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DIRECTOR'S STATEMENT

The OSU/NOAA Cooperative Institute for Marine Resources Studies (CIMRS) represents a strong, long-term, NOAA-university partnership dedicated to research in marine science, graduate and public education, and cooperation with regional industries and communities that are dependent on marine resources.

An integral part of the OSU's Hatfield Marine Science Center (HMSC), CIMRS is a model cooperative institute for many reasons. By its co-location with three regional NOAA laboratories representing two NOAA Line Offices, the Institute is able to bring together research partners from a variety of disciplines to address complex multidisciplinary issues relating to the living and non-living components of the marine environment. It is also the administrative home for 28 research staff and 3 research faculty working on collaborative projects with NOAA investigators who serve as OSU courtesy faculty. No other OSU research institute provides both grant administration and personnel review in the manner of an academic department. CIMRS faculty also conduct research with funding from agencies such as NSF and ONR, which extends the impact of the Institute and its value to NOAA.

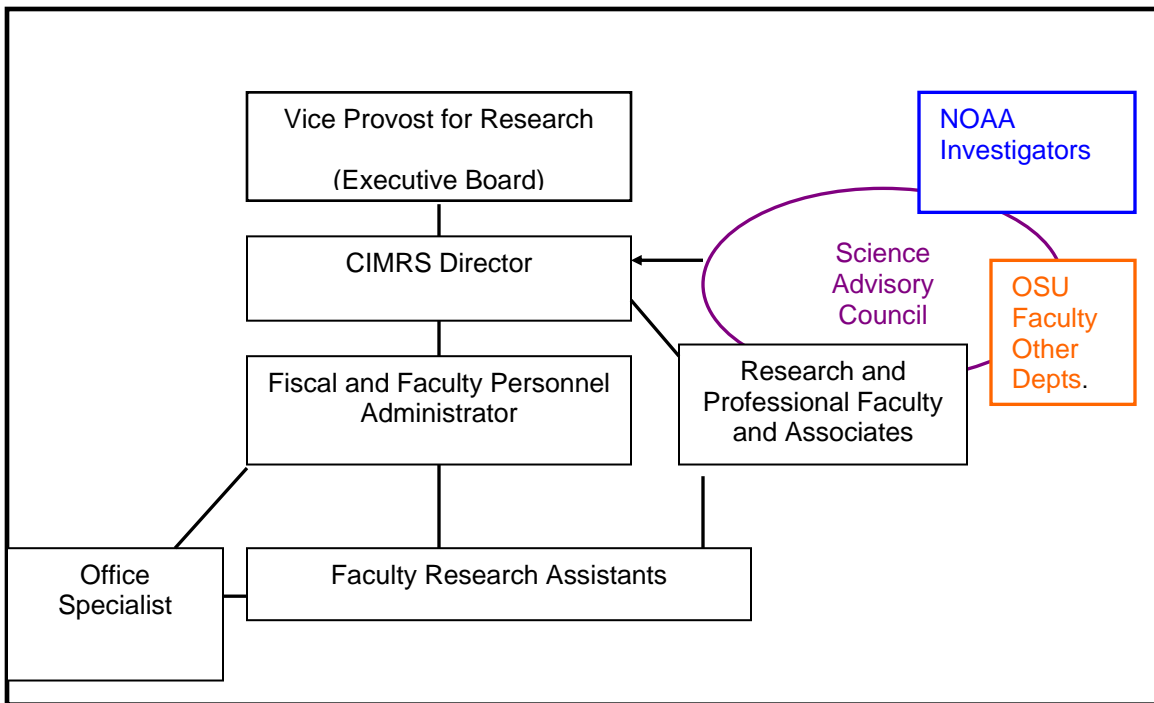
The research focus of CIMRS addresses living and non-living marine resources and is thus linked to programs that require environmental sampling or observing within the ocean and programs that characterize seafloor habitats. This focus encompasses the broad field of marine fisheries (including fisheries oceanography, habitat research, and ecosystem-based management), geological/chemical oceanography, marine mammal acoustics, and the effects of climate change on marine ecosystems. It thus addresses ecosystem and climate mission goals in NOAA's 5-year research plan and poises CIMRS research to contribute to NOAA's 20-year research vision.

The Institute thrives because of the commitment of leaders from within the laboratories of its NOAA associates and the OSU Research Office. As a result, during the past few years external research grant funding has grown, graduate student opportunities have diversified, and CIMRS has entrained many more OSU investigators from a broad range of disciplines to join together and address research problems of environmental, economic and social importance.

In summary, the scientific accomplishments of CIMRS demonstrate its value to both NOAA and the University. Its purpose is to serve as a bridge between traditional disciplines, a crossroad for fostering new ideas, and a dependable source of new research and analysis. It is anticipated that ongoing efforts will continue to raise the profile of the Institute and the partnerships it cultivates. For more information, please contact our website at <<http://oregonstate.edu/groups/cimrs>>.

ORGANIZATION

CIMRS is administered through the OSU Research Office with oversight from an Executive Board made up of members from the participating NOAA laboratories and collaborating OSU colleges and programs under the terms of a Memorandum of Understanding between OSU and NOAA/NMFS. A Science Advisory Council (SAC) gives input on research directions, progress, and policy to the Director.



**2005
EXECUTIVE BOARD**

Rich Holdren (Chair)
Vice-Provost for Research, Oregon State
University

Mark Abbott
Dean, College of Oceanic & Atmos.
Sciences, OSU

Usha Varanasi
Director, Northwest Fisheries Science
Center, NOAA

Robert Malouf
Director, Oregon Sea Grant, OSU

Eddie Bernard
Director, Pacific Marine Environmental
Laboratory, NOAA

George Boehlert
Director, Hatfield Marine Science
Center, OSU

Sherman Bloomer
Dean, College of Sciences, OSU

Clare Reimers
Director, CIMRS (Ex Officio), OSU

Erik Fritzell
Assoc. Dean, College of Agricult. Sci., OSU

SCIENCE ADVISORY COUNCIL

Michael Banks Dept. of Fish and Wildlife, OSU, Newport OR

Hal Batchelder College of Oceanic and Atmospheric Sciences, OSU, Corvallis OR

Kelly Benoit-Bird College of Oceanic and Atmospheric Sciences, OSU, Corvallis OR

Bill Chadwick CIMRS, OSU Hatfield Marine Science Center, Newport OR

Elizabeth Clarke FRAM Division Director, NOAA Fisheries, Northwest Fisheries
Science Center, Seattle WA and Newport OR

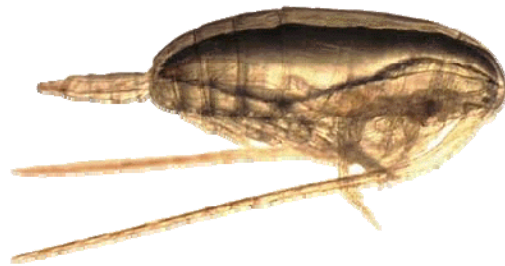
Tracy Collier EC Division/Ecotoxicology, NOAA Fisheries, Northwest Fisheries
Science Center, Seattle WA

Robert Embley Ocean Environment Research Division, Pacific Marine
Environmental Laboratory, NOAA, OSU Hatfield Marine Science
Center Newport OR

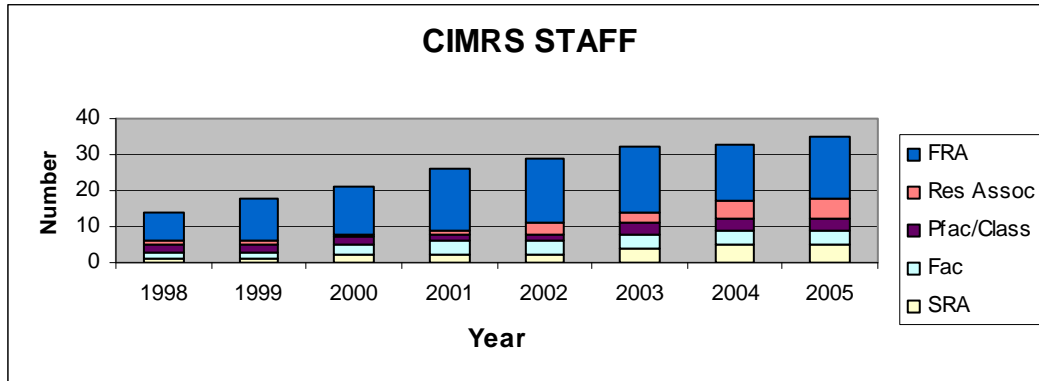
John Ferguson FE Division, NOAA, Fisheries, Northwest Fisheries Science
Center, Seattle WA

Selina Heppell Dept. of Fisheries and Wildlife, OSU, Corvallis OR
David Mellinger CIMRS, OSU Hatfield Marine Science Center, Newport OR
Alan Mix College of Oceanic and Atmospheric Sciences, OSU, Corvallis OR
Cliff Ryer RACE Division, NOAA Fisheries, Alaska Fisheries Science
Center, OSU Hatfield Marine Science Center, Newport OR

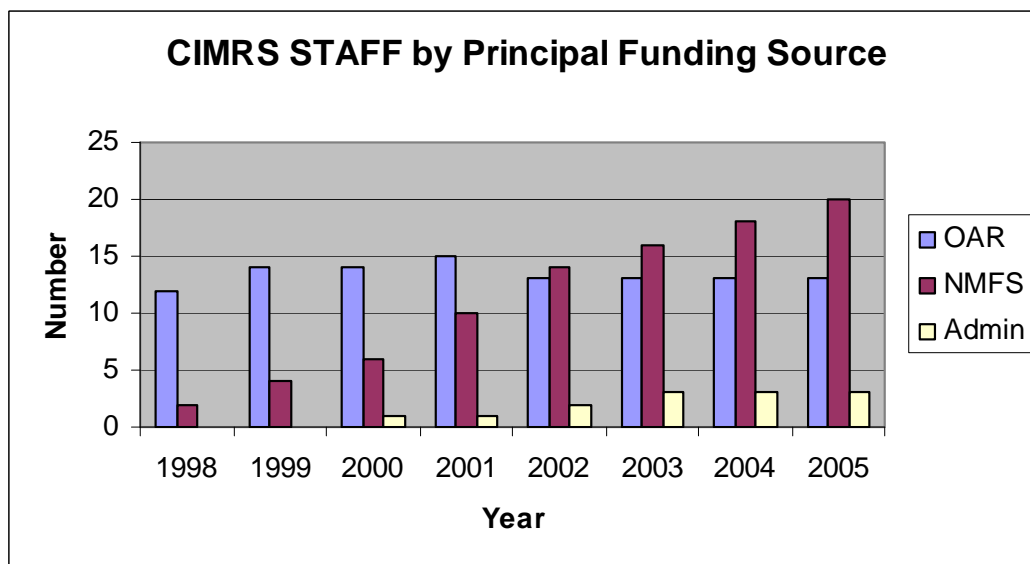
Ex-Officio – Clare Reimers



The number of CIMRS staff has grown steadily over the past 7 years as a result of new research initiatives in fisheries ecology, stock assessment, and marine mammal acoustics. The range of responsibilities and expertise of the staff have also grown and been recognized through promotion.



Faculty = Research Professors and the Director, ResAssoc = Research Associates, PrFac = Professional Faculty, Class = Classified Staff, SFRA = Senior Faculty Research Assistants, FRA = Faculty Research Assistants.



ADMINISTRATIVE SUPPORT

In FY2005, \$131,551 was expended by the university for CIMRS administration. These funds provided salary and benefits for the Director, Clare Reimers (0.2 FTE), the Fiscal and Faculty Personnel Administrator, Jessica Waddell (1.0 FTE), and a part-time office specialist (0.5 FTE). Administration funds were also used for personnel training and staffing, routine office supply costs, communication, computer network fees, equipment storage, hosting meetings, and contributing to public events at HMSC. Administrative support provided by the HMSC business office is not included in this figure.

Additional directed support from the NWFSC for project coordination provided another portion of the Director's salary and benefits (0.3 FTE).



“Marine Team” fisheries students experience survival training at HMSC.

PROJECTS SUPPORTED WITH CONTRIBUTED FUNDS FROM NOAA PARTNER LABORATORIES IN FY 2005

This section summarizes directed research projects undertaken by CIMRS with research funding received from NOAA through the Northwest Fisheries Science Center and the Pacific Marine Environmental Laboratory. All projects were approved by the Assistant Administrator and the Grants Management Division of NOAA after independent merit review.

Projects under Grant NA17FE2705

Total Award \$1,560,013; 9/1/04-8/31/05

“The Effects of Ocean Variability on Marine Survival of Fishes”

This project supports the active monitoring of ocean conditions, zooplankton distributions, and fish populations off the coasts of Washington, Oregon and California. New field efforts and retrospective analysis of historical data are being undertaken with all efforts emphasizing relationships between ocean conditions and growth and survival of marine fishes. Specific focus areas are *Plume Habitat and Pelagic Fish Ecology*, *Zooplankton Ecology*, *Nekton Distribution*, *Trophic Ecology*, *Pelagic/Demersal Fish Habitat and Bioacoustics Studies*, and *Long-term Indices of Annual Growth of Long-lived Groundfishes*.

OSU Investigators, Research Staff: George Boehlert, Professor, Fisheries and Wildlife, William Percy, Professor-Emeritus, College of Oceanic and Atmospheric Sciences; Vladlena Gertseva and Bryan Black, postdoctoral fellows; Becky Baldwin, Leah Feinberg, Joe Fisher, Julie Keister, Greg Krutzikowsky, Cheryl Morgan, Suzan Pool, Rian Hooff, Todd Sandell, Tracy Shaw, Mitch Vance (all CIMRS)

Collaborating NOAA Investigators: Ric Brodeur, Bob Emmett, Bill Peterson, Tom Wainwright, Kym Jacobson, FE/NWFSC; Mary Yoklavich, SWFSC

“Fisheries Habitat Investigations”

The objective of this work is to integrate many types of oceanographic, biological, geological (e.g., seafloor bathymetry, sidescan sonar images, sediment and rock types, active fault zones, observations and measurements from submersibles) and groundfish fisheries data (including fishery dependent records) into a Geographical Information System (GIS) so that information can be overlain on spatial maps. These maps are then utilized to characterize, classify and predict the distribution of seafloor habitats, to study relationships between habitat type and productive versus unproductive fishing grounds, and to document the consequences of management measures on fishing activities and habitat.

OSU Investigators, Research Staff: Chris Goldfinger, Associate Prof., College of Oceanic and Atmospheric Sciences, Jack Barth, Professor, College of Oceanic and Atmospheric Sciences, David Sampson, Associate Professor, Coastal Oregon Marine Experimental Station; Chris Romsos (all COAS); Scott Heppell, Assist. Prof. Senior Res., Dept. Fisheries and Wildlife

Collaborating NOAA Investigators: Waldo Wakefield and Elizabeth Clarke, FRAM/NWFSC

“Socio-Economics”

This project recognizes the need for research on the linkages between fisheries and ecosystem management and regional economics. OSU is analyzing methods to alleviate negative impacts of regulation through economic incentives and alternative forms of technology. The immediate focus area is *Using Economic Incentives to Manage Bycatch in West Coast Groundfish Fisheries*.

OSU Investigator: Susan Hanna, Professor, Agriculture and Resource Economics Department

“Cooperative Research”

Information on West Coast groundfish can be increased through collaboration with the fishing community and other constituents interested in groundfish research and data sharing. Under this project, programs are enabling new collaborative research between scientists and constituents. This and other outreach efforts increase communications between university scientists, the NMFS, and the fishing community. The program should also greatly enhance the transfer of knowledge between scientists and constituents, and between the scientific community and the public.

The main project elements in 2005 were:

- a) The Port Liaison Project. This program matches industry collaborators with university scientists through a proposal and advisory committee process.
- b) Educational. Marine Team: Student-led Investigations in the Marine Sciences
- c) Outreach. This effort is expanding the Headsup website to provide cooperative research information and general outreach information to fishers.

OSU Investigators: Flaxen Conway, Sociology Department; Selina Heppell and Scott Heppell, Department of Fisheries and Wildlife

Collaborating NOAA Investigators: Elizabeth Clarke, Waldo Wakefield, John Harms, FRAM/NWFSC



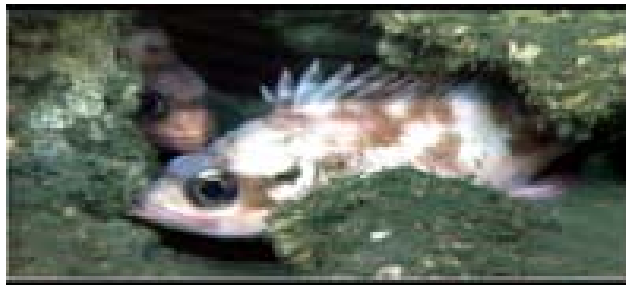
“Stock Assessment Improvement”

The focus of this project is the incorporation and evaluation of environmental parameters into population assessments of West Coast sablefish. Statistical studies are also being performed to establish the suitability of sea level as an independent variable and its control on recruitment trends. Incorporation of recruitment predictions in stock assessment models is being tested.

CIMRS also directed a search for a Visiting Professor in Marine Stock Assessment to join the institute for collaborative research in FY2005.

OSU Research Staff: Jim Colbert, CIMRS

Collaborating NOAA Investigator: Michael Schirripa, FRAM/NWFSC



Projects under Grant NA17FE1167

Total Award \$105,872; 6/1/05-8/31/06

“Relationships Between Disease, Natural and Anthropogenic Factors that Influence Disease Prevalence and Survival of Juvenile Salmon in the Estuarine and Nearshore Ocean Environment”

The overall objective of this project is to identify mechanisms and processes linked to environmental variables that can cause parasites to have an influence on the size and population structure of wild salmonids.

OSU Investigators, Research Staff: Larry Curtis, Professor, Environmental and Molecular Toxicology; Paul Reno, Associate Professor, Microbiology; Coral Stafford, Faculty Research Assistant; Claudia Bravo, GRA, CIMRS

Collaborating NOAA Investigators: Mary Arkoosh, Tracy Collier, EC/NWFSC

Projects under Grant NA17RJ1362

Total Award \$819,420; 7/1/04-6/30/05

“Ocean Environment Research”

This multidisciplinary project seeks to quantify the effects of submarine volcanic and hydrothermal activity on the ocean. Continuous acoustic monitoring of spreading centers in the world’s oceans allows investigators to detect and study the chemical, physical, geological and biological effects of tectonic activity on the global ocean and to follow free-ranging populations of large cetaceans. Specific focus areas are *Ocean Observing Systems, Hydrothermal Venting, Marine Mammal Acoustics, Microbiology of Seafloor Vents and Eruptions, Fisheries Oceanography*. More than half of the funding covers ship-time for GLOBEC projects.

OSU Investigators, Research Staff: William Chadwick, Associate Prof., Sr. Res., Robert Dziak, Associate Prof., Sr. Res., Haru Matsumoto, Research Associate, David Mellinger, Assistant Prof., Sr., Res.; Andra Bobbitt, Leigh Evans, Matthew Fowler, Ron Greene, Joe Haxel, Sara Heimlich, Andy Lau, Susan Merle, Sharon Nieukirk (all CIMRS)

Collaborating NOAA Investigators: Robert Embley, Stephen Hammond, John Lupton (all PMEL/OERD)



FY 2005 CONTRACTS

Title	Source	Total Funding	Duration	PI
Stock Assessment Graduate	AFSC	\$79,845	8/04-9/05	Reimers
Historic Habitat Opportunities...	NOAA	\$85,823	2/10/04-8/31/05	Reimers
Growth and Survival of Juvenile Salmon in the Columbia River Plume	NOAA	\$449,953	8/1/04-8/31/05	Reimers
Top Trophic Studies Survival, Growth and Health of Juvenile Salmon in CRE	NOAA	\$34,208	5/10/04-11/30/04	Reimers
Acoustic Marine Mammal Assessment: Tools for the Next Level	ONR	\$107,815	11/1/04-10/30/05	Mellinger
Library of Marine Animal Sounds	Cornell University	\$41,561	7/1/04-2/28/06	Mellinger



FY 2005 GRANTS FROM OTHER AGENCIES

Title	Source	Total Funding	Duration	PI
Hydroacoustic monitoring of Seismicity in the North Atlantic	NSF	\$183,575	1/05-12/06	Dziak, Matsumoto
Productivity, Biogeochemical Transformations and Cross-Margin Transport...	NSF	\$77,891	6/1/04-5/31/05	Peterson
Data Retrieval from an Acoustic Extensometer Experiment...	NURP	\$28,567	3/1/05-2-28-06	Chadwick
Historic Habitat Food Web Linkages	BPA	\$128,176	6/1/05-5/31/06	Reimers



Institute Director's Research Activities

The Institute Director's research was supported in 2005 through several grants through the College of Oceanic and Atmospheric Sciences where she holds a faculty appointment at the rank of Professor.

Project Title "Ocean Microbial Energy Generation Assessment (OMEGA)"

Source of Support: DARPA

Total Award: \$1,020,277

Period Covered: 03/15/04-09/30/05

Person Months Committed to the Project by PI: 3

Project Title: "The Seafloor Bio-fuel Cell: Long-term Power and Effects on Sedimentary Organic Matter"

Source of Support: NSF

Total Award: \$510,261

Period Covered: 03/01/03-2/28/06

Person Months Committed to the Project by PI: 7

Project Title: "Developing a Seafloor Power Source"

Source of Support: Sea Grant

Total Award: \$100,000

Period Covered: 08/01/03- 07/31/05

Person Months Committed to the Project by PI: 2

CIMRS Fellowship Opportunities and Graduate Students Supported Through Joint Projects

Fisheries Oceanography Graduate Fellowships

The goals of NOAA's strategic plan are to build sustainable fisheries, to recover protected species, and to sustain healthy coasts. These goals require the support of sound scientific research to build the knowledge base for maintaining economically viable fisheries and, at the same time, minimize anthropogenic impacts on marine ecosystems. To accomplish these goals a Fisheries Oceanography Graduate Fellowship program was started within CIMRS in 2003 with funds provided by the Alaska Fisheries Science Center of NOAA/NMFS. This program seeks to recruit highly talented M.S. or Ph.D. students to oceanography, fisheries or wildlife science, resource economics, zoology, environmental science or a related field at Oregon State University, with an intended focus on ecological and natural resource issues in the Northeast Pacific, Aleutian Islands, and Bering Sea. In 2005, three fellowships (first awarded in 2003) were continued.

2005 Fellows and Projects

Cara Fritz Towards Establishing a Natural Disturbance Mosaic on the Pacific Northwest Margin
Major Professor: Rob Wheatcroft, COAS

Julie Keister Investigations of Variability of Mesoscale Energy off the Coast of Central Oregon and Northern California
Major Professor: Tim Cowles, COAS

Rob Suryan Comparative Foraging Ecology of Five Species of Pacific Seabirds: Multiscale Analyses of Marine Resource Utilization
Major Professor: Dan Roby, F&W

Graduate Students supported through Joint Research Projects

A growing number of graduate student projects are being supported with contributed grant funds from the Northwest Fisheries Science Center. The CIMRS Director works to match qualified students with projects and courtesy faculty based at the Hatfield Marine Science Center.

Ph.D. Candidates – *Fisheries and Wildlife*

Todd Miller 1999-2006 Trophic Dynamics within Varying Conditions of the Northern California Current
Major Professor: Hiram Li
NOAA Fisheries Rep: Ric Brodeur, NWFSC

College of Oceanic and Atmospheric Sciences

Douglas Reese 1999-2005 Community Characteristics, Spatial Distributions, and Habitat Preferences of Marine Fauna within the Northern California Current Ecosystem
Major Professor: William Percy, COAS
Minor Rep: David Burch, Physics Dept.
NOAA Fisheries Rep: Ric Brodeur, NWFSC

Environmental Molecular & Toxicology

Claudia Bravo 2002-2006 Toxicology of Polycyclic Aromatic Hydrocarbons: Dibenzo [a,l] pyrene (DB[a,l]P) in Rainbow Trout, *Oncorhynchus mykiss*
Major Professor: Larry Curtis, E&MT
NOAA Fisheries Rep: Mary Arkoosh, NWFSC

Agricultural and Resource Economics

Haixia Lin 2002-2006 Spatial Statistical Analysis of Marine Resource Economic/GIS data
Major Professor: Susan Hanna, COMES

M.S. Candidates - Marine Resource Management

Josie Thompson 2002-2005 Life history of the Longnose Skate (*Raja rhina*) from the U.S. West Coast and Vulnerability to Fishery Impacts
Major Professor: Scott Heppell, F&W
Minor Rep: Douglas Markle, F&W
NOAA Fisheries Rep: Michael Schirripa, NWFSC

Vicki Wedell 2002-2005 Participatory GIS for Local Fisheries management in the Community of Port Orford, OR
Major Professor: Jim Good, COAS
NOAA Fisheries Rep: Elizabeth Clarke, NWFSC

Fisheries and Wildlife

Lance Campbell	2002-2005	Life History of Columbia River Salmon Major Professor: Ian Fleming, COMES NOAA Fisheries Rep: Dan Bottom, NWFSC
Brooke Martin	2002-2006	Purification and Characterization of Vitellogenin, and use for Enzyme Linked Immuno-absorbent Assay (ELISA) for gender and maturity status in Black rockfish (<i>Sebastes melanops</i>) Major Professor: Selina Heppell Minor Rep: Scott Heppell NOAA Fisheries Rep: Grant Thompson, AFSC

Degrees Completed

M.S. Marine Resource Management

Chris Romsos	2002-2004	Mapping Physiographic and Lithologic Habitats of the Oregon and Washington Continental Margin for West Coast groundfish Species, and Habitat Analysis of Historic NMFS Trawl Survey Stations Major Professor: Chris Goldfinger, COAS Minor Rep: Scott Heppell, F&W NOAA Fisheries Rep: Waldo Wakefield, NWFSC
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M.S. Fisheries and Wildlife

Marlene Bellman	2001-2004	Shifting Groundfish Trawl Efforts: A Case Study to Evaluate Fisheries Management Measures and Effects on Essential Fish Habitat Major Professor: Scott Heppell, F&W NOAA Fisheries Rep: Waldo Wakefield, NWFSC
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2005-2006 Publications

Dziak, R.P., D.K. Smith, D.R. Bohnenstiehl, C.G. Fox, D. Desbruyeres, H. Matsumoto, M. Tolstoy, and D.J. Fornari. 2004. Evidence of a recent magma dike intrusion at the slow spreading Lucky Strike segment, Mid-Atlantic Ridge. *J. Geophys. Res.* 109(B12102) doi: 10.1029/2004JB003141.

Fisher, J.P. and W.G. Pearcy. 2005. Seasonal changes in growth of coho salmon (*Oncorhynchus kisutch*) off Oregon and Washington and concurrent changes in spacing of scale circuli. *U.S. Fishery Bull.* 103(1): (In press).

Haxel, J.H. and R.P. Dziak. 2005. Evidence of explosive seafloor volcanic activity from the Walvis Ridge, South Atlantic Ocean. *Geophys. Res. Lettr.* 12: L13609, doi:10.1029/2005GL023205.

Krutzikowsky, G.K. and R.L. Emmett. 2005. Diel differences in surface trawl fish catches off Oregon and Washington. *Fish. Res.* (In press).

Ressler, P. H., R. D. Brodeur, W. T. Peterson, S. K. Pierce, P. M. Vance, A. R. Rostad, J. A. Barth. 2005. The spatial distribution of euphausiid aggregations in the northern California Current during August 2000. *Deep Sea Research Part II: Topical Studies in Oceanography*, 52(1-2): 89-108.

Schirripa, M. and J.J. Colbert. 2005. Interannual changes in sablefish (*Anoplopoma fimbria*) recruitment in relation to oceanographic conditions within the California Current system. *Fish. Oceanogr.* (In press).



CIMRS OUTREACH ACTIVITIES

Educational and scientific outreach is important in all aspects of CIMRS research. Websites are a venue that reaches an enormous audience. CIMRS investigators feature their collaborative research efforts in the fields of fisheries oceanography, geophysical and acoustic monitoring of spreading centers, ocean exploration, and bioacoustic monitoring of large cetaceans at several sites hosted by NOAA. One award winning website (<http://www.pmel.noaa.gov/vents>) features educational curricula, video clips of in situ seafloor experiments, and animated 3-dimensional fly-through movies of seafloor ridges.

The Visitor Center at OSU's Hatfield Marine Science Center also lends a convenient outlet for educational displays and programs. *OceanQuest* is a program that connects visiting audiences to real-time shipboard research through the use of interactive websites. NOAA's Teacher-at-Sea Program and the Ocean Exploration Program have helped sponsor educators on land and at sea who together present and interpret research activities for the general public. CIMRS investigators have also collaborated with Sea Grant Educational staff to design and prepare interactive exhibits. At the "ROPOS Exhibit", visitors can pilot a remotely operated vehicle to the seafloor and back with a joystick while viewing computer-generated and real video clips of the seafloor.

A land seismometer exhibit was installed in the HMSC Visitor Center in August 2004 just a week before a 4.7 magnitude earthquake in Newport. The exhibit has now been completed with interactive demonstrations of how seismometers operate and with a recording system for local earthquakes.

