**Roadmap – Strawman document.**

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# Organization of Arctic Observing Systems.

**Develop coordination and collaboration between data providers and stakeholders in the pan-Arctic region**

Organize new Arctic observing systems into existing national/regional/global programs for which adequate networks/systems exists e.g. International Arctic Buoy Program, ARGO, EPOS. **(WP2)**

For observing systems where such programs do not exist we recommend to establish new network or programs. **(WP2)**

Better coordination and collaboration between European, American, Canadian, Chinese and Japanese in implementation and operation of observing programs and infrastructures ( e.g. joint field programs, joint RI, interoperable data systems)

# Observing technology (platforms and sensors)

1. **Improvement of the observing platforms and sensors, facilitate for year-round operation, especially in sea ice areas (Technology)**

## Land based

Upgrade and complement existing land based stations in the Arctic through investment in new technology to further automatize the measurements.

* + deployment of large quantity of cheap, autonomous sensors over the critical gaps in spatial representativeness (e.g GNSS sensors for snow water equivalent, web-cams for snow extent, ice velocity, and coastal sea ice presence/drift).
* Invest in in situ Cal/Val multidisciplinary supersites and field campaigns to improve satellite retrievals, models and data assimilation.

## Sea Ice and Ocean based.

more observations should be based on ships of opportunity

All research expeditions should collect routine ocean, sea-ice and atmosphere observations.

For the ocean: increased number of autonomous observing platform and systems is needed, deployed on ice and under ice during field campaigns

A paradigm shift in atmospheric system design is needed, where field experiments correspond to the reference system, satellites to baseline and reanalysis replaces the comprehensive level. (PLEASE REFORMULATE TO A RECOMMENDATION).

Perform Cal/Val field campaigns in sea ice and open ocean to improve satellite retrievals, models and data assimilation.

Better coordination between in situ observing and satellite programs to optimize the distribution of autonomous sensors (e.g. spatial representativeness) and planning of in situ measurement programs.

## Community based monitoring

# Data value chain.

From instrument to data system to user defined application and services. (See Fig from Torill)

Operationalization of data delivery from sensors on different platforms into interoperable data systems. (cross cutting)

Develop mediator roles between disciplines in the data value chain through improved distribution of roles and responsibility according to competence.

1. **Data sampling, transmission, processing, archiving and build distributed and connected databases (Data management – FAIR principles)**

# Sustainability.

1. **How to develop sustainability of the observing systems, and how can funding mechanisms be adapted (Engagement🡪 Funding)**

**Engagement – communication.**

**International collaboration and coordination.**

**Funding mechanisms.**

Revision of funding mechanisms:

* increase coordination/shared funding between operational and scientific driven observations

Dedicated funding should be ensured to the data management (from national or int. bodies)