

TSMAD: Transfer Standard Maintenance & Applications Development WG

Julia Powell – Vice Chair

ToR Objectives – To maintain, develop and extend:

- (i) the S-57 IHO transfer standard for digital hydrographic data;
- (ii) the S-100 IHO Geospatial Standard for Hydrographic Data;
- (iii) the S-101 IHO ENC Product Specification;

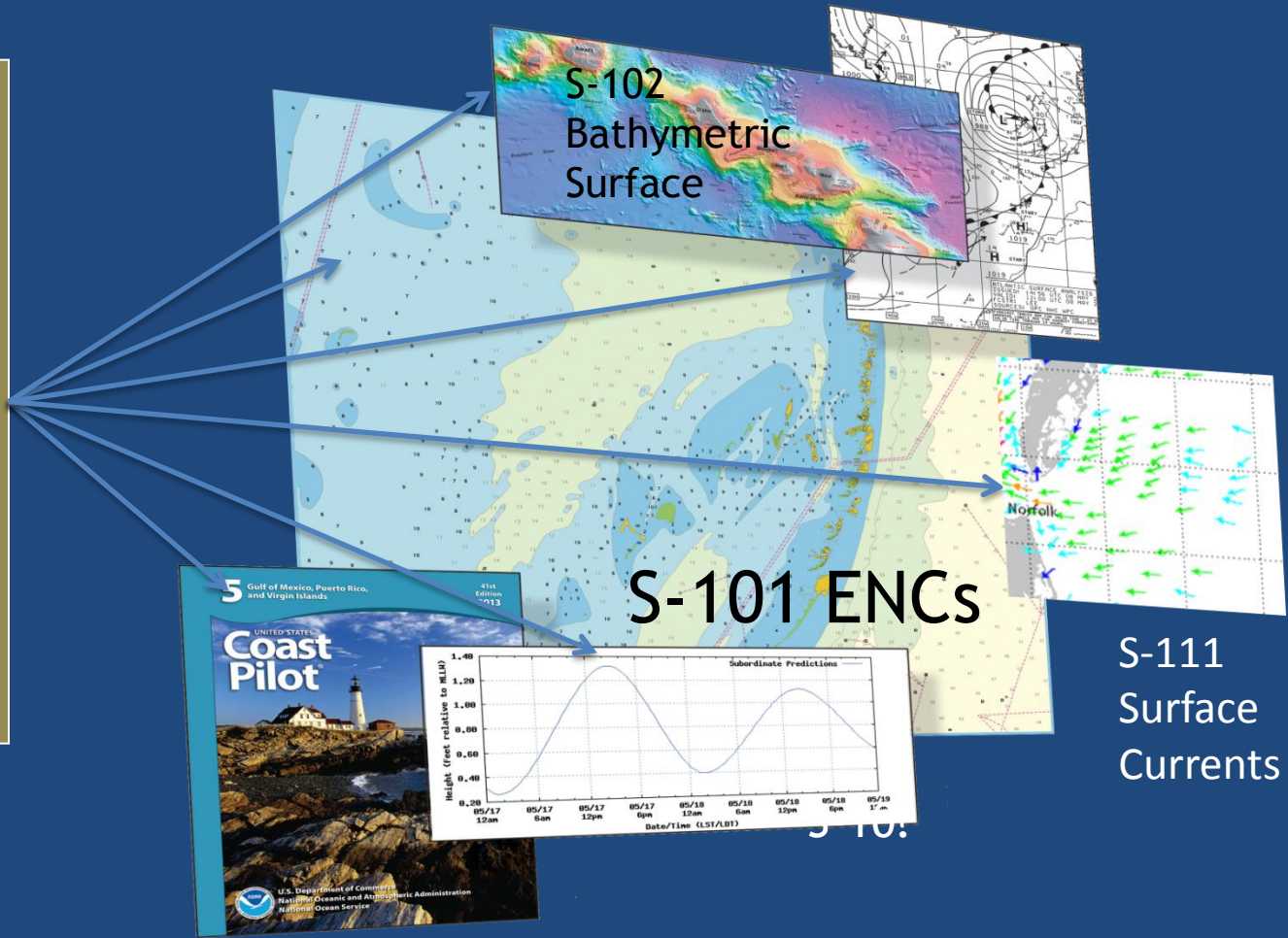
To monitor the development of other related international standards.

- Update the S-100 document – latest version scheduled by end of 2014
- Create the Feature Catalogue Builder (xml) – nearing completion (by Korea)
- Create a test bed (PC app) for product development - draft timeline completed
- Create an S-1xx template - completed

S-100 and other Product Specifications



... contains all the components to make different product specifications for all types of hydrographic data



Components of an S-100 Product Spec.

A. Main Document

- Specifies what is needed to build a complete product
- Feature Types
- Geometry
- Data formats and file size
- Metadata

B. Feature Catalogue

- Features
- Attributes
- Enumerants
- Bindings
- Point, Curve or Surface

C. Portrayal Catalogue

- Symbols, Line Styles and Area Fills
- Rule for how the feature attribute combination must be portrayed

D. Data Classification and Encoding Guide

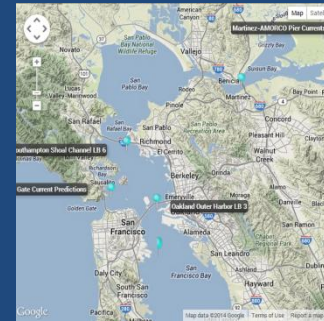
- Contains the guidance for how the data should be encoded by the data producer
- Useful as a template for building the feature catalogue

E. Exchange Format

- Data format that is used for data exchange
- ISO 8211 – normally used for ECDIS
- GML – good for exchanging information outside of the ECDIS arena
- XML – text based data exchange for both ECDIS and non - ECDIS

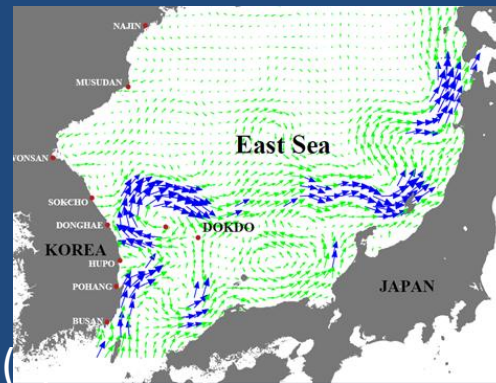
B. Categories of Features for Currents

1. Geometric Feature:
a point, line, or surface



Point: Location of a tidal current prediction or real-time observation

2. Coverage Feature:
an image, point set, or grid



Grid (georectified)



Grid (ungeorectified)

Output from a forecast model

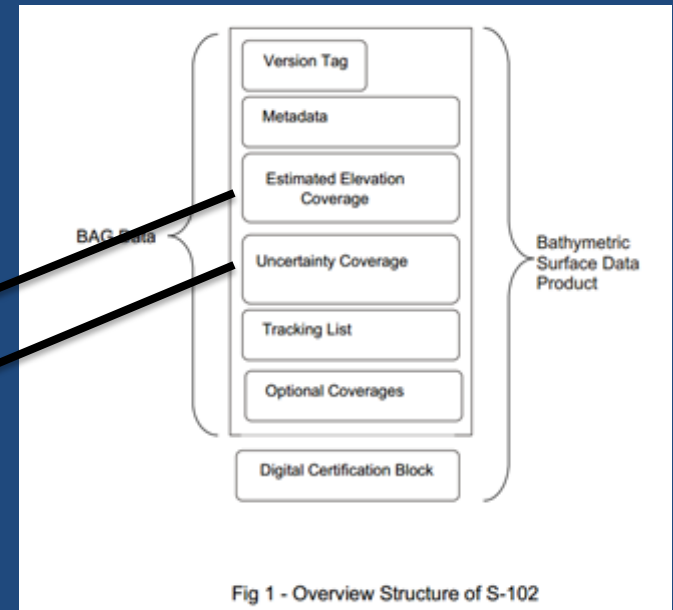
Feature Attributes

IHO Definition: CURRENT (Water Current): Definition. (Source of definition).

S-10n Geo Feature: Water Current

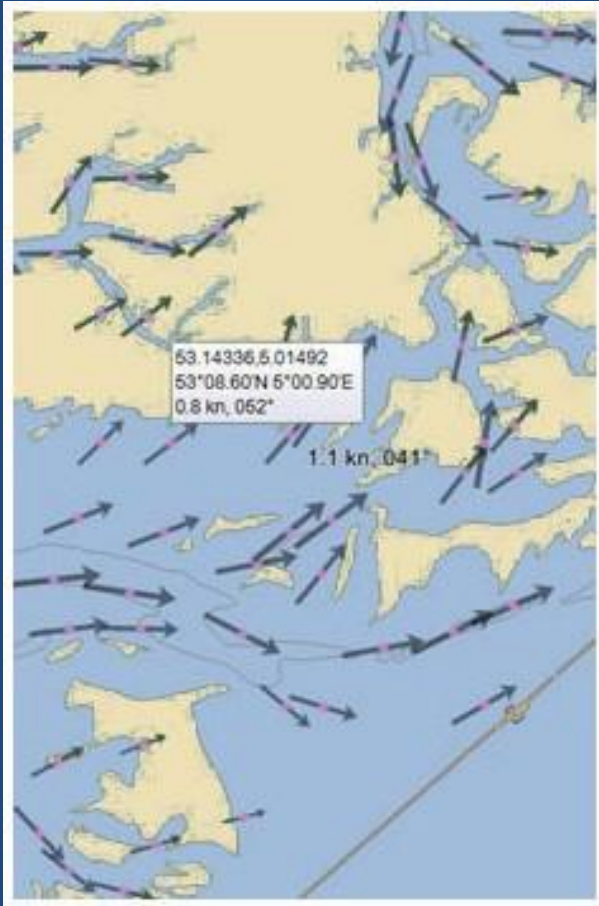
Primitives: Point, Curve, Surface, Grid

S-10n Attribute	Allowable Encoding Value	Type	Multiplicity
Speed		C	1,1
Speed Value		(S) RE	1,1
Speed Units	1: Metres per second 2: Kilometres per hour 3: Miles per hour 4: Nautical miles per hour (knots)	(S) EN	1,1
Speed Uncertainty		C	0,1
Speed Value		(S) RE	0,1
Speed Units	1: Metres per second 2: Kilometres per hour 3: Miles per hour 4: Nautical miles per hour (knots)	(S) EN	0,1
Direction		C	1,1
Azimuth Degrees		(S) RE	1,1
Direction Uncertainty		C	0,1
Azimuth Degrees		(S) RE	0,1
Time		C	1,1
Valid Time		(S)DT	1,1
Age (of Fcst, Obs, etc.)		(S)DT	1,1
Depth		C	1,1
Actual Depth		(S)RE	1,1
Layer Depth	1: 0 to 5 metres 2: 0 to 12 metres 3: 0 to 25 metres	(S)EN	1,1
Type		C	1,1
Composition	1: Tidal 2: Total	(S)EN	1,1
Character	1: Prediction (Tide only) 2: Observation 3: Forecast (Tide plus meteorological and other forcing)	(S)EN	1,1
Source		C	1,1
Country		TE	1,1
Agency (or Entity)		TE	1,1



Point Feature

C. Portrayal: User Survey on Preferences



1. Vectors with mouse-over



2. Streamlines with background

D. Data Exchange Formats

Present data formats:

- ISO 8211 – normally used for ECDIS
- GML – good for exchanging information outside of the ECDIS arena
- XML – text based data exchange for both ECDIS and non-ECDIS

Future S-100 formats:

- HDF5 – useful for large gridded data sets
- NetCDF – potential use for grids

HDF 5 Data Format

```
HDF5 "h5ex_d_alloc.h5" {
GROUP "/" {
  DATASET "DS1" {
    DATATYPE H5T_STD_I32LE
    DATASPACE SIMPLE { ( 4, 7 ) / ( 4, 7 ) }
    DATA {
      (0,0): 0, -1, -2, -3, -4, -5, -6,
      (1,0): 0, 0, 0, 0, 0, 0, 0,
      (2,0): 0, 1, 2, 3, 4, 5, 6,
      (3,0): 0, 2, 4, 6, 8, 10, 12
    }
  }
  DATASET "DS2" {
    DATATYPE H5T_STD_I32LE
    DATASPACE SIMPLE { ( 4, 7 ) / ( 4, 7 ) }
    DATA {
      (0,0): 0, -1, -2, -3, -4, -5, -6,
      (1,0): 0, 0, 0, 0, 0, 0, 0,
      (2,0): 0, 1, 2, 3, 4, 5, 6,
      (3,0): 0, 2, 4, 6, 8, 10, 12
    }
  }
}
}
```

Adaptable to:

Point Data

Geo-rectified Gridded Data

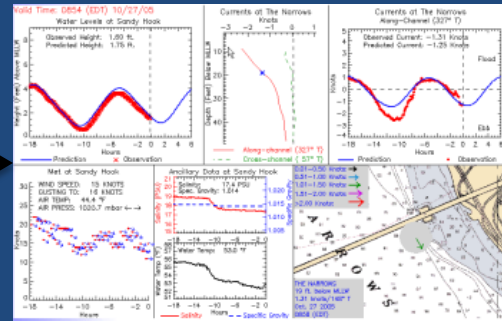
Ungeo-rectified Gridded Data (?)

Incorporation of Real-Time Data

Point
Data:



Real-Time Currents



Web-based Data Display

Date	Time	CS	CD
2014-05-16	00:00	1.720	190
2014-05-16	00:06	1.707	190
2014-05-16	00:12	1.689	189
2014-05-16	00:18	1.728	189
2014-05-16	00:24	1.643	190
2014-05-16	00:30	1.676	190
2014-05-16	00:36	1.732	191
2014-05-16	00:42	1.567	191
2014-05-16	00:48	1.608	190
2014-05-16	00:54	1.547	188

Text Data

Gridded
Data:



HF Radar (Codar)



Web-based Data Display

Summary of Next Steps with TSMAD

- Get feature and attributes into the register
- Continue to revise the S-111 document
- Continue to develop the portrayal options
- As needed, propose surface current changes in, or additions to, S-100 for approval
- Liaise with TWLWG on common issues

DIPWG: Digital Information Portrayal WG

Colby Harmon - Chair

ToR Objective:

To maintain IHO specifications for colours, symbols and display rules used to show System Electronic Navigation Chart (SENC) information on ECDIS in a safe and ergonomic manner.

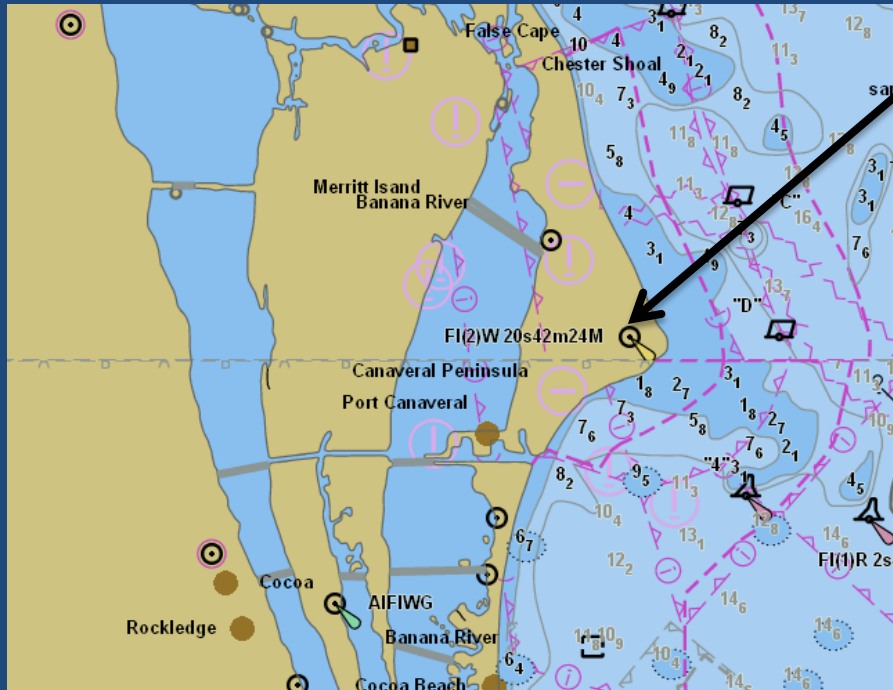
Specifications apply to:

Requirements for
Data and Metadata

Symbol Selection
Options

Rules for
Placement

ENC Example: Cape Canaveral Light



Sample ENC

Identify Results (1 of 9)

US3GA10M [Less Info](#) [Zoom To](#)

Feature:	LIGHTS
Geometry:	Point
Usage:	Coastal
Compilation Scale:	449659

CATLIT:	Unknown
COLOUR:	white
EXCLIT:	night light
HEIGHT:	41.7
LITCHR:	flashing
SCAMIN:	700000
SIGGRP:	(2)
SIGPER:	20

'Pick'
Report

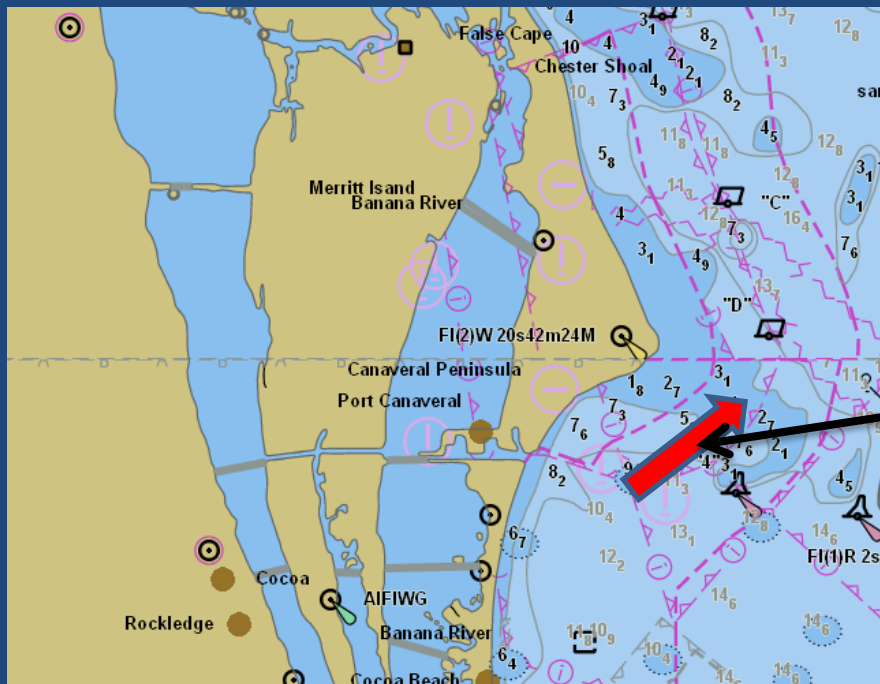
Identify Results (2 of 9)

US3GA10M [Less Info](#) [Zoom To](#)

Feature:	LNDMRK
Geometry:	Point
Usage:	Coastal
Compilation Scale:	449659

CATLMK:	tower
COLOUR:	white,black
COLPAT:	horizontal stripes
CONVIS:	visually conspicuous
FUNCTN:	light support
INFORM:	Conical
NATCON:	metal

Surface Currents Point Feature Mock-up:



Identify Results (1 of N)

Data Set Name




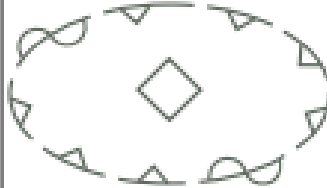
Feature:	SURFACE CURRENT
Geometry:	Point

Speed:	2.2
Direction:	060
Speed Uncert:	0.2
Direction Uncert:	005
Current Depth:	7.2
Longitude:	-80 26 39.31
Latitude:	28 21 53.72
Type:	RT Obs

Portrayal Issues:

- A. Need to update existing ECDIS symbols
- B. Symbol prior use
- C. Other:
 - A. zoom capability
 - B. layer transparency
 - C. symbol selectability
 - D. color selectability
 - E. temporal change (animation)



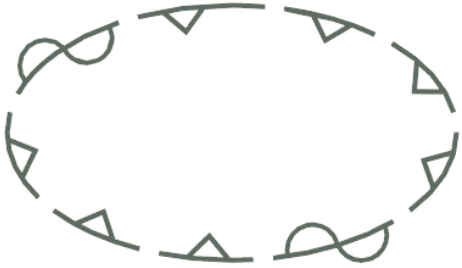
A. Existing Symbols

				ECDIS	
Tidal streams referred to . . .					
Hours		Geographical Position			
Before High Water	Directions of streams (degrees)	Rates at spring tides (knots)	Rates at neap tides (knots)	 53°51.2'N 7°17.8'E	
High Water					
After High Water				 	
				Point or area for which a tidal stream table is available Boundary of an area for which there is tidal information	
				Supplementary national symbols: m-t	

No. H-31

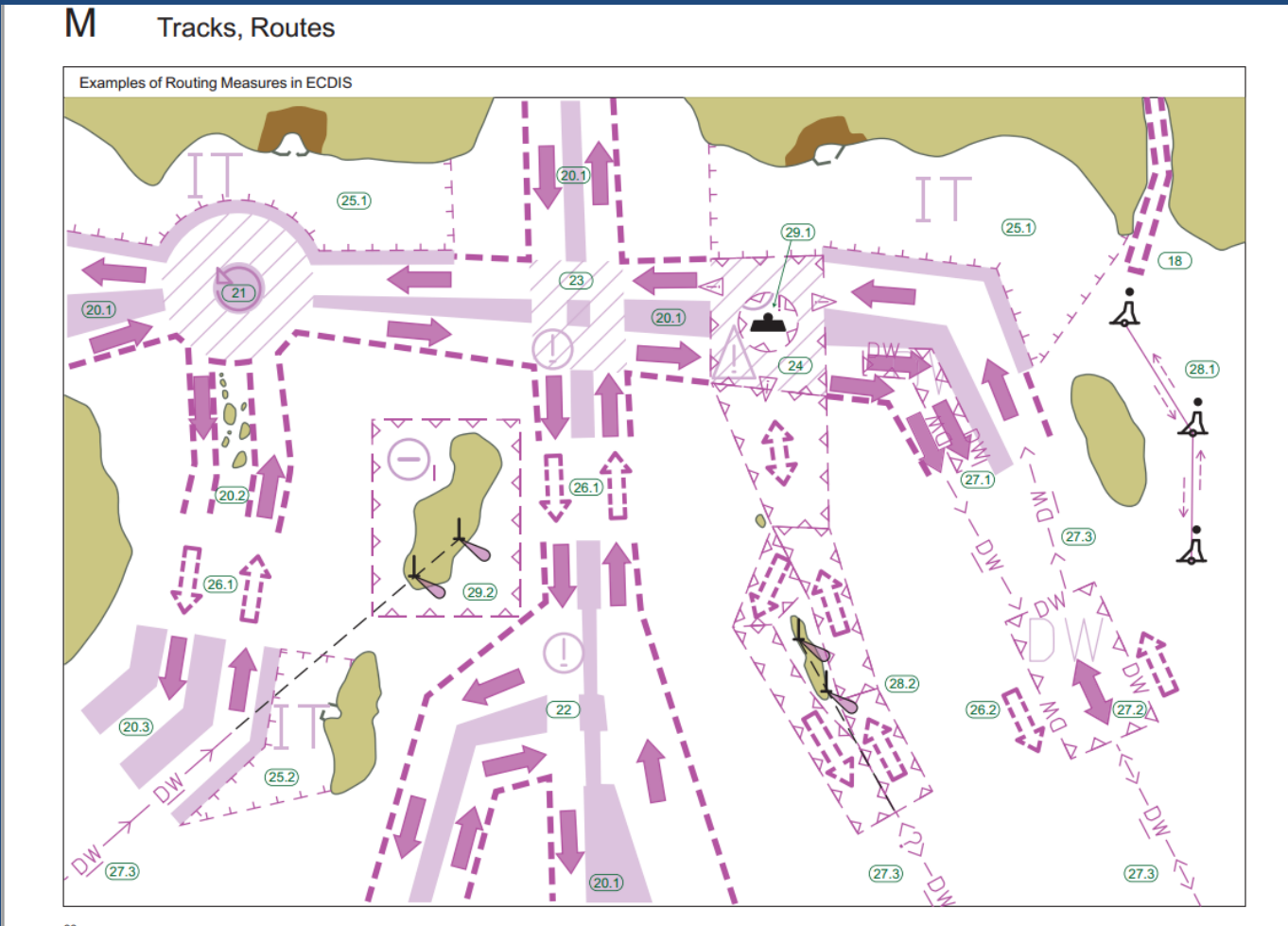
Existing Symbols (cont'd)

No. H-40

ECDIS	
	Flood stream, rate at spring tides
	Current or tidal stream whose direction is not known
	Boundary of an area for which there is tidal information

B. Prior Use: ECDIS Traffic Separation Symbols

Five different arrow symbols



Summary: Surface Currents Layer Production

