



IHO

Geospatial World Forum

IHO Standards and the Path to Data Independence

Dr. John E. Nyberg

Director of Technology



IHO

International
Hydrographic
Organization



IHO

International
Hydrographic
Organization

Maintaining sovereign control over national marine data and nautical chart production is essentially an extension of controlling a country's borders and territorial waters — both physically and in the data domain.

Global Data Production

Many countries do not collect their own marine data or produce their own nautical products

Opportunities

- Regional cooperation (e.g., RCHC networks) can pool resources to extend data coverage
- Emerging low-cost survey technologies (UAVs, satellite-derived bathymetry) lower barriers to entry
- Capacity-building partnerships can empower smaller nations to develop their own production capabilities
- Economic opportunity for nationals who wish to conduct work
- ROI directly through national product distribution

Challenges

- Many countries lack resources, funding, or technical capacity to collect marine data or produce nautical products
- Heavy dependence on Primary Charting Authorities creates data gaps and delays
- Inconsistent data quality and coverage across sovereign waters



IHO

Ownership and control throughout the value chain is the essence of data sovereignty.

International
Hydrographic
Organization

Data Distribution and Ownership

Many countries do not own data that is collected in their waters or maintain any control of it through the distribution process.

Opportunities

- S-100 architecture enables data licensing and access control, giving nations sovereignty over data sharing
- Developing national data policies aligned with UN GGIM frameworks can secure long-term ownership rights
- Commercial data partnerships can be structured to retain in-country data control – immediate participation in the distribution decision process is key

Challenges

- Many countries do not own data collected in their waters and have no control over its distribution
- Lack of legal and technical frameworks to assert data sovereignty throughout the value chain
- Some countries do not know that this is a possibility for them



IHO

International
Hydrographic
Organization

A sustainable, IHO-managed data standards infrastructure is the foundation upon which every nation can build its sovereign maritime data capability — driving economic growth, supporting the blue economy, and safeguarding the societies that depend on safe and navigable seas.

Sustainable Data Standards Infrastructure

An international data standards infrastructure is being built to support the long-term sustainability of S-100.

Opportunities

- IHO-managed S-100 infrastructure provides a stable, globally recognized foundation every nation can build upon
- Open, interoperable standards lower adoption costs and foster a broader ecosystem of compatible tools
- Shared infrastructure reduces duplication of effort and accelerates implementation across the maritime community

Challenges

- Building and maintaining an international standards infrastructure requires sustained political will, funding, and coordination
- Smaller Member States may struggle to engage meaningfully with standards development
- Ensuring that all countries are progressing at the same time



IHO

International
Hydrographic
Organization

The data gathered to support IHO products is not merely a technical input — it is a national asset, rich with economic opportunity, from the ports that drive trade to the seas that sustain communities.

Availability of Supporting Data

Many IHO S-100 require additional or more detailed supporting data, like hydrography, to realize their potential benefits.

Opportunities

- Marine navigation data has high secondary value for fisheries, climate research, offshore energy, and coastal management
- Improved supporting data unlocks the full economic and safety potential of the blue economy
- Economic opportunity for countries to collect their own data

Challenges

- Many S-100 products (e.g., S-104, S-111) require high-resolution supporting data that many nations simply do not have
- Data gaps limit the real-world utility and safety value of these products



IHO

IHO standards extend far beyond navigation — they are a framework for understanding, protecting, and sustainably managing the seas that society depends upon.

International
Hydrographic
Organization

Use of IHO Standards for Non-Navigation Purposes

IHO Standards offer great potential beyond navigation, but these opportunities are often overlooked.

Opportunities

- S-100 products can support marine spatial planning, environmental monitoring, offshore renewables, and disaster response
- Positioning IHO standards as a cross-sector framework broadens the community invested in standards sustainability
- Collaboration with the UN Ocean Decade can showcase IHO standards as essential tools for ocean governance

Challenges

- The broader potential of IHO standards beyond navigation is frequently underrecognized by policymakers
- Siloed thinking between maritime, environmental, and economic agencies limits cross-sector adoption



IHO

International
Hydrographic
Organization

Thank You Very Much

john.Nyberg@iho.int



IHO

International
Hydrographic
Organization