

2016 International Symposium of Transport Simulation (ISTS'16 Conference), June 23~25, 2016

## A Study on the Improvement of the preconditioning process data for Multi-purpose data management system to bathymetry

Jiyeon Kim<sup>a</sup>, \*Jaemyeong Kim<sup>c</sup>, Sunmi Park<sup>b,c</sup>, Jongchul Kim<sup>d</sup>, Seocheol Kim<sup>d</sup>

<sup>a</sup>AKT Spatial information Corporation, Dangsan SK VI CENTER (E) 9th floor #904-2, 11 Dangsan-ro 41-gil, Yeongdeungpo-gu, Seoul Metropolitan, Seoul 150-806, Republic of Korea

<sup>b</sup>CHUNG-ANG AEROSURVEY, 18 Gyonam-dong jongno-gu, Seoul Metropolitan, Seoul 110-100, Republic of Korea

<sup>c</sup>University of Seoul, 163 Seoulsiripdaero, Dongdaemun-gu, Seoul 02504, Republic of Korea

<sup>d</sup>Korea Hydrographic and oceanographic agency, 351 Haeyang-ro, Yeongdo-gu, Busan 606-806, Republic of Korea

---

### SUMMARY

Multi-purpose bathymetry is the system to make decision for marine and harbor policy through the bathymetric data. Since this system should process the large size of depth information, H/W and S/W infrastructures should be built and expanded continuously. And by the gradual development of the survey instruments and IT technology, the bathymetric data processing capacity is being increased. In addition, the service reflection time is being increased by the data preprocessing process and the computing resources is used up according to the increase of processing capacity. Therefore, the measure to renew and reflect the data and to reduce the computing resources using up at the same time is required through the preprocessing process improvement. In this article, such problem were intended to be solved through the automated data preprocessing process through the WPS and marine internet communication.

Copyright © 2017 The Authors. Published by Elsevier B.V.

Selection and Peer-review under responsibility of Dept. of Transportation Engineering, University of Seoul.

Keyword: Hydrographical survey, Submarine topography, Web Processing Service, s-102, e-Navigation

---

### 1. Introduction.

Multi-purpose bathymetric system is the system to manage the bathymetric data systematically, which is the basic data when making decision related to the sea, and has a purpose of using the bathymetric data collected in the hydrographic survey in making decision for diverse maritime and port policies getting away from the use for existing electronic navigational chart. For the utilization and analysis of multi-purpose bathymetric system, the sounding survey results are expressed as depth information with point cloud, 3D GIS techniques, etc. In addition, the system that the large size of depth information built are applied fit to S-102 standards, which are the standards for the next generation electronic navigational chart, is being established.

---

\* Corresponding author. Tel.: +82-10-4331-5338; fax: +82-2-6490-5588

E-mail address: [jykim@aktgeo.com](mailto:jykim@aktgeo.com)

Therefore, the multi-purpose bathymetric system should accompany with the many processes and use up the computing resources in using and building the system, and the survey method and the survey equipment are being developed continuously by the development of recent hydrographical survey and IOT technique. Accordingly, it has not only diverse analysis methods and data formats but also the size of outcome is being increased geometrically. To solve such problems, the big data platforms such as Hadoop. etc. are being reflected in the system.

However, it has difficulty to reflect the characteristics of submarine topography, which has relatively lots of changes according to time, due to the processes used from information collection stage to building and utilization stage for the characteristics of depth information.

In this study, the measure to reduce the resource used up and to utilize the good quality information through the improvement of data preprocessing process used in building and analyzing the multi-purpose bathymetric data is suggested.

## **2. Analysis of Existing System and Points to be Improved.**

The multi-purpose bathymetric system identifies the characteristics of depth data from existing large size of raw data on the depth according to the project type (national fishing port, national basic marine survey, basic costal area survey, coastal area precision survey, port area precision survey) and depth acquisition equipment (single beam, Multi- beam, CZMIL) and provides the service through common standard data format. The data utilized in this system should be complied with S-102 standards, the standards for next generation electronic navigational chart.

S-102 standards refer to the standards of submarine topography of S-10X standards, and are the geographical information standards to express the submarine geography in the form of grid.

Above standards were developed by International Hydrographic Organization based on the BAG format developed by ONSWG (Open Navigation Surface Working Group) to share the submarine topographic information. BAG format by ONSWG was the industrial standards for submarine topographic information, but was recognized officially as the standards regarding the submarine topographic information in the next generation ECDIS and e-Navigation by the enactment of S-102 Standards [1]

So, data generation and compilation should be accommodated by the standards for next generation electronic navigational chart.

In case of existing bathymetric data, the program types are different according to the survey method due to development of bathymetric technology and sounding equipments. The acquisition and compilation program for the single beam bathymetric data is Hypack, the acquisition and compilation program for the multi-beam bathymetric data is Caris hips&sips, and some of EIVA program data, which were used in the past but recently have not been used due to introduction of latest equipments are included. These tools are the PC-based program and should be executed in one PC when preprocessing the data.

The data generated in the PC is stored in the database for depth information service using Hadoop platform. They form the 3D spatial information service through the web service using stored data.

Download English Version:

<https://daneshyari.com/en/article/5125448>

Download Persian Version:

<https://daneshyari.com/article/5125448>

[Daneshyari.com](https://daneshyari.com)