S-57 to S-101 Converter

TSM3-3.5 Report updated for IEHG 13 Nanjing, China

Introduction

- Esri tasked to develop converter in 2010
- Funded jointly by NOAA and Esri
- Multiple iterations as S-100 and S-101 have matured
- Version 0.8.9 was originally provided on June 30th 2015
- Version 0.8.14 was provided at Test Strategy Meeting 3 (Sept 2015)
- Baseline documents
  - S-101 ENC Product Specification 20150623_baseline
  - S-101 Data Classification and Encoding Guide Final Baseline (April 2014)
  - S-101 Feature Catalog baseline version 0.8.8
  - S-100 Edition 2.0.0

Implemented Requirements

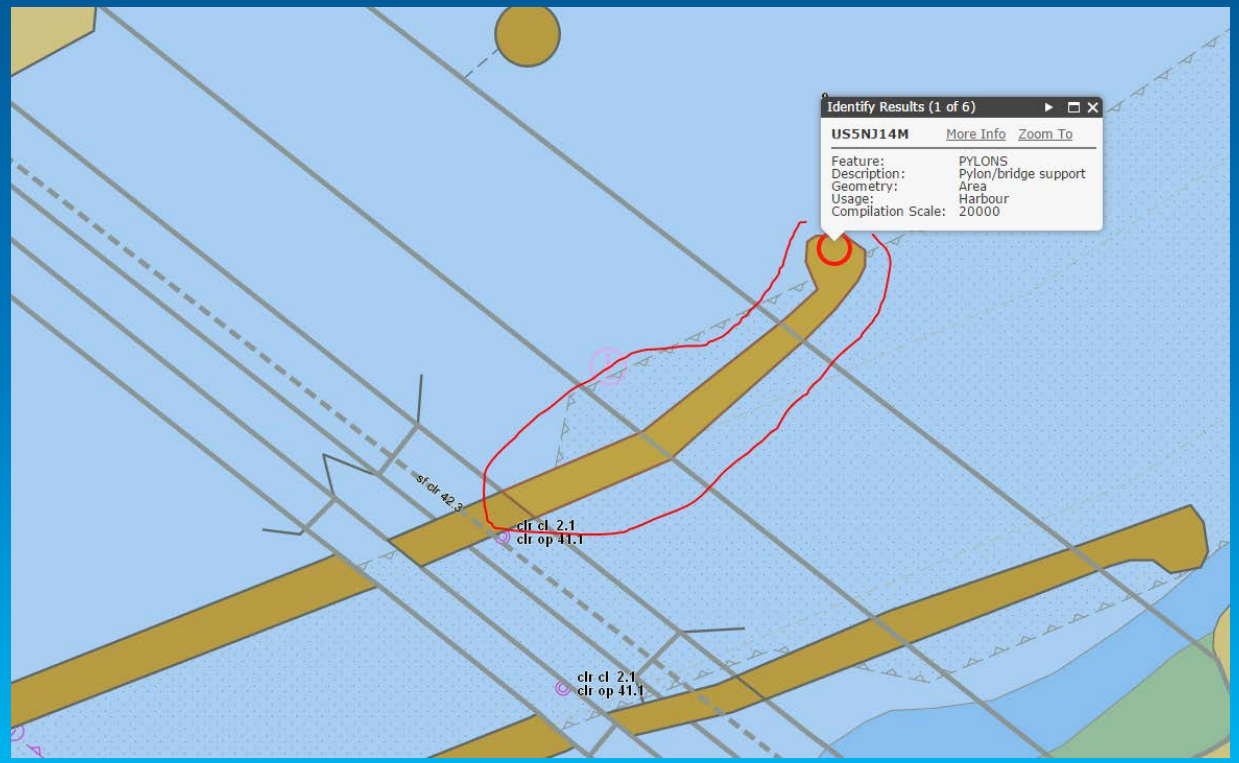
- **Support S-100 Edition 2.0.0 changes to the Feature Catalogue schema**
  - **Version 0.8.8 of the S-101 Feature Catalogue (ROK)**

- **Calculate ECDIS System Attributes**
  - **Default Clearance Depth (based on TSMAD28_DIPWG6_9.4A paper)**
  - **Surrounding Depth (based on TSMAD28_DIPWG6_9.4A paper)**
  - **Sector Extension (S-52 6.0 CSP LIGHTS06 logic)**
  - **In the Water (use DCEG definition of navigable water)**
  - **Flare Angle (S-52 6.0 CSP LIGHTS06 logic)**

Implemented Requirements

Support new Bridge modelling

- Implemented DCEG modeling
- Limitation discovered when a multiple bridges share the same pylon
  - Each bridge touching that shared pylon gets converted as the same bridge aggregation
- All features convert correctly
- Potential solution
  - Create a C_AGGR



Implemented Requirements

- M_CSCL Conversion to Data Coverage features
  - No limit imposed.
  - CSCALE is used to populate maximum display scale
  - Datasets CSCL used to populate minimum display scale

- Support V-AIS modeling

Implemented Requirements

Implement min/max display scale override support for Data Coverage features

- **Added MinMaxDisplayScaleOverride.xml**

```
<MinMaxDisplayScaleOverride>
  <S57Dataset name = "" MinimumDisplayScaleOverride = "">
    <S57ScaleOverride scale = "" MaximumDisplayScaleOverride = ""/>
  </S57Dataset>
</MinMaxDisplayScaleOverride>
```

- **Allows you to override existing:**
  - **M_CSCL feature's CSCALE values**
  - **Sets minimum and maximum display scale values for M_COVR with CATCOV = 1 features when converted to Data Coverage features**

- **According to S-101 "When a dataset has multiple Data Coverage features, then the minimum Display Scale must be the same for all Data Coverage features within the dataset. The maximum Display Scale for multiple Data Coverage features within a dataset may be the same or different."**

Implemented Requirements

Support CATZOC modelling provided by DQWG

- Based on DQWG Nov. 2014 report
- Custom code to map CATZOC table was required
- Esri modified feature catalog to include modeling found in DCEG and report
  - Version S-101_FC_0.8.9
- Inconsistencies found
  - DCEG and Report did not match
  - Multiplicities not defined for all attributes
    - Defaulted to 0,1 when in doubt to avoid conversion errors
  - Attributes already defined in feature catalog 0.8.8 as simple, DQWG made them complex
    - verticalUncertainty is an example of this. Created a new complex attribute named verticalUncertaintyX

Dropped Requirements

- **Mapping Table**
  - Use of Alias in Feature Catalog addressed many use cases
  - Recommend evaluating the need for a mapping table after this baseline is tested

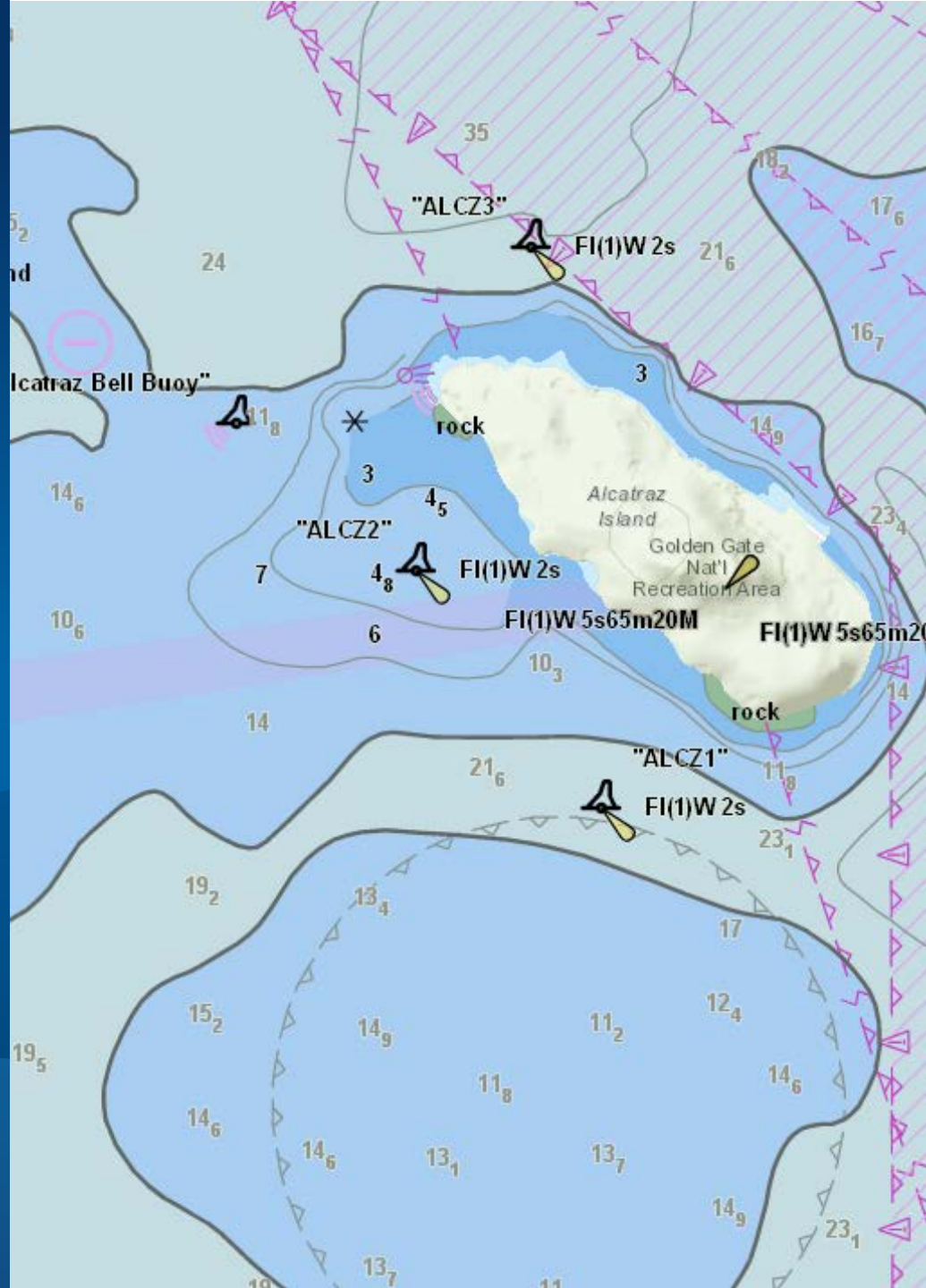
- **Adding DOCARE and LOKBSN to Group 1**
  - Requires new geometries to be created in order to create holes in existing Group 1 features
  - Creating new geometries is outside the scope of the converter
  - Recommend further discussion at TSM3 and next S-100WG meeting

New Functionality

- CATALOG.031 files are now supported
  - Updates and external file references are automatically applied
- Updated log file
  - Added additional warning messages to identify gaps in the feature catalogue
- Updated data dictionary for S-100 Dump utility
- Implemented version control
  - As long as the schema does not change new content can be added
  - Allows updated feature catalogue files to be distributed without modifying the converter

Demo

S-57 to S-101 Converter



Testing

- The following datasets passed conversion
  - All NOAA dataset published on June 25, 2015
  - Mickelfirth 2007

- Additional contribution from
  - IC-ENC: tested their complete set of ENC and reported no errors
  - Caris: identifying issue with C2IL coordinates and curve records
  - ROK: providing a copy of their S-100 Viewer for testing

Items to be Recognized

- It was agreed during TSMAD 29 that S-57 Object and Attribute acronym values will be added to the Feature Catalogue Alias field for use by the converter.
- As new bindings are added to the Feature Catalogue, using the existing S-100 Edition 2.0.0 schema, the S-57 to S-101 Converter will automatically discover them.
- Warning messages have been added to the log file to help identify gaps in the S-101 Feature Catalogue

Recommendations

1. Encourage ENC producers and distributors to convert their ENC datasets using the latest version of the S-57 to S-101 Converter and provide their log file to the S-100WG. This will help identify any issues with the converter and help identify gaps with the S-101 Feature Catalogue.
2. Create an updated S-101 Feature Catalogue that is up to date with the DCEG baseline document at a minimum. This will allow the converter to convert 100% of the S-57 ENC content to S-101 and provide richer test data for the S-100/S-101 Test Bed project.
3. Have the DQWG and the DCEG work item leader discuss and harmonize the inconsistencies for Quality of Bathymetric Data.
4. Propose encoding guidance to create a C_AGGR feature in S-57 ENC for bridge features that share the same pylon.
5. Discuss alternatives for converting DOCARE and LOKBSN features to Group 1.

S-100/S-101 Test Strategy Meeting 3 (TSM3)

Update

- S-57 to S-101 Converter v.0.8.14 was delivered
- S-101 test dataset created using S-57 to S-101 Converter
  - Includes 21 datasets and exchange set
- KHOA and SPAWAR
  - S-101 Viewers and test tools will be made available (Date TBD)
- New IHO Register servers online by end of year
  - Will allow new content to be added to the S-101 Feature Catalogue
- Feature Catalog Builder and Portrayal Catalog Builder
  - Complete but require new servers to be operational before shared
- IALA S-124 model not harmonized with S-100
- S-100 based product interoperability is a high priority work item
- Various papers will be submitted at S-100 WG 1 as actions from TSM3

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