PML | Plymouth Marine Laboratory

Listen to the ocean

Exploring Ecosystem thresholds by combining ecosystem and statistical models

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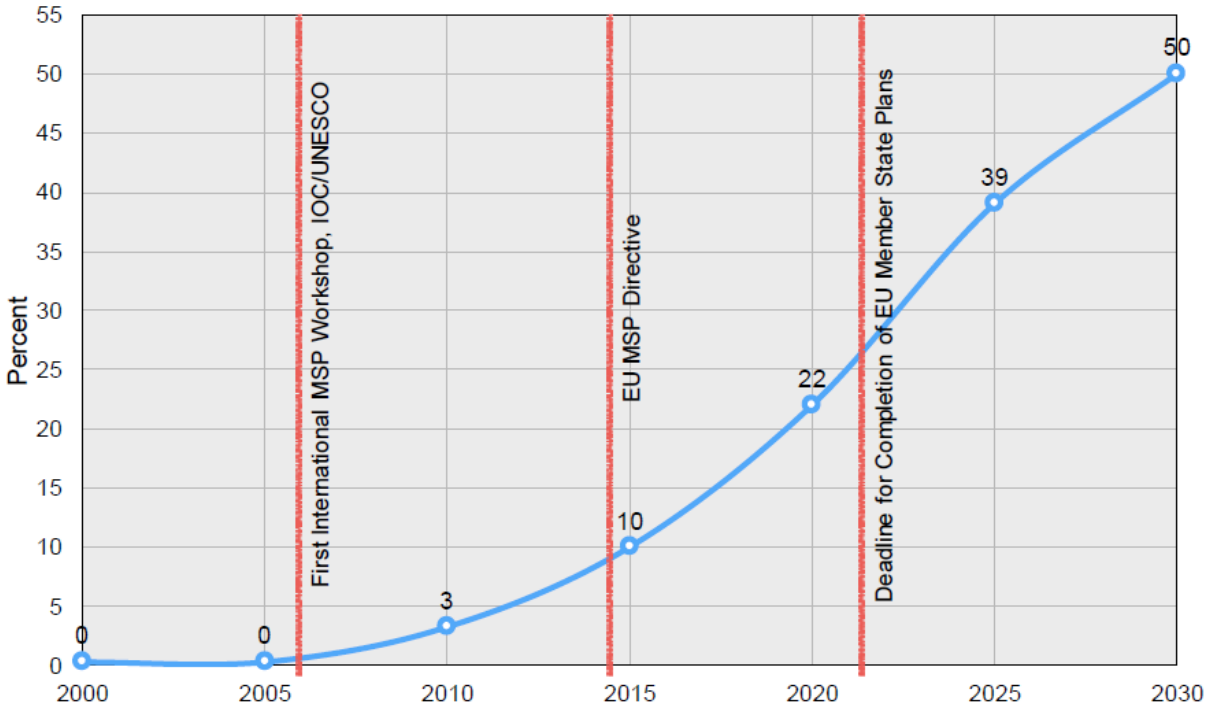
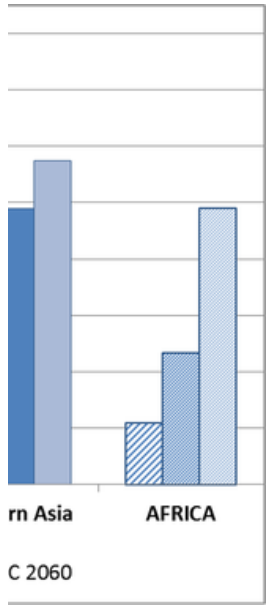
Plymouth Marine Laboratory - University of Exeter Research Day 24 April 2017

Motivation



or 2030/2060 per region,

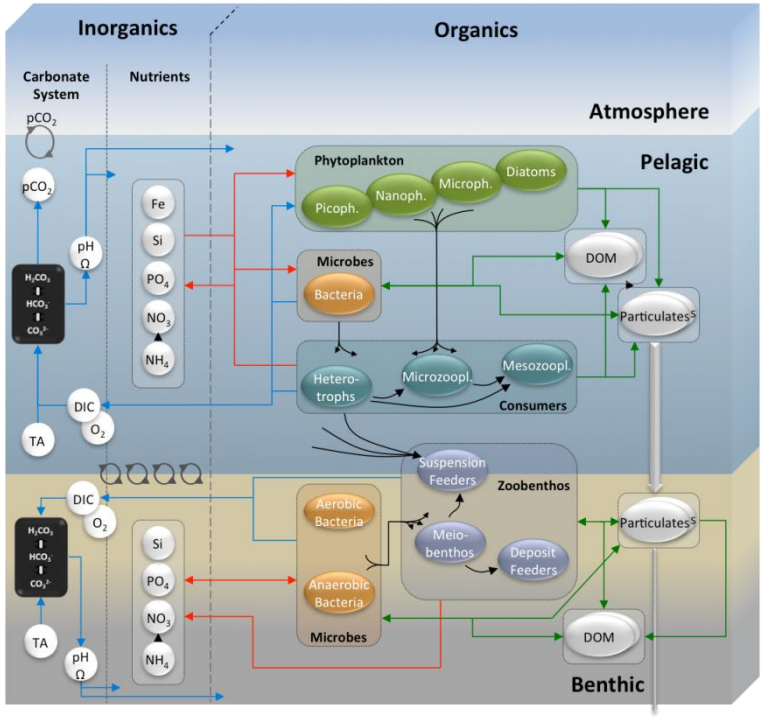


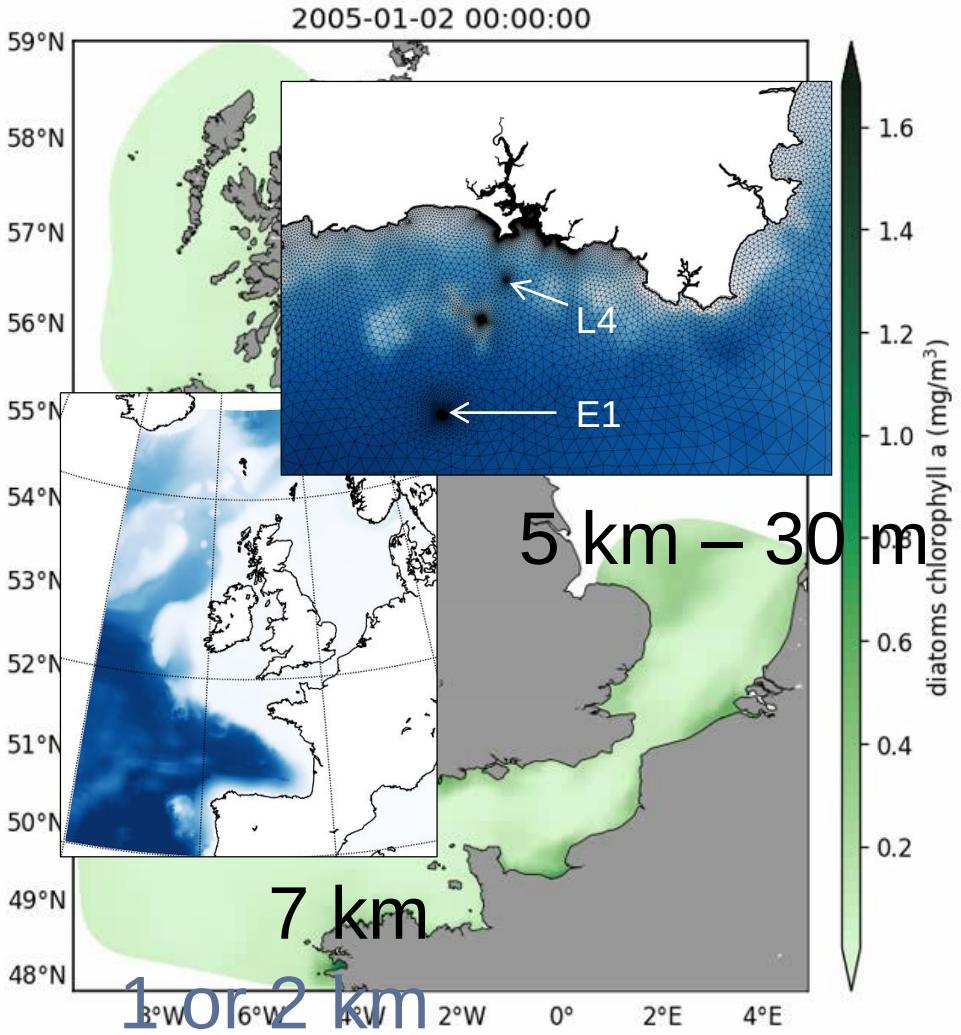
tal Population Growth and
. PLOS ONE 10(3):

PLOS ONE | TENTH ANNIVERSARY

Increase population → Increase demand for food… → …Energy → …Habitats → Ecosystem impacts

Resources



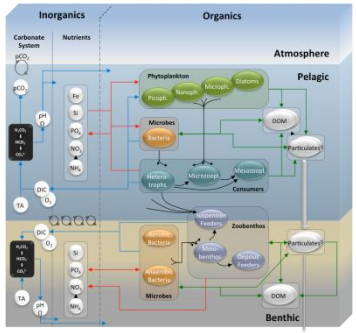


Large number of simulations (+30 years) provide a wealth of information on the state of the marine planktonic ecosystem … however, relevant (policy-wise) what-if questions are difficult to pose with these systems

Opportunities

USE STATISTICAL EMULATORS to explore SENSITIVITY and RESILIENCE

Ecosystem data set



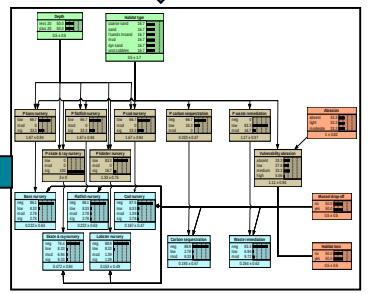
Define question

What is the carrying capacity of Lyme Bay to mussel farming?

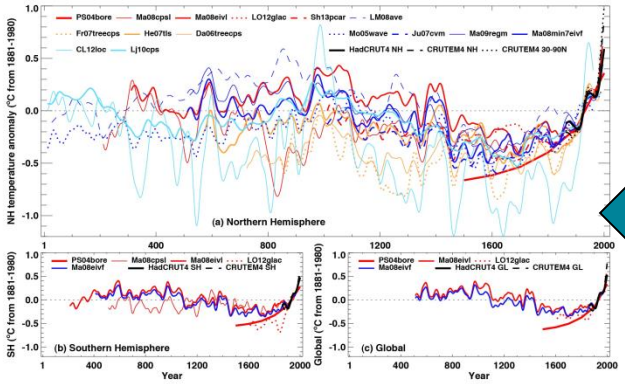
What spring-bloom strength leads to hypoxia events off Plymouth?

Develop training data set

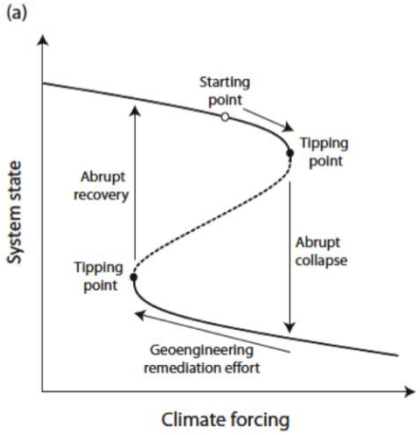
- PP over Spring-bloom
- Duration of spring-bloom
- Bottom Oxygen post bloom
- Stratification
- …



Build statistical emulator



Generate Ecosystem response simulations



Identify thresholds, sensitivity and resilience