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Merging Marine and Land Data for Coastal Area Mapping

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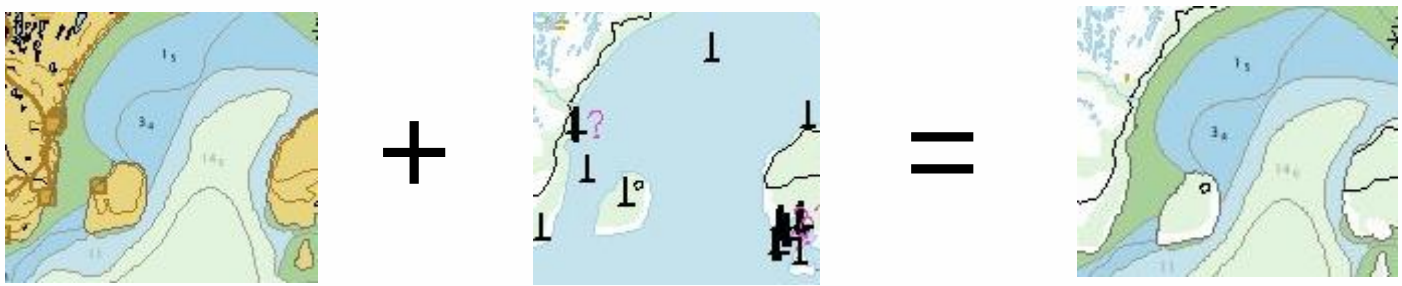
Introduction

- The increasing demand to map coastal zone areas has highlighted issues presented when merging Topographic and Hydrographic data.
- New technologies can help overcome these challenges.
- This experiment was about having both data types in the same database, so they could be merged for analysis while the original datasets were to retain their integrity.

Objectives

- Implement a system where the original data sources can be maintained as such;
- Allow data from various sources to reside in the same database, and then be merged into combined layer(s).
- Free the data from presentation;
- Remove the limitations due to map extents



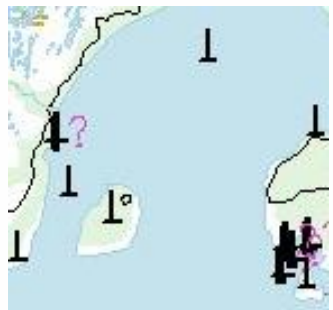
The Prototype

- CARIS HPD was used to combine hydrographic and topographic data, into a single database

- Data used:
  - 4 X 1:50,000 NTDB Map Sheets from NRCan (Shape files)
  - One 1:20,000 S-57 file.

Merging Topographic with Hydrographic data - Issues

- Typically, marine sources have used the low water line to delineate coastlines…
- …and land sources have used high water line.
- Charts come with a built-in safety bias.
- Geographic entities are encoded with different catalogs, at different scales.
- Vertical datums.
- Metadata available



Pre-Processing

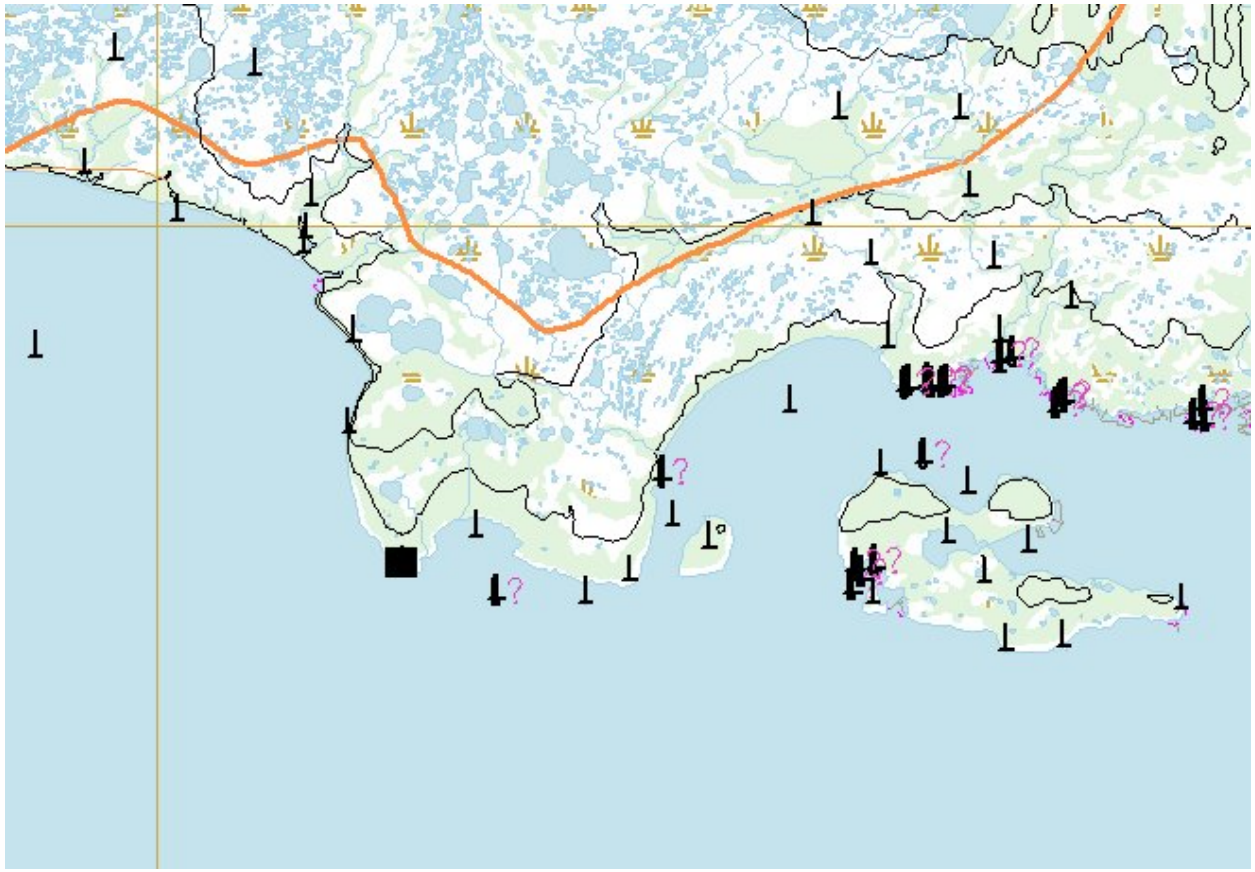
- The HPD data (object) catalogue had to be extended for NTDB features and attributes.
- This allows both S-57 and NTDB data objects to be managed in HPD
- So that each dataset can be displayed with its “own” symbolization, the presentation lookup files had to modified to include the NTDB symbolization instructions. (HPD object model frees features from presentation)

The Data Loading Process

- HPD does not automatically shift data to a common **Vertical Datum**, it must be adjusted prior to data integration.

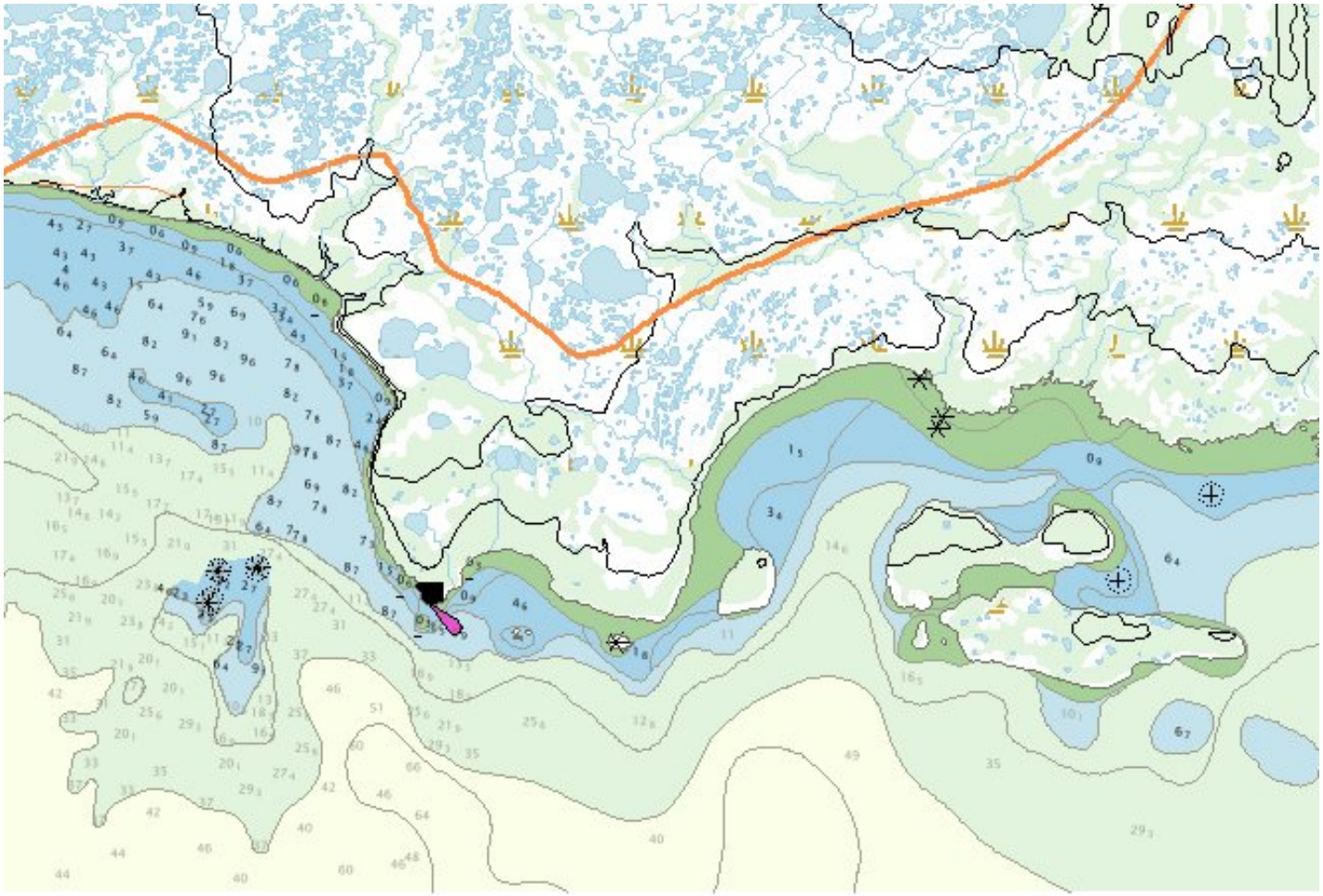
- With regards to the **Horizontal Datum** (NAD83 vs WGS84) the NTDB dataset was converted to WGS84 by the system during the import process.

Topographic Data



Hydrographic Data

Combined Data



Combining Topographic and Hydrographic Data

- When selecting the coastline, the project proponents determined that the ENC coastline would be used for the combined layer.
- This decision was based on the larger scale of the ENC

According to the deliverable, the choice of coastline can vary. HPD can support "N" Product Layers. Compilation on each of the Product (Combined) layers is done according to the Product's Specifications.

Technical Conclusions

- Today's database technologies allow data managers to combine varying datasets from various origins in a single database without compromising the data integrity of the source datasets.
- The land and marine data formats can remain independent, yet be combined for various reasons.
- Vertical datum de-confliction is an important issue.
- The Client is always right.

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