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Paper for Consideration by TWLWG

Comments on the Tidal Data Object Catalogue

Submitted by:	UK
Executive Summary:	This paper comments on the TWLWG draft Tidal Data Object Catalogue. It proposes an alternative data structure for Tidal Predictions and suggests that TWLWG liaise with the DIPWG and the DQWG to address the other elements required to realise dynamic tides in ECDIS.
Related Documents:	1. Tidal Data Object Catalogue
Related Projects:	1. S-101

Introduction / Background

1. The UK welcomes the work of the TWLWG on the Tidal Data Object Catalogue. With the application of dynamic tides in ECDIS as a primary focus this paper provides comments on the object catalogue and proposes a different approach to the modeling of Tidal Predictions. This paper also considers how the display of dynamic tides might work in ECDIS. It represents the comments of the UK and not that of the TSMAD working group,

Analysis/Discussion

2. The draft Object and Attribute Catalogue has made a good start in rationalizing the initial S-57 objects and attributes. However as any implementation of this product specification will require significant modification of any ECDIS we should not limit ourselves to S-57 and could use S-100 data structures such as complex attributes*. A complex attribute allows a single attribute to have multiple sub-attributes which may have multiple instances.

Comment – Consider the use of Complex Attributes to provide more structure to the data and avoid text strings which the ECDIS needs to ingest.

3. Although SISTAW** and T_HMON*** could be included the UK suggests that a single Feature be used to carry tidal predictions (only) in order to support dynamic tides. At this time the varying formats of real time tidal data make this impractical and the use of Harmonic Constituents allows for variability and inconsistency in ECDIS. This would replace the current T_TIMS object and would be best included as an area object which corresponds to a co-tidal zone. An area feature would have the advantage that all depth areas and soundings in an ENC would have an underlying Tidal Predictions object to access in order to support the display of a tide adjusted safety contour.

Comment – Suggest that only Tidal Predictions be used to support dynamic tides at this time. An area feature corresponding to a Co-Tidal zone might be the best way of incorporating this.

*Complex Attribute – An attribute with one or more sub-attribute, for example a Complex Attribute – Source Information may contain attributes for Source Date and Source Indication. This enables systems to use the date value more easily as it is structured rather than part of a long text string.

**SISTAW – Signal station, warning

***T_HMON - Tide – harmonic prediction

The following data model is proposed to support this structure, it incorporates complex attributes to avoid the use of long structured text strings. It would be an area object which corresponds to a co-tidal area in order to support depth areas and soundings. Annexe A includes an example of data in this structure.

Comment – Consider the data model as an alternative approach to structuring tidal predictions.

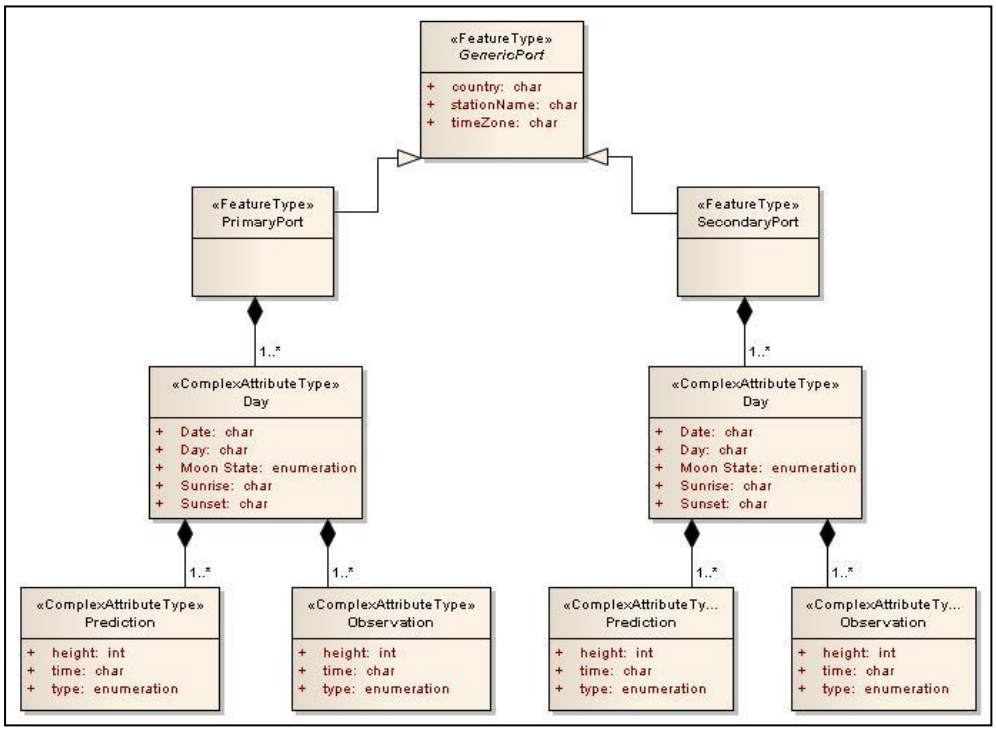

Figure 1 – Data Model for Tidal Predictions/Observations using Complex Attributes

5. These comments are based on the concept that tidal height predictions could be used to generate a tide adjusted safety contour much like the safety contour generated in ECDIS. A similar conditional symbology procedure (as in S-52) could be used but by adding the tidal prediction value from the underlying tidal prediction area object valid at that time the contour would be adjusted by tide. This approach clearly needs more consideration and liaison with DIPWG would be one way to explore the display options for this information further. One issue raised in the Object and Attribute Catalogue was data quality. The DQWG are currently looking at the Data Quality Indicators for ENC. Clearly for dynamic tides a composite indicator is required which combines the quality or bathymetry with that of the tidal prediction to give an overall depth confidence value. This could be indicated on any tide adjusted safety contour by adjusting its thickness or changing its colour. The UK suggests that TWLWG request the assistance of the DQWG to address this issue.

Conclusion

6. There is clearly significant effort required to realise dynamic tides in ECDIS but the Object and Attribute Catalogue represents a good first step and its further development will provide the underlying tidal data to support dynamic tides. This paper proposes an alternative structure for tidal predictions and suggests Liaison with the DIPWG and DQWG to progress the issues identified regarding the display and data quality of dynamic tides.

Action Required of TWLWG

- Review and discuss the comments on the Tidal Data Object and Attribute Catalogue
- Consider the proposed data model for Tidal Predictions
- Consider the display of dynamic tides in ECDIS and liaise with DIPWG/DQWG to address the wider issues

Annexe A

Feature	**Primary Port**
Attribute	Value
Country	UK
Station Name	Bristol
Time Zone	UTC

Complex Attribute	**Day**
Attribute	Value
Date	01/03/2011
Day	Tuesday
Moon	?
Sunrise	?
Sunset	?

Complex Attributes	**Prediction**	
Height	Time	Type
4.10	0000	P
3.70	0100	P
3.20	0200	P
2.80	0300	P
2.50	0400	P
2.30	0500	P
2.30	0509	LW
2.40	0600	P
2.80	0700	P
3.20	0800	P
3.61	0900	P
3.84	1000	P
3.90	1100	P
3.90	1103	HW
3.90	1200	P
3.80	1300	P
3.40	1400	P
3.00	1500	P
2.80	1600	P
2.60	1700	P
2.50	1739	LW
2.50	1800	P
2.70	1900	P
3.10	2000	P
3.50	2100	P
3.90	2200	P
4.10	2300	P
4.10	2334	HW