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Paper for Consideration by CSPCWG

**Dataset Rating for Confidence Assessment**

Submitted by:	USA/NGA
Executive Summary:	Rating datasets for confidence reporting, transparency to customer, and improved products.
Related Documents:	None
Related Projects:	None

Introduction / Background

The National Geospatial-Intelligence Agency is taking a proactive approach to customer requests by moving towards a data-centric environment versus a product-centric environment. Because of this, data that was once segregated by producer will now be integrated. The customer will have the opportunity to choose the multiple data layers they need to produce a single custom made product, rather than searching for several products, that may not be connected or on the same format. This change is seen to be beneficial for both the agency and the end user, as both will have weighted measures and confidence ratings in the datasets that makes up their products. It seeks to make the information discoverable, accessible and usable. The rating system can help manage the data over its lifetime by currency and accuracy. It will also allow customer to provide feedback on the data and it's validity to help improve it for continued use.

Data will be collected, evaluated, differentiated, cataloged, delivered and governed, giving the data differing qualities, or Data Quality. The consumer will need to be able to differentiate the multiple levels of data and be able to review it for its intended use. It is the hope that the customer will be able to learn and gain insight to the data quality with this continual process and better be able to select specific data when needed. As feedback is received, the descriptive metrics derived from this process will serve as a baseline to improve datasets.

The Current model has customers contacting several groups for several different products. Each product can be on a different format (jpeg, adobe, etc.) and, more than likely, not be interchangeable. The Future model has the customer able to pick and choose what data is needed and wanted, all in one useable format.
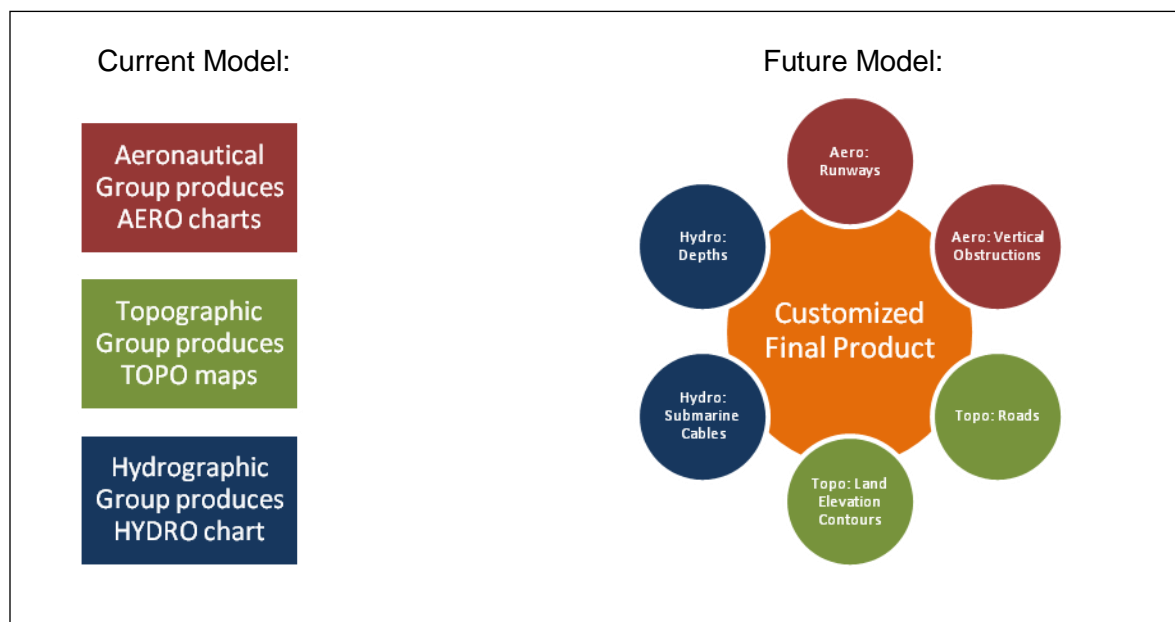
Analysis / Discussion

The system would have three parts:

1) Fit-for-Use Rating:
   a. Describes the purpose of a given dataset and is assigned by the analyst in that area of expertise. Fit-for-Use and quality are not the same. A product could be of high quality but not fit for the use the customer intends. Another dataset would be needed, but may be of lower quality (due to any of the factors in the next section.)
   b. The Maritime Safety Office would need to ensure that the datasets are designated for Safety of Navigation use.
   c. Could have a possible visual symbol.

2) Subject Matter Expert (SME) Rating (Table1):
   a. SME evaluates the dataset against specific criteria as it pertains to its specific use. The rating can change as more current source becomes available. Each area (NtM, Bathy, DNC) determines how the rating is assigned and maintains the values throughout.
   b. Six quality elements are given with a rating from low to high. These ratings have been derived from ISO 19114 and ISO 19113. The SME can also assign a weight to certain elements as they pertain to importance over one another. If a SME determines that one element over the other five is the most important, it may have double the "weight" than the other elements, therefore having it count higher in the final calculation. These elements include qualitative and quantitative elements. Intent is development of a quality metric (5 star scale) when all elements have been rated and calculated.
   c. The higher the rating the more confidence the user can have in the dataset. As the rating decreases, it reminds the customer to use the product with caution or as reference only.

Elements	Low ★	Below Average ★★	Average ★★★	Above Average ★★★★	High ★★★★★
Positional Accuracy (scale)	Not specified or >1M	500K – 1M	250K – 500K WGS84 datum	250K – 10K WGS84 datum	<10K WGS84 datum
Logistical Accuracy (paper, digital, copy)	Little/no metadata, existence cannot be verified.	Min metadata, existence cannot be verified	<100% required metadata populated and correct, data existence verified with untrusted sources	Mandatory metadata is populated and correct, data existence verified with trusted sources	100% required metadata populate, some or all of optional metadata is populated and correct, data existence verified with trusted sources
Source Lineage	Unknown, not validated or nonauthoritative (non-Prime)	Known, no history of source authority or methodology (non-Prime)	Known, unknown/unreliable updates available since publication (Prime)	Known, reliable updates monthly/bi-monthly NtM, translations needed (Prime)	Known, reliable updates weekly NtM, on-line or received on regular basis, English (Prime)
Completeness	0	0-40%	40-75%	75-85%	>85%
Temporal Accuracy (Print Date)	>15 yrs	12-15 yrs	8-12 yrs	4-8 yrs	<4 yrs
Thematic Accuracy	Inaccurate/no attribution or symbolization of features	<67% of attributes and symbols are correct or unidentified	At least 67% of attributes and symbols are correct and identified	At least 85% of attributes and symbols are correct and identified	At least 95% of attributes and symbols are correct and identified

Table 1

3) User Rating
   a. Similar to the SME rating, with an extra category, "Not evaluated". It is the same across all datasets. Ratings would be visible to all other users who look for or use that dataset. If ratings vary differently between several raters, an alert will be sent to the SME for review. Users will also be able to indicate their level of expertise when providing feedback.

Conclusions

Ratings for datasets would greatly increase the confidence of the information provided to our customer base. Consistent feedback with increased use would better help NGA improve products and determine where gaps may or have occurred. The users are given better confidence of the materials that are being provided, which help with intended use instead of blind faith that the datasets and products delivered are of good quality.

At the same time, information must be tightly controlled in regards to initial and consequent ratings. Allowing users to self-identify lever of expertise can be subjective and skew results. There must also be a regimented approach to determining errant feedback to understand the user's perspective and not have carte blanche to delete all errant entries to portray a confident dataset. Determination also needs to be made on how to use customer feedback. Since the information received could be subjective, how the information is to be processed and value found is still unknown.

In regards to information for nautical charts, some regions have older datasets which are still valid. Multiple points must be taken into account when determining final rating criteria and rating of specific areas. Subject matter expertise is paramount in being able to determine credibility to the datasets.

Recommendations

None.

Justification and Impacts

None.

Action required of CSPCWG

The CSPCWG is invited to:

   a.   review the paper and provide comment.