

INSITE

Influence of
man-made
structures in
the ecosystem

The INSITE Programme
April 2015



INSITE	Influence of man-made Structures In The Ecosystem: <i>“To provide stakeholders with the independent scientific evidence-base needed to better understand the influence of man-made structures on the ecosystem of the North Sea”</i>
Funding	8 Sponsoring organisations, made up of oil and gas operators (open to new entrants)
Research Funds	Foundation Phase £2.4M (£1.8M net) over 3 years
Scientific Direction	Independent Scientific Advisory Board (ISAB)
Outcomes	Papers and articles published in the scientific media (requirement) Stakeholder workshops at end of years 1 and 2 of Programme
Timeline	INSITE Sponsor Contract: Foundation Phase: <ul style="list-style-type: none">- April 2014- Pre-proposals: August 2014- Full Proposals: December 2014- Funding Awards: March 2015

The overall aim of the INSITE Programme is:

- *To provide stakeholders with the independent scientific evidence-base needed to better understand the influence of man-made structures on the ecosystem of the North Sea*

The primary objectives of the study are to help establish:

- a) *the magnitude of the effects of man-made structures compared to the spatial and temporal variability of the North Sea ecosystem, considered on different time and space scales; and*
- b) *to what extent, if any, the man-made structures in the North Sea represent a large inter-connected hard substrate system.*

Programme Phases (Initial Concept)

JIP Phase	Foundation	Preparatory	Survey
Output	<p>An Ecosystem Approach?</p> <p>Develop an Ecosystem Framework</p> <p>Ecosystem Model research, observations and validation</p> <p>Propose scope for further work</p>	<p>Preparation for survey phase</p> <p><i>Scope subject to outcomes from Foundation Phase</i></p>	<p>Data collection and ecosystem model update</p>
Timeline (estimated)	2014-2016	2017-2018	2019-2020

(a) To help establish: *“the magnitude of the effects of man-made structures compared to the spatial and temporal variability of the North Sea ecosystem, considered on different time and space scales”*; INSITE is:

- (i) Evaluating the ecological relevance of man-made structures on trophic functioning (using, for example, biological trait analysis, effect size analysis, and mass balance models such as Ecopath with Ecosim)
- (ii) Developing a cost efficient method for the inventory of sessile communities using state-of-the-art DNA metabarcoding, and analysing the genetic population structures of mussels and other abundant invertebrates that have different dispersal strategies
- (iii) Developing an ecological model for the North Sea that uses a GIS interface to couple existing spatial data and modelled habitat to a food web model
- (iv) Measuring concentrations and fluxes of particles (organic matter, larvae) and solutes (nutrients, dissolved organic matter) around an offshore installation in shallow and deep settings to assess the impact on the surrounding benthic community through community parameters (biomass, respiration)

(b) To help establish: “*to what extent, if any, the man-made structures in the North Sea represent a large inter-connected hard substrate system*”; INSITE is:

- (i) Evaluating the potential connectivity of disconnected systems **of** man-made structures, analysed by species genetic population structure in combination with modelling approaches (larval-drift and individual-based-dispersal models), validated by species genetic population structure
- (ii) Performing network analysis of ecosystem connectivity and assessing the impacts of potential decommissioning strategies
- (iii) Re-analysing existing fish tagging data to assess the importance of man-made structures for fish distribution
- (iv) Facilitating access to oil and gas industry data collected at offshore installations (e.g. marine growth data)

Note: The INSITE Programme is grateful for significant in-kind support offered by oil and gas operators and scientific institutions in the form of vessel time and access to offshore facilities

- INSITE has established a model of collaboration between the European scientific community and industry to deliver independent, relevant science for the benefit of all stakeholders
- Outcomes from INSITE will directly inform the offshore decommissioning debate (decommissioning of 500 + oil and gas platforms in the next 50 years; estimated costs: 100-150 billion Euros) and any other discussion relating to man-made structures in the North Sea (e.g. O&G or wind-farm developments)
- The INSITE ISAB has identified an initial (fully-funded) programme of research with a value of £1.2M, starting in 2015 – INSITE Foundation Phase
- A further programme of research estimated at £600K is proposed by ISAB (also as part of Foundation Phase) – this has yet to confirm funding
- The INSITE Programme is actively seeking partners to develop a funding model beyond Foundation Phase

INSITE web-site is available for information and progress updates:

www.insitenorthsea.org

- Dr Graham Shimmield (Chair), *Bigelow Laboratory for Ocean Sciences, Maine*
 - Professor Jan de Leeuw, *Royal Netherlands Institute for Sea Research and University of Utrecht*
 - Professor Karen Wiltshire, *Alfred Wegener Institute and University of Bremen*
 - Professor Steve Thorpe, *School of Ocean Sciences, Bangor University*
 - Professor Torgeir Bakke, *Norwegian Institute for Water Research*
 - Professor Henk Brinkhuis, *Royal Netherlands Institute for Sea Research and University of Utrecht*
 - Professor John Shepherd, *National Oceanography Centre, University of Southampton*
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The INSITE ISAB has recommended a program of research for 2016 (subject to additional funding); the selected proposals will:

- (i) Use industry marine growth surveys and computer simulations of high-resolution ocean conditions and dynamics to estimate dispersal potential between 'donor' and potential 'recipient' platforms.
- (ii) Examine how the distributions of apex predators are influenced by proximity to man-made structures, while considering other temporal and spatial variation in their environment (e.g. habitat, depth, temperature)
- (iii) Use animal-borne device data to quantify the encounter rate with man-made structures and also the proportion of encounters that result in the use of structures for foraging
- (iv) Focus on trying to identify whether MMS have had an impact on the plankton community, using statistical methods to remove environmental signals from plankton time series, and compare this to areas where MMS are absent

Funding decisions due by end of October 2015

Objective Area	Key Definitions
Influence	Ecosystem approach Cumulative effects compared to other stressors Coupled ecosystem modeling is an important aspect
Man-made Structures	Anything which has an 'Environmental Impact ' Plus shipwrecks Marine litter is excluded
Ecosystem	Thematic areas Impact of fisheries will not be considered Influence of man-made structures on fisheries and fish stocks will be included
North Sea	May include east Irish Sea, but not West of Shetland UK, Norway, Netherlands and Denmark included

The RFP Process – Scientific Governance

