MARINE RESOURCES ADVISORY COUNCIL

Meeting summary
September 11, 2019 10 a.m. to 3:30 p.m.
Kenneth K. Chew Center for Shellfish Research and Restoration
Manchester, WA

Meeting attendance and objectives
The Washington Marine Resources Advisory Council (MRAC) held its 20th meeting on September 11, 2019 in Manchester, Washington. The meeting was facilitated by Martha Kongsgaard, MRAC Chair, and Angie Thomson, EnviroIssues.

Members in attendance: Martha Kongsgaard (Chair), Bill Dewey (Taylor Shellfish Farms), Dale Norton (Washington Department of Ecology- alternate for Maia Bellon), Garrett Dalan (The Nature Conservancy), Gus Gates (Surfrider Foundation), Kirsten Feifel (Washington Department of Natural Resources), Libby Jewett (National Oceanic and Atmospheric Administration), Marilyn Sheldon (Coastal Shellfish Growers), Mike Rechner (Washington Department of Natural Resources), Mindy Roberts (Washington Environmental Council), Rich Childers (Washington Department of Fish and Wildlife – alternate for Kelly Susewind)

MRAC members not in attendance: Alan Clark (Northwest Straits Commission), Brian Allison (Puget Sound Commercial Crab Association), Representative Dave Hayes (Washington State House of Representatives), Erica McPhee-Shaw (Western Washington University), Jay Manning (Puget Sound Partnership), Senator Jesse Salomon (Washington State Sentate), Representative Joe Fitzgibbon (Washington State House of Representatives), Lisa Graumlich (University of Washington), Mike Cassinelli (Recreational Fishing Tourism), Norm Dicks (Van Ness Feldman LLP), Ron Shultz (Washington State Conservation Commission), Terry Williams (Tulalip Tribes of Washington), Tom Davis (Washington Farm Bureau), Tony Floor (Northwest Marine Trade Association)

Other participants: Betsy Peabody (Puget Sound Restoration Fund), Brad Warren (Global Ocean Health), Cristiana Figueroa-Kaminsky (Washington Department of Ecology), Dustin Bilhimer (Washington Department of Ecology), Greg Pelletier (Washington Department of Ecology), Kelly Ferron (Washington Department of Ecology), Jan Newton (Washington Ocean Acidification Center), Jennifer Hennessey (Office of the Governor), Joth Davis (Pacific Hybreed), Meg Chadsey (Washington SeaGrant), Shallin Busch (National Oceanic and Atmospheric Administration), Paul Williams (Suquamish Tribe), Peter Murchie (Environmental Protection Agency – alternate for Linda Anderson-Carnahan)

Additional participants for the tour: Anna Nepomuceno (Chair of House Transportation Committee, Washington State House of Representatives – Representative Jake Fey Legislative Assistant), Matthew Griffin (Washington Station House of Representatives – Representative Caldier Legislative Assistant)

Meeting objectives:
- Share updates on recent ocean acidification activities and events
- Hear an update on recent scientific developments

- Hear a presentation on the latest science and action related to nutrient monitoring and reduction
- Discuss Adaptation & Remediation ad hoc challenges, ideas, and policy/budget gaps
- Hear an update on recent communication strategies and materials
- Tour Kenneth K. Chew hatchery and learn about current research projects
- Hear a preview of MRAC's 2019-21 biennium workplan

Materials distributed:

- MRAC 2019-2021 State Budget Priorities one-pager
- Blue Ribbon Panel Actions Being Implemented at the Kenneth K. Chew Center
- Puget Sound Restoration Fund one-pager
- Kenneth K. Chew Center one-pager
- Meeting agenda

Welcome and introductions

Martha Kongsgaard, MRAC Chair, opened the meeting and thanked council members for their participation.

Recent OA happenings and research

Angie Thomson, EnviroIssues, invited participants to share updates on recent happenings related to ocean acidification work.

- Mindy Roberts, Washington Environmental Council, shared an update on recent progress with the Southern Resident Orca Task Force and a draft report on recommendations for orca recovery. Some recommendations align with the need to address the impact of ocean acidification, specifically on the connection with the marine food web. Mindy invited attendees to review the report and provide notes on the proposed recommendations. Mindy also announced *We Are Puget Sound*, an initiative to promote public engagement and advocacy to address issues affecting Puget Sound.

- Jennifer Hennessey, Office of the Governor, announced the OA Alliance and MRAC representatives will be participating in the Coast to Coast State Convening workshop in New York to discuss regional impacts of ocean acidification, exchange lessons learned, and share Washington's story.

- Rich Childers, Washington Department of Fish and Wildlife, noted a shellfish growers and west coast shellfish work group will convene in September to share regional findings and research updates.

- Kirsten Feifel, Washington Department of Natural Resources, shared an update on kelp research. Data collected in the past few years from the Department of Natural Resources is reflecting dramatic declines in kelp in south Puget Sound. Data collection and analysis for central Puget Sound is currently underway and expected to be available in early 2020. A kelp conservation recovery plan, in partnership with NOAA and the Northwest Straits Commission, is in progress. Kirsten also noted a study is underway using sensors placed

within eelgrass beds to better understand site variability and water conditions. Olympia oysters are planted at these locations to observe impacts on growth.

- Jan Newton, Washington Ocean Acidification Center (WOAC), participated in a west coast webinar that discussed the impacts of frequent marine heat waves. When upwelled water off the coast of Washington is warmer than average, conditions linger due to the silt and retentive nature of Puget Sound. Jan encouraged the group to check out the recent development from the Global OA Observing Network including a workshop with 160 nations in China last April.

- Dale Norton, Washington Department of Ecology, announced the Department of Ecology received permanent funding to hire a senior ocean acidification scientist. The posting was distributed to the group.

- Libby Jewitt, National Oceanic and Atmospheric Administration, shared how NOAA is in the final stages of developing its ten-year OA Research Strategic Plan. The plan will be available in the coming months on the OA Information Exchange.

- Peter Murchie, Environmental Protection Agency, encouraged MRAC members to engage in conversations around where ocean acidification could fit into priorities for the next Puget Sound Partnership Action Agenda.

Science update

Jan Newton, WOAC, presented on recent science developments and key takeaways from the 2019 WOAC Symposium. Highlights include:

- WOAC will continue to focus on monitoring and modeling efforts, including:
    - Monitoring in Washington waters (buoys and vessel cruises) with a focus on comprehensive chemistry and plankton
    - Monitoring shellfish hatcheries with consultation from UW and NOAA chemists
    - Modeling of ocean acidification forecasts with LiveOcean
- WOAC-led monitoring in Washington waters will have an increased focus on biology, including eDNA, larvae, etc. with potential sampling of cup corals.
- Biological experiments on Washington species will continue to investigate impacts on salmon, expand to include new work on forage fish in collaboration with WWU, and will expand to explore the connection between harmful algal blooms and ocean acidification.
- Key takeaways from the 2019 WOAC Symposium include:
    - The combination of monitoring strategies (cruises, buoys, nearshore, offshore, etc.) by Washington partners is worthwhile and has helped to explain there are site-specific differences in ocean acidification conditions in Washington waters (NOAA, UW):
        - Puget Sound vs. outer coastal waters (buffering)
        - Shallow vs. deep (processes)

        - Stratified basins vs. well-mixed basins (geography)
    - Lab experiments show there are multiple effects from ocean acidification on multiple species including:
        - A decline in Coho salmon's ability to detect and avoid predators, this may be related to changes in blood chemistry and effects on ability to sense chemicals in the water (UW, NOAA)
        - An increase in herring death rates due to higher temperatures and lower pH levels (WWU)
        - A decrease in Dungeness crab larval survivorship, and slower development in survivors, when exposed to abnormally high dioxide levels(NOAA)
    - New techniques have helped to explain new discoveries such as eDNA from *Kareniaceae*, a potentially toxic alga, is rare but found repeatedly in low pH waters (UW).
    - Field observations show pteropod shells from the coast are one-third thinner than those collected in open ocean (SCCWRP, UW).
    - New modeling tools include forecasting on daily scales, projections on end-of-century scale, and biological threshold assessment.

The group noted the following points:

- The Department of Fish and Wildlife has forty- years of data on forage fish populations for lab and field experiments available as a resource to Western Washington University graduate students.
- Taylor Shellfish experienced major mortality rates in their shellfish this past summer due to increased algal blooms in North and Discovery Bay.
- The Puget Sound Restoration Fund hatchery experienced an increase in the dinoflagellate *A. Cinguinea* that was difficult to control and remove from the hatchery.
- There is a need to draw the connection between ocean acidification and harmful algal blooms.

Nutrient update

Dustin Bilhimer, Washington Department of Ecology's Nutrient Forum, presented on nutrient monitoring and reduction efforts underway at the state-level. Highlights include:

<u>Human nutrients and ocean acidification:</u>

- Sources of human nutrients include domestic wastewater treatment centers, unmanaged stormwater runoff, increased urbanization, and poor land management practices. These alterations increase stormwater runoff from agricultural and forestry land, while impairing the natural ecological functions watersheds use to process nitrogen.
    - Managing growth now through practices of low impact development and green stormwater infrastructure can help prevent expensive future problems.
- Salish Sea Model results show that human nutrient inputs cause about 15-20% of the decrease in pH/omega over wide-spread areas in Puget Sound, many of the same areas experience low dissolved oxygen impacts due to human sources. With nutrient reduction

technology, we could see half as many non-compliant days and improve the spatial extend of marine water that meet dissolved oxygen standards.
- Excess human nutrients are causing negative biological impacts to some of the most sensitive life history stages of species at the base of the food chain. Results suggest crab megalopae and pteropod eggs may be significantly affected conditions caused by human nutrient sources.

Ecology's Puget Sound Dissolved Oxygen work:

- In 2018, Ecology's Water Quality Program launched the Puget Sound Nutrient Source Reduction Project to address dissolved oxygen problems in Puget Sound. Human nutrient reduction goals focus on meeting biologically-based numeric Dissolved Oxygen criteria. If this numeric criteria cannot naturally be reached then all human sources combined are restricted to not decreasing dissolved oxygen by more than 0/2mg/L.
- Reduction goals are based off natural levels which includes the influence of increased nitrogen and decreased dissolved oxygen upwelled from the deep Pacific Ocean. If the natural chemistry is lower than the desirable criteria, then the total human impact cannot reduce dissolved oxygen by more than 0/2mg/L below the natural condition.

Puget Sound Nutrient Forum:

- Over the past 16 months Ecology hosted a series of all-day workshops for tribes, stakeholders, and the public to discuss the importance of nutrient management, learn about water quality trends, and develop an understanding of the Salish Sea Model.
- Speakers from Chesapeake Bay, Long Island Sound, San Francisco Bay, and other U.S. coastal estuaries shared strategies they are taking to manage excess nutrients.
- Nutrient management activities in Puget Sound were highlighted such as the LOTT Center Wastewater Treatment Center and nonpoint activities by Snohomish Conservation District. A regional economist presented on cost-effectiveness of nutrient reduction solutions including advanced wastewater treatment.
- Ecology shared approaches to managing potential point and nonpoint sources and grants to support research into this topic.
- These Forums will continue in 2020 with shorter and more focused web-based meetings.

Current actions to reduce nutrients:

- In August, Ecology announced a Preliminary Determination to develop a Nutrients General Permit over the next two years for controlling point-source pollution from Puget Sound Wastewater Treatment Plants. Over the next two years, the Salish Sea Model will be used to better understand the significance of the following:
    - The impacts from watersheds and marine nutrient sources on near-field dissolved oxygen within each Puget Sound Basin
    - Expected improvement from year-round vs. seasonal wastewater treatment plant reductions
    - Future population growth impacts
    - Combined watershed and marine source reductions needed to meet standards
- The goal in the coming years is to use science to inform regulatory and policy decisions to reduce excess nutrients in Puget Sound through the development of a Nutrient Managing Plan. This plan will include:

- Reducing the magnitude and duration of Dissolved Oxygen events
- Reducing local human impacts contributing to ocean acidification
- Improve and restore nearshore habitats
- Provide a healthier marine food-web for forage fish, salmon, and orca populations

A member of MRAC made a motion to provide a letter of support for the Department of Ecology's proposal to reduce nutrients from wastewater treatment plants by issuing a nutrient general permit.

Tour of the Kenneth K. Chew Center for Shellfish Restoration and Research
Representative Michelle Caldier, Matthew Griffin (Legislative Assistant to Rep. Caldier), and Anna Nepomuceno (Legislative Assistant to Rep. Fey) joined MRAC for the meeting and a tour of the hatchery facilities.

Adaptation & Remediation
Angie Thomson shared that upcoming MRAC meetings will focus on each ad hoc topic, starting with Adaptation & Remediation, to pinpoint existing barriers, policy needs, and budget asks in preparation for the next biennium budget process. Highlights from the Adaptation & Remediation discussion include:

- The Department of Fish and Wildlife and Department of Natural Resources met to discuss the need for defined regulations around the permitting, cultivation, and harvesting of bull kelp.
- The Department of Ecology was identified as a potential host for a forum focused on geoduck aquaculture to discuss the permitting overlaps with vegetation, cultivation impacts on the environment, and share similar experiences.
- Participants discussed the role bull kelp plays in understanding ecosystem health in Puget Sound, and how recent data reflects declining kelp populations. The group identified how kelp is not currently included in the Puget Sound Partnership's Puget Sound Vital Signs.
- Med Chadsey and Jodie Toft are working to obtain funding for a series of kelp and seaweed workshops this November to discuss upcoming research, propagation and cultivation findings, and ecological and commercial benefits and impacts.
- The Department of Ecology is investigating the ability to include harvesting seaweed within shellfish permits and is considering expanding vegetation research from bull kelp to other types of seaweed and eelgrass.
- NOAA, The Rock Fish Recovery Group, Department of Natural Resources, Port of Seattle, and PSRF are working collaboratively on several bull kelp research projects. An advisory group between NOAA and UW are supporting these efforts with data on topics like kelp genetics better understand population trends.
- The NW Straits Commission and partners are working on a kelp recovery plan for over 20 native kelp species, including bull kelp.
- A group is going to convene to clarify questions related to seaweed harvest and inform a later discussion on funding needed to answer those questions.

Education & Outreach
Jennifer Hennessey, Office of the Governor, provided an update on recent work to develop communication materials. This summer, a work group convened to brainstorm strategic

messaging and materials to communicate the Washington ocean acidification story to legislators. Materials developed as a result of this work group will be available in the coming months.

Jennifer is working with the Department of Ecology on a supplemental piece to Dustin's nutrient work that will provide a more detailed set actions, an update on OA efforts, and share nationwide collaborations to present to key legislators.

Next steps
Martha Kongsgaard, Chair, and Angie Thomson, EnviroIssues, shared a preview of MRAC's workplan and key milestones over the next two years. The next in-person MRAC meetings will be early 2020. Summer 2020 will focus on developing budget requests.