

**Woods Hole Science and Technology Education Partnership**

**Science Safari May 8, 2014**

**Geophysical Fluid Dynamics Lab**

**Dr. Claudia Cenedese**

**Online Resources from WHOI's Web Pages**

**General resources on currents**

WHOI Ocean Topics page: Currents, Gyres, and Eddies - links to multimedia, animations, video:

<http://www.whoi.edu/main/topic/currents--gyres-eddies>

Activity on currents from WHOI's educational site Dive and Discover
<http://www.divediscover.whoi.edu/expedition4/daily/activity_010410.html>

Tools for measuring currents:
Floats and Drifters: <http://www.whoi.edu/page.do?pid=10320>

Moorings and Buoys: <http://www.whoi.edu/page.do?pid=10316>

Moored Profilers: <http://www.whoi.edu/page.do?pid=8415&tid=3622&cid=10978>

Current Meters: <http://www.whoi.edu/page.do?pid=8415&tid=3622&cid=819>

For the lab open house by Dr. Claudia Cenedese:

Claudia Cenedese <http://www.whoi.edu/profile/ccenedese/>

Oceanus magazine articles:

"The Ocean - Captured in a Box" <http://www.whoi.edu/oceanus/viewArticle.do?id=28706>

"The Ultimate Fluid Environment for Scientists: the Geophysical Fluid Dynamics Program at WHOI" <http://www.whoi.edu/oceanus/viewArticle.do?id=51026&sectionid=1000>

"As the World Turns and the Oceans Flow" <http://www.whoi.edu/oceanus/viewArticle.do?id=55486>

The "Global Ocean Conveyor"

Background

<http://www.whoi.edu/main/topic/ocean-conveyor>

Oceanus magazine article: "A Newfound Cog in the Ocean Conveyor:

<http://www.whoi.edu/oceanus/viewArticle.do?id=132749>

Oceanus magazine article: "Ocean Conveyor's 'Pump' Switches Back On"

<http://www.whoi.edu/oceanus/viewArticle.do?id=54347>

Videos:

"What Makes the Great Currents Flow?" <http://www.whoi.edu/main/topic/ocean-conveyor>

The global conveyor <http://www.whoi.edu/main/topic/ocean-conveyor>

**Classroom activities and lessons**

\*1. NOAA Education Resources pages on "Ocean Currents" –includes links to multimedia and video, to lessons and activities, and to real-time and archived data sources. <http://oceanservice.noaa.gov/education/tutorial_currents/welcome.html>

and <http://www.education.noaa.gov/Ocean_and_Coasts/Ocean_Currents.html>

\*2. Alaska Sea Grant site for grade 7 – "Ocean in Motion" – experiments and lessons (ranging from 1 to 12 days) linked to ocean literacy principles and to Alaska grade level science standards. Includes assessment tools. <http://seagrant.uaf.edu/marine-ed/curriculum/grade-7.html>

3. NOAA Office of Oceanic and Atmospheric Research link to an interactive website for students to analyze ocean current data: <http://www.oar.noaa.gov/k12/html/oceancurrents2.html>

4. Middle school lesson plan related to the NOAA "Adopt a Drifter" program, linked to national science standards – pdf: <http://www.adoptadrifter.noaa.gov/lessons/ADP_LessonPlan_Climographs_Cook.pdf>

5. NASA Ocean Motion And Surface Currents website: <http://oceanmotion.org/html/introduction-general.htm> – this site has many parts, including a teacher's lesson plan matrix

6. Mapping Ocean Currents, for grades 3-8, from National Geographic Education:

<http://education.nationalgeographic.com/education/activity/mapping-ocean-currents/?ar_a=1>

You Tube video on currents by Bill Nye, the Science Guy

<http://www.youtube.com/watch?v=w_8mw-1HYFg>

**High School level (and higher) data sources and ideas for teaching**

\*1. Rutgers "COOL (Coastal Ocean Observatory Laboratory) Classroom" project for high school physics classes: "Follow that Bloom" – about the physics of ocean currents. Students use coastal radar data to predict movement of a phytoplankton bloom in the coastal ocean.

<http://www.coolclassroom.org/cool_projects/lessons/physics_highschool/physicshighschool.html>

NASA animation of global surface current from 6/2005 to 12/2007, based on satellite observations

<http://www.nasa.gov/topics/earth/features/perpetual-ocean.html>

NOAA National Ocean Data Center (NODC) list of sources for ocean data

<http://www.nodc.noaa.gov/General/current.html> (includes link to near-real-time global "ocean surface currents from altimeter and scatterometer" data, or "OSCAR": <http://www.oscar.noaa.gov/> )

National Weather Service Ocean Prediction Center site shows animations of ocean model simulations of the 72-hour ocean currents forecast, from the Navy Coastal Ocean. This loads slowly, but is very interesting. <http://www.opc.ncep.noaa.gov/newNCOM/NCOM_currents.shtml>

pdf: Teaching Physical Concepts in Oceanography, a supplement to *Oceanography* magazine – contains directions for many experiments with explanations, notes to teachers, and the math involved.

<http://www.tos.org/hands-on/teaching_phys_concepts.pdf>