



LOIS RACS(C) Core Programme
***Tamaris* Tweed 4**
Preliminary Cruise Report
7th -14th November 1996

Personnel:

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Tuesday 7th: The scientific and boat party traveled to Berwick from Plymouth, Southampton, Wallingford and Hull.

Friday 8th: High Water 1243. Low Water approx 0645.

The scientific party arrived on the vessel at 0845. The *Tamaris* was positioned against the wall, inside the Pilot Boat. While the *Tamaris* and the Pilot Boat were being repositioned the semi-rigid inflatable was launched from the slip between the two road bridges. After loading the equipment at the far side (northwest corner) of the dock (where the wall is lower thus allowing easier access) the *Tamaris* returned to its mooring along side the Pilot Boat.

At 1345 the semi-rigid left the harbour to deploy a rig upstream at station 20 (near Union Bridge). This deployment at the most up stream station was in conjunction with IH Wallingford.

Between 1545 and 1645 a second rig containing an EMP2000s was deployed from the shore at station 9. The later rig was deployed as late as practicable, while still in day light, to coincide as far as possible with low water.

Throughout the day laboratory equipment was set up, and calibrated, on the vessel for the following surveys. The party departed from the *Tamaris* at 1915.

Saturday 9th: High Water 1313. Low Water approx 0720.

Arrived at the boat at 0800. The quayside and the deck of the *Tamaris* were icy. Before the *Tamaris* left the dock, equipment from the U of Southampton was loaded, the semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. The vessels left the dock at 0940 and was on station just below the old road bridge (station 5) at 0955. Monitoring of the standard suite (salinity, temperature, turbidity, pH and dissolved oxygen) started at 1000.

The NERC aircraft carried out a number of runs over the estuary between 1030-1100 and 1300-1330. John Cook was in contact with the *Tamaris* and kept us informed of their progress throughout.

At approximately half tide *Tamaris* left the anchor station (at 1100) and went downstream to station 4 adjacent to the Lifeboat slipway. Due to inclement weather it was not possible to go further seaward. From 1112 to 1518 (the high water period) ten repetitive transects were carried out on *Tamaris* between station 4 and 8. The semi-rigid was used on a transect from station 3 to station 20 to collect samples for U of Southampton and IH Wallingford. The later transect took place between 1145 and 1512.

On completion of the transects the *Tamaris* returned to station 5 (1530) and continued monitoring until leaving at 1645 for the dock. The vessel was along side the Pilot Boat at 1700 and the party disembarked at 1800. The quayside and all vehicles were all beginning to be covered in ice.

Due to problems with the auto analyser: nutrient analysis was confined to ammonia analysis during the transect work over high water. In addition the U of Southampton took samples at all the stations (3-20) for later analysis of a suite of parameters including most nutrient species.

Sunday 10th: High Water 1354. Low Water approx 0800.

Arrived at the dock at 0530 to find the quay-side, access ladders, deck of *Tamaris* and the semi-rigid all covered in ice. The laboratory of the vessel was also freezing cold with ice on the windows, benches and other surfaces. The semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated.

At 0615 the *Tamaris* left the dock and arrived at station 5 at 0625. Standard suite monitoring started at 0630. At 0830 the ammonia analyser was on line followed at 0950 by the phosphate and nitrate channels of the nutrient analyser. Monitoring continued at station 5 throughout the low water period. At 1200 *Tamaris* left the anchor station and proceeded seaward for the start of the axial transect. The axial transect started at station 3 (1225) and continued on *Tamaris* to station 8 (1310). The semi-rigid was used to extend the survey from station 8 to station 20. During this part of the transect bulk discrete samples were collected in 10l pots for standard suite, nutrients, chlorophyll, gravimetrics, C/N and later determination of trace metals (and related parameters) in conjunction with the U of Plymouth. The semi-rigid returned at 1507.

The NERC aircraft carried out a number of runs over the estuary in the morning and afternoon flying over both *Tamaris* and the semi-rigid. John Cook was in contact and kept us informed of their progress throughout.

Between 1225 and 1532 (the high water period) eight repetitive transects were carried out on *Tamaris* between stations 4 and 8. Due to the weather it was not possible to go further seaward. On completion of the transects the vessel was at anchor at station 5 monitoring until 1745. The *Tamaris* docked at 1800 and the party disembarked at 1900. The quayside, access ladders and all vehicles were all covered in ice.

Monday 11th: High Water 1427. Low Water 0830.

Arrived on the *Tamaris* at 0600. The equipment from the U of Southampton was loaded, the semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. The vessel left the dock at 0645 and was at station 5 at 0700. Standard suite monitoring started at 0711.

Due to 8/8 cloud cover the flights of the NERC aircraft were canceled. Monitoring continued at station 5 throughout the low water period (0715-1215). During this time (0900-0925) the semi-rigid was used to collect a mud sample for the U of Plymouth.

At approximately half tide *Tamaris* left the anchor station (at 1215). Due to inclement weather it was not possible to go further seaward than station 5. From 1223 to 1518 (the high water period) ten repetitive transects were carried out between station 4 and 8. The semi-rigid was used on a transect from station 3 to station 20 to collect samples for U of Southampton and IH Wallingford. The later transect took place between 1200 and 1520.

On completion of the transects the *Tamaris* returned to station 5 (1544) and continued monitoring until leaving at 1745 for the dock. The vessel was along side the Pilot Boat at 1800 and the party disembarked at 1900.

Due to problems with the auto analysers nutrient analysis was patchy throughout the day. However the U of Southampton took samples at all the stations (3-20) for later analysis of a suite of parameters including most nutrient species.

Tuesday 12th: High Water 1503. Low Water approx 0900.

Arrived onboard the *Tamaris* at 0430. Before departure at 0520 the semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. The vessel arrived at the anchor station (station 5) at 0540. Station 5 was chosen for the tidal cycle station as, due to the weather, it was the most seaward position that could be used. During the repetitive profiling on Monday salinities of fresh water to almost 30 psu had been found. In addition tidal cycle observations had been recorded at this station during previous LOIS work on the Tweed.

The standard suite was on line at 0545. At 0810 the ammonia analyser was on line followed at **** by the phosphate and nitrate channels of the nutrient analyser. During the tidal cycle bulk discrete samples were collected in 10l pots for standard suite, nutrients, chlorophyll, gravimetrics, C/N and later determination of trace metals (and related parameters) in conjunction with the U of Plymouth. The first sample was collected at 0600. A further seven samples were collected throughout the day until 1718. After initially being at 6 psu the salinity fell to fresh water at 0645 where it remained. The constancy in salinity is reflected in the small number of samples collected. We were always waiting for the salinity to increase before taking the next sample. When this did not occur samples were collected at approximately hourly intervals after around 1500 (samples collected at 0600, 0634, 0756, 1454, 1542, 1637 & 1718). The anchor station was completed at 1745.

The NERC aircraft carried out a number of runs over the estuary in the morning and afternoon. Cloudy weather is not ideal for this work so coverage was patchy. John Cook kept us informed of their progress.

Between 0900 and 1000 the rig at station 9 was recovered and between 1230 and 1400 the rig at station 20 recovered (times for when personnel were away from the *Tamaris*). The semi-rigid was recovered, with some difficulty, between 1515 and 1600 at the slip between the road bridges. A sample of seawater was collected at Spittal for the U of Plymouth.

At 1800 the *Tamaris* had returned to the dock and proceeded to the northwest corner for unloading. After unloading the scientific equipment the *Tamaris* returned across the dock to her berth inside of the Pilot Boat. After loading equipment into the van and sorting out the trailer for the semi-rigid, work was completed at 2030.

Wednesday 13th: Travelled from Berwick to home bases.

Results:

Notes:

This was the third of the LOIS RACS(C) Core Programme surveys of the Tweed to be carried out using the *Tamaris* and the semi-rigid inflatable. It was the first to have a significant Special Topics involvement. All the other (*Tamaris*) surveys have had Special Topics involvement but to a lesser extent. Although affected by the weather the work went well and most of the objectives were met.

For part of the work a land based laboratory was employed by the teams from the U of Southampton and IH Wallingford. Samples were transferred from the vessels to the laboratory for preliminary treatment and analysis. This part of the programme worked well. The facilities were adequate and warm.

The NERC aircraft flew twice a day throughout most of the survey. The conditions were ideal on the Saturday and Sunday. John Cook kept us informed throughout.

A major problem was the weather which effected the programme in three ways:

a: the NERC aircraft did not fly on Monday due to the cloudy conditions. The coverage on Tuesday was patchy for the same reason.

b: the windy conditions were such that the transect from *Tamaris* could not go further seawards than station 4 or 5. (One evening a window in the Hotel was blown in).

c: the main problem was the cold weather. This could have caused more problems than it did. For example if we had had the conditions found on Sunday evening on the Tuesday it is unlikely that we could have unloaded the *Tamaris* until the following day. The slope of the quay in the northwest corner would have compounded the problems that the ice would have caused. Embarkation and disembarkation of the *Tamaris* was extremely hazardous on Saturday and Sunday.

d: it was extremely cold on board *Tamaris* particularly early in the morning.

During the week it was not possible to service the EMP2000s attached the to slip at the Lifeboat Jetty. On a small number of occasions instruments have been left out for up to two months in the Humber with out any problems. However the Humber is not as cold as the Tweed. This is now a priority for the week in December. A communication problem with the EMP2000s led to it not being deployed at station 20.

The help and advice from Ron Easton and Tony Rumsby was greatly appreciated by all working on board the *Tamaris*.

LOIS-RACS(C) Core Programme TWEED Station Grid

Station No	Position*	Station Description	Station Name
1		Offshore	
2		Offshore	
3	009 524	Lighthouse	Lighthouse
4	002 520	Lifeboat Station	Lifeboat Station
5	997 527	Chandlery	Chandlery
6	993 532	Just before Rail Bridge	Royal Border Bridge
7	984 532	White House on RHS	High Pool
8	981 530	Derlict Building/Telegraph Poles on LHS	Lower Yarrow Shiel
9	979 523	Building Past Outfall on LHS	Toddles Shiel
10	978 521	Prominent tree on either side of River	English New Water Shiel
11	974 517	Just before A1 Road Bridge	A1 Road Bridge
12	968 516	2nd set of Pylons/cables	North Middle Ord
13	964 517	Disused Fishery on LHS & RHS	Heugh Shiel
14	958 518	Disused Fishery on LHS (blue door)	West Ord
15	951 519	Next Fishery/Power Cables	Coroners Meadow
16	946 521	Next Fishery on RHS (red roof)	Low House
17	930 522	Green/Blue hut/shed on RHS	Yardford Shiel
18	935 520	Boat House on RHS	Paxton
19	932 516	End of Trees before Big House on Quarry RHS	
20	934 510	Chain Bridge	Union Bridge

* Ordnance Survey
Pathfinder 438

