OFFSHORE WIND
Geophysical data
AO5, AO6/AO9 & AO7

December 2024

Providing integrated environmental, survey and inspection solutions

Globally. Offshore & Nearshore. On shore. In our own Labs.

TECNOAMBIENTE

A TRADEBE COMPANY

Enabling sustainable progress

Team Overview

Tecnoambiente

- DGEC/RTE AO5, AO9/AO6 & AO7 Survey program
- François Lopez – Operational Manager
- Peak – Processing - Acquisition, Processing & Interpretation
- Tecnoambiente Team - Reporting

- Overview of the AO5, AO6/O9, AO7 areas
- Surveys performed by TA
- UHR Seismic acquisition & Processing
- AO5 Summary of results
- AO9/AO6 Summary of results
- AO7 Summary of results

Q/A session after

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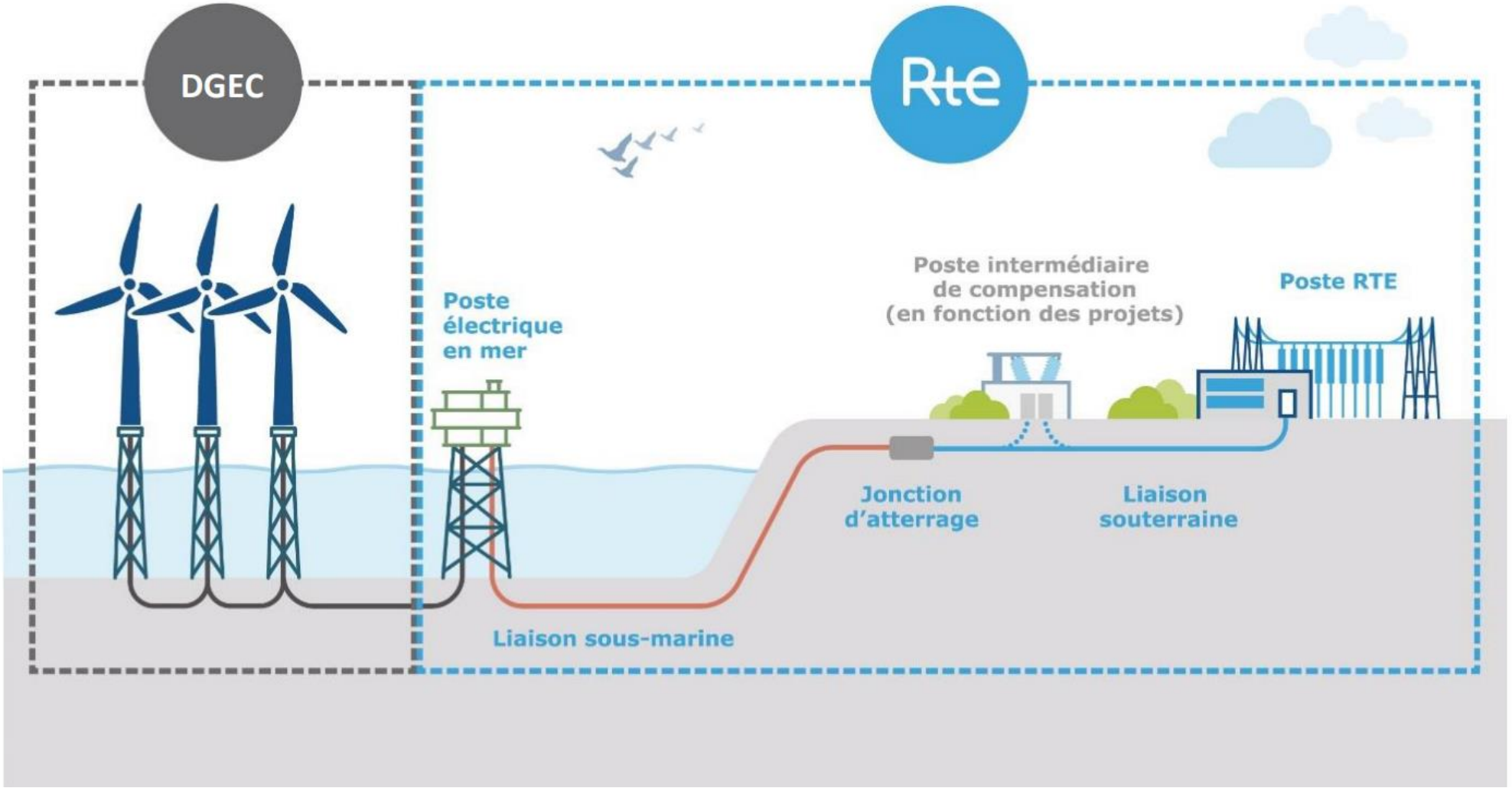
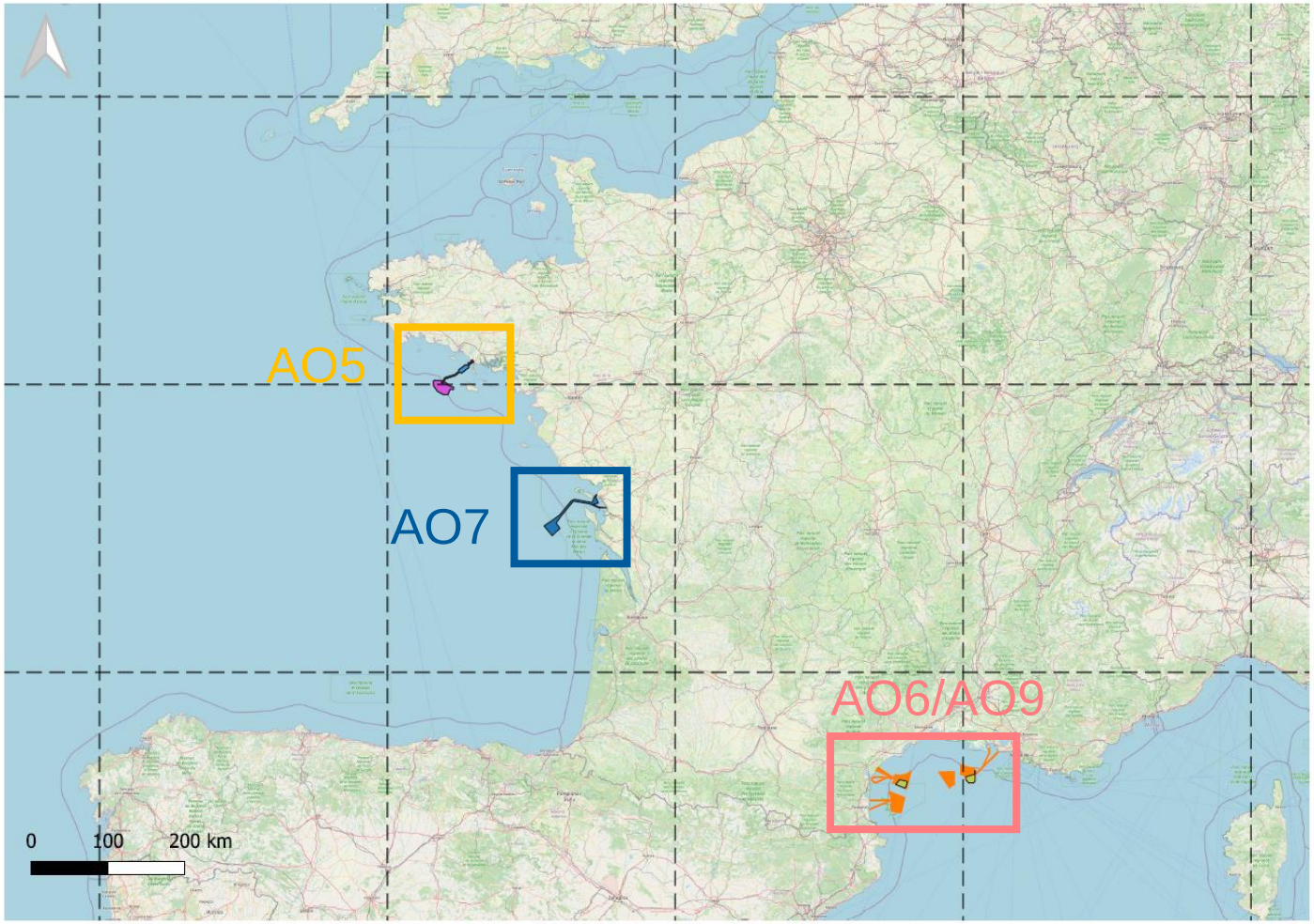
Overview of Work Packages AO5, AO6/AO9 & AO7

Scope of Works



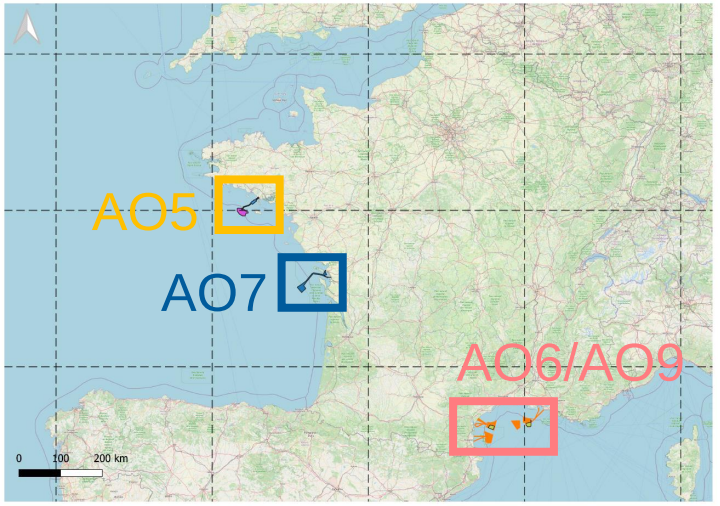
Survey Areas AO5, AO6/AO9 & AO7



Survey Areas AO5, AO6/AO9 & AO7

Work Packages

- AO5 Survey area:
  - EC: MBES, SSS, SBP, ALARP Cert., Geotech
  - OSS → UHRS
  - OWF:
    - UHRS:
      - Seabed topography
      - Shallow (nominally 30 m BSB) SUBSURFACE GEOLOGY
  - UXO for ALARP certificates

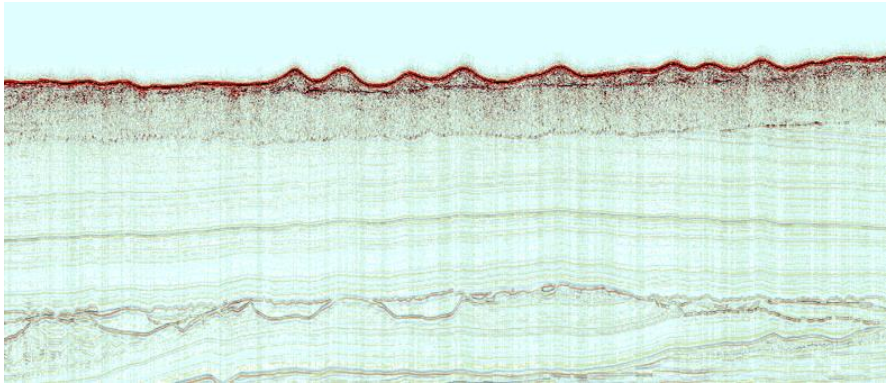


- AO6/AO9 4 Survey areas:
  - EC: MBES, SSS, SBP, ALARP Cert., Geotech
  - OSS→ UHRS
  - 4 OWF:
    - UHRS:
      - Seabed topography
      - Shallow (nominally 30 m BSB) SUBSURFACE GEOLOGY
  - UXO for ALARP certificates
  - Geotech

- AO7 Survey area:
  - EC: UXO for ALARP certificates
  - OSS → UHRS
  - OWF:
    - UHRS:
      - Seabed topography
      - Shallow (nominally 30 m BSB) SUBSURFACE GEOLOGY

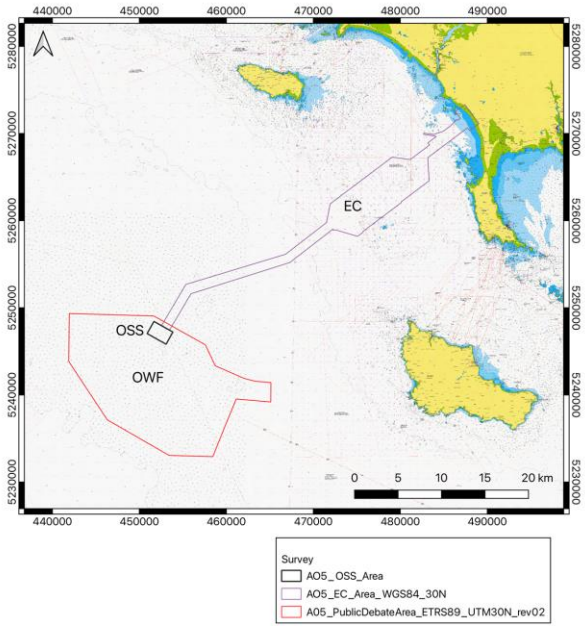
Geophysical Scope of Works

- OWF GEOPHYSICAL SURVEY OBJECTIVE:
  - MBES & UHRS
  - OSS → UHRS
- Purpose:
  - Define water depths & Seabed topography
  - Define shallow (nominally 30 m BSB) SUBSURFACE GEOLOGY

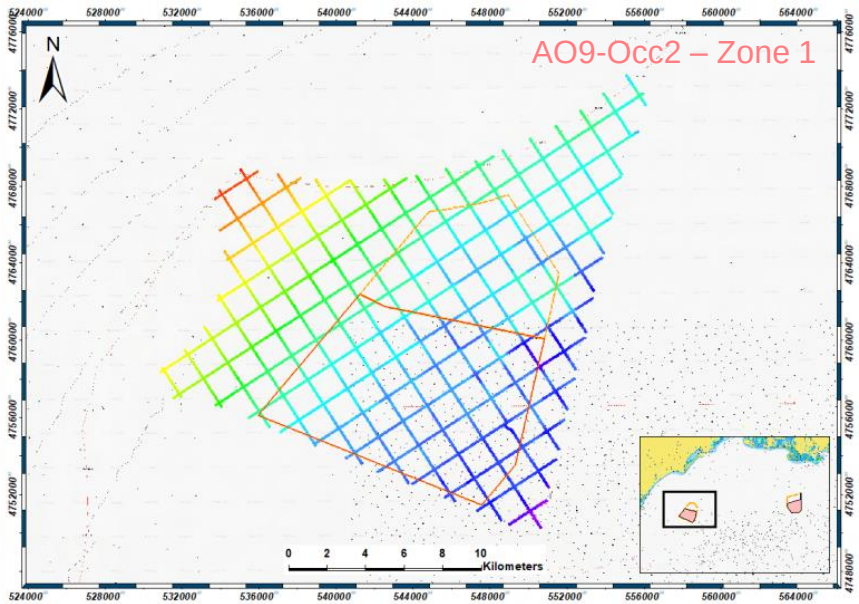


The surveys were undertaken to provide an interpretation of the geophysical data to better understand the main characteristics of the seabed and geology.

AO5 Survey Area



AO6/AO9 Survey Area

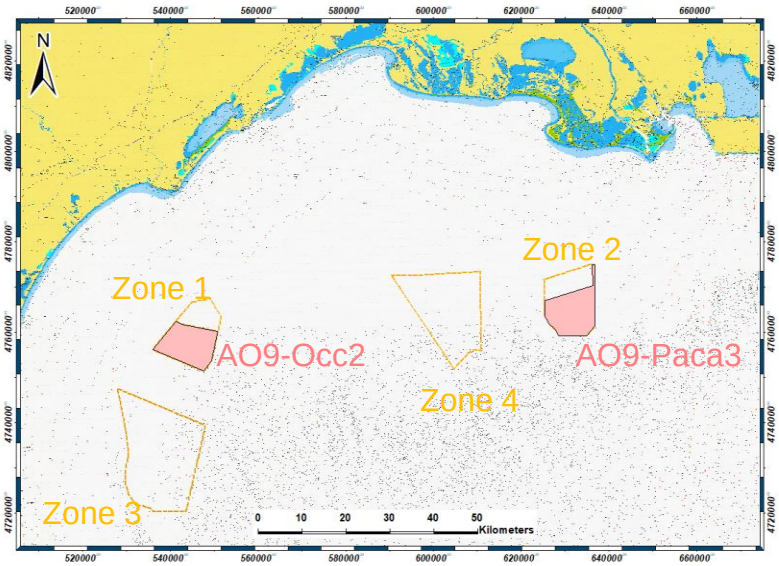


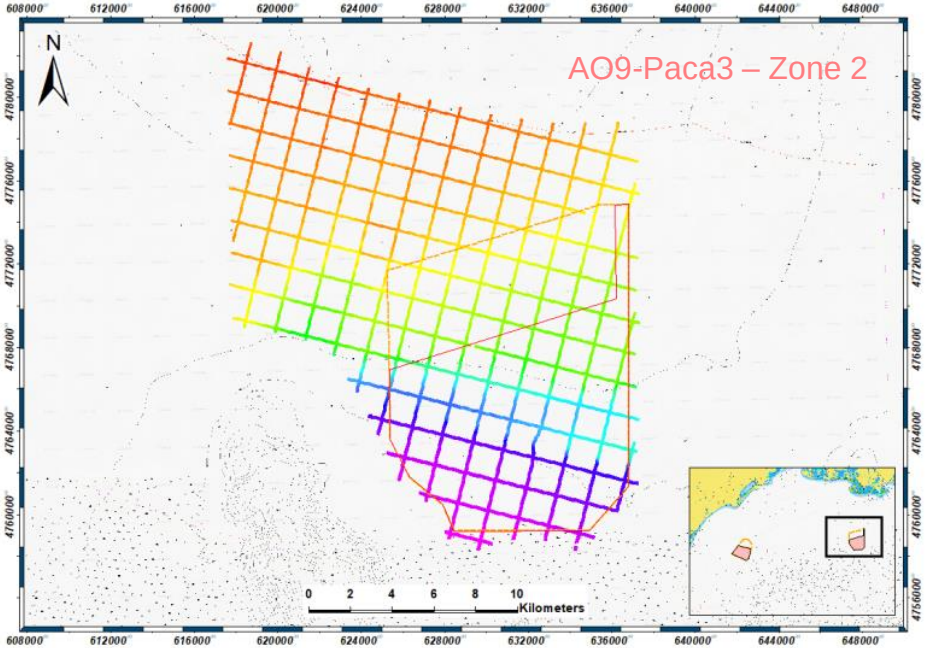
Legend

BATHYMETRY (m ZH)

High : -68,4725

Low : -103,857





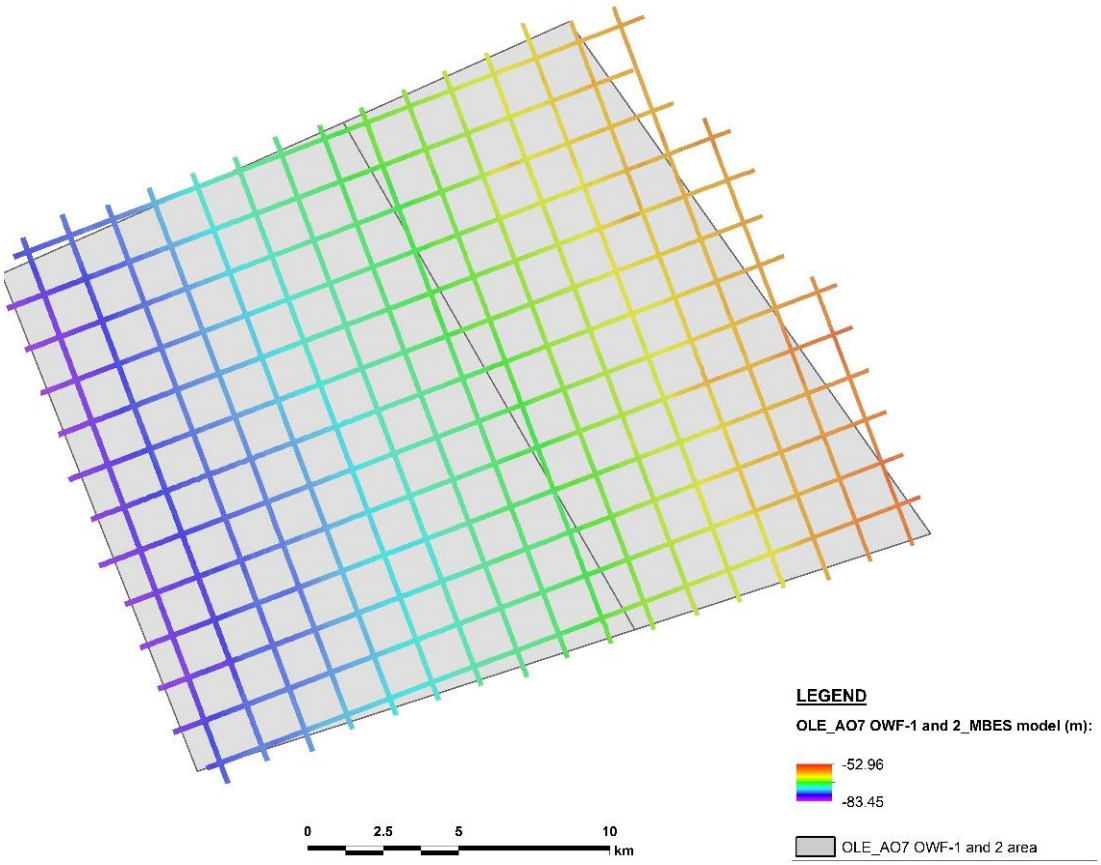
Legend

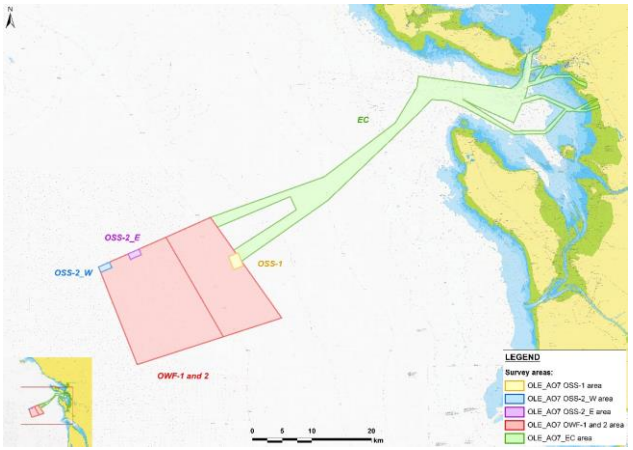
BATHYMETRY (m ZH)

High : -71,1155

Low : -127,621

AO7 Survey Area





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UHR Seismic Acquisition & Processing

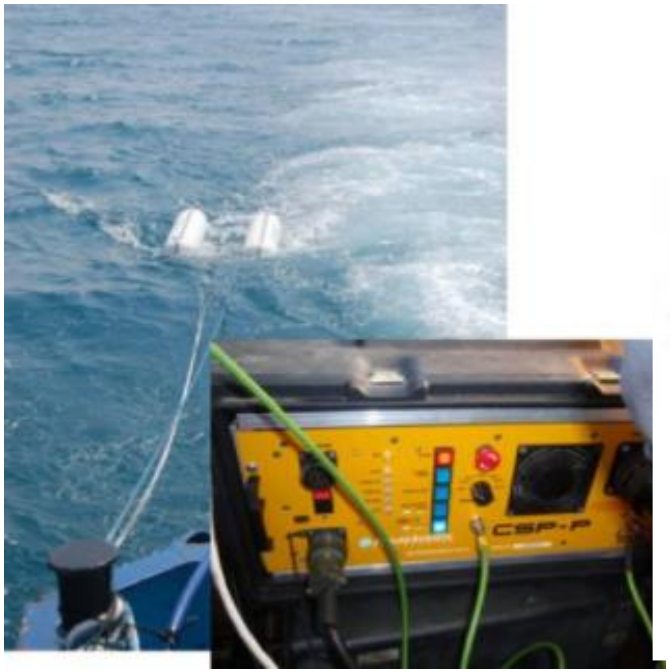
Seismic survey UHRS

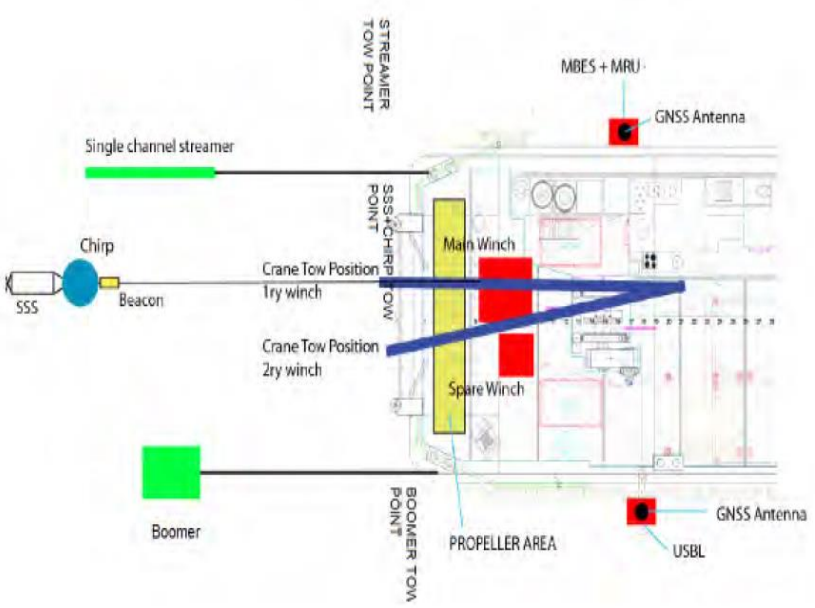
UHR Seismic data was acquired using GSO 540-tip Sparker sled and Applied Acoustics CSP-N pulsed power supply unit as the acquisition source, interfaced with a Geometrics GEOEEL LH16 recording system and 48 channel UHR streamer. The first 24 channels of the streamer at 1m group interval and the remaining 24 channels at 2m. The streamer was kept at a depth of 1m by a head and tail buoy as well as 2 Digicourse 5011 levellers (Birds). Accurate positioning was collected using Modulus 101G GPS pods mounted on each towed system, Sparker sled as well as head & tail buoys for streamer positioning.

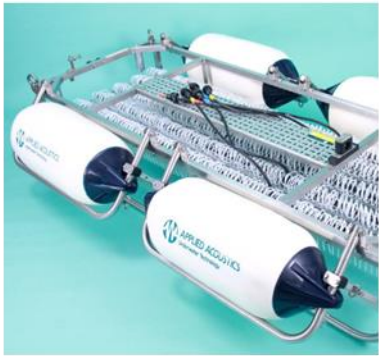
The shot point interval for the survey was 1 m, giving a nominal fold of 36 when binning with a CDP spacing of 1m to keep the bins consistent with the variable channel spacing. True fold will vary around this value when real source and receiver positions are used rather than nominal geometry, according to variations in ship speed and feather angle changes between shots.

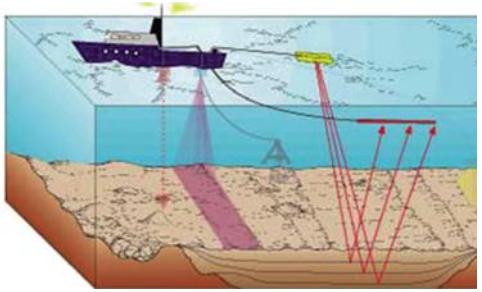
Methodology

Seismic Streamer: 48 Channel LH-16 Geoeel Gel Streamer with CH 1-24 (1m Group Interval) // CH 25-48 (2m Group Interval)
Active Streamer Length: 72m
Configuration:
1x 65m Tow cable – 1x 5m Stretch – 24ch @ 1m Group Interval x 24ch @ 2m Group Interval, 1x 5m Tail stretch, 3x LH16 Digitiser Units









Seismic Processing Overview

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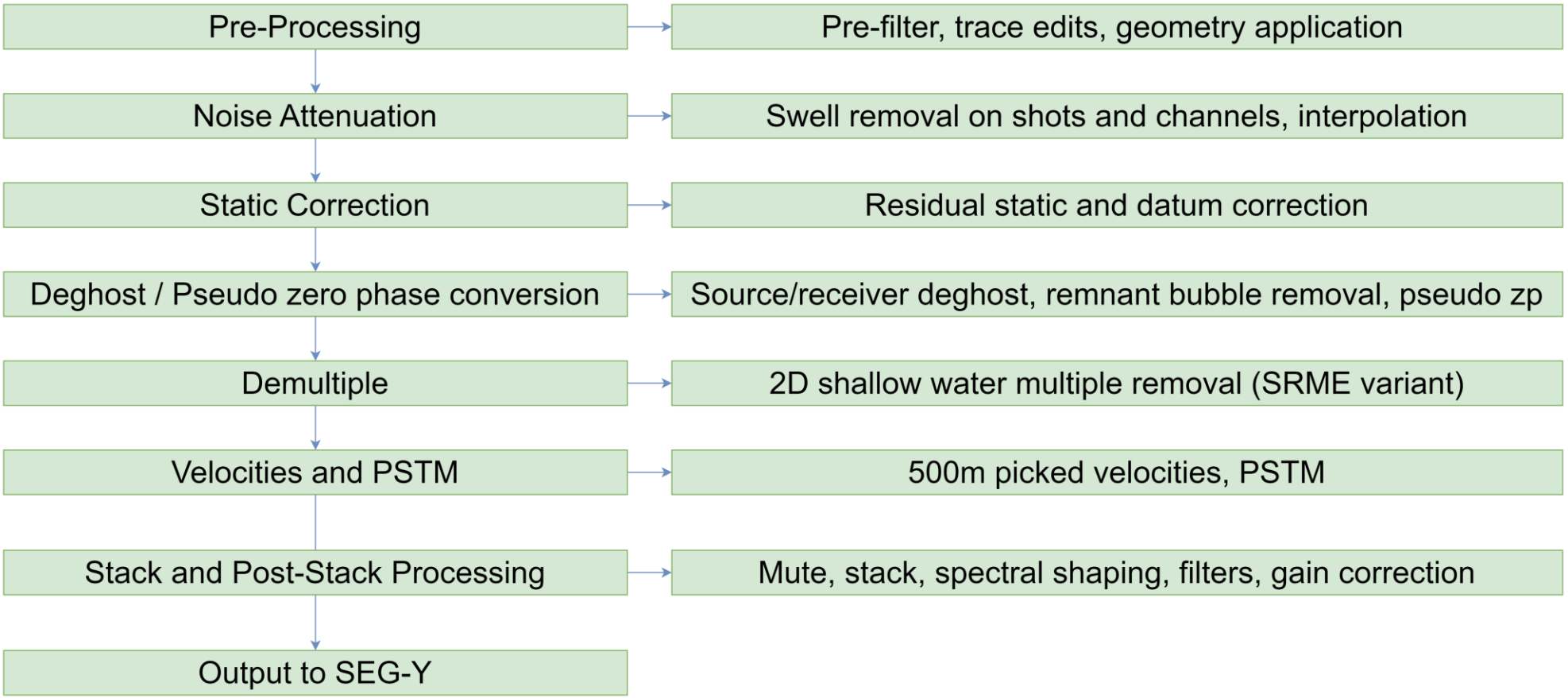
PARAMETER	VALUE
Sample Rate	0.0625ms
Record Length	0.250ms
Shot Point Interval	1m
Source	Sparker – GSO – 400 tips
Target Source Tow Depth	0.4m

PARAMETER	VALUE
Active Streamer Length	75m
Number of channels	48
Group Length	Channels 1-24 :1m Channels 25-48 : 2m
Target Tow Depth	1m +/-0.5m
Near Offset	~5-6m

PEAKPROCESSING

Seismic Processing Overview



MED_A06 Velocity Picking Example

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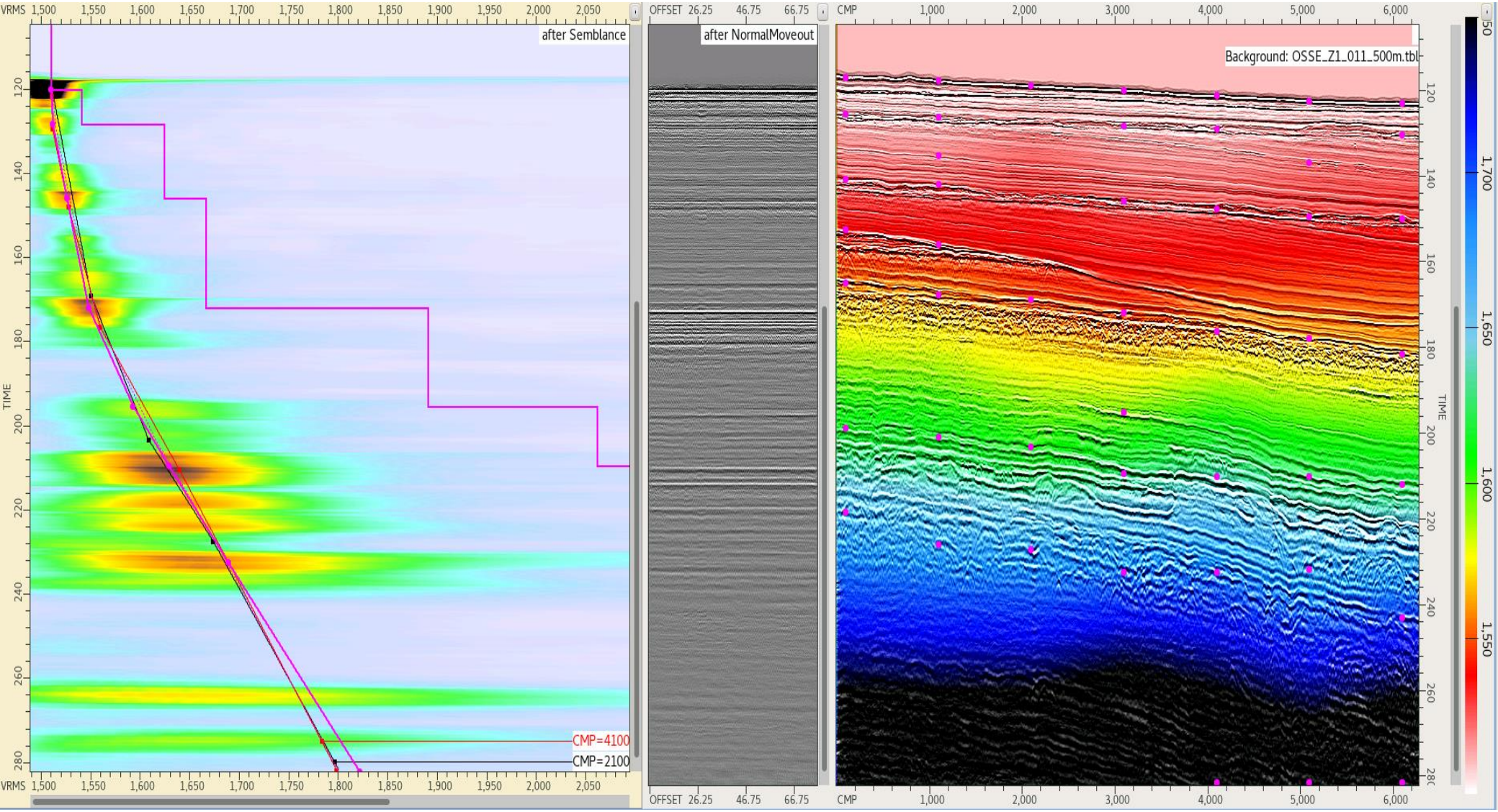

PEAKPROCESSING

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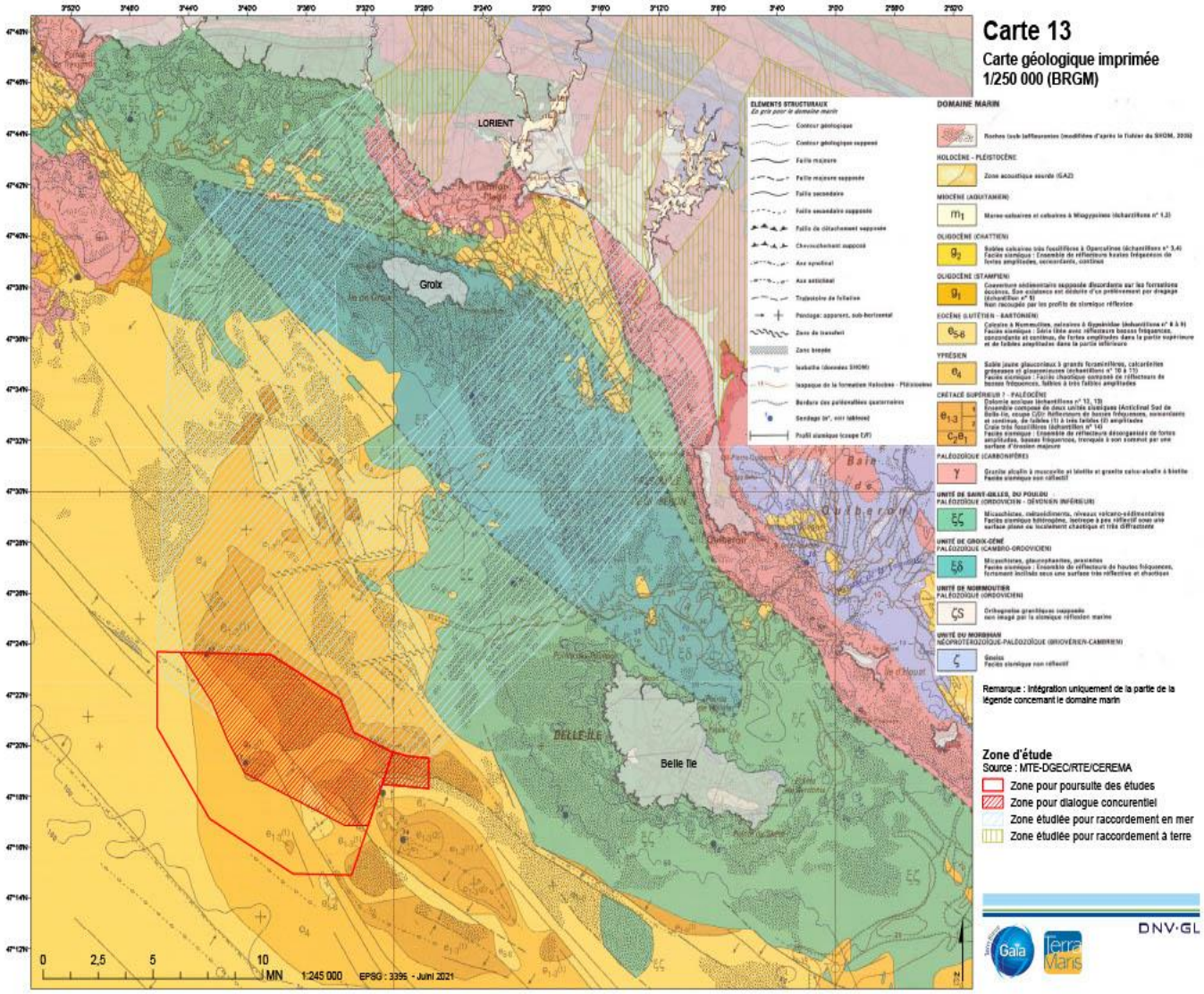
AO5 UHR Seismic Results

PEAKPROCESSING

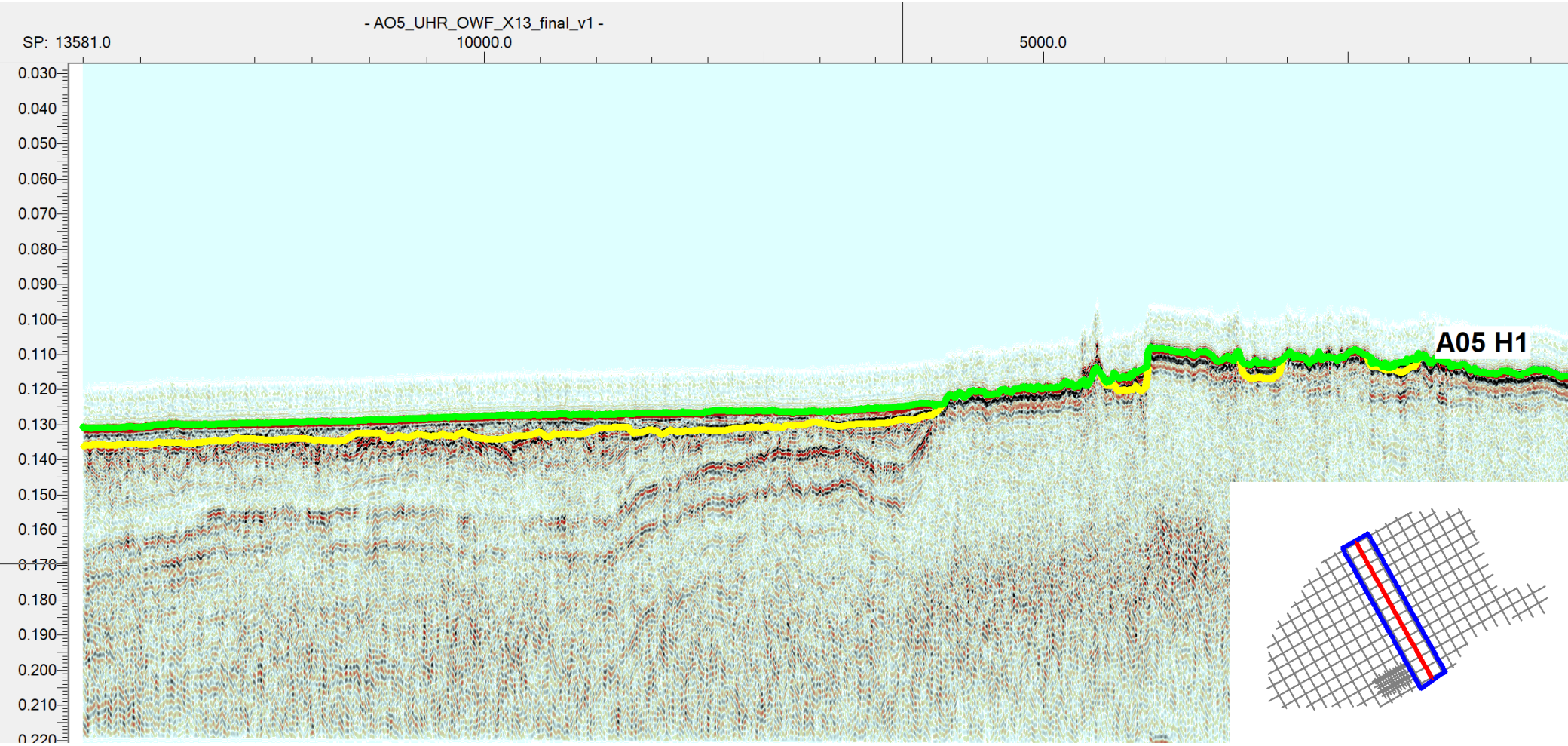
A05 Background material



BRE_AO5, situated in the Bay of Biscay

Gaia- Blue Earth prepared a geological bibliographic study of Southern Brittany (Gaia - Blue Earth, 2021).

A05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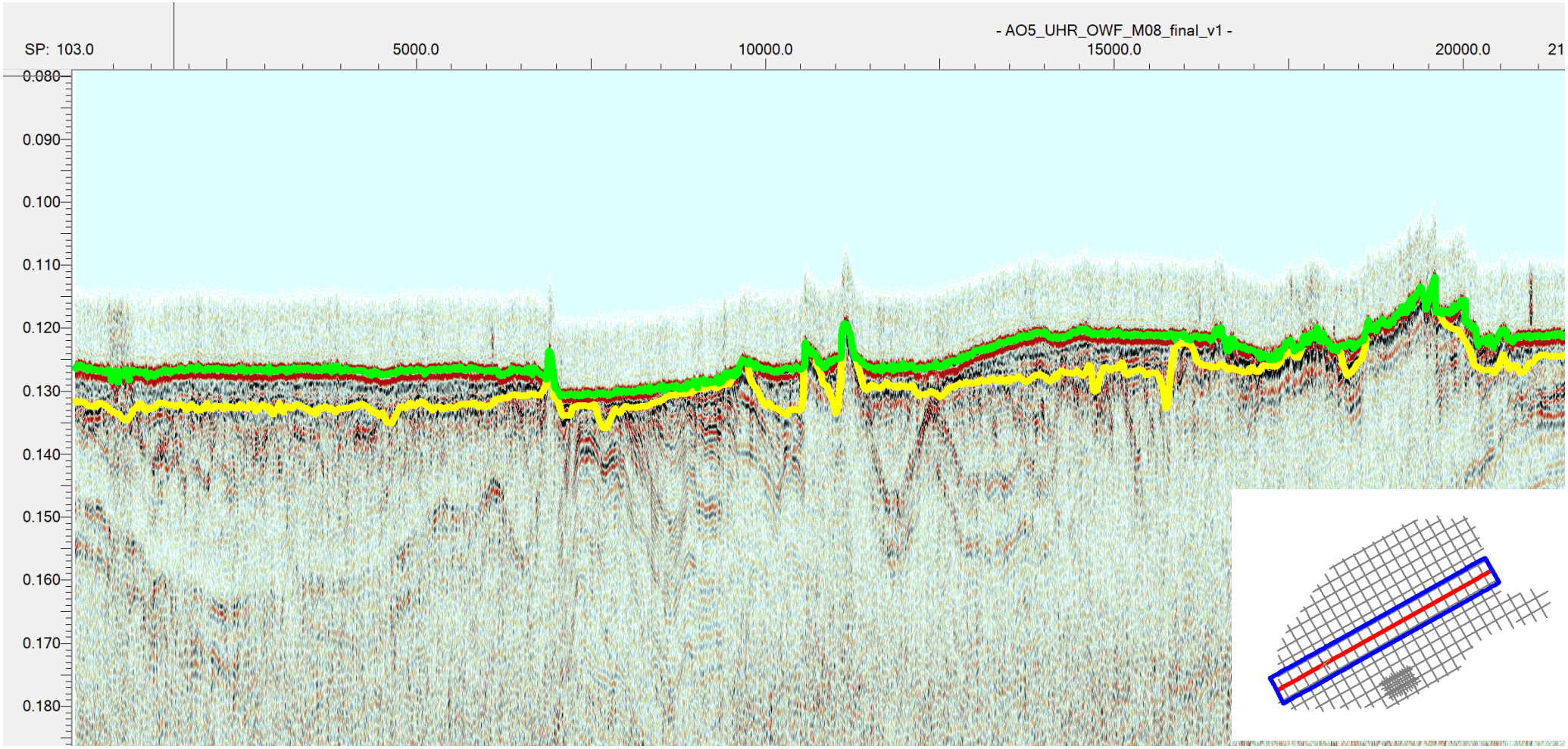
5000.0
0.030
0.040
0.050
0.060
0.070
0.080
0.090
0.100
0.110
0.120
0.130
0.140
0.150
0.160
0.170
0.180
0.190
0.200
0.210
0.220
A05 H1

A05


- AO5_UHR_OWF_M08_final_v1 -
SP: 103.0
5000.0
10000.0
15000.0
20000.0
0.080
0.090
0.100
0.110
0.120
0.130
0.140
0.150
0.160
0.170
0.180

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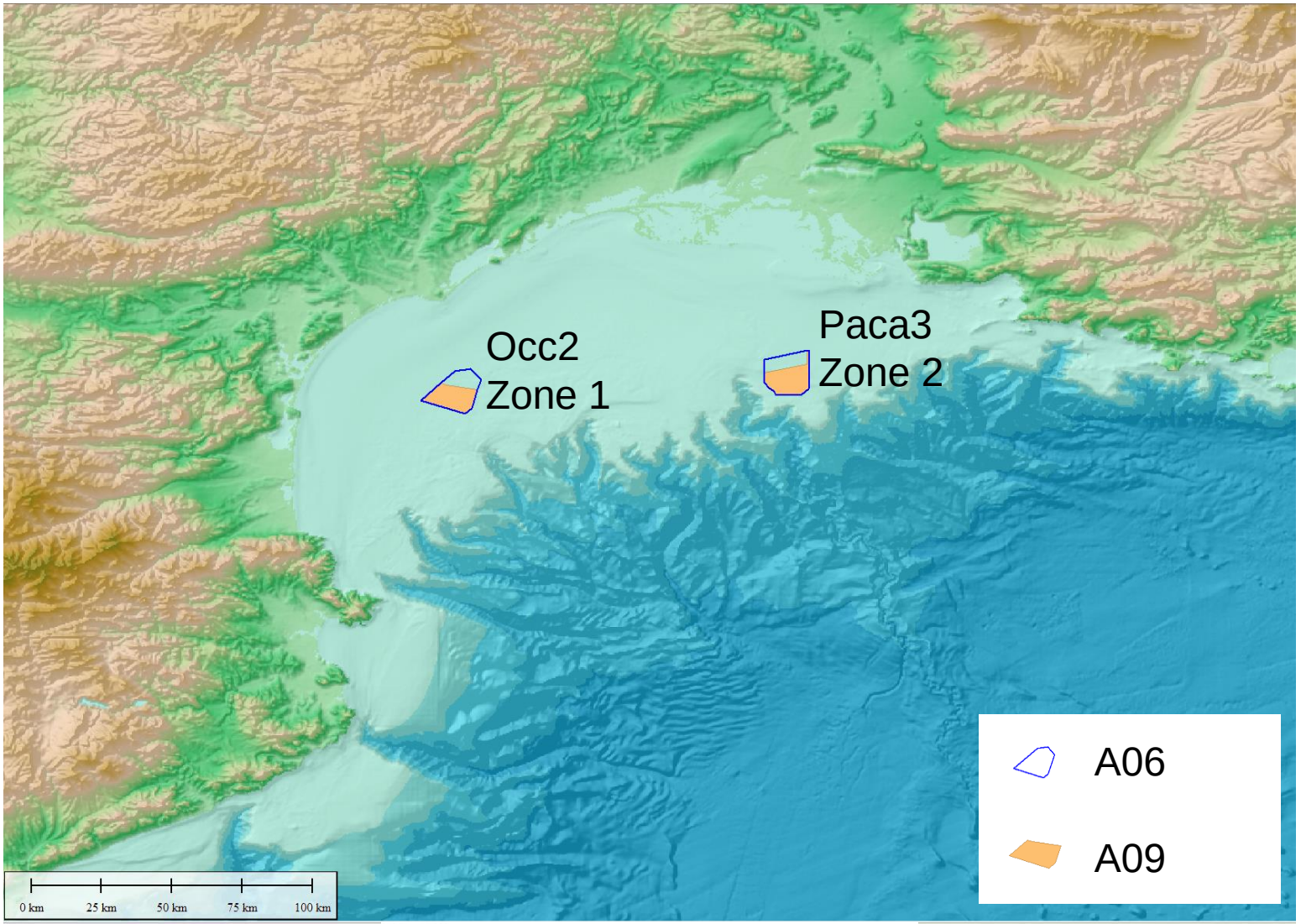
AO6/AO9 UHR Seismic Results

PEAKPROCESSING

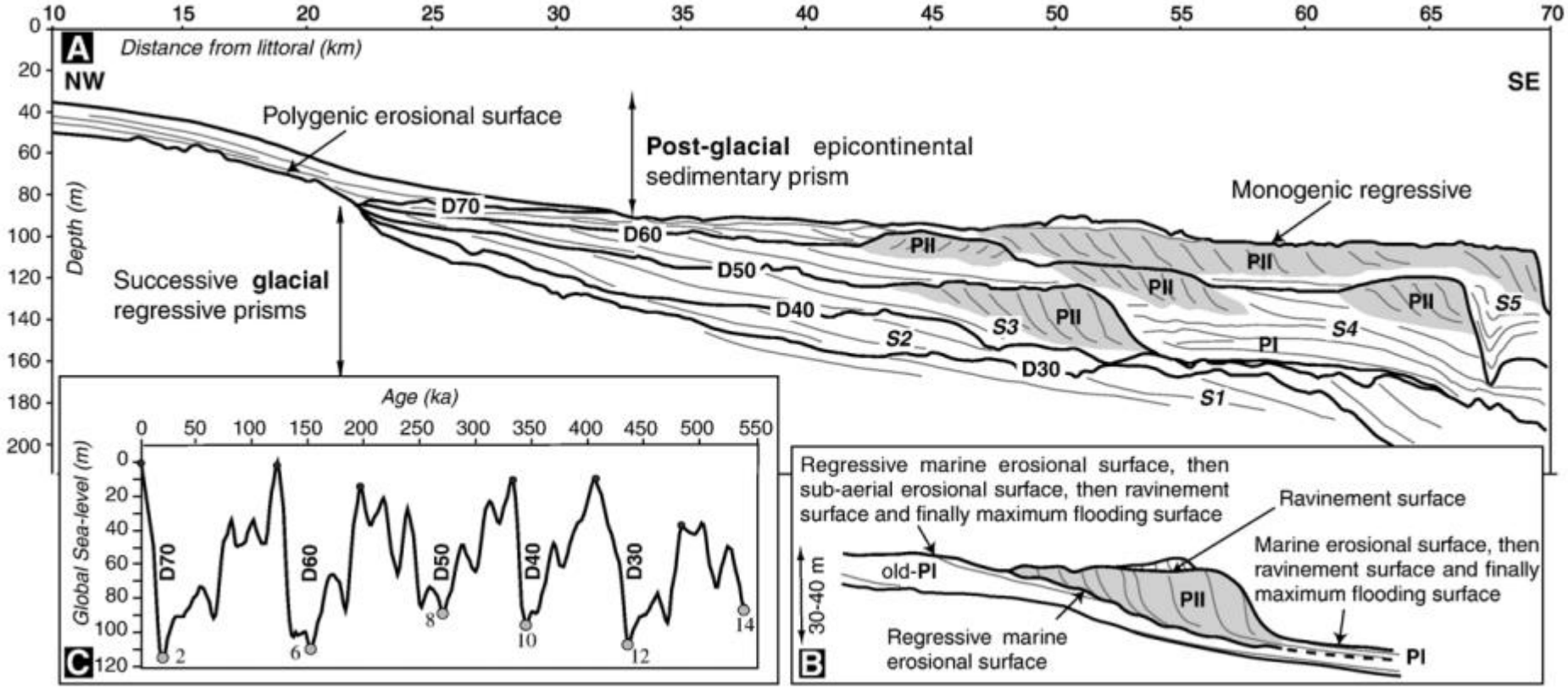
Scope of Works A06/AO9



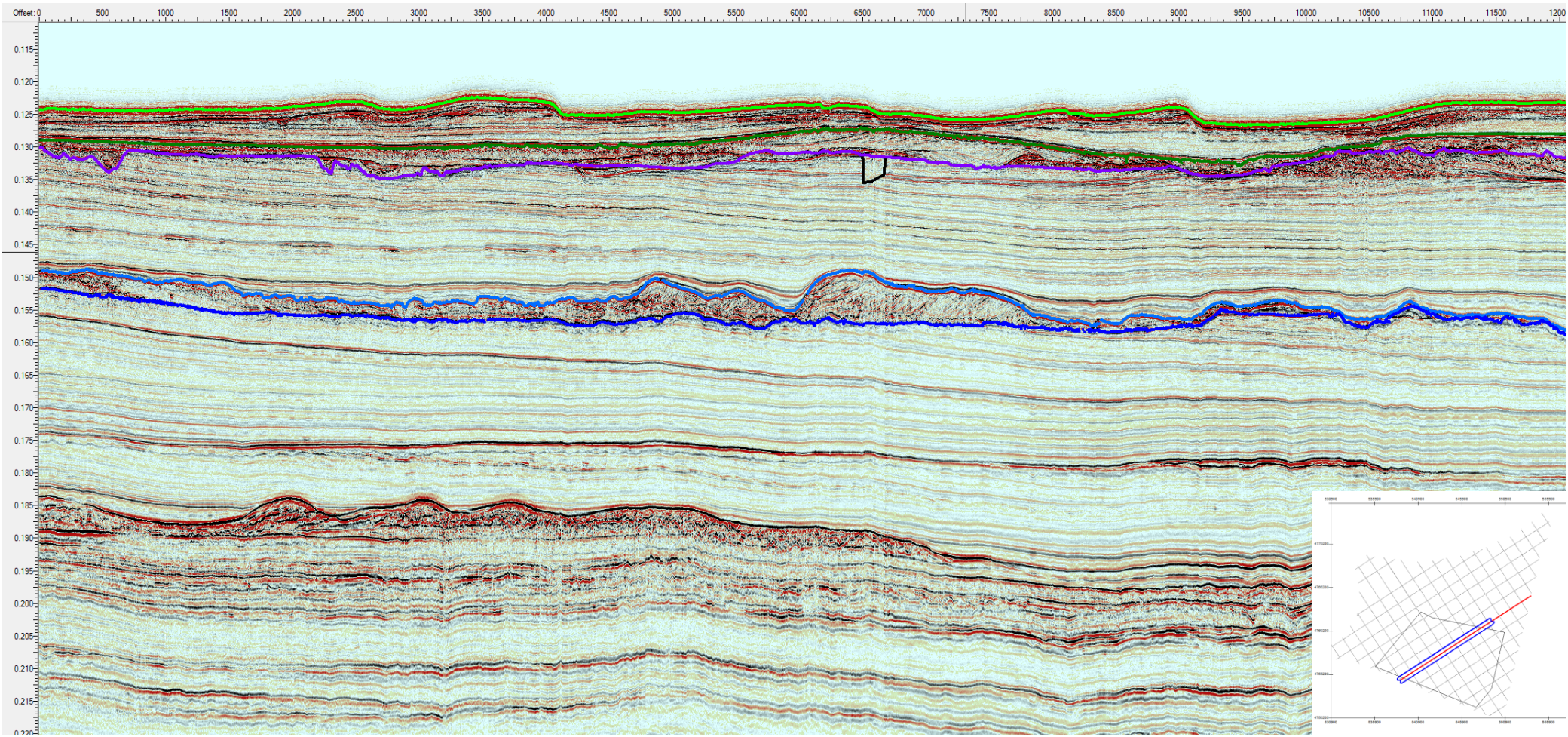
Scope of Works A06/AO9

The cycles of deposition are split by unconformities, D30, 40 etc. which represent MFS and peak glaciations, the insert on the diagram shows how these unconformities correlate with MIS stages. The deposits are almost all of regression, the flatter clinoforms were laid down during regression. These deposits are topped by Marine Regressive Erosion Surfaces, cut when the storm wave base was in contact with the seabed and able to erode. More steeply dipping (sandy beach type facies?) deposits, PII facies, were deposited over the erosion surface. The D surfaces go over these PII facies and may represent a thin condensed layer of transgressive sediments. They act as a MFS marker for the next cycle of base level change/sedimentation.

Model, Jouet et al



A06/AO9 Occ2 - Zone 1



A06/AO9 Occ2 - Zone 1

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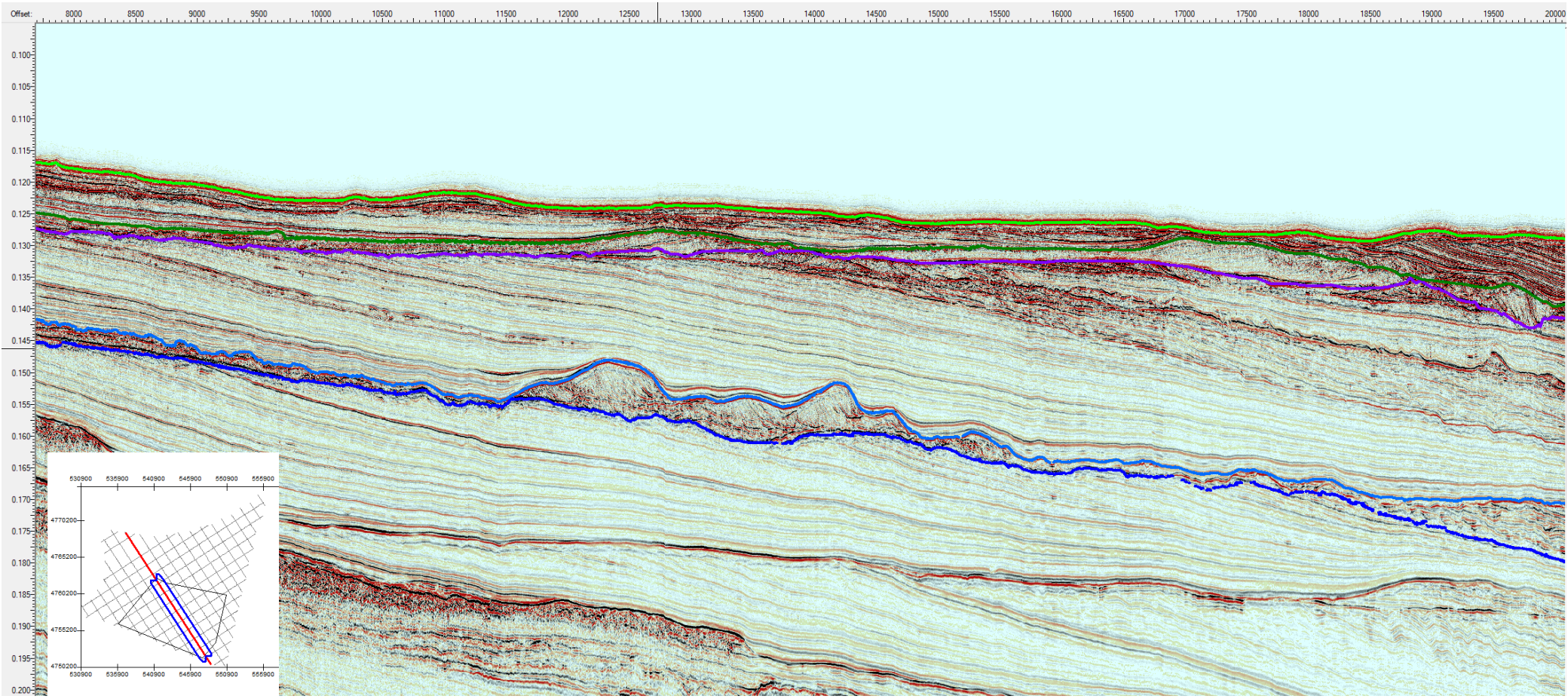

PEAKPROCESSING

A06/AO9 Paca3 - Zone 2

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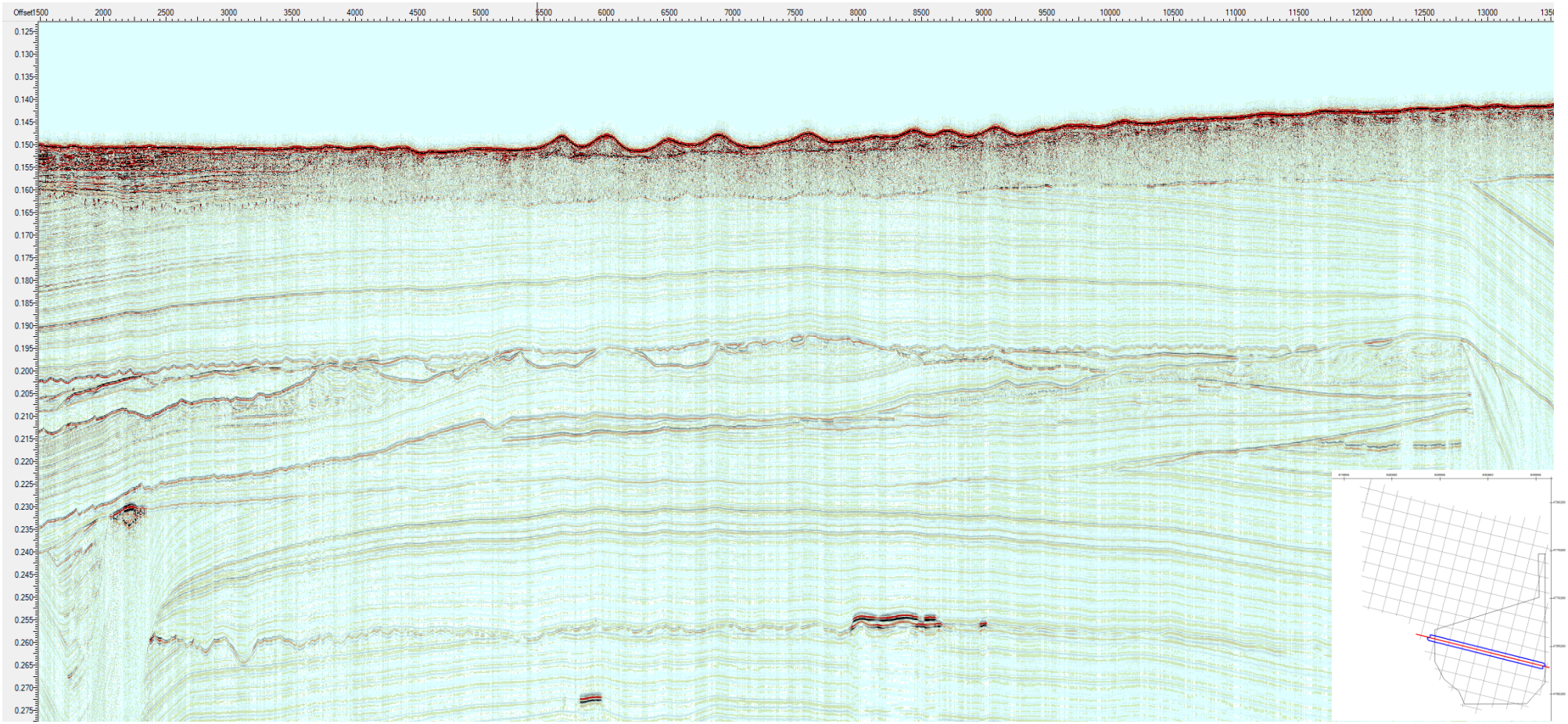
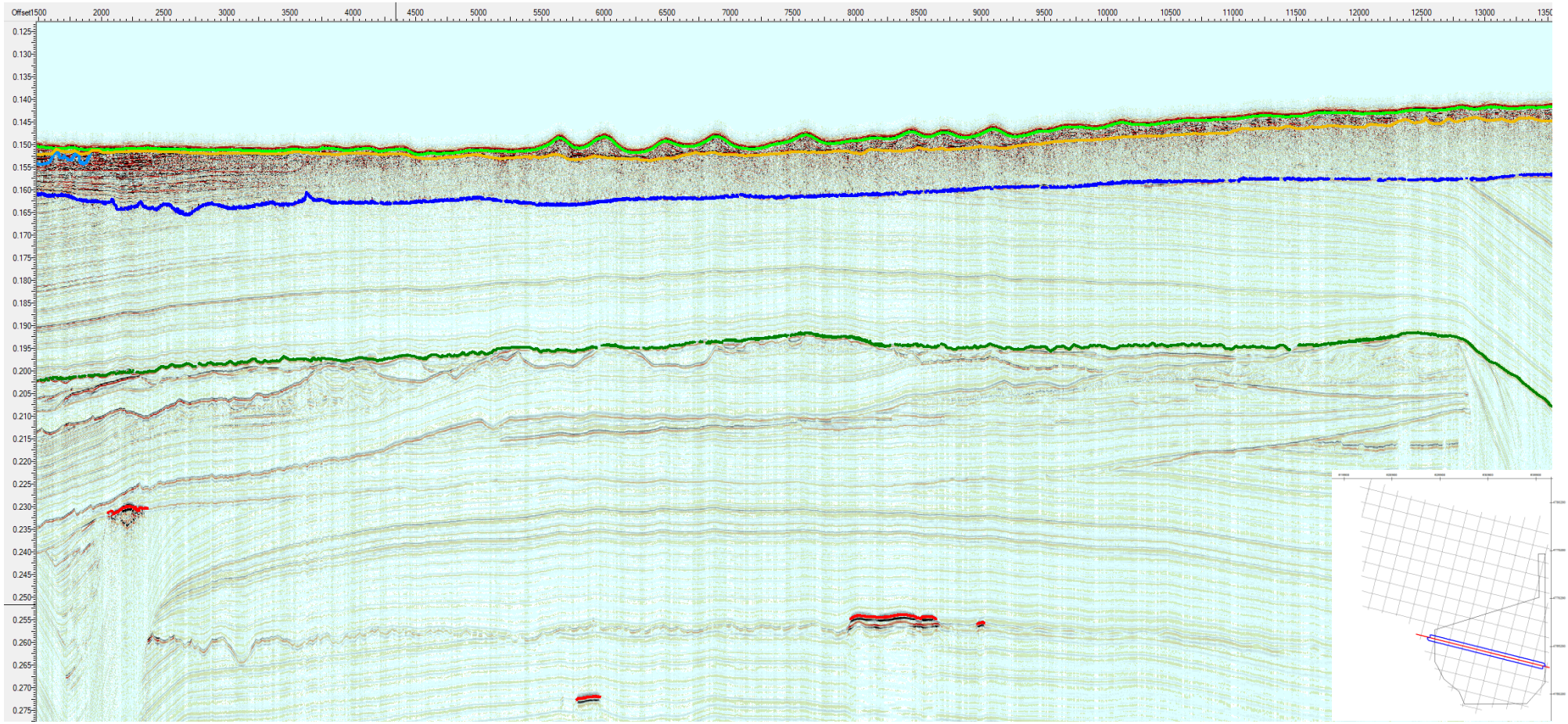
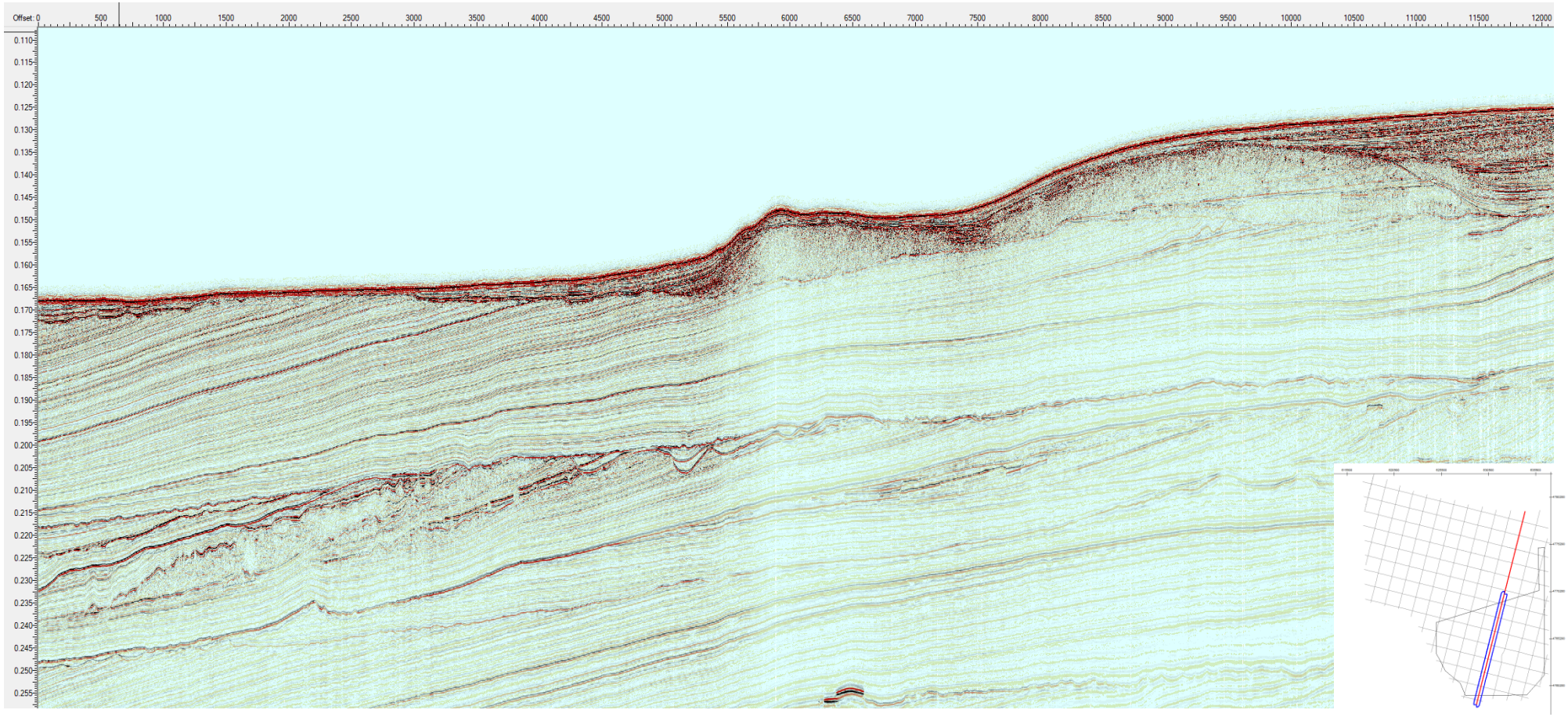


PEAKPROCESSING

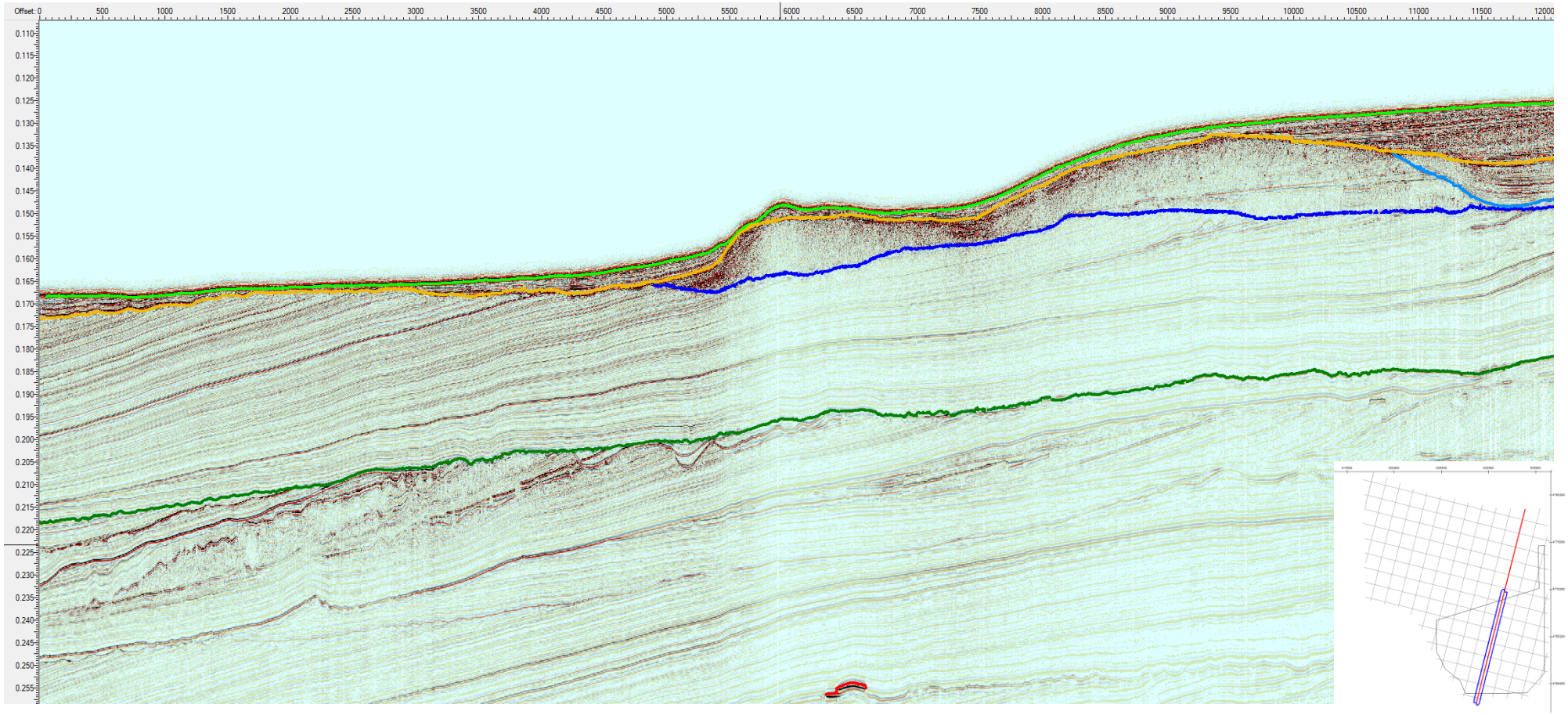
A06/AO9 Paca3 - Zone 2



A06/AO9 Paca3 - Zone 2



A06/AO9 Paca3 - Zone 2



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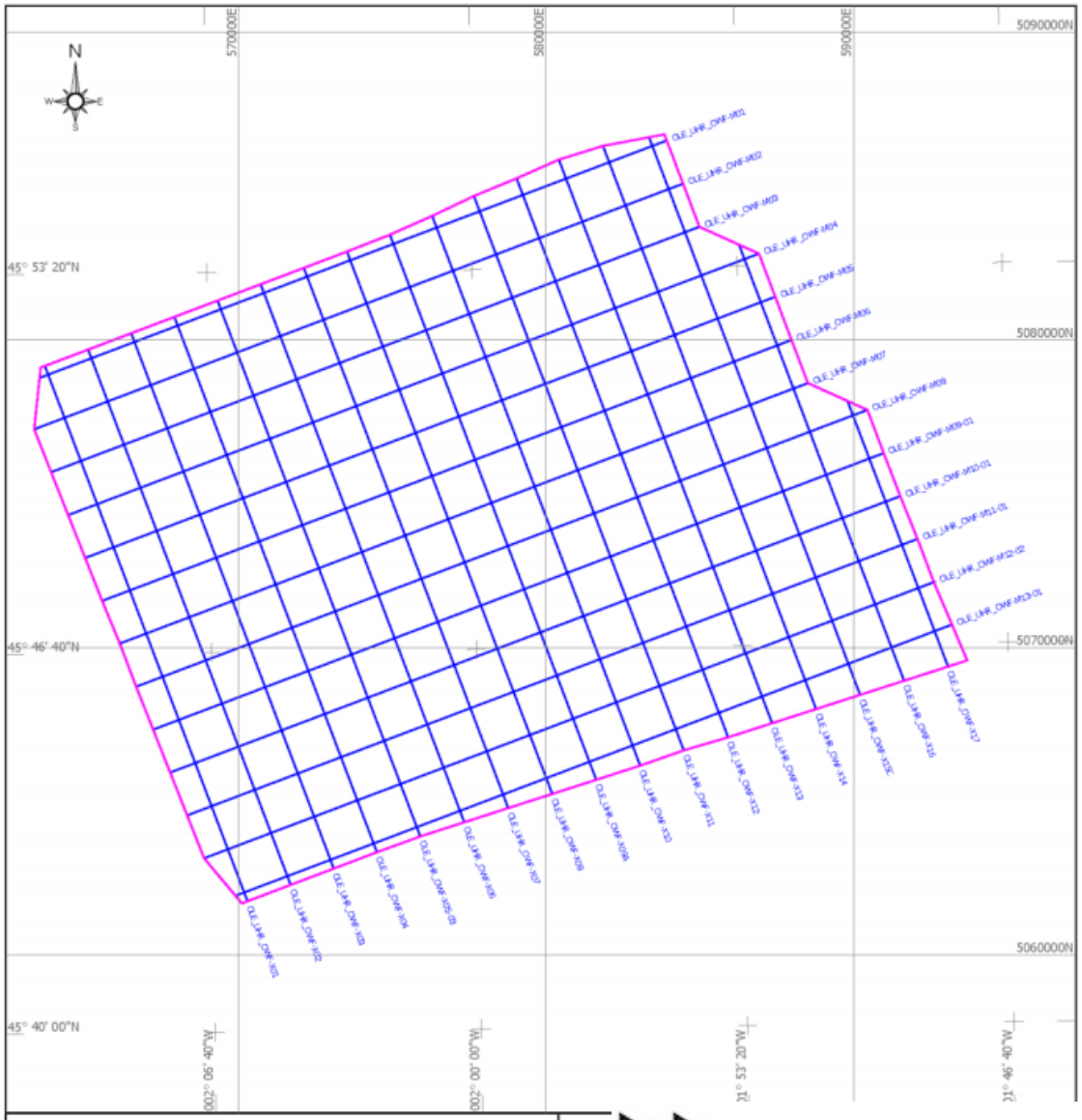
AO7 UHR Seismic Results

PEAKPROCESSING

Seismic survey UHRS - A07



LEGEND

Survey line

Survey area

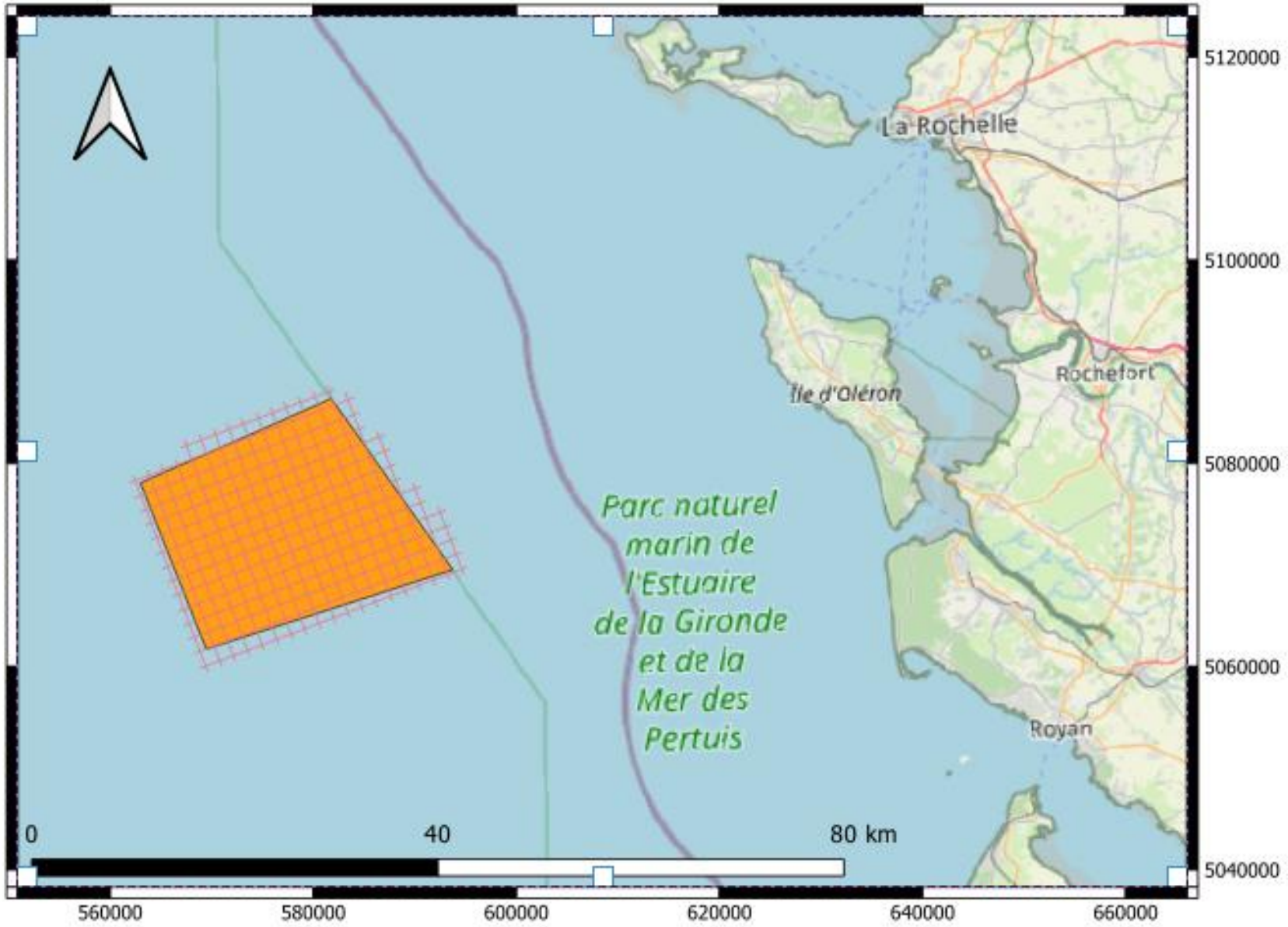
WGS84, UTM Zone 30 North, CM 3° West

HORIZONTAL SCALE

0 3000 6000 9000 12000 15000

Metres

Scope of Works A07



MED_A07 Velocity Picking Example

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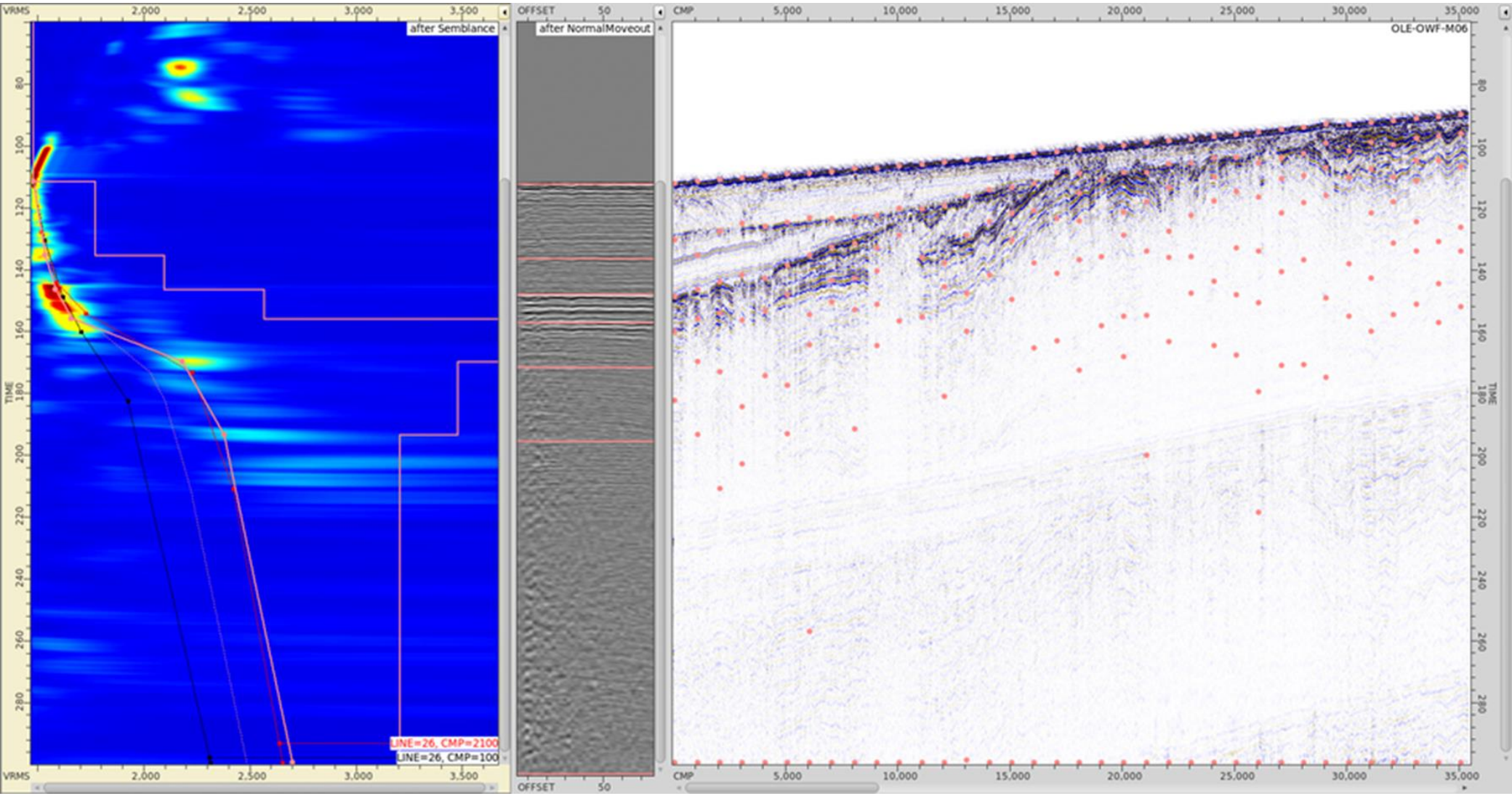
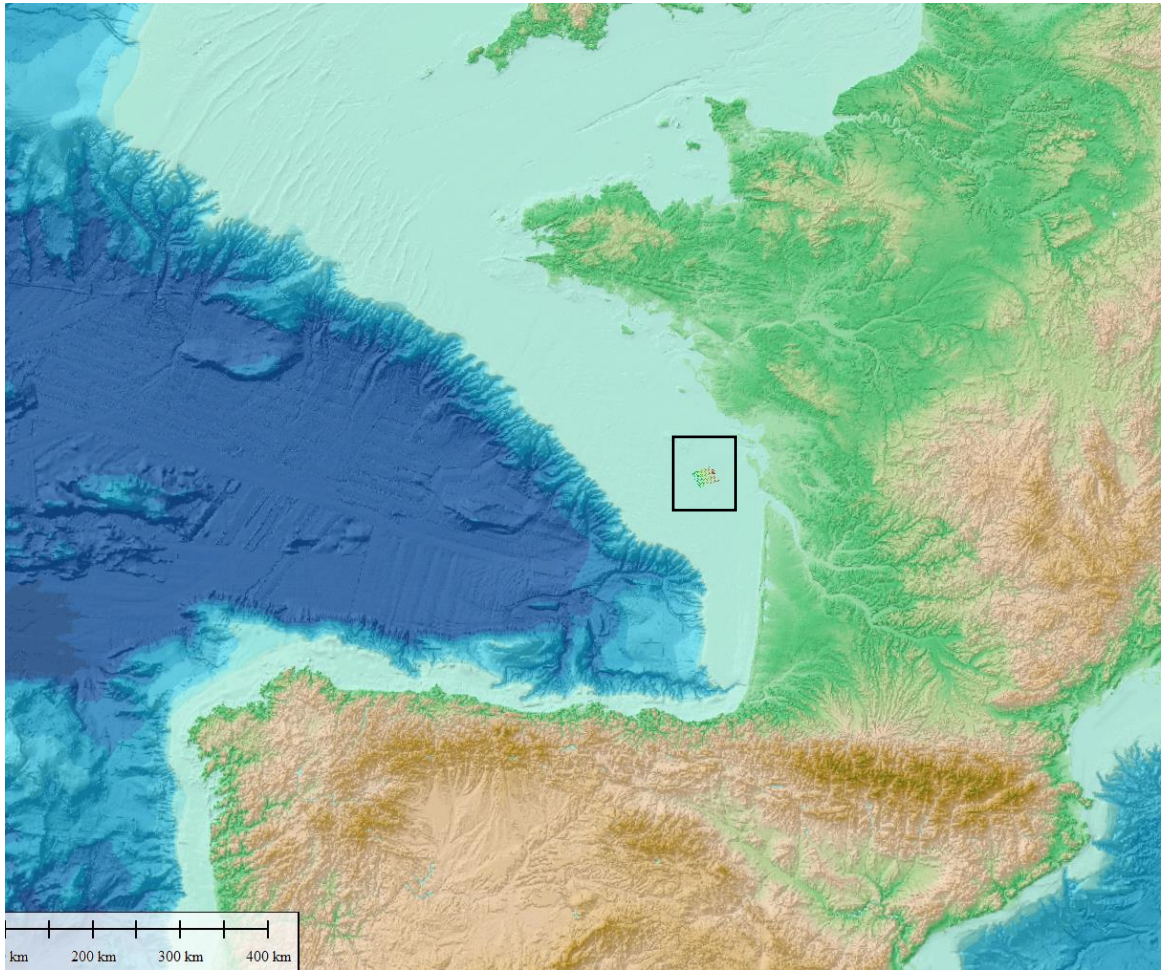
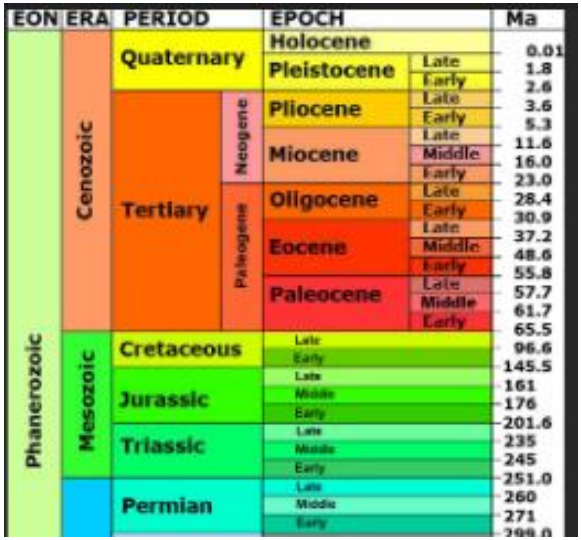


PEAKPROCESSING

A07 Location





- Uppermost bedrock from the Cretaceous period
- Opening up of the Atlantic since Cenozoic
- Compression of the African and Eurasian plate started during the Eocene with most uplift during the Oligocene

A07

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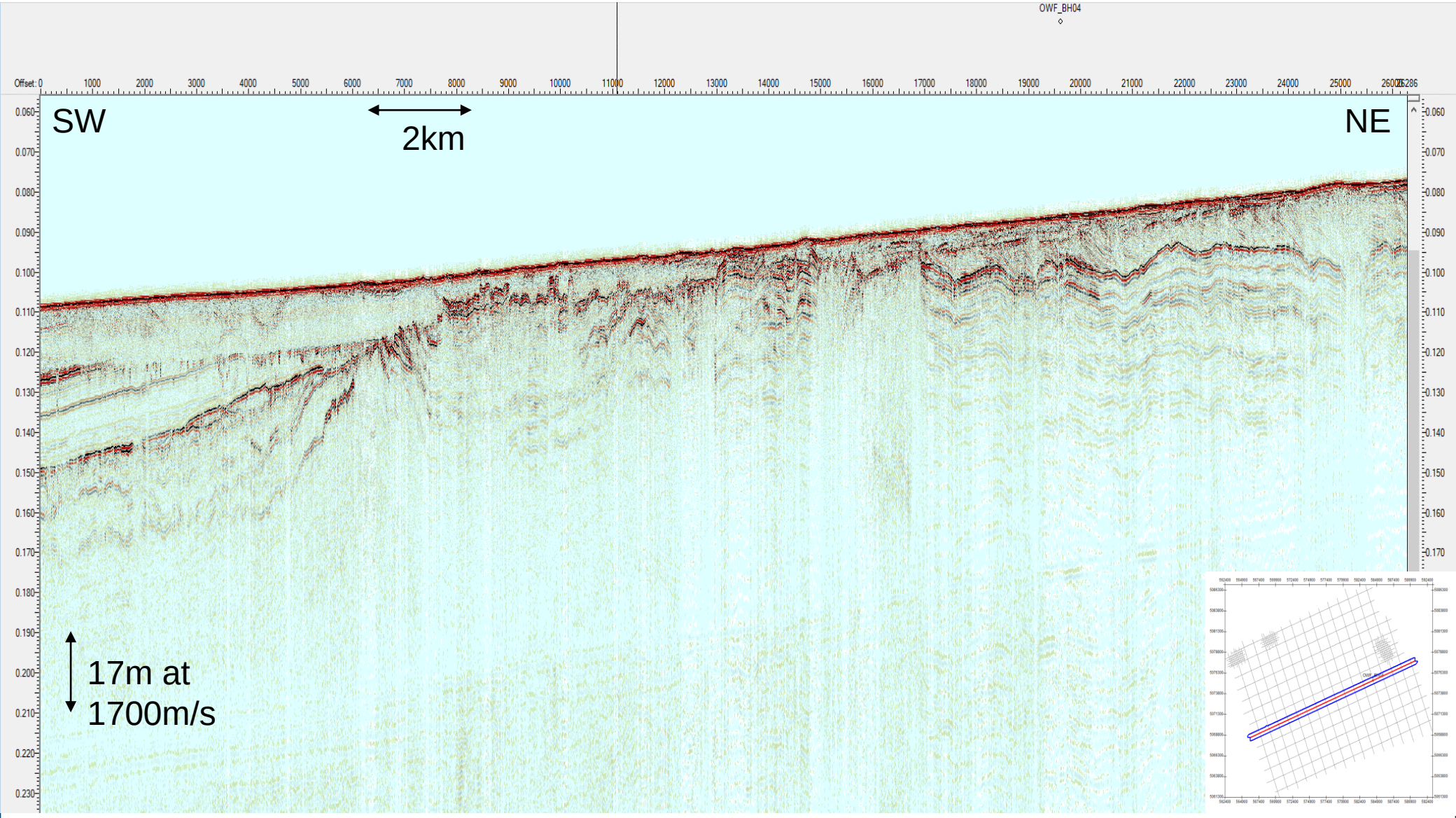

PEAKPROCESSING

A07

TECNOAMBIENTE
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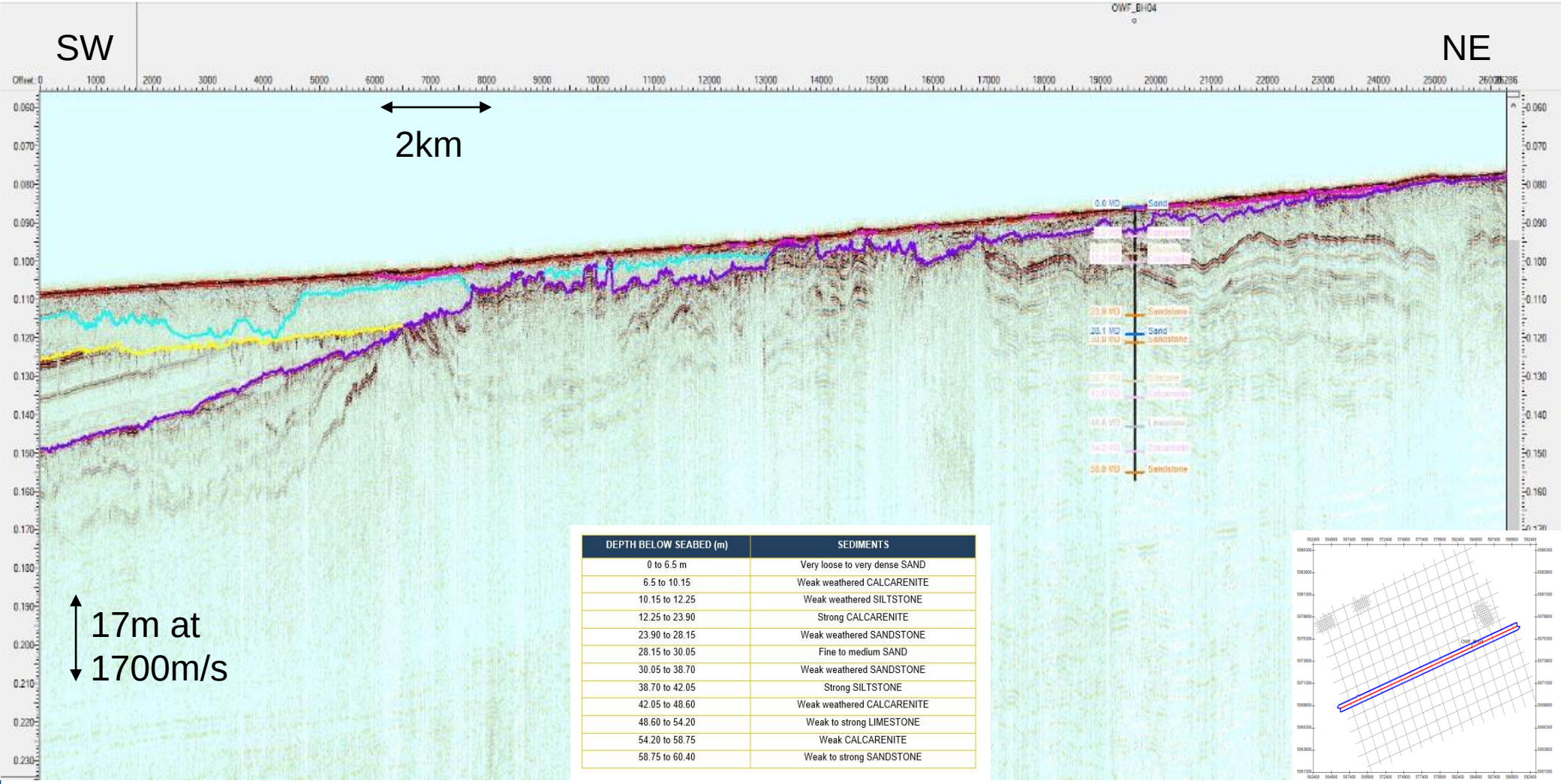
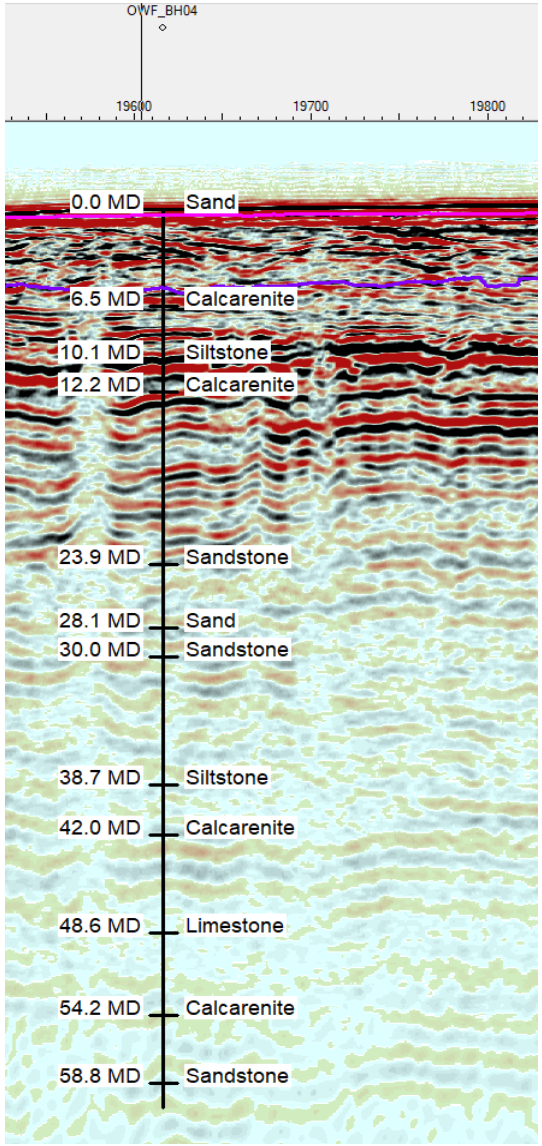


DEPTH BELOW SEABED (m)	SEDIMENTS
0 to 6.5 m	Very loose to very dense SAND
6.5 to 10.15	Weak weathered CALCARENITE
10.15 to 12.25	Weak weathered SILTSTONE
12.25 to 23.90	Strong CALCARENITE
23.90 to 28.15	Weak weathered SANDSTONE
28.15 to 30.05	Fine to medium SAND
30.05 to 38.70	Weak weathered SANDSTONE
38.70 to 42.05	Strong SILTSTONE
42.05 to 48.60	Weak weathered CALCARENITE
48.60 to 54.20	Weak to strong LIMESTONE
54.20 to 58.75	Weak CALCARENITE
58.75 to 60.40	Weak to strong SANDSTONE

PEAKPROCESSING

OWF_BH04



- Top Bedrock on the UHR data aligns well with the depth to rock on BH04

- Velocity data below top bedrock likely to be too slow, but the data is useful to show the layers within the rock

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48.60 to 54.20	Weak to strong LIMESTONE
54.20 to 58.75	Weak CALCARENITE
58.75 to 60.40	Weak to strong SANDSTONE

A07

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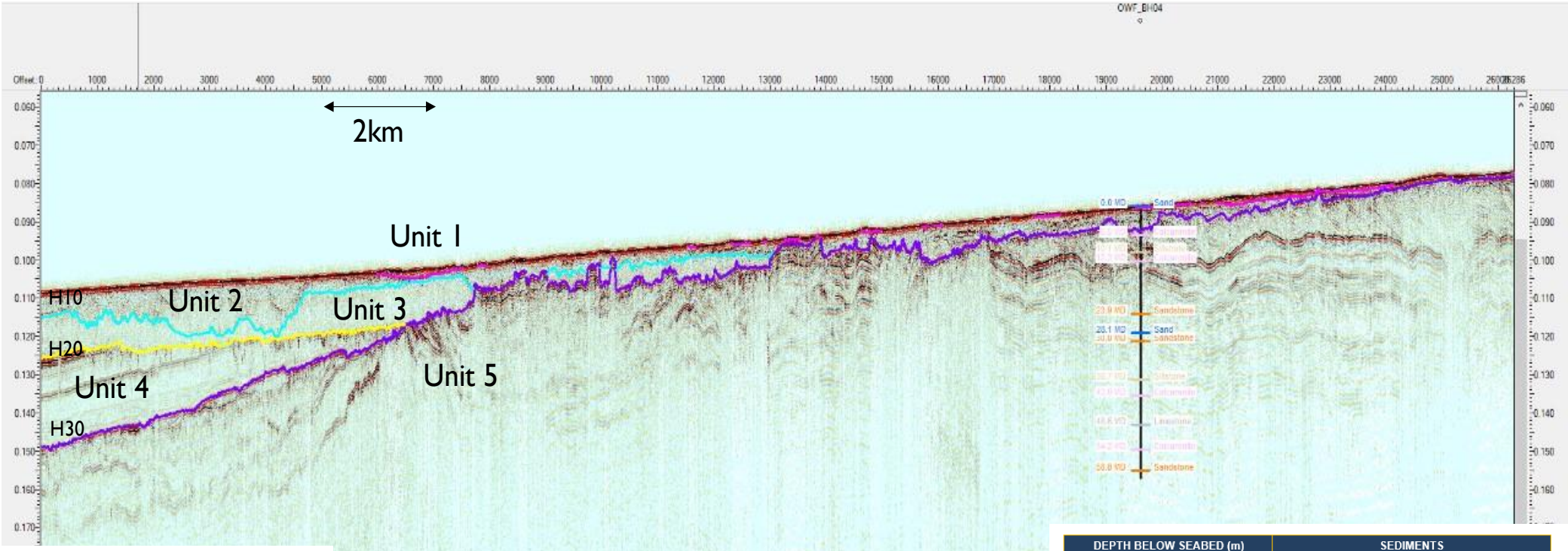

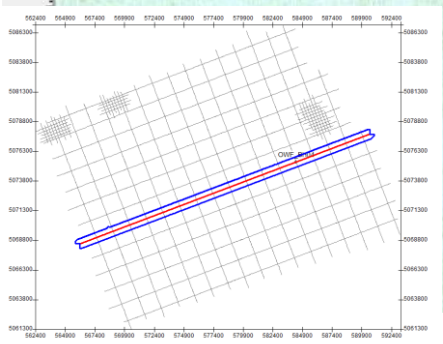

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38.70 to 42.05	Strong SILTSTONE
42.05 to 48.60	Weak weathered CALCARENITE
48.60 to 54.20	Weak to strong LIMESTONE
54.20 to 58.75	Weak CALCARENITE
58.75 to 60.40	Weak to strong SANDSTONE

PEAKPROCESSING

A07

TECNOAMBIENTE
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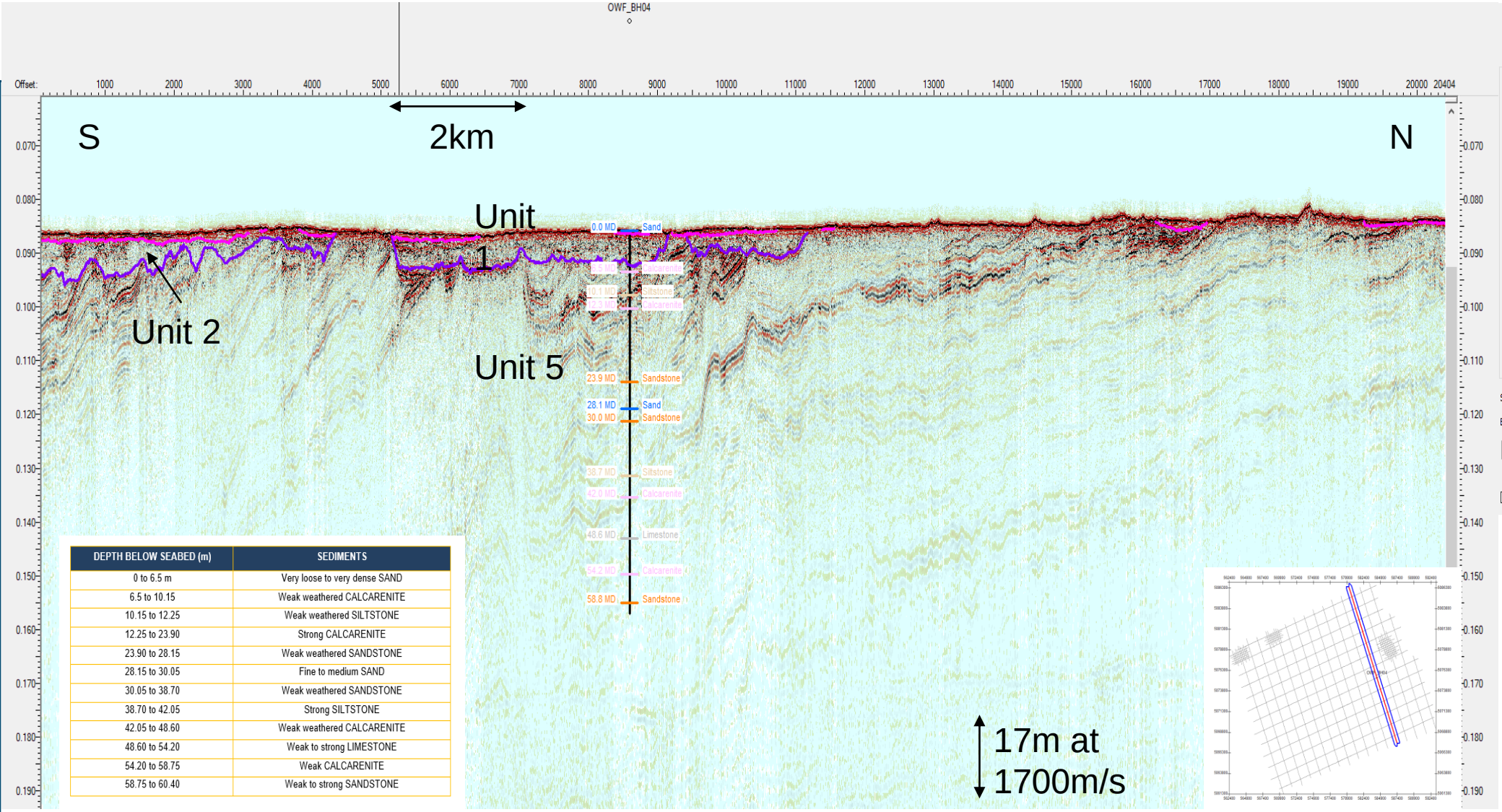

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48.60 to 54.20	Weak to strong LIMESTONE
54.20 to 58.75	Weak CALCARENITE
58.75 to 60.40	Weak to strong SANDSTONE

PEAKPROCESSING

THANK YOU!

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Contact us

España

Catalunya (HQ)
Ronda Can Fatjó 19-B, Parc Tecnològic del Vallès
08290 Cerdanyola del Vallès (Barcelona)
T. +34 93 594 20 36
F. +34 93 387 80 39
tecnoambiente@tecnoambiente.com

Catalunya (Laboratory)
C/ Indústria, 550 – 552
08918 Badalona (Barcelona)
T. +34 93 387 80 80
F. +34 93 387 80 39
tecnoambiente@tecnoambiente.com

Andalucía
c/ Newton nº 15 Letra E, Parque empresarial
11407 Jerez de la Frontera (Cádiz)
T. +34 956 30 24 86
F. +34 956 31 01 39
delegacion.andalucia@tecnoambiente.com

Galicia
Avda. Fisterra, 275, 2º
15008 A Coruña
T. +34 981 27 47 20
F. +34 981 27 47 77
delegacion.galicia@tecnoambiente.com

Aragón (Laboratory)
C/ Sisallo, nave D9, Pol. Ind. Empresarium
50720 Zaragoza
T. +34 976 13 26 33
F. +34 976 13 26 48
delegacion.aragon@tecnoambiente.com

Canary Islands
C/ Domingo J. Navarro, 48 - bajo
35002 Las Palmas de Gran Canaria
T. +34 93 594 20 36
F. +34 93 387 80 39
delegacion.canarias@tecnoambiente.com

Perú

Avda. Arequipa, 2450, Oficina 608
Lince, LIMA
T. +51 444 1238
sucursal.peru@tecnoambiente.com

Colombia

Calle 90, 12 -28, Oficina 24
Chicó, Bogotá D.C.
T. +571 6386894
sucursal.colombia@tecnoambiente.com