Ocean Observing Systems Summer Teacher Institute
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OOS? What’s that??
COSEE-West
2008 Ocean Observing Systems Summer Teacher Institute – Resources/Lesson Plans
http://www.usc.edu/org/cosee-west/resources.html#Aug08
Teacher created lesson plans from 2008 OOS workshop
http://www.usc.edu/org/cosee-west/LessonPlans.html

COSEE-Coastal Trends
Observing the Ocean – Get Started
http://www1.coseecoastaltrends.net/modules/observing_the_ocean/get_started/

Woods Hole Oceanographic Institute (WHOI)
Why do we need them (ocean observatories)?
http://www.whoi.edu/page.do?pid=24336
Types of Observatories
http://www.whoi.edu/page.do?pid=24395
Who Builds Them?
http://www.whoi.edu/page.do?pid=24399
Oceanus Magazine (WHOI publication)
“Seeding the Seafloor with Observatories”
http://adcp.whoi.edu/page.do?pid=12555&tid=282&cid=2442

NOAA’s Monitoring and Observing Tools
(Summary of NOAA’s space, airborne, land-based, and water-based observing tools)
http://www.noaa.gov/features/earthobs/tools.html

NOAA’s Undersea Research Program (NURP)
Undersea Technology: Tools for Research
http://www.nurp.noaa.gov/Tech.htm

What is…? (“glossary” of the main types of data collecting tools)
Southern California Coastal Ocean Observing System (SCCOOS)
http://www.sccoos.org/cc-whatis.html

Rutgers University COOL Room (Coastal Ocean Observing Lab)
Tutorials on measuring surface currents, satellite pictures of sea surface temp/chlorophyll, etc.
http://rucool.marine.rutgers.edu/

Global and National OOS Programs, Initiatives, etc.
Global Ocean Observing System (GOOS) is an international effort to monitor the world’s global ocean; it is part of the Global Earth Observation System of Systems (GEOSS)
http://www.ioc-goos.org/
Global Earth Observation System of Systems (GEOSS)
“The aim is to provide the right information, in the right format, to the right people, at the right time, to make the right decisions.”
http://www.noaa.gov/eos.html

Integrated Ocean Observing System (IOOS) is the United States’ contribution to GOOS
http://www.ocean.us/what_is_ioos

Ocean Observatories Initiative (OOI) is the National Science Foundation’s contribution to IOOS. http://www.joiscience.org/ocean_observating/initiative

Joint Oceanographic Institutions (JOI) was awarded money to support the development, installation and initial operation of the coastal and global components of OOI. Technical descriptions of the ocean-observing network in progress. http://www.joiscience.org/ocean_observating

NOAA’s Undersea Research Program (NURP)
NURP was merged with NOAA’s Office of Ocean Exploration
http://explore.noaa.gov/

NOAA National Buoy Data Center
http://www.ndbc.noaa.gov/

NOAA Tropical Atmosphere Ocean (TAO) Project
http://www.pmel.noaa.gov/tao/index.shtml

More OOS Programs
NOAA’s Coastal Ocean Observing Systems (COOS)
Has been taken off-line temporarily. An improved site should be up in the near future. http://www.csc.noaa.gov/coos/

NOAA’s Adopt a Drifter Program
http://www.adp.noaa.gov/

NOAA’s DART (Deep-ocean Assessment and Reporting of Tsunamis) http://nctr.pmel.noaa.gov/Dart/index.html

Pacific Coast Ocean Observing System (PaCOOS) http://www.pacoos.org/
Oceanic Mapping Data for Pacific Coast - West Coast Habitat Server http://pacoos.coas.oregonstate.edu/
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Southern California Coastal Ocean Observing System (SCCOOS)
http://www.sccoos.org/

Ocean observatories at Monterey Bay Aquarium Research Institute (MBARI)
http://www.mbari.org/moos/
    Monterey Accelerated Research System (MARS)
        http://www.mbari.org/mars/

Santa Monica Bay Observatory (SMBO) buoy
http://quercus.igpp.ucla.edu/smbo/smbo_mooring.html

Break down by technology:

**Autonomous Underwater Vehicle (AUV) & other automated things**
What is an Autonomous Underwater Vehicle (AUV)?
http://en.wikipedia.org/wiki/Autonomous_underwater_vehicle

Autonomous Underwater Vehicles
A listing of groups and projects. Also lists international AUV projects.
http://www.transit-port.net/Lists/AUVs.Org.html

MBARI (Monterey Bay Aquarium Research Institute) AUVs
http://www.mbari.org/AUV/

AUV Laboratory at MIT Sea Grant
Dedicated to the development and application of autonomous underwater vehicles
http://auvlab.mit.edu/

NOAA Ocean Explorer AUV Fest 2008. Lesson plans for Grades 5-12 to complement the science, mathematics, marine archaeology and maritime heritage focus of AUVfest 2008
http://oceanexplorer.noaa.gov/explorations/08auvfest/welcome.html

“Underwater Robot Makes History Crossing Gulf Stream” (November 2004)
Scripps News, Scripps Institution of Oceanography
http://scrippsnews.ucsd.edu/Releases/?releaseID=655

“Submerged Autonomous Launch Platforms” (November 2007)
Oceanus Magazine, Woods Hole Oceanographic Institution
http://www.whoi.edu/oceanus/viewArticle.do?id=34106

“Cytobot Gives Early Red Tide Warning” (July 2008)
Oceanus Magazine, Woods Hole Oceanographic Institution
http://www.whoi.edu/oceanus/viewArticle.do?archives=true&id=46486
Remotely Operated Vehicle (ROV) & equipment to put on them
What is a Remotely Operated Vehicle (ROV)?
http://oceanexplorer.noaa.gov/technology/subs/rov/rov.html

Marine Technology Society
ROV Background/History/Current State of the Industry
http://www.rov.org/info.cfm

MBARI’s ROVs
  ROV Doc Ricketts
  ROV Ventana
    http://www.mbari.org/dmo/vessels_vehicles/ventana/ventana.html

Video of testing an ROV in MBARI’s test pool
http://www.youtube.com/watch?v=qGFd-ygFgdM

Video from the an ROV looking for new life in the depths of the Celebes Sea
http://www.youtube.com/watch?v=JGXz9efC0QI

NOAA Mission plan & logs from that cruise:
http://oceanexplorer.noaa.gov/explorations/07philippines/welcome.html

“Can't Bring Deep-sea Samples Up? Send a Lab Down.”
Oceanus Magazine, Woods Hole Oceanographic Institution
http://www.whoi.edu/oceanus/viewArticle.do?id=41566

“Students Create Underwater Remotely Operated Vehicle For Use In Scientific Research” (May 2005)

Satellites
Ocean Surface Topography Mission (OSTM) - Jason 2 satellite
  Delta II launch vehicle:

NOAA National Environmental Satellite, Data and Information Service (NESDIS)
http://www.nesdis.noaa.gov/
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National Oceanographic Data Center  
http://www.nodc.noaa.gov/

Maps & other cool visuals
Google Ocean. 3-D visualizations of bathymetry, tide predictor and other interesting ocean related sections (ship wreck, etc.).  
http://www.justmagic.com/GM-GE.html

University Corporation for Atmospheric Research (UCAR)  
Surface ocean currents  
http://www.windows.ucar.edu/tour/link=/earth/Water/ocean_currents.html

Office of Naval Research  
Ocean in Motion: Currents  
http://www.onr.navy.mil/Focus/ocean/motion/currents1.html

NASA Scientific Visualization Studio (SVS)  
A searchable database of animations and other visualizations dealing with the Earth and Space Science research activities at the Goddard Space Flight Center.  
http://svs.gsfc.nasa.gov/

General OOS Related Articles
From KPBS  
“High-Tech Robot Explores Waters Off California” (August 2009)  

From ScienceDaily  
Unmanned aircraft helping scientists learn about Alaskan Ice Seals (June 2009)  
“Scientists Find Tsunami ‘Shadow’ Visible from Space” (July 2009)  

Popular Mechanics  
Diving robots could recover Air France 447’s black box (June 2009)  
http://www.popularmechanics.com/science/robotics/4320244.html

The Washington Post  
Robot on a Tether Targets The Mysteries of the Deep (June 2009)  
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Oceanus
Arctic Voyage Tests New Robots for Ice-covered Oceans (April 2008)
http://www.whoi.edu/oceanus/viewArticle.do?id=40787&sectionid=1000

NOAA Ocean Explorer
http://oceanexplorer.noaa.gov/explorations/08auvfest/welcome.html

Lesson Plans
Southern California Coastal Ocean Observing System (SCCOOS)
SSCOOS in the classroom
http://www.sccoos.org/commclass.html
Especially for Teachers
http://www.sccoos.org/cc-EspTeachers.html

Santa Monica Bay Observatory (SMBO) buoy
Lesson plans by teachers based on the data from this buoy
http://quercus.igpp.ucla.edu/smbo/smbo_edu_teacher.html

EARTH (Education and Research: Testing Hypotheses)
Joint project of MBA & MBARI (Monterey Bay Aquarium & MBA Research Institute)
http://www.mbari.org/earth/
EARTH Lesson Plans
http://www.mbari.org/earth/lesson_grid.htm

C.O.O.L Classroom (Coastal Ocean Observation Laboratory)
Lesson plans based on data from the Atlantic Ocean (near New Jersey)
http://www.coolclassroom.org/home.html
"Create an Ocean Weather Forecast"
http://www.coolclassroom.org/cool_projects/lessons/earth_science/earthscience.html
High School Physics: "Follow that Bloom"
http://www.coolclassroom.org/cool_projects/lessons/physics_highschool/physicalschool.html
Middle School Physics: "Navigation and Ocean Currents"
Biology/Language Arts/English: "Gone Fishing"

COOL Room Webcam
http://marine.rutgers.edu/cool/coolcam.htm

COOL YouTube Videos
http://www.youtube.com/results?search_query=RutgersCOOL
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Taking the Pulse of our Ocean  
Lesson plans created by COSEE-Mid Atlantic to learn about using OOS & the data associated with such systems  
http://www.cosee-ma.net/education/ocean_pulse/  

Center of Excellence for Coastal Ocean Observation and Analysis (University of New Hampshire)  
http://www.cooa.unh.edu/education.jsp  
A few lesson plans  
http://www.cooa.unh.edu/education/lessons.jsp  

SEA’s K-12 lesson plans (Sea Education Association)  
http://www.sea.edu/academics/k12.asp  
The Unseen Ocean Floor  
Your students try to piece together seafloor bathymetry by using “remote” sensing  
http://www.sea.edu/academics/k12.asp?plan=unseenoceanfloor  

Jason-1 “Voyage on the High Seas” Board Game  
http://sealevel.jpl.nasa.gov/education/jason-1-game.html  

OceanGLOBE Powerpoints (user name: ocean, password: globe)  
http://www.msc.ucla.edu/oceanglobe/slides.htm  

OceanGLOBE Investigations for grades 4-8 and 9-12  
http://www.msc.ucla.edu/oceanglobe/investigations.htm