Solutions for Reliable Navigation in Low Water Conditions on Hungary's Danube Section

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Presenter: **Ágnes Takácsné Tóth**

Date: 4 March 2026

Joint Workshop on Waterway Management of EUSDR/PA1a and the Danube Commission

Institutional & Operational Challenges

Key Aspects for Implementation of a Deep Channel Designation System in Hungary

Legal & Regulatory Aspects

- Update Notices to Skippers to reflect changes
- Amend national regulations

Technical Aspects

- Maintaining up-to-date Inland ECDIS charts
- Increase frequency of bathymetric surveys

Economic & Resource Aspects

- Survey & chart update costs
- Resource requirements

Hydromorphological Aspects

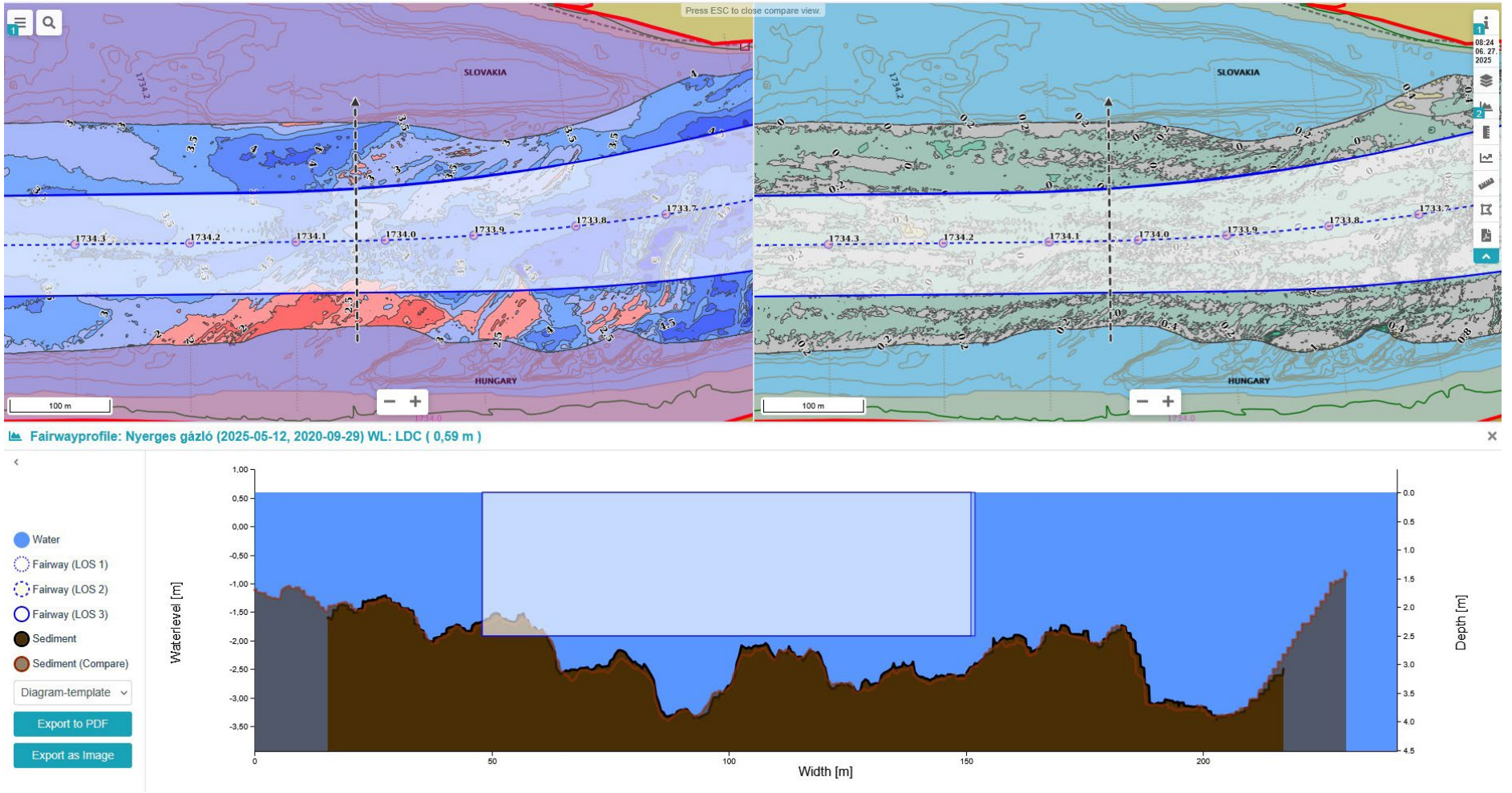
- Survey frequency linked to riverbed dynamics
- Specific bed material in each section

source: chatgpt

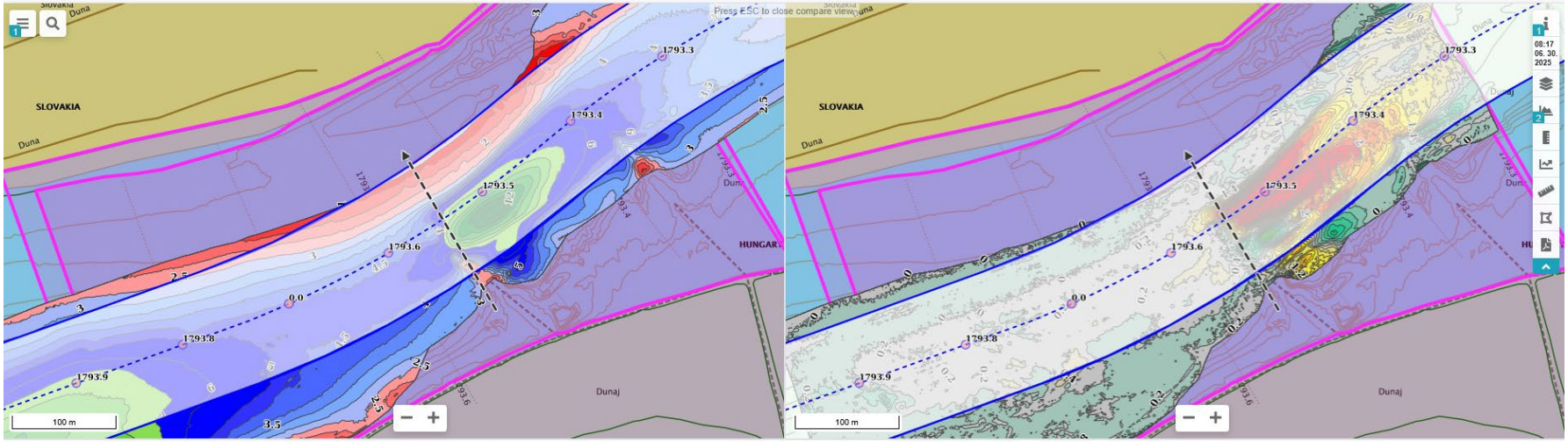
Frequency of bathymetric survey – Stable sections

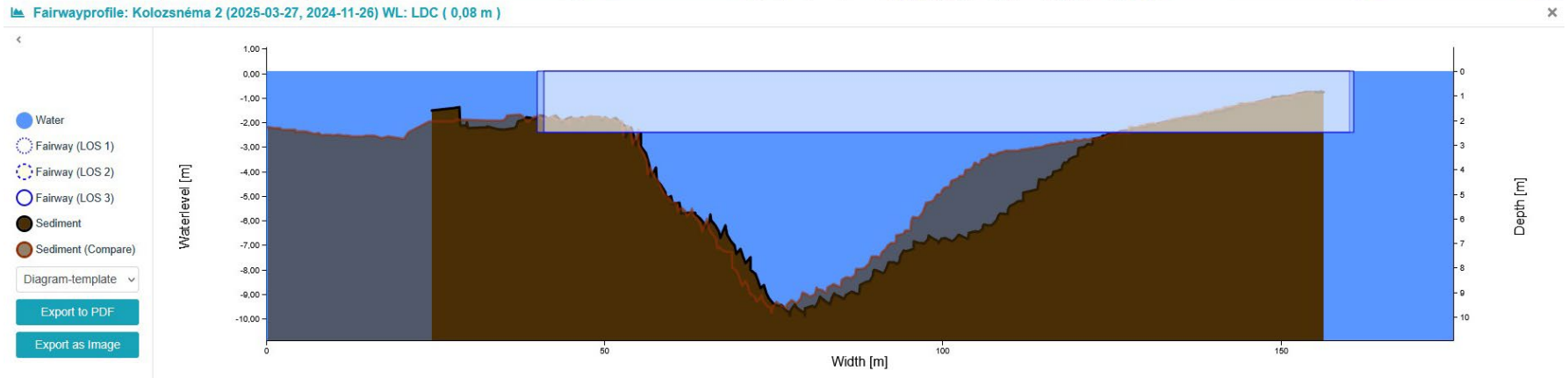
Stable sections need less frequent surveys

- **Nyergesújfalu**: rocky riverbed, measured 2×/year, no significant bed changes over time



Bed Changes at Kolozsnéma in 4 Months





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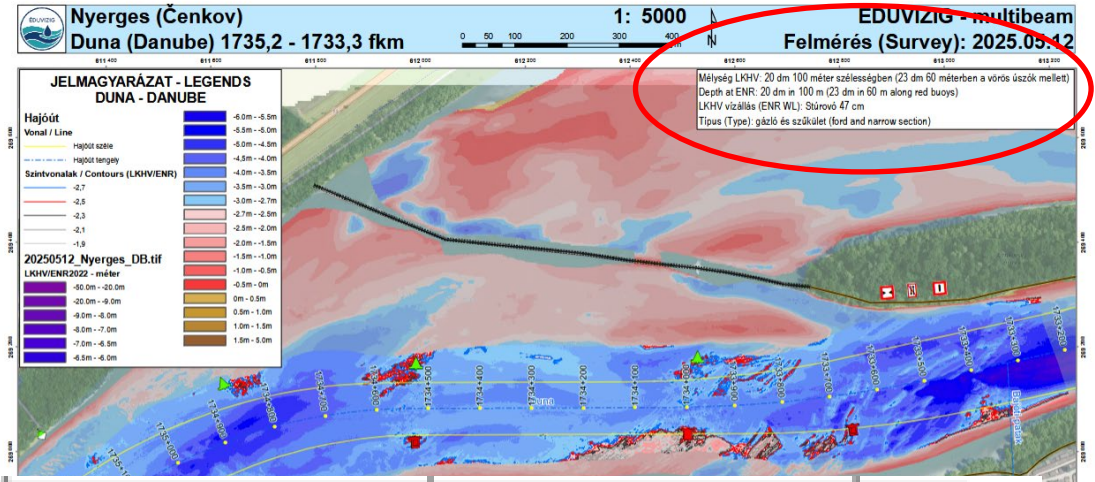
Additional information – a similar approach

Gázlóviszonyok a Dunán
Kiadva: 2025. november 18. 08:27

#	Fkm-től	Fkm-ig	mélysége [dm]	szélessége [m]	hossza [m]	információ	helye	mélysége [dm]	szélessége [m]	hossza [m]	helyszínrajz
1	1808.1	1807.6	26	120	500		piros úszó mellett	28	60	500	
2	1799.0	1798.7		100	300	hajóútszűkület					
3	1797.4	1796.6		80	800	hajóútszűkület					
4	1796.3	1795.5		110	800	hajóútszűkület					
5	1795.5	1795.2		80	300	hajóútszűkület					
6	1793.9	1793.3		70	600	hajóútszűkület					
7	1792.1	1791.6	22	100	500		zöld úszó mellett	27	50	500	
8	1789.2	1788.3	25	120	900		piros úszó mellett	27	80	900	
9	1786.7	1785.9	25	120	800		zöld úszó mellett	28	80	800	
10	1735.2	1733.3	21	100	1900		piros úszó mellett	24			
11	1732.6	1732.2	22	130	400		zöld úszó mellett	27			
12	1726.0	1724.4	26	120	1600						
13	1711.5	1710.7	22	100	800		piros úszó mellett	24			

Our bottleneck publication already provides additional fairway information for skippers
→ in practice, we are already applying a very similar approach.



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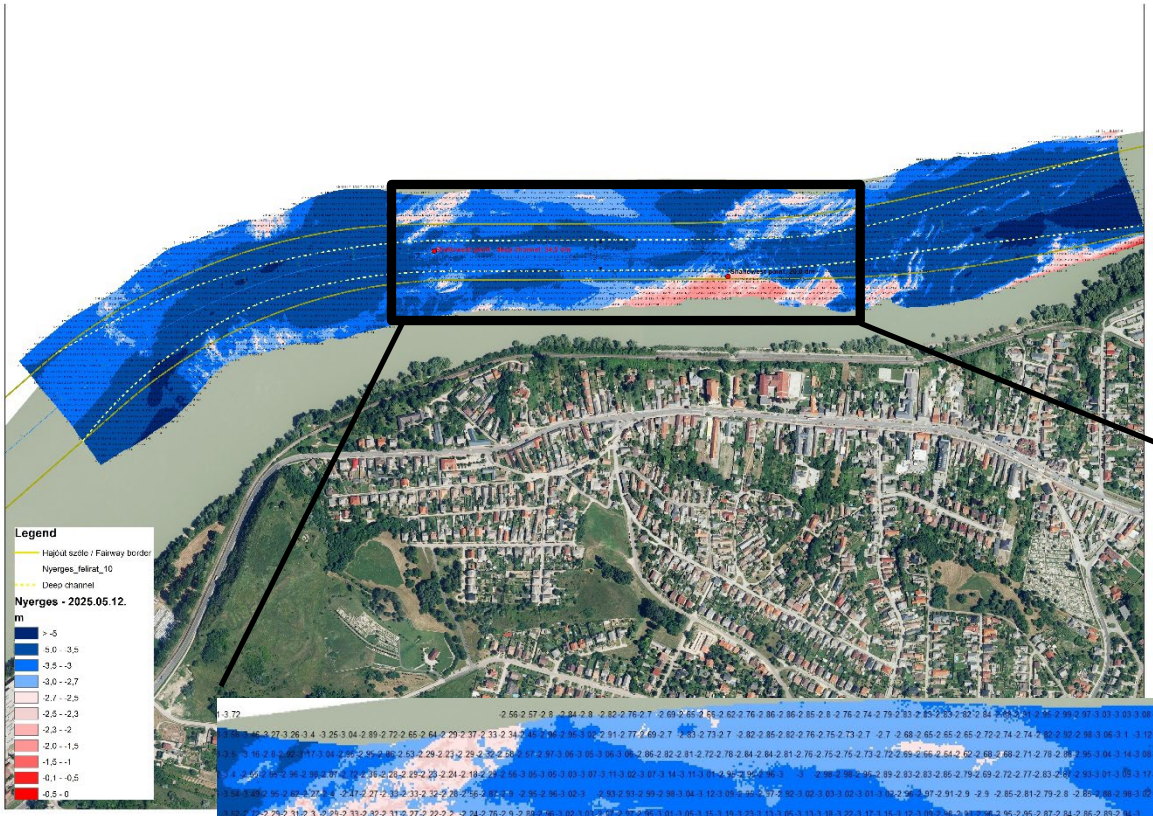
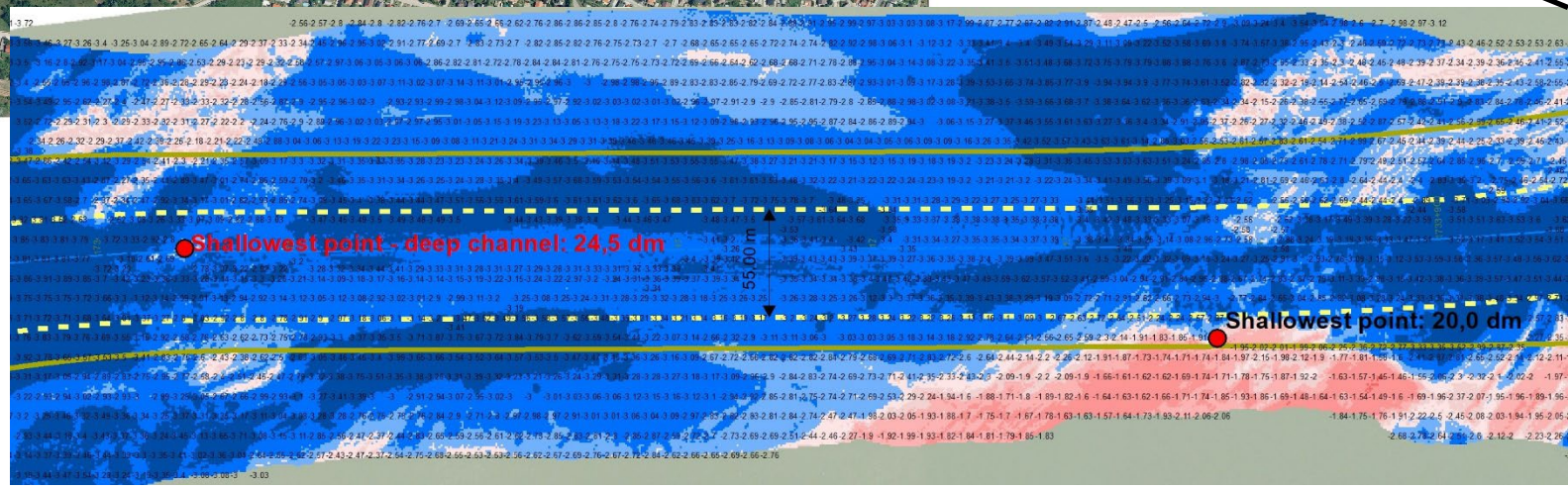
Mélység LKHV: 20 dm 100 méter szélességben (23 dm 60 méterben a vörös úszók mellett)
Depth at ENR: 20 dm in 100 m (23 dm in 60 m along red buoys)

Next step: Designation of the deep channel - Nyerges





Based on the May 12, 2025 bathymetric survey:

Available fairway depth:
20 dm over 100 m width.

Deep channel:
24,5 dm over 55 m width

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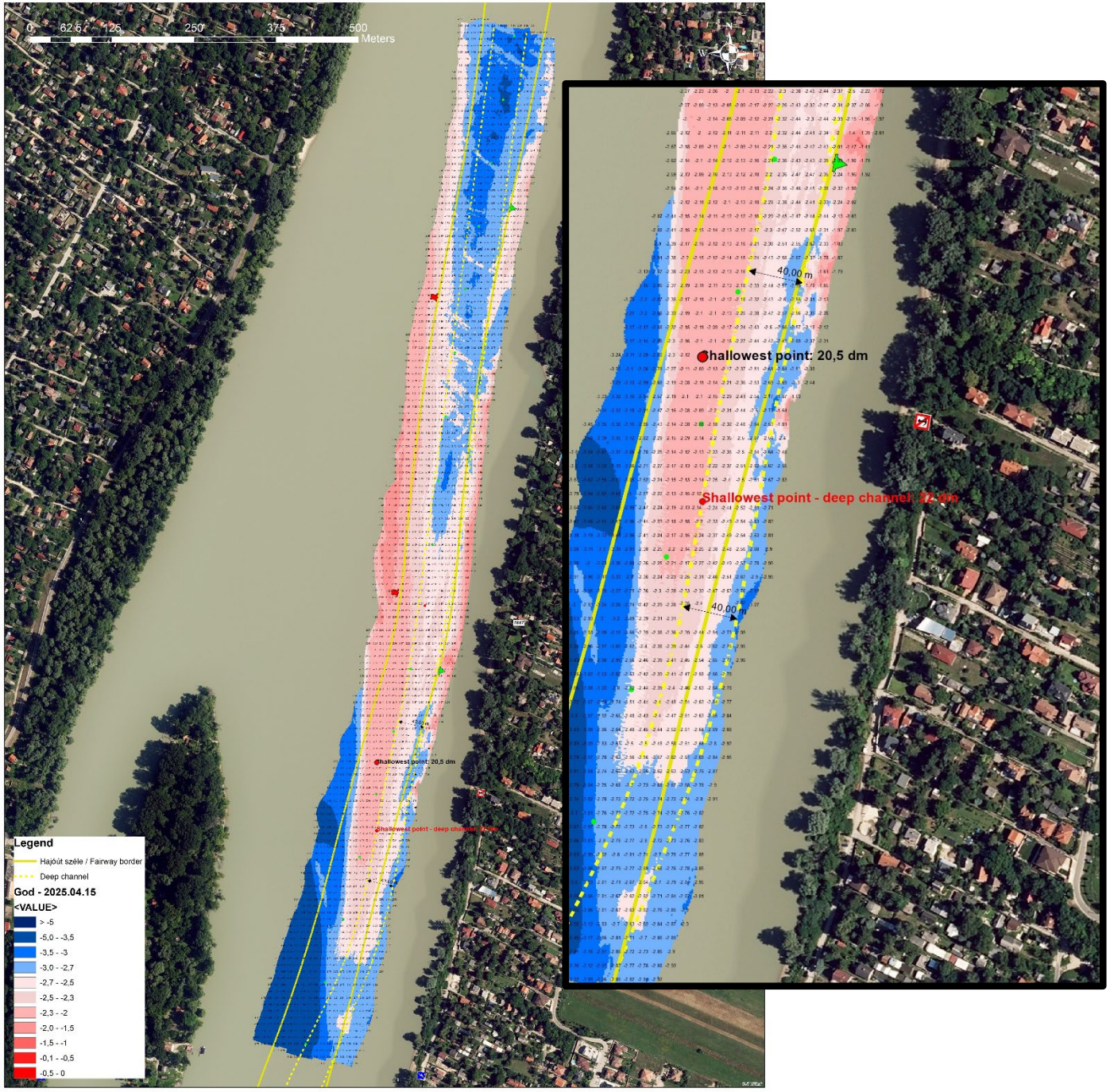
Based on the April 15, 2025 bathymetric survey:

Available fairway depth:
20,5 dm over 80 m width

Deep channel
22 dm over 40 m width



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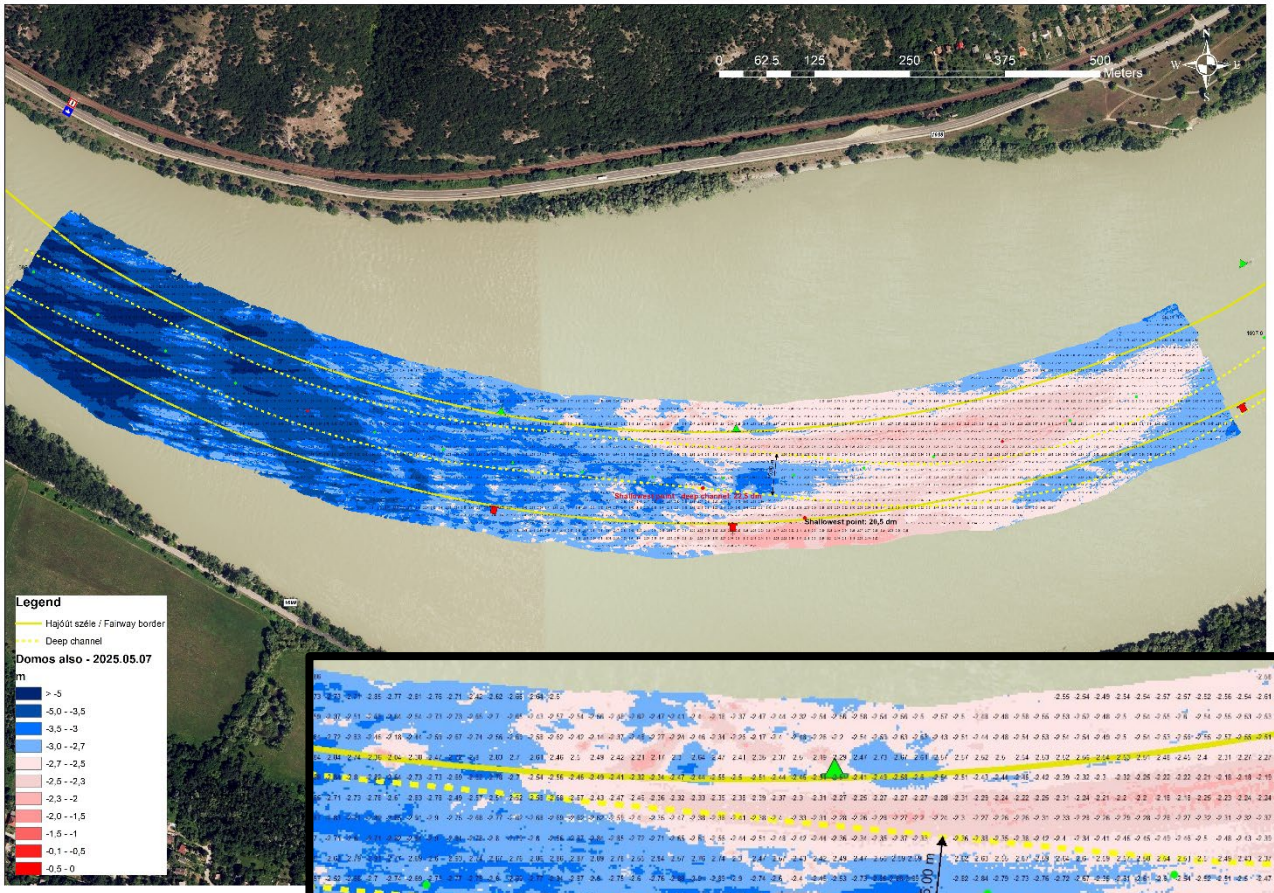
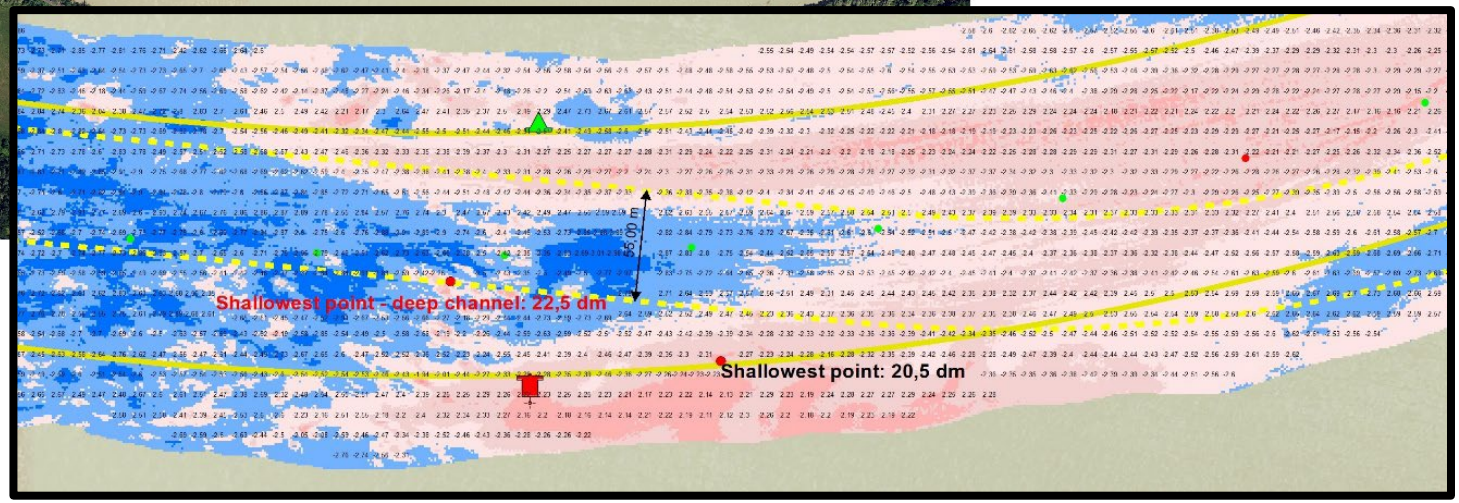
Lower Dömös





Based on the May 7, 2025 bathymetric survey:

Available fairway depth:
20,5 dm over 120 m width

Deep channel:
22,5 dm over 55 m width

R=600 m!

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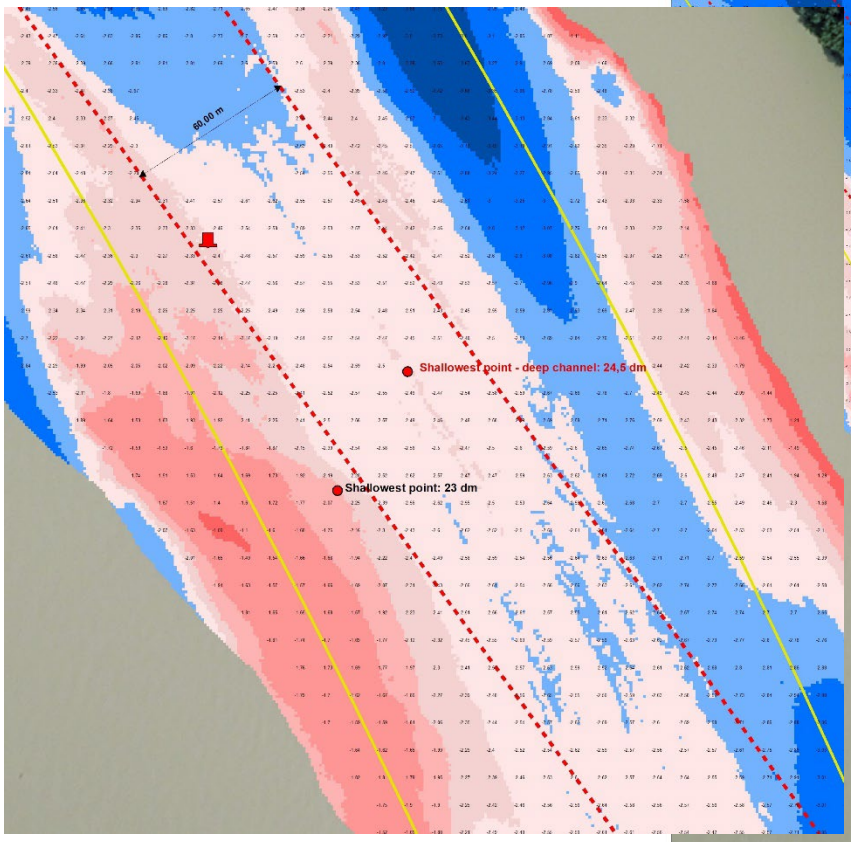
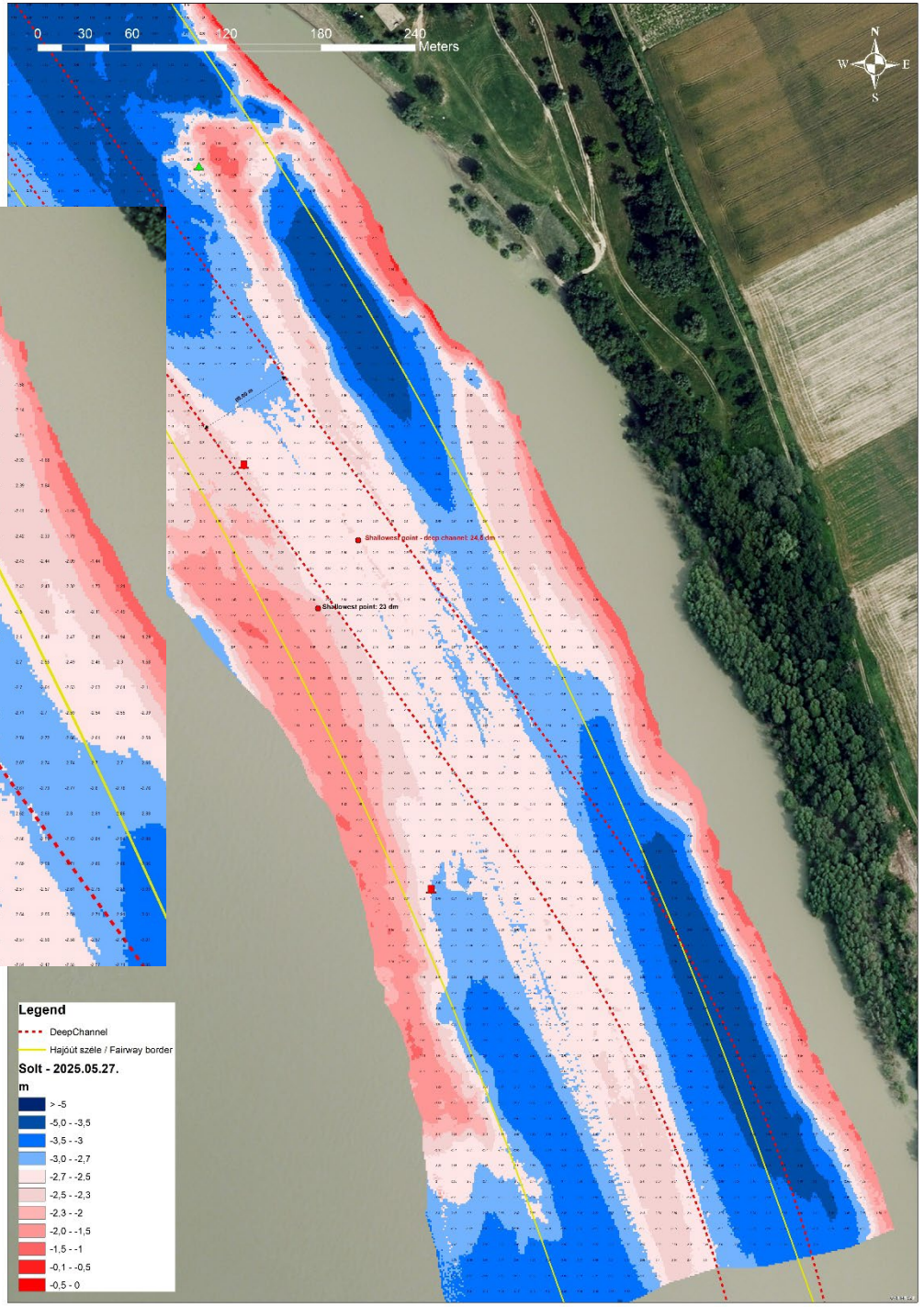
Solt





Based on the May 27, 2025 bathymetric survey:

Available fairway depth:
23 dm over 80 m width

Deep channel:
24,5 dm over 60 m width

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Source: chatgpt

Proposal on short-term intervention measures

Improving the publication of bottlenecks and fairway depths

- Publication of fairway depths in **centimeters** and at **hourly** intervals on the official website
  - Notice to skippers –by Shipping Authority (ÉKM)
  - Informing relevant stakeholders appropriately about the change
  - Partly supported on the Danube FIS Portal
  - Implementation requires modifications to the national hydrological database

More flexible and adaptive regulatory environment within short time and at relatively low cost

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13	1711.5	1710.7	22	100	800		piros úszó mellett	24	70	800	

source: hydroinfo.hu

Proposal on short-term intervention measures

Increasing the frequency of riverbed survey linked to hydrological events

- Definition of critical sections
- Funding and human resource are not resolved

Updating the legal framework

- New Reference Water Levels,
- Review of the **safety distance values** depending on the quality of the riverbed material and clarification of their application

Source: marinetraffic

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Deep channel

Designation of deep channel where technically feasible

1. New digital maps, designation ✓
2. Development of the relevant regulatory framework (set of rules) – under discussion
3. Testing applicability on pilot sections (e.g. Dömös)
4. After succesful tests, update of notice of skippers, publish updated maps and geometry
5. Examination of maintenance dredging

Risks:

- Use of deep channel requires advanced navigation requirement (ECDIS)
- under the current iENC standard, such a display is not yet possible and cannot be encoded → FAIRway Danube II (WAMOS 2.0)
- The effectiveness of the deep channel strongly depends on the onboard navigation equipment.

Summary – Key Conclusions

Key Findings of the Assessment:

- Hungary already applies an adaptive and responsive bathymetric monitoring system
- Deep channel designation is feasible on the Hungarian section

Specific Finding in Assessed Sections:

- Limited depth gains even when fairway width is reduced
- Deep channel width varies between 40-55 m

Current Focus:

- Improving the publication of bottlenecks and fairway depths
- Applying legally supported temporary traffic regimes (Notices to Skippers)
- Updating the legal framework
- Increasing the frequency of riverbed survey linked to hydrological events
- Continue consultations with the Ministry of Transport regarding the implementation of the deep channel
    - Setting the rules,
    - share the concept with the stakeholders,
    - Start the pilot as soon as possible

Thank you for your attention!