***Piero Calosi* (UQAR)**

Will marine invertebrates be able to rapidly adapt to global climate changes to prevent their extinction?

a case study on the polychaete warm Ophryotrocha labronica

UQAR Université du Québec à Rimouski

FONDATION UQAR

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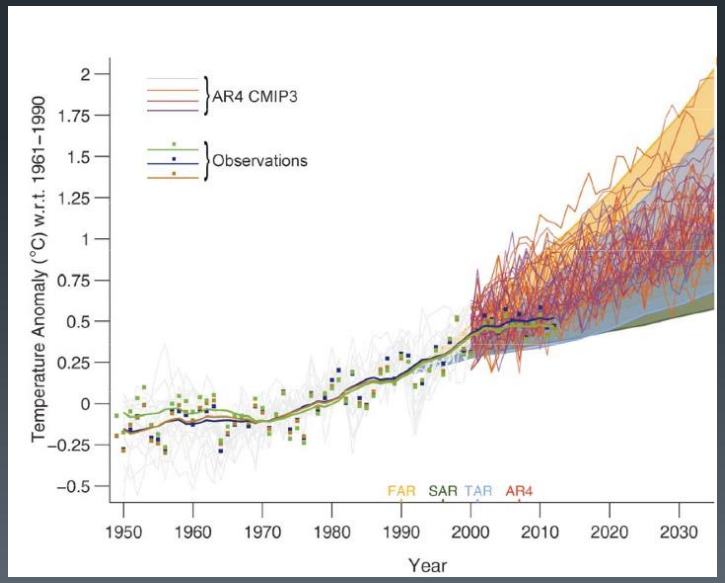
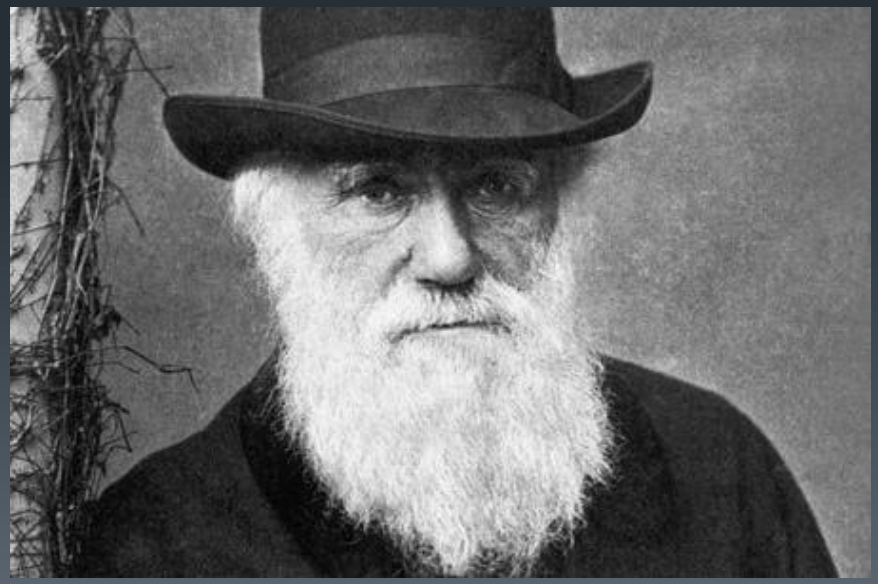
The issue

Unprecedented rapidity of global environmental changes

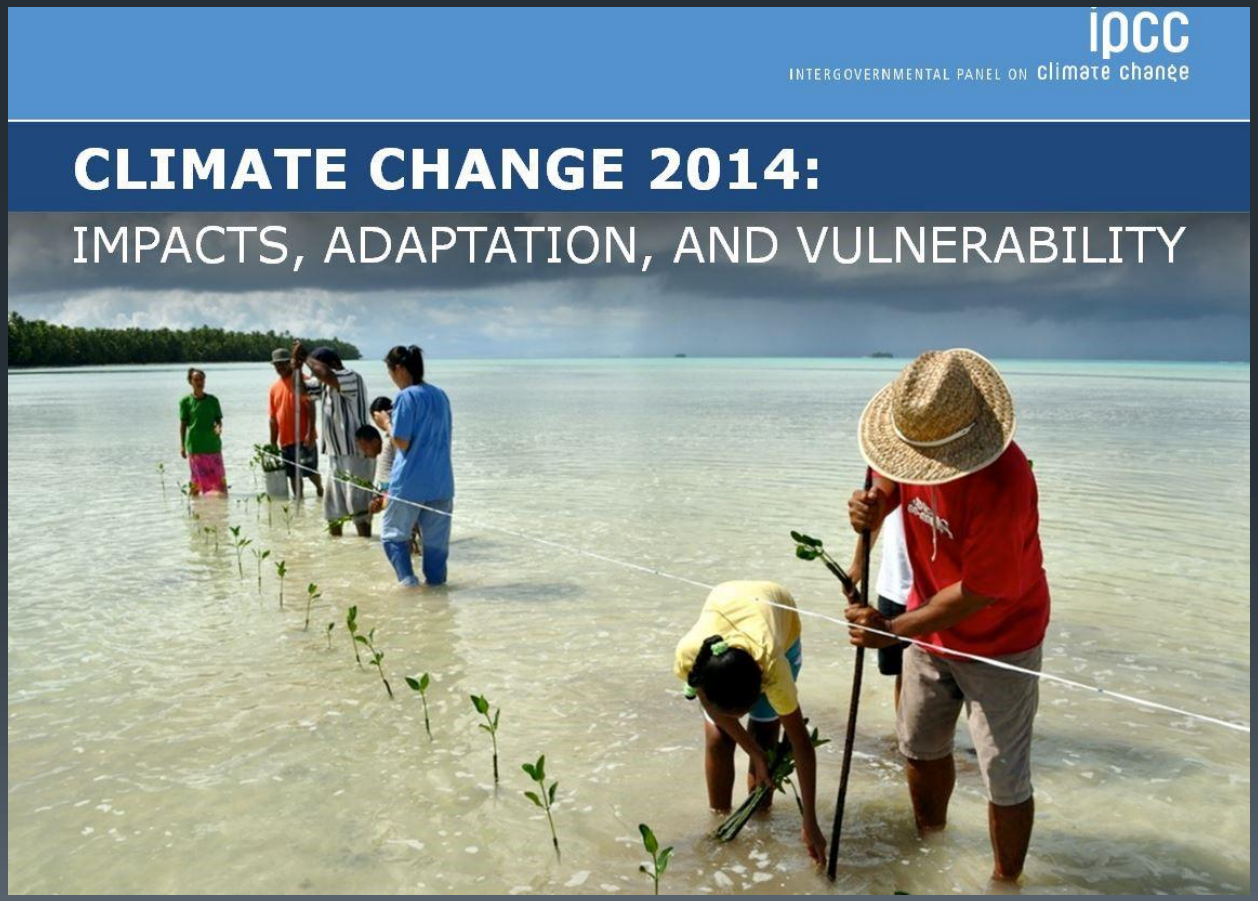
Lack of information on evolutionary responses of marine organisms





The consequences

‘Adaptation’ (*socio-economic*) without adaptation (*biological*)

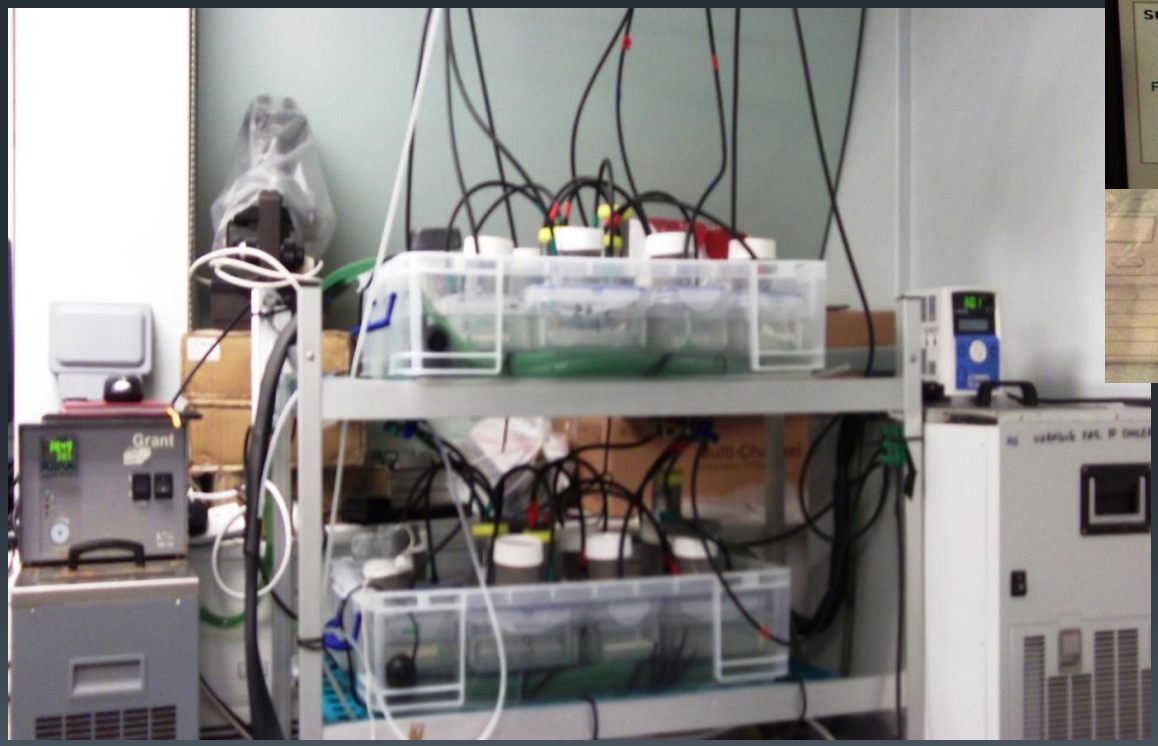


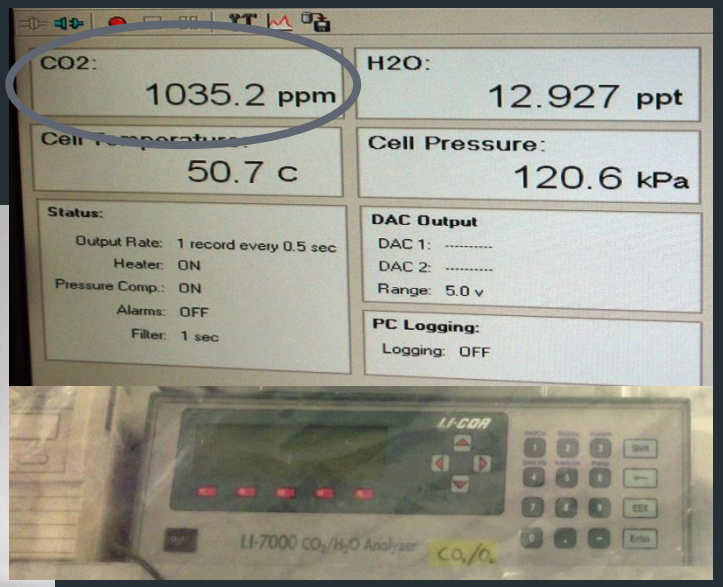
Our Objectives

Provide evidence that transgenerational plasticity (Obj. #1) and rapid adaptation (Obj. #2) are rescue mechanisms which will help preventing species and populations extinction in marine invertebrates within the context of rapid global climate changes

The System

Experimental System



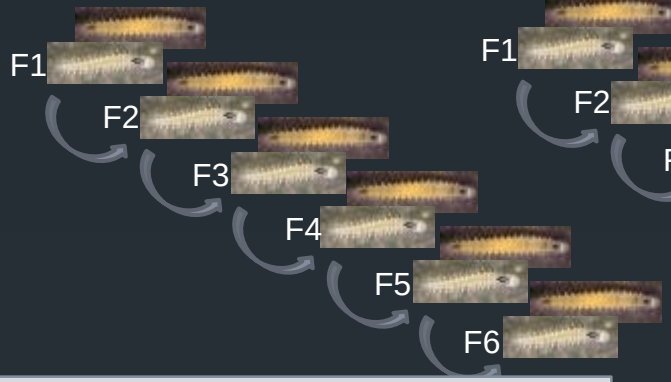


Experimental Design

Oprhyotrocha labronica

Experiment #1 : Multigenerational

FUTURE (F)



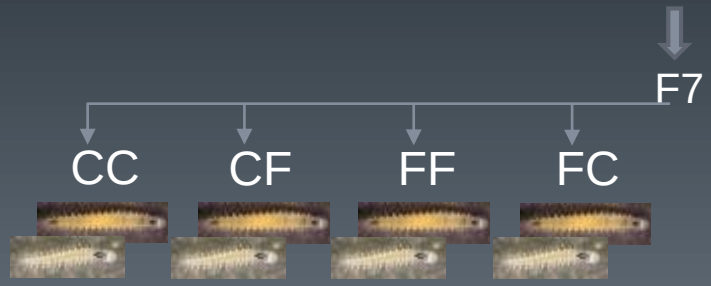
CURRENT (C)

- life history
- whole-organism physiology
- cellular physiology

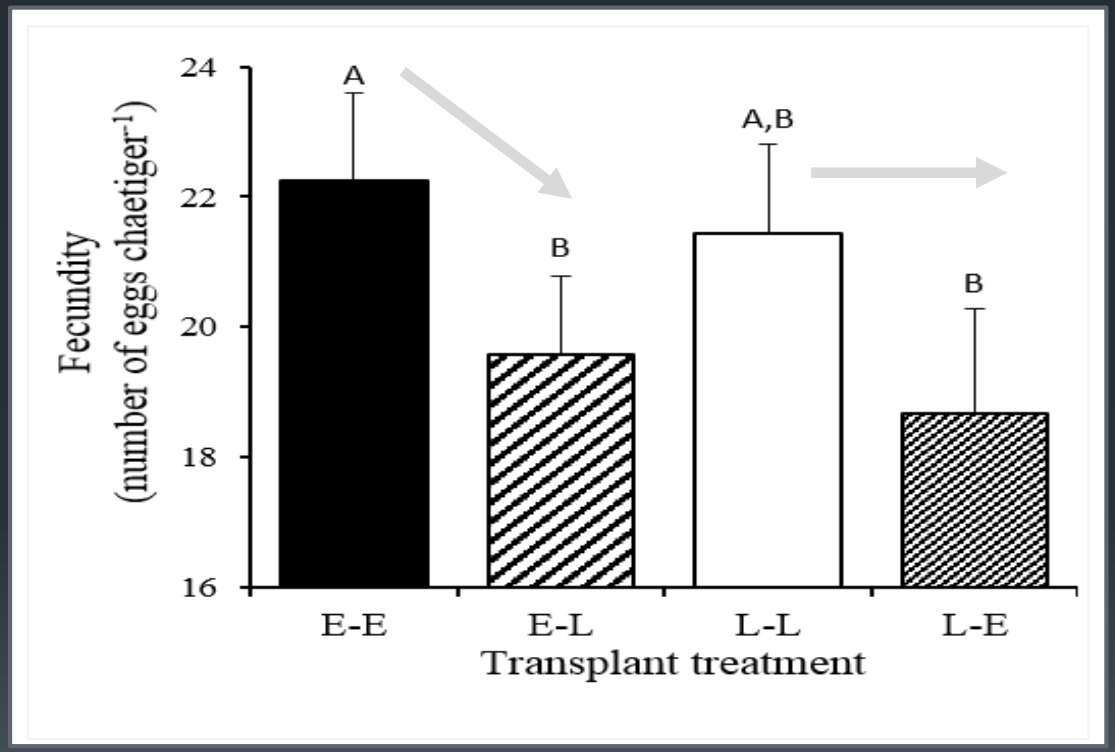
Dr Emma Gibbin

Experiment #2 : Transplantations

E: elevated pCO_2
L: low pCO_2



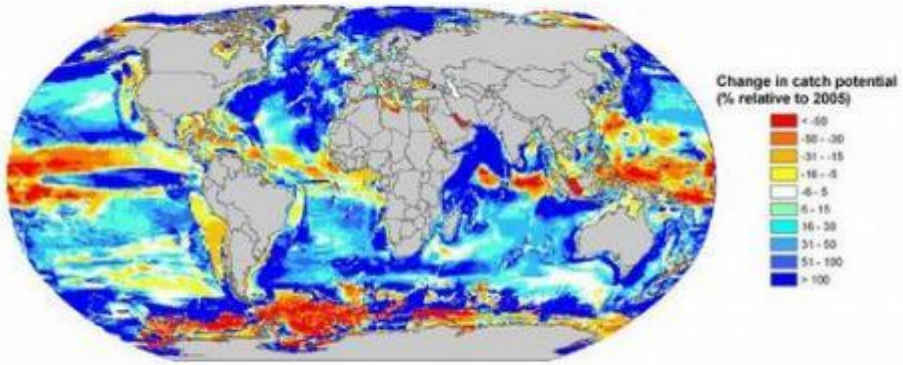
Preliminary Results



The Implications

Projected change in catch potential by 2055

Scenario: High-range greenhouse gas emission



- High latitude countries are projected to gain in catch potential while countries/regions in the tropics may suffer from losses;
- E.g., USA (excluding Hawaii & Alaska) may lose over 15% of their catch potential from 2005 to 2050.

Source: Cheung, Lam, Kearney, Sarmiento, Watson, Zeller, Pauly (submitted manuscript)

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INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2014:

IMPACTS, ADAPTATION, AND VULNERABILITY