Charting for the future, reducing the challenges of chart updating

Cartographier pour le futur, réduire les difficultés de la mise à jour des cartes

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Presentation outline

• Challenges of chart updating
• Leveraging s-100 standards
• Future Grid based ENC schema
• Rationalization of chart portfolio
• Moving towards full continuous maintenance
• Automating paper charts production
• The future of Sailing Directions
Challenges of chart updating

- CHS’ portfolio is still Paper Chart based and requires a serious Rationalization effort
- In comparison with ENC, Updating paper chart is an archaic procedure and is limited (written notice or patch)
- Cartographic tools are not adapted for a fast and easy integration of new data sets (still a manual process)
Leveraging S-100 standards

- Datacentric / data services
- S101-S102-S104-S111- S121-(S1++)
  - Cell-based approach
- S101
  - Should be ready by 2021
  - ENC oriented
  - Vector data coverage (moving from BSBs to ENCs)
Future Grid based ENC schema

• Is CHS proposed S102 grid schema suitable for S101 (south of 68N)?

• Results:
  • 3 level grid: 0.1° x 0.1°, 1° x 1°, 4° x 4°
  • Maximum of 3 coverage in a given area
  • 3 usages: Port-Transit-Overview

<table>
<thead>
<tr>
<th>Port</th>
<th>Transit</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1:22,000</td>
<td>1:22,001 - 1:150,000</td>
<td>&lt; 1:150,001</td>
</tr>
<tr>
<td>0.1° x 0.1°</td>
<td>1° x 1°</td>
<td>4° x 4°</td>
</tr>
</tbody>
</table>
Future Grid based ENC schema

- What about the North / Arctic?
  - Sparse data coverage and large cost for data acquisition
  - Scheme Alignment with ARHC members

<table>
<thead>
<tr>
<th>Level/usage</th>
<th>scales</th>
<th>Coverage of the arctic area south of 68N*</th>
<th>Coverage 68N to 80N</th>
<th>Coverage North of 80N</th>
</tr>
</thead>
<tbody>
<tr>
<td>overview</td>
<td>&lt; 1:150001</td>
<td>4° X 4°</td>
<td>8° X 4°</td>
<td>16° X 4°</td>
</tr>
<tr>
<td>transit</td>
<td>1:22001 to 1:150000</td>
<td>1° X 1°</td>
<td>2° X 1°</td>
<td>4° X 1°</td>
</tr>
<tr>
<td>Port</td>
<td>&gt;1:22001</td>
<td>0.1° X 0.1°</td>
<td>0.2° X 0.1°</td>
<td>0.4° X 0.1°</td>
</tr>
</tbody>
</table>

- Rectilinear grid reaching the pole = eccentricity issues
- Think outside the box: DGGS Uber H3 ?
Rationalization of Chart portfolio

- Analyse the current portfolio against the grid and rule of 3
- Use existing products to fill in the cells
- Define the best approach to move from 6 to 3 usages
- Identify ENC gaps (Arctic)
- Digitize raster information
- US-CAN Transboundary ENCs

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<tr>
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<th>Transit</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berthing / Port</td>
<td>Approach / Coastal</td>
<td>General / Overview</td>
</tr>
</tbody>
</table>
Moving towards full-continuous maintenance

- Incorporate fully all new sources (bathy and non-bathy) into ENCs
  - All the information: Not only NTM
  - No stacking for the next New Edition

- What is required:
  - Comparative validation of new bathymetric source
    - required for the creation of S102 products
Moving towards full-continuous maintenance

• What is required (cont):
  • Enhanced cartographic tools (minimising manual edits):
    • Automatic sounding selection process
      • required by ECDIS for S102 overlay
    • Automatic countouring (generalisation) (phase 2)
    • Automatic Integration of data set into existing ENCs (phase 3)
Automating the production of paper charts

- **PC2.0**: auto-generate paper charts from ENC
- New look and feel
  - Not intended to mimic our traditional paper charts
  - International symbology
- **SAFE** Product
- Satisfies **NEW** carriage requirements
- Provides mariners with a backup to their ECDIS
- Moving towards subscription based service
The future of Sailing Directions

- Online pdf copies
- Provide full continuously maintained digital online copies
- Prepare and structure the information for future conversion into S1XX layers
  - Sliming process: essential navigational information
  - Learn from HOs and other organisations
The future of Sailing Directions

• (Cont’)
  • Actively Participate in the IHO NIPWG
  • Collaborate with the ECDIS industry to find ways to display SD type information
  • Optimise / leverage the current S-57 database
  • Develop conversion and customisable extraction options
Take home message

- Moving towards S100 standards
  - Services provision
  - Cell-based layers approach
- Rationalizing and restructuring our products
- Moving towards Full continuous maintenance
- Automating tools and production

CHS is actively collaborating with partners, clients and industry to make it happen!