

<http://climatesantabarbara.blogspot.com/>

California Adaptive Climate Change Policy

*The importance of
regional biodiversity in
an age of climate
disturbance*



Dr. Michael Vincent McGinnis

Senior Fellow, Institute of Policy Studies, VUW

Email: mike.mcginnis@vuw.ac.nz

New Zealand Climate Change Research Institute

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California - Background

- History of leadership in environmental policy innovation
- Strong regulatory & legal framework
 - Coastal Management/Coastal Commission (1969)
 - Biodiversity Protection and Ecosystem-based approach (Marine Life Protection Act, 1999)
 - Leader in Marine and Coastal Policy in the USA
 - Strong civil society (# of NGOs per capita)
 - Leader in Adaptive and Strategic Planning to address impacts from climate change

The logo for Ocean.com, featuring the word "Ocean.com" in a white serif font with a blue wave graphic integrated into the letter "O".

Ocean.com

think deep.



National Center for Ecological
Analysis and Synthesis

$$\frac{\partial}{\partial t} (\nabla^2 \phi) = \frac{\partial \psi}{\partial z} \frac{\partial}{\partial x} (\nabla^2 \psi) - \frac{\partial \psi}{\partial x} \frac{\partial}{\partial z} (\nabla^2 \psi) + \nu \nabla^2 (\nabla^2 \psi) + g\alpha \frac{dT}{dx}$$



thankyouocean.org 

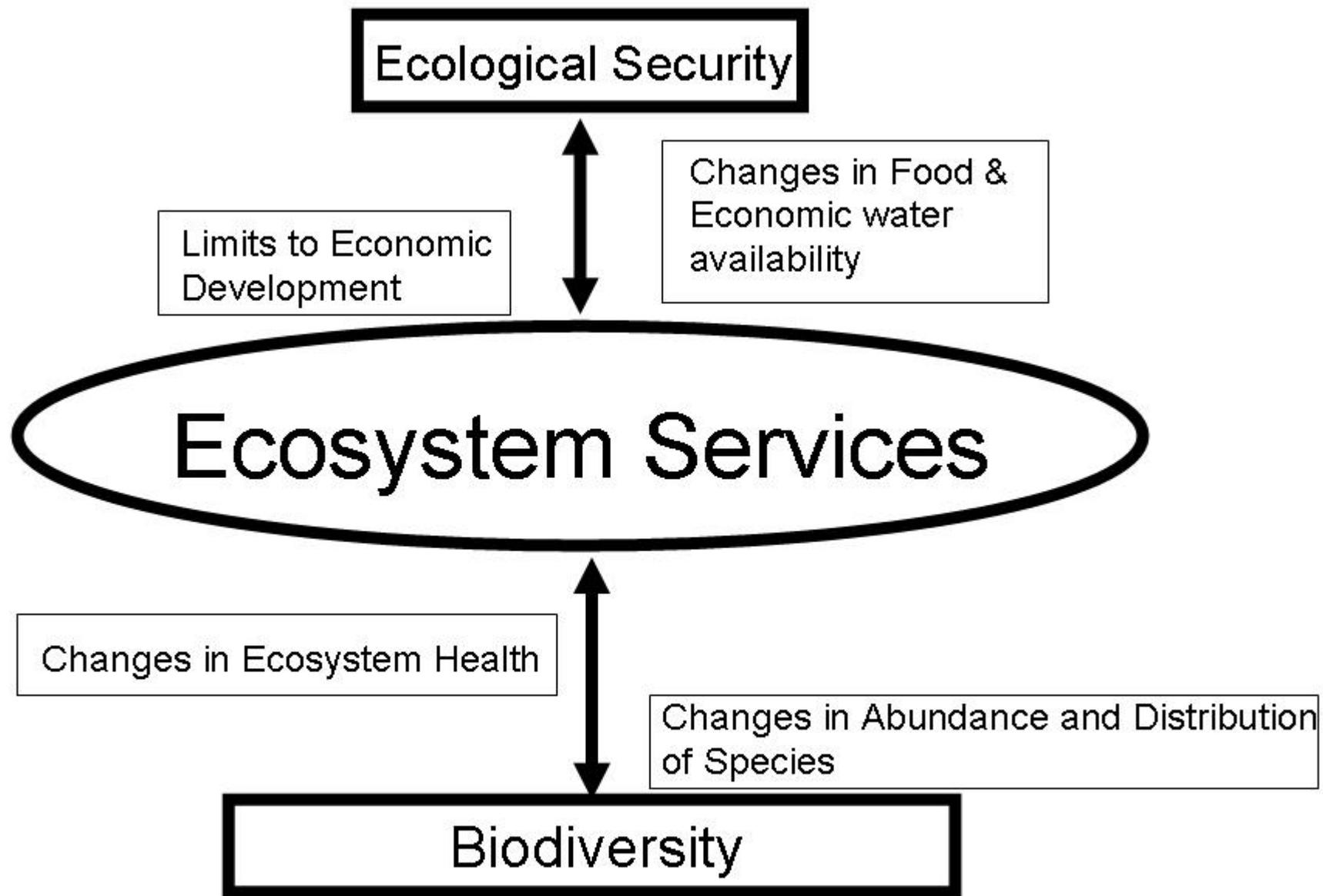
the David &
Lucile Packard
FOUNDATION

GORDON AND BETTY
MOORE
FOUNDATION

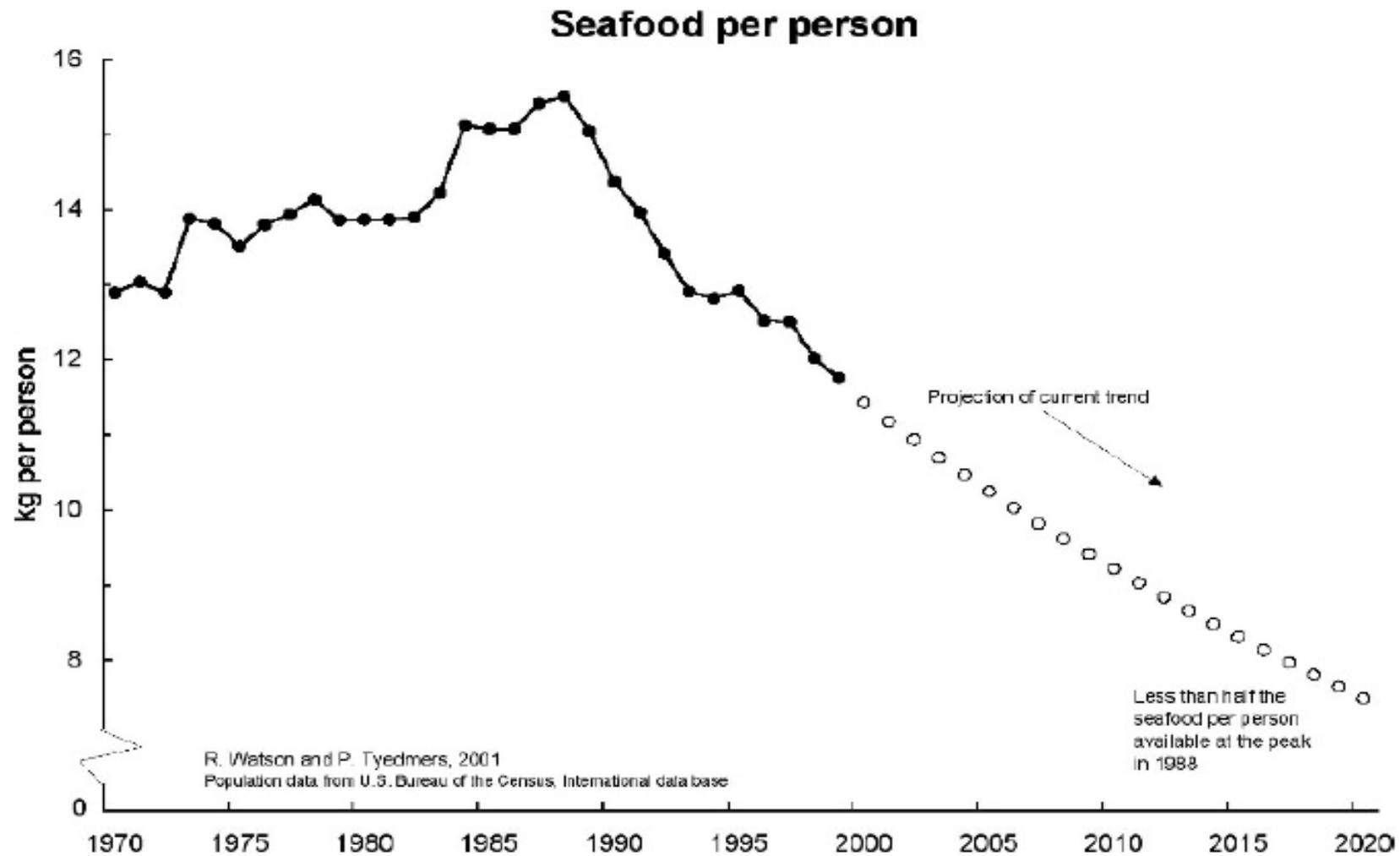
Creating positive outcomes for future generations

COMPASS
COMMUNICATION PARTNERSHIP FOR SCIENCE AND THE SEA

A background image for the COMPASS logo showing a school of small, silvery fish swimming in clear blue water.

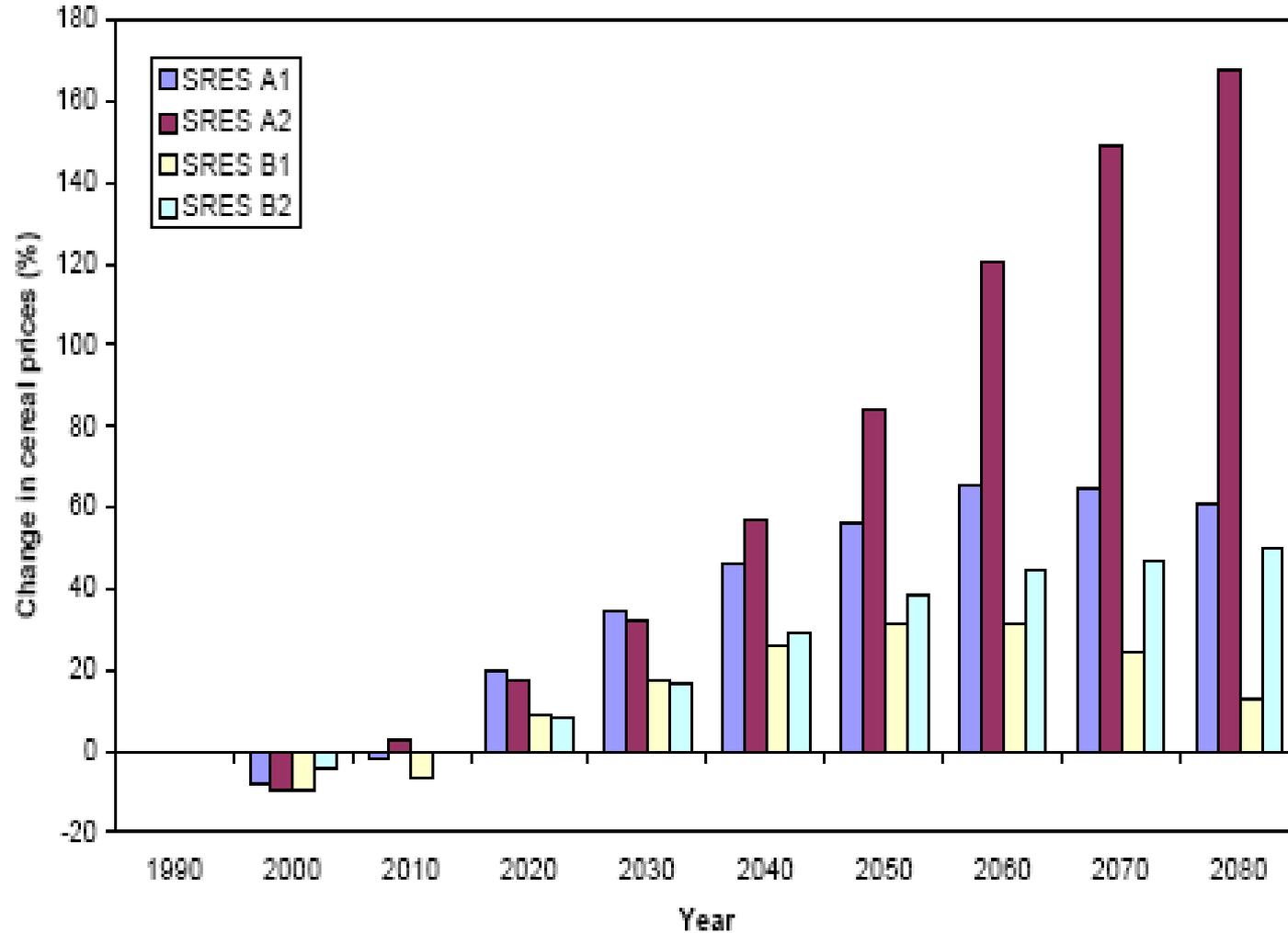


Declining global seafood supply



Sources: Watson & Pauly (2001) Nature 414:534 – 536,
U.S. Bureau of the Census, International data base

Change in Prices of Cereal Prices

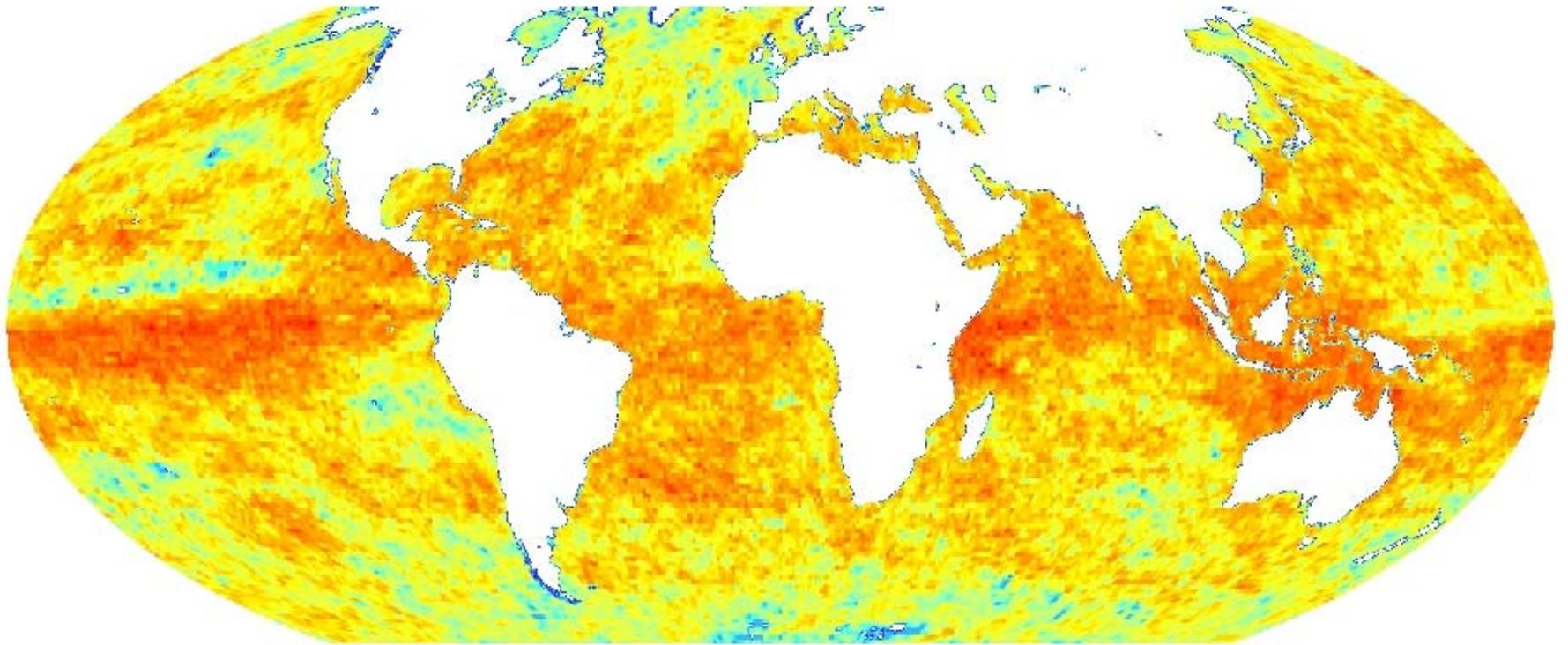


Lester R. Brown. *Outgrowing the Earth : The Food Security Challenge in an Age of Falling Water Tables and Rising Temperature* (New York: W.W. Norton, 2004, 240pp.)

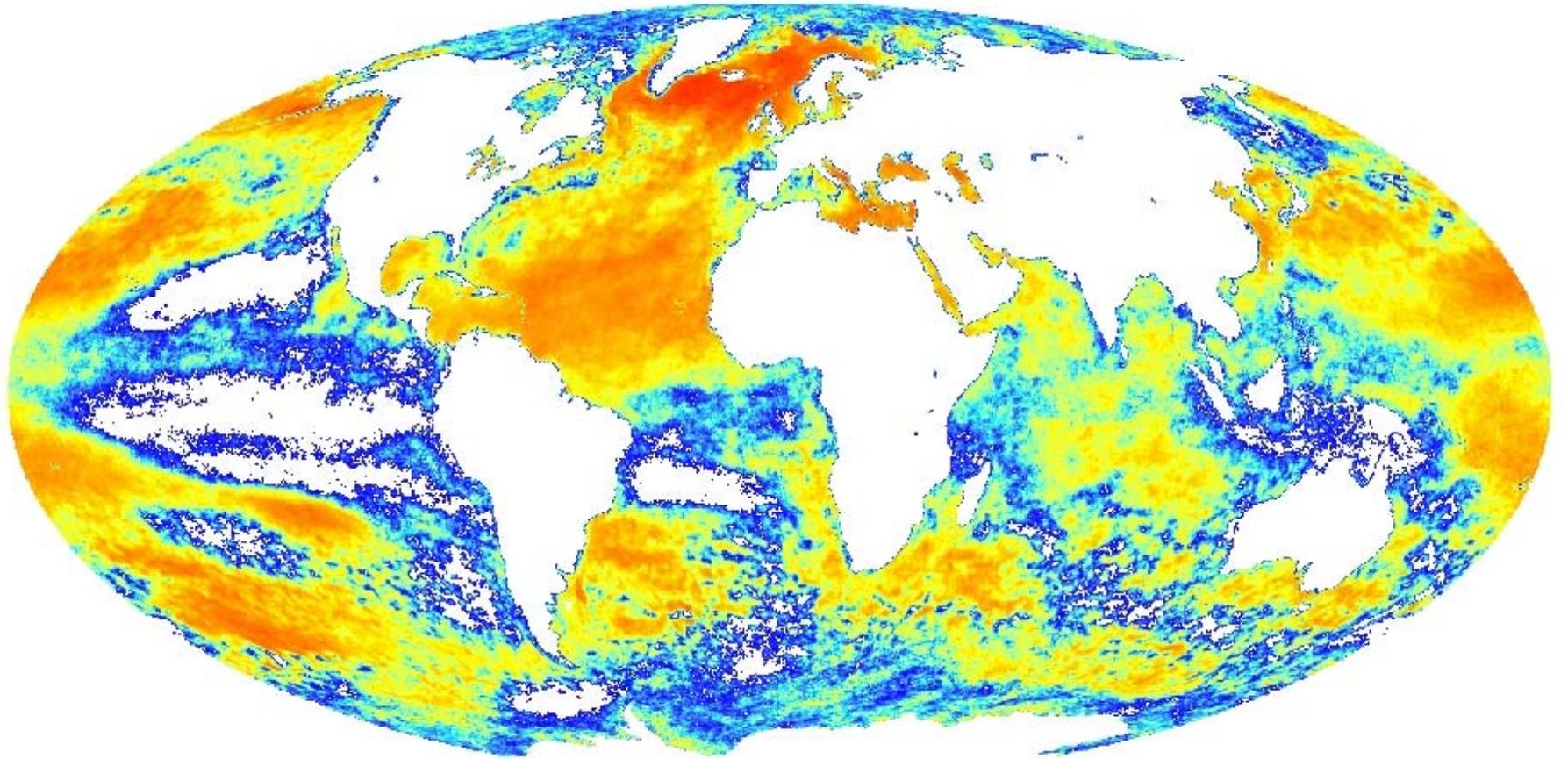
WATER INSECURITY



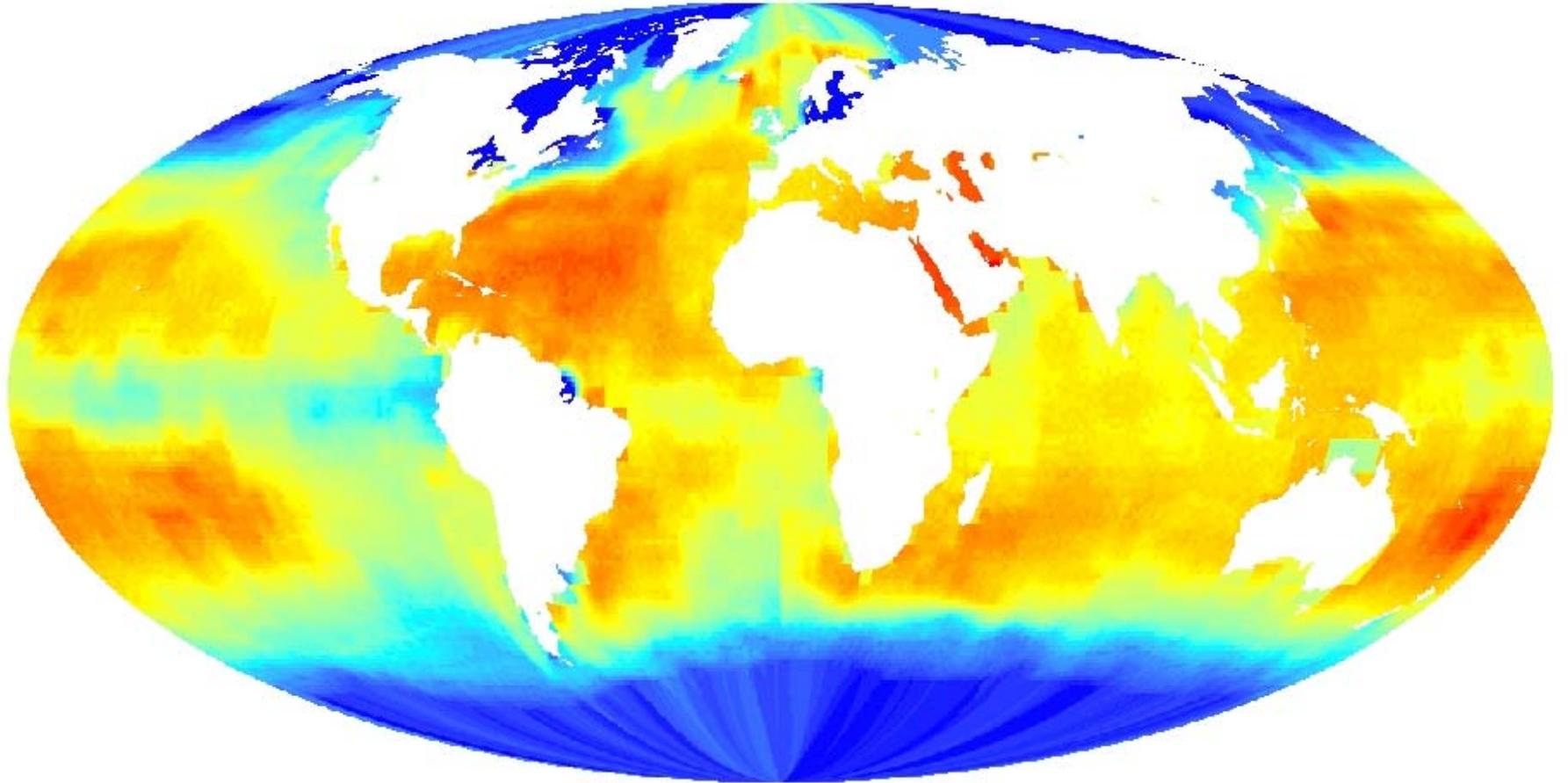
Climate change (UV)



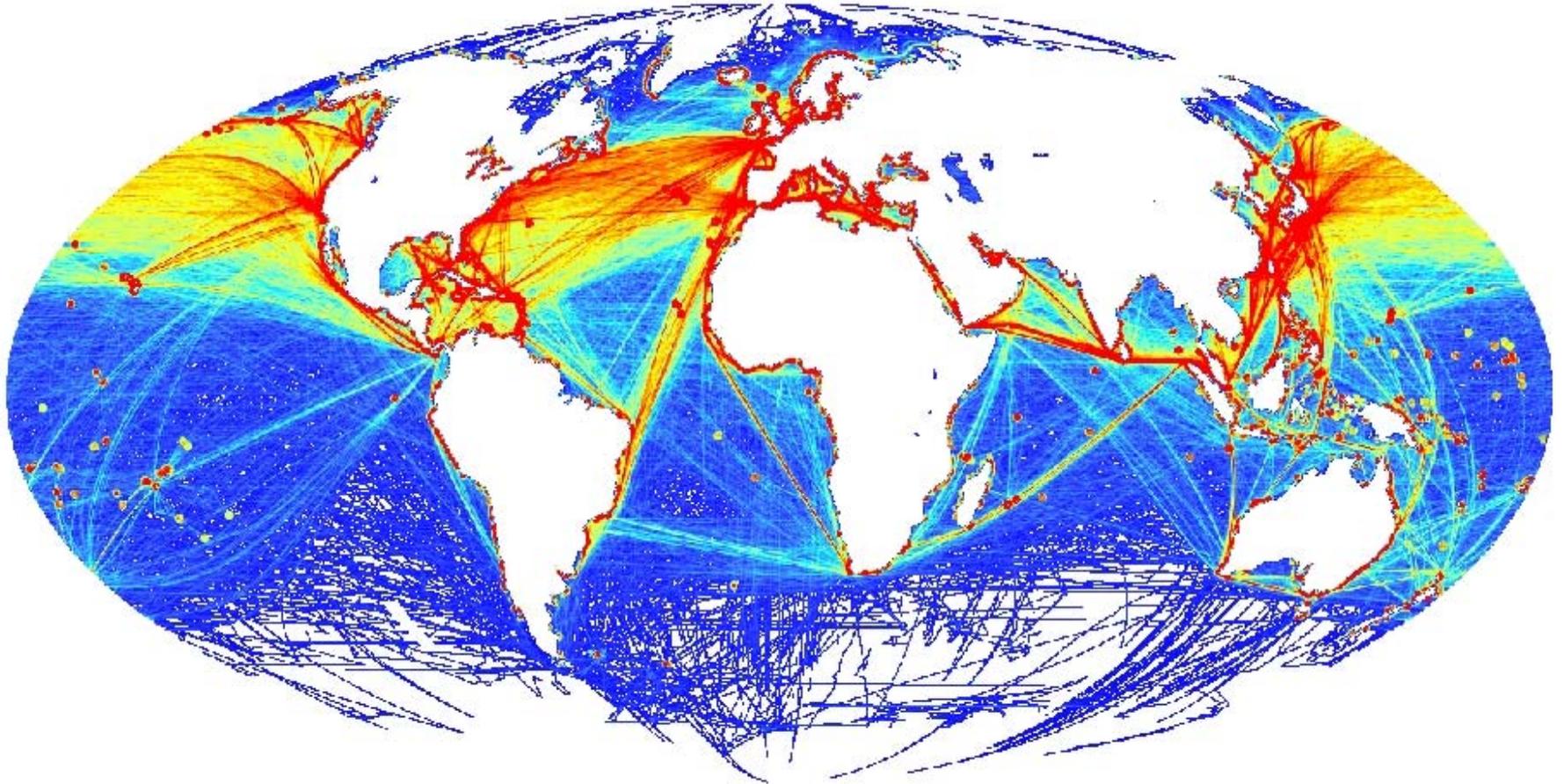
Sea Surface Temperature (SST)



Ocean Acidification



Ocean-based Pollution

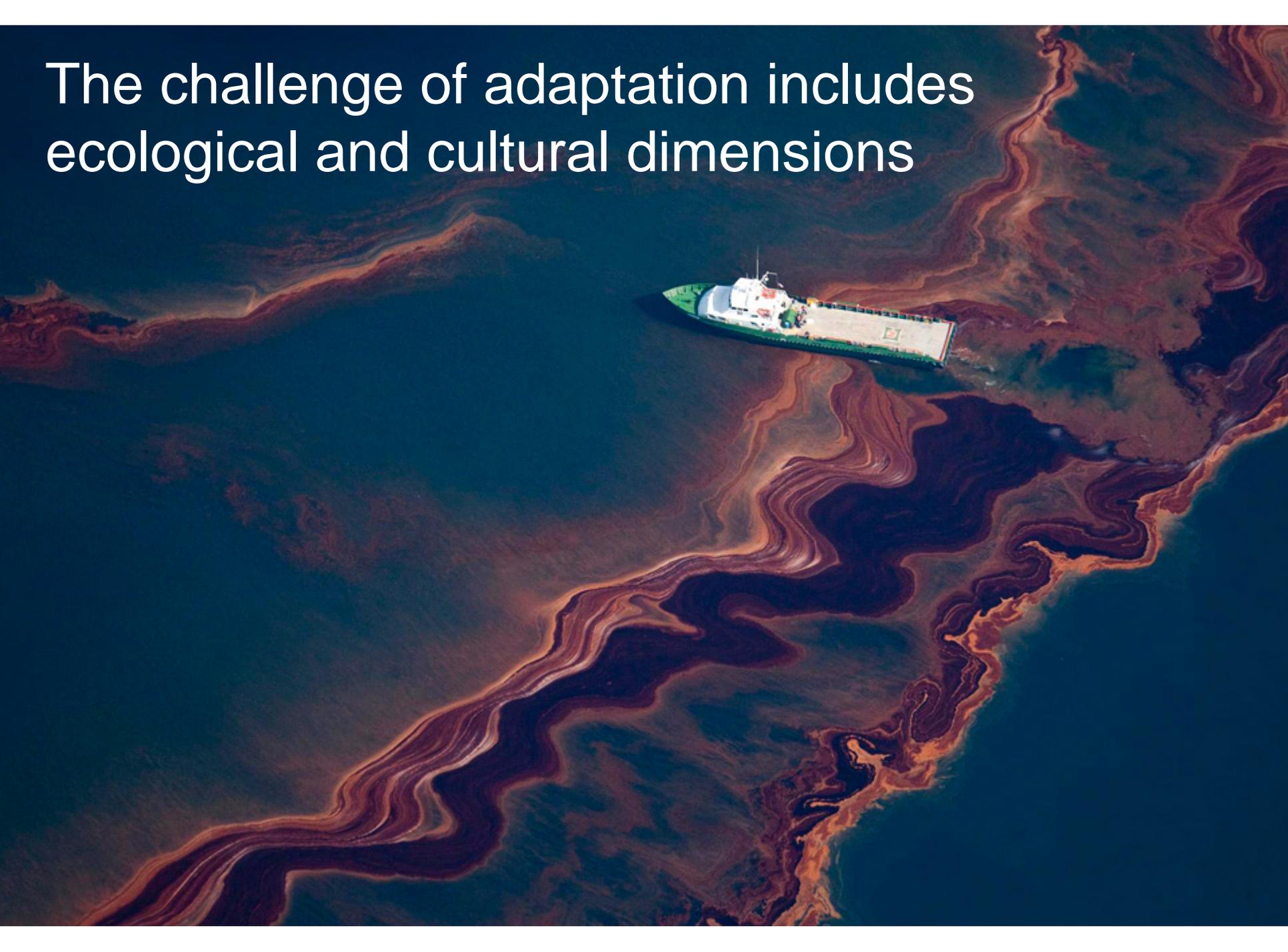




As interdisciplinary
science advances,
*what will be the human
response?*

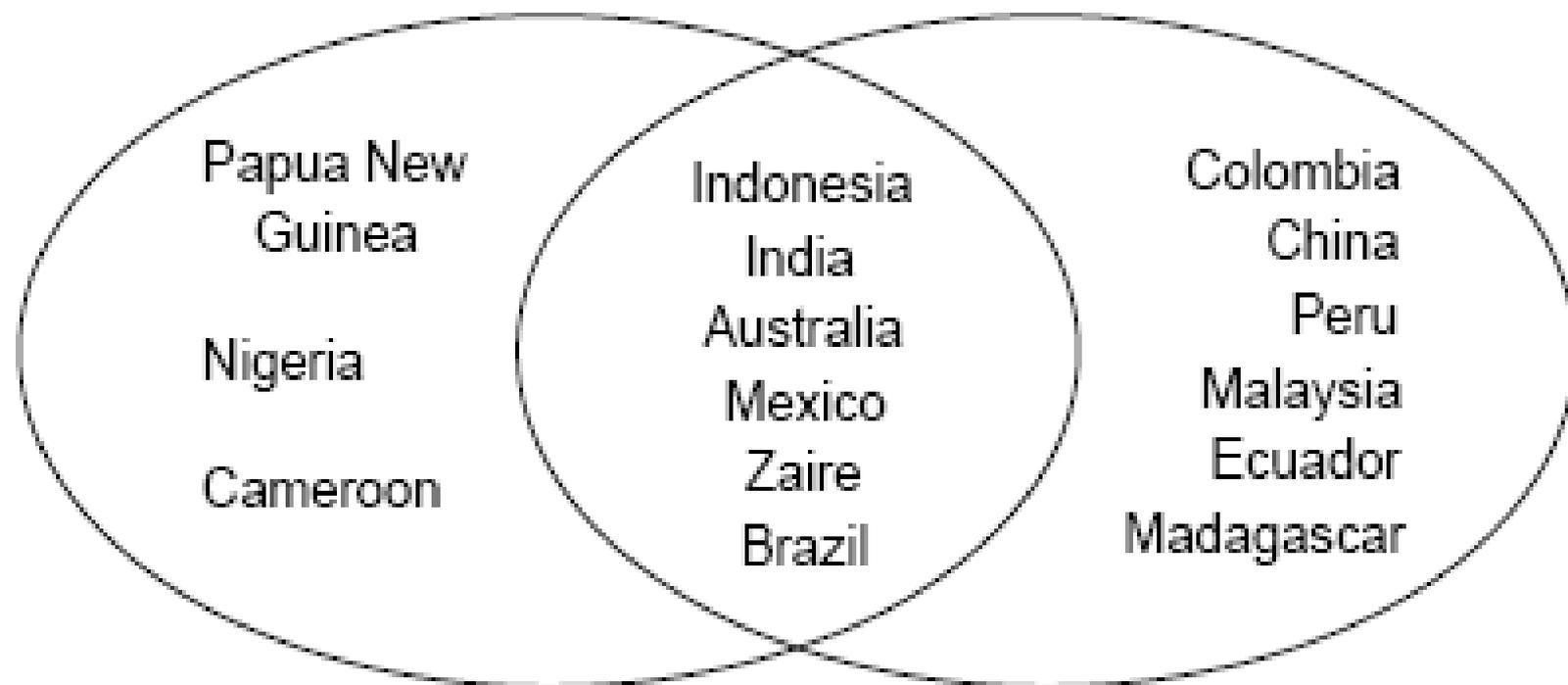


The challenge of adaptation includes ecological and cultural dimensions



High Cultural Diversity¹

High Biological Diversity²

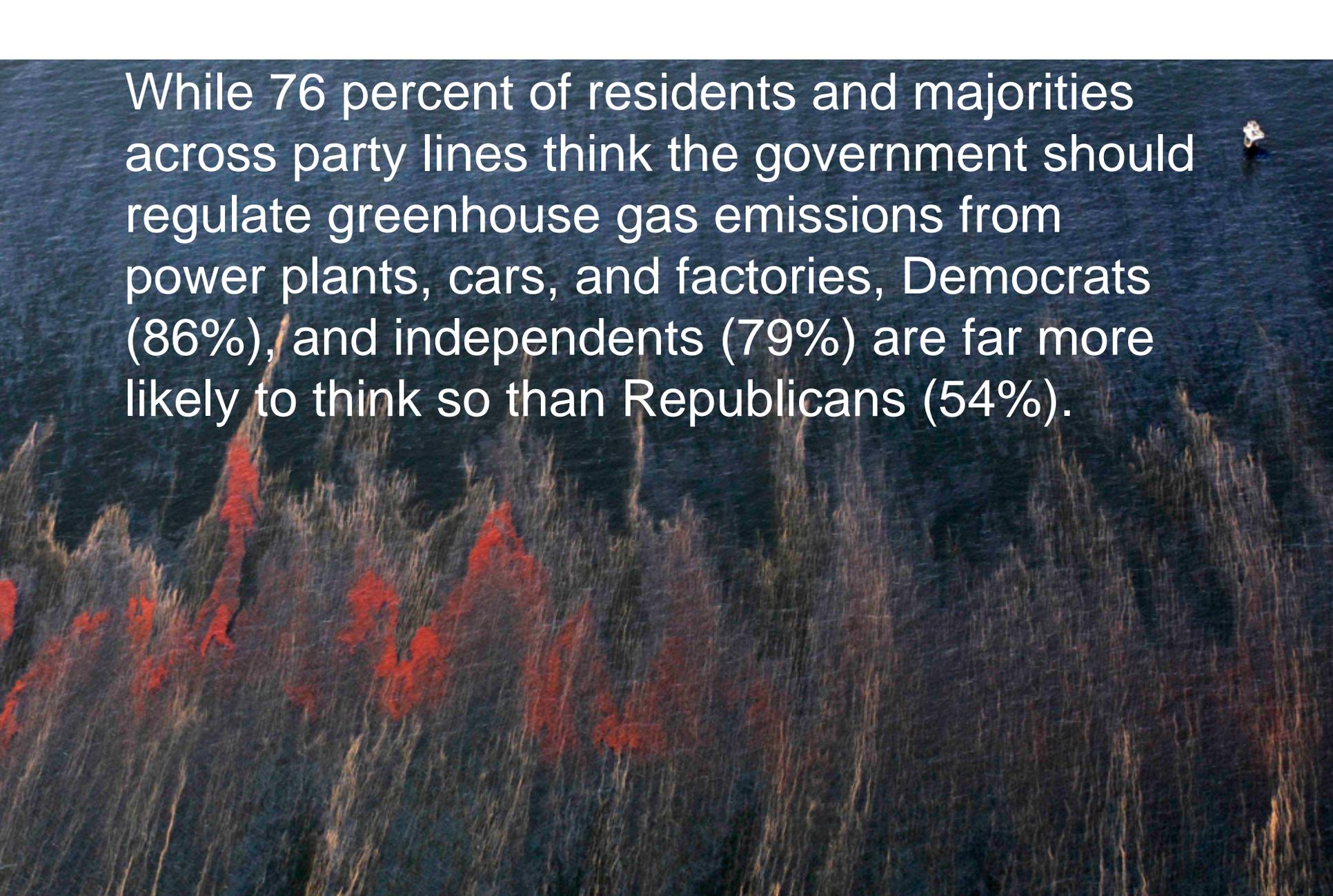


1) *Countries where more than 200 languages are spoken*

2) *Countries listed by biologists as 'megadiversity' countries for their exceptional numbers of unique species*

Figure 1: Cultural and Biological Diversity 1990

Source: World Watch Institute, cited in IUCN (1997: 31)

An aerial photograph of a forest with a path highlighted in red. The path winds through the trees, and the overall scene is captured from a high angle, showing the texture of the forest canopy and the dark water of a lake or river in the upper right corner.

While 76 percent of residents and majorities across party lines think the government should regulate greenhouse gas emissions from power plants, cars, and factories, Democrats (86%), and independents (79%) are far more likely to think so than Republicans (54%).



PPIC

PUBLIC POLICY
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Californians are nearly as likely today (61%) as they were last year (64%) to say the effects of global warming are already occurring, and they are more likely to say so than adults nationwide (53%), according to a March Gallup poll.

Across parties today, solid majorities of Democrats (76%) and independents (61%) agree, compared to just 36 percent of Republicans.

And one in three Republicans (34%) say global warming will never happen, an increase of 10 points since last year (24%).



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Gov't Response -- *Energy*



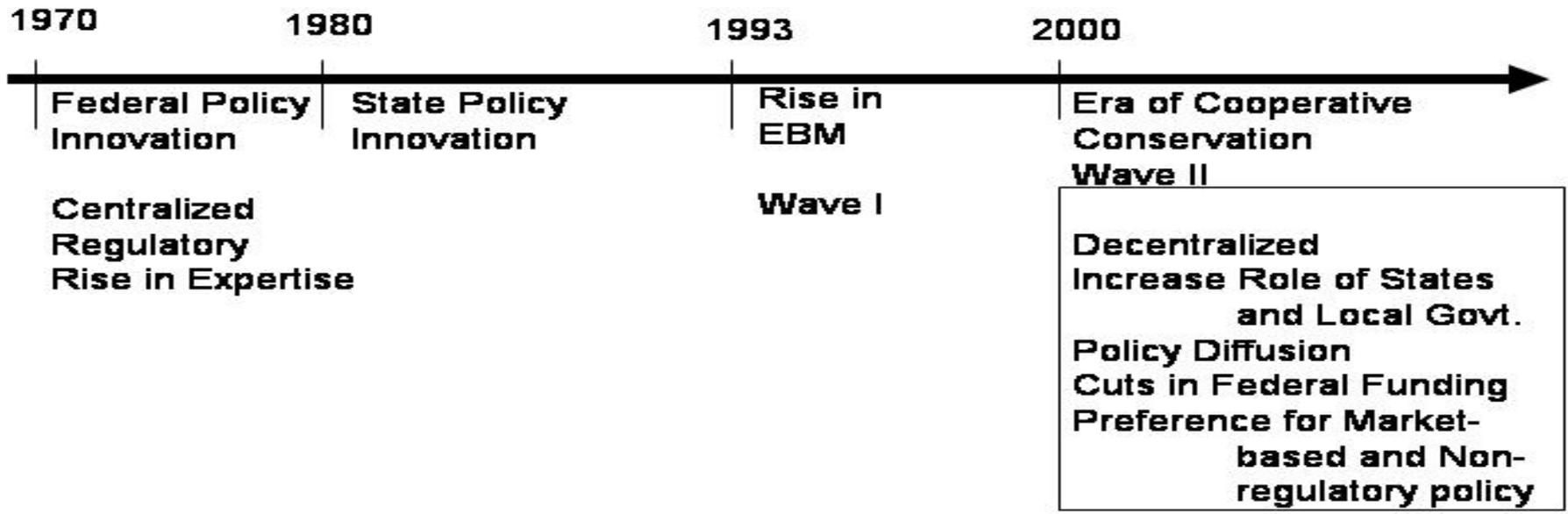
Is Climate Policy on the Federal Agenda?

Energy use
Technology
Public Transportation
Fossil Fuels
Renewable Resources
Food production-consumption
Global trade
Education
Security
Water Use
Fire Management
Immigration
Native Species diversity
Poverty and Justice
Worldview
Risk Perception



**Curbing greenhouse
gas emissions will not
prevent long-term and
large-scale ecological
disturbance**

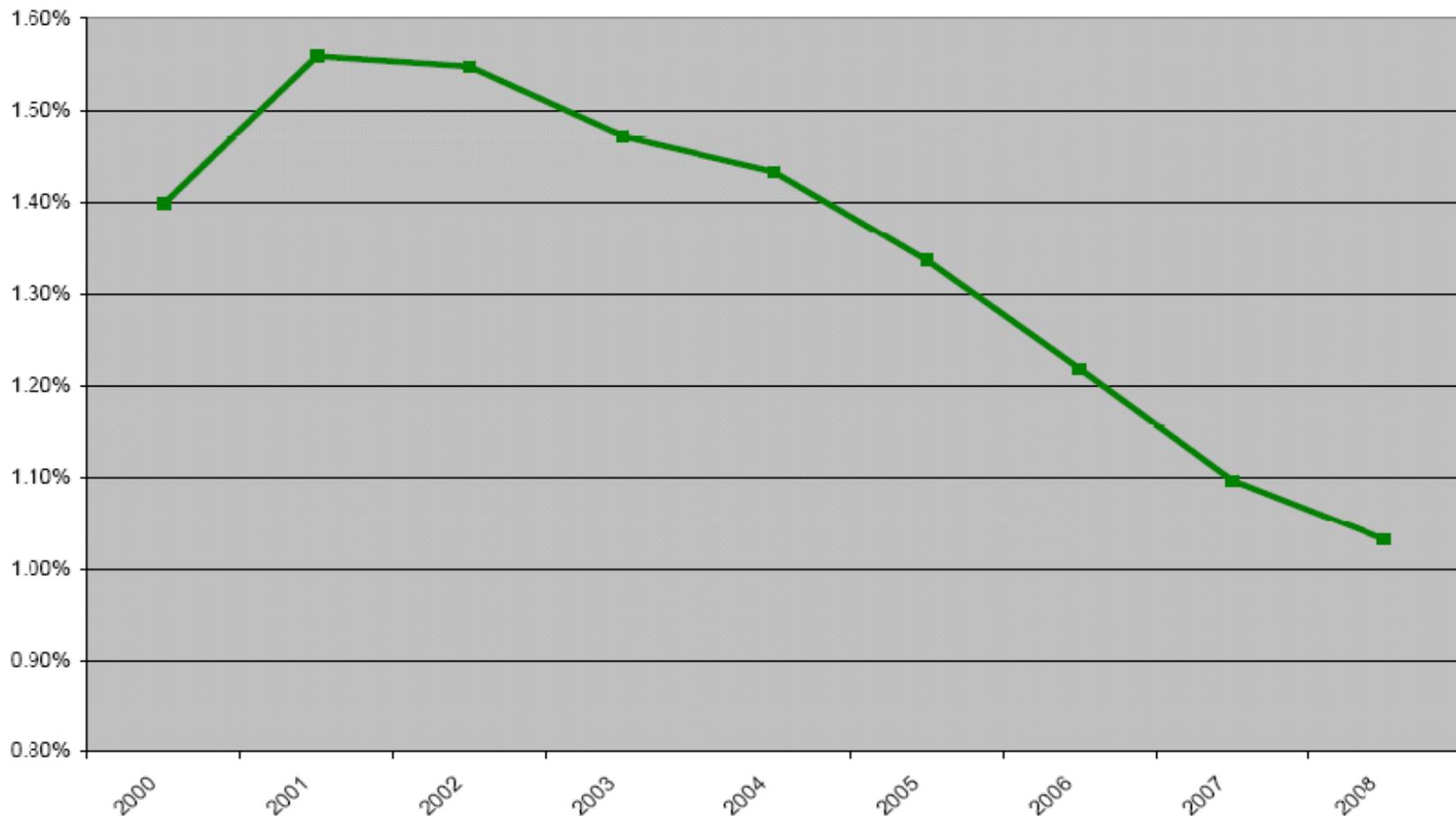




INCREASING ROLES OF STATES & LOCALITIES

Closing Window of Opportunity (decline in Federal funding)

Function 300 as a Percentage of the Overall Budget



Policy Innovation - California

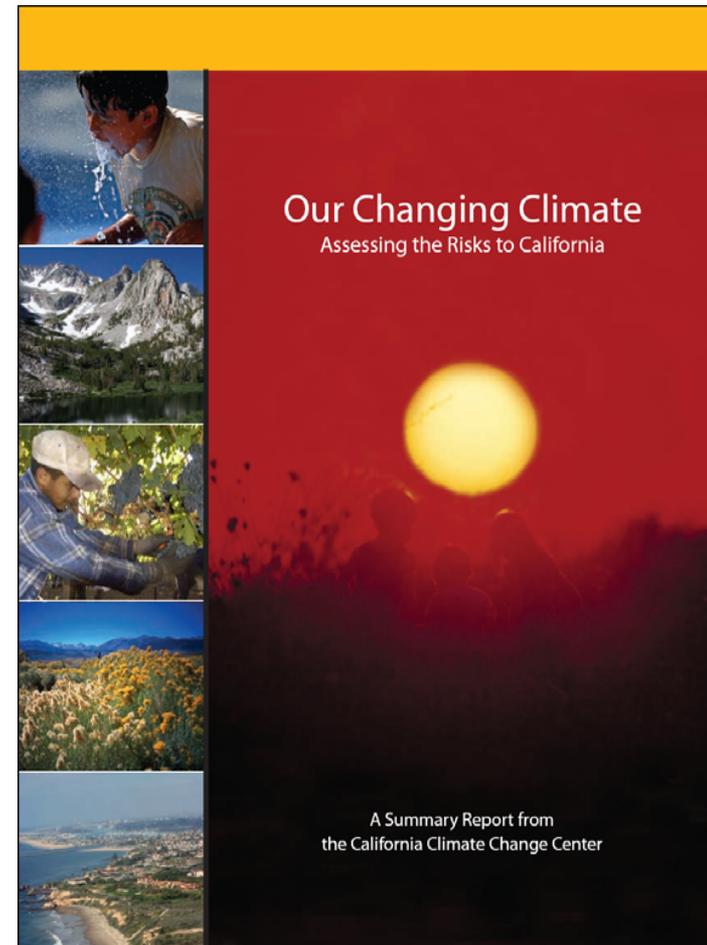
California's GHG Reduction Targets

2010: Emissions at 2000 levels, 11% below business as usual. Reduction of 60 million tons.

2020: Emissions at 1990 levels, 28% below business as usual. Reduction of 173 million tons.

2050: Emissions at 80% below 1990 levels.

Governor's Executive Order: S-3-05 and Assembly Bill 32



Most residents (66%) support the 2006 California law (AB 32) that requires greenhouse gas emissions to be reduced to 1990 levels by 2020.



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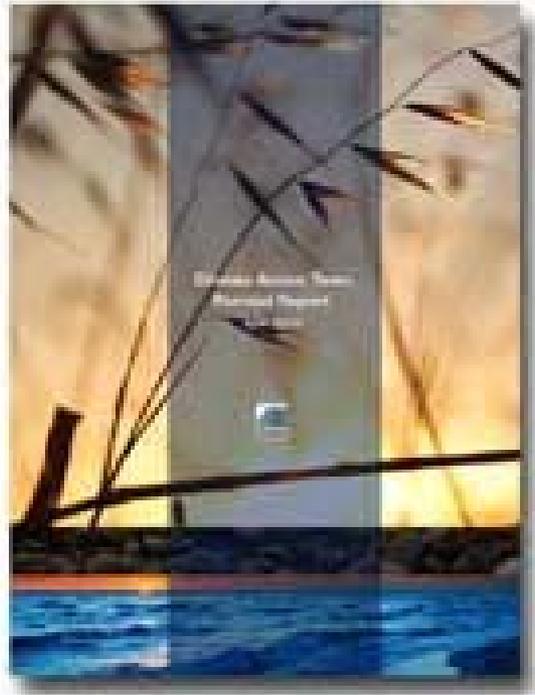
CALIFORNIA CLIMATE CHANGE PORTAL

CLICK TO VISIT

CalAdapt
The Google Earth
Climate Adaptation
Visualization
Project



Climate Action
in California
with Governor Schwarzenegger



Final Climate Action Team
Biennial Report
Now Available

Revolutionary Climates & the California MTE

droughts:

892-1112 (220 years)

1209-1350 (141 years)

The longest drought of the 20th Century lasted 6 years during 1987-1992.

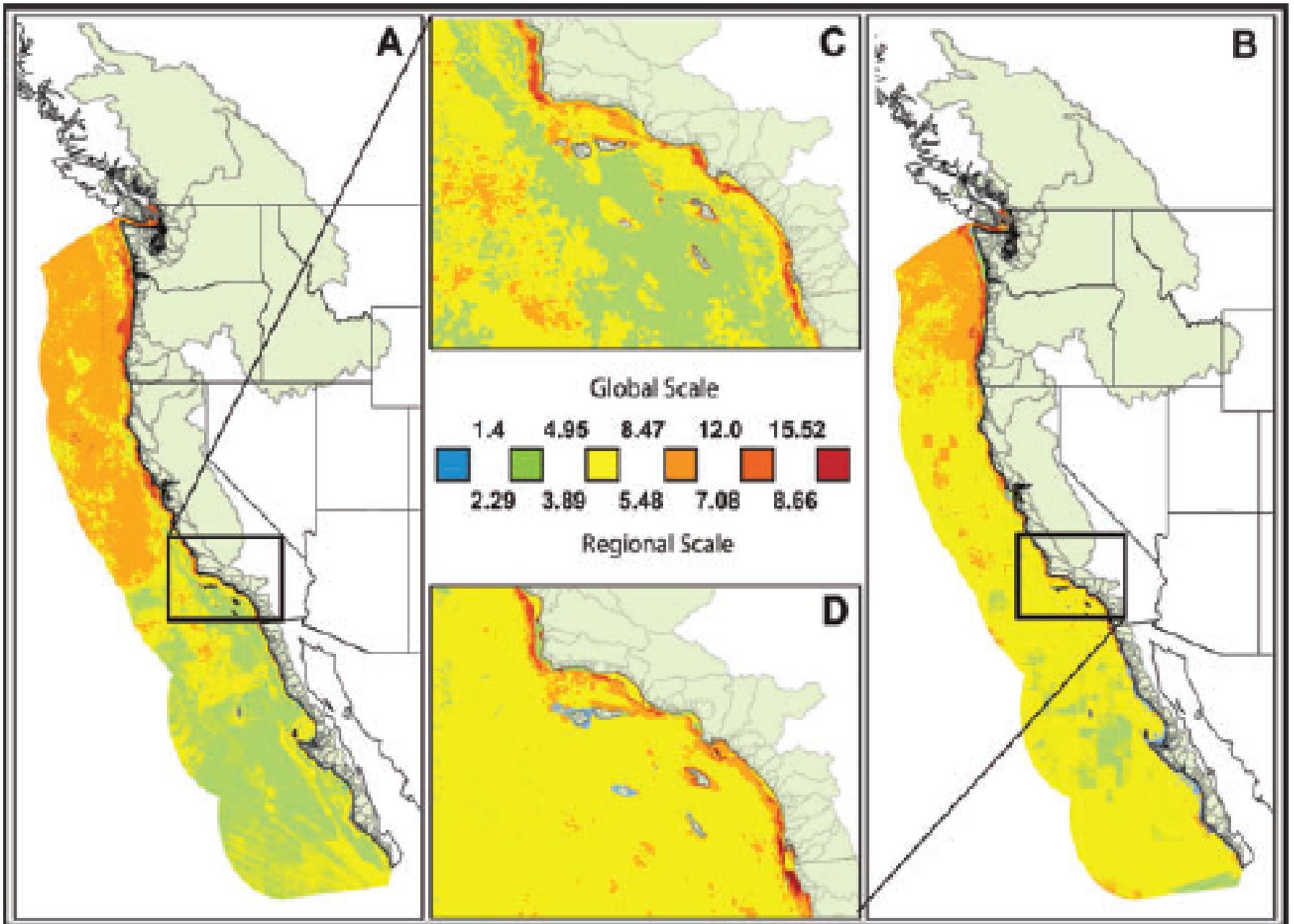
The California's MTE has lost many important coastal habitats:

estuarine wetlands 75-90%;
riparian communities 90-95%; and
vernal pools 90%

(McGinnis 2000, 2006).

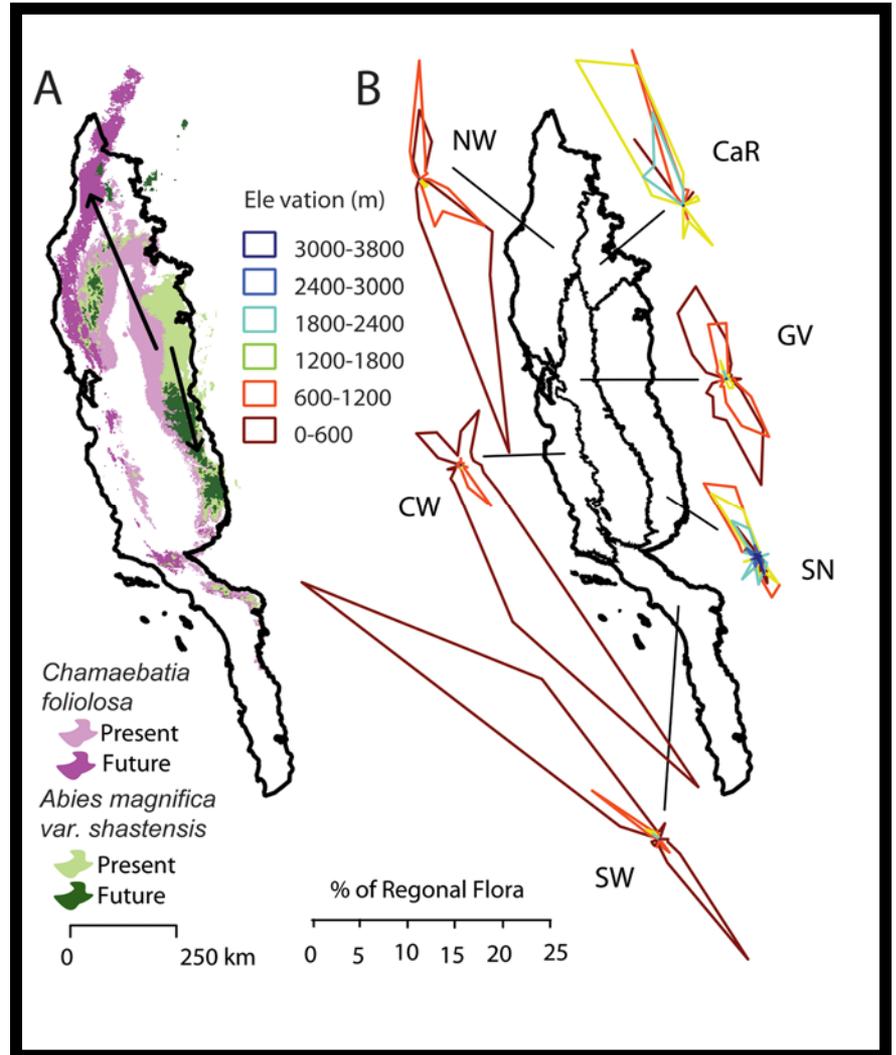


A global map of the cumulative impact of human activities on marine ecosystems showed the California Current region to have many areas of high impact and few refuges of low impact (Halpern *et al.* 2009)



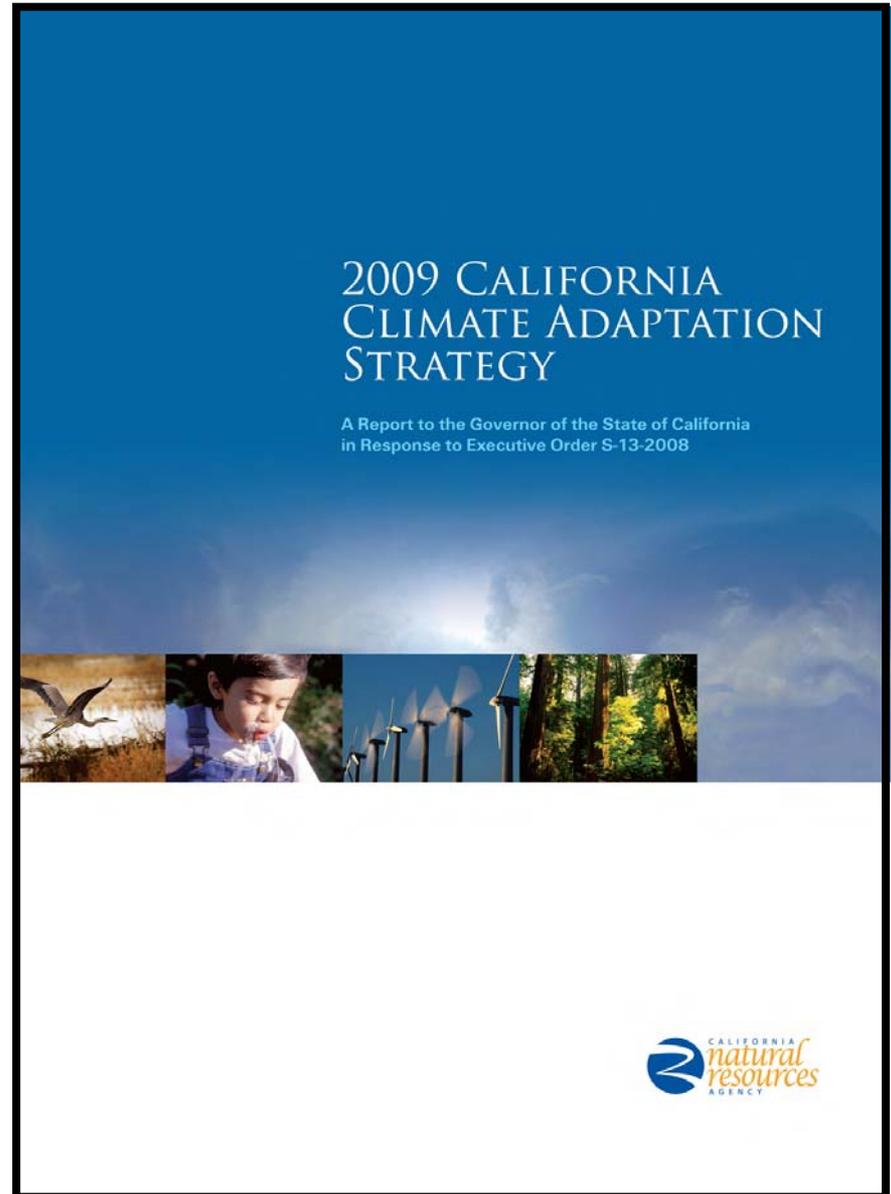
SOURCE: Halpern et al. 2009

Two-thirds of California's "endemics" could suffer more than an 80 percent reduction in geographic range by the end of the century (Loarie et al. 2008).



A first-of-its-kind multi-sector strategy...

summarizes the best known science on climate change impacts in **seven specific sectors** and provides recommendations on **how to manage against those threats.**



An Initial Assessment of the Impacts of Sea Level Rise to the California Coast



Photo by D. Revell – 2/23/08



California Coastal Records Project

Dr. David Revell and Matt Heberger, P.E.

Dr. Peter Gleick, Bob Battalio, P.E., Heather Cooley, and Justin Vandever



http://www.pacinst.org/reports/sea_level_rise/index.htm

2.23 M sea level rise in SF





Lagoon, Santa Barbara, California.



Blue Line Movement



Emphasis on Local Jurisdictions

- California coastal managers currently are not required to consider future climate in their planning or management decisions.
- Most do not use weather-, climate-, or sea level-related information in their decision-making today.
- They lack the time, staff, or financial resources to examine potential impacts of climate change on their management responsibilities.
- Lack of institutional capacity

Biodiversity Adaptive Policymaking

- **Vulnerability analysis**
- **Precautionary Principle**
- **Adaptive Management**

- **Community-based Planning Processes**
- **Identify and preserve Habitat Migration Corridors and Core Areas**
- **Integration of New Policies into Existing coastal plans**

[McGinnis, 2010. Protecting Climate Refugia Areas: The case of the Gaviota coast in southern California, *Endangered Species Update* 25, 4 (June, *In press*)]



Figure 16: Estimated Biodiversity Value within the Conception Coast Region



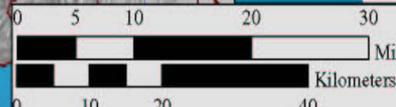
Biodiversity Value

- Higher
- Medium
- Lower
- No Value Modeled
- RCG Boundary
- Counties
- Major Highways
- Residential Roads
- Major Rivers
- Perennial Streams

Methodological Overview:

Biodiversity values are estimated by combining four ecological criteria: listed species hot spots, habitat representation, wild lands, and landscape connectivity (Figures 9, 10, 12, and 15). This analysis does not include threat. Areas with "no value modeled" have no biodiversity value modeled for any of the criteria. For the data sources of this analysis and more information, please see Appendix

By John Gallo
Conception Coast Project
& Department of Geography
U.C. Santa Barbara



Thank
you.



Questions?

Ecology

The maintenance of
Ecological integrity and health

Multiscalar system governance

Face-to-face
Democracy

Ecological Sustainability

Equitable Allocation
of Public Goods

Place-based Economic
Development

Equity

The promise of civil
society

Economy

