

Understanding and Predicting Changes in the Ocean Sciences, Technology, and Operations Workforce

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We would like to inform the ocean observing systems (OOS) community of a new research project related to the OOS workforce. This project is designed to:

- produce a more complete description of the present state of the ocean science, technology, and operations (OSTO) workforce
- anticipate future developments in this workforce
- characterize the educational programs that will be needed to respond to those developments

Our focus will be on the workforce required to support current and future ocean observing systems (OOS, Table 1). However, we will also examine related sectors of the ocean economy that require similar knowledge and skill sets (KSS), such as the oil and gas industry, telecommunications, navigation, hydrographic surveying, ocean engineering, and basic and applied ocean research.

We will use existing workforce studies and collect new workforce information when adequate data does not currently exist. Our methods for collecting new information will include: (a) online workforce surveys; (b) focus groups to define occupations in detail; and (c) workshops to provide insight into present and future workforce and educational needs. We will also compare the OSTO workforce to those for similar non-oceanic fields (e.g., space-based Earth observing systems; weather observation, analysis, and forecasting). These comparisons will be used to improve our analysis and prediction of the evolution of the OSTO workforce, and our identification of effective practices for the education and training of the OSTO workforce.

Data analyses will be conducted to:

1. Quantitatively describe the major characteristics of the present OSTO workforce

2. Identify major temporal, geographic, and demographic patterns in the workforce
3. Assess the major factors that determine the supply of and demand for workers
4. Describe the main relationships between educational programs, the KSS required for employment, and employment patterns
5. Anticipate future developments in OSTO and the workforce that will be needed to support those developments
6. Describe the educational programs that will be needed to prepare that future workforce

The results of our analyses will be used to identify the most probable scenarios for the evolution of the OSTO workforce, and to recommend methods for monitoring and predicting this evolution on a continuing basis. Drawing from effective practices in industry and related sectors of the economy undergoing rapid changes and increasing pressures from globalization, we will also identify the educational practices that appear to be best suited for supporting this evolution, and propose methods for testing and monitoring the effectiveness of OSTO educational programs. The major deliverable products of this project will be: data from, and reports on results from, project surveys, focus groups, and workshops; online databases; project web site with access to project data and reports; and conference papers and journal articles.

We welcome the participation of the OOS community in the project surveys, focus, groups, and workshops. We would also welcome the opportunity to coordinate and collaborate with people working on related efforts. More information, including contact information, can be found at the project web site:

<http://www.marinetech.org/OSTOworkforcestudy/>.

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Project Leadership

Deidre Sullivan	MATE Center, Monterey Peninsula College, PI
Tom Murphree	Naval Postgraduate School, Project Director, Co-PI
Leslie Rosenfeld	Naval Postgraduate School, Co-PI
Lisa Campbell	Texas A&M University, Co-PI
Sharon Franks	Scripps Institution of Oceanography, Co-PI
Bruce Gilman	Marine Technology Society, Co-PI
Janice McDonnell	Rutgers University, Co-PI
Drew Michel	ROV Technologies, Inc., Shell Oil, Co-PI
Cheryl Peach	Scripps Institution of Oceanography, Co-PI

Table 1. Examples of the types of OOS-related occupations that will be investigated in this project.

Design, Operation, and Maintenance of Facilities, Platforms, and Instrumentation	Analysis, Modeling, Forecasting, and Interpretation of Ocean Information
Electronics Technician Instrumentation Technician Marine Technician AUV Technician ROV Technician/Pilot Submersible Technician/Pilot Navigation Technician Hydrographic Survey Technician HF Radar Technician LIDAR Technician Electrical Engineer Mechanical Engineer Operational Oceanographer Ship Personnel	Ocean Scientists Oceanographer (Physical, chemical, etc.) Marine Geologist Marine Biologist Marine Ecologist Taxonomist Hydrologist Aquaculturist Remote Sensing Analyst Research Technician Numerical Modeler Ocean Forecaster GIS Analyst Resource Manager
Data and Information Management	Education, Outreach, and Applications
Webmaster GIS Technician Database Administrator Network Systems Analyst Information Technology Manager Computer Support Specialist Computer Software Engineer	Education Specialist Education Director Outreach Specialist Ocean Extension Agent Science Applications Specialist Communications / PR Director