

Atlantic Coast Environmental Indicators Consortium

ACE-INC 0303 Cruise Report 13-17 October 2003

This report provides a summary of the research activities completed on the R/V Aquarius. Additional sampling was conducted from the 25' Parker and is briefly noted.

Research Vessel: R/V Aquarius

Area of Operations: Patuxent and Choptank Rivers

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Goals and Objectives:

The ACE INC program goal is to develop integrative indicators of trophic structure and function that reflect changes in nutrient loading resulting from a changing landscape. Biota are proposed to be integrators of changing conditions in the Bay. Physical variability, both temporal and spatial, especially dissolved oxygen, is proposed to modulate trophic responses to nutrient over-enrichment. Phytoplankton, zooplankton, and fish responses are being analyzed to develop integrated indicators of Bay 'health.' We proposed that the structure of biotic communities will differ in the Patuxent and Choptank Rivers as a response to their differing trophic status. The Patuxent is 'recovering' from nutrient over-enrichment while the Choptank continues to receive high nutrient loading from agricultural inputs.

Cruise Activities:

RV Aquarius

The Patuxent and Choptank Rivers were sampled at five fixed stations on each river (**Figure 1**). Each river was sampled over a two-day period. **Table 1** is a log of the activities conducted at each station. Once on station, a CTD cast was made prior to any other activities. TAPS (acoustic profiler) was configured to the CTD array and collected zooplankton size and abundance data on each cast.

Pump and grab samples were obtained for chlorophyll, seston, particulate absorption, dissolved inorganic nutrients, total CO₂, HPLC pigments (size fractionated) and particle size analysis (fixed samples). Primary production was measured using 14C methodology. In-water bio-optical profiles were obtained using both Satlantic MicroPro (vertical) and Hyper-TSRB (surface) instruments.

Zooplankton was collected in bottom and surface pump samples, vertical lifts of a 0.5 diameter 64µm mesh plankton net, and acoustical sampling by TAPS. The plankton net was lowered to the bottom and lifted to the surface.

A 1m² Tucker trawl tow with 280-µm mesh was used to sample ichthyoplankton. Each tow provided a 2-min bottom and 2-min top sample that together sampled the entire water column. One 10-min mid-water trawl (MWT) tow was conducted at each station to collect juvenile and adult fish.

RV 25' Parker

In conjunction with activities on the R/V Aquarius, surveys were conducted from Horn Point Laboratory's 25' Parker. Activities included, CTD casts and ACROBAT tows. For questions related to the Parker activities, please contact Tom Wazniak (see below).

Problems:

1. High winds on 15 Oct prevented sampling
2. High winds on 16 Oct caused a change in cruise plan

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CTD Data

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Table1: Consecutive station log for the ACE 0303 cruise conducted on 13 -17 October 2003.

ACE 0303 Consecutive Station Log

RV Aquarius 13-17 October 2003

| STA | CTD | STA 2 | LOCATION | TIME | DAY | DEPTH | LAT | LONG | CTD | TAPS | TT | MWT | ZOOPS | VL | C14 | MP | TSRB | CF |
|--------------|-----|----------|----------------------|------|-----|-------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|
| 1 | 1 | PAX_MR | Battle Cr. | 905 | 13 | 8 | 38.4329 | -76.6162 | X | X | X | X | X | X | X | X | X | X |
| 2 | 2 | PAX_LMR | St. Leonard Cr. | 1045 | 13 | 9.6 | 38.3746 | -76.5052 | X | X | X | X | X | X | | X | X | X |
| 3 | 3 | PAX_LR | Pax River mouth | 1245 | 13 | 13.5 | 38.3064 | -76.4349 | X | X | X | X | X | X | X | X | X | X |
| 4 | 4 | PAX_SR | Holland's Cliff | 900 | 14 | 5.5 | 38.6135 | -76.6724 | X | X | X | X | X | X | X | X | X | X |
| 5 | 5 | PAX_UMR | Chalk Pt. | 1040 | 14 | 3.8 | 38.5318 | -76.6690 | X | X | X | X | X | X | | X | X | X |
| 6 | 6 | CHOP_SF | Day Marker 52 | 934 | 16 | 11 | 38.7242 | -76.0133 | X | X | X | | X | X | X | X | X | X |
| 7 | 7 | CHOP_UMR | Blinkhorn Creek | 1045 | 16 | 8 | 38.6533 | -75.9561 | X | X | X | | X | X | | X | X | X |
| 8 | 8 | CHOP_MR | Chancellor's Point | 1150 | 16 | 12 | 38.5744 | -76.0272 | X | X | X | | X | X | X | X | X | X |
| 9 | 9 | CHOP_SF | Day Marker 52 | 1333 | 16 | 10 | 38.7232 | -76.0210 | X | X | | X | | | | | | |
| 10 | 10 | CHOP_UMR | Blinkhorn Creek | 1452 | 16 | 8 | 38.6536 | -75.9558 | X | X | | X | | | | | | |
| 11 | 11 | CHOP_MR | Chancellor's Point | 1542 | 16 | 11 | 38.5744 | -76.0266 | X | X | | X | | | | | | |
| 12 | 12 | CHOP_LR | Choptank River mouth | 749 | 17 | 11 | 38.6508 | -76.3191 | X | X | X | X | X | X | X | X | X | X |
| 13 | 13 | CHOP_LMR | Castle Haven Point | 934 | 17 | 8 | 38.6434 | -76.1684 | X | X | X | X | X | X | | X | X | X |
| Total | | | | | | | | | 13 | 13 | 10 | 10 | 10 | 10 | 6 | 10 | 10 | 10 |

Field Codes:

STA - consecutive station number; **CTD** - CTD station number; **STA2** - secondary station identifier; **LOCATION** - geographic station location; **TIME** - arrival time; **DAY** - day of the month (July); **DEPTH** - station depth in meters; **LAT**- latitude; **LONG** - longitude.

Activity Codes:

CTD - Conductivity, Temperature and Depth datalogger; **TAPS** - Tracor Acoustic Profiler System; **TT** - tucker trawl; **MWT** - Mid-water Trawl; **ZOOPS** - Zooplankton Pump Samples; **VL** - Zooplankton Vertical Lift (35um); **C14** - Carbon uptake incubations (primary production); **MP** - MicroPro vertical profiler; **TSRB** - Towed Surface Radiometry Buoy; **CF** - Cold Filtration (Chlorophyll);

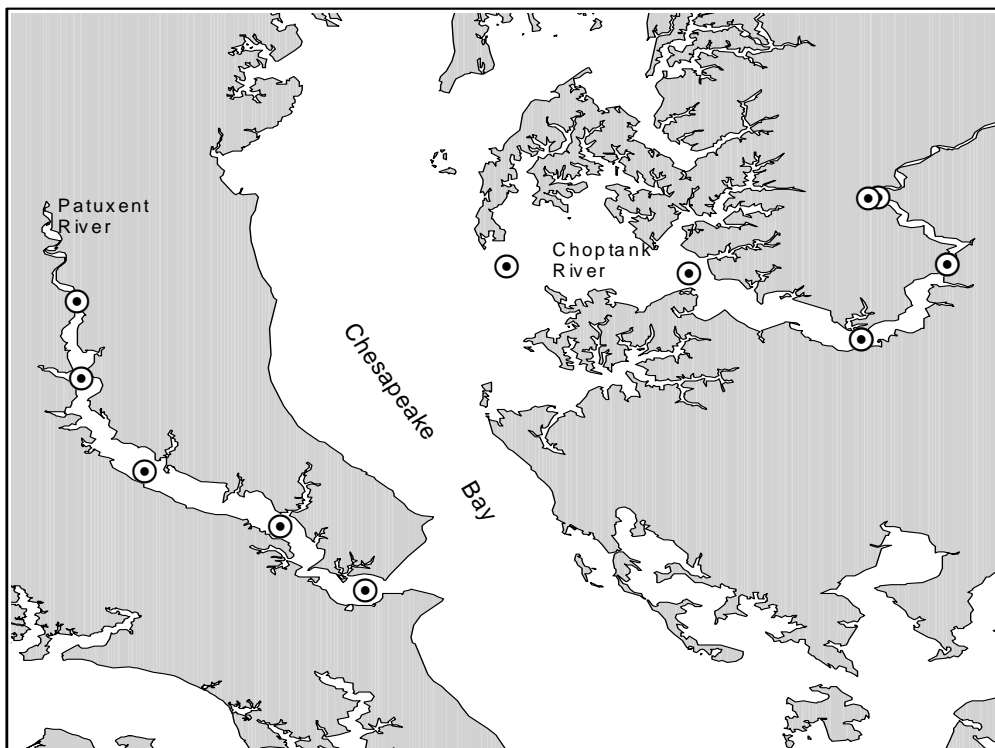


Figure 1: Patuxent and Choptank Rivers, Chesapeake Bay, Maryland. Map of stations on ACE cruise 0303, 13 - 16 October 2003.