

Paper for Consideration by NIPWG

A New Approach for Developing S-126 *Physical Environment* Including Marine Forecast

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| Submitted by: | KHOA, Republic of Korea |
| Executive Summary: | A new approach for developing S-126 <i>Physical Environment</i> including marine forecast data |
| Related Documents: | NIPWG4-WP2-6 Rev1 KHOA: Service for Safety Navigation WP2-10 KHOA: BaRoView multiple datasets in 3D WP3-1 S-111 and S-126 NIPWG4-15.1 S-126 Physical Environment: Status of development and Annex (.xls) |
| Related Projects: | S-101, S-111, S-126, S-411 and S-412 |

Introduction / Background

S-126 represents marine physical phenomena contained in pilots. NIPWG4-15.1 verified if there was overlap between S-126 and other products and discussed the future plan. NIPWG4-WP3-1 introduced a way to express S-126 with S-111.

KHOA plans to add marine physical phenomena forecasts to S-126 using forecast data. We have continued to provide information to improve the safety of navigation and marine activities. Based on these, we forecast marine physical phenomena and add them to S-126 to improve interoperability with other product specifications.

Analysis/Discussion

S-126 is a product specification for marine physical phenomena extracted from pilots. Most physical phenomena such as strong tidal currents or sea ice consist of figures and sentences. This is described in the NIPWG4-15.1 document.

In the case of pilots, forecast results are not reflected and the past ones are the majority. While the latest information on topography and features are less important, forecast information on marine physical phenomena covered in S-126 is important.

NIPWG4 discussed S-126 could be combined with real-time data or developed in conjunction with other products. KHOA suggests extending S-126 by adding forecast data to existing pilots. Forecasting through short- or long-term prediction will improve the voyage planning stage and enable safer navigation.

KHOA has extensive experience in providing user-oriented marine data from ocean prediction systems (*Ocean Data in Grid Framework*, *Bada Road View*, and *Marine Forecast Chart*). We presented these at the Visualization Workshop of NIPWG4.

We service tide prediction information so that users can easily recognize inundation according to danger index, and also service sailing index through wave heights, tidal currents and so on. In addition, the results obtained from the ocean prediction systems are provided to various users in the form of Marine Forecast Charts which include information on water temperature, wave heights, tidal currents, tides and wind at a glance.

Since this year, KHOA plans to enhance S-126 by visualizing the physical phenomena in pilots and forecast prediction information in Marine Forecast Charts together.

We believe the completed service will be useful for S-126 users. For example, we are going to conduct short- or long-term predictions of ocean data such as current velocity and water temperature and use them to forecast marine physical phenomena such as eddies and load warnings according to the level of risk. Sea ice can also be forecasted through the prediction of salinity and water temperature and be displayed on ENC's in conjunction with S-411 *Ice Information*. Furthermore, we will display marine information, i.e. Marine Forecast Charts, according to the position of ships, contributing to the safety of navigation.

Conclusions

We propose the development of S-126 to include forecast data in the voyage planning stage. As discussed at the NIPWG4, marine physical phenomena included in S-126 overlap with other products.

NIPWG4 noticed that marine physical phenomena contained in pilots can be used at voyage planning stage and that phenomena in other products are different since they are suitable for real-time data presentation thus cannot be used at the planning stage. If S-126 includes forecast information, it can prove more usefulness in the voyage planning stage. Moreover, its necessity in the planning stage can be enhanced since it contains pilots and short- or long-term forecast data.

KHOA has experience in providing user-friendly service of marine physical phenomena in various fields through its ocean prediction systems. Based on this experience, KHOA suggests a new approach to the development of S-126. In 2018, we plan to develop a detailed plan for the product development and perform data modeling.

Action Required of NIPWG

The NIPWG is invited to:

- a. Provide feedback and guidance for further work