EXTERNAL REVIEW
OF THE
COOPERATIVE INSTITUTE FOR MARINE RESOURCE STUDIES (CIMRS)
OREGON STATE UNIVERSITY
CORVALLIS, OREGON

SUBMITTED TO THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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SUMMARY

An external review of the research, education, and outreach programs of the COOPERATIVE INSTITUTE FOR MARINE RESOURCE STUDIES (CIMRS) at the Oregon State University (OSU) was conducted on 28-29 April 2015 in Newport, OR and Corvallis, OR. Guidelines for conducting the review were provided by the Cooperative Institute Program Office within the National Oceanic and Atmospheric Administration (NOAA) Office of Oceanic and Atmospheric Research. The review was conducted under the auspices of the NOAA Science Advisory Board (SAB) and, therefore, is subject to the requirements of the Federal Advisory Committee Act (FACA). A list of review panel members is provided in Appendix I. The review panel's on-site agenda is provided in Appendix II.

Overall, the review panel rated CIMRS' performance as "outstanding." However, there was some variation in performance across the four topics required for evaluation: strategic planning, research, education and outreach, and science management. Although the current science foci of the cooperative institute are bold and engaging, *strategic planning* to affect that vision is weak. In particular, the design and implementation of a structure that allows the resident research, education and outreach community to implement the current vision, and plan for the future, is needed. The four major *research* themes identified by CIMRS—seafloor processes, marine ecosystems and habitat, protection and restoration of marine resources, and marine bioacoustics--were all clearly addressed by ongoing work that ranged from excellent to world-renowned. In particular, research on marine acoustics is an exemplar of team-based work with strong ties to application and potential commercialization. CIMRS has been effective in its facilitation of "seed" projects, including ocean acidification impacts on shellfish aquaculture. *Education and outreach* have strong potential that is not yet fully realized. Greater attention is needed on diversity/inclusion issues, and workforce pipeline programming more generally. With respect to *science management*, CIMRS has built a strong collaborative research community that meets NOAA needs and takes advantage of the expertise at OSU and--more broadly--expertise resident in the Hatfield Marine Science Center community. Nevertheless more gains would be realized with a more strategic approach that focuses on the unique strengths of a collaborative OSU-NOAA interaction, ensuring both bold future research capacity and significant workforce development.

The panel makes nine recommendations directed primarily at CIMRS (enumerated) and three recommendations directed primarily at NOAA (alphabetized), all of which are listed immediately below in abbreviated form.

STRATEGIC PLAN

Recommendation 1: CIMRS should produce a more formal strategic plan that creates a structure within which the CIMRS, NOAA and OSU communities can flexibly address ongoing and emerging issues that are expressive of the unique value and expertise resident at OSU and at HMSC and consistent with the research themes for which NOAA created CIMRS.

Recommendation 2: The Director should embrace his role as the primary representative and spokesperson for CIMRS.

Recommendation A (for NOAA): Leadership of NOAA partner agencies should

provide guidance and consultation to CIMRS at the earliest stages of discussion and long-range planning with respect to unique value-added programs, projects and products the cooperative institute could provide.

SCIENCE REVIEW

Recommendation 3: More systematic discussion and planning are needed to take advantage of potential for commercialization of intellectual property.

Recommendation 4: CIMRS should foster research depth in research themes that are strong and unique contributions to the NOAA mission, potentially at the expense of breadth.

EDUCATION/OUTREACH

Recommendation 5: A stronger, more visible partnership should be created between CIMRS and Oregon Sea Grant.

Recommendation 6: Mechanisms must be found to create stronger undergraduate student, graduate student, and postdoctoral participation in CIMRS.

Recommendation 7: A proactive plan is needed to engage traditionally underrepresented groups in CIMRS research and activities.

SCIENCE MANAGEMENT

Recommendation B (for NOAA): Increase Task 1 funding to at least the level originally identified in the request for proposals, so that OSU can become more of a genuine partner and not merely a contractor.

Recommendation 8: The Director should devote increased attention to strategic management and implementation (in addition to strategic planning), organizational structure, decision-making, and branding and marketing/communications

Recommendation 9: In consultation with the Science Advisory Council, the Director should foster more cohesion and collaboration within those research themes that currently lack focus and a long term implementation strategy.

OTHER

Recommendation C (for NOAA): NOAA should finalize as quickly as possible new instructions to review panels to allow more nuanced and detailed evaluations of the various components of CIs.

OVERVIEW OF COOPERATIVE INSTITUTE FOR MARINE RESOURCE STUDIES (CIMRS)

The Cooperative Institute for Marine Resources Studies (CIMRS) was established in 1982 as a single institution Cooperative Institute to foster collaborative research between Oregon State University and the National Oceanic and Atmospheric Administration (NOAA) in fisheries science, aquaculture, oceanography, marine-resource technology and related fields. The present-day CIMRS partnership brings university scientists together with scientists from NOAA's

Northwest Fisheries Science Center (NWFSC), Alaska Fisheries Science Center (AKFSC), and Pacific Marine Environmental Laboratory (PMEL). Current research themes are: Marine Ecosystems and Habitat, Protection and Restoration of Marine Resources, Seafloor Processes, and Marine Bioacoustics. CIMRS' diverse and richly multidisciplinary range of applied and basic research investigations include marine chemistry and geophysics, ocean acidification and hypoxia, trophic dynamics and modeling, fisheries stock/habitat assessment and behavioral ecology, longer term prediction of physical (mesoscale/upwelling/plume/estuarine) and biological (predator/prey, lipid composition) inter-relationships and climate, zooplankton ecology, genomics, passive acoustic monitoring of marine mammals, socio-economic issues related to fisheries, and spatial planning.

CIMRS has major clusters of personnel on the main Oregon State University campus in Corvallis as well as at OSU's Hatfield Marine Science Center (HMSC) on the coast in Newport, OR. At the HMSC location, CIMRS benefits tremendously from being co-located with five federal agencies—NOAA, Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), U.S. Geological Survey (USGS), and the U.S. Fish and Wildlife Service (USFWS)--and the Oregon Department of Fisheries and Wildlife. At HMSC, NOAA is represented by PMEL, NWFSC, and AKFSC. Over the last four years, annual total funding to CIMRS has ranged from $1.3M to $2.5M, with NOAA providing from about 50% to 70% of the total. Task 1 funding from NOAA has ranged from $50K to $71K annually.

STRATEGIC PLAN

The scientific vision for CIMRS is "holistic oceanography," which addresses NOAA's science, service, and stewardship missions. CIMRS has four on-going research themes, with each theme responsive primarily to one or two line offices of NOAA.

- **Marine Bioacoustics** (PMEL), with substantial additional funding from the Office of Naval Research (ONR) and the National Science Foundation (NSF); this is the most well-funded and cohesive research team, contributing roughly half of all CIMRS expenditures.
- **Seafloor Processes** (PMEL), including hydrothermal vents, volcanism and earthquakes.
- **Marine Ecosystems & Habitat** (NWFSC and AFSC); social science (economics and sociology) is strongly represented in this theme, which has suffered substantial loss of financial support from NOAA in recent years.
- **Protection and Restoration of Marine Resources** (NOAA NMFS NWFSC and AFSC), including research related to fish stock assessment and marine mammals.

  An emerging research theme is geomatic engineering, because mutual interest exists between new faculty hires in OSU's School of Civil and Construction Engineering and the NOAA National Geodetic Survey. A potential future theme is environmental (seafloor) microbial genomics, because of overlap of interest between NOAA and OSU, which is likely hiring new faculty lines in genomics and bioinformatics. Additional potential future themes were mentioned by the Director.

Findings:

- CIMRS has a strong record of accomplishment on its four research themes. Marine bioacoustics is the only research group that clearly functions as a team, and that has a sustained record of leveraging NOAA investments into major additional external funding.

This group has a strong national and international reputation, and has successfully transitioned software and hardware into the marketplace.

- No formal strategic plan document exists, and in practice CIMRS is primarily responsive and opportunistic to the needs of NOAA, seeking opportunities for synergy between OSU and NOAA.

Recommendation 1: The panel recommends that CIMRS produce a more formal strategic plan that creates a structure within which the CIMRS, NOAA and OSU communities can flexibly address ongoing and emerging issues that are expressive of the unique value and expertise resident at OSU and at HMSC and consistent with the research themes for which NOAA created CIMRS. Such a plan would better balance what has been an almost entirely reactive and opportunistic approach by CIMRS. A much more concrete and proactive plan is essential; such a plan would identify and champion research foci that are distinctive to CIMRS, and do not overlap greatly with larger, deeper programs at other universities. One important opportunity is the joint planning that could occur in the context of OSU's proposed new residential Marine Studies Program (proposed to serve 400 undergraduates, 100 graduate students) at the HMSC. On the other hand, the panel recognizes that there has been little incentive to develop a strategic plan because of the lack of discretionary funding available to the Director (whose appointment is 40% as Director) by which he might incentivize such planning and influence research directions.

Recommendation 2: The Director should embrace his role as the primary representative and spokesperson for CIMRS in order to: promote the value of the NOAA-university partnership within OSU, to NOAA, and to other potential funders that could leverage CIMRS investments and HMSC infrastructure; and to increase the transition of research into private practices, management, policy, and the marketplace.

Recommendation A (for NOAA): Leadership of NOAA partner agencies should provide guidance and consultation to CIMRS at the earliest stages of discussion and long-range planning with respect to unique value-added programs, projects and products that CIMRS could provide.

SCIENCE REVIEW

CIMRS science presentations demonstrated that all four of the research theme groups were participating in exciting, important and collaborative research projects. This outcome was also evident in the increased rate of scholarly products generated over the last four years relative to earlier years. The seafloor processes group and the marine bioacoustics theme group are exemplary with respect to operating effectively as teams as well as leveraging external funding. The marine bioacoustics group was clearly a well-oiled team of researchers and engineers who have co-developed a suite of work and products. Their focus on ocean soundscapes, and on passive acoustics, is distinctive across the landscape of marine acoustics in the U.S. (contrasted, for instance, against the much larger active acoustics communities at Scripps, University of Washington (UW), and AFSC). As a result, this team has access to a diversity of funding sources outside of NOAA, including ONR and NSF. They have also formed linkages to the marine mammal research community beyond OSU (e.g., USSC).

Other highlights of the scientific programs were the seafloor monitoring of a recent volcanic eruption off the Oregon Coast, advantages related to passive acoustic monitoring of ambient as well as whale-derived noise worldwide, and efficacious monitoring of carbonate chemistry along with temperature as it relates to the timing of oyster larval development in the Pacific Northwest.

Overall the range of scientific work was impressive, from basic to applied, from natural science to social science to citizen science, and across a range of disciplines represented by multiple colleges at OSU, and multiple line offices at NOAA.

Findings:

- It is clear that extensive collaborations exist among CIMRS faculty and OAR NOAA investigators from PMEL due to the collocation of these groups in the NOAA research facilities as part of the HMSC in Newport, as well as among CIMRS, PMEL & JISAO scientists based in Seattle.

- We heard many times that "CIMRS makes things easier" by funding pilot projects (at least in the past when funding allowed), bridging gaps in student funding (again, mostly in the past when funding allowed), and facilitating the networking among various public and private groups. CIMRS is structured to be a nimble, flexible structure to receive NOAA funding for a wide range of projects and programs. Rather than limit itself to create depth in a narrow research focus, CIMRS actively seeks to augment its research foci through additional partnerships and opportunities. This keeps CIMRS on several leading edges of academic scholarship and mission-oriented research. Several researchers pointed to the "low walls, low overhead" approach - CIMRS makes it easy to process NOAA funding.

- As the partnering organization between OSU and NOAA located principally at the HMSC, CIMRS augments the human capacity and research programs of the NOAA laboratories, in part because research staff and research professors can be hired much more easily by CIMRS than directly by NOAA. Thus, CIMRS is in a position to augment existing NOAA functionality, and to more closely link that functionality to OSU faculty lines and research. An example of this flexibility was the ability to add research staff to the Newport Line (Bill Peterson, PI), during the period when the NWFSC provided additional funding to support this effort. Research stemming from this effort supports NOAA initiatives (e.g., integrated ecosystem assessments of the California Current LME), and is used by a wide range of academic scientists from oceanographers to biologists.

- With the exception of the Marine Bioacoustics group, none of the highlighted research programs/projects seemed to be part of a larger team, although multiple projects were grouped under themes. This makes the themes broad topics of convenience rather than strong associations of researchers who can realize a greater whole by working in close collaboration.

- The present plan of running after the emerging edges of new research without an adequate plan of how to either support existing programs, or sunset those that are no longer vital, could threaten CIMRS, particularly in a future economic downturn.

- With few exceptions (e.g., dynamic behavior of fishers to other fishers), social science was rarely integrated into research themes.

Recommendation 3: More systematic discussion and planning for commercialization of intellectual property are needed given the potential for such efforts to help sustain and augment projects in future. Several projects presented to the review panel appeared to have incipient or actual commercial applications, including engineered products, software, and data visualization and storage.

Recommendation 4: CIMRS should consider fostering more research depth in chosen research themes (similar to what exists in Marine Bioacoustics theme), potentially at the expense of breadth, to make it more possible for staff to move between projects and labs as NOAA funding changes over time. These efforts could include greater integration of social sciences. Trying to be all things to all people across the OSU-NOAA interface has stretched CIMRS thin. The steady growth (1999-2006), and steep decline (2011-2014), of NMFS funding, for instance, resulted in a staff-up, and then down, across several CIMRS thematic areas. One possible solution to consider would be to have a smaller number of more well-connected projects and PIs working together to secure additional outside funding sources to supplant the recent downturn in NMFS funds.

EDUCATION/OUTREACH

Education and outreach are interwoven at many different levels at CIMRS. The Sea Grant- run HMSC Visitors Center is an impressive public interface, and simultaneously an innovative site for research on public interaction with educational material. The primary theme is to demonstrate how scientific research enhances our ability to interpret the natural processes that shape our world, with the goal of a better appreciation of managing and sustaining coastal and marine resources. CIMRS scientists have contributed to many of the Visitor Center's exhibits, programs and classes. CIMRS scientists have also participated on at least one project with the Confederated Tribes of the Siletz Indians.

Findings:

- Integration of dedicated outreach and engagement programs seemed nascent at best despite the collocation with Oregon Sea Grant, which devotes significant staff and budget to engagement, extension services, and educational research.

- Postdoctoral researchers and graduate students were conspicuously absent, which is a missed opportunity for leverage by NOAA because junior researchers often serve as the catalysts for multidisciplinary research and as the 'glue' pulling senior collaborators together. Whereas total FY14 budget (all sources) was $4.7M, only five PhD student were listed in the FY14 Annual Report (although this may not have adequately reflected the total number of students supported on projects funded through CIMRS, e.g., M.S. students).

- Staff of CIMRS is 50% female, but white males were over-represented as presenters. No program exists to increase diversity and inclusion of under-represented groups at student, staff, or faculty levels. Although mention was made of linking to the Research Experience for Undergraduates (REU) center at HMSC, with the concomitant possibility of helping to sponsor a marine science research opportunity for an undergraduate from an underrepresented community, this has not been an active collaboration in recent years.

Recommendation 5: A stronger, more visible partnership should be created between CIMRS and Oregon Sea Grant.

Recommendation 6: Mechanisms must be found to create stronger undergraduate student, graduate student, and postdoctoral participation, and to provide graduate students and postdocs with more professional development opportunities to realize career goals associated with NOAA and other federal agencies. Without such steps, NOAA will lose the opportunity to more effectively use CIMRS as a mechanism of work force development. The development by OSU of the Marine Studies Initiative at HMSC may provide such an opportunity.

Recommendation 7: Develop and implement a plan to play a role in opening marine science, social science, and engineering to traditionally underrepresented communities of students, including underrepresented minorities, women, first generation college students, members of the military, and students from economically disadvantaged backgrounds.

SCIENCE MANAGEMENT

CIMRS Director Michael Banks has an open-door policy through which he links OSU faculty, student, and program resources to NOAA mission needs, as reflected in the breadth of the four major CIMRS research themes. The Director is proactive in attempting to make these links in either direction – as he sees new complimentary opportunities arise at OSU (such as the recent expansion in engineering regarding geodetics and geomatics) and in response to NOAA needs. A long-term collaboration with the School of Public Policy on work relating to the social-ecological system is lauded, work that links the public, stakeholders, and practitioners with researchers and students. CIMRS has taken advantage of the breadth in NOAA research and outreach at the HMSC. CIMRS has been adept at "seeding" projects that grow into bigger and better things as other investments are leveraged. Like other cooperative institutes, CIMRS contributes to the NOAA mission through its flexibility, nimbleness, and ability to leverage diverse resources.

The Director meets quarterly with his Executive Board, which includes OSU administrators and leaders of partner agencies in NOAA. The Director also meets at least annually with his local Science Advisory Council. The Director seems to balance well his own research interests with those of the greater marine research community when attempting to build capacity and has been able to interface effectively across diverse disciplines. The Director has earned the trust and respect of his OSU and NOAA colleagues.

The review panel was impressed with the level of collegiality between the Director, OSU administrators, and the diverse NOAA partners. Terms such as "excellent relationship", "galvanizes the NOAA relationship", "low walls" and "low overhead", and "doorway to the North Pacific" were used by NOAA and OSU partners. The general sense from the NOAA

partners is that they and CIMRS go in the directions that make sense, and that CIMRS is very open to possibilities and responding to NOAA needs – the Director is actively looking for intersections and opportunities. Through CIMRS, NOAA is able to access research expertise it does not possess, students, and procures the ability to expand studies and experiments it could not do otherwise.

On the other hand, the scientific breadth of CIMRS also has seemed to foster a high level of diffuseness within some research themes, which seem to be little more than a collection of research projects that are unrelated to each other, but each of which is effective and helps serve some NOAA need. To some extent this may not be bad, but it gives the impression that CIMRS is merely a vehicle to satisfy rapidly changing NOAA needs for staffing. In addition, the Director indicated that he wants to increase the number of research themes, with eight more ideas mentioned during the review.

In the end, the breadth of work done at CIMRS is commendable and individual projects are exemplary, but OSU's proposed Marine Science Initiative may exert more pressure on CIMRS to broaden even further. Only strategic planning and strategic implementation can balance the competing needs for research depth and sustained capacity on the one hand, against the needs for research breadth on the other hand.

Over the last four years, total NOAA funding has ranged from $2.2M to $3.6M annually, with the ratio of other external funding to NOAA funding ranging from 0.5 to 1.1. In light of fluctuating and generally declining support from NOAA--and echoing the panel's concerns with strategic planning (see earlier section)--the panel was concerned about strategic management of the breadth of CIMRS research. There is a sense that the Director attempts to be all things to all people—the door may be too open. In periods of ample funding this may not be a bad thing. However, during recent periods of declining funding, it is the panel's sense that the tough decisions were driven only by fiscal concerns and did not embody longer-term strategic management. It is the panel's conviction that immediate funding changes should not be the only driver of long term priorities and of building and/or maintaining human capacity.

Findings:

- CIMRS Director Michael Banks has gained broader scientific and management perspective across the cooperative institute landscape in recent years by chairing the Executive Committee of the 16 cooperative institutes located across the US.

- The Director is accomplished at helping individual faculty and agency researchers realize grant funding through CIMRS.

- If CIMRS were to cease to exist, there would be a significant impact to university-NOAA linkages at HMSC where three of every four staff on site is a NOAA employee. A vital synergistic mechanism would be lost.

- Management of CIMRS science is probably better than could be reasonably expected given the low Task I funding rate from NOAA (which was increased last year from $50K to $71K annually). The Director has in some cases heroically leveraged administrative support from OSU and funding from grants and other partners to augment NOAA shortfalls. Given the declining funding from NOAA and the perpetually low level of Task 1 funding, the Director currently has little ability to influence research direction or

engage in strategic planning or implementation. The administrative cost of maintaining CIMRS vastly exceeds the direct funding received through NOAA Task I and OSU sources (~$165K), forcing the Institute to use the vast majority of overhead recovery funds (~$185K) and simultaneously trim central staff to a minimum. Clearly, even if the funding base of Task II and Task III funds expanded, the current model would put increasing pressure on the CIMRS Director to provide administrative services: CIMRS gain could be its failure. Declining budgets have already resulted in less seed funding for new projects, and loss of support for students, which the panel finds rather unfortunate given the creativity and high level of work seen during the student poster session. Attempts at strategic engagement with NOAA partners have sometimes been thwarted at times by fiscal restraint and lack of long-term planning both at OSU and at NOAA.

Recommendation B (for NOAA): Increase Task 1 funding to at least the level specified in the request for proposals, so that OSU can become more of a genuine partner and not merely a contractor; it is likely that the return on that investment would be large because opportunities for NOAA to leverage existing and planned OSU investments would increase as a result.

Recommendation 8: The Director should devote increased attention to strategic management and implementation (in addition to strategic planning), organizational structure, decision-making, and branding and marketing/communications. Strategic management by the Director could be improved with increased mentoring and on-going collaboration with OSU leadership. In particular, improvements could be made toward an efficient administrative structure that facilitates the mission and vision of CIMRS; a revenue positive structure that allows for multiple income streams above and beyond Task I-III funding; and an interactive structure between CIMRS, NOAA and OSU that allows for critical decision-making with respect to the current and future foci of the institute.

Recommendation 9: In consultation with the Science Advisory Council, the Director should foster more cohesion and collaboration within the research themes that currently lack focus and a long term strategy.

SUMMARY AND CONCLUSIONS

The panel found Director Michael Banks, all other OSU personnel, and all NOAA personnel to be helpful, engaged, and constructive. The panel felt that they were provided sufficient information and access to procure the understanding necessary to conduct an accurate and fair review. However the panel felt too constrained by the required overall assessment being boiled down to one of three choices. NOAA would benefit from inviting panels to make more nuanced judgments about multiple components of each CI.

Conclusion for CIMRS: The panel judged the overall performance of CIMRS to be **outstanding**.

APPENDIX I

LIST OF EXTERNAL REVIEWERS

David Lodge, Chair and Member, NOAA Science Advisory Board

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Professor David Lodge is the founder and Director of the University of Notre Dame Environmental Change Initiative (ND-ECI), which focuses on the interrelated problems of invasive species, land use, and climate change, and their synergistic impacts on water resources. ND-ECI provides solutions that minimize the trade-offs between human welfare and environmental health where trade-offs are unavoidable, and seeks to discover win-win solutions where they are possible. One of the world's leading experts on aquatic invasive species, Lodge has extensive research experience on a wide variety of vectors of invasive species, including ships, boats, canals, and commerce in life food, pets and plants. He and his numerous collaborators have studied Eurasian watermilfoil, rusty crayfish, zebra and quagga mussels, and Asian carp and many other species. Lodge has published more than 180 scientific papers, and has edited two books. His research focuses on ecological forecasting to better inform environmental risk assessment, policy development, and natural resource management. On numerous occasions Lodge has testified before the U.S. Congress, and has also served as an expert witness in federal court. He served as the first chair of the U.S. government's national Invasive Species Advisory Committee in 2000-01, led research on freshwater biodiversity as part of the United Nations' Millennium Ecosystem Assessment in 2000-05, and led an expert subcommittee providing advice to the U.S. Environmental Protection Agency on reducing invasions from the ballast water of ships in 2010-11. He is a member of the scientific advisory board of the International Joint Commission, and a Jefferson Science Fellow in the US Department of State in 2014-15. Professor Lodge has a long history of collaborating with economists, historians, theologians, and philosophers, and has extensive experience partnering with outside organizations such as The Nature Conservancy to help translate and transfer his scientific work to the public policy arena. As a Rhodes Scholar, Lodge received his doctoral degree from the University of Oxford, and has been on the faculty at Notre Dame for over 28 years.

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Craig Moyer received a bachelor's degree in biology in 1986 and an M.S. degree in microbiology in 1988 from Oregon State University. He went on to receive his Ph.D. in biological oceanography in 1995 from the University of Hawaii. From there, he held a post-doc position for two years at the Center for Microbial Ecology at Michigan State University. Dr. Moyer is currently a professor in the Biology Department at Western Washington University, where he teaches undergraduate and graduate courses in microbiology, microbial ecology and evolutionary biology. His specialty is the functional genomics, metagenomics and phylogenetics of iron-rich microbial communities found in hydrothermal vent ecosystems. He has participated in over 60 oceanographic expeditions (six as chief scientist) and acted as scientific observer and/or advisor on over 300 dives using multiple deep-submergence platforms (e.g., AUVs, HOVs and ROVs). His website can be found at --http://fire.biol.wwu.edu/cmoyer/research.html

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Julia K. Parrish is the Lowell A. and Frankie L. Wakefield Professor of Ocean Fishery Sciences at the University of Washington, where she also serves as Associate Dean for Academic Affairs and Diversity in the College of the Environment. Julia holds a joint appointment in the School of Aquatic and Fishery Sciences and in the Department of Biology, and an adjunct appointment in the School of Marine and Environmental Affairs. She is a marine biologist, a conservation biologist, and a specialist in animal aggregation. For more than 25 years, Julia has conducted field research on seabirds, focused on the natural and human-caused factors causing population decline. She works in active fisheries on seabird bycatch issues, on seabird-salmon interactions, and on species affected by oil spills. Julia is also the Executive Director of the Coastal Observation and Seabird Survey Team (COASST), a citizen science program involving over 800 participants collecting monthly data on the identity and abundance of beach-cast birds, with the goal of creating the definitive baseline against which the impacts of any near-shore catastrophe, from an oil spill to an algal bloom, could be measured. Julia has been invited to speak at over 100 national and international conferences, including recent keynote addresses at the National Marine Educators Association Conference and the Alaska Native Forum for the Environment. In 1998, Julia was honored as a NOAA Year of the Oceans Environmental Hero by Vice President Al Gore; and in 2013, she was honored at The White House as a Champion of Change for her dedication to increasing public engagement in science and science literacy through COASST. She is an Elected Fellow of the American Ornithological Union, an Aldo Leopold Leadership Fellow and has been honored with the UW Distinguished Teaching Award for her excellence in the classroom. She received her undergraduate degree from Carnegie-Mellon University, her PhD from Duke University, where she studied the schooling behavior of fish, and was awarded a postdoctoral fellowship at UCLA.

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Randy Peppler is the Interim Director of the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS) at the University of Oklahoma. He also manages the U.S. Department of Energy Atmospheric Radiation Measurement Program Data Quality Office and is a Lecturer in the Department of Geography and Environmental Sustainability at Oklahoma. He graduated from Purdue University with Bachelors and Masters degrees in Atmospheric Science, from the University of Illinois at Urbana-Champaign with a Masters degree in Industrial Engineering, and in 2011 from the University of Oklahoma with a Ph.D. in Geography. His dissertation research looked at how Native American farmers in southwestern Oklahoma form knowledge of weather and climate in place, including in culturally meaningful or traditional ways, and how they use their insights and accrued wisdom in their agricultural endeavors. Current research includes studying the role of place in the formation of tornado knowledge and how it might affect risk assessment and response.

APPENDIX II

REVIEW AGENDA

April 28th HMSC Library Seminar Room, Newport

Time	Topic	Presenter
6:30 - 7:30	**Breakfast at Corvallis Hilton - Closed Introductory Meeting - Review Panel & NOAA**	
7:35 - 8:35	**Travel to HMSC**	Driver Selina Heppell
8:45 - 9:00	**Welcome/Introductions**	Ron Adams OSU Acting VP Research
9:00 - 9:45	**Introduction, Strategic Planning and Overview**	Michael Banks, Director CIMRS, Prof. COMES (FW)
9:45 - 10:00	**Coffee/Tea Break**	
10:00 - 12:00	**Science Presentations (10 minutes presentation, 5 minutes questions):**	
10:00 - 10:20	**Theme: Seafloor Processes**	
	Impacts of Submarine Volcanism	Bill Chadwick, CIMRS Professor (CEOAS)
10:20 - 11:20	**Theme: Marine Ecosystems & Habitat**	
10:20-10:35	CWGSI - Fisherman, Scientist & Agency Collab.	Gil Sylvia, Director COMES, (AEc)
10:35-11:50	NH Line, Climate, Plankton Fishery Indexes	Jay Peterson, FRA CIMRS
11:50-12:05	End-To-End Model Platform for Coastal Ecosystems	Jim Ruzicka, Research Associate, CIMRS
11:05-11:20	Lipids, AK Fisheries, Trophic Ecology & Aquaculture	Louise Copeman, Assist. Prof., CEOAS
11:20 - 11:30	**Coffee/Tea Break**	
11:30 - 12:30	**Theme: Protection and Restoration of Marine Resources**	
11:30-11:45	Pacific Hake & Bioeconomic Simulation	David Sampson, COMES Professor (FW)
11:45-12:00	Distinct Pop. Segments for N. Pac. Humpback Whales	Debbie Steel, SrFRA MMI
12:00-12:15	Sperm Whales & BP oil in Gulf MX	Bruce Mate, Director MMI Prof. (FW)
12:15-12:30	Sea Turtle and Fisheries Assessment	Selina Heppell, Dept. Head Prof. FW
12:30 - 1:30	**Panel Closed Session with NWFSC, PMEL & AFSC Leadership (Catered Lunch in LSR)**	
	Theme: Marine Acoustics (NOAA RSF Building)	

1:30 - 2:30	Panel Exchange with Scientists & Tour of Facility & Equipment	David Mellinger, CIMRS-CEOAS Professor Holger Klinck, CIMRS-FW & Cornell U. Sharon Nieukirk, SrFRA CIMRS-FW Bob Dziak, CIMRS-CEOAS Professor - now PMEL Haru Matsumoto, CIMRS Assist. Prof. (CEOAS) Joe Haxel, CIMRS-CEOAS Assist. Prof.
2:30 - 3:00	Tour of Sea-Water and OA Research Facilities	Cliff Ryer (AFSC), Louise Copeman & George Waldbusser (CEOAS)
3:00 - 3:15	**Coffee/Tea break (HMSC lunch room)**	
	Outreach	
3:20 - 3:30	Fisheries Council Field Trip and Marine Team	Selina Heppell, Dept Head OSU FW
3:30 - 4:00	Tour HMSC Visitors Center	Shelby Walker, Director OR Sea Grant
	Education	
4:00 - 5:00	Student Poster Session & Reception (Hall outside HMSC lunch room)	
5:00 - 5:30	Panel Closed Session (LSR)	
6:00 - 8:00	**Dinner at Local Oceans (upstairs) with stakeholder representation**	Bob Cowen: Director HMSC, CIMRS Exec Board, CEOAS Gil Syliva: Director COMES, AEc, CAS Jeff Feldner: Local Fisherman, Salmon Council Selina Heppell, Head Department FW, Marine Team Shelby Walker, Director OR Sea Grant, CIMRS Exec Comm Bill Pearcy: CIMRS SAC, early CIMRS director Waldo Wakefield: NWFSC, NOAA Habitat Jeremy Matthis: Division Leader OERD, PMEL David Noakes: CIMRS SAC, Director OHRC FW John Stein: Director NWFSC
8:00 AM	**Return to Corvallis Hilton**	Driver Selina Heppell

April 29th Asian Pacific American Room OSU MU 206, Corvallis

Time	Topic	Presenter
6:30 - 7:30	**Breakfast at Corvallis Hilton - closed session Panel Executive Session**	
7:30 - 8:00	**Review Panel Executive Session with Michael Banks at Corvallis Hilton**	Review Panel and Michael Banks
8:30 - 9:00	**Welcome/Introductions**	Sastry Pantula, Dean, College of Science Jack Barth, Associate Dean for Research CEOAS
9:00 - 11:30	**Science Presentations:**	Dan Edge, Associate Dean, CAS
9:00 - 9:45	**Theme: Marine Ecosystems & Habitat**	
9:00 - 9:15	Ecosystem-based Fishery Management	Lorenzo Ciannelli, Prof. CEOAS
9:15 - 9:45	Seafloor Habitat Mapping	Chris Romsos, SrFRA CEOAS
9:45 - 10:00	Carbonate & Oysters, Does OA matter?	Burke Hales, Prof. CEOAS
10:00 - 10:15	**Coffee/Tea Break**	
10:15 - 10:30	NOAA National Geodetic Survey & Geomatics	Dan Gillins, Assist. Prof. CCE
10:30 - 10:45	Pilot Marine Debris Monitoring Program	Jamie Doyle, OR Sea Grant Extension
	Theme: Protection and Restoration of Marine Resources	
10:45 - 11:00	PNW Oral Histories	Flaxen Conway, Prof. Sociology , Dir. MRM CEOAS
11:00 - 11:20	Broader Reach Collaboration	Michael Banks, Director CIMRS, Prof. COMES
11:20 - 1:00	**Panel closed session with catered lunch**	
1:00 - 2:30	**Panel tour of CEOAS (Hales) & CCE (Parrish) then return APAR, MU)**	
2:30 - 4:00	**Panel closed session (APAR, MU)**	
1:00 - 4:00	**Administrative Review (Kerr Ad. Build. 502)**	NOAA & OSU Fiscal Offices, Banks & Waddell
4:00 - 4:30	**Initial report back to CIMRS, Exec Brd: Preliminary Findings & Recommendations (APAR, MU)**	

AEc	Applied Economics
AFSC	Alaska Fisheries Science Center
APAR	Asian Pacific American Room MU 206
CAS	College of Agricultural Sciences
CCE	School of Chemical & Construction Engineering

CEOAS	College of Earth, Ocean, & Atmospheric Sciences
CIMRS	Cooperative Institute for Marine Resources Studies
COMES	Coastal Oregon Marine Experiment Station
CWGSI	Coast-wide Genetic Stock Identification Collaborative
FRA	Faculty Research Assistant
FW	Department of Fisheries and Wildlife
HMSC	Hatfield Marine Science Center
LSR	Library Seminar Room
MMI	Marine Mammal Institute
MRM	Marine Resource Management
MU	Memorial Union
NH	Newport Hydrographic
NWFSC	Northwest Fisheries Science Center
OERD	Ocean Environment Research Division
OSU	Oregon State University
PMEL	Pacific Marine Environmental Laboratory
PNW	Pacific Northwest
RSF	Research Support Facility
SAC	Science Advisory Council