Marine Optical Buoy (MOBY) Ocean Color Calibration/Validation Time Series (1997 - 2000)

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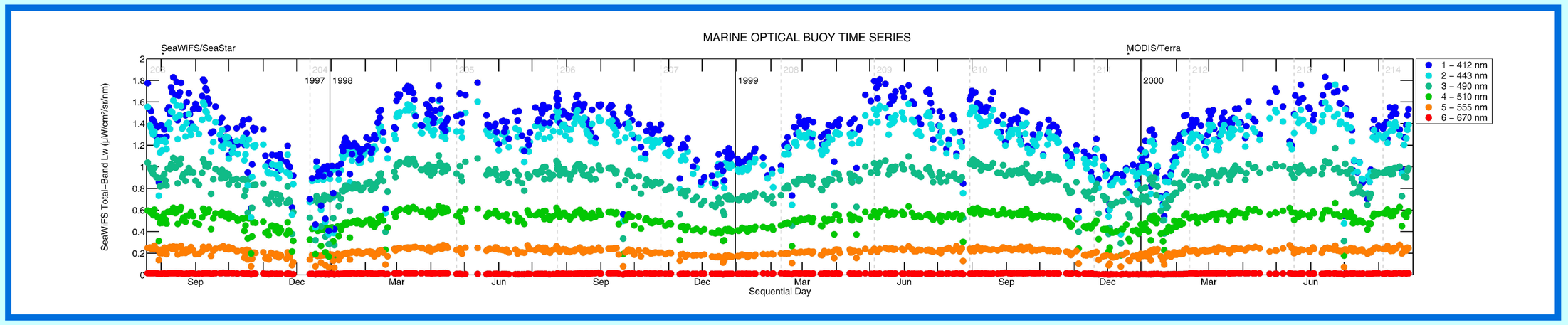
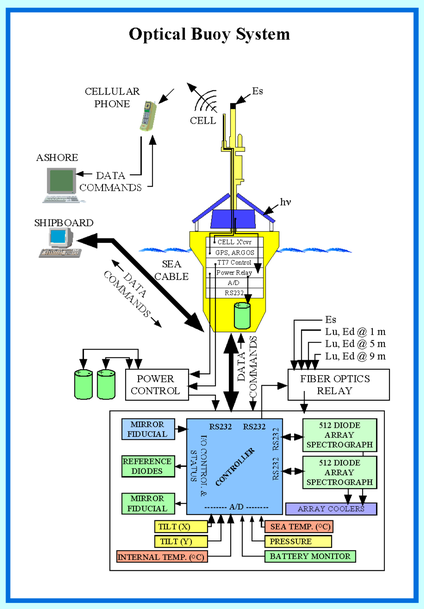
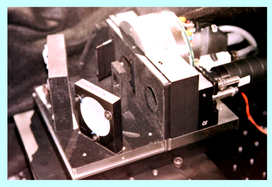
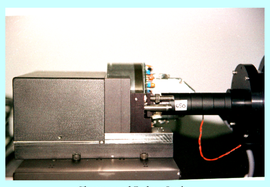
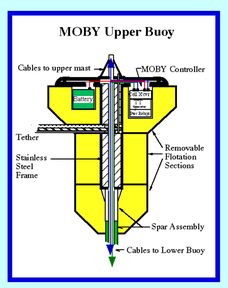
William A. Broenkow,[2] and Yong Sung Kim[3]

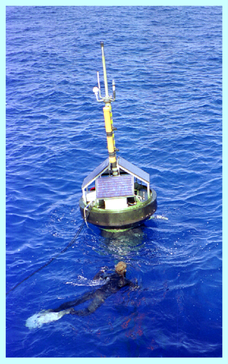


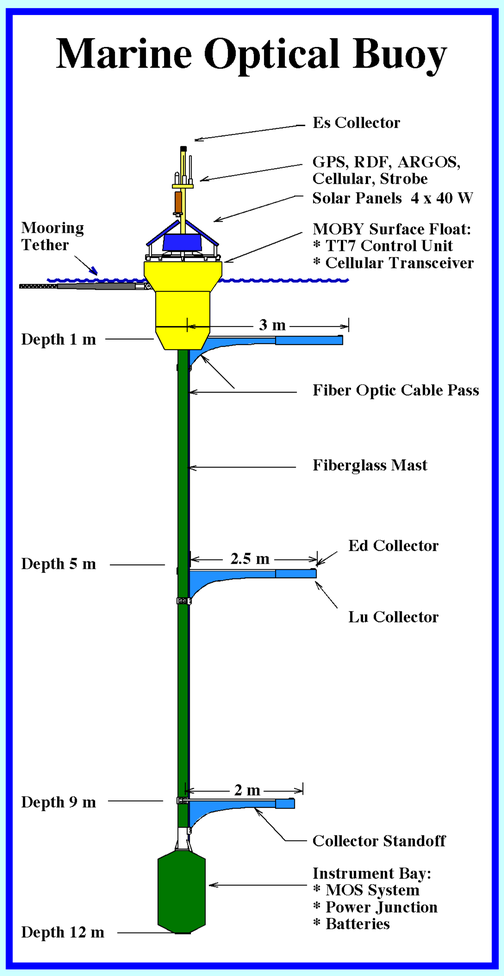


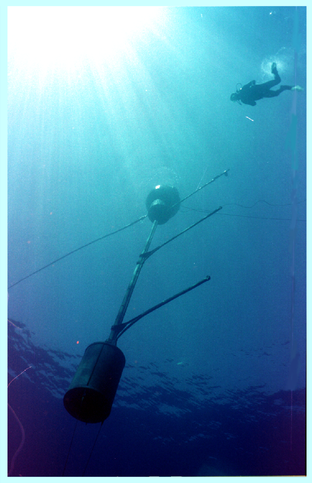

Offner Spectrograph (American Holographic/NESDIS-ORA)

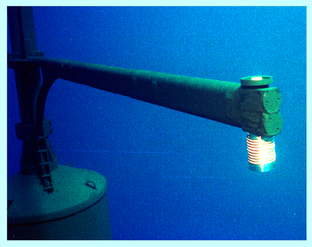

Shutter and Relay Optics

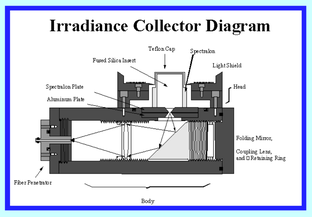


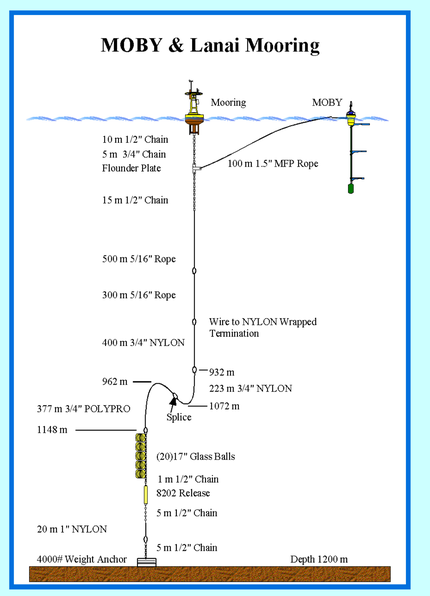




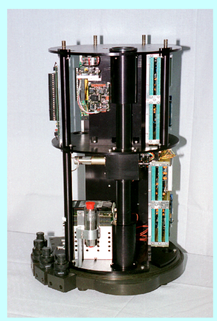




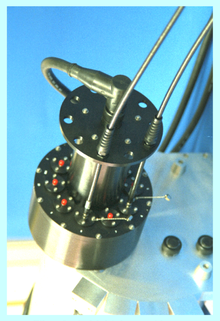


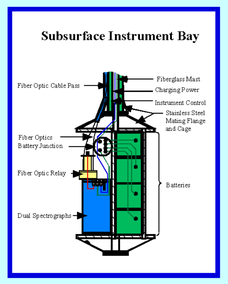


Approximately 15 meters long, The Marine Optical Buoy (MOBY) is the world's largest marine optical device. In the ocean, only its antennae, solar panels, strobe light, and surface buoy (which houses the computer and cellular phone for data transmission) are visible, standing about 2 meters above the water line. Optical collectors (irradiance and radiance) are located at the ends of the arms to collect downwelled light and the upwelled light emanating from the ocean. At the top of the surface buoy, an irradiance collector measures the incident energy. Lenses within these collectors focus the light onto fiber optic cables which then transmit the light to a fiber optic multiplexer housed in the instrument bay. The multiplexer relays the light into a dual spectrograph optical system with cooled CCD detector arrays that measure the spectral radiant energy. These signals are then digitized and relayed by microprocessors and transmitted up to a main computer housed in the surface buoy. These data are stored on a disk drive and are transferred via cellular phone to the MOBY operations data center for processing. The satellite water-leaving radiance data are typically available within 24 hours for the satellite/MOBY match-up database analysis.

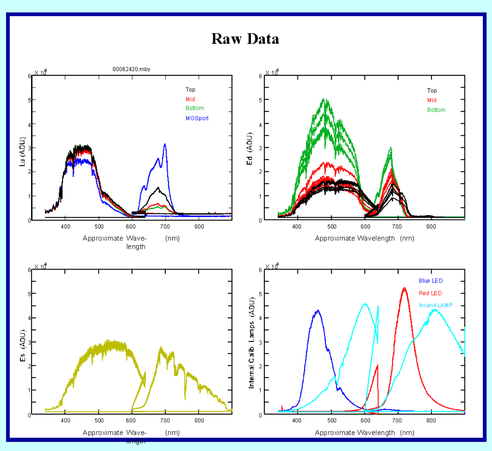

Marine Optical Spectrograph System (MOS)

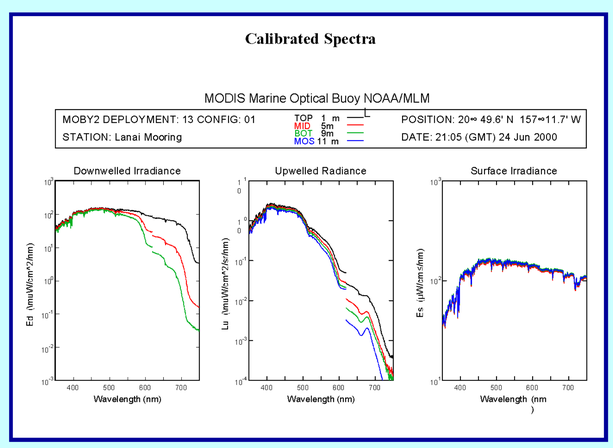
Sub-Surface Instrument Bay with MOS

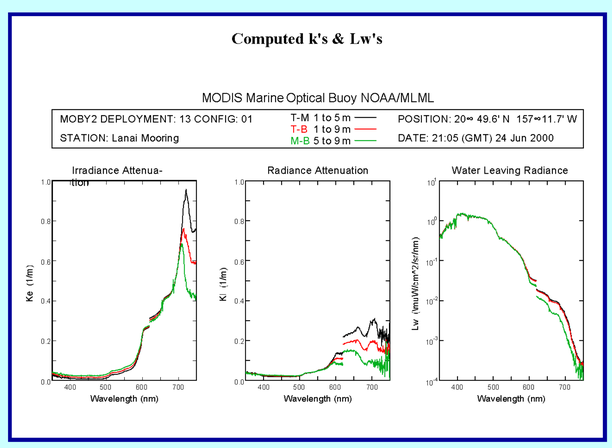

Fiber Optic Multiplexer - 10 port

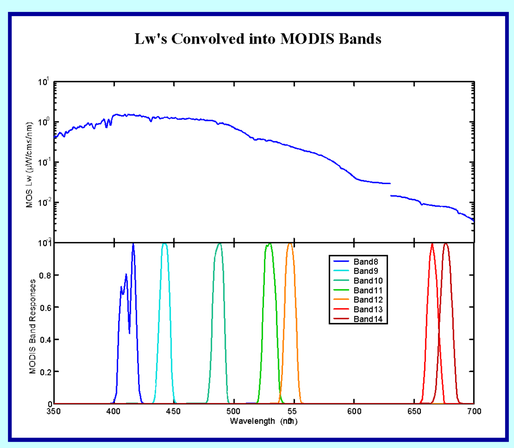


Data Processing



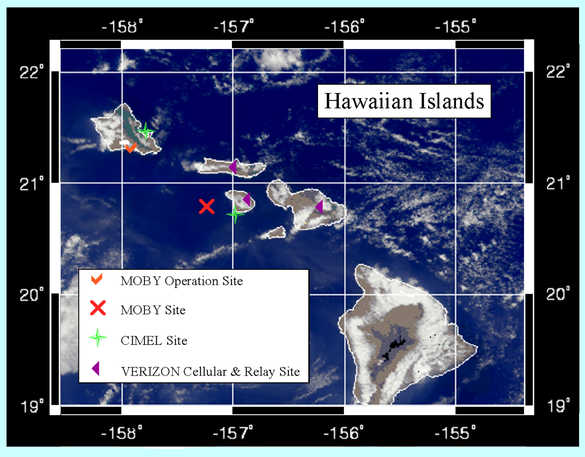




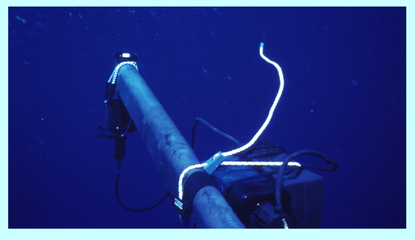


MOBY Operations Site

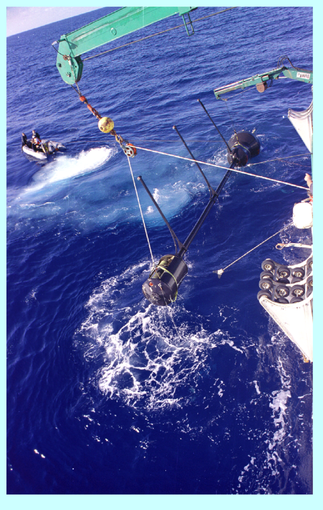
Operation Facility at The University of Hawaii Marine Center and Research Vessel



MOBY At-Sea Operations



Diver Calibrations



Deployment/Retrieval

1. Office of Research and Applications, National Environmental Satellite Data and Information Service, National Oceanic and Atmospheric Administration, Camp Springs, Maryland, USA.
2. San Jose State University Foundation, Moss Landing Marine Laboratories, Moss Landing, California, USA.
3. Research and Data Systems Corporation, Greenbelt, Maryland, USA.

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