Data

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Collaborative Research: The Role of Wind in Estuarine Dynamics, Upper Chesapeake Bay, VIMS Instruments deployed in collaboration with UMCES and WHOI; March-May, 2012 deployment.

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URI:

http://hdl.handle.net/10288/21950

Location (place name):

Upper Chesapeake Bay, MD; South of Choptank River

Location (bounding box coordinates):
38^0 38.33' N, 076^0 28.982'W; 38^0 33.530' N, 076^0 22.483'W; 38^0 22.136' N, 076^0 22.049'W; 38^0 23.097' N, 076^0 18.380'W

Start Date:

2012 March 12

Abstract:

While the project is a collaborative effort involving several researchers from the Virginia Institute of Marine Science (VIMS), the University of Maryland Center for Environmental Science (UMCES) and the Woods Hole Oceanographic Institution (WHOI), the data archive here is primarily from VIMS owned instrumentation deployed as part of the project. A series of instruments were deployed in three transects in Upper Chesapeake Bay, South of the Choptank River from March to May 2012. This dataset was collected with autonomously deployed Acoustic Doppler Current Profilers (ADCP), Acoustic Doppler Velicometers (ADV), and Conductivity and Temperature Sensors (CT).

Description of Data:

With the aim of detecting the along-channel density gradient, along-channel variability in lateral circulation and stratification, and helping to resolve the local spatial variability in wind forcing, two sparser cross-estuary arrays were placed a tidal excursion landward and seaward of the primary dense array. These were

identified as the northern (N) array and the southern (S) array. See "WINDSTATIONSCHEMATICSversion9.0.pdf" for description of each station within the all three transects. The primary cross-estuary instrument array, the main (M) array, consisted of stations equipped with bottom-mounted ADCPs equipped with temperature-salinity (T-S) recorders. Stations were marked with surface buoys equipped with meteorological sensors and surface temperature-salinity recorders. Additional T/S sensors were be placed in the middle of the water column on the inner 3 moorings to monitor pycnocline variability. At the instrumented tower station, a vertical array of 6 ADVs and 6 temperature-salinity recorders was deployed to provide direct measurements of velocity, momentum flux, turbulent dissipation, water column stability and surface wave statistics. The tower was an open-lattice structure designed for rigidity and to minimize flow disturbance. Taut cables from a 4-anchor array were attached to a winch platform near the top of the tower through sheaves located at approximately 60% of the tower height above the bottom. The ADVs were cantilevered away from tower perpendicular to the along-channel flow to minimize the potential for flow disturbance. Turbulence measurements collected at the tower were complemented with bottom tripod mounted ADVs at five additional locations to provide detailed near-bed turbulence measurements at five locations in the cross section. A sonic anemometer package was mounted to a platform on top of the tower with its measurement volume positioned to avoid any structural turbulent wakes. The apparatus was mounted on the same tower set to sample all three axes of wind velocity at 10 Hz for 30 min every hour. Temperature and relative humidity sensors were mounted just below the sonic anemometer. The topmost ADV was mounted approximately 1 m below MLW, and was set to sample both velocity and pressure at 4 Hz for approximately 9 min every 0.5 hr for estimation of subsurface turbulent momentum flux, surface wave characteristics, and tidal height. All 11 of the other surface buoys were equipped with standard sensors for measuring wind velocity and temperature; the sensors were mounted 3-5 m above water, depending on the size of the buoy.

Raw and processed data from each VIMS owned instrument are zipped in a folder, or series of folders, identified by the type and serial number of the instrument. See DEPLOYMENT1INSTRUMENTLIST.xlsx and "Wind Station Array V6 Modified with VIMS deployed serial numbers.pdf" for a detailed list of all instruments deployed. "VIMS deployment logbook.pdf" and "VIMS retrieval logbook.pdf" provide detailed deployment and retrieval information for each VIMS instrument. ADV Burst data is too large for inclusion here so the data archived here includes only burst averages and statistics. Original Burst data is available upon request. All times are Eastern Standard Time (EST).

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