

Symposium on Marine Science in the Northeast Pacific
Exxon Valdez Oil Spill (EVOS) Trustee Council/Prince William Sound
Regional Citizens' Advisory Council (PWSRCAC)
Physical Oceanographic Data and Research Workshop Notes
January 15, 2003
Captain Cook Hotel – Quadrant Room

Meeting Highlights

- There was general agreement that sharing research data and getting it out and accessible to others was a good idea.
- There are three data sharing protocols available now (NASA, GLOBEC, & EVOS/GEM) along with one under development by IOOS (Integrated Ocean Observing System) Consortium that will be available in a couple months. These protocols could be used as a starting point or model for oceanographic research in Alaska or the EVOS Trustee Council/CIRCAC/PWSRCAC region.
- There are several potential areas and projects in the Hinchinbrook Entrance area that could benefit from collaborative research.
- It is important to not just make data available to end users and others, its also important to link end users into the planning component of the research process.
- Data sharing protocols need to be supported by data storage infrastructure and hardware.
- A method for coordinating future research in the region could be a workshop as part of the EVOS Trustee Council annual meeting, with others as co-sponsors.
- Attendees supported the concept of a steering committee to promote ongoing communication and to address the two subjects of data sharing and coordination of future research. Initial steering committee members were set as - PWSRCAC- Joe Banta, GEM- Phil Mundy, Science Center/OSRI-Nancy Bird, UAF- Dave Musgrave, CIRCAC- Sue Saupe.

Welcoming Remarks – RCAC & Trustee Council Staff

Joe Banta, of PWSRCAC, welcomed the group, introduced himself and explained some of the history behind PWSRCAC and EVOS Trustees Council interest in the workshop. Katharine Miller, Science Coordinator for the EVOS Trustees Council, then introduced herself and stated that one of the goals is to develop collaboration among various research and funding organizations for data collection and sharing.

Introductions & Agenda Overview – Lisa O'Brien, Session Moderator

Lisa O'Brien, the meeting facilitator, introduced herself and then had the group introduce themselves.

O'Brien then focused the group on the purpose and five goals for the workshop:

Workshop Purpose:

To bring together area researchers to find ways to share data and coordinate future research efforts through planning and modeling.

Draft Synopsis of Workshop Goals:

Goal 1 - Understand the rewards, pitfalls and means of sharing data. What kinds of data are available? Who has them? Are the data real-time or not? Are data sharing protocols available and adequate to the task?

Goal 2 - Develop recommendations for a model or system that will provide the mechanism for sharing past, recently acquired, and future data. Who has the models? What do they provide and how do people access the products? Do they use the same data? What kinds of operating systems and software do they require?

Goal 3 - Develop ideas on coordinating mechanism for planning for future research among various research organizations. Do we need a standing committee or work group (see Goal 5, below)? MOA?

Goal 4 - Understand funding opportunities and schedules of availability.

Goal 5 - Determine the level of interest in forming a work group to follow up on the recommendations of this workshop and to develop a science plan for area marine current data.

O'Brien prefaced "The Case for Change" discussion on collaboration by stating the "publish or perish" competitive mindset that existed now wasn't as productive in this time of shrinking funds, and that discussion of some collaborative research models would occur later in the agenda. After all the discussion, the question to end with today would be, "Is there interest in forming a stakeholder group?" The use of the word "model" for today was defined as a framework or procedure (not a computer model).

The Case for Change – RCAC & Trustee Council Staff

Banta led the discussion by stating that RCAC's interest was in developing a more collaborative process, to get the data out and accessible, and to share funding opportunities. He added that RCAC's primary project interest was in Hinchinbrook Entrance, where the remote location and associated safety concerns make the expense of research an even greater factor.

Miller stated that the GEM program was developed to try to understand change. In order for GEM to participate in the many projects that were underway, there was a need to collaborate. RCAC approached EVOS about this collaborative model and EVOS suggested this workshop was a good forum. The types of models GEM is interested in developing are water circulation in PWS, atmospheric and oceanographic models, biological and physical models. She again clarified that the GEM Program is interested in developing certain numerical models, but that for the workshop we could use the term "model" to mean a collaborative process.

Presentation on the GLOBEC Model changed to PMEL

Rather than the GLOBEC Model listed on the agenda, Kimberly Bahl, metadata coordinator for NOAA, PMEL and AFSC/UW, (www.pmel.noaa.gov/bering/mdb), spoke about her work. She maintains a metadata directory of references containing information and sources on a variety of research. They provide a searchable website. Anyone interested in the North Pacific ecosystem, i.e. birds, mammals, fish, seaweed, biological and physical research could access and contribute to this metadata base. Questioned why this was being created when SIMS already existed, she responded that they shared their data back and forth.

Kate Hedstrom informed the group that her husband was also keeping a database of primarily oceanographic data at UAF. Jon Agosti referred to the Alaska Geospatial Data clearinghouse as he felt it had the most accessible, user-friendly data and should be utilized as a prototype by this group. NODC was described as another database where all projects funded by NOAA must submit their data. One problem with this database as a source of data is that it is very difficult to get data out of the system. The distribution process is cumbersome. Bob Piorkowski of ADF&G referred to ADF&G's Fisheries program data. Although it involves a tremendous amount of data, it's confidential, so a request has to be made and the information is then sanitized for distribution. Others noted that it could be tremendously difficult to get data out of ADF&G even when the data are not confidential. If we want data from this source, we need to involve ADF&G in our collaboration. Commercial fishing operators' annual reports are also confidential.

Facilitated Discussion with Speakers and Workshop Participants

Examples of Rewards and Obstacles:

Lisa Ka'aihue, RCAC, spoke of the long-term data set for the Long Term Environmental Monitoring Project done by RCAC. Mussels have been sampled twice/year since 1993. RCAC has a substantial data set on the website available to anyone. She discussed a study that made use of the RCAC LTEMP data to make a worldwide comparison of PAH exposure from oil spills and industrial sources - "Toxic equivalency factors for PAH and their applicability in shellfish pollution monitoring studies." It utilized data requested from both RCAC and from NOAA, as well as from all over the world. On Table 2 in the report, the author indicated the summary of the data sources, crediting PWSRCAC.

Lessons Learned:

1. Data can be used in different ways.
2. Consider the opportunity to share data with lay people.
3. Sharing data provides a broader context for results (when RCAC made its data available, RCAC had no idea its data would be compared to other areas all over the world).

Banta suggested that we need the archiving infrastructure (hardware, servers, staff, etc.) as well as the policy to truly implement data sharing, and that saving money was a major benefit.

Peter Olsson with UAA, said a data definition was needed and that data should be defined in a broader manner – as both definitions and model output. Data is measurable; in the scientific world, modeling is simulated. The geographic timescale is long term. The weather timescale is very short. Metadata vs. data needs to be considered. He noted that they produce a gigabyte worth of information every 24 hours for weather; more data than could be used .

Banta explained how RCAC had partnered with OSRI and invested \$15,000 to upgrade OSRI tide stations with wind equipment that benefited multiple agencies as well as industry and the public. Nancy Bird gave the background of the project and explained how it was a balancing act of choosing the sites and how the project was very successful due to the collaborative prioritization process at the front end.

Miller suggested that coordination on hardware such as the data collection systems could provide sharing opportunities also.

Lessons Learned:

1. Need to establish a common data format for similar projects, but it will not be possible to establish a common data format across all users/needs.
2. Data needs to be archived somewhere.
3. Need for archiving infrastructure as well as policy.
4. Potential to save money.
5. Some projects lend themselves better to sharing data than others.

Olsson suggested some obstacles were data format, i.e. the atmospheric model is a local polygraphic grid that no one else used. Oceanographic data would need another grid. Actual format of data like netcdf might still be around in five years, but many do not exist for long periods of time, i.e. ten years.

Banta gave another example of an obstacle, where a marine mammal commission staffer provided data and another researcher used the data and published it as his own. A general problem is that data could be misused or misrepresented. To address this, GLOBEC policy states that investigators are co-authors of published results. GLOBEC data by design is shared almost immediately; proprietary data only existed up to 6 months to a year.

Lessons Learned:

1. Data Formats are different
2. Computer systems become obsolete; older data can't always be retrieved
3. Data ownership/credit/misuse needs address in any data sharing protocol
4. Accountability

Different conclusions might be drawn from the same data sets. Information about the data, who collected it, how it was collected, etc., is Metadata. There is no standard for collection however, it is important to define it. Bahl said there is a standard that they follow and there is protection to the collector. Shari Vaughan, PWS Science Center, said there are instrument differences and entering raw data into databases can be a tremendous amount of work.

Lessons Learned:

1. Databases are dynamic-potential to reach different conclusions
2. Metadata is good information about the data; no standard
3. Differences in instruments can result in great differences in data format
4. Database entry is time intensive

Olsson spoke to real time data sharing giving Inkweon Bang's oceanographic model as an example that shipped out real time data, not something from a database. It had to be immediate and the data sharing arrangement is already in place. There is no quality control on such data. Recreational fishermen log on to see the weather in real time. Real time is more informational than data.

Lessons Learned:

1. Real time data is immediate turnaround with no quality control
2. Data sharing is different than database
3. Is the data a product?

The group's conclusion was that the time seems to be right for collaboration and sharing of funds and data.

Break

Brainstorm Potential Collaborative Projects (Hinchinbrook Entrance):

- The Concept of Pre-Data Collaboration

Miller spoke about pre-data collaboration, for instance if there are instruments already in place, who else might benefit from the data from those instruments? What sensors could be added at minimal cost to collect other data of interest to another group? Activities that are ongoing might have potential for collection of other data, and leverage the project.

- UAF's SALMON Project

Dave Musgrave of UAF spoke about UAF's SALMON data collection project that planned to use CODAR surface current radar in the Entrance if future mid-Sound placement works out. These projects have real time data and will be putting three mooring buoys out that would measure currents, temperature, salinity, and velocities across Hinchinbrook. He indicated that there seems to be a four-way flow in this region, so research would need to over sample initially. They hope to do the same in Montague Strait at a later date. Each of these moorings cost \$75,000. Maintenance or continuation money for CODAR operational costs amounts to \$50,000 -100,000/year.

We might need to think larger than PWS to broaden the level to include the GEM research and monitoring area, Cook Inlet, as well as PWS/RCAC. The GEM science plan discussion at the next day of the workshop will begin with a collaborative question and ask how equipment might be utilized for multiple data. RFP process needs to be narrower and focused to collect baseline data. When questioned if there would be a planning meeting, the response was that there wasn't enough time before 1/15 and it was best to bring that question up tomorrow. Resources, locations need to be researched to see what we can work on together. Miller stated that we might all have a stake in the data for Hinchinbrook so we can leverage funding.

- Other ideas for collaborative projects:

a. Ken Adams of the PWS Fisheries Research Application Planning (PWSFRAP) Group, an EVOS Trustee-supported project in Cordova, expressed support for a comprehensive zooplankton sampling program as an example. The data would be beneficial to ADF&G, hatcheries, commercial fishermen, etc. He emphasized the importance of not just making data available to end users, but also the importance of linking these end users into the front end of the research process.

b. Mooring could have other projects piggybacked on, i.e. additional biological measurements.

c. Banta explained PWSRCAC's interest in a project that would document Hinchinbrook Entrance surface currents in order to see how they would impact spilled oil or influence a tanker that had lost power. This is a broad area where much detail is needed. He added it

looks like CODAR is one of the technologies that could do this, so RCAC is very interested in that technology.

d. ADCP's could provide some current data; Musgrave indicated he would be installing one this year and the remaining five next year. There is an ADCP currently in HE funded by EVOS and overseen by Vaughan/PWSSC.

e. The surface current model in PWSSC's Nowcast/Forecast Model is being expanded, the web address of PWS-NFS (Nowcast/Forecast System), an ocean circulation model component is (<http://129.171.100.38/~nfs>).

f. Musgrave said they are trying to get a portable CODAR to get valuable information on a three-month basis in different locations. Each cost around \$300,000 (without logistical support for site placement).

g. There was a suggestion that GEM might fund a project to assess the needs for data collection in HE and PWS, to evaluate data collection activities that are ongoing or planned, and to assess how such activities fit with GEM missions/goals. It was recommended that the proposal include a synthesis of existing data, such as the results of SEA.

h. It was agreed that a coordinated plan for HE is needed – but GEM alone will not set the standard for all data collection/modeling, as Musgrave's SALMON Project, OSRI, PWSRCAC, etc. all have interests in this area as well. Again, this might be one of the initial areas we address under a collaborative framework.

i. Current meters attached to buoys are a good, inexpensive addition for single point data. The Montague area is also in need of current data acquisition.

j. O'Leary said member organizations in RCAC would need data for geographic areas that might be affected, i.e. fisherman's interests and other practical applications for folks living in the region. She was in agreement with PWSFRAP about the importance of linking research to end users. O'Leary also said that although our immediate interest was in the surface currents, PWS RCAC would also use other data collected in its other projects, such as salinity measurements for chemical dispersants research.

k. In general, more detailed information from already existing projects is needed.

Lessons Learned:

1. Need to decide what subset of data to be saved
2. Need to coordinate and plan before collecting data
3. Plan instruments-what can be added at minimal cost; who else can benefit?
4. Sharing of systems to collect data
5. Plan for maintenance
6. It is important to not just making data available to end users, but also important to link these end users into the front end of the research process, i.e. planning, etc.
7. Schedule an annual planning workshop for coordinating research

Ideas for Mechanism of Data Sharing:

Who has the data sharing models? Four organizations - GLOBEC, EVOS, NASA, and IOOS. Nationally, standards for data sharing and dispersal are being developed by IOOS (Integrated Ocean Observing System www.ocean.us.org). We should review them following their development of final standards in the next few months and consider using these standards as well as the other three. To access IOOS funding, researchers will need to follow their standards and they might have done the work for us.

Along with data sharing, there is a need for extra funds to input data and provide for the operational system to house and manage the information, data bases, servers, etc.; all need to be a recognized part of data funding. Data sharing protocols need to be supported by data storage infrastructure and hardware. Funding and research organizations need to address this issue. Are we asking for one system or access to other systems? Making data storage a reality is an issue, who keeps what data, how is its storage funded, and how is it accessible? Standardized protocols for data sharing should help to answer these questions.

There are many complex issues that become collection or project specific. We might need a group of mechanisms or memorandums of agreement to deal with this question. We might want to have someone from the Planetary Data System PDS speak to us.

Musgrave suggested IOOS would presumably specify the standard for data. It was likely that data would reside locally, with access through a server. But, how would we keep things on line in perpetuity?

Nancy Bird asked for further explanation of what we were trying to accomplish with this agenda item. Banta explained that we were exploring standards for sharing data, and suggested that it looked like the IOOS protocols under development would guide us and the other three could be a resource as well. With that in mind, then individual funding organizations will likely manage their own data and make it accessible.

Musgrave suggested we needed to define what product we need, not just the data stream. A system isn't worth anything without a product and he questioned if that should be part of an RFP? Whose responsibility is it to define the product, funding organizations like RCAC? He added that we need a greater receptivity to stakeholder needs and should recognize that we need to serve the public, not scientists. Is our intent to serve the nation and its societal needs?

Discuss/Develop Coordinating Mechanism for Research:

The group discussed how to develop a coordinating mechanism for future research. Would GEM/NPRB sponsor such meetings? Bird said OSRI wanted these types of meetings, yet with limited staff and budget they might not want to use their funding for it. Miller suggested that OSRI, PWSRCAC and other collaborators could work with GEM to hold a collaborative meeting. Maybe a regional planning group with scientists, stakeholders, principal investigators, consultants, etc. is needed for a good dialogue.

Miller suggested that since EVOS already holds an annual meeting, maybe a joint partnership half-day workshop could be held in conjunction with the annual meeting. CIRCAC and PWSRCAC could co-sponsor.

O'Leary suggested we look at the Gulf of Alaska and bring the scientists together for a separate, more comprehensive meeting that covers a larger area than the EVOS area. Bird said she thought that was a quantum leap and would like to work over the next few months to meet at the EVOS annual meeting to continue this discussion. Banta thought we needed a focused group, OSRI, UAF, CIRCAC, GEM and PWSRCAC etc., essentially the groups who were represented here to plan such a meeting.

Musgrave explained that Alaska's recently formed Coastal Alaska Observing System (CAOS) was a consortium set up to develop a permanent coastal and oceanographic monitoring network across Alaska in order to gather data about marine resource and conditions of importance to Alaskans. He said that CAOS would be convening to do what we were attempting to do here - develop data sharing protocols, and would likely make use of the IOOS model. They would also be addressing coordinated research planning. This group might want to be a subset of the GEM area planning and we should have a coordinated Alaska plan as well as a more regional GEM/EVOS/CIRCAC/RCAC plan. The opportunity to meet again with scientists, stakeholders, fishermen, and coastal management could help this group influence the larger CAOS process. There are many other funding agencies out there.

O'Brien summarized that there was an impetus to collaborate and share data, yet we identified some obstacles and determined that a potential model might be IOOS, and in the least, we needed to evaluate that model when it is out. With regard to planning and coordinating future research, the annual meeting with EVOS could be the arena for a planning/coordination workshop.

Is there Interest in Forming a Stakeholder Group for Data Sharing and Coordinated Research?

O'Brien defined a steering committee as an organizing group and explained that we had the potential to be in the driver's seat with two options- steering committee or subgroup or a couple of individuals to communicate, then piggyback with EVOS Trustees Council.

John Devens, Executive Director of PWSRCAC, supported the concept of a steering committee to promote ongoing communication and to address the two subjects of data sharing and coordination of future research. O'Brien suggested a small number to represent those who were in attendance here today.

Next Steps:

Steering Committee Membership:

PWSRCAC - Joe Banta

GEM - Phil Mundy

Science Center/OSRI - Nancy Bird

UAF - Dave Musgrave

CIRCAC - Sue Saupe

Deciding when to connect again - Banta agreed to contact steering committee members via email and make use of teleconferences for follow up meetings.

The meeting ended at 5:40 p.m.

Attending

Ken Adams	PWS Fisheries Research Application Planning Group
Jon Agosti	Qutekak Shellfish Hatchery
Rhonda Arvidson	PWS RCAC
Kimberly Bahl	NOAA PMEL& AFSC
Inkweon Bang	University of Miami
Joe Banta	PWS RCAC
Nancy Bird	PWSSC/OSRI
Janelle Cowan	PWS RCAC
John Devens	PWS RCAC
Michelle Hahn-O'Leary	PWS RCAC
Kate Hedstrom	UAF/ARSC
David Janka	Auklet Charter Service
Lisa Ka'aihue	PWS RCAC
Barat Laportig	Patton Boggs
Katharine Miller	EVOS Trustees Council
Dave Musgrave	UAF/SALMON Project
Doug Mutter	DOI
Peter Olsson	UAA
Paul Pamamanioff	Ouzinki Tribe
Bob Piorkowski	ADF&G
Linda Robinson	PWS RCAC
Sue Saupe	CIRCAC
Shari Vaughan	PWSSC
Han Yi	UAA

Workshop Conclusions

Data Sharing

There is interest in and a need for collaboration on research, data collection, and data sharing in PWS. The difficulty is in deciding what data is needed by the various interest groups, and whether these data are available in format useful by the various interests. It is not necessarily practical to save and disseminate all data - e.g. Olson's model output - so discussion/collaboration is needed to evaluate what data should be kept, how it should be stored, where it should be stored, and how it can be disseminated to end users.

Data Collection

Collaboration and coordination is needed in data collection activities - e.g. instrumentation. There appears to be interest from many areas in collecting oceanographic data in PWS and throughout the GOA region. To avoid redundancy, it would be helpful to coordinate data collection activities. It would be beneficial to have a coordinated research plan for evaluating current flow into and out of PWS - what are the data needs common to OSRI, SALMON, PWSRCAC and GEM? How can we work together to obtain necessary data?

Collaboration

It makes sense to form a steering committee or working group that will facilitate partnering and collaboration on these issues. From the GEM and SALMON standpoints, it would be most cost and time efficient if this working group were broader than just PWS and included the entire GOA/GEM region. This workshop identified a PWS group that could be a subset of a larger working group for the GOA. One starting point for collaboration/coordination could be evaluating currents into and out of PWS.