

## Methods

From January through July 2006, we gathered data from the education research community, SWMP/IOOS stakeholders (n = 54) and K-12 teachers (n = 92) from across the U.S. through the following methods:

- a review of peer-reviewed articles and published evaluation reports (literature review) on the use of environmental RTD in K-12 classrooms
- interviews and an online survey of stakeholders (that is, people with fiscal, decision-making or other significant influence) to determine the current status of SWMP/IOOS data and the vision for associated educational products
- teacher focus groups nationwide to determine needs and capabilities regarding RTD use
- prioritizing activity with teachers and stakeholders (prioritizing a list of 40 features for a RTD education product that resulted from the focus group discussions).

## Literature Review

We reviewed and summarized more than 25 peer-reviewed articles and published evaluation reports focused on the use of real-time environmental data in K-12 classroom.

## Stakeholder Interviews & Survey

During the spring of 2006 we conducted interviews and an online survey of stakeholders (as identified by NOAA), that is, people with fiscal, decision-making or other significant influence on the development of education products/programs that make use of SWMP/IOOS data for K-12 audiences. We interviewed 11 people, mostly by telephone, and each interview lasted on average about an hour.

The online survey consisted of 24 questions. It was launched in March 27, 2006 with an email sent to 60 people. Over a period of three weeks, we sent 2 reminders and closed the survey on April 15, 2006, with 27 responses (a response rate of 45%, which is higher than average for online surveys).

## Teacher Focus Group Sessions

For the focus group sessions we worked with NERRS and COSEE sites nationwide. Each site invited 10 – 15 teachers who teach using RTD (*see our definition on page 1*). We didn't restrict use to certain kinds of RTD or to specific grade levels.

We conducted seven focus group sessions in five U.S. regions:

- South/Southeast: Weeks Bay NERR, Alabama
- Northern/Central California: Elkhorn Slough NERR/San Francisco Bay NERR
- Southern California: COSEE-West, Los Angeles
- New England: Waquoit Bay NERR, Massachusetts
- Mid-Atlantic: Jacques Cousteau NERR, New Jersey

Teachers who participated represented a range of grades (from elementary to high school) and a range of teaching experience with RTD (from no experience to weekly use). Study participants were a convenient sample selected by the local site coordinators following the criteria that teachers had to be using RTD with their students (although we actually got a range of RTD users). We chose this approach because we needed teachers familiar with using RTD to “concept test” an education product based on RTD. (In focus groups we found that teachers who were not using RTD were unable to provide feedback on what they needed). However, due to our selection criteria and sampling method, participants' views may not be representative of all U.S. teachers.

Each focus group session was offered on a Saturday morning or afternoon and lasted 2.5 to 3 hours following this agenda:

- Introductions: Facilitators, teachers, session goals and definition of RTD (20 minutes)
- Teachers' Current RTD Use (30 minutes)
  - Group Discussion: What data, where from, where it fits in curriculum, why do they use the data/sources they use?
- Where Do RTD Fit? (10 minutes)
  - Individual Exercise: On a blank sheet of paper answer this question... At what stage(s) of your lesson planning & teaching process do you use RTD? Where do RTD fit?
  - Individual Exercise: Using the provided "map" of lesson planning/teaching elements, show us where the RTD you use fit (use colored pen to write RTD in relevant bubbles)
- SWMP/IOOS RTD Overview PowerPoint Presentation (15 minutes)
- Where do SWMP/IOOS RTD Fit? (20 minutes)
  - Individual Exercise: Using another provided "map" of lesson planning/teaching elements, show us where SWMP/IOOS RTD fit (use same colored pens)
- RTD Websites Review (40 minutes)
  - Individual or small groups review CDMO SWMP website & Eyes on the Bay website as models of RTD education products (via a feedback form)
- The Ideal RTD Ed Product (30 minutes)
  - Group Discussion: Based on teachers' experiences with RTD and the two websites, what features/formats would create the ideal RTD ed product for teachers?
- Closure & Thank yous.

### **Teacher Prioritizing Sessions**

Based on focus group discussions we developed a list of approximately 40 features that teachers had requested for a RTD education product. Because we thought it was important to offer a prioritization of this long list of features, we decided to take advantage of teachers and stakeholders participating in an April 2006 follow-up meeting of the COSEE-Mid-Atlantic summer '05 teacher workshop and the MBARI (Monterey Bay Aquarium Research Institute) EARTH summer workshop held in July 2006. Twenty-five teachers representing at least 14 U.S. states participated, along with sixteen stakeholders (workshop scientists and educators).

During an hour-long session at each of the two workshops we gave small groups (teachers in grade-level groups and stakeholders in separate groups) an envelope containing the 40 features and asked them to prioritize by writing a 1, 2 or 3 on each feature, with 1 = essential, 2 = nice to have, and 3 = not necessary.

## Timeline

What follows is a projected timeline for this project.

Timing Task	Oct. - Dec. 2005	Nov. - Dec. 2005	Jan. & Feb. 2006	Mar. - May 2006	May - Sept. 2006
start project	<ul style="list-style-type: none"> <li>finalize the evaluation plan</li> <li>conduct literature review</li> </ul>				
data collection from stakeholders	<ul style="list-style-type: none"> <li>identify key stakeholders</li> <li>set up interview dates</li> </ul>	<ul style="list-style-type: none"> <li>conduct interviews</li> <li>conduct online survey</li> </ul>	<ul style="list-style-type: none"> <li>send thank yous</li> </ul>		
data collection from teachers (pre-workshop surveys; focus groups; RTD Fit map; websites review; prioritizing activity)		<ul style="list-style-type: none"> <li>select host sites</li> <li>set up meeting dates</li> </ul>	<ul style="list-style-type: none"> <li>develop focus group protocols (all)</li> <li>select teachers and invite to participate</li> </ul>	<ul style="list-style-type: none"> <li>coordinate with host sites</li> <li>conduct focus groups at host sites</li> <li>ask teachers to prioritize product features</li> </ul>	<ul style="list-style-type: none"> <li>send thank yous to hosts and teachers</li> </ul>
report findings				<ul style="list-style-type: none"> <li>begin analyzing data</li> </ul>	<ul style="list-style-type: none"> <li>analyze data</li> <li>write and deliver report</li> </ul>

## Data Tallying & Analysis

Responses to interview /focus group questions were mostly qualitative and open-ended. For analysis we summarized, categorized, then tallied to determine trends. The top responses are reported in the main report as the frequency and percentage by category. We've included all the open-ended responses in the appendices.

Survey and feedback instruments used a mix of questions to collect qualitative and quantitative data. Responses to qualitative questions were categorized, then tallied. All responses were reported as the frequency and percentage by category. Responses to quantitative questions (such as rating scales) were tallied and are reported here as frequencies and averages.

What follows are the evaluation results.