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comparing CTD values with climatological data for the experimental region. Data values that were different by more than two standard deviations (i.e., outliers) from the climatological mean were eliminated.

Samples for nitrate + nitrite ($\mu M\ L^{-1}$) and chlorophyll *a* ($mg\ m^{-3}$) were collected at discrete depths using the rosette sampler (see Rii et al., 2008). Nitrate + nitrite samples were analyzed in the laboratory using a Technicon Autoanalyzer II. For determinations of chlorophyll *a*, 2-L water samples were filtered immediately after collection and analyzed (post-cruise) using high performance liquid chromatography. These discrete values of total chlorophyll concentration were used to determine the total chlorophyll–fluorescence regression coefficients for the E-Flux I and III cruises. These coefficients were then used to convert fluorescence voltage into total chlorophyll *a* concentrations. Unfortunately, for the E-Flux II cruise it was not possible to compute the regression coefficients, because HPLC measurements on the collected water samples were not available; therefore the conversion was made using the same coefficients computed for the E-Flux III cruise (same fluorometer). The 1% light level depths were directly computed from scalar irradiance (PAR) profiles for the CTD casts collected during daytime. These data were used to compute the relationship between the 1% light level depths and the mean total chlorophyll concentrations between the surface and the 1% light level depths. The coefficients were then used to derive the 1% light levels depths for the casts collected at night from total chlorophyll *a* concentration data (Morel, 1988). Unfortunately, no discrete dissolved oxygen data were obtained from the water samples, and thus it was not possible to properly post-calibrate the dissolved oxygen sensor. Hence, it is not possible to verify the accuracy of oxygen concentrations. Nonetheless, individual profiles can still be compared within a specific cruise, but it is not possible to compare absolute oxygen concentration values between cruises.

For some profile measurements, a specialized optics package was tethered 1.5 m beneath the CTD/rosette. The optics package was equipped with two spectral absorption–attenuation instruments (WETLabs AC-9 and AC-S), a fluorometer/turbidity instrument (WETLabs FLNTU), and a Sea-Bird CTD. Also, both ships collected meteorological and near-surface (flow-through) physical, chemical, and biological data. Neither the optics package data nor the ship underway data are discussed in the present report.

(2) *Ship-based ADCP data*: The simultaneous mapping of upper ocean currents as functions of depth and geographic position was a critical part of the E-Flux experiment. ADCP data were used not only to determine the dimensions of the eddies, but also to locate the positions of the eddy centers and to choose the transect paths that intersected them.

Profiling ADCPs (VM150 kHz Narrow Band manufactured by RDI) were provided by the R/V *KOK* and R/V *Wecoma*. The current data were recorded as 15-min averages in 10-m bins from 40 to 450 m depth. The data acquisition systems were linked to GPS and heading systems to provide accurate position data as well. Details concerning the ADCP instrumentation and data processing routines may be found on the R/V *KOK* and R/V *Wecoma* websites.

(3) *Drifters*: Drifters were deployed during each of the E-Flux experiments. In particular, a surface drifter (called OPL Drifter) with a 1.5-m cylindrical foam core and 1-m cross-shaped drogue (located at depths of either 80 or 90 m) was deployed to track the fluid motion of the eddies. In addition, the OPL drifter was used to obtain a nearly Lagrangian time series (1-min sampling intervals) of temperature from near the surface to a depth of 150 m at 10-m intervals using internally recording temperature sensors (Onset Inc.). Geographic coordinates of the drifter were obtained through the Argos communication satellite system and these data were transmitted to the Ocean Physics Laboratory (OPL) in Santa Barbara. The position data were then forwarded to scientists onboard the research vessels via email for near real-time tracking of the drifter. Temperature data were offloaded after recovery of the drifter and time series were plotted. This drifter was recovered once, but was lost later in the experiment.

A bio-optical surface drifter (METOCEAN), which was not drogued, was deployed during the E-Flux I and III cruises. The surface drifter provided temporal measurements (data were acquired every 3 h) of drifter position, barometric pressure, air temperature, sea-surface temperature (SST), and chlorophyll *a* concentration. These data were transmitted via satellite to OPL in Santa Barbara and then emailed back to the research vessel for examination and plotting of positions. The chlorophyll *a* concentrations were found to be in generally good agreement with those obtained from the ship measurements.

Finally, a drifting sediment trap array (Rii et al., 2008), though not designed as a Lagrangian drifter, was also useful for tracking the general patterns of motion of the eddies. The trap array, which represented the major current drag element, consisted of 12 particle interceptor traps (PITS) suspended at a depth of 150 m. The location of the array was obtained through an Argos satellite transmitter; geographic coordinates were then sent via email to the ship. For recovery purposes, the array was also equipped with an RDF radio and strobe lights. Samples obtained from the traps were used by other E-Flux investigators to examine the influence of eddy pumping on the export rates of particulate carbon, nitrogen, phosphorus, biogenic silica, and taxon-specific pigments.