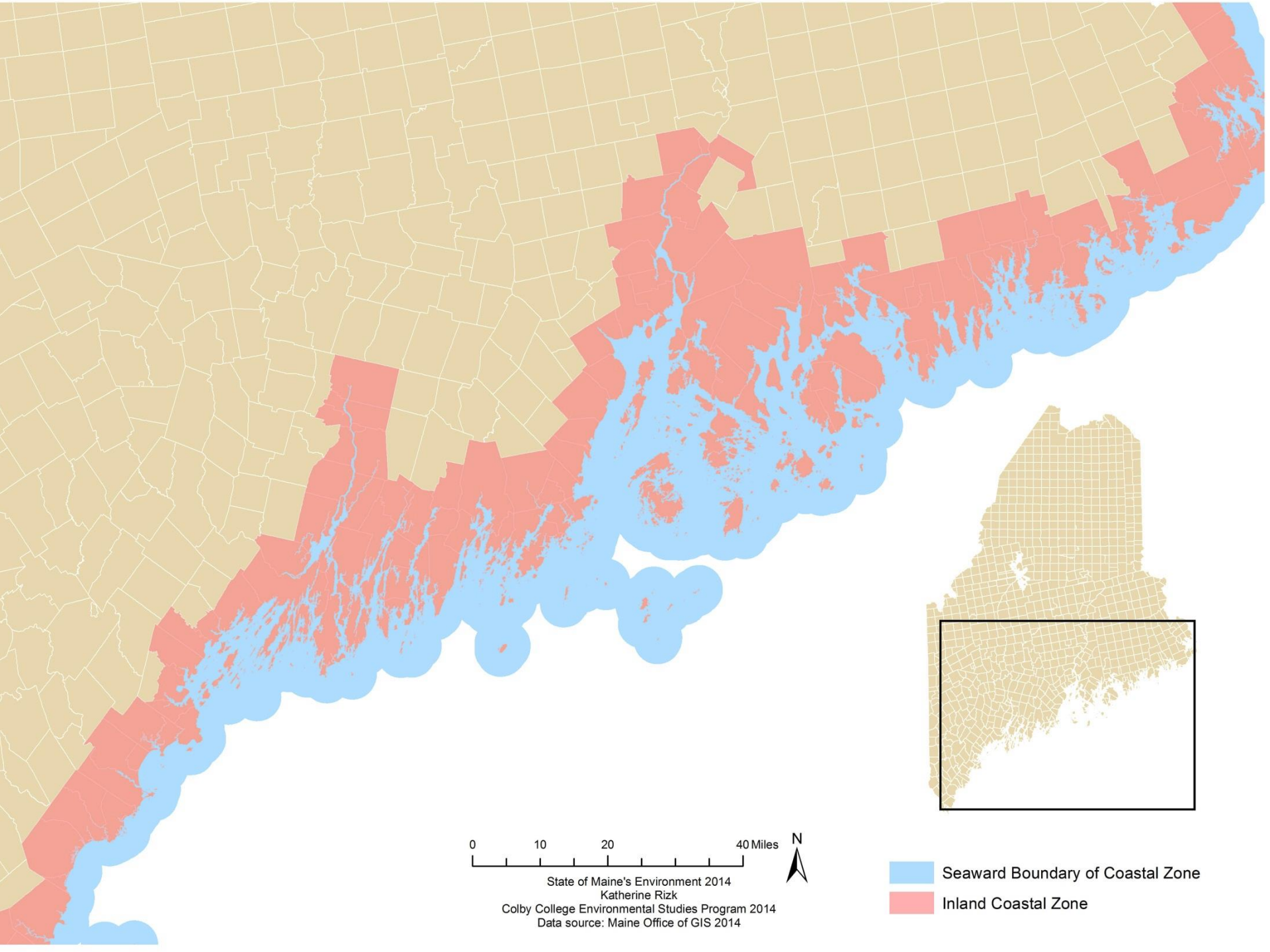
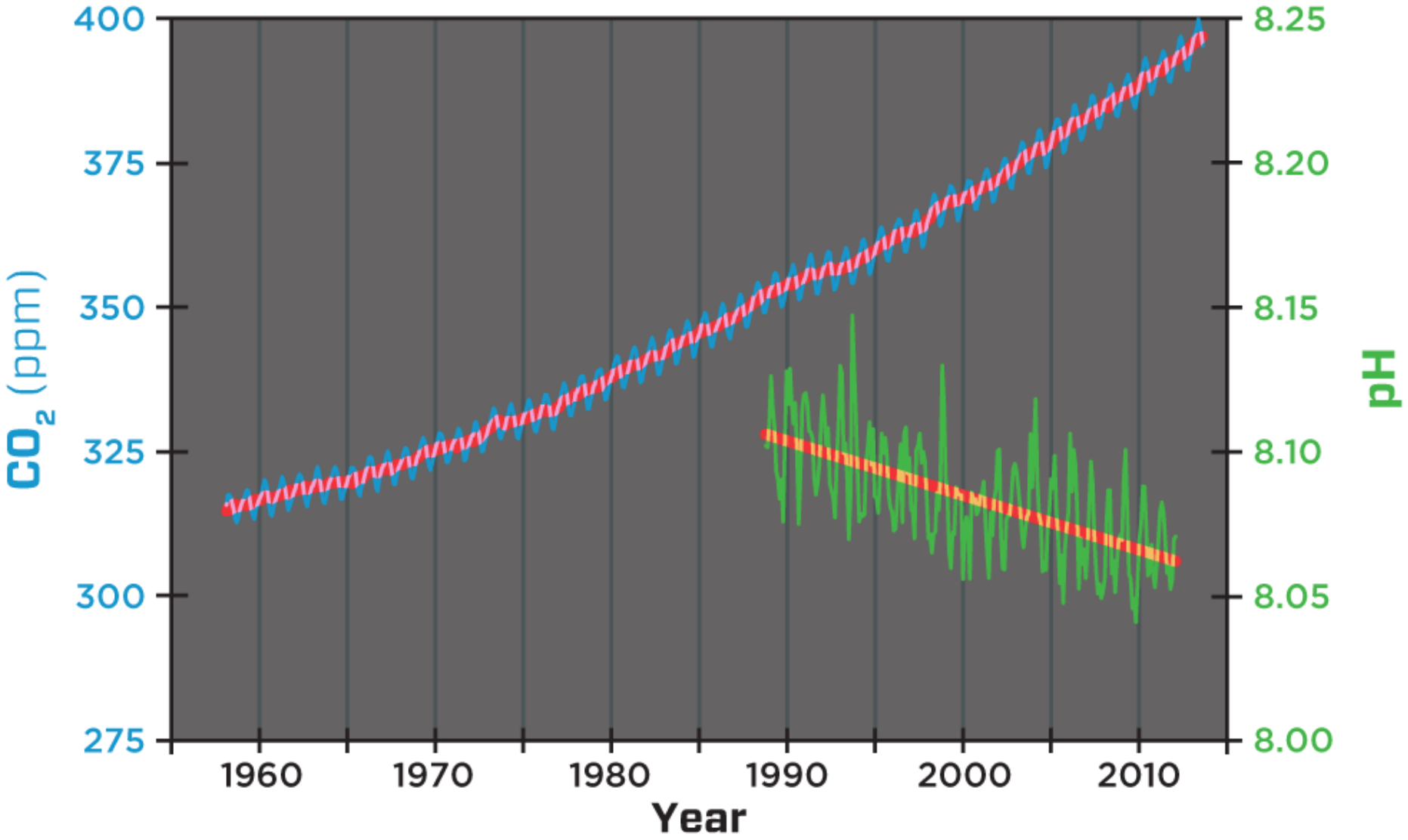
Ocean and Coastal Acidification in Maine


LOBSTER
7.50
MUSSELS



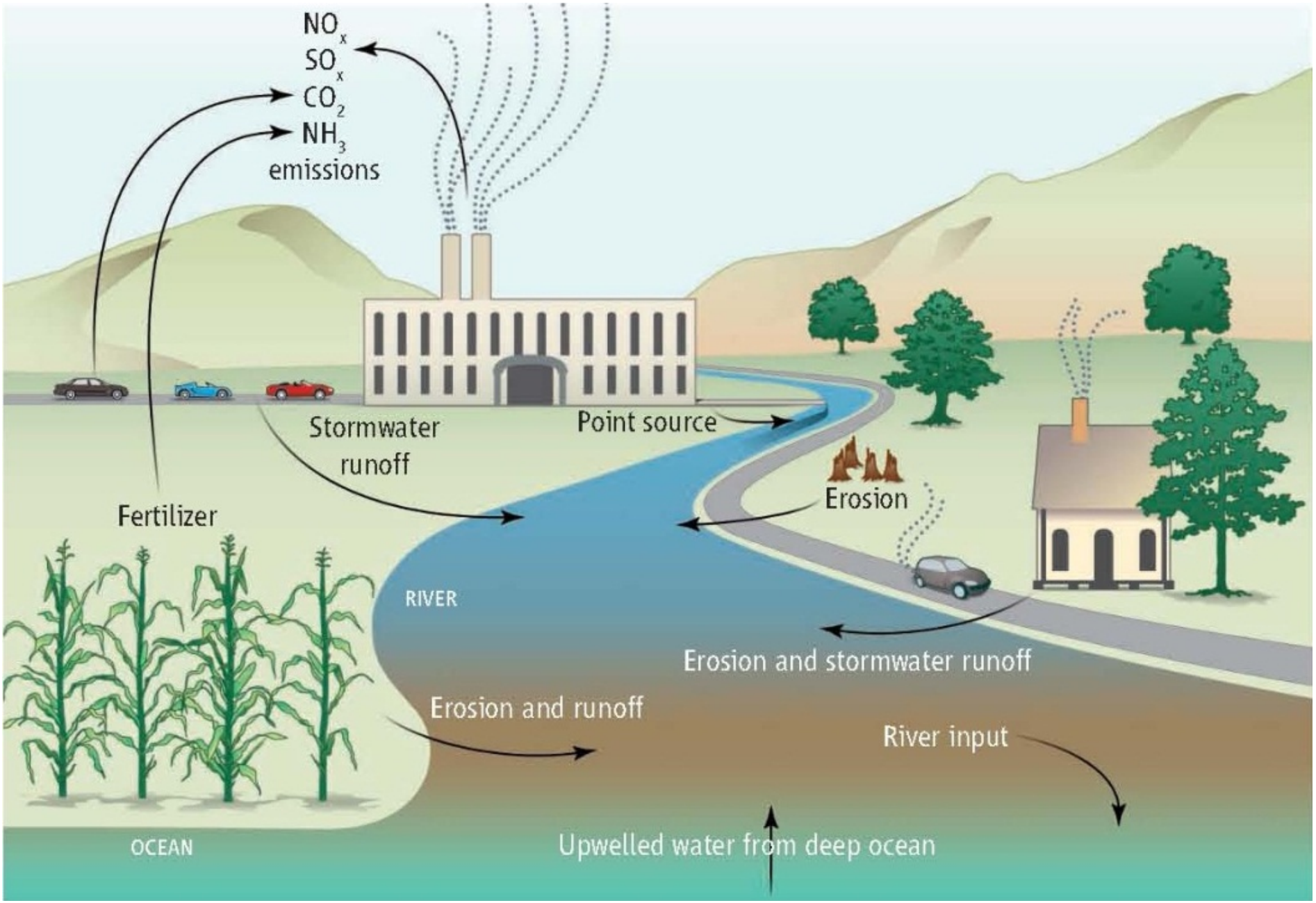
State of Maine's Environment 2014
Katherine Rizk
Colby College Environmental Studies Program 2014
Data source: Maine Office of GIS 2014



Visualising Ocean Acidification

Posted on March 20, 2014 by oceanacidificationportal

Credit: Adapted from Richard Feely (NOAA), Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccgg/trends) and Ralph Keeling, Scripps Institution of Oceanography (scrippsco2.ucsd.edu)



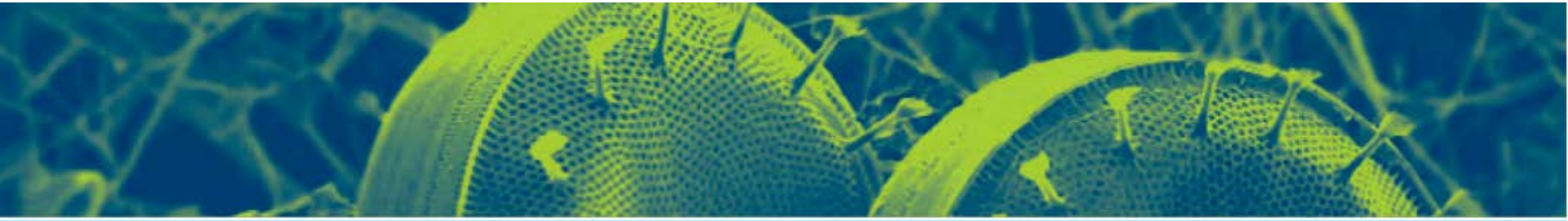
Doney et al. PNAS 2007; Doney Science 2010; Kelly et al. Science 2011

Maine 2016 Report

2016 Maine Infrastructure Report Card

$970 million in wastewater infrastructure needs over the next 20 years

Maine communities face challenges with their aging collection systems, particularly systems that get overwhelmed with stormwater and lead to combined sewer overflow (CSO). According to the Maine 2012 Clean Water Needs Survey, CSO abatement represents the largest obligation of Maine's estimated $1 billion wastewater infrastructure need. Most communities do not have user rates and fees that are adequate to self-fund their capital needs causing reliance on federal and state loan and grant funding that historically have not been adequate to cover the known needs in the state. This adversely affects public health and the environment. Wastewater infrastructure has two primary categories: collection systems, which collect waste from homes and businesses and transfer it to the second category, the treatment facility. Maine has 162 publicly owned treatment facilities – some facilities have had little or no major upgrades.

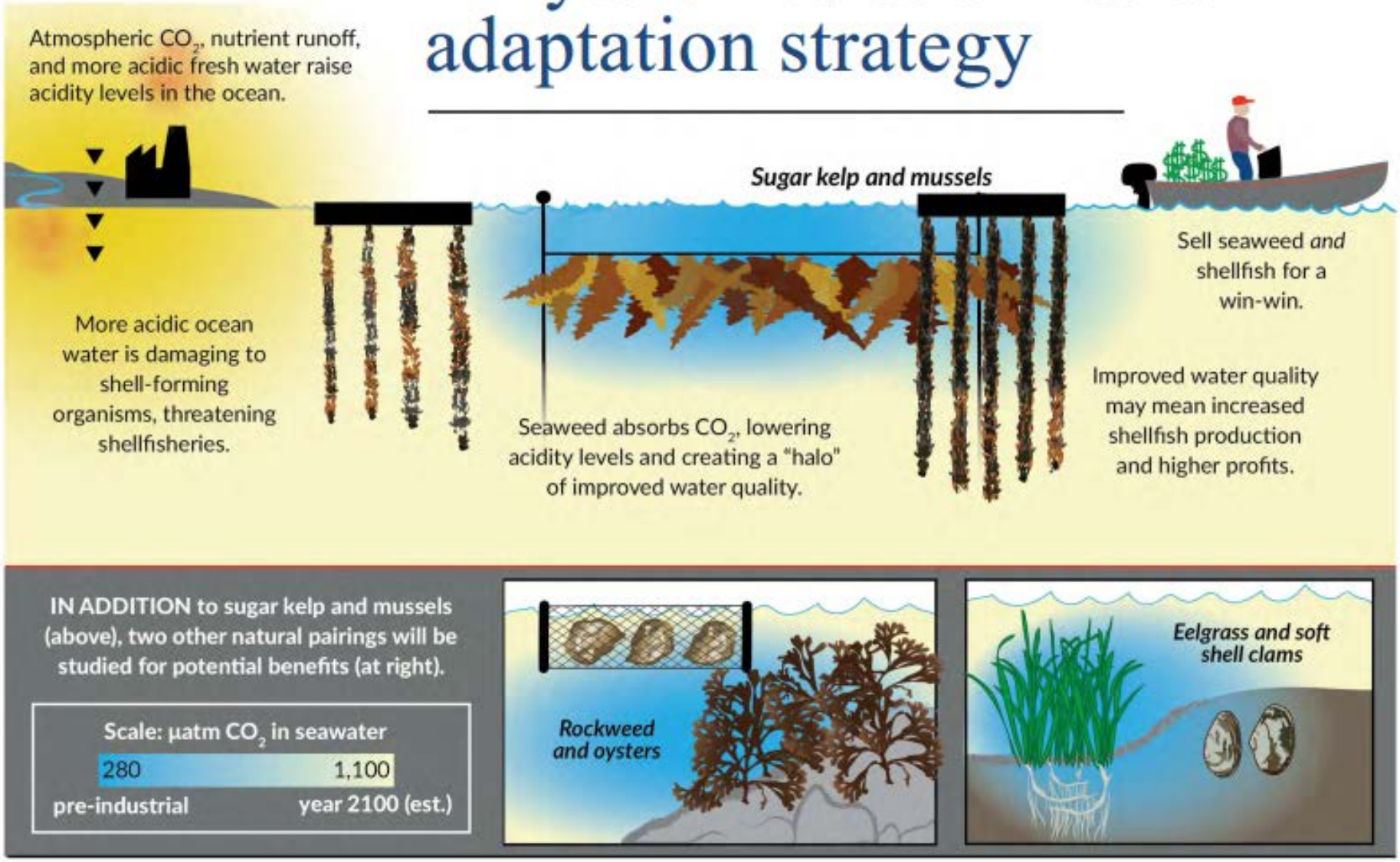


Phytoremediation potential of kelp and eelgrass

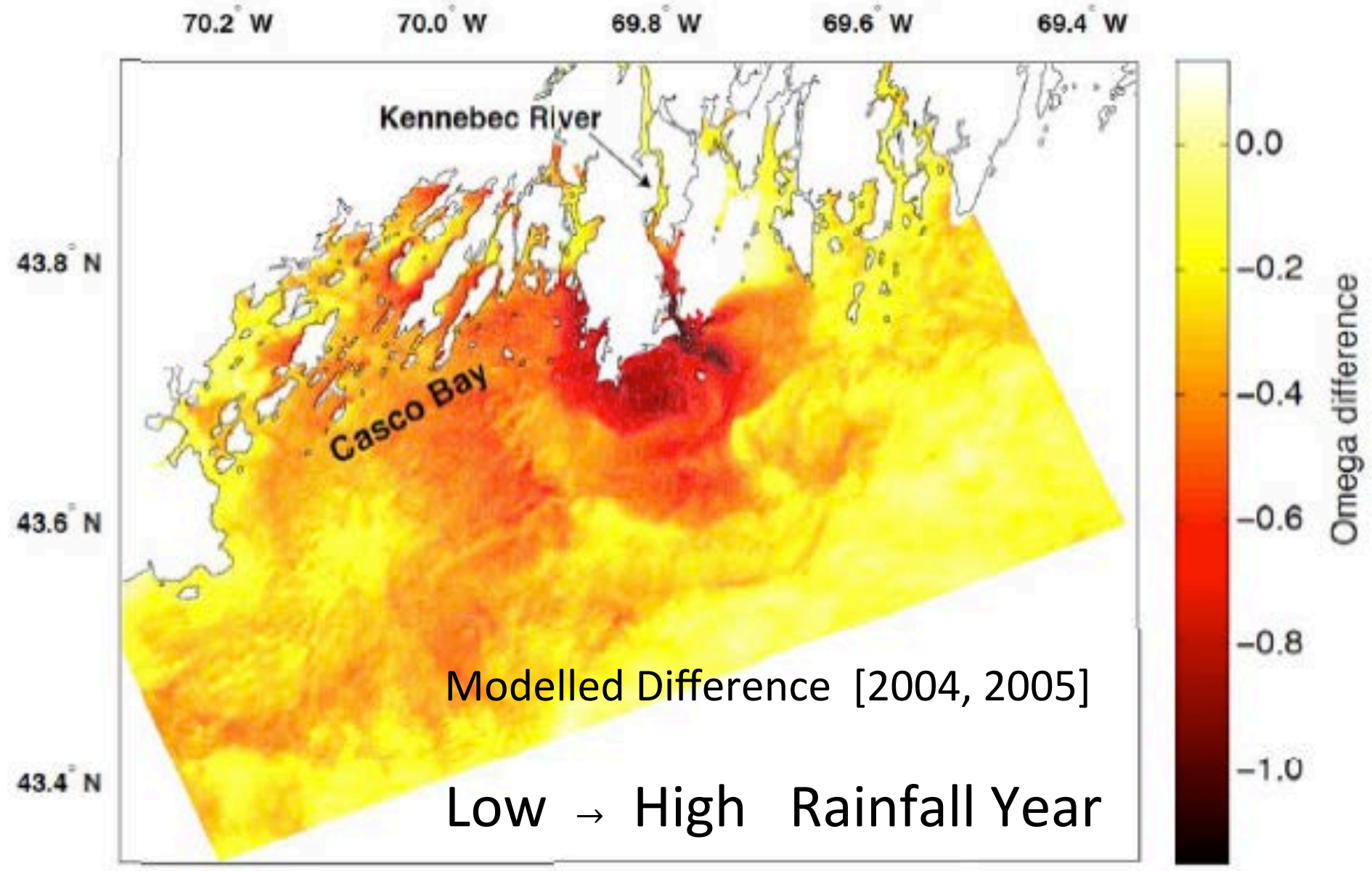
Nichole Price, Ph.D.
Senior Research Scientist
Director of the Center for Venture Research on Seafood Security
nprice@bigelow.org
207 315 2567 x306

Bigelow | Laboratory for Ocean Sciences

"Phytoremediation" as an adaptation strategy



Credit: Nicole Price, MOCA



Gledhill et al. Oceanography 2015

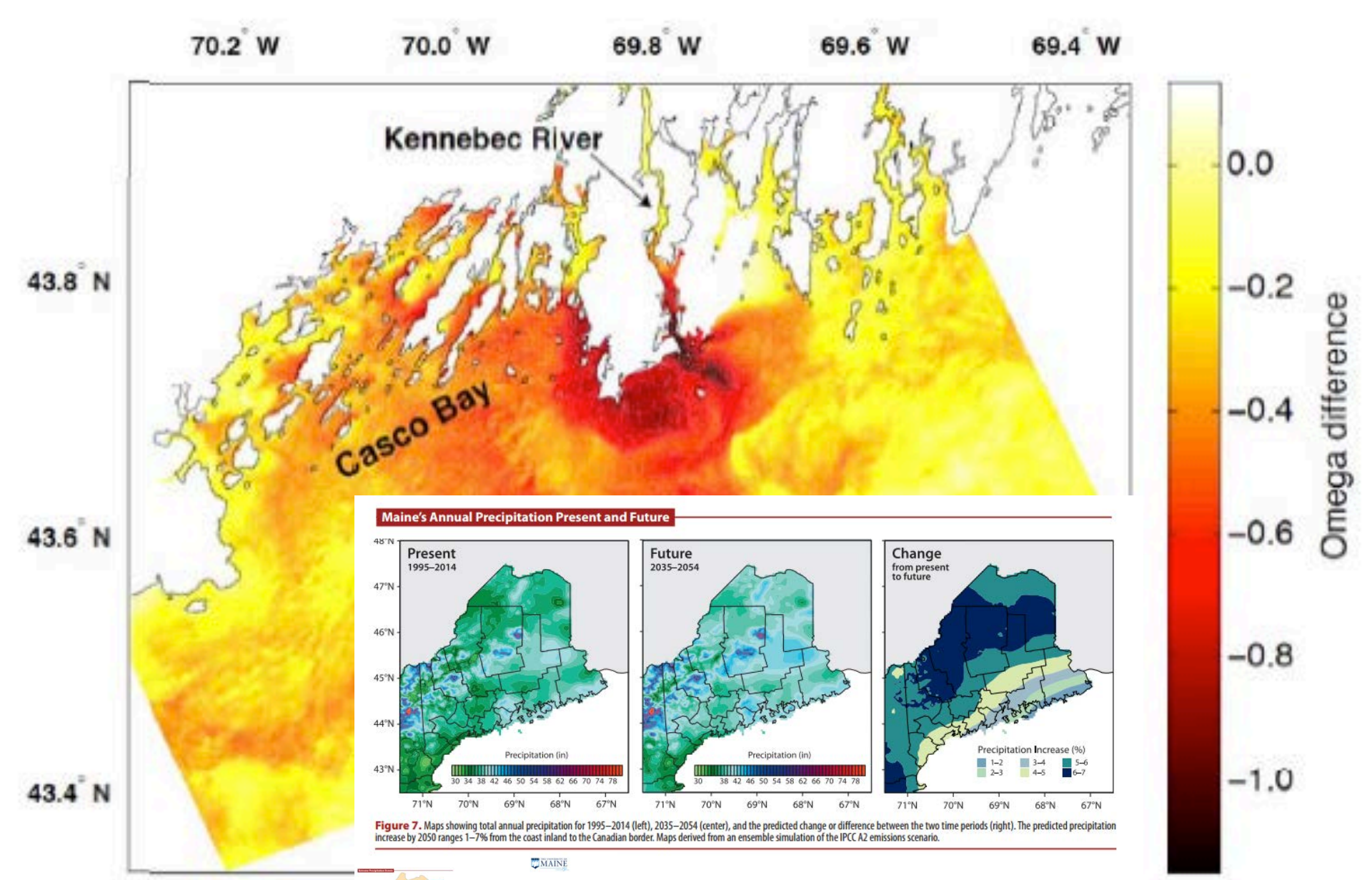
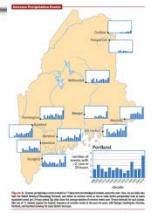


Figure 7. Maps showing total annual precipitation for 1995–2014 (left), 2035–2054 (center), and the predicted change or difference between the two time periods (right). The predicted precipitation increase by 2050 ranges 1–7% from the coast inland to the Canadian border. Maps derived from an ensemble simulation of the IPCC A2 emissions scenario.



MAINE'S CLIMATE FUTURE 2015 UPDATE

More Intense,

and More **Rain**. . .

Maine Coastal Observing Alliance

Georges River Tidewater Association

Education · Water Monitoring · Advocacy

DAMARISCOTTA RIVER ASSOCIATION · SINCE 1973 ·

SHEEPSCOT · VALLEY · CONSERVATION · ASSOCIATION

MEDOMAK VALLEY LAND TRUST

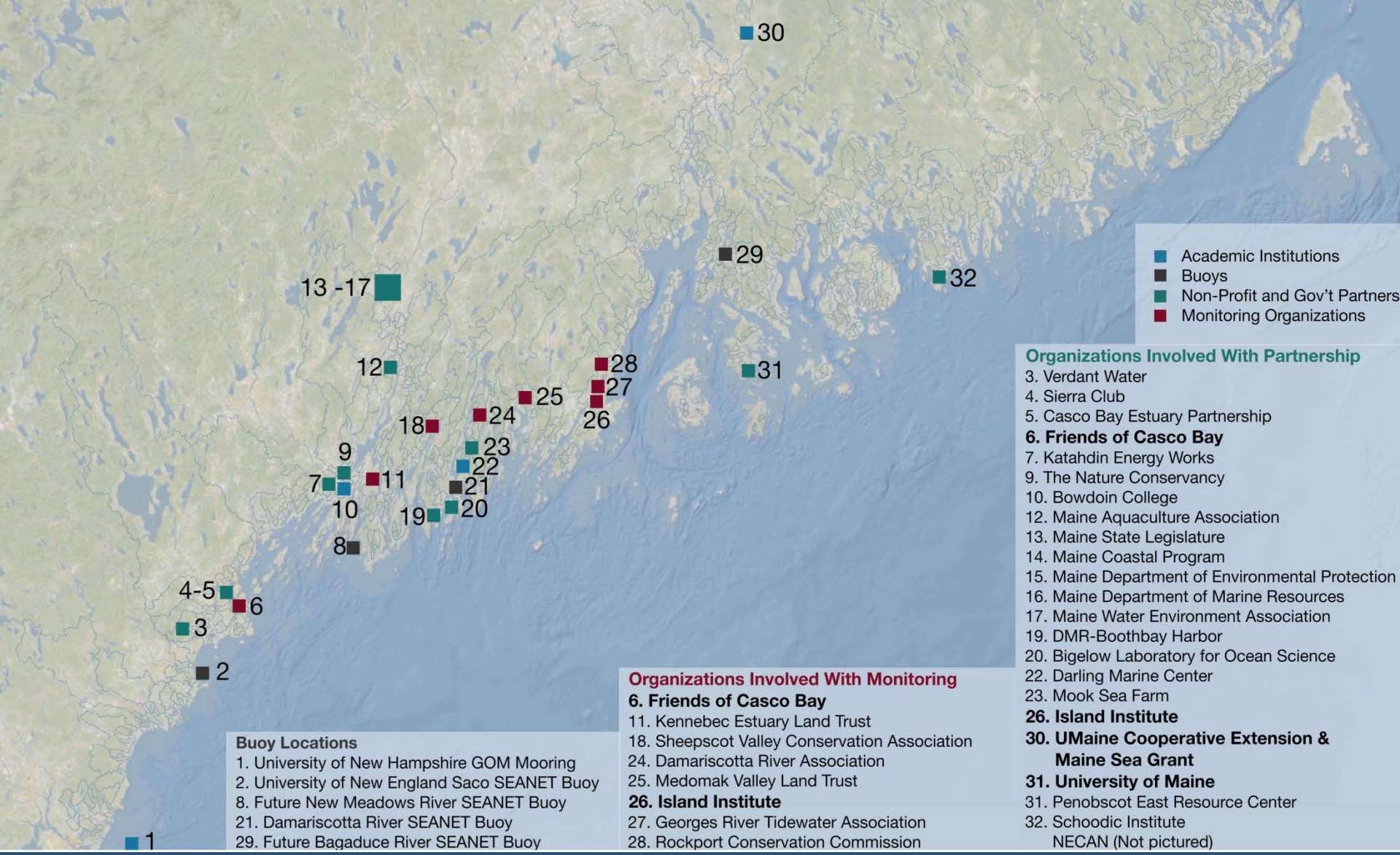
KENNEBEC ESTUARY LAND TRUST

ROCKPORT, MAINE 1891 OFFICIAL TOWN SEAL

Friends of Casco Bay
Casco BAYKEEPER

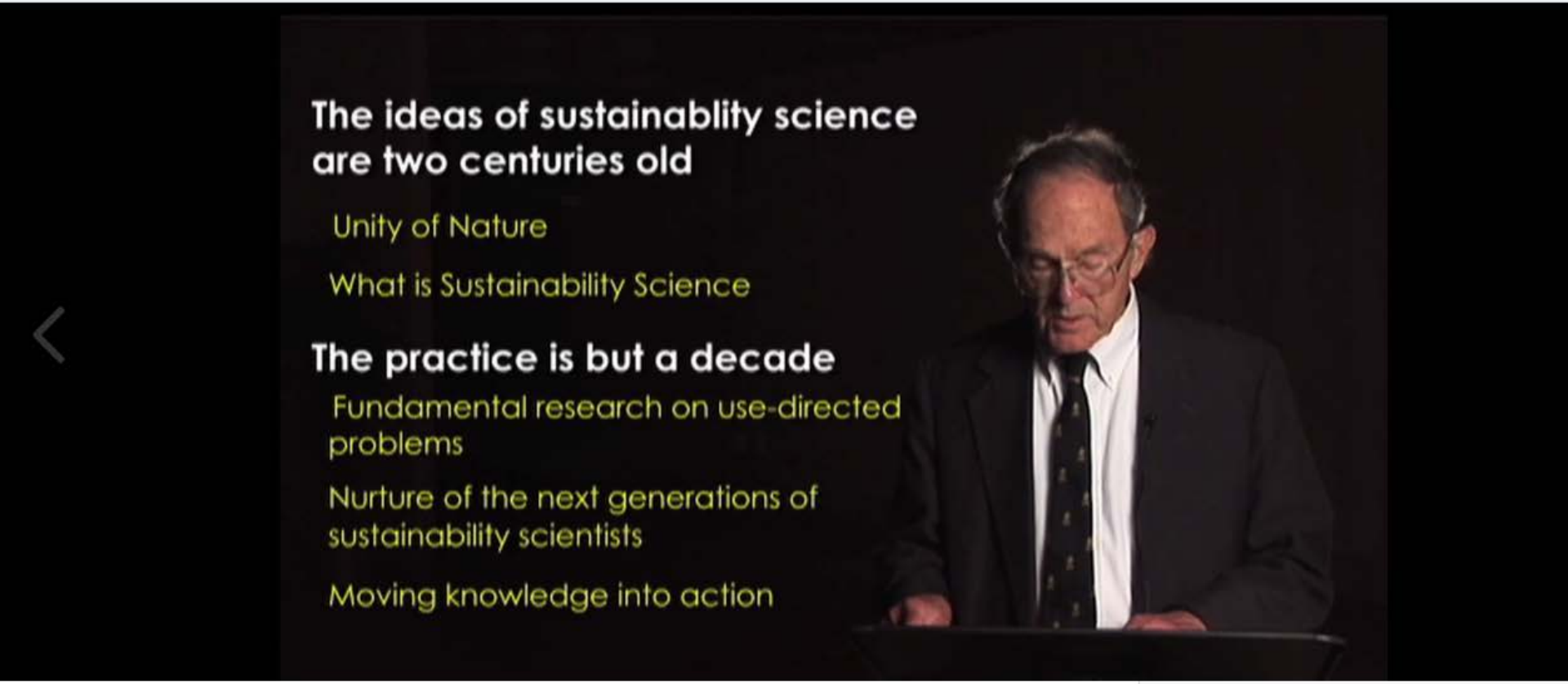
Funded by: DAVIS CONSERVATION FOUNDATION

Maine Sea Grant



Gassett and Strong 2016 (RARGOM MEETING)

Partners, Stakeholders, and Monitoring Buoys



Sustainability Science: Ideas & Practice

The Great Acceleration

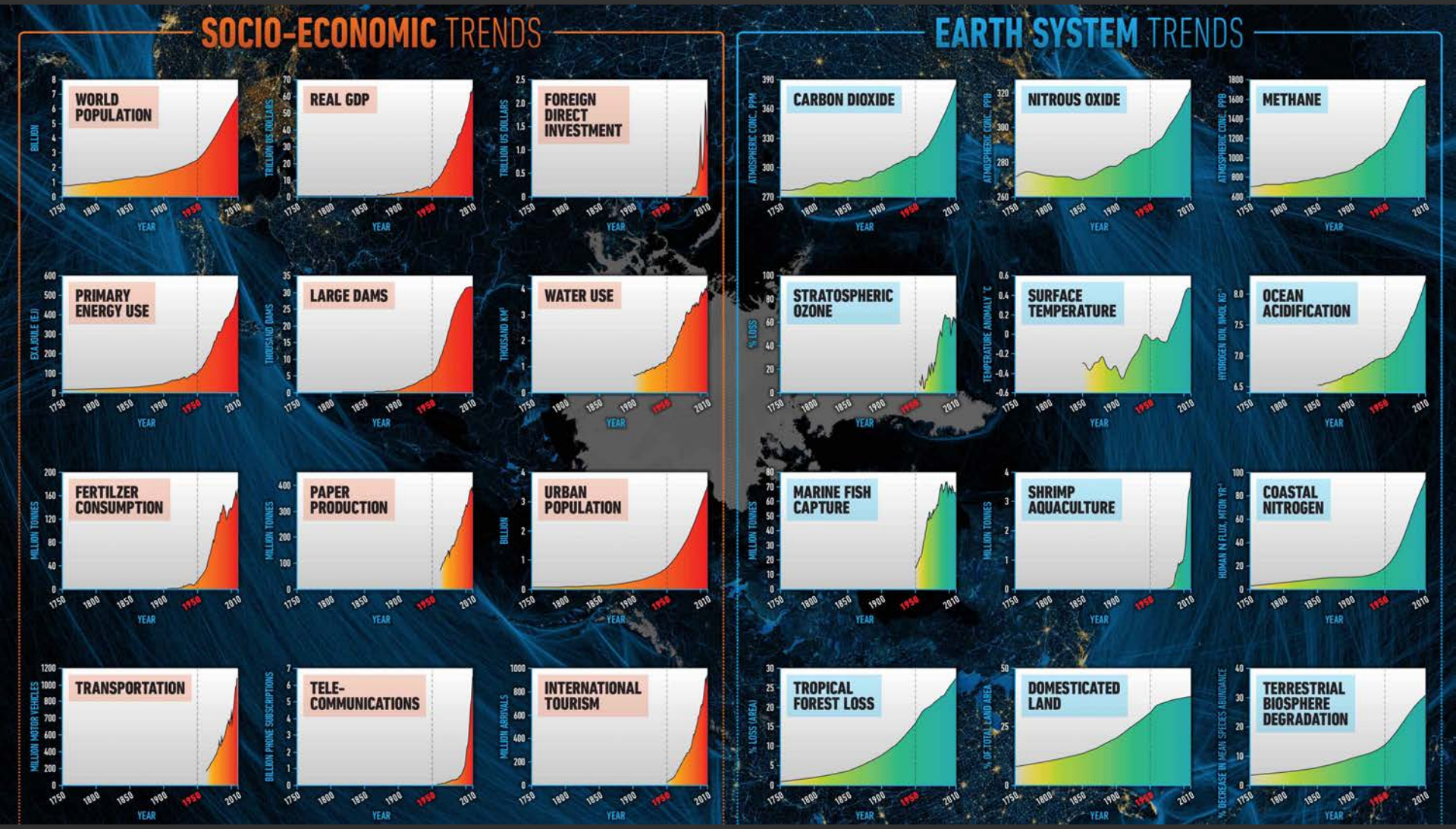


Figure 4 . Lynn Bannister (l) and Bob Kennedy (r); of RCC sampling in Rockport Harbor.

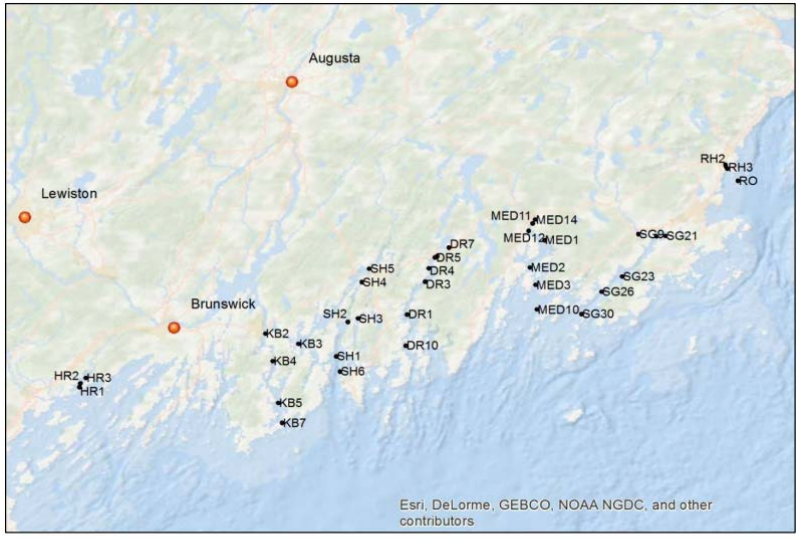
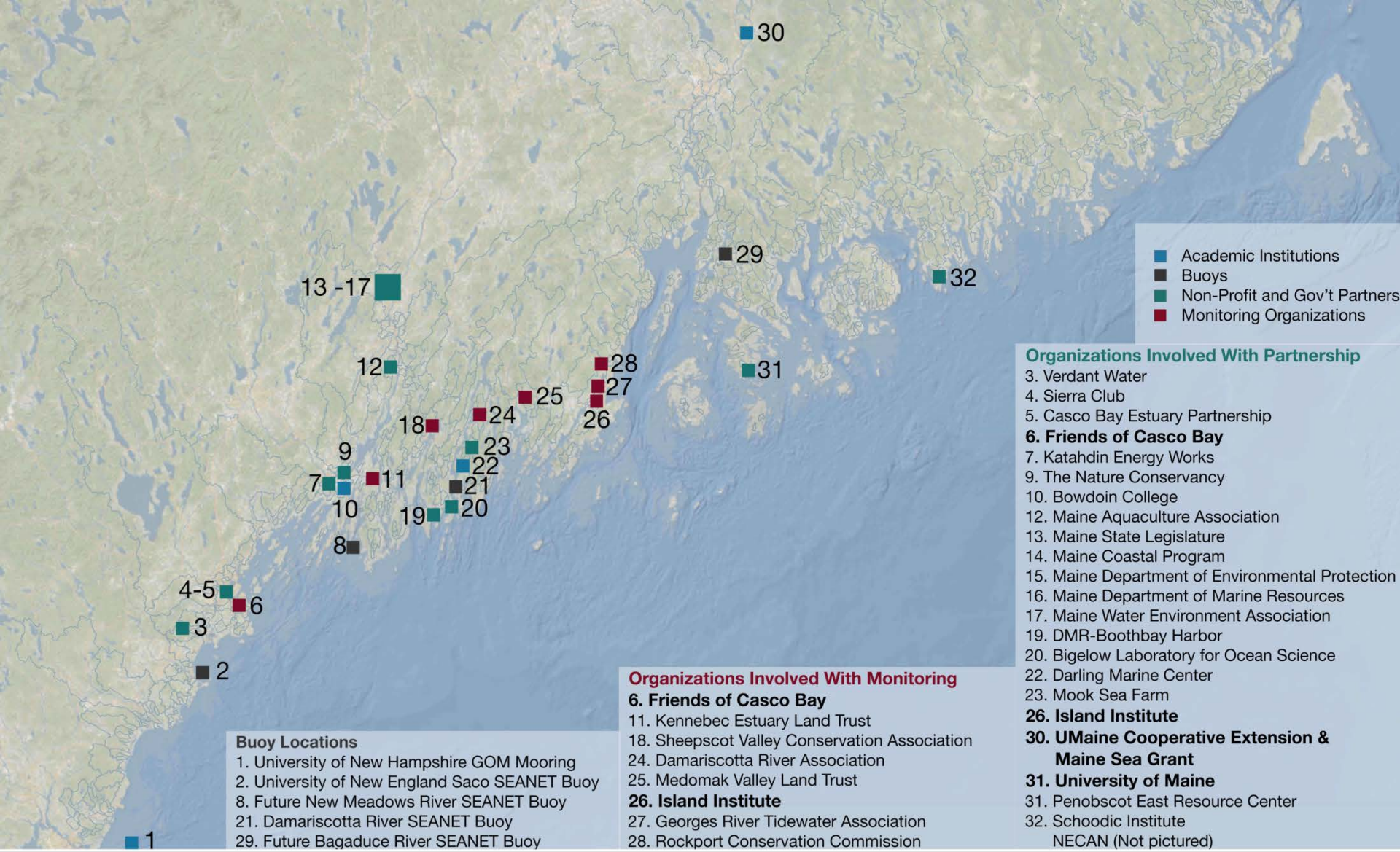


Figure 12. 2014 MCOA sampling stations. HR – Harraseeket , KB – Kennebec, SH – Sheepscot, DR – Damariscotta, MED – Medomak, SG – Saint George, RH – Rockport Harbor.

Figure 5. MCOA technician, Celeste Mosher sampling in the Sheepscot Estuary with the Manta 2. Photo courtesy of SVCA.



Gassett and Strong 2016 (RARGOM MEETING)

Partners, Stakeholders, and Monitoring Buoys

Figure 6. Rockport Harbor Master Abbie Leonard (l) and Lynn Bannister (r) in Penobscot Bay. Photo courtesy of Bob Kennedy (RCC).

Figure 7. Celeste Mosher taking measurements in the Kennebec estuary. Photo courtesy of KELT.

Workshops

Training Programs

Tailored for:

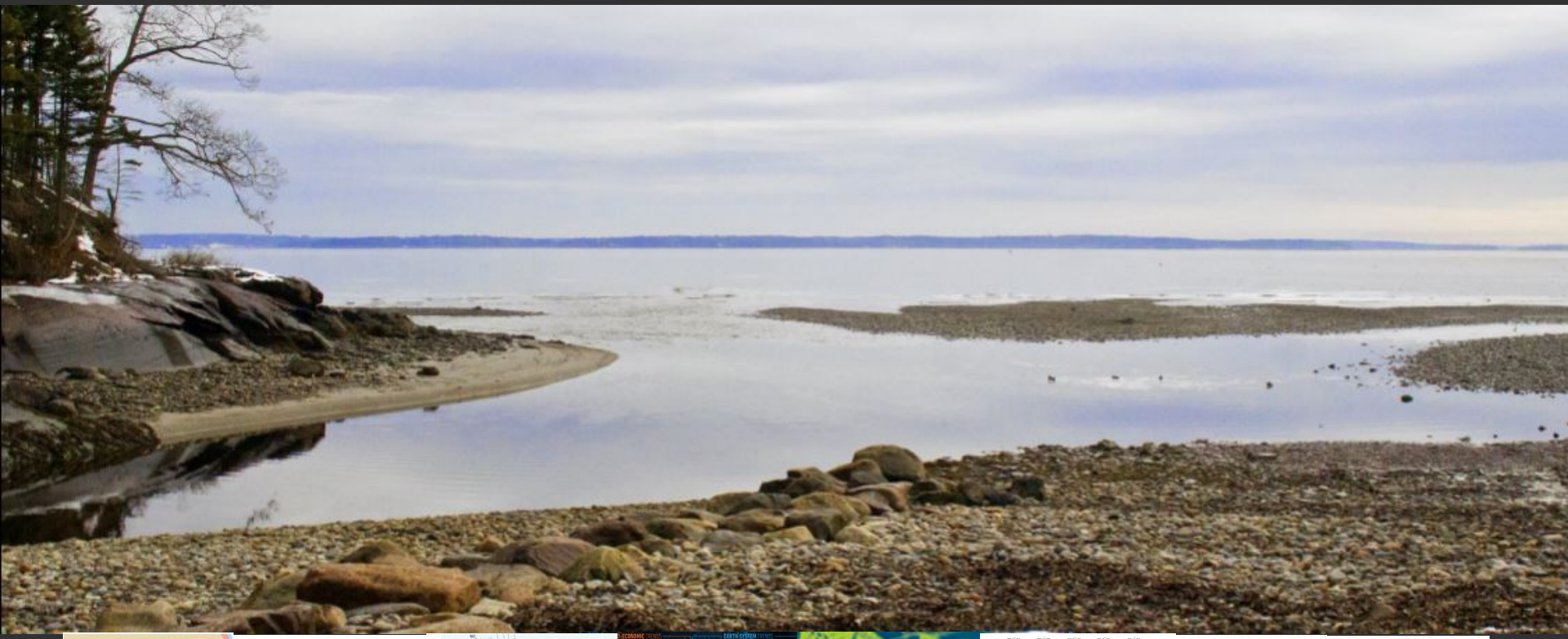
- Maine
- southern Massachusetts
- Connecticut

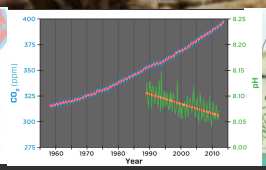
Sea Grant Outreach

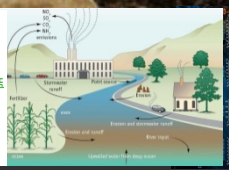
Maine Sea Grant
Marine Science for Maine People

"The best way to predict the future is to invent it."
—Alan Kay,
Palo Alto Research Center meeting, 1971

Ocean and Coastal Acidification in Maine







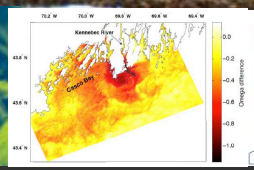


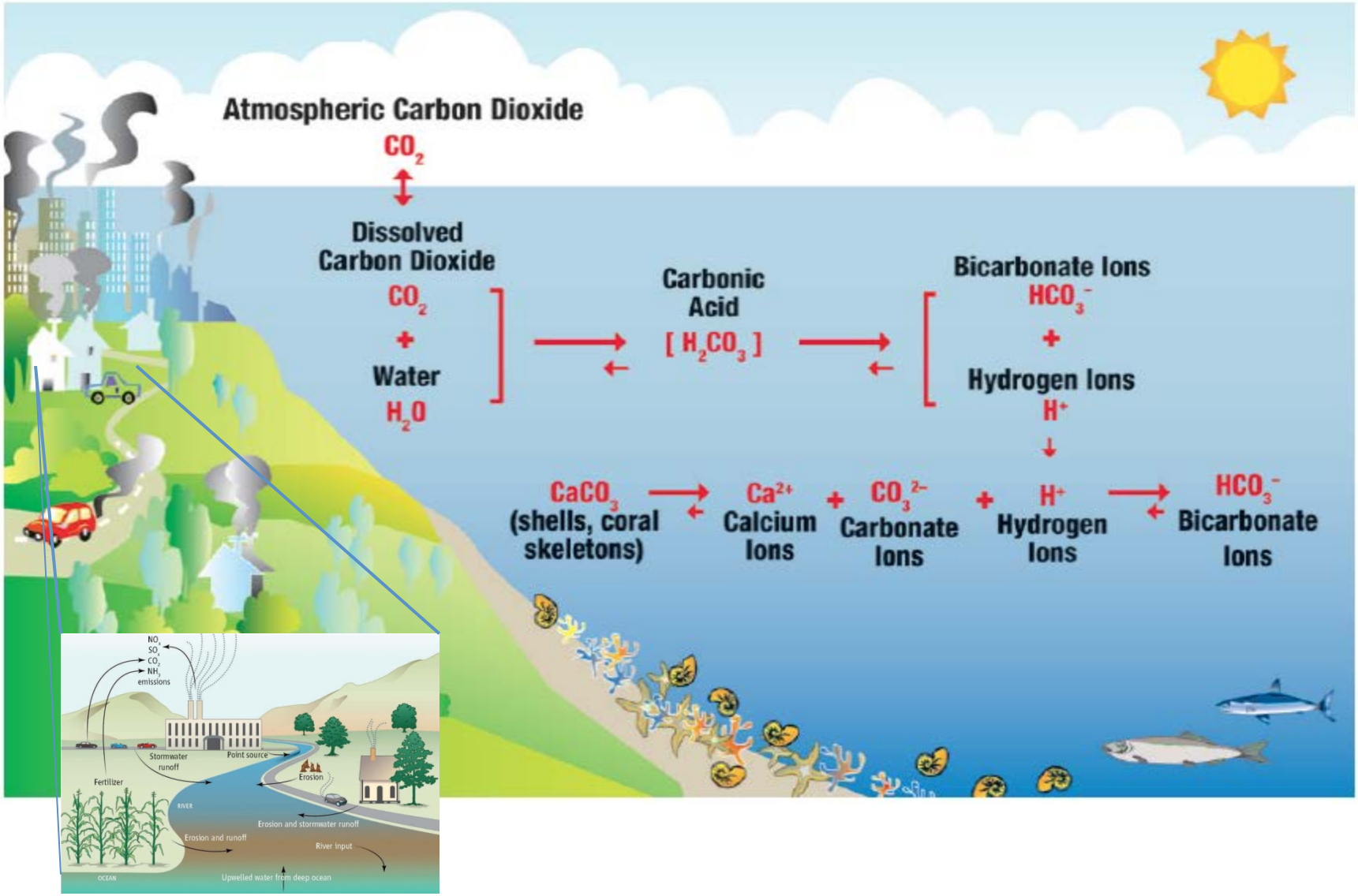
Figure 6. Rockport Harbor Master Abbie Leonard (l) and Lynn Bannister (r) in Penobscot Bay. Photo courtesy of Bob Kennedy (RCC).

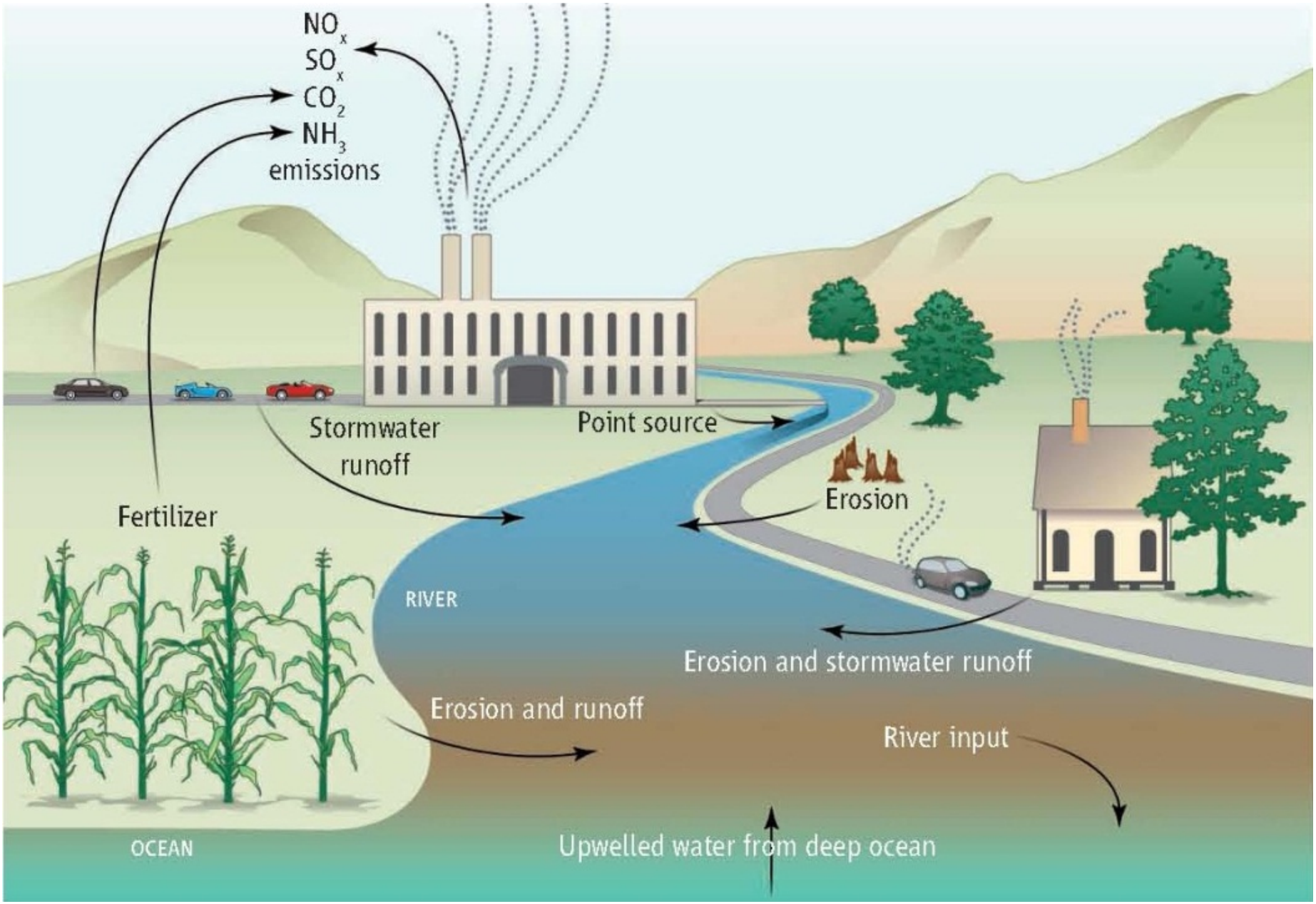
Maine Sea Grant
Marine Science for Maine People

Thank You,


Ocean and Coastal Acidification
DARLING MARINE CENTER
Working Meeting on
Standardizing Monitoring Protocols
JUNE 19

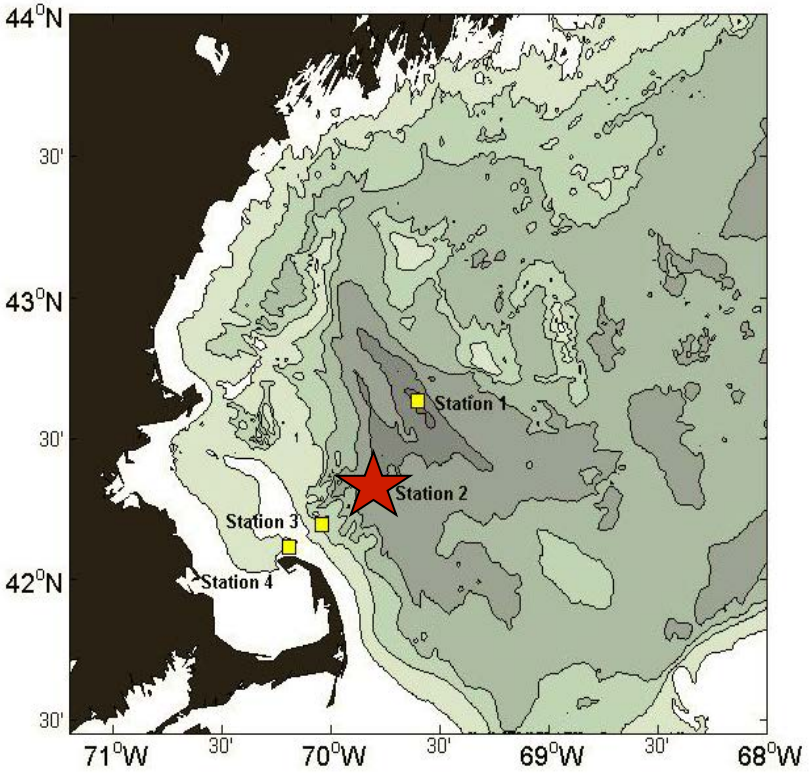
The Chemistry of Ocean Acidification

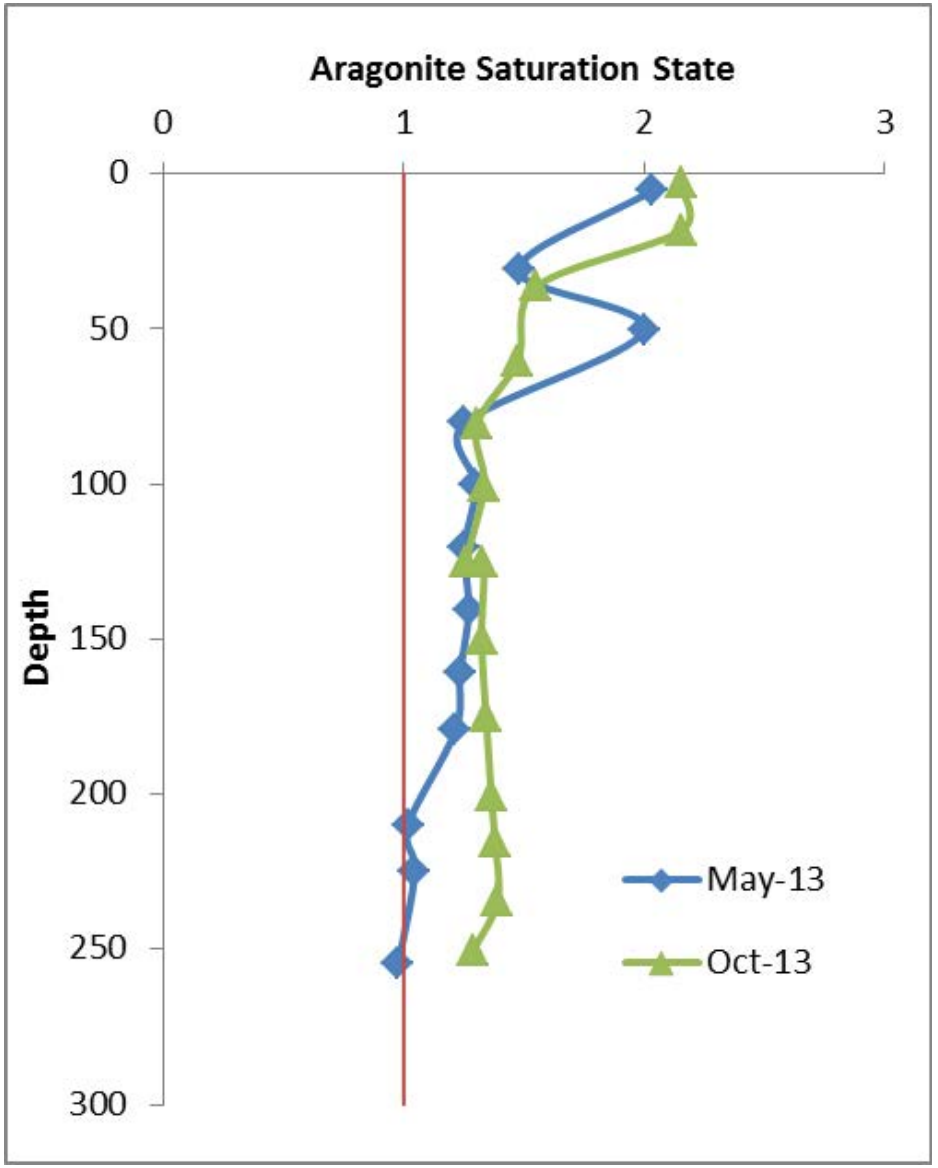




Doney et al. PNAS 2007; Doney Science 2010; Kelly et al. Science 2011

Seasonally Corrosive Waters in Deep Gulf of Maine





Figures: Wang & Lawson, in prep.
Slide: Doney

Gulf of Maine Sea Surface Temperature

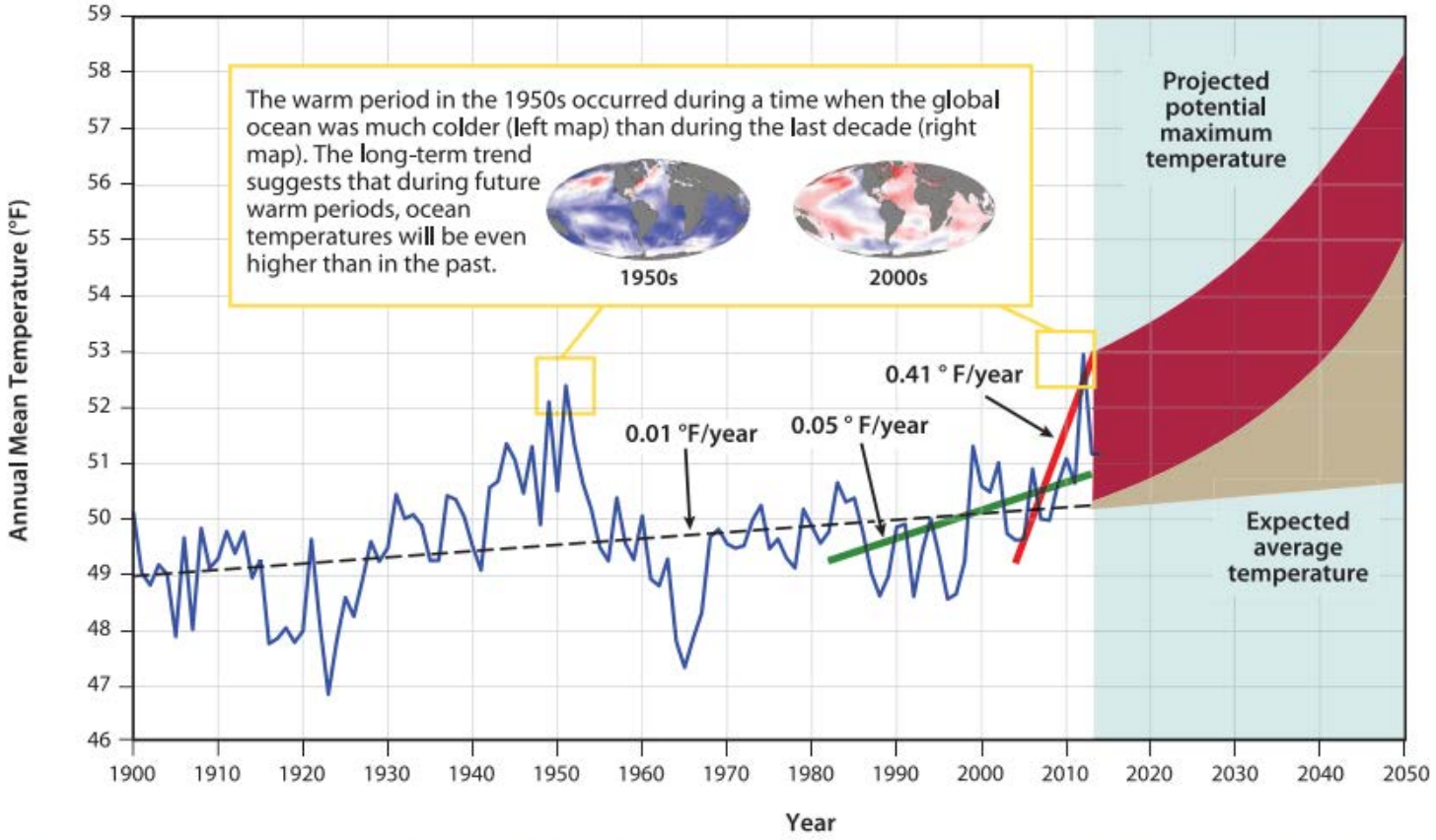


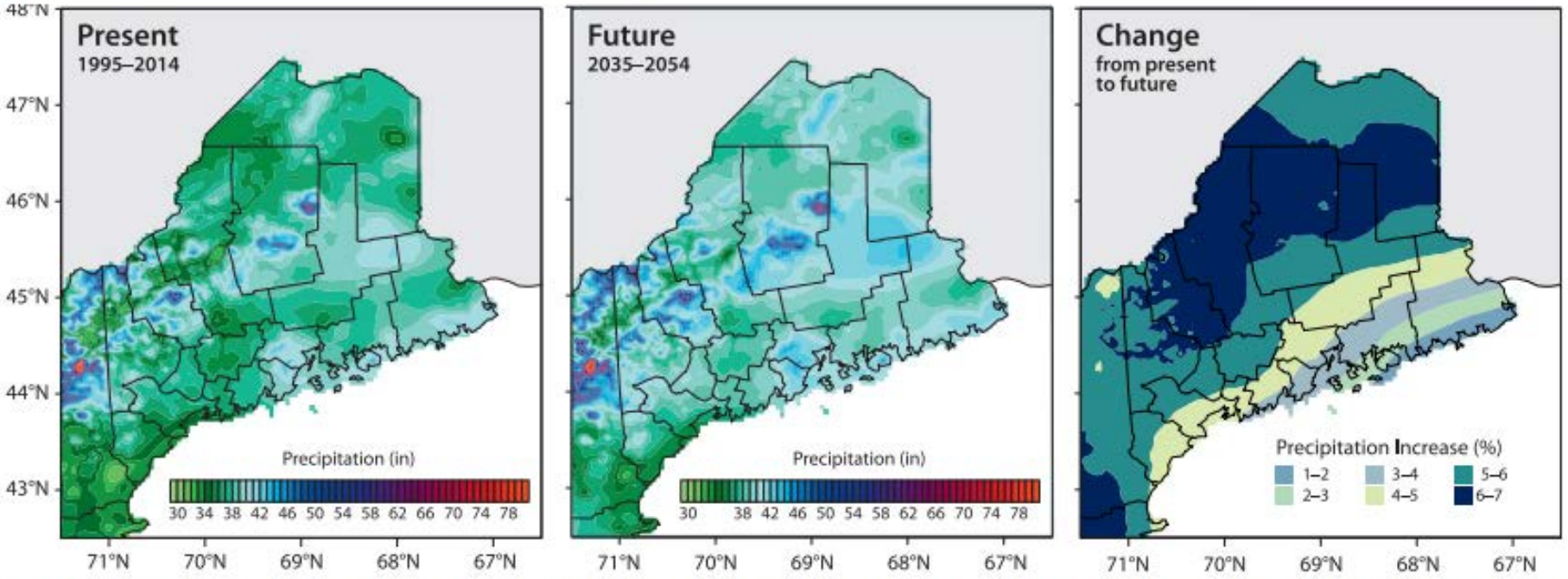
Figure 12. Mean sea surface temperature in the Gulf of Maine from 1900 to 2014 (blue), based on Extended Reconstructed Sea Surface Temperature (ERSST) version 3b data provided by the NOAA/OAR/Earth System Research Laboratory Physical Sciences Division, Boulder, CO (*esrl.noaa.gov/psd/*). The temperature trend over the entire record is 0.01 °F per year (black line). The rate accelerated to 0.05 °F per year after 1982 (green line) and was 0.41 °F per year from 2004–2013 (red line), based on NOAA Optimum Interpolation ¼ degree daily sea surface temperature analysis (*ncdc.noaa.gov/sst/*). Climate models provide a range of estimates of future mean temperatures (red and tan area), with the range driven by the uncertainty in how much carbon dioxide and methane will be added to the atmosphere.[2]

Sea Grant Maine at the University of Maine

1865 THE UNIVERSITY OF MAINE Celebrating 150 years

CLIMATE CHANGE INSTITUTE

Maine's Annual Precipitation Present and Future



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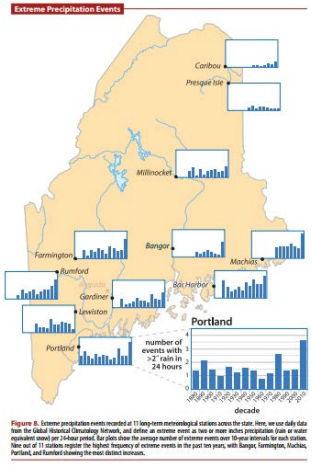


THE UNIVERSITY OF MAINE

MAINE'S CLIMATE FUTURE

2015 UPDATE

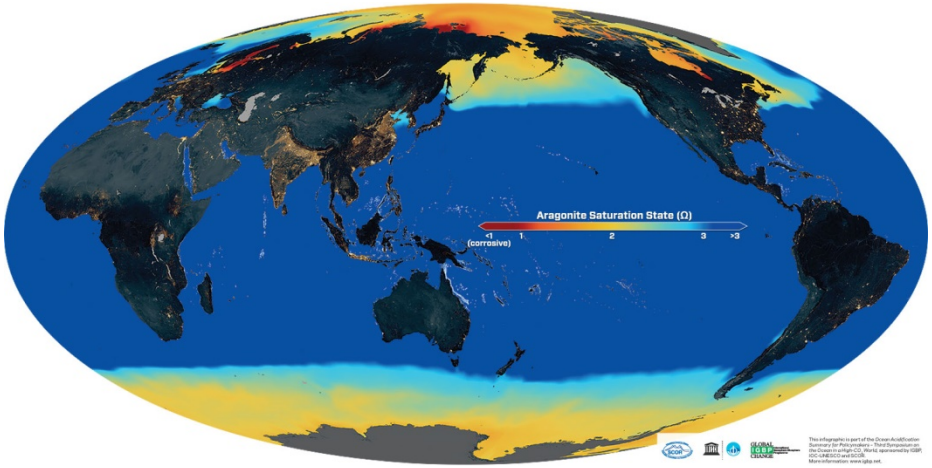
More Intense,

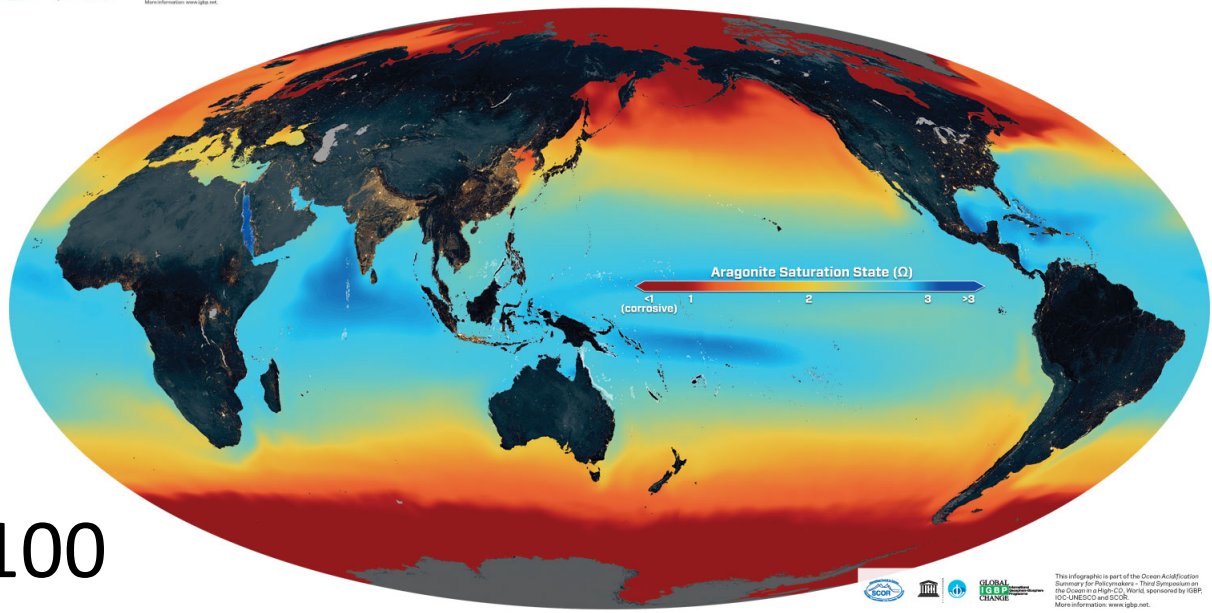
and More **Precipitation . . .**


Top Down & Bottom Up
Governance
Policy
Permits
Boundary Spanning Organizations
Resource Sharing
Mitigation
Community Action
Community Identity

Figure 1.

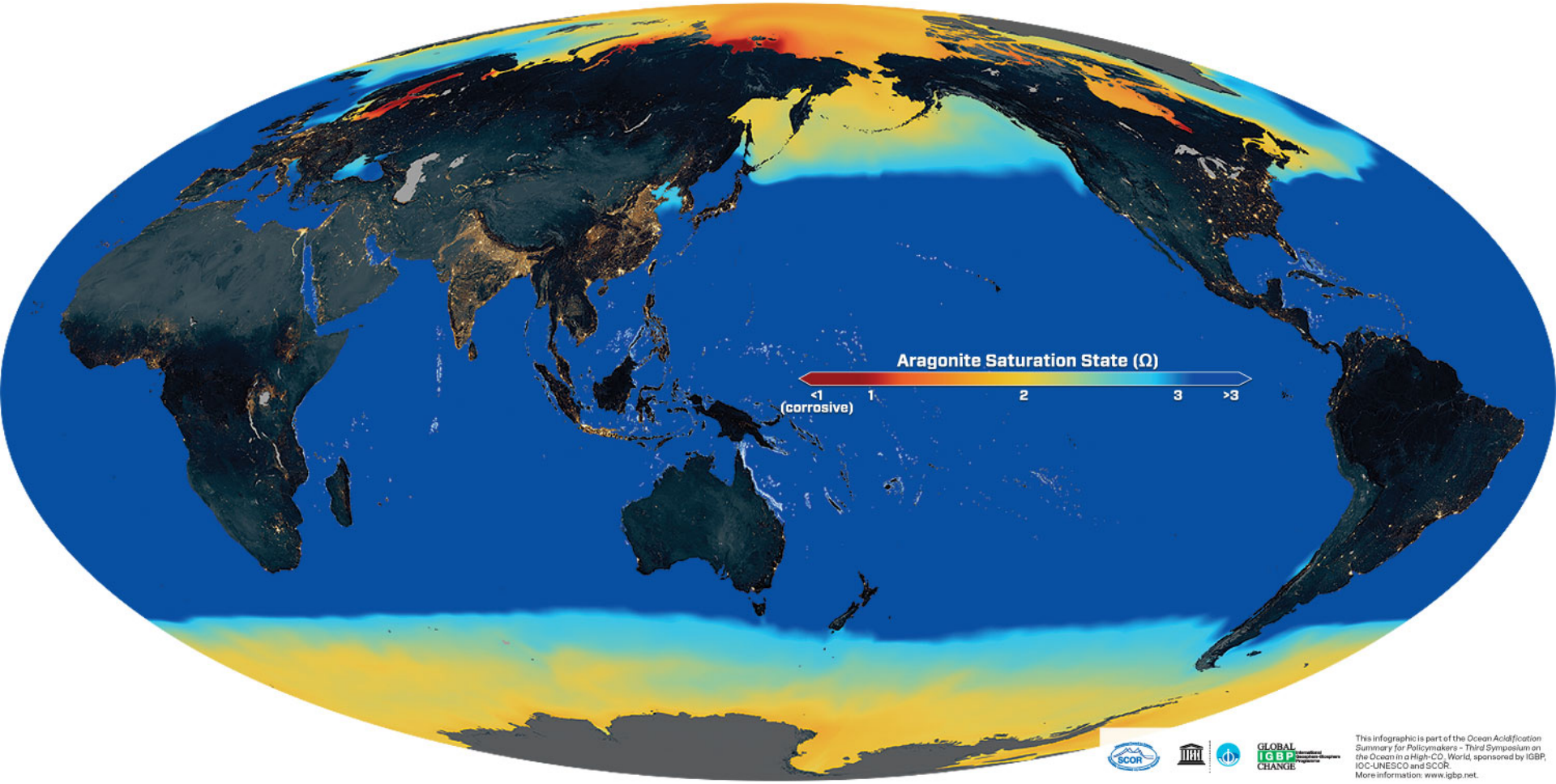
Pre-industrial projection





Projection for 2100

Pre-industrial projection



Projection for 2100