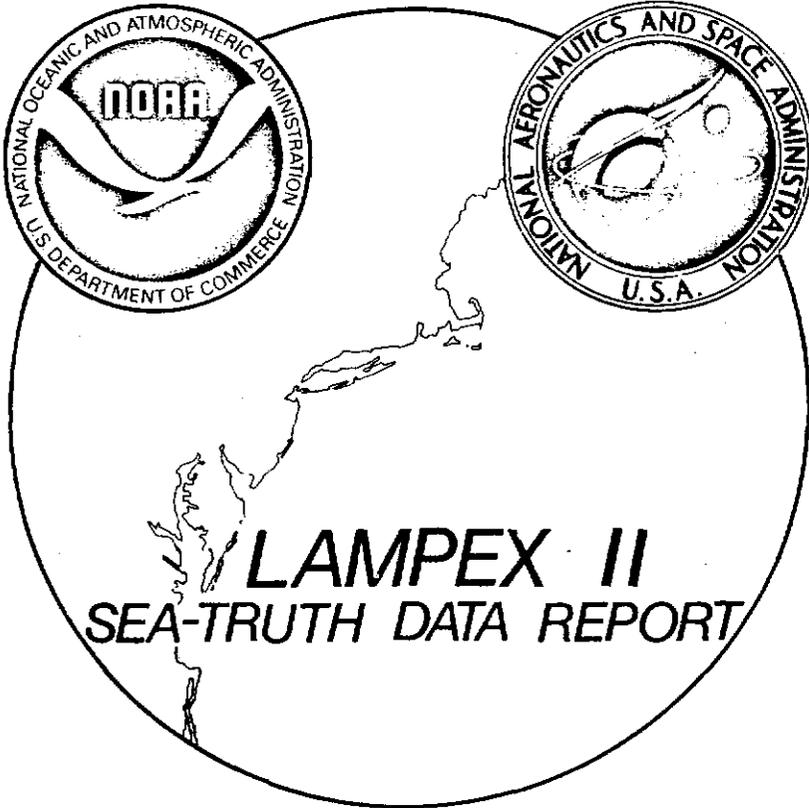
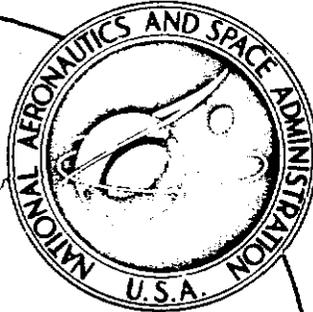
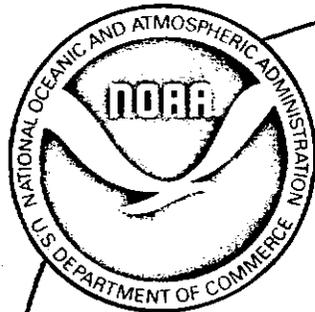


Large Area Marine Productivity Experiment



LAMPEX II
SEA-TRUTH DATA REPORT

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Sandy Hook Laboratory
Division of Environmental Assessment
Highlands, New Jersey

Report No. 79-36 (October 1979)

LARGE AREA MARINE PRODUCTIVITY-POLLUTION EXPERIMENT

LAMPEX II Sea-Truth Data Report

September 12-28, 1979

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INTRODUCTION

Large Area Marine Productivity-Pollution Experiments (LAMPEX) were designed as a joint program between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) with cooperative participation from academia to: 1) increase our understanding of regional marine ecosystem processes; 2) to provide an extensive, synoptic, integrated and timely data base for application to problems of ocean resource and environmental management; 3) to provide a basis for comparative studies of ecological and contaminant processes in boreal, temperate and subtropical coastal and oceanic waters; and 4) to advance the development of improved remote sensing systems and techniques for monitoring and assessing regional marine resources and environmental quality. As part of the continuing joint effort, this report presents the sea truth data (total chlorophyll a, phaeopigment and total suspended matter) collected by the NOAA/National Marine Fisheries Service/Northeast Fisheries Center for the Nimbus-7 Coastal Zone Color Scanner (CZCS). The data were collected at eight locations (Figure 1) during an Ocean Pulse cruise (RV Albatross IV, September 12-28, 1979) from the Gulf of Maine-Georges Bank to the continental shelf waters east of the Maryland-Virginia state line. The data (Table 1) were collected near mid-day to be concurrent with the overpass of the Nimbus-7 satellite. These data are to become part of the calibration for the CZCS whose imagery is to be obtained by the NOAA/National Environmental Satellite Service (NESS) from the NASA/Goddard Space Flight Center. Certain basic research aspects of processing and analysis of CZCS remotely sensed data will be done by NASA. Interim and final reports will be made available for immediate use in habitat protection and fisheries management programs.

METHODS

Chlorophyll a measurements were those described in Strickland and Parsons (1972). Filtration, extraction and measurements of fluorescence were done at sea, shortly after collection of seawater. Samples were collected from the surface, 5, 10, 15, 20, 25, 30, 35, 50 and 75 meters, using PVC Niskin bottles. When primary productivity was measured at local apparent noon, depths sampled corresponded to 100%, 69%, 46%, 25%, 10%, 3% and 1% light penetration as determined with a photometer. After collection, seawater was transferred from the Niskin into an opaque 500 ml polyethylene bottle, through a 300 μm nylon in-line filter connected to the Niskin petcock by a short length of silicon tubing. This removed the larger zooplankton. The phytoplankton in a measured subsample (100-500 ml) were filtered serially onto a 2.5 cm diameter Nitex (nominal retention 20 μm) and a Whatman GF/F glass fiber filter (nominal retention 0.7 μm). Care was taken not to exceed 55 mm Hg vacuum during filtration. The phytoplankton adhering to the walls of the filter funnel were rinsed down onto the filter using prefiltered seawater from the same station as the chlorophyll sample.

After the rinse passed through the filter, the filter was removed and submerged in 2-3 ml of 90% acetone in a glass tissue grinding vessel. The filter and plankton were pulverized using a teflon-tip grinding rod attached to an electric hand-drill. The volume of extract in the grinding vessel was brought to 10 ml using 90% acetone. The vessels were stoppered and shaken. Particulates and glass fibers were separated from the chlorophyll extract by centrifugation. Approximately 6 ml of this extract was placed in a fluorometer cuvette and the fluorescence measured on a Turner Designs fluorometer. Two drops of 5% HCl was added to the extract and its fluorescence was reread

within 5 minutes on the fluorometer. The two fluorescence readings and appropriate equations were used to generate "corrected" estimates of chlorophyll a and phaeopigments.

The Turner Designs fluorometer was calibrated by the spectrophotometric method for "corrected" chlorophyll a according to Lorenzen's (1967) equations given by Strickland and Parsons (1972) using purified chlorophyll a extract.

Total Suspended Matter

Total suspended matter was determined following the procedures in Standard Methods (APHA, 1975) and Strickland and Parsons (1972) except that an isotonic ammonium carbonate $[(\text{NH}_4)_2 \text{CO}_3]$ solution (Uematsu et al., 1978) was used instead of distilled water to rinse salt through the filters. Additionally, double filters were used for each sample with the lower filter serving as a blank, and unused filters (3), carried through the same procedures as the sample filters with the exception that no seawater was filtered, were used as humidity blanks. Filtration was accomplished using Nucleopore filters (47 mm diameter, 0.4 μm pore size). Samples were filtered under low vacuum (approximately 55 mm Hg).

REFERENCES

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TABLE 1. Total suspended matter (TSM), total chlorophyll a and total phaeopigment a collected on Ocean Pulse cruise AL-79-10 as sea truth measurements for Nimbus-7 Coastal Zone Color Scanner (CZCS).

Date	Time (EST)	Lat. (N)	Long. (W)	Station	Depth (m)	TSM (mg/l)	Total Chloro. <u>a</u> (mg/m ³)	Total Phaeopigment <u>a</u> (mg/m ³)	Cloud Cover
9-13-79	1107	41°50.0'	69°29.0'	P28	1	0.79*	0.54	0.13	0
9-16-79	1136	42°18.0'	67°41.0'	145	1	0.67	1.49	0.57	0
9-17-79	1107	40°45.0'	67°34.0'	A150	1	0.52	0.70	0.30	0
9-18-79	1120	40°04.0'	69°11.0'	A115	1	0.18	0.12	0.06	0
9-19-79	1204	41°10.0'	70°52.0'	SBS5	1	1.57	1.82	0.22	0
9-20-79	1115	41°18.0'	71°20.0'	A75	1	0.55	0.75	0.25	0
9-24-79	1135	38°56.5'	75°09.2'	DBA	1	3.88	7.51	2.18	.6
9-27-79	1135	39°51.0'	72°17.0'	308A	1	0.28	0.29	2.01	.7

*Average of two replicates 0.96 and 0.61

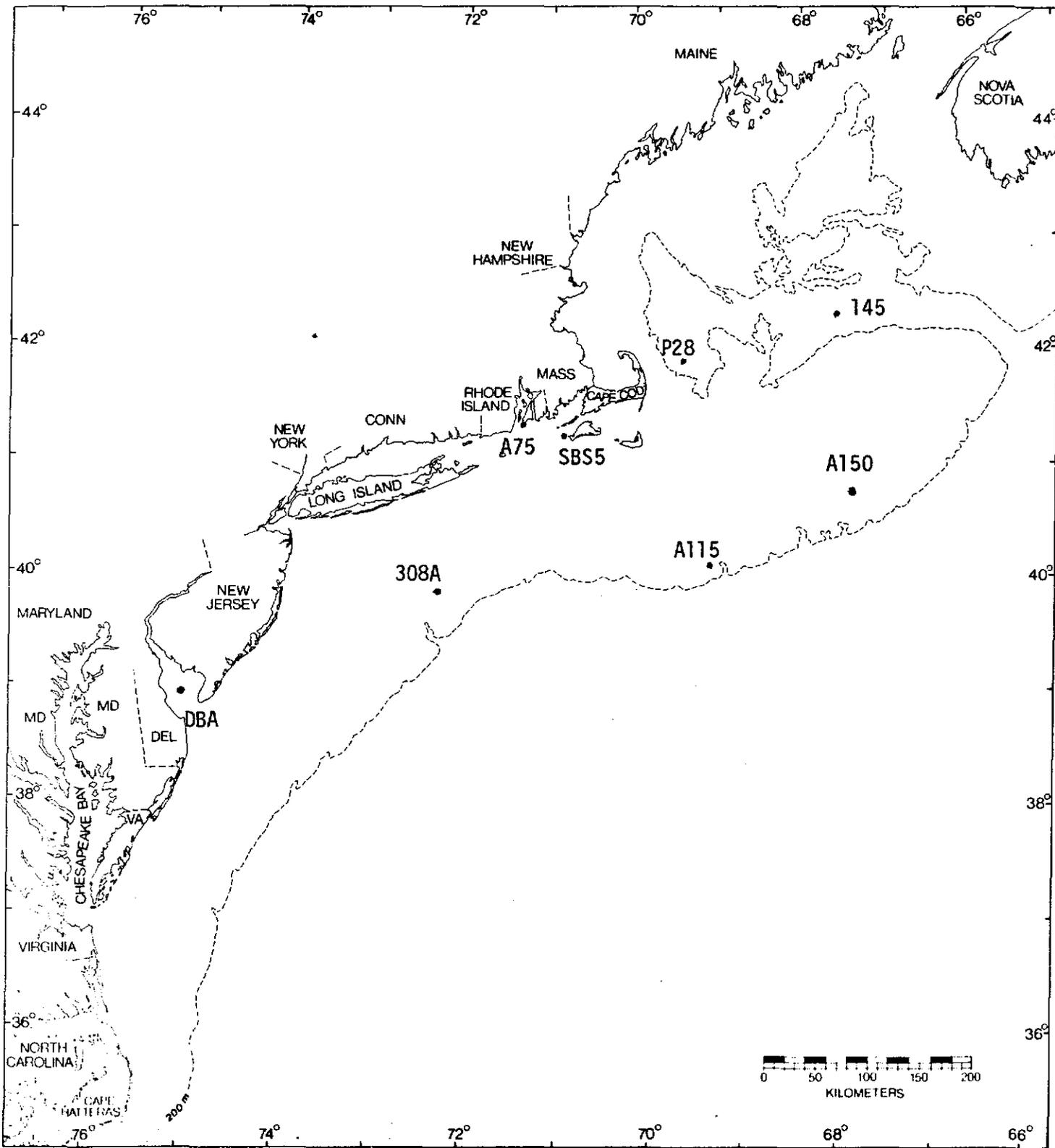


Figure 1. Stations sampled September 12-28, 1979 on Ocean Pulse cruise (AL-79-10) for total chlorophyll *a* and total suspended matter to be used as sea truth for the Nimbus-7 Coastal Zone Color Scanner (CZCS).