



Science Advisory Board

CLIMATE WORKING GROUP

CWG's Review and Recommendations to NOAA on the "2020 NOAA Ocean and Great Lakes Acidification Research Plan"

Presented by: Joellen Russell, Ph.D.
Chair
Climate Working Group
December 17, 2019

Why?

- The 2020 NOAA Ocean and Great Lakes Acidification Research Plan is a ten-year, 12-chapter research plan that identifies research objectives and actions for NOAA's Ocean Acidification science for the coming decade at both the national and regional levels.
- NOAA's Ocean Acidification Program invited the Climate Working Group (CWG) to review the Research Plan.



NOAA OCEAN AND GREAT LAKES ACIDIFICATION RESEARCH PLAN 2020-2029

Coordinating Editors

Elizabeth Jewett (OAR/Ocean Acidification Program)
Emily Osborne (OAR/ Ocean Acidification Program)
Rik Wanninkhof (OAR/Atlantic Oceanographic and Meteorological Laboratory)
Benjamin DeAngelo (OAR/Climate Program Office)
Krisa Arzayus (NOS/U.S. Integrated Ocean Observing System Office)
Kenric Osgood (NMFS/Office of Science and Technology)

Front cover photo: TBD

Acknowledgements

DRAFT PLACEHOLDER TEXT: We acknowledge the ## members of the NOAA Ocean and Great Lakes Acidification Research Plan writing team for the considerable thought and effort developing this strategic document. Coordinating Editor credit/external review/LO review thanks/ graphic designer and copyediting and formatting thanks.

Recommended Citation:

Jewett, E., E. Osborne, R. Wanninkhof, B. DeAngelo, K. Arzayus, K. Osgood, Eds., 2020. NOAA Ocean and Great Lakes Acidification Research Plan 2020-2029. U.S. Dept. of Commerce, NOAA Technical Memorandum [insert final publication details here].

January 2020



U.S. Department of Commerce
Wilbur L. Ross, Jr., Secretary

National Oceanic and Atmospheric Administration
Neil Jacobs, Ph.D., Acting NOAA Administrator

Task Team



Dr. Joellen Russell
Professor
University of Arizona,
Department of Geosciences
Acting Chair, NOAA
Science Advisory Board's
Climate Working Group



Dr. Irina Marinov
Associate Professor
University of Pennsylvania
Department of Earth and
Environmental Science
External expert



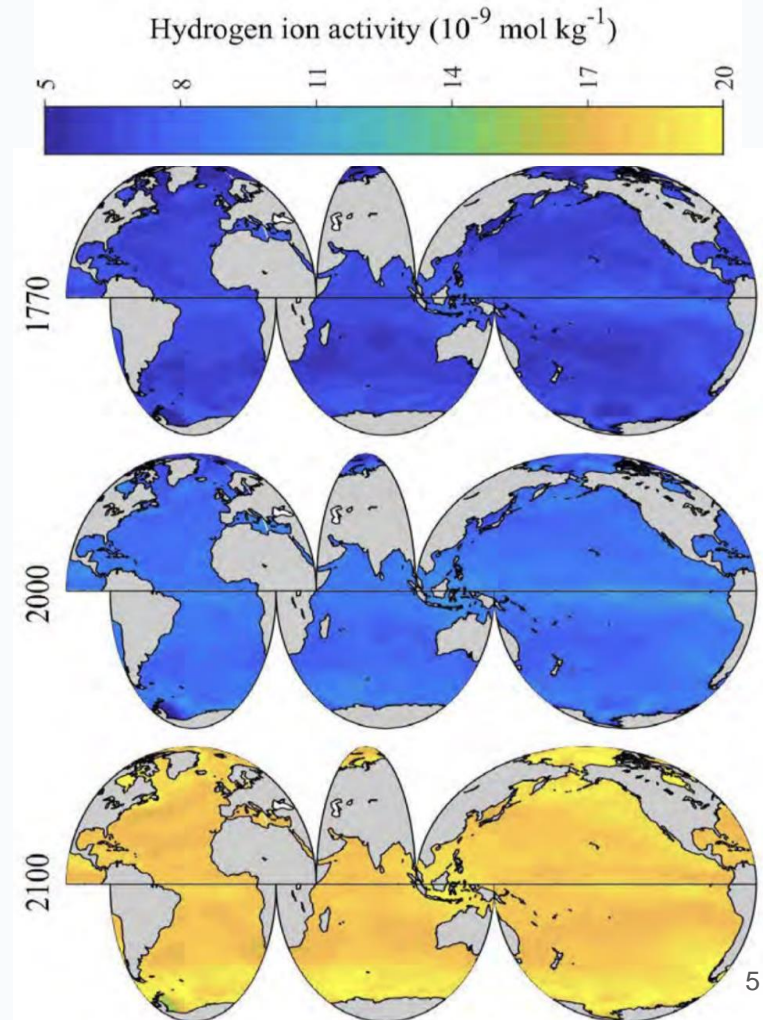
Dr. Nancy Williams
Assistant Professor
University of South Florida
College of Marine Science
External expert

Background

- Ocean acidification (OA) is driven predominantly by ocean uptake of atmospheric CO₂ and is resulting in global-scale changes in ocean chemistry with predictions of broad scale ecosystem impacts.
- Acidification in the Great Lakes is projected to decline at a rate similar to that of the oceans but may be confounded by regional air quality and acid deposition via precipitation.
- Acidification of the oceans, coasts, and Great Lakes continues to raise concerns due to the ecological impacts and resulting social and economic effects.
- The Federal Ocean Acidification Research and Monitoring (FOARAM) Act of 2009, requires NOAA to have an OA monitoring and research program to determine the potential consequences for marine organisms and ecosystems; assess the regional and national ecosystems and socioeconomic impacts; and identify adaptation strategies and techniques for conserving affected ecosystems.

Research Themes

1. Document and predict change via environmental monitoring, analysis and modeling;
1. Characterize and predict biological sensitivity of species and ecosystems to; and
1. Understand human dimensions and socioeconomic impacts of ocean acidification.



Research Goals

1. Advance OA observing systems, modeling, technologies and data stewardship to improve the understanding and predictive capability of OA trends and processes;
1. Enhance understanding and prediction of OA as a stressor co-occurring with other 108 prominent ocean and Great Lakes changes;
1. Improve understanding of the biological response and adaptive capacity of ecologically and economically important species, ecosystems, and communities; and
1. Increase research to understand the vulnerability of communities and stakeholders to OA and to generate useful data that supports adaptation and resilience plans.

Vulnerability of U.S. Coasts to Ocean Acidification

Social vulnerability (land)



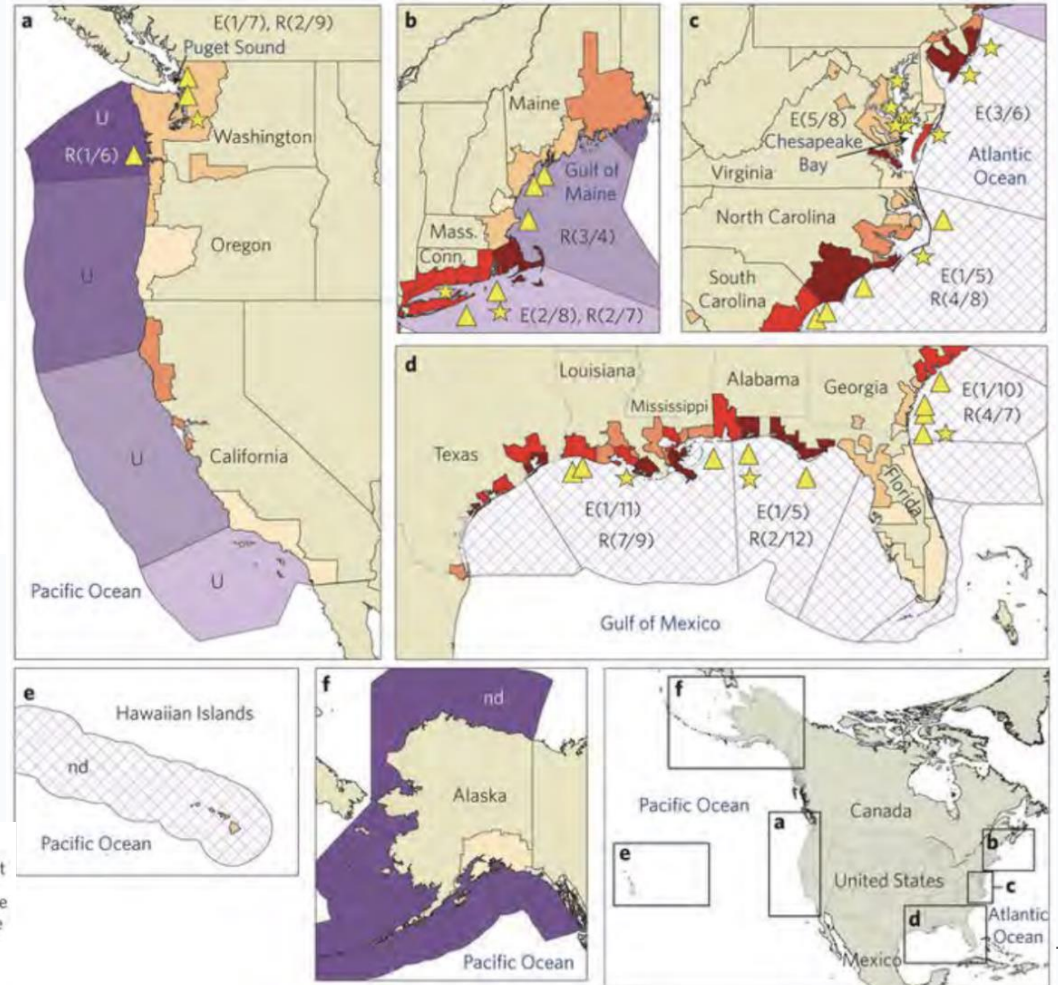
Marine ecosystem exposure (water)

Year threshold hit



Local amplifiers

- E ★: Highly eutrophic estuaries present
- R ▲: River drainage low saturation state and high annual discharge volume
- U: Upwelling is strong
- nd: No data available for E or R



1.0, NOAA-wide Integrated Modeling

Recommendation 1: Formally commit to an integrated modeling approach across NOAA line offices.

Recommendation 2: Prioritize the linking of regional ecosystem models and biogeochemical frameworks so that OA observations can be utilized to their full potential.

Pending CWG Member Approval

2.0, Interactions between Onshore, Nearshore and Offshore processes

Recommendation 3: Increase sampling of nearshore waters in sensitive and economically important areas.

Recommendation 4: The co-varying and possibly exacerbating effects of eutrophication and acidification on each other should be studied.

Pending CWG Member Approval

3.0, Data Management and Products

Recommendation 5: Highlight centralized access to NOAA's existing data syntheses and products.

Recommendation 6: Highlight and or initiate planned communications with stakeholders on the desired data products and syntheses that would be most useful to those communities.

Pending CWG Member Approval

4.0, Metrics of Success

Recommendation 7: Include metrics by which NOAA can quantify the success of its OA research and outreach.

Recommendation 8: Quantify the economic benefit of NOAA's OA research and products to the Blue Economy.

Pending CWG Member Approval

THANK YOU

BACKUP SLIDES



Climate Working Group SAB December 2020 Meeting



Working Group Overview

Chair/Co-Chairs: Russell
NOAA SAB liaison(s): Kalnay and Joseph

Membership (vacancies, expertise, timing of approval):

- Submitted requests for second term: Russell, Dow, Ravishankara (September 2022).
- Recommended new members for: Roemmich, Zhang, Mote, Murtugudde. Approved new members are: Cecilia Bitz, Michael Anderson, Susan Wijffels, and Le Jiang.

Activities since July 2019 SAB meeting

- Planned and held an in-person Fall Meeting.
- Finalized the content of a white paper.
- Discussed a potential collaboration with EISWG to review S2S Reports from NOAA to Congress.
- Finalized dates for the Spring 2020 virtual meeting.
- Submitted a membership package to the SAB with: 3 second term requests; 4 candidates for replacement positions; 4 alternate candidates; and an co-chair recommendation.
- Developed a draft 2020-2022 work plan

Scope and Focus of Current Efforts

- Develop a white paper that will review current capabilities and future opportunities for Subseasonal-to-Seasonal-to-Decadal (S2S2D) forecasting.
- Pending collaboration with EISWG to review S2S Reports from NOAA to Congress.
- Provide comments on NOAA's 2020 Ocean Acidification Strategic Plan.
- Provide comments on NOAA's climate-related programs as requested by the NOAA Climate Team.

Future

- Update the SAB at the next meeting.
- Develop the content for the Spring 2020 in-person meeting and coordinate with NOAA partners on presentations.
- Continue to collaborate with the EISWG.
- Continue to comment on NOAA's climate-related programs as requested by the NOAA Climate Team.
- Continue to deliver informed recommendations per the work plan.