CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE

LOWESTOFT LABORATORY, SUFFOLK, NR33 0HT

2014 RESEARCH VESSEL PROGRAMME

REPORT: Cefas Endeavour: Survey CEND1014.

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DURATION: 17th May-6th June 2014

LOCATION: Dogger Bank, North Sea

AIMS:

Priority 1: To gather data to support a paired 'Before, After, Control, Impact' (BACI) study to investigate changes in benthic communities inside and outside proposed fisheries management zones within the Dogger Bank SCI. This will focus on four proposed fisheries closure areas within the Dogger Bank SCI. Data will be collected from similarly sized areas both inside (impact/treatment) and outside (control) the proposed closure areas (addressing Type 3 monitoring).

Priority 2: To sample along a fishing pressure gradient (informed by a subsurface abrasion gridded data layer) to develop a greater understanding of how the infaunal biological communities, characteristic of the Dogger Bank, respond to changes in fishing pressure (addressing Type 2 monitoring).

Priority 3: To collect data using different grabs to facilitate a gear comparison study: Survey some stations using at least two methods (e.g. the 0.1 m^2 mini Hamon grab and the 0.2 m^2 Van Veen grab) to enable the comparison of infaunal data collected using different gear types, possibly revisiting the historical 'Wieking and Kröncke' sampling stations. Revisiting the 'historic' sampling stations will also act to inform on the Type 1 monitoring principles, namely to explore temporal patterns in benthic faunal communities at fixed stations within the SCI.

NARRATIVE:

In 2014, Cefas, in partnership with the JNCC, carried out a pilot monitoring survey at the Dogger Bank SCI to collect 'baseline' data to help inform on the effectiveness of several proposed fishery management areas (Figure 1). The survey is intended as a pilot survey to apply the principles of the 'MB Monitoring R&D Programme' at the Dogger Bank SCI. Three types of monitoring principles are considered, namely Type 1: to measure rate and direction of change in the long-term, Type 2: to correlate observed change with possible causes and Type 3: to establish the cause of observed changes.

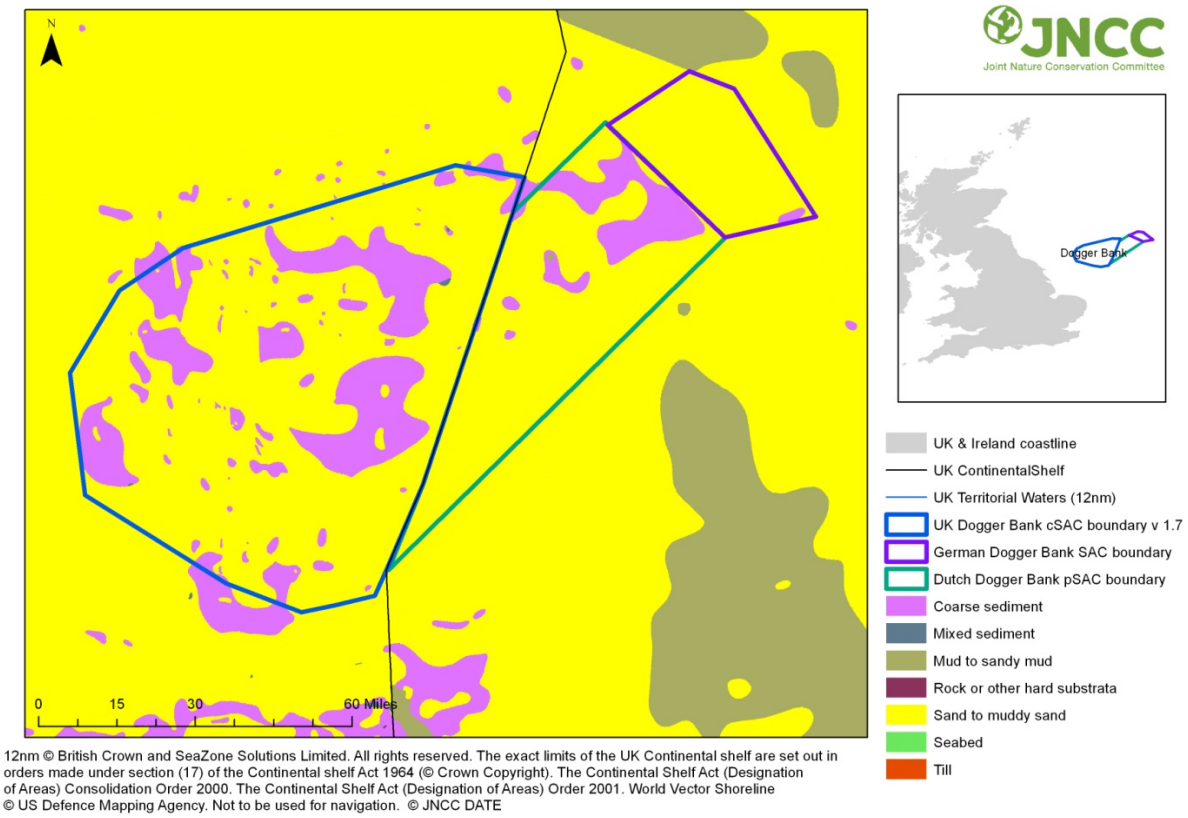

Figure 1. Location of the Dogger Bank SCI.

RV Cefas Endeavour departed Lowestoft at approximately 24:00 BST on 17th May 2014 and began the transit to the Dogger Bank SCI. The vessel arrived at the first BACI survey area, 'Block A' (proposed fishery management area 'UK 242'), at approximately 14:00 on 18th May at which time detailed guidance was provided regarding the safe deployment of the various sampling gears to be utilised during survey and the Standard Operating Procedures (SOPs) for subsequent sample processing. Final equipment checks and calibrations were carried out prior to survey commencing (15:30, 18th May 2014). Survey continued (combination of Hamon grabbing, seabed imagery and 2m 'scientific' beam trawling) at 'Block A' until 22:50, 20th May 2014 when all survey objectives at this area had been successfully completed.

The vessel transited to the second survey area, Block B. Objectives at Block B included sampling (as for Block A) to inform on a BACI experimental design for proposed fishery management area 'UK 1081' (see section 3.1.1) and also acquisition of samples to fulfil objectives of 'Type 2' monitoring as detailed in section 3.1.2. Survey within this block also incorporated a dedicated study designed to allow a comparison of samples acquired (e.g., PSA analyses and infaunal metrics) using different grab sampling devices (0.1 m^2 Hamon Grab and 0.2 m^2 Van Veen grab). A number of samples were also acquired at the historical 'time series' fixed stations (established by Wieking and Kröncke, 2003) using a 0.1 m^2 Hamon grab (and 0.2 m^2 Van Veen grab where possible). Following successful completion of all survey objectives at Block B (24:00, 26th May 2014), the vessel transited to Block C (BACI survey design for proposed fishery management area 'UK 375') where survey resumed at 02:20 on the 27th May 2014. Similarly, survey at this site employed a combination of seabed sediment grab sampling (0.1 m^2 Hamon grab), seabed imagery techniques (camera sledge) and utilisation of a 2 m scientific beam trawl to sample epibenthic fauna. At 07:45 on the 30th May 2014, all survey objectives at Block C had been completed and the vessel transited to the final survey area, Block D (BACI survey in proposed fishery management area 'UK/2260') where survey was resumed. All planned sampling (sediment sampling using a 0.1 m^2 Hamon grab, seabed

imagery and beam trawling) was successfully completed within this survey block by 02:30 on the 3rd June 2014. The completion of sampling at survey Block D also comprised the completion of all primary survey objectives. Therefore, a number of 'contingency' survey options were prioritised for the time remaining on survey. These consisted of 1) additional gear comparison survey (0.25 m^2 Hamon grab, 0.1 m^2 Day grab and Shipek grab) at the subset of stations in Block B previously sampled with the 0.2 m^2 Van Veen and 0.1 m^2 Hamon grabs and 2) additional BACI survey within the UK portion of the 'cross boundary' proposed fishery management area 'UK + NL/1275'.

The additional gear comparison survey work commenced in Block B at 04:00 on the 3rd June 2014 with all sampling successfully completed by 08:30 on the 4th June 2014. The vessel then transited to the final 'contingency' BACI survey within Block E (UK + NL 1275) where work commenced at 09:00 on the 4th June 2014. Due to the limited time remaining, only grab sampling (using the 0.1 m^2 Hamon grab) was conducted across this survey block with all sampling successfully completed by 22:45 on the 5th June 2014. The vessel then transited to the final historical time series station (WK01_33) after which the vessel travelled back to the home port of Lowestoft for demobilisation, arriving at 15:00 on the 5th June 2014.

RESULTS:

Type 1 Monitoring: 'Wieking Kröenke' Time Series Stations

The 'Wieking Kröenke' time series stations were all successfully sampled (using both the 0.1m2 Hamon grab and 0.2m2 Van Veen grab) during the 2014 survey (Figure 2).

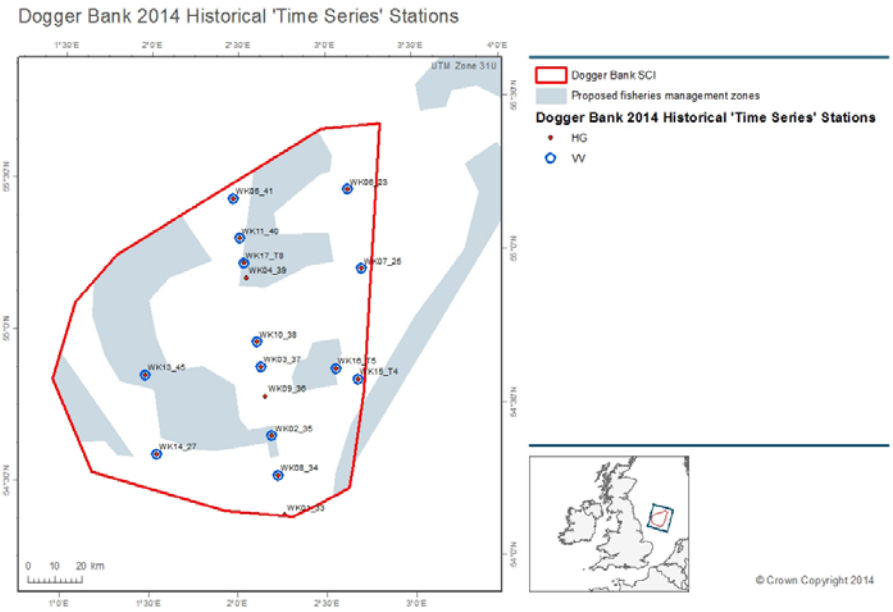

Figure 2. Groundtruth sample station positions planned using the newly acquired acoustic data.

Type 2 Monitoring: Benthic status across a pre-determined abrasion pressure gradient

All planned stations to help inform on the 'Type 2' abrasion pressure gradient study were successfully completed during the 2014 survey. A combination of sediment sampling for PSA and infaunal analysis (using 0.1m^2 Hamon grab) and seabed imagery and beam trawl sampling (to explore the epifaunal component of the seabed community) was employed for this purpose (Figure 3).

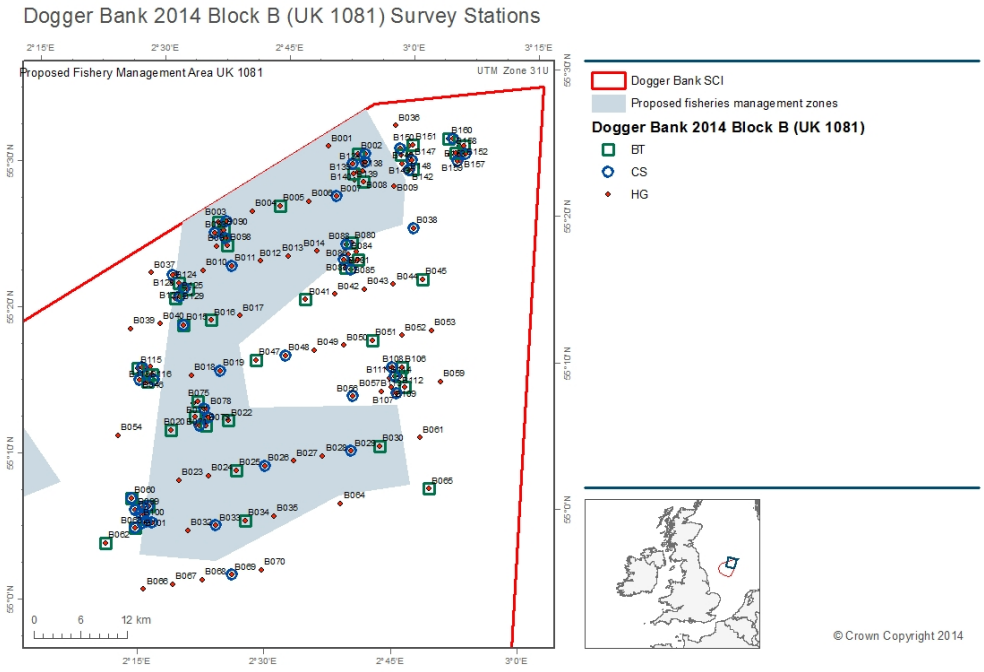

Figure 3. Location of stations successfully sampled during 2014 survey in support of 'Type 2' element of the survey.

Type 3 Monitoring: BACI surveys

BACI surveys, in support of the 'Type 3' monitoring objectives of the 2014 survey were successfully completed across all five planned survey blocks (Figure 4). A combination of sediment sampling for PSA and infaunal analysis (using 0.1m^2 Hamon grab) and seabed imagery and beam trawl sampling (to explore the epifaunal component of the seabed community) was employed for this purpose.

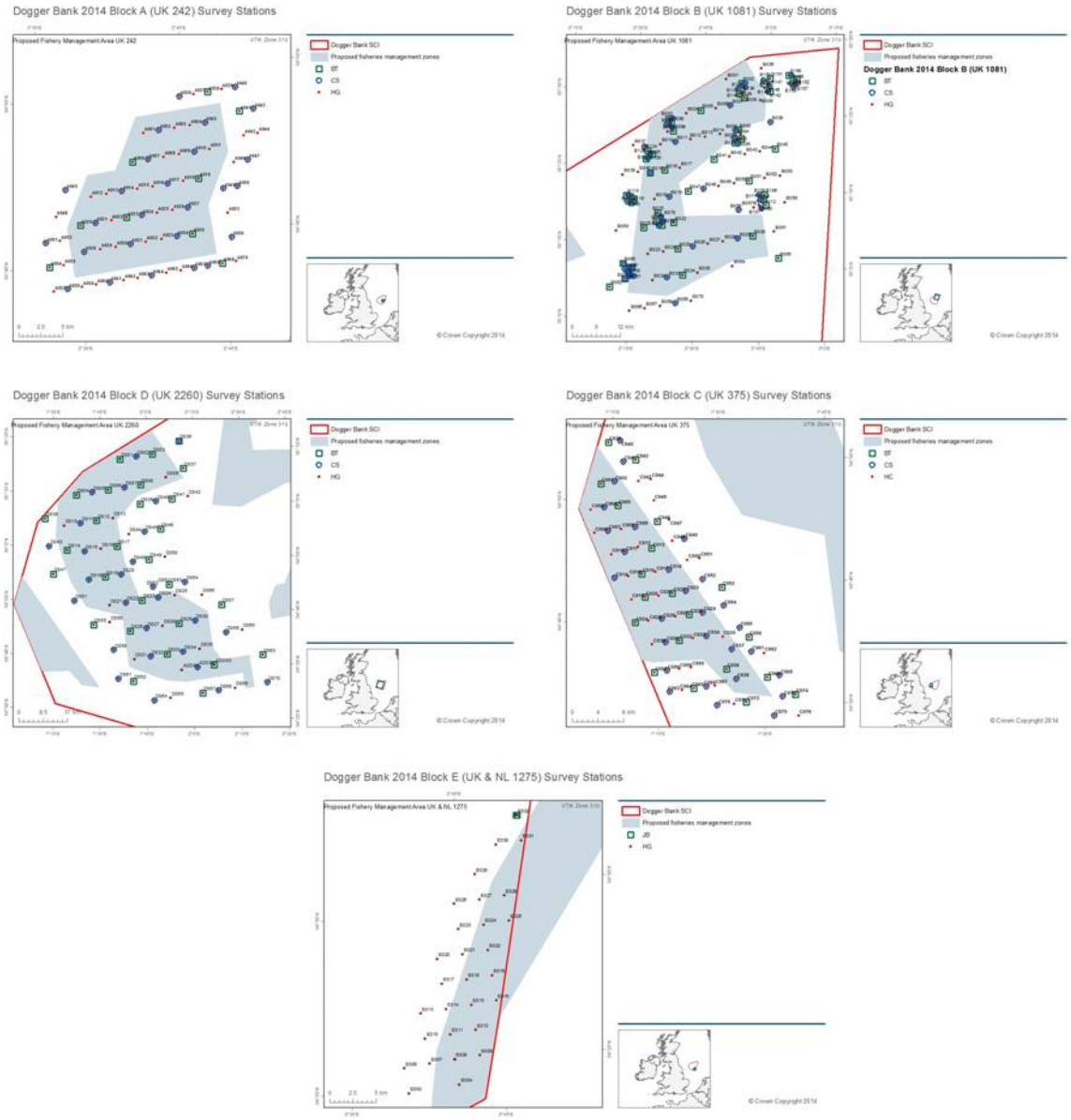

Figure 4. Location of stations successfully sampled at each of the Type 3 BACI survey areas.

Gear Comparison Study

Grab sampling employing a variety of seabed sediment sampling gears (0.1 m^2 Hamon grab, 0.2 m^2 Van Veen grab, 0.1 m^2 Day grab, 0.25 m^2 Hamon grab and the Shipek grab) was successfully completed across the 12 pre-planned stations (WK1, WK4, B31, B60, B63, B99, B100, B101, B102, B103, B104, B105) (Figure 5). Additional 'gear comparison' stations were also successfully sampled at the historical time series stations illustrated in Figure 2.

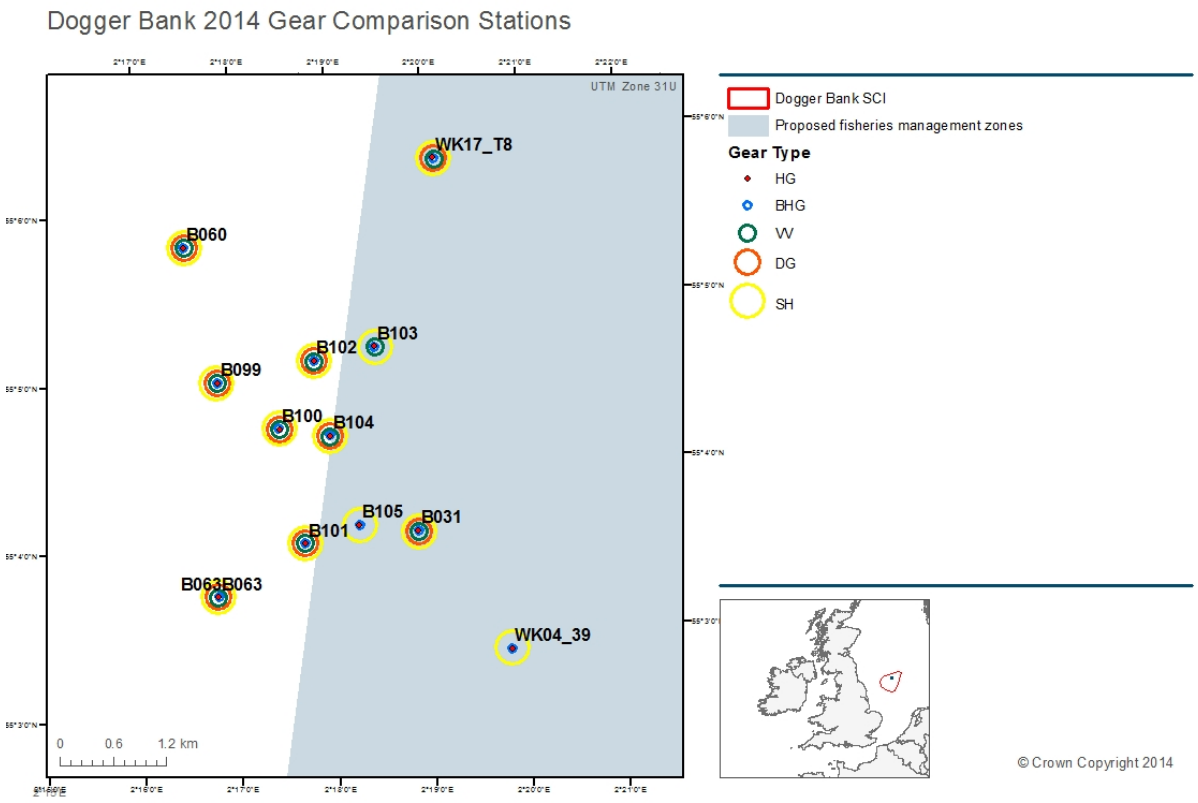

Figure 5. Location of 'gear comparison' stations successfully completed during the 2014 survey.

Sue Ware
Scientist In Charge
01/07/2014

SEEN IN DRAFT

Master: Terry Byrne
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INITIALLED:

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