Inland ENC Harmonization Group

Bathymetric Inland ENCs

Depth information in Inland ENCs

- Depth information for inland waterways is even more important than for maritime areas
- Inland vessels are navigating with very little keel clearance
- The available depth on a certain waterway section is determining the maximum draught and therefore the maximum payload
- The riverbed is changing rapidly in some free flowing sections of the big rivers
- In order to support the safety and competitiveness of inland navigation it is necessary to provide up-to-date depth information

Depth information in “normal” IENCs

- Survey data from multibeam or singlebeam surveys needs postprocessing e.g. to eliminate false echoes
- The contours of the depth areas have to be simplified by sophisticated algorithms to reduce the amount of data
- Old depth areas in the IENCs have to be deleted and the new depth areas have to be introduced
- The geometry of the depth areas has to be cut and combined with the geometry of shorelines, shoreline constructions, bridge pylons etc.
- As a result the production of an update of depth data is time consuming and expensive

“Normal” depth layer IENCs

- The current standard provides also the possibility to create a cell with a higher usage that is only containing depth data
- The depth areas in this cell would however cover all other objects in the waterway (buoys, bridges, ferry routes, etc.)
- It would therefore be necessary to have all objects that are situated within the boundaries of depth areas in an overlay cell
- The display would show:
  - Information outside the depth areas from the base cell
  - Depth areas from the cell with the higher usage
  - Objects within the depth areas from the overlay cell
- The production process is a little bit faster, but not optimal

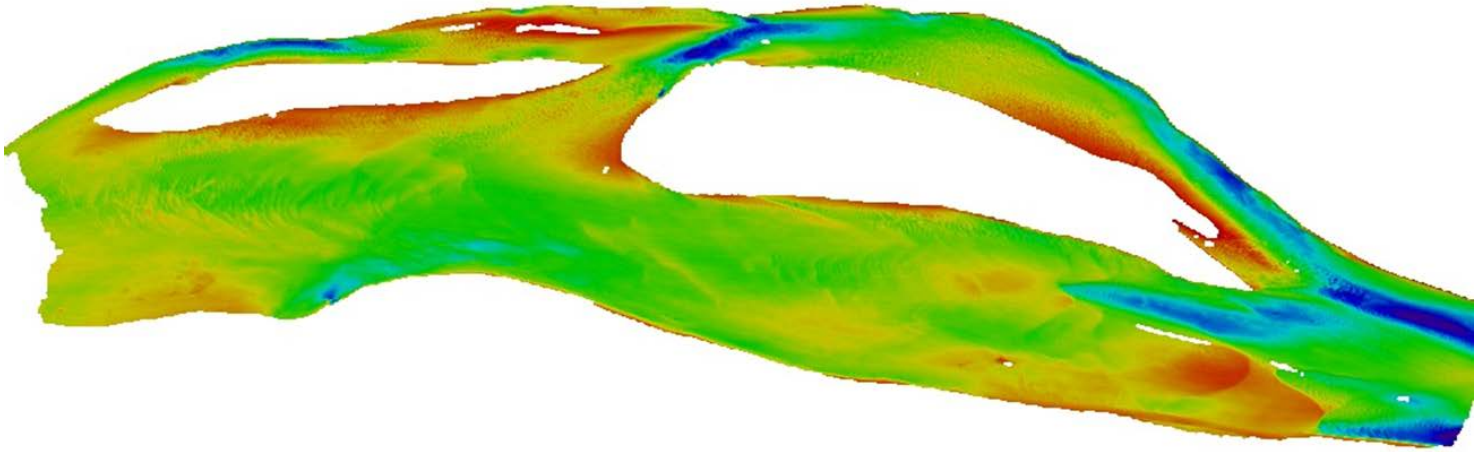
Test of S-102 and bathymetric IENCs

Within the European research and development project IRIS Europe 3 we have tested two alternative approaches:

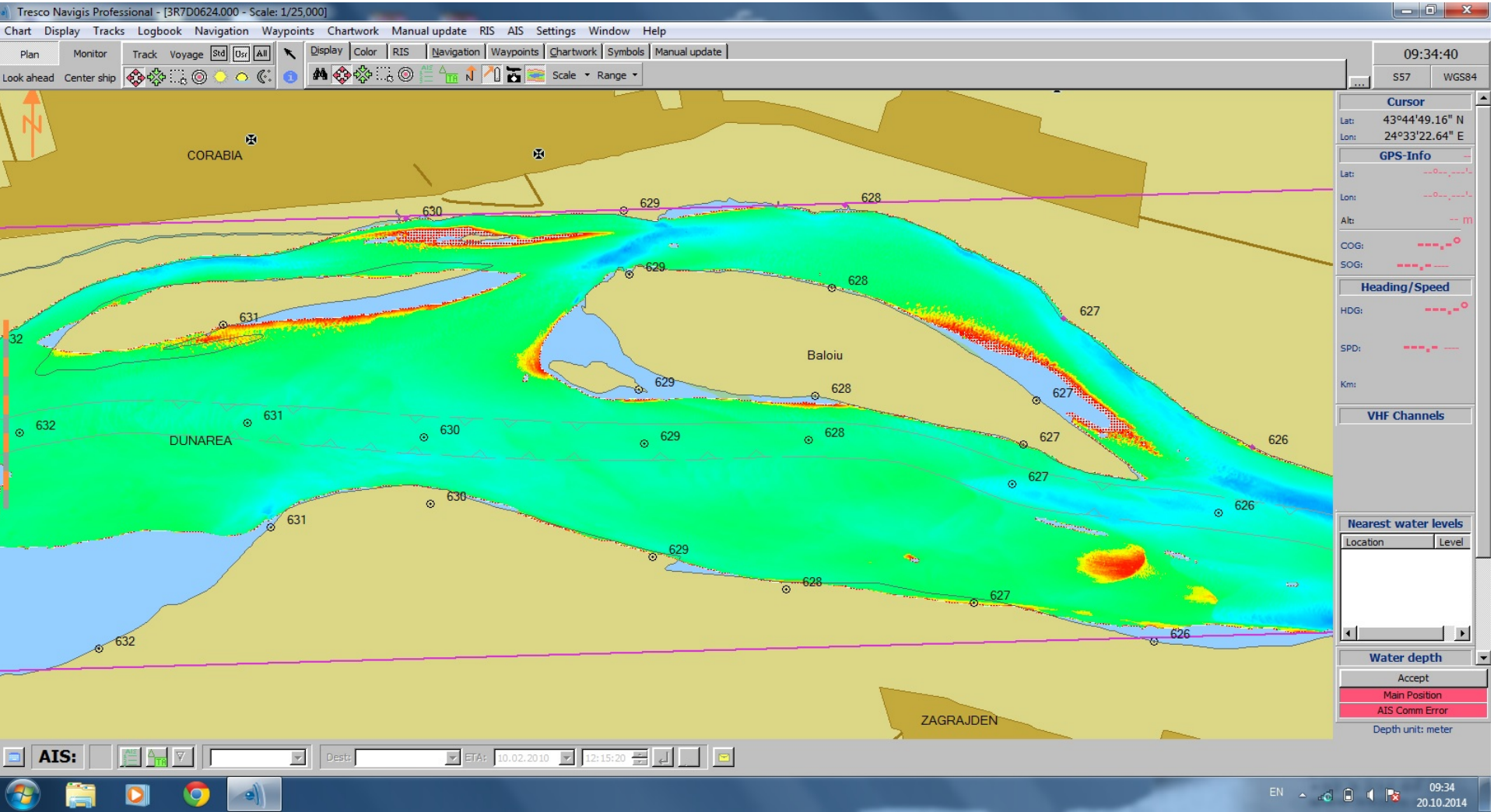
- S-102 bathymetric ENCs
  S-102 is the first S-100 based Product Specification of IHO
  An S-102 bENC is not containing depth areas but gridded data of a digital terrain model, the depth display is created in the application
- Bathymetric Inland ENCs
  very similar to the last slide, but this Product Specification allows to have all data in the base cell and the objects within the depth area are automatically displayed on top of the depth areas

S-102 bathymetric ENCs

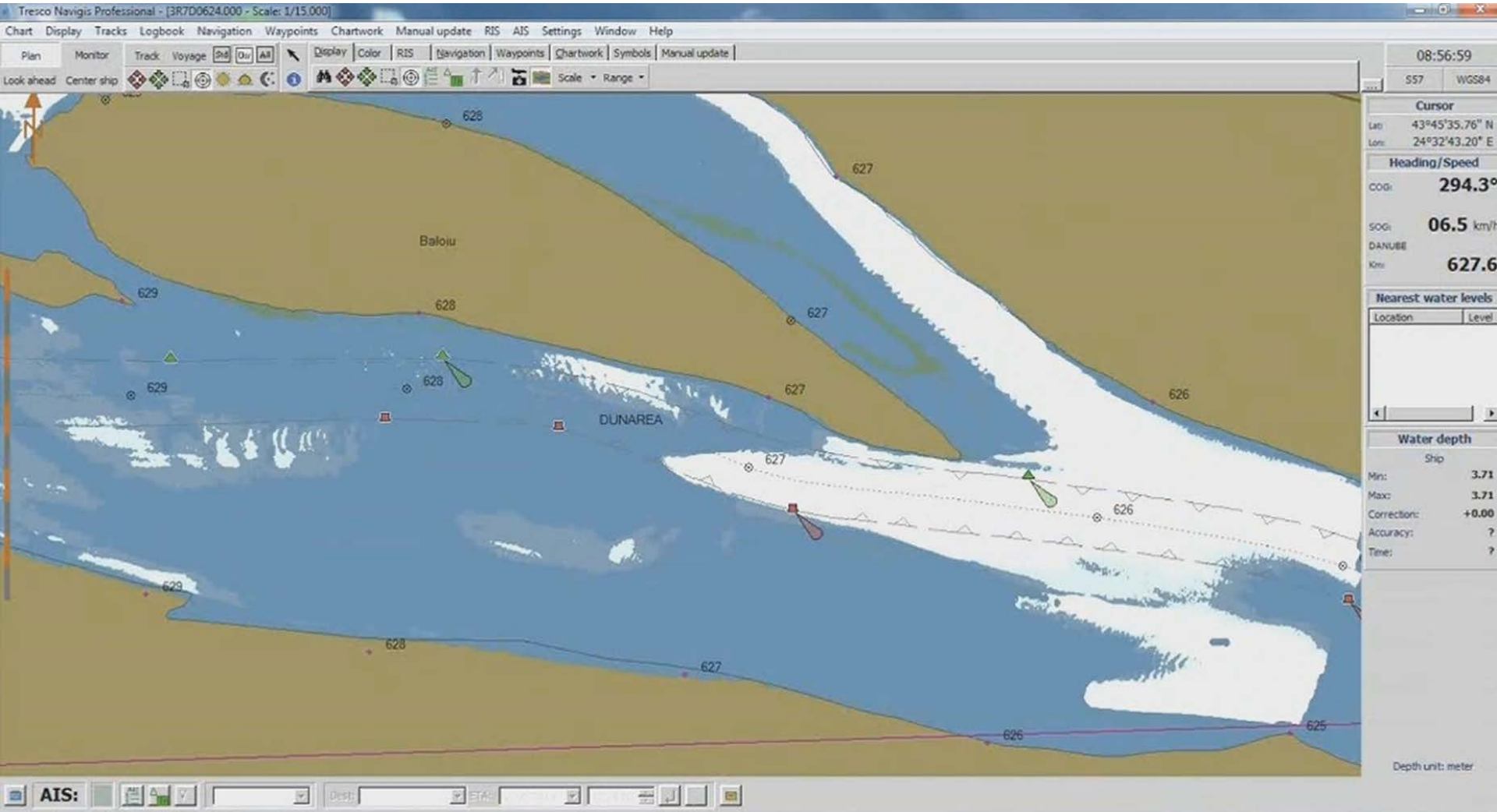
- .bag (bathymetric attributed grid) file created from the survey



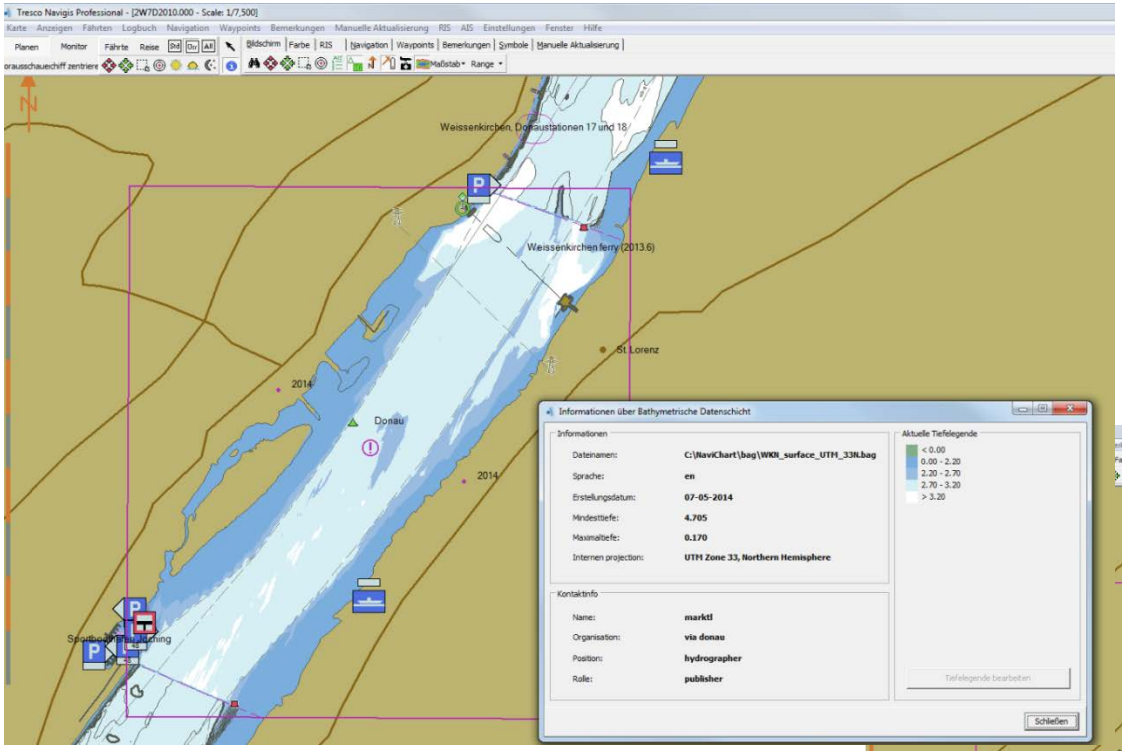
S-102 bathymetric ENC with IENC

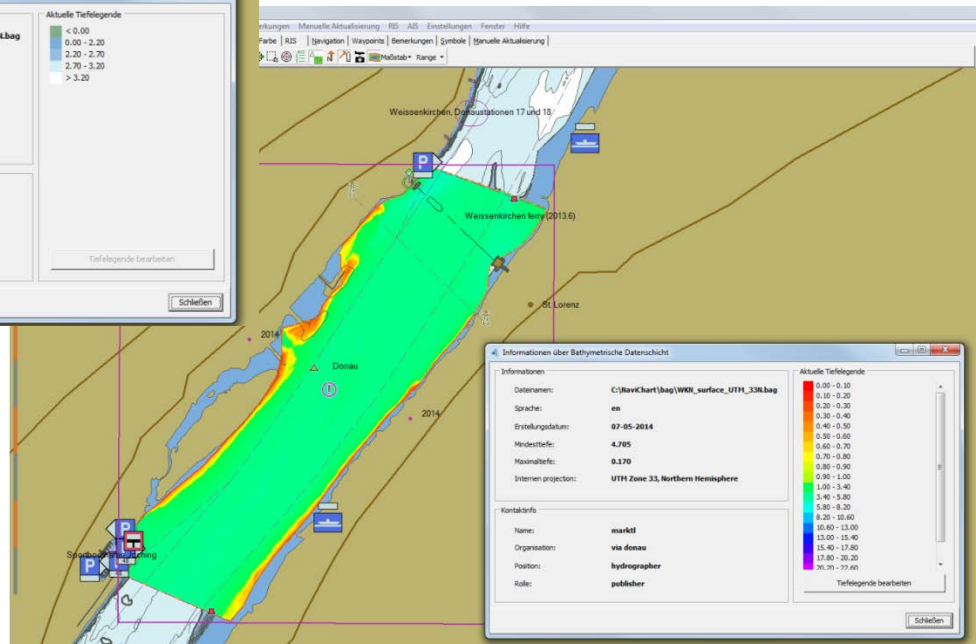


S-102 bathymetric ENC with IENC



S-102 bathymetric ENC with IENC





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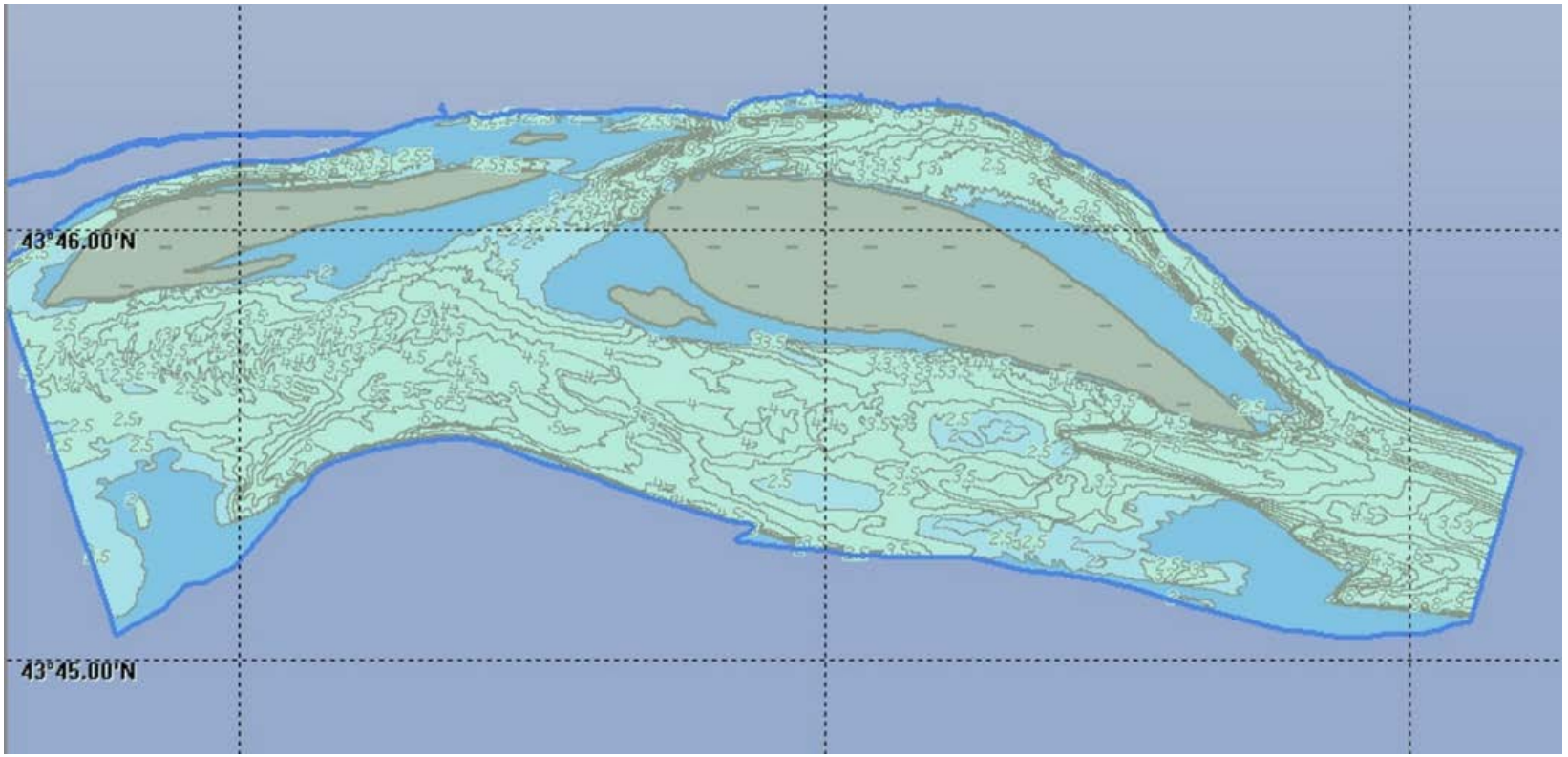
S-102 conclusions

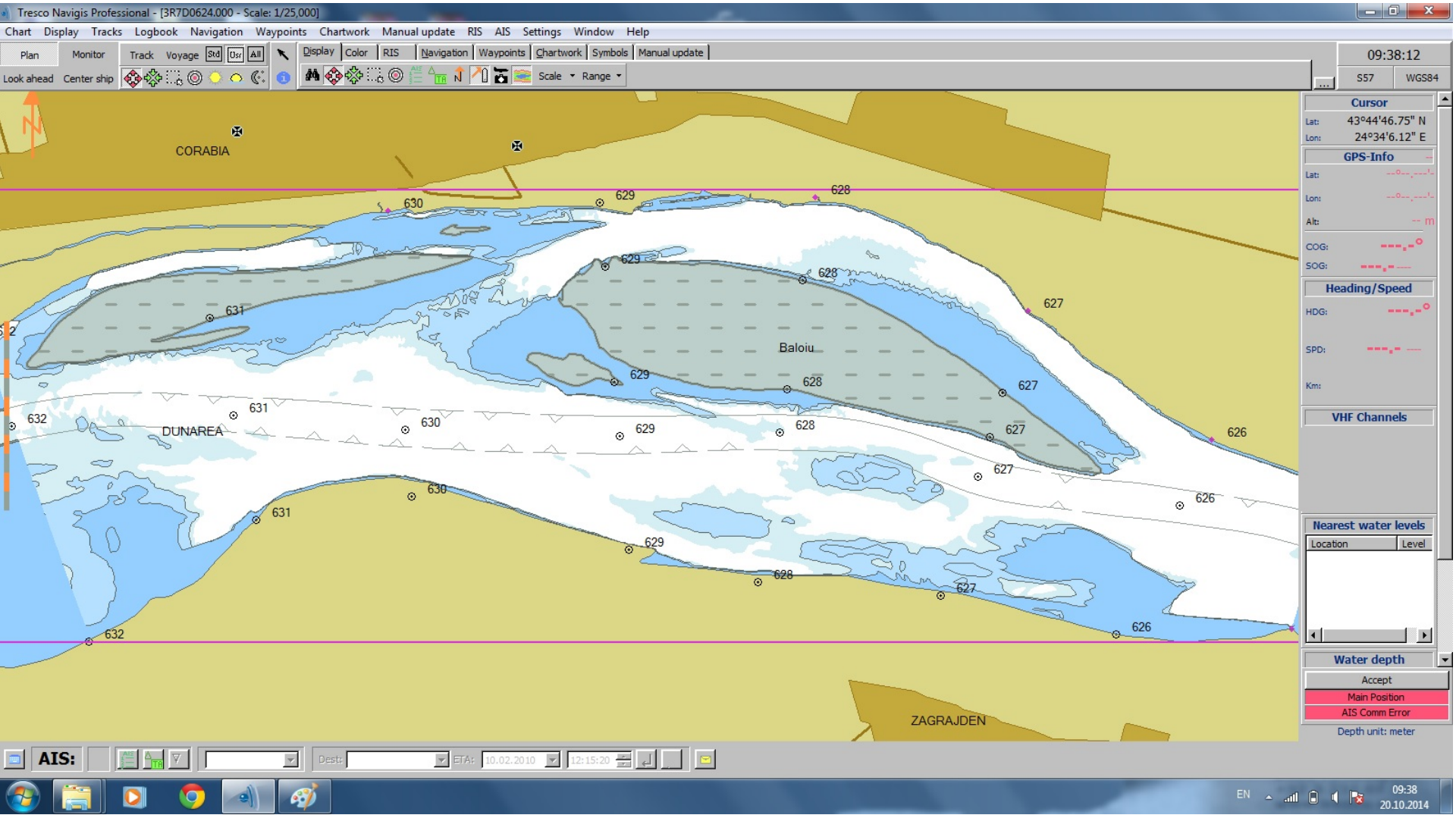
- Relatively easy to produce
- It is possible to combine S-102 bathymetric ENCs with Inland ENCs
- Very high data volume
- Expensive data transfer especially with roaming
- The applications on the vessels must be capable to calculate the depth display from the gridded data
- Would require bigger investments for applications on the vessels

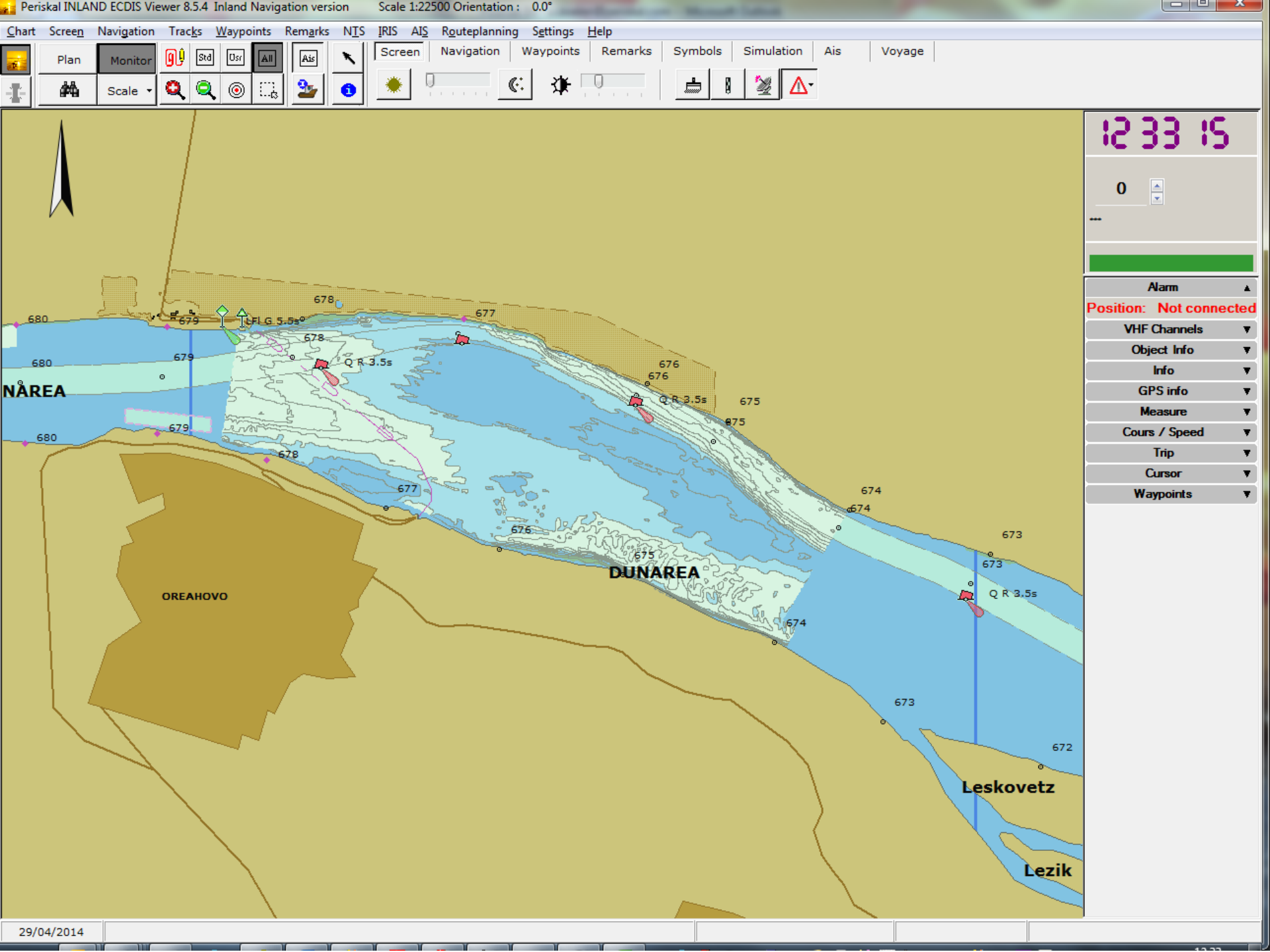
Bathymetric Inland ENCs

- Inland ENC that is only containing depth information



Bathymetric Inland ENC with IENC




Periskal INLAND ECDIS Viewer 8.5.4 Inland Navigation version
Scale 1:22500 Orientation : 0.0°
Chart Screen Navigation Tracks Waypoints Remarks NTS IRIS AIS Routeplanning Settings Help
Plan
Monitor
Scale
Std
Dsr
All
Ais
Screen
Navigation
Waypoints
Remarks
Symbols
Simulation
Ais
Voyage
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Alarm
Position: Not connected
VHF Channels
Object Info
Info
GPS info
Measure
Cours / Speed
Trip
Cursor
Waypoints
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OREAHOVO
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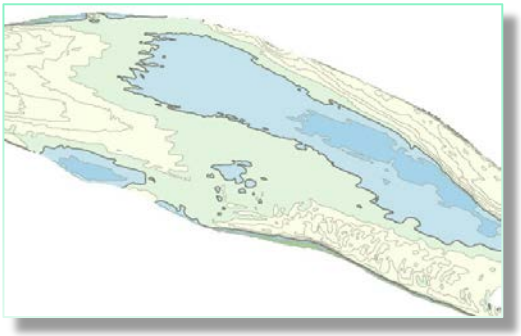
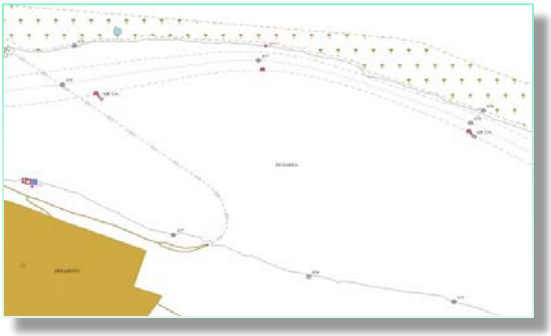
Bathymetric Inland ENC with IENC

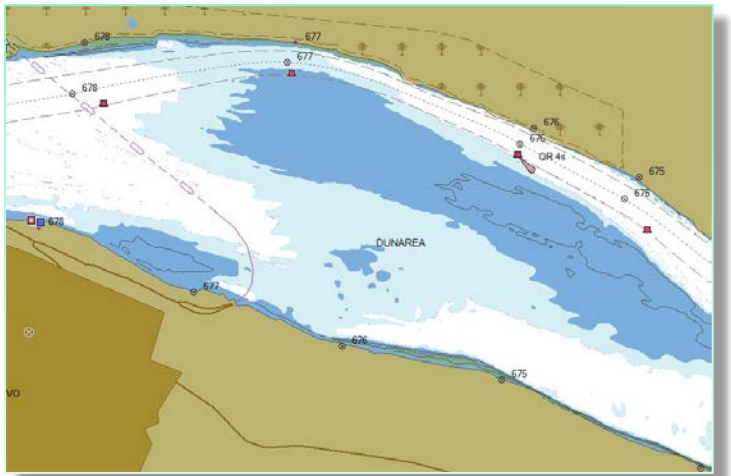
Skin of the earth features in the base cell

depth data in the bathymetric Inland ENC

other features in the base cell







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Bathymetric Inland ENC conclusions

- Fast and cost effective production
- Same data volume as classic Inland ENC
- Therefore easy to distribute
- Requires only a small update of the applications
- Familiar display for the skipper

- Bathymetric Inland ENCs will therefore be included in the European standards
- The Economic Commission for Europe of the United Nations has already agreed with the proposal on working group level, formal adoption in November

Bathymetric Inland ENCs and IEHG

- The members of IEHG have been informed about the proposal in spring
- There was no objection
- The European Inland ECDIS expert group proposes to adopt the Product Specification for bathymetric Inland ENCs
- Registration of a S-57 based Product Specification in the S-100 registry has to be clarified

Product Specification Feature Catalogue XML XSD

Detailed presentation of tests RO1 AT1 RO2