CENTRE FOR ENVIRONMENT, FISHERIES & AQUACULTURE SCIENCE LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND 2015 RESEARCH VESSEL PROGRAMME

PROGRAMME: RV CEFAS ENDEAVOUR: CRUISE 12/15

PROJECT: MB003N

STAFF:ANA M. LEOCADIO (SIC)ROB MASEFIELD (2SIC/CRP)JON ELSONKAREN VANSTAENROSSLYN MCINTYRESHAUN DORANNATHAN EDMONDSMARC WHYBROW (MIST)

DURATION:04 – 11 June 2015LOCATION:North Sea (English NE)

AIMS:

- 1. To conduct a standard underwater TV survey of *Nephrops* burrow densities on the Farn Deeps grounds, 55° 35' 54° 45' N and 1° 30' 0° 40' W, and to evaluate *Nephrops* abundance (110 stations).
- 2. To conduct seabed multibeam survey (at each TV survey station).
- To collect surface water samples. This data will be used for the Shelf Sea Biogeochemistry Research Programme, WP1 Candyfloss (NERC/Defra funded)¹ and will contribute to estimating the size of the shelf carbon pump over the whole NW European shelf, and its relationship to the global carbon cycle.

Point of contact: Naomi Greenwood (naomi.greenwood@cefas.co.uk)

¹ Shelf Sea Biogeochemistry Research Programme – The goals of this project are (1) to quantify the role of the NW European shelf seas in the global nutrient and carbon cycles, and (2) to understand the critical processes by which this role is sustained. The project will rely on a year-long whole NW European shelf sampling programme using vessels of opportunity (Objective 1) along with process studies on 4 cruises in the Celtic Sea (Objective 2) The whole shelf sampling programme will allow a synoptic assessment of the distribution and cycling of inorganic and organic carbon and nutrients, CO2 and N2O. Daily sampling from Endeavour is part of Objective (1) and will contribute to estimating the size of the shelf carbon pump over the whole NW European shelf, and its relationship to the global carbon cycle.

4. To collect and filter on board water samples for determination of chlorophyll (phytoplankton pigments) concentration and to collect samples for SPM analysis, that will be used for calibrating ocean colour space-borne data under the EU FP7 project HIGHROC².

PLAN:

CEFAS ENDEAVOUR will sail on 4th June from Lowestoft and will return to the same port on 11th June, 2015. This survey involves 24 hour procedures and the scientific staff will be working 4/8 hours shifts (2 people per shift).

Under objective 1&2:

Video data will be collected from cameras mounted on a towed sledge. On the Farn Deeps grounds, 110 stations will be visited with the aim of recording a clear 10 minute continuous video transect of the sea bed at each station (Figure 2, Table 1).

A multibeam run will be conducted at each TV survey station.

All video will be analysed and the counts confirmed at sea. Data will be entered and QC onboard.

Under objective 3:

Water samples will be collected daily (3 samples per day) form the surface underway supply whenever it fits in with the work (this will approximately take about 40 minutes). The samples can be taking whilst steaming or whilst on station from the underway surface supply. The Ferrybox pump will need to be running (P&O engineers should switch this on routinely when the boat is underway out of port) as samples will be collected from the Ferrybox sample outlet.

Samples after being collected will be preserved (using mercuric chloride) for analysis of total alkalinity/dissolved inorganic carbon, inorganic nutrients and dissolved organic matter.

Under objective 4:

Water samples will be collected within 500 m from Smartbuoy sites (Dowsing SmartBuoy: 53.53 N 1.06 E), from the surface underway supply. The samples can be taken whilst steaming. The Ferrybox pump will need to be running (P&O engineers should switch this on routinely when the boat is underway out of port) as samples will be collected from the continuous water supply in the garage (see relevant SOP).

Samples for SPM analysis, after being collected, will be stored in a fridge, while samples for chlorophyll analysis will be filtered and stored in the -80C freezer.

² The HIGHROC (HIGH spatial and temporal Resolution Ocean Colour) project will carry out the research and development necessary for the next generation coastal water products and services from ocean colour space-borne data by giving an order of magnitude improvement in both temporal and spatial resolution. These improvements will both open up new application areas for remote sensing, such as the assessment/monitoring of environmental impacts from dredging and offshore construction, and will strengthening existing applications, such as the assessment and monitoring of water quality in the context of the European Union Water Framework and Marine Strategy Framework Directives.

Point of contact: Veronique Creach (<u>veronique.creach@cefas.co.uk</u>) or Elisa Capuzzo (<u>elisa.capuzzo@cefas.co.uk</u>)

GEAR:

TV sledge: The sledge will be towed (0.7 Knot) against the tide and 10 minutes of good footage will be recorded. This corresponds to \sim 200m of track.

Multibeam: Change tower to side gantry. Multibeam has to cover the TV tracks and cross both sides of the ring. Multibeam needs to run slightly off set (~ 50m, speed 5 to 6 knots).

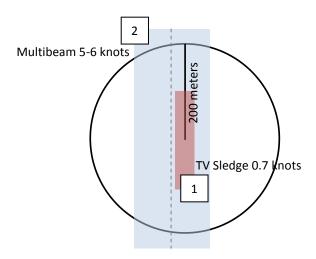


Figure 1. Representation of sledge tow (1) and multibeam tow (2) at station.

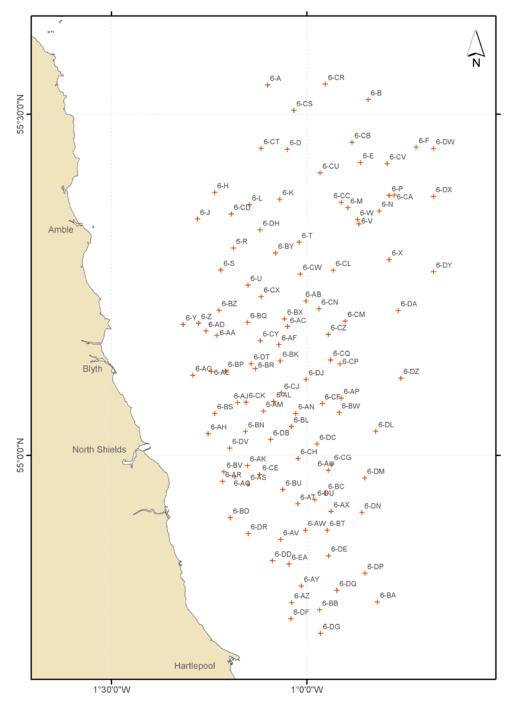


Figure 2. CEnd12/15 final stations for Farn Deeps area (FU6).

ANA LEOCADIO (Scientist-in-Charge) 05 May 2015

DISTRIBUTION: Cefas staff (Ewen Bell; Robin Masefield; Matthew Parker-Humphreys; Jon Elson; Marc Whybrow; Karen Vanstaen; Rosslyn McIntyre; Shaun Doran; Nathan Edmonds); MMO (North Shields); NE IFCA.
 Table 1. CEND12/15 station positions for the Farn Deeps area.

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| 6-Z5511.6655-116.593055.1944-1.27666-AA5510.5855-113.755555.1764-1.22936-AB5513.6265-10.093055.2271-1.00166-AC5511.3755-12.935055.1896-1.04896-AC5510.9925-115.468555.1832-1.25786-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL553.7155-11.681555.0619-1.02806-AM553.7155-11.681555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AQ5457.7100-112.906554.9118-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.7030-13.971054.8758-1.06226-AU5458.6765056.680054.9779-0.94476-AX5452.0255056.234554.9171-0.9372 <tr<< th=""><th></th><th></th><th></th><th></th><th></th><th>55.2874</th><th></th></tr<<> | | | | | | 55.2874 | |
| 6-AA5510.5855-113.755555.1764-1.22936-AB5513.6265-10.093055.2271-1.00166-AC5511.3755-12.935055.1896-1.04896-AD5510.9925-115.468555.1832-1.25786-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL553.9190-16.626055.0643-1.11046-AM553.7155-11.681555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AQ5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5455.7030-13.971054.8758-1.06226-AU5455.0255056.630054.9771-0.93726-AV5455.0255056.234554.9171-0.93726-AY5455.0255056.234554.9171-0.9372 | 6-Y | 55 | 11.5520 | -1 | 18.9570 | 55.1925 | -1.3160 |
| 6-AB5513.6265-10.093055.2271-1.00166-AC5511.3755-12.935055.1896-1.04896-AD5510.9925-115.468555.1832-1.25786-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL553.9190-16.626055.0633-1.10446-AM553.9190-16.626055.0653-1.1046-AN553.7155-11.681555.0619-1.02806-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7303-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5455.0255056.234554.9171-0.93726-AY5455.0255056.234554.9171-0.9372 <th< th=""><th>6-Z</th><th>55</th><th>11.6655</th><th>-1</th><th>16.5930</th><th>55.1944</th><th>-1.2766</th></th<> | 6-Z | 55 | 11.6655 | -1 | 16.5930 | 55.1944 | -1.2766 |
| 6-AC5511.3755-12.935055.1896-1.04896-AD5510.9925-115.468555.1832-1.25786-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AN553.7155-11.681555.0619-1.02806-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5455.7030-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5455.0255056.680054.9779-0.94476-AW5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.0133 <t< th=""><th>6-AA</th><th>55</th><th>10.5855</th><th>-1</th><th>13.7555</th><th>55.1764</th><th>-1.2293</th></t<> | 6-AA | 55 | 10.5855 | -1 | 13.7555 | 55.1764 | -1.2293 |
| 6-AD5510.9925-115.468555.1832-1.25786-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL553.9190-16.626055.0653-1.10446-AM553.7155-11.681555.0619-1.02806-AN553.7155-11.681555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5453.3690-10.185054.8955-1.03116-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5464.9490-12.280054.7825-1.0380 | 6-AB | 55 | 13.6265 | -1 | 0.0930 | 55.2271 | -1.0016 |
| 6-AE557.3930-114.626055.1232-1.24386-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.1046-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5446.9490-12.280054.7825-1.0380 | 6-AC | 55 | 11.3755 | -1 | 2.9350 | 55.1896 | -1.0489 |
| 6-AF559.7795-14.247055.1630-1.07086-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AM553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5455.7030-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5455.0255056.680054.9779-0.94476-AV5453.3690-13.971054.8758-1.06626-AW5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | 6-AD | 55 | 10.9925 | -1 | 15.4685 | 55.1832 | -1.2578 |
| 6-AG557.0760-117.472555.1179-1.29126-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AM553.7155-11.681555.0619-1.02806-AQ5458.1145-111.014554.9686-1.18366-AQ5457.7100-112.906554.9618-1.21516-AQ5457.730-11.351554.9284-1.02256-AU5455.7030-11.351554.9284-1.02256-AU5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8071-0.93726-AY5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | 6-AE | 55 | 7.3930 | -1 | 14.6260 | 55.1232 | -1.2438 |
| 6-AH551.9165-115.132055.0319-1.25226-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AM553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.9815-1.03116-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | 6-AF | | 9.7795 | -1 | 4.2470 | 55.1630 | -1.0708 |
| 6-AJ554.6500-110.570055.0775-1.17626-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5453.3690-10.185054.8855-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AK5459.1040-19.079054.9851-1.15136-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.7300-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5453.3690-10.185054.8958-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AL554.7580-15.048055.0793-1.08416-AM553.9190-16.626055.0653-1.11046-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8071-0.93726-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AM553.9190-16.626055.0653-1.11046-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AN553.7155-11.681555.0619-1.02806-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AP555.0640054.688555.0844-0.91156-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.9171-0.93726-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AQ5458.1145-111.014554.9686-1.18366-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AR5457.7100-112.906554.9618-1.21516-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AS5457.4505-19.001554.9575-1.15006-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AT5455.7030-11.351554.9284-1.02256-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AU5458.6765056.680054.9779-0.94476-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AV5452.5465-13.971054.8758-1.06626-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AW5453.3690-10.185054.8895-1.00316-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AX5455.0255056.234554.9171-0.93726-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| 6-AY5448.4275-10.800554.8071-1.01336-AZ5446.9490-12.280054.7825-1.0380 | | | | | | | |
| | 6-AY | | | | | | |
| 6-BA 54 46.9985 0 49.0960 54.7833 -0.8183 | 6-AZ | 54 | 46.9490 | -1 | 2.2800 | 54.7825 | -1.0380 |
| | 6-BA | 54 | 46.9985 | 0 | 49.0960 | 54.7833 | -0.8183 |

| 6-BB | 54 | 46.2940 | 0 | 57.9900 | 54.7716 | -0.9665 |
|------|----|---------|----|---------|---------|---------|
| 6-BC | 54 | 56.6560 | 0 | 57.0660 | 54.9443 | -0.9511 |
| 6-BD | 54 | 54.4800 | -1 | 11.7040 | 54.9080 | -1.1951 |
| 6-BK | 55 | 8.3505 | -1 | 4.0680 | 55.1392 | -1.0678 |
| 6-BL | 55 | 2.5395 | -1 | 2.3485 | 55.0423 | -1.0391 |
| 6-BN | 55 | 2.1020 | -1 | 9.3845 | 55.0350 | -1.1564 |
| 6-BP | 55 | 7.4605 | -1 | 12.4680 | 55.1243 | -1.2078 |
| 6-BQ | 55 | 11.7365 | -1 | 9.0545 | 55.1956 | -1.1509 |
| 6-BR | 55 | 7.6645 | -1 | 7.8575 | 55.1277 | -1.1310 |
| 6-BS | 55 | 3.7130 | -1 | 14.1035 | 55.0619 | -1.2351 |
| 6-BT | 54 | 53.3655 | 0 | 56.8425 | 54.8894 | -0.9474 |
| 6-BU | 54 | 56.9725 | -1 | 3.6540 | 54.9495 | -1.0609 |
| 6-BV | 54 | 58.5370 | -1 | 12.6950 | 54.9756 | -1.2116 |
| 6-BW | 55 | 3.7895 | 0 | 54.9875 | 55.0632 | -0.9165 |
| 6-BX | 55 | 12.0335 | -1 | 3.3930 | 55.2006 | -1.0565 |
| 6-BY | 55 | 17.8435 | -1 | 4.7670 | 55.2974 | -1.0794 |
| 6-BZ | 55 | 12.8030 | -1 | 13.4300 | 55.2134 | -1.2238 |
| 6-CA | 55 | 22.9280 | 0 | 46.5375 | 55.3821 | -0.7756 |
| 6-CB | 55 | 27.5395 | 0 | 53.0340 | 55.4590 | -0.8839 |
| 6-CC | 55 | 22.2735 | 0 | 54.6865 | 55.3712 | -0.9114 |
| 6-CD | 55 | 21.2535 | -1 | 11.5550 | 55.3542 | -1.1926 |
| 6-CE | 54 | 58.3090 | -1 | 7.2080 | 54.9718 | -1.1201 |
| 6-CF | 55 | 4.5760 | 0 | 57.5980 | 55.0763 | -0.9600 |
| 6-CG | 54 | 59.2270 | 0 | 56.1380 | 54.9871 | -0.9356 |
| 6-CH | 54 | 59.7265 | -1 | 1.3170 | 54.9954 | -1.0220 |
| 6-CJ | 55 | 5.5165 | -1 | 3.8465 | 55.0919 | -1.0641 |
| 6-CK | 55 | 4.7055 | -1 | 9.2940 | 55.0784 | -1.1549 |
| 6-CL | 55 | 16.3350 | 0 | 55.9150 | 55.2722 | -0.9319 |
| 6-CM | 55 | 11.8550 | 0 | 54.0750 | 55.1976 | -0.9013 |
| 6-CN | 55 | 12.9350 | 0 | 58.1000 | 55.2156 | -0.9683 |
| 6-CP | 55 | 8.0800 | 0 | 54.8800 | 55.1347 | -0.9147 |
| 6-CQ | 55 | 8.4150 | 0 | 56.3200 | 55.1402 | -0.9387 |
| 6-CR | 55 | 32.6215 | 0 | 57.1150 | 55.5437 | -0.9519 |
| 6-CS | 55 | 30.3300 | -1 | 1.9465 | 55.5055 | -1.0324 |
| 6-CT | 55 | 27.0125 | -1 | 6.9910 | 55.4502 | -1.1165 |
| 6-CU | 55 | 24.8635 | 0 | 57.9310 | 55.4144 | -0.9655 |
| 6-CV | 55 | 25.6790 | 0 | 47.6245 | 55.4280 | -0.7937 |
| 6-CW | 55 | 15.9795 | -1 | 0.9605 | 55.2663 | -1.0160 |
| 6-CX | 55 | 14.0000 | -1 | 6.9850 | 55.2333 | -1.1164 |
| 6-CY | 55 | 10.1215 | -1 | 7.1140 | 55.1687 | -1.1186 |
| 6-CZ | 55 | 10.6740 | 0 | 56.6820 | 55.1779 | -0.9447 |
| 6-DA | 55 | 12.7935 | 0 | 45.9230 | 55.2132 | -0.7654 |
| 6-DB | 55 | 1.4035 | -1 | 5.5210 | 55.0234 | -1.0920 |
| 6-DC | 55 | 0.9965 | 0 | 58.3980 | 55.0166 | -0.9733 |
| 6-DD | 54 | 50.6505 | -1 | 5.2015 | 54.8442 | -1.0867 |
| 6-DE | 54 | 51.1000 | 0 | 56.6280 | 54.8517 | -0.9438 |
| 6-DF | 54 | 45.5120 | -1 | 2.4110 | 54.7585 | -1.0402 |
| 6-DG | 54 | 44.2030 | 0 | 57.8560 | 54.7367 | -0.9643 |
| 6-DH | 55 | 19.8625 | -1 | 7.1260 | 55.3310 | -1.1188 |
| | | | | | | |

| 6-DJ | 55 | 6.7000 | -1 | 0.0835 | 55.1117 | -1.0014 |
|------|----|---------|----|---------|---------|-----------|
| 6-DL | 55 | 2.1165 | 0 | 49.3725 | 55.0353 | -0.8229 |
| 6-DM | 54 | 57.9890 | 0 | 51.0605 | 54.9665 | -0.8510 |
| 6-DN | 54 | 54.9440 | 0 | 51.4915 | 54.9157 | -0.8582 |
| 6-DP | 54 | 49.5390 | 0 | 51.0360 | 54.8257 | -0.8506 |
| 6-DQ | 54 | 48.0295 | 0 | 55.3390 | 54.8005 | -0.9223 |
| 6-DR | 54 | 53.0750 | -1 | 8.9700 | 54.8846 | -1.1495 |
| 6-DT | 55 | 8.1025 | -1 | 8.5145 | 55.1350 | -1.1419 |
| 6-DU | 54 | 56.0585 | 0 | 58.7305 | 54.9343 | -0.9788 |
| 6-DV | 55 | 0.6380 | -1 | 11.8270 | 55.0106 | -1.1971 |
| 6-DW | 55 | 27.0000 | 0 | 40.5000 | 55.4500 | -0.675 |
| 6-DX | 55 | 22.8000 | 0 | 40.5000 | 55.3800 | -0.675 |
| 6-DY | 55 | 16.2000 | 0 | 40.5000 | 55.2700 | -0.675 |
| 6-DZ | 55 | 6.8311 | 0 | 45.5009 | 55.1139 | -0.758348 |
| 6-EA | 54 | 50.3640 | -1 | 2.6958 | 54.8394 | -1.04493 |
| | | | | | | |

Dowsing SmartBuoy: 53.53 N 1.06 E