

CLIMATE CHANGE, PEOPLE, AND NATURE: IMPACTS AND SOLUTIONS



OUTLINE

1. Climate Change: Why it matters
2. Mitigation is essential to reduce climate change impacts. But we must also now manage to allow change (*adaptation and resilience*)
3. Climate change impacts show just how connected ecosystems, ecosystem services, and people are.
4. Policy and funding recommendations

Roger Revelle



TOP: Revelle testifying at a Congressional hearing, Washington, DC, 1979
BOTTOM: Charles Keeling in the lab, La Jolla, CA, 1996

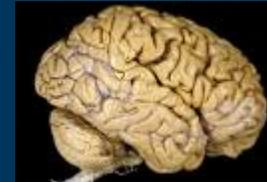
Source: Gore, (2006) *Inconvenient Truth*

WHY DO WE NOT ACT NOW?

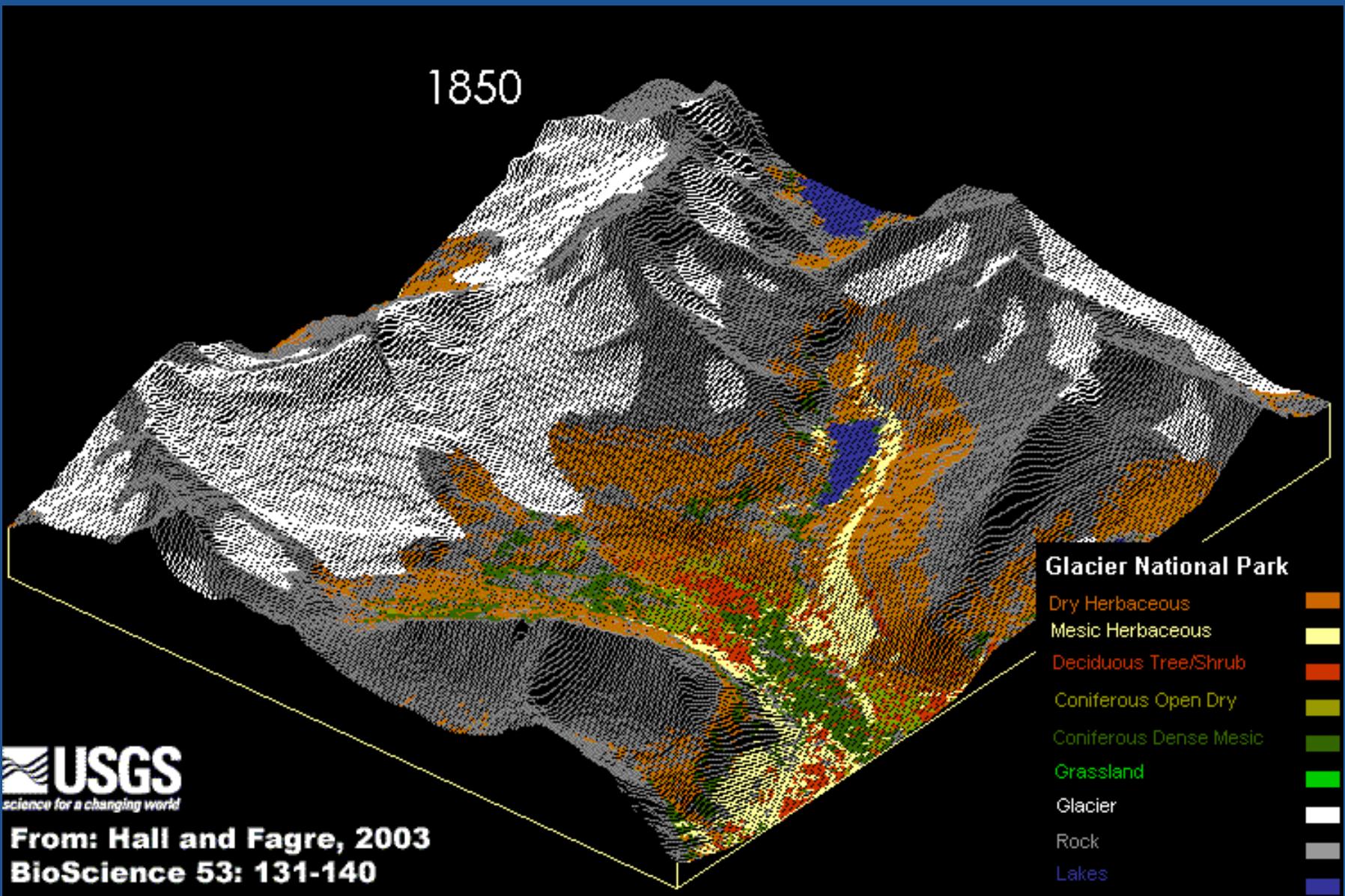
HUMAN BEHAVIORAL CONSTRAINTS ON PERCEPTION OF RISK

Rational versus fear-based thinking

We'd react more strongly if..
climate change had a face;
climate change was considered immoral;
the public understood climate change to be a
present danger, with local impacts;
we had a better capacity to recognize gradual change.



WE MUST MANAGE TO ALLOW CHANGE (ADAPTATION): HABITATS AND SPECIES ON THE MOVE



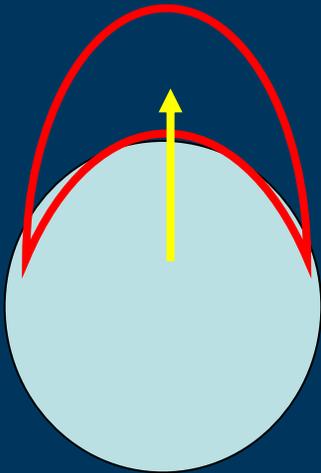
SOMEWHERE TO GO; NOWHERE TO GO



ADAPTATION IS NECESSARY – NATURE-BASED IS CHEAPER

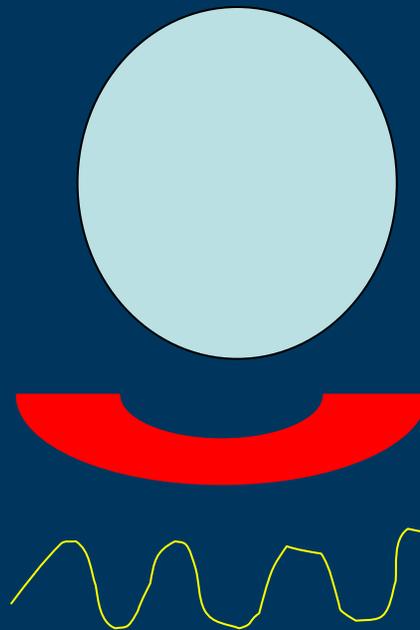
ACCOMODATION

*Ensure Opportunity
For Movement*



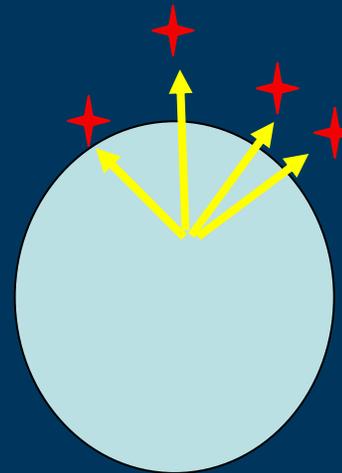
PROTECTION

*Living
Shorelines*



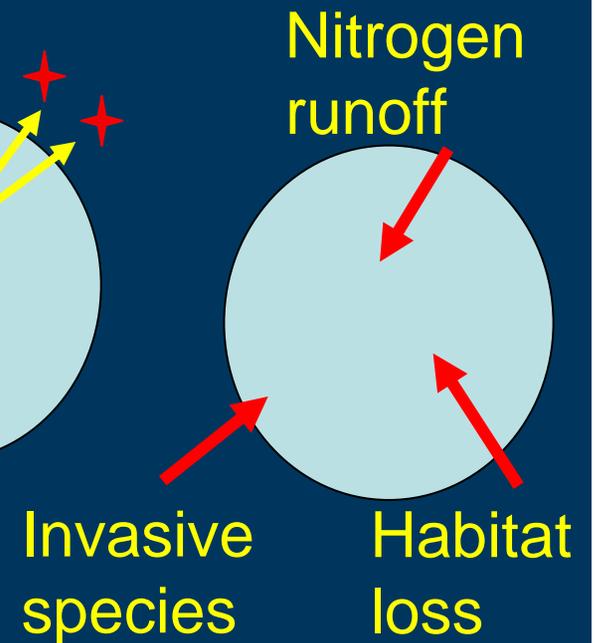
RETREAT

*Move People
and Wildlife*



ENHANCE
RESILIENCE

*Reduce other
threats*



THE NATURE CONSERVANCY'S ACTIONS ON CLIMATE CHANGE

REDUCING IMPACT

Market-based mitigation of emissions; reducing deforestation and promoting reforestation

ADDRESSING IMPACT

Reducing impacts on people and nature by building

nature's *resilience* with *adaptive management* (RI, LI, NC)



CONNECTIONS

**CLIMATE CHANGE: TEMPERATURE INCREASE
PRECIPITATION INCREASE**

ESTUARIES



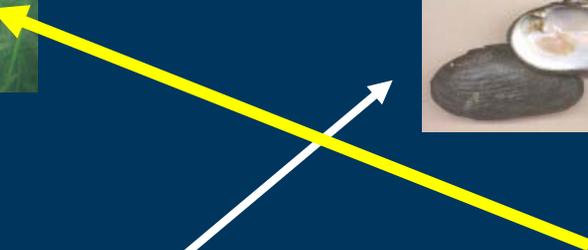
FRESH WATER



LAND



**OTHER STRESSORS:
NITROGEN RUNOFF**

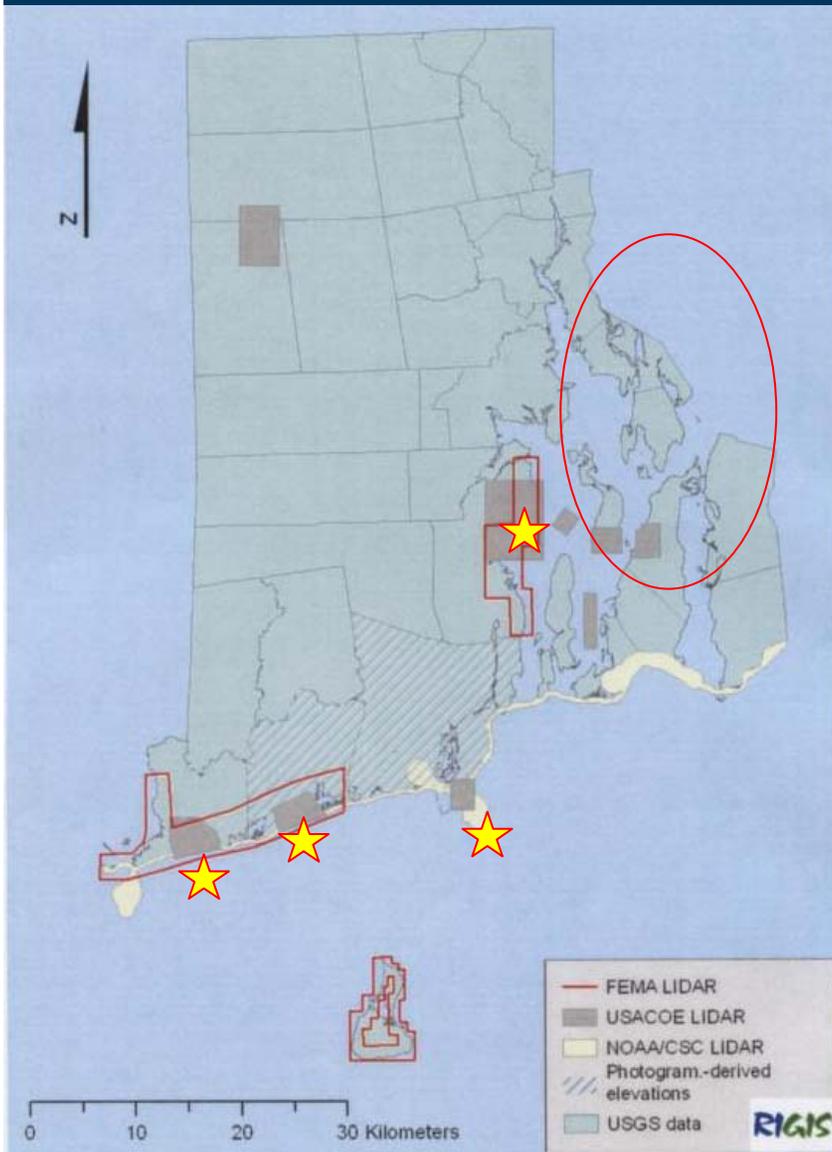


POLICY RECOMMENDATIONS: ADDRESS GAPS AND OBSTACLES

Federal agencies need to coordinate

High-resolution LIDAR maps of sufficient landward extent are essential

Lessons, data, and tools need to be shared



POLICY RECOMMENDATIONS

Support Mandatory Market-based Policies To Reduce Emissions From Fossil Fuel Consumption And Deforestation

Support Funding For Adaptation To Restore Habitats And Boost Resilience Acquire, protect, manage, and enhance a national system of conserved lands and waters

Promote the protection of ecosystem services provided by natural systems, including those that enhance the resilience of humans and natural systems.

Restore and rehabilitate ecosystems that have been lost or compromised

Reduce non-climatic stressors such as invasives, nutrient pollution, and habitat loss

Address the impacts to coastal systems and communities.

Testing of different adaptive management techniques

Models for communities to develop strategic options

GIVEN THE IMPORTANCE OF THE OCEAN TO ALL LIFE....



“The question is not whether oceans can survive what humans are doing to them, but whether humans can.”

Mark Hertsgaard, 2006

Temperature Increases

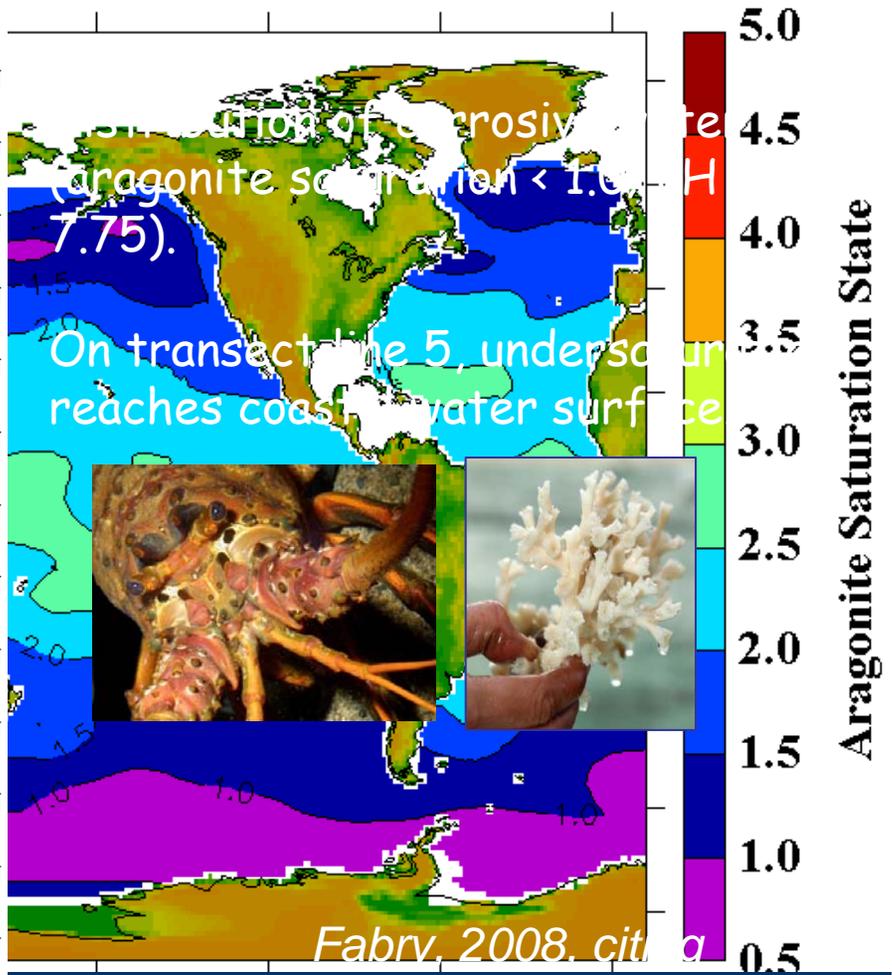
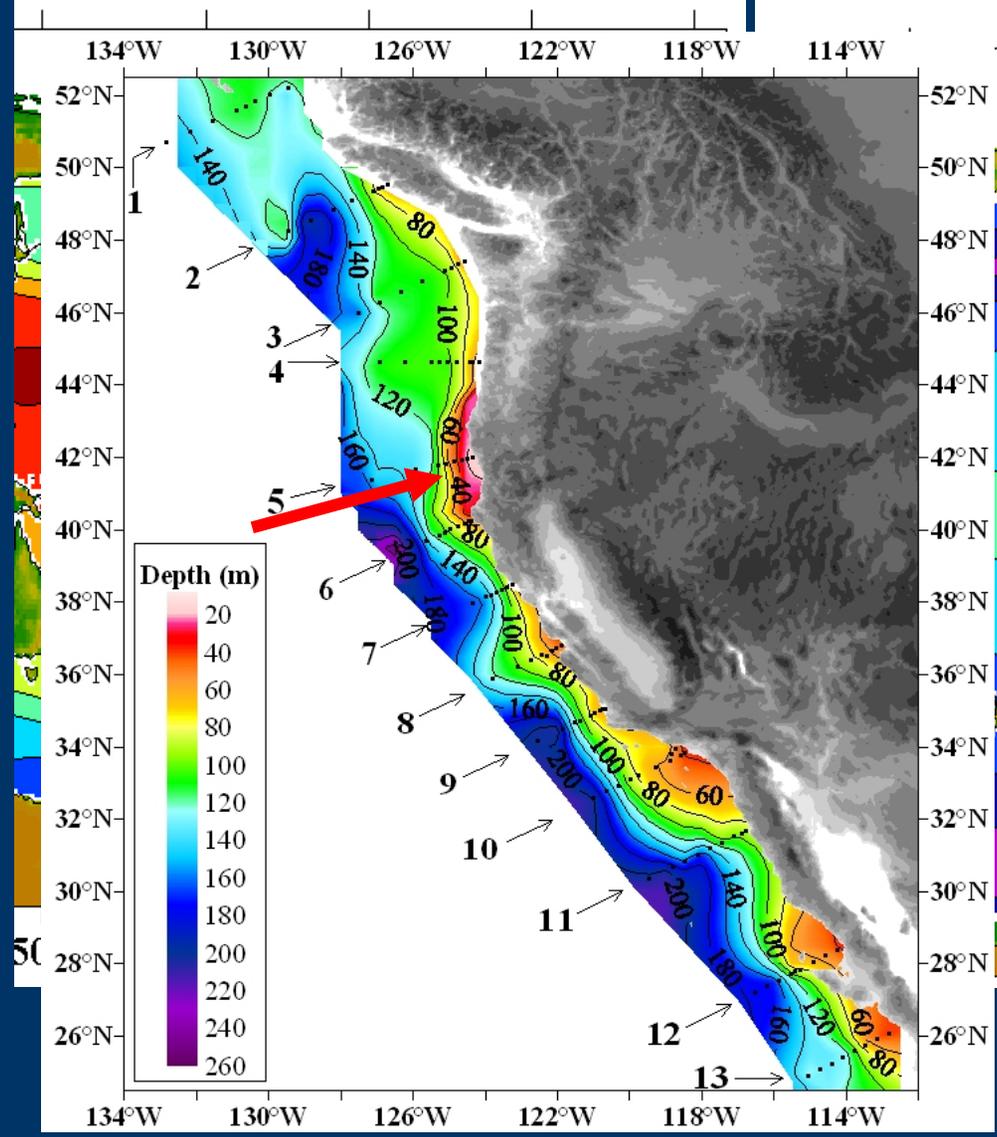
- Now: 2°F increase in water temp, > global av. (0.5°)
- Future: summer temps will feel like that of VA & GA
- 90% decline of *winter flounder* (northern (boreal) species). Adults can't feed when water > 73°F
- Loss of *eelgrass* (stress at water temps 59-68°F; mortality at 77°F)
- *Ecosystem shifts* (zooplankton shift in Narragansett Bay)

Sea level rise

- ELSEWHERE: Ocean Acidification – see coastal impacts in summer in California this year

OCEAN ACIDIFICATION: ARAGONITE SATURATION IN 1765

Undersaturation is seen already on California coast



Fabry, 2008, *cit. a*
 Feely et al (2008)