

INTAROS – Integrated Arctic Observation System

A project funded by EC - H2020-BG-09-2016

Coordinator: Stein Sandven and Hanne Sagen (deputy)

Nansen Environmental and Remote Sensing Center, Norway

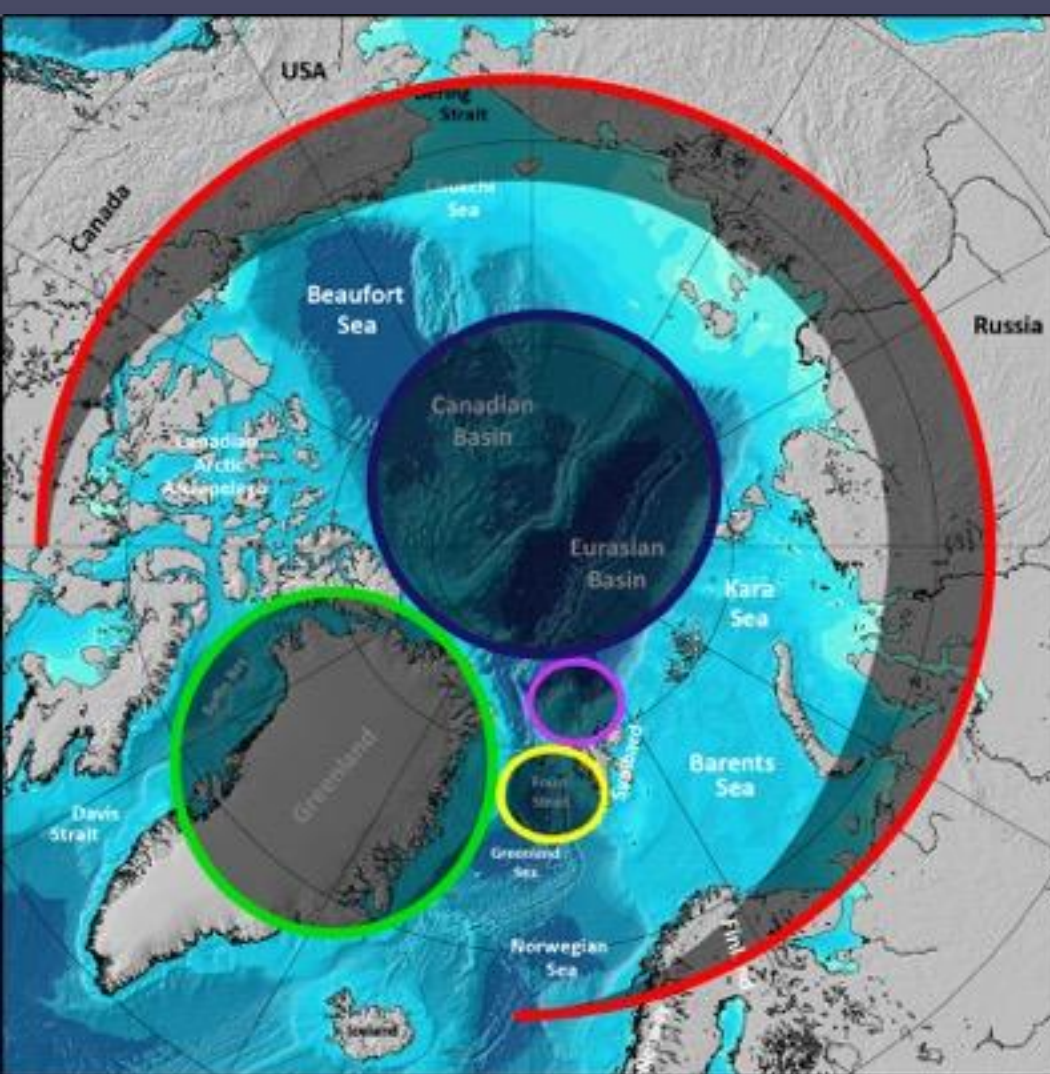
Overall objective: to develop an efficient integrated Arctic Observation System by **extending, improving and unifying** existing and evolving systems in different regions of the Arctic



INTERACT Annual Meeting
22 October 2017, Longyearbyen



An integrated Arctic Observing System



Need to cover:

- Atmosphere
- Ocean
- Terrestrial

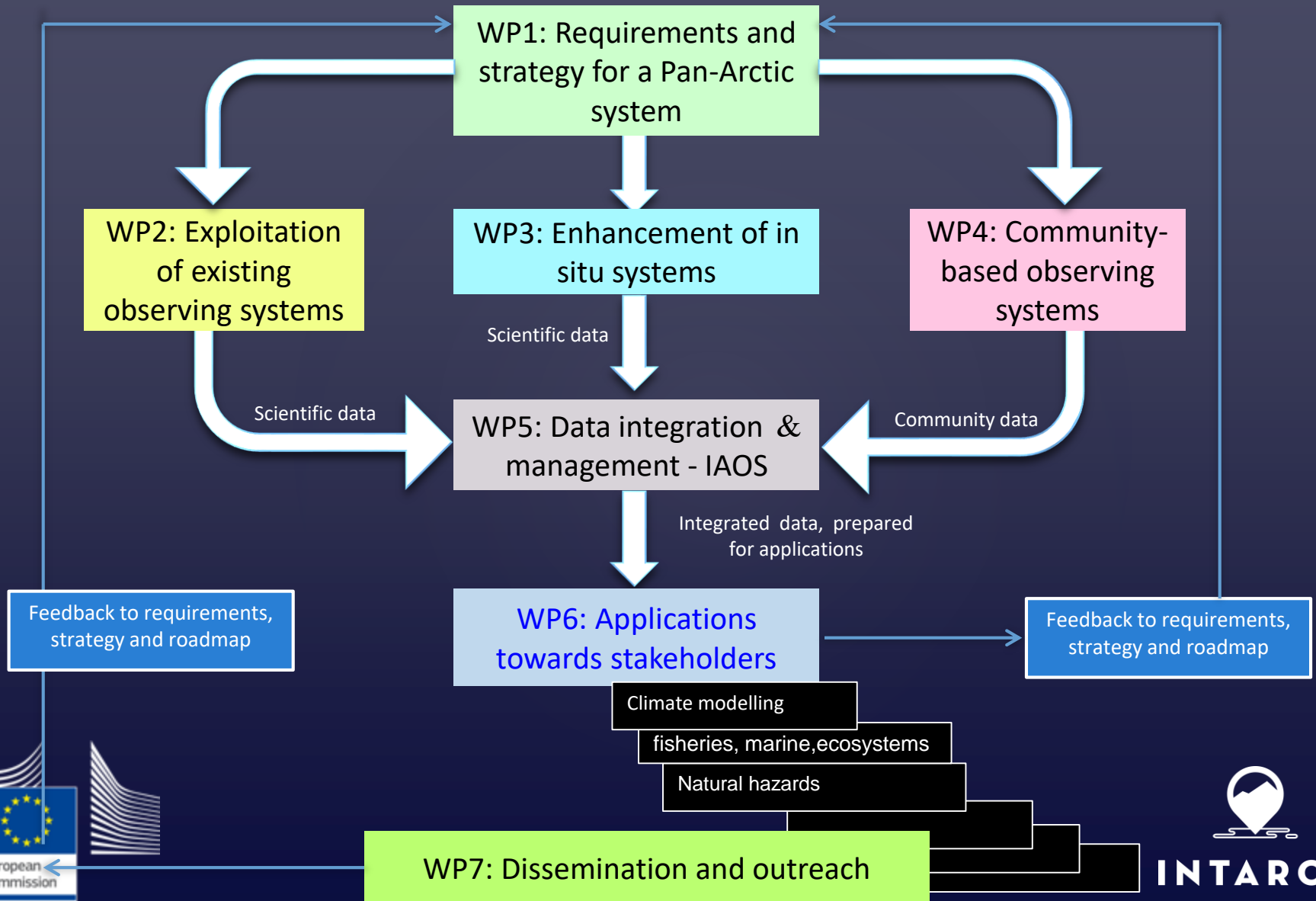
Themes at appropriate time and space resolution

Main gaps are in the in-situ observing system

Specific objectives

- Establish a *Pan-Arctic* forum for collaboration across EU and non-EU countries and transnational organisations (WP1)
- Develop a *Roadmap* for building a sustainable Arctic observing system (WP1)
- *Exploit existing observing systems and databases* (WP2)
- *Fill gaps* of the present in situ observing systems (WP3)
- Enhance *community-based* observing programmes (WP4)
- Develop and implement *the iAOS platform* for integration of multidisciplinary data from distributed repositories (WP5)
- Conduct application studies using iAOS to selected stakeholders (WP6)
- Demonstrate *assimilation* into climate models (WP6)

Workpackage structure



WP1: Requirements and strategy for Pan-Arctic Observing Systems

Lead: S. Sandven

The main objectives of WP1 are to

- (1) Review the high-level requirements and strategies for a Pan Arctic Observing System based on present initiatives⁽ⁱ⁾
- (2) Plan and coordinate the INTAROS activities in agreement with other Arctic projects, initiatives and stakeholder requirements,
- (3) Strengthen European participation in Arctic observing networks and establish a Pan-Arctic Observation Forum
- (4) Develop a roadmap for future sustainable Arctic Observing System



(i) GEO Cold Region Initiative (CRI), SAON and other international initiatives, related to the Arctic and European Blue Growth strategy;



WP2: Exploitation of existing observing systems

Lead: Roberta Pirazzini, FMI

- Task 2.1 Analyze strengths, weaknesses, and gaps of the existing observation networks and databases
- Task 2.2 Exploit selected datasets in order to increase the quality and number of data products
- Task 2.3 Enhance standardization of data and metadata to ensure that best practices are followed, and integrate sparse in situ data into established networks, preparing delivery to iAOS
- Task 2.4 Synthesis

ON-GOING: 4 QUESTIONNAIRES TO ASSESS AND CATALOGUE

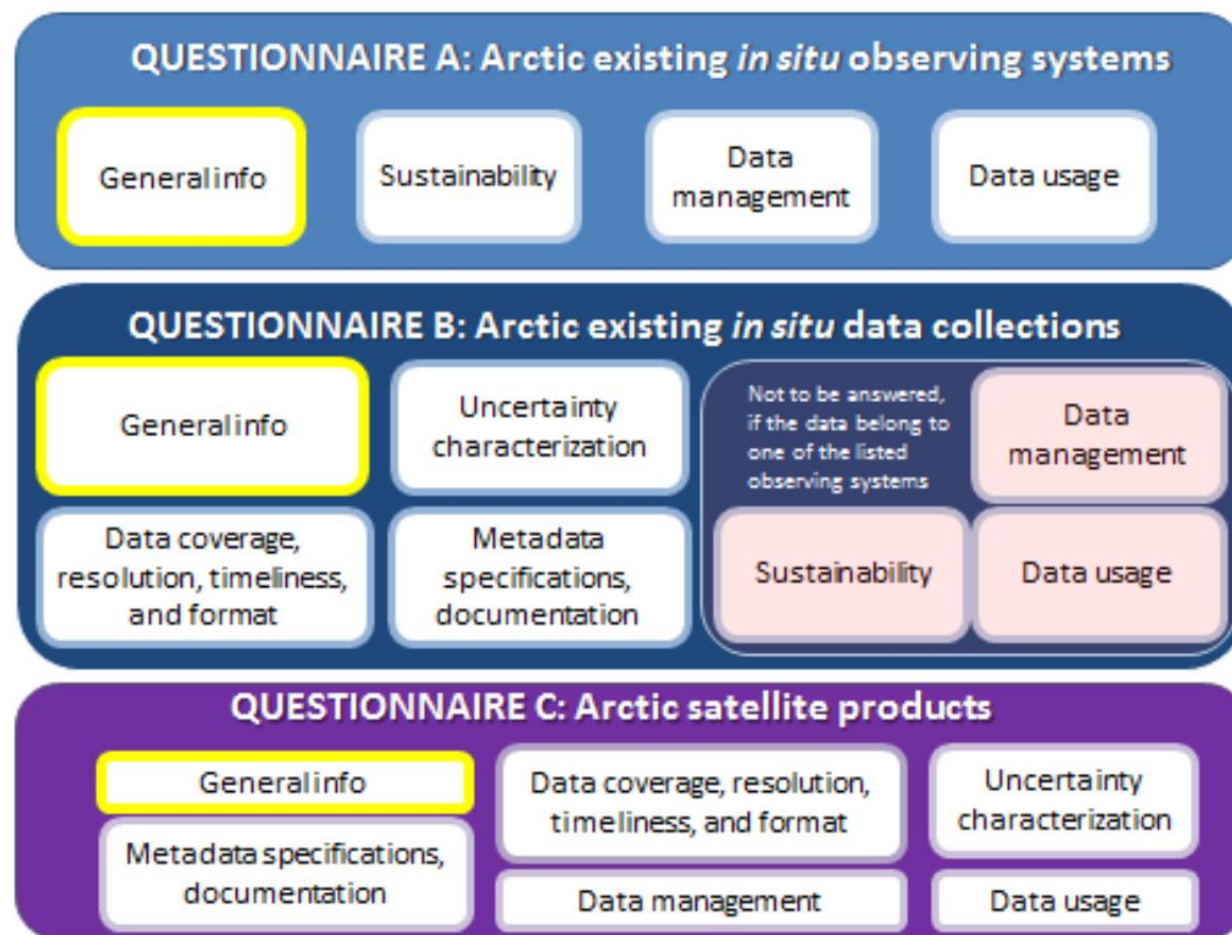


Figure 2. Schematic illustration of the topics addressed in the three questionnaires

QA: Survey of observing systems (29) and QB: datasets (26)

LIST OF SURVEYED OBSERVING SYSTEMS

ATMOSPHERE

GCOS Upper-Air Network (GUAN)
Radiosonde stations not included in GUAN
Global-GAW
GRUAN (GCOS Reference Upper Air Network)
WMO Integrated Global Observing System (WIGOS)
ICOS
PROMICE automatic weather station network
Tower network for atmospheric trace gas mixing-ratio monitoring_NOAA
Greenland Ecosystem Monitoring program
Regional-GAW

OCEAN AND SEA ICE

FRAM
Fram Strait Multipurpose Acoustic System
NIVA Barents Sea FerryBox
A-TWAIN
IOC tide gauge network
R/V Håkon Mosby
Piniarneq

LAND INCLUDING TERRESTRIAL CRYOSPHERE

Greenland Ice Sheet Monitoring Network (GLISN)
Greenland GPS Network
Ameriflux, Fluxnet
Airborne observations of surface-atmosphere fluxes
GNET - GPS networks
Federation of Icelandic River Owners
Fávllis – Sámi Fishery Research Network
Spring bird migration phenology

Map of observing sites

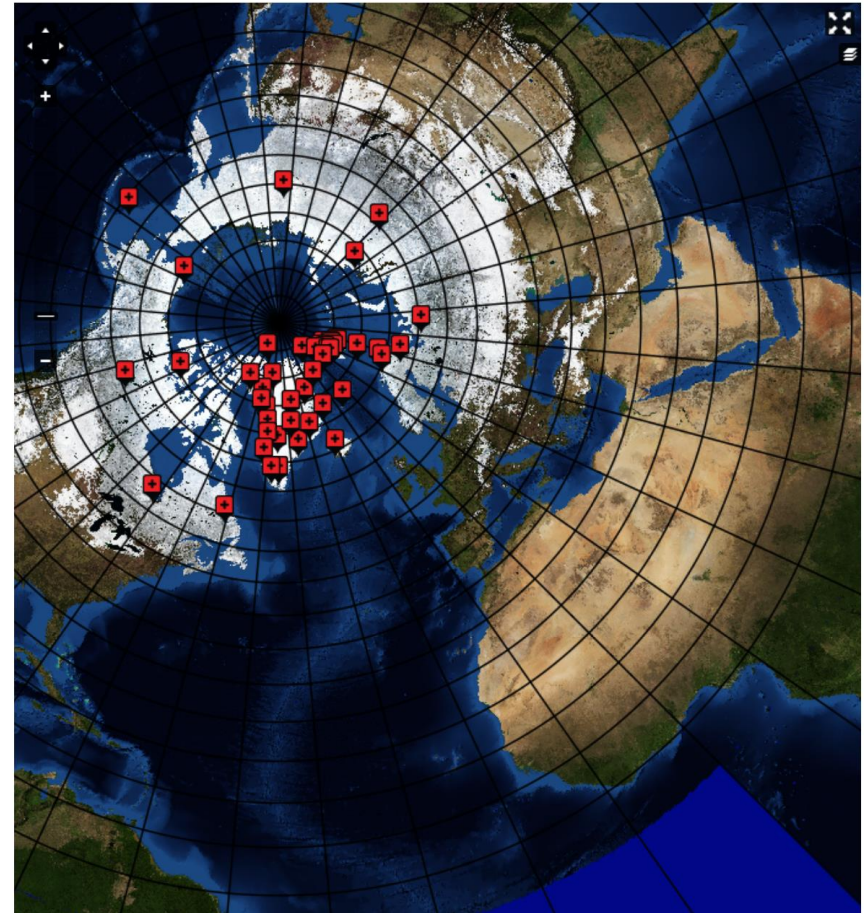
Partner

Domain

- Any -

- Any -

Filter



WP3: Enhancement of multidisciplinary *in situ* observing systems

Lead A. B.-Möller

Develop and integrate autonomous and robust *in situ* systems for year round measurements of key variables

Deploy mature and new sensors and *in situ* platforms in selected reference sites and distributed observatories

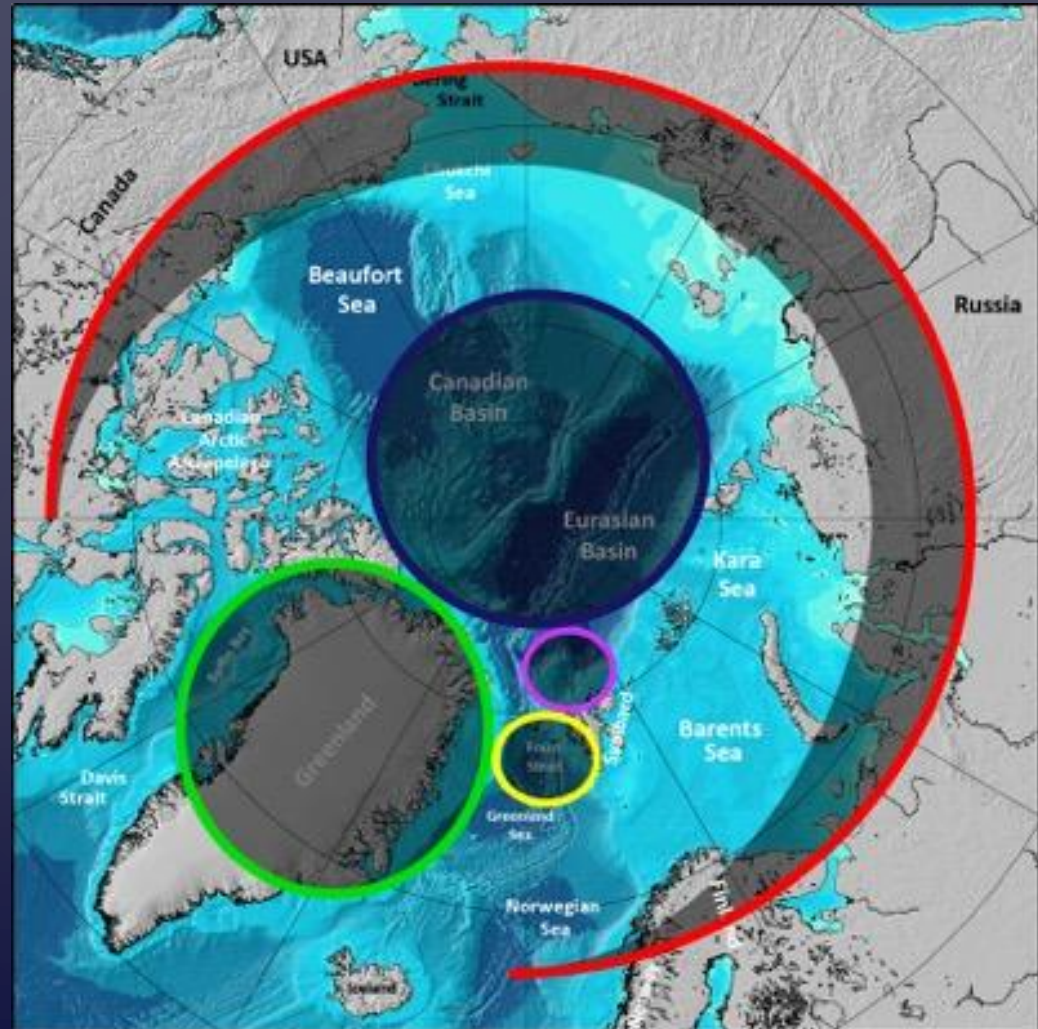
Extend existing ocean and land infrastructures with multidisciplinary measurements by adding new biogeochemical sensors

Deliver geophysical, biogeochemical and biological data products for data integration (WP5), demonstration studies (WP6) and stakeholders consultations (WP7)

WP3 Deployment areas

Experiment areas:

- Coastal Greenland/Baffin Bay
- North of Svalbard towards the deep Nansen Basin
- Fram Strait and Kongsfjorden
- Central Arctic: Distributed systems for ocean and sea ice
- **Pan-Arctic region:**
Distributed systems for atmosphere and land

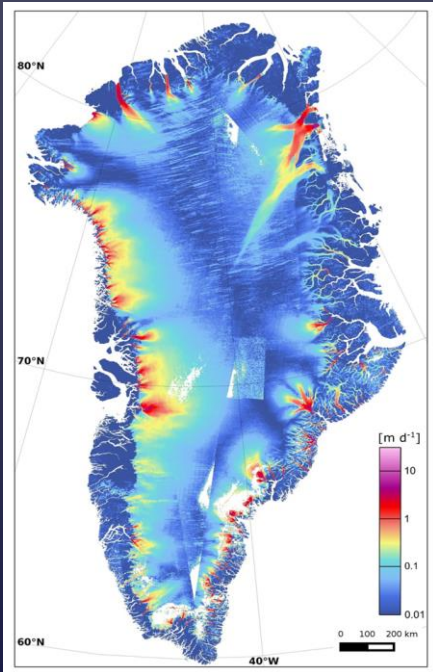
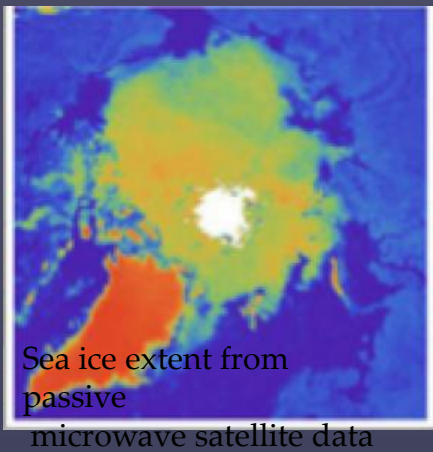




INTAROS IS HELPING
SUPPORTING FIVE
EDDY COVARIANCE
TOWERS IN ALASKA

Ref. Dona Zola,
University of Sheffield,

Cryosphere



- In-situ cryospheric and land observations from past and new campaigns and research stations
- Use of satellite snow, hydrological, and ice mass change products

WP4: Community-based observing systems

Lead: F. Danielsen, NORDECO

Objective: Enhance community-based observing for participatory research and capacity-building



WP4 Tasks

Task 4.1 Survey and analyze existing community-based observing programmes in the Arctic

Task 4.2 Advance tools for cross-fertilizing indigenous and local knowledge with scientific knowledge

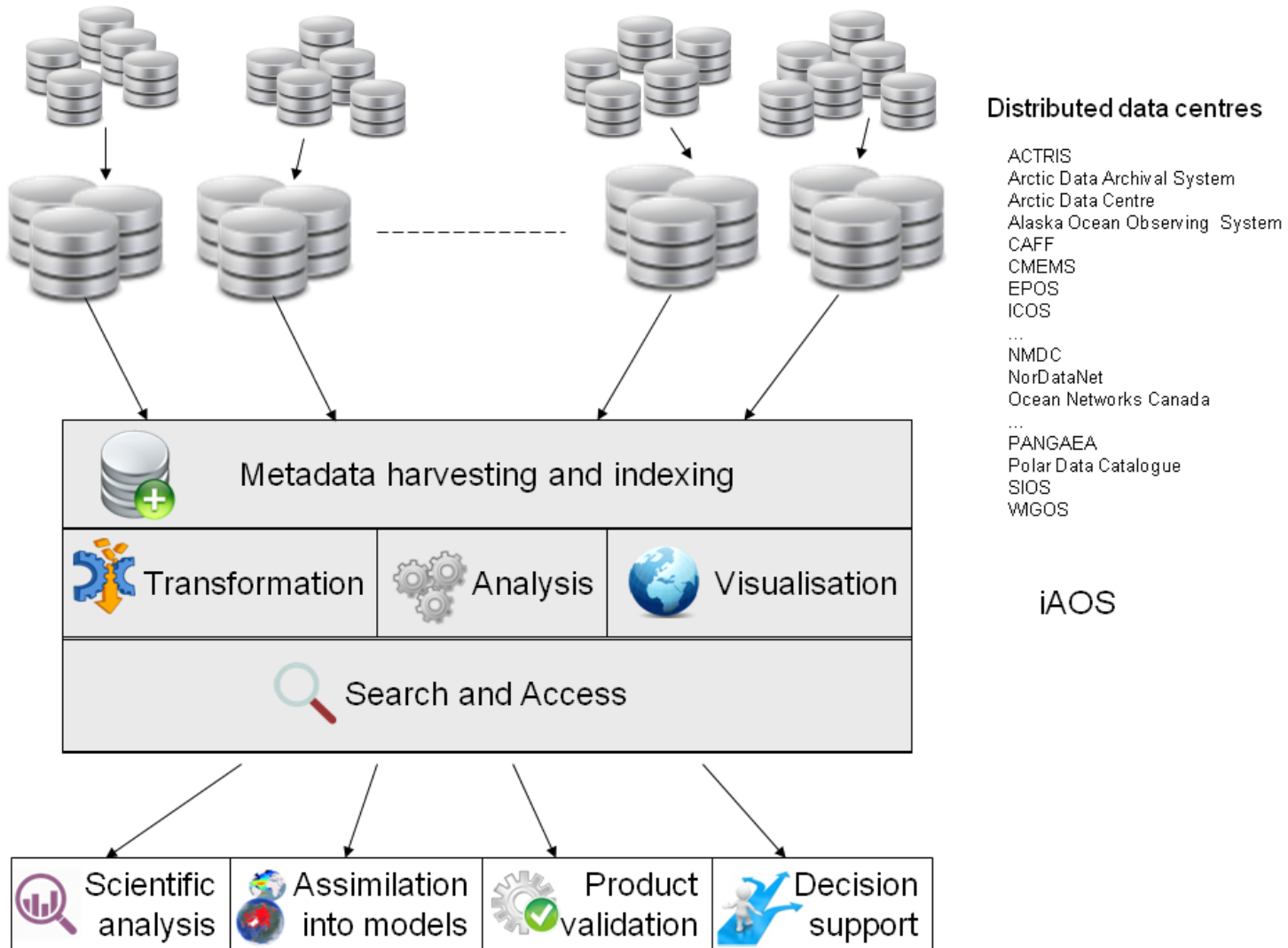
Task 4.3 Pilot community-based observing networks of relevant parameters for communities in Svalbard and Greenland to support local and national decision-making processes

Task 4.4 Make community-based observations accessible for iAOS



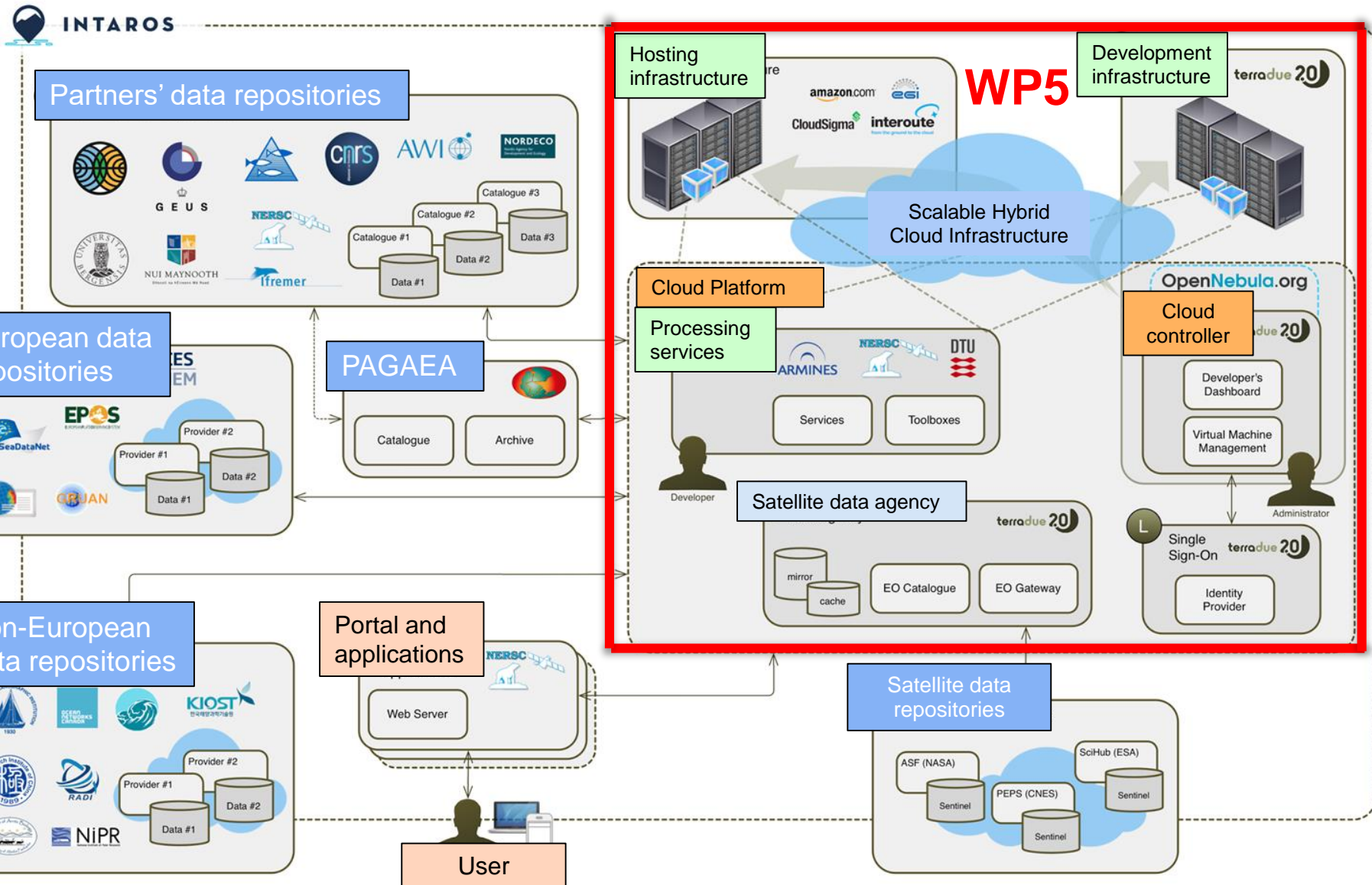
WP5: Data integration and management

Lead: P. Gonçalves, Terradue



iAOS

iAOS – Systems Overview



WP6 Demonstrate iAOS towards stakeholder groups

Lead: Geir Ottersen

Objective

To demonstrate the benefits of an integrated Arctic Observing System through a suite of application studies towards research, governance, local communities and industry

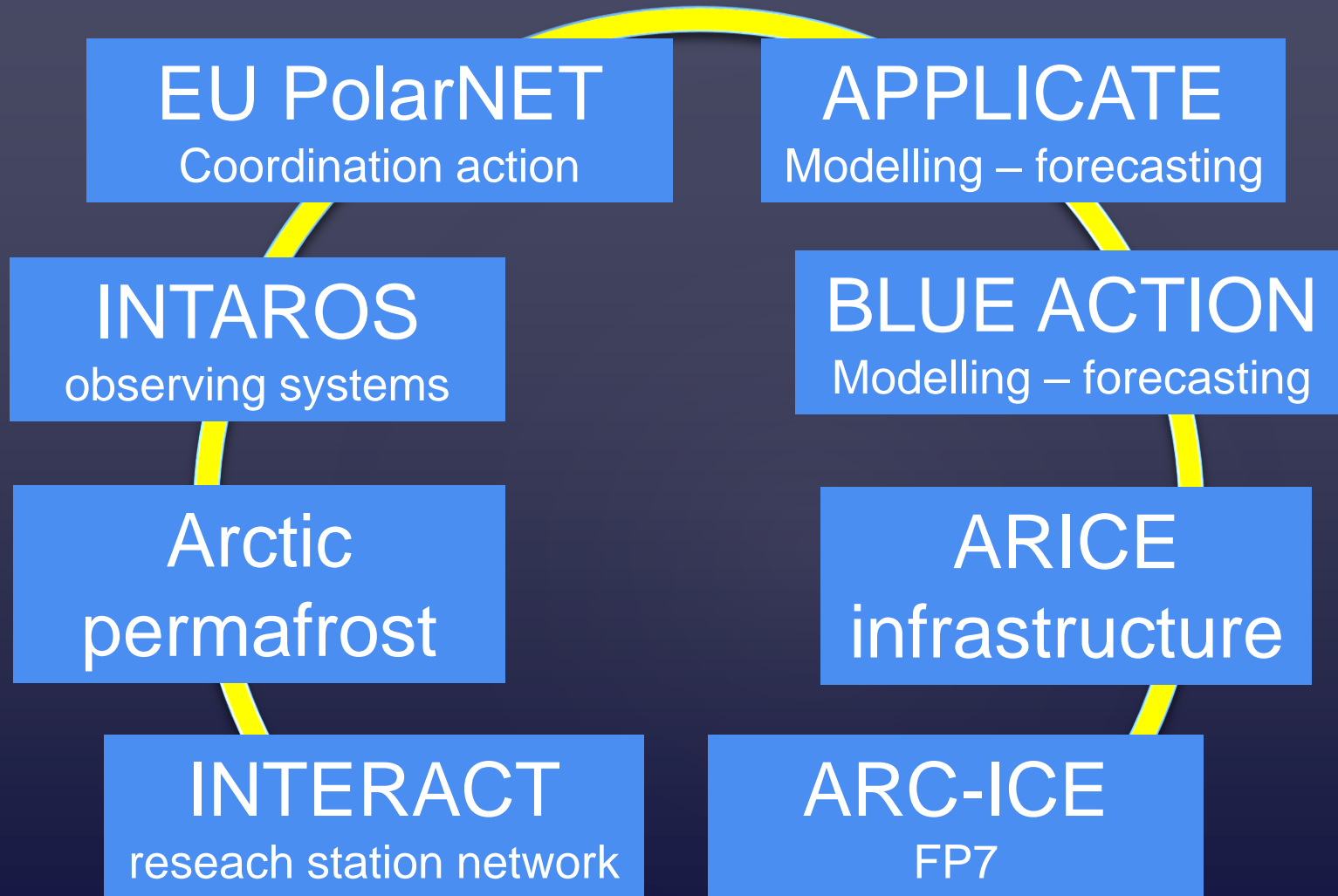
Application studies for specific stakeholder groups

- Climate modelling and prediction
- Marine ecosystem understanding and management
- Ice-ocean statistics for decision support and risk analysis
- Natural hazards
- Greenhouse gases exchanges – atmosphere, ocean, land
- Local community interaction with scientific observing systems
- Support to marine and maritime industries
- Demonstration for fisheries and environmental agencies

Stakeholder engagement in INTAROS

- First workshop in Brussels 05 May 2017 with invited participants, addressing relative high-level requirements across the various disciplines and stakeholder groups.
- Dialogue with decision makers and policy bodies, jointly with other Arctic projects and the Commission
- Stakeholders in each of the thematic areas (Atmosphere, Ocean and Seafloor, Sea ice, Marine Ecosystem, Terrestrial sciences, Glaciology, Natural hazards, and Community-based monitoring
- Stakeholder and Innovation Advisory Panel, ca 5 members, will be appointed and participate in the project
- Follow-up workshops

EU's Arctic project cluster 2017-2021



Other infrastructure projects:
ACTRIS, ICOS, SIOS, ENVRI PLUS, ++

INTAROS: Executive board



Stein Sandven,
Coordinator, (NERSC)



Roberta Pirazzini
(FMI)



Hanne Sagen, Deputy
Coordinator (NERSC)



Finn Danielsen
(NORDECO)



Agnieszka B. Möller
(IOPAN)



Ralf Doescher
(SMHI)



More info at www.intaros.eu



