Students build, decorate, and deploy GPS-equipped drifters

Building

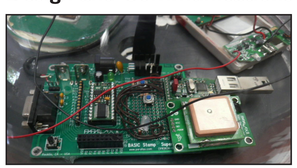
Cape Fear Community College students build and decorate a drifter.

Deploying

Cape Fear Community College and University of New Hampshire students deploy their drifters on ocean cruises.

Long Beach City College is experimenting with drifter designs. This drifter was designed to go down the Los Angeles River during flood stage.

Experimenting with Drifter Design and Communications

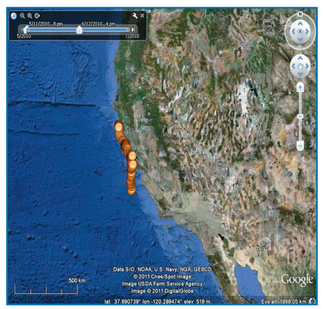


Comtech Mobile Datacom Corporation provides a web-based tracking system.

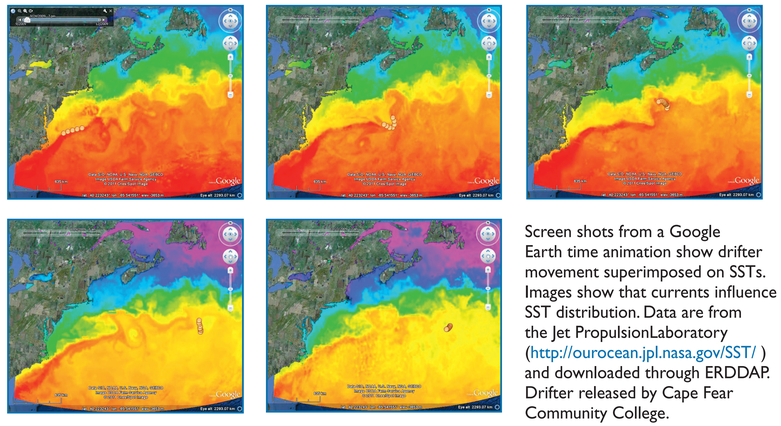
Building, decorating, and deploying the drifter creates a personal connection between students and the drifter. These efforts increase students' curiosity and interest in the fate of the released drifter.

Students track the path of the drifter in real-time over the Internet

Google Earth screen shots show drifter tracks from the Pacific (left) and the Atlantic (right) at the same scale. Both images represent roughly one month time. After deploying drifters themselves, students are often impressed by the differences in velocity between the California Current and the Gulf Stream. Both images are shown at the same scale; the bar scale in the lower left represents about 500 km in each image.



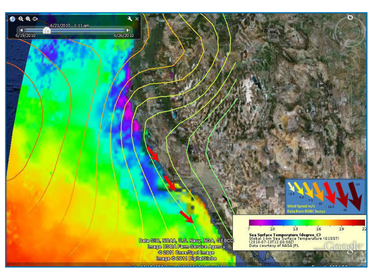
Students view time animations of ocean processes using Google Earth



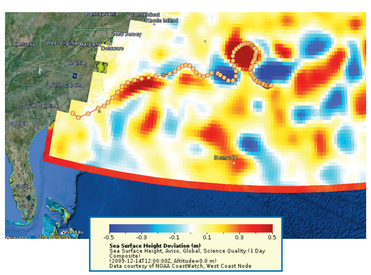
Screen shots from a Google Earth time animation show drifter movement superimposed on SSTs. Images show that currents influence SST distribution. Data are from the Jet PropulsionLaboratory (http://ourocean.jpl.nasa.gov/SST/) and downloaded through ERDDAP. Drifter released by Cape Fear Community College.

SSTs, atmospheric pressure, winds, and drifter movement

SSTs, sea-level atmospheric isobars, and wind arrows show conditions favorable for upwelling along the CA coast in June, 2010. Upwelling indicated by the dark blue and purple along the central coast. In response to northwest winds created by an offshore atmospheric high, Ekman transport moves near-surface water away from the coast. This near-surface water is replaced by colder water from deeper levels. Thus, the cool SSTs along the coast are a result of the upwelling. Drifter locations removed for clarity.



Drifter movement superimposed on sea surface height



In this screen shot the drifter track is superimposed on sea surface height (SSH). The "hills" are warm-core rings and the "depressions" are cold-core rings. Students can follow the track of the drifter as it moves clockwise around warm-core rings and counterclockwise around cold-core rings. Later in this track the drifter was "stuck" circling a cold-core ring for close to 2 months. By turning on and off layers in Google Earth, students can visualize the relationship between currents (via their drifter) SST, SSH, and primary productivity.

Acknowledgements: This project was funded in part by the National Science Foundation's Advanced Technology Education Program (NSF/DUE #0703197), the Division of Ocean Science's Centers for Ocean Science Education Excellence (NSF/OCE #0731046), and the Monterey Peninsula College Foundation. Scientific and technical support was provided by: Jim Manning of NOAA's Northeast Fisheries Science Center; Bob Simmons, Lynn Dewitt and Cara Wilson of NOAA's Southwest Fisheries Science Center; John Ryan of MBARI; Sage Lichtenwalner of Rutgers University; and Leslie Rosenfeld of CeNCOOS.

Data Sources: NOAA's ERRDAP http://coastwatch.pfeg.noaa.gov/erddap/index.html, National Data Buoy Center www.ndbc.noaa.gov

To view the resource website for drifter information and curriculum go to: http://coseenow.net/mate/