

The Sustainable Fisheries Partnership: OA monitoring networks in the California current and beyond



Todd L. Capson & Brad Warren
Sustainable Fisheries Partnership

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Potential benefits of an OA network

A dynamic partnership between stakeholders, scientists, and policy makers could generate:

- Opportunities for technology-transfer and capacity building for resources users to monitor ocean chemistry
- Information sharing on a regional level, leading to a better understanding of the links between OA, its impacts on marine ecosystems, organisms, and seafood supplies
- A regional structure and body of information that could facilitate access to new sources of funding



Potential benefits of an OA network

- High quality data to inform management decisions for the seafood industry and that add to the scientific community's understanding of OA
- A cooperative model for other regions impacted by OA
- More capable and informed stakeholders to address causes, consequences, and societal responses to OA



OA monitoring in the Pacific Northwest: Monitoring of pH helps Taylor Shellfish hatchery in WA avoid exposing larvae to harmful concentrations of CO₂



Economics of monitoring OA by oyster hatcheries in the Pacific NW

- **COST:** ~\$500,000 to launch
- Pacific oyster farm revenues: **\$83 million**
- Cost of 22% harvest loss: **\$18.3 million**
- Overall economic impact of 22% loss: **\$46 million**
- Portion of production restored: **3/4**
- **RETURN ON INVESTMENT:** **\$34.6 million**

OA Monitoring and Outreach in the Pacific NW

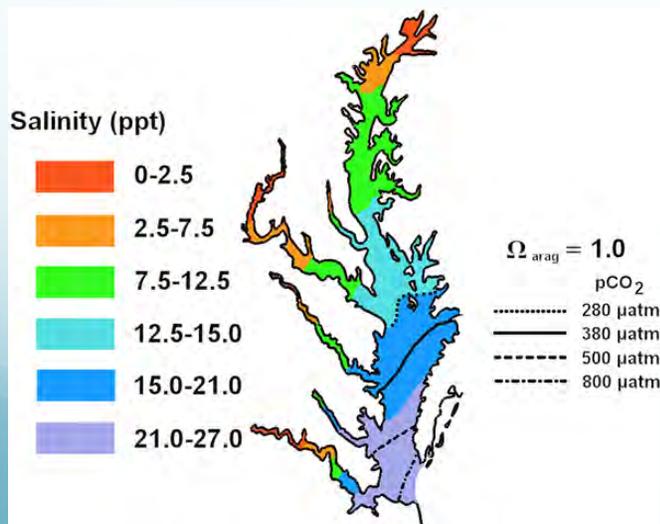
Educational Foundation of America funding enables us to support the monitoring and outreach program of the Pacific Coast Shellfish Growers Alliance for one year, in particular:

- **Document impacts of acidification** on shellfish production in the Pacific Northwest by measuring changes in seawater chemistry using low-cost, proven methods.
- **Help producers develop monitoring skills** to acquire reliable data on changing chemistry of seafood-producing waters in order to inform effective policies to address OA and to detect and “dodge” harmful waters where possible
- **Expand the use of monitoring** to other regions and fisheries
- **Build industry capacity** to protect seafood supplies and marine ecosystems through actions and policies to reduce CO2 emissions and public investment in OA research

Expansion of the harvester-scientist model:

I. Monitoring of OA on the East Coast

- Since December 2010, SFP and its collaborators have worked to expand the Pacific Coast OA monitoring model to hatcheries in Maine
- Chesapeake Bay

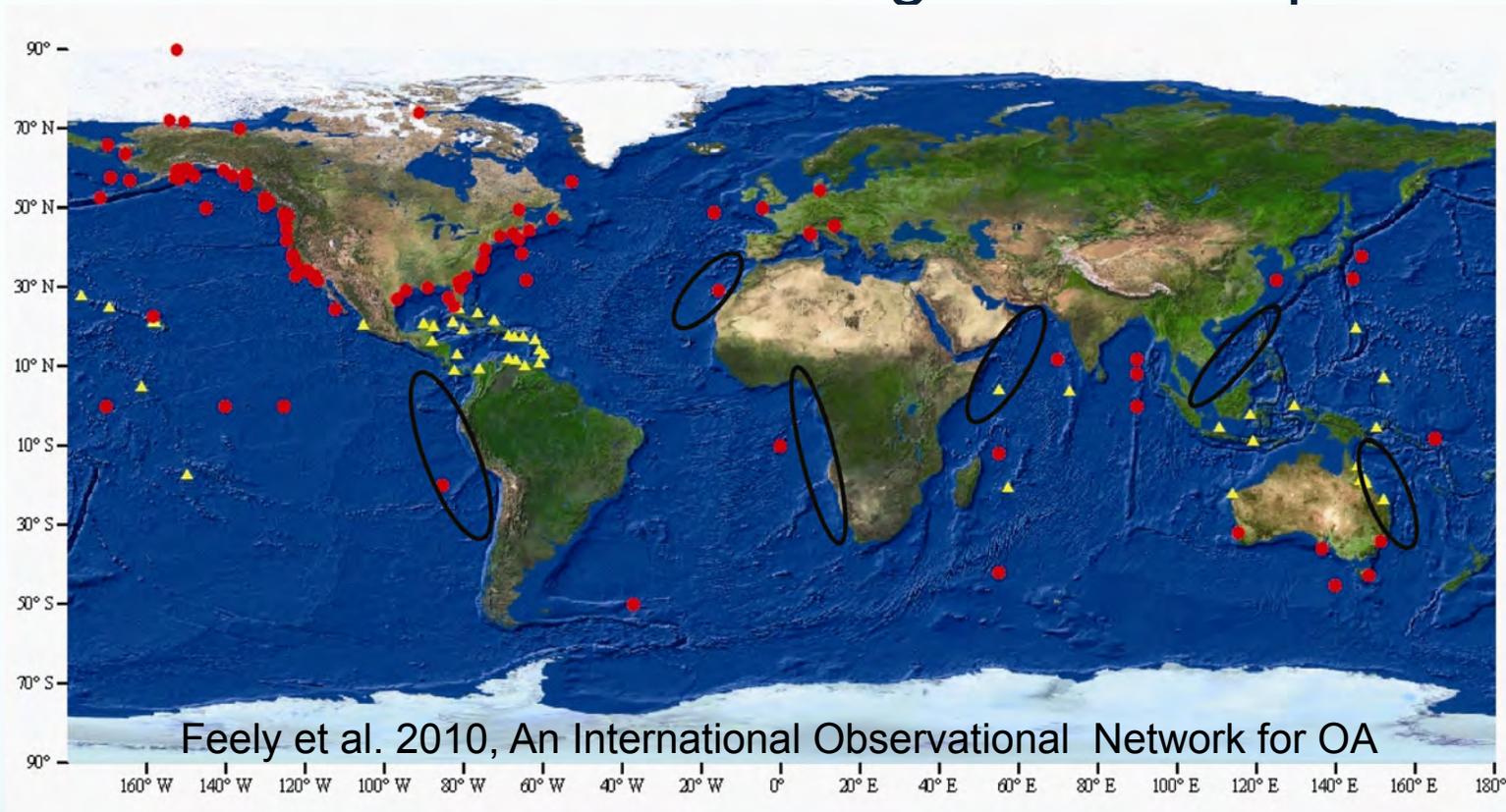


Projected mean summer positions of aragonite compensation points for the Chesapeake Bay.

Shellfish Face Uncertain Future in High CO_2 World: Influence of Acidification on Oyster Larvae Calcification and Growth in Estuaries. Miller et al. *PLoS ONE* 4(5): e5661.



International monitoring in OA hotspots

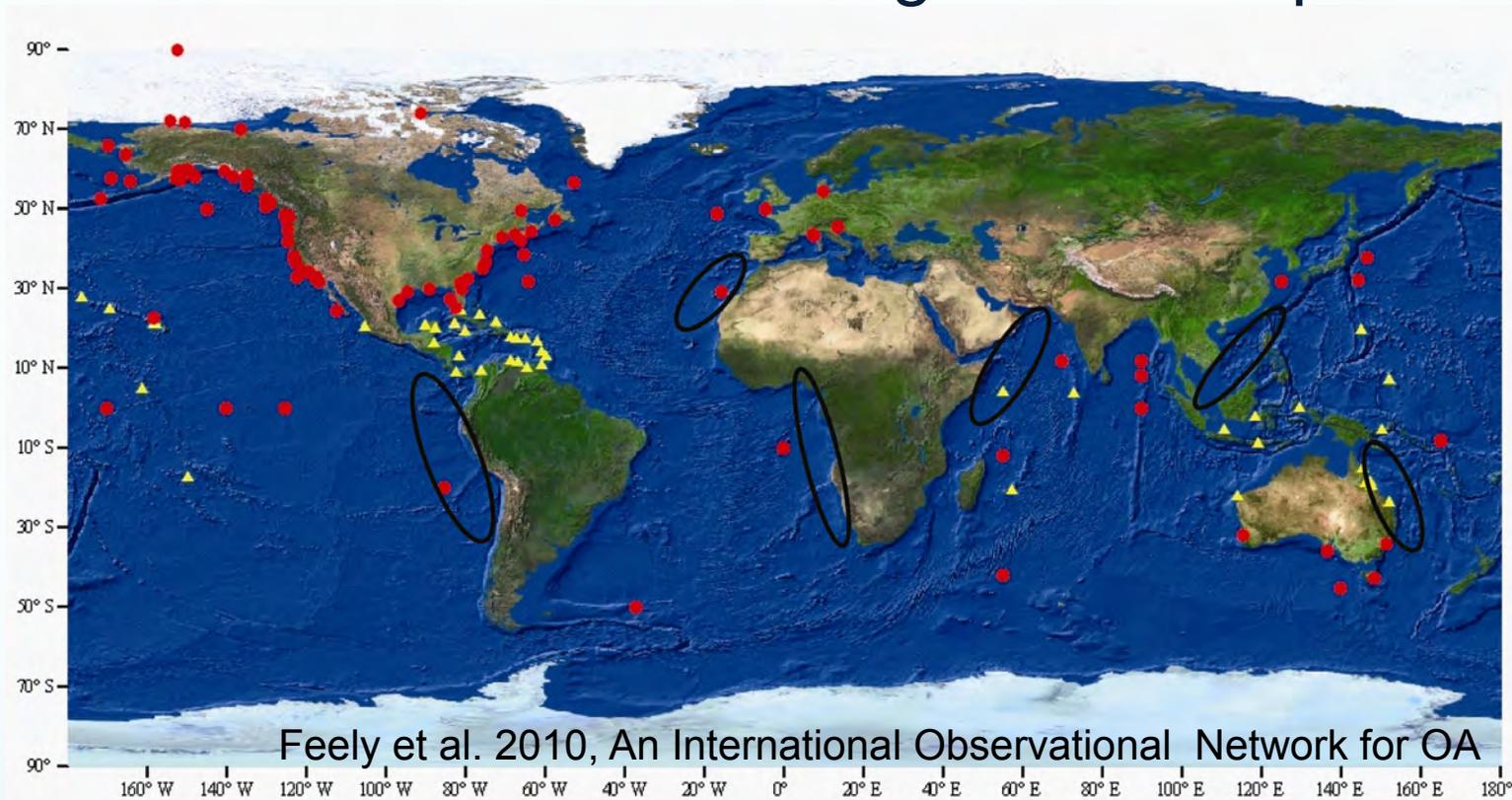


Red circles: deployed or planned open-ocean monitoring sites; yellow triangles: deployed or planned coral reef monitoring sites. Ovals: Future sites likely to experience aragonite undersaturation in the near future.

Eastern Boundary Upwelling Ecosystems (EBUEs) represent around 20% of the global take of marine fish over an area of less than 1% of the global ocean



International monitoring in OA hotspots



EBUE upwelling brings CO₂- and nutrient-rich waters to the surface leading to a large range of pH variability in space and time. They are among the first regions expected to experience undersaturation with respect to aragonite (Gruber, Hauri et al. 2010)

For many of the developing countries on EBUE shores the economic and social benefits of harvest are substantial





Steve Linfield

Thank you

todd.capson@sustainablefish.org