

Making Connections

8th Biennial
Bay-Delta Science Conference

Six Things the Delta Science Community has Learned in the Past Two Years

Peter Goodwin

Science is a Journey



Town Hall Meeting October, 2012

How can do collaborative science when the next day we are in court?
Director Mark Cowin, Department of Water Resources

We need a universal model or suite of models that builds understanding between stressors and actions in this complex system
Randy Fiorini, Chair, Delta Stewardship Council

PPIC Stress Relief: May 2013

It is the uncertainty that makes this so difficult. It is in everyone's interest to get the best scientific information on which to base decisions

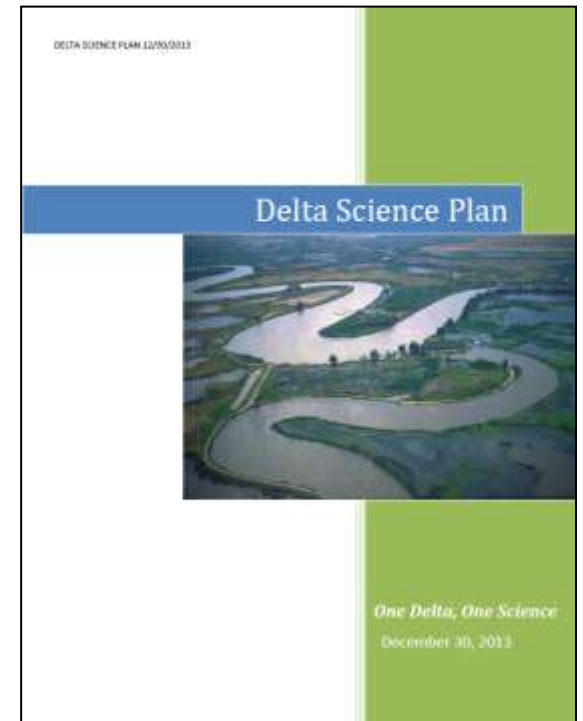
Jeff Kightlinger, Metropolitan Water District of Southern California

One Delta – One Science

Unlearn combat science
CSAMP-CAMT
IEP Stake-holder Engagement
SFWCA Science Program

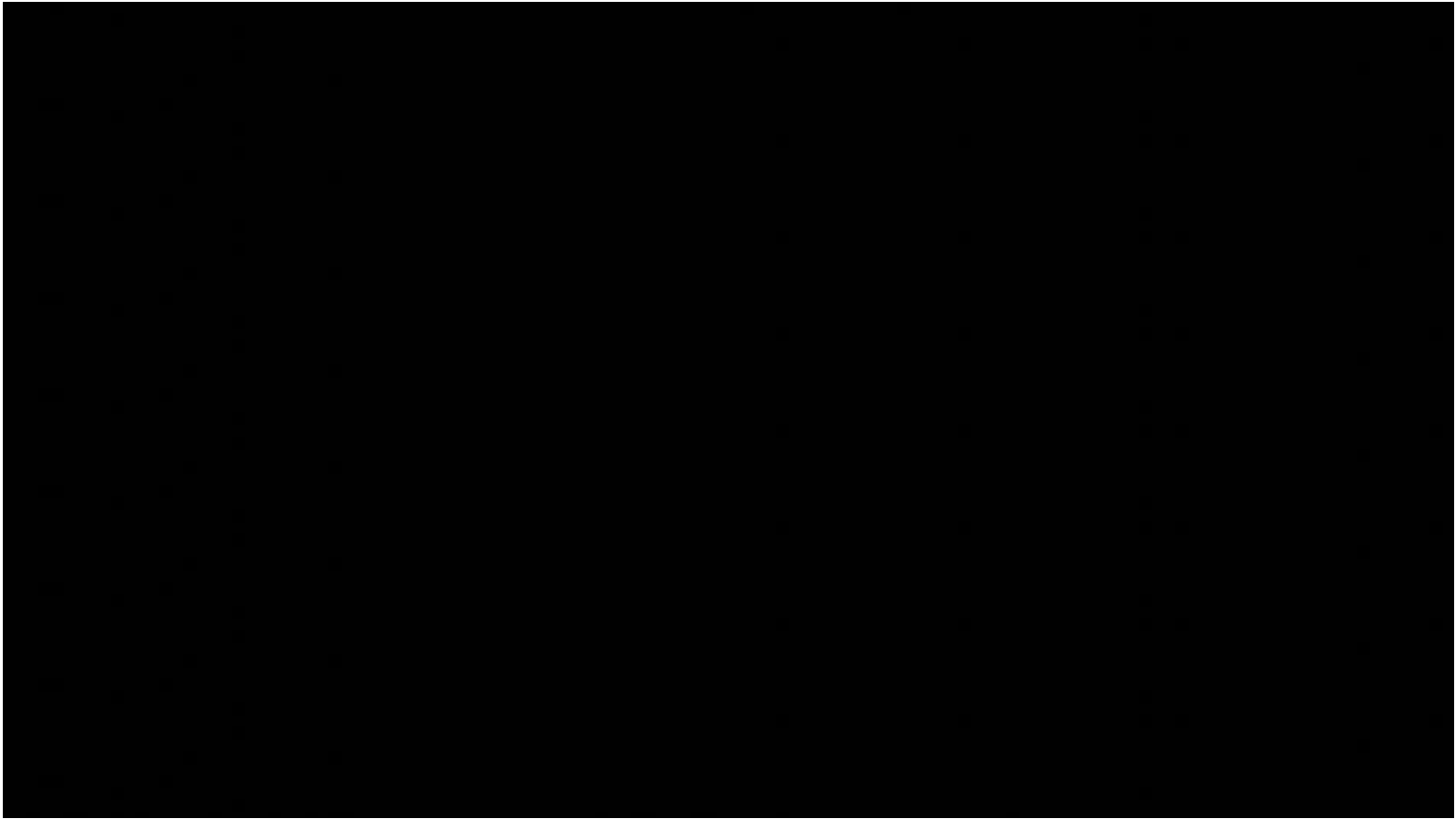
We need change

Scientists and managers have invested time and resources



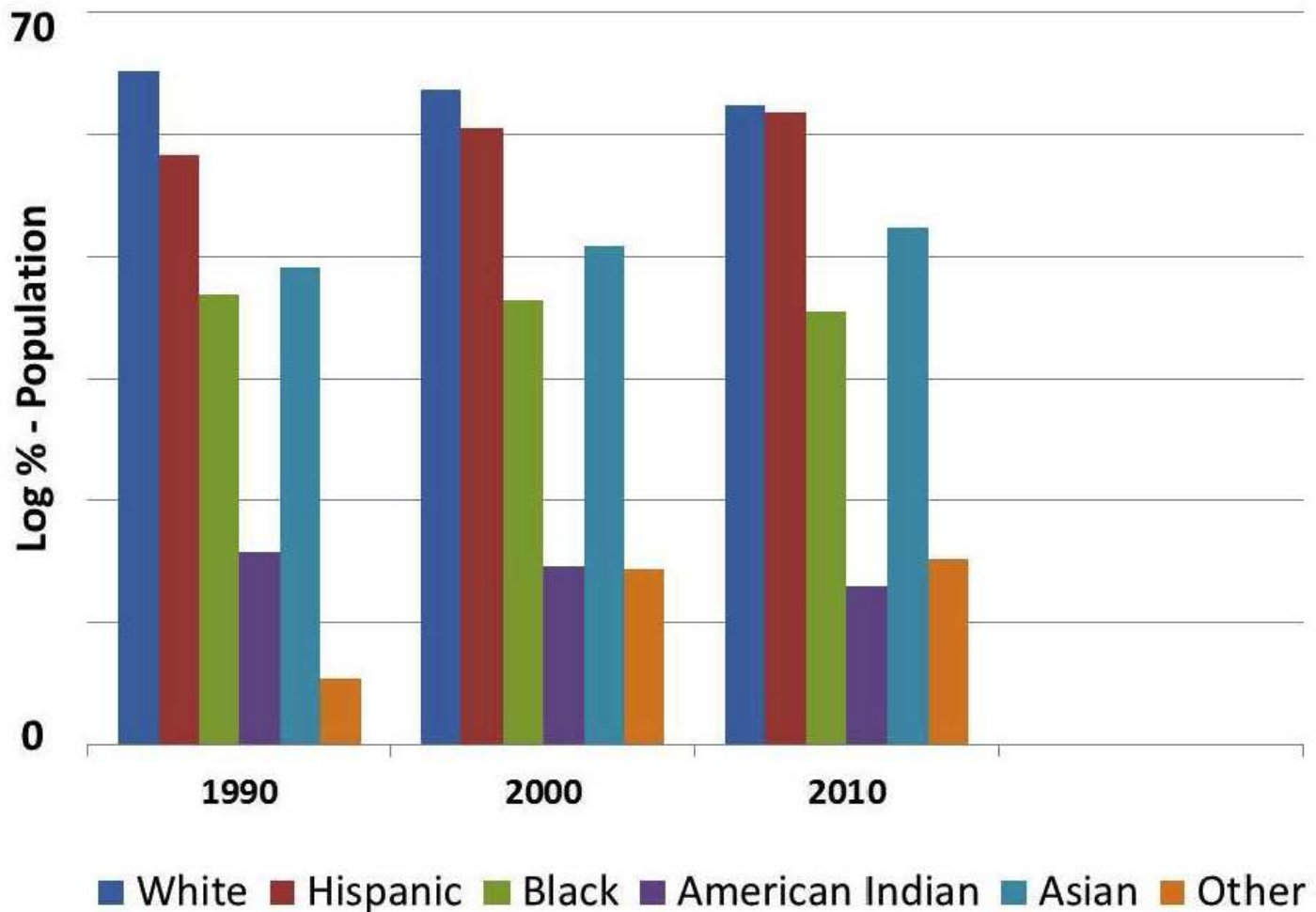
One Delta – One Science

First Thing: It is the people that create change



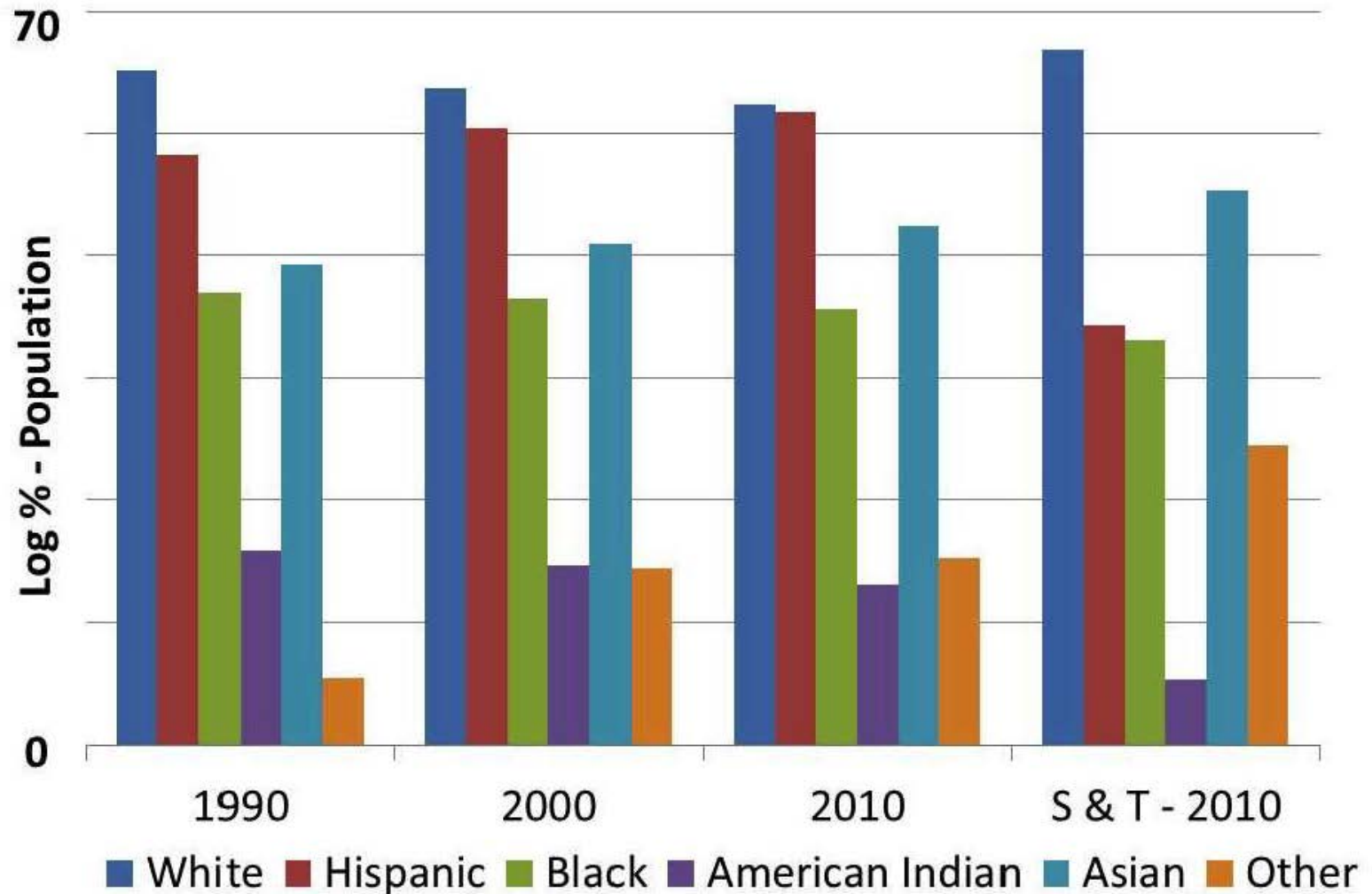
Source: Derek Sivers. TED. 'How to Build a Movement'. February 2010

The Changing Demographics of California



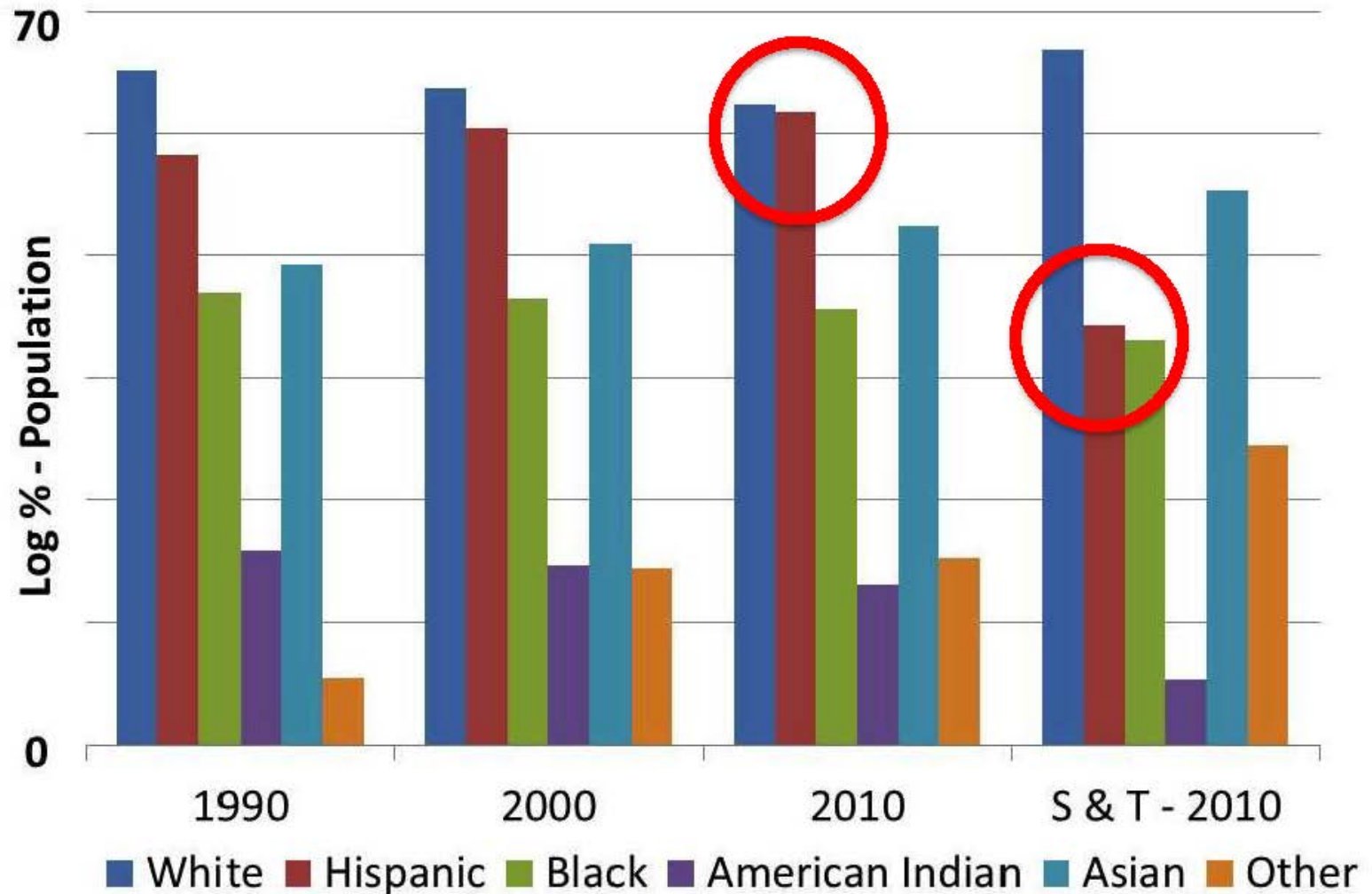
Source: Brookings Institute. www.censusscope.org

The US Science and Engineering Workforce



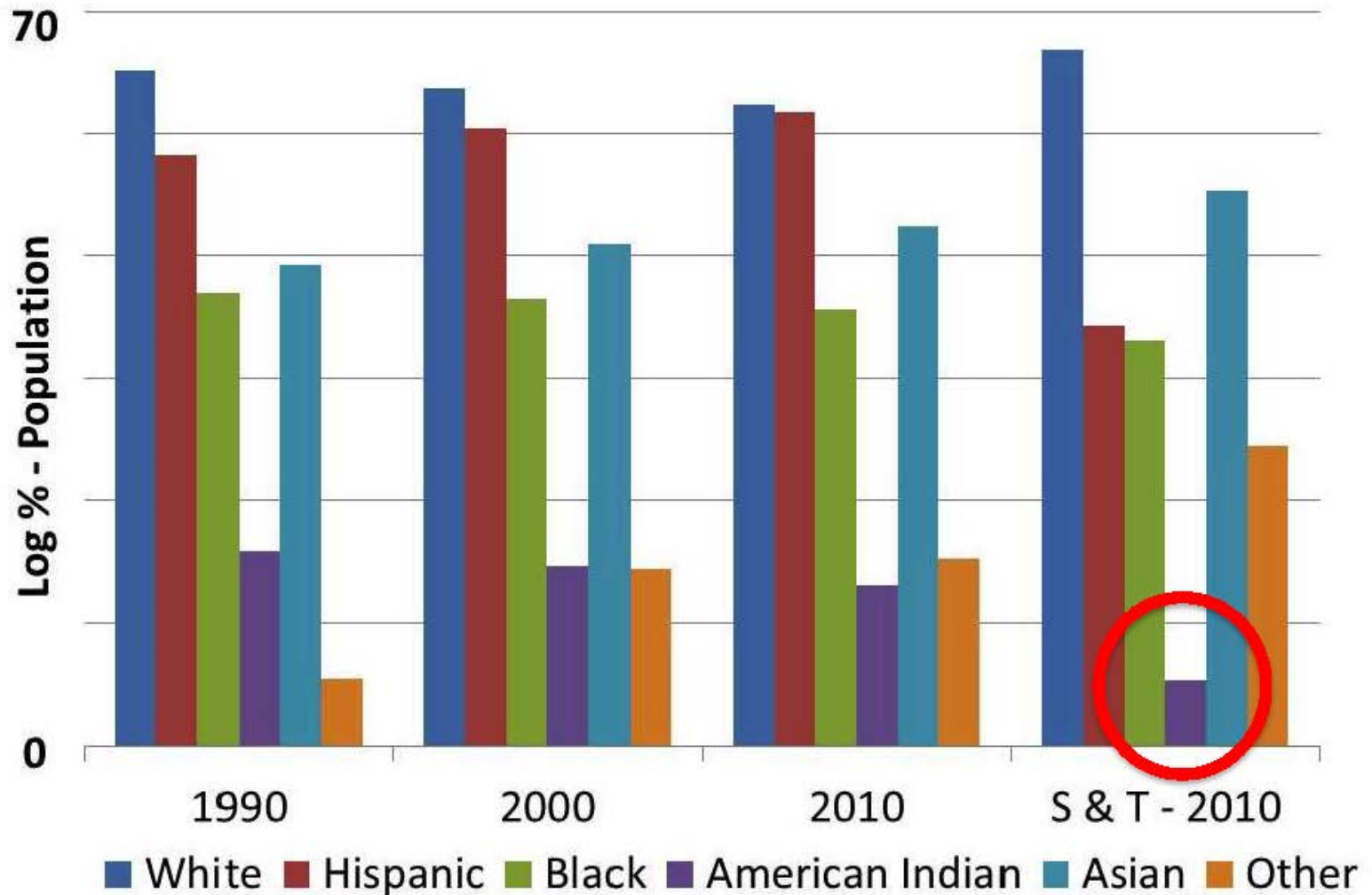
Source: NSB Science and Engineering Indicators

The US Science and Engineering Workforce



Source: NSB Science and Engineering Indicators

The US Science and Engineering Workforce

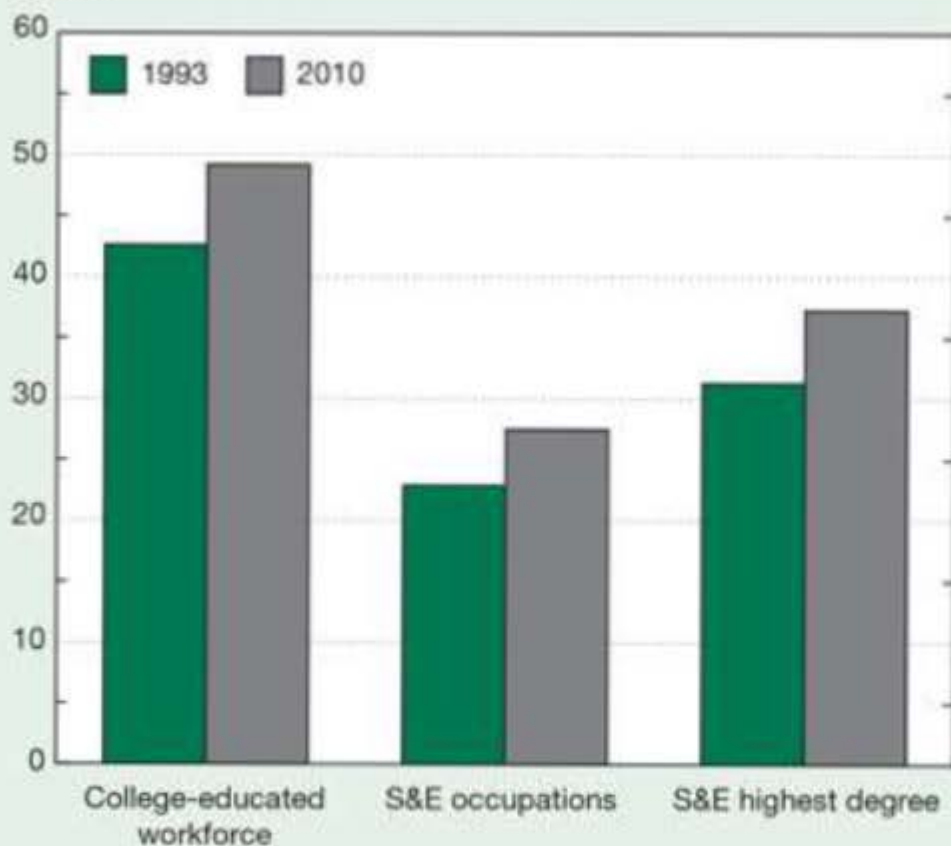


Source: NSB Science and Engineering Indicators

Figure 3-29

Women in the workforce and in S&E: 1993 and 2010

Percent



SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, Scientists and Engineers Statistical Data System (SESTAT) and National Survey of College Graduates (NSCG) (1993 and 2010), <http://sestat.nsf.gov>.

Role Models and Mentoring

Why is this relevant to us?

- Mentoring our early career scientists
- Career-Life Balance
- Develop the 'pipeline' of Science, Technology, Engineering and Mathematics (STEM).
- Professional responsibility to be recruiting the future generation of scientists

Thing 2: Sustaining Intellectual Capacity

Our people – a diminishing resource that will need to be replenished creatively with a long-term view and careful transition planning

Support and enhance the State Fellows and Science Fellows Programs

Thing 3: Role of Technology

- The Era of Big Data

S. Azimi-Gaylon Wednesday 8:20-10am

White Paper due December 2014

- Sensor Technologies

- Smelt Cam
- NASA – JPL and AMES
- What is next?

- Focused Integrated Models

- DeltaEFT, Life-cycle Models, Yolo Bypass
- Integrated Modeling Workshop - 2015



Science Discoveries – Thing 4

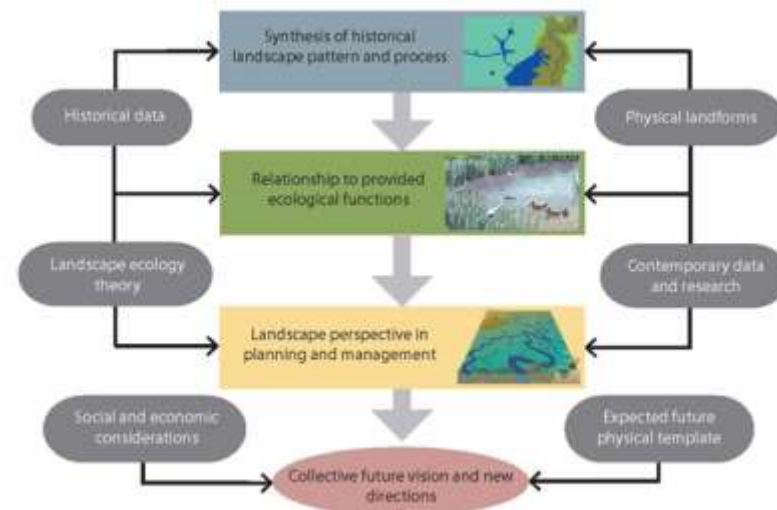
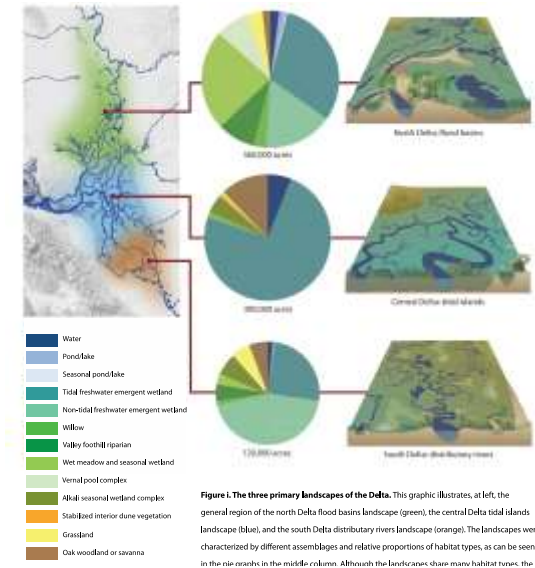
The Role of Historical Ecology

AUGUST 2012
SAN FRANCISCO ESTUARY INSTITUTE
AQUATIC SCIENCE CENTER
SFEI
AOSOC

Delta Landscapes Project (2012-present)

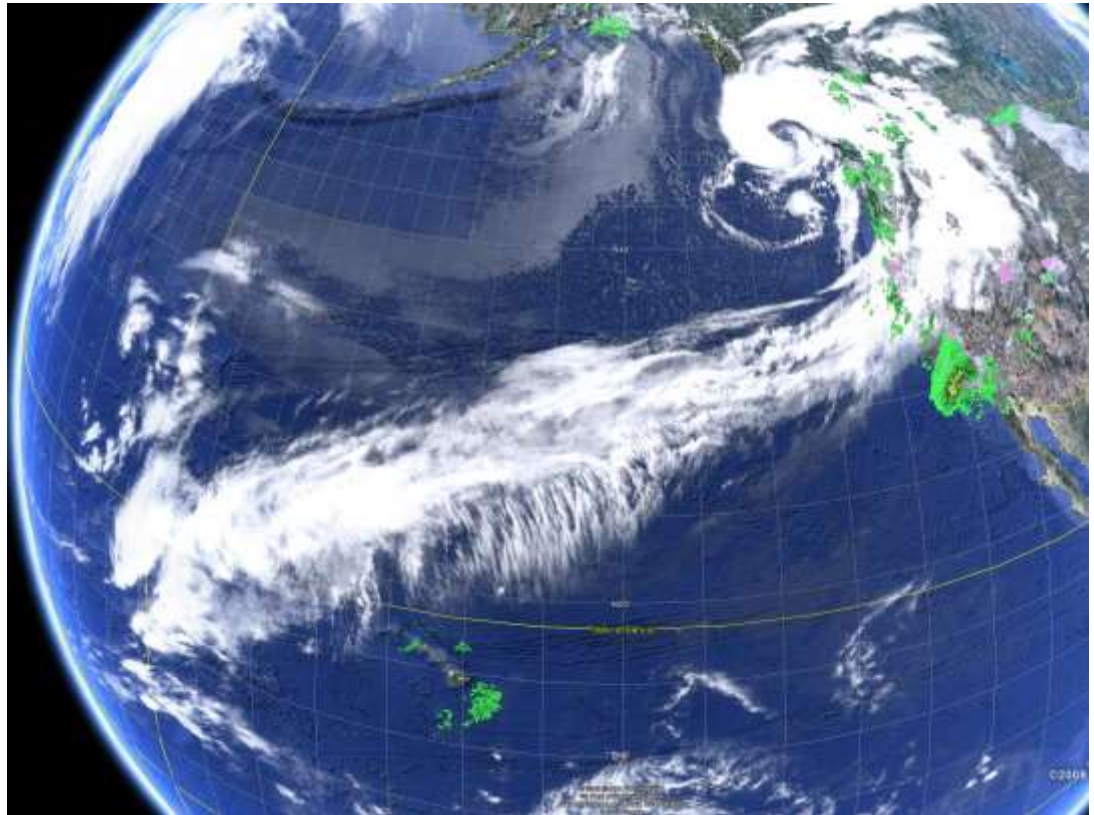
It takes a community of scientists

Robin Grossinger. Wednesday 2:35-2:55



Science Discoveries – Thing 5

Climate Change

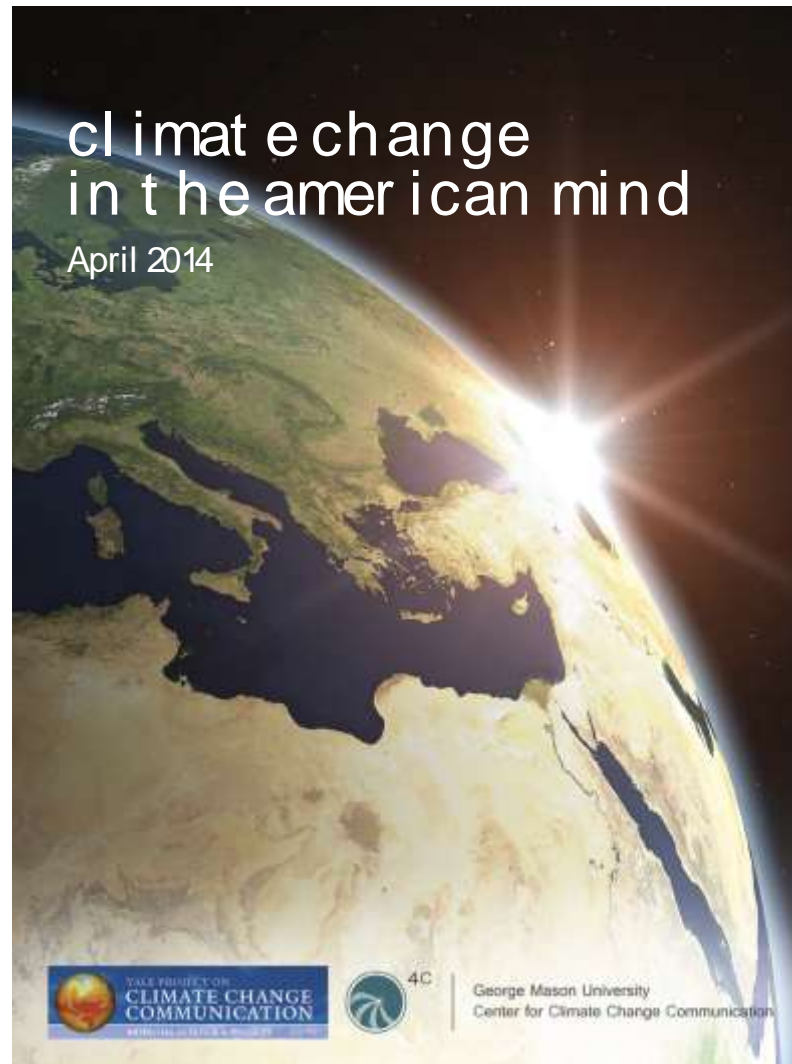


Atmospheric Rivers, Levees and floodplains in the Bay-Delta

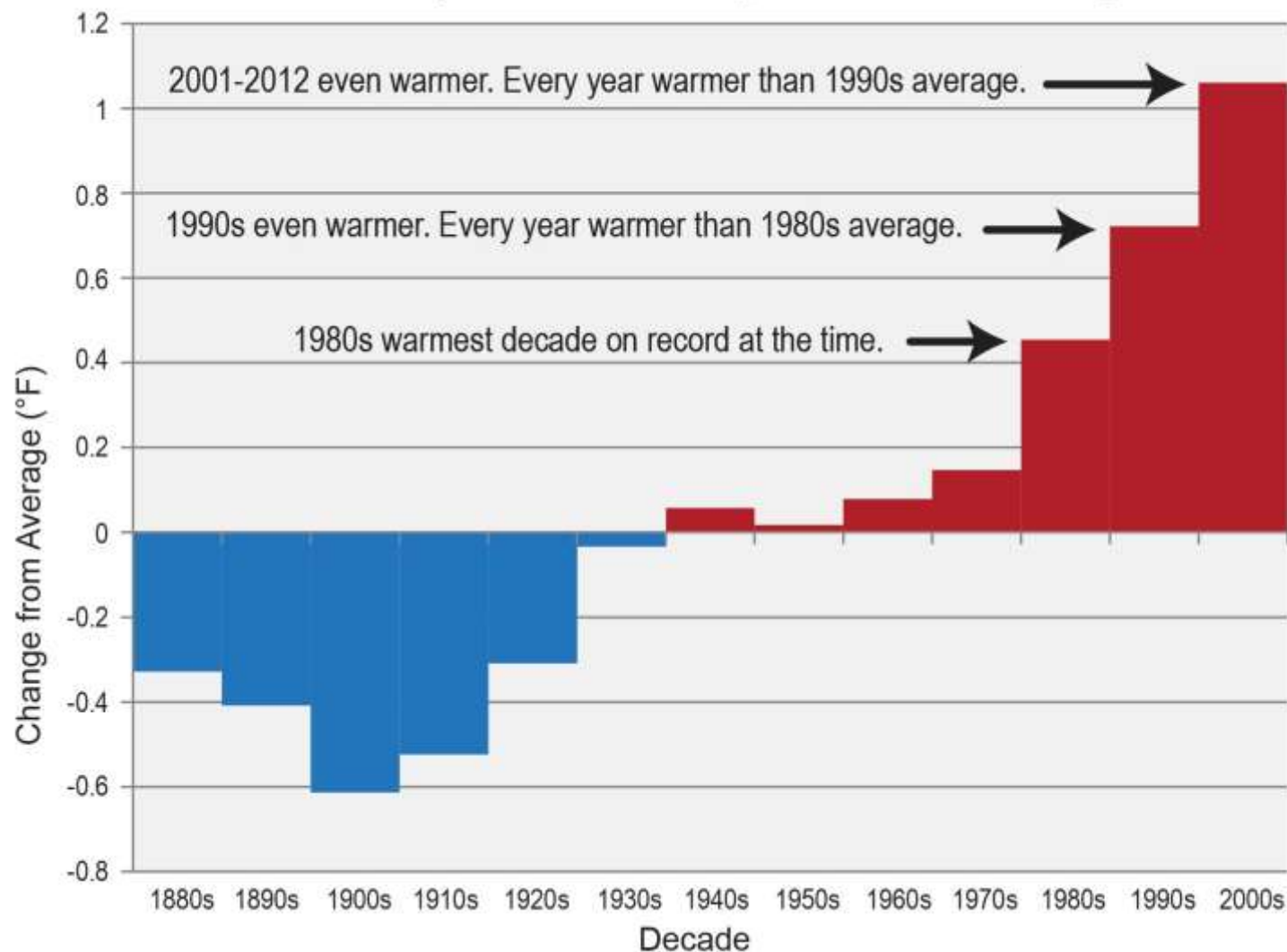
**Michael Dettinger, USGS, SIO, La Jolla, Joan Florsheim, UC Davis,
Marty Ralph, NOAA/ESRL/PSD and many others**

Science Discoveries – Thing 5

Climate Change and Communication

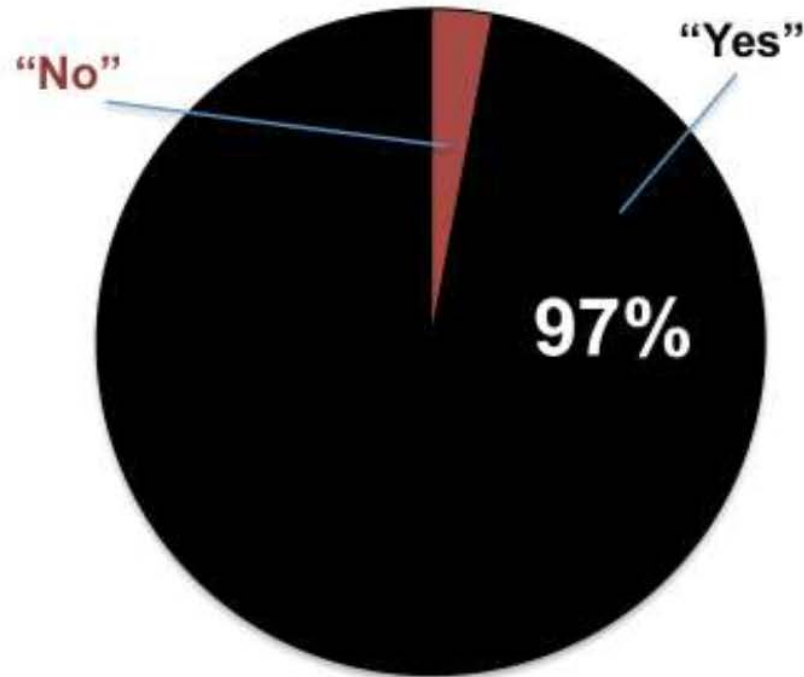


Global Temperature Change: Decade Averages



Bars show the difference between each decade's average temperature and the overall average for 1901 to 2000. The far right bar includes data for 2001-2012. (Source: U.S. [National Climate Assessment](#)).

Climate Scientists¹ say...



¹Proportion of peer-reviewed papers that stated a position on the reality of human-caused global warming and said it is happening and human caused (Cook et. al, 2013).

The Amer

"No" or
"Don't know"

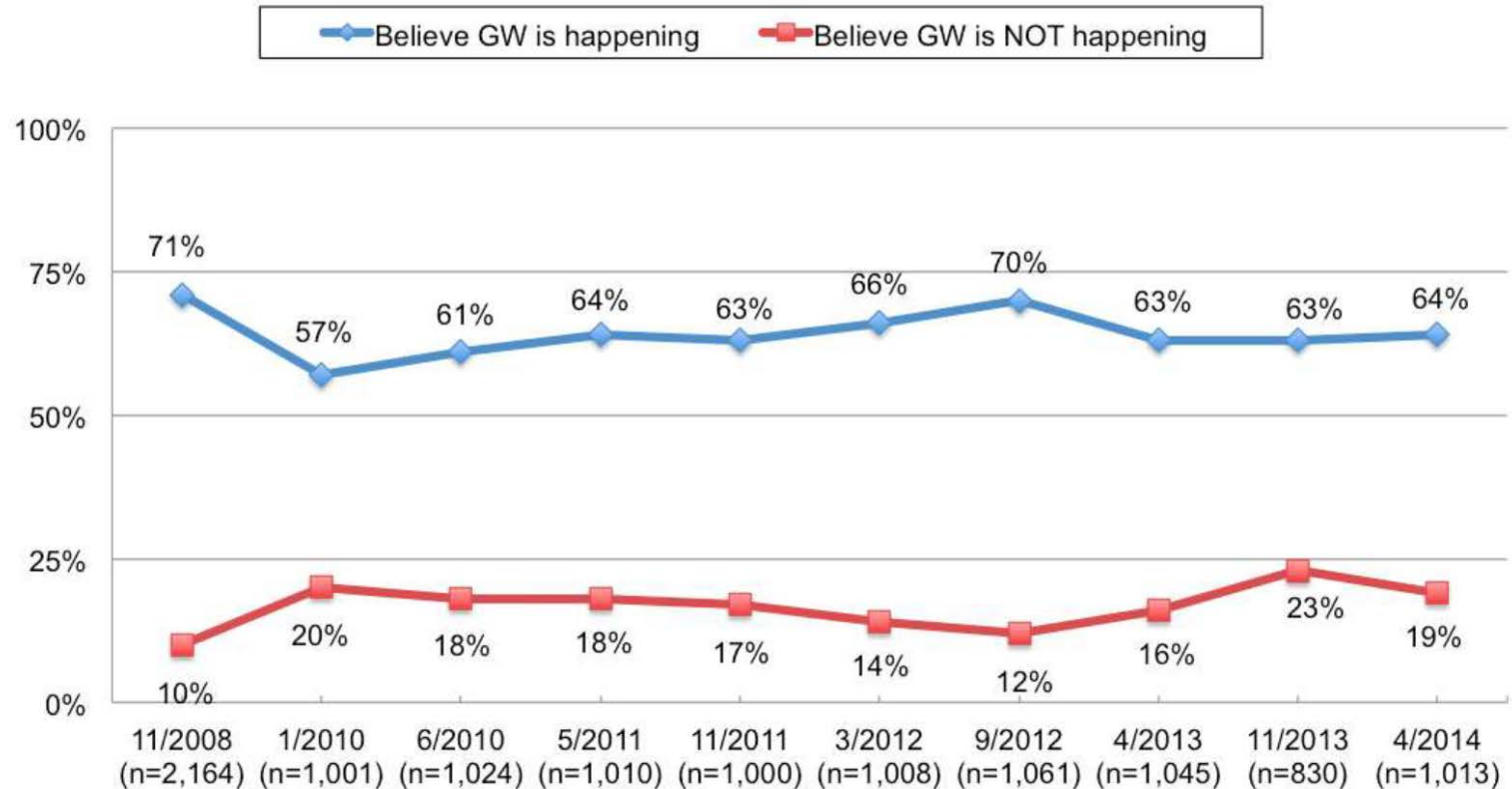


²Question asked of Americans: "Is global warming happening, do you think it is happening, do you think it is caused by human activities; caused mostly by natural other; none of the above; or not happening."

Base: Americans 18+ years old

Majority of Americans Think Global Warming Is Happening

- Slight decline in the number of Americans who think it is not happening -



Do you think global warming is happening?

Base: Americans 18+. April, 2014.

Note: Respondent who either said they "don't know" or who did not answer the question are not included in the chart. As a result, percentages sum to less than 100%.



George Mason University
Center for Climate Change Communication

Thing 6: There is no magic bullet

Interagency Ecological Program

Multi-stressor analyses and POD studies – ‘a landmark change in thinking’. NRC 2012.

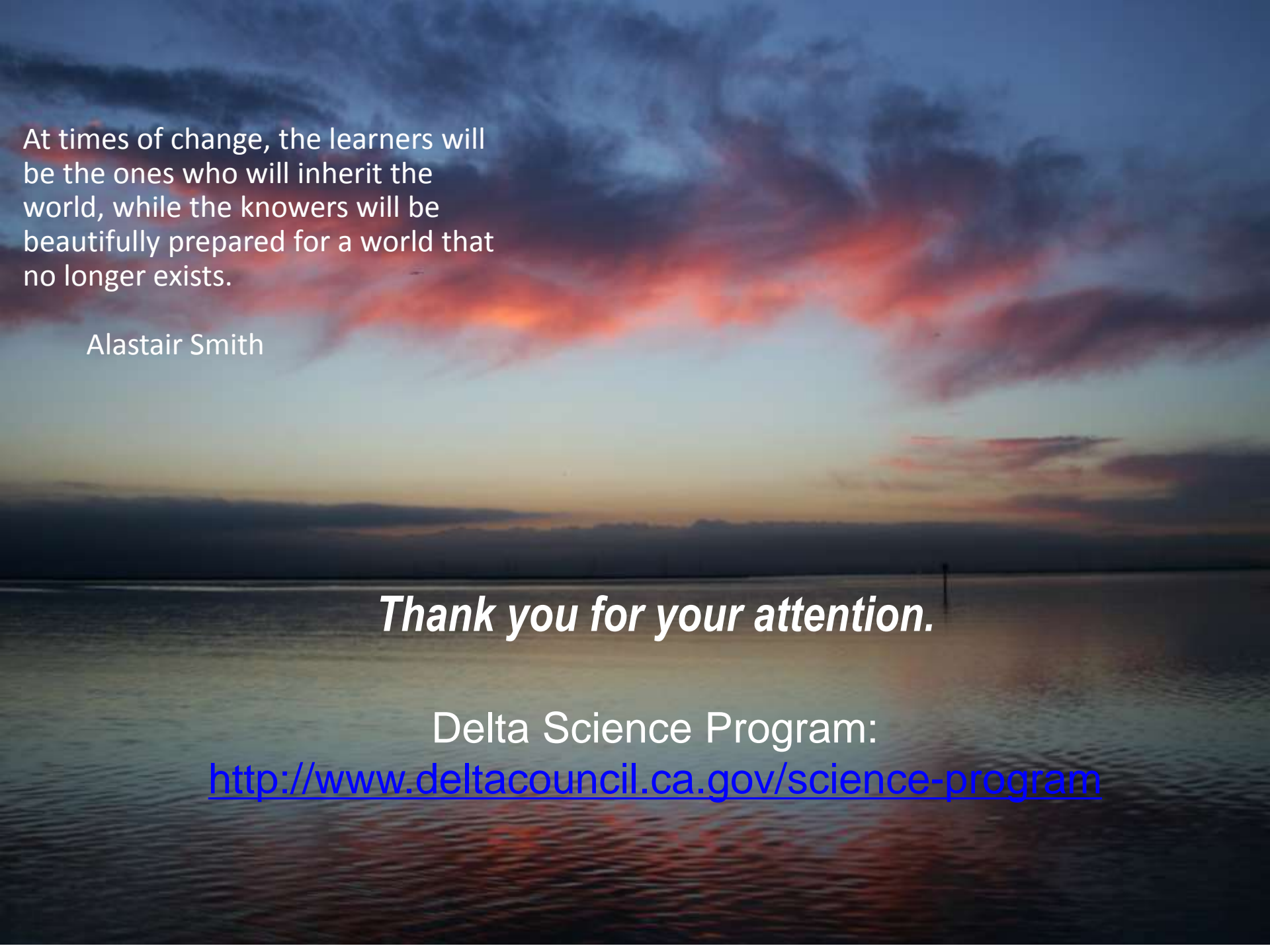
Dr. Kenny Rose (Louisiana State University) and Dr. Steve Culberson (USFWS).

State Water Resources Control Board – Delta Outflows Workshop, 2014

Thing 6: There is no magic bullet

Sustained science synthesis is essential to understand and keep pace with this dynamic socio-ecological system as it adapts to climate change, population growth, episodic events, invasive species and our management actions.

An update of the State of Bay-Delta Science is underway for completion in 2015

The background of the slide is a photograph of a sunset or sunrise over a body of water. The sky is filled with large, dark clouds that are illuminated from below by the sun, creating a vibrant orange and red glow. The water in the foreground is calm, reflecting the colors of the sky. The horizon line is visible in the distance, separating the water from the sky.

At times of change, the learners will
be the ones who will inherit the
world, while the knowers will be
beautifully prepared for a world that
no longer exists.

Alastair Smith

Thank you for your attention.

Delta Science Program:

<http://www.deltacouncil.ca.gov/science-program>