On mapping and monitoring geodiversity and benthic habitats in a dynamic shallow water coastal environment: Example from Rødsand lagoon, western Baltic Sea

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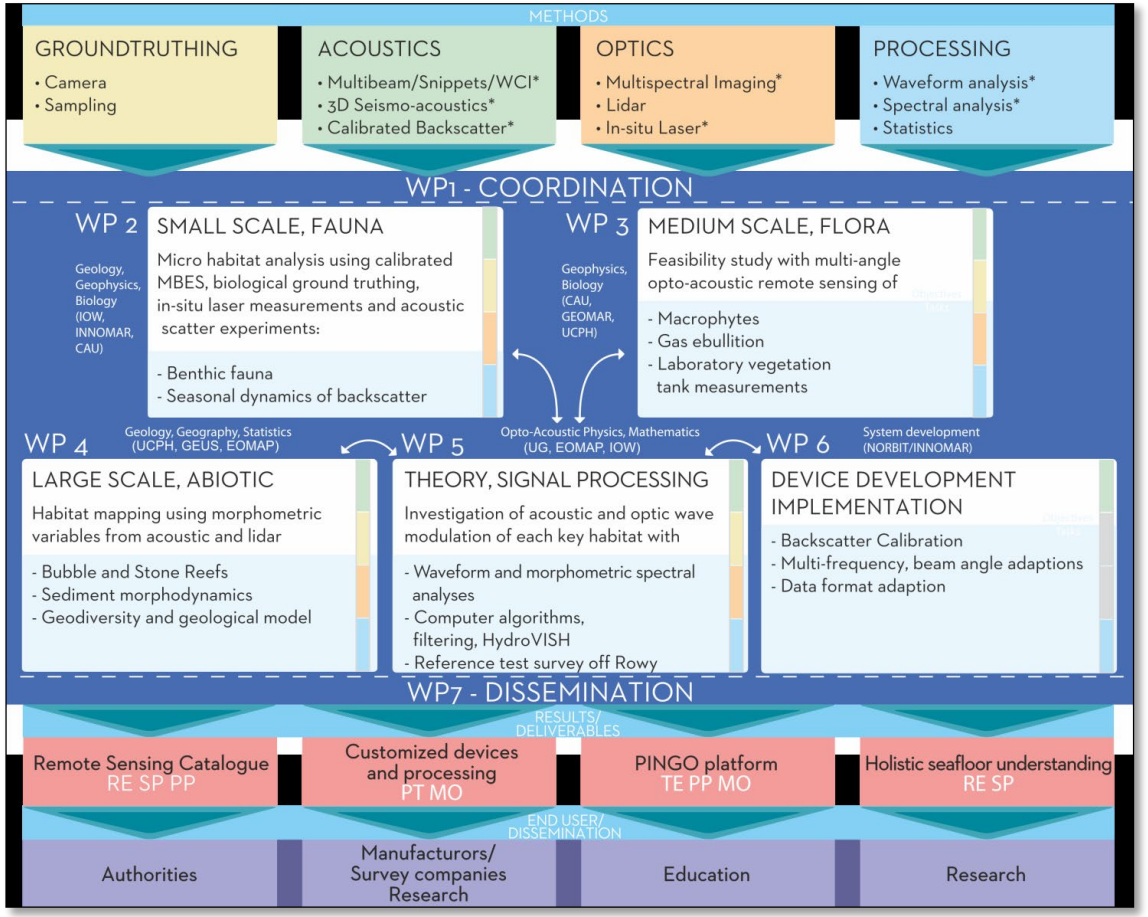
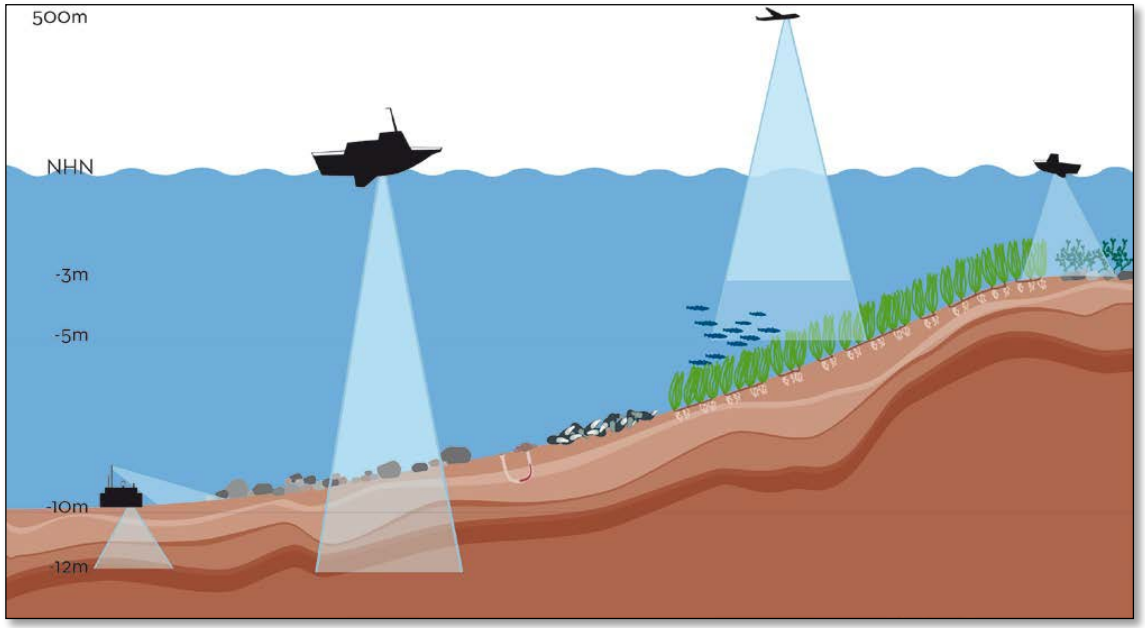
UNIVERSITY OF COPENHAGEN

GEUS

AHM AIRBORNE HYDRO MAPPING

ECOMAP-project





(www.bonus-ecomap.eu)

ECOMAP-project Work Package 4

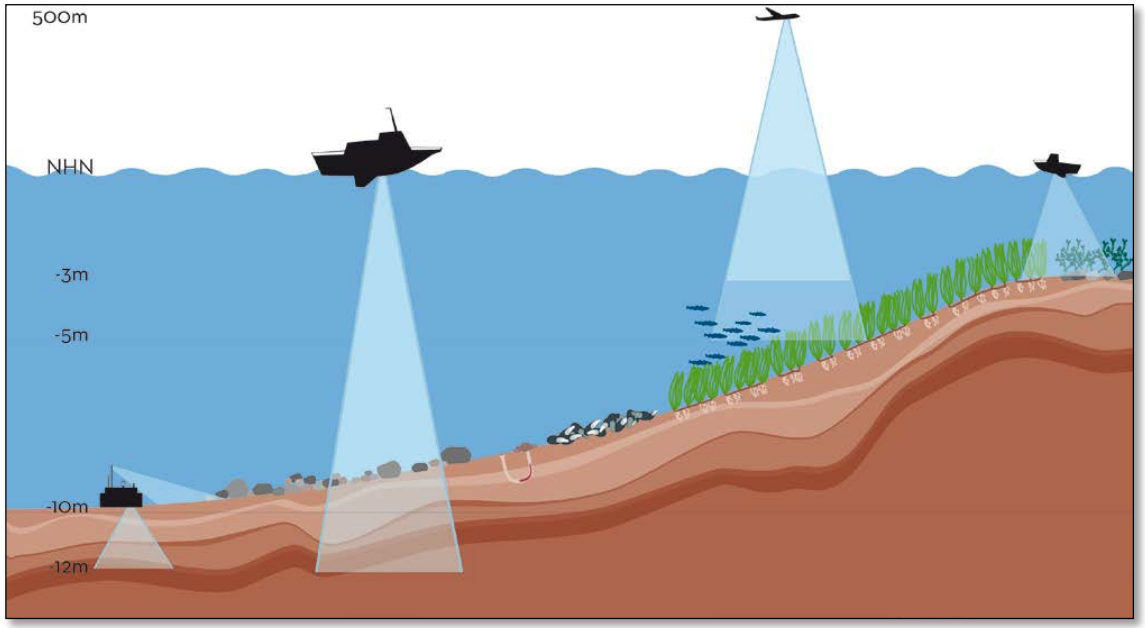
In situ remote sensing of geodiversity for habitat mapping

Aim

- Developing the best-practice of combined hydroacoustic and optical mapping and monitoring of geodiversity and specific habitats at different water depths.

Objectives

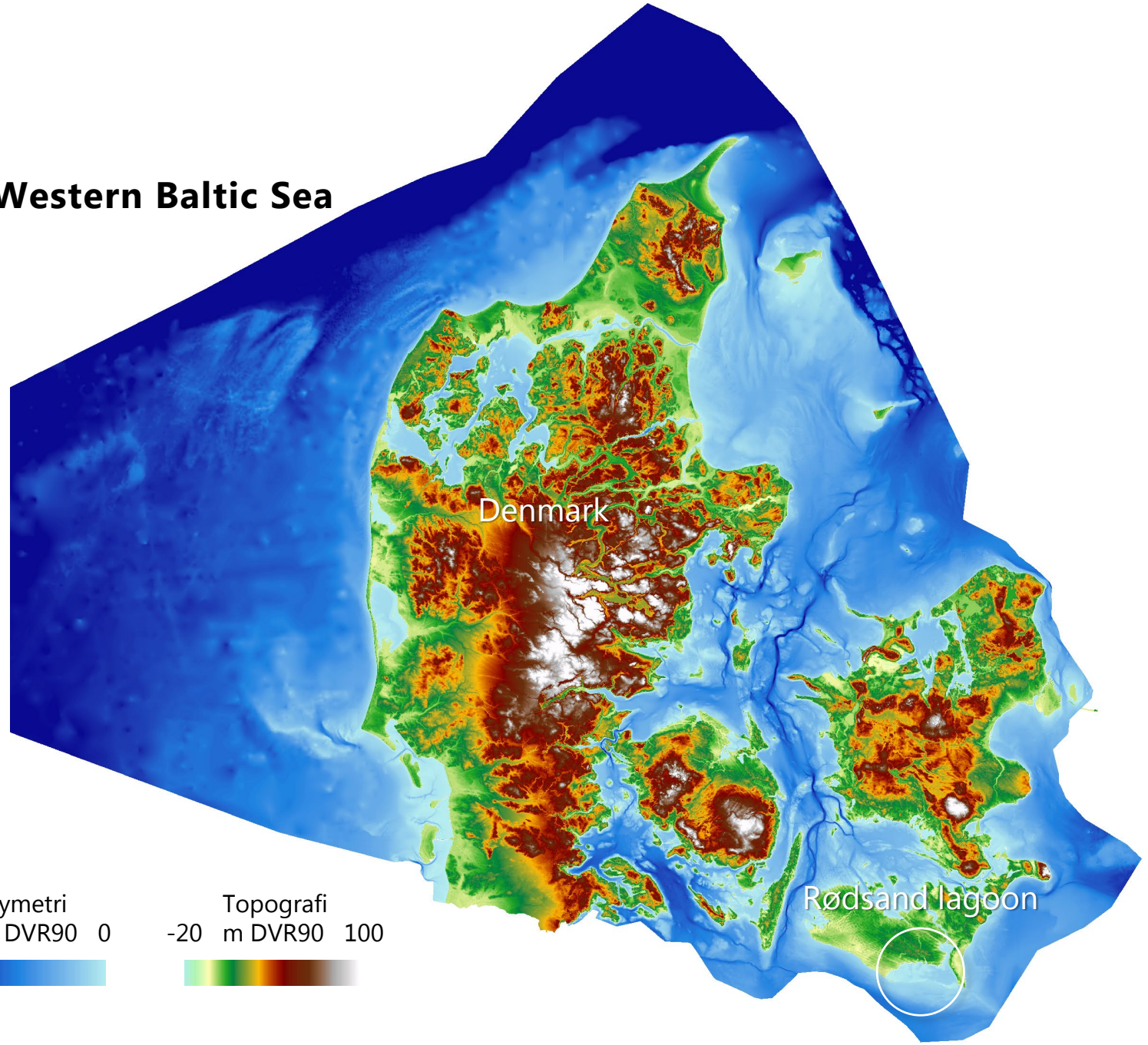
- Acquiring repetitive opto-acoustic data of stone reefs, sandbanks, and bubble reefs.
- Developing geological and geomorphological models.
- Developing best-practice for mapping and monitoring geodiversity.



(www.bonus-ecomap.eu)

Study site

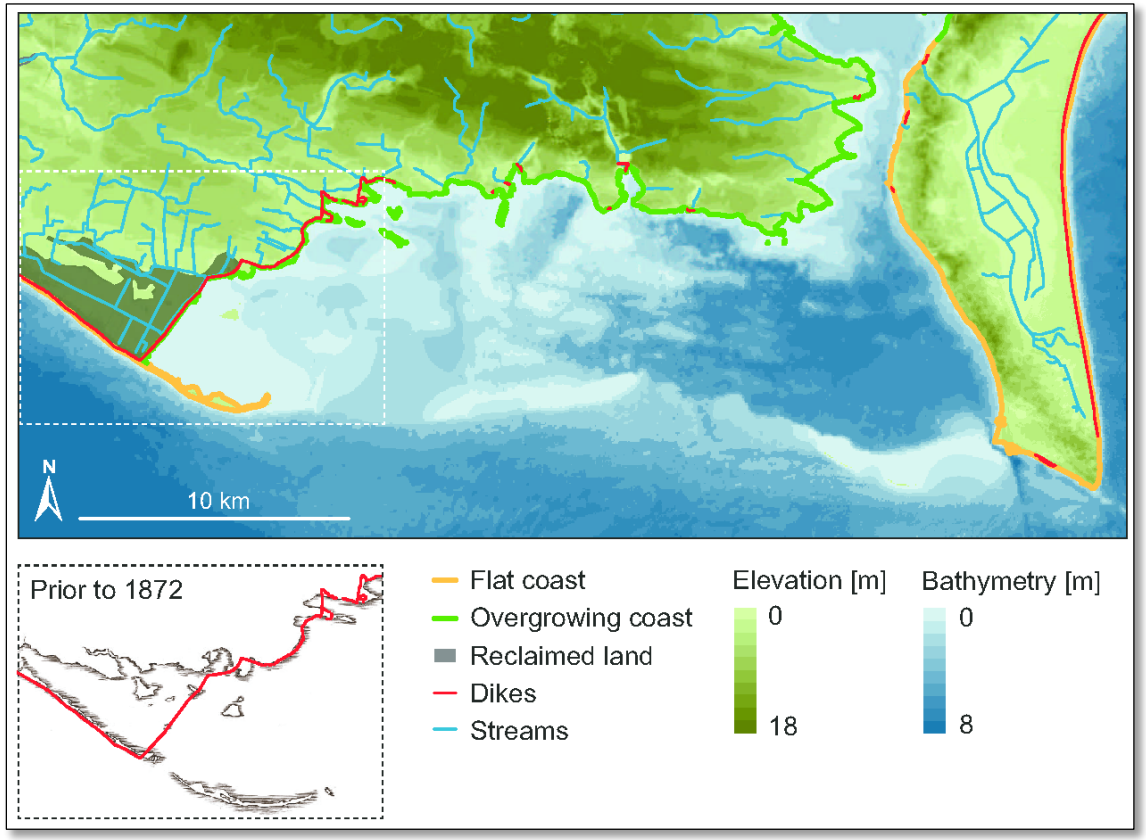
Rødsand lagoon, Western Baltic Sea



(www.gst.dk)

Abiotic components

Topography and bathymetry



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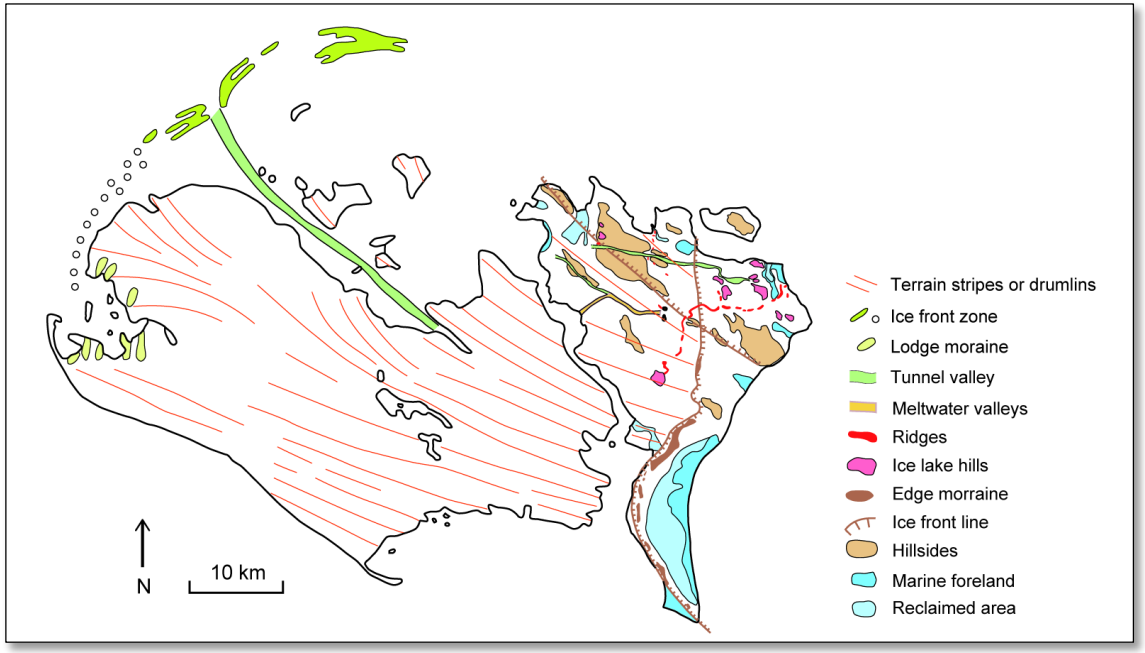
Geomorphology



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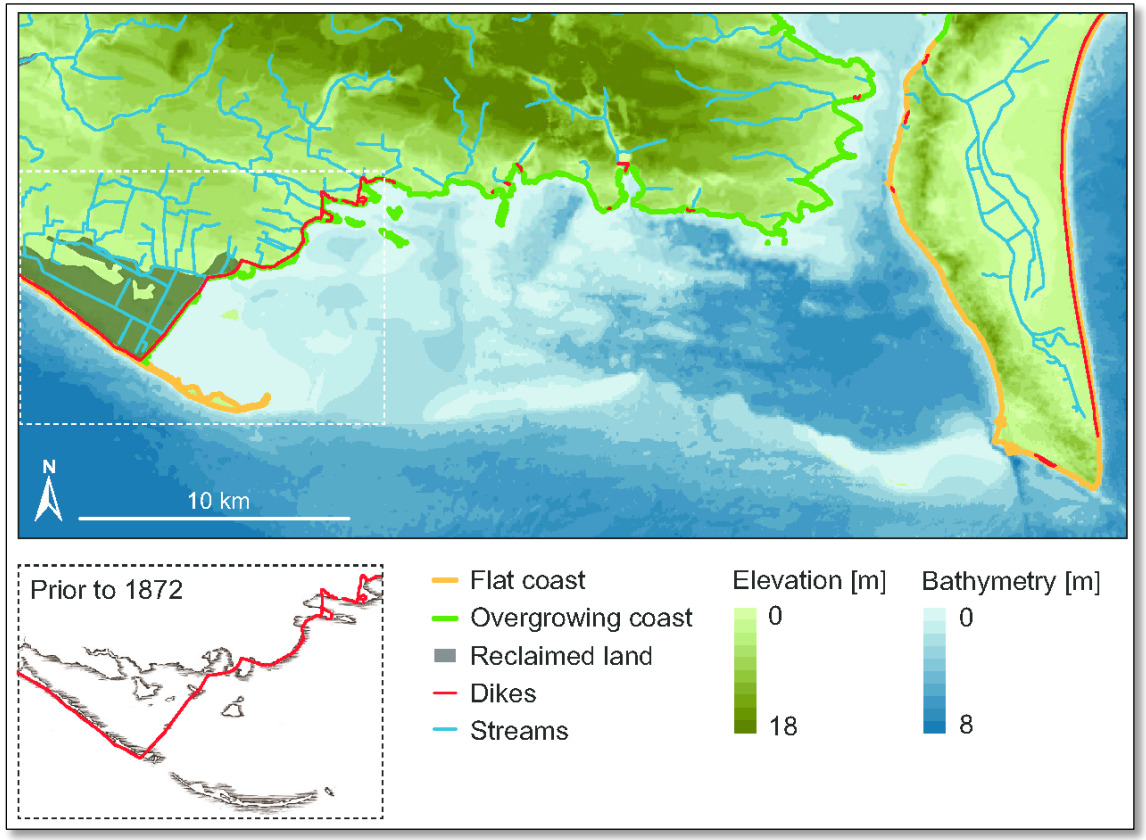
Biotic components

Topography and bathymetry



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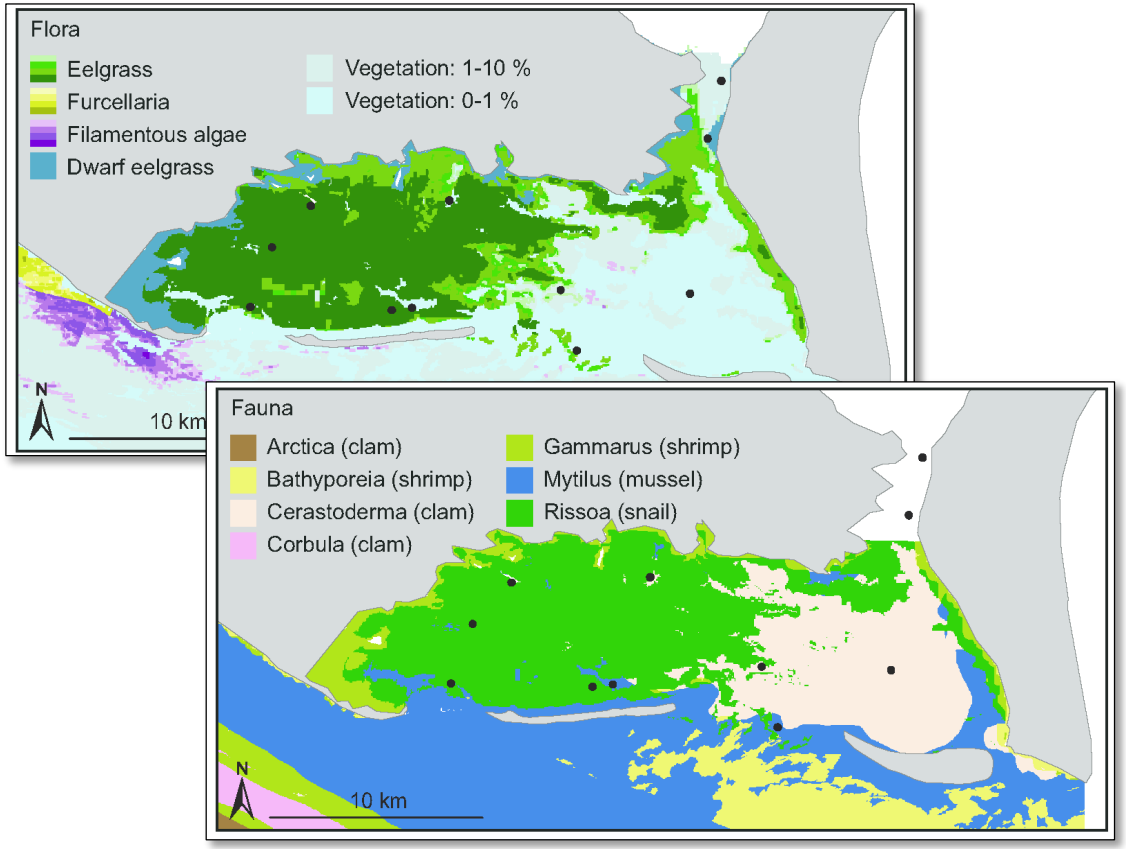
Benthic flora and fauna



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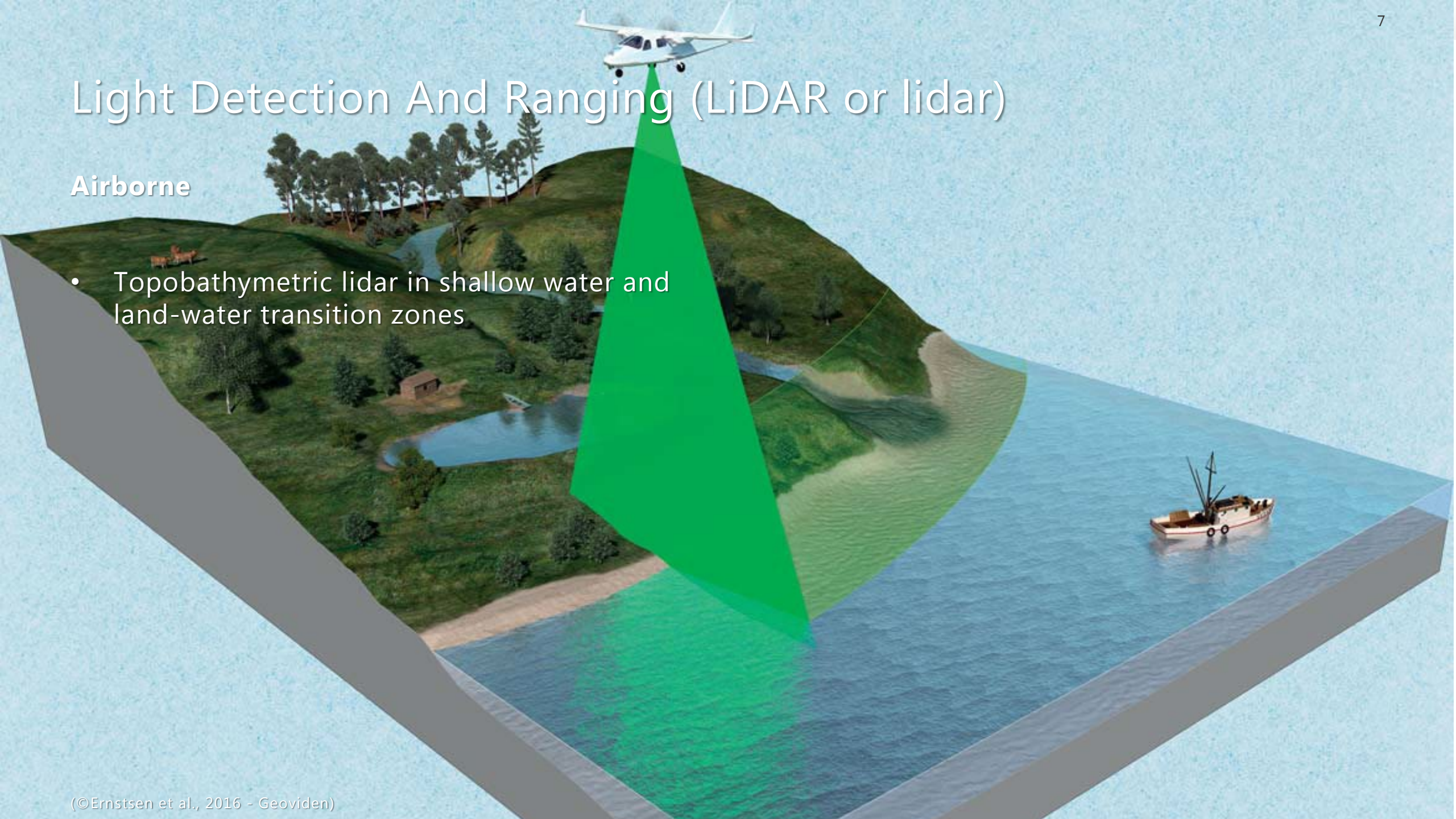
Light Detection And Ranging (LiDAR or lidar)

Airborne

- Topobathymetric lidar in shallow water and land-water transition zones



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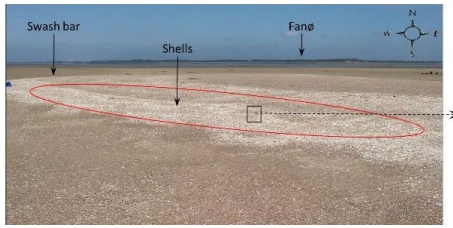
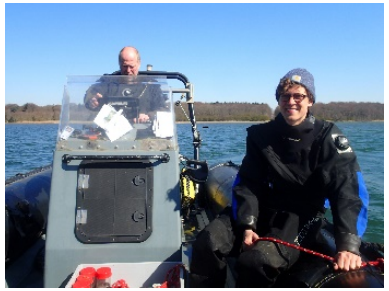
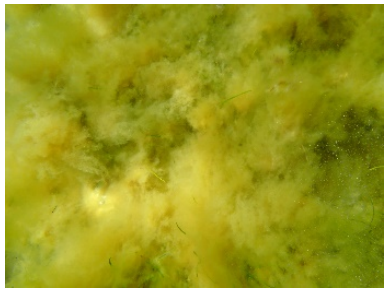
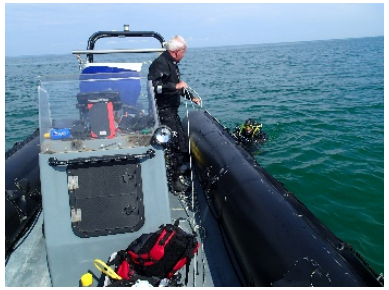
Groundtruth

Seabed photo, video and bed material sampling

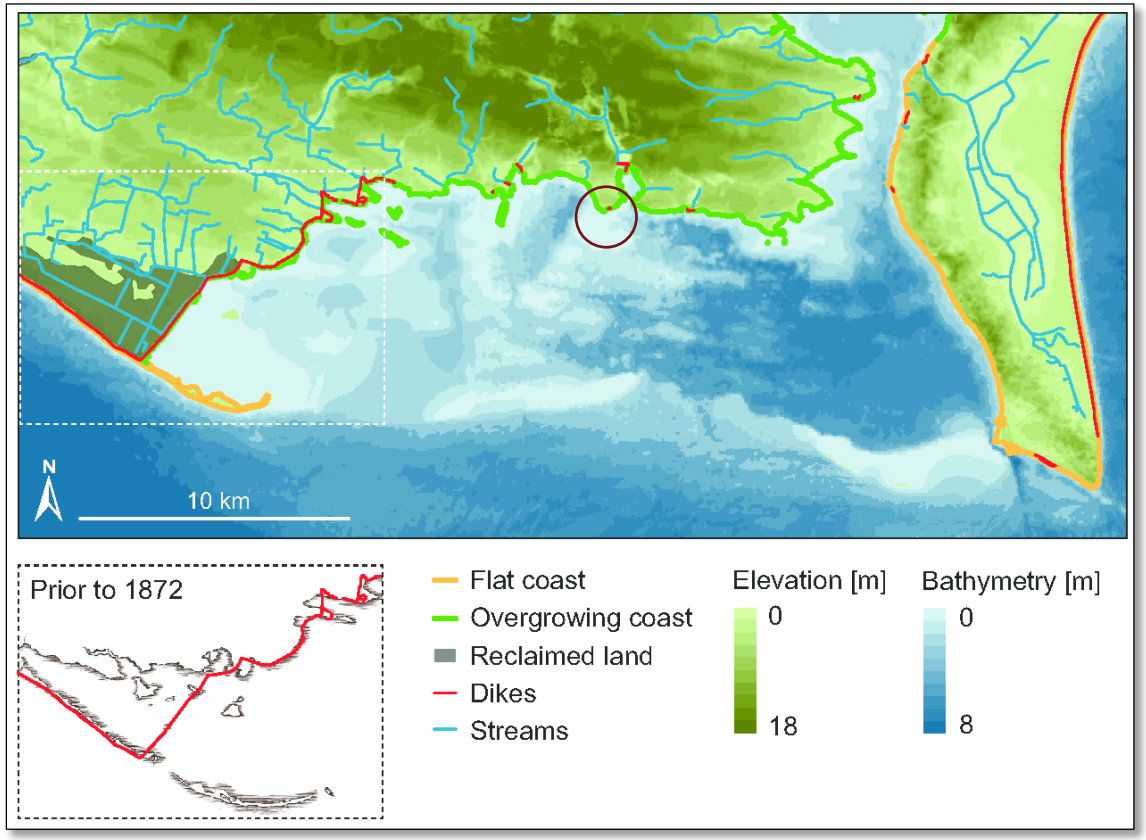


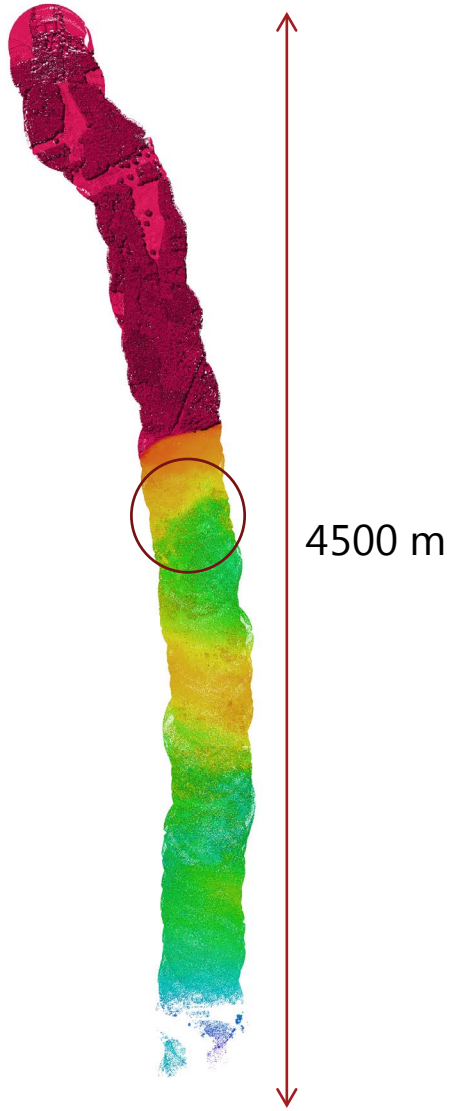






Ridges and swales





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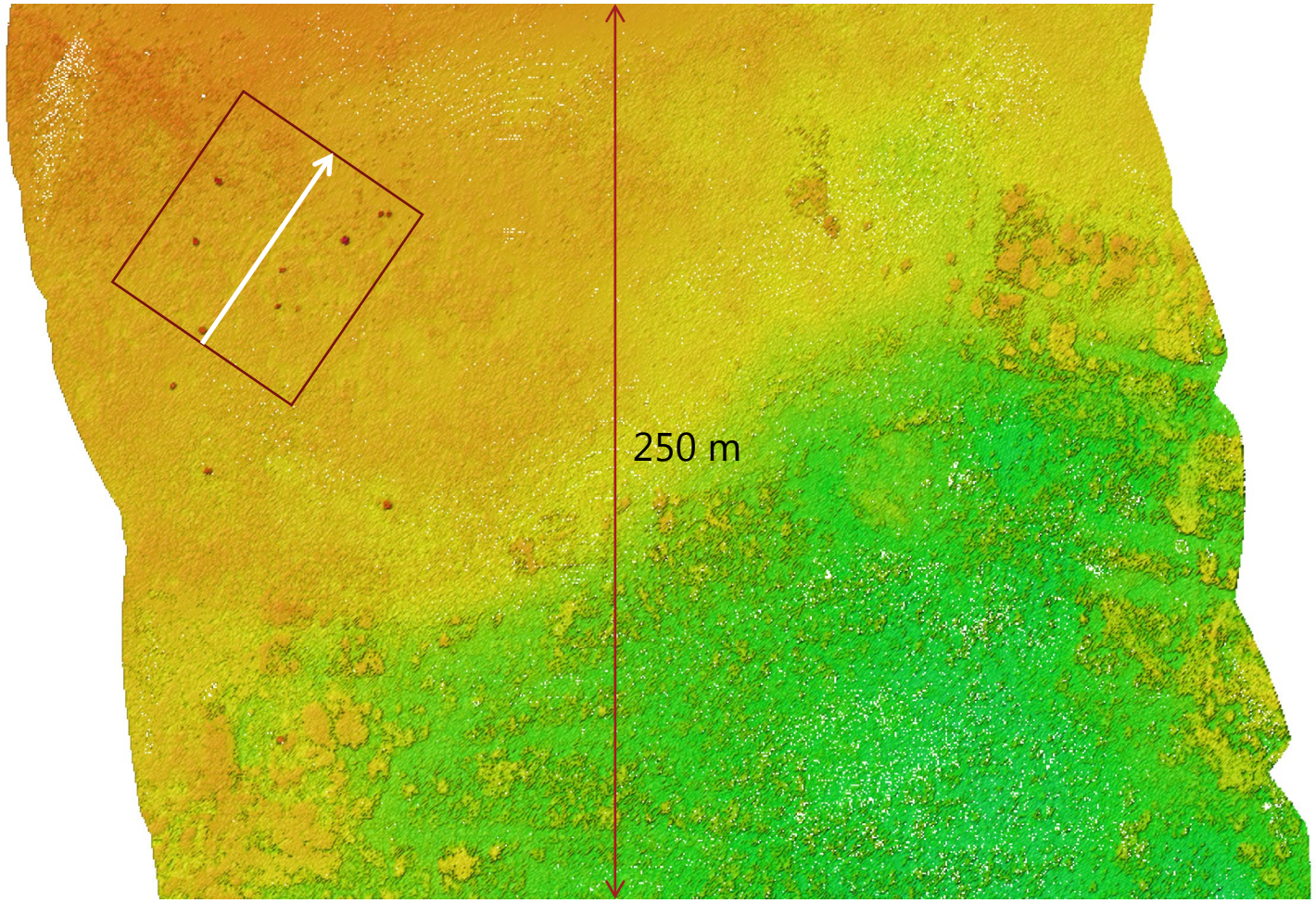
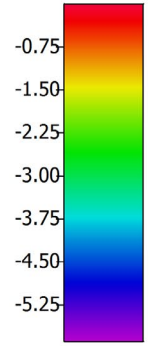
Abiotic components

Stones

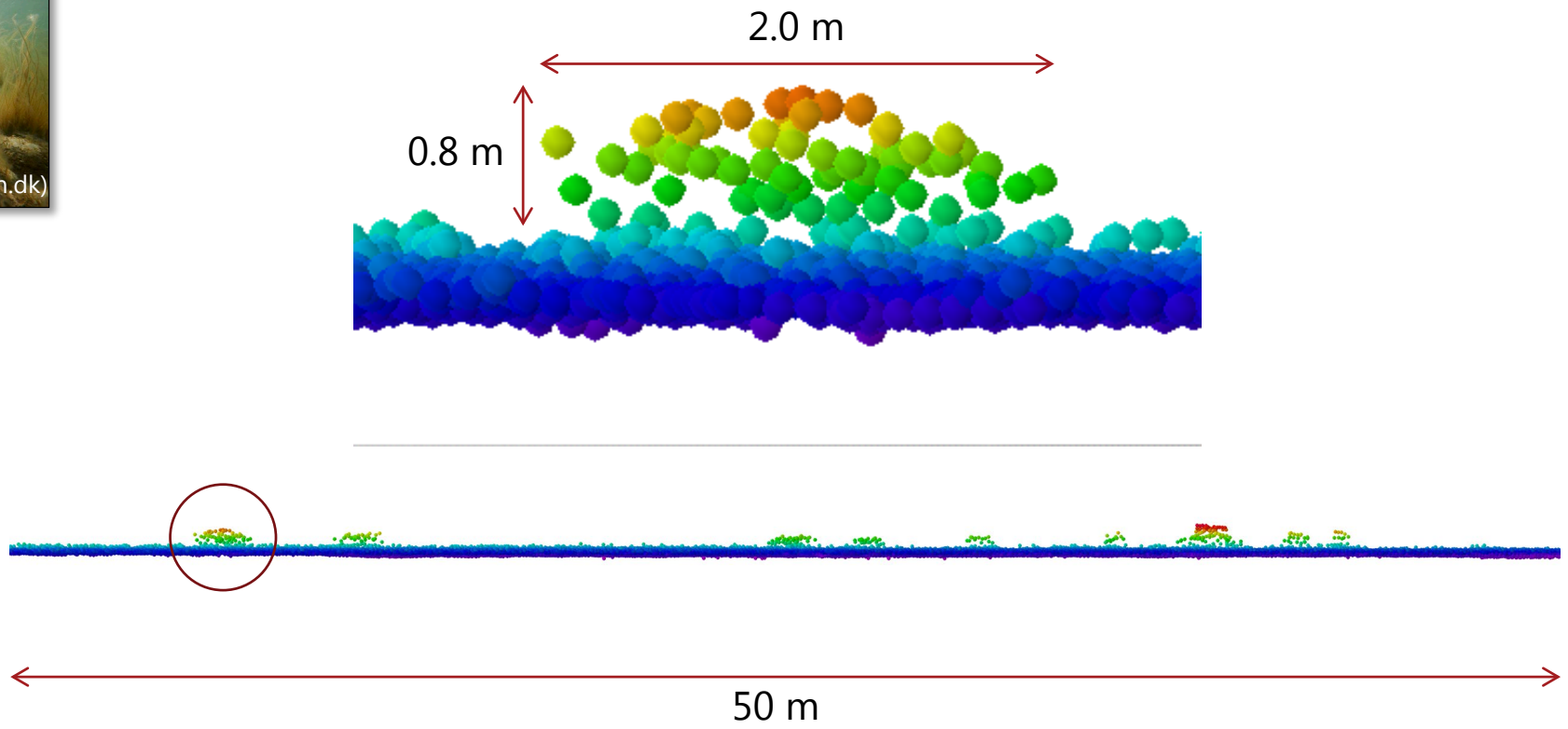


Elevation (m DVR90)



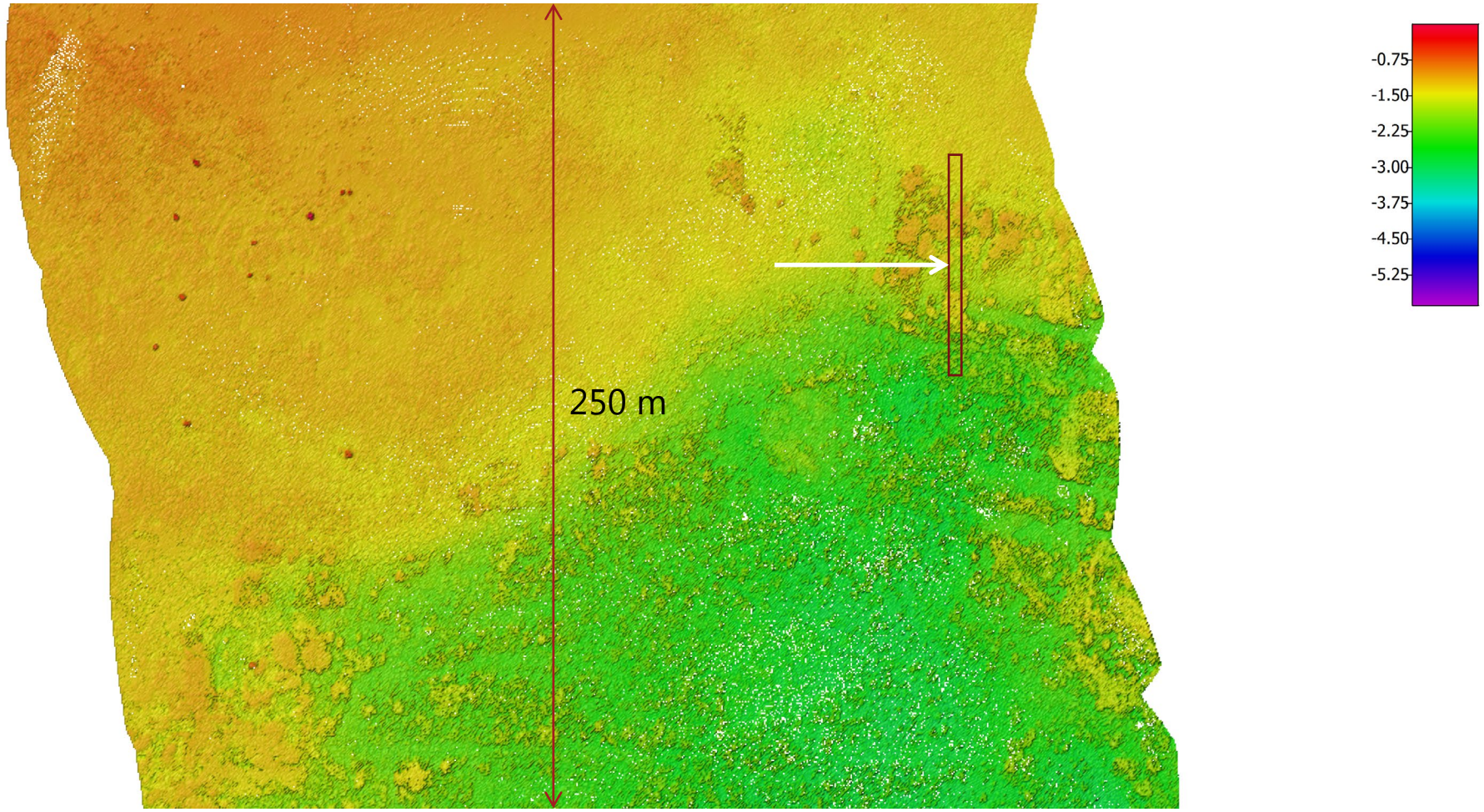
Abiotic components

Stones



Biotic components

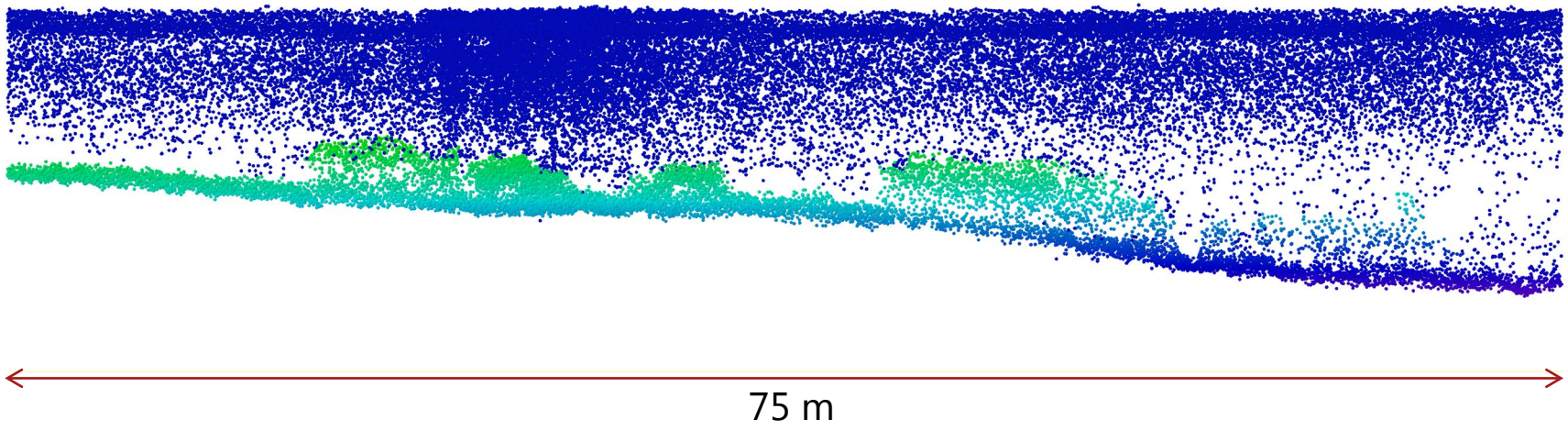
Flora



Biotic components

Flora

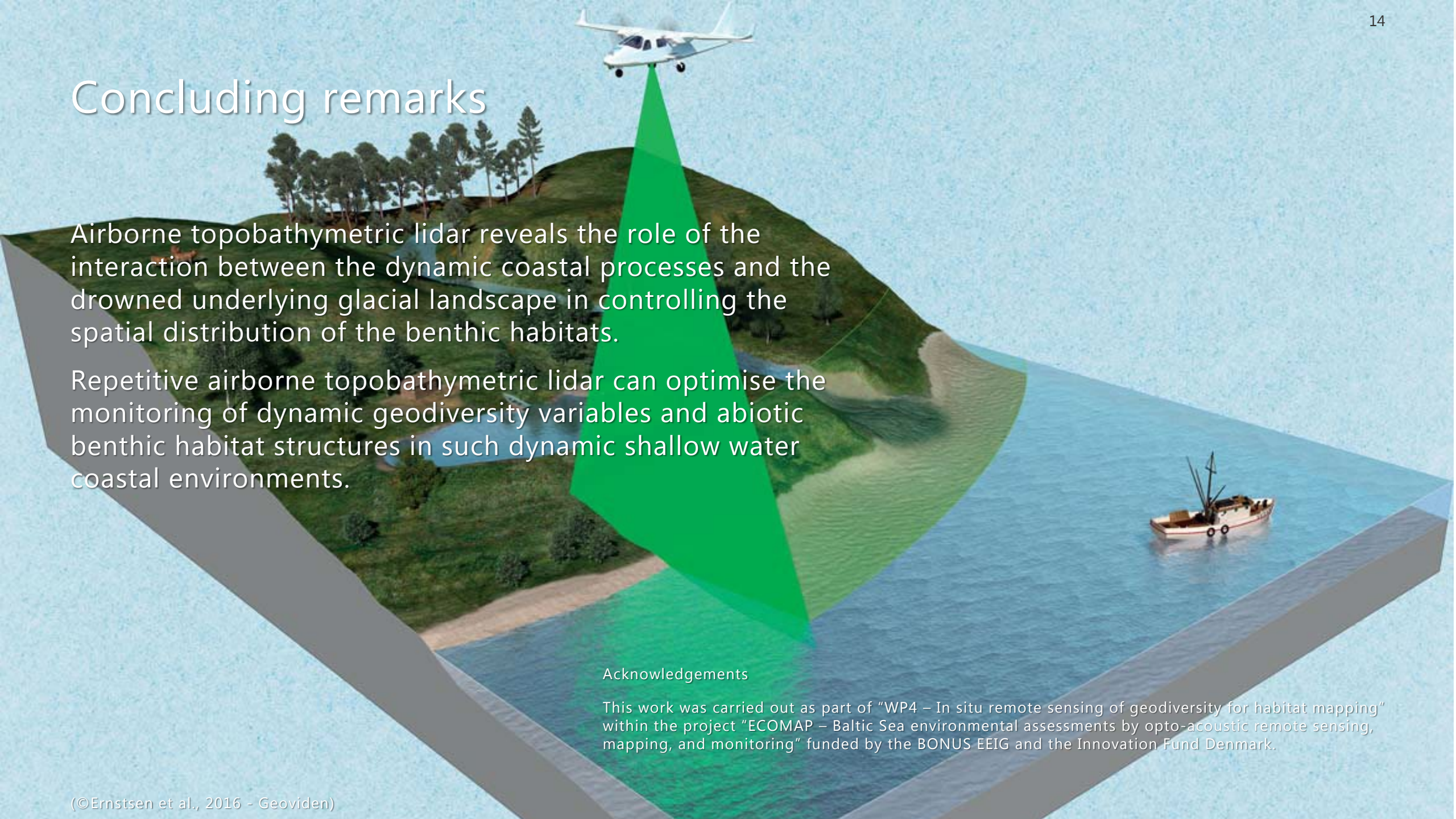
5 x height exaggeration



Concluding remarks

Airborne topobathymetric lidar reveals the role of the interaction between the dynamic coastal processes and the drowned underlying glacial landscape in controlling the spatial distribution of the benthic habitats.

Repetitive airborne topobathymetric lidar can optimise the monitoring of dynamic geodiversity variables and abiotic benthic habitat structures in such dynamic shallow water coastal environments.



Acknowledgements

This work was carried out as part of "WP4 – In situ remote sensing of geodiversity for habitat mapping" within the project "ECOMAP – Baltic Sea environmental assessments by opto-acoustic remote sensing, mapping, and monitoring" funded by the BONUS EEIG and the Innovation Fund Denmark.