



# Underwater Cultural Heritage ('SeArch') - Technological Innovation, a Legal Framework and Public Access

## Introduction

Large parts of the Belgian continental shelf are affected by commercial activities such as aggregate extraction, wind farms, dredging, cable/pipeline projects, intensive fishing, infrastructural works for harbour extension, etc. All these activities constitute a serious threat for the underwater cultural heritage. The 'SeArch' project (2013-2016) wants to provide different solutions for this urgent problem.



Marine Spatial Planning in the Belgian part of the North Sea. (© Mieke Van De Velde, Marijn Rabaut, Charlotte Herman en Steven Vandenborre, Er beweegt wat op zee... Een marien ruimtelijk plan voor onze Noordzee, FOD Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, maart 2014)

## Technological Innovation

To develop a reliable survey methodology based on geophysical and remote sensing techniques that allows accurate and cost-effective evaluation of the archaeological potential of marine areas under development (offshore, nearshore, intertidal areas).

## Legal Framework

Work out comprehensive proposals for a transparent and sustainable management policy regarding the marine historic environment and for the further development and implementation of a legal framework based on the international commitments (UNESCO 2001 convention).

## Public Acces / Outreach / Communication

Offer guidance to stakeholders (marine industry, government agencies, fisheries, harbor authorities,...) on how to implement the new methodology and management approach and increase the general awareness with regards to underwater cultural heritage.

After thorough assessment of the present-day geophysical & remote sensing technology and the available archaeological & geological data of the Belgian part of the North Sea, different testsites (offshore, nearshore + intertidal) were selected to be surveyed.

### Oostende valley survey

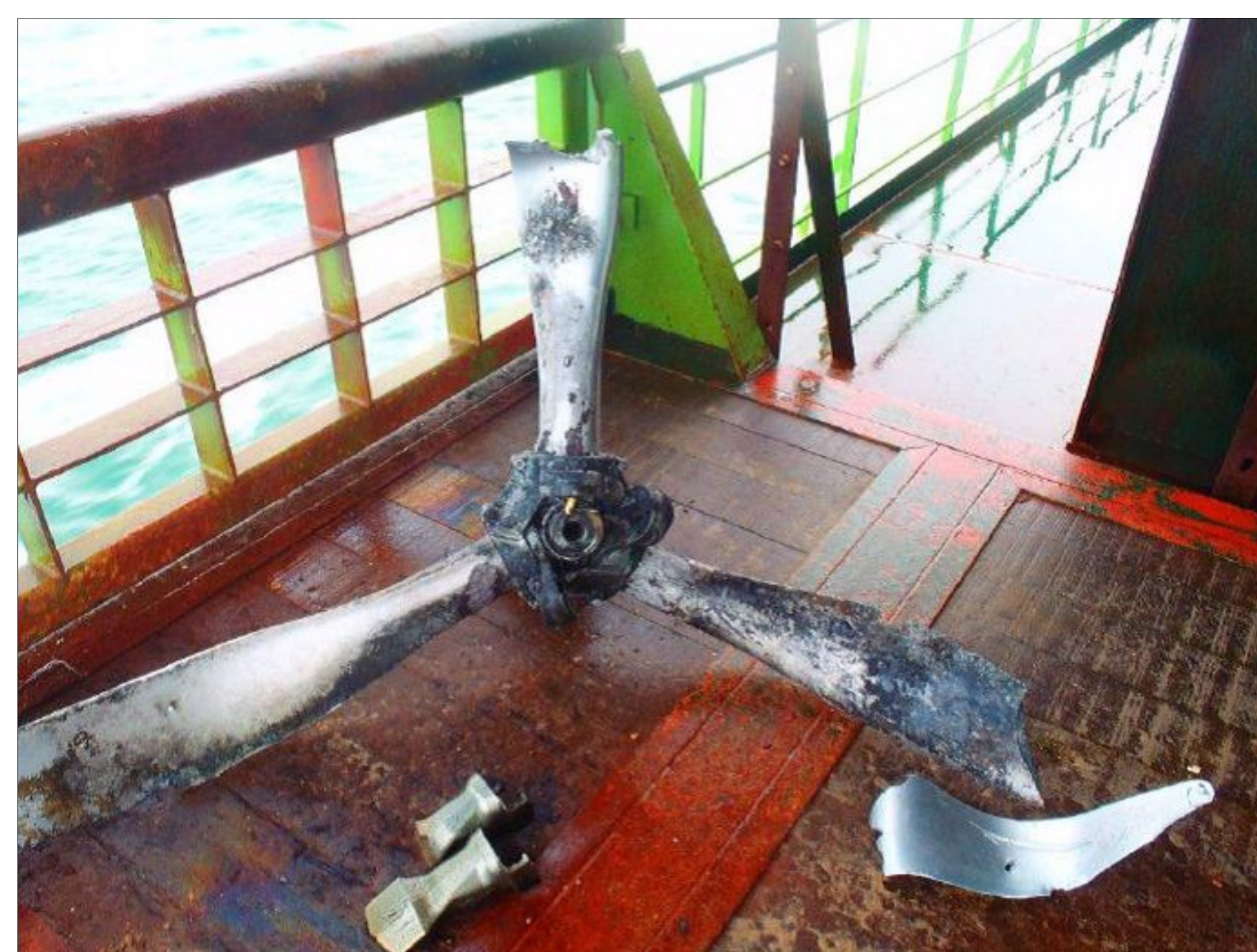
In October 2013 and May 2014 a wide range of marine acoustic sources and receivers were tested over a buried Pleistocene river valley, the Oostende Valley, nowadays covered by a large sand bank.



(© UNESCO)

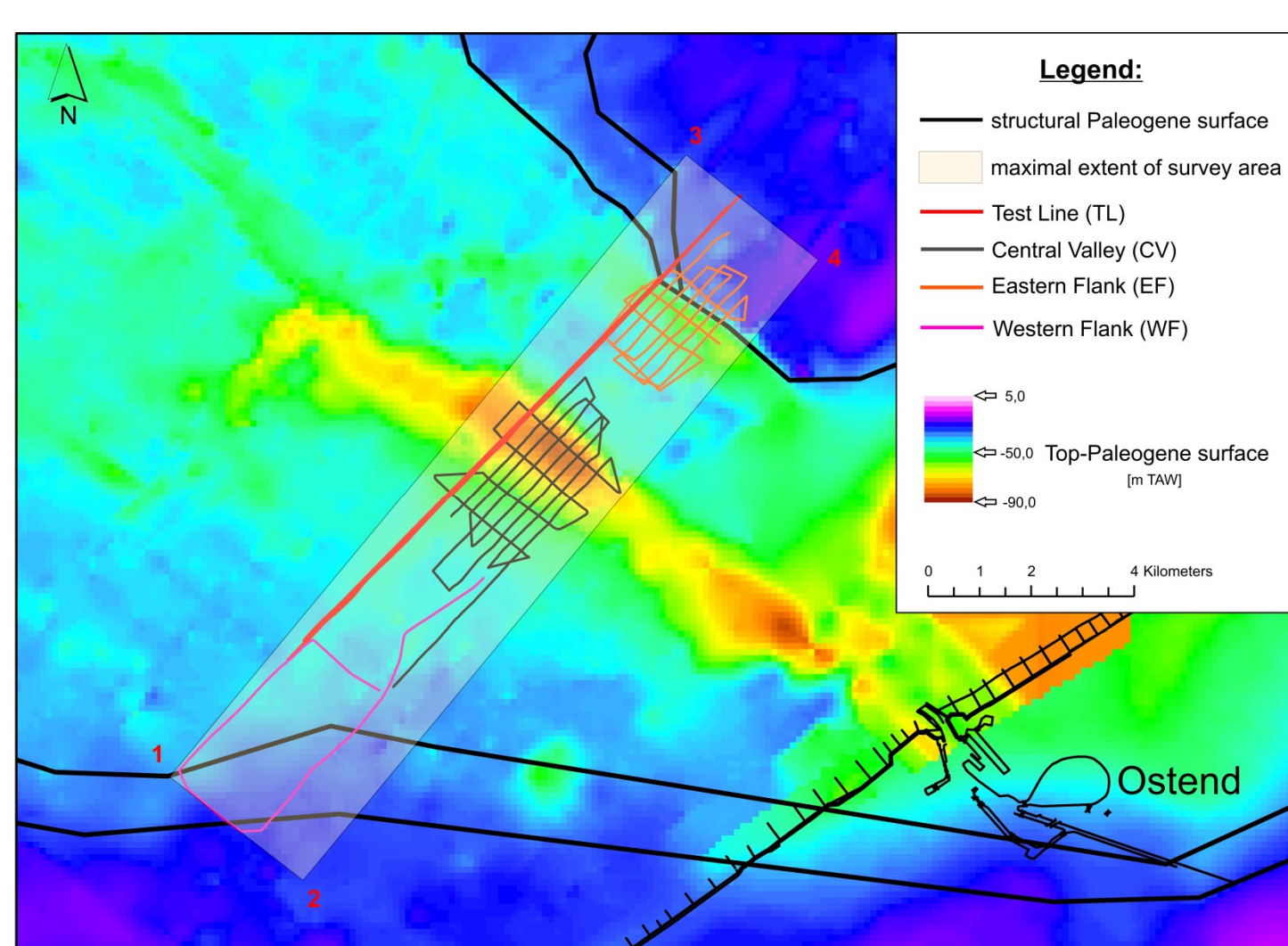
In 2013-2014 Belgium has ratified and implemented the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage. The new Federal law "Wet betreffende de bescherming van cultureel erfgoed onderwater" came into force allowing Belgium to protect and preserve the Underwater Cultural Heritage.

This new law also states that finds, made within the Belgian part of the North Sea, have to be reported to the "Receiver of Cultural Heritage Underwater".



Dredgers reported the discovery of an airplane propeller, indicating the crash site of a WWII airplane. (© DEME)

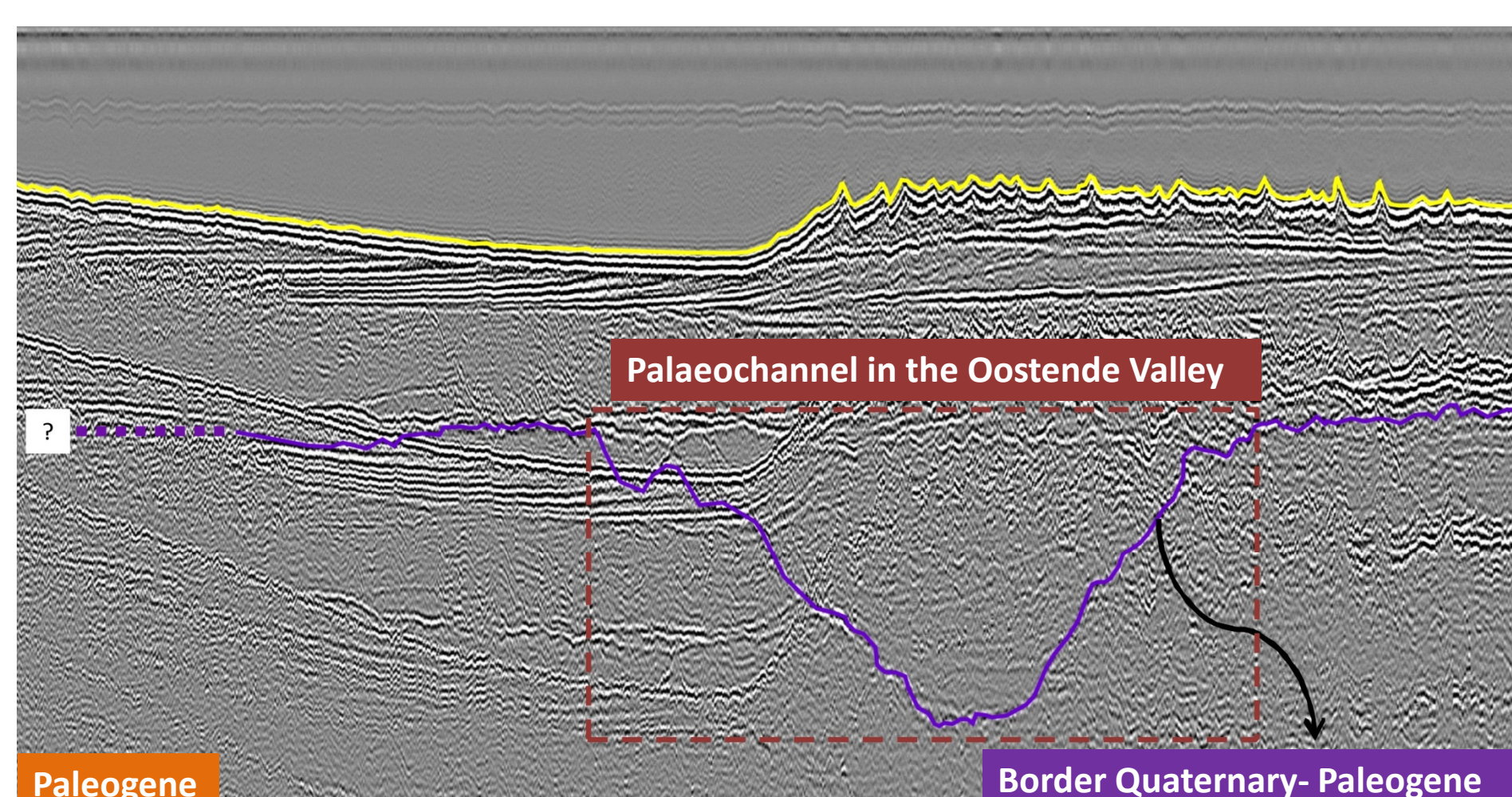
The SeArch project will develop protocols to report and deal with archaeological discoveries at sea. Furthermore it will provide guidance, advice and procedures for every stage of marine development from assessment of new license areas, to mitigation and monitoring of sensitive sites.



Equipment	Frequency range	Vertical resolution	Penetration
Centipede sparker	1.1 - 1.2 kHz	> 35 cm	in a sandy sea bottom, up to 50 m
SIG sparker	800 - 900 Hz	> 50 cm	In a sandy sea bottom, up to 100 m
'Seistee' boomer	1 - 5 kHz (main frequency of 2.5 kHz)	> 25 cm	up to 100 m
AA300 boomer	2 - 6 kHz	> 35 cm	up to 50 m
X-Star chirp	500 Hz - 12 kHz	30 cm or better	in a sandy sea bottom a penetration of 10-20 m
Geopulse	3.5 kHz	25 cm	up to 50 m (depending on sediment)
Parametric Echosounder	6 - 12 kHz / 100 kHz	15 cm	up to 30 m (in soft sediments)

Characteristics of the equipment used during the Oostende Valley survey (© Ghent University, Renard Centre of Marine Geology)

- A wide range of acoustic sources and receivers were used
- where possible simultaneously ('one-sweep survey')
- Emphasis on advanced ('smart') processing



First data interpretation of the Oostende Valley survey (© Ghent University, Renard Centre of Marine Geology)



## More Information

[www.sea-arch.be](http://www.sea-arch.be)

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