

S-126 update

DEFINITIONS, SURFACE CURRENT RESEARCH, INTEROPERABILITY,
PROTOTYPES AND LESSONS LEARNED

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In the meeting for NIPWG5 (Italy 2018) the PT was tasked to report upon what should be removed from the compiled list of topics possible to represent under S-126 as well as compile use cases for S-126. This update report will instead talk about specific items that are recommended to be kept based on the use case examples used in the study.

2 main focuses for discussion

1. What should the focus of S-126 be?
2. Surface Current related analysis

It also came up since the last meeting the need to better define the current goals and desires for the S-126 product.

And then a focus on the chosen topic of surface currents and reasons why it was chosen.

Definition

WHAT DATA IS REPRESENTED BY THE S-126?

The first issue to discuss is the actual definition of S-126....

Definition of S-126 – NIPWG WIKI

Describing

1. topography (marine and terrestrial)
2. currents, tides, weather (prevailing, seasonal, and hazardous)
3. other environmental conditions.

On the NIPWG WIKI site it has been defined as

Definition of S-126 – NIPWG WIKI

Describing

1. [Maritime Topography](#)
2. [Currents, Tidal Streams and Flow \(S-111\)](#)
3. [Sea Level and Tides \(S-104\)](#)
4. [Sea and Swell \(S-412\)](#)
5. [Sea Water Characteristics \(S-412\)](#)
6. [Ice Conditions \(S-411\)](#)
7. [Climate and Weather Information \(S-412\)](#)

This are broken down in the following categories, most of which have similarities with other products.

TWCWG related data

Describing the prevailing, seasonal, and hazardous
Water conditions

.... to support the S-111 and S-104

(which has been contained in the form of texts in nautical documents.)

The focus for *THIS* meeting

Definition of S-126 – TWCWG comment

There are some elements in S-126 which seems to be close TWCWG domain, relating currents and water level data S-111, S-104.

Thus it is important to define what S-126 should contain and what will then be the tasks on NIPWG relating to it.

It should be taken care of that there is not overlap between S-111, S-104 and S-126. This might need some correspondence between NIPWG and TWCWG.

The groups developing those other products have contributed to the discussion of defining the S-126.

The Tides, Water-Levels and Currents working group shared this:

Definition of S-126 – TWCWG comment

In Australian Sail directions there are quite a few areas around the coastline where they would not be able to provide S-111 or S-104 quality data but there may be paragraphs about seasonal expectations.

Where tidal predictions for major ports and real –time broadcast are available, they are mentioned in the sailing directions referring to the Tide Table Tidal stream publications.

It was also pointed out from the Australian point of view.....

Definition of S-126 – KHOA

The S-126 is the standard for
expressing the symbols or colors

....so that readability can be enhanced for more intuitive understanding of the
marine physical phenomenon

(which has been contained in the form of texts in nautical documents.)

And the Korean Hydrographic and Oceanographic Agency had expressed this as their
understanding of the S-126.

We need a CLEAR definition For S-126

...so, assuming that we are still dealing with the physical environment and textual data from the Pilots/Sailing Directions....

...and knowing that the S-111 surface current data is in production and released for use...

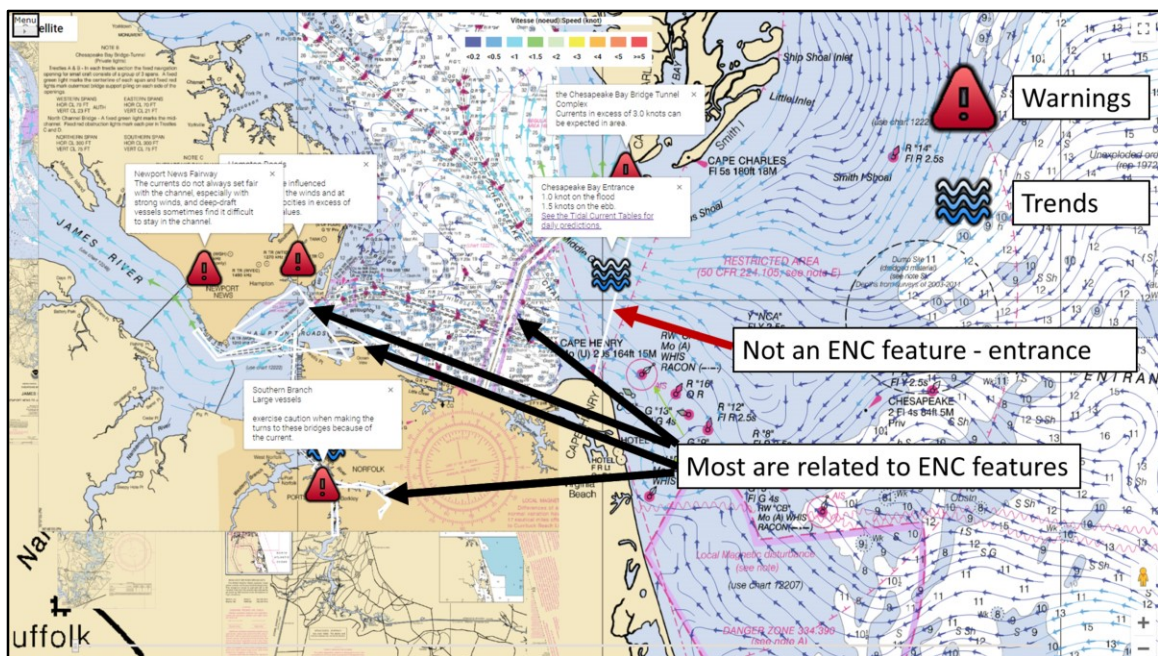
surface currents

A PROTOTYPE FOR S-111 DATA AND THE S-126 SUPPORTING DATA

I would like to just focus now on surface current related data.

It's important to coordinate between the actual data layer and the supporting textual layer

So I created a prototype to do just that and to verify how beneficial the supporting data is



This visualization displays all the surface current related data from the US Coast Pilot for the Chesapeake Bay entrance on the East Coast of the United States.

In the background is the latest S-111 surface current data (rendered in streamlines instead of gridded arrows).

There are two icons shown:

Blue waves - the expected speeds at given locations

Is it adding value to have the general trend information

Red triangles - warnings about surface currents

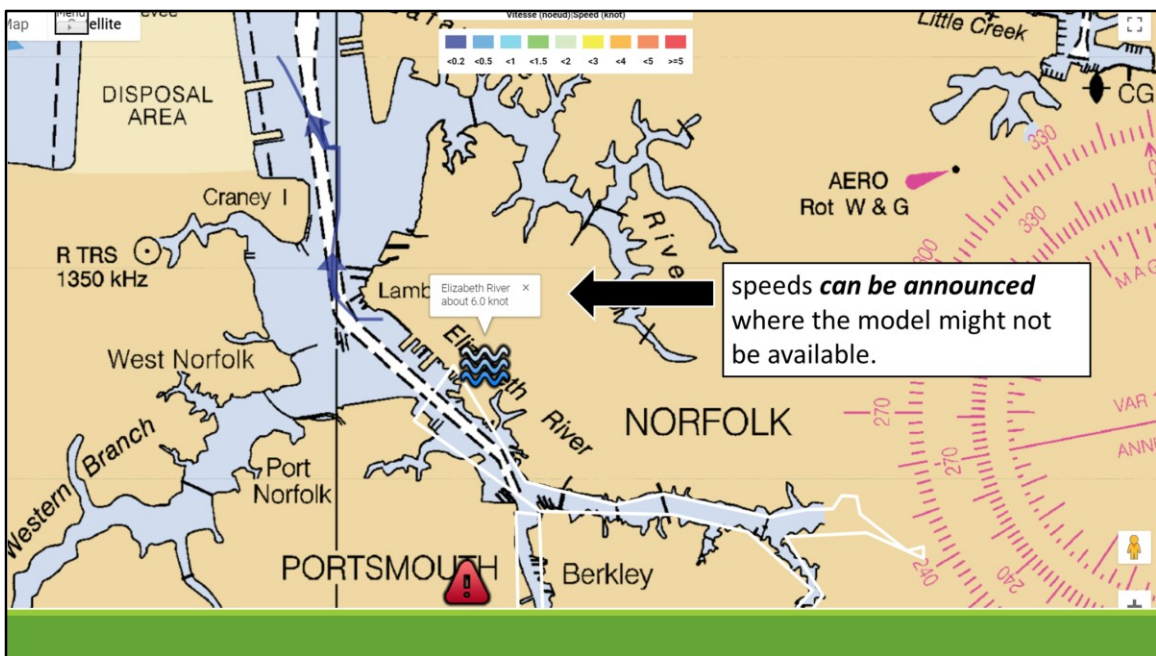
Are warnings for currents repeated in S-124?

Are there categories in S-124 to also show surface current related warnings on this layer?

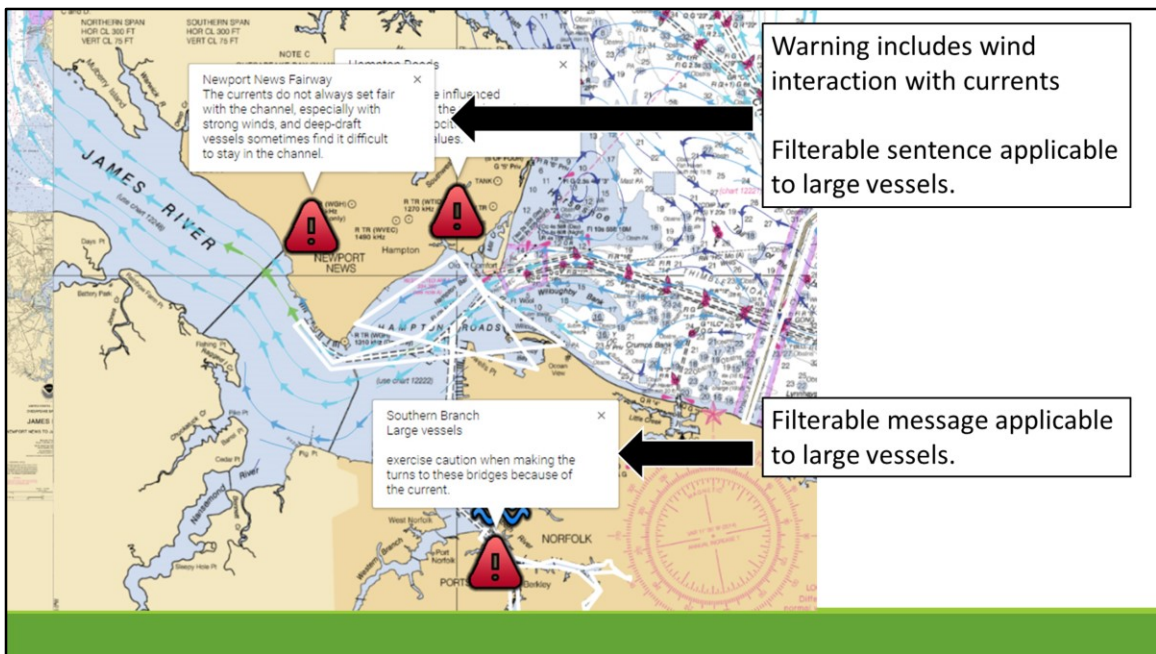
- Textual data indicates specific areas of concern where the data model can't
 - The textual data is already a refinement by years of experience of all possible data a mariner could receive...less is more sometimes
- The textual data can give more information at a glance for specific locations than the flow model can (as a flow model gives more information over a larger area to

visualize general patterns)

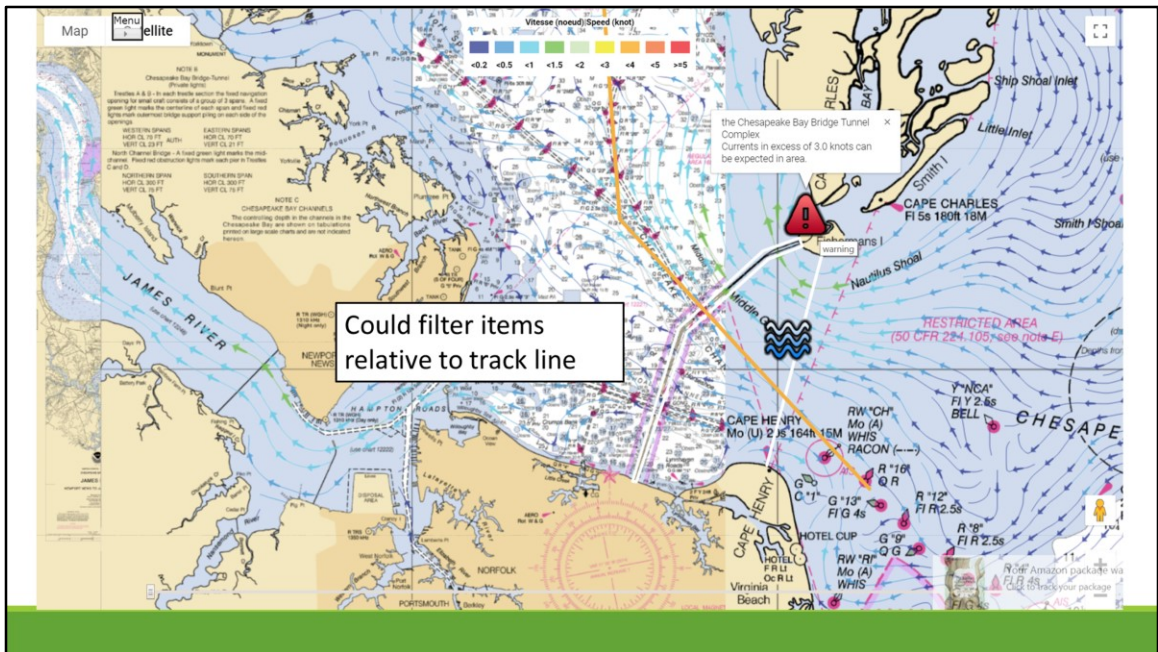
- The textual data can be mapped to existing S-101 features (the white lines)



The textual data gives values where there isn't a data model available.



The textual data could be filtered depending on vessel type or location (i.e. if a track-line was created.....)



Tide/current features related to surface currents

10 Geo Features – Tides, Currents

10.1 Tidal data (see S-4 – B-406 to B-408)

The inclusion of tidal information in ECDIS is optional. As such, for ENC only tidal stream and current information is required to be encoded. The implementation of tidal models based on predictions or applications to incorporate real-time tidal observations in ECDIS will be the subject of additional Product Specifications utilising the S-100 Universal Hydrographic Data Model.

- Tidal stream – flood/ebb
- Current – non-gravitational
- Tidal Stream Panel data
- Water turbulence

TidesAndVariationsA			
FC Subtype	Category of Total stream	Current velocity	Orientation
LOCMAQ_LocalMagneticAnomaly	<Null>	<Null>	<Null>
MAGVAR_MagneticVariation	<Null>	<Null>	<Null>
MAGVAR_MagneticVariation	<Null>	<Null>	<Null>
MAGVAR_MagneticVariation	<Null>	<Null>	<Null>
MAGVAR_MagneticVariation	<Null>	<Null>	<Null>

- ☐ MetaDataP
- ☐ MetaDataL
- ☐ MetaDataA
- ☐ CoastlineP
- ☐ CoastlineL
- ☐ CoastlineA
- ☐ TidesAndVariationsP
- ☐ TidesAndVariationsL
- ☒ TidesAndVariationsA
- ☐ <all other values>
- FC Subtype
- ☐ LOCMAQ_LocalMa
- ☒ MAGVAR_Magnetic
- ☐ T_HMACON_TideHar
- ☐ T_NHMACON_TideHar
- ☐ T_TMS_TideTimeS
- ☐ TIDEVY_TideWay
- ☐ TS_FEB_TideGleam
- ☐ TS_PAD_TideGleam
- ☐ TS_PPH_TideGleam
- ☐ TS_PPH_TideStream
- ☐ TS_TIS_TideStream



The S-101 also has specific tide and current features, however; in the test area in question there were no entries in the database. (only Magnetic Variations)

Is this because it is too much work to maintain right now?

Perhaps they had no data for this area from their source ...yet, clearly the Coast Pilot does.

So, will the S-126 populate this for the S-101 or will the S-101 release this from their control and allow NIPWG to be responsible for it so they (the S-101) can use it as a layer?

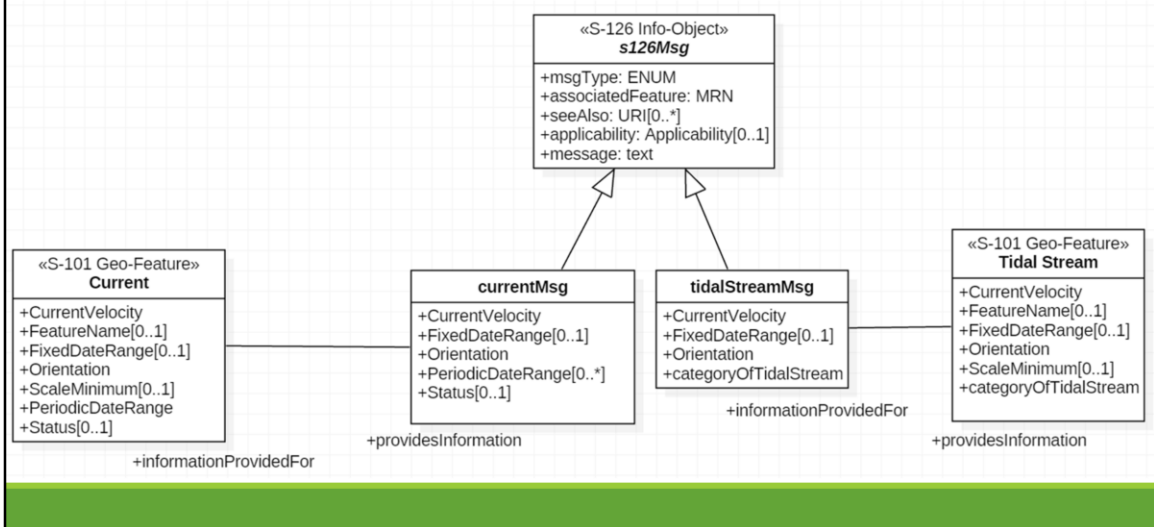
S-101 tidal/current objects

S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of tidal stream	(CAT_TS)	1 : flood stream 2 : ebb stream 3 : other tidal flow	EN	1,1
Current velocity			C	1,1
Velocity maximum	(CURVEL)	velocity maximum > velocity minimum	(S) RE	1,1
Velocity minimum		velocity minimum < velocity maximum	(S) RE	0,1
Feature name			C	0,*
Display name			(S) BO	0,1
Language		ISO 639-3	(S) TE	0,1
Name	(OBJNAM) (NOBJNM)		(S) TE	1,1
Fixed date range			C	0,1
Date end	(DATEND)	ISO 8601: 2004	(S) DA	0,1
Date start	(DATSTA)	ISO 8601: 2004	(S) DA	0,1
Orientation			C	1,1
Orientation uncertainty			(S) RE	0,1
Orientation value	(ORIENT)		(S) RE	1,1
Scale minimum	(SCAMIN)	See clause X.X	IN	0,1

Non-tidal current

Using to this data model to guide the process....

Possible schema for S-126 tidal/current objects



...this could be a schema that would allow for the S-126 data to populate the S-101 (if needed) or carry the necessary values to stand alone.

The S126 generic message is an information object that would be associated directly to an S-101 feature via the MRN.

The added information includes:

1. An additional field indicating the type of data; a warning/caution or general trends (and perhaps others)
2. The ability to associate specific cultural and natural features to the current and tidal information
3. A URL reference for related tables or external data sources
4. The applicability of the message relating to vessel type/size
5. The message to convey, if it is more than just a speed and direction.

NOTE: In mapping out the data from the prototype to the S-101 features it was clear there were cases for the textual information that didn't contain speed/direction (or orientation) values or contained average values and not the maximum or minimum as

is defined by the CurrentVelocity attribute. So how to encode that?

Recommendations

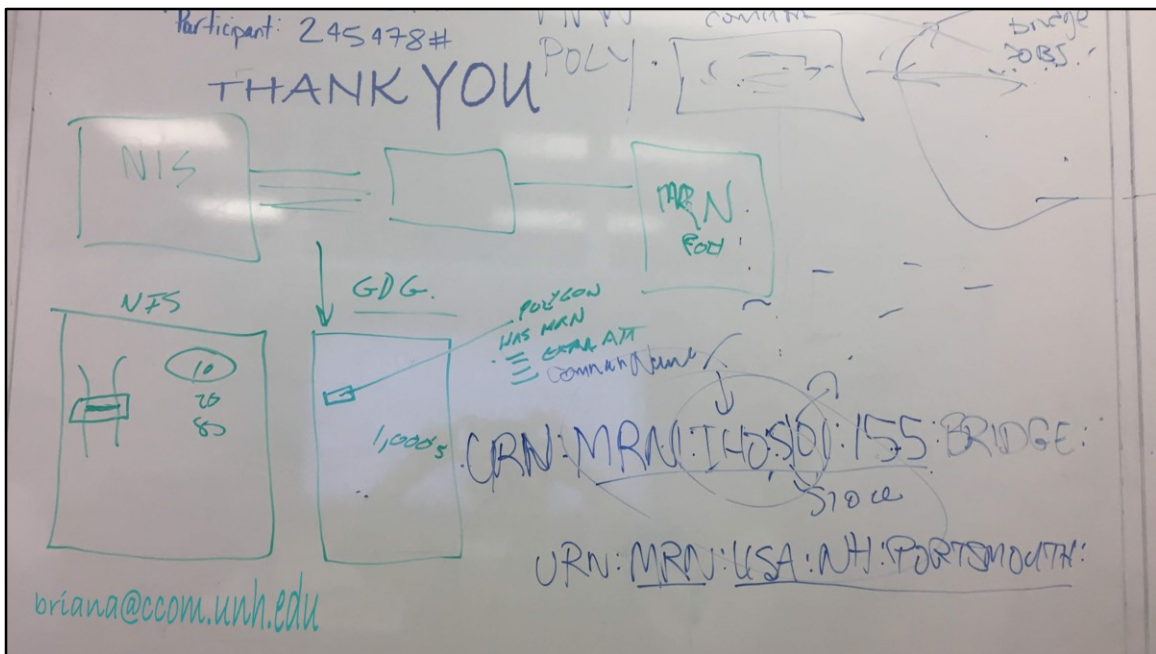
BASED ON THIS EXPERIENCE

The recommendations to the NIPWG

Recommendations

- Clearly define expectations of/uses for S-126
- Continue with S-126 data modelling for surface current information (if defined as part of S-126)
- Develop in liaison with TWCWG and S-111 data
- Discuss what was presented for possible data model
- Decide what the next steps should be
- Canvas HO's for viability of implementation within their systems

The idea would then be to be able to package all the surface current related information in one layer...



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