Technical Report 0624

Ocean Acidification Impacts on Shellfish Workshop: Findings and recommendations

Integrated Ocean Observing Systems, California Sea Grant, USC Sea Grant, Oregon Sea Grant, Washington Sea Grant, California Ocean Science Trust and Southern California Coastal Water Research Project

EXECUTIVE SUMMARY

Overview

For at least the past six years, the West Coast Shellfish industry has observed larval mortality in hatcheries and poor larval recruitment success for some species in the wild, especially during periods of high upwelling. One hypothesis is that these dramatic declines in productivity may be related to increasing ocean acidity and the corresponding decrease in the saturation state of carbonate minerals which shellfish use to create their shells. The West Coast shellfish industry sought help from scientists to explore the causes of the shellfish losses, what role ocean acidification and other factors might be playing, and how to adapt to sustain West Coast shellfish resources. Addressing questions about ocean acidification requires integration of ocean observing measurements, laboratory exposure studies, shellfish recruitment and production data, and field studies of organism performance in relation to ocean conditions. However, these data are collected by different sectors that, to date, have had limited interaction. To stimulate collaborations among these sectors, and at the request of the shellfish farming and wild harvest communities, the Integrated Ocean Observing Systems, California Sea Grant, USC Sea Grant, Oregon Sea Grant, Washington Sea Grant, and California Ocean Science Trust convened a workshop. Fifty-one participants were invited, including state and federal managers, industry representatives, and leading academic researchers and oceanographers with expertise in larval recruitment, laboratory studies, and ocean chemistry.

The workshop consisted of 8 plenary talks and three breakout sessions. The plenary presentations provided information summarizing OA research as related to impacts on the west coast shellfish industry including: monitoring programs, laboratory exposure studies, and industry observations. In the first breakout session, participants separated into three groups to outline existing and ongoing data sets, as well as what is needed to answer questions on OA impacts on the West Coast in three areas: oceanographic data, recruitment data, and exposure study data. In the second breakout session participants discussed how existing data sets can be better integrated to clarify impacts of OA and discuss what is needed for future studies both in the near-shore and open-ocean. In the third breakout session, three working groups discussed how to integrate existing research programs and develop future programs to better address impacts of OA on the West Coast. The workshop concluded with a summary of findings and recommendations for next steps.

Significant Workshop Findings

Workshop participants generally agreed that existing datasets cannot be used to explain impacts of OA on shellfish productivity. These datasets are physically and spatially dissociated and standardized protocols for data collection have not been applied. Consequently, interpreting patterns and relationships with existing data sets is difficult. In order to resolve these problems, there is a need to:

- Develop standardized data collection methodology.

- Coordinate chemical data collection at the best biological monitoring sites, leveraging long-term data sets and employing standardized methods.
- Supplement correlative data with an understanding of biological processes.
- Develop predictive models at smaller scales.

Different communities must work collaboratively to address concerns of OA impacts on the West Coast. The momentum generated at this workshop should be maintained.

Recommendations

West Coast Ocean Acidification–Shellfish Workshop participants reviewed existing research, identified information gaps, and proposed modifications and potential solutions to improve the state of knowledge of ocean acidification on the West Coast and to address problems faced by shellfish hatcheries, growers and harvesters. Recommendations included:

1) A West Coast Ocean Acidification Research Coordination Working Group should be established to provide recommendations on best practices and standardized research methods to achieve a coordinated network of ocean observations and experimental studies, in order to observe, understand and quantify the evolving threats posed by ocean acidification along the West Coast of the United States.

2) A West Coast Ocean Acidification Data Exchange, integrated with IOOS, and consisting of a single website that serves as an entry portal to data and information, should be established to provide easy access to available data sets and information regarding ocean acidification processes affecting West Coast fish and shellfish.

3) The proposed NOAA West Coast Ocean Acidification Observing Network should be enhanced and expanded to include sites on the West Coast where in-field biological response studies are conducted.

All workshop materials, including video of presentations and slides are posted online at: www.sccwrp.org/Meetings/Workshops/OceanAcidificationWorkshop.aspx.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/624_OA_ShellfishProceedings.pdf