



LOIS RACS(C) Core Programme
***Tamaris* Tweed 9**
Preliminary Fieldwork Report
4th -10th April 1997

Personnel:

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Friday 4th: The scientific and boat party traveled to Berwick from Plymouth and Hull.

Saturday 5th: High Water 1346. Low Water approx 0745.

The scientific party arrived at Berwick Docks in time to sort out the equipment in preparation for loading the *Tamaris*. The vessel was positioned against the harbour wall, inside the Pilot Boat. Between 0900 and 0930 the equipment was loaded on board the *Tamaris* and the semi-rigid inflatable was launched using the hired crane.

At 1000 the party left Berwick docks to deploy the EMP2000 at station 9 (1030) and the EMP2000 and NAS-2 at station 16 (1100). A YSI6000s was deployed on the bed at station 20 (1130) to record tide height.

Throughout the day laboratory equipment was set up and calibrated for the following surveys. This included the nutrient analysers (nitrate, nitrite, phosphate, silicate and ammonia) and the YSI6000 'standard suite' (salinity, temperature, turbidity, pH and DO).

The semi-rigid was used on a transect from station 20 to station 3 (PML/U of Plymouth). This transect which took place between 1345 and 1650 involved depth profiling using the YSI for standard parameters (salinity, temperature, turbidity, pH and dissolved oxygen). In the upper estuary (stations 20-13) which was found to be homogeneous with depth measurements were made at the surface only. Downstream of this information was recorded at the surface, middle and bottom of the water column. Surface samples were analysed, in addition to standard suite for nutrients, gravimetry, chlorophyll and C/N. Bathymetric surveys across the width of the river were undertaken at stations 19, 17, 15, 13, 11, 9, 7, and 5. In addition samples were collected for incubation experiment at stations 20 and 3.

On returning to the *Tamaris* work continued in setting up the equipment. Work was completed at 1830.

Sunday 6th: High Water 1425 Low Water approx 0830.

Arrived at the boat at 0545. The semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. The vessels left the dock at 0615 and was on station just below the old road bridge (station 5) at 0630. Monitoring of the standard suite

(salinity, temperature, turbidity, pH and dissolved oxygen) started at 0639 and samples for the nutrient analyser (nitrate, nitrite, silicate and phosphate) were collected from 0645.

At low water (0750-0840) the EMP2000 from the Lifeboat Slipway (station 4) was recovered and replaced by a second instrument.

At approximately half tide *Tamaris* left the anchor station (at 1215) and went downstream to station 3 at the breakwater. From 1241 to 1650 (the high water period) eight repetitive transects were carried out on *Tamaris* between station 3 and 8. The semi-rigid was used on a transect from station 20 to station 3 to collect samples for U of Southampton and IH Wallingford. The later transect took place between 1335 and 1650. Surface samples were collected. The water was monitored using the YSI6000 for salinity, temperature, turbidity, pH and dissolved oxygen values.

On completion of the transects the *Tamaris* returned to station 5 (1650) and continued monitoring until leaving at 1655 for the dock. The vessel was alongside, inside the Pilot Boat, at 1715 and analysis continued until the party disembarked at 1830.

Monday 7th: High Water 1510. Low Water approx 0915.

The scientific party arrived at the boat at 0630. Before the *Tamaris* left the dock the semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. The vessels left the dock at 0650 and was on station just below the old road bridge (station 5) at 0705. Monitoring of the standard suite (salinity, temperature, turbidity, pH and dissolved oxygen) started at 0712. The nutrient analysers (nitrate, nitrite, phosphate, silicate and ammonia) measured samples at 15 minute intervals, from 0715, when 'anchored' at station 5. During the axial profiles samples were collected for nutrient analysis at each passage through the stations.

At approximately half tide *Tamaris* left the anchor station (at 1317) and went downstream to station 3. From 1322 (station 3) to 1636 (the high water period) seven repetitive transects were carried out on *Tamaris* between station 3 and 8.

The semi-rigid was used on a transect from station 20 to station 3 (PML/U of Plymouth). This transect which took place between 1453 and 1636 involved depth profiling using the YSI for standard parameters (salinity, temperature, turbidity, pH and dissolved oxygen). In the upper estuary (stations 20-13) which was found to be homogeneous with depth measurements were made at the surface only. Downstream of this information was recorded at the surface, middle and bottom of the water column. Samples were analysed, in addition to standard suite (all stations) for nutrients, and for later determination of gravimetry, chlorophyll, C/N and trace metals at stations 20, 18, 16, 14, 12, 10, 8, 6, and 4.

On completion of the transects the *Tamaris* returned to the dock (1700). The vessel was alongside the Pilot Boat and the party disembarked after completion of analysis of samples and standards at 1830.

Tuesday 8th: High Water 1600. Low Water 1000.

Arrived onboard the *Tamaris* at 0445. Before departure at 0515 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 0530. Tidal cycle observations have been recorded at this station during previous LOIS work on the Tweed. Monitoring of the standard suite (salinity, temperature, turbidity, pH and dissolved oxygen) started at 0535. The first of the planned samples for nutrient analysers (nitrate, nitrite, phosphate, silicate and ammonia) was collected at 0545.

Surface samples were collected for nutrient analysis at 15 minute intervals throughout the day. Hourly samples were analysed, in addition to standard suite for nutrients, gravimetry, chlorophyll and C/N.

Time (salinity): 0615 (15.01), 0715 (12.78), 0815 (2.53), 0915 (0.94), 1015 (0.70), 1115 (0.57), 1215 (0.73), 1315 (5.29), 1415 (22.52), 1515 (32.93), 1615 (32.01), 1715 (31.61), 1815 (21.59) and 1845 (16.02).

Depth profiles of standard parameters were conducted half hourly from 0600 to 1830 (26 profiles). Recordings were made at the surface and at one metre intervals throughout the water column.

The semi-rigid was used on a transect from station 20 to station 3 to collect samples for U of Southampton and IH Wallingford. The later transect took place between 1531 and 1800. Surface samples were collected. The water was monitored using the YSI6000 for salinity, temperature, turbidity, pH and dissolved oxygen values.

The YSI6000s was down between 1642 and 1712 due to an electrical problem. The final measurements were made at 1845 and the *Tamaris* returned to the dock (1900)

The party disembarked the vessel after completion of analysis of samples and standards at 2030.

Wednesday 9th: High Water. Low Water approx

The party arrived onboard the *Tamaris* at 0745. Before departure at 0830 the semi-rigid was prepared and the on-board monitoring equipment was set up and calibrated. In addition the van was unloaded to make space for rig that were to be collected later in the day. The vessel arrived at the anchor station (station 5) at 0850. Monitoring of the standard suite (salinity, temperature, turbidity, pH and dissolved oxygen) started at 0853. The nutrient analysers (nitrate, nitrite, silicate and phosphate) measured samples at 15 minute intervals from 0900. Monitoring was over the low tide period from 0900 to 1500.

Between 0940 and 1200 the rigs at station 20 (1010-1030) and 16 (1040-1100) and station 9 (1120-1135) were recovered. The instruments were packed away but the data was not downloaded.

The *Tamaris* departed from the station at 1500 and was fast inside the Pilot Boat at 1530. The hired Crane was unavailable to unload the equipment and recover the semi-rigid. The equipment unloaded and packed into the van between 1600-1630 and the semi-rigid recovered and put on its trailer at the slip between the bridges (1630-1715). Work was completed at 1830.

Thursday 10th: Traveled from Berwick to home bases.

Acknowledgment:

The help and advice from Mike Williams and Matt Revill was greatly appreciated by all working on board *Tamaris*.

Results:

Summery:

This was the ninth of the LOIS RACS(C) Core Programme surveys of the Tweed. The work went well and the objectives were met. In brief.

a) Axial transects from station 3 to 20

Saturday: standard suite (depth profiles), nutrients, gravimetry, chlorophyll and C/N

Sunday: standard suite (surface samples)

Monday: standard suite (depth profiles), nutrients, gravimetry, chlorophyll, C/N and trace metals.

Tuesday: standard suite (surface samples).

b) Tidal Cycle at station 5

Tuesday: 1; surface monitoring for standard suite (12 sec) and nutrients (15 min),

2; hourly surface sampling for gravimetry, chlorophyll, C/N

3; half hourly depth profiles for standard suite (26 profiles)

c) Profiling over lower estuary, stations 3 to 8 (high tide period)

Sunday: eight transects, standard suite and nutrients

Monday: seven transects, standard suite and nutrients

d) Sampling over the low tide period at station 5

Sunday: standard suite and nutrients

Monday: standard suite and nutrients

Tuesday: standard suite, nutrients and hourly sampling for gravimetry, chlorophyll, C/N

Wednesday: standard suite, nutrients and hourly sampling for gravimetry, chlorophyll, C/N

e) Rig deployments Saturday 5th-Wednesday 9th

station 9: EMP2000

station 15: EMP2000 and NAS-2

station 20: YSI6000

Notes:

The data collected in the main log books should be transcribed after each survey (or the book photocopied). If this does not occur it could be a disaster waiting to happen.

The dates for the week in August, Tweed 13, were decided as follows: travel to Berwick on the 31st July, 1st-5th August surveys and return to home bases on the 6th August. The hotels in Berwick have been informed that we may be seeking accommodation at this time. Given that this is the height of the holiday season a more definite booking should be made as soon as possible.

In addition to the reports sent to Roger Swinfen copies should be sent to the *Tamaris* crew as they are interested in the work undertaken. The later could be in the first instant be copies of the preliminary report.

Throughout the week we were in contact with John Cook (NERC aircraft) about possible overflights in support of the remote sensing project. There were no overflights on Saturday, Sunday and Monday due to 8/8 cloud cover. The weather was little better on Tuesday and a flight may have occurred.

On arrival on the *Tamaris* on Monday morning it was apparent that the vessel had been visited by vandals during the night. The cover was off the generator and the clips had been opened (confused for a locker?) it however had not been damaged. One of the ropes securing the semi-rigid to the *Tamaris* had been ripped off and the port quarter handle had been broken.

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

