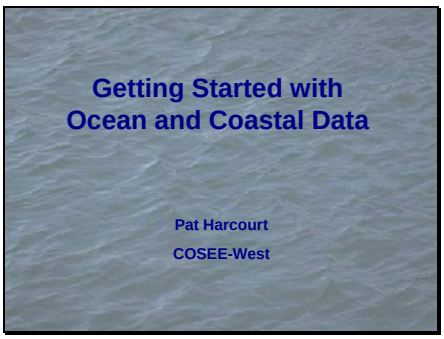
Slide 1

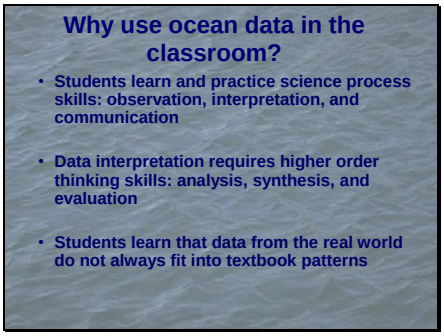



This is based on a presentation I gave at the NSTA national convention in 2012

Slide 2


Basic rationale for studying marine systems

Slide 3




Basic rationale for using data

Slide 4

In the field, students can conduct real research and monitoring projects, collect data that is analogous to data collected by more sophisticated instruments. Their results can be compared with data from many other places which has been posted on the internet.

Slide 5

Even in the classroom, students can collect data.

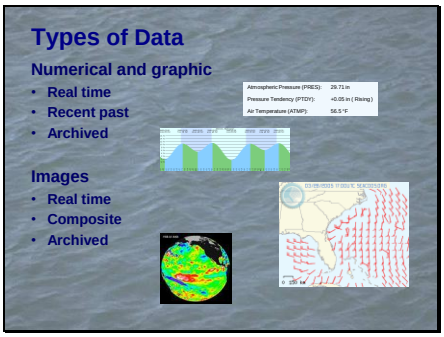
Slide 6

These students are using aerial photos to study change over time in an estuary watershed

Slide 7

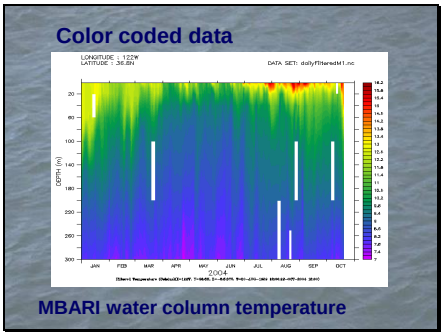

Communicating is an important part of science, and classroom and field studies of marine topics can provide great motivation for students to present their work.

Slide 8



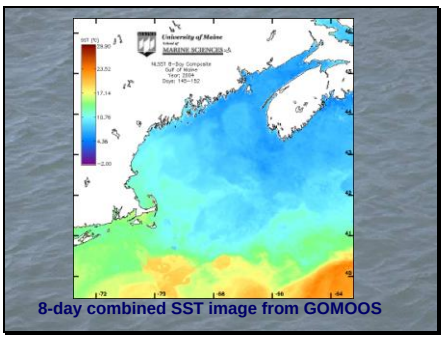

This slide introduces some categories of data available on the internet. The following slides give examples. The web links for each slide are given in the handout "Links for Coastal and Ocean Data in the Classroom"

Slide 9



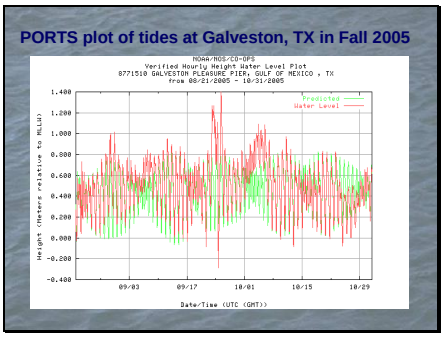

Example of color coded data: water column temps vs. time from MBARI

Slide 10



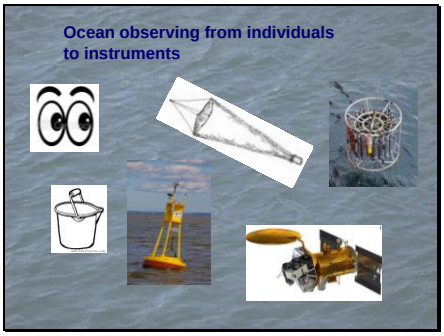

Physical oceanography: 8-day combined sea surface temp image from Gulf of Maine (GOMOOS) in May2004 reduces loss of coverage from cloud masking.

Slide 11



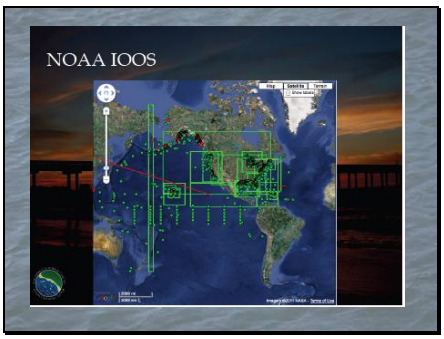

Predicted and observed tidal levels, Galveston, TX, showing the passage of hurricane Rita in September 2005

Slide 12




Ocean observing: observation, bucket, plkankton net, moored data buoy, rosette of Nislin bottles with CTD, and Aquarius satellite

Slide 13



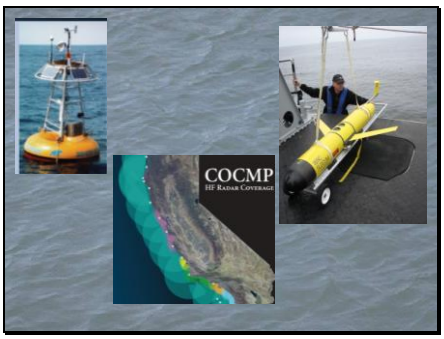

National Oceanic and Atmospheric Administration  Integrated Ocean Observing System

Slide 14


SCCOOS = Southern California Coastal Ocean Observing System

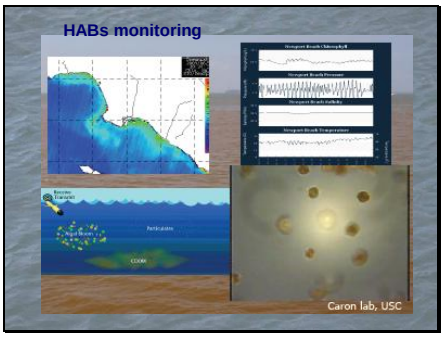
Slide 15

Slide 16



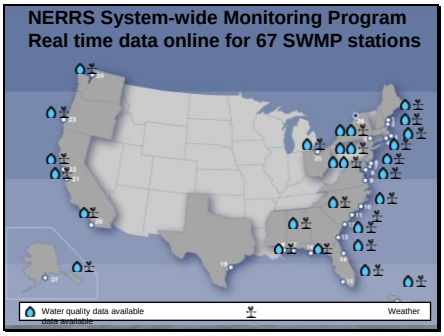

Some elements of SCCOOS: data buoys, coastal radar, and gliders

Slide 17




Harmful algal bloom monitoring uses satellites, gliders, data buoys, and in-person sampling and analysis

Slide 18




- Telemeter system installed in 2007.
  - Currently 111 SWMP WQ stations (nominally 4/Reserve) Of these, 39 are telemetered for near-RT data delivery
  - There are also 28 Wx Stations (1/Reserve), all of which are telemetered for near-RT data delivery

- All non-telemetered data is archived and available in provisional form within 2 weeks of collection

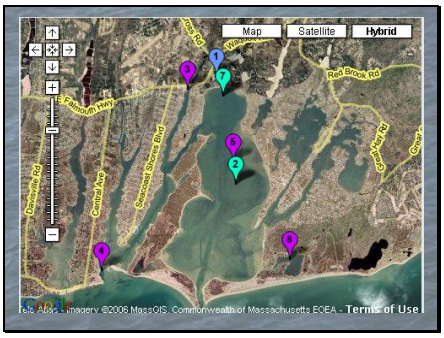
The Centralized Data Management Office (CDMO), established in 1995, as a partnership between USC and NOAA in order to support NERRS SWMP data management needs develop, implement and manage the basic infrastructure and data protocol of the NERR SWMP, and support the assimilation and exchange of data and metadata within the NERRS framework and to outside users

Operate a centralized data management system that supports the assimilation and exchange of data and metadata within the NERRS framework and to outside users. Lead: The Centralized Data Management Office (CDMO), established in 1995.

Conservatively, the CDMO reviews, archives and disseminates:

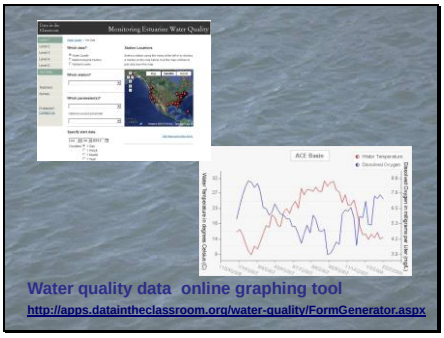
- 13.5 million data points per year for the water quality monitoring program (4 stations collecting 8 parameters every half-hour at 27 NERRS sites)
- 34.4 million data points per year for the meteorological monitoring program (1 station collecting 25 parameters quarterly, hourly and daily intervals at 27 NERRS sites)
- 31,104 data points per year for the nutrient monitoring program (4 stations collecting monthly grabs and 1 station collecting monthly diel of 6 parameters at 27 NERRS sites)

Slide 19

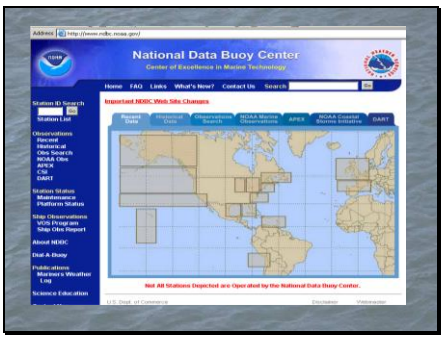



System Wide Monitoring Program: Research Reserves around the US collect watere quality, meteorological, and nutrient data in a standardized way

Slide 20



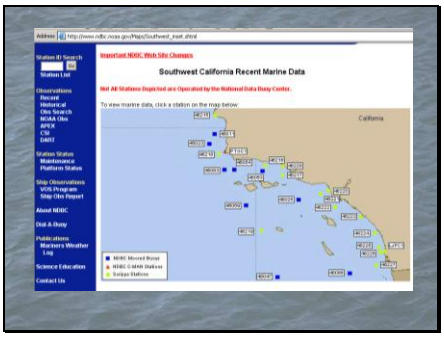
Slide 21




**National Data Buoy Center**

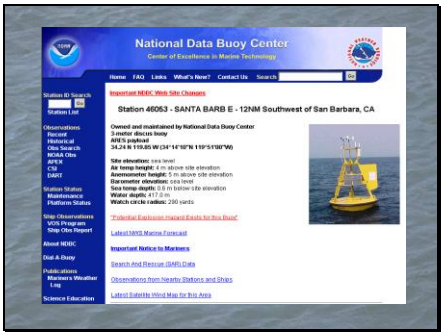
Real-time data on wind and wave conditions is available from data buoys around the coasts of the US. Look at the graphs of recent conditions and try downloading data from the last 45 days. Start by choosing a location from the map

Slide 22



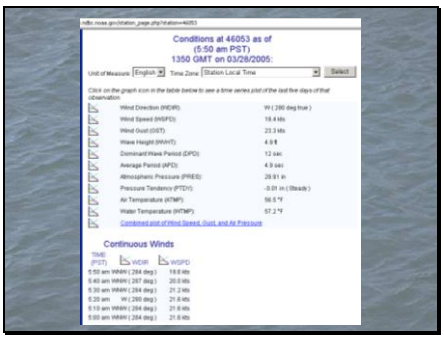

Choose a data buoy of interest in the area

Slide 23



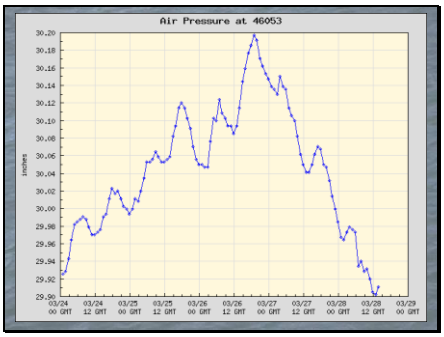

Each buoy has a page packed with information, including a description of the buoy and its characteristics, and current conditions

Slide 24



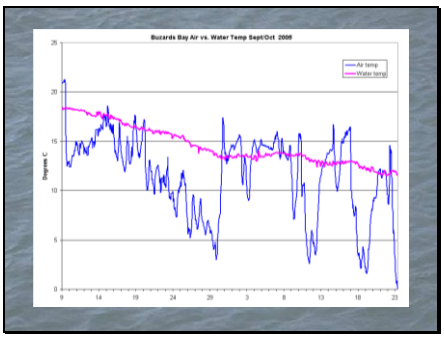

One of the most useful and simple data sets are the graphs of recent measurements. Click on the graph icon to see a graph of that parameter for the past 5 days.

Slide 25



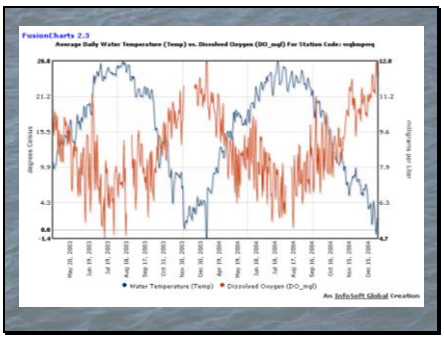

This example shows the graph for barometric pressure at Buoy # 46053 off Santa Barbara in March 2005

Slide 26




This graph shows air vs. water temp in fall 2005 at the Buzzards Bay buoy

Slide 27




Although web-based graphing tools may have limited flexibility, they are very useful for gaining a first look at patterns and can help users decide what data sets to download. This graph compares water temperature and dissolved oxygen levels in 2003 and 2004 at Waquoit Bay National Estuarine Research Reserve.

Slide 28

As educators, we want to help students understand marine and coastal ecology.  Data resources can complement classroom and field studies so students can really feel a connection to their coasts.

Slide 29

We want students to understand, appreciate, and protect the ocean and its planet.