



IHO S-111 Surface Currents specification update



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IHO Tides Water Levels Currents Working Group Vice-Chair

S-100 WG TSM5, Arlington Virginia USA

September 2017



Plan

- S-111 Surface currents specification status
- Tests Datasets
- Use of Korea S-100 viewer and SLGO validator
- Portrayal examples
- Next Steps



S-111 Surface currents specification status

- 36 metadata entries
- Supports point, point set, trajectory, grids, unstructured grids
- Supports predictions, forecasts, observations
- S-111 to be submitted to IHO members states in 2017

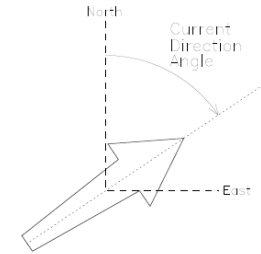
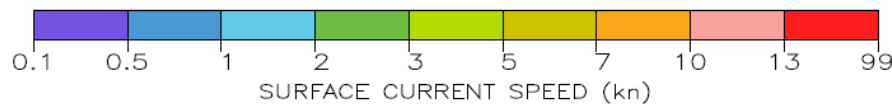


Table 9.1 – Speed ranges (knots) and RGB colour values for the 9-step display.

Step	Minimum Speed (kn)	Maximum Speed (kn)	Appx. Interval (kn)	Colour Scale Intensity			Displayed Colour
				Red	Green	Blue	
1	0.10	0.49	0.4	118	82	226	
2	0.50	0.99	0.5	72	152	211	
3	1.00	1.99	1	97	203	229	
4	2.00	2.99	1	109	188	69	
5	3.00	4.99	2	180	220	0	
6	5.00	6.99	2	205	193	0	
7	7.00	9.99	3	248	167	24	
8	10.00	12.99	3	247	162	157	
9	13.00	99.99	87	255	30	30	



HDFView 2.10.1

File Window Tools Help

Recent Files C:\Data\SCWG\IHO_Datasets\Canada_east_coast_109.h5

Canada_east_coast_109.h5

- Group 1
 - Direction
 - Speed
- Group 10
- Group 11
- Group 12
- Group 13
- Group 14
- Group 15
- Group 16
- Group 17
- Group 18
- Group 19
- Group 2
- Group 20
- Group 21
- Group 22
- Group 23
- Group 24
- Group 3

Direction at /Group 1 [Canada_east_coast_109.h5 in C:\Data\SCWG\IHO_Datasets]

Table

0-based

	0	1	2	3	4	5	
0	247.88633...	240.88967...	236.71468...	235.68153...	232.00966...	222.29815...	211.29

(96)

Group size = 25
 Number of attributes = 36
 dataCodingFormat = 3
 dataProtection = 0
 dateTimeOfFirstRecord = 20030215T000000Z
 dateTimeOfIssue = 20161114T000000Z

Properties - /

General Attributes User Block

Number of attributes = 36

Name	Value	Type	Array Size
dataCodingFormat	3	64-bit integer	Scalar
dataProtection	0	64-bit integer	Scalar
dateTimeOfFirstRecord	20030215T000000Z	String, length = 16	Scalar
dateTimeOfIssue	20161114T000000Z	String, length = 16	Scalar
dateTimeOfLastRecord	20030215T230000Z	String, length = 16	Scalar
depthTypeIndex	1	64-bit integer	Scalar
gridLandMaskValue	-1.0	64-bit floating-point	Scalar
gridOriginLatitude	0.0	64-bit floating-point	Scalar
gridOriginLongitude	0.0	64-bit floating-point	Scalar
gridSpacingLatitudinal	0.0	64-bit floating-point	Scalar
gridSpacingLongitudinal	0.0	64-bit floating-point	Scalar
horizDatumReference	EPSG	String, length = 4	Scalar
horizDatumValue	4326	64-bit integer	Scalar
maxSurfCurrentSpeed	23.305031428153033	64-bit floating-point	Scalar
methodCurrentsProduct	FVCOM	String, length = 5	Scalar
minGridPointLatitudinal	0	64-bit integer	Scalar
minGridPointLongitudinal	0	64-bit integer	Scalar
minSurfCurrentSpeed	0.0	64-bit floating-point	Scalar
nameRegion	Canada	String, length = 6	Scalar
nameSubregion	East	String, length = 4	Scalar
numPointsLatitudinal	0	64-bit integer	Scalar
numPointsLongitudinal	0	64-bit integer	Scalar
numberOfNodes	27016	64-bit integer	Scalar
numberOfStations	0	64-bit integer	Scalar
numberOfTimes	24	64-bit integer	Scalar
productSpecification	S-111_version_1.0.0	String, length = 19	Scalar
protectionScheme	Not_applicable	String, length = 14	Scalar
surfaceCurrentDepth	0.0	64-bit floating-point	Scalar
timeRecordInterval	3600	64-bit integer	Scalar
typeOfCurrentData	5	64-bit integer	Scalar
uncertaintyOfDirection	-1.0	64-bit floating-point	Scalar
uncertaintyOfHorzPosition	-1.0	64-bit floating-point	Scalar

Close

HDFView 2.10.1

File Window Tools Help

Recent Files C:\Data\SCWGIHO_Datasets\Canada_east_coast_109.h5

Group 15
Group 16
Group 17
Group 18
Group 19
Group 2
Group 20
Group 21
Group 22
Group 23
Group 24
Group 3
Group 4
Group 5
Group 6
Group 7
Group 8
Group 9
Group XY

X at /Group XY [Canada_east_coast_109.h5 in C:\Data\SCWGIHO_Datasets]

Table

0-based

	0	1	2	3	4	5	
0	-60.292285...	-60.318695...	-60.303264...	-60.264484...	-60.259105...	-60.234661...	-60.2

Y at /Group XY [Canada_east_coast_109.h5 in C:\Data\SCWGIHO_Datasets]

Table

0-based

	0	1	2	3	4	5	
0	45.688507...	45.662700...	45.638416...	45.648376...	45.678558...	45.694080...	45.7

Y (5104, 2)
64-bit floating-point, 1 x 27016
Number of attributes = 0

Properties - /

General Attributes User Block

Number of attributes = 36

Name	Value	Type	Array Size
dataCodingFormat	3	64-bit integer	Scalar
dataProtection	0	64-bit integer	Scalar
dateTimeOfFirstRecord	20030215T000000Z	String, length = 16	Scalar
dateTimeOfIssue	20161114T000000Z	String, length = 16	Scalar
dateTimeOfLastRecord	20030215T230000Z	String, length = 16	Scalar
depthTypeIndex	1	64-bit integer	Scalar
gridLandMaskValue	-1.0	64-bit floating-point	Scalar
gridOriginLatitude	0.0	64-bit floating-point	Scalar
gridOriginLongitude	0.0	64-bit floating-point	Scalar
gridSpacingLatitudinal	0.0	64-bit floating-point	Scalar
gridSpacingLongitudinal	0.0	64-bit floating-point	Scalar
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horizDatumValue	4326	64-bit integer	Scalar
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methodCurrentsProduct	FVCOM	String, length = 5	Scalar
minGridPointLatitudinal	0	64-bit integer	Scalar
minGridPointLongitudinal	0	64-bit integer	Scalar
minSurfCurrentSpeed	0.0	64-bit floating-point	Scalar
nameRegion	Canada	String, length = 6	Scalar
nameSubregion	East	String, length = 4	Scalar
numPointsLatitudinal	0	64-bit integer	Scalar
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numberOfNodes	27016	64-bit integer	Scalar
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uncertaintyOfDirection	-1.0	64-bit floating-point	Scalar
uncertaintyOfHorzPosition	-1.0	64-bit floating-point	Scalar

Close



S-111 Tests Datasets on IHO website now

US

Time series at a few fixed locations

Fictive Data

4 stations

6 minutes interval

Regularly gridded data

Lake Ontario

25 x 61 grid

6 hours of data

Irregularly gridded data

Chesapeake Bay

1560 data points

6 hours of data

Argo surface drifter data

Pacific

384 data points

Canada

Hindcast of West Coast

72963 data points

24 hours of data

30 Mo

Hincast of East Coast

27016 data points

24 hours of data

10 Mo

2017 Currents predictions of all stations in Canada

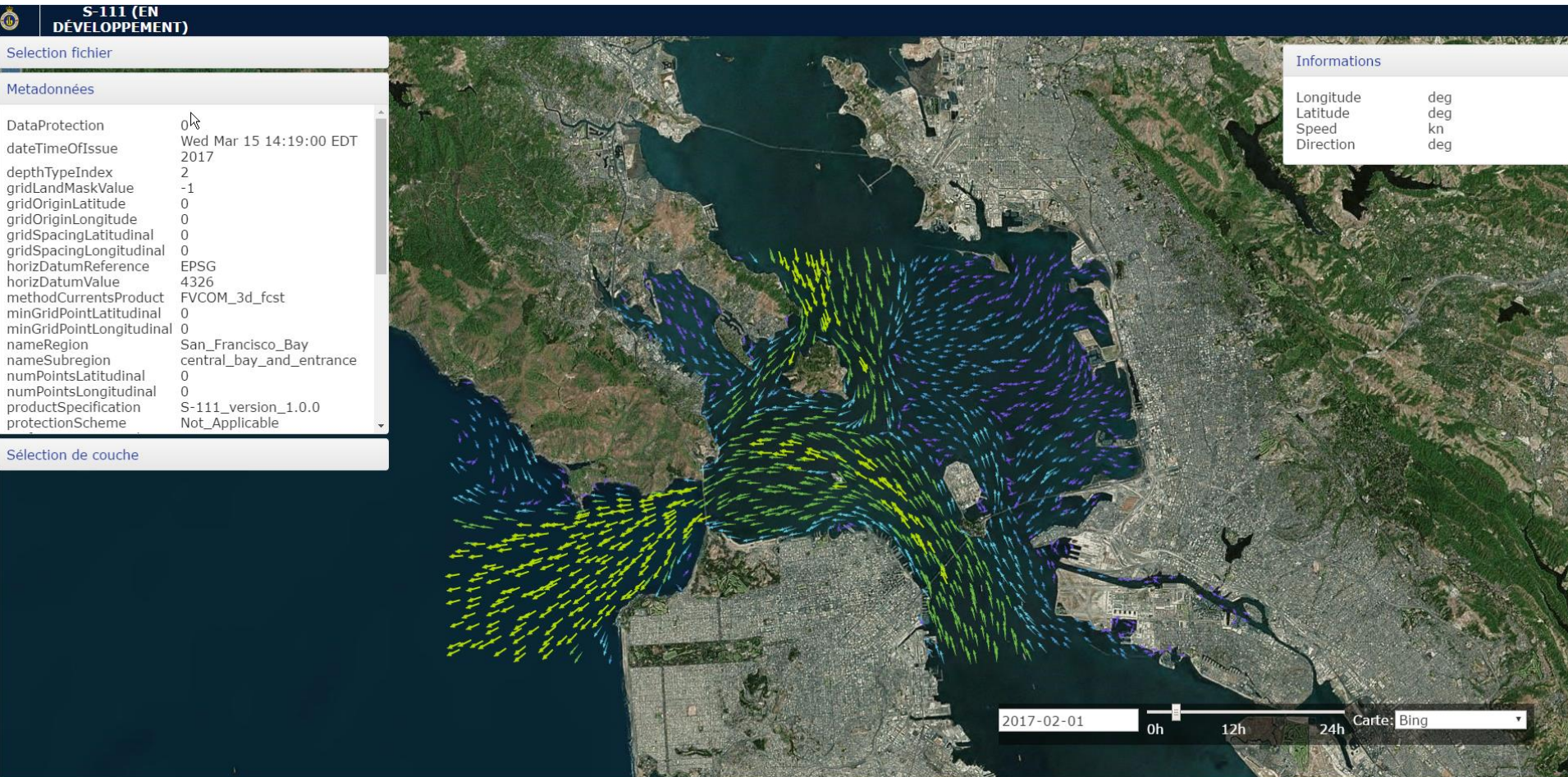
23 stations

15 minutes interval

12 Mo, comp. 1.5 Mo



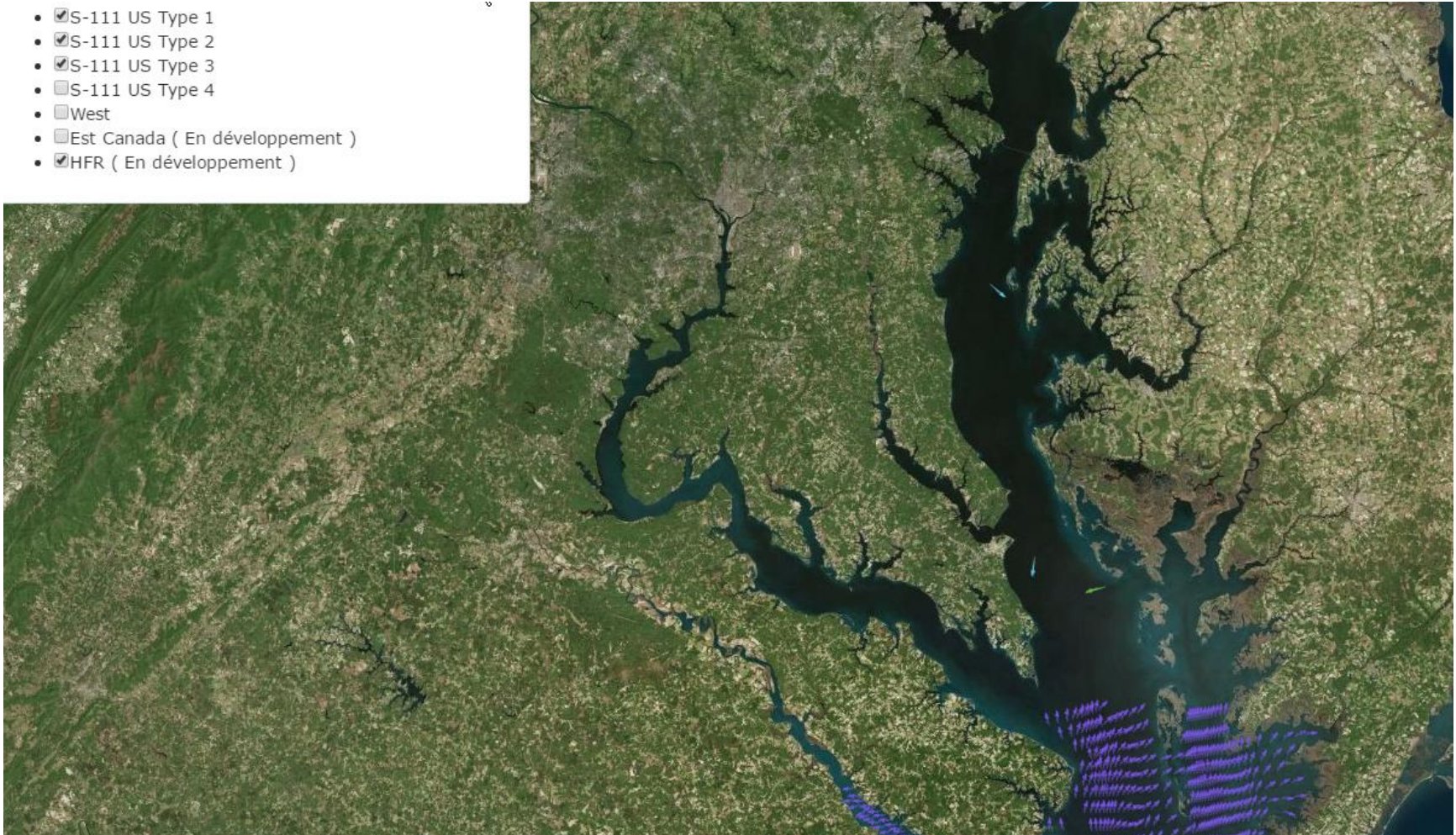
Use of Korea S-100 viewer and SLGO validator





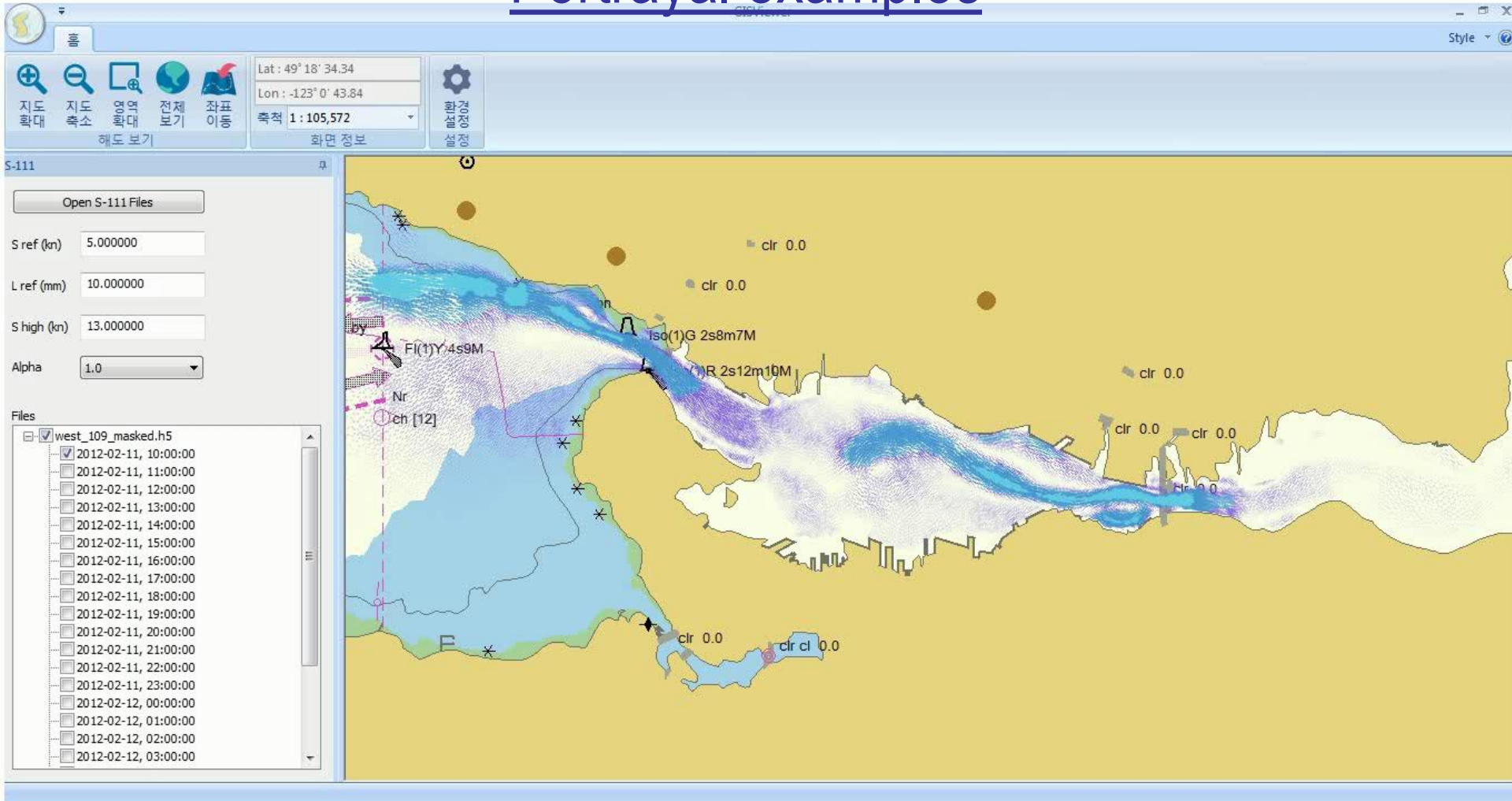
Use of Korea S-100 viewer and SLGO validator

- S-111 US Type 1
- S-111 US Type 2
- S-111 US Type 3
- S-111 US Type 4
- West
- Est Canada (En développement)
- HFR (En développement)



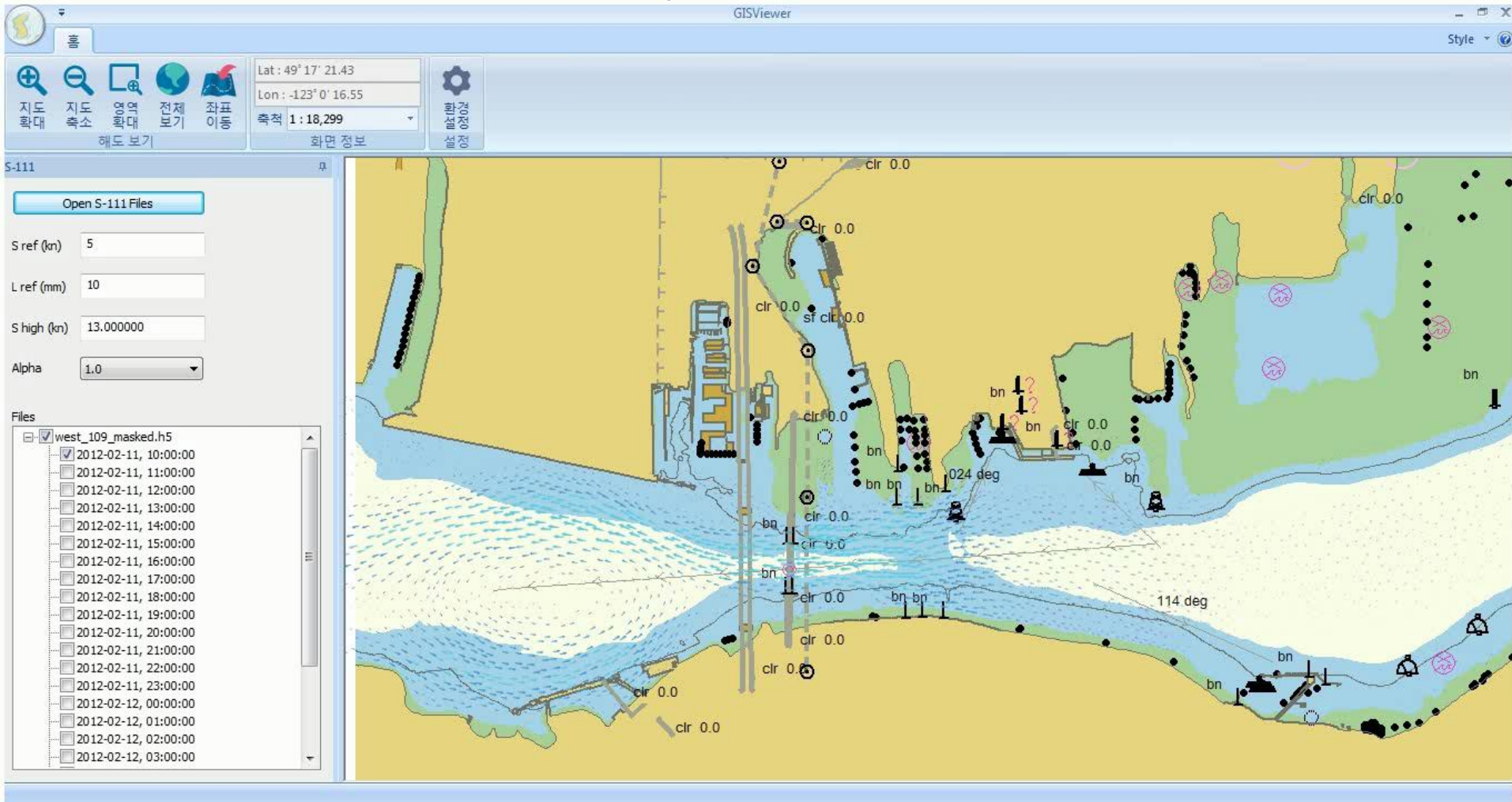


Portrayal examples



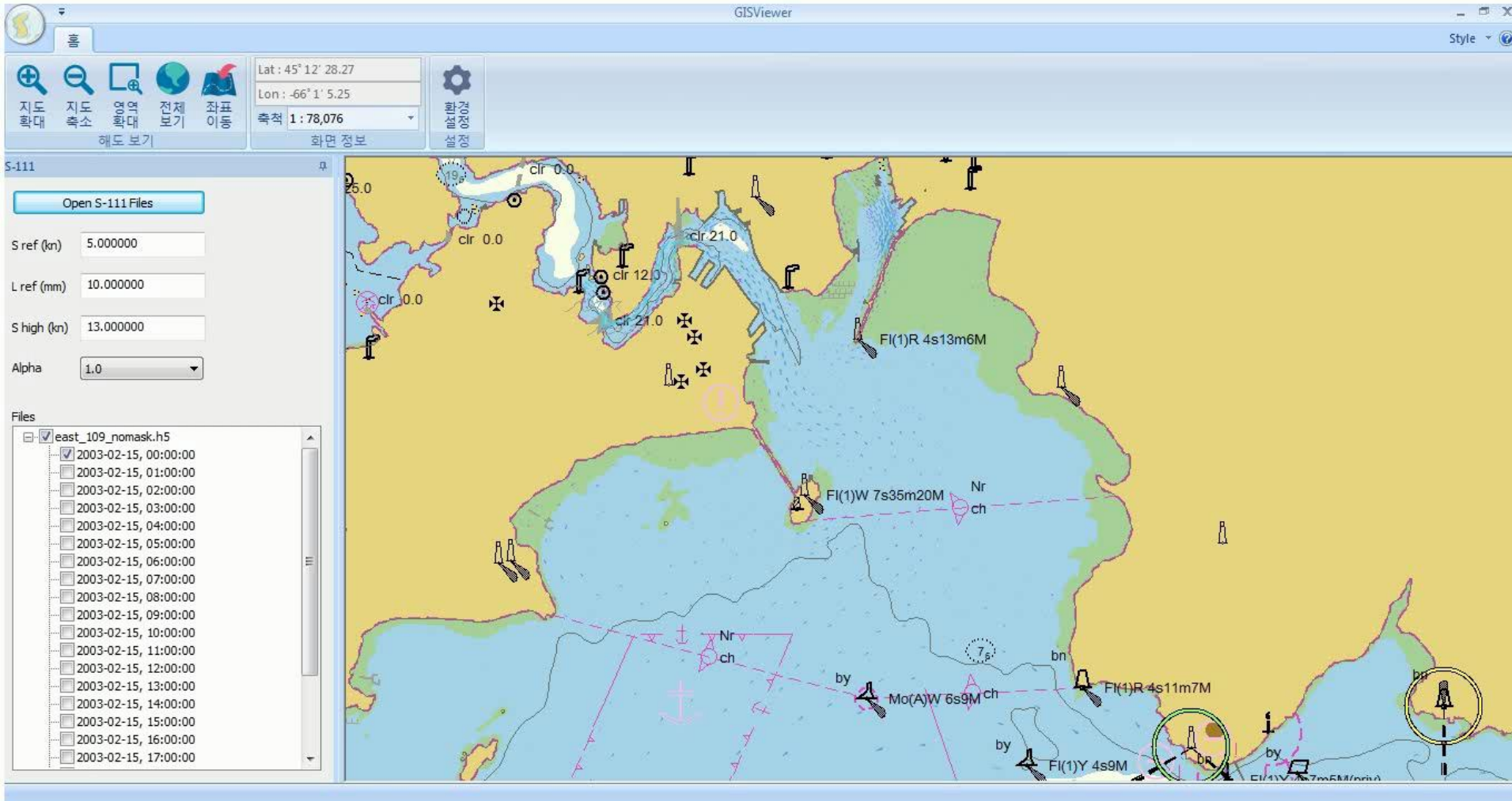


Portrayal examples





Portrayal examples





Next steps

- Discovery metadata
- Exchange set
- Transfer between HO and user
- Propose S-111 version 1.0 to members states
- S-104 encoding tests (recycle most of S-111)
 - First S-104 test dataset was produced 2 weeks ago.
- CHS to support manufacturer work on S-111/S-102/S-104
- S-100 service delivery model (Business plan)
- Objectives of Canada's Ocean Protection Plan.
- ...