BSHC 18th Conference
16-18 September 2013
Tallinn, Estonia

Agenda Item E.3
Explanatory Note
Estonia

HYDROGRAPHIC INFORMATION SYSTEM (HIS) OF ESTONIA

BRIEF DESCRIPTION

0. PREDEFINITIONS

All Estonian waters (also inland waters) are divided into survey areas which have different statuses (planned, under survey, surveyed, under cleaning, cleaned, under validation, final). All surveys, subsequent data cleaning and management in Estonia are based on these areas. Survey area means folder with data from survey lines and some additional data files.

1. TASKS

Seamless database for hydrographic info (survey areas, depths, underwater objects, contours) + storage of raw data.
Survey areas management (view, query, access).
Access to survey data for data cleaning and validating (raw datafiles).
Automatic data backups.
Access to information about stored data (like detailed info about wrecks and pictures) + metadata.
WMS Services.
Data download services.
HIS is accessed over web interface and has restricted and public versions. The public version has fewer capabilities and currently does not include a data download section.

2. COMPONENTS

2 servers (main and backup) with the following :
Fedora core 15 64-bit linux
PostgreSQL 9.1.1
PostGIS 1.5
Fopenserver (WMS/WFS server)
Apache Tomcat 6
HIS programs (in JAVA).
These servers are located in different houses.

CARIS GIS 4.5 (in separate Windows 2000 server) – used for soundings suppression and contour generation + some other tasks.
Also 2 more servers operate for raw data backups.

3. STRUCTURE

1. Survey areas:

Areas can be shown, selected, queried and managed in many ways.
New – previously non-planned areas can also be easily loaded.
Surveys from other surveyors (Private or non-Estonian) are stored in database as well and accessed the same way as other areas.
Raw data (packed survey areas) are stored in file structure and accessible over web interface.

2 Databases: MAIN and SEA.

The SEA database contains only soundings (at max resolution of 5 m) and contours (1m interval, based on soundings suppressed to about 15m distance from each other).
Sounding suppression and contour generation is done automatically by CARIS programs.
Contours are based on TIN-s. All Estonia is divided into cells (10x10 km, exact match with Estonian 1:20000 topographic charts layout). Queries from the SEA database are based on cells. Data can be displayed and downloaded over web interface. Data are stored in different scales (11 scales from 1:500 to 1:100000). Therefore zooming in and out means changing scales and loading only relevant data.
Depths from new survey areas are automatically added into cell structure (relevant cells updated) and contours from these cells are newly generated (including 1 km area around cells). Depths and contours from SEA database are open for free public viewing and as WMS service.
The SEA database allows also extraction of depths from very large areas (all Estonian waters are possible) into XYZ format in desired scale.
The MAIN database: All other information (areas, objects, more dense soundings etc.).
Soundings are stored in the MAIN database approximately in 1m resolution. Data can be downloaded in different formats, scales and categories (only soundings, only objects, soundings+objects+contours). Data suppression, contour generation and final map compilation is done with CARIS programs automatically. Max map size can be 2000 $km^{2.}$
Depths from the MAIN database can currently be used only by Estonian Maritime Administration workers.
Links have been established to other databases (Harbours and Navaids), so data from these are shown in HIS web interface as well.

3 Backups:

Database backups are automatic from the main server to the backup server using PostgreSQL feature „synchronous replication“. This means that any change in the MAIN database is automatically reflected in the backup database about at the same moment.
Raw data + system are daily automatically backed up by rsync from the main server to backup servers.

4. DISPLAY

1. Layers: base map (general sea chart, land charts and ortophotos over WMS from Estonian Land Board, S-57 maps from PRIMAR) , survey areas (status, survey time and IHO S-44 orders), wrecks, rocks/obstructions, AtoN, harbours, depths contours.
2. Features: zoom, pan, click on objects brings up info about this object, tooltips (hovering mouse on objects brings small info about underlying objects), measuring, coordinate key in etc. Query constructors (like „select all survey areas form year 2000 and surveyed by some

company and with IHO special order etc.) for all object types excluding soundings and contours. Queries can also be restricted by defineable areas (drawing on screen or key in coordinates). Query results can be sent to different outputs (screen, csv file, dxf + some others).
Coordinate system is Estonian Lambert CC, data can be accessed also in WGS84 lat/longs. Height datum is the Baltic height system 1977. This will change after some years to the European height system.