Summary of OSU Cruise Activities:

1) **OPTICS** - At stations 5, 18, 19 and 20 we deployed an optics package consisting of an ac-9, hyperspectral ac-s, seabird CTD, and phycoerythrin (PE), CDOM and chl-a fluorometers. The purpose of these deployments was to characterize the inherent and apparent optical properties of sampling stations and to provide information regarding the distribution of cyanobacterial pigments and CDOM relative to water column structure. A small sample of this data showing chl-a, CDOM, PE (relative to water column density) and particle concentrations are shown below (Station 19).

2) **CORE MEASUREMENTS** – At all extended sampling stations we collected samples for chl-a and particulate elements. The general breakdown of these sample collections is as follows:
   - **Station 1:**
     - Collected samples for chl-a
   - **Station 5 and Station 19:**
     - Collected samples for size-fractionated chl–a to coordinate with PP array
     - Vertical profiles for microscopy (> 2um), chl-a, particulate Si, PP, PC, PN and phycoerythrin (PE).
     - Collected water from multiple depths for the determination of the relative fractionation of PP-pools.
   - **Transect stations 9-18 and 20-24:**
     - Collected samples for chl-a
   - **GAS ARRAY** - At stations 5 and 19, with D. Viviani and others, we deployed the gas array for the measurement of 24-hr in situ $^{15}$N and $^{13}$C production rates at six ascribed depths (5m, 25m, 45m, 75m, 100m and 125m).
4) **ON-DECK 15N-FIXATION MEASUREMENTS** - At Stations 5 and 19, we collaborated with JP Zehr to measure $^{15}$N/$^{13}$C fixation rates in on-deck incubations (12hr-light, 12hr-dark, 24-hr). These measurements were meant to coordinate with Zehr’s nanoSIMS incubations.

5) **MIXING EXPERIMENTS** - At stations 5 and 19, we coordinated with a number of other cruise participants (K. Bjorkman, Z. Kolber, JP Zehr, B. Li, D. Repeta and the Bidigare group) to conduct on-deck ‘mixing’ experiments. In short, water was collected from 45m and amended with water (10% volume) collected from 200m, 300m and 500m. Duplicate treatments and controls were sampled daily over the course of a 4-day period. Preliminary results (FRRF, microscopy and observation of filters) indicate significant growth in all treatments relative to controls by the end of these experimental sampling periods.

6) **NET TOWS** - At stations 3,5,6,19 and 20 we conducted net tows using a hand-towed plankton net (80-um mesh size). All tows were off current or ship drift and lasted ~10 minutes. From these collections, we isolated colonies of *Trichodesmium* for analysis of elemental composition (C-N-P and P-fractionation). Individual colonies of various morphologies were also isolated, imaged and saved for later determination of the distribution of colony size (diameter), the number of trichomes per colony and the number of cells per trichome. Various other organisms were also imaged for educational purposes.