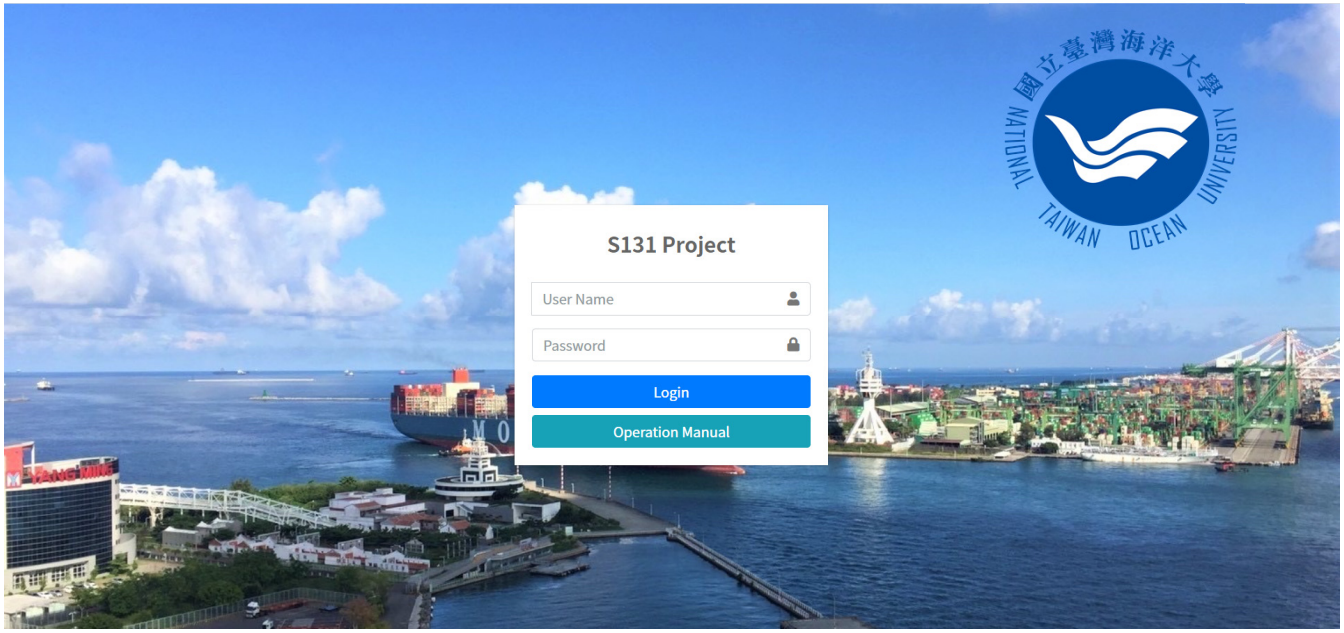
IHO International Hydrographic Organization

15th Meeting of the Hydrographic Services and Standards Committee

Feedbacks from the System Design and Implementation for S-131 Database Project

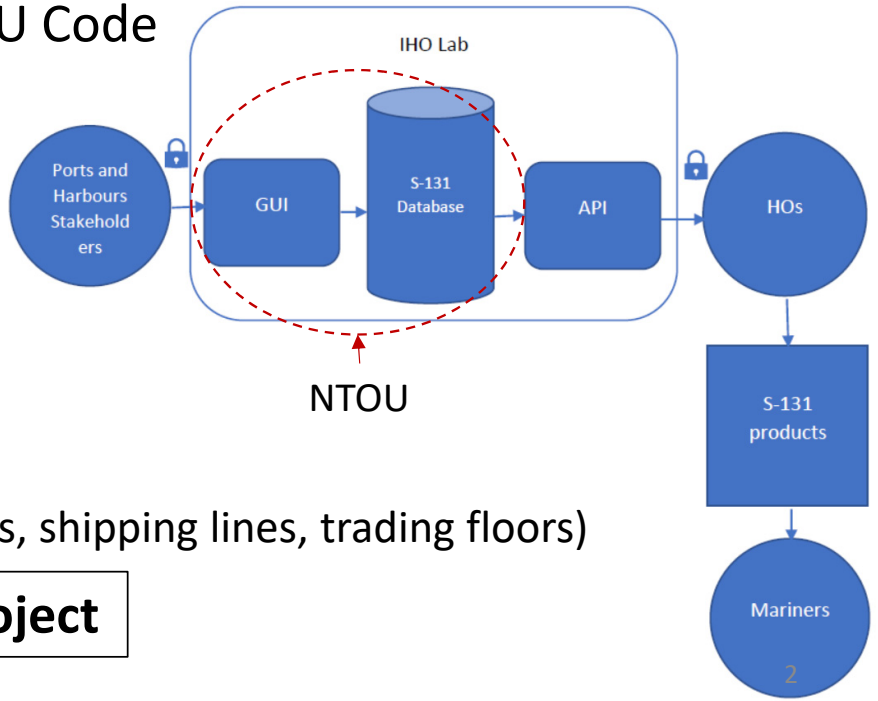
Agenda Item HSSC15-PS9

Shwu-Jing Chang, National Taiwan Ocean University (NTOU)



S-131: Goals or Targets

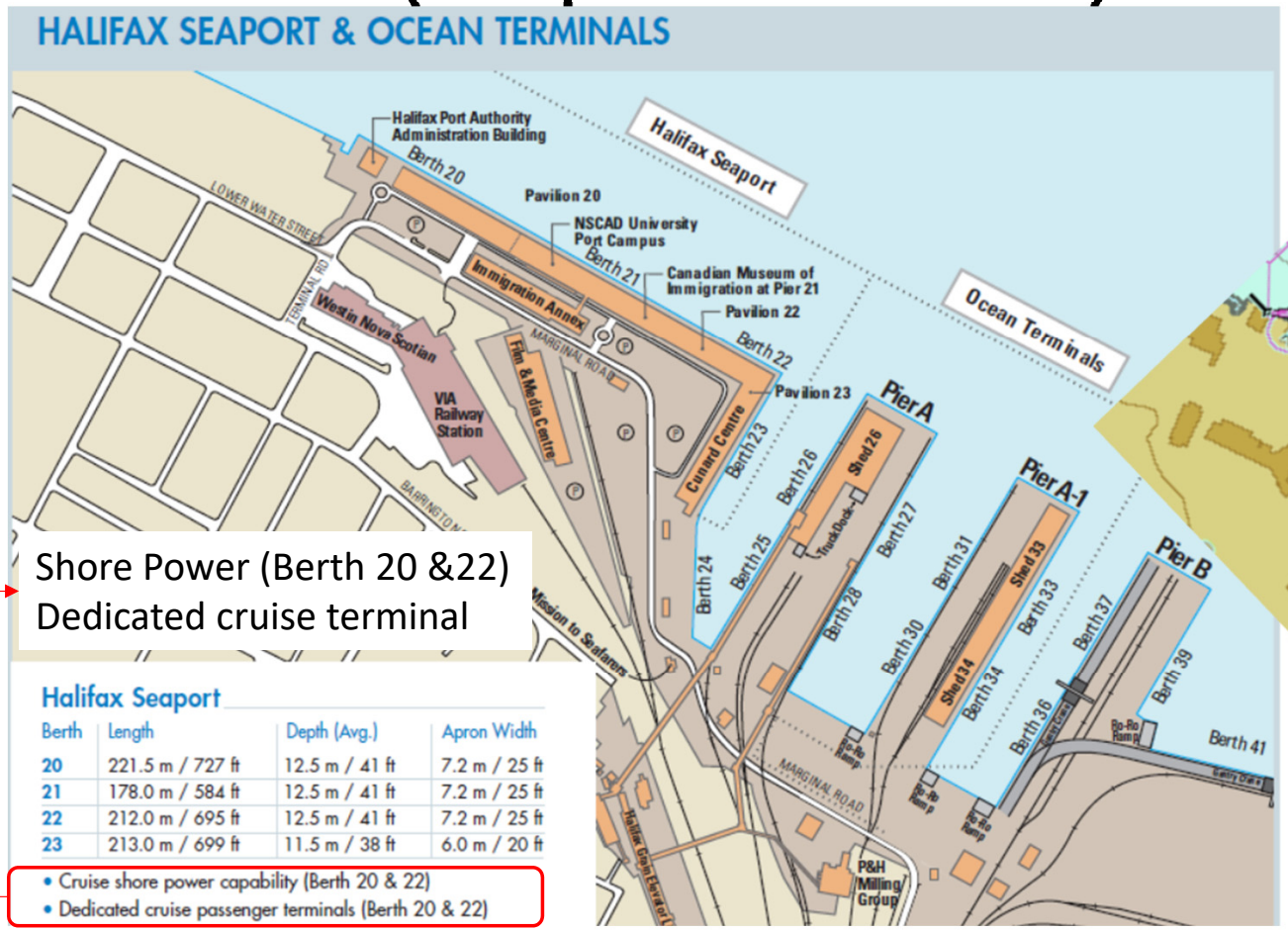
- S-131 Marine Harbour Infrastructure (MHI) Product Specification
  - Voyage planning [IMO A.893(21)] : berth-to-berth
    - including those areas necessitating the presence of a pilot
  - Port Information Books [IMO A.862(20)]: BLU Code
- The IHO-SG Lab S-131 Database Project
  - Improve the information exchange
    - between harbours and HOs
  - Support the creation of S-131 products
  - Facilitate the exchange of information
    - compliant with S-101 and S-131
    - between harbours, HOs and port users (mariners, shipping lines, trading floors)



Update S-131 with observations from the project

Port Info.(Map on Website)

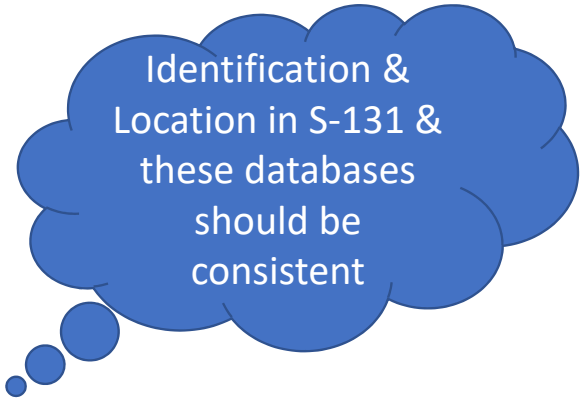
ENC/ECDIS



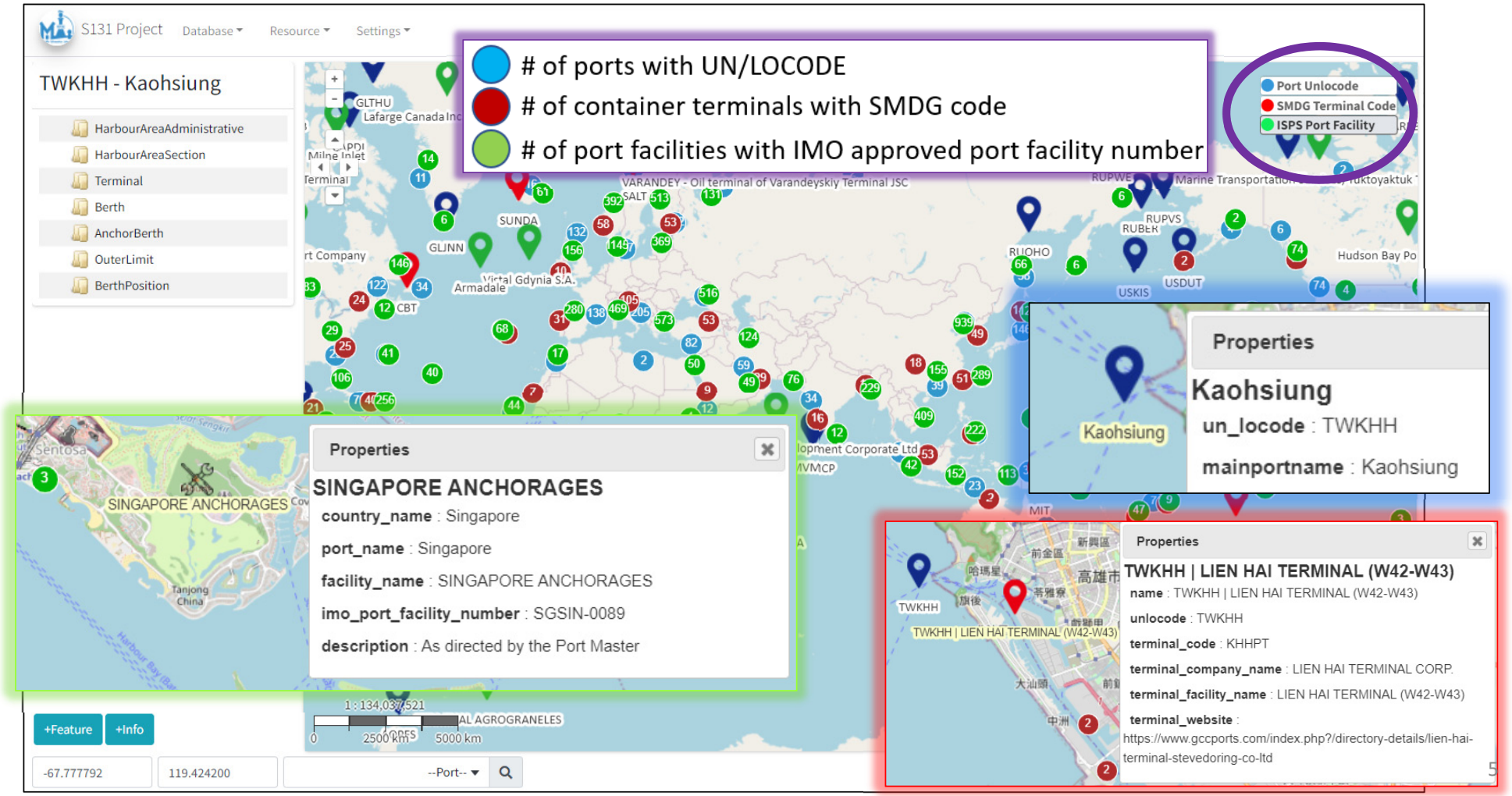
Shore Power (Berth 20 &22)
Dedicated cruise terminal

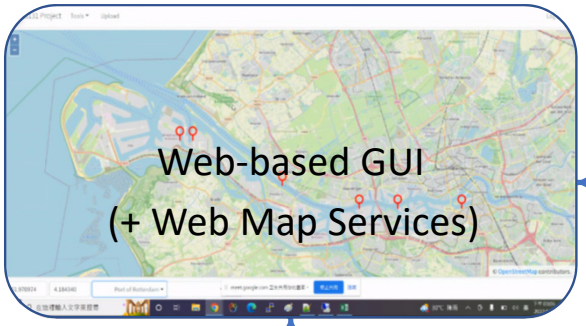
1st Step: Identification & Location

- Reference databases (as resources to all users)
  - UN/LOCODE
    - https://unece.org/trade/uncefact/unlocode
  - SMDG (Container) Terminal Code
    - ~ monthly update on http://smdg.org/smdg-code-lists
  - IMO Port Facility Number (GISIS ISPS Code database)
    - https://gisis.imo.org/Public/ISPS/Download.aspx
  - [IMO GISIS Port Reception Facility Database] → Information (no geometry)
    - MEPC.1/Circ.834/Rev.1 ..Guidance for port reception facility providers and users
- Add port database, features → Locate & identify the features → edit



Common Resources : IMO GISIS, SMDG,…





New data & updates

Geometry:
Extract/digitize/convert

Feature/attribute
Information/association

S-131
Database

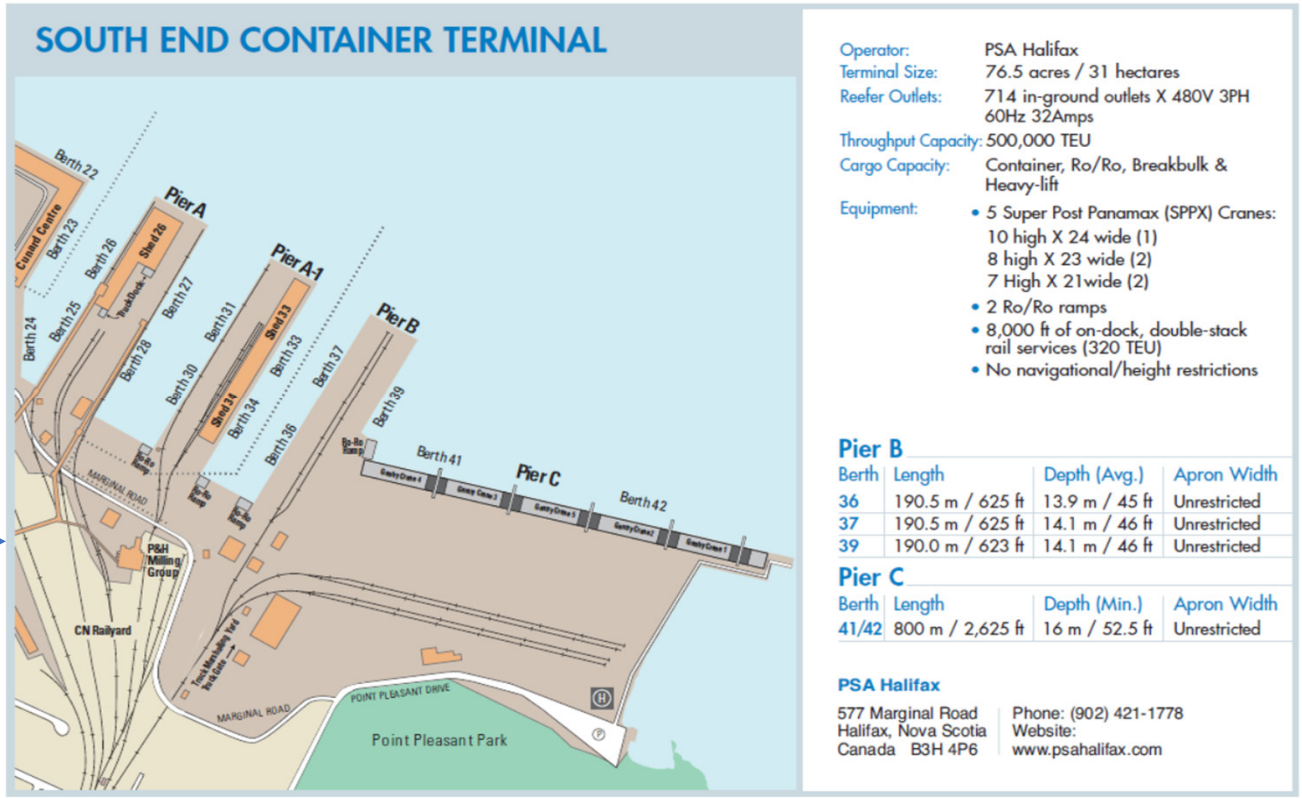
S-131 (GML)
API for M2M data exchange

Upload
or
Overlay

Geodata (Resource):
GIS files (.shp)
Text and Graphics
GML ?

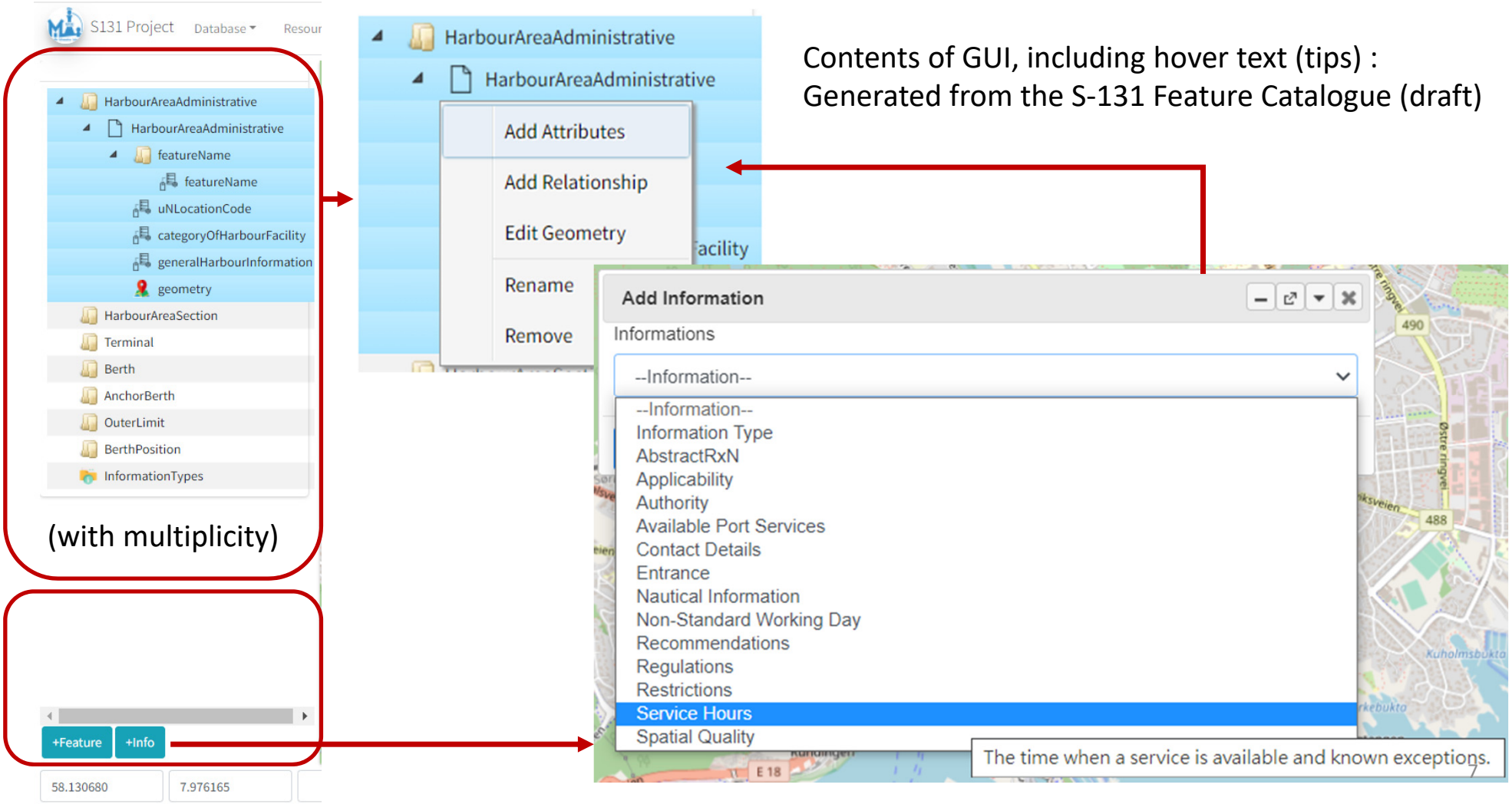
Port
Database

Port Information Guide
Port Website



https://www.portofhalifax.ca/wp-content/uploads/2021/03/POH-Harbour-and-Facilities-Map-Feb-2021-South-End-Container-Terminal.pdf

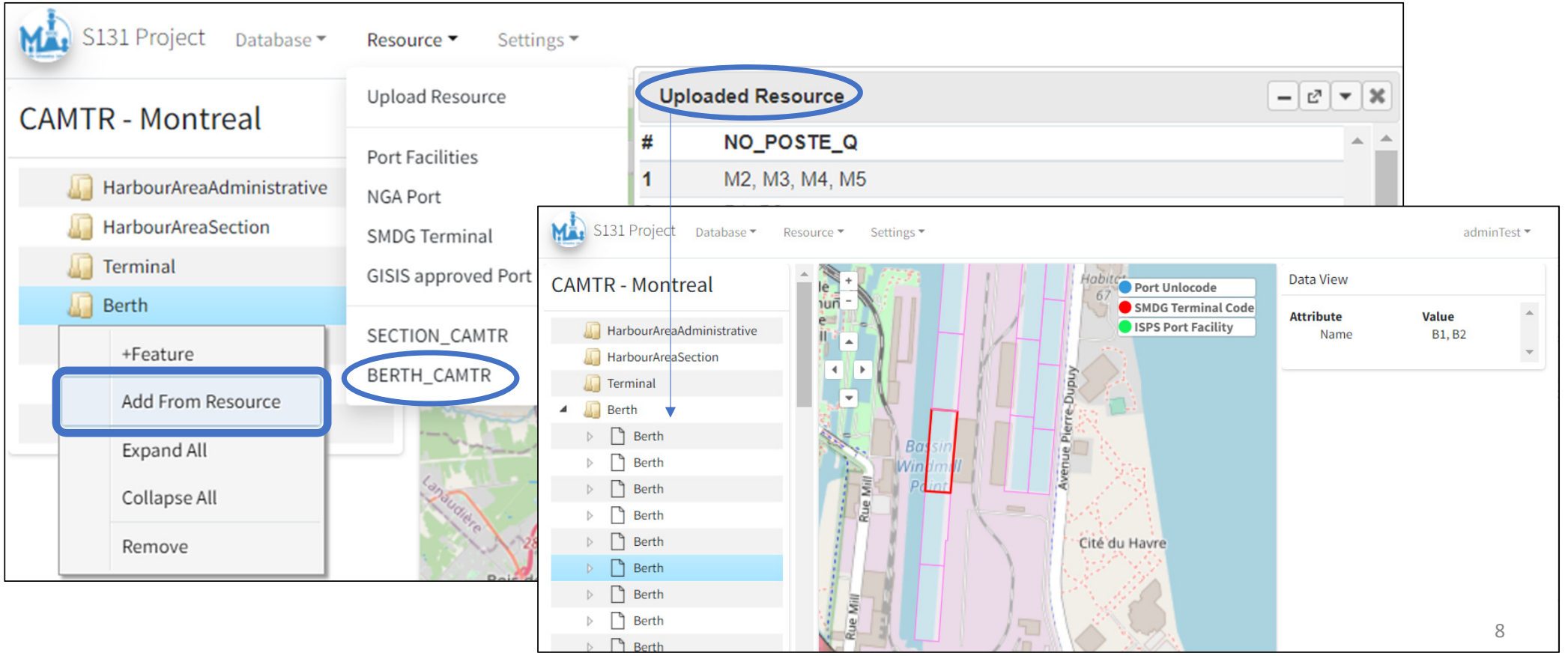
GUI: Key Feature Types (+ Feature) (+ Info)



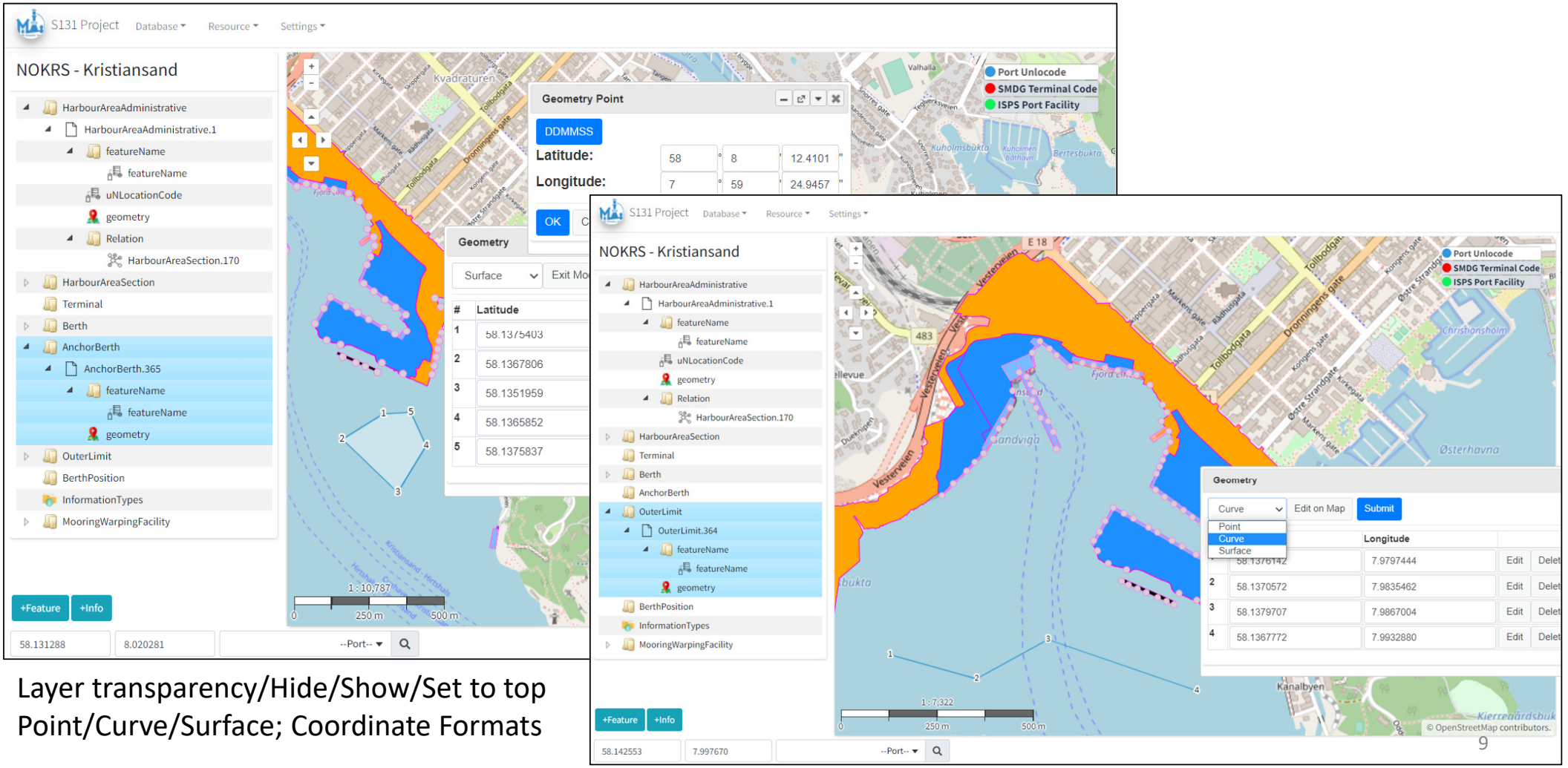
Contents of GUI, including hover text (tips) :
Generated from the S-131 Feature Catalogue (draft)

Upload Resource (zipped GIS files)

Add feature from uploaded resource || Batch create features while uploading



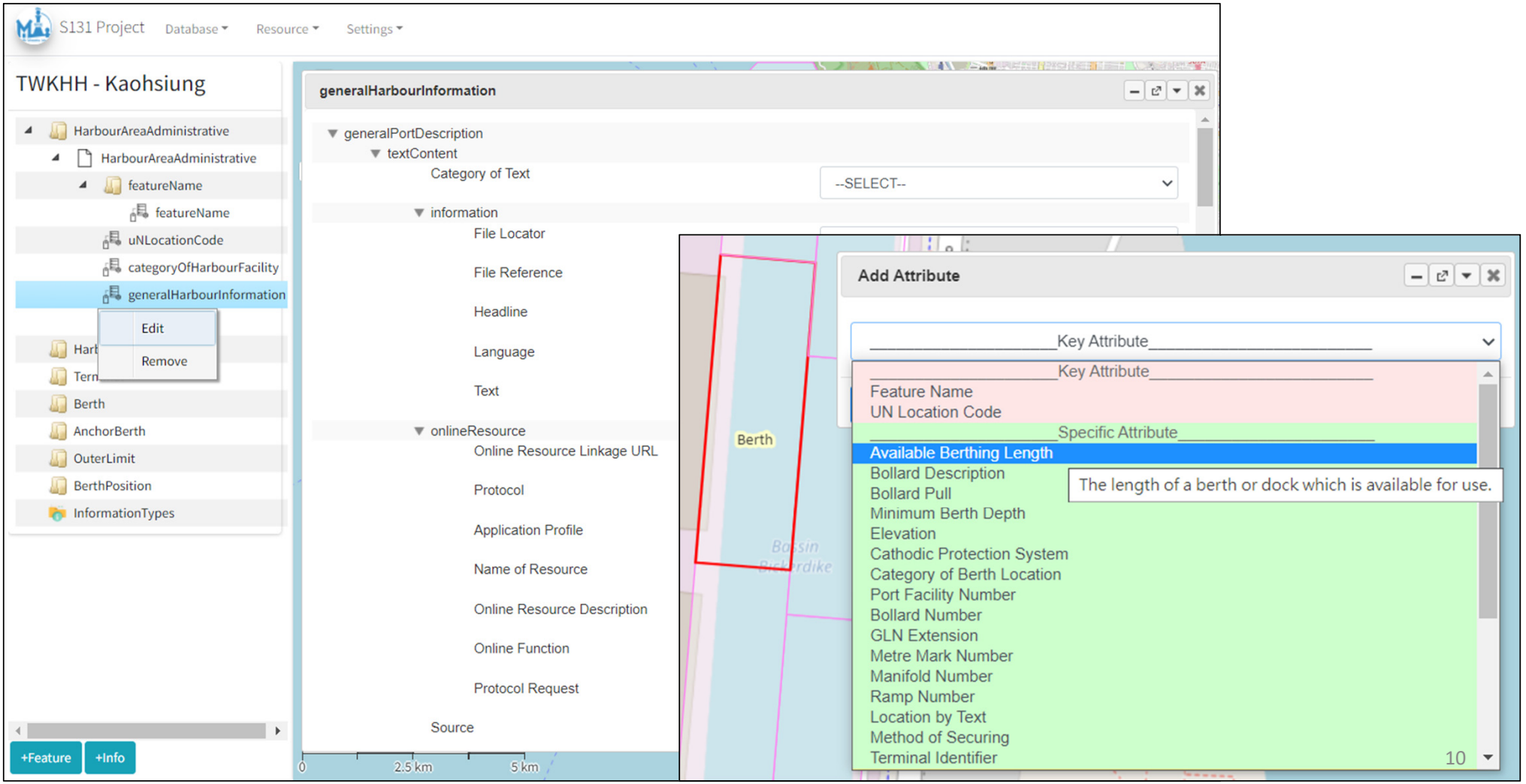
Geometry (edit on map and/or coordinates)



Layer transparency/Hide/Show/Set to top

Point/Curve/Surface; Coordinate Formats

Add Attributes : Simple, Complex, (+Inherited)



Observations

- S-131 data model
  - Split information (edited books, designed web pages) into data elements
    - Feature Types, Information Types, Attributes (+ Spatial Geometry + Support Files)
  - Group or link by using “multiple levels” of complex attributes and associations
    - generalHarbourInformation/generalPortDescription/textContent/information/fileReference
    - Feature → Regulations → Applicability (→ Authority → ContactDetails)
- Challenge - Encoding
  - source material → mapping to data model (assisted by GUI/software) → dataset
    - Narrative texts providing explanations and advice; annotated photo; illustrating graphics ?
- Challenge - Viewing
  - dataset → data model → portrayal → user interface for human cognition (mental map)
    → machine, for automation ?
  - How to improve the end result /usability ? “Who” is responsible to “which” ? Collaboration
- Challenge - Information Exchange
  - S-131 data model is fundamentally different from that of known GIS system
  - Need additional ‘middle-ware’ for M2M connection with existing GIS system to be useful

Related general discussions in NIPWG (extract)

NIPWG-VTC03-06.8A : “Gap between French SDs and S-100 based nautical publications” ,December 2022

IHO TRENDS

International Hydrographic Organization

Trends

- Simple model for high added value (modeling according to the result on the display)
- Easy to produce data using existing material (current SD)
- Keep textual explanations and advice in the data (better than a complex model involving tricky/impossible production and unlikely ECDIS advanced features).

NIPWG_VTC01_2023_06.0A: “Concepts for Associations”, March 2023

- NPUBs use of associations and information types is complex
  - Pick report-like portrayal is insufficient especially for associations.
  - Producer U/I based purely on data objects is likely to be difficult to use.
  - Other concepts are needed for both production and end-user portrayal interfaces.

Encoding - in S-131 Sample Dataset : AA.CAHAL.Terminal.05

S131:textContent
- S131:information
  - S131:fileLocator table02 S131:fileLocator
  - S131:fileReference file:/SUPPORT_FILES/13100AA_CAHALPG_APPA.HTML S131:fileReference
  - S131:headline HPA Port Information Guide S131:headline
  - S131:headline Appendix A S131:headline
  - S131:headline PSA Halifax Fairview Cove S131:headline
- S131:information
- S131:information
  - S131:headline Terminal size S131:headline
  - S131:text 70 acres / 28.3 hectares S131:text
- S131:information
- S131:information
  - S131:headline Reefer outlets S131:headline
  - S131:text 500 in-ground outlets X 440V S131:text
- S131:information
- S131:information
  - S131:headline Equipment S131:headline
  - S131:text 3 Super Post Panamax (SPPX) Cranes: 7 high x 22 wide; 2 Pan
- S131:information

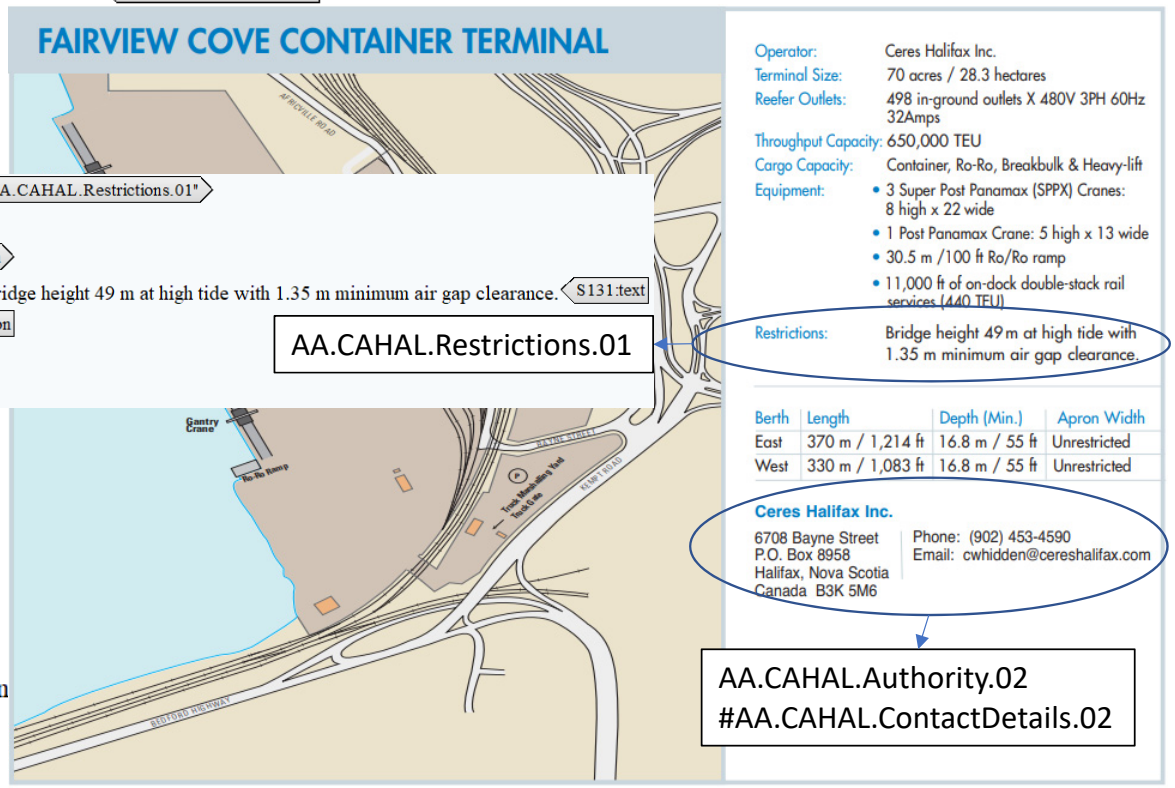
S131:textContent

S131:theRxN xlink:href="#AA.CAHAL.Restrictions.01" S131:theRxN

S131:controlAuthority xlink:href="#AA.CAHAL.Authority.01" S131:controlAuthority

S131:Restrictions gml:id="AA.CAHAL.Restrictions.01"
- S131:textContent
  - S131:information
    - S131:text Bridge height 49 m at high tide with 1.35 m minimum air gap clearance. S131:text
  - S131:information
  - S131:textContent
- S131:Restrictions

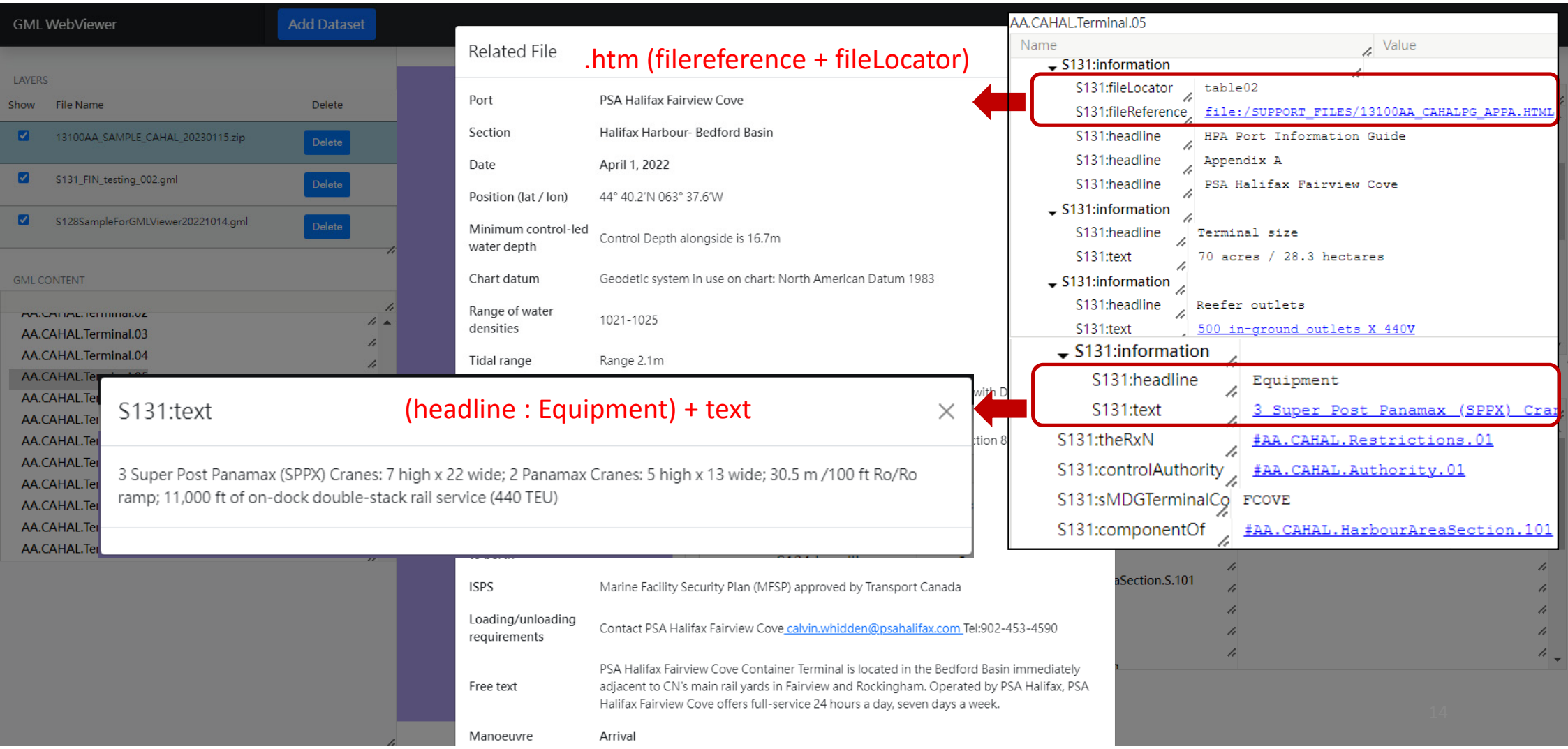
AA.CAHAL.Restrictions.01



AA.CAHAL.Authority.02
#AA.CAHAL.ContactDetails.02

https://www.portofhalifax.ca/wp-content/uploads/2021/03/POH-Harbour-and-Facilities-Map-Feb-2021-Fairview-Cove.pdf

Viewing - textContent (fileReference, headline, text) of that Terminal



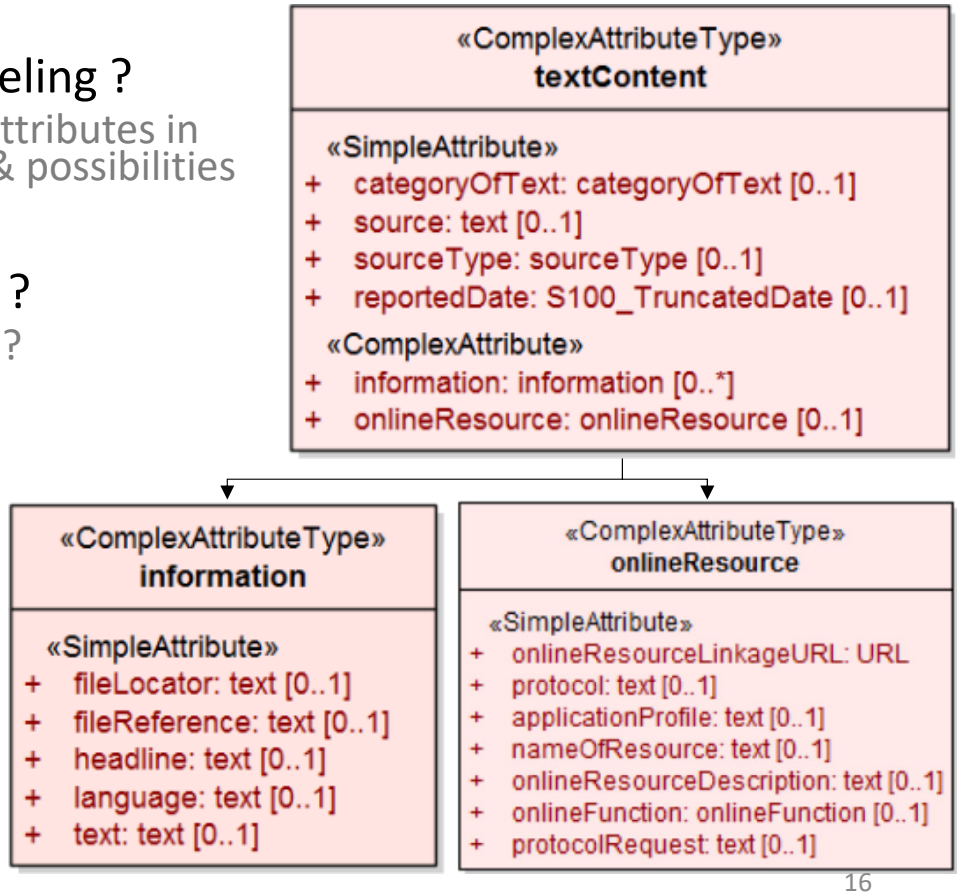
Regulations + Applicability +Authority + ContactDetails

Questions / Thoughts- from different perspectives

- Data production
  - Is the added value worth such complex modeling ?
    - splitting textual content of a feature into sub-attributes in groups and multiple level – providing options & possibilities
- GUI (Editing support)
  - How to convey the DCEG (use of the Model) ?
    - To which extent could/should the GUI support ?
- End user interface (portrayal)
  - Combine sub-attributes again, into .HTM ?
    - [support file] fileReference + fileLocator
    - headline1, headline2, headline3….
    - headline + text ….
    - [onlineResource]
  - How ? Readability ?

Organize/edit on the production side instead?

UML of the Data Model



‘graphic’ in S-131 may also contain textual info.

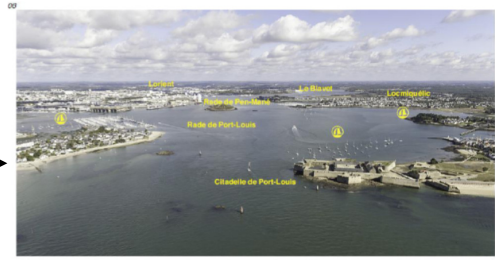
- All S-131 feature types have graphic and textContent complex attributes
- All S-131 Information types have graphic complex attribute
  - RxN (Regulations, Restrictions, Recommendations, and NauticalInformation) inherit textContent from AbstractRxN, thus provides attributes textContent and graphic for textual and pictorial material **respectively**

graphic

Definition: Pictorial information such as a photograph, sketch or other graphic, optionally accompanied by descriptive information about the graphic and the location relative to its subject from which it was made.

Sub-attribute		Type	Mult.
pictorialRepresentation	.TIF support file	text	1..*
pictureCaption		text	0..1
sourceDate		date	0..1
pictureInformation		text	0..1
bearingInformation		complex	0..1

Like this ?



3.4.1. — Rade de Lorient (2016).

11 La **rade de Lorient** s'étend au Nord de la citadelle et se compose de la **rade de Port-Louis** au Sud et de la **rade de Pen-Mané**, au Nord.

18 **Lorient** est à la fois un port de commerce, un port de pêche et un port de plaisance établi au confluent des rivières **le Ter**, **le Scorff** et **le Blavet**.

Extracted from: NIPWG-VTC03-06.8A (SHOM)

S-100 support file may be .HTM or .XML

- Dataset support files as specified in S-101 Ed. 1.1.0:
  - Picture: .TIF
    - Referenced by the attribute **pictorial representation**
  - Text: .TXT, .HTM, .XML
    - HTML files must only include inline or embedded Cascading Style Sheet (CSS) information and must not contain embedded Javascript or other dynamic content, for example DHTML, Flash etc.
    - Referenced by the complex attribute **information**, sub-attribute **file reference**
- Dataset support files as specified in the draft S-131 PS:
  - Picture: .TIF
  - Text: .TXT, .HTM, .XML
    - HTML and XML files must contain only text and markup as defined in the relevant W3C standards. References in datasets to HTML and XML support files must treat them as text files (i.e., they should not be referenced using attributes intended for picture files). The extension must be HTM for HTML files and XML for general XML files.

Add graphic with HTML <svg> element ? Embed SVG in .HTM support file

Trial - using embedded CSS + SVG, for illustration

PORT INFORMATION GUIDE (Port of Halifax)

7.19 MAXIMUM ALLOWABLE LOAD LIMITS FOR HPA BOLLARDS

The bollards located on the piers of marine facilities operated and leased by the HPA have been painted different colours to indicate load limits. When conducting mooring operations, it is the responsibility of the Master to ensure that the strain on the mooring lines does not exceed the maximum allowable load limit of the bollard(s) indicated in the table below. It is also recommended, whenever possible, that vessels shall not share bollards or use more than two (2) mooring lines per bollard.

Bollard Colour	Bollard Allowable Load Limit (Max)
BLACK with RED X	OUT OF SERVICE
SAFETY RED	50 Tonnes
SAFETY ORANGE	100 Tonnes
SAFETY YELLOW	150 Tonnes
SAFETY GREEN	200 Tonnes

S-131 Support File (.htm with internal css and SVG)

MAXIMUM ALLOWABLE LOAD LIMITS FOR HPA BOLLARDS

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S-131 Support File (.htm with internal css)

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Using HTML <svg> element to add the **X**

Summary

- Update GUI/system design & implementation for S-131 DB project
  - Comments ? Suggestions ?
- Feedbacks
  - reconsider the # of levels in complex attributes and associations
    - So that users won't easily get lost during the "navigation" while editing or viewing
    - More feasible and less loss for M2M information exchange with existing GIS system

    "Simple model for high added value (modeling according to the result on the display)"
  - consider making use of the .htm, .xml introduced in S-100
    - Not just a support file for formatted text
    - Explore the potential in improving the user interface (in a standardized/consistent way)
      - Product specification, Data Production (Editing) , End-User Interface (Portrayal)