Cooperative Institute for Marine Resources Studies

Annual Report

1 July 2013 – 30 June 2014
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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 sciences, graduate and public education, and cooperation with regional industries and communities that are dependent on marine resources. CIMRS is the only OSU research institute that provides both grant administration and personnel review in the manner of an academic department.

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 and is a model cooperative institute due to the commitment of leaders from within the laboratories of its NOAA associates and the OSU Research Office and being an integral part of the OSU Hatfield Marine Science Center (HMSC). 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.

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 FY14, CIMRS provided administrative home for 14 research staff including postdoctoral research associate and 6 research faculty working on collaborative projects with NOAA investigators who also serve as OSU courtesy faculty. Additionally, CIMRS faculty conduct research with funding from agencies such as Office of Naval Research, Bonneville Power Administration, and National Science Foundation which extends the impact of the Institute and its value to NOAA. In FY14, non-NOAA research funding was $2,183,050.

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. More information is available on CIMRS website, http://oregonstate.edu/cimrs, and in HMSC Annual Reports, http://hmsc.oregonstate.edu/annual-reports.
FY 2014 Overview

As part of the University, the Institute follows the OSU fiscal year cycle. Fiscal Year 2014 activities as reported in this document span July 1, 2013 to June 30, 2014.

In FY14, CIMRS provided administrative home for 19 research staff and 6 research faculty working on collaborative projects with NOAA investigators who also serve as OSU courtesy faculty. Recent research highlights include:

1. $2,183,050 raised from external fund sources by CIMRS principal investigators; and
2. 25 peer reviewed manuscripts published in FY 14.

After thirty years of developing and offering opportunities for joint research and outreach to a growing community of University and NOAA scientists, in FY12 the Institute was afforded authentic status through their success in an open competition for a Cooperative Institute to support NOAA’s Northwest research facilities in the area of marine resources. FY14 was the third year of a five-year award for research under four primary themes:

- Marine Ecosystems and Habitat;
- Protection and Restoration of Marine Resources;
- Seafloor Processes; and
- Marine Bioacoustics.

Research growth and success will provide impetus for renewal for an additional 5-year term.

Media recognition of CIMRS research this year included but was not limited to Discovery News, National Geographic Daily News, ABC News, and Scientific American.
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 Agreement between OSU and NOAA. The role and responsibilities of the Executive Board are to: 1) make recommendations to the President of the University for the Directorship of CIMRS; 2) review and approve the general policies, research themes, and priorities of CIMRS; and 3) conduct an annual evaluation of CIMRS programs and activities, including the budget, with appropriate recommendations.

A Science Advisory Council (SAC) gives input on research directions, progress, and policy to the Director. The Science Advisory Council’s responsibilities are to offer advice on the general research and educational goals of CIMRS that promote cooperation between university and federal agency researchers to make the most of collaborative opportunities at Hatfield Marine Science Center, in the Pacific Northwest, and globally. CIMRS relies on the Council for guidance on emerging OSU research initiatives and NOAA mission goals for which CIMRS is well placed to merge synergy.

![Figure 1. CIMRS Organizational Chart](image-url)
## FY 2014 Executive Board

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rick Spinrad</strong></td>
<td>Chair</td>
<td>CIMRS, OSU</td>
</tr>
<tr>
<td></td>
<td>Vice-President for Research,</td>
<td>Oregon State University</td>
</tr>
<tr>
<td><strong>Rich Holdren</strong></td>
<td>Interim Director</td>
<td>Oregon Sea Grant, Oregon State University</td>
</tr>
<tr>
<td><strong>Mark Abbott</strong></td>
<td>Dean, College of Earth, Ocean, &amp; Atmospheric Sciences</td>
<td>Oregon State University</td>
</tr>
<tr>
<td></td>
<td>Interim Director, Sea Grant,</td>
<td>Oregon State University</td>
</tr>
<tr>
<td><strong>John Bengtson</strong></td>
<td>Director, National Marine Mammal Laboratory, AFSC</td>
<td>AFSC, NOAA</td>
</tr>
<tr>
<td></td>
<td>Director, CIMRS, OSU</td>
<td></td>
</tr>
<tr>
<td><strong>Stella Coakley/ Larry Curtis</strong></td>
<td>Associate Dean, College of Agricultural Sciences</td>
<td>Oregon State University</td>
</tr>
<tr>
<td></td>
<td>Director, CIMRS, OSU</td>
<td></td>
</tr>
<tr>
<td><strong>Robert Cowen</strong></td>
<td>Director, Hatfield Marine Science Center, OSU</td>
<td></td>
</tr>
<tr>
<td><strong>Chris Sabine</strong></td>
<td>Director, Pacific Marine Environmental Laboratory</td>
<td>NOAA</td>
</tr>
<tr>
<td><strong>Sastry G. Pantula</strong></td>
<td>Dean, College of Science, Oregon State University</td>
<td></td>
</tr>
<tr>
<td><strong>Stella Coakley</strong></td>
<td>Associate Dean, College of Agricultural Sciences</td>
<td>Oregon State University</td>
</tr>
<tr>
<td><strong>Patricia Livingston</strong></td>
<td>Director, REFM,</td>
<td>Oregon State University</td>
</tr>
<tr>
<td><strong>John Stein</strong></td>
<td>Science and Research Director,</td>
<td>Oregon State University</td>
</tr>
<tr>
<td><strong>Michael Banks</strong></td>
<td>(Ex Officio)</td>
<td>CIMRS, OSU</td>
</tr>
</tbody>
</table>

## FY 2014 Science Advisory Council

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>David Noakes</strong></td>
<td>Chair</td>
<td>CIMRS, OSU</td>
</tr>
<tr>
<td></td>
<td>Professor, Department of Fisheries and Wildlife</td>
<td>OSU</td>
</tr>
<tr>
<td><strong>William Pearcy</strong></td>
<td>Professor Emeritus, College of Earth, Ocean, &amp; Atmospheric Sciences</td>
<td>OSU</td>
</tr>
<tr>
<td><strong>Jerri Bartholomew</strong></td>
<td>Associate Professor, Department of Microbiology</td>
<td>OSU</td>
</tr>
<tr>
<td><strong>Clare Reimers</strong></td>
<td>Professor, College of Earth, Ocean, &amp; Atmospheric Sciences</td>
<td>OSU</td>
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<tr>
<td><strong>George Boehlert</strong></td>
<td>Emeritus Professor of Fisheries, Department of Fisheries and Wildlife</td>
<td>OSU</td>
</tr>
<tr>
<td></td>
<td>Fisheries Biologist, FBE, RACE Division, AFSC, NOAA</td>
<td></td>
</tr>
<tr>
<td><strong>William Chadwick</strong></td>
<td>Professor, CIMRS, OSU</td>
<td></td>
</tr>
<tr>
<td><strong>Clifford Ryer</strong></td>
<td>Research Fisheries Biologist, Con Bio Division, NWFSC, NOAA</td>
<td></td>
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<tr>
<td><strong>Kurt Fresh</strong></td>
<td>Estuarine and Ocean Ecology Program Manager, FE Division, NWFSC, NOAA</td>
<td></td>
</tr>
<tr>
<td><strong>Paul Wade</strong></td>
<td>Research Biologist, National Marine Mammal Laboratory, AFSC, NOAA</td>
<td></td>
</tr>
<tr>
<td><strong>Laurie Weitkamp</strong></td>
<td>Research Fisheries Biologist, Con Bio Division, NWFSC, NOAA</td>
<td></td>
</tr>
<tr>
<td><strong>Michelle McClure</strong></td>
<td>Director, FRAM Division, NWFSC, NOAA</td>
<td></td>
</tr>
<tr>
<td><strong>Michael Banks</strong></td>
<td>(Ex Officio)</td>
<td>CIMRS, OSU</td>
</tr>
</tbody>
</table>

**Michael Banks** (Ex Officio)
Director, CIMRS, OSU
CIMRS Staff

The number of CIMRS staff has grown steadily over the 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 promotions. However, in recent years, CIMRS staff has been affected by federal budget cuts.

![CIMRS Staff by Principal Funding Source](image1)

**Figure 2. CIMRS Staff by Principal Funding Source, FY 1999 - 2014.** The number of staff is based on 1.0 Full-Time Equivalent calculations.

![CIMRS Staff by Classification](image2)

**Figure 3. CIMRS Staff by Position Classification, FY 1999 - 2014.** \(\text{ResFac} = \text{Research Professors}; \text{ResAssoc} = \text{Research Associates, Post-Docs}; \text{SFRA} = \text{Senior Faculty Research Assistants}; \text{FRA} = \text{Faculty Research Assistants}; \text{PFac/Cl} = \text{Professional Faculty and Classified Technical/Admin Staff.}\)
Administrative Support

In FY14 $278,256 was expended by the University for CIMRS administration. These funds provided salary and benefits for the Director, Michael Banks (0.37 FTE), the Fiscal and Faculty Personnel Administrator, Jessica Waddell (1.0 FTE), and three part-time office specialists. Administration funds were also used for personnel training and staffing, routine office supply costs, communications, computer network fees, travel, hosting meetings, and contributing to public events at HMSC. Administrative support provided by the HMSC Business Office is not included in this figure.

Within CIMRS’s five-year institutional award granted by NOAA, $50,000 was received in FY14 under Task I – Administration, Education, and Outreach, which provided partial support for the Director and the Administrator.

More information on administrative activities in FY14 is provided by CIMRS’ 2013 – 2014 Annual Progress Reports to NOAA on Award NA11OAR4320091 at http://oregonstate.edu/cimrs/sites/default/files/fy14_progrept_institutionalaward_fin.pdf
CIMRS Outreach Activities

Educational and scientific outreach is important in all aspects of CIMRS research. Websites are a venue that reach 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 marine mammals at several websites hosted by NOAA and CIMRS. Research activities, contributions, and news stories throughout the year are posted on CIMRS website, http://oregonstate.edu/cimrs/. Owing to the collaborative nature of CIMRS, a large component of outreach provided by CIMRS investigators is on the award winning website, http://www.pmel.noaa.gov/vents, which continues to feature educational curricula, video clips of in situ seafloor experiments, and animated 3-dimensional fly-through videos of seafloor ridges.

CIMRS research efforts are featured at OSU Hatfield Marine Science Center’s (HMSC) Visitor Center, which is dedicated to the lifelong exploration and discovery of coastal and marine sciences and resources. Many educational exhibits and programs at the Visitor Center correspond with current research conducted by the multiple federal labs co-located with HMSC and may be viewed by 150,000 attendees annually. CIMRS investigators have collaborated with Oregon Sea Grant educational staff to design and prepare interactive exhibits, covering the entire range of CIMRS research. Among the permanent exhibits, “Rumbleometer” and “Ring of Fire” demonstrate submarine volcanism research on the seafloor. “Hydrothermal Vents” and “Burning Ridge” bring the seafloor to life with real volcanic rock specimens and a 3-D mid-ocean ridge model. “Dive and Explore” allows visitors to simulate piloting a remotely operated vehicle to the seafloor and back with a joystick while viewing computer-generated and real video clips of the seafloor. “Patterns from Sound” exhibit educates visitors on marine acoustics research. In addition to these permanent exhibits, a real hydrophone and an interactive earthquake/seismic kiosk are on display. “Riding the Ocean Currents” is a multimedia exhibit that illuminates the relationship between ocean currents and plankton larval dispersal off the Oregon coast; the exhibit includes digital screens depicting ocean currents at various depth, 3-D sculptures of crab larvae, and microscopes showing actual larvae. Also on display are live crabs outfitted with tags that are part of a bycatch research project.

CIMRS researchers provide valuable volunteer hours at K-12 Science Fairs and related activities throughout the year.
CIMRS Graduate Students Supported through Joint Projects

A number of graduate student projects are being supported with contributed grant funds from NOAA Fisheries.

Ph.D. Candidates

OSU Department of Fisheries and Wildlife

Kevin Thompson 2008-2016
Project: Predator Diets and Multi-species Models
Major Professor: Selina Heppell
NOAA Fisheries Rep: Grant Thompson, AFSC

Linsey Arnold 2012-2016
Project: Management Strategy Evaluations for Rockfish
Major Professor: Selina Heppell
NOAA Fisheries Rep: Grant Thompson, AFSC

Brandon Chasco 2014-2018
Project: TBA
Major Professor: Selina Heppell
NOAA Fisheries Rep: Eric Ward, Eli Holmes, NWFSC

OSU College of Agriculture Sciences, Applied Economics

Christopher Cusack 2009-2016
Project: Bioeconomic Spatial, Multi-species Fishery Simulator
Major Professor: David Sampson
NOAA Fisheries Rep: Cindy Thomson, SWFSC, Andi Stephens, NWFSC

OSU College of Earth, Ocean, and Atmospheric Sciences

Caren Barceló 2009-2016
Project: TBA
Major Professor: Lorenzo Ciannelli
NOAA Fisheries Rep: Ric Brodeur, NWFSC
Institute Director’s Activities

ADMINISTRATIVE

National Service

➢ Named Chair of the National Cooperative Institutes Directors’ Executive Committee:
  • Summer Executive Meeting with NOAA and Sea Grant leadership, 6 August 2013
  • OAR update with OAR AA Dr. Bob Detrick, 4 September and 4 December 2013
  • Interview with Avery Sen, OAR Senior Analyst NOAA DC, September 9th & 17th, 2013
  • OAR Senior Research Council & NMFS meeting in Miami, 25 & 26 February 2014
  • National CI Directors meeting, Washington DC, 17 & 18 March 2014
  • Lead preparation of letter to OMB delivered 11 February 2014:
  • Visited Capitol Hill with CI Directors, 19 & 20 March 2014

➢ Participated in NMFS Northwest Fisheries Science Center, Science Symposium, 25 & 26 March 2014, at NOAA Western Regional Center in Seattle, WA.

➢ Communicated CIMRS 5th ‘Hot Item’, 24 March 2014: Antarctic’s Siren Call: The Sound of Icebergs
  http://ci.noaa.gov/InTheNews/HotItems/TabId/722/ArtMID/1835/ArticleID/10496/Antarctic%E2%80%99s-Siren-Call-The-Sound-of-Icebergs.aspx

University Service

➢ OSU Centers, Institutes and Programs meetings, quarterly
➢ OSU Provost’s Marine Council meetings, quarterly
➢ Conducted review of CIMRS faculty and staff in November 2013
➢ Convened meetings for CIMRS coordination and oversight:
  • Executive Board, Corvallis, OR (30 June 2014)
  • CIMRS Faculty (20 January 2014)
➢ Engaged in various HMSC/OSU Marine Studies Campus and Building meetings
➢ Engaged in HMSC Executive Committee meetings, bi-weekly
RESEARCH

The Institute Director’s research was supported in 2013 – 2014 through grants awarded to the Coastal Oregon Marine Experiment Station, Department of Fisheries and Wildlife where he holds a faculty appointment at the rank of Associate Professor.

<table>
<thead>
<tr>
<th>Principal Investigators</th>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
</tr>
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<tbody>
<tr>
<td>M. Banks</td>
<td>Confederated Tribes of the Siletz Indians</td>
<td>Analysis of DNA Samples to Identify Juvenile Winter and Spring Run Salmon</td>
<td>2012-14</td>
<td>$184,146</td>
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<tr>
<td>M. Banks/ A. Hydrodysky/ C. Davis</td>
<td>NOAA/ LMRCSC</td>
<td>Microsatellite Markers Isolation (EST-SSR’s) for Association Tests in the Context of Environmental Variability for Chinook Salmon</td>
<td>2013-14</td>
<td>$48,000</td>
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PUBLICATIONS

Marine Fisheries Genetics & Conservation (n=5)


Research at CIMRS

CIMRS partnership brings university scientists together with scientists from NOAA Northwest Fisheries Science Center, Alaska Fisheries Science Center, and Pacific Marine Environmental Laboratory.

Current research themes are:
- Marine Ecosystems and Habitat;
- Protection and Restoration of Marine Resources;
- Seafloor Processes; and
- Marine Bioacoustics.

CIMRS’ diverse and richly multidisciplinary range of applied and basic research investigations include marine chemistry and geophysics, ocean acidification and hypoxia, trophic dynamics and modeling, fisheries stock/habitat assessment and behavioral ecology, longer term prediction of physical (mesoscale/upwelling/plume/estuarine) and biological (predator/prey, lipid composition) inter-relationships and climate, zooplankton ecology, genomics, passive acoustic monitoring of marine mammals, socio-economic issues related to fisheries, and spatial planning.

The advancement of basic knowledge about ocean ecosystems from local to global scales, the conservation of endangered species, maintaining sustainable commercial and recreational stocks, and predicting and mitigating natural hazards associated with the solid earth (e.g., earthquakes and volcanoes) and climate change (e.g., changing weather, sea level rise, and ocean acidification) are in line with NOAA’s mission. Over the next decade, CIMRS expects to assist NOAA in meeting existing and emerging environmental and ecological challenges through research, education and outreach. Our research efforts will promote technological and scientific advancements that lead to ecological health, marine geophysical dynamics, sustainable marine resources, and socioeconomic benefits.

In FY14, CIMRS researchers spent 121 days at sea. In addition, CIMRS researchers conducted 10 sampling days on the Newport Hydrographic Line.
Marine Ecosystems and Habitat

CIMRS Marine Ecosystems and Habitat research focuses on NE Pacific Ocean ecosystems including coastal Alaska waters. Research efforts are often interdisciplinary and are provide understanding of interactions between people and natural systems at the regional and local level. Areas of emphasis are:

- Ecosystem monitoring by both new and established tools and approaches;
- Large-scale environmental and small-scale process studies for understanding ecosystem health, habitat function and environmental change;
- Modeling and forecasting activities that make extensive use of current and past ecological, environmental and socio-economic data; and
- Development of decision-support tools that enable improved regional ecosystem forecasting, management and policy decisions.

Total FY14 Award: NMFS = $401,565

More information on the following projects is provided by CIMRS’ 2013 – 2014 Annual Progress Reports to NOAA on Award NA11OAR4320091 at [http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf](http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf)

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
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</thead>
<tbody>
<tr>
<td>NMFS</td>
<td>Coast-wide Genetic Stock Identification – Ecosystem Effects on Adult Chinook Salmon Distribution and Abundance</td>
<td>5/1/13 – 9/30/14</td>
<td>$102,767</td>
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<tr>
<td>NMFS</td>
<td>Climate and Habitat Effects on Productivity of Important Alaska Fishery Species</td>
<td>7/1/13 – 6/30/14</td>
<td>$97,059</td>
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<tr>
<td>NMFS</td>
<td>Effects of PDO, ENSO, Climate Change on the Northern California Current Ecosystem</td>
<td>10/1/13 – 2/28/15</td>
<td>$100,000</td>
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<tr>
<td>NMFS</td>
<td>Long-term Observations of Physical and Biological Oceanographic Conditions in Coastal Waters off Oregon: Hydrography and Zooplankton</td>
<td>10/1/13 – 9/30/14</td>
<td>$101,739</td>
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</table>
CIMRS research in Protection and Restoration of Marine Resources has three foci:

- Collaborative research and education to improve assessments and evaluation of fisheries management strategies and actions;
- Research and integration of biological data on species distribution and habitat use into regional programs on coastal marine spatial planning with attention to renewable ocean energy, aquaculture, and fishing; and
- Conservation of protected species listed under Endangered Species Act, Marine Mammal Protection Act, other statutes, international treaties, and conventions.

Total FY14 Award: NMFS = $111,043

More information on the following projects is provided by CIMRS’ 2013 – 2014 Annual Progress Reports to NOAA on Award NA11OAR4320091 at [http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf](http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf)

### Protection and Restoration of Marine Resources Projects in FY14:

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
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</thead>
<tbody>
<tr>
<td>NMFS</td>
<td>Development of Quantitative Tools for Assessing Effects of Anthropogenic Mortality on Marine Turtle Populations</td>
<td>10/1/13 – 12/31/14</td>
<td>$84,000</td>
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<tr>
<td>NMFS</td>
<td>Kemp’s Ridley Sea Turtle (<em>Lepidochelys kempii</em>) Population Model: Re-Evaluated</td>
<td>12/1/13 – 11/30/14</td>
<td>$10,644</td>
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<tr>
<td>NMFS</td>
<td>Stock Assessment Research Review of Pacific Hake</td>
<td>2/1/13 – 6/30/14</td>
<td>$16,399</td>
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</table>
Seafloor Processes

CIMRS research in Seafloor Processes involves exploration, time-series observations, remote monitoring, and innovative instrumentation concerning the impacts and consequences of submarine volcanism and hydrothermal venting on the global ocean. Research assesses the effects of seafloor spreading-center activity, volcanism and hydrothermal systems on the physical, chemical and biological components of the world oceans and deep-sea ecosystems through the use of the most advanced technologies in acoustics, seafloor imaging, and physical, chemical, and biological oceanography. These technologies include submarine hydrophones to detect earthquake and volcanic activity, multi-beam sonar systems for detailed mapping of seafloor bathymetry, instrument packages deployed from surface ships for detecting and mapping water-column hydrothermal plumes, and submersibles (both manned and robotic) for direct observation and sampling of seafloor hot spring systems.

Recent research activity has focused on submarine volcanic systems, including mid-ocean ridge spreading centers such as Juan de Fuca Ridge off the Washington-Oregon coast and subduction zone systems such as Mariana volcanic arc in the western Pacific.

Total FY14 Award: OAR = $955,156

More information on the following projects is provided by CIMRS’ 2013 – 2014 Annual Progress Reports to NOAA on Award NA11OAR4320091 at http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf

**Seafloor Processes Projects in FY14:**

<table>
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<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAR</td>
<td>Impacts of Marine Volcanism and Hydro</td>
<td>7/1/13 – 9/30/16</td>
<td>$955,156</td>
</tr>
</tbody>
</table>
Marine Bioacoustics

CIMRS Marine Bioacoustics research specializes in the collection and analysis of marine acoustic data. Research encompasses instrument development for data collection in both nearshore and pelagic environments, as well as the development of analysis techniques. Marine acoustic data is collected using autonomous deep-sea hydrophones, cabled observatories, and animal-borne instruments. Research is conducted in five areas:

- Platforms for acquiring acoustic data;
- Algorithms and software for automatic detection, classification, and localization of animal sounds;
- Species identification, behavior, and ecology;
- Monitoring anthropogenic noise and its potential effects on marine mammals; and
- Rare species identification in remote areas of the ocean.

Total FY14 Award:  
NMFS = $79,000  
OAR = $276,829

More information on the following projects is provided by CIMRS’ 2013 – 2014 Annual Progress Reports to NOAA on Award NA11OAR4320091 at http://oregonstate.edu/cimrs/sites/default/files/fy13_progrept_institutionalaward_fin_0.pdf

**Marine Bioacoustics Projects in FY14:**

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMFS</td>
<td>Real-time Acoustic Observing System for Marine Mammals</td>
<td>7/1/13 – 6/30/15</td>
<td>$79,000</td>
</tr>
<tr>
<td>OAR</td>
<td>Fin Whale Vocalization Behavior in Response to Long-term Variations in Deep Ocean Ambient Sound across the North Pacific</td>
<td>7/1/13 – 6/30/14</td>
<td>$56,308</td>
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<tr>
<td>OAR</td>
<td>Pinniped Acoustic Controlled Exposure Study: PACES Phase II</td>
<td>7/1/13 – 6/30/14</td>
<td>$11,617</td>
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<tr>
<td>OAR</td>
<td>Advanced Methods for Passive Acoustic Detection, Classification, and Localization of Marine Mammals</td>
<td>10/1/13 – 9/30/14</td>
<td>$150,575</td>
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</tbody>
</table>
Appendix A. FY 2014 Grants and Contracts from Non-NOAA Agencies

CIMRS receives numerous grant awards and contracts from non-NOAA agencies for projects within our institute research expertise.

FY 2014 non-NOAA awards are listed in the following table:

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
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<tr>
<td>R. Dziak</td>
<td>NSF</td>
<td>Cascadia Initiative Expedition Team</td>
<td>9/26/11 – 8/31/14</td>
<td>$23,147</td>
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<tr>
<td>D. Mellinger</td>
<td>ONR</td>
<td>Detection, Classification, and Density Estimation of Marine Mammals</td>
<td>7/1/11 – 6/30/14</td>
<td>$151,048</td>
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<td>D. Mellinger/ H. Klinck</td>
<td>ONR</td>
<td>DURIP SeaGliders</td>
<td>6/15/13 – 9/30/14</td>
<td>$332,815</td>
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<td>M. Banks</td>
<td>BPA</td>
<td>Ocean Plume</td>
<td>10/1/13 – 9/30/14</td>
<td>$251,435</td>
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NSF = National Science Foundation
ONR = Office of Naval Research
BPA = Bonneville Power Administration

Contracts/Subawards received by CIMRS this fiscal year are listed in the following table.

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<tr>
<th>Principal Investigator</th>
<th>Funding Source</th>
<th>Project Title</th>
<th>Project Duration</th>
<th>Funded Amount</th>
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<tr>
<td>D. Mellinger</td>
<td>Portland State University</td>
<td>Application of Density Estimation Methods…</td>
<td>8/1/13 – 9/30/16</td>
<td>$37,809</td>
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<td>H. Matsumoto</td>
<td>Office of Naval Research</td>
<td>Demonstration of a Commercially Available High-Performance PAM Glider and Profiler Float</td>
<td>3/31/14 – 3/30/15</td>
<td>$452,879</td>
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<tr>
<td>R. Dziak</td>
<td>Korea Polar Research Institute</td>
<td>KOPRI Terra Nova</td>
<td>11/1/13 – 9/30/14</td>
<td>$41,201</td>
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<td>J. Ruzicka</td>
<td>U of Maryland subaward (Lenfest Ocean Program)</td>
<td>Developing Ecosystem-based Management…</td>
<td>12/1/12-12/31/15</td>
<td>$28,544</td>
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</tbody>
</table>
Appendix B. FY 2014 Publications


Brodeur, RD., Barceló, C., Robinson, KJ., Daly, E., Ruzicka, JJ. (In press) Seasonal and interannual variability in the spatial overlap between forage fishes and large medusae in the northern California Current region. *Marine Ecology Progress Series, Special Issue.*


Wells, B., Schroeder, I., Santora, J., Hazen, E., Bograd, S., Bjorkstedt, E., Loeb, V., McClatchie, S., Weber E., Watson, W., Thompson, A., Peterson, W., Brodeur, R.