MSDI in support of the blue economy:
emerging issues on marine geographic information

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Introduction: supply and demand

Bathymetric data is the crucial contribution of the Hydrographic community to sustainable ocean development.

The Blue Economy: represents data demand side
MSDI: represents data supply side
The Blue Economy: the sea as a resource

The sea is a resource for:
- Energy;
- Food;
- Medicines;
- Minerals;
- Recreation;
- Telecommunications;
- Transportation.

The sea is now the workplace of the blue economy.
The Blue Economy: threats

**Extreme events:**
- Disaster Risk Management (DRM)

**Competition for marine space:**
- Marine Spatial Planning (MSP)
- Law of the Sea (LOS)
- Coastal Zone Management (CZM)

**Healthy oceans:**
- UN Sustainable Development Goals (SDG)
- Common Fishery Policies (CFP)
- Climate Change (IPCC)

=> Spatial data is necessary to reduce the threats.
MSDI: the elements

- Policy & Governance (People)
- Technical Standards (Standards)
- Information Systems (ICT)
- Geographic Content (Data)
**MSDI: the long road**

1990s: National Oceanographic Data Centers (NODC)
1994: Open GIS Consortium (OGC)
2000s: NODCs cooperate under SeaDataNet
2006: EU Green paper on Future Marine Policy leads to EMODnet
2007: INSPIRE Directive
2008: IHO Marine SDI WG (MSDIWG)
2010: Gunther Pauli, “The Blue Economy” report to the Club of Rome
2013: PSI Directive
2014: EU Communication Marine Knowledge 2020 “Blue Growth”
2015: Sendai Framework for Disaster Risk Reduction
2015: Paris Agreement on Climate Change
2016: Conference UN Sustainable Development Goal 14 “Oceans”
2016: OGC Marine Domain WG (MDWG)
2018: UN-GGIM Marine Geospatial Information WG (MGI-WG)
Bathymetry as a keystone for the blue economy

MSDI: examples
Lack of data: the problem

“We have higher resolution maps of the Moon, Mars and Venus than most of the world’s seas and oceans”

Deep Ocean:
<10% surveyed

Coastal waters:
<50% surveyed

THE BIG ISSUE
UNDERNEATH
Lack of data: the problem indeed

USS San Francisco, 8 January 2005

Kea Trader, 12 July 2017

Mighty Servant 2, 2 November 1999
Lack of data: the obvious solution

More surveying power:
- Laser Detection and Ranging (LIDAR)
- Satellite Derived Bathymetry (SDB)
- Unmanned Survey Vehicles (USV)
- Crowd Sourced Bathymetry (CSB)
- Satellite Altimetry (e.g. Jason)
- Gravimetry Missions (e.g. GOCE)
Lack of data: a practical solution

Better quality indicators:
• Source diagram
• S-57 CATZOC
• S-101 QualityOfBathymetricData
• EMODnet Composite Quality Indicator
Global cooperation: the MSDI elements

- Policy & Governance (People)
- Technical Standards (Standards)
- Information Systems (ICT)
- Geographic Content (Data)

IHO HSSC: standards, data
IHO MSDIWG: policy, data
OGC MDWG: standards, ICT
UN-GGIM MGIWG: policy, data
Global cooperation: marine subdomains

IHO: nautical information and its reuse (S-1XX)
IALA: aids to navigation (S-2XX)
IMO: maritime service portfolios (S-100 as CMDS)
UNESCO-IOC: oceanography (S-3XX)
IEHG: inland waters (S-401)
WMO/IOC: meteorology-oceanography (S41X)
ICES: marine biology

OGC: overarching (standards, ICT)
UN-GGIM: overarching (policy, data)