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Decision making in a climate changed world

GENIES/SimCLIM Tools

to Support Climate Change Information and Marine Resource Management

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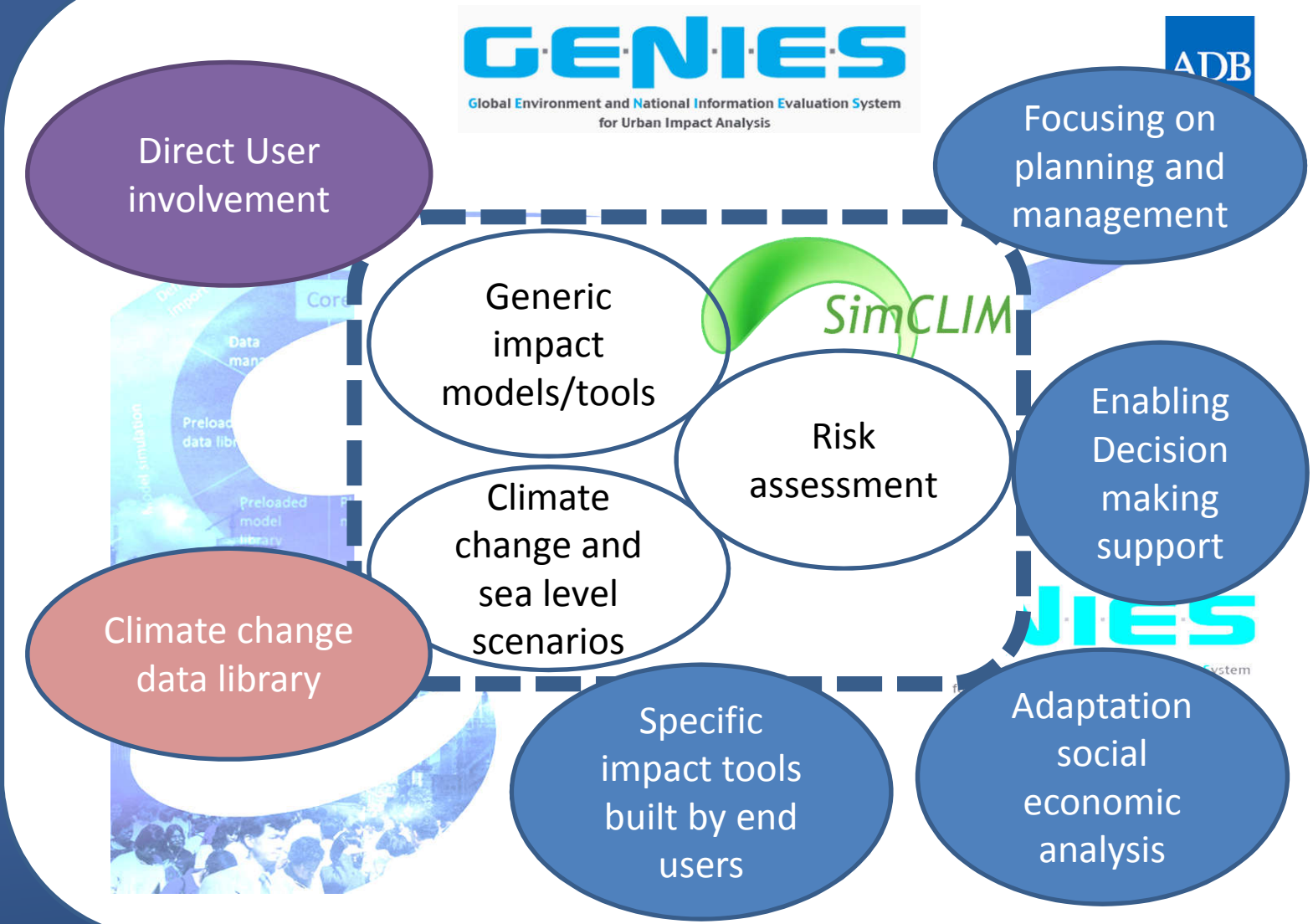
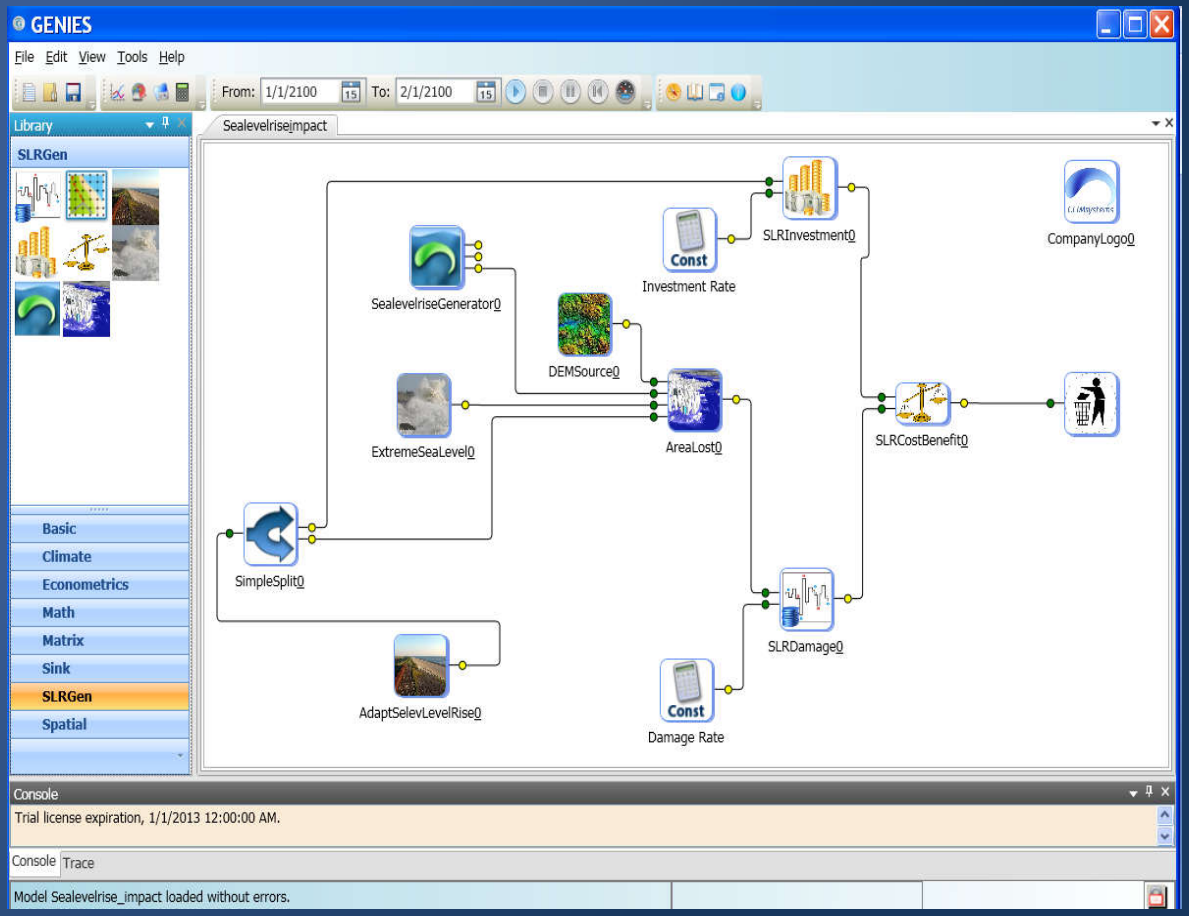
SimCLIM for ArcGIS / Marine

SimCLIM and GENIES



Dynamic model building and scenario simulation based on system dynamics engine

- Drag from the toolbox and drop blocks in the canvas
- Equation editing and compiling
- Connector
- Model building and revising
- Block and sub-model logos which link to the detail of the block and model
- Model control parameter setup
- Simulation
- Results visualization, plot and 2D
- Model skin design (change background, insert images, text boxes, logos)

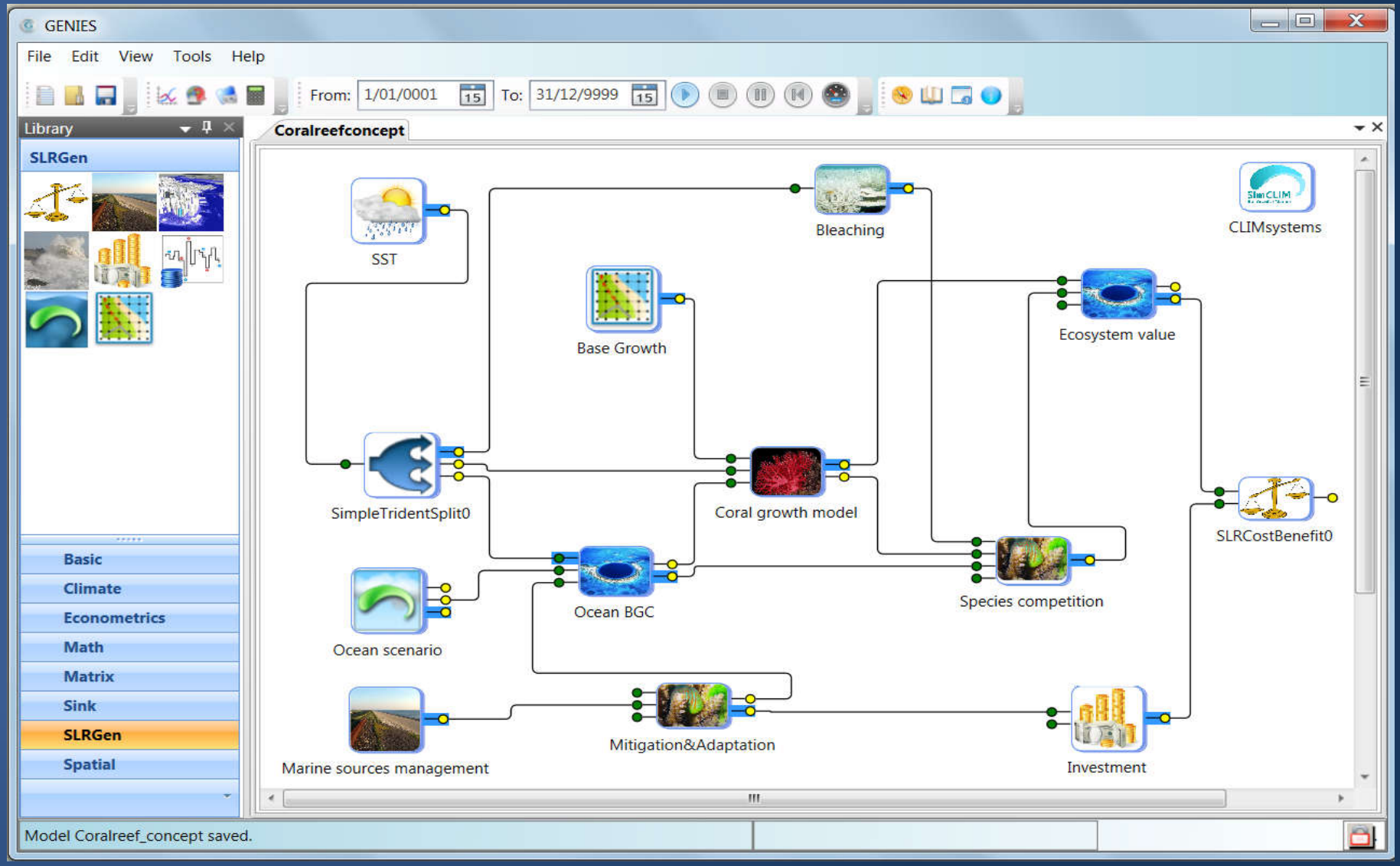


Model/Block library

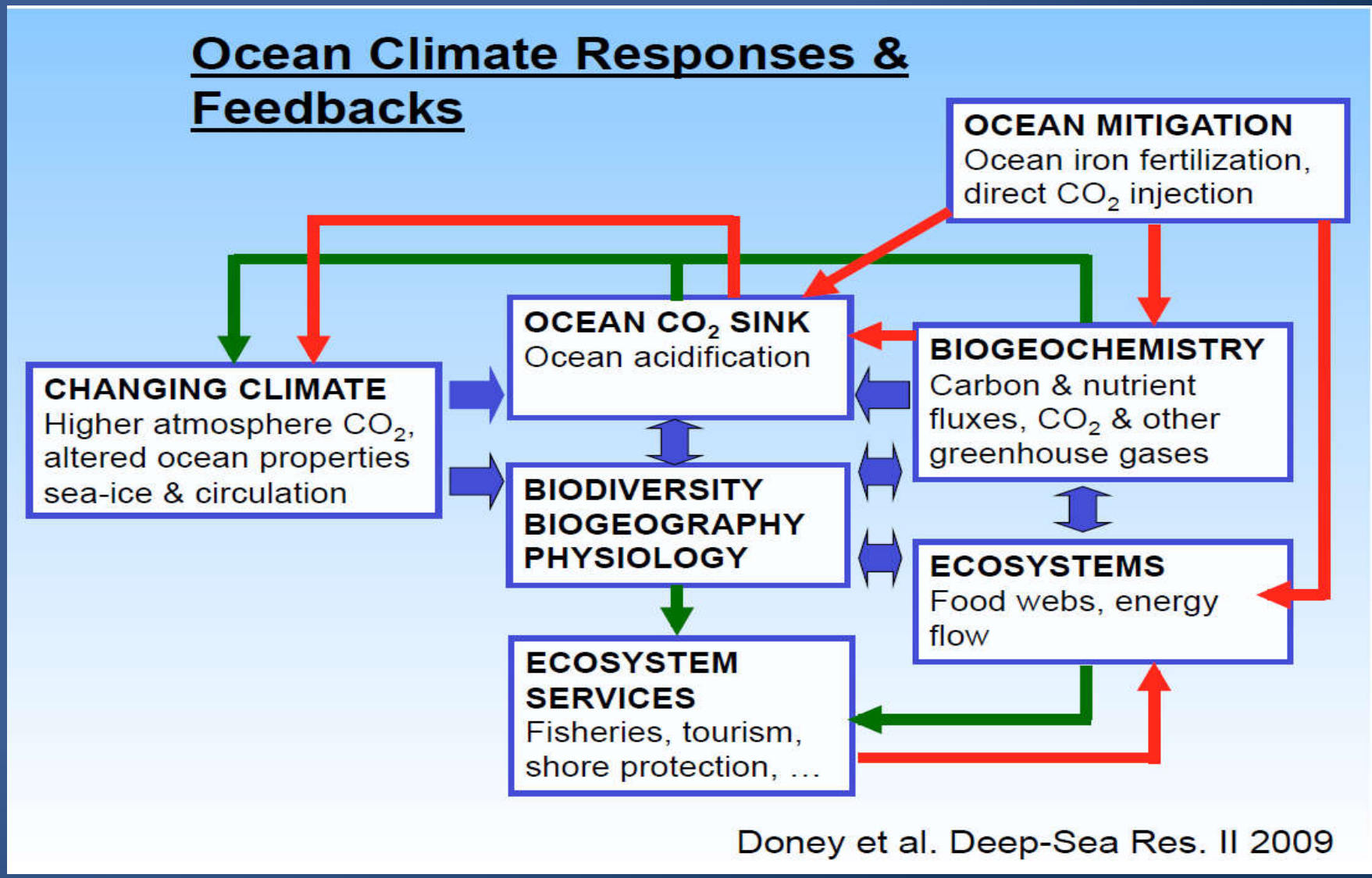
Each block in the library can be dragged into the canvas to be configured and used as a component of a model, the blocks can be linked to each other according to their data and function nature.

The blocks were classified according their functions, more blocks and categories will be added with the progress of GENIES.

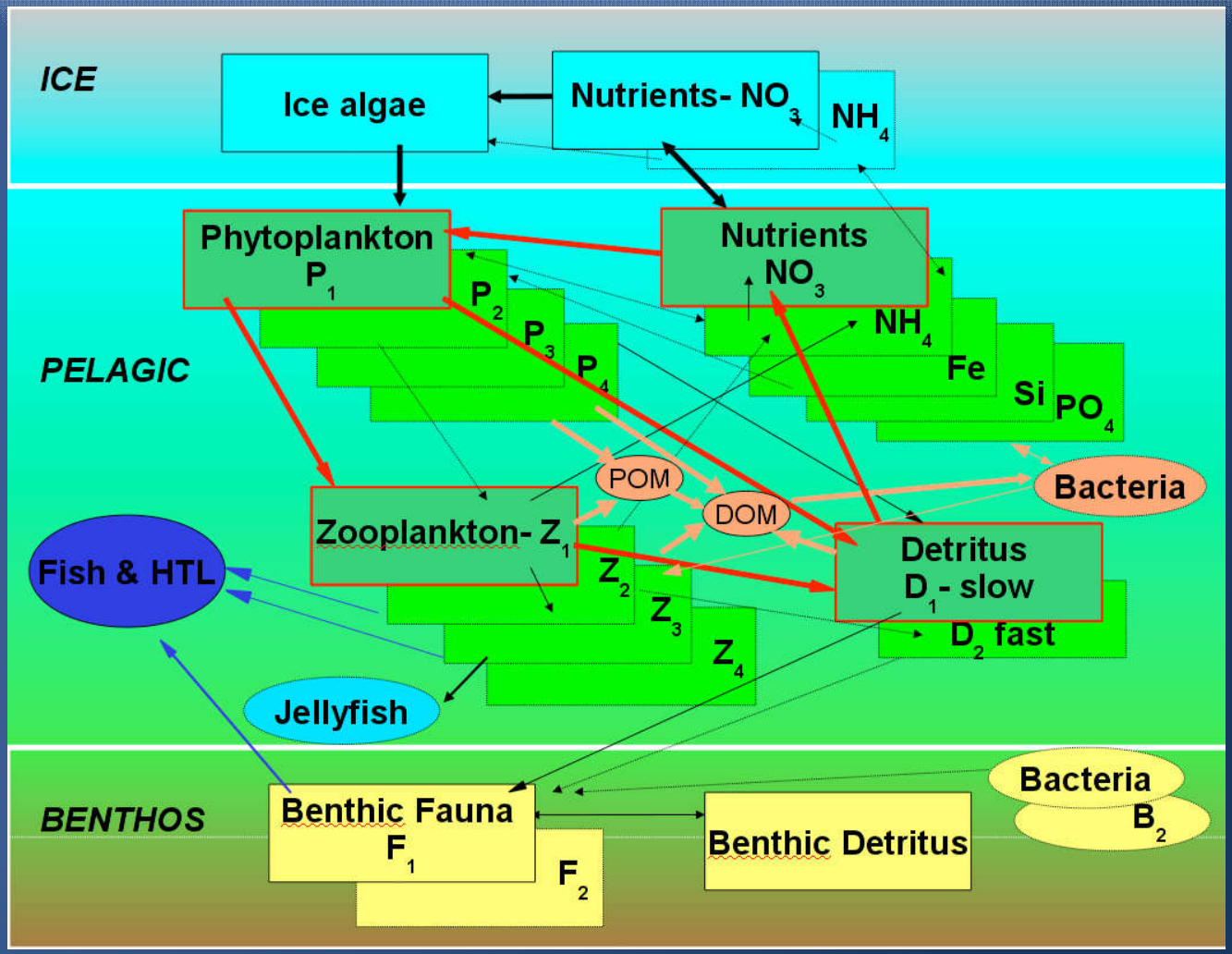
GENIES coral reef concept model



Ocean - Climate Concept



Simplified Ecosystems Model



- The simplest NPZD (Nutrient, Phytoplankton, Zooplankton, Detritus) model as used in some ESMs.

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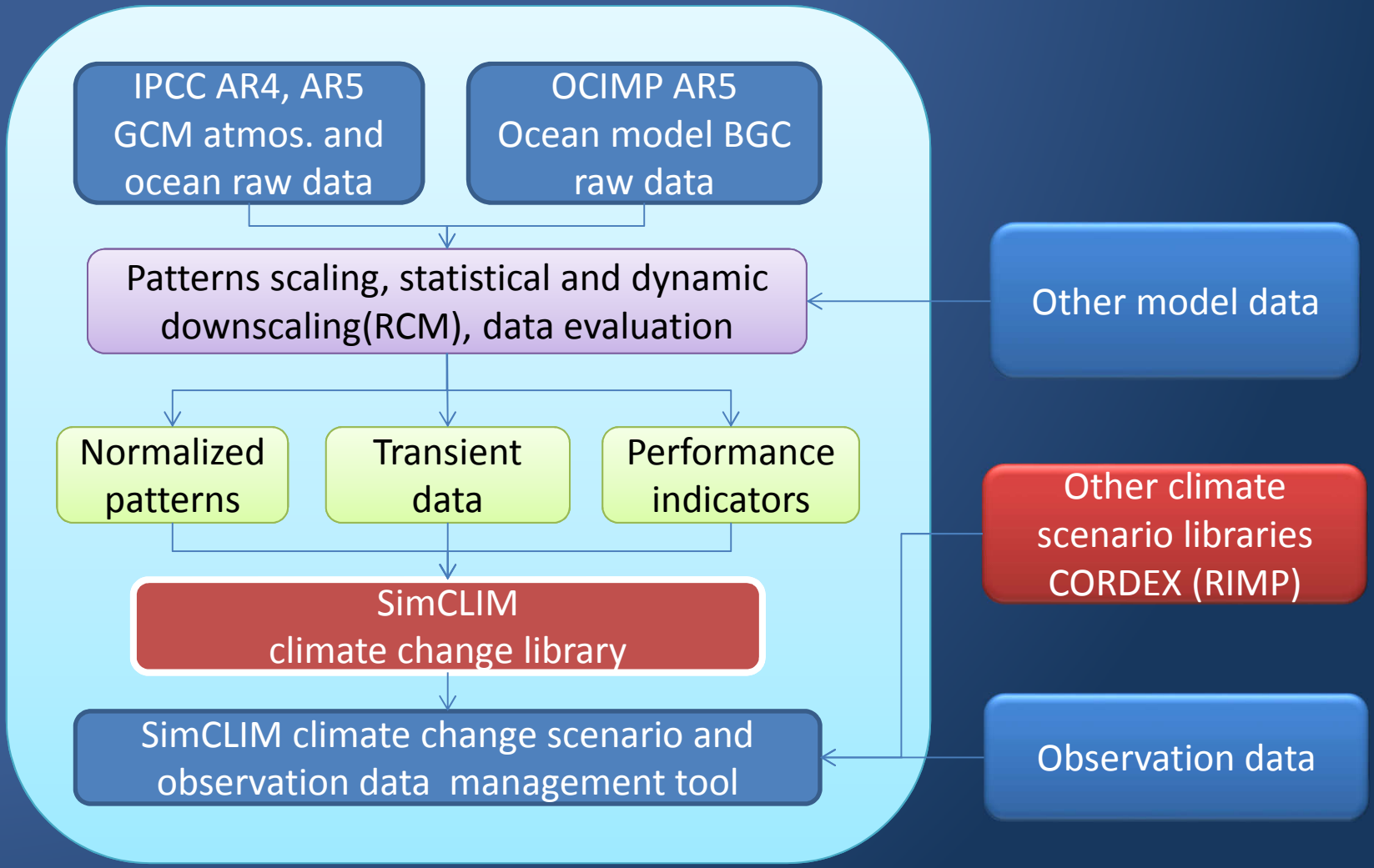
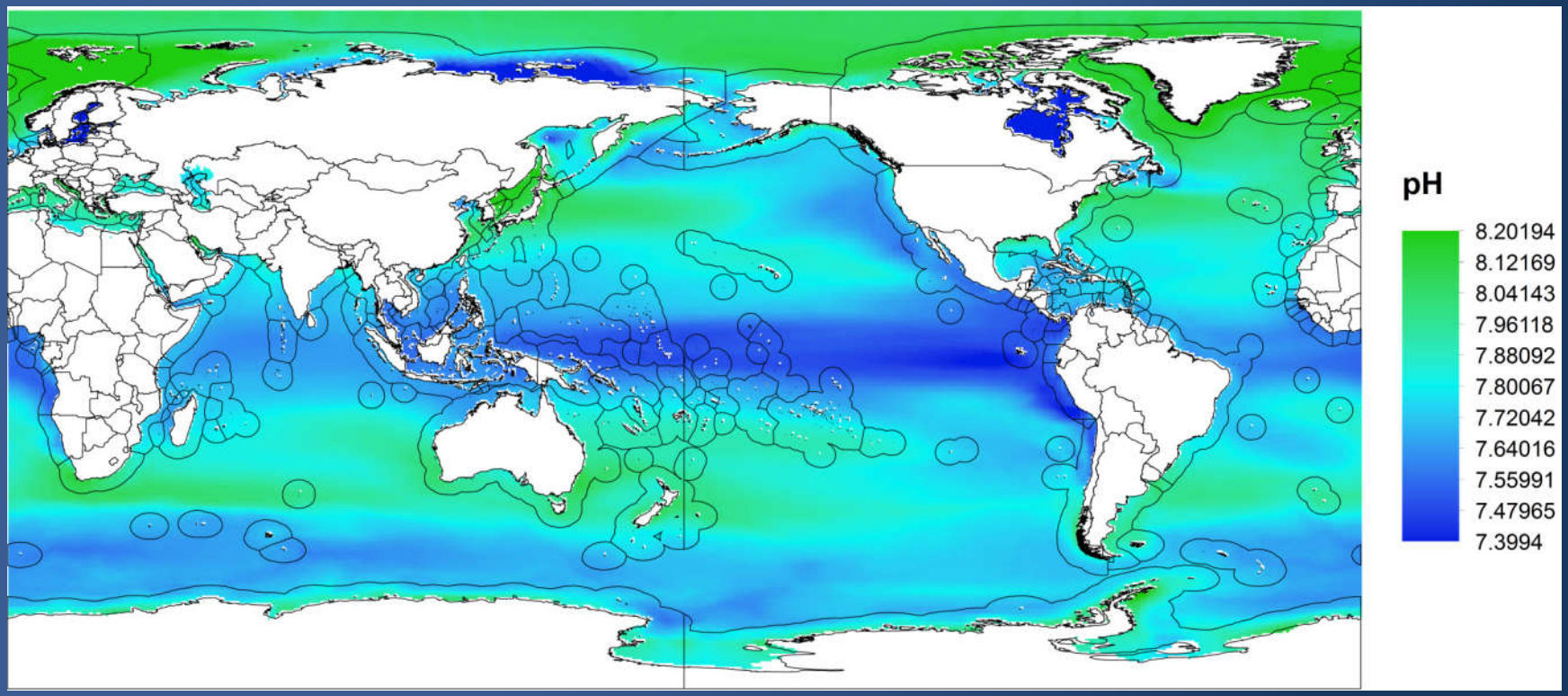
"People don't understand the earth, but they want to, so they build a model, and then they have two things they don't understand,"
-Gerard Roe in "The Whale and the Supercomputer" by C. Wohlforth

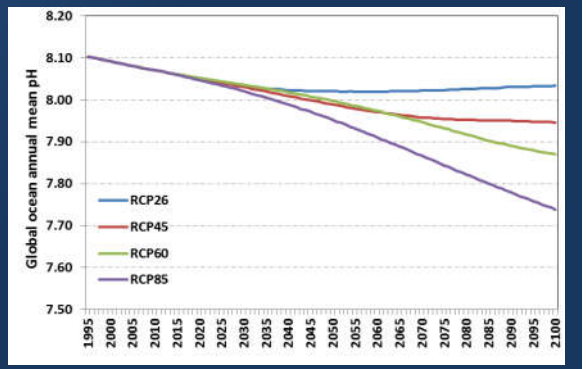
- Models are an indispensable tool, especially if you understand what they are doing
- Ocean GCMs offer realistic ocean environments in which to build ecosystems and experiment with biogeochemical cycling
- Help with refining hypotheses – but useless without observations to test

SimCLIM climate change library method

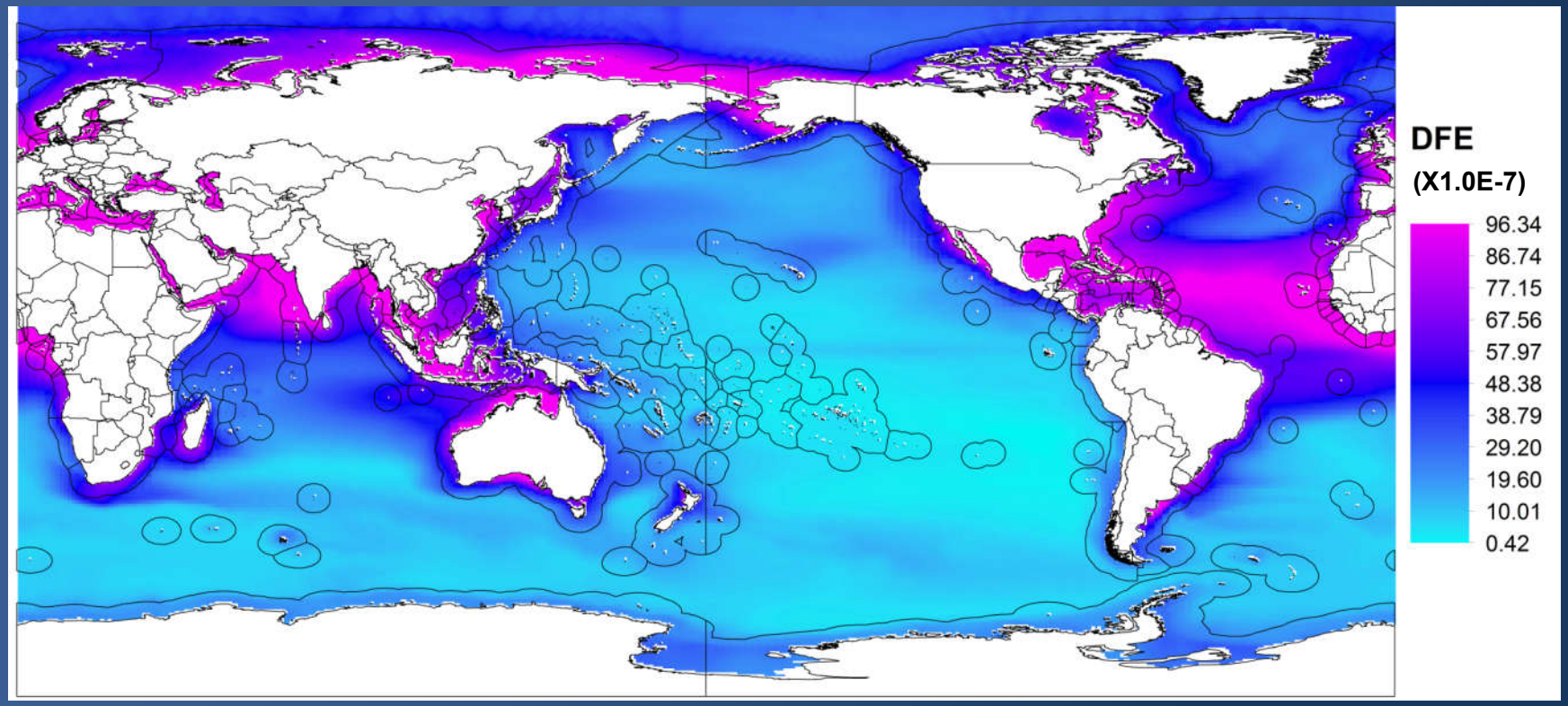


pH at Surface Baseline

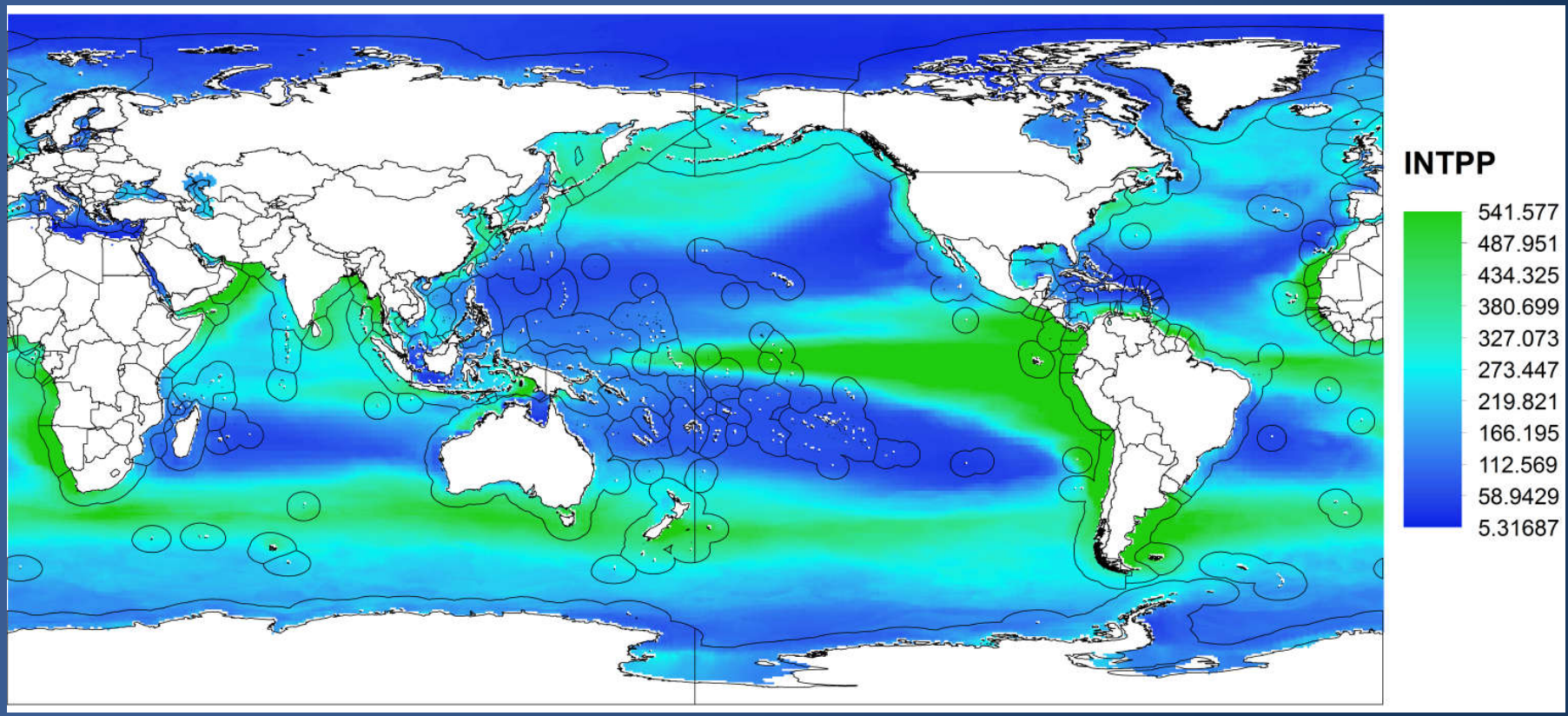




Dissolved Iron Baseline



Primary Production (gC/m2/yr)



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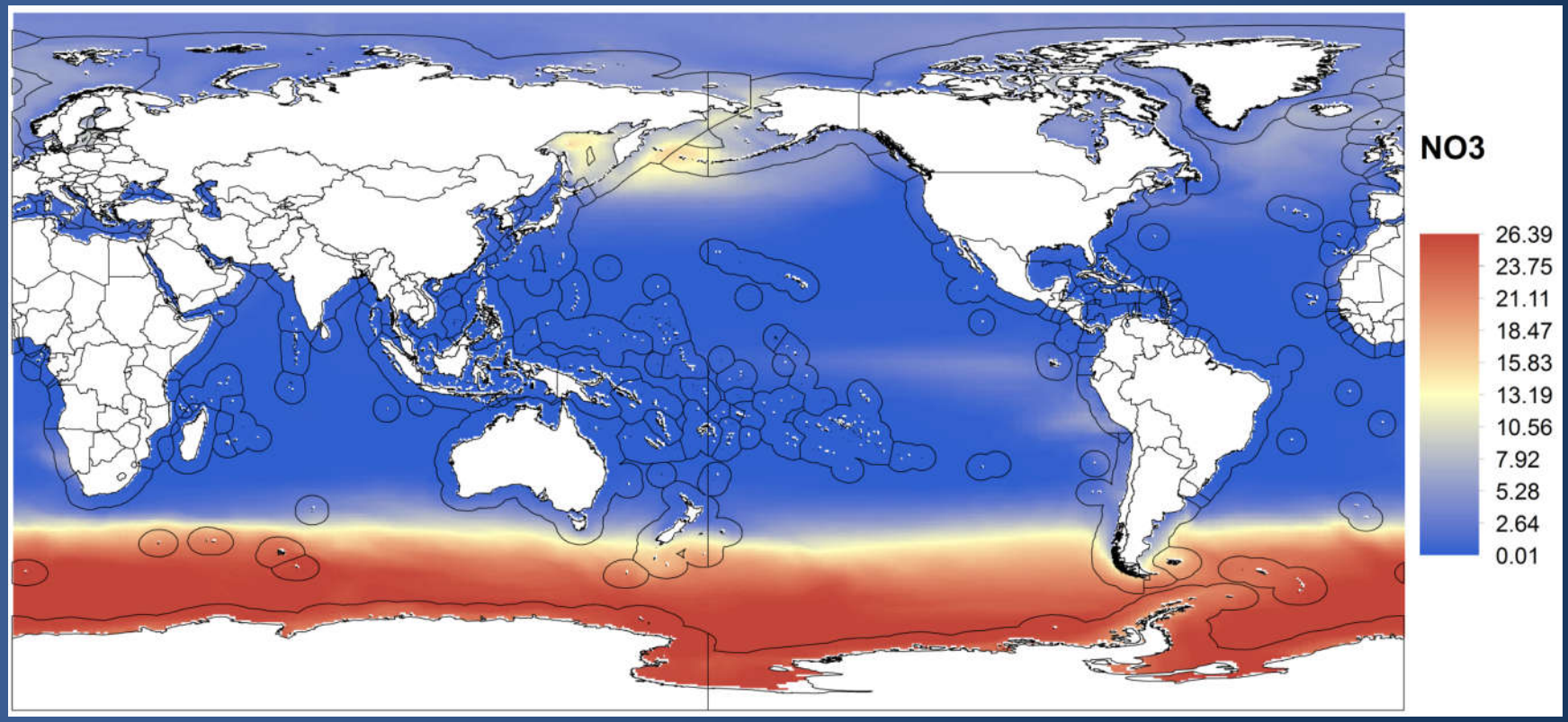
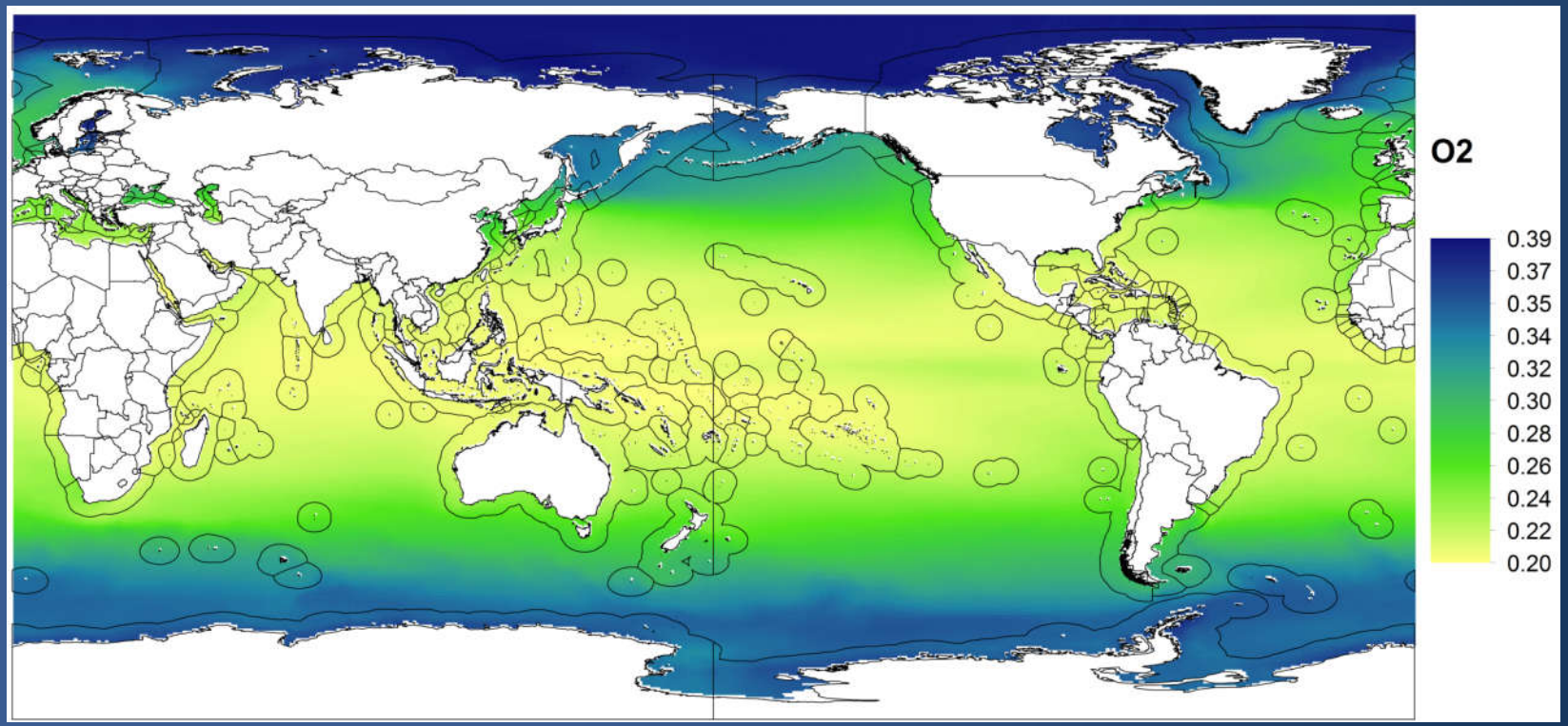
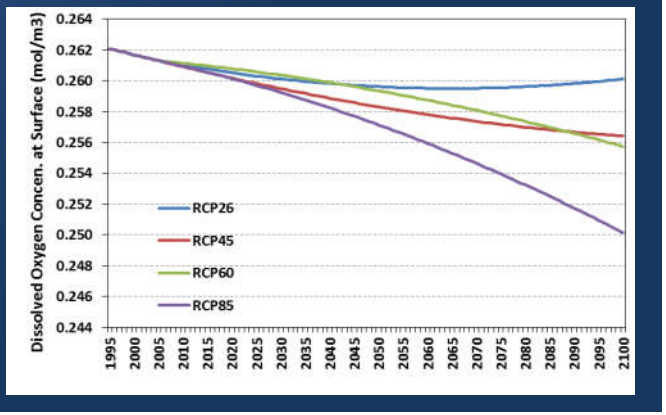
Dissolved NO3 (mmol/m3)

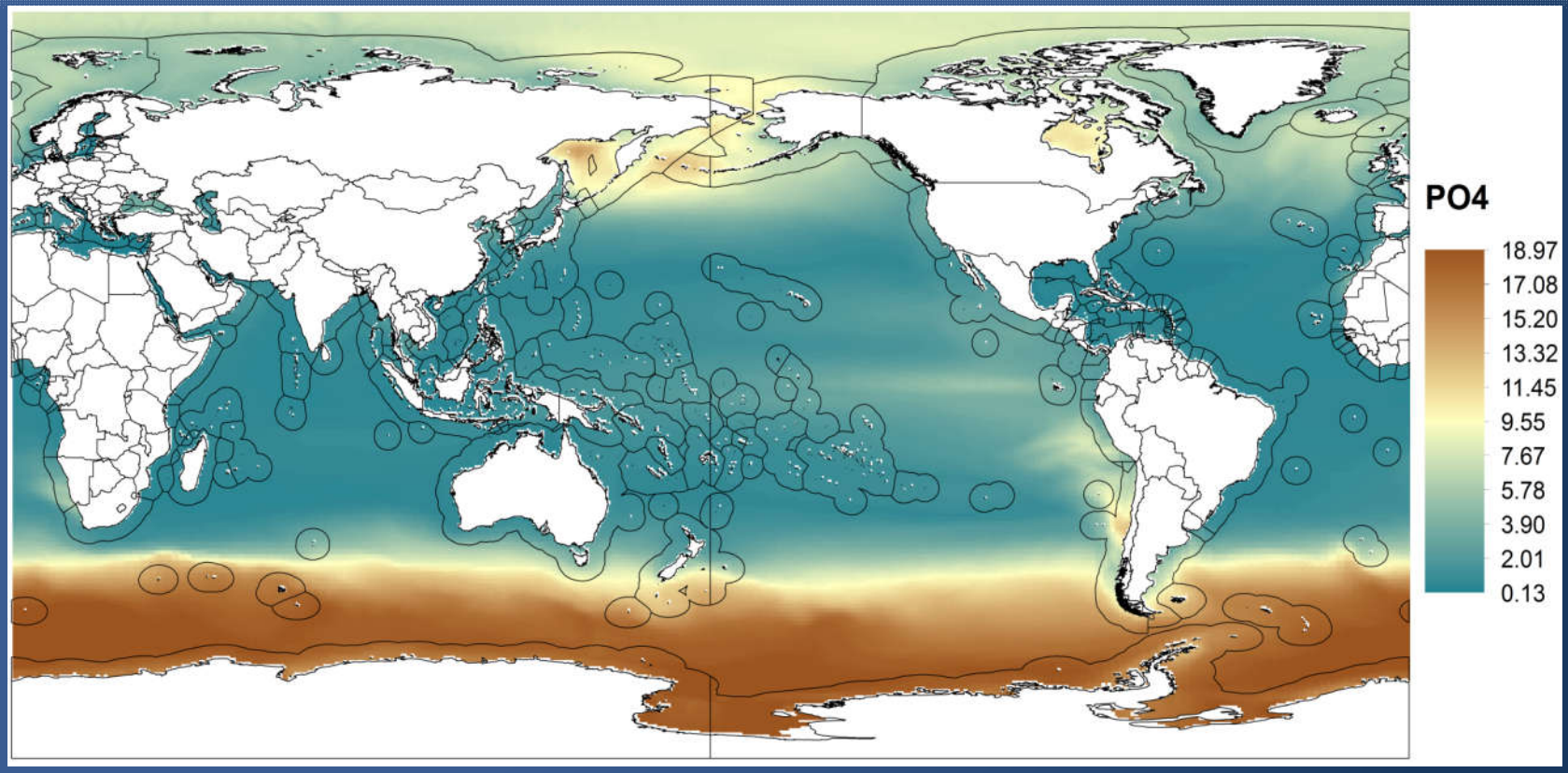


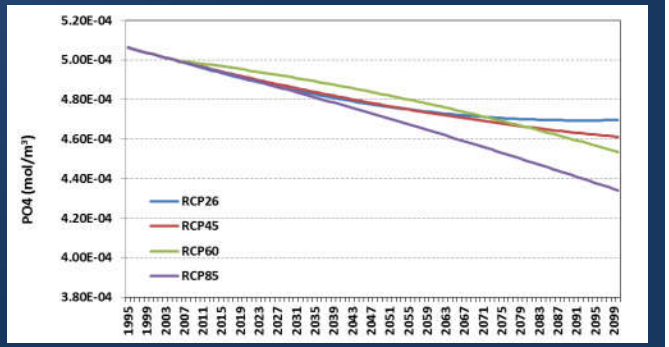
Dissolved O2 (mol/m3)



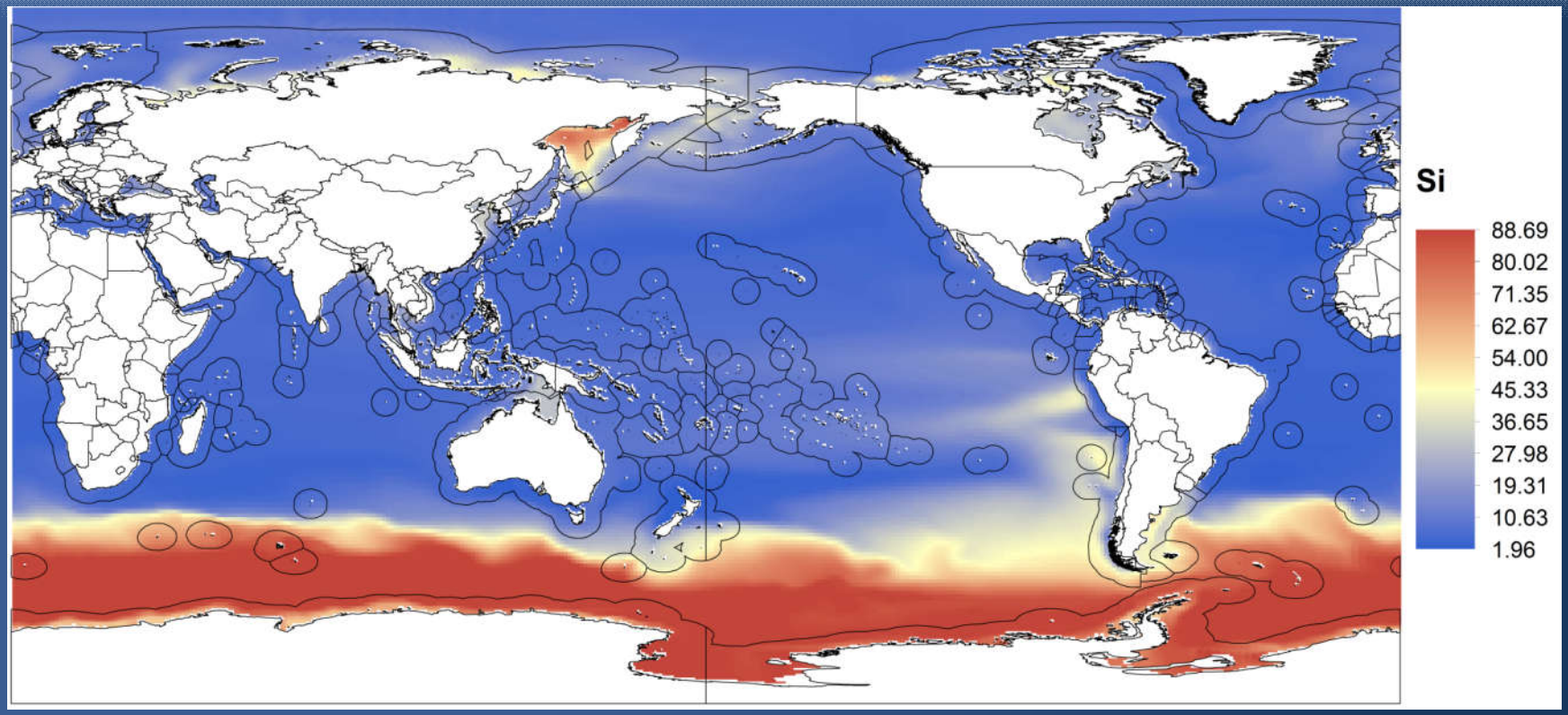


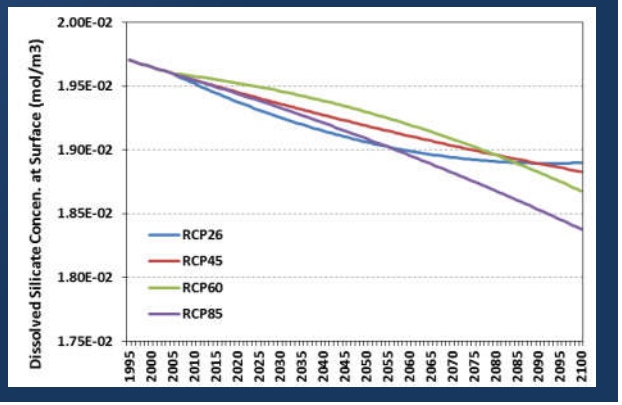
Dissolved PO4 (mol/m3)



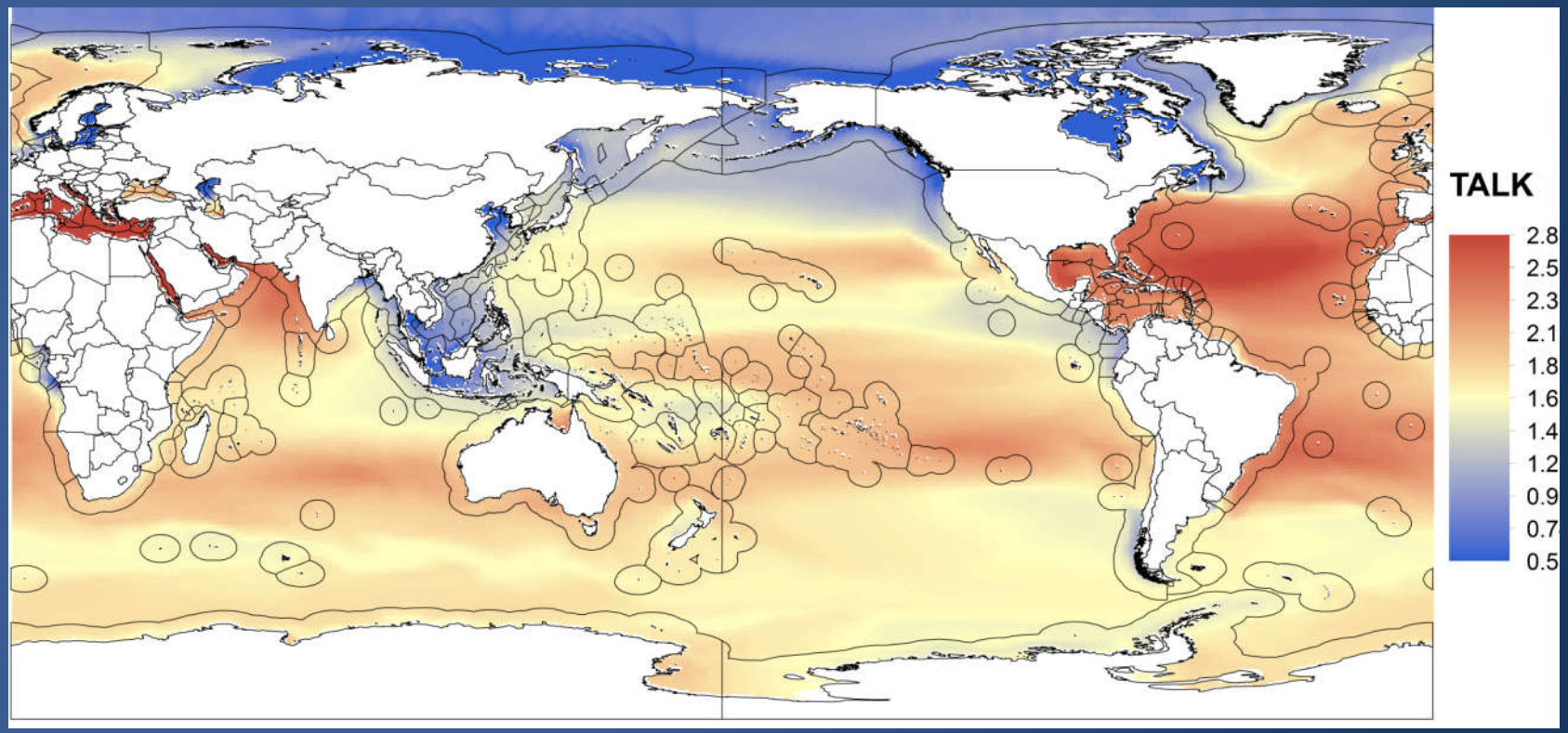


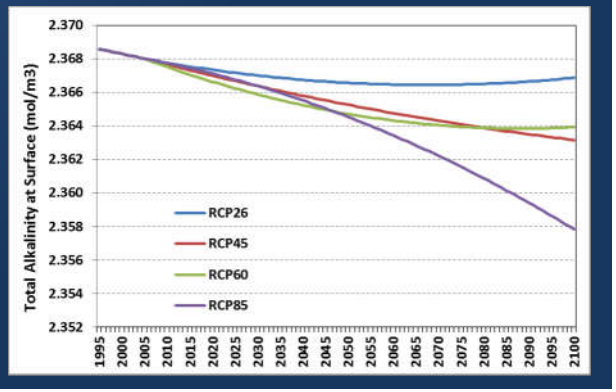
Dissolved Silicate (mmol/m3)



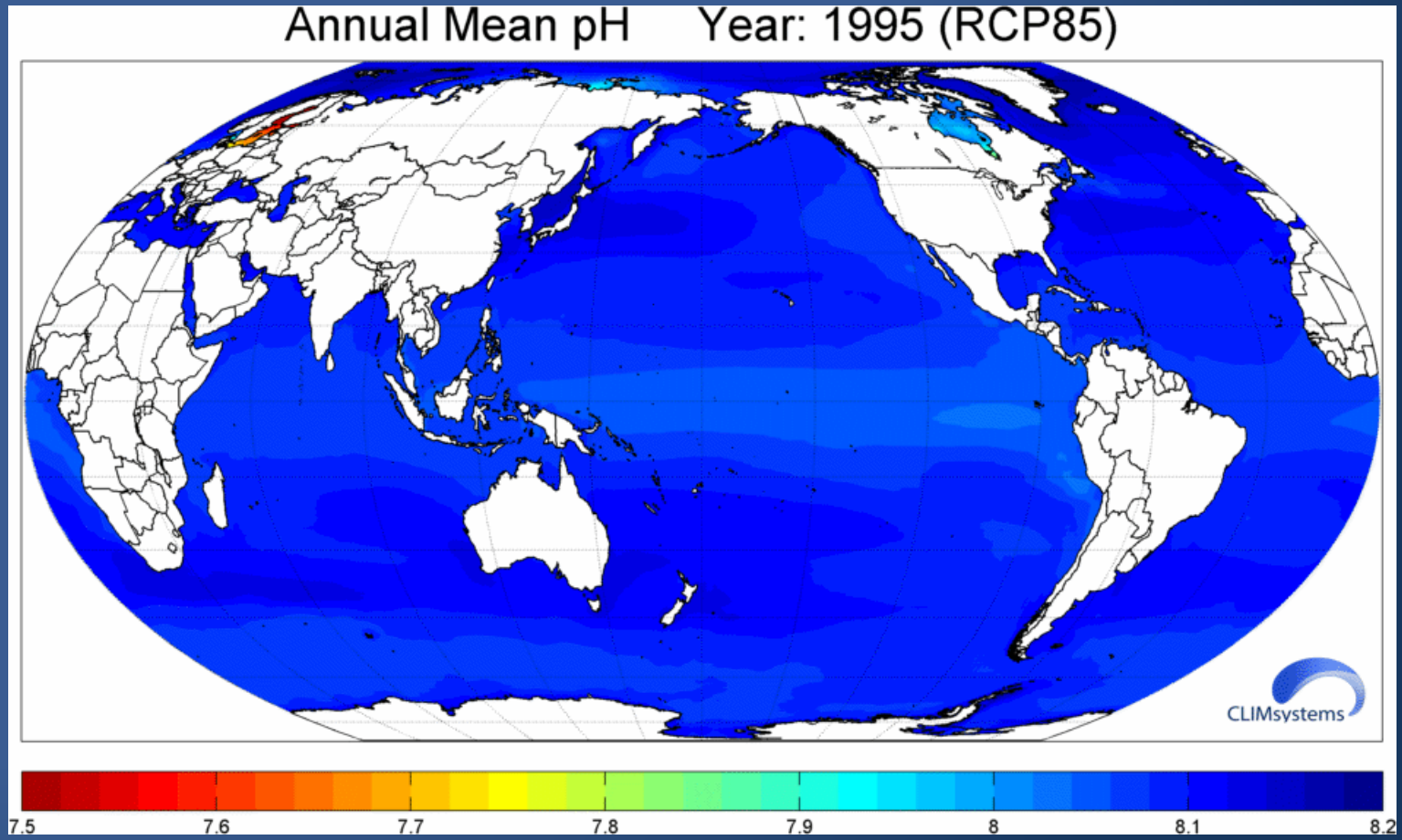


Total Alkalinity at Surface (mol/m3)

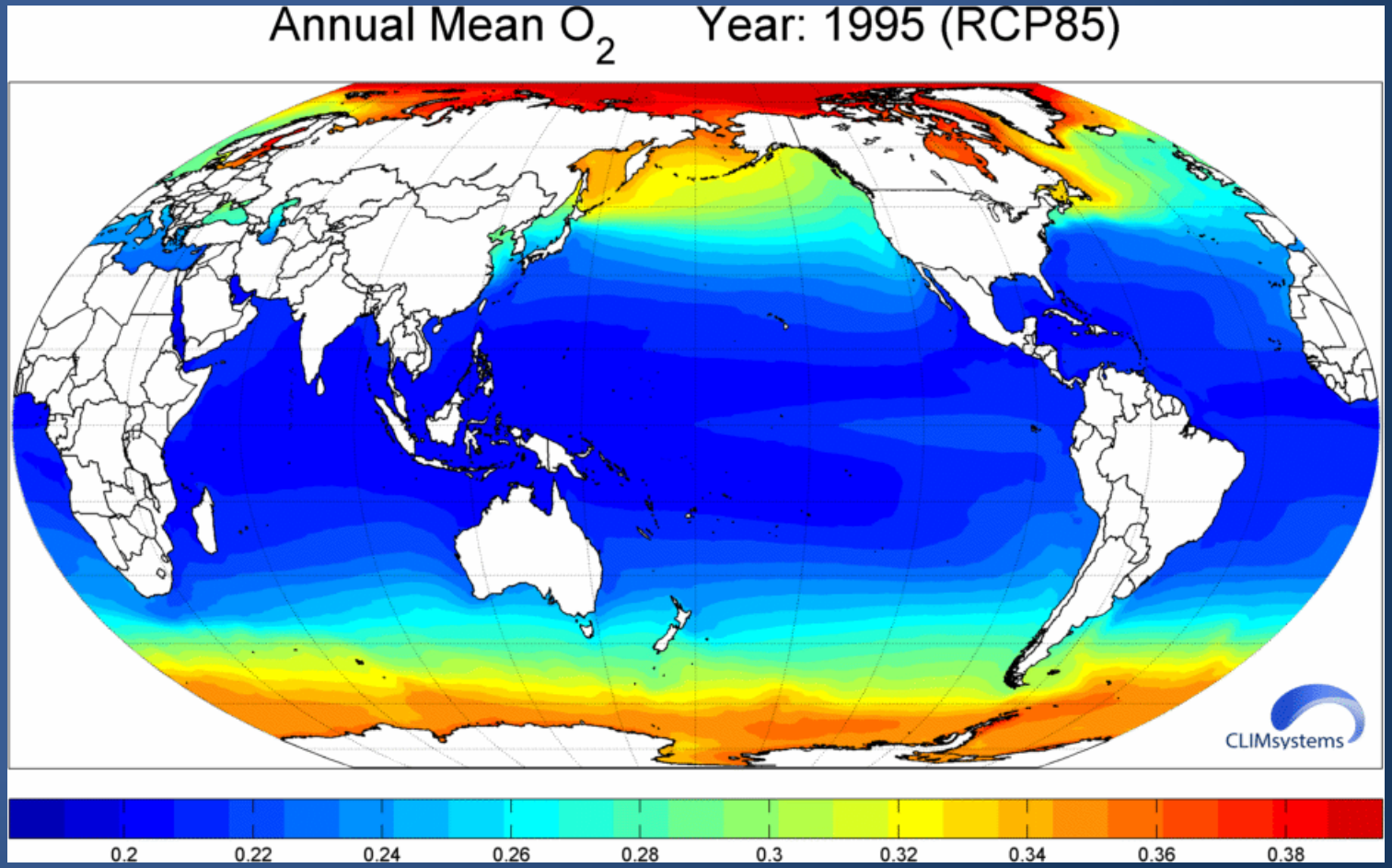




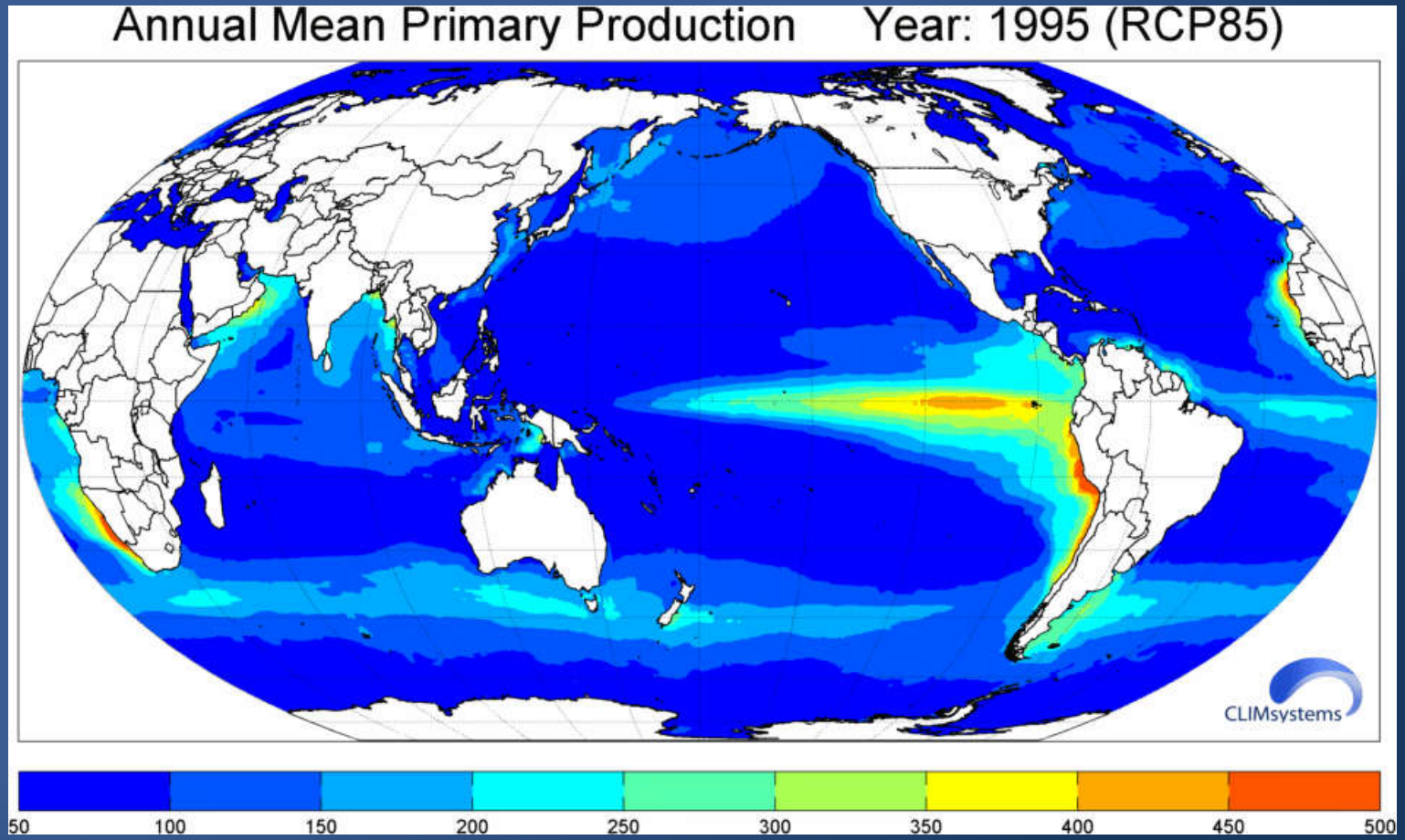
Annual Mean pH (RCP 85)



Annual Mean O_2 (RCP 85)



Annual Mean Prim. Prod.



Zoom In to Belize Barrier Reef