MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
CEFAS, LOWESTOFT LABORATORY, SUFFOLK, ENGLAND

1998 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 2/98

STAFF: JD Metcalfe (SIC)
BH Holford
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MO Eagle
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DURATION: Left Lowestoft 1210 h, 2 February 1998
Docked Lowestoft 0300 h, 21 February 1998

LOCALITY: Eastern English Channel/Southern North Sea

AIMS:

1. To estimate swimming speed and orientation of spent plaice on their post-spawning migration by simultaneous use of the sector scanning sonar and the ADCP.

2. To assess the precision of geolocation using the POL tidal model in conjunction with hydrostatic data logged by data storage tags.

NARRATIVE: (All times are Greenwich Mean Time)

CORYSTES sailed at 1210 h on 2 February and proceeded to the plaice spawning ground in the eastern English Channel in an area centred on 50° 11.80' N, 00° 09.00'W. Fishing for spent female plaice commenced at 0830 h on 3 February and continued until 2015h. Fish tracking commenced the following morning; after brief tag trials, a 60 cm spent female plaice (E66 4828), equipped with a long-life transponding acoustic tag, was released at 1053 h (4 February) at 50° 04.61'N, 00° 01.35'E, just prior to slack water preceding an east-going tide. This fish, which was tracked for over five days (121 h), remained in mid-water almost continuously for the first 72 h of the track, before going to the sea-bed at 1110 h on 6 February. The fish made no further significant movement, either into mid-water or across the sea bed, and was finally abandoned at 1200h on 9 February.

Subsequently, CORYSTES steamed about 20 miles west to approximately 50° 04'N, 00° 15'E again to fish for plaice (an additional Aim in response to a TELEX request from Dr Scott for live, mature fish). Fishing commenced at 1540 h on 9 February and continued until 2230 h. CORYSTES subsequently steamed to Southampton, docking at 1200 h on 10 February, to put the fish ashore for transport back to Lowestoft. CORYSTES sailed again at 1530 h the same day and returned overnight to the plaice spawning ground in the eastern English Channel to resume fish tracking the following day.

After brief tag trials, a 39 cm spent female plaice (E67 1000), equipped with a long-life transponding acoustic tag, was released at 0956 h on 11 February at 50° 12.28'N, 00° 02.29'E, a little over half way through an east-going tide. This fish was tracked

until 1730 h the same day when it was lost whilst moving north-east over the sea bed. Despite a search, which continued until 0000 h on 12 February, the fish was not found.

A third spent female plaice (37 cm, E66 1975) equipped with a long-life transponding acoustic tag, was released at 50° 13.01'N, 00° 02.08'E at 0025 h on 12 February at the beginning of a west-going tide. This fish was tracked for a little over eight days (197.5 h) during which it moved north-east towards the Dover Strait by selective tidal stream transport on night-time east-going tides. The fish was finally abandoned at 0600 h on 20 February having returned to the sea bed on the western edge of the Vergoyer bank. CORYSTES then proceeded to Lowestoft via the Outer Gabbard where the sector scanning sonar was used to carry out a brief, unsuccessful search for recording oceanographic equipment (Aqua Monitor mooring frame) lost previously during CIR 2/98.

CORYSTES docked at 0300h on 21 February.

RESULTS:

1. *Fishing for live plaice* occurred on two occasions. On both, fish were caught using a 4 m steel beam trawl towed for 15 minutes on each haul. On the first occasion (3 February), 104 plaice were caught in a total of 18 hauls. Most of these fish were either males, or too small for tracking. Nonetheless 7 female (mostly spent) and one male fish were considered suitable, fitted with tag saddles, and retained in sea water deck tanks.

   On the second occasion (9 February) 123 plaice were caught in 13 hauls, of which ~20 ♀ and ~80 ♂ fish were retained; the remaining fish were either immature, or damaged, and were discarded. The retained fish were put ashore the following day at Southampton for transport back to Lowestoft.

2. *Fish tracking*. Three spent adult female plaice (Fish 1 to 3) fitted with long-life acoustic tags were followed for periods of 121, 7.5 & 197.5 hours respectively. Fish 1 remained in mid-water almost continuously for the first 60 h of the track (Fig. 1), moving on both east-going and west-going tidal streams (Fig. 2). The fish subsequently went to the sea-bed, having travelled a net distance of 29.4 km. The fish remained on the sea-bed for a further 49 h without making any further substantial movements, either into mid-water or across the sea bed, and was finally abandoned due to lack of movement.

   Fish 2 was tracked for only a short period and was lost whilst moving north-east over the sea bed.

   Fish 3 adopted a very distinct pattern of vertical movement soon after release, coming into mid-water on each night-time, east-going tide (Fig. 3). The fish was tracked over a distance of 90.7 km as she migrated east-north-east towards the Dover Strait (Fig. 4) by selective tidal stream transport on 8 consecutive night-time tides The fish was finally abandoned in order to return to Lowestoft.

   Measurements of the speed and direction of the tidal streams were made with the ADCP continuously during the tracks of the fish and valuable data for calculating swimming speed and orientation of the fish were gathered during mid-water excursions. Generally, the long-life tags worked extremely well giving clear signals out to over 350 m. However, one of the tags (fish 3) went through a unusual phase during the first three days of the track. Although initially strong, the signal became progressively faint to a point where, on the second day, it was extremely difficult to follow. Subsequently, the signal strength gradually increased to a normal level and then remained good for the rest of the track. From the way the tag signal deteriorated and then improved, it is unlikely that the problem was due to an

electronic or technical fault. It is more likely that the signal was affected by weed or some other foreign material that became caught around the tag.

Throughout tracking, the sector scanner functioned faultlessly, and the "Sextant" survey package was used continuously to aid tracking by displaying the position of the fish relative to the ship.

3. *Accuracy of estimates of geolocation*. Time did not permit this aim to be attempted.

JD Metcalfe
21 February 1998

SEEN IN DRAFT: B A Chapman, (Master)
M Reynolds, (Senior Fishing Mate)

INITIALLED:

DISTRIBUTION:

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JD Metcalfe
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FIGURE CAPTIONS:

Figure 1. The vertical track (7 point running mean with bottom contact preserved) of fish 1 (60 cm, Petersen tag no. E66 4828),(fish: —— ; sea bed: -----).

Figure 2. The ground track of fish 1: 1053 h, 4 February - 1200 h, 9 February.

Figure 3. The vertical track (7 point running mean with bottom contact preserved) of fish 3 (37 cm, Petersen tag no. E66 1975),(fish: —— ; sea bed: -----).

Figure 4. The ground track of fish 3: 0025 h, 12 February - 0600 h, 20 February.

Figure 1. Vertical movement of fish 1, 4-9/2/98

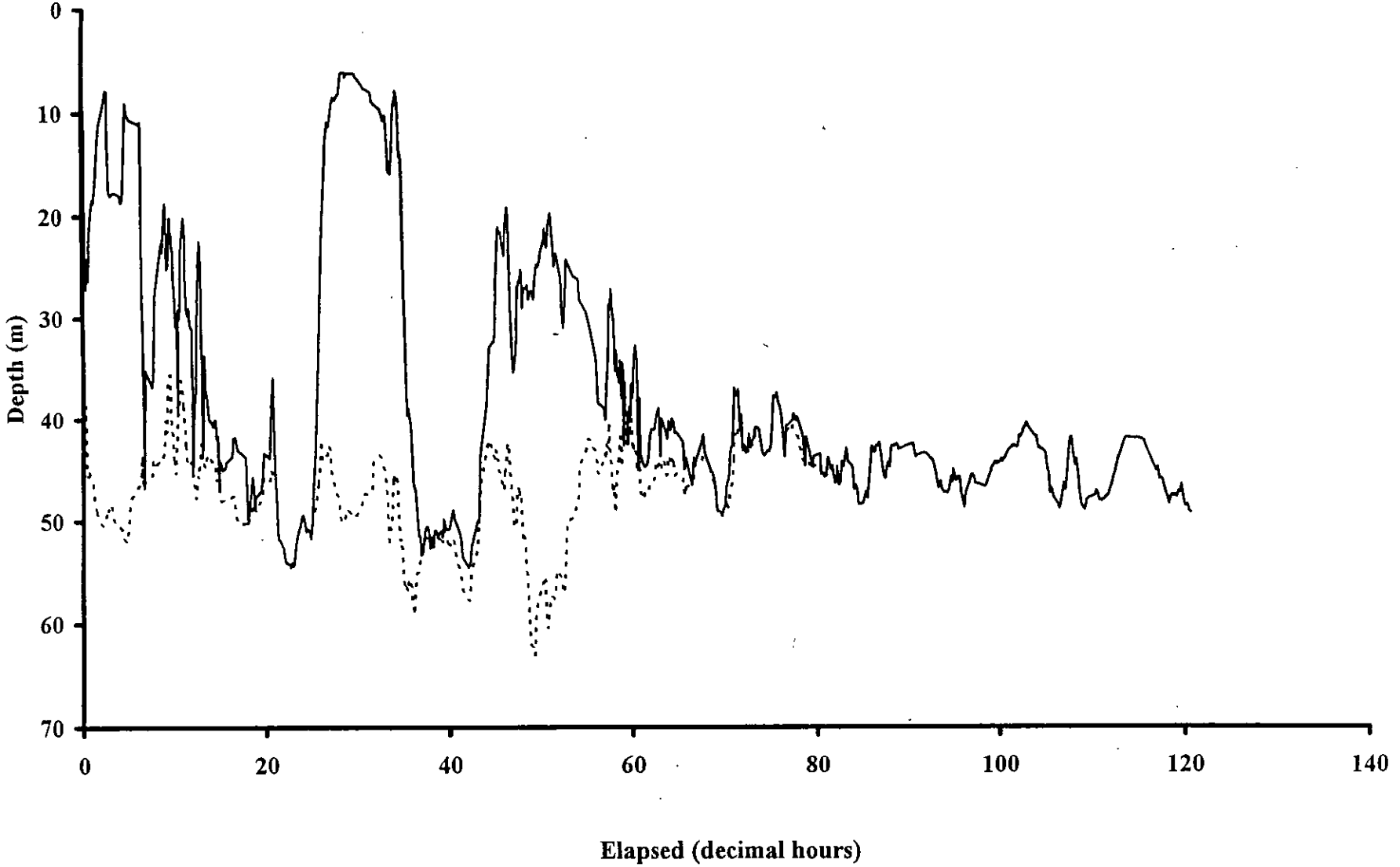

Figure 2. Ground track of fish 1.

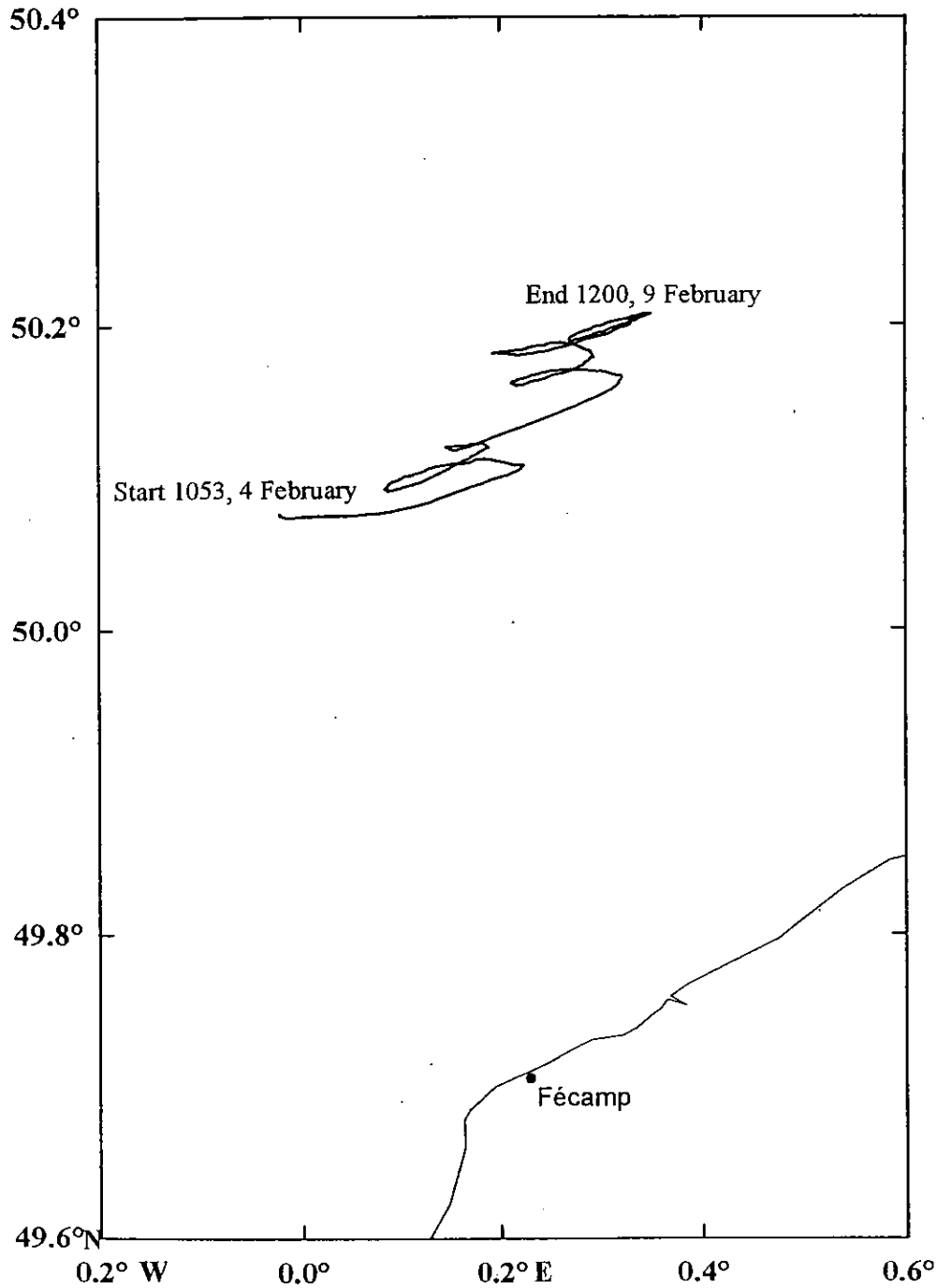

Figure 3. Vertical movement of fish 3, 12-20/2/98

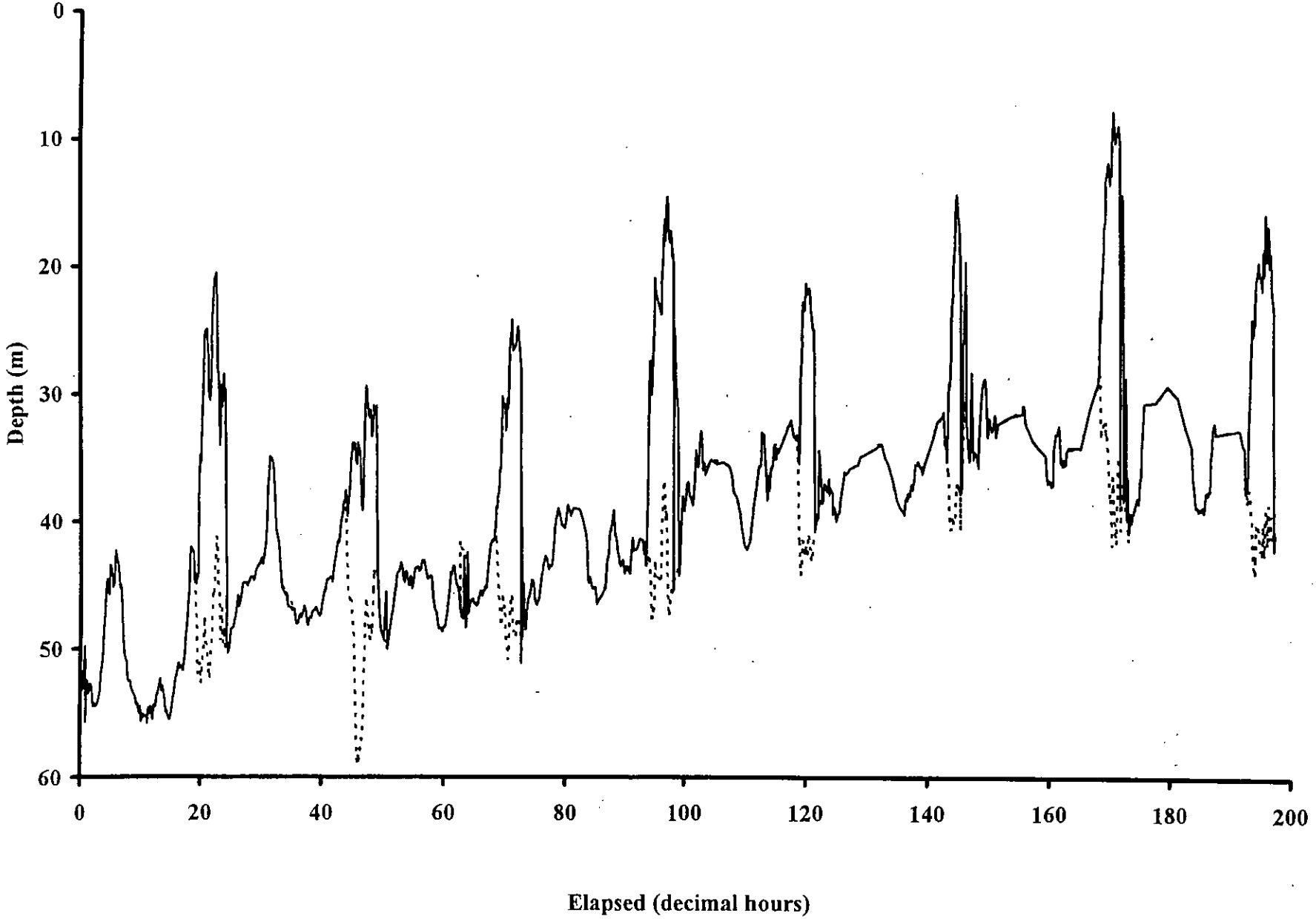

Figure 4. Ground track of fish 3.