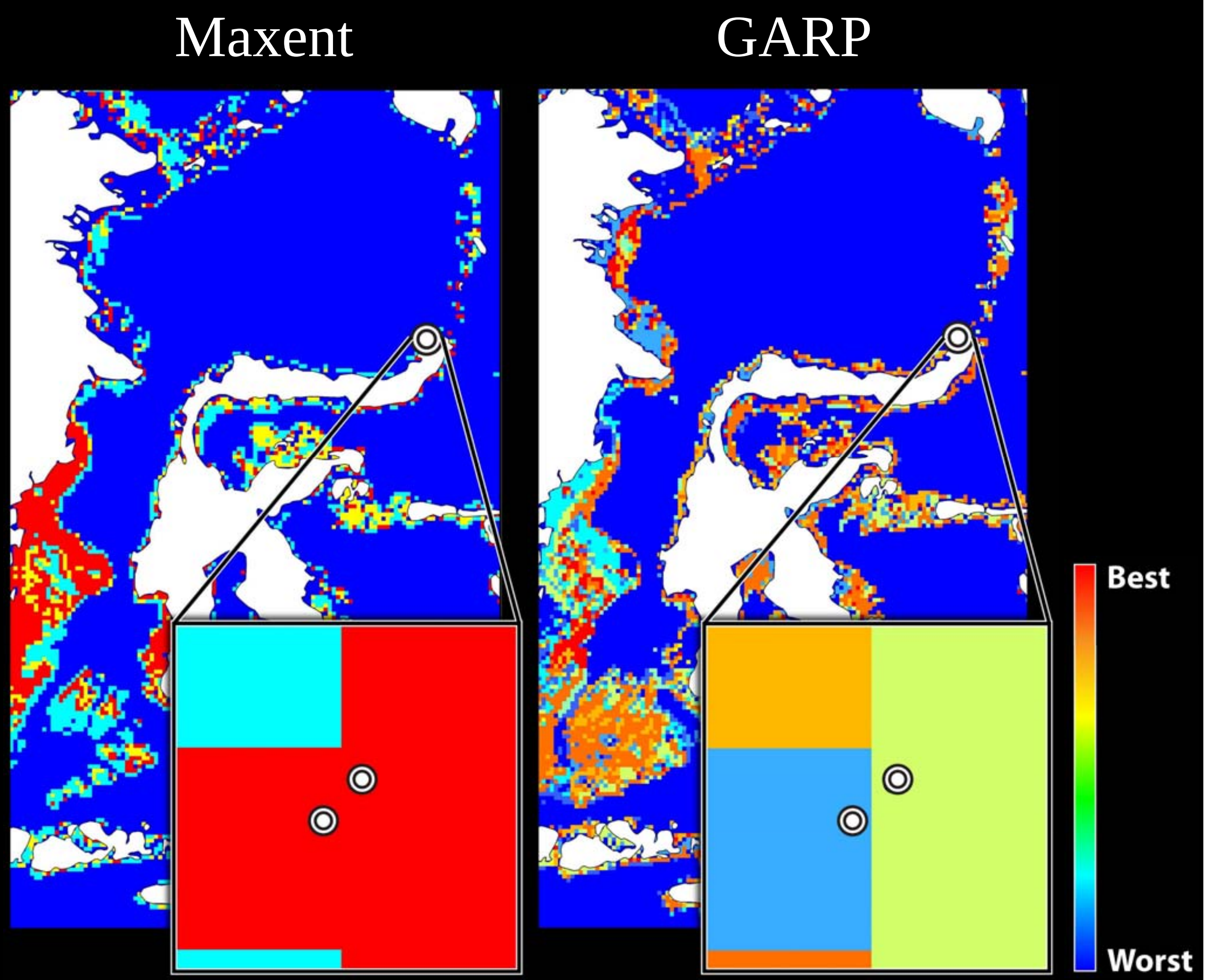




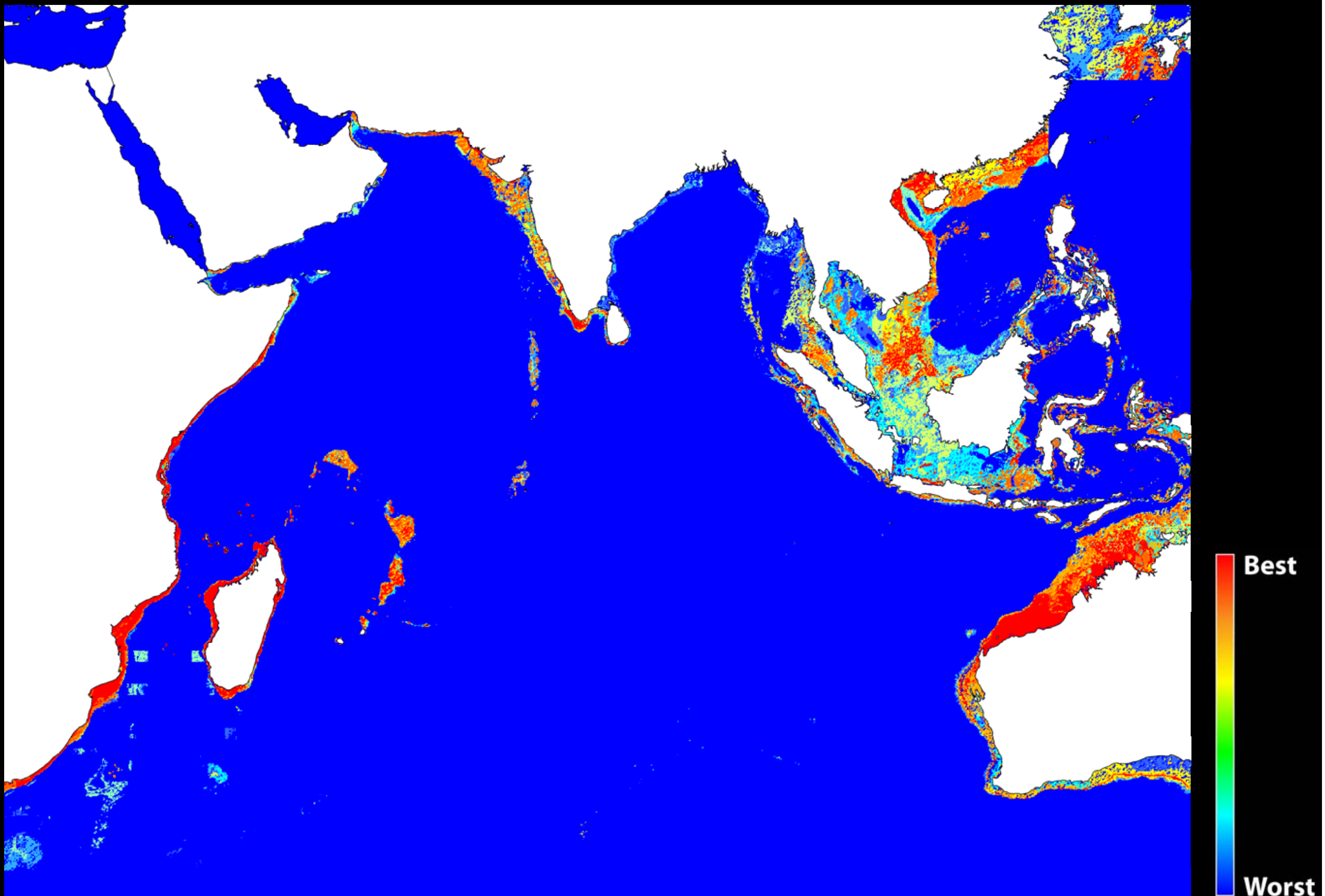
GARP Results

Predicting Other Species

- Model of *L. chalumnae*
- Prediction of *L. menadoensis*
  - Maxent
    - 99th percentile
  - GARP
    - 93rd percentile



Indian Ocean Projection



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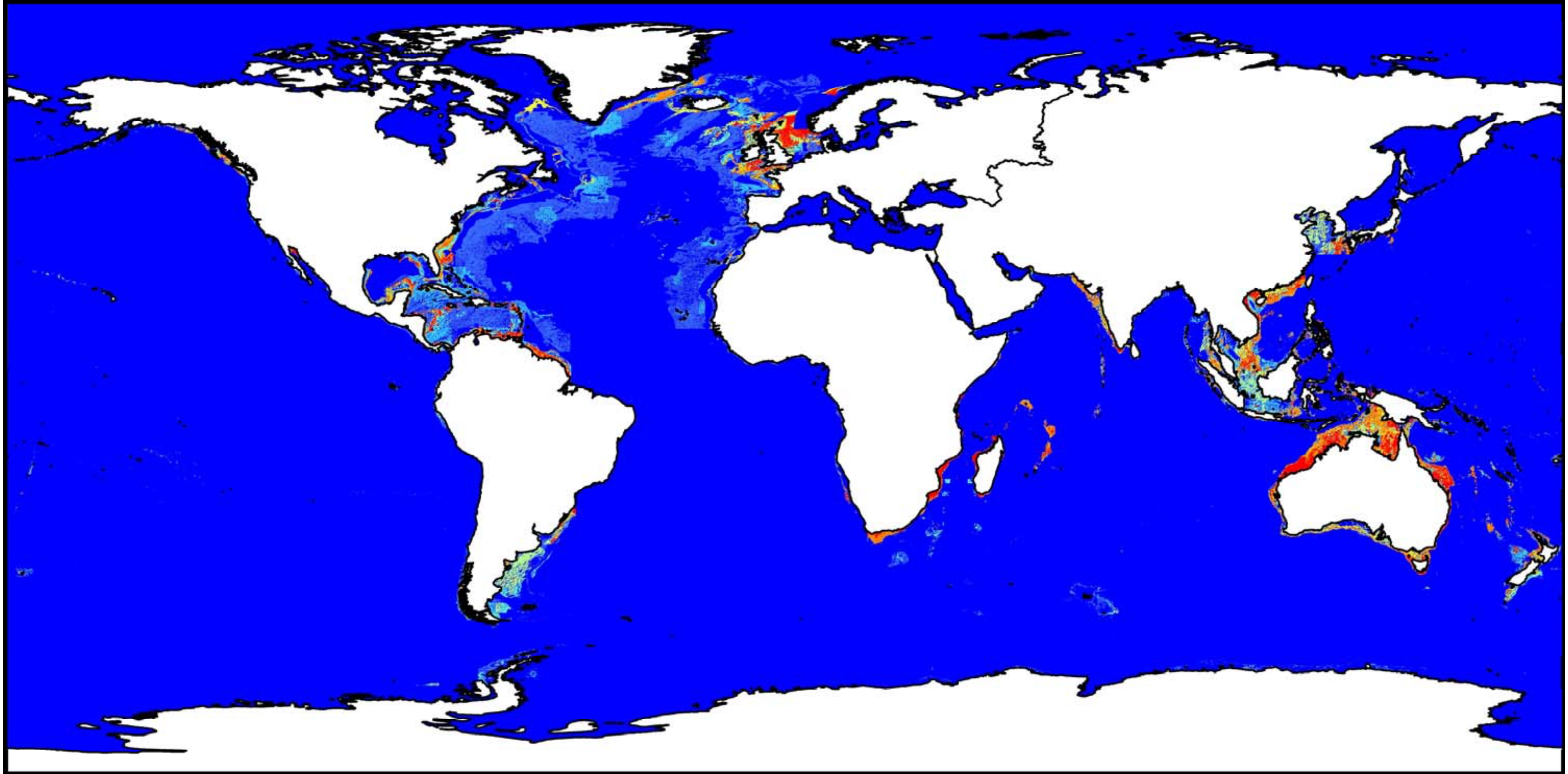
Questions?

Bonus Material: World in GARP



Bonus Material: World in Maxent