

7th Annual
Heceta Head Coastal Conference
“Oregon’s Ocean: Catching the Next Wave of Discoveries”
Florence Events Center ~ October 28-29, 2011

SUMMARY OF CONFERENCE PROCEEDINGS

Friday, October 28

Discovery Trip

Sponsored by the Siuslaw Estuary Partnership, this field trip of the Florence Waterfront featured the ecology and stewardship of the Siuslaw Estuary. The walk was introduced by **Sandra Belson**, SEP Project Manager and Community Development Director, City of Florence. Stormwater treatment was covered by **Dan Graber**, Water Treatment Supervisor & City Engineer, City of Florence.

Fred Jensen, Curator, Siuslaw Pioneer History Museum chronicled the walk through Old Town. The end of the Discovery Trip explored the wetlands upriver from the Port of Siuslaw with biologists **Jevra Brown**, Wetland Specialist, Department of State Lands, and **Jason Kirchner**, Estuary Habitat Protection Biologist, Oregon Department of Fish and Wildlife.

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Dinner with Angela Pozzi

Craig McMicken, Chairman, HHCC, Inc., Presiding

Angela Haseltine Pozzi is Director of “Washed Ashore Project.” As an active arts educator, she described some of her background that has led her to center around the ocean. Over the past decade she has launched a movement to overcome ocean debris washing up on Oregon’s beaches. In particular, the clutter of plastic pollution.

Using visual art, Pozzi demonstrated how various types of discarded and recycled materials may be used to represent strange and undiscovered creatures that dwell in the underwater world. She buys nothing but wire and metal framework materials, gathering every bit of material from local beaches.

Presently, Pozzi is leading the Bandon community in a collective effort to build giant sculptures of sea creatures most threatened by plastics in the ocean. Hundreds of volunteers and school children have helped in the drilling and stitching plastics to create the sculptures.

She believes arts have the power to transform people and their interactions with the world. Instead of drowning in despair about the disappearances of coral reefs, or the pollution in the ocean, she is using what the ocean is throwing back to create an artistic response.

At the conclusion of her presentation, the audience was invited to view and handle some of the “washed ashore” objects which she presented as samples of ocean debris.

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Saturday, October 29

Program

Program Chairman: Stephen, Brandt, Director, Oregon Sea Grant

“The Importance of Ocean Research in Oregon”

Representative Jean Cowan, Chair of the Legislative Coastal Caucus

Rep. Cowan focused on why ocean research is particularly important for policy makers. She cited two reasons: 1) the crucial need for good, unbiased science to guide the difficult policy choices; and 2) the economic value that the ocean research “industry” brings to coastal communities.

She stated that in today’s world there is a struggle to balance the real challenges to socio-economic health of coastal communities with the on-going need for preservation and revitalization of natural resources. Policy makers have no easy answers. For guidance to policy makers, ocean researchers help in finding a fair and comprehensive means of balancing the demands for the use of our ocean resources with responsible preservation efforts.

“How do we make today’s lifestyles work, while simultaneously preserving a healthy environment and an abundant ocean?” Cowan said. She went on to say that good decisions must be made on good science. To produce the necessary, high quality, scientific data that we need, our ocean research industry must continue to grow. Policy-makers will continue to seek the help of science to better understand what’s really happening in the ocean. What extractive activities can sustainably supply the demand for food from the sea. And how can we move forward with desperately needed alternative energy production methods, while maintaining our view sheds.

Cowan gave credit to the science community for respecting the value of the recreational and commercial fishing industries as they contribute their skills and knowledge to this effort. For example, the initial experiment with five small Marine Reserves—which will exclude all extractive activity—will allow us to learn how the creatures of the sea are impacted by such efforts. Such steps are not easy, Cowan said, noting the Marine Reserve plan emerged from many, challenging conversations amid heated committee hearings.

Cowan concluded that continuing ocean research will unlock the key to a healthy future for Oregon’s Coast. Good science will help keep working waterfronts, working. And it will guide rational and informed policy development, and play a crucial role in our continued economic development. Exciting times lie ahead.

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“Implementation of a Columbia River Estuary Ocean Observatory for Ecosystem Research and Monitoring”

Joseph Needoba, Ph.D., Oregon Health Sciences University

The Columbia River estuary is a dominant geographic and ecological feature of the Pacific Northwest coastal zone. The estuary is strongly influenced by both freshwater flows and seawater intrusion that together create a highly dynamic mixing zone and short residence times of water masses. The ecosystem of the Columbia River estuary has recognizable ‘hotspots’ of biological activity that can thrive in the midst of this dynamic physical environment. The most prominent of these are: the estuary turbidity maximum, the benthic regions of the lateral bays, and pelagic plankton blooms of *Myrionecta rubra*.

We have developed and implemented a long-term regional program to investigate the natural and human-caused variability associated with these important aspects of the ecosystem. Our approach includes the operation of an observing system that utilizes advanced chemical and biological sensors capable of making near real time observations of nutrients, chlorophyll, dissolved oxygen, and a myriad of other water quality parameters that will enable a unique view of the ecosystem by capturing the spatial and temporal variability at the scale of the daily tidal cycle.

A primary scientific focus for 2012-2016 will be to use the observational network to better understand the role of coastal hypoxia and ocean acidification on the ecological hotspots of the Columbia River estuary.

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“Monitoring and Research in Oregon’s Two Pilot Marine Reserves”

Alix Laferriere, Oregon Department of Fish & Wildlife

In 2009, the Oregon legislature designated two pilot marine reserves in Oregon’s nearshore waters. The Ocean Policy Advisory Council, a legislatively mandated marine policy advisory board, designated these sites

with the biological goal of conserving marine habitats and biodiversity and to provide a framework for scientific research and monitoring.

Redfish Rocks Marine Reserve and Marine Protected Area were developed for nearshore ground fish species, predominantly caught in the live fish fishery. Otter Rock Marine Reserve was developed to protect the unique ecology and potential juvenile rockfish habitat of the site. These two pilot sites will be closed to extractive use in 2012 and will serve as reference areas over time, enabling the measurement of change due to natural influence versus those caused by human induced stressors.

In the summer of 2010 & 2011 we conducted baseline surveys to assess oceanographic condition, characterize habitat and determine species presence, abundance and distribution within the reserves and associated comparison areas. We present here the design framework and methods employed as well as summer oceanographic conditions, habitat characterization, species abundance and distributional data. From the baseline studies and analyses we will implement a long-term monitoring plan from which to evaluate changes in habitat, invertebrate and demersal fish populations.

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“Social Science Application in Oregon’s Ocean Planning Process”

John Stevenson, College of Oceanography and Atmospheric Sciences, OSU

This talk will introduce common social science research techniques and discuss two applications used to support Oregon’s effort to develop ocean renewable energy off its coast. The first case study draws on a stakeholder analysis that identified areas of policy consensus and disagreement among key actors involved in Oregon’s wave energy ‘subsystem’.

The second study looks at research used to represent important fishing grounds for consideration in the state’s process to identify offshore areas for future wave energy development. The talk will close with a discussion of ethical obligations researchers have to their participants and highlight key considerations for Oregon’s ocean planning context.

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“Ocean Acidification Impacts on Oregon Shellfish Aquaculture: Peering Into the Future Ocean”

George Waldbusser, Ph.D., Asst. Prof., Biological Oceanography ~ COAS, OSU

The Whiskey Creek Shellfish Hatchery on Netarts Bay is the largest producer of oyster spat in Oregon for growers, and supplies roughly 50-70% of the total spat for Pacific Northwest oyster growers. Beginning in 2005 the hatchery experienced repeated production failures that resulted in significant economic hardship for the hatchery and put a strain on the oyster industry.

In the summer of 2009 hatchery personnel, working with Oregon State University researchers, found a correlation between larval production and the corrosiveness, or acidity, of incoming water. Coastal upwelling along the Oregon coast results in high CO₂ seawater entering Oregon’s estuaries. These upwelled waters carry with them carbon dioxide from respiration of organic matter in the ocean’s interior, as well as a baseline carbon dioxide level from when those waters last contacted the atmosphere. It is currently estimated that the waters upwelling along the Oregon coast are roughly several decades old based on the limited understanding of the ocean’s currents and water properties.

Currently mitigation strategies are designed to improve water quality for larval success. Ongoing work has provided significant insights into the possible physiological mechanisms of larval failure from monitoring biochemistry of larvae through the production cycle in the hatchery. If the baseline pCO₂ concentrations are shifting along the Oregon coast, additional mitigation strategies will likely be needed to fortify the Pacific oyster industry.

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“Bringing Albatross Conservation to West Coast Groundfish Fisheries”

Troy J. Guy, Washington Sea Grant, Marine Advisory Services ~ UW

Incidental fisheries mortality is considered one of the primary threats to albatross and petrel populations worldwide. Albatrosses and other seabirds aggregate at vessels to feed on discarded offal and baits. They can become hooked in longline fishing gear and drown, or they can collide with trawl net cables (warps and third wires) causing death or serious injury.

In longline fisheries, 12-15 percent of baits can be lost to seabirds, leading to increased costs and fewer fish caught. The streamer line is a common, inexpensive and effective mitigation device that scares birds from fishing gear. Long, bright-colored streamers suspended from a towed line keep birds away from sinking baits and trawl cables, saving both birds and bait.

In April 2011, a longline vessel targeting sablefish off central Oregon caught a short-tailed albatross — the first recorded mortality of this species in U.S. West Coast groundfish fisheries. Short-tailed albatrosses are listed as endangered and are the focus of an intensive multi-national recovery program. Using satellite telemetry and at-sea seabird surveys, we compared albatross distributions with observed West Coast groundfish fisheries effort to understand where the two overlap and where mitigation may be most effective at reducing mortality.

Results suggest that short-tailed albatrosses are at most risk in longline fisheries for sablefish that occur from Monterey to the Canadian border in depths between 200 and 1000 meters. Efforts are underway to make information on streamer lines and best-practice mitigation available to priority fishery sectors, free of charge.

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“Potential Interactions of Ocean Energy Installations and the Environment”

Sarah K. Henkel, Ph.D., Asst. Prof., N.W. National Marine Renewable Energy Center ~ HMSC, OSU

While the coastal waters of western North America hold great potential for ocean energy development, concerns have been raised about potential environmental impacts related to the installation of devices and complex mooring systems.

The Northwest National Marine Renewable Energy Center at OSU aims to close key gaps in understanding the technical, ecological, and human dimensions aspects of offshore wave energy development. We focus on prioritizing the most pressing interactions of concern and working to address those within the scope of the broad expertise of researchers at Oregon State and the Hatfield Marine Science Center. Our lab investigates benthic conditions and biological communities in offshore sedimentary and reef habitats.

Little is known about natural species-habitat relationships and community processes in the depths and substrate types targeted for wave energy installation relative to other habitats. Understanding the dynamics of these systems is of utmost importance if we hope to understand changes brought about by ocean energy development.

Since May 2010 we have conducted surveys of benthic habitats from northern California to Washington using a variety of techniques, providing baseline data on habitats and species potentially affected by offshore ocean energy development, identifying species-habitat relationships, and quantifying spatial and temporal trends in species abundances and distributions.

Other OSU-NNMREC researchers are engaged in a variety of projects addressing additional interactions of concern including changing ocean conditions, modeled changes to wave and sediment patterns, and bird, whale, and crab distributions along the Oregon coast.

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Keynote Address

“Managing the Oceans and Coasts: Linking Research, Policy, and New Institutions”

Robert Costanza, Ph.D., Director, Institute for Sustainable Solutions, Portland State University

Before moving to PSU in Sept. 2010, Dr. Costanza was the Gund Professor of Ecological Economics and founding director of the Gund Institute for Ecological Economics at the University of Vermont. Before

Vermont, he was on the faculty at Maryland and LSU, and visiting scientist at the Beijer Institute in Sweden, and the Illinois Natural History Survey. He holds BA and MA degrees in Architecture and a Ph.D. in Environmental Engineering Sciences (Systems Ecology with Economics minor) all from the University of Florida..

Dr. Costanza's transdisciplinary research integrates the study of humans and the rest of nature to address research, policy and management issues at multiple time and space scales, from small watersheds to the global system. Dr. Costanza is co-founder and past-president of the International Society for Ecological Economics, and was chief editor of the society's journal, *Ecological Economics* from its inception in 1989 until

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Research Colloquium

Responding to questions posed by Moderator Dr. Costanza and from the audience, the Panelists were:

Sara Skamser, Co-Owner, Foulweather Trawl

Sarah and John opened Foulweather Trawl in Newport 27 years ago. Foulweather Trawl builds and repairs new bottom and shrimp trawls. Serving customers from Monterey to Neah Bay, the business also builds gear for the distant water fleet that travels to Alaska for pollock and cod, and all the assorted ground fish complexes. John was a fisherman for most of his adult life and Sara fished commercially for salmon and crab in her younger adventurous years.

Pete Stauffer, Ocean Ecosystem Manager, Surfrider Foundation

Pete Stauffer's work supports Surfrider Foundation's engagement in ocean and coastal policy issues. Pete holds a Bachelor's degree in Environmental Policy from Duke University and a Master's degree from the University of Washington's School of Marine Affairs. Previous to being hired by Surfrider, Pete spent several years working for the NOAA Fisheries Service in Washington D.C., providing support for NOAA's Ecosystem Observations Program. Pete is an active participant in Oregon's ocean planning efforts and currently serves as Chair of the Redfish Rocks Community Team in Port Orford.

Dr. Kerry Carlin-Morgan, Director of Education and Volunteer Services at the Oregon Coast Aquarium.

Dr. Carlin-Morgan oversees the Aquarium's education, interpretation, exhibit signage, and volunteer programs. She has a courtesy appointment with Oregon State University's Marine Resource Management program and works regularly with graduate students conducting research and evaluation projects on marine education and free-choice learning. Dr. Carlin-Morgan did her graduate work at the University of Florida where she studied science education and wildlife conservation. Her doctoral research specifically looked at what 4th and 5th grade students learned on a field trip to a zoo.

Jason Busch, Executive Director of Oregon Wave Energy Trust

The Oregon Wave Energy Trust is a nonprofit public-private partnership funded by the Oregon Innovation Council to support the responsible development of wave energy in Oregon. It's goal is to have ocean wave energy producing 2 megawatts of power – enough to power about 800 homes – by 2010 and 500 megawatts of power by 2025. Mr. Busch holds a B.A. in Political Science from Texas A&M University and a M.A. in Philosophy from the University of Southern Mississippi. He received a Doctor of Jurisprudence degree in 2006 from the University of Oregon School of Law. He is the vice-chair of the Steering Committee for Oregon League of Conservation Voters of Multnomah County, and also serves on the Renewable Energy Advisory Committee to the Energy Trust of Oregon.

Tawnya D. Peterson, Ph.D., Assistant Professor, Oregon Health Sciences University

Dr. Peterson's work focuses on the growth and distribution of aquatic protists—single-celled eukaryotic plankton that not only play major roles in biogeochemical cycling, but are often important for human health and well-being. She is interested in two primary lines of research: (1) understanding the role that interactions

among microbes play in biogeochemical cycling within aquatic systems and (2) determining how mesoscale physical circulation (10's to 100's of km) influences patterns of algal standing stocks and species composition in both coastal and deep waters eddies. She holds a B.Sc. degree from Mount Allison University, Sackville, New Brunswick, Canada, and a Ph.D. from the University of British Columbia, Vancouver, B.C. Canada, 2005.

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Student Poster Session

Thirty-three students from the OSU College of Oceanic & Atmospheric Sciences and the Oregon Institute of Marine Biology displayed their research projects and stood by them while being viewed by Conference attendees. Four were selected as most outstanding and given awards. For the full record entries, see the link to "[Student Poster Abstracts.](#)"

Title: Population Assessment of Burrowing Shrimp in Yaquina Bay, Oregon

Author: Katelyn Bosley

Institution: Oregon State University

Abstract: The burrowing shrimps *Neotrypaea californiensis* and *Upogebia pugettensis* are essential components of estuarine ecosystems in the Pacific Northwest. Over the last decade population monitoring has shown declines in both *N. californiensis* and *U. pugettensis* which have led to concern regarding the future of these species. Currently efforts are underway to develop a population model for burrowing shrimp in Yaquina Bay, Oregon. In this study, a population assessment was conducted for *N. californiensis* and *U. pugettensis* on Idaho Flats in Yaquina Bay to provide a baseline estimate of abundance for constructing population dynamics models. Shrimp bed edges were mapped with GPS and 100 randomly selected points were visited within each shrimp bed to obtain burrow count information. Twenty core samples were also taken to determine the relationship between burrow count and shrimp density for each species. Total shrimp abundance was then calculated in ArcGIS using an Inverse Distance Weighted interpolation (IDW) of shrimp density in area sampled. The total number of *N. californiensis* was estimated to be $6,330,136 \pm 746,956$ and the total for *U. pugettensis* was $9,347,844 \pm 1,290,002$. This assessment will be repeated in 2012 and 2013 to track changes in the burrowing shrimp populations in Yaquina Bay.

Title: Movement Behavior of Fishes of the Redfish Rocks Marine Reserve

Author: Tom Calvanese

Institution: Oregon State University

Abstract: Marine reserves can be a viable component of conservation and fisheries management by restoring biodiversity and functioning ecosystems, and rebuilding fish stocks. There is evidence of increased biomass within reserves, and spillover to surrounding areas, but these effects are a function of reserve size and the extent of adult movements. My goal is to understand the movement patterns of fishes of Redfish Rocks to help determine optimal reserve size needed to balance protection with spillover, and to contribute to baseline data prior to closure. I am using acoustic telemetry to evaluate movement patterns of six species; the China Rockfish, *Sebastes nebulosis*, Quillback Rockfish *S. maliger*, Canary Rockfish *S. pinniger*, Copper Rockfish *S. caurinus*, Black Rockfish *S. melanops*, and Cabezon *Scorpaenichthys marmoratus*. Surgically implanted acoustic tags transmit coded signals identifying each fish and its depth, which are recorded when the fish swims within detection range of an acoustic receiver. An array of receivers is collecting data that will be used to test three hypotheses; (1) The marine reserve at Redfish Rocks will provide different degrees of protection to different species due to species-specific differences in home range size and movement patterns. (2) The rate of movement between Redfish Rocks and Island Rock, similar habitat outside the reserve, is species-dependent. (3) Habitat associations within the reserve are species-specific. This work will provide information essential to the effective management of a network of marine reserves in Oregon state waters, and will improve our understanding of species-habitat associations.

Title: Seasonal Variation in Gut Condition of Select Juvenile Flatfish Species

Author: Caitlyn E. Clark

Institution: Oregon State University

Abstract: This study is a preassessment of the ecological effects of wave energy device installation, focusing on five flatfish species. Butter sole (*Isopsetta isolepis*), English sole (*Parophrys vetulus*), Sand sole (*Psettichthys melanostictus*), Pacific sanddab (*Citharichthys sordidus*), and Speckled sanddab (*Citharichthys stigmaeus*) were collected bimonthly from June 2010 to May 2011. Fish were then analyzed and dissected to determine overall and gut condition. Gut contents were also identified to the lowest taxonomic level possible using light microscopy, and then measured for caloric density via bomb calorimetry. Results from Analysis of Variance (ANOVA) tests suggest that each species of flatfish has a unique feeding ecology that is more pronounced with increased fish size. In some species, overall and gut condition varies significantly over depth and season. The caloric density does not vary significantly over meal types.

Title: Growth and settlement of the marine bryozoan *Schizoporella japonica*

Author: Kira Treibergs

Institution: University of Oregon; Oregon Institute of Marine Biology

Abstract: The short pelagic larval duration of the bryozoan *Schizoporella japonica* and year-round reproduction in the inner boat basin of Charleston OR make this organism well-suited for the study of settlement behavior and effects of larval size on colony growth. An encrusting cheilostome bryozoan, *Schizoporella japonica* is a common member of the fouling community on the undersides of mussels and on the sides of docks and boats. When exposed to bright light after remaining in darkness for approximately 48 hours, colonies release lecithotrophic coronate larvae. Successful larvae eventually settle on hard surfaces to form the founding colony zooid, the ancestrula. Larval settlement success on varying surfaces was assayed, with the conclusion that larvae have highest settlement success on roughened surface (as opposed to smooth or grooved surfaces). In laboratory settlement studies approximately 40% of larvae settled within 24 hours, and remaining larvae either attempted settlement and failed, or died without settling. In another experiment, larval size was measured at the time of release, and ancestrula size was measured upon settlement. A significant positive correlation existed between larval area and ancestrula area. Ancestrulae were then transferred to the boat basin and photographed over 3 months to monitor colony growth. Significant positive correlations existed between ancestrula area and colony area after 2 to 6 weeks of growth. Results from this study give a clearer picture of the larval settlement dynamics and colony growth of this species.

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CONFERENCE CLOSING

“Discovery, Learning and Engagement for Tomorrow’s World”

John V. Byrne, President Emeritus, Oregon State University

The presentations at this, the seventh annual Heceta Head Coastal Conference, provide an excellent overview of many of the challenges involving the Oregon coast and the ocean immediately adjacent to the coast. They portray the coastal challenges of today, and they also give evidence of what the challenges of tomorrow are likely to be. Speakers at this conference emphasized the importance of research in understanding the environmental threats brought on by climate change, ocean acidification, and the added complications caused by man’s activities to harness the energy of the ocean, catch more fish and manage a burgeoning coastal population.

As we look to the future we can anticipate a world population well in excess of the seven billion people of today. The population of Oregon has been estimated to double to seven or eight million people by 2050. Many of these citizens will see the Oregon coast as a desirable place to live and to develop profitable businesses. There will no doubt be great competition for available, or not so available, space, thereby increasing the magnitude and complexity of the social, economic and political problems of the coastal society.

As the ability to monitor the coastal environment with automated observational systems increases, the demands on computational facilities will increase exponentially. The research necessary to understand these challenges must increase as well, however it is unlikely that governmental sources of money will be available to support such research. New funding systems involving the private sector-- the fundamental creator of wealth-- must be developed. In order to meet the challenges of tomorrow's world, new attitudes involving all of society will be required.

Discovery will continue to include the traditional role of research in creating new knowledge. It will also emphasize the importance of finding new and innovative ways of using existing knowledge.

Learning will be all- encompassing. Formal K-graduate school education will continue to be important, but the role of "free-choice learning" will be more and more important. Emphasis will be on the learning process, both in and out of the classroom, everywhere and at any time.

Engagement of researchers, managers, teachers with members of the community will be essential. Outreach will be important, but not as important as the engagement of all who have a stake in the new knowledge and ways of using that knowledge. Partnerships involving researchers and community members must be developed at the very outset of the identification of problems, be they social, economic, environmental, whatever.

The integration of Discovery, Learning, Engagement will be essential to the successful meeting of coastal challenges and the solution of coastal problems.

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PROGRAM NOTES

Critiquing the Conference The Conference is an annual event held each year on the last Friday-Saturday in October. For making improvements next year, see online survey: <https://www.surveymonkey.com/s/88JVNC5>.

Acknowledgments Meeting the expenses of the Conference would not be possible without the support of people and organizations who believe in our mission. They include:

<u>Grants:</u>	Oregon Sea Grant; College of Oceanic & Atmospheric Sciences, OSU
<u>Patrons:</u>	John Minter & Assoc., Inc.
<u>Supporters:</u>	Port of Siuslaw; City of Florence; Lea Patten & Dick David; Our Ocean
<u>Discovery Trip</u>	Siuslaw Estuary Partnership
<u>Treasury Services:</u>	Hart Financial Services
<u>Accommodations:</u>	River House Inn
<u>Web Master:</u>	Tiffany Rogato and Travis Virili, <i>OregonFast.net</i>
<u>TV Coverage:</u>	Campbell Productions CH 10

Conference Committee

HHCC, Inc. Board: Craig McMicken, Chairman; Paul Cornett, Jamie Doyle, Terry Newell, Lea Patten, Ken Rystrom, Jimmie Hart

Oregon Sea Grant: Jamie Doyle, Extension Faculty Barbara Miller, Ron Bruton, Wendy Farley, Joanne McMicken, Phyllis Koontz, Jean White,

Heceta Head Coastal Conference, Inc. ...

...is a nonprofit corporation whose mission is to inform and educate the public of the need for a healthy, productive, and resilient marine ecosystem in the Pacific Ocean off the Oregon coast.

The Conference brings together a diverse group of leaders, providing a balance of viewpoints, from the worlds of science, fishing, conservation, government, education, business, and philanthropy.

Oregon Sea Grant ...

... develops and supports research, outreach and education programs that help people understand, use and conserve marine and coastal resources.