DEFRA

CEFAS LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND, UK.

2016 RESEARCH VESSEL PROGRAMME

RV *CEFAS ENDEAVOUR* : **CRUISE 08/16**

STAFF:

Name	Role	Cabin	Shift
Dave Pearce		C2	Not specified
Neil Needham		C3	
Tom Hull		C4	
Eric Fitton		C1	
		D3	
		C5	
Veronique Creach		C6	
		C8	
Elisa Capuzzo	SIC	B1	
Hayden Close		C7	
		C4	
		B2	

DURATION: 09 to 12 May 2016

MOBILISE: Lowestoft Cefas quay

DEMOBILISE: **LOWESTOFT CEFAS QUAY**

OPERATION AREAS: Southern North Sea

AIMS:

1. Service SmartBuoys at Dowsing, Warp and West Gabbard (SLA25G – 2 day)
2. Galloper move (C7080C – 0.5 day)

CRUISE REPORT - All times in GMT unless specified

The Cefas Endeavour sailed at 09:00 of the 9th May 2016 and proceeded to the Warp SmartBuoy. A brief stop was carried out along the route (at 11:01) to test the new CTD and Rosette (sensors and bottle firing mechanism). The test was satisfactory, showing the firing mechanism and sensors of the CTD/Rosette sampling were working well. A toolbox talk and muster were completed immediately after lunch (11:30). On arrival at the Warp SmartBuoy a CTD/Rosette cast was carried out (at 15:49), followed by the recovery of the SmartBuoy (deployment 122); recovery operations were completed by 16:40. The Warp SmartBuoy was then deployed (deployment 123) at location 51° 31.609N 001° 01.738E at 17:02, followed by a CTD/Rosette cast. All operations were finished by 17:20, when the Cefas Endeavour headed north to service the West Gabbard SmartBuoy.

Observations by remote sensing and in situ measurements (by Ferrybox and flow cytometer) indicated that a phytoplankton bloom was occurring off the Thames Estuary and into the North Sea. Measurements from the flow cytometer showed that the high chlorophyll concentration at the Warp SmartBuoy site, and in the surrounding area, was due to a bloom of *Phaeocystis* (colonies were visible without the need of microscope).

The good weather and sea conditions (sea height <0.5 m and slight swell), that characterised the operations at the Warp SmartBuoy, continued on the following day, 10th of May, when the SmartBuoy and Wavebuoy at West Gabbard were serviced. The operations started with a CTD/Rosette cast at 05:01 followed by the recovery of the Wavebuoy at 05:40. Immediately after the West Gabbard SmartBuoy (deployment 104) was recovered (at 06:18). By 06:30 all operations were completed and the Cefas Endeavour headed towards the new site (West Gabbard 2), off the Galloper wind farm. Operation started again after the *Galatea* completed the deployment of the two guardbuoys at West Gabbard 2. The Wavebuoy was deployed at 51° 57.207N 002° 06.603E at 8:43, while the West Gabbard SmartBuoy was deployed at 51° 57.292N 002° 06.604E at 09:00 (deployment 1). A CTD/Rosette cast was carried out at completion of the deployment operations (09:29).
The Cefas Endeavour remained stationary in the proximity of the West Gabbard SmartBuoy until 12:00 when a further CTD/Rosette cast was completed for collection of surface samples for validation of the SmartBuoy. To collect samples of the *Phaeocystis* bloom (to take back to Cefas Laboratory for culture), the Cefas Endeavour headed towards the Warp, and a CTD/Rosette cast was carried at 51° 46.910N 001° 34.076E at 14:35. While steaming north towards the Dowsing SmartBuoy, measurements were taken to study the effect of ship wakes on the Ferrybox oxygen sensors; this was achieved by crossing the wake of other vessels (Stena Hollandica Ferry at 17:00 and dredger Swalenge at 17:34) at different distances. Oxygen samples were collected from the Ferrybox while the Cefas Endeavour was steaming within the vessel wakes.

On the 11th May, upon arrival in proximity of the Dowsing site (06:59), a CTD/Rosette cast was carried out, followed by the recovery of deployment 43 of the Dowsing SmartBuoy (07:35); the SmartBuoy (deployment 44) was then deployed at 53° 31.808N 001° 03.389E at 08:01. A post deployment CTD/Rosette cast was completed (08:27) before leaving the area and head south towards Lowestoft. As during the previous days, sea and weather conditions were good with sea height of 0.5 m and slight swell. The route back was designated to target the coastal waters off north Norfolk down to Lowestoft, to investigate the potential presence of phytoplankton blooms (which cannot be detected by remote sensing due to proximity to land). In fact, another smaller bloom was picked up by the Ferrybox and flow cytometer approximately 2 miles off Winterton (52° 44.686N 001° 44.158E), down to Lowestoft. More samples for chlorophyll analysis were collected within this bloom.

Samples for analysis of inorganic nutrients, chlorophyll concentration, suspended particulate matter, and salinity were collected at the surface and above the bottom using the Rosette, before the recovery and after the deployment of each SmartBuoy. The samples will be analysed at the Cefas Laboratory in Lowestoft and used for validation of the sensors on the SmartBuoys and Ferrybox. Samples for analysis of dissolved oxygen concentration were processed on board using a microWinkler analyser.
Profiles of temperature, salinity, dissolved oxygen, fluorescence, backscatter and Photosynthetically Available Radiation (PAR) were also collected at the SmartBuoy sites using the CTD/Rosette.

During the survey, the different sensors of the CTD/Rosette were tested and a protocol for using the CTD/Rosette started to be developed. The flow cytometer was connected to the Ferrybox and was running online during the survey. This was done in preparation for a survey in June 2016, on board the Cefas Endeavour, when the Cefas flow cytometer will be working in parallel with another flow cytometer, run by Dutch colleagues as part of the Jerico-Next project.

The Cefas Endeavour docked in Lowestoft approximately at 23:48 on the 11th May.
Elisa Capuzzo 12/05/2016