

SWMP/IOOS Real-Time Data in K-12 Classrooms: A Front-end Evaluation

EVALUATION REPORT

Overview

This evaluation project, originally titled, “Assessing Capacity and Needs for Integrating IOOS into K-12 Classrooms,” is a front-end study designed to investigate the ways by which kindergarten through 12th-grade (K-12) teachers and students can use real-time data (RTD) and associated education products to understand and appreciate the role that the environment, in particular the ocean, plays in their lives..

For this project we defined real-time data as data that you can access as the data are being collected (or shortly thereafter) to study current conditions or events. (For some, this definition also applies to near-real-time data.) The interest in getting RTD into K-12 classrooms stems from the current national focus on the ocean and the changes occurring in ocean research. NOAA’s NERRS (National Estuarine Research Reserve System) is uniquely positioned to support the use of real-time data by the education community. Through its water quality data stream (System-wide Monitoring Program or SWMP) and national network of educators, the NERRS will play an important role in NOAA’s Ecosystem Goal Team and provide leadership in linking IOOS (Integrated Ocean Observing System) data to key user audiences.

This study focused on K-12 classrooms. We recognize that college & university teachers and students, coastal decision-makers, the general public and informal education institutions are all important audiences, but the goal here was to study one target group in depth, rather than studying many narrowly.

The vision for RTD use by the K-12 audience is to enable teachers to engage their students in exploring the ocean in real time right from their classrooms. The main question is: What do they need to do so? To answer that question NERRS (through the Jacques Cousteau NERR in New Jersey) collaborated with the National Marine Sanctuary Program, National Sea Grant College Program and the Centers for Ocean Science Excellence in Education (COSEE) to conduct this front-end evaluation.

Evaluation Goals & Objectives

The goals of this front-end evaluation were to:

- identify the gap between SWMP/IOOS scientific data (current and projected) and the needs/capabilities of K-12 teachers and students to use those data, and
- to determine and recommend ways to bridge that gap via data visualization/presentation and educational products/services.

The basis for this study’s design was utilization-focused evaluation (Patton, 1997) and it employed a mix of traditional evaluation methods (interviews, focus groups and surveys) to gather qualitative and quantitative data from stakeholders and users (teachers). With these data we conducted a gap analysis (Weber, 1986) to answer the questions: Where are we now? and Where do we want to be? The results will aid NOAA/NERRS in designing and developing an education product that successfully addresses the gap between what stakeholders wish to accomplish and what teachers can use.

Our tasks were to:

1. Assess current capacity & status: What data resources and formats are currently available?
2. Identify the ideal: What do stakeholders (NOAA, NERRS, IOOS, COSEEs, Sea Grant, etc.) view as the ideal uses of SWMP/IOOS data?
3. Determine needs: What data can K-12 teachers use and what formats/products are they likely to use?
4. Analyze the gap(s): What's the gap between the ideal and the needs/capabilities, and what's needed to bridge that gap?

Evaluation Questions/Issues

The questions/issues this evaluation addressed were:

Objective 1

- What SWMP/IOOS data streams/data types are available or will be available in the near future?
- What resources/models/products/projects currently provide classroom teachers with real-time observatory data? Which resources have been proven (evaluated) to work?

Objective 2

What is the stakeholders' vision for the use of SWMP/IOOS data?

- Who are the users they want to reach?
- What are their desired goals/outcomes?
- What would they like to provide users?
- What do they think the users need/want/would use?
- What do they think would facilitate use? What would prevent use?
- What's out there now that they think works?

Objective 3

What's happening currently with potential users? What's their current use, needs, capabilities for SWMP/IOOS data?

- What's out there now that they're currently using and what's working or not working?
- What are their data visualization/formatting/presentation needs, based on what works and what doesn't?
- What are their educational products needs (lesson plans, etc.) and what are their formatting preferences for such products?
- How/where would these data fit into the curriculum (oceans, atmosphere, climate, humans & environment)?
- What enables them and what prevents them from using such data?

Objective 4

Where are the gaps between data offerings and what teachers can/would use?

And, what might bridge those gaps?

- data types/topics, data format
- technology access
- teacher skills, student skills
- lesson plans
- curriculum fit, standards/testing
- time
- perception of usefulness.