Nautical Publications and the SNPWG data model in the BLAST Project

Report to SNPWG 14

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Introduction

Jeppesen, BSH, NHS and KMS are collaborating on a sequence of projects as part of Work Package IV in an INTERREG IVB project, Bringing Land and Sea Together (BLAST). Recent activity for this collaboration concerned the conversion of nautical information into XML datasets using the S-100 standard and the SNPWG data model. The information converted consisted of extracts from nautical publications pertaining to three ports, one each from Norway, Germany, and Denmark.

The results of this investigation are described in a report to the BLAST project, enclosed with this paper. This report describes the selected source material, the process of mapping and conversion, and the resulting XML datasets.

Activities

The content to be converted was determined by the eventual application, which is a prototype digital routeing guide to be developed in the next phase of BLAST. A product specification was written earlier (SNPWG 13-7A). The source material for conversion consisted mainly of sailing directions or the equivalent (both general and waterway sections), VTS guides, and Lists of Radio Signals. ENCs for the areas were also used, mainly to determine the geographic locations with which information from the publications is associated. The specific material converted was determined by the HO participants who identified extracts from the material which are applicable to a routeing guide product.

An XML encoding based on the S-100 standard and derived from GML 3.2.1 was defined. The encoding is capable of coding geographic features, information objects, simple and complex attributes, feature associations, and information associations.

A spreadsheet template was developed for the information mapping work, covering features, information types, attributes and their values, and indications of feature and information associations. Participants at BSH, KMS, and NHS did the information mapping for the selected extracts using the template. Coordinates for geographic features were determined from the text if available; if not, the coordinates were obtained from the appropriate ENC or created in an ENC editing tool. The results were reviewed by Jeppesen.

Jeppesen converted the results of the information mapping phase into XML representations of the mapped information using the XML encoding mentioned earlier. The converted XML datasets were in turn reviewed by the hydrographic office participants. The end result was an XML data set file for each of the HO partners. This was in turn reviewed by the HO partner. The XML data files can be viewed in an XML editor tool as well as an off-the-shelf free GML viewer.

Experiences

HO partners reported their experiences with the mapping work. Notable points reported are:

- Significant effort was required for the creation of spatial linkages or geometry for geographic features.
- There were difficulties locating places in the ENC which publications describe verbally (as opposed to providing coordinates). Further, there are sometimes mismatches between feature location as specified in ENCs and the location mentioned in nautical publications.
- The mapping process led to discovering ENC discrepancies, such as a feature displaced from its correct location.
- The hydrographic offices noted the complexity of converting laws and regulations. There were doubts about whether interpretations and translations made by the mappers were correct. There was also the general problem of encoding rules expressed in human languages in an information model based on object and attributes. Capturing all the variations and nuances in a rule was reported to be a particular concern.

- A few extensions or adaptations to the SNPWG data model were needed, such as modeling of graphic images included in nautical publications. These were duly developed and passed on to SNPWG for consideration.
- Better GIS and product editing tool support is needed for manipulating S-100 data in general, as well as for specific tasks in mapping information from nautical publications.

The report to BLAST provides more details about experiences during information mapping.

Conclusion

The exercise demonstrates that it is possible to convert a widely varying set of source documents into datasets based on S-100 and the SNPWG model. Converted data will be used in a common product (the digital routing guide), which will further test the concept and results by providing harmonised presentation of the information, as compared to harmonised data.

Data classification resulted in the discovery of several data mismatches between ENC data and nautical publications information. This suggests that the move to digital nautical publications will create a need to harmonise the publications with charted data, which will increase the workload on hydrographic offices until smarter processes using the “store once, use many times” principle are implemented.

The difficulty of converting certain kinds of nautical information (especially rules and regulations) using a data model conforming to the S-100 framework indicates that the S-100 standard needs to be extended to accommodate more kinds of information than it was originally designed for.

SNPWG is invited to consider in particular:

- The reported experiences with information mapping.
- The GML-based XML encoding as an example of how S-100 information can be encoded in XML and/or GML.

Action required of SNPWG

SNPWG is requested to:

1) **note** this paper.
2) **comment** on the experiences and conclusions in this paper and the accompanying report to BLAST as they pertain to S-100 and the SNPWG data model.