



KHOA

1st Meeting of HSPT1

Unmanned Survey Platforms

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SEE THE SEA,
THEN YOU WILL SEE THE FUTURE

- Why Unmanned survey?
- Innovative technologies for Hydrographic survey
- Unmanned survey platforms
- Adopt New Regimes into the New IHO S-44

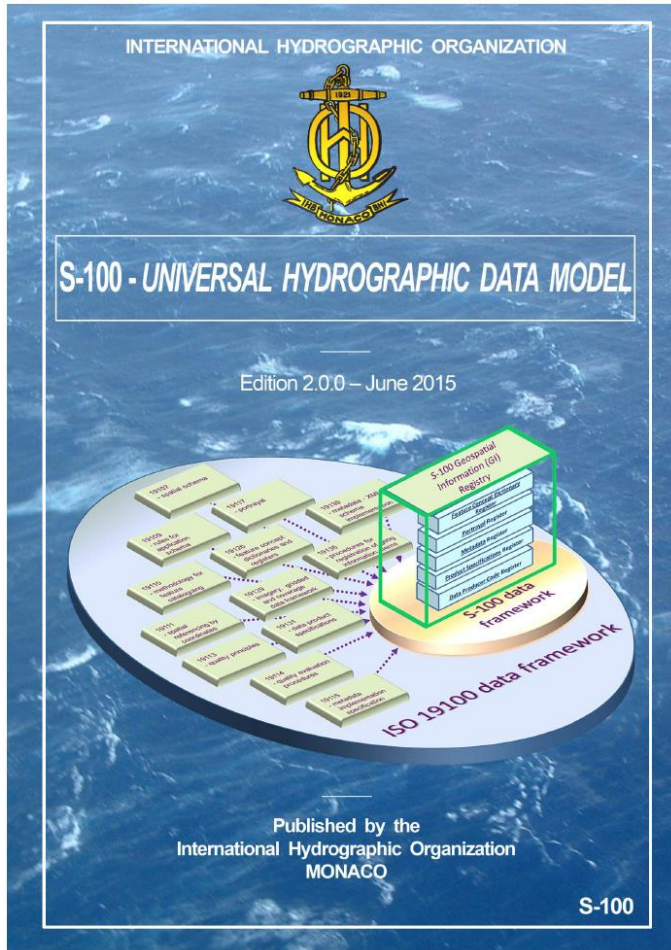
New platform? Why Unmanned survey?



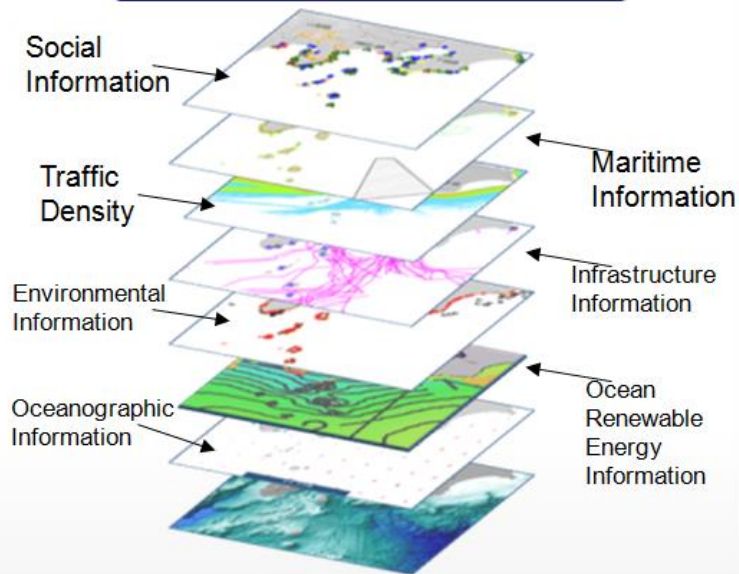
S-44 is designed to provide a set of standards for the execution of **hydrographic surveys** for the collection of data which will **primarily** be used to compile navigational charts to be used for **the safety of surface navigation** and the **protection of the marine environment**

- Hydrographic survey in S44 means manned survey using vessels
- Current S44 can NOT define other survey platforms than vessel

- ## Definition of S-100



Provides the **data framework** for the development of the next generation Electronic Navigational Charting products, as well as other digital products required by the hydrographic, maritime and GIS communities

Marine-related information

Users choose information and overlap them onto a map.

- Join mainstream GIS
- New Components not developed in isolation
- Easier use of hydro data beyond Hos and ECDIS users
- Extensible and active feature catalogue registry
- Plug-and Play updating of data, symbology and software enhancements
- S-100 has been built using Unified Modeling Language(UML)

SDG 14a

Sustainable Development Goal (SDG) 14: *Conserve and sustainably use the oceans, seas and marine resources for sustainable development*

Target 14a - Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.

- **Provide fundamental mapping of the seas and oceans**
 - Supporting national surveying programs, Investigating the use of innovative technologies

A variety of Unmanned survey Platforms

- Aerial Vehicles
- Surface Vehicles
- Underwater Vehicles
- Gliders

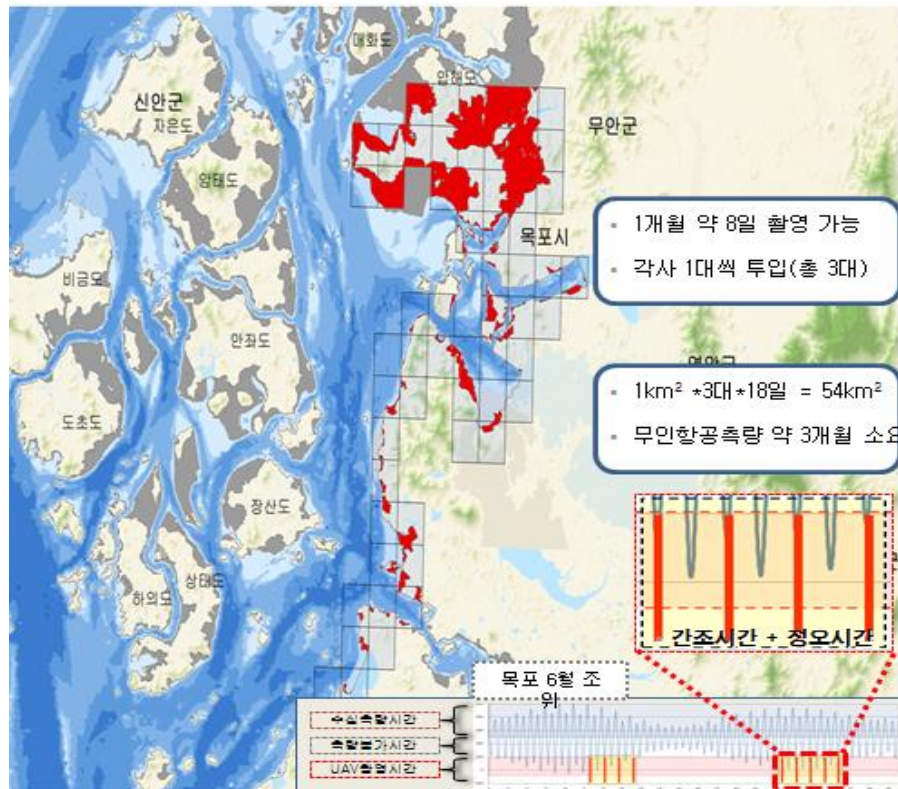


Unmanned Hydrographic survey

● video

KHOA's Unmanned Survey

1. Drone survey for intertidal zones

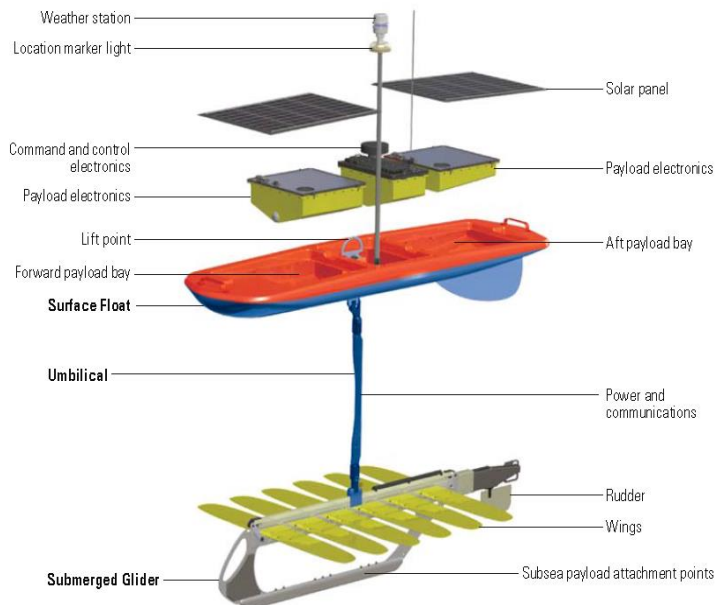


2. Unmanned survey crafts – Wave Glider



Wave Glider

Wave Glider



Application cases



Wave glider

Ocean observation

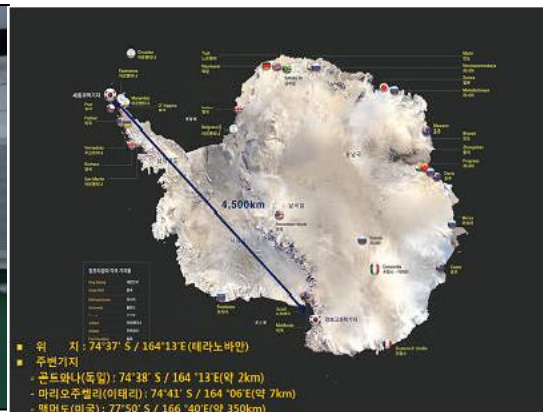
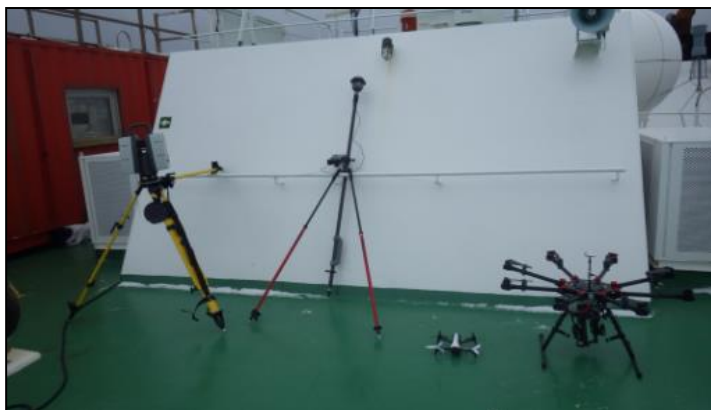
Realtime Tsunami monitoring

Multibeam survey

Sea State	Wave Height, m	Ocean Surface Characteristics
0	0	Glassy calm
1	0 to 0.1	Rippled
2	0.1 to 0.5	Smooth or with wavelets
3	0.5 to 1.25	Slight
4	1.25 to 2.5	Moderate
5	2.5 to 4	Rough
6	4 to 6	Very rough
7	6 to 9	High
8	9 to 14	Very high
9	More than 14	Phenomenally high

Wave Glider is capable of the
Sea State 6

Antarctic Survey



<Lyttelton Harbour – Final test>



<Jangbogo Station – UAV test run>

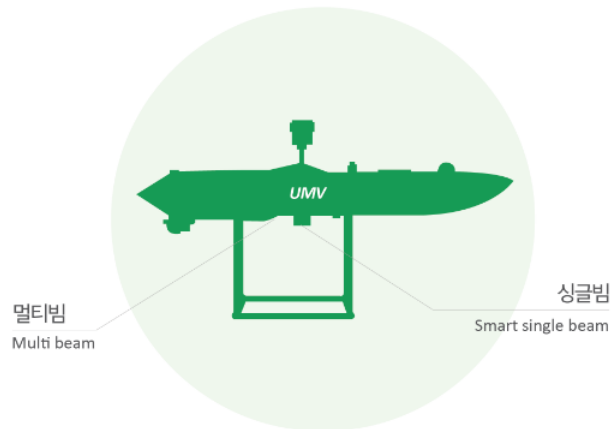
3. Unmanned survey crafts – UMV



UMV (Unmanned Maritime Vehicle)

무인선박 UMV

장비구조



Autonomous collision
avoidance

Application cases



Unmanned Surface vehicle

Unmanned coast guard, rescue



Sonobot

Restrict area, MPA

Conclusion

- To Make S-44 more useful for innovative, new technologies
- To Broaden S-44's coverage for surveying platforms and definitions
- To consider Autonomous surveys platforms (Unmanned survey)



Thank you