

S-123 Creation Report

NIPWG VTC 04 2021

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Presented by Hugh Astle



Project on S-123 Digitization

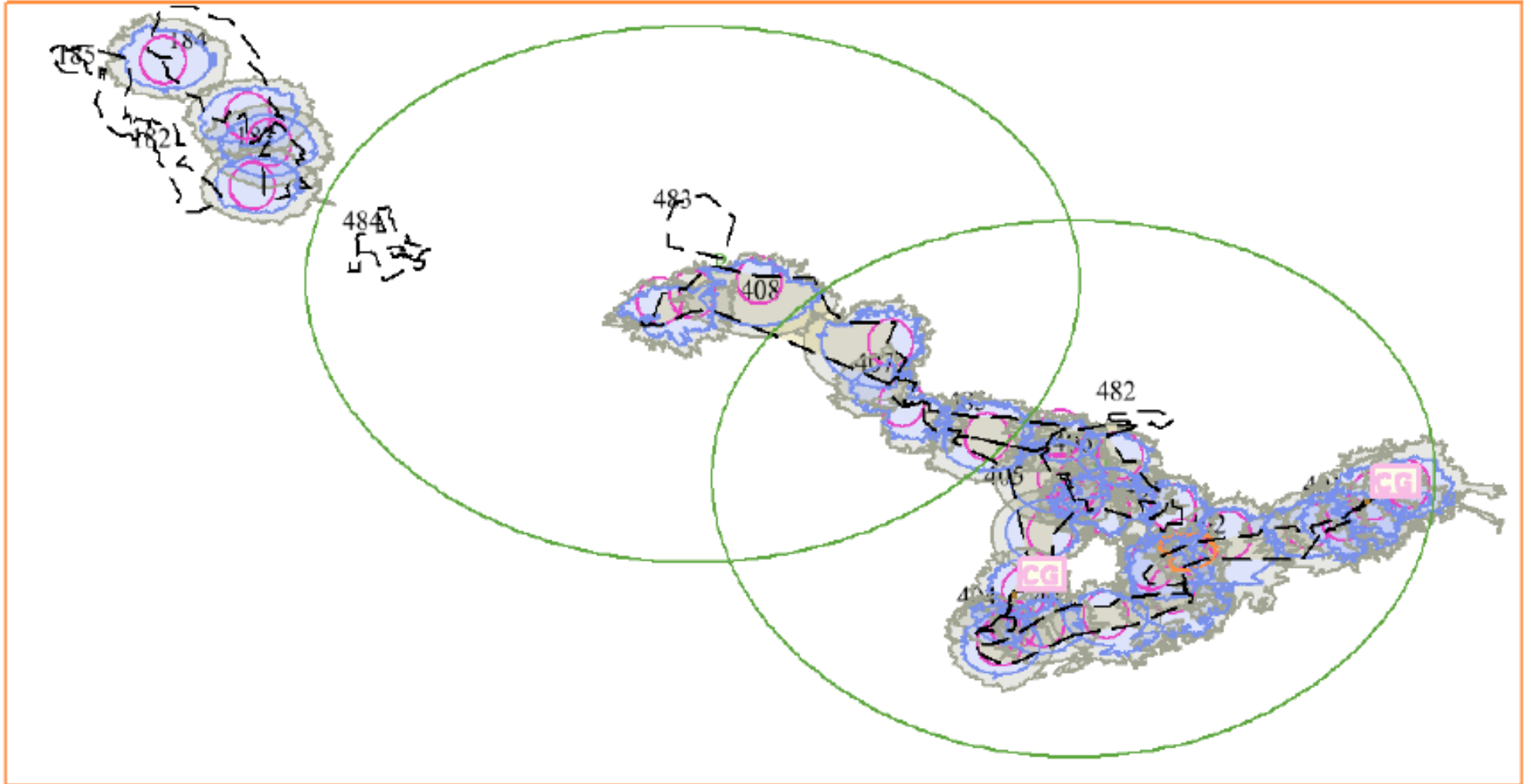


Figure 1 - Radio Services in Great Lakes region of Canada



S-123 General feedback

- Duplication and inconsistencies across Application Schema, DCEG and Feature Catalogue.
 - Consider including UML diagrams in DCEG
 - Consistency issues with naming conventions and spelling
- Dataset naming convention
 - Follow S-97 and harmonize with other specs
- Exchange Catalogue
 - Consistency, use 'catalog.xml' not 'catalog.123.xml'
- Duplication of GML format details across Product spec and GML schema documents.



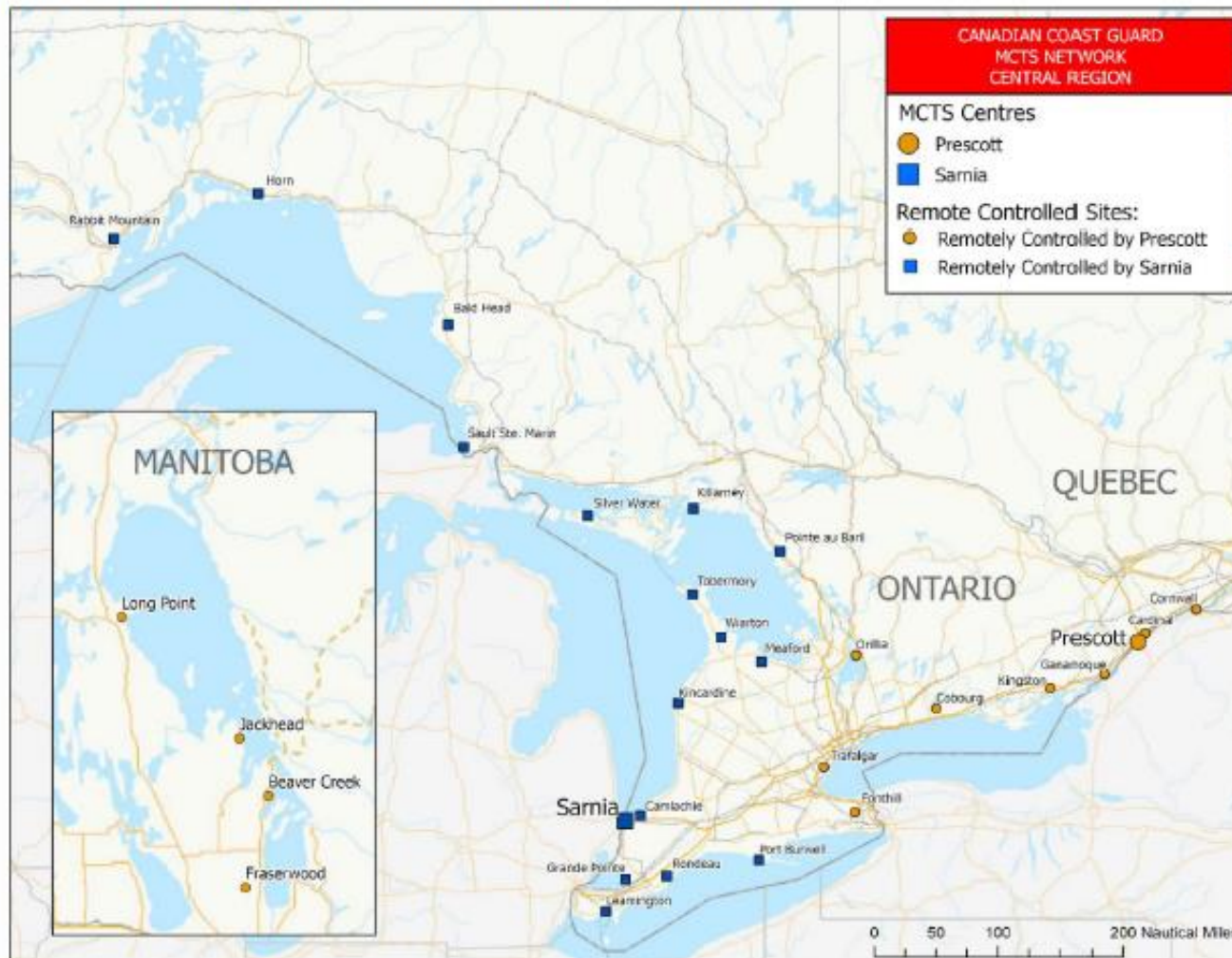
S-123 Data Model General

- Some inconsistencies between documentation and associated Feature Catalogue
 - E.g. Abstract feature base class textContent 0..* but FC has 0..1



Coastguard Station

Figure 2-1 - MCTS Network – Central Region – Great Lakes

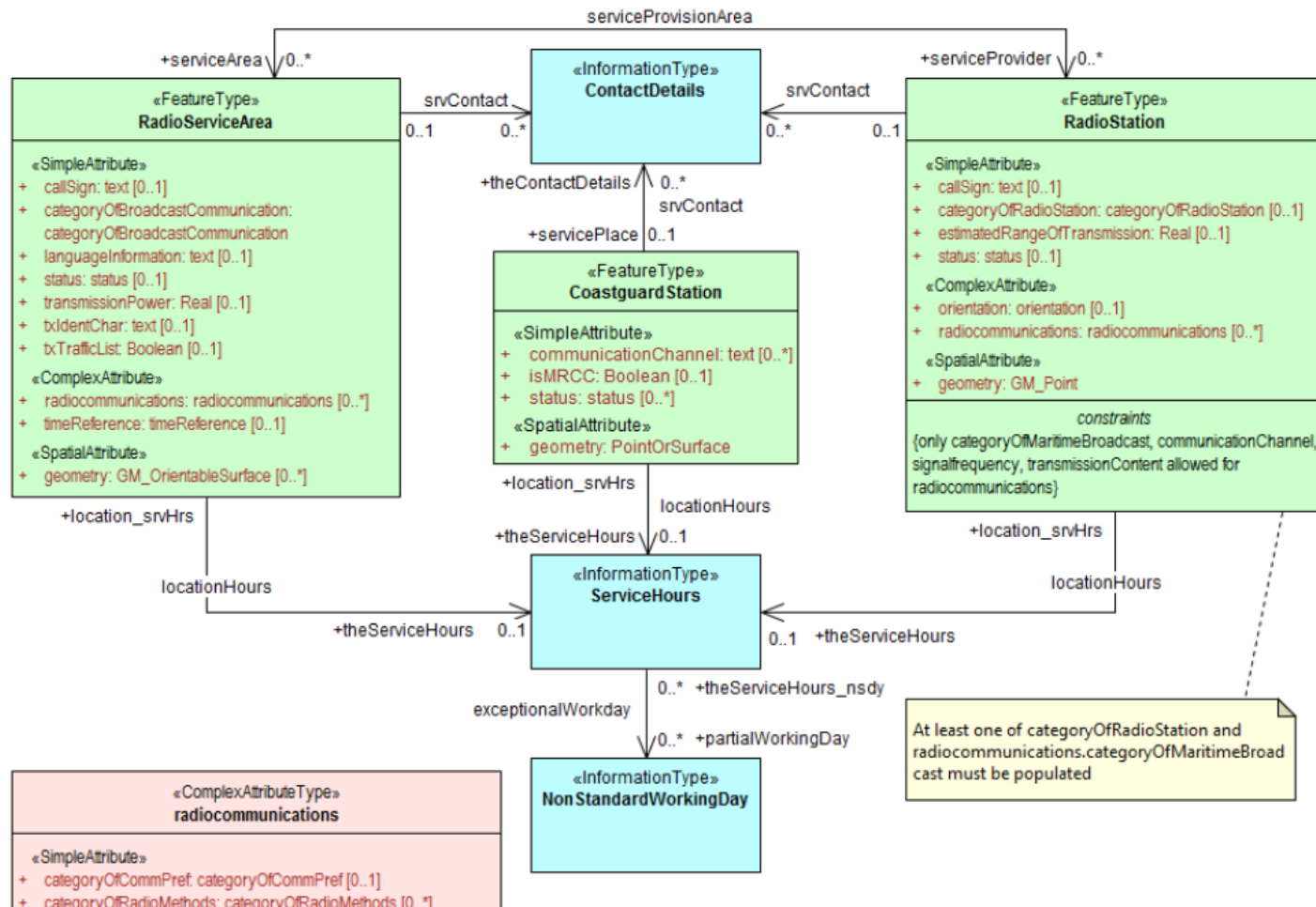


Radio Stations listed with Coastguard Station

Table 2-13 - Prescott MCTS/VBR - Ship/Shore Communications

Sites located at	Channels	Frequencies		Remarks
		Transmit	Receive	
Cornwall 45°01'06"N 074°43'47"W	Ch16 Ch70 Ch85	-	-	Operational March 15 to December 31.
Cardinal 44°47'17"N 075°25'19"W	Ch16 Ch26 Ch27 Ch70	-	-	Operational March 15 to December 31.
Gananoque 44°23'59"N 075°58'23"W	Ch16 Ch85	-	-	Operational March 15 to December 31.
Kingston 44°15'46"N 076°40'39"W	Ch16 Ch24 Ch26 Ch70	-	-	-

Coastguard Station and Radio Station





Radio Stations

- Need link to controlling Coastguard Station
- Indication if station is remotely operated/controlled
- Use specific complex attribute **radioStationCommunicationDescription** to constrain radiocommunication description instead of notes in spec regarding which attributes to encode.
- Define in DCEG how **RadioServiceArea** features are intended to provide details of radio services.



GMDSS Areas

- Overlap between GMDSS Areas and Radio Service Areas.
- Actual coverage is defined by one or more Radio Service Areas.
- Recommend using an aggregation association to Radio Service Areas instead of dedicated geometry.
 - Simplifies model
 - Reduces duplication
 - Simplifies maintenance
- Seems to overlap Inmarsat Ocean Region Area
 - Provide distinction



Landmarks

- Landmark features are used only if needed to encode a location relevant to **radiocommunications** but for which a radio service or station is not appropriate.
- The related radio communications information must be encoded using a **RadioStation** and/or **RadioServiceArea**.
- Consider an association link between a **Landmark** and a **RadioStation**.



Navigational Meteorological Area

- Consider associating **NavigationalMeteorologicalArea** with **RadioServiceArea** or **RadioServiceAreaAggregate** features instead of to **RadioStation**.
- Consider association between **NavigationalMeteorologicalArea** and **NavtexStationArea**.
- Consider adding possible association between **NavigationalMeteorologicalArea** and **ContactDetails**.



Navtex Station Area

- The **NavtexStationArea** appears to be an administration area within which NAVTEX coverages are defined by way of **RadioServiceArea** features.
- **RadioServiceArea** have radiocommunications with a **categoryOfRadioMethods=6(NAVTEX)**
- Consider an association between **NavtexStationArea** and **RadioServiceArea**.
- Allow a **NavtexStationArea** to have multiple **txIdentChar** attributes or make a complex that pairs language and **txIdentChar**



Radio Service Area

- Most common encoded feature in S-123
- Consider breaking into sub-types in order to differentiate between types of service such as VHF, MF, AMVER, NAVTEX etc.
 - Simplify digitization and maintenance
 - Simplify portrayal and query useability
- Separate **radioCommunications** complex into separate structures for communications details vs broadcast details



Broadcasts across Radio Stations

Continuous	Cardinal	Ch21B	<p>Radiotelephony(English)</p> <ul style="list-style-type: none">• Localized weather warnings/watches, marine weather statements, technical marine synopsis, regular marine forecasts, wave height forecast and extended marine forecasts for St. Lawrence River from Kingston to Montréal and Lake Ontario (Areas: 309, 401 and 402).• Navigational warnings in St. Lawrence River west of Melocheville, Lake Ontario east of 77 40W, Trent River and portions of the Rideau Canal receiving coverage from the Kingston and Cardinal facilities.• Water level readings from Montréal Harbour and Lake Ontario.• Ice forecast for Lake Ontario.
	Cornwall Kingston	Ch83B	



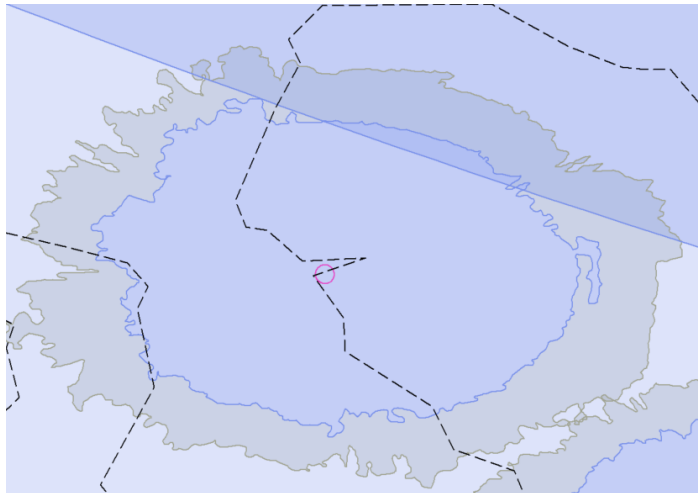
Radio Service Area

- Consider modeling broadcast details as information types to allow associating the broadcast details with multiple RadioServiceArea features providing the broadcasts.
 - Avoid duplication and maintenance issues
- DCEG: Consider additional dedicated documentation and use case examples for radio communications details.
- Error in xml FC regarding permitted Primitives



Fuzzy Areas or RadioServiceAreaAggregate

- 90% coverage vs 50% coverage
 - **RadioServiceArea** used as a core service area correspond to the 90% coverage
 - **IndeterminateZone** used to define the 50% coverage
- Inconsistencies related to description and encoding of **informationConfidence** attribute values.





Weather Forecast Warning Area

- **WeatherForecastWarningArea** are understood to be identifiable regions for which forecasts are available.
- Ideally these weather areas would be linked to the **RadioServiceArea** which are broadcasting the information about them, but the model does not include this association.
- Include unique identifiers (such as numeric code)
- Consider modeling broadcasts as information types which could be shared across Radio service areas to optimize and improve useability such as queries.
- Consider additional **categoryOfFrcstAndWarningArea** values.

Radiocommunications – too complex?

radiocommunications (Radiocommunications) 1	„4 (Very High Frequency (VHF) voice traffic),16,26,,,,,,,,,6
categoryOfCommPref (Category of communication preference)	
(New categoryOfMaritimeBroadcast (Category of maritime broadcast) 1)	
categoryOfRadioMethods (Category of radio methods) 1	4 (Very High Frequency (VHF) voice traffic)
(New categoryOfRadioMethods (Category of radio methods) 2)	
communicationChannel (Communication channel) 1	16
communicationChannel (Communication channel) 2	26
(New communicationChannel (Communication channel) 3)	
contactInstructions (Contact instructions)	
facsimileDrumSpeed (Facsimile drum speed)	
(New frequencyPair (Frequency pair) 1)	
selectiveCallNumber (Selective call number)	
signalFrequency (Signal frequency)	
timeOfObservation (Time of observation)	
timesOfTransmission (Times of transmission)	
(New tmIntervalsByDoW (Time intervals by day of week) 1)	
transmissionContent (Transmission content)	Operational May 15 to October 31.

Radiocommunications – too complex?

radiocommunications (Radiocommunications) 2	,2 (meteorological warning),6 (meteorological forecast),1 (navigational warning),
categoryOfCommPref (Category of communication preference)	
categoryOfMaritimeBroadcast (Category of maritime broadcast) 1	2 (meteorological warning)
categoryOfMaritimeBroadcast (Category of maritime broadcast) 2	6 (meteorological forecast)
categoryOfMaritimeBroadcast (Category of maritime broadcast) 3	1 (navigational warning)
(New categoryOfMaritimeBroadcast (Category of maritime broadcast) 4)	
categoryOfRadioMethods (Category of radio methods) 1	4 (Very High Frequency (VHF) voice traffic)
(New categoryOfRadioMethods (Category of radio methods) 2)	
communicationChannel (Communication channel) 1	Ch26
(New communicationChannel (Communication channel) 2)	
contactInstructions (Contact instructions)	
facsimileDrumSpeed (Facsimile drum speed)	
(New frequencyPair (Frequency pair) 1)	
selectiveCallNumber (Selective call number)	
signalFrequency (Signal frequency)	
timeOfObservation (Time of observation)	
timesOfTransmission (Times of transmission)	,,,2 (UTC),0140,0840,1240,1640,2140
minutePastEvenHours (Minute past even hours)	
minutePastEveryHour (Minute past every hour)	
minutePastOddHours (Minute past odd hours)	
timeReference (Time reference)	2 (UTC)
transmissionTime (Transmission time) 1	0140
transmissionTime (Transmission time) 2	0840
transmissionTime (Transmission time) 3	1240
transmissionTime (Transmission time) 4	1640
transmissionTime (Transmission time) 5	2140
(New transmissionTime (Transmission time) 6)	
(New tmlIntervalsByDoW (Time intervals by day of week) 1)	
	Radiotelephony (English followed by French)
transmissionContent (Transmission content)	<ul style="list-style-type: none"> • Localized weather warnings/watches, marine weather statements, regular mari • Navigational warnings for Lake Winnipeg, Playgreen Lake and Red River north
transmissionRegularity (Transmission regularity) 1	1 (continuous)



Radiocommunications – too complex?

- Consider separating broadcast details to a separate information type
- Languages: Awkward to model communications/broadcasts in different languages, forces duplication or blobs of text which reduce machine readability.
- **categoryOfMaritimeBroadcast** – consider additional values
- How to encode emission codes such as ‘J3E’ or ‘F1B’?
- Difficult to encode/manage frequency pairs
- Should **communicationsChannel** be number or integer?
- How to encode facilities available?:
 - “Ch24, Ch26, 2142 and 2206: Facilities are available for connecting ships directly to the commercial telephone system on shore.”



Radiocommunications – too complex?

- Date range of broadcast
 - One broadcast may be served by multiple Radio Stations and Radio Service Areas. Also note that some of the content is periodic.
 - Consider `fixedDateRange` within `radioCommunications`



Contact Details

- Delivery points
 - multiple **deliveryPoint** entries needed
 - no mechanism/property to distinguish them
 - The order can be defined but there is no machine readable way to isolate a contact label from a post office box or street address.
- Language
 - Add a language attribute to the top level
 - Allow machines to find/separate content by language



Contact Details

2.1.7 Prescott, Ontario

MMSI: 003160029

Call Sign: VBR

Hours: H24

Services in English and in French.

All communications with Canadian Coast Guard Marine Communications and Traffic Services Centres are recorded.

For Radio Services, call Prescott Coast Guard Radio.

Coordinates

Mailing Address:

Fisheries and Oceans Canada
Canadian Coast Guard
Officer-in-Charge – MCTS Operations
Prescott MCTS Centre
P.O. Box 1000
401 King Street West
Prescott, ON K0E 1T0

Telephone: 613-925-4471
613-925-0618
613-925-0666

MCTS Operations
Officer-in-Charge
NAVWARN Desk / NAVAREA XVII and XVIII

Facsimile: 613-925-4519

Email: Safety.Prescott@innav.gc.ca Prescott MCTS
navarea17.18@innav.gc.ca NAVAREA XVII and XVIII
NAVWARN.MCTSPrescott@innav.gc.ca



Service Hours

- Complex model makes simple situations hard to manage
 - Consider simplifying service hours to support common situations such as 24-hour service (H24).
 - Consider if **scheduleByDoW** needs to be mandatory



Periodic Date Range, Fixed Date Range

- Attribute order
 - current Feature Catalogue the order of the sub-attributes is **dateEnd, dateStart** which is not intuitive.
- Fuzzy dates
 - Consider an attribute within the **dateRange** complex to indicate an approximate range.
- Seasons can vary – consider a ‘season’ attribute
 - Winter, Spring, Summer, August
 - Ice Reports applicable when it is cold
 - Lobster season, tsunami season



GML encoding

- Structure/order of elements
 - Consider similar to 8211 encoding
- Metadata element to hold Dataset metadata fields
- Are **member** and **imember** needed?
 - Group information types in one **imember** element
 - Group feature types in one **member** element
- Enumerations using numeric code
- Use role names as association elements
- Geometry inline or shared, levels of inheritance



Exchange Set

- Signature should be mandatory for official data
- The property **specificUsage** is mandatory from S-100 metadata, but for a product such as S-123 the product is typically scaleless.
 - S-101 uses Port Entry, Transit, Overview
 - Perhaps a string is needed to indicate scales
- Vertical datums
 - Listed as mandatory in S-123 but optional in S-100 Ed 4.
- Agency duplication should be rationalized



Summary

- As expect the project to make actual data uncovered some areas for improvement and modeling considerations.
- Testing with actual data is critical in validating the specification.
- Overall, the spec was useable and data could be created. Improvements mainly entail simplification, special cases and considerations for usability in end systems.
- Portrayal and validation important to address.

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