**NEEDS**

1) Better access to quality-controlled data

* Better access to the types of data researchers or managers can use for their work
* Community ownership, access, and ability to share/integrate data
* common platform. Getting there but issues among States/countries
* data gathering assessments
* Shared vocabularies and ontologies where possible and appropriate.
* Sharing data across Countries. Firewalls/IT blockers. Infrastructure needed to accommodate these restrictions.
* A useful "guide" so that someone can know where to find the data. Think of a State of the Environment Report - this gives essential info about the environment. Could the same "State of data" report be created (online) to guide users to where
* Way to create a flexible network to link together all possible initiatives from different initiatives in Hydrospatial Data and Information Arctic world.
* Funding for supporting high level scientific processing, metadata production, publishing and creating portal availability.
* User-defined needs driving data collection, Monitoring standards, no essential ocean Arctic variables, lack of co-design and coproduction of knowledge, integrating these systems is a challenge, uneven distribution of data across

2) Integration of data from all important Arctic actors

* Inclusion of industry collected dataset
* Integration of biophysical and socio-economic data with international and interdisciplinary inclusion in view of Arctic sustainability
* Significant private/industry engagement to just data for SDG solutions
* Requirement for ongoing & systemic involvement of Indigenous Knowledge and Environment knowledge.
* Greater investor diversity and interest to assist coastal/indigenous entrepreneurship
* Socio-ecological data inclusion
* integration of biophysical and socio-economic data from the Arctic Ocean to achieve progress with precautionary approaches that involve governance mechanisms and built infrastructure as well as their coupling to achieve progress
* Connecting with policy and political content such as with the Arctic Council...
* Reduce (better: remove) barriers to work in EEZs (for certain types of data to begin with. The Decade as an UN initiative should be the perfect vehicle to achieve this ambitious goal.
* Building SDG focused economic uses cases

3) Infrastructure requirements to improve data collection

* State of the art scientific icebreaker driven by an international consortium with equal access for all scientist based on the merit of the project.
* A network/cable link connecting the Arctic region to provide high speed, timely, reliable data connectivity.
* More and better sea ice services -- not necessarily data -- for societal needs (navigation, subsistence, recreation, security).
* Access to infrastructure in the Arctic (e.g. vessels) is too much governed by national interests and better ways of transnational access need to be developed.

*Move to section key data needs:*

*Winter data, synoptic data*

*Lack of high-quality hydrography related data e.g. Multibeam Surveys, crowdsourced Bathymetry. Better satellite coverage. Accurate and updated digital navigational charts. Real time data with relevance to Marine related uses*.

*Biodiversity monitoring part 2. A coordinated network is one of the basis for sustainable management or Ecosystem based management.*

*General lack of biodiversity monitoring, especially regarding plankton, benthos and Sea-Ice Biota. individual research projects are not long term M. Approaches and data handling not coordinated+*

*Lack of high quality hydrography datasets e.g multibeam Surveys. Better Satellite coverage. Real time data with relation to maritime/marine related use.*

**CHALLENGES**

1) Telecommunication requirements to improve data collection

* Telecommunication access and availability for activities in the Arctic.
* IT infrastructure & cybersecurity
* Establishing sufficient communication infrastructure and high-quality remote sensing capabilities
* Not everyone has access to reliable internet, especially in remote Arctic regions.
* Access to high speed internet in remote communities

2) Reliable data networks and data sharing

* connection of existing data infrastructure
* Establishing resilient, responsive, timely and reliable data networks.
* GNSS Jamming & Spoofing increased issues and importance of considering it...
* Adoption of standards for sharing of data e.g. IHO (S-100), UN-GGIM (IGIF) and OGC standards. Establishing relevant MSDIs
* Benefits of open data and engagement to coastal/arctic communities
* Common data dictionaries/standards totally possible
* Data portals are too scattered, and one should think about a multidisciplinary Arctic database/access point.
* Drive for scientists not as high to deliver high quality data and DB as there is to publish research papers.
* optimize transnational data sharing
* social dataset usage requirements to remain within local communities (but still need to be visible)
* firewall issues
* Ensure equal access & capabilities
* Absolutely needed to make sure that all communities have thorough access

3) Access and interoperability of infrastructure and technology for data collection

* Battery life is very short in cold regions, remoteness of survey locations etc. Climate conditions in general. Earth Observation data is also an issue in that it is expensive and not everyone can access it.
* Engagement with Industry & Shipping interests
* Develop enabling technologies that work across Arctic environments
* In benthic work, making sure that sampling methodology is comparable across the Arctic
* Cost to deploy & operate ships in Arctic Ocean Frontier Areas.
* Replacement of an aging fleet of research icebreakers
* Have G7 and G20 to commit in $ and/or in-kind (ship time) to the Arctic Ocean.
* Emergence and impact of Maritime Autonomous Surface Ships (MASS) in term of Risks and especially "Opportunities".
* I think there few technologies out there (or soon to be release that are up to the challenge)

4) Better cooperation and coordination on an international level

* Less fragmentation in development, more coordination in the Arctic research community
* This is one of the biggest challenges at high latitudes but global coverage at higher speed are available
* support of Sustaining Arctic Observing Networks
* Ensure full engagement and involvement of Arctic Indigenous Communities at all steps.
* effective implementation of the Arctic Science Agreement
* Digital Diplomacy: we have the technology - we need long-term relationships and agreements: projects evaporate too quickly
* collaboration networks
* Financial Support
* OTHER: Continued dialog
* Existing sparse &incomplete mapping & Charting.