Baywei

Sea possibilities

A productivity investigation in extreme shallow water revealed an interesting geological structure

January, 2022 – Budapest (Hungary)

Introduction

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- Potential Baywei MBES Customers often ask us about the productivity of the system. Their main concern: How dense you need to make the survey lines in an extreme shallow water (a few meters depth only), when the maximum swath is 130DEG?
- Therefore, we have decided to make a small trial, when the Duna-folyó (Danube river) was very low (max. 2-3 meters in the area we worked).
- As a surprise, - we found a riverbed structure we never saw before in the Danube, therefore, we have asked geophysical data from the same area.
- The couple of years old geophysical and the new bathymetric data matched very well, - revealing a nice, parallel bedrock structure in the riverbed.

The site
In the Center of Budapest

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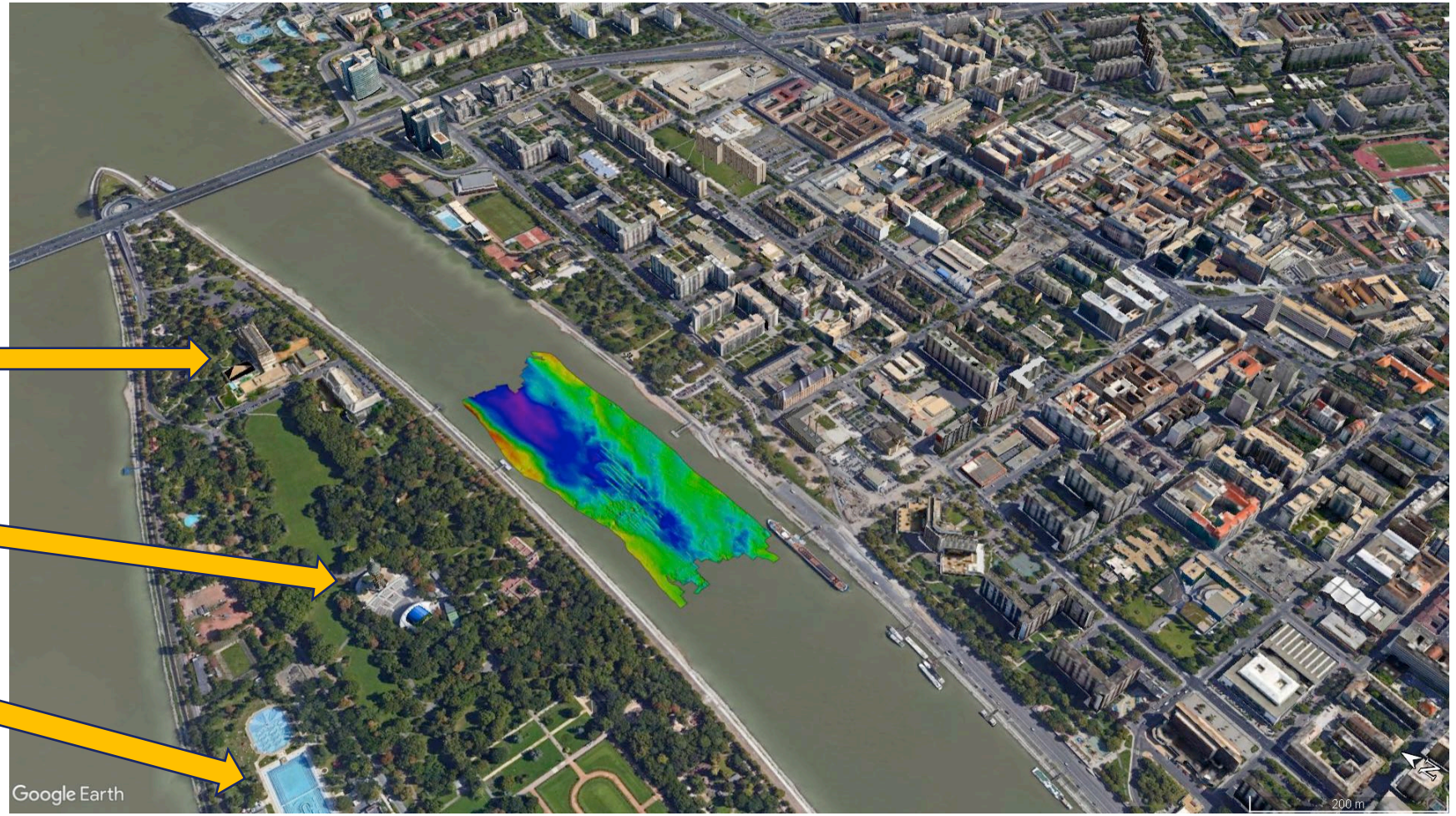
Ensana Grand Health Spa Hotel

Water Tower and Open Theatre

Palatinus Outdoor Pools and Spa



The boat

5.5 m long, 2.3 m wide, low draught

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A challenge
Difficult navigation, steering

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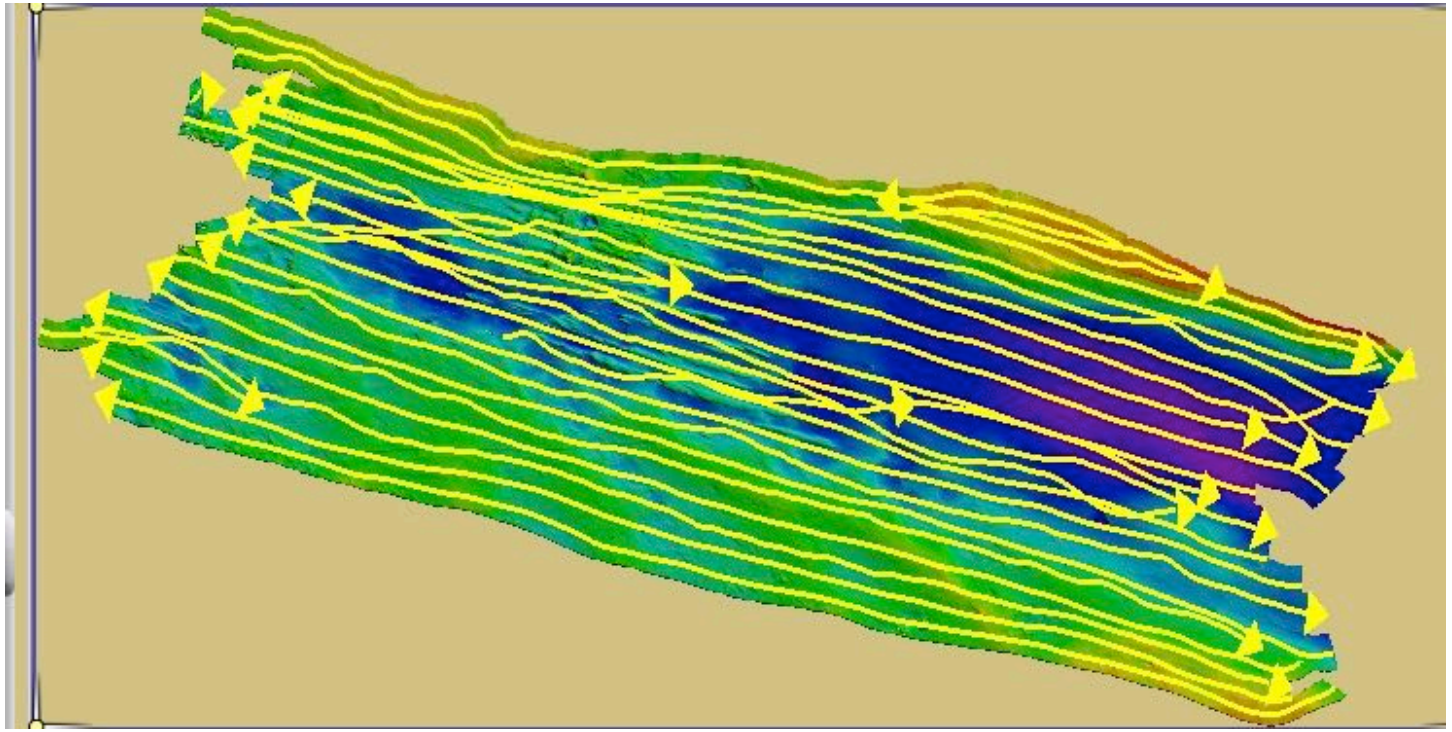

The riverbed structure combined with the very shallow water, and the strong current resulted high turbidity, – what made a nice, parallel navigation impossible.

The Multibeam Echosounder

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Baywei M5 Multibeam Sonar
with Integrated GNSS/INS

Specifications:

Swath coverage	Up to 130 degrees
Number of RX beams	256
TX beam width along-track	1.45°
RX beam width	1° ±0.1
Range	>100m
Beam distribution	Equi-Distant and equi-angular beam distribution
Roll stabilisation	Yes
Pressure rating	100m
GNSS/INS	INS in Sonar
Position	HOR: ±(8mm +1ppm X Distance from RTK Station) VER: ±(15mm +1ppm X Distance from RTK Station) (Assumes 1m GNSS Separation)
Heading Accuracy	0.08° (RTK) with 2m Antenna Separation
Pitch/Roll Accuracy	0.03° Independent of Antenna Separation
Heave Accuracy	2cm or 2% (TRUEHEAVE™). 5cm or 5% (Real Time)
Ping Rate	50 Hz
Outputs	Bathymetry, Side Scan
Compatible with	Qinsy, Hypack, EIVA and others
Weight	Air: 3.5 kg Water: 1.1 kg

Checking the productivity
The survey in numbers

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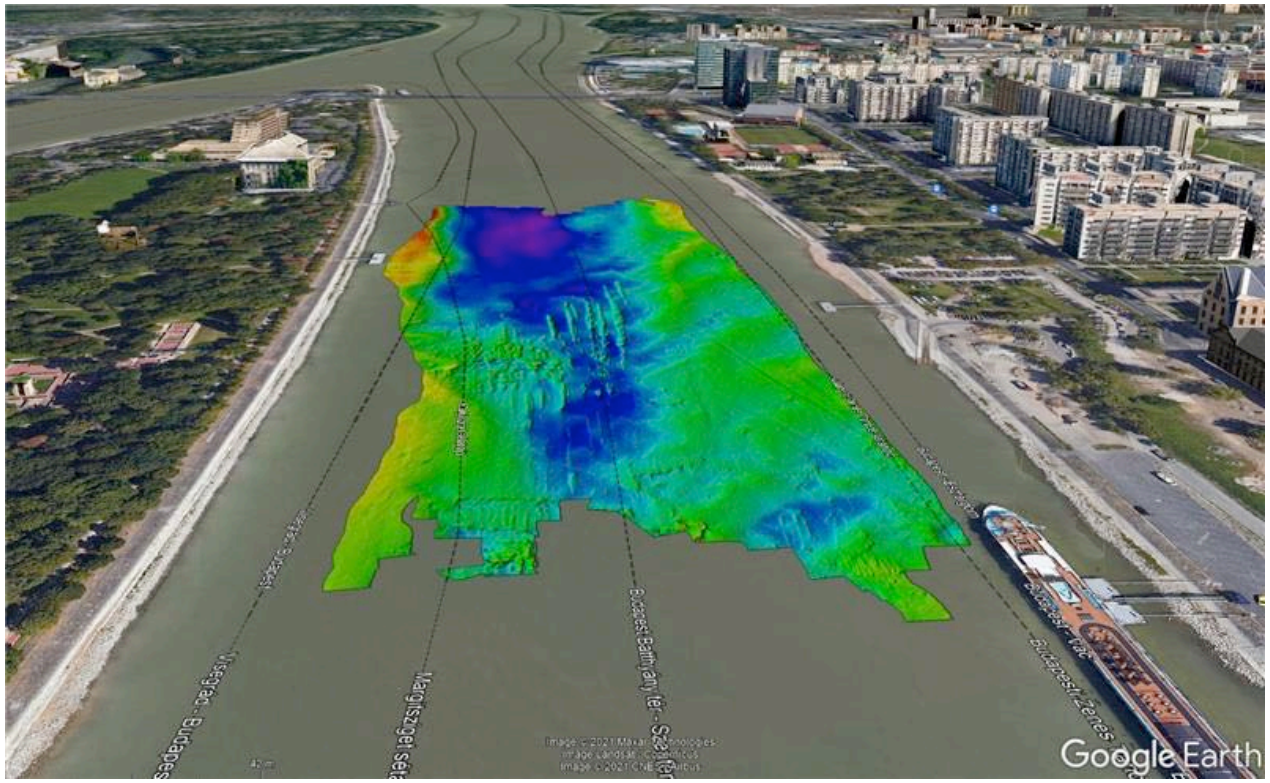

- Water depth: >2.5m
- Overlap: 50%
- Survey time: 98'
- Survey area: 62,119m2
- Collected data: 4.6GB
- Software used: Baywei GUI
- Software used: QPS Qinsy, QPS Qimera, Cloud Compare

Bathymetric results

Parallel structure swell out from the gravel and sediment

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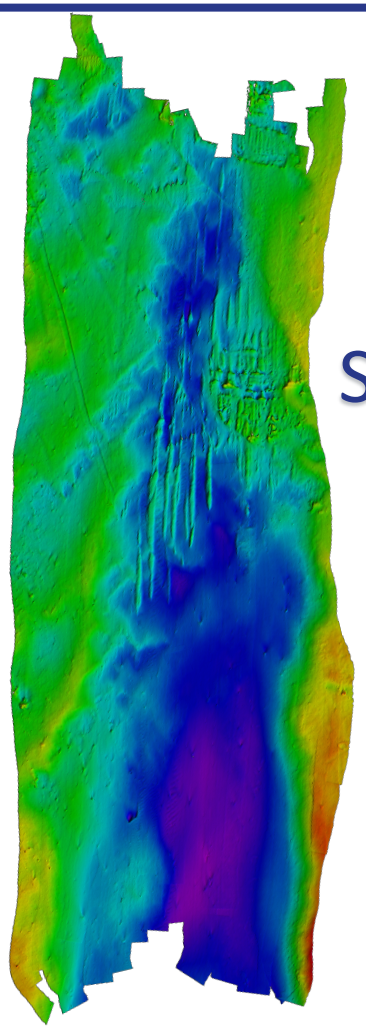
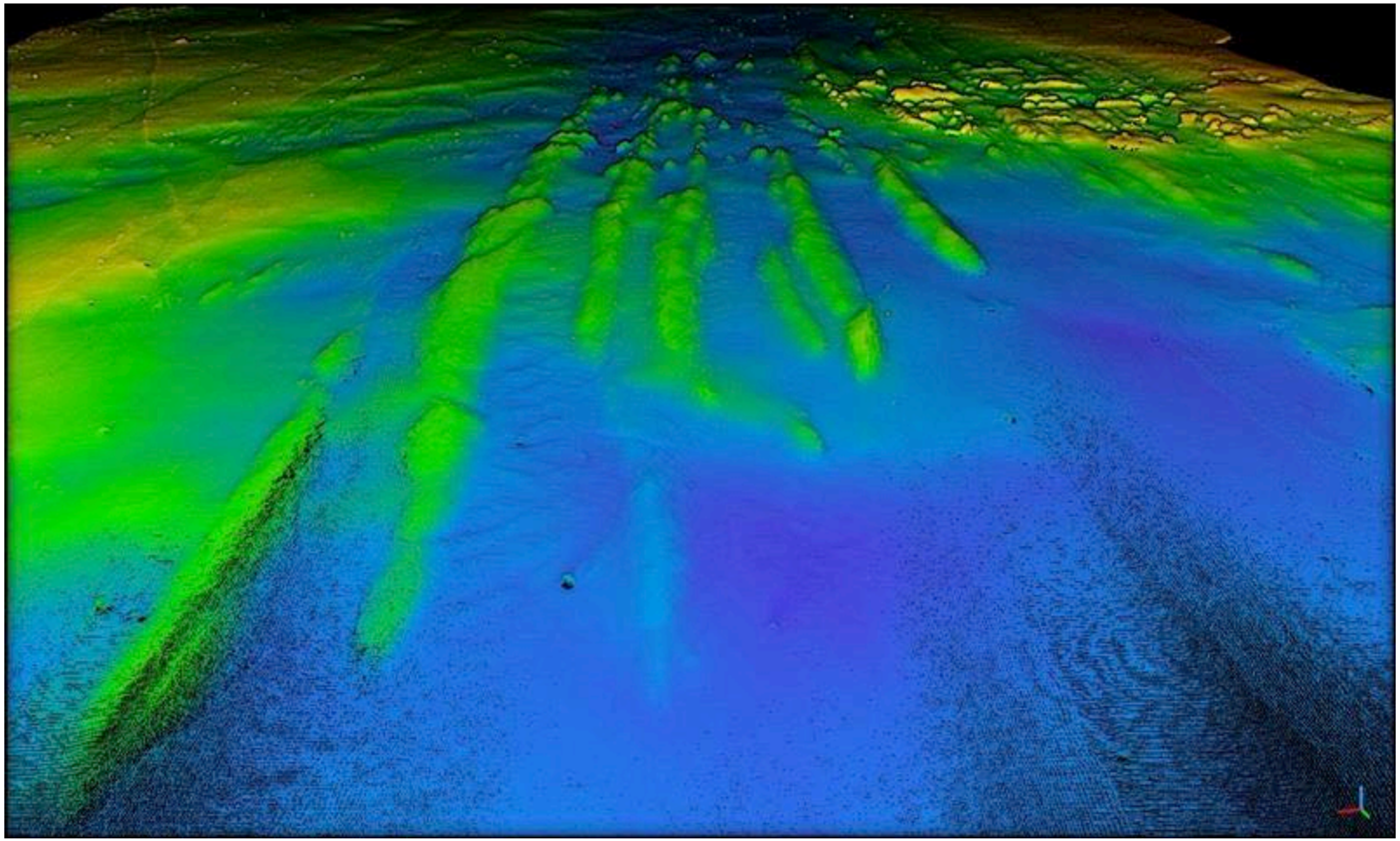


South up!



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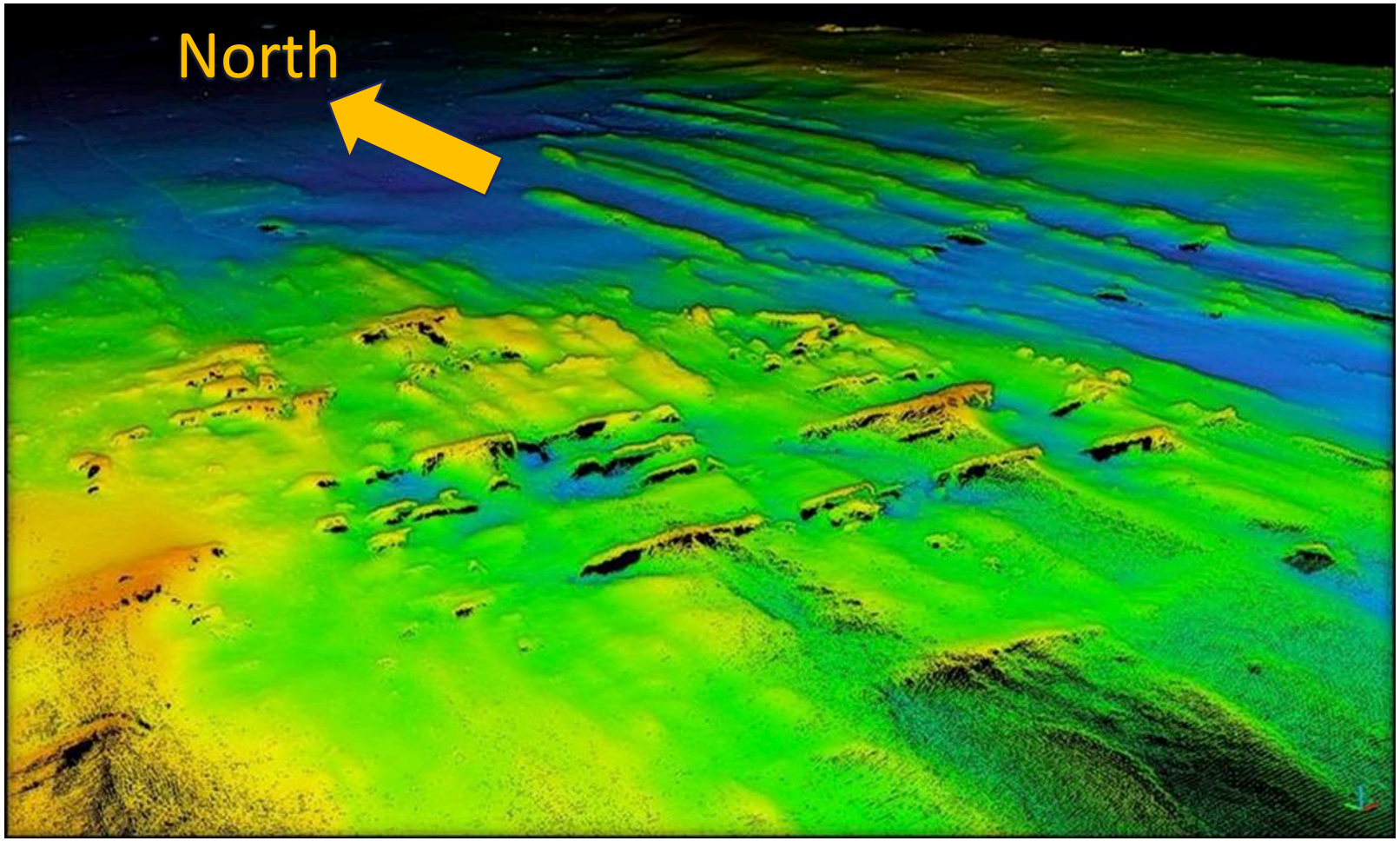

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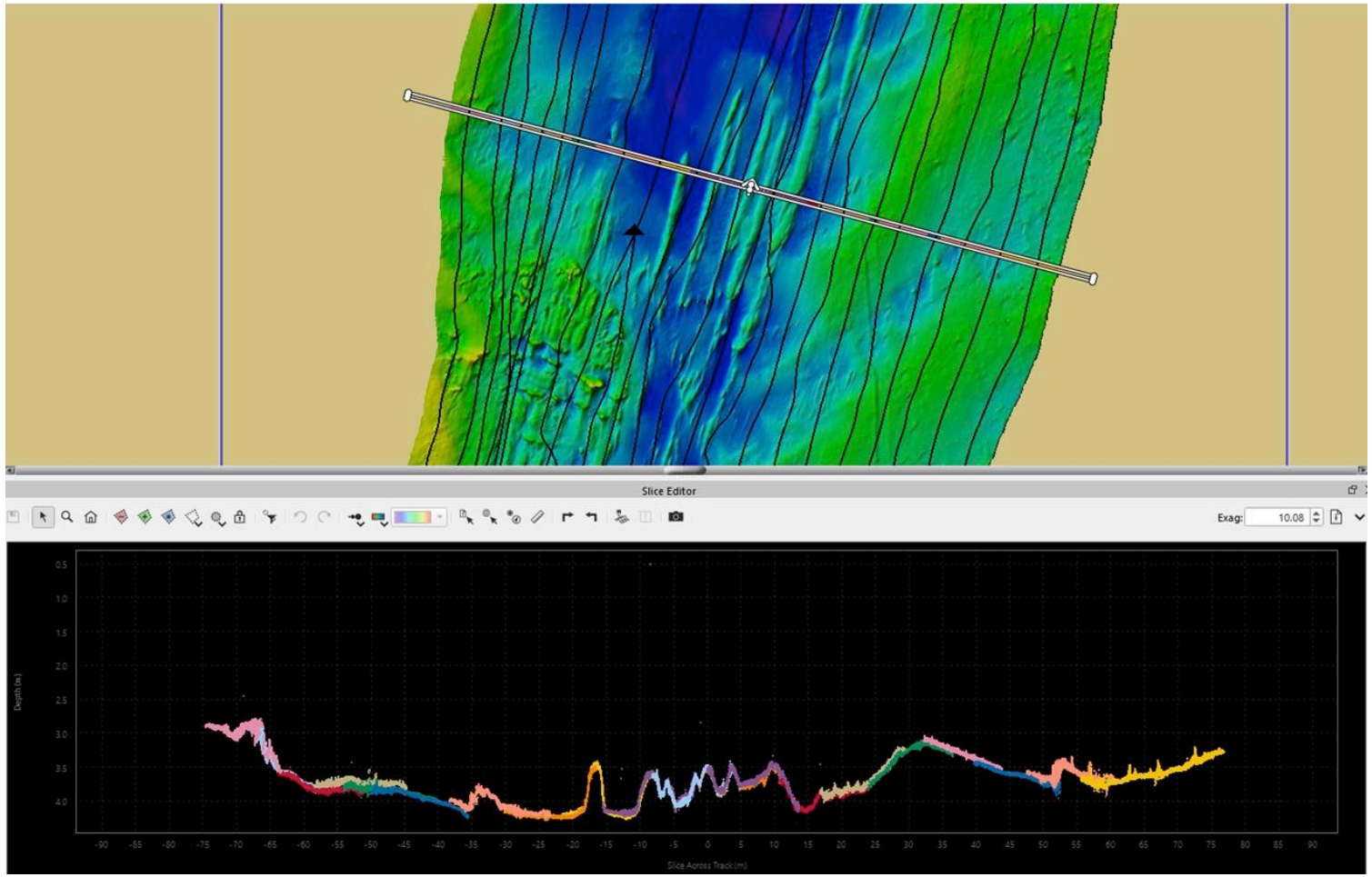

Finding the structure interesting,

we have requested consultancy from Geomega Ltd.

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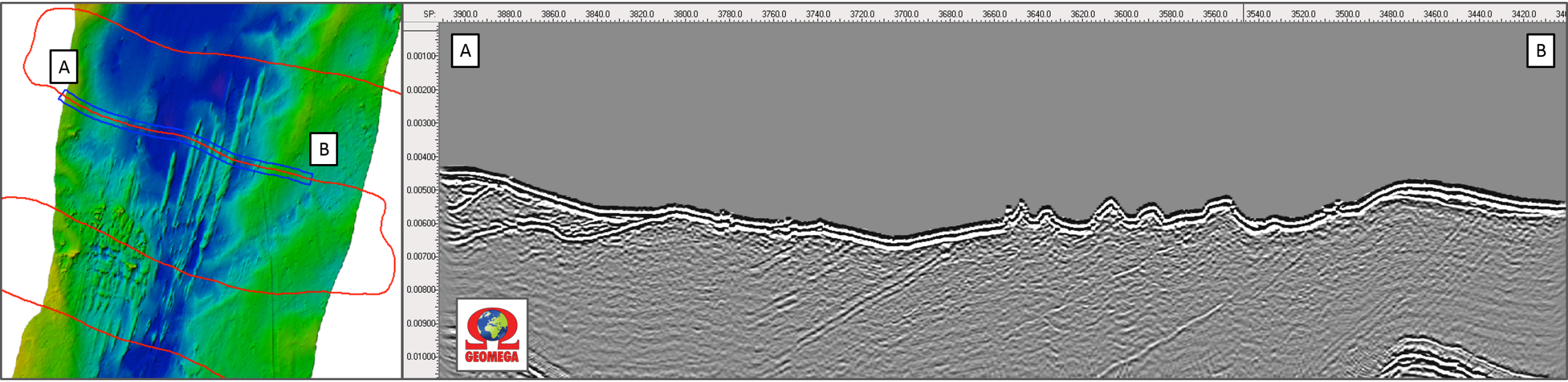
- Both parties were lucky, as Geomega Ltd. made underwater geophysical survey in the same area just 1.5 years earlier. They were ready to match a few of their cross sections with our depth measurements.
- Seismic data was recorded in June 2020 by Geomega's ultra-high resolution single-channel IKB-Seistec sub-bottom profiler. (Energy source was a high frequency boomer, data were recorded using Geomega's PreSeis seismic system with integrated RTK-GPS positioning.)
- Seeing the next images, nobody needs to be an expert to see how well the two data sets fits to each other.
- Their conclusion was: "In this section of the riverbed, there's no sediment in the Danube, - making visible the bedrock that draws those picturesque, almost parallel shapes."

Merging the two data sets



Combination of the A–B geophysical cross-sections with depth (left) and the original seismic (subsurface) dataset (right)

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