



Ocean Observing Systems Summer Teacher Institute August 10 – August 14, 2009

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-what-is.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/>



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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_observing/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_observing

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>



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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*

http://www.mbari.org/dmo/vessels_vehicles/Doc_Ricketts/Doc_Ricketts.html

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)

<http://www.physorg.com/news4209.html>

Satellites

Ocean Surface Topography Mission (OSTM) - Jason 2 satellite

Mission Overview: <http://topex-www.jpl.nasa.gov/mission/ostm.html>

Mission Fact Sheet: <http://topex-www.jpl.nasa.gov/mission/ostm-factsheet.html>

Delta II launch vehicle:

http://www.nasa.gov/mission_pages/launch/delta_II_count_101.html

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)

<http://www.kpbs.org/news/2009/aug/03/high-tech-robot-explores-waters-california/>

From *ScienceDaily*

Unmanned aircraft helping scientists learn about Alaskan Ice Seals (June 2009)

<http://www.sciencedaily.com/releases/2009/06/090606110130.htm>

“Scientists Find Tsunami ‘Shadow’ Visible from Space” (July 2009)

<http://www.sciencedaily.com/releases/2009/07/090716103849.htm>

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)

http://www.washingtonpost.com/wp-dyn/content/article/2009/06/12/AR2009061201711.html?wprss=rss_nation/science



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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§ionid=1000>

NOAA Ocean Explorer

AUVfest 2008: Navy Mine-Hunting Robots Help NOAA Explore Sunken History (May 2008)
<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/physicshighschool.html
Middle School Physics: "Navigation and Ocean Currents"
http://www.coolclassroom.org/cool_projects/lessons/physics_middleschool/physicsmiddle.html
Biology/Language Arts/English: "Gone Fishing"
http://www.coolclassroom.org/cool_projects/lessons/biology/biology.html
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=unseenoccanfloor>

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>