



KAVEL 10: DE LINK TUSSEN ONSHORE EN OFFSHORE COVERAGE

31-Jul-25

- Deep
- De service van Kavel 10
- BorWin 6

31-Jul-25

SOORTEN OPDRACHTEN



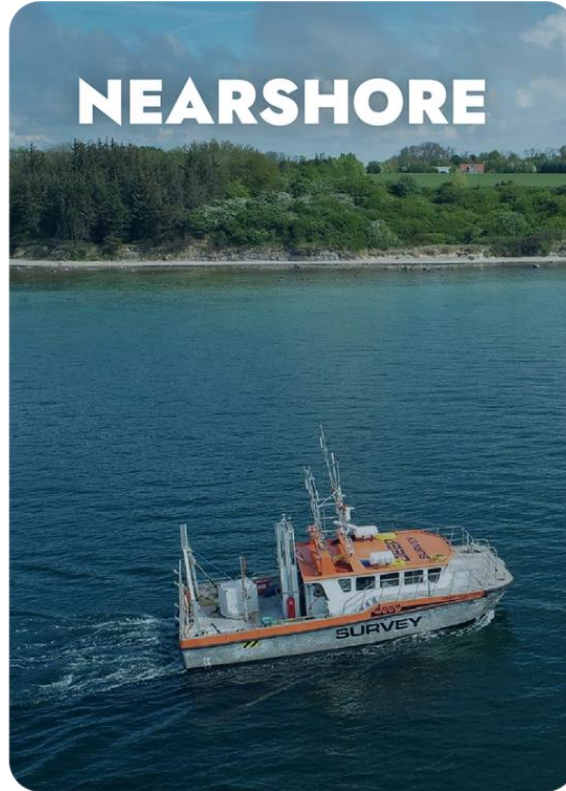


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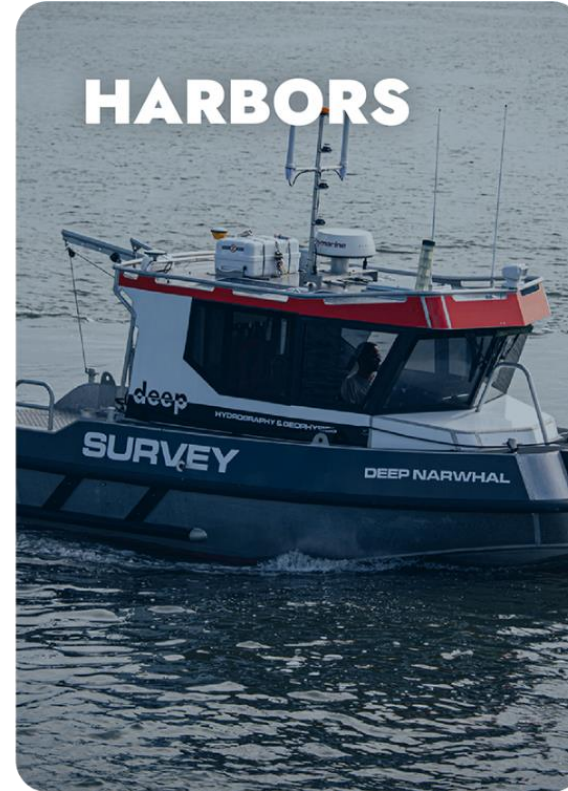
OFFSHORE



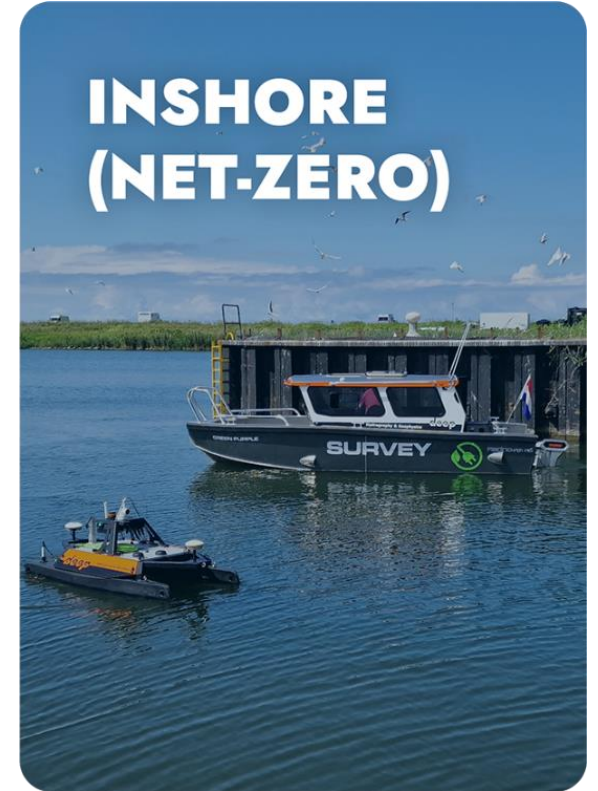
NEARSHORE



HARBORS



INSHORE (NET-ZERO)



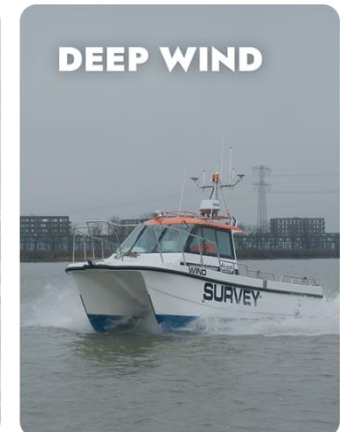
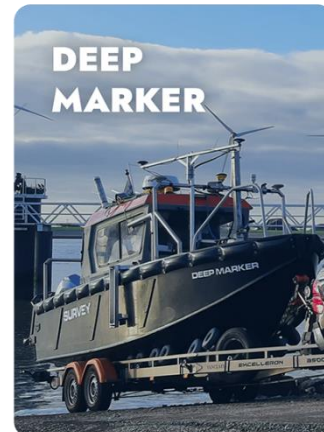
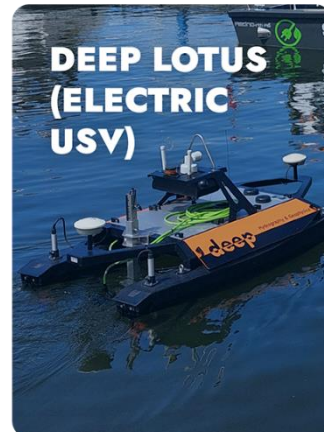
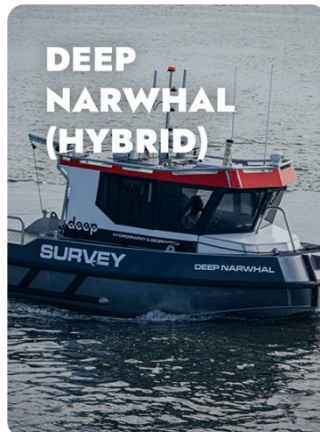
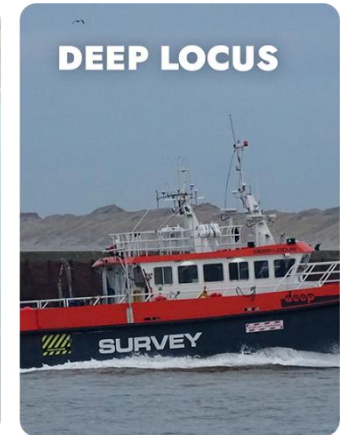
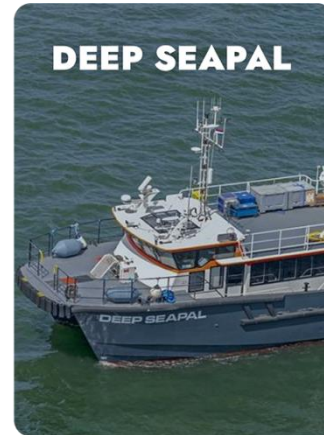
SOORTEN OPDRACHTEN

- Marine en Geofysisch onderzoek op **Route Surveys**
- **UXO Detectie en Avoidance Surveys**
- Deep Green Emissie vrije surveys op binnenwater
- **Hydrografische Surveys**
- Dredging Support met USV's
- Geofysische & Hydrografische Data Processing
- Berging Support en Emergency Response
- Surface en Sub-surface Offshore Positionering
- **Subsea Kabel & Pijpleiding Pre- and Post-installatie Surveys**
- Subsea Kabel & Pijpleiding DoB (diepteligging)
- **Marine Archaeologische Surveys**
- Kademuren & golfbreker Inspecties

31-Jul-25



OUR VESSELS



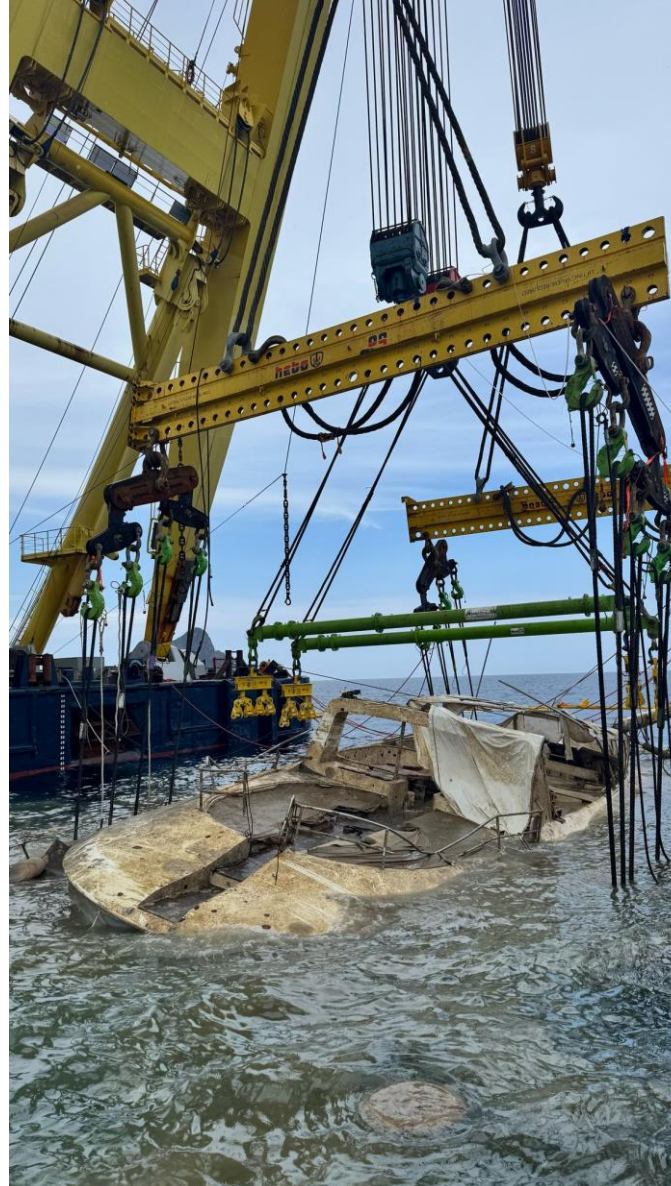
Windmolenpark IJmuiden Ver

- Scour protection surveys
- Inter array cable
- Offshore substation



Bergingswerk

- Positionering dmv USBL
- MBES in- uit survey



Diepte meting rondom
woonboten bij IJburg

- Multibeam en Sidescan sonar
- 100% electric



Uxo detectie Port of Leith

- MAG, MBES, SSS
- Voorbereiding
baggerwerkzaamheden



Nexans BorWin 6

Route survey met aanlanding

Getijdengebied

Bathymetrische data MBES en SSS voor targets



NEXANS – AANLEG BORWIN 6 KABEL



DAN MOETEN WIJ DEEPERS...



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13

... DE MANNEN VAN KAVEL 10 BELLEN

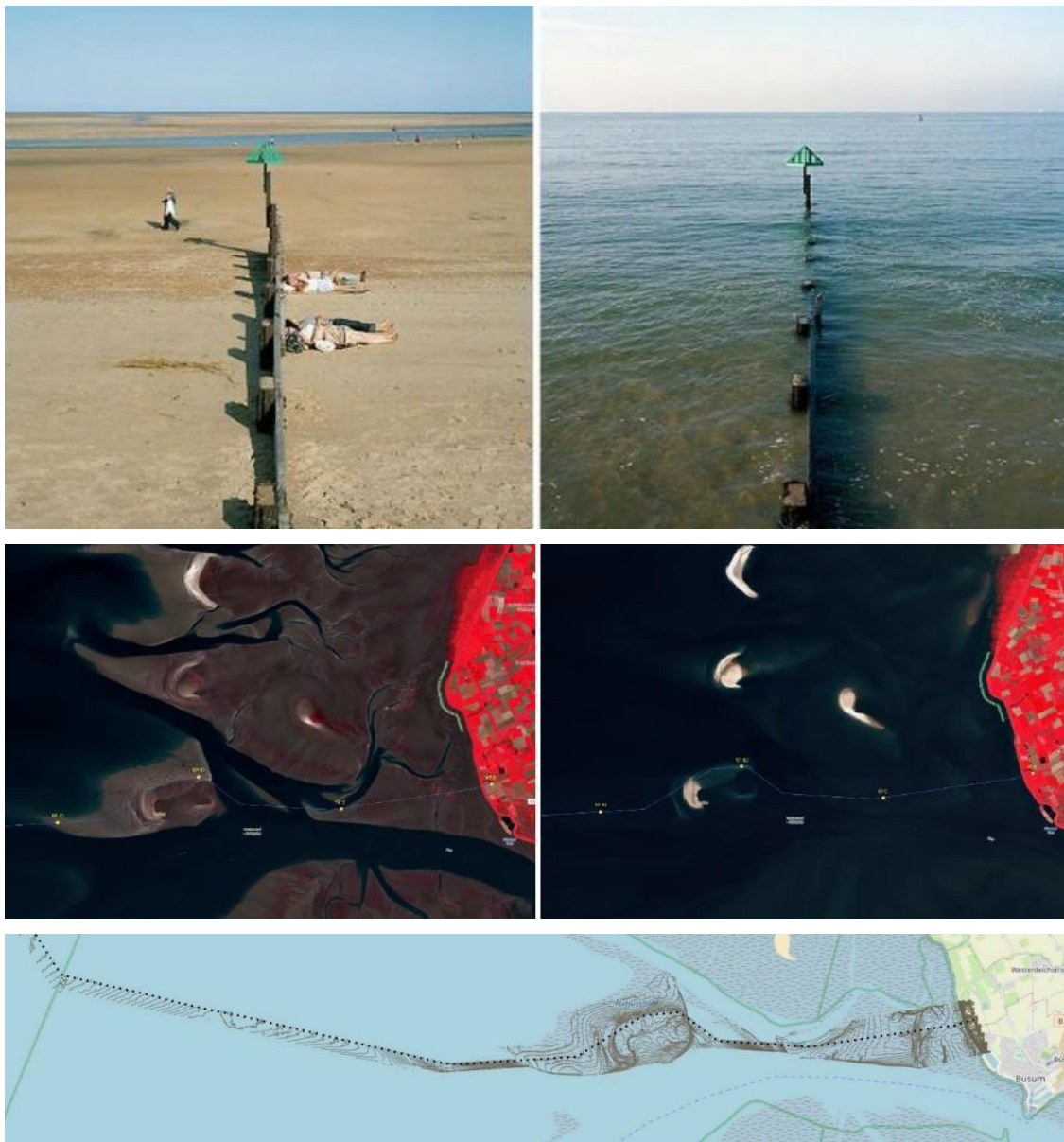


SCOPE DEEP & SCOPE KAVEL 10S

Survey snelheid

Kavel 10: $9.7 \text{ km}^2/\text{uur}$

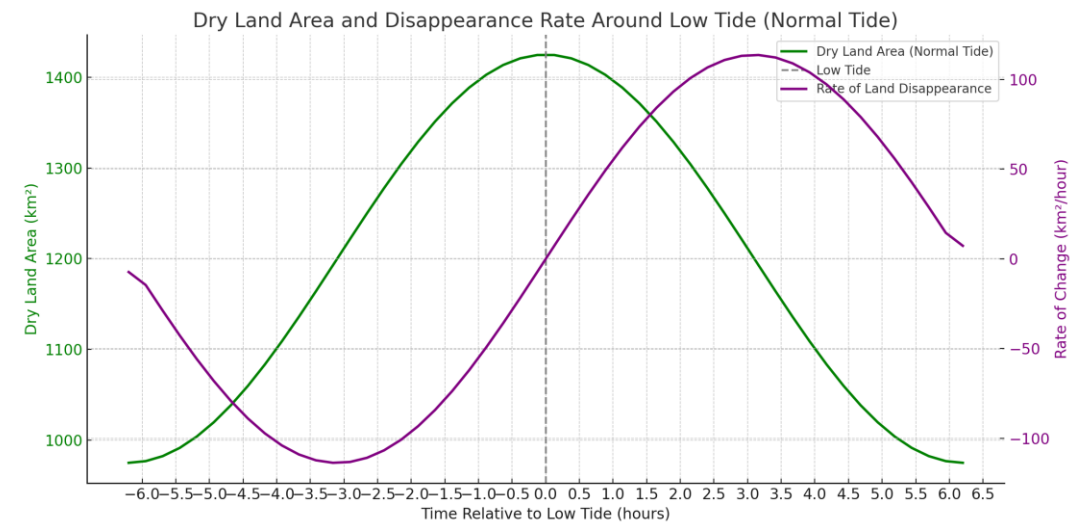
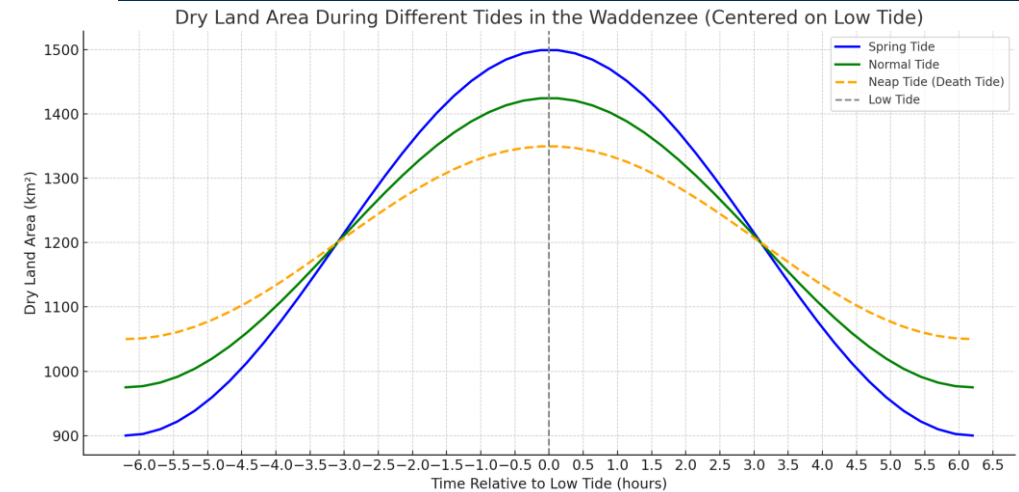
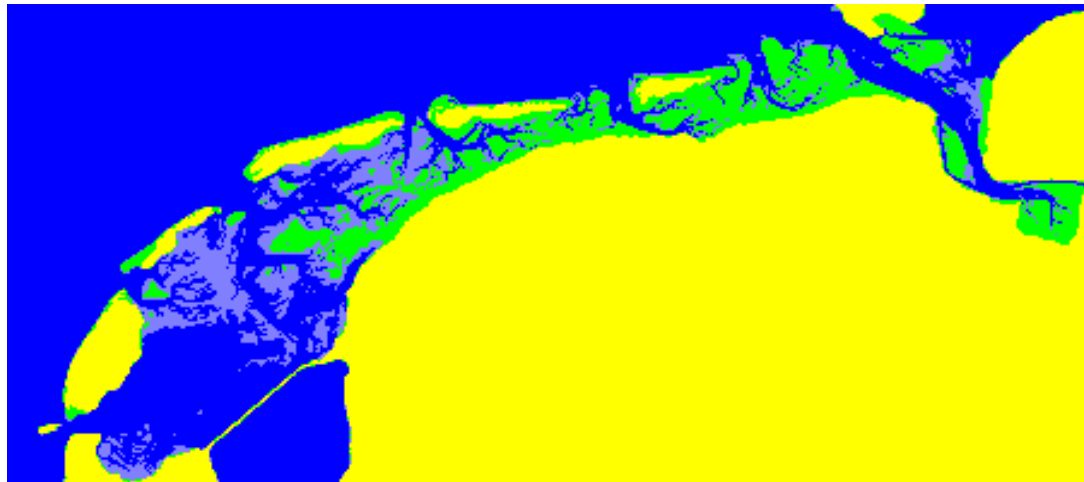
Deep Wind: $0.07 \text{ km}^2/\text{uur}$



EFFICIENTE SAMENWERKING

Survey snelheid

- Efficiëntie springtij do tij, vliegen tussen + en – 30 min rondom spring laag water. Waarom?



Start tot eind

- Benodigde dichtheid tbv boulders/debris
 - Survey parameters
 - Data deliverables
- Survey
- Classificeren
- Prelim water naar klant
- Controle coverage
- Combineren van beide data sets.

Parameters:

Hitcount, nauwkeurigheid en dergelijke.

MBES		
Item	Requirement	Remarks
Coverage	100%	Applicable for 95% per survey area/block
Overlap	25%	
Pings per cell	3	Valid pings per 0.2m cell (bin)
Object detection size	0.4m	
Grid size	0.2m	0.1m preferred (optional item)
Frequency	400kHz	

De vraag van DEEP naar K10

Project informatie (PEP)

Geodesie horizontaal, ETRS89 UTM 32N inclusief translatie en rotatie parameters

Data deliverables

Geodetic Configuration

Switch to Advanced Setup

Project Coordinate System:

ETRS89 / UTM zone 32N + DHHN2016 height

Vertical Datum: DHHN2016 Height - GCG2016 (Germany)

Source Coordinate System:

WGS 84 (4326)

Transformation:

WGS 84 to ETRS89 (Custom)

Name: WGS 84 to ETRS89

EPSG:

Source Coordinate System: WGS 84

EPSG: 4326

Target Coordinate System: ETRS89

EPSG: 4258

Swap Source and Target Coordinate Systems

Method: Helmert (7 Parameters)

Position Vector

EPSG: 1033

Parameter	Value
X-axis translation	0.05615
Y-axis translation	0.05365
Z-axis translation	-0.10165
X-axis rotation	0.002876
Y-axis rotation	0.017395
Z-axis rotation	-0.028116
Scale difference	0.003715
Accuracy	1.0
Linear unit	meter
Angular unit	arcsecond
Scale unit	part per million

Geodesie verticaal

Aangeleverd als XYZ data



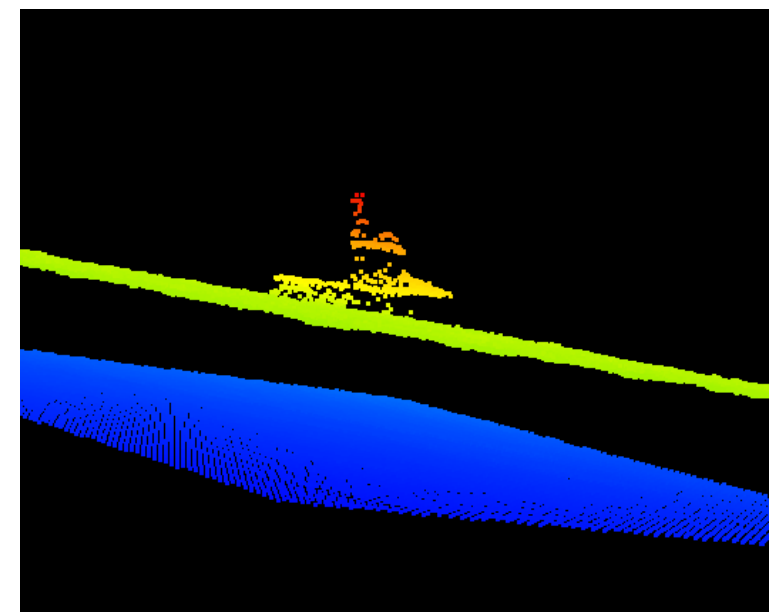
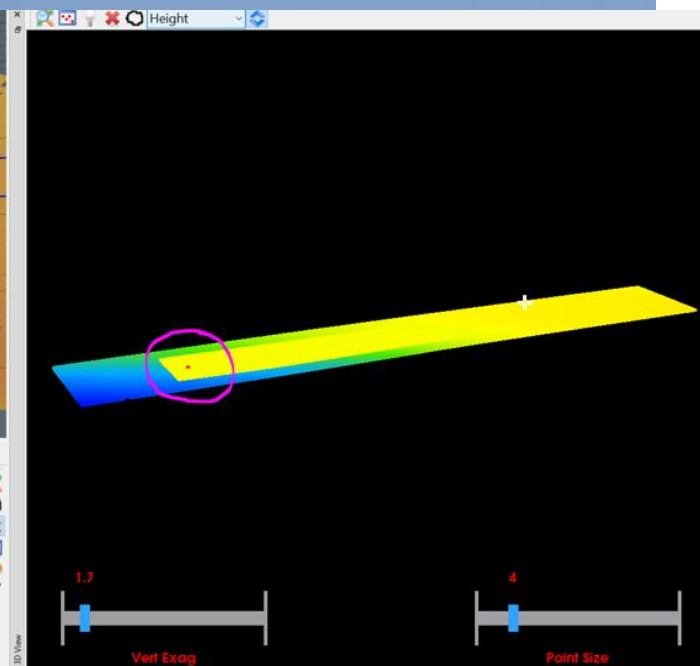
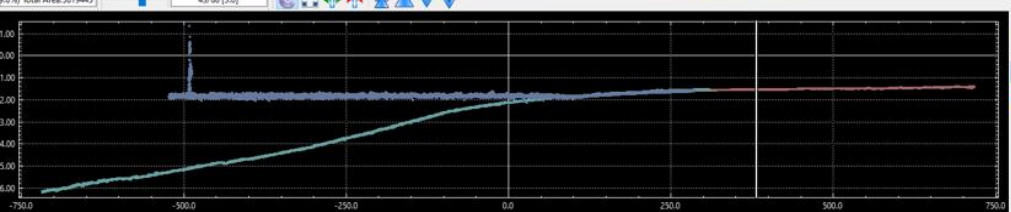
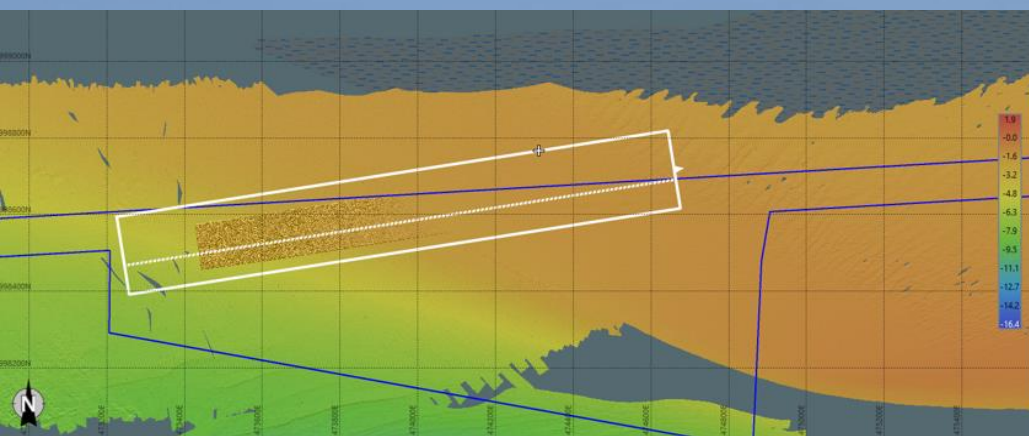
SURVEY



LiDAR survey tijdens laag water, voor maximale dekking.

Vliegtuig gespot door peilboot

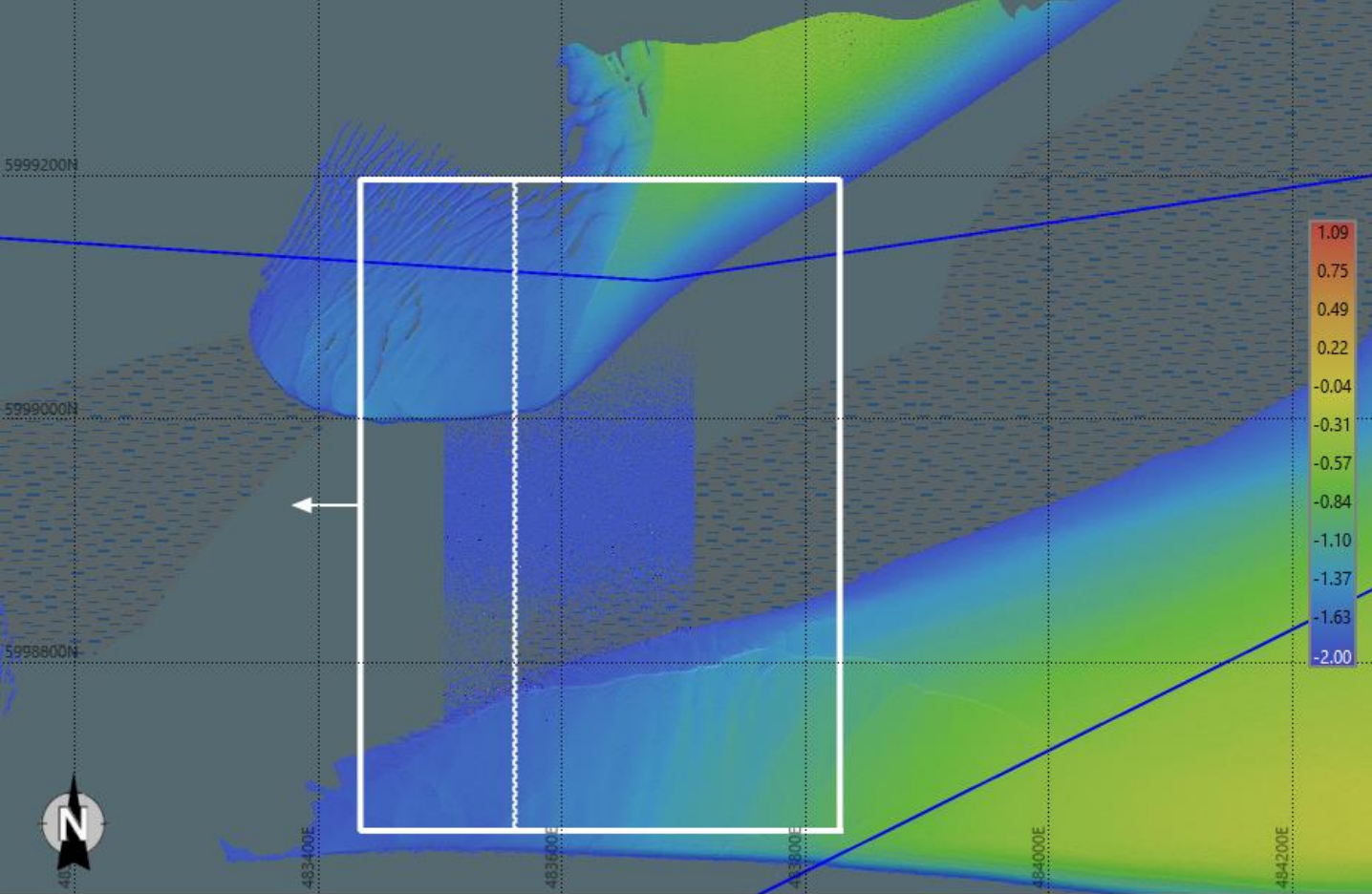
Peilboot gemeten door vliegtuig



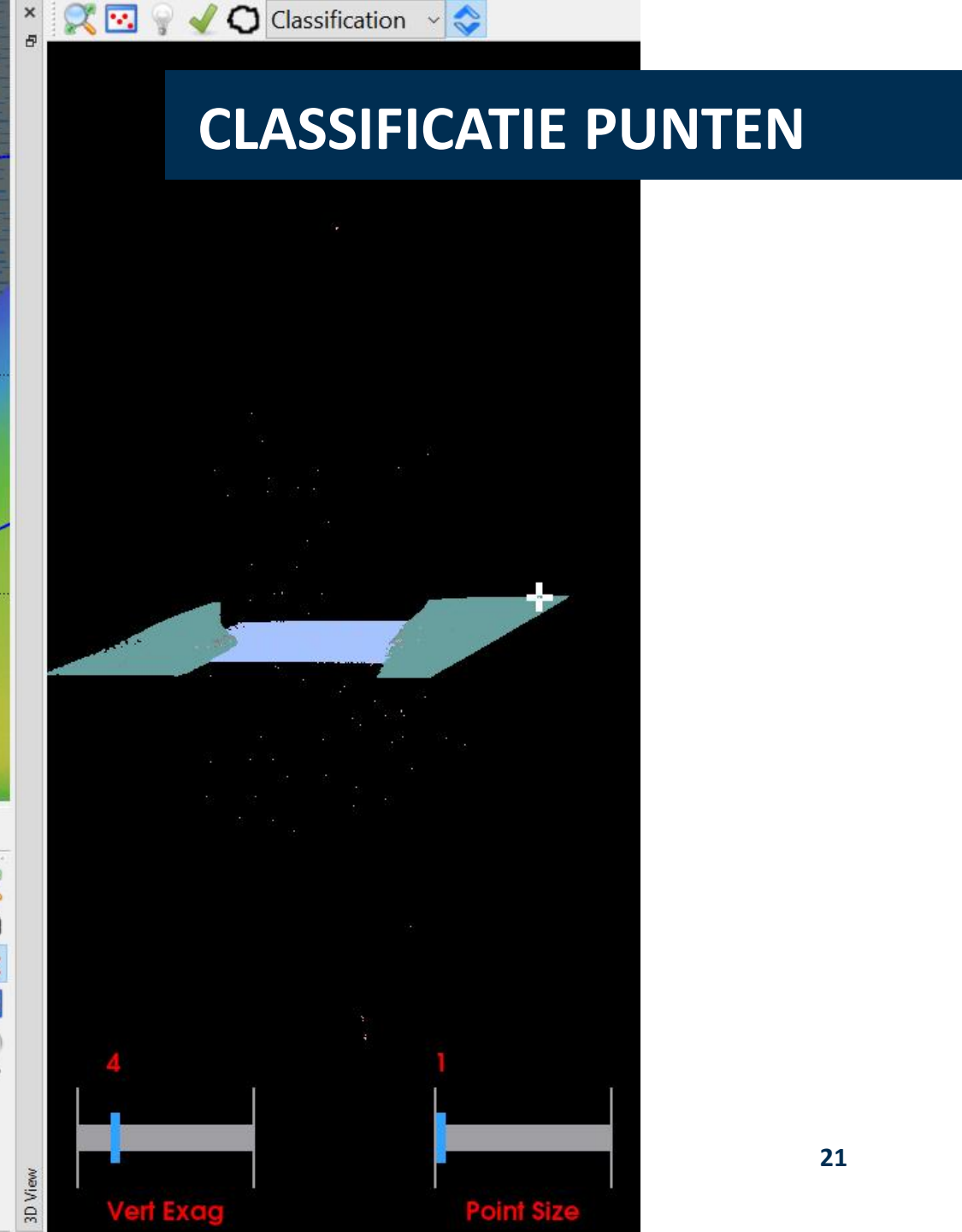
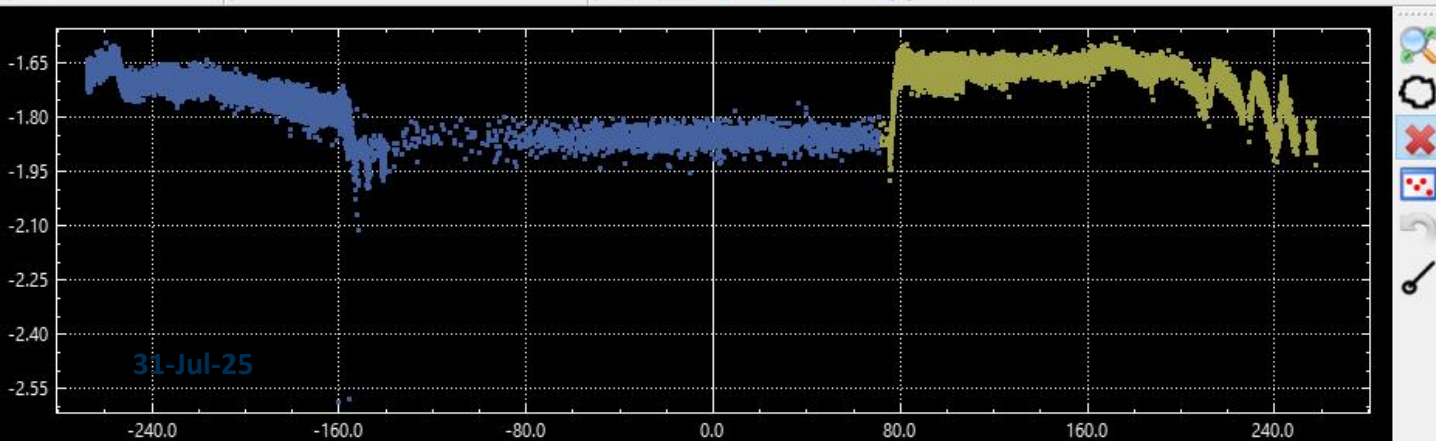
PRELIMINAIRE RESULTATEN

Shapefile met gedeeltes water





0.2% Total Area: 4465557 177/261 [1.5]



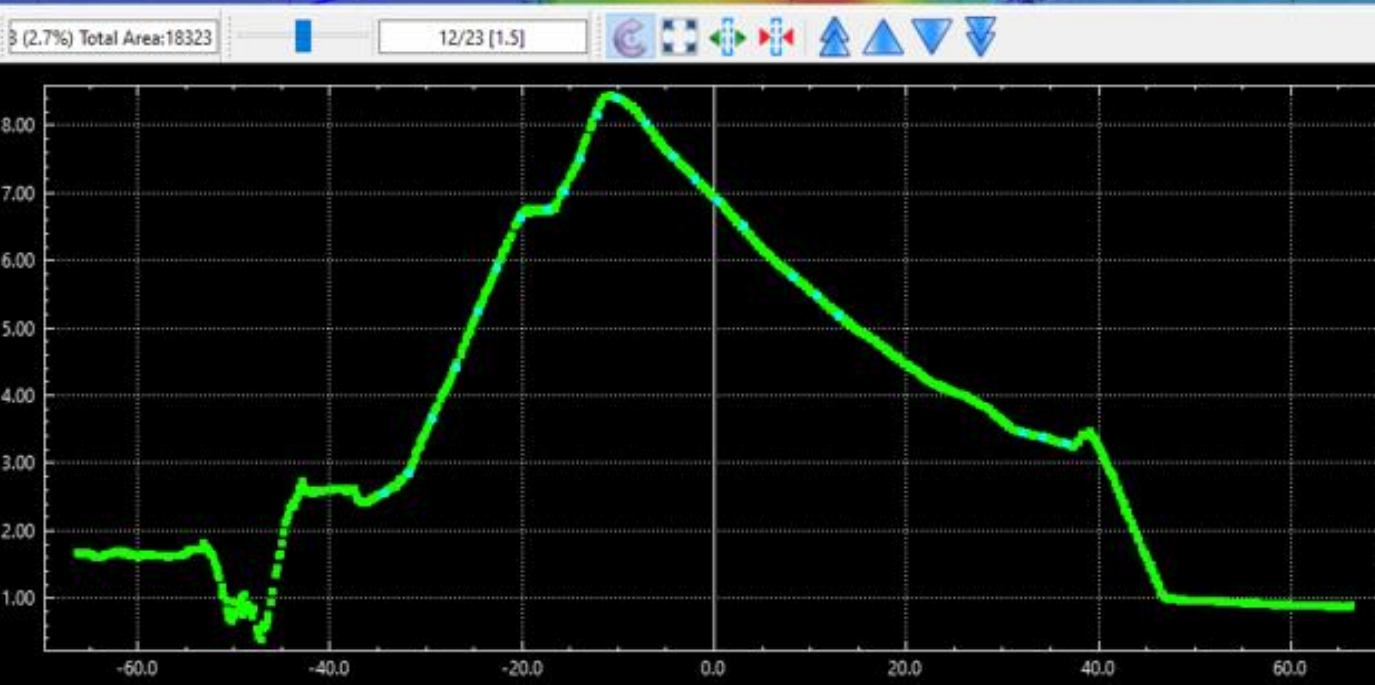
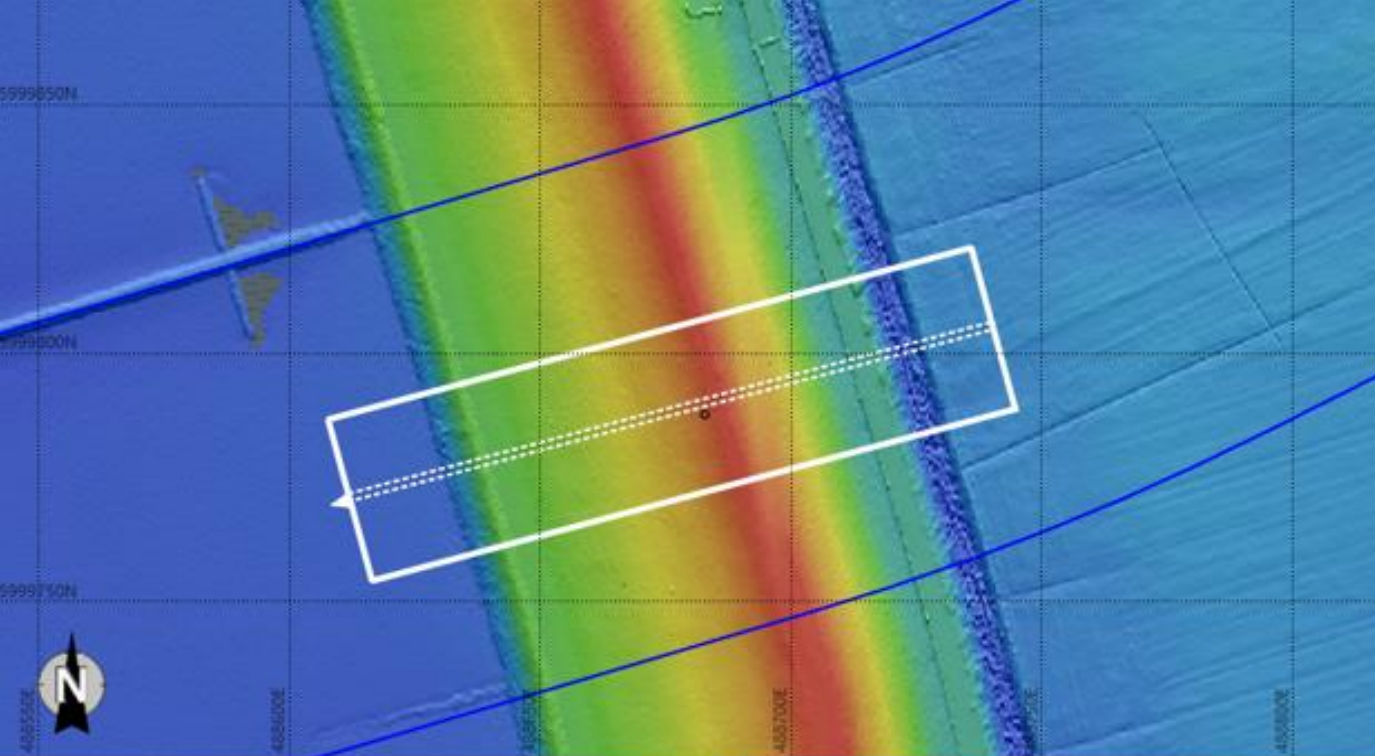
CONTROLEPUNTEN

Controlepunten op de dijk

Ingemeten met RTK Stonex positionering.

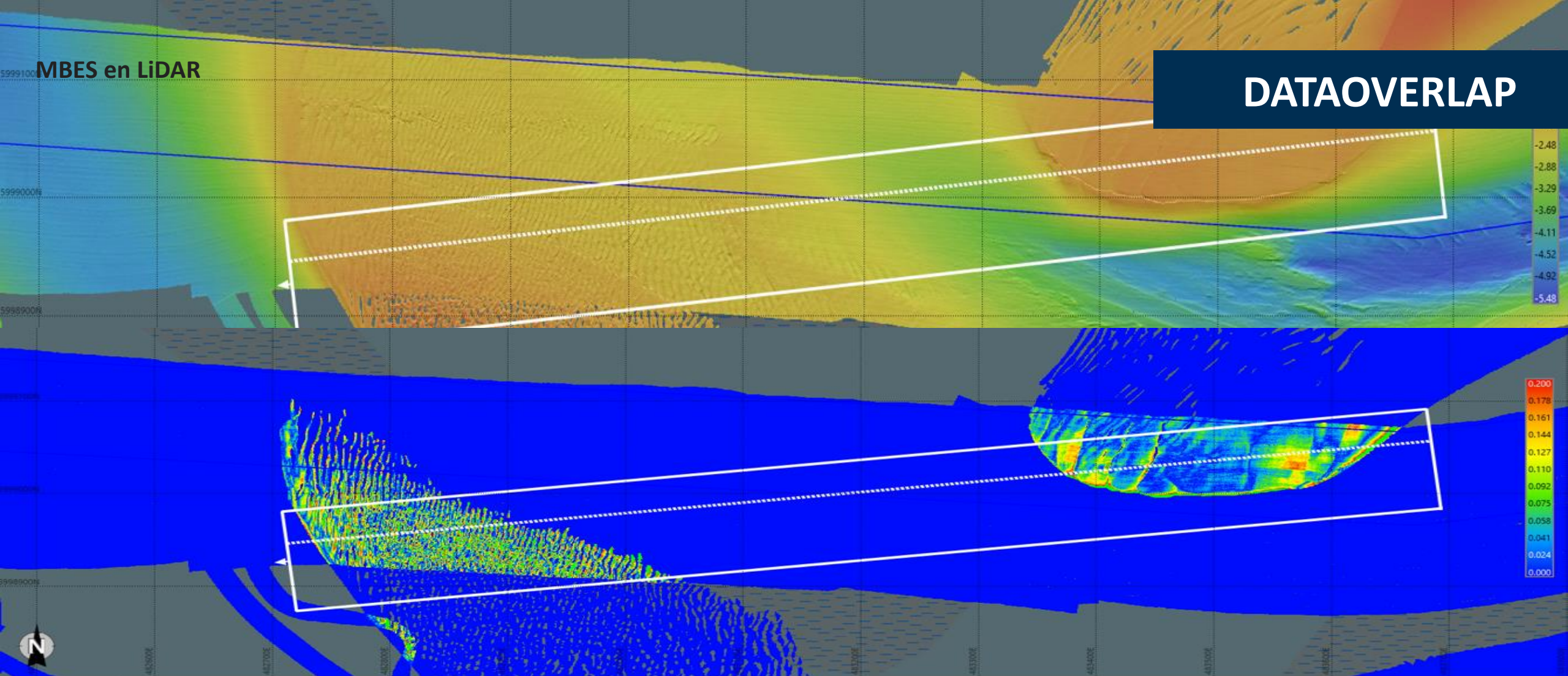
Controle op LiDAR

Sluit perfect!



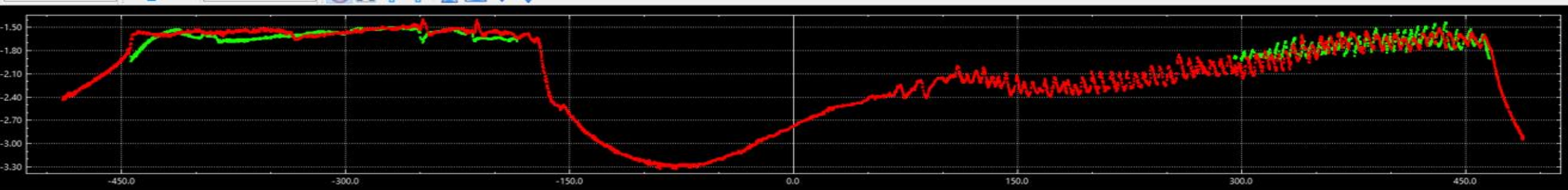
MBES en LiDAR

DATAOVERLAP



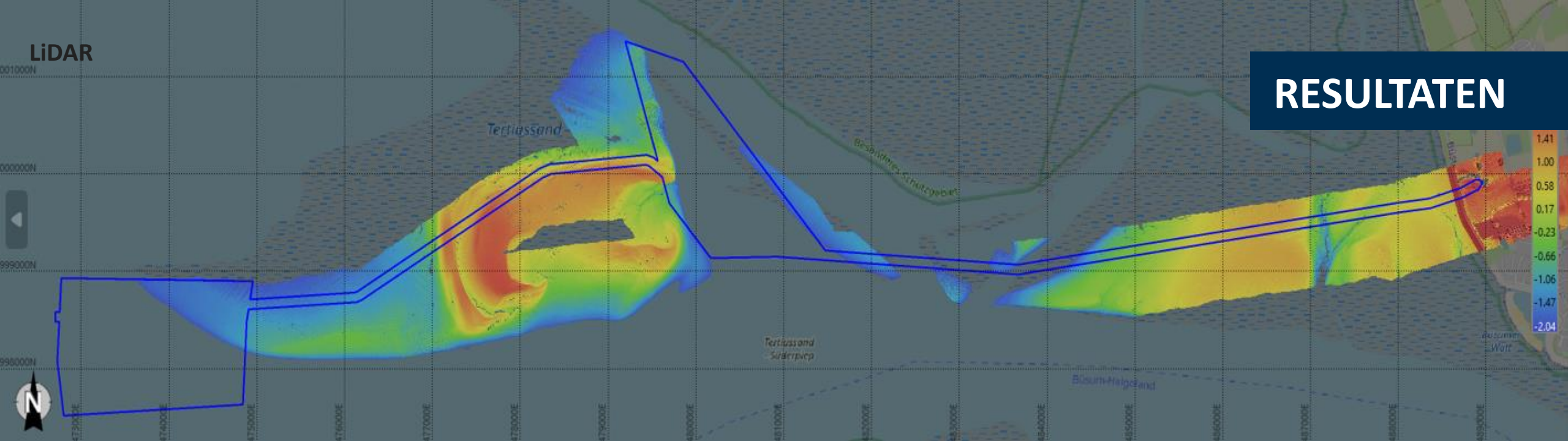
(0.7%) Total Area:536472

49/72 [1.5]

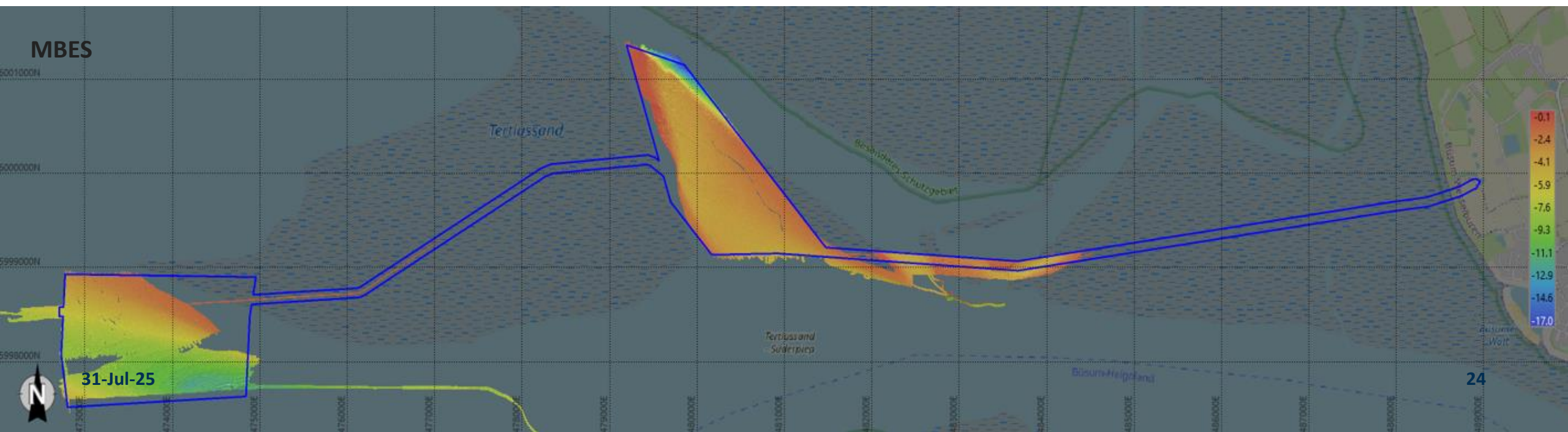


LiDAR

RESULTATEN

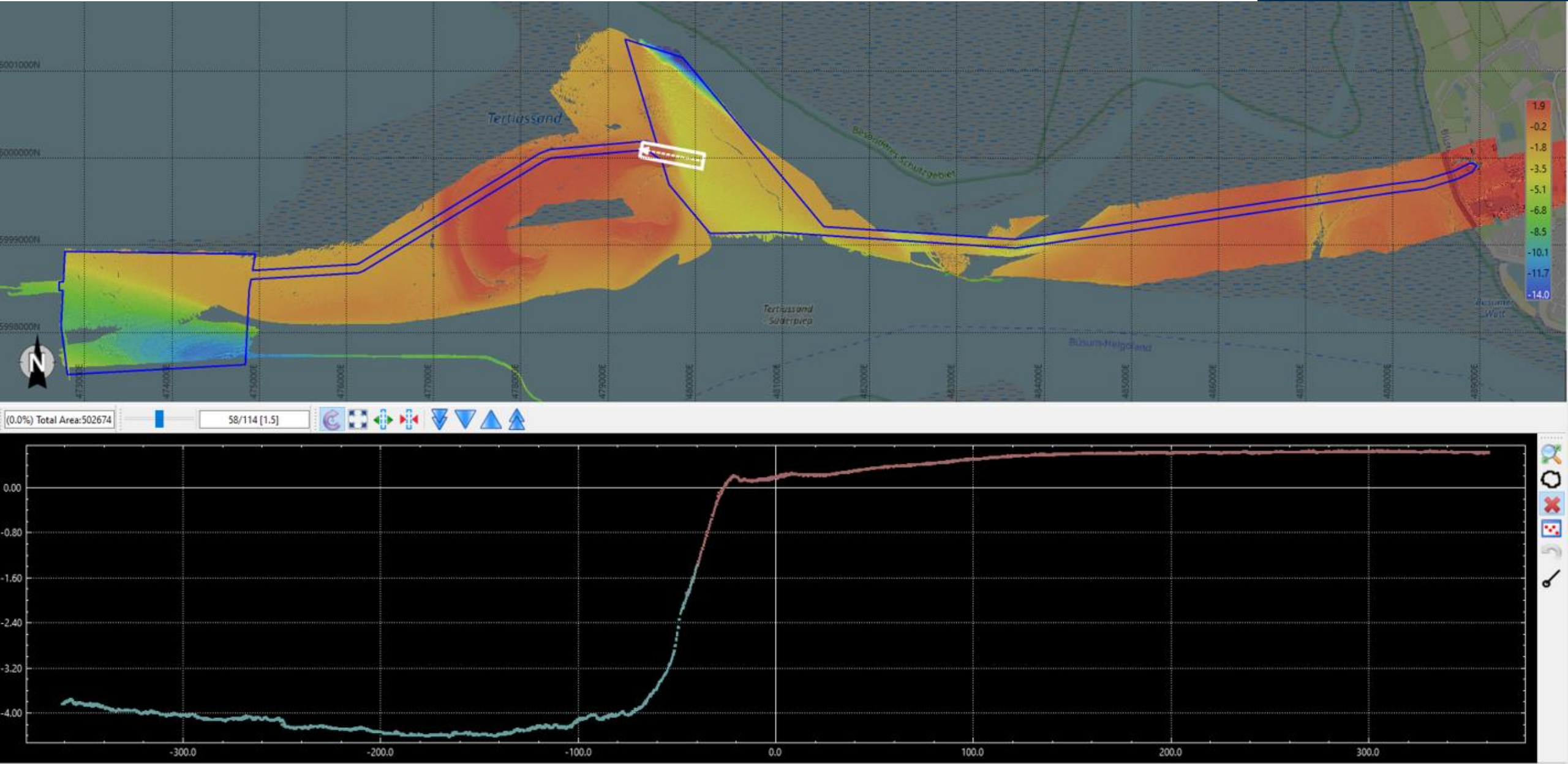


MBES



LiDAR en MBES gecombineerd.
Eindresultaat inclusief profiel

RESULTATEN

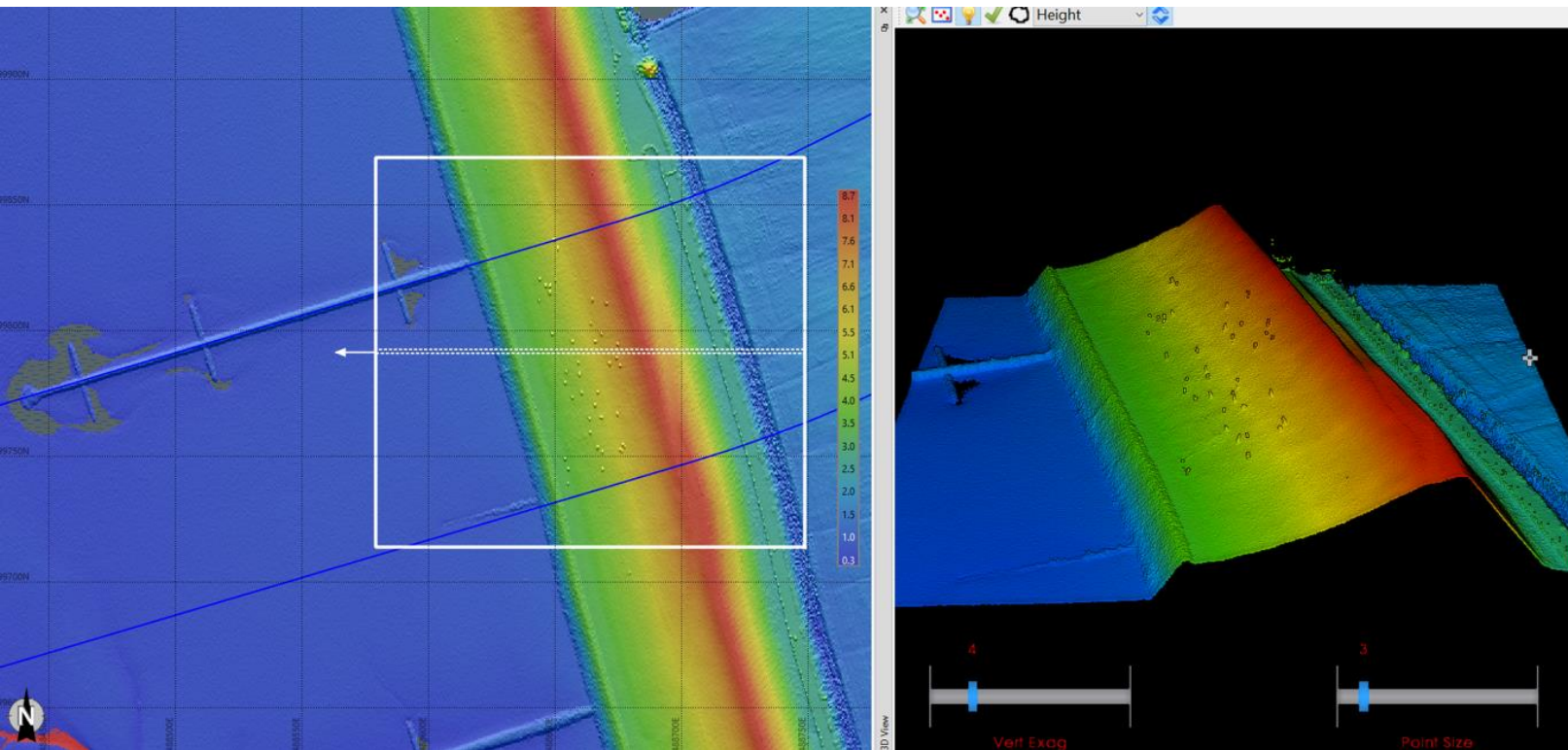


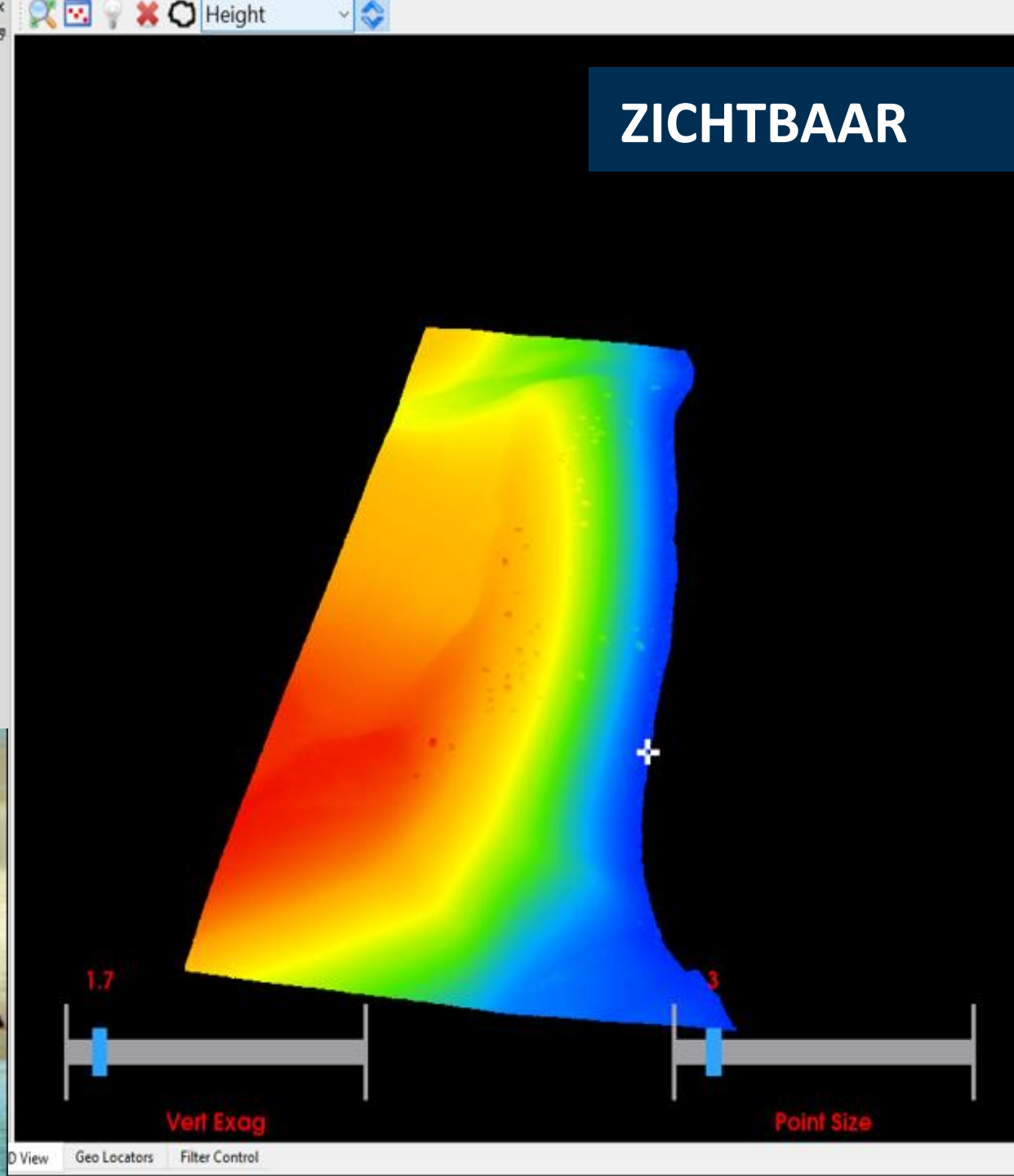
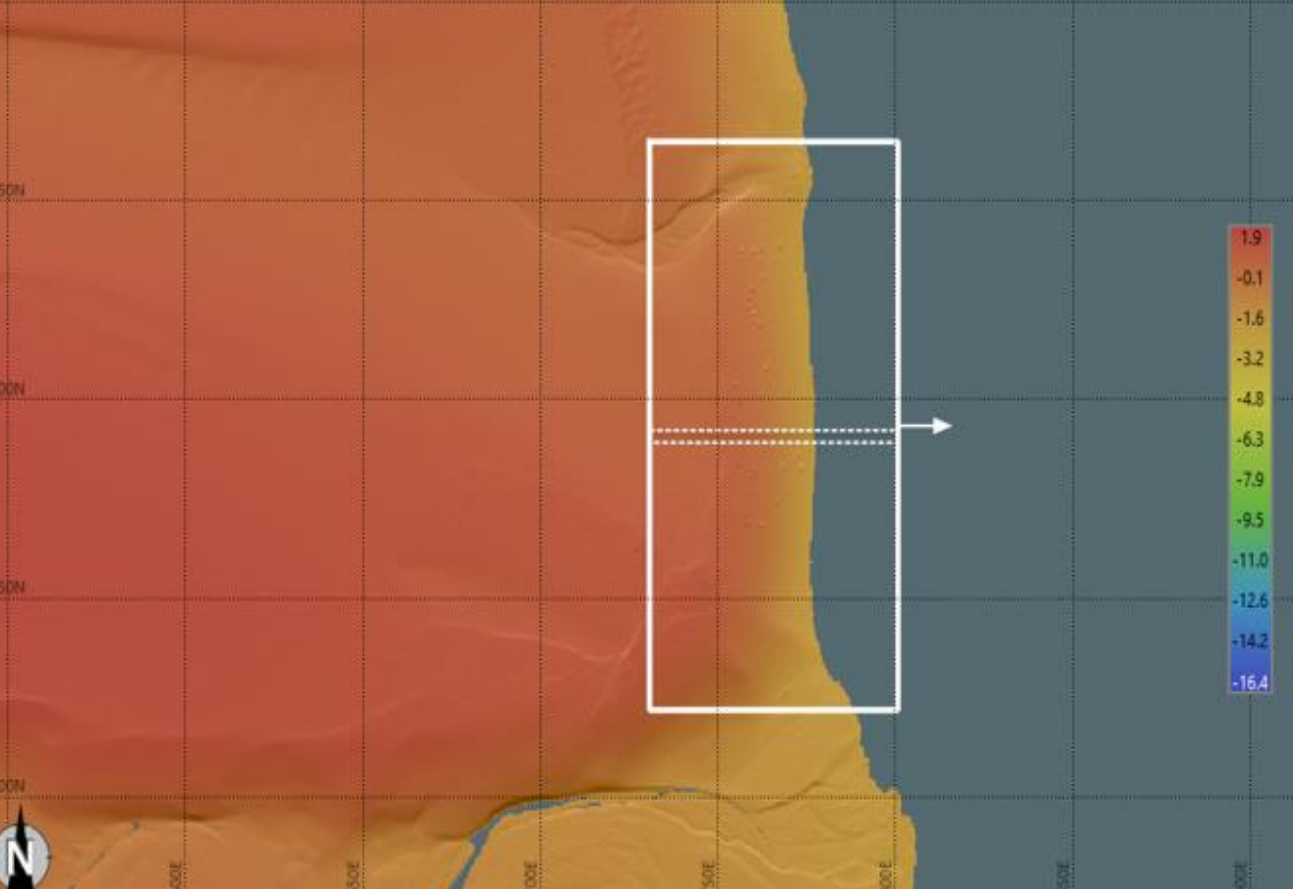
ZICHTBAAR VERSUS ONZICHTBAAR

LiDAR

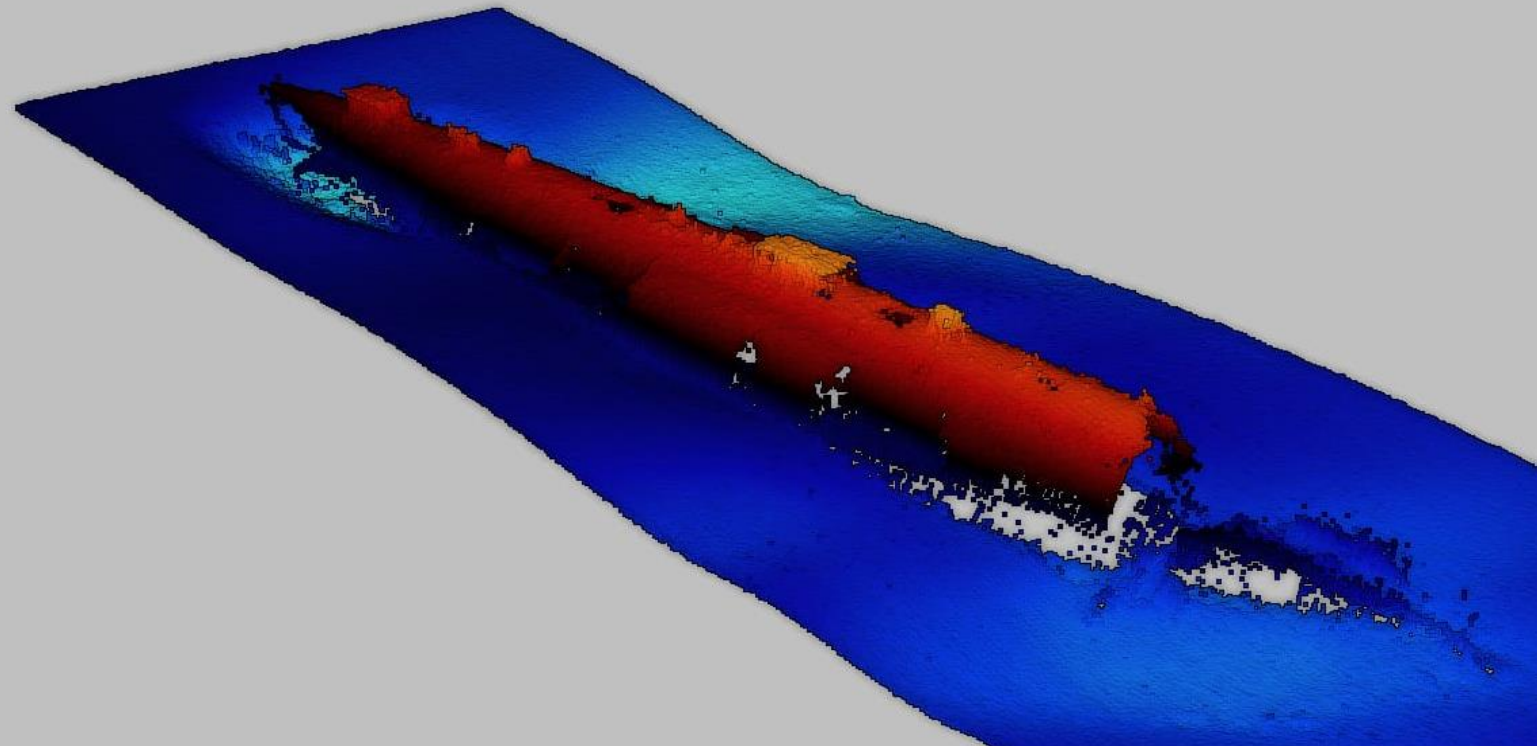
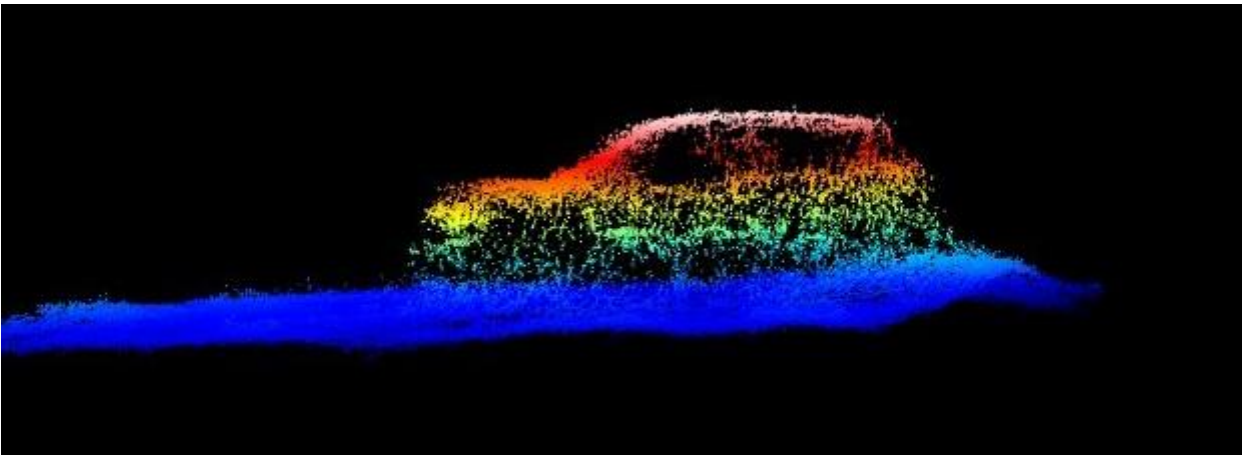
Bekend terrein

Diverse voorbeelden:



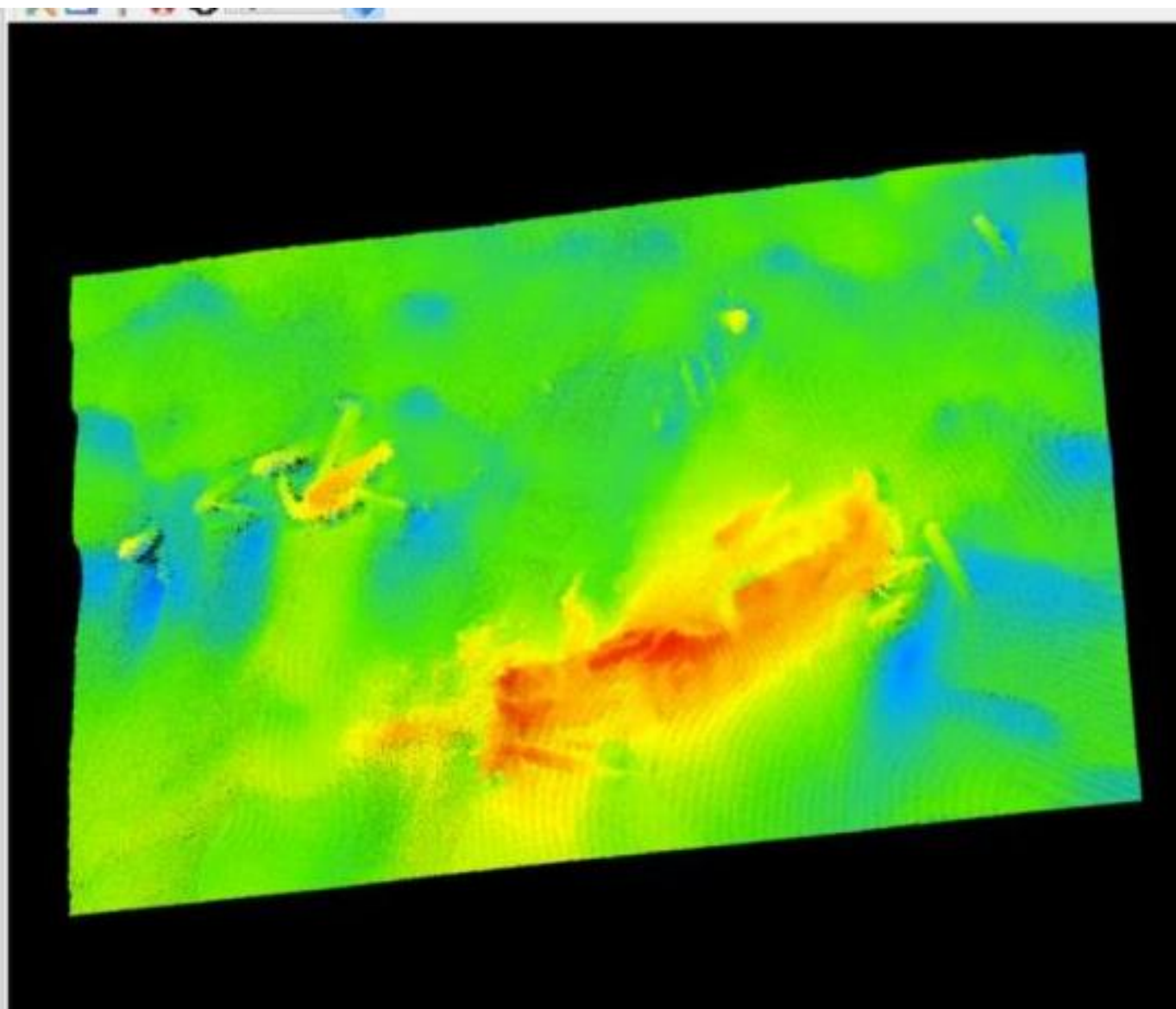
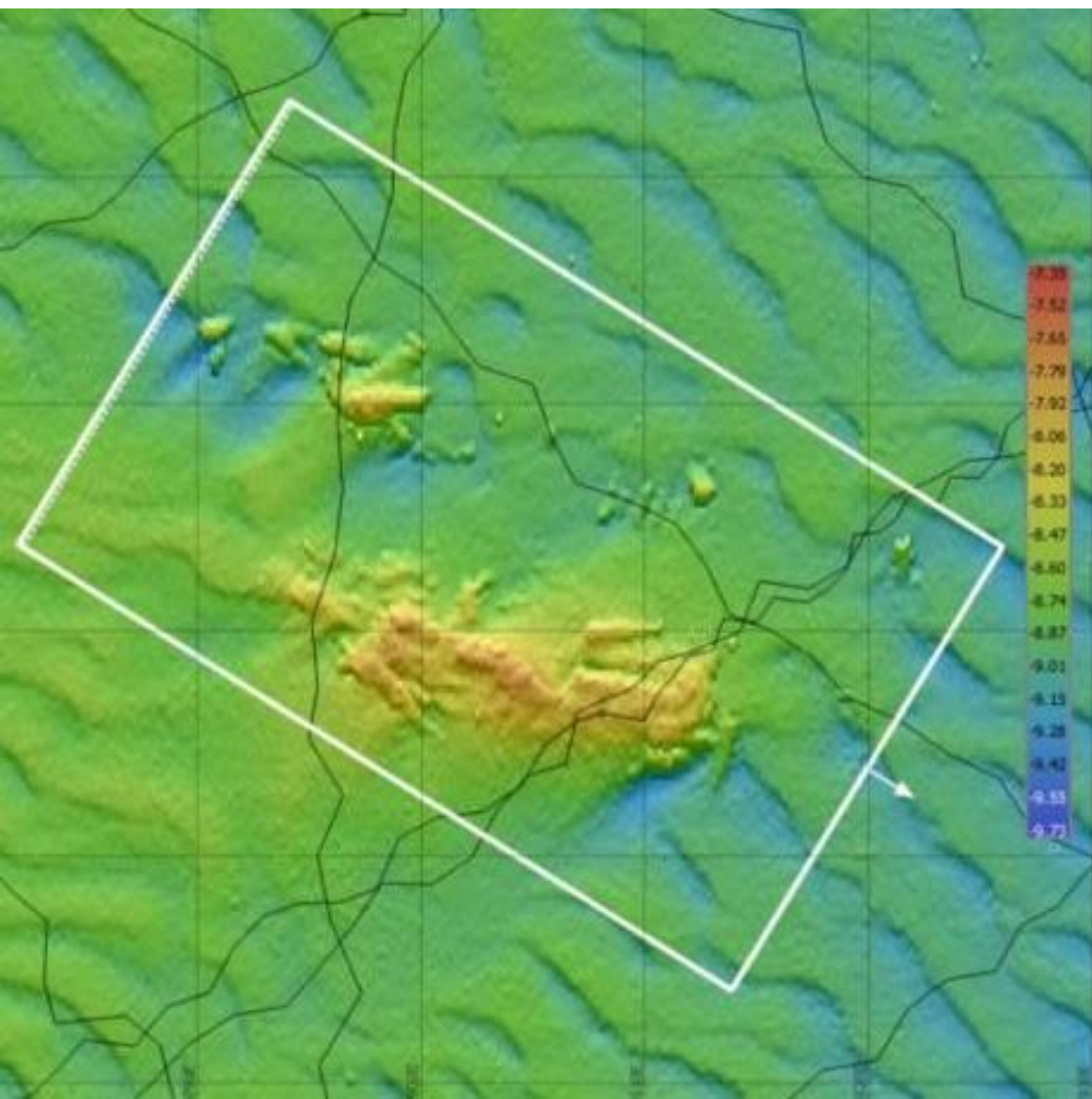


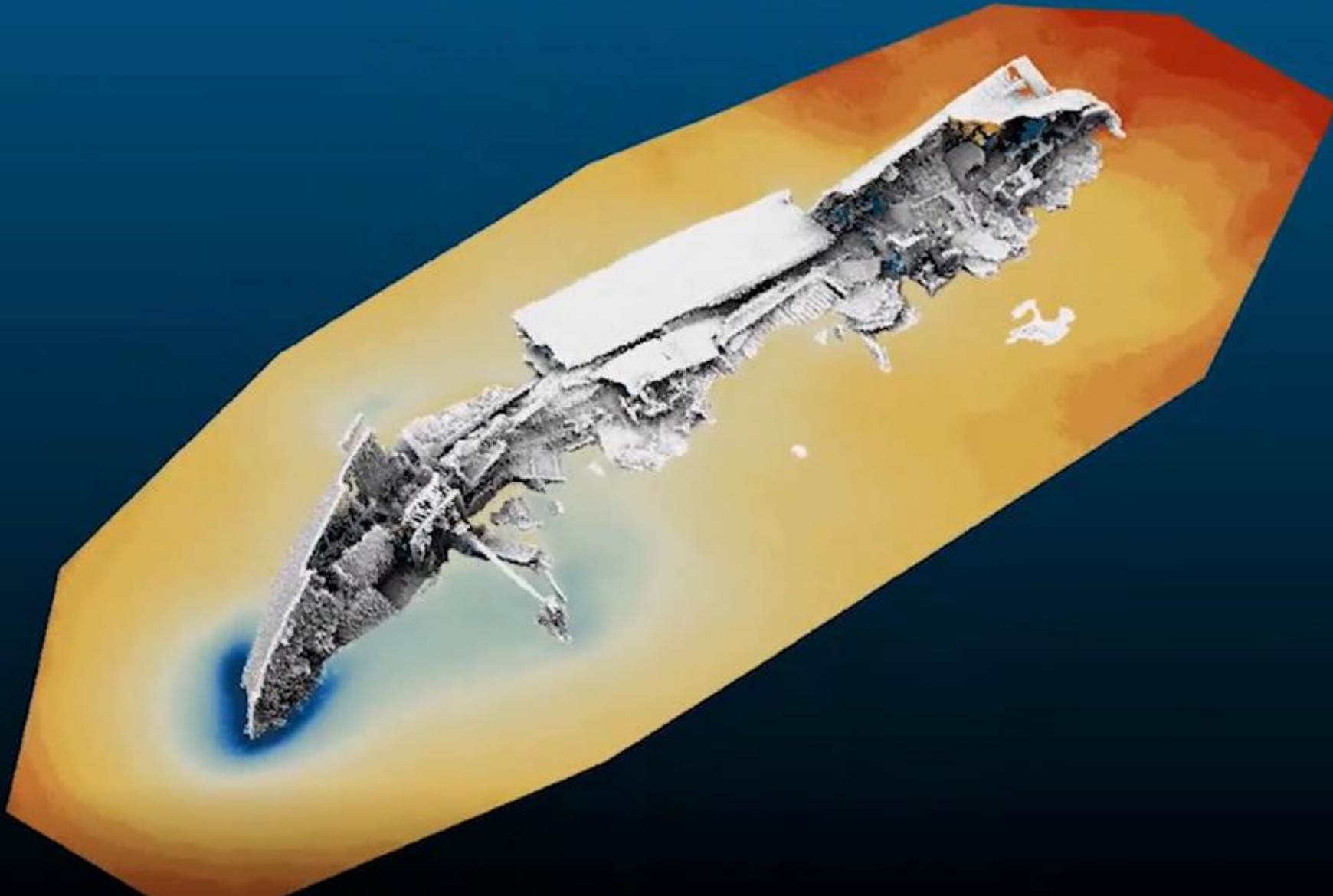
NORMAAL GESPROKEN ZICHTBAAR



Soms is interpretatie vanzelfsprekend

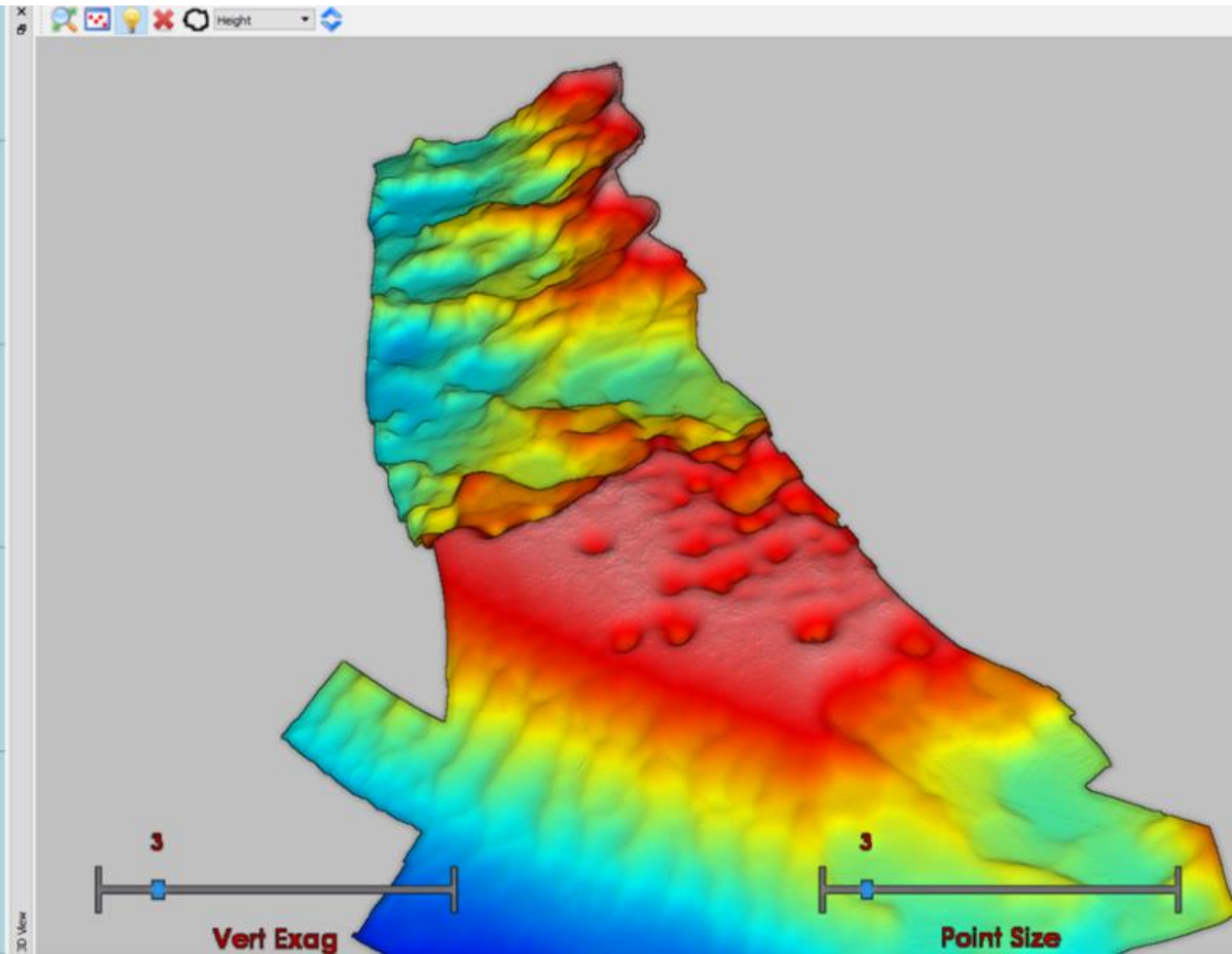
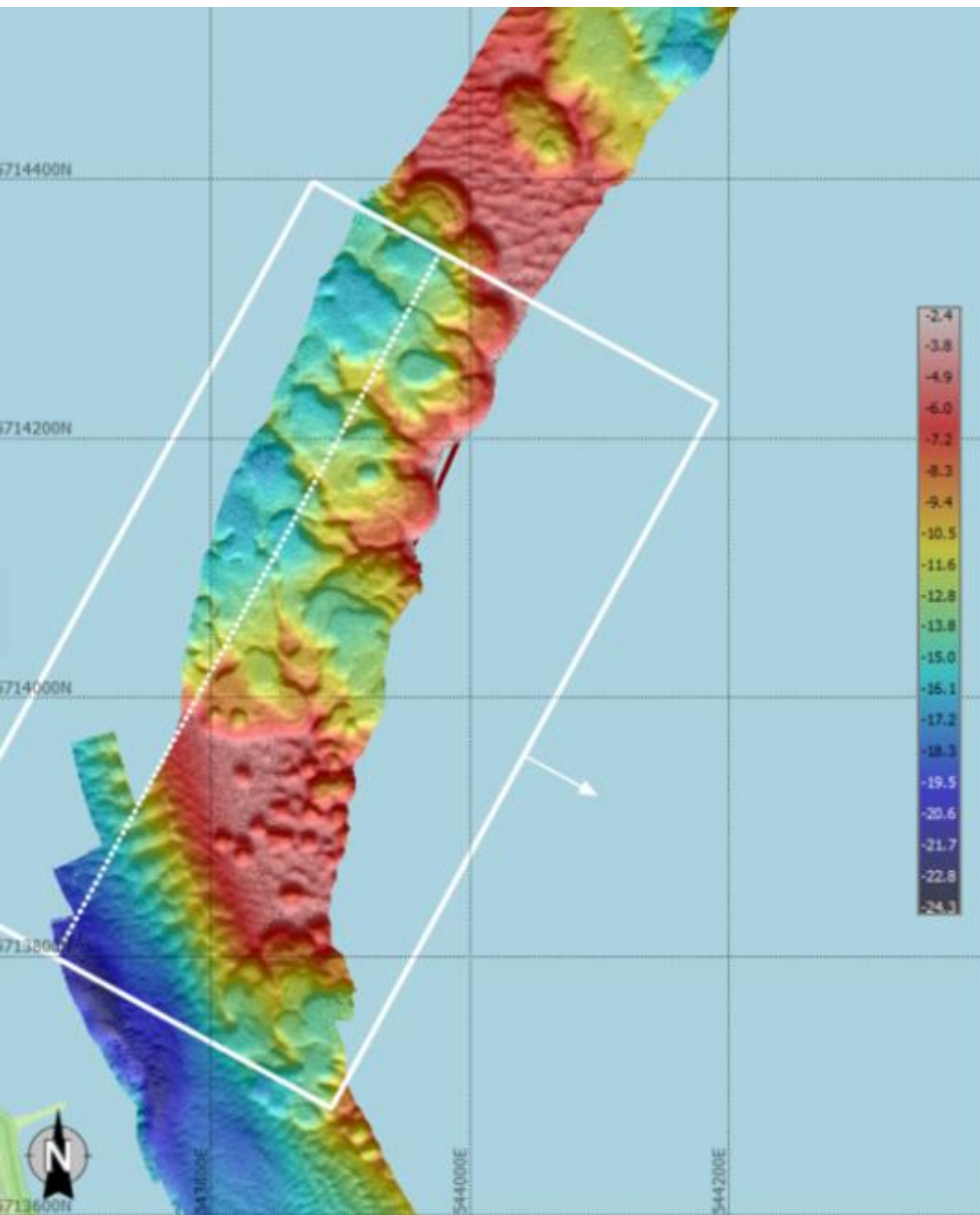
HET ONZICHTBARE



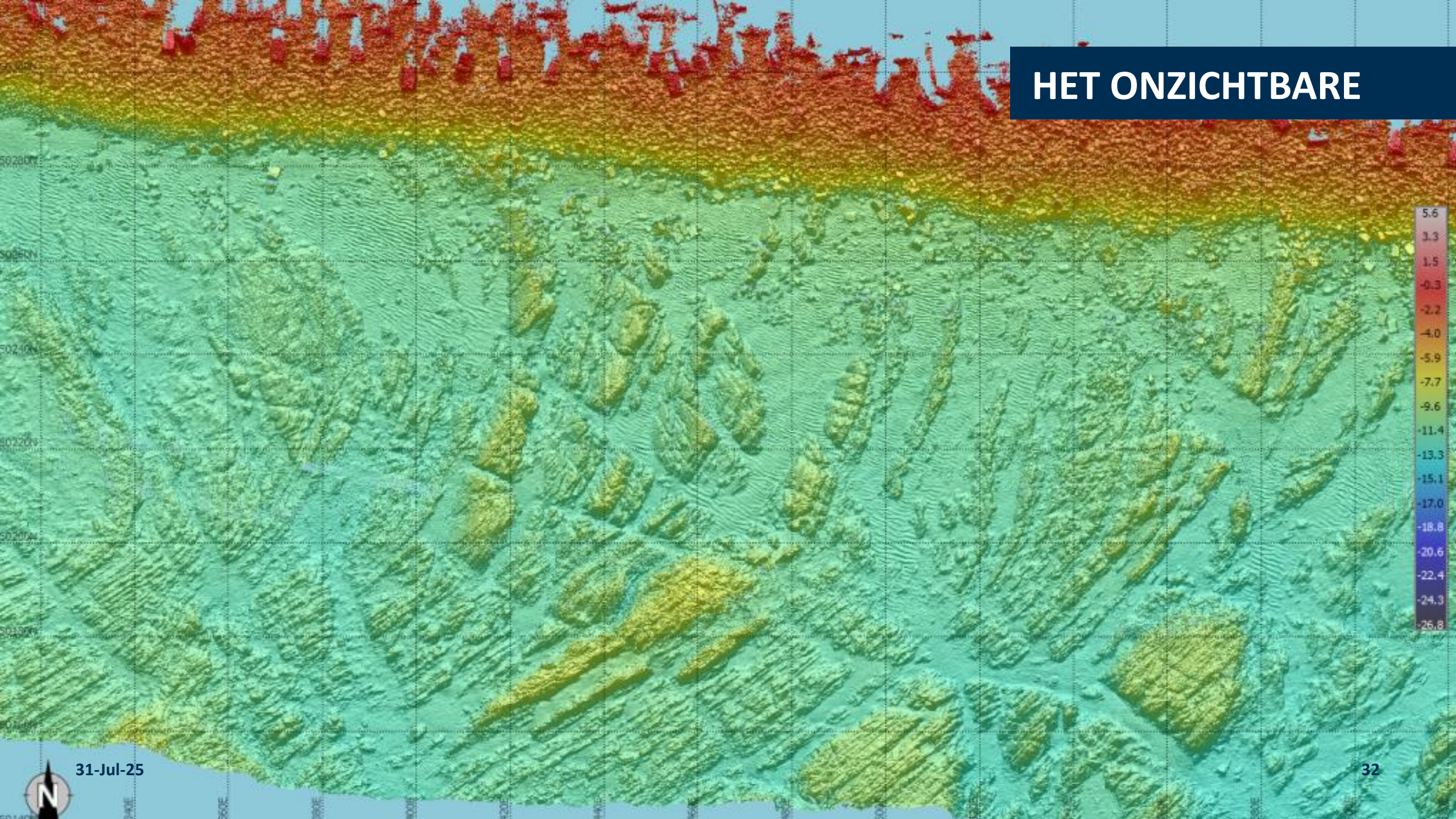


En soms is interpretatie wat complex zonder extra informatie

HET ONZICHTBARE

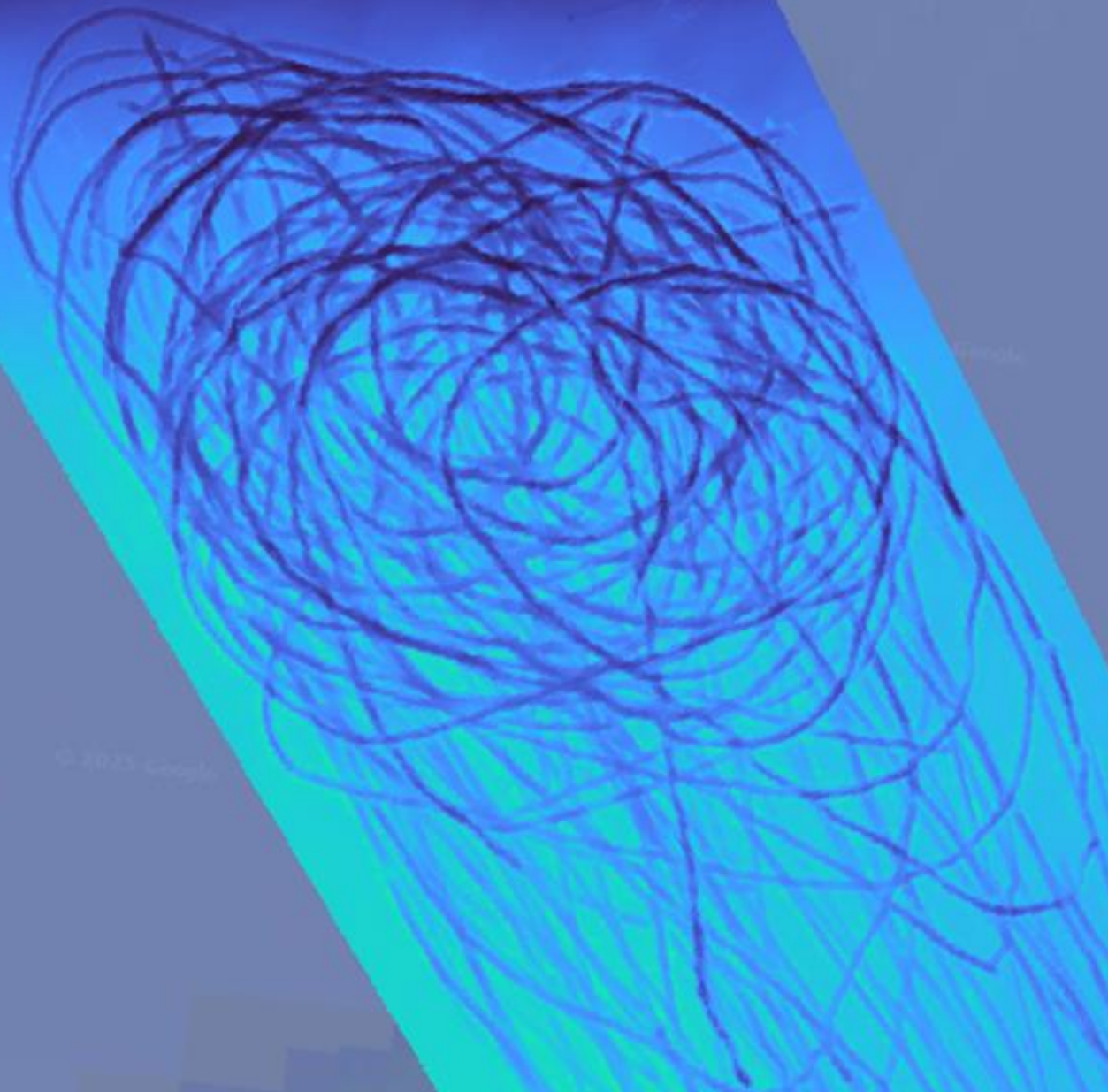


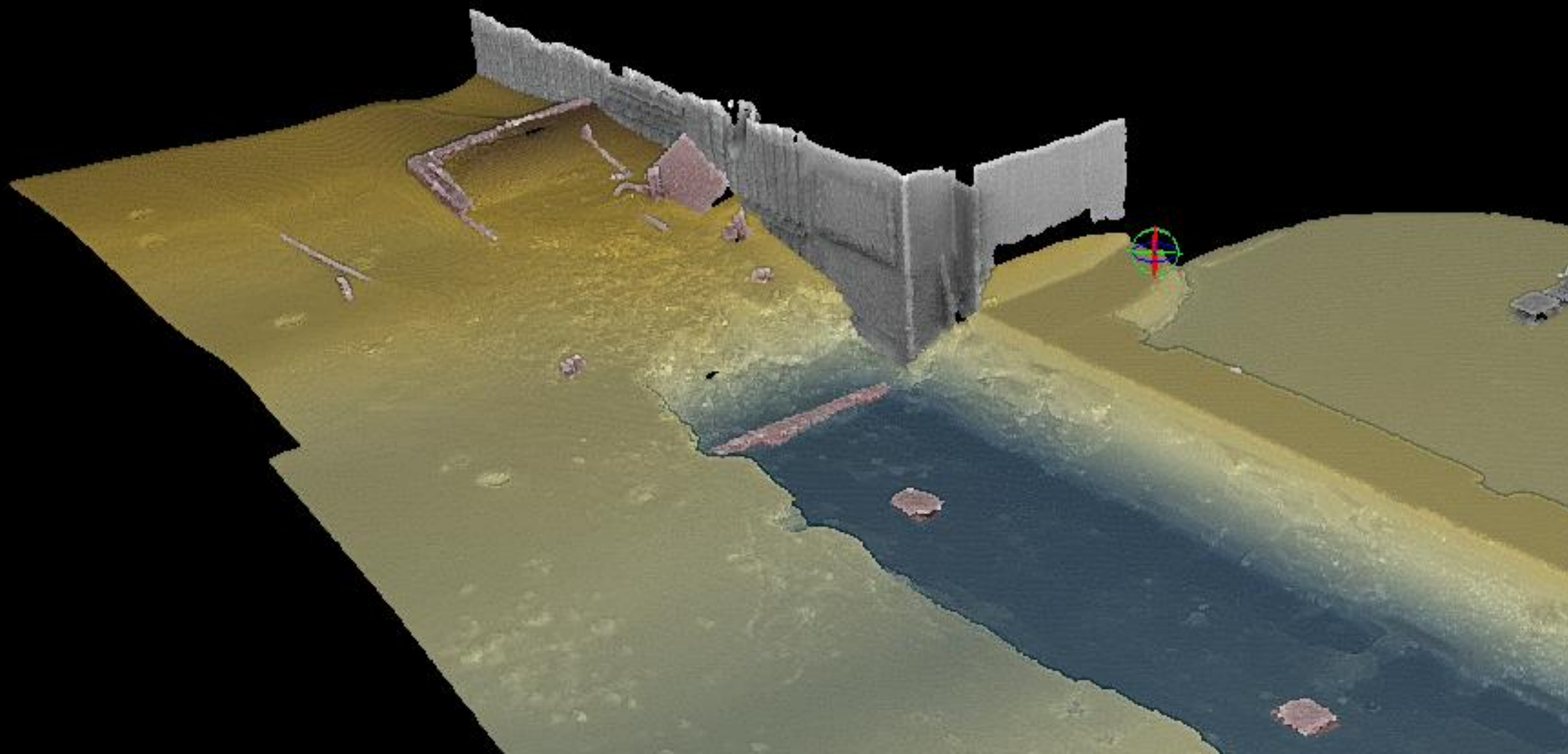
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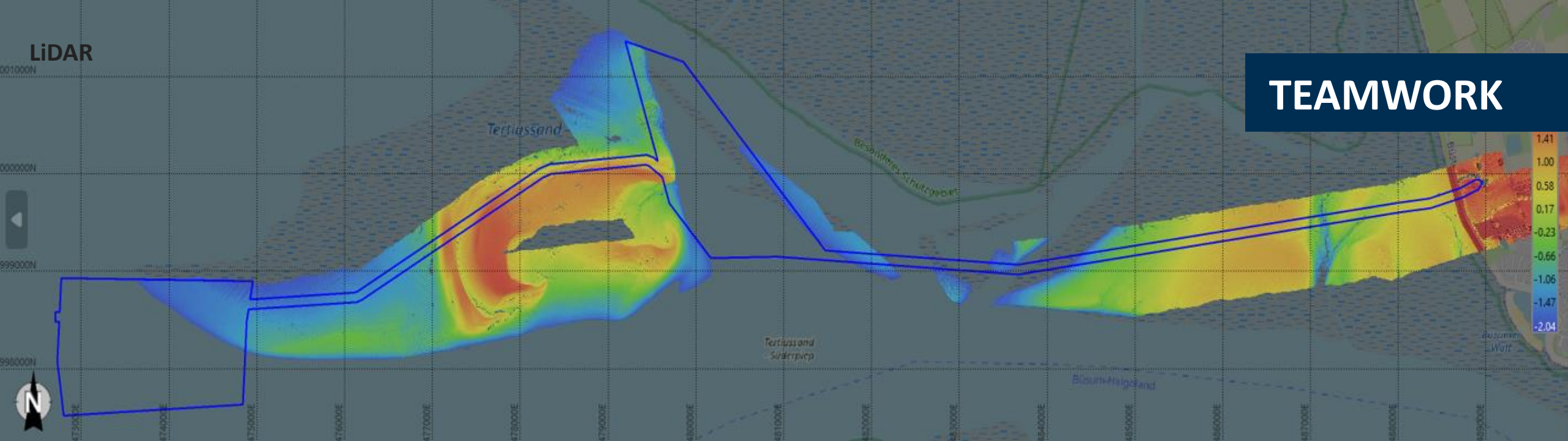
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HET ONZICHTBARE

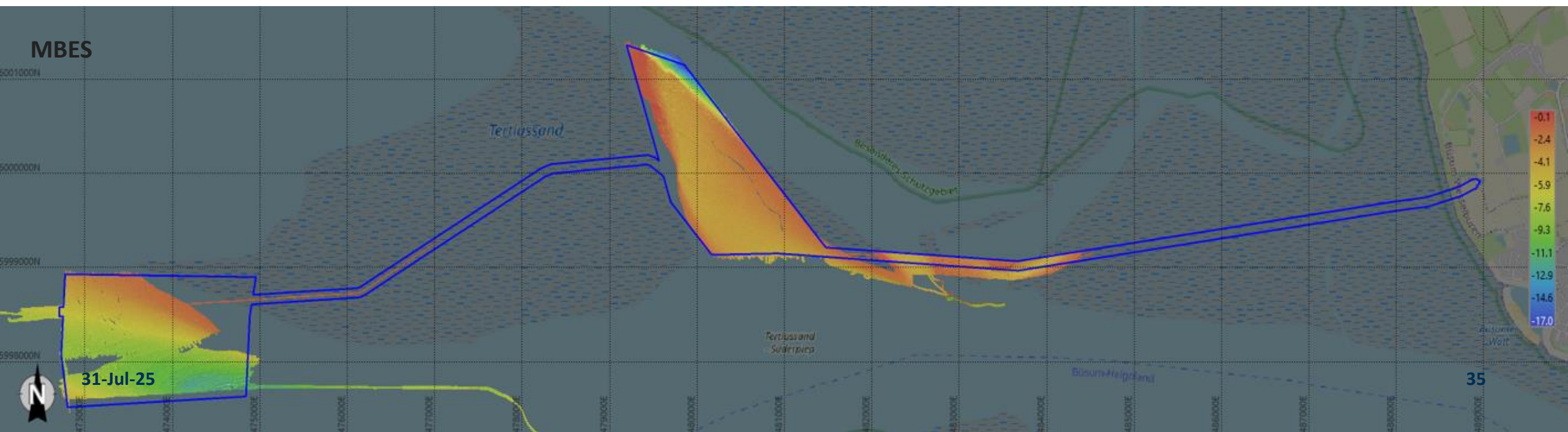




LiDAR



MBES



WE GET THE JOB **DONE.**

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