

Ocean Acidification Workshop

Participant Biographies

Simone Alin

Dr. Simone Alin is an Oceanographer at NOAA's Pacific Marine Environmental Laboratory in Seattle, where she does research on various aspects of the marine carbon cycle, including ocean acidification. Geographically, most of her research focuses on the California Current System along the US West Coast. She has been actively involved with planning NOAA's ocean acidification research effort for North American coastal oceans, which will include moored and ship-based observations of the chemistry, biology, and physics associated with ocean acidification. She is also developing predictive relationships to facilitate the hindcasting of pH and carbonate saturation states based on historical data, such as oxygen concentrations, temperature, and salinity.

Debbie Aseltine-Neilson

Debbie Aseltine-Neilson is currently a Senior Marine Biologist Specialist with the California Department of Fish and Game and is the Marine Region's coordinator for research and data partnerships. She has over 30 years of experience working as a marine/fisheries biologist. For much of this time, she worked on projects associated with marine resources off California, though she also spent time studying species within the Atlantic/Caribbean, Gulf of Mexico, and South China Sea. Her work has included studying the impacts of water flow on sea urchin distributions, documenting changes in invertebrate, algal, and fish communities on artificial and natural reefs, surveying catches from the set gill net fishery, and examining the vertical distribution of bioluminescence in coastal waters. Aseltine-Neilson has also worked on a variety of management and assessment projects, such as assisting in the development of a fishery management plan for the nearshore finfish fishery, representing California on the Pacific Fishery Management Council's Groundfish Management Team, participating on several stock assessment teams, and assisting Sea Grant staff to convene a Managing Data-Poor Fisheries Workshop in 2008. She is currently a management advisor for an ocean acidification study headed by Dr. Victoria Fabry.

Jim Barry

Dr. Jim Barry is a Senior Scientist at the Monterey Bay Aquarium Research Institute. He is a marine ecologist with wide-ranging interests. His research program uses advanced undersea robotics to broaden understanding of how fossil fuel emissions affect ocean ecosystems from the surface to the deep sea. In addition to publishing over 75 scientific papers, Barry has helped to inform Congress and the public about ocean acidification, ocean carbon sequestration, and climate change. He is a contributing author to the "IPCC Special Report on Carbon Capture and Storage", and is an author of the

National Research Council's report on "Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean".

Peter Betzer

Dr. Peter Betzer is currently president of the St. Petersburg Downtown Partnership. Prior to joining the Partnership in 2008, he was an oceanographer at the University of South Florida (USF) from 1971 until 2008, and served as the founding Dean of USF's College of Marine Science from 2000 to 2007. His research focused primarily on the role of marine organisms in geochemical cycles. He was part of a scientific team that in 1986 discovered the important role of atmospheric dust in stimulating primary production in the North Pacific Ocean. He has participated on the Scientific Steering Committee for Britain's AUTOSUB, was twice elected vice-chair for the University National Oceanographic Laboratory System, and in 2005 was appointed to the Ocean Research and Resource Advisory Panel, a group that formulates recommendations for federal agencies. During his academic career he helped to create a major marine science complex in St. Petersburg that currently houses over 1,200 people from 10 agencies, including federal, state, university, non-profit, and non-governmental organizations. During his career at USF he also generated legislative support for new laboratory facilities, helped attract two new federal laboratories (USGS and NMFS), and created and staffed a Center for Ocean Technology.

Sue Cudd

Sue Cudd is the owner of Whiskey Creek Shellfish Hatchery, a bivalve hatchery in Tillamook, Oregon that supplies larvae and seed for west coast shellfish growers. She graduated from the University of Washington's School of Fisheries and has been working in the shellfish hatchery business for 25 years. Since 2006, the hatchery has been experiencing serious oyster larvae mortalities. They are now working with Oregon State University to monitor and try to solve this problem, which may be related to elevated CO₂ levels in the incoming seawater.

Anthony D'Andrea

Dr. Anthony D'Andrea is the Project Leader for the Shellfish and Estuarine Assessment of Coastal Oregon (SEACOR) project at the Oregon Department of Fish and Wildlife (ODFW). SEACOR focuses on mapping and quantifying estuarine habitat and shellfish resources in Oregon estuaries, developing approaches for long-term monitoring of shellfish populations, and maintaining legacy shellfish datasets for Oregon estuaries. D'Andrea came to ODFW after a period as a National Research Council fellow at the US EPA's Pacific Coastal Ecology Lab, and an academic career at both the University of the Virgin Islands and Oregon State University, where he ran a research program investigating the ecology of intertidal invertebrate communities in Oregon estuaries. D'Andrea received his master's degree in Marine Science

from the University of South Carolina and his PhD in Coastal Oceanography from The State University of New York at Stony Brook.

Andrew Dickson

Dr. Andrew Dickson is a Professor of Marine Chemistry at the University of California, San Diego's Scripps Institution of Oceanography. He leads the Marine Physical Laboratory's Oceanic Carbon Dioxide Quality Control research group, which is engaged in a variety of projects studying upper-ocean biogeochemistry and carbon dioxide chemistry in seawater. Specific projects include: development of strategies for quality control of oceanic carbon dioxide measurements, including the production and distribution of appropriate reference materials; improvement of techniques for measuring carbon dioxide parameters in seawater; and, a detailed study of acid-base chemistry processes in seawater, including aspects related to ocean acidification. In particular, his group is currently collaborating on a project to study ocean acidification exacerbated by coastal upwelling on the California shelf, which is directed by Dr. Victoria Fabry (California State University, San Marcos) and funded by the California Ocean Protection Council. They are also involved in a project directed by Dr. Richard Feely (NOAA/PMEL) to ascertain whether changes in ocean pH or aragonite saturation along the California coast can be accurately inferred from hydrographic measurements such as salinity, temperature, and oxygen concentrations.

Robin Downey

Robin Downey has served as the Executive Director of the Pacific Coast Shellfish Growers Association (PCSGA) since 1998, representing the environmental, regulatory, food safety, and marketing issues of shellfish farmers from Alaska, Washington, Oregon, California, and Hawaii. Effective July 1, 2010, Downey retired from her post as PCSGA executive director, but will remain involved in the Emergency Oyster initiative to oversee implementation of the hatchery monitoring and water treatment component. She and her husband own and manage Discovery Bay Shellfish in Pt. Townsend, Washington, where they grow oysters and clams including geoduck. Downey led development of the "Emergency Plan to Save Oyster Production on the West Coast," in response to drastic oyster seed mortalities in hatcheries and failure of natural set on the West Coast over the past several years. This was a collaboration of scientists from several disciplines, along with hatchery personnel, growers, and state and federal agencies. The Emergency Plan was developed two years ago and it identifies priorities including: extensive monitoring of waters in key estuaries, and water bodies adjacent to and in hatcheries; development of small-scale experimental water treatment systems within hatcheries; identification of oyster families that are resistant to poor sea water quality, including genetic traits; and development of tools to detect and neutralize *Vibrio tubiashii*, pathogenic marine bacteria that have been associated with larval mortalities. Downey also serves on the executive board of the Interstate Shellfish Sanitation Conference (ISSC), along with various committees of the ISSC, including Vibrio Management, Research Guidance, Post-Harvest Processing, and Shellfish Restoration. Other

professional affiliations include the Washington Department of Health's Vibrio Advisory Committee, and the Integrated Pest Management Committee under the Washington State Department of Ecology. Downey graduated from The Evergreen State College in Washington with a BA in Social Science, and was certified in conflict mediation by the Justice Institute of British Columbia.

Tom Ebert

Tom Ebert is a population biologist. He retired from San Diego State University and is now a courtesy professor in the Zoology Department at Oregon State University. He is particularly interested in evolution of demographic traits like growth, survival, reproduction, and longevity. Most of his research involved marine invertebrates (particularly echinoderms), but he has also worked with mollusks, lobsters, and desert and tundra vegetation. He is currently studying purple sea urchins along the Pacific coast from the northern tip of Vancouver Island, Canada, to Punta Baja, Mexico. The focus of this work is to document changes that have taken place in growth, survival, and recruitment since similar studies were done in the 1980s. The analysis also involves linking demographic rates with oceanographic conditions. As part of this study, he is attempting to gather data from old studies of sea urchins that have measured growth, size structure, density, and reproduction, with a goal of making all data available through the Ecological Society of America website.

Ralph Elston

Dr. Ralph Elston is the President of AquaTechnics Inc., a veterinary practice for fish and shellfish, specializing in health management, disease control, and disease diagnosis. His expertise and experience includes research investigations on biological mechanisms behind marine shellfish and fish diseases, genetics and nutrition, environmental pathology and toxicology, parasitology, aquatic animal health management, disease diagnosis and prevention, resource management, and Good Laboratory Practices for aquatic animal studies. From 1982 to 1995, Elston worked with the Battelle Marine Research Laboratory in Sequim, Washington where he was head of the laboratory's Marine Biotechnology and Biomedicine Group. Elston is affiliated with the University of Washington (Affiliate Professor, School of Fisheries) and the Pacific Shellfish Institute (Member, Board of Directors). AquaTechnics is approved by the National Veterinary Services Laboratory, Animal and Plant Health Inspection Service, and the U.S. Department of Agriculture for the export health certification of live mollusks.

Robert Emanuel

Dr. Rob Emanuel serves the North Coast of Oregon with water- and watershed-related education, training, and technical assistance to citizens, property owners, businesses, community leaders, and organizations through Oregon Sea Grant. Before joining Oregon Sea Grant, Emanuel coordinated a statewide watershed extension program in Arizona and conducted doctoral research on watershed

management by ranchers on the U.S.-Mexico border. His projects and research interests include non-point source pollution prevention, bioretention, benthic macroinvertebrate monitoring, relationships between water quality and invasive aquatic plants, drinking water protection, as well as landowner recruitment for salmonid habitat restoration or water quality improvement.

Benoit Eudeline

Dr. Benoit Eudeline is the Production and Applied Research and Development Manager for the Quilcene shellfish hatchery of Taylor Shellfish, Inc. He has been involved in shellfish research and aquaculture both in France (Ifremer) and on the west coast of the United States for the last 17 years. His research interests include cytogenetic systems development and optimization for shellfish/seed culture and more recently, understanding water quality/chemistry changes and their impact on shellfish larvae survival. His PhD focused on developing new techniques of tetraploidy induction in the Pacific oyster *C. gigas*.

Vicky Fabry

Dr. Victoria Fabry is a Professor of Biological Sciences at California State University, San Marcos. Fabry is a biological oceanographer whose research interests focus on the role of marine organisms in geochemical cycles. Her current research deals with the sensitivity of calcareous organisms and marine ecosystems to elevated carbon dioxide and ocean acidification, and the dissolution kinetics of biogenic calcium carbonates in the upper ocean. She earned her BA, MA, and PhD in Biology from the University of California, Santa Barbara.

Richard Feely

Dr. Richard Feely is a Senior Scientist at the NOAA Pacific Marine Environmental Laboratory in Seattle, Washington. He also holds an affiliate full professor faculty position at the University of Washington's School of Oceanography. His major research interests are carbon cycling in the oceans and ocean acidification processes. Feely is the co-chair of the US CLIVAR/CO₂ Repeat Hydrography Program, and a member of the Steering Committee for the US Ocean Carbon and Biogeochemistry Program. He was awarded the Department of Commerce Gold Award in 2006 for his pioneering research on ocean acidification. He received a BA in chemistry from the University of St. Thomas, and an MS and PhD from Texas A&M University, both in chemical oceanography.

John Finger

John Finger is the co-owner of Hog Island Oyster Company in Tomales Bay, California. The company started in 1983. Today it covers 160 acres and raises over 3 million Pacific, Kumamoto, and Atlantic

oysters each year, as well as Manila clams and mussels. Hog Island advocates for the oceans and environment, and their oysters and shellfish are on the “Super Green” list of sustainable seafood issued by the Monterey Bay Aquarium Seafood Watch. Finger previously worked as a mariculture consultant in Ireland and Spain, and as a Field Supervisor, Director of Research and Development, and Manager of Nursery Operations with International Shellfish Enterprises in Moss Landing, CA. He received his BS in Marine Biology from Southampton College.

Marsha Gear

Marsha Gear has 31 years of experience in university communications. At California Sea Grant, she is responsible for disseminating scientific information through publications, media relations, online databases, and the web. She led an effort to supply California beaches with more than 4,500 rip current and steep beach warning signs and more than 50,000 aquatic safety brochures. Prior to joining Sea Grant in 1998, Gear worked in various communications positions at San Diego State University (SDSU) for 19 years. She earned Accreditation in Public Relations from the national Public Relations Society of America in 1990, and has served on the local chapter board. Gear earned a bachelor's degree in Journalism with an emphasis in Public Relations from SDSU.

Carl Gouldman

Carl Gouldman joined the National Oceanic and Atmospheric Administration (NOAA) in 2000. He spent three years as program coordinator at the NOAA Coastal Services Center. In 2003, he served for one year as executive secretary to the NOAA Ocean Council analyzing and responding to the US Commission on Ocean Policy Report. Since October 2004, Gouldman has worked for NOAA's Integrated Ocean Observing System (IOOS) Program Office, where he serves as the Division Chief for Management, Budget, and Programming. In 2006, he served as Executive Secretary for the Interagency Working Group on Ocean Observations supporting the multi-agency group charged with oversight for IOOS. Gouldman received a BA from Duke University and a Masters in Coastal Environmental Management from the Duke Nicholas School of the Environment. Prior to completing his Masters, he worked for three years as a field educator and Senior Manager for the Chesapeake Bay Foundation where he participated in oyster recovery projects as part of the education curriculum, training teachers and students about Chesapeake Bay ecosystems and human impacts on the Bay.

Phyllis Grifman

Phyllis Grifman is Associate Director of the Sea Grant Program at the University of Southern California. In this capacity, she manages the research and outreach components of the program. She works extensively with stakeholders in Southern California to ensure that Sea Grant is aware of research and information needs, and that results of this research find their way back to decision-makers and

managers. She is also Secretary of the Channel Islands National Marine Sanctuary Advisory Council and a Board Member for the California Shore and Beach Preservation Association. Grifman has a Master's Degree in Political Science from the University of California, Santa Barbara, where she worked on multiple-use conflicts.

Steve Hankin

Steve Hankin is a data manager at NOAA's Pacific Marine Environmental Laboratory. Hankin is currently responsible for many data integration activities, including the CF conventions for netCDF (separate activities for models, satellites, and in-situ observations), the NOAA integrated data environment (GEO-IDE), Earth Systems Grid (CMIP/IPCC climate model outputs), NOAA's Observing System Monitoring Center for in situ ocean observations, and the global surface ocean carbon flux community (SOCAT). He began his work in software and oceanography by developing the Ferret program in 1984, an interactive computer visualization and analysis environment designed to meet the needs of oceanographers and meteorologists analyzing large and complex gridded data sets. In the early 1990s, he created the Live Access Server, a Web server offering custom scientific visualization and inter-comparison of datasets. In 2002, he led the team planning the data management strategy for the US Integrated Ocean Observing System. Hankin was educated in applied mathematics at the University of Washington.

Juliette Hart

Dr. Juliette Hart is a Regional Research and Planning Specialist with University of Southern California (USC) Sea Grant and a Research Assistant Professor at USC in Marine Environmental Biology. Her research interests include coastal marine policy, sustainable ecotourism, regional ocean governance, and sustainable coastal development. In 2007, she was a Knauss Marine Policy Fellow in Washington, DC, where she worked at the National Oceanic and Atmospheric Administration's National Ocean Service. Hart received her doctorate from USC in Ocean Sciences, along with a Graduate Certificate in Environmental Sciences, Policy, and Engineering: Sustainable Cities.

Maria Haws

Dr. Maria Haws is an Assistant Professor of Aquaculture at the University of Hawaii, Hilo, where she also directs the bivalve research and hatchery program. Her areas of research and extension are aquaculture, coastal management, and climate change adaptation. She additionally serves as a University of Hawaii Sea Grant Aquaculture Extension Specialist and the Pacific Islands Coordinator for the Pacific Islands Integrated Ocean Observing System (PacIOOS). Haws received her PhD in Wildlife and Fisheries Management from Texas A&M University.

Dennis Hedgecock

Dr. Dennis Hedgecock joined the University of Southern California (USC) as the first Paxson H. Offield Professor of Fisheries Ecology in 2003, following a nearly 30-year career at UC Davis. He is a member of the Marine Environmental Biology Section within the Department of Biological Sciences. Hedgecock's research interests include the population, quantitative, evolutionary, and conservation genetics of marine fish and shellfish, primarily Pacific oysters, white seabass, and Pacific salmon. Hedgecock was elected Fellow of the American Association for the Advancement of Science in 1986, and is currently a member of several other scientific societies, including the American Genetics Association, the Genetics Society of America, the National Shellfisheries Association, and the Society for the Study of Evolution. Hedgecock also serves on the editorial boards of *Aquaculture* and the *Journal of Experimental Marine Biology and Ecology*. He received his BS in Biology from St. Mary's College, California, and his PhD in Genetics from the University of California, Davis.

Annaliese Hettinger

Annaliese Hettinger is a graduate student in the Bodega Marine Laboratory at University of California, Davis. Her general interests are in biomechanics and hydrodynamics as they relate to interactions between marine organisms and their physical environment. She is examining connections between fluid flows, various types of biological structures, and topographical features that span an assortment of habitat types. Her dissertation research will entail quantifying the impacts of ocean acidification on the strength, structural integrity, and function of several key species in rocky intertidal ecosystems. Part of this research focuses on impacts occurring over the complete life cycle of the native Olympia oyster (*Ostrea conchaphila*) in Tomales Bay. Hettinger earned her undergraduate degree in marine biology from Dalhousie University in Halifax, Nova Scotia, Canada.

Gretchen Hofmann

Dr. Gretchen Hofmann is the Director of the Center for the Study of Ocean Acidification and Ocean Change, a UC-multicampus initiative. She is an eco-physiologist whose research focuses on the effects of climate and climate change on the performance of marine species. In particular, her recent work investigates the impact to marine organisms from rising atmospheric CO₂ concentrations via global warming and ocean acidification. Studies by Hofmann and her collaborators are identifying key developmental challenges for the sensitive larval stages of marine species in acidified waters, and gene pathways that may play a role in those processes. They are also investigating how marine species will cope with the dual challenges of global warming and ocean acidification in the coming century. Hofmann currently serves on the National Research Council Ocean Acidification Committee, and on the Ocean Acidification Task Force, organized by the Ocean Research and Resources Advisory Panel (ORRAP). She is also a member of the US National Science Foundation's Office of Polar Programs Advisory Panel.

Ian Jefferds

Ian Jefferds is general manager of Penn Cove Shellfish LLC on Whidbey Island, Washington, America's oldest and largest commercial mussel farm. He also represents commercial marine interests and aquaculture as Chair of the Island County Marine Resources Committee and is on the Board of the Pacific Coast Shellfish Growers Association. His focus related to offshore observation is on marine water quality and how it relates to shellfish recruitment and survival. Jefferds holds a degree in marine resource assessment planning and biology from Huxley College of Environmental Studies at Western Washington University.

Libby Jewett

Dr. Libby Jewett is a research program manager for the Center for Sponsored Coastal Ocean Research (NOAA/NOS/NCCOS/CSCOR). Their office funds competitively awarded, extramural research on a diversity of topics including coral reef ecosystems, harmful algal blooms, hypoxia, and sea level rise. Jewett's current focus is hypoxia research both in the Gulf of Mexico and around the US. CSCOR anticipates receiving funds to run an extramural research competition on the topic of how ocean acidification will impact (or is already impacting) commercial fisheries and their broader ecosystems. Jewett will be the program manager for this new initiative and is interested in updates on current stakeholder concerns and research needs.

Teri King

Teri King is a Marine Water Quality Specialist with Washington Sea Grant (WSG). For the past 19 years, she has been working with communities in the Pacific Northwest on pollution abatement, seafood safety, and shellfish culture. She manages a multitude of citizen monitoring efforts and outreach networks within Hood Canal and Puget Sound. Recognized for her leadership in the Hood Canal region, she was selected to serve on the Ecosystem Coordination Board by the Puget Sound Partnership. Her most recent program, 'Bivalves for Clean Water' provides a unique opportunity for tideland owners to better understand their role as ecosystem managers. Before joining the WSG team in 1990, King worked as a fisheries biologist for the Washington Cooperative Fish and Wildlife Research Unit on the control of invasive aquatic plants and salmon habitat issues, as well as for Alaska Sea Grant to determine the carrying capacity of shellfish aquaculture operations in Southeast Alaska. King completed her BS and MS at the University of Washington.

Terrie Klinger

Dr. Terrie Klinger is an Associate Professor of Marine Affairs at the University of Washington (UW), Adjunct Associate Professor in the School of Aquatic and Fisheries Sciences, and a leader of the Center

for Ecology of Changing Oceans at UW's Friday Harbor Laboratories. Her research focuses on the ecology of nearshore benthic communities, with a special emphasis on the impacts of multiple stressors on marine ecosystem function and the development of management strategies to reduce such impacts. She also serves as a gubernatorial appointee to the Northwest Straits Commission, the Chair of the Olympic Coast National Marine Sanctuary Advisory Council, and a Science Advisor to the Communication Partnership for Science and the Sea (COMPASS). Klinger earned her PhD in Biological Oceanography from the Scripps Institution of Oceanography at UC San Diego.

Chris Langdon

Dr. Chris Langdon is a Professor of Fisheries in the Department of Fisheries and Wildlife and the Coastal Oregon Marine Experiment Station at Oregon State University. Langdon's research focuses on mollusk physiology and aquaculture, including nutrition, microencapsulation, polyculture, and genetic improvement of oyster broodstock. He works closely with the West Coast shellfish industry, as well as with state and federal agencies, to improve benefits from the wise use of marine shellfish resources of the West Coast. He joined the faculty of Oregon State University in 1985 after receiving a PhD from the University of Wales and completing a post-doc at the University of Delaware.

Larry Langebrake

Dr. Larry Langebrake is the Director of SRI International's Marine Technology Program in St. Petersburg, Florida. In his role at SRI, he leads 70 researchers and engineers on cutting-edge projects that span homeland defense to environmental research. He was an integral part of the team that attracted SRI to St. Petersburg and he became the Director when SRI opened its doors on January 1, 2007. Prior to working at SRI, Langebrake spent 15 years in the aerospace industry and led the Center for Ocean Technology at the University of South Florida's (USF's) College of Marine Science, where his efforts resulted in the creation of an engineering organization that became an internationally recognized leader in environmental sensor research and development. Langebrake is also a registered professional engineer in the State of Florida and has been awarded 6 patents covering a range of alkali-metal fuel cells and marine sensors. He holds an MS degree in Electrical Engineering from the University of South Florida and has completed PhD in marine science.

Kevin Lunny

Kevin Lunny is a third generation family rancher/farmer who has lived on the Point Reyes Peninsula for 50 years. Lunny is one of the founders of the Point Reyes Seashore Ranchers Association, and remains active as a steering committee member. He is also a board member of Marin Organic and the Pacific Coast Shellfish Growers' Association, and serves as the board president of both the Marin Farmers Market Association and the Marin Agricultural Institute. In addition, he is a member of the Marin County

Farm Bureau, the California Aquaculture Association, and the National Shellfisheries Association. Lunny is passionate about producing food locally and organically, with minimum impacts to the environment, while supporting biodiversity and local food systems. One current project he is working on is the restoration and cultivation of two native shellfish species at the family oyster farm in Drakes Estero, Drakes Bay Oyster Farm. Although important to indigenous people, these native species have not been cultured by California shellfish farmers for many decades. Lunny is committed to ensuring that future generations of National Seashore family farmers/ranchers be encouraged, supported, and valued in their role as food producers for the community. Love for the family farm is what originally prompted him to obtain a UC Davis degree in Animal Science and, 21 years later, the first organic certification of beef cattle in Marin County.

Skyli McAfee

Skyli McAfee has recently taken the helm of the California Ocean Science Trust (OST), a position that also serves as the Science Advisor of the California Ocean Protection Council (OPC) and thus co-chair of the OPC-Science Advisory Team. In both roles, she is dedicated to providing the best available science to inform policy decisions by building a collaborative dialogue between scientists and decision-makers. Before coming to the OST, McAfee served as the Assistant Director of the University of California's Bodega Marine Laboratory, where she facilitated program development and administration, encouraging productive collaborations with federal and state partners such as the National Oceanic and Atmospheric Administration, US Geological Survey, and California Department of Fish and Game. McAfee received her undergraduate degree from University of California, Santa Barbara in Aquatic Biology and a Master's degree from Moss Landing Marine Laboratories.

Paul McElhany

Paul McElhany is the lead ocean acidification researcher at the NOAA Northwest Fisheries Science Center (NWFSC), and was primary author of the West Coast section of NOAA's Ocean Acidification Research Plan. His background is in population dynamic and ecosystem modeling. He is currently heading construction of an experimental research facility at the NWFSC to analyze how species will respond to simultaneous future changes in CO₂/pH, temperature, and oxygen levels. Ongoing experiments involve oysters, geoduck, clams, and abalone (with Dr. Carolyn Freidman at University of Washington) and krill, crab larvae, and other crustacean zooplankton (with Dr. Julie Keister at University of Washington). In collaboration with Dr. Shallin Busch and others at the NWFSC, McElhany has developed a marine ecosystem model exploring how changes from ocean acidification may indirectly affect the food web in Puget Sound.

Karen McLaughlin

Dr. Karen McLaughlin joined the Southern California Coastal Water Research Project (SCCWRP) in March 2007. She is an aquatic chemist specializing in the use of stable isotopic and chemical tracers for examining biogeochemical cycling of nutrients and organic matter in coastal systems. McLaughlin will also serve as SCCWRP's lead scientist for coordinating and conducting ocean acidification research. Her present research efforts include identifying nutrient sources and cycling in southern California coastal wetlands and watersheds, and nutrient criteria to mitigate coastal eutrophication and nutrient loading. She received her BS in Geosciences from Penn State University in 1999, and her PhD in Geological and Environmental Sciences from Stanford University in 2005.

Bruce Menge

Dr. Bruce Menge has held several faculty positions at Oregon State University from 1976 to the present. His research interests include marine, community, ecosystem, meta-ecosystem, physiological, and geographical ecology, as well as the impacts of climate change and ocean acidification on coastal ecosystems. He is currently a lead investigator in the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), a large-scale, long-term ecological consortium of four institutions (OSU, UCSC, UCSB, and Stanford) focused on the dynamics of the California Current Large Marine Ecosystem, as well as, the International Consortium for Research in Upwelling Marine Biogeographic Areas (ICORUMBA), a consortium of five institutions (OSU, UCSB, University of California, University of Cape Town, and University of Canterbury) focused on coastal ecosystem dynamics of global upwelling ecosystems. He formerly held a post-doc at the University of California, Santa Barbara, and an Assistant Professorship at the University of Massachusetts. Menge received his BA degree from the University of Minnesota, and his PhD from the Department of Zoology at the University of Washington.

Russ Moll

Dr. Russ Moll is Director of the California Sea Grant College Program at the University of California, San Diego. This institution supports research and outreach activities throughout California, and is the largest Sea Grant program in the country. Moll has served as an aquatic science researcher and administrator in a range of capacities, conducting extensive research in the nearshore marine environment, salt marshes, mangrove systems, the Great Lakes, small lakes, and temperate and tropical rivers. His former positions include Director of the Michigan Sea Grant College Program, Director of the Cooperative Institute for Limnology and Ecosystems Research at the University of Michigan, Associate Program Director in the Biological Oceanography Program at the National Science Foundation, and Associate Director of the University of Michigan Biological Station in charge of the Center for Great Lakes and Aquatic Studies. He also has formal training in biostatistics and has analyzed extensive databases from both freshwater and marine environments. Moll received his BA from the University of Vermont, MS in marine science from

Long Island University, MS in biostatistics from the University of Michigan, and PhD in marine ecology from the State University of New York at Stony Brook.

Jan Newton

Dr. Jan Newton is a Principal Oceanographer with the Applied Physics Laboratory of the University of Washington (UW) and affiliate faculty with the UW School of Oceanography and the School of Marine Affairs, both in the new UW College of the Environment. Having earned her PhD in biological oceanography, her research has focused on a systems view of marine ecosystems, spanning estuaries, such as Puget Sound, the outer PNW coast, and the open Pacific Ocean, and assessing factors such as climate forcing and human effects on the characteristics and productivity of these systems. She is the Principal Investigator of the Hood Canal Low Dissolved Oxygen Program Integrated Assessment and Modeling Study, a monitoring-modeling research study to cumulatively assess the impacts of human, watershed, ocean, and climate factors on dissolved oxygen in Hood Canal, WA. She is currently working with colleagues at UW and NOAA to assess the status of ocean acidification in Puget Sound and coastal Washington. Newton also is the Executive Director for the Northwest Association of Networked Ocean Observing Systems (NANOOS), which is the Pacific Northwest regional association for the US component of the Integrated and Sustained Ocean Observing System (IOOS), working towards building better ocean observing infrastructure. She co-chairs NOAA's Alliance for Coastal Technologies Stakeholder Council and is involved with several regional and national coastal/estuarine assessment efforts. Newton serves on the Puget Sound Partnership's Science Panel, and was Vice Chair from 2007-2009.

Dave Nisbet

David Nisbet is President and founder of the Nisbet Oyster Company, Inc., Goose Point Oyster, Inc., and Hawaiian Shellfish LLC. These companies were established in 1979 and consist of a 500-acre Pacific Oyster farm in Willapa Bay, Washington, as well as a 20,000 sq ft processing facility. They produce approximately three million pounds of shellfish annually. Product forms are fresh, frozen, and high hydrostatic pressure (HHP) treated. Nisbet attended Oregon State University and the Oregon Institute of Marine Biology.

Mark Ohman

Dr. Mark Ohman is a Professor of Biological Oceanography and Curator of Pelagic Invertebrates at the Scripps Institution of Oceanography, where he studies marine zooplankton ecology. Ohman recently published a paper analyzing the long-term variability of calcareous zooplankton in the California Current. He is also Lead Investigator of the NSF-supported California Current Ecosystem Long-Term Ecological Research (CCE-LTER) site. The CCE-LTER site focuses on the effects of climate change on the pelagic ecosystem of the southern sector of the California Current System. In connection with the CCE-LTER site

and colleagues, he has deployed two interdisciplinary moorings off the southern California coast. These moorings include measurements of pCO₂ in the atmosphere and ocean surface, as well as several physical and biological variables. In the same region, the California Cooperative Oceanic Fisheries Investigations conduct quarterly shipboard measurements, and CCE-LTER has two Spray ocean gliders continuously sampling across the main axis of the California Current.

Dennis Peterson

Dennis Peterson is the Director of Science at Carlsbad Aquafarm Inc (CAI). After high school, he worked in the sportfishing industry out of San Diego for five years. He then served for four years in the United States Coast Guard making trips to Antarctica aboard the USCGC Glacier and USCGC Polar Sea. Peterson attended California State University San Marcos, where he obtained a BS in biology and worked for CAI as a mussel harvesting diver, as well as a hatchery and grow-out technician for abalone. He attended graduate school at the University of Southern California in the Biological Sciences Department's Marine Environmental Program, where he studied outbreeding depression and speciation using the copepod *Tigriopous californicus* as a model system, advanced to candidacy, and was awarded the National Science Foundation's Doctoral Dissertation Improvement Grant. Returning to CAI four years ago, Peterson now oversees the culture of mussel, oyster, abalone, a variety of seaweeds, microalgae, and a variety of crustaceans.

Diane Pleschner-Steele

Diane Pleschner-Steele (pen name DB Pleschner) has been involved in west coast fishery affairs for 29 years, beginning as a feature writer and contributing editor for Pacific Fishing magazine, covering fisheries and environmental issues from California to British Columbia. Currently, she serves as Executive Director of the non-profit California Wetfish Producers Association (CWPA), representing California's historic wetfish industry, which has produced 80% or more of the statewide commercial fishery harvest since the turn of the 20th century. CWPA is a partner in collaborative research, working with the Department of Fish and Game, National Marine Fisheries Service Southwest Region, and the Southwest Fisheries Science Center. Pleschner-Steele is also active in the Pacific Fishery Management Council process, as a representative of California's wetfish industry on the Coastal Pelagic Species Advisory Subpanel, and on the California Sea Grant Advisory Board. In 1990, she coordinated industry referenda to establish the California Seafood Council, as an advisory board to the Department of Food and Agriculture. Pleschner-Steele managed the Council from 1991 until it closed its doors in 2001.

Ray RaLonde

Raymond RaLonde is the Associate Director and an aquaculture specialist with Alaska Sea Grant Marine Advisory Program (MAP). He is also a Professor of Fisheries for the University of Alaska Fairbanks School

of Fisheries and Ocean Sciences. Since 1991, RaLonde has directed the effort to develop an economically viable and environmentally sustainable shellfish aquaculture industry, as well as to provide public service and education to the Alaska's private, non-profit salmon aquaculture industry. Aside from aquaculture, RaLonde is also engaged in water quality training and monitoring, harmful algal bloom research and education, and seafood quality and safety research.

Steve Ramp

Dr. Steve Ramp is the Executive Director of the Central and Northern California Ocean Observing System (CeNCOOS). Ramp specializes in making observations in the coastal ocean and marginal seas from ships, moorings, and aircrafts. He has been on more than 80 research expeditions in the Atlantic, Pacific, and marginal seas. He held positions at the National Marine Fisheries Service, the Naval Postgraduate School, and the Office of Naval Research. Ramp received his MS in Physical Oceanography from the University of Washington and his PhD, in Physical Oceanography, from the University of Rhode Island.

Bill Robertson

(bio not available)

Steve Schroeter

Dr. Stephen Schroeter is a marine ecologist at the University of California, Santa Barbara's Marine Science Institute working in nearshore systems including kelp forest, rocky intertidal, and coastal wetland habitats. His applied work includes assessment of anthropogenic impacts and the performance of impact mitigation and management activities. In recent years, Schroeter has worked on designing and implementing protocols to collect information needed to assess and manage the red sea urchin and rock crab fisheries in California, with an emphasis on collaboration among a community-based fishery, scientists, and regulators. This work includes the design and implementation of long-term settlement monitoring as a sustainable, cost-effective, and fishery-independent measure of stock health.

Bruce Steele

Bruce Steele has spent 35 years in the ocean as a commercial diver and fisherman. He currently serves as an alternate board member for the California Sea Urchin Commission. His affiliations include a decade on the Channel Islands National Marine Sanctuary Advisory Council, stints on the California Department of Fish and Game (CDFG) Sea Urchin Advisory Committee and Sea Grant Living Marine Resources Committee, and member of the team of technical consultants to the sea otter recovery team. Bruce's personal gauge of involvement in management is to what extent it can help conserve ocean resources as

a whole. He believes it is equally important to focus on the “little creatures” and their role in the ecosystem – a “bottom up” approach, instead of the usual “top-down” focus on macrofauna. Bruce has had extensive experience with CDFG fishery conservation and management through grass-roots efforts to conserve the sea urchin industry. He sees involvement of industry as essential to the effectiveness of any conservation/management approach.

Phil Taylor

Dr. Phillip Taylor is the Acting Director of the Ocean Sciences Division at the US National Science Foundation, as well as the Head of the Ocean Section. He joined the NSF as a rotator in Biological Oceanography in 1985 and became Director of the Biological Oceanography Program in 1988. His research in California coastal systems pertained to the biological interactions and physical processes controlling the composition species assemblages on shorelines. He also studied the role of grazers in community structure control in Caribbean coral reef and mangrove ecosystems. He previously held positions as a professor at the University of the Virgin Islands, and Visiting Scientist at the Smithsonian's Museum of Natural History. Taylor has a Bachelor's Degree (from University of California, Santa Barbara) and a Master's Degree (from California Polytechnic State University) in Biological Sciences. He received his PhD from the University of California, Irvine in Ecology and Evolutionary Biology.

Brent Vadopalas

Brent Vadopalas is a principal research scientist at the University of Washington's School of Aquatic and Fishery Sciences, focusing on conservation genetics in marine invertebrates. His current research is assessing the effects of ocean acidification on Puget Sound shellfish, and use of triploidy in shellfish aquaculture. Other recent projects involved application of quantitative polymerase chain reaction technology to quantify pelagic marine invertebrate larvae, and design of reintroduction strategies for *Haliotis kamtschatkana* and *Ostrea lurida*. Vadopalas received both his MS in Fisheries and PhD in Aquatic and Fishery Sciences from the University of Washington, on geoduck population genetics.

Russ Vetter

Dr. Russ Vetter is Director of the Fisheries Resources Division (FRD) at the NOAA's Southwest Fisheries Science Center (SWFSC), located on the grounds of Scripps Institution of Oceanography. Vetter's personal expertise is in genetics and physiology. The Fisheries Resources Division conducts scientific research and provides management advice for federally-managed coastal pelagic fish and invertebrate species, including northern anchovy, Pacific sardine, and market squid. The Division also conducts research on highly migratory species (pelagic sharks, tunas, and billfishes). Abalones are managed by State entities, but FRD has responsibility for Endangered Species Act listed abalone species (e.g., white abalone, black abalone) and abalone Species of Concern (e.g., pink abalone). FRD has particular

concerns about the effects of ocean acidification (OA) on the larval stages of threatened or endangered abalone species and the early life history stages of coastal pelagic fishes and squid. The FRD maintains a number of long-term time series of interest to the study of OA and climate variation. The California Cooperative Oceanic Fisheries Investigations (CalCOFI) observing program is the longest and most extensive oceanographic and early life history observing program in existence. In this program, eggs and larvae of over 400 fish species plus commercially important invertebrates such as spiny lobster and market squid are routinely identified. Important OA-related oceanographic properties such as temperature, salinity, and dissolved oxygen are part of the CalCOFI program and are maintained in collaboration with Scripps Institution of Oceanography in a web accessible database. The SWFSC facility is currently being relocated to a new building, which will have a state of the art experimental aquarium suitable for the maintenance and husbandry of endangered species and the study of the effects of ocean acidification on marine invertebrates and fishes.

George Waldbusser

Dr. George Waldbusser is an Assistant Professor in the College of Oceanic and Atmospheric Sciences at Oregon State University. Waldbusser's general interests are benthic biogeochemistry and ecology, with focus on both how organisms affect biogeochemistry and how biogeochemistry impacts organisms. He has strong interests in estuarine carbonate cycling and the many processes that regulate pH in coastal and estuarine environments, particularly those with possible consequences to bivalves. He has most recently been working on the role of pH and saturation state in structuring infaunal and epifaunal bivalve populations. His interest in bivalve ecology spans back to undergraduate research of oyster recruitment dynamics in the Hudson-Raritan River estuarine complex. Waldbusser received his PhD in Marine and Estuarine Environmental Science from the University of Maryland and his MS in Oceanography from University of Connecticut.

Brad Warren

Brad Warren directs the Productive Oceans Partnership, the Sustainable Fisheries Partnership's program on ocean acidification. This program works to inform and prepare the seafood industry to address challenges to fishery productivity that arise from ocean acidification and related changes in seawater chemistry. As a journalist and consultant, Warren has worked on fisheries conservation and marine resource management since the early 1980s. He was editor of *Pacific Fishing* from 1996 to 2004, and a correspondent and editor for *National Fisherman* from 1981 to 1996.

Stephen Weisberg

Dr. Stephen Weisberg is Executive Director of the Southern California Coastal Water Research Project (SCCWRP), a research agency at the interface between science and water quality management in

California. His research emphasis is development of environmental assessment tools and monitoring programs. Weisberg is on the Governing Boards of the California Ocean Science Trust and the Southern California Coastal Ocean Observing System. He also serves on numerous advisory committees, including the State of California's Clean Beach Task Force, the California Ocean Protection Council Science Advisory Team, California's Water Quality Monitoring Council, and the US EPA Board of Scientific Counselors. Weisberg received his undergraduate degree from the University of Michigan and his PhD from the University of Delaware.

Lou Zeidberg

Dr. Lou Zeidberg is a staff researcher studying fisheries oceanography with a group from the Scripps Institution of Oceanography and NOAA's Southwest Fisheries Science Center (SWFSC). He obtained his PhD from UCLA, investigating the early life history of market squid. Ultimately, this research was able to predict the size of the fishery nine months in advance by taking a census of the paralarvae (hatchlings). In his first post-doctoral fellowship, he used the Monterey Bay Aquarium Research Institute's (MBARI's) remotely operated vehicles to observe and collect jellyfish, zooplankton, squid, and fish from the deep sea for nitrogen and carbon stable isotope analysis, in order to enhance the current view of the Monterey Bay food web. Later at Stanford, he used respirometry measurements and satellite pop-off archival tags to investigate the behavioral physiology of Humboldt or jumbo squid, *Dosidicus gigas*, in the Gulf of California. From these experiments, he confirmed energy saving behaviors that rectified a long standing energy conundrum for squid metabolism.