

MINISTRY OF AGRICULTURE FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK NR33 0HT, ENGLAND

1993 RESEARCH VESSEL PROGRAMME

REPORT: RV Corystes Cruise 6a/93

STAFF: P A Gurbutt (S.I.C.)
D S Kirkwood
J Knowles
J W Read
A Poole
W Broadgate (UEA)
S Danes (UEA)

DURATION: Sailed from Lowestoft 1000h 8 June
Docked in Lowestoft 0400h 14 June
(All times are Greenwich Mean Time)

LOCALITY: Wash, Humber, North Sea

AIMS:

1. To identify and quantify the fate of river-borne nutrients entering the Wash and Humber estuary, examining nutrient distributions from the river inputs through to the North Sea. (AE00504A)
2. To measure environmental parameters relevant to phytoplankton growth and nutrient depletion. (AE00504A)
3. To take samples over a grid in the southern North Sea to improve knowledge of the seasonal signal in nutrients, particularly phosphate. (AE00503A)

NARRATIVE

RV Corystes sailed from Lowestoft on the morning tide on 8 June and proceeded via the north Norfolk coast to the Humber. *En route* surface water samples were collected at 6 stations for nutrient determination.

During 9 June a series of CTD and surface water stations was worked, commencing close to the Holderness coast and finishing in the mouth of the Wash. On 10 June the Wash grid of stations was worked, starting in the mouth of the Wash, and finishing close to Bar Flat Buoy at the entrance to the Nene and Old Lynn Channels.

Overnight on 10/11 June, RV Corystes proceeded to the Outer Silver Pit to sample nutrients and chlorophyll across the front that is normally found there. Four CTD stations were worked, one on the well-mixed side and three in the stratified region.

RV Corystes then steamed south to commence the grid of phosphate stations from 11 to 13 June. Originally, these were to be a mixture of CTD and surface water stations, but to increase areal coverage in the time remaining, only surface water samples were taken. These were at 30 minute

intervals along parallel tracks running east/west down the Dutch coast. Further surface samples were collected between the Rhine and the Thames.

Throughout the cruise, surface water and air samples were collected for on board hydrocarbon determination.

With no further working time remaining, RV Corystes sailed for Lowestoft and docked on the early morning tide on 14 June.

RESULTS

1. All water samples were filtered for later determination of suspended load, chlorophyll and particulate carbon, nitrogen and phosphorus.
2. Total oxidised nitrogen, nitrite, phosphate and ammonia analyses were completed on all water samples. The silicate analyses will be completed on return to Lowestoft. The expected summer low (often below detection limit) levels of total oxidised nitrogen, nitrite and phosphate were found at most stations with generally little or no variation from surface to bottom in the vertically mixed region.

Off shore between the Humber and the Wash south of 53° 18'N and in the Wash measurable levels of ammonia (up to 2.9 $\mu\text{mol l}^{-1}$ with a detection limit of 0.2 $\mu\text{mol l}^{-1}$) were detected. In the Outer Silver Pit there were detectable levels of ammonia at the surface, none at about 15-20m near the thermocline and concentrations of 1.3-1.7 $\mu\text{mol l}^{-1}$ at the bottom (>60m).

The expected depletion of all nutrients were seen on the eastern side of the grid of stations in the Southern Bight. However, there were measurable levels of phosphate (0.17 $\mu\text{mol l}^{-1}$ with a detection limit of 0.02 $\mu\text{mol l}^{-1}$) in the far north west of the grid and there was a maximum of 3.9 $\mu\text{mol l}^{-1}$ along the Dutch coast north of the Rotterdam port entrance.

3. Jet-like features were seen on the Acoustic Doppler Current profiler when crossing the front near the Outer Silver Pit. These were particularly strong around 35m water depth on the southern edge of the Outer Silver Pit.
4. A preliminary examination of the results of the hydrocarbon concentrations reveals that ethane and ethene concentrations were very high compared with other hydrocarbons.

P A Gurbutt
(Scientist in Charge)

Seen in draft: R Taylor (Master)
W May (Fishing Skipper)

Initialed: PG-S

Distribution:

Basic List +
P A Gurbutt (S.I.C.) A Poole
D S Kirkwood W Broadgate (UEA)
J Knowles S Danes (UEA)
J W Read

CORYSTES 6A/93- JONUS 17: CRUISE TRACK

SHOWING :
 CRUISE TRACK
 STATION POSITION
 STATION NUMBER
 COASTLINE

