### **Information Systems Specialist**

Upper Ocean Processes Group, Physical Oceanography Department, Woods Hole Oceanographic Institution

# **Specialization**

Development of information systems for data acquisition, analysis, distribution and archive, with a focus on interoperability; design strategies to improve and promote dissemination and reuse of oceanographic data; build automated real-time data handling systems. Programming expertise in Matlab, Shell, Python, C, Perl, HTML, Javascript.

# Education

B.A., Swarthmore College

Continuing Undergraduate Courses, UMass/Lowell at Woods Hole: Technical Communications, Data Structures in C, C Program Design, Shell Script Programming, UNIX System Administration, Network System Administration, Java Programming Short courses at WHOI: FGDC Metadata, Python, Matlab, Drupal, MySQL, CSS, XML.

# **Current Affiliations**

#### Upper Ocean Processes Group, Woods Hole Oceanographic Institution

The main focus of the UOP group is the deployment of ocean reference stations; long term, open ocean buoys, instrumented from the surface to near the sea floor. We also participate in instrument development and collaborate with investigators at other institutions and agencies. As an Information Systems Specialist in this small group, I have the opportunity to participate in many aspects of our projects, including mooring deployments and recoveries, data management, web presentation, and software systems development.

#### **OceanSITES Data Management team**

OceanSITES is an international collaboration of researchers deploying ocean reference stations; long term, deep-ocean moorings capable of making high quality measurements suitable for climate studies. As a co-chair of the Data Management Team, I was a primary author of the data interchange format for the group. Working with team members from IFREMER, PMEL, SIO, MBARI, and other organizations, we have developed a NetCDF specification that is used to share data from Ocean Reference Stations around the world. This standard builds upon Climate and Forecast standard as well as the new NetCDF Attribute Convention for Data Discovery.

#### **NetCDF Climate and Forecast Standards Committee**

The Climate and Forecast (CF) project is an international collaborative effort to develop and maintain a specification for data collection and storage of environmental data using the NetCDF system. I was asked to serve on the Standard Names Committee when it was founded in 2006, and continued on to join the new Standards Committee when it was formed in 2012. Our purpose is to ensure that community requests for extensions to the standard are dealt with promptly and consistently. My background in observational data provides a different perspective from those working with models and remote sensing products, and as more users from the observational community adopt CF, this has become more important to the team.

#### NetCDF Attribute Convention for Data Discovery Steering Team

This team was convened by NOAA and its work is being hosted by the Federation of Earth Science Information Partners (ESIP). We are attempting to create a standard to enhance data

interoperability and increase data discovery; part of our focus is to be compliant with ISO standards, so widely adopted in Europe. A variety of disciplines, research organizations and federal agencies are represented on this team.

# **Recent Publications**

- 2014: Ocean Observatory Infrastructures; WP4 Progress, Sensor Metadata Comparison, and Tsunami Use-Case, Beranzoli, L, et al (poster)
- 2014. COOPEUS GEOSS Utilization Workshop Report, July, 2014, Waldmann et.al
- 2014. OceanSITES Data Format Reference, OceanSITES Data Management Team, oceansites.org/docs/oceansites-user-manual-v1.2.pdf.
- 2014. OceanSITES Data Providers' Guide, N. Galbraith, M. Lankhorst, J. Zing
- 2014. OceanSITES Data Users Guide, N. Galbraith, M. Pagnani
- 2014. A Workshop for the Coordination of Irminger Sea Region Science, Web Site, Galbraith et.al, <u>http://irminger-dev.whoi.edu/</u>
- 2014. Bay of Bengal Project web site, http://uop.whoi.edu/projects/Bengal/index.html
- 2011. Iridium Use in the Upper Ocean Processes Group at WHOI; NOAA Iridium workshop, September 13-16
- 2011. OceanSITES Users Manual, OceanSITES Data Management Team, oceansites.org/docs/oceansites-user-manual-v1.2.pdf.
- 2010. OceanSITES Data Management and Community Standards, Galbraith et al., IMDIS 2010.
- 2010. The MMI Guides: Resources for navigating the world of marine data management, Stocks et al., Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl.
- 2010. The MMI Device Ontology: Enabling Sensor Integration, Rueda, C., Galbraith, N., et al., Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl.
- 2009. The MMI Guides: Navigating the World of Marine Metadata, Stocks, et al., http://marinemetadata.org/guides.

# Earlier Affiliations

# Marine Metadata Interoperability Project

MMI is an international collaborative project designed to promote the exchange, integration and use of marine data. As a member of the MMI Technical Team, I have worked with many ocean informatics specialists on several projects in support of the MMI goals. I have contributed extensively to the development of the MMI web site and have collaborated on several AGU presentations for this project. As a member of the Device Ontology team, I helped to develop a data model for the accurate identification of instruments and sensors.

# IOOS DMAC Metadata and Data Discovery Expert Team

The IOOS Metadata Expert Team was charged with providing guidance on metadata standards to the US-IOOS program. Our activities included compiling information about existing content standards, reviewing proposed standards, tools, and vocabularies, and helping define best practices for IOOS data providers. This group, active until 2009, was mainly comprised of members from US federal agencies and the commercial sector.