

Ocean Carbon and Biogeochemistry Data System

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EDDIES cruise: 2004 and 2005 R/V Oceanus Survey cruises Satlantic light-profiling system processing notes

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Methodology

It is important to note that two different light-profiling systems were used for the EDDIES experiment. The Weatherbird II used a Satlantic profiling radiometer system (SPMR/SMSR), which has been a standard operating procedure for BBOP over the past 8 years. The Oceanus used a Satlantic Micro-Profiler II.

R/V OCEANUS Satlantic Micro-Profiler Description

The profiler aboard the Oceanus was a Satlantic Micro-Profiler. Like the SPMR (used during the Weatherbird II cruises), its primary optical measurements are downwelling irradiance (E_d) and upwelling radiance (L_u). However, the Micro-Pro collects measurements in the following wavelengths: 305, 325, 340, 380, 412, 443, 490, 510, 555, 665, and 683. (Note the additional UV channel). The units for each channel are the same ($\mu W/cm^2/nm$ and $\mu W/cm^2/nm/sr$ respectively).

SMSR

The Micro-Pro is accompanied by the same system as Weatherbird although data is later synchronized based on time.

DATA COLLECTION

[Same as Weatherbird II] A profile begins after the instrument has been deployed and reaches a distance of approximately 50 meters from the ship's stern (to avoid ship shadow). The instrument is then released and falls at approximately 0.5 m/s and is synchronized with the SMSR on the deck of the ship.

DATA PROCESSING

Data collected from the Micro-Pro is processed with Satlantic ProSoft 7.7.

Like the BBOP method, surface values of the profiler measurements are obtained as the intercept of a least squares regression fit. In cases of shallow depths that do not meet the number of points for regression, the surface variable is calculated based on the intercept of the k slope from the first depth value that does have the required number of points. Derived surface products include remote sensing reflectances (R_{rs}), down-welled attenuation coefficients (K_d) and up-welled attenuation coefficients (K_l). The units are $1/sr$, $1/m$ and $1/m$ respectively.

These data are a collection of in-situ measurements gathered from the OCEANUS research vessel during the EDDIES experiment (2004 and 2005) Survey cruises.

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