

Some personal perspectives of how federal agencies can better accomplish their mission by conducting adaptation research

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Science for Climate Change Adaptation:
Enhancing Decision Support Capability



NCAR

Aug 9, 2012



We are all
living on
the same
planet!

Rodney King
said "Can't
we all get
along!"

No!

Is this the future?



We have not tried to
bring in some world class
experts on the question
of how to do adaptation
such as this guy!



How do we offset
this guy's
communication system to
20 million people every day?

Education of public, media, policymakers
Academies are the "fact checkers"

Statement of Task for new USGCRP NRC committee

- Provide ongoing, integrated advice to the USGCRP on program-wide issues.

This work will begin with a review of the Strategic Plan and is expected to include other tasks such as a review of the national climate assessment and evaluation of USGCRP progress toward Strategic Plan objectives.

- Provide a forum for informal interaction between the USGCRP and relevant scientific communities.
- Provide a forum for exchange of experience and insights for integrating across science communities and improving linkages between officials of the Program and the science communities.

Committee Membership

Warren Washington (Chair), NCAR

Kai Lee (vice-Chair), The David and Lucille Packard Foundation

Mark Abbott, Oregon State University

John M. Wallace, University of Washington

Robert Dickinson, University of Texas

Maria Carmen Lemos, University of Michigan;

Thomas Dietz, Michigan State University

Henry Jacoby, Massachusetts Institute of Technology

Kathleen Tierney, University of Colorado

Doug Arent, National Renewable Energy Laboratory

Susan Avery, Woods Hole Oceanographic Institution

Charles Vorosmarty, City University of New York

Karen Seto, Yale University

Camille Parmesan, University of Texas

Gary Yohe, Wesleyan University

Ian Noble, consultant, The World Bank

USGCRP: Participating Departments and Agencies

\$2.7 Billion



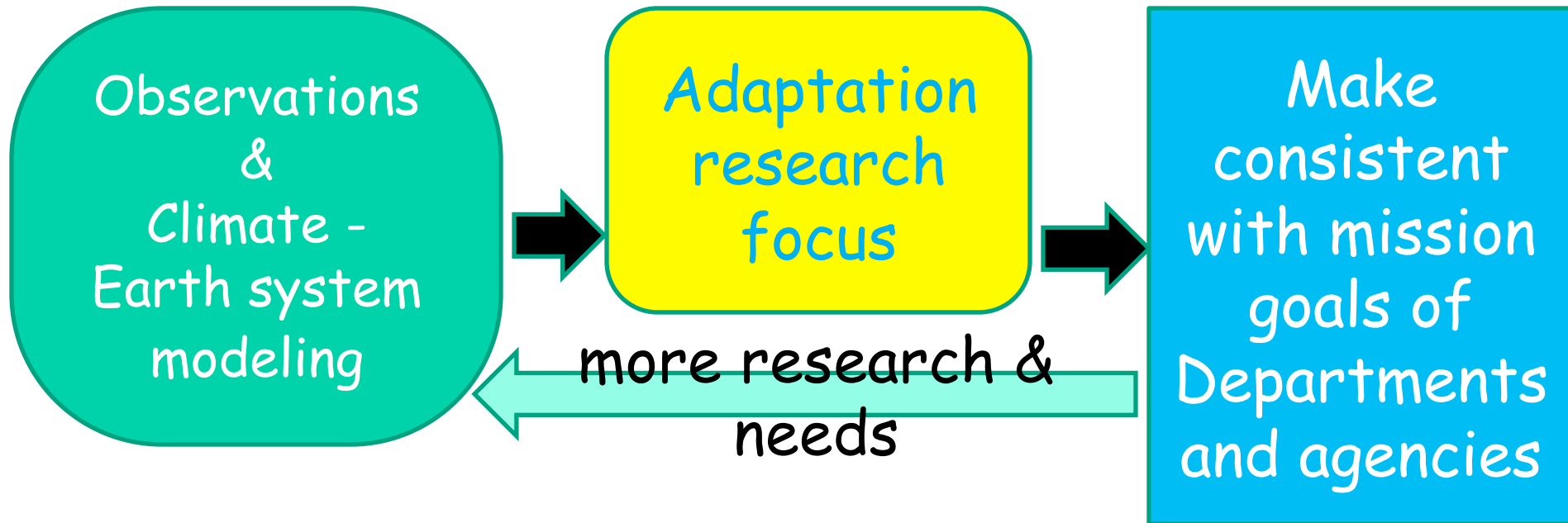
Information needs (models can help)

- Global warming and will lead to more heat records and less cold records
- Stronger rain and snowfall events
- Increased and areal extent of droughts
- Flooding
- Arctic sea ice retreat and thinning, less snow cover
- Affecting water, energy, agriculture, transportation, and ecosystems
- Sea level rise, storm surges, increased winds over oceans
- Improved surface ozone, aerosols, CO, SO₂,
- More tropical diseases
- Increased tree growth, longer growing season
- Increased ocean acidification

New Connection:

Stronger summer convection
puts more water vapor in the
lower stratosphere and causes
more UV comes to the
ground...health and plant
effects.

U.S. Global Change Research

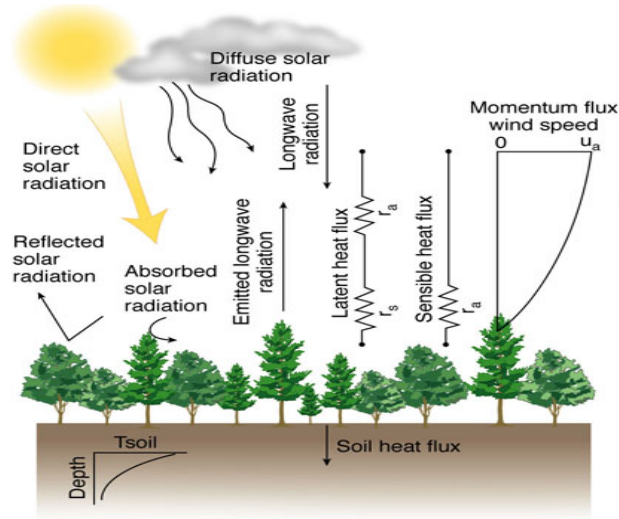


Model data is standardized (e.g. Earth System Grid)

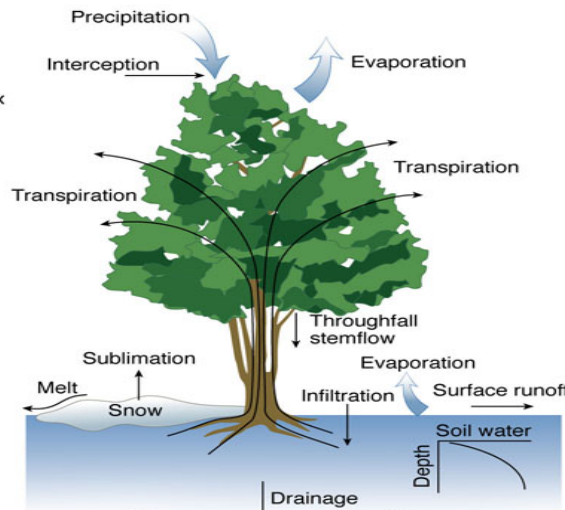
New tools that can
help with adaptation
research

Community Land Model 4

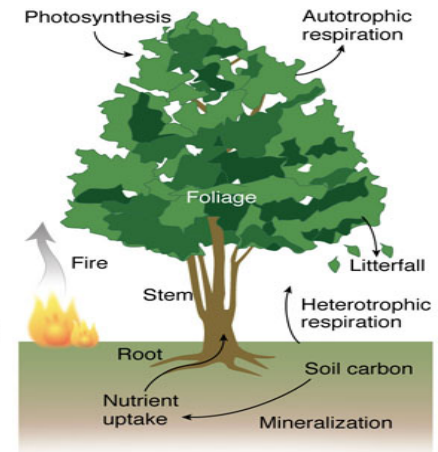
Surface Energy Fluxes



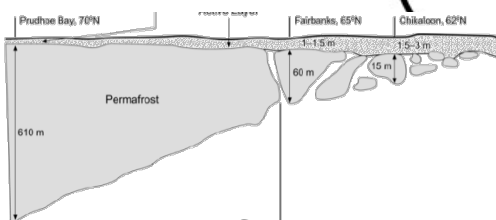
Hydrology



Carbon/Nitrogen Cycling



Urbanization



Permafrost

D

Competition

Vegetation Dynamics

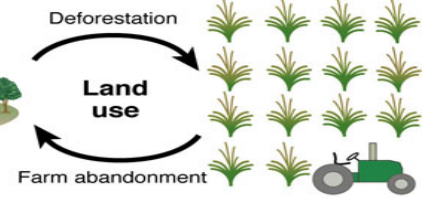
Growth

Disturbance

Establishment

E

CLM4



Land Use & Change

Bonan (2009)

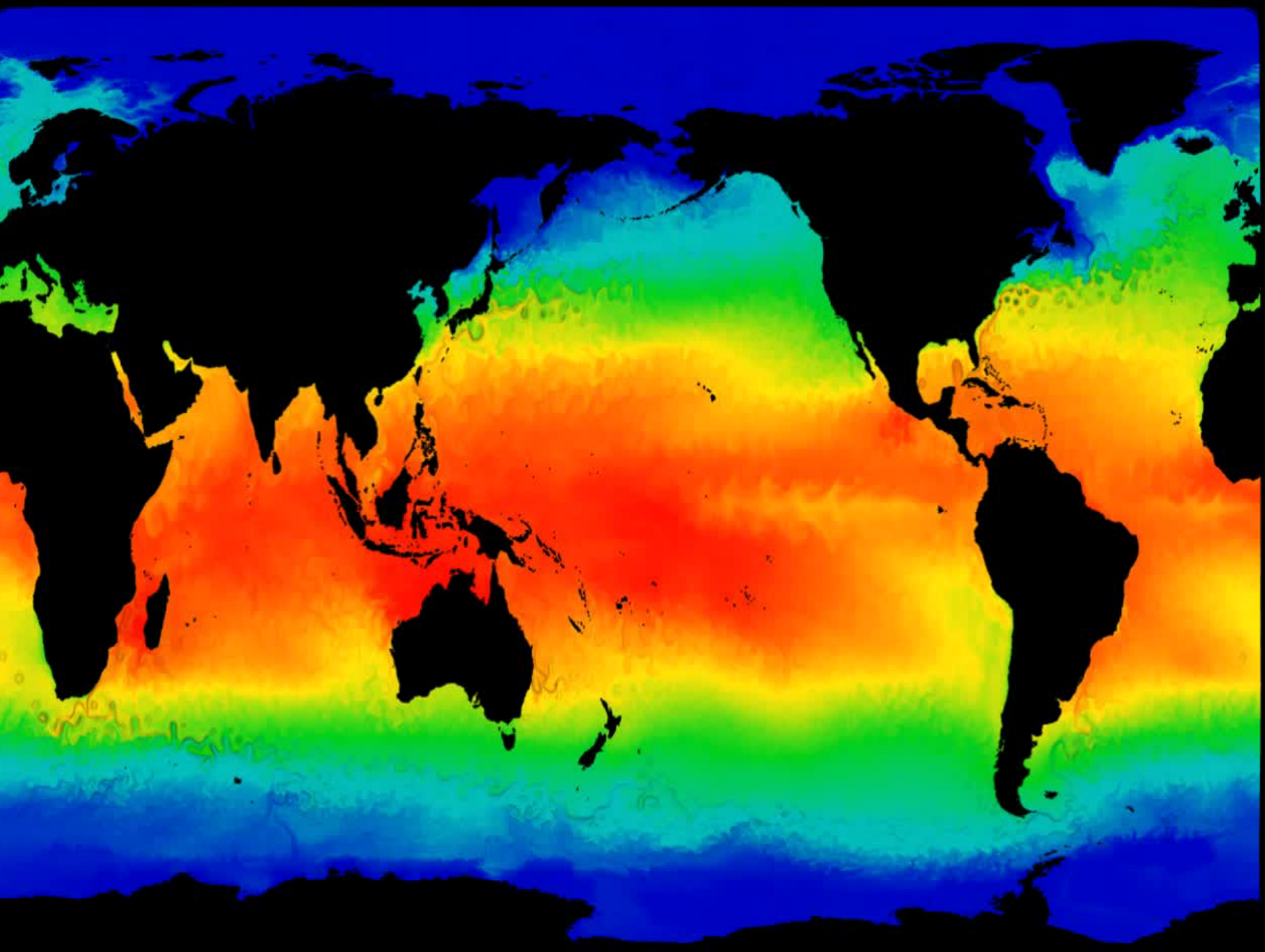
Connection between atmospheric carbon dioxide and land cover change . (T. Pagano-NASA JPL, AIRS)


Earth System Model ensemble predictions of the 20th and 21st century climate and global change.

Land cover changes are now included.

Glacier interactions being included.

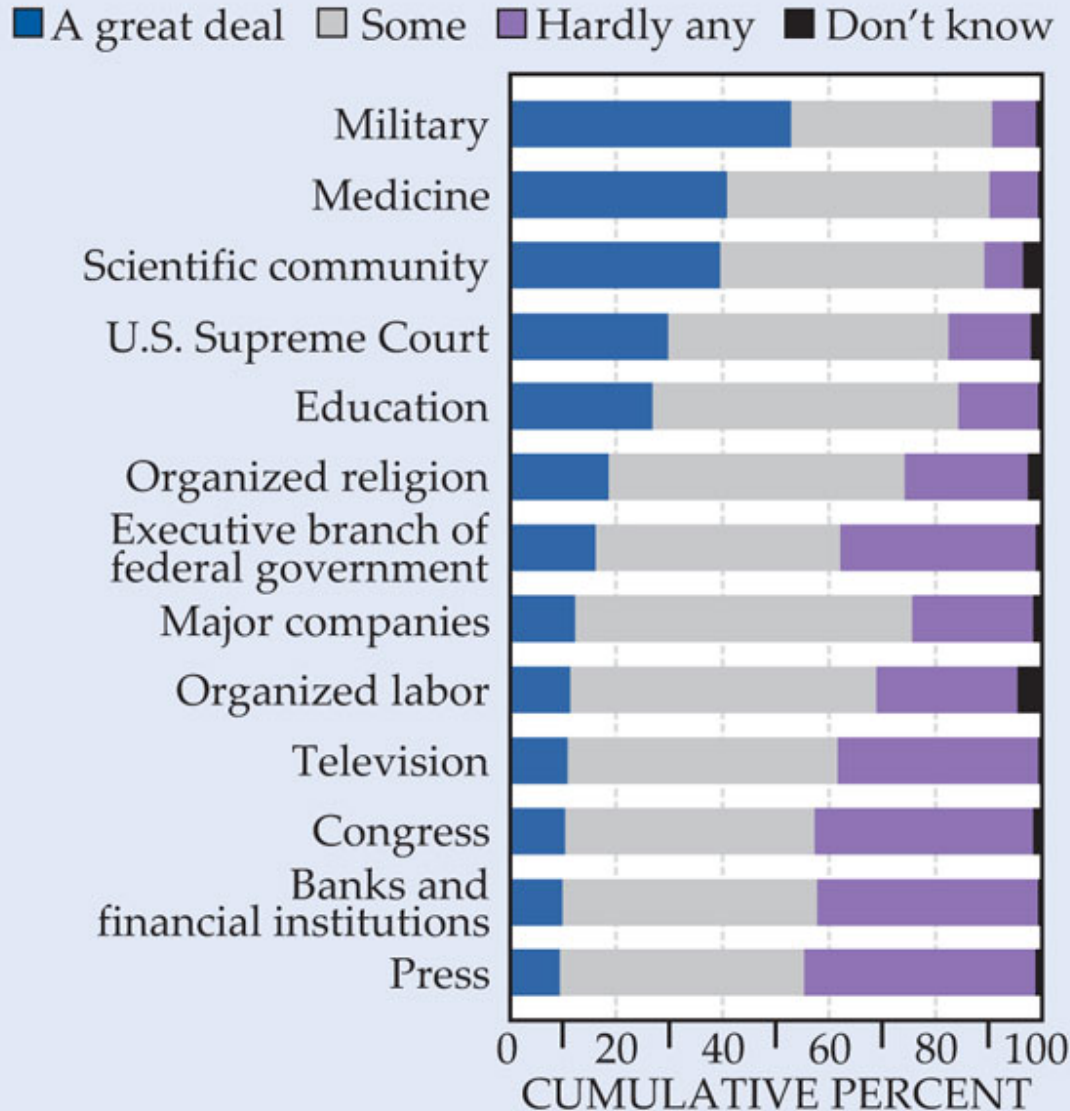
Integrated assessment models being included.



A close-up of a person's face, primarily blue, with a world map overlay. The map shows continents in green and yellow and oceans in blue. The person has green eyes and dark hair. The text is overlaid on the lower part of the face.

The younger generations will thank us!
My third great grandchild was born last night...6 lb 5 oz.

Professions: Public Trust



We are still in relatively good shape on the trust scale!

From National Science Board S & E Indicators (2012)

Funding for SBE research

NSF
other agencies and
departments

The End