



Classroom Series – Module #1

## **An Introduction to the Integrated Ocean Observing System**

### **Description of Activity**

In this instructional module, students will be introduced to the latest methods, instruments, benefits, and current users of the Integrated Ocean Observing System (IOOS). Students will work individually through this Flash-based interactive program which makes use of several engaging multimedia elements, including audio, video, animation, and screen capture features in order to teach students about the Integrated Ocean Observation System.

### **Related Subjects and Grade Level**

Oceanography, Technology, Resource Management, Conservation

Grades: Middle and High School Level

### **California Science Content Standards Alignment**

- Scientific Progress (Investigation and Experimentation): 1a - Select and use appropriate tools and technology – Grade 9-12
- Scientific Progress (Investigation and Experimentation): 7a - Select and use appropriate tools and technology – Grade 7

(Source: [www.cde.ca.gov/be/st/ss/scmain.asp](http://www.cde.ca.gov/be/st/ss/scmain.asp))

### **Prerequisite Prior Knowledge**

Students should have had instruction in the following related topics prior to beginning this lesson:

- General understanding of the scientific method in which making observations is a necessary component of the scientific process.
- An understanding that science relies on advances in technology to make more accurate and reliable measurements.
- Basic knowledge of computer operation (e.g. web navigation, mouse and keyboard function, etc.)

### **Time Required**

30-45 minutes to complete the module, either in class (computer lab) or assigned as homework.

**Specific Learning Objectives**

Students will be able to:

1. Describe what the Integrated Ocean Observing System is
2. Identify several instruments that are used in making on-going ocean observations
3. List three kinds of partners/users of the integrated ocean observing system
4. Describe three ways in which the integrated ocean observing system is beneficial to society

**Materials**

For each student:

- Computer with internet access (with Flash 8 minimum installed)
- Copy of the Student's Guide: "An Introduction to the Integrated Ocean Observing System".

**Description of Lesson and Related Activities**

This module is divided into four sections, each focusing on a different aspect of the Integrated Ocean Observing System (IOOS). They are:

- Overview
- Instruments of IOOS
- Users/Partners
- Benefits

Students will be expected to complete the entire module which includes a short built-in graded quiz correlated to the learning objectives. Students have the flexibility of reviewing and repeating the different components as they work through the program, navigating to the main menu after completing each previous section. Furthermore, as students work through the program they will be recording several of their own responses directly onto their guide. This guide can then be collected and graded for accountability as needed.

**Overview**

This section is an introduction to the Integrated Ocean Observing System including a general description of member partners, instruments, products, and users. (Time required: 5-7 minutes)

## Instruments

This section focuses more closely on the key instruments and technologies that are used in making ongoing ocean observations. Students view video and animation sequences that describe and demonstrate the deployment and use of these instruments. Furthermore, there is a simulation of how the data is collected from these instruments and how they are made available online to the public through [www.cencoos.org](http://www.cencoos.org) or other regional member websites.

(Time required: 10-12 minutes)

## Partners and Users

Next, students are guided through a short description of people/organizations whom contribute and/or depend most on the information gained from ocean observations, some of whom include recreational users, scientists, policy makers, managers, fishermen, mariners, and the public in general. This section contains excerpts from podcasts of organizations that are in one or more ways related to IOOS.

(Time required: 6-8 minutes)

## Benefits

This section focuses on how data from the Integrated Ocean Observing System is used to help shape ocean-related policies, better respond to natural and human induced hazards, more accurately predict long term climate changes and short term weather patterns, and aid in improving and protecting the health of both humans and wildlife.

(Time required: 5-7 minutes)

## Quiz

The quiz consists of seven questions including multiple choice, true/false, matching, and identification. This quiz is automatically graded and the results are given to the student in a summary slide. Students will record their results on the student guide which can then be turned-in for credit once they have finished working through the module.

Quiz Key:

1. A
2. False
3. Instrument floating on the surface (Mooring)
4. Yellow instrument on the far left below the surface (AUV)
5. Yellow instrument below the surface in the middle of the screen behind a school of fish (Float)
6. E,C,D,B,A (in this order)
7. All activities listed are supported by IOOS