

**Workshop on Physical Oceanographic Data Sharing and Coordinated Research
in the Prince William Sound/Exxon Valdez Oil Spill Region**
January 16, 2004

Attendance:

Lisa Ka'aihue, PWSRCAC	Peter Olsson, AEFF/UAA	Michael Lilly, GW Scientific
Linda Robinson, PWSRCAC	Dave Musgrave, UAF	David Janka, Auklet Charters
Joe Banta, PWSRCAC	Steve Okkonen, UAF	Susan Saupe, CIRCAC
Tony Parkin, PWSRCAC	Han Yi, AEFF/UAA	Molly McCammon, AOOS
Linda Swiss, PWSRCAC	Allen Macklin, NOAA/PMEL	
Carl Schoch, OSRI	Walter Parker, PWSSC/OSRI/NPRB	
Nancy Bird, PWSSC		

Welcoming remarks:

Joe Banta of PWSRCAC and Carl Schoch of OSRI welcomed the group and thanked those attending.

Introductions and Agenda Overview:

Following introductions, Banta reviewed the proposed actions from the notes of the January 15, 2003 workshop, as well as the current agenda.

Steering Committee Report:

Banta reviewed the past PWS/GOA Physical Oceanography Data Steering Committee notes from May 1, 2003 and October 9, 2003 with the group. No changes were made to the notes. The group also discussed the proposed mission statement and modified it to state: "to bring area researchers and end users together in order to find ways to share data and coordinate future research efforts through planning and modeling."

Update from AOOS:

Molly McCammon provided an update on the work of the Alaska Ocean Observing System (AOOS). She indicated AOOS is planning on being part of a global ocean observing entity and that it will be serving as the Alaska connection for the national network of observing systems, the Integrated Ocean Observing System (IOOS). AOOS will include members such as NOAA, OSRI, Kachemak Bay Research Reserve, etc. AOOS has received funding for two years to provide for program development. Similar regional associations from all coasts of the country are facilitating and coordinating systems in order to be prepared to go after federal monies that are to be made available under the IOOS program. It is anticipated that significant funding per regional organization will become available, in the neighborhood of \$5 to 25 million. This would benefit Cook Inlet, Prince William Sound, and the Gulf of Alaska as well as other areas.

The authorizing legislation has passed the Senate, is now before the House, and has good support from the administration.

AOOS Data Management and Communication Committee

Allen Macklin complimented the group on how well organized they are and how this presented a real opportunity for integration and funding. AOOS is considering a pilot project in Prince William Sound.

Macklin then presented information on the Data Management and Communications (DMAC) Committee of the national IOOS and on the AOOS DMAC Committee. He explained that IOOS and AOOS consists of three subsystems: (1) observation, (2) modeling and analysis, and (3) data management and communications, and that DMAC is the integrating component. Macklin reported that the current AOOS DMAC Committee consists of five members – Rob Bochenek (EVOSTC), Steven Gebert (ADF&G), Bern Megrey (NOAA/PMEL), Buck Sharpton (UAF), and himself. He said he would like to expand membership on this committee. The greatest needs are for data managers and visionaries.

The guiding principles of the DMAC Committee are to ensure that the AOOS serves Alaska and is part of the IOOS system on a national level. One of the committee's jobs is to make sure Alaska knowledge and data is recognized and fits in with the rest of the country. Guiding principles include interoperability, where operating systems are free to evolve independently with power remaining in each agency. Easy access to information will be necessary, as well as continuous outreach. User dynamics will drive expansion and growth of AOOS. Development of standards and protocols will foster buy-in from potential participants. Preservation of data and products will be an additional component, with participants being responsible for archiving information and data.

The ocean observation services will provide:

1. Metadata description – each element will have a metadata description identifying what it is and where it is published (similar to a card catalog in a library). Metadata will be in FGDC format.
2. Data discovery – how to search for and find data and data manipulation tools (similar to title, author, and subject card catalogs).
3. Data transport – access to data from computer applications across the Internet (similar to “checking out” the item).
4. On-line browse – evaluation of data through web browsers (comparable to reading a book jacket on the library shelf).
5. Data archive – long-term and secure data storage for later use (similar to the permanent, non-circulating collection or microfiche in a library). Data archiving will be up to the participants.

Agencies can ready themselves for AOOS participation by creating FGDC-compliant data and by sharing metadata with to-be-designated facilities. Agencies would make data

available through the OPeNDAP data access protocol and make data browsable on-line via Live Access Server. Agencies will need to ensure data is archived either locally or through a designated entity.

DMAC will be hosting a workshop March 1-2, 2004. The purpose of the workshop will be to share IOOS and AOOS DMAC background; identify data and product characteristics, priorities, and users; and to begin formulating standards and protocols. Expanding the committee and guiding the pilot project will be additional goals of the workshop.

Project Updates/Discussions

PWS Weather Station Network

Carl Schoch discussed how existing meteorological observations and maps could be used as a tool to indicate where gaps occur in information and data. He proposed that a determination should be made as to whether it is necessary to measure everything everywhere. For instance, OSRI has specific needs for its modeling effort.

The list of oceanographic data observations include pressure gauges measuring tidal flux, CODAR, NOAA tide gauges, OSRI tide gauge, ice radar, etc. Possible expansion plans for the future include salinity measurements, CODAR coverage, and nearshore moorings in Montague and Hinchinbrook.

He added that costs associated with gathering data and maintenance of operations are significant. Deployments of OOS equipment are a technical challenge, but duration of these systems is a political one. OSRI cannot fund this solely, additional outside funding sources for operations and maintenance are essential.

The two elements of an OOS are infrastructure development and long-term operation and maintenance. Long-term maintenance is a major and expensive component of an OOS. This group could develop a strategy for deciding how the PWSOOS will operate so the system can be maintained. Access and usefulness of real-time data are elements that require financial consideration and include formats, data quality, access restrictions, delivery mechanisms, and real time synthesis, modeling, and instrument placement. Schoch said that the PWSOOS should form a consortium of contributing institutional partners and that the steering committee should be expanded to include more expertise.

Schoch explained that an annual project inventory would enable others to see who is doing what research where and fulfill many of the goals of this annual workshop. Such a catalog, updated annually, could provide this service with continuity.

Meaningful data is necessary, and measurements have to be relevant on all scales of time. What can be maintained indefinitely with funding sources will need to be determined.

Hypothesis research will always be necessary, but research that can be relied on and used in the future is an additional component.

He added that missing from the groups is input from data users and communities. Participation from these groups is essential. Public participation must also be maintained. For funding to continue, a strong presence of public backing will be necessary. He suggested that RCAC should seek further funding based upon long-term plans for operations and maintenance. RCAC's role is to bring together all the groups - industry, science, and end users.

PWSRCAC Project Outline

Banta, Ka'aihue, and Parkin provided a project outline that listed current and future PWSRCAC projects.

Project 653 Weather Data: Portable weather stations are to be available this spring. PWSRCAC also has a data management white paper and bibliography dealing with meteorological studies in PWS.

Project 654 Geographic Response Strategies: This project is focused more on habitat protection, and sensitive area sites to be identified are in Prince William Sound, Copper River, and Southeast Cook Inlet.

Project 961 Port Valdez Coring Project: This project focuses on hydrocarbons from the Valdez Marine Terminal. Sediment cores will be collected within the Port for PAH analysis and radioisotope dating on sediments. This project also includes risk assessments for potential re-introduction of PAH's into Port Valdez. A request for proposals is currently available on PWSRCAC website.

Project 951 LTEMP: This project is designed to monitor environmental impacts of Alyeska Marine Termination operations and associated tankers. Hydrocarbon monitoring has been conducted at 10 sites, and PAH analysis has been done on mussel tissue and sediments. This project is in its 11th year.

Project 952 Aquatic Nuisance Species: This project is evaluating the risk of harmful non-indigenous species invasions via ballast water.

Project 956 Copepod Testing: This project focuses on TAPS hydrocarbon pollution in the marine ecosystem and will be analyzing PAH in copepods this spring.

Project 958 In Situ UV Measurements: This project involves taking UV measurements in Prince William Sound, and has been used in evaluating photo-enhanced toxicity issues.

Project 557 Valdez Air Quality: Several air quality issues in and around Valdez will be addressed.

Project 558 Chemical Analysis of BWTF Effluent: This project deals with non-regulated chemicals in effluent from the Ballast Water Treatment Facility that is pumped into Port Valdez.

Project 560 Microbial Efficiency of Biological Activity at BWTF: This project focuses on Port Valdez and will assess the effectiveness of biological activity in removing BETX from effluent.

Project 756 Response Gap/Closure Limits: This project will look at gap between clean up limits and closure conditions using weather conditions such as wave height and wind speed, thus depending on oceanographic data and possibly modeling.

State of the Environment of Port Valdez: This study will be centered on the current environmental state of Port Valdez and is scheduled to begin in FY05.

Ka'aihue added that PWSRCAC projects include both science/research and planning/policy issues. The relevance of long-term monitoring of oceans needs to be understood by the board.

Other Projects

AEFF: Peter Olsson explained that AEFF runs real time forecasting which is available on hourly intervals both in PWS and Cook Inlet.

PWSSC: Steve Okkonen said he is working on hydrographic surveys of PWS and planned to place some mooring arrays in Hinchinbrook Entrance and Montague Strait in March. Mary Anne Bishop has deployed moorings in Strawberry Channel and Egg Island Channel.

CIRCAC: Sue Saupe has been involved with developing an oil spill trajectory model that is used to examine shoreline risk. More oceanographic data and near-shore habitat information is needed in Cook Inlet. Other projects include changes in tidal measurements across the boundaries to determine what contributes to the net outward flow between Upper Cook Inlet and Lower Cook Inlet. CIRCAC did some testing of CODAR instruments with Dave Musgrave's team. CIRCAC is doing contaminant work as well. CIRCAC has been the lead on scientific project development for State of Alaska national coastal management. CIRCAC would like to participate on coordinating physical oceanography information.

Nancy Bird is working on OSRI programs with Carl Schoch. The PWS Science Center has been able to get special congressional funding to continue. OSRI is planning an August

field experiment that aims to place a host of scientific instruments in Prince William Sound that would track in real time such things as ocean currents, temperature and salinity. The data would be used to validate and improve the Nowcast/Forecast computer models of the Sound's ocean circulation.

Walter Parker – Walter mentioned some of the current projects being undertaken by the Prince William Sound Science Center.

Dave Janka and Nancy Bird reported on the two moorings on the Copper River Delta.

Steve Okkonen said he has been gathering hydrographic information in Cook Inlet through the use of specially equipped research buoys and satellites. His research there centers on how tidal currents influence sea ice and sediments in Cook Inlet, as well as temperature and salinity.

Okkonen reported that four moorings will be deployed in PWS – two in Montague Strait and two in Hinchinbrook – for collection of physical oceanographic data. This work is set to begin in March, 2004.

UAF SALMON Project: Musgrave presented information on the Sea-Air-Land Modeling and Observing Network (SALMON) Project. This project is at the University of Alaska Fairbanks and promotes the implementation and operation of ocean-observing systems in the Northern Gulf of Alaska. The SALMON Project, in cooperation with other institutes, is providing observations of ocean circulation and ecosystems and linking these with models to provide ocean forecasts similar to the way that weather forecasts are made.

Dave Musgrave also presented his project “Surface Current Mappers Using HF Radar” explaining that ocean currents are measured from land by using high frequency radar. Applications of Surface Current Mappers include safe and efficient navigation in marine operations; efficient hazardous spill trajectory prediction and clean up; monitoring, predicting, and mitigating coastal hazards; and shipping safety. Issues in Alaska consist of site topography; remote power and data transmission; huts containing equipment; bears; permits including FCC and land use; and upfront and operational costs. Logistics become a big issue with access and power to sites.

Musgrave said that he is working on CODAR (now being surface current mappers as CODAR is a trade name) placement in PWS by this spring. This is pending receipt of the Johnstone Point/Shelter Bay Permit. He said that it looks like a ship detection algorithm is being developed and that it may make the data of interest to the USCG or shippers. He reported that one of the goals of the deployment is to quantify the operational cost of remote placement of this equipment. It looks like the operational cost will be around \$150,000 to \$250,000 per year with \$50,000 of that being in fuel alone. With that in mind they are interested in evaluating winter operations and factors such as icing. He added

that long-range surface current mappers are being planned for placement on Middleton Island and Rugged Island near Seward.

Science Planning

The group agreed that preparation and maintenance of annual project information on a website in catalog form would be a very valuable service. Schoch suggested doing it on a regional basis such as PWS. Banta and Ka'aihue suggested that RCAC could consider doing this service in-house.

Carl Schoch asked "what do we do next?" He said he supports a consortium and proposes a meeting on ocean observation systems. A broader financial base will be necessary, as OSRI cannot support this effort on its own. Projects that will continue are the ones with long-term vision and funding.

Schoch suggested that a user-needs analysis be done which would reveal actual users of the information (communities and fishing organizations, for example). This information could be used to determine which data collection tools should be used and which should be eliminated.

Schoch said he also supports formation of a steering committee. He recommends the steering committee be formed prior to the field season, then they could proceed on producing an annual project catalog. After that, a science strategy could be developed, the timeframe being within the next year. There would then be some structuring work for PWSOOS. While the plan will be a stand-alone plan and guide science for the region, individual organizations will still have their own science plans (that would still be developed in conjunction or coordination with the larger plan).

Molly McCammon said that she thought the focus should be on the biggest end users and reminded the group that AOOS will be coordinating a March DMAC workshop.

Schoch recommended keeping current on what research is available in many areas, including meteorology, oceanography, and ecology. He suggests accessing the Monterey Bay Aquarium and Research Institute that could provide research information usable in Alaska.

Banta asked the group whether non-physical or biological plans should be part of this science planning effort. For instance, PWSRCAC has NIS and LTEMP projects and he asked where these fit in. This group is ahead of the curve on the physical oceanography side. Schoch said he thinks the group should do an inventory first to determine what needs to be done. McCammon suggests the group figure out what is to be achieved; a scope should be defined. She suggested the biological part is a module that can be plugged into this science plan, for instance the plan would need to address salmon biology.

Meeting Summary and Closing Comments

Banta led the group in summarizing meeting results and plans for moving forward. The group agreed to take the following actions:

1. Develop an annual project catalog for the region that would be used as a one-stop shop for coordinating projects and which would be produced annually as part of an annual physical oceanography data meeting. PWSRCAC will review the option of placing the catalog on its website. PWSRCAC and OSRI will take the lead on coordinating formative meetings and of drafting a prototype catalog for the group's review. Once developed, each organization would be responsible for filling out catalog information sheets for their organizational projects.
2. Develop a PWSOOS Physical Oceanography Science Plan using an expanded steering committee over the next year. OSRI will coordinate the process, with a goal of having the first steering committee meeting in May 2004.
3. Draft a plan for developing a biological component or module that could plug into the PWSOOS Science Plan. This would be a longer-term project in the two-year + timeframe, following development of the PWSOOS Science Plan.