Governor's Blue Ribbon Panel on Ocean Acidification

Summary of Third Meeting
Wednesday, May 23, 2012, 9:00 p.m. – 3:30 p.m.
UW Center for Urban Horticulture – NHS Hall
3501 NE 41st Street, Seattle

Meeting documents are available on the WA Dept. Ecology Ocean Acidification webpage: http://www.ecy.wa.gov/water/marine/oceanacidification.html.

Meeting Attendance and Objectives

The Blue Ribbon Panel on Ocean Acidification held its third meeting on May 23, 2012, at the UW Center for Urban Horticulture, in Seattle, WA. The meeting was open to the public and broadcast as a webinar.

Panel members and staff participating in this meeting included Hedia Adelsman, Brian Blake, Steven Bloomfield, Chad Bowechop (Makah Tribe alternate for Micah McCarty) Shallin Busch, Meg Chadsey, Chris Davis, Bill Dewey, Richard Feely, Carolyn Friedman (via webinar), Peter Goldmark, Kate Kelly (EPA alternate for Dennis McLerran), Sara Kendall, Terrie Klinger, Jay Manning, Ed Miles, Jan Newton, Betsy Peabody, Bill Ruckelshaus, Jennifer Ruesink, Ted Sturdevant, Terry Williams, Brad Warren, and Lara Whitely Binder.

Special guests invited to present at this meeting included: Julia Roberson (Ocean Conservancy), Lisa Dropkin (Edge Research), Sandy Howard (WA Dept. of Ecology) and Ryan Kelly (Stanford University, Center for Ocean Solutions). Over 65 members of the public and interested stakeholders participated.

Meeting objectives included:

1. Present and discuss key findings of the ocean acidification science white paper.
2. Present results of Edge Research survey of public awareness and understanding of OA.
3. Provide overview of existing ocean acidification recommendations from Federal reports and other initiatives.
4. Update Panel members on the development of:
    a. The draft Panel communications plan (WA Dept. of Ecology);
    b. The white paper on the technical feasibility of OA response strategies (Sustainable Fisheries Partnership);
    c. The policy tool kit analysis white paper (Center for Ocean Solutions);
    d. The status of the Washington Shellfish Initiative; and
    e. Next steps for development of the white papers and collection of initial action recommendations

Presentations and Discussions

All presentations are available on the WA Dept. of Ecology Ocean Acidification webpage (http://www.ecy.wa.gov/water/marine/oceanacidification.html) and should be consulted for details. This summary focuses on discussions generated by the presentations.

Welcome

Co-chairs Jay Manning and Bill Ruckelshaus welcomed the Panel members, and announced the addition of Congressman Norm Dicks (WA-6th) to the panel. Facilitator Lara Whitely Binder reviewed the development of the major products associated with the Panel's charge, and outlined the meeting agenda. Members of the public attending in person and via the webinar were asked to submit comments and questions via email for the public comment period at 3:00pm.

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_welcome_presentation.pdf.

Draft Key Findings from the Science Summary

Richard Feely, NOAA Pacific Marine Environmental Laboratory; Jan Newton, UW Applied Physics Laboratory; Terrie Klinger, UW School of Marine and Environmental Affairs and Meg Chadsey, WA Sea Grant.

This presentation summarized the draft key findings of the ocean acidification science white paper (draft scheduled for release June 6, 2012). The presentation was structured to address 1) what we know (and need to know) about ocean acidification in Washington waters, 2) the sensitivity of habitats, species, and ecosystems to changing ocean chemistry, and 3) observations and research needed to address information gaps in Washington State.

Washington State is particularly vulnerable to pH decline because the regional drivers, including upwelling, hypoxia, nitrogen oxide (NO_X) and sulfur dioxide (SO_X) emissions, and watershed inputs of nutrients, that can combine with the global drivers to exacerbate the acidification process. Different combinations of these drivers influence the expression of acidification on the outer Washington coast, in Puget Sound and the Strait of Juan de Fuca, and in shallow estuaries (e.g. the Columbia River, Willapa Bay, Totten Inlet). The oceanic signal has been estimated to account for 24-49% of acidification in Puget Sound; the remaining signal is assumed to derive from local inputs, such as nitrate contamination and airborne pollutants. The sources of these inputs, and their relative contribution to acidification, have not been established, however.

The regional biological response to acidification is expected to vary depending on location, species life history, genetic diversity, and several other factors. The complexity of biological systems makes it difficult to predict outcomes. We do know that calcifying species, such as

oysters, tend to respond negatively, and that food webs will be perturbed. The current rate of acidification is ten times faster than during any other historical episodes of acidification over the past 300 million years, each of which was accompanied by major marine extinctions.

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_sciencewhitepaper_presentation.pdf

The hour following the presentation was spent addressing questions from the Panel. Major points that emerged during that discussion period included the following:

- The Panel Science Summary definition of ocean acidification should expand upon the IPCC 'preferred' definition, and include additional drivers of chemistry that combine to make Washington waters particularly vulnerable to pH and saturation state decline. The Panel scientists will provide an alternate definition for the science white paper.
- More information on the contribution of watershed nitrate inputs and atmospheric nitrogen (NO_X) and sulfur (SO_X) compounds to regional acidification would be valuable, as well as information about if and how local carbon dioxide emissions affect regional pH levels. The Panel scientists will look into the feasibility of some of these analyses (a function of data availability, time, and cost).
- The science white paper should identify the relative importance of the different drivers contributing to ocean acidification and declining pH to the extent possible. How difficult or costly will it be to control the dominant drivers? What is the risk of acting on incomplete information vs. waiting to act? The science summary white paper and science recommendations should attempt to ask/answer these threshold questions.
- The science white paper should include an estimate of nitrogen loading from various sources (wastewater treatment, agriculture, etc.) if such data exist.
- The science white paper should include a discussion of acidification in sediments, and the effect of pH on infaunal organisms, such as Manila clams, that inhabit them.
- The science white paper should include a discussion of carbon cycling through various biological sinks (managed forests, seagrass beds, shell material).

Communications Related to Ocean Acidification

Julia Roberson, Ocean Conservancy; Lisa Dropkin, Edge Research; Sandy Howard and Hedia Adelsman, WA Dept. of Ecology

These presentations summarized the results of an Edge Research survey about public awareness and understanding of ocean acidification in the U.S., and the implications of these results for the WA Dept. of Ecology plan for communicating the work of the panel and the final report to the public. Key survey findings: awareness of ocean acidification is low; effective messaging should emphasize 'ocean services' and the rapid rate of ocean chemistry change; human interest stories engage the public better than scientific explanations. The Washington Dept. of Ecology is

striving to keep the Panel process transparent and build anticipation for the final report, which will include an emphasis on the relevance of ocean acidification to Washington's economy and residents' quality of life. Ecology is drafting a Problem Statement and FAQ sheet. Communications training will be offered to Panel members in the coming months; panel members were encouraged to serve as 'Panel Ambassadors'.

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_publicopinion_presentation.pdf
http://www.ecy.wa.gov/water/marine/oa/20120523_communications_presentation.pdf

Update on the Technical Paper on the Science of Response Strategies
Brad Warren, Sustainable Fisheries Partnership

Brad Warren's presentation reviewed potential sources of atmospheric and nutrient pollution that could be contributing to ocean acidification in Washington State, and highlighted potential mitigation, adaptation and remediation response strategies based on work done to date for the analysis being prepared by the Sustainable Fisheries Partnership. The practical and scientific feasibility of these and other measures will be assessed in the forthcoming technical paper. Points raised by Panel members following this presentation included: a request that the technical paper include a cost analysis of various measures; ways to engage and compensate stakeholders affected by such measures; the fact that pollution control measures can have unintended consequences (e.g. The N. American Emissions Control Act requiring maritime traffic to switch to cleaner fuel upon entering U.S. waters may actually increase local acidification, due to seawater 'scrubbing' of fuel tanks.

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_warren_presentation.pdf

Overview of Policy Tool Kit Analysis:
Ryan Kelly, Stanford University, Center for Ocean Solutions

Dr. Kelly explained how the forthcoming report on laws and policies relevant to ocean acidification management in Washington State will be structured, and invited panel members to submit their ideas for policy options. By way of example, the laws and policies applicable to reducing nitrogen waste generated by the dairy industry were reviewed. Ideally, various options could be assessed in terms of their implementation time, the time to realized benefits, and magnitude of realized benefits. New incentives and disincentives need to be developed to deal creatively with the problem of ocean acidification. Points raised by Panel members following this presentation included: the need for international policy tools to address acidification inputs originating in Canada (e.g. contributions from Frasier River); the appropriateness of invoking the

Clean Water Act 303(d) rules to address acidification; and the need for Washington agencies to help align interests among various stakeholders (e.g. farms and fisheries in Snohomish Co.).

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_kelley_presentation.pdf

Overview of International and Federal OA Recommendations

Lara Whitely Binder, UW Climate Impacts Group

This presentation was shortened to keep the meeting on schedule; panel members were asked to review the information posted on the Washington Dept. of Ecology ocean acidification webpage for more detail. The analysis looked at the types of recommendations identified in the Federal Ocean Acidification Research and Monitoring Act of 2009, the National Research Council's *Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean* (2010), the National Ocean Policy's *Draft National Ocean Policy Implementation Plan* (2012), and the *Washington State Integrated Climate Response Strategy* (2012).

With the exception of the Washington strategy, the recommendations for addressing ocean acidification are very general. Common themes were: 1) increased and more coordinated monitoring (related themes: improved data collection, management, standardization), 2) identifying and filling capacity gaps (e.g., in monitoring, research facilities, technical resources, training and education, etc.), 3) research (key areas: physical science, biological impacts, and socioeconomic impacts), and 4) increased interagency coordination.

The Washington State Integrated Strategy included many of these themes in a set of action recommendations focused on enhancing understanding and monitoring of ocean acidification in Puget Sound and coastal waters, and the ability to adapt to and mitigate effects of seawater acidity on shellfish, other marine organisms, and marine ecosystems. More specifically, the State Strategy recommends:

- Supporting the work of Blue Ribbon Panel on Ocean Acidification
- Expanding collaboration with NOAA Fisheries, other federal agencies, nonprofit organizations, academic groups, and the shellfish industry to enhance monitoring to track biological and chemistry changes
- Coordinating with state and federal agencies to improve monitoring by evaluating and adopting improved pH measurement protocols.
- Continuing to actively address problems of pollutants in marine waters by studying toxics and nutrients entering Puget Sound, and develop models to determine the effects of nitrogen discharges on dissolved oxygen levels in Puget Sound.
- Continuing to explore how Clean Water Act authorities can be used to prevent or reduce localized effects from ocean acidification and climate change.

Details on the recommendations from the other reports reviewed for this assessment are available in the related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_binder_presentation.pdf

Update on the Status of the Washington Shellfish Initiative

Josh Baldi, WA Dept. of Ecology

This presentation reviewed how the Washington Shellfish Initiative (SI) is implementing its three-part charge:

1. To establish public/private partnerships to improve aquaculture
2. To promote native shellfish restoration & recreational harvest
3. To ensure clean water to protect and enhance shellfish beds

In carrying out its charge, the SI has opportunities to raise awareness of acidification (e.g. highlighting the potential of restored shellfish beds to mitigate acidification).

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_baldi_presentation.pdf

Discussion on Science Expectations

The Panel held an unscheduled conversation, prompted by a comment from a Panel scientist, about the expectations being placed on the science white paper. Some of the Panel members' requests for information could be addressed by additional analyses, but additional time and resources would be necessary. Panel co-chairs invited Panel scientists to submit workplans for additional analyses that could enable the Panel to recommend scientifically-supported actions addressing local acidification drivers. The science white paper should clearly state when scientific information is inadequate to support particular policy measures.

Panel Process: Updates and Next Steps

Lara Whitely Binder, UW Climate Impacts Group

Lara's presentation focused on next steps for distribution and review of the draft white papers and solicitation of initial action recommendations from Panel members.

White Papers. White papers will be sent to Panel members on June 6 (target date) for review and use when developing initial action recommendations. Comments will be due on Friday, June 29. This is an extended deadline from previous plans. Panel comments will be synthesized, reviewed, and addressed (when possible) during July. Final draft copies of the white papers are expected in early August,

Collecting Initial Action Recommendations. Panel members were asked to begin collecting their initial action recommendations for Panel review and discussion. Recommendations will be collected using an online survey tool that walks Panel members through a series of questions for each recommendation they are submitting. A Word version of the template will also be provided but use of the online tool will allow the facilitation team to more quickly and effectively prepare the recommendations for discussion by the Panel at the June 20 meeting. Requested information for each action recommendation will include (with response options noted):

- Title and description of recommendation
- Geographic Domain: All coastal areas, Puget Sound, Outer coast, Other, Not applicable
- Implementation Time Frame: Near (<5 years), Medium (5 to 10 years), or Long term (10 + years)
- Implementation Barriers
- Programs to Leverage (Yes, No, Please identify)
- Implementation Partners
- Estimated Relative Cost: Low (e.g., <$250k), Medium ($250k to $1 million), High (>$1 million), Don't know, Not applicable
- Relative Risk of the Action (a no/low-regrets action?): Yes, No

Recommendations are due by Friday, June 15. The facilitation team will have less than two days to compile and prepare the recommendations for discussion on June 20, so Panel members were again encouraged to use the online tool that will be made available to them.

Related presentation slides:
http://www.ecy.wa.gov/water/marine/oa/20120523_nextsteps_presentation.pdf

Document Appendix

May 23, 2012 Blue Ribbon Panel on Ocean Acidification Meeting Agenda:
http://www.ecy.wa.gov/water/marine/oa/20120523_agenda.pdf

Ocean Acidification Blue Ribbon Panel

Agenda - Meeting #3 *(updated 5.21.12)*

May 23, 2012 | 9:00 am - 3:30 pm

University of Washington Center for Urban Horticulture – NHS Hall

3501 NE 41st Street, Seattle

Public access to the meeting is available via webinar. Registration is required. To register, go to: https://wadismeetings.webex.com/wadismeetings/j.php?ED=194292252&RG=1&UID=0&RT=MiM0. Once the host approves your request, you will receive a confirmation email with instructions for joining the meeting.

9:00 – 9:10	**Welcome and Overview of the Day** *Panel co-chairs, Jay Manning and Bill Ruckelshaus, and Lara Whitely Binder, UW Climate Impacts Group (CIG)*
9:10-10:10	*Presentation and Discussion* **Draft Key Findings from the Science Summary** *Richard Feely, NOAA Pacific Marine Environmental Laboratory* *Jan Newton, UW Applied Physics Laboratory* *Terrie Klinger, UW School of Marine and Environmental Affairs* *Meg Chadsey, Washington Sea Grant* This presentation will provide an update on the development of the science summary being prepared by Panel scientists and an overview of key findings related to the physical drivers of OA, biological impacts, and monitoring. Questions and discussion about the key findings will follow the presentation.
10:10-10:30	*Break*
10:30-11:30	*Key Science Findings Discussion (cont'd)* This session will provide additional time for facilitated discussion on key findings from the science summary.
11:30-12:00	*Lunch* (provided for Panel members and invited speakers)
12:00-1:05	*Presentation and Discussion (working lunch)* **Communications Related to OA** *Julia Roberson, Ocean Conservancy* *Lisa Dropkin, Edge Research* *Sandy Howard and Hedia Adelsman, Dept. of Ecology* The presentation and discussion will cover the results of a comprehensive survey of U.S. public awareness and understanding of ocean acidification. The presentation will also provide an update on the draft communication plan on how to effectively communicate the work of the Panel and the results of the final report.

1:05-1:20	*Break*
1:20-2:30	*Presentations and Discussion* This session will include a series of brief presentations from and about the following. Opportunity for questions and discussion will follow each presentation. **Update on SFP's Technical Paper on the Science of Response Strategies** *Brad Warren, Sustainable Fisheries Partnership* This presentation will provide a brief update on the paper being prepared by the Sustainable Fisheries Partnership (SFP) summarizing and evaluating the technical feasibility of response options for ocean acidification. **Policy Tool Kit Analysis** *Ryan Kelly, Center for Ocean Solutions* This presentation will provide an overview of work done to date identifying policy tools that could be used to address ocean acidification. Opportunity for questions and discussion will follow the presentation. **Overview of International and Federal OA Recommendations** *Lara Whitely Binder, UW Climate Impacts Group* This presentation will briefly highlight recommendations provided in existing international and national reports for addressing ocean acidification.
2:30-2:50	*Presentation and Discussion* **The Washington Shellfish Initiative** *Josh Baldi, Washington Department of Ecology* This brief presentation will provide an update on the status of the Washington Shellfish Initiative and how that work relates to the Panel's charge.
2:50-3:10	*Presentation and Discussion* **Updates and Next Steps** *Lara Whitely Binder, UW CIG and Meg Chadsey, WA Sea Grant* This session will include updates on next steps for the science summary, development of science and other recommendations, and other information.
3:10-3:15	**Meeting Close** *Lara Whitely Binder, UW CIG and Panel Co-chairs*
3:15-3:30	**Public Comment Period** *Facilitated by Lara Whitely Binder, UW CIG*