



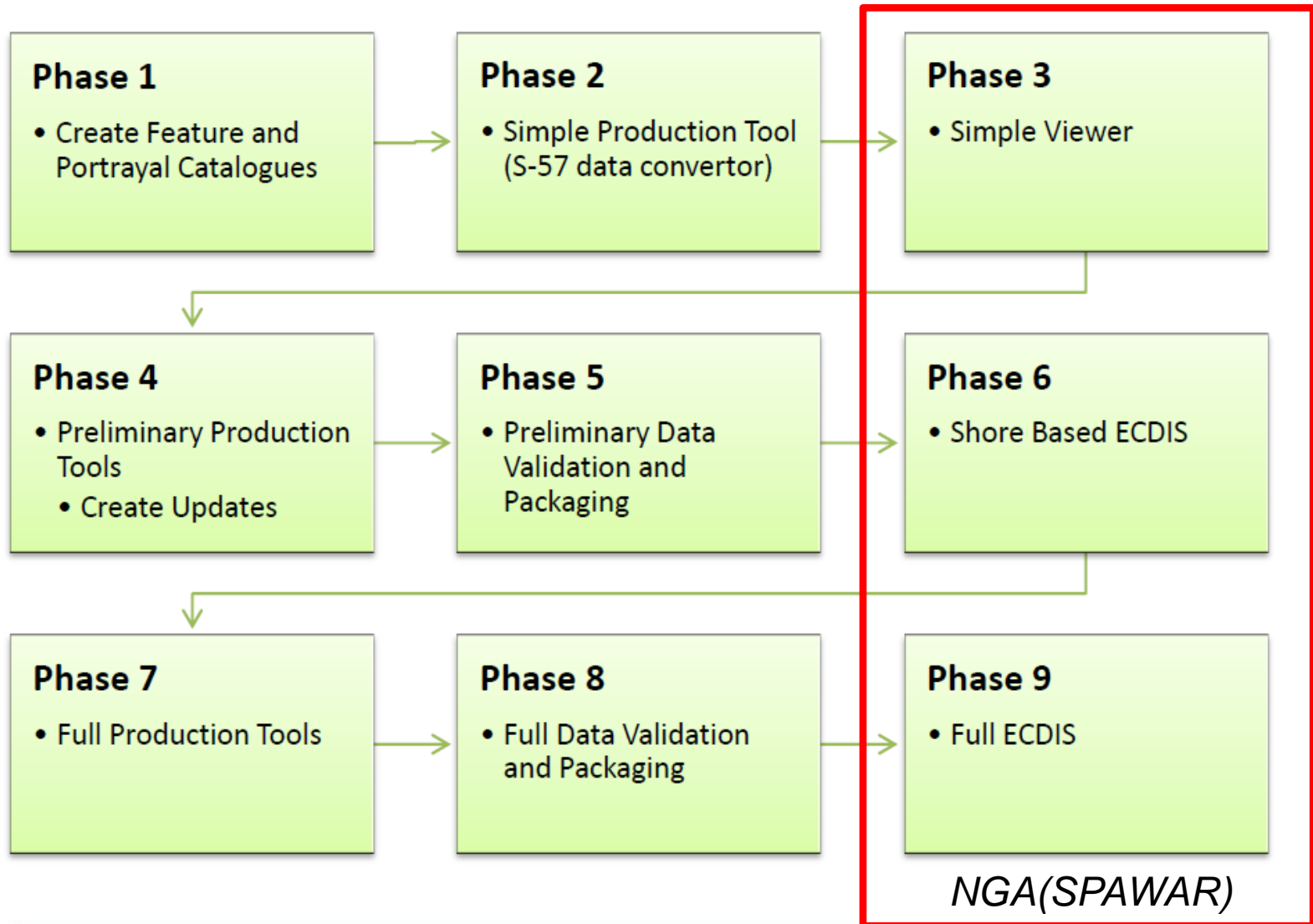
# S-100 Viewer Status



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# S-100 Testbed (S-View)



# Software Development



Visual  
Studio IDE

Cross  
Platform

C#

Automated  
XML  
Classes

Windows

Linux

## Functionality

- Feature Catalog Browser with Search
- Dataset Browser with Search
- Dataset Visualization
- Modify Mariner Settings
- Error / Validation Log

File

Raw UR OR **Feat** MS

Feature Catalog KR3G3B00\_\_000

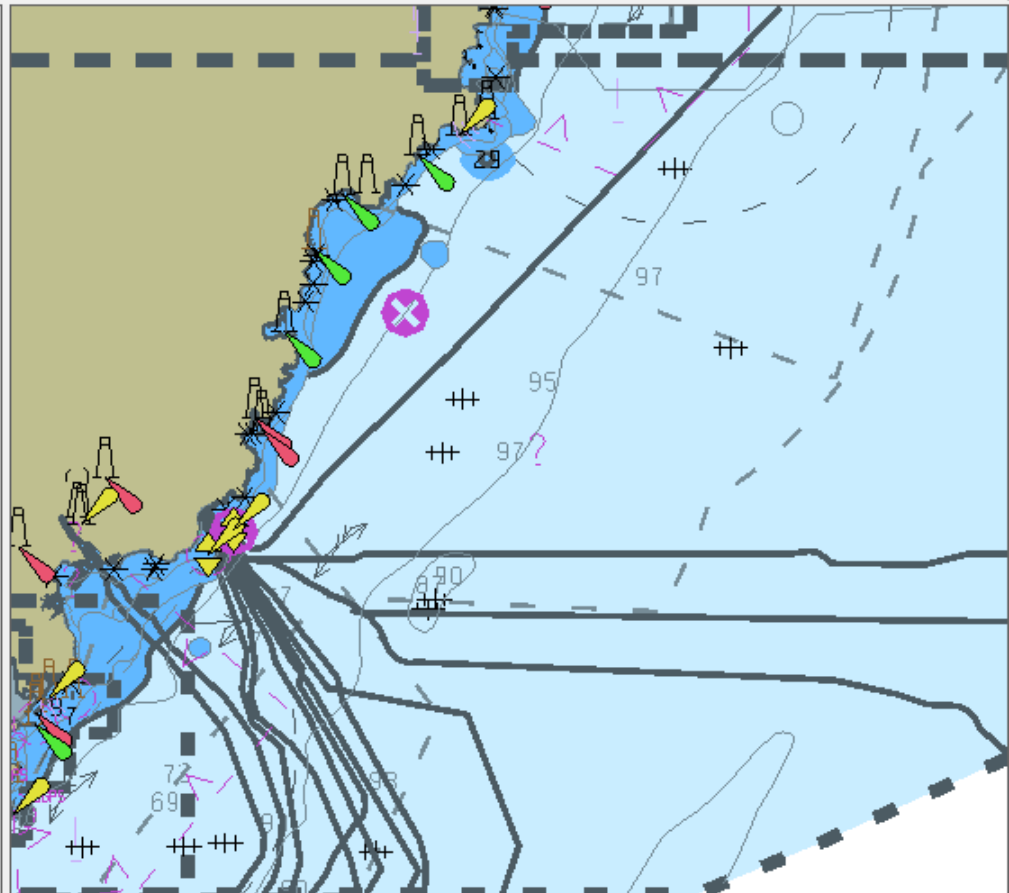
**DSID (DataSetGeneralInformationRecord)**

- CSID (DataSetCoordinateReferenceSystem)
- IRID (InformationRecord):1
- IRID (InformationRecord):2
- IRID (InformationRecord):3
- IRID (InformationRecord):4
- IRID (InformationRecord):5
- IRID (InformationRecord):6
- IRID (InformationRecord):7
- IRID (InformationRecord):8
- IRID (InformationRecord):9
- IRID (InformationRecord):10

DataSetIdentifier CTK.Interchange.S

- Encoding: **S-100 Part 10a**
- Encoding: **1.1**
- ProductId: **INT.IHO.S-101.1**
- ProductEd: **1.0.0**
- Applicator: **1**
- DataSetFile: **KR3G3B00\_\_000**
- DataSetTitle
- DataSetReference: **20141031**
- DataSetLanguage: **EN**
- DataSetAbstract
- DataSetEdition: **13**
- DataSetTopicCategory: **Dataset TopicCategory**
- RecordName: **10**
- RecordID: **1**
- NameKey: **266**

EncodingSpecific: **S-100 Part 10a**  
EncodingSpecific: **1.1**  
ProductIdentifier: **INT.IHO.S-101.1.0.0**  
ProductEdition: **1.0.0**  
ApplicationProfile: **1**  
DataSetFileIdentifier: **KR3G3B00\_\_000**  
DataSetTitle  
DataSetReference: **20141031**  
DataSetLanguage: **EN**  
DataSetAbstract  
DataSetEdition: **13**  
DataSetTopicCategory: **Dataset TopicCategory**  
[0] Oceans  
[1] Transportation  
RecordName: **10**  
RecordID: **1**  
NameKey: **266**



Debug Log

- Error Portrayal Error Attempt to render point feature 164 as line.
- Error Portrayal Error Attempt to render point feature 165 as line.
- Error Portrayal Error Attempt to render point feature 166 as line.
- Error Portrayal Error Attempt to render point feature 167 as line.
- Error Portrayal Error Attempt to render point feature 168 as line.
- Error Portrayal Error Attempt to render point feature 169 as line.

Total time: 2345ms | 1:350,000 | 35.4103 N 129.2652 E

# Feature Catalog Browser



Feature Catalog

name

- AdministrationArea
- Berth
- displayName
- featureName
- LandRegion
- name
- pictorialRepresentation
- SeaAreaNamedWaterArea
- stationName
- surveyAuthority
- textualDescription
- Waterfall
- WeedKelp

SubAttributes

- AttributeBinding[] Array
- displayName
- language
- name

Features

- Feature Type[] Array
- LocalMagneticAnomaly
- Coastline
- LandArea
- IslandGroup
- LandElevation
- River
- Rapids
- Waterfall
- Lake
- LandRegion
- Vegetation
- IceArea
- SlopingGround
- SlopeTopline
- Tideway
- BuiltUpArea
- Building
- AirportAirfield
- Runway
- Bridge

FeatureUse Type

geographic

Features

Primitive Types

- Information
- InformationBinding[] Array
- SpatialQuality
- Attributes
- AttributeBinding[] Array
- categoryOfCoastline
- colour
- elevation
- featureName
- natureOfSurface
- radarConspicuous
- visuallyConspicuous

Abstract

False

Name

Coastline

Definition

The line where shore and water meet. Although

Code

Coastline

Remarks

Alias

COALNE

# Dataset Browser

Feature Catalog KR3G3B00\_\_000

wreck

FRID (Feature TypeRecord):731 - Wreck  
FRID (Feature TypeRecord):732 - Wreck  
FRID (Feature TypeRecord):734 - Wreck  
FRID (Feature TypeRecord):736 - Wreck  
FRID (Feature TypeRecord):737 - Wreck  
FRID (Feature TypeRecord):738 - Wreck  
FRID (Feature TypeRecord):739 - Wreck  
FRID (Feature TypeRecord):742 - Wreck  
FRID (Feature TypeRecord):743 - Wreck  
FRID (Feature TypeRecord):759 - Wreck  
FRID (Feature TypeRecord):780 - Wreck  
FRID (Feature TypeRecord):786 - Wreck  
FRID (Feature TypeRecord):790 - Wreck  
FRID (Feature TypeRecord):808 - Wreck  
FRID (Feature TypeRecord):815 - Wreck  
FRID (Feature TypeRecord):837 - Wreck  
FRID (Feature TypeRecord):838 - Wreck  
FRID (Feature TypeRecord):839 - Wreck  
FRID (Feature TypeRecord):840 - Wreck  
FRID (Feature TypeRecord):841 - Wreck

Attributes S101Attribute[] Array

- [0] categoryOfWreck=1 - non-dangerous wreck
- [1] scaleMinimum=699999
- [2] valueOfSounding=35
- [3] waterLevelEffect=3 - always under water/submerged
- [4] defaultClearanceDepth=30
- [5] surroundingDepth=30

InformationAssociations

SpatialAssociations S101SpatialAssociation[] Array

- [0] Point

FeatureAssociations

Feature Type Wreck

Feature Use Type geographic

Features

Primitive Types point, surface

Information InformationBinding[] Array

Attributes AttributeBinding[] Array

Abstract False

Name Wreck

Definition The ruined remains of a stranded or sunken

Code Wreck

Remarks

Alias WRECKS

Geometry POINT (129.5600695 35.9448173)

[0] categoryOfWreck=1 - non-dangerous wreck

AttributeType Value categoryOfWreck

EnumeratedValue 1

ChildAttributes non-dangerous wreck

AttributeIndex 1

ParentIndex 0

[1] scaleMinimum=699999

AttributeType Value scaleMinimum

EnumeratedValue 699999

ChildAttributes

AttributeIndex 1

ParentIndex 0

[2] valueOfSounding=35

AttributeType Value valueOfSounding

EnumeratedValue 35

ChildAttributes

AttributeIndex 1

ParentIndex 0

[3] waterLevelEffect=3 - always under water/submerged

AttributeType Value waterLevelEffect

EnumeratedValue 3

ChildAttributes always under water/submerged

AttributeIndex 1

ParentIndex 0

[4] defaultClearanceDepth=30

AttributeType Value defaultClearanceDepth

EnumeratedValue 30

ChildAttributes

AttributeIndex 1

ParentIndex 0

[5] surroundingDepth=30

AttributeType Value surroundingDepth

EnumeratedValue 30

ChildAttributes

AttributeIndex 1

ParentIndex 0



# Catalogs / Inputs



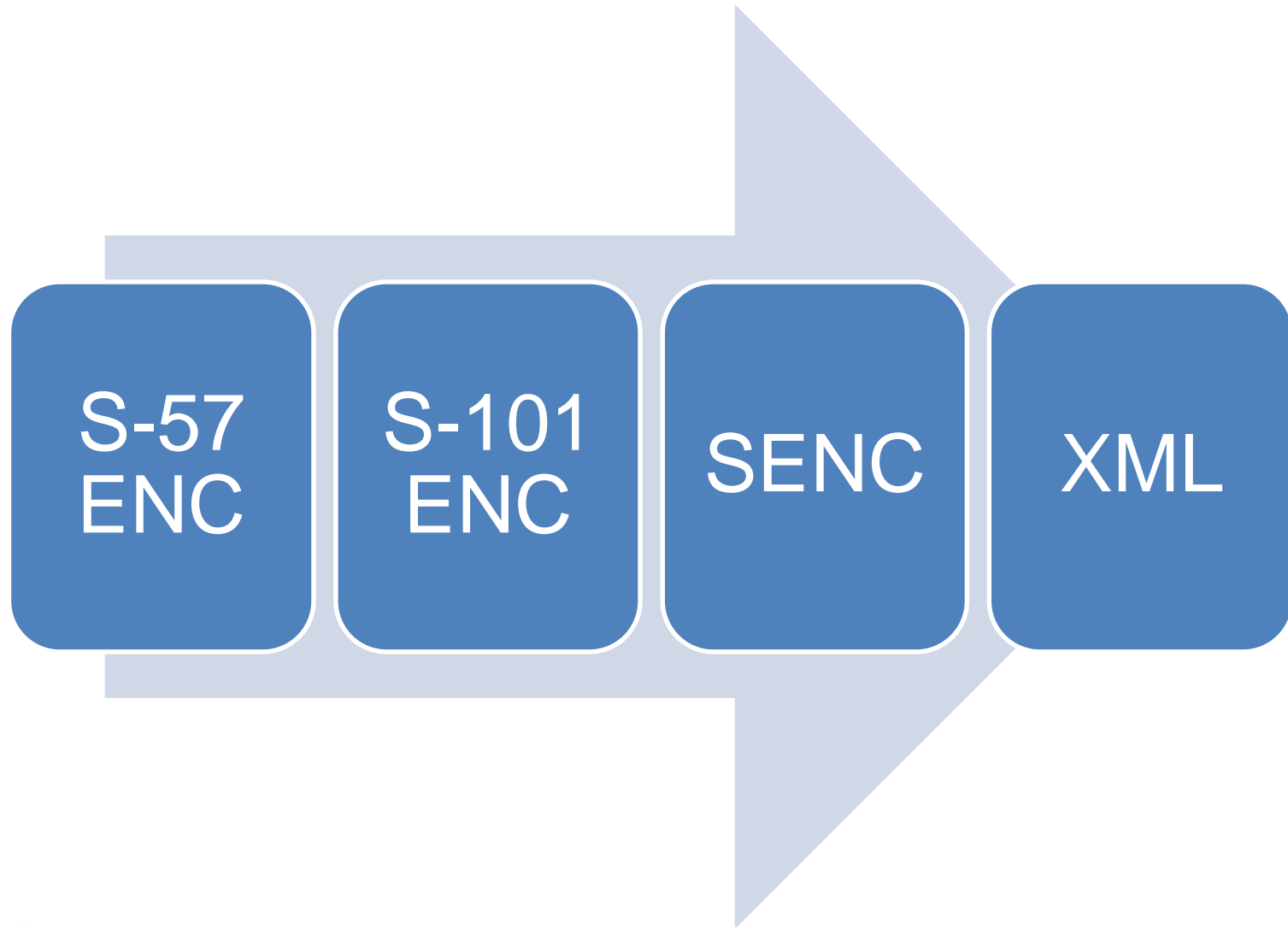
Feature  
Catalog  
0.8.9

Portrayal  
Catalog 1.0  
June 2015

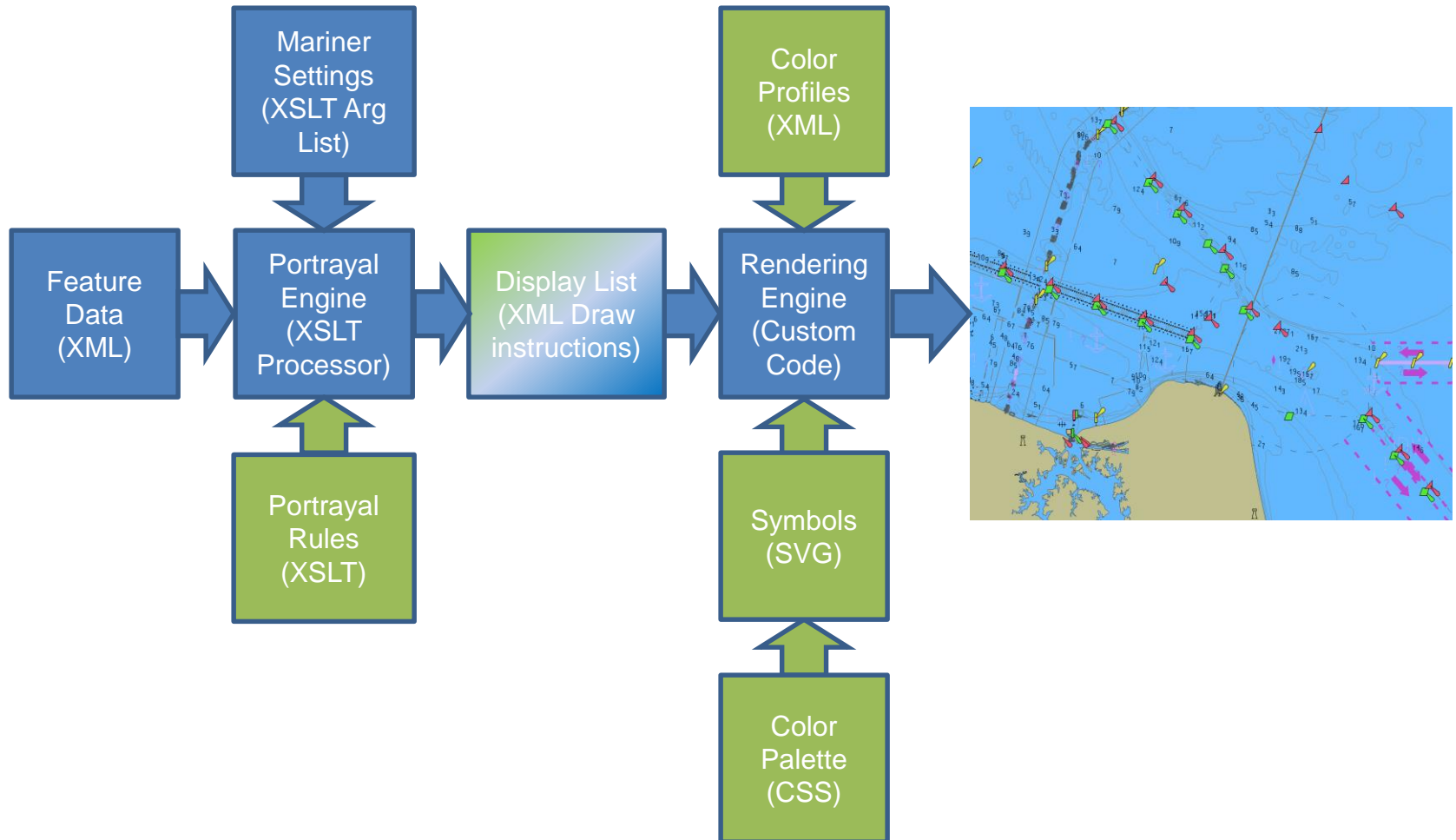
S-57  
Converter  
0.8.12



# Conversion Process



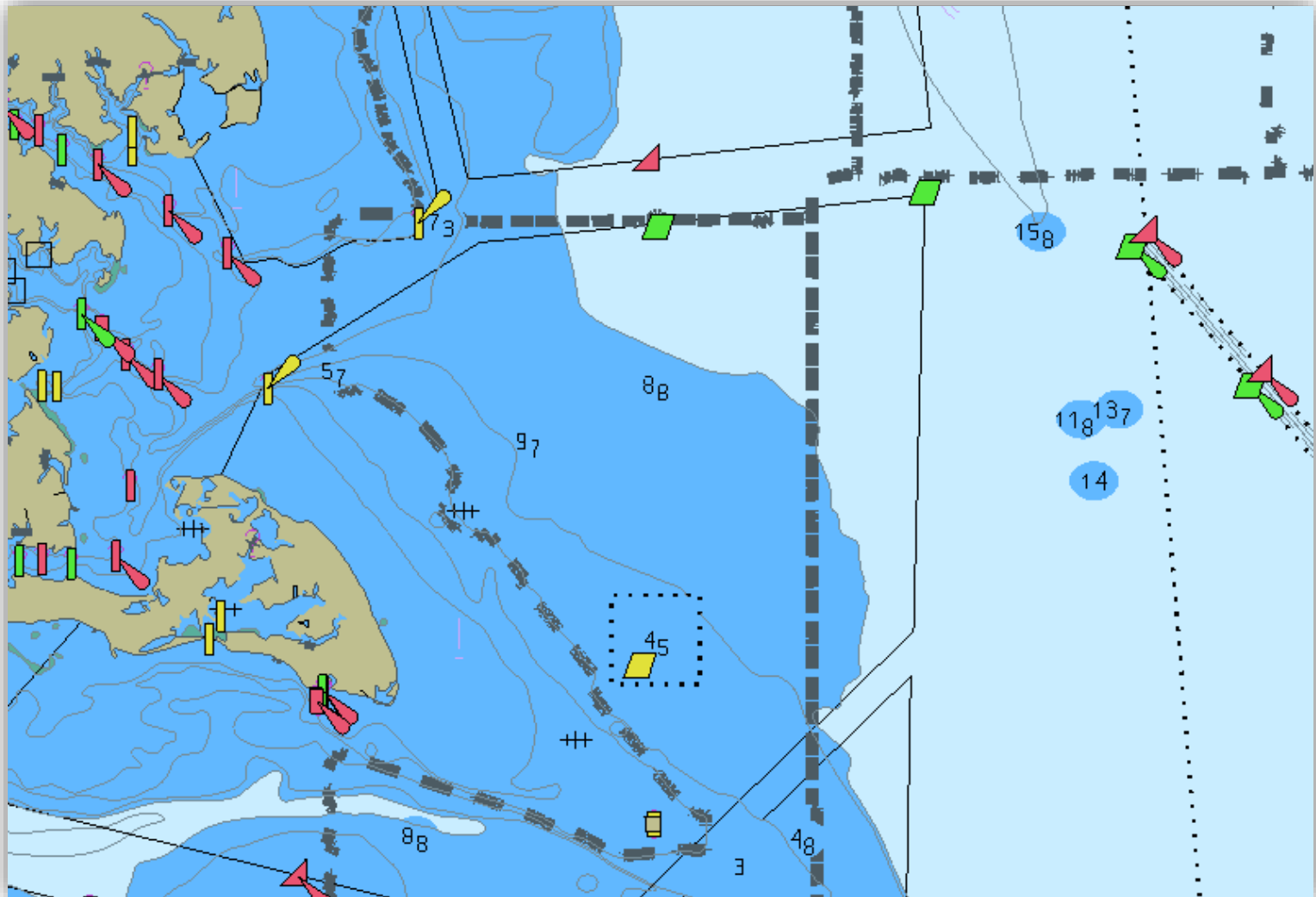
# Rendering Process



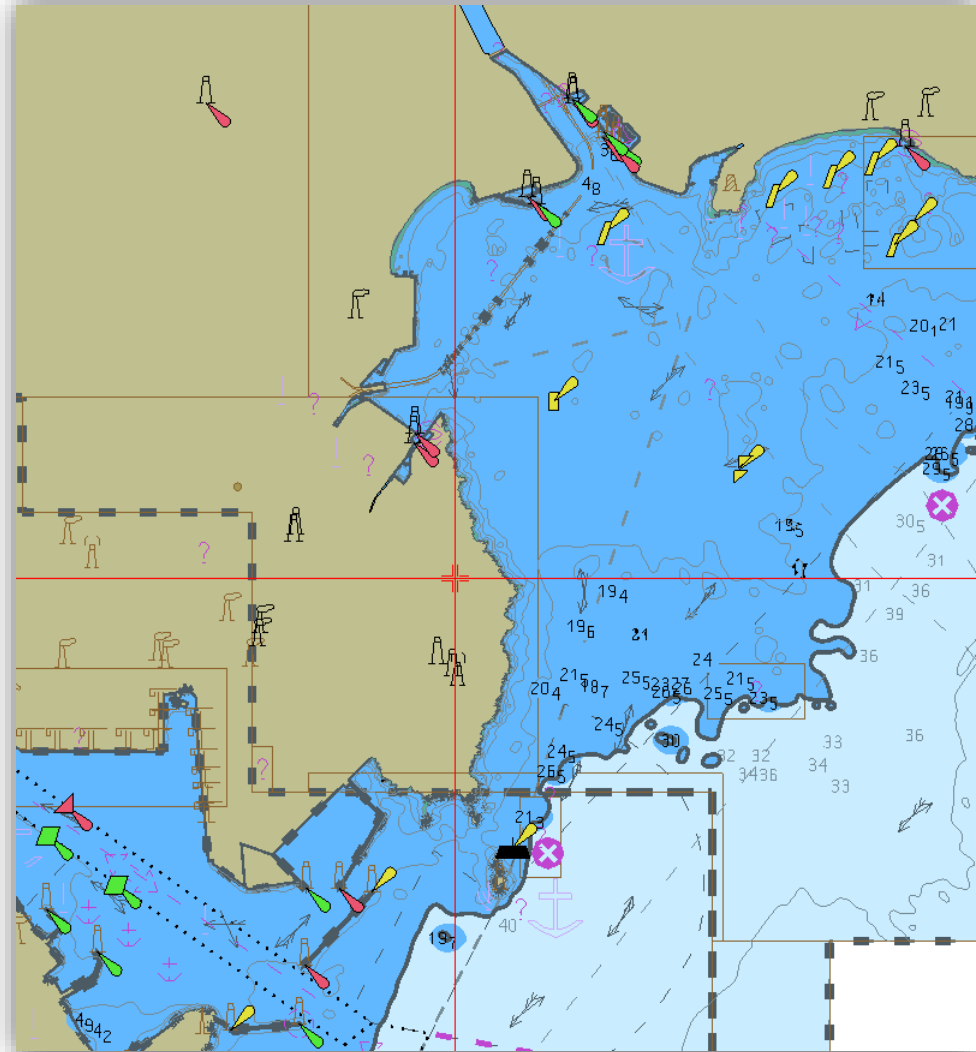
## Updates to catalogs have enabled significant progress

- Generation of code from XSDs
- Implementation of feature catalog browser
- Implementation of dataset browser
- Implementation of portrayal
- Portrayal of NOAA data sets
- Portrayal of Korean data sets

# US4VA40M



# KR5G3B33



## Work Remaining

- Rendering unimplemented feature types
- Masked Edges
- Viewing and Text Groups
- Palette Selection
- Validation and reporting for portrayal and feature catalogs
- Extend portrayal to other S-100 based products

# Issues



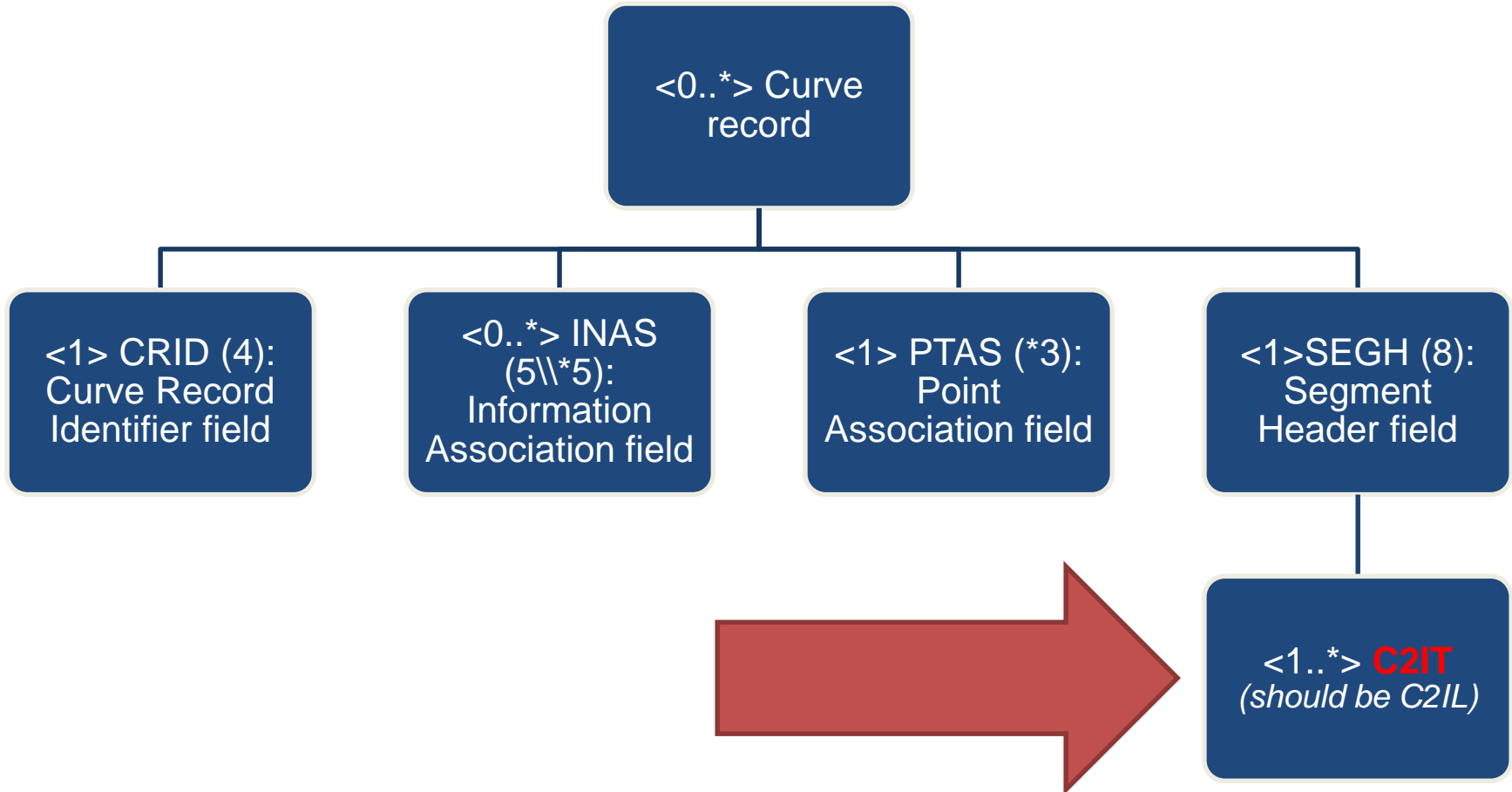


# S-57 Converter Issues



- Field tree layout for the curve record set to CRID/SEGH/C2IT instead of CRID/SEGH/C2IL
  - The record is coded correctly as C2IL in the Data Records

# S-57 Converter Issues



# S-57 Converter Issues



- Some feature types exist only in S-101. These features can't be tested while using converted data.
- Updates are applied prior to conversion, therefore updates can't be tested while using converted data.
- Conversion process is deterministic, meaning native S-101 ENCs may exhibit issues not encountered with converted data.

# Feature Catalog Issues



- RoleCode  
“ModifiedToSupportQualityOfBathymetricData” is invalid
  - Fails XSD validation
  - Modified for testing by setting RoleCode to “publisher”
- To comply with S-100, S100\_FC\_ComplexAttribute needs to be an extension of S100\_FC\_Attribute
  - Currently S100\_FC\_ComplexAttribute extends S100\_FC\_Item
  - Issue is in S100FC.XSD line 184
  - Reference S-100 pg 5-13, Table 5-A-13

# Portrayal Catalog Issues



- There is no XSD describing the Feature XML input to the XSLT
  - This issue was identified at TSMAD 29
- We generated Feature XML based on the provided sample
  - In-memory representation, application specific
  - Subject to manufacturer assumptions
  - Process is not unambiguous

# Portrayal Catalog Issues



- No XSD for Feature XML input to XSLT (continued)
  - As outlined in S-100 v2.0.0, section 9-11, recommend feature input definition (as XSD) within S-101.
  - Include with portrayal catalogue as called out in S-101 section 9.2

# Portrayal Catalog Issues



- Only the day palette is currently provided
  - colorProfile.xml only contains day palette
  - SVGStyle.css only contains day palette
  - Guidance should be provided for using other palettes



# Portrayal Catalog Issues



- There is not a good way to treat viewing groups and text groups as separate entities
  - S-100 doesn't address text groups
  - S-101 discusses text groups, but doesn't specify how to implement them in the portrayal rules

# Portrayal Catalog Issues



- For example, LightDescription.xsl outputs viewing group “27070+23” for its text instruction for light description
  - Presumably this indicates viewing group 27070 (lights) and text group 23 (light descriptions)
  - Both the viewing group and the text group have to be set for the text to display

# Portrayal Catalog Issues



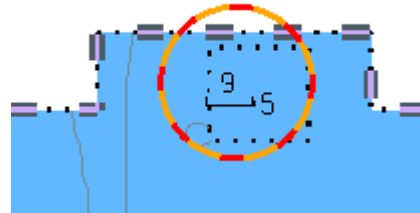
- Possible solutions
  - Ceate a “textGroup” element specifically for textInstructions
    - This would require a change to S-100 or be specific to S-101 portrayal
  - Allow multiple viewing groups per instruction that must all be true for display
    - This would require a change to S-100 or be specific to S-101 portrayal
  - Leave as is and modify the spec to read that a “+” in the “viewingGroup” element means that both the viewing group and text group must be set for display

- Point land area outputs line instruction
  - The portrayal correctly outputs the proper point symbol, but also emits a line instruction

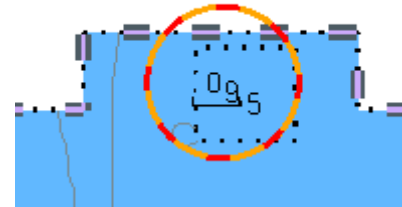
```
<pointInstruction>  
  <featureReference>5040</featureReference>  
  <viewingGroup>12010</viewingGroup>  
  <displayPlane>OVERRADAR</displayPlane>  
  <drawingPriority>12</drawingPriority>  
  <symbol reference="LNDARE01" />  
</pointInstruction>  
<!-- The following line instruction shouldn't be emitted -->  
<lineInstruction>  
  <featureReference>5040</featureReference>  
  <viewingGroup>12010</viewingGroup>  
  <displayPlane>OVERRADAR</displayPlane>  
  <drawingPriority>12</drawingPriority>  
  <lineStyle>  
    <pen width="0.32"><color>CSTLN</color></pen>  
  </lineStyle>  
</lineInstruction>
```

# Portrayal Catalog Issues

- Obstructions shoaler than one meter are not symbolized properly



Incorrect



Correct

```

<pointInstruction>
  <featureReference>6216</featureReference>
  <viewingGroup>33010</viewingGroup>
  <displayPlane>OVERRADAR</displayPlane>
  <drawingPriority>18</drawingPriority>
  <symbol reference="SOUNDS19" /> <!-- should be SOUNDS10 -->
</pointInstruction>
<pointInstruction>
  <featureReference>6216</featureReference>
  <viewingGroup>33010</viewingGroup>
  <displayPlane>OVERRADAR</displayPlane>
  <drawingPriority>18</drawingPriority>
  <symbol reference="SOUNDS5" /> <!-- should be SOUNDS59 -->
</pointInstruction>
  
```

# Portrayal Catalog Issues



- QualityOfBathymetricData feature symbolized with 2mm wide line
  - S-52 specifies a 0.64mm wide line
  - In S-52 line widths are expressed in 0.32mm units, so 2 units is equivalent to 0.64mm
  - It is clear that in this case, the “2” was copied directly from the S-52 draw instructions.
  - This appears to be an isolated incident – no other similar issues were found

- QualityOfBathymetricData example:

## Feature:

```
<QualityOfBathymetricData id="6979" primitive="Surface">  
  <dataUnassessed>1</dataUnassessed>  
  <categoryOfTemporalVariation>5</categoryOfTemporalVariation>  
</QualityOfBathymetricData>
```

## Results in draw instruction:

```
<lineInstruction>  
  <featureReference>6979</featureReference>  
  <...>  
  <pen width="2"> <!-- Should be 0.64 -->  
</lineInstruction>
```



# Portrayal Catalog Issues



- Some XSLT portrayal rules use the old S-57 attribute codes
  - Workaround: Generate XML input to XSLT using feature catalog to output each attribute twice, once with S-101 attribute, and once with S-57 equivalent attribute (if applicable)
  - Modify Portrayal Catalog so that only S-101 attribute codes are used

# Portrayal Catalog Issues



- NOTE: Masked edges are not used by the current XSLT rules
  - No reference in portrayal rules to masked relations
  - We assume the handling of masked edges is implicit to the referenced feature (e.g. skip transformation of masked edges)

# Summary



- Despite some minor issues, we are using the existing catalogs to successfully portray converted S-101 datasets
- We look forward to obtaining native S-101 data to ensure the portrayal of all feature types are tested
- We plan to deliver the first version of the viewer within the next few months