

Preparing for the Rising Tide

Helping Coastal Communities Cope with the Impacts of Climate Change

Juliette Finzi Hart

USC Sea Grant

NOAA Central Library Brown Bag Seminar - April 4, 2011

Overview of Presentation

- About USC Sea Grant
- Climate Change Science
- Climate Change Adaptation
- Teaching Climate Change
- Partnerships and Collaborations

About USC Sea Grant

Sea Grant in the US



What We Do

- Fund local research projects
- Connect research to policy
- Develop outreach and education tools that describe current research
- Fund and train graduate students



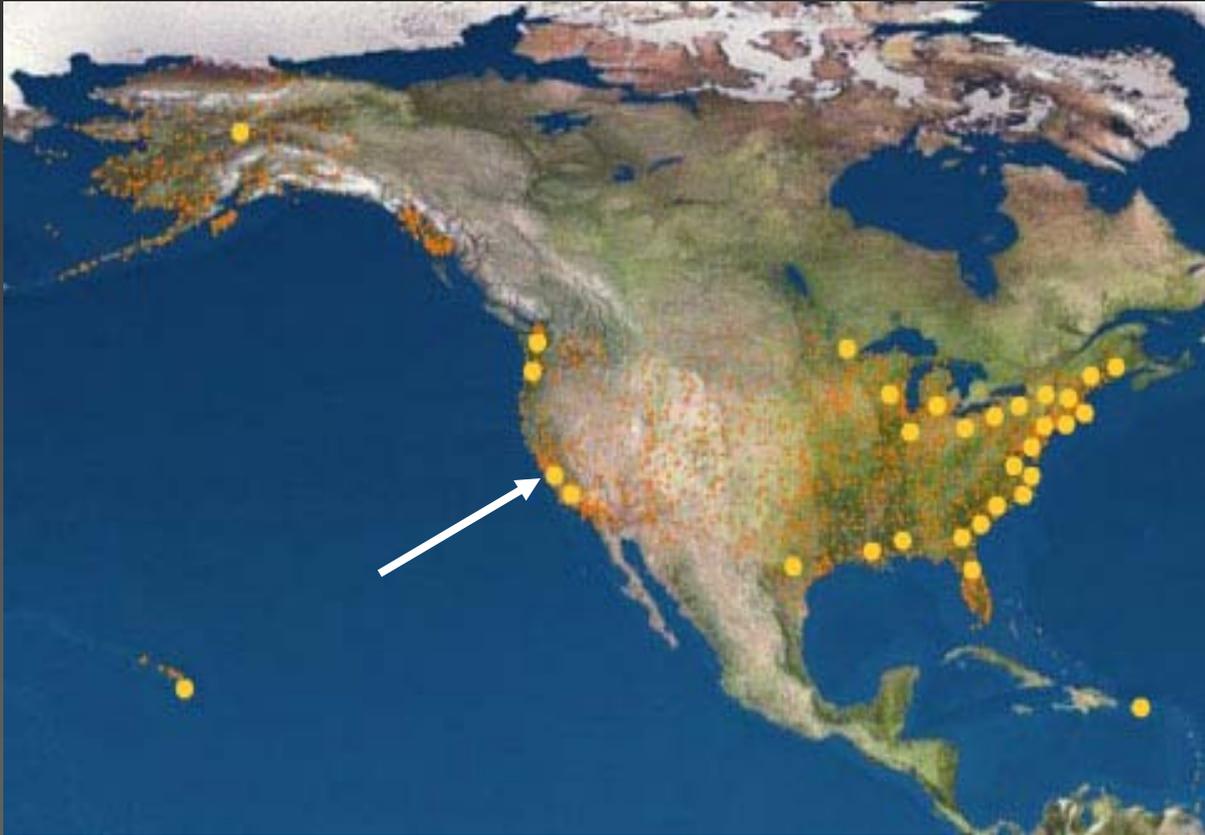
Our Philosophy



Photo credit: Chris Lowe

- Basic and applied science addressing current questions
- User/stakeholder driven
- Non-advocacy approach (“Honest Broker”)
- University-based scientists & educators (no regulatory function)

Southern California Sea Grant?



The Urban Ocean Program

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Photo credit: www.usc.edu

The Urban Ocean Program

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Photo credit: Charlotte Stevenson

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- LA, Orange, Ventura, San Bernadino and Riverside Counties
 - ◆ LA County population ~10 million
- Urban impacts on coastline
 - ◆ Water Quality
 - ◆ Invasive Species
 - ◆ Climate Change
 - ◆ Education

The Urban Ocean Program

Water Quality

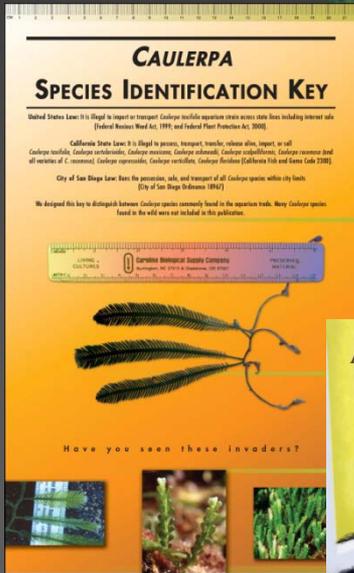
- Research
 - ◆ Chemical & Biological Contaminants
 - ◆ Harmful Algal Blooms
- Outreach
 - ◆ California Water and Land Use Partnership
 - ◆ LA City Low Impact Development Ordinance



The Urban Ocean Program Aquatic Invasive Species



Photo credit: RW



- Research on *Caulerpa* by SG Trainee (Zaleski)
- *Caulerpa* ID Key
- Books, DVD & Curricula
- Now Regional Partnership on Aquatic Invasive Species Pathways Study

Our Staff

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- Linda E. Duguay
- Phyllis Grifman
- Lyndell Whitley (WIES)
- Linda Chilton
- James A. Fawcett
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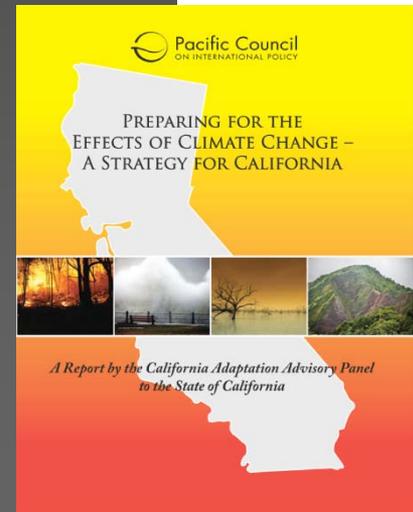
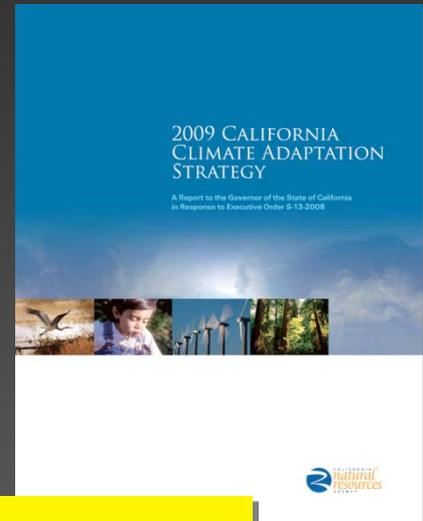
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-
- 1.25 million LA County residents / staff member

CA Climate Change Policy Overview

- Global Warming Solutions Act (2006)
 - ◆ GHG Emissions/Mitigation 1990 levels
 - ◆ Mandatory reporting
- CA Climate Adaptation Strategy (2009)
 - ◆ Recommended Strategies (2010)
 - Long-term data gathering on resources and land use
 - CA Climate Risk Council (science-based)
 - Increase communication across planning entities
- CA Ocean Protection Council
 - ◆ Climate Change Resolution (2007)
 - ◆ Sea Level Rise Resolution (2011)



Climate Change Science

Is Climate Change Real?

Is Climate Change Real?

From: Union of Concerned Scientists <action@ucsusa.org>
Subject: Climate change pushes Groundhog Day to January
Date: April 1, 2011 10:40:09 AM EDT
To: juliette hart
Reply-To: Union of Concerned Scientists <action@ucsusa.org>



Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

 [FORWARD](#) [SIGN UP](#) [DONATE](#)

Climate Change Pushes Groundhog Day to January

Dear Juliette,

The Union of Concerned Scientists and the town of Punxsutawney, Pennsylvania **announced today** that Groundhog Day will be pushed forward eight days to January 25 in 2012 in recognition of the impact climate change has had in the region.

The change is based on [analysis by UCS scientists](#) who found that, since 1997, spring has come an average of eight days earlier to western Pennsylvania.

"We hope that the change in date will bring needed attention to the consequences of climate change in Pennsylvania and the importance of investing in a clean energy economy," said Dr. Phil DeGraeve, a climate scientist at Pennsylvania State University.

[Read more about the analysis behind the Groundhog Day change and learn how various elected officials are reacting to the news.](#)

Sincerely,

Michael Halpern
National Field Organizer
UCS Scientific Integrity Program

Spring Comes Eight Days Earlier

Groundhog Day will be pushed forward eight days in recognition of the impact climate change has had on the region.

[READ MORE](#)

Is Climate Change Real?

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Union of Concerned Scientists

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[READ MORE](#)

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UCS Scientific Integrity Program

Climate Change in the Southern California Bight

- College 2020 Research Collaboration
- Consolidate existing data
- Developing education and outreach opportunities
- 1st Data Meeting - Fall 2010
- 1st Town Hall - Fall 2011



Impacts of Ocean Acidification on Pacific Shellfish Fisheries

- Summer 2010 Workshop
 - ◆ 4 West Coast SG Co-Sponsors
 - ◆ Industry/Academic Partnership
 - Shellfish Harvesters
 - Shellfish Aquaculture Growers
 - Field and Lab Researchers
- California Coastal Acidification Network (C-CAN)
 - ◆ Establish Research Best Practices
 - ◆ Data Exchange Portal
 - ◆ Continued Communication

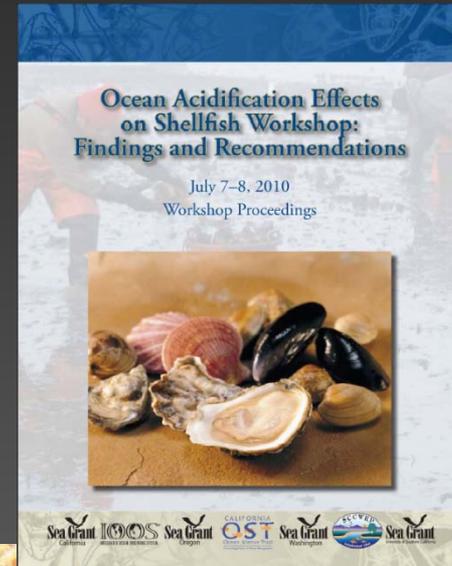


Photo credit: Paul Matson

Climate Change Adaptation

NSGO Coastal Communities Climate Adaptation Initiative



- NSGO - Coastal Communities Climate Adaptation Initiative
 - ◆ \$1 million for all SG Programs
 - ◆ Rapid Response Demonstration Project
- USC SG Proposal
 - ◆ LA & Ventura Counties Needs Assessment Survey
 - ◆ Workshops - Adaptation into Planning Documents
 - ◆ Planning Grant - SLR Perception in Ventura County

Perception of Sea Level Rise in Ventura County, CA

- Van Arsdol & Constable
 - ◆ First funded by USC SG in 1999
 - ◆ Revisit study in 2011
- Stakeholder Interviews
- Demographic Overlay of Census Data
- Collaboration with Monique Myers (CA SG)
 - ◆ Dr. Shawna Dark (CSUN)
Inundation of Wetlands GIS Tool



Photo credit: Phyllis Grifman

CA Climate Change Adaptation Survey

- Monique Myers and Susan Schlosser (CA SG)
 - ◆ CNAP/RISA Research and Information Needs Assessment (Dan Cayan, UCSD)

CA Climate Change Adaptation Survey

- Monique Myers and Susan Schlosser (CA SG)
 - ◆ CNAP/RISA Research and Information Needs Assessment (Dan Cayan, UCSD)
- 16 CA Partners
 - ◆ Many at NOAA
 - CA SG, CSC, GFNMS, Tijuana River and San Francisco Bay NERRs
 - ◆ Coastal Commission
 - ◆ Coastal Conservancy
 - ◆ Ocean Protection Council
 - ◆ Ocean Science Trust
 - ◆ ICLEI - Local Governments for Sustainability
 - ◆ Susanne Moser Research & Consulting
 - ◆ Center for Ocean Solutions at Stanford University
 - ◆ San Francisco Bay Conservation and Development Commission
 - ◆ Southern California Coastal Ocean Observing Network

CA Climate Change Adaptation Survey

- 2005 Moser & Tribbia Survey
 - ◆ “More than just information...”
 - ◆ Role of Boundary Organization (e.g. SG)
- “Taking the Pulse” Survey
- Sea Grant National Survey led by:
 - ◆ Joe Cone (OR SG)
 - ◆ Esperanza Stancioff (ME SG)
 - ◆ Jess Whitehead (NC/SC SG)



Photo credit: Juliette Hart

Climate Change Education

Teaching Climate Change

USC SG and COSEE-West Partnership

- Educator Workshop (2009)
 - ◆ Communicating Climate Change
 - ◆ Tools/activities on difficult concepts
- Adapted by Channel Islands NMS (Fall 2010)
 - ◆ 120 Sanctuary Docents Trained
- USC SG/COSEE-West/JPL
 - ◆ Online climate change workshops (Resources)
- Linda Chilton (lchilton@usc.edu)



Photo credit: Laura Francis (CINMS)



Photo credit: Laura Francis (CINMS)

The Urban Mariner - USC Sea Grant's Urban Ocean Report



Photo Credit: Phyllis Grifman

Our Changing Climate: Learning and Adapting

Ship to Shore: Linking Science to Policy

Global climate is changing. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as: "a change of climate which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods."

Impacts from climate change include increased rates and scales of sea level rise due to the rapid melting of polar ice caps, potentially increased severity and duration of storms, changing weather patterns (increased drought in some locations, increased rain in others), and increased ocean acidification due to dissolving atmospheric carbon dioxide (CO₂) into ocean waters. These impacts pose substantial threats to both coastal ecosystems and communities. USC has a number of researchers tackling many of these issues and USC Sea Grant is funding these researchers and others to advance the science of climate change.

Like all coastal societies worldwide, Los Angeles and other seaside California cities face very real threats. The potential future economic impacts are likely to be measured in billions of dollars. While not related to climate change, events such as the recent tsunami in Japan, and the subsequent impacts on coastal cities in California, provide a frightening snapshot of worst-case scenarios of flooding. There are lessons to be learned from these kinds of events and we are on the front lines of this analysis.

Even as most cities and communities continue to find ways to mitigate impacts on our changing climate (for example by trying to reduce their CO₂ emissions in daily operations), many have also realized that they need to start planning for impacts that are already starting to be felt. *(Continued on page 2)*



USC Sea Grant's Urban Ocean Report, March 2011, Vol 3, No. 1

URBAN MARINER



<http://urbanocean.urbanmariner.org>

Partners Along the Way...

National Sea Grant Office, California Sea Grant, Oregon Sea Grant, Washington Sea Grant, Jet Propulsion Laboratory, California Institute of Technology, Los Angeles County, Los Angeles City, and Orange County Sanitation, National Marine Fisheries Services, Santa Monica Bay Restoration Commission, Southern California Coastal Ocean Observing System, San Francisco Bay National Estuarine Research Reserve, Tijuana River National Estuarine Research Reserve, Central and Northern California Coastal Ocean Observing System, Pacific Coastal Ocean Observing System, Southern California Coastal Water Research Project, University of California, Irvine, University of California, Los Angeles, Institute of the Environment, University of California, San Diego, Scripps Institution of Oceanography, San Diego State University, Pacific Coast Shellfish Growers Association, NOAA Pacific Marine Environmental Laboratory, California Wetfish Producers Association, Bruce Steele, California sea urchin diver, University of California, Santa Barbara, California Coastal Commission, California Nevada Applications Program through the NOAA Regional Integrated Sciences and Assessments Program, COSEE, COSEE-West, California Ocean Protection Council, California Ocean Science Trust, Center for Ocean Solutions, Stanford University, NOAA Coastal Services Center, ICLEI - Local Governments for Sustainability, San Francisco Bay Conservation and Development Commission, Susanne Moser Research & Consulting, California State University, Northridge, Channel Islands National Marine Sanctuary, Gulf of the Farallones National Marine Sanctuary, Sea Grant Climate Network

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Enhancing NOAA Partnerships

- Sea Grant Climate Network
 - ◆ <http://sgccnetwork.ning.com/>
- CSC (Digital Coast)
- NOS/OCRM (Adapting to Climate Change Planning Guide)
- Climate Program Office (RISA)



Climate Science is Interdisciplinary

NAS Sackler Colloquim:

*Fostering Advances in Interdisciplinary
Climate Science*

- Role of Social Science
 - ◆ Steven Chu (Secretary of Energy)
 - Need to incorporate social costs into models
 - ◆ Harold Money (Stanford University)
 - Social science must be included
 - ◆ Ari Patrinos (Synthetic Genomics, Inc.)
 - Persistence, patience and be prepared to take your blows...
- SG Regional Social Science RFPs

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decompressor
are needed to see this picture.

Thank You!
jahart@usc.edu



The image shows the top portion of the USC Sea Grant website. At the top left is the "Sea Grant" logo with a white bird icon above the text "Sea Grant" and "University of Southern California" below it. To the right of the logo is the text "University of Southern California Sea Grant" and "The Urban Ocean Program". At the top right is the "USC UNIVERSITY OF SOUTHERN CALIFORNIA" logo. Below the header is a navigation menu with a home icon and the following items: "About Us", "Research & Outreach", "Education", "Publications", "Fellowships", and "Funding". Below the navigation menu are three photographs: the first shows three young boys in a classroom; the second shows a man and a young girl looking at something on a table; the third shows a group of people looking into a large white container. Below the photographs is a text banner that reads: "The Fire Within": USC Sea Grant's Latest Issue of the Urban Mariner Focuses on our Education Programs



<http://www.usc.edu/org/seagrant/>
<http://urbanocan.urbanmariner.org>

Collaborate, collaborate, collaborate...

- Climate Change in the Southern California Bight
- CA Climate Change Adaptation Survey

- Urban Adaptation Climate Change Collaborative
 - ◆ Science
 - ◆ Policy, Planning & Development
 - ◆ International Relations
 - ◆ Economics

Sea Grant - Making the Connections

Climate Change Science Climate Change in the Southern California Bight

College 2020 Research Collaboration

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- 1st Town Hall - Fall 2011
- Regional Partners



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 - Role of Boundary Organizations, like SG
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