

INTAROS – Integrated Arctic Observation System

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

Coordinator: Stein Sandven

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



SAON Board Meeting, ASSW
07 April 2017





Pan-Arctic integrated observation system(s)

SAON

Nordic
21

INTAROS

EU-
Polarnet

Regional Arctic
Integrated
Observation
systems/networks

INTERACT

Pan-Arctic thematic
networks

IPA

IASOA

ICOS

PEEX

ArcticROOS

SIOS

European research
infrastructures

Regional Arctic
Thematic
networks

ARCTOS

ACTRIS

COAT

National
consortia
Regional

National
consortia
Thematic

National
scientific
networks

Arctic ABC

ANAEE

EISCAT

GEM

EPOS

Host institutions of the research/observation facilities

Individual sites/stations/research vessels/facilities

Zeppelin obs

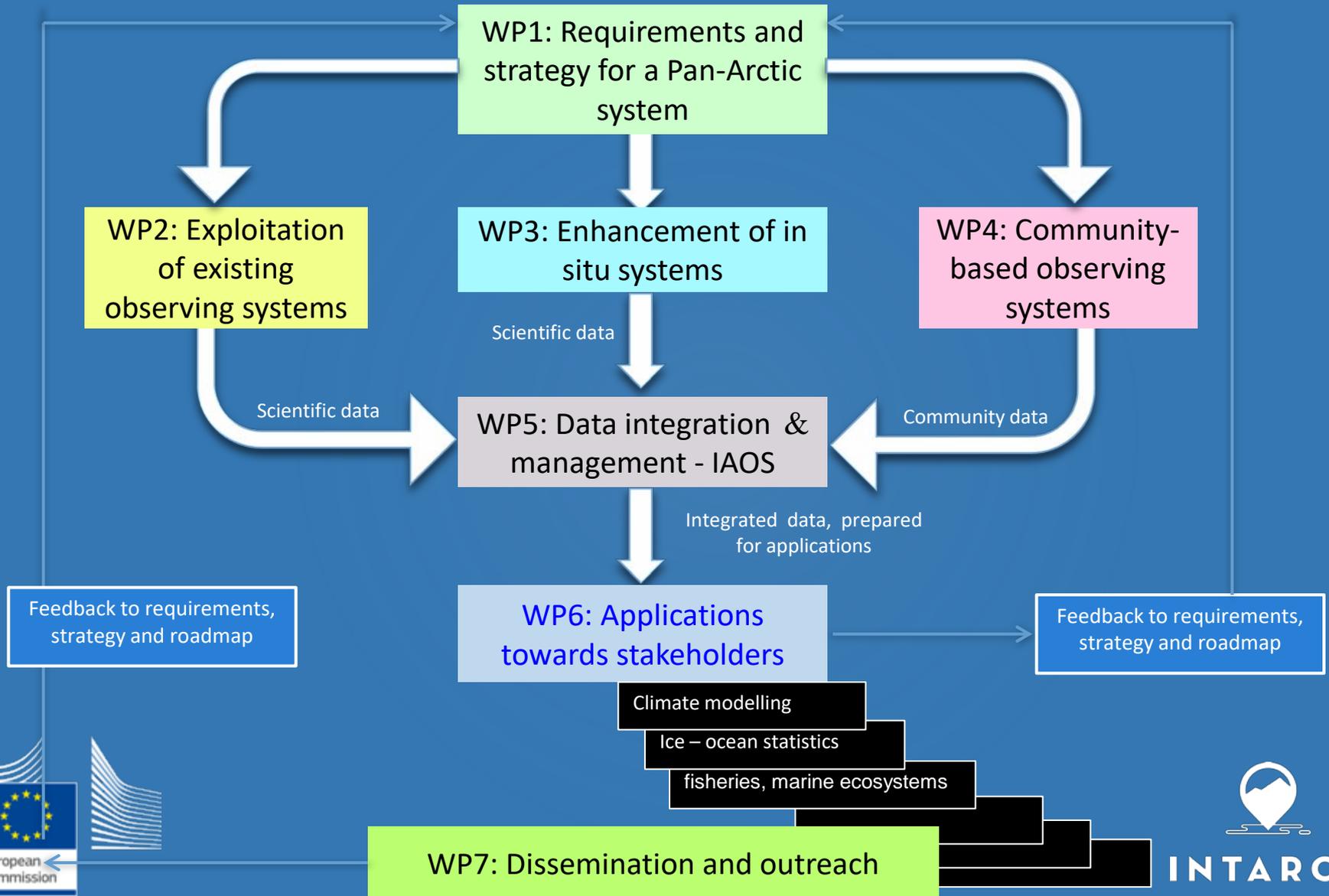
Abisko

Ny-Ålesund

Pallas-
Sodankylä

Zackenber

Workpackage structure



WP1: Requirements and strategy for Pan-Arctic Observing Systems

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:

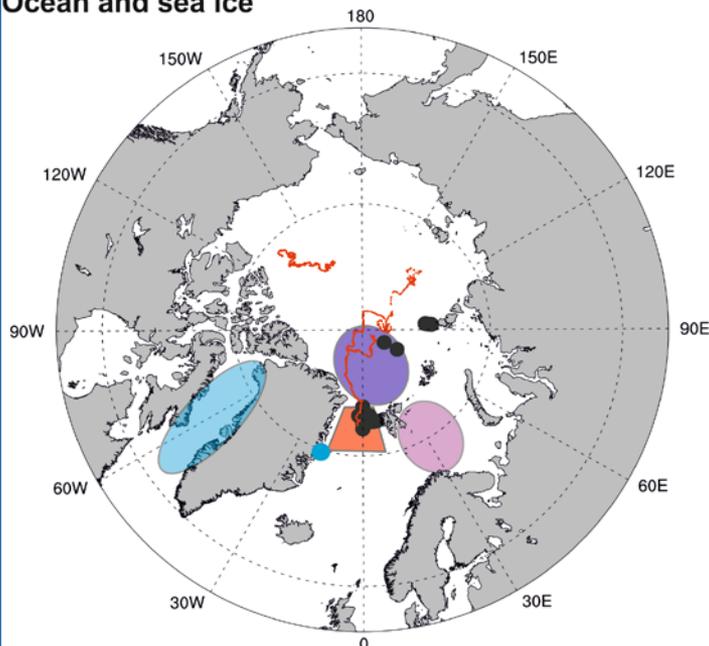
Exploitation of existing observing systems

- 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

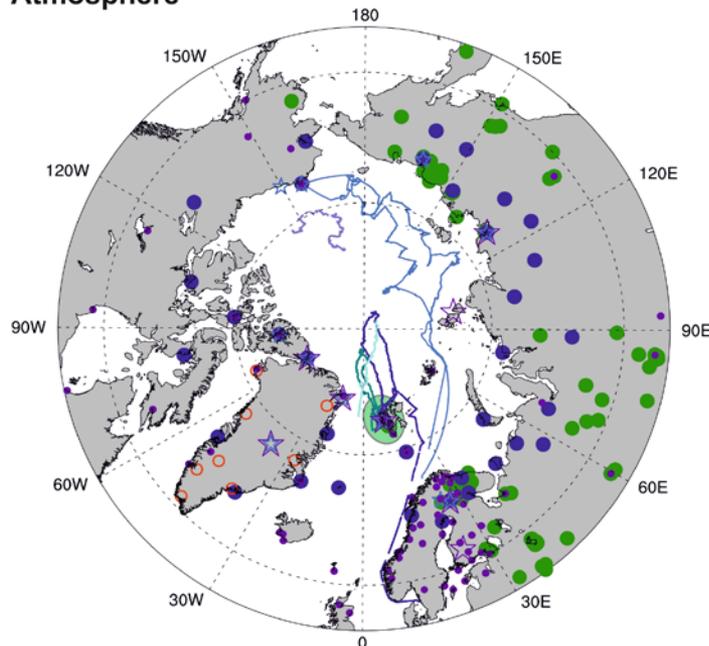


Examples of existing observing systems

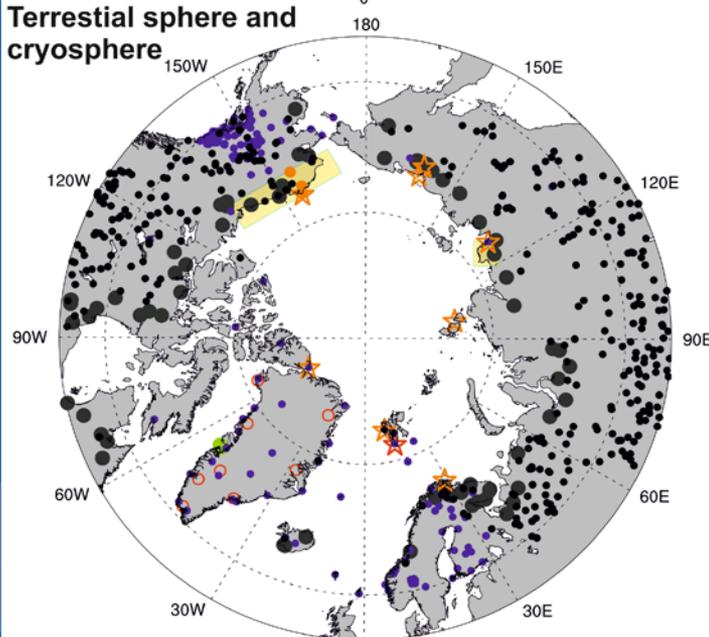
Ocean and sea ice



Atmosphere



Terrestrial sphere and cryosphere



Ocean and sea ice

- AWI sea-ice buoys
- FMI sea-ice buoys
- AU sea-ice mass balance system
- Biochemical observing system
- AWI deep sea observatory Hausgarten
- Deep ocea-to-surface physical & biogeochemical system
- Biogeochemical & optical system

Atmosphere

- IGRA
- ★ IASOA
- PROMICE
- ★ ACTRIS supersite
- ACTRIS
- PEEEX
- SHEBA 1997–1998
- TARA 2006–2008
- Oden 2001
- Oden 2008
- Oden 2014
- UAV observations

Terrestrial sphere and cryosphere

- ★ glaciology supersite
- PROMICE
- seismometers
- hydro station at river mouth
- hydro station
- ★ soil-atm. tall tower
- ★ soil-atm. short towers
- airborne soil-atm.
- community-based obs.

Status of WP2 (April 2017)

- ❖ Creation of **3 QUESTIONNAIRES**, to collect the info needed **TO ASSESS AND CATALOGUE** :
 - A. The Arctic existing in situ observing systems
 - B. The in situ datasets: already established (Task 2.1), exploited (Task 2.2), and integrated into existing repositories (Task 2.3)
 - C. The Arctic existing satellite products
- The questionnaires will be web-based, open to all partners and collaborators through the **INTAROS internal web page**
- The info collected through the questionnaires will be summarized in several deliverables of WP2

WP2 templates for survey and catalogue

❖ Creation of **Templates for the DELIVERABLES:**

- D2.1 (ocean and sea ice),
- D2.4 (atmosphere),
- D2.7 (terrestrial sphere and cryosphere):

Assessment of the existing Arctic observing systems (Task 2.1)

- D2.2 (ocean and sea ice)
- D2.5 (atmosphere),
- D2.8 (terrestrial sphere and cryosphere):

Report on exploitation of existing data (Task 2.2)

- D2.3 (ocean and sea ice),
- D2.6 (atmosphere),
- D2.9 (terrestrial sphere and cryosphere):

Catalogue of the existing and exploited datasets, and of the data service providers (Task 2.3)

WP3: Enhancement of multidisciplinary *in situ* observing systems

Objectives:

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

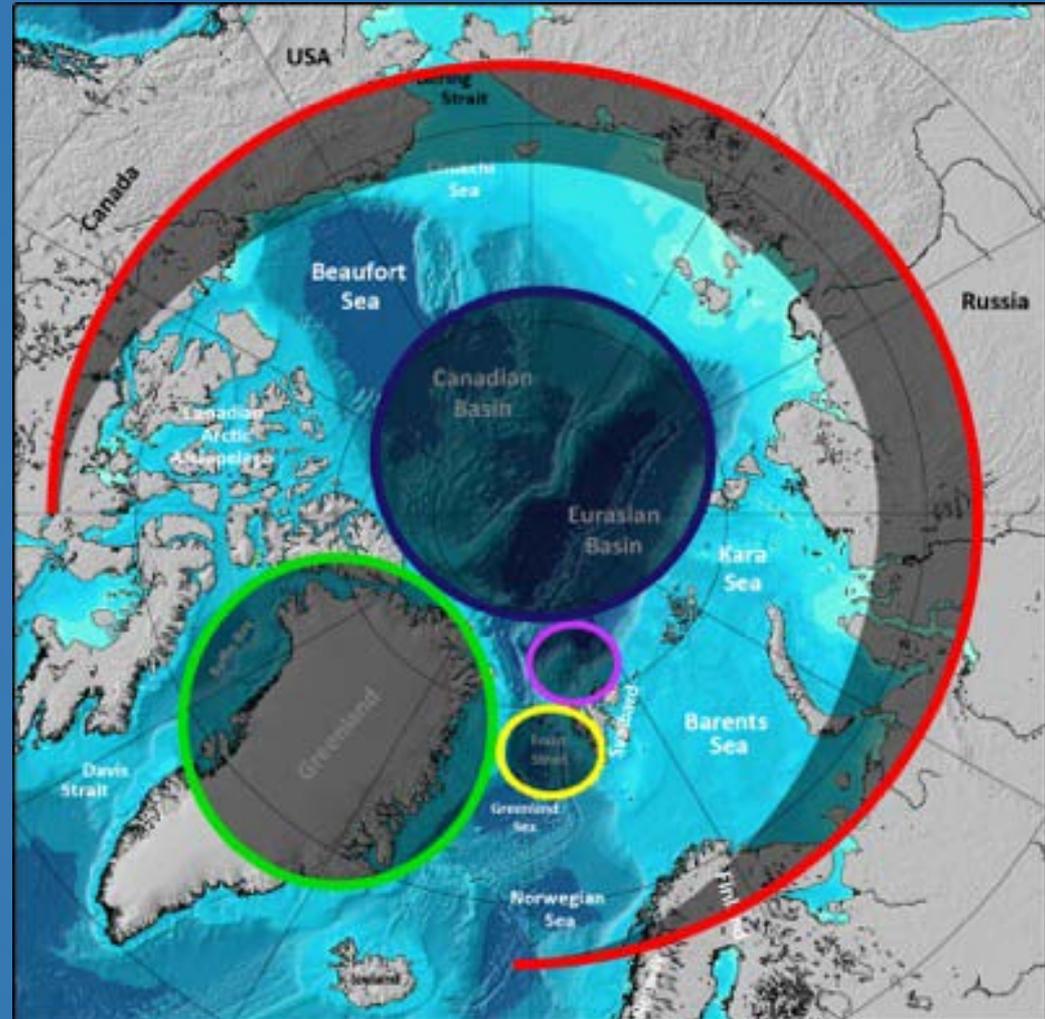
Deliver geophysical, biogeochemical and biological data products for data integration (WP5), demonstration studies (WP6) and stakeholders consultations (WP7)



WP3 Deployment areas

Experiment areas:

- Coastal Greenland/Baffic 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



WP4: Community-based observing systems

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

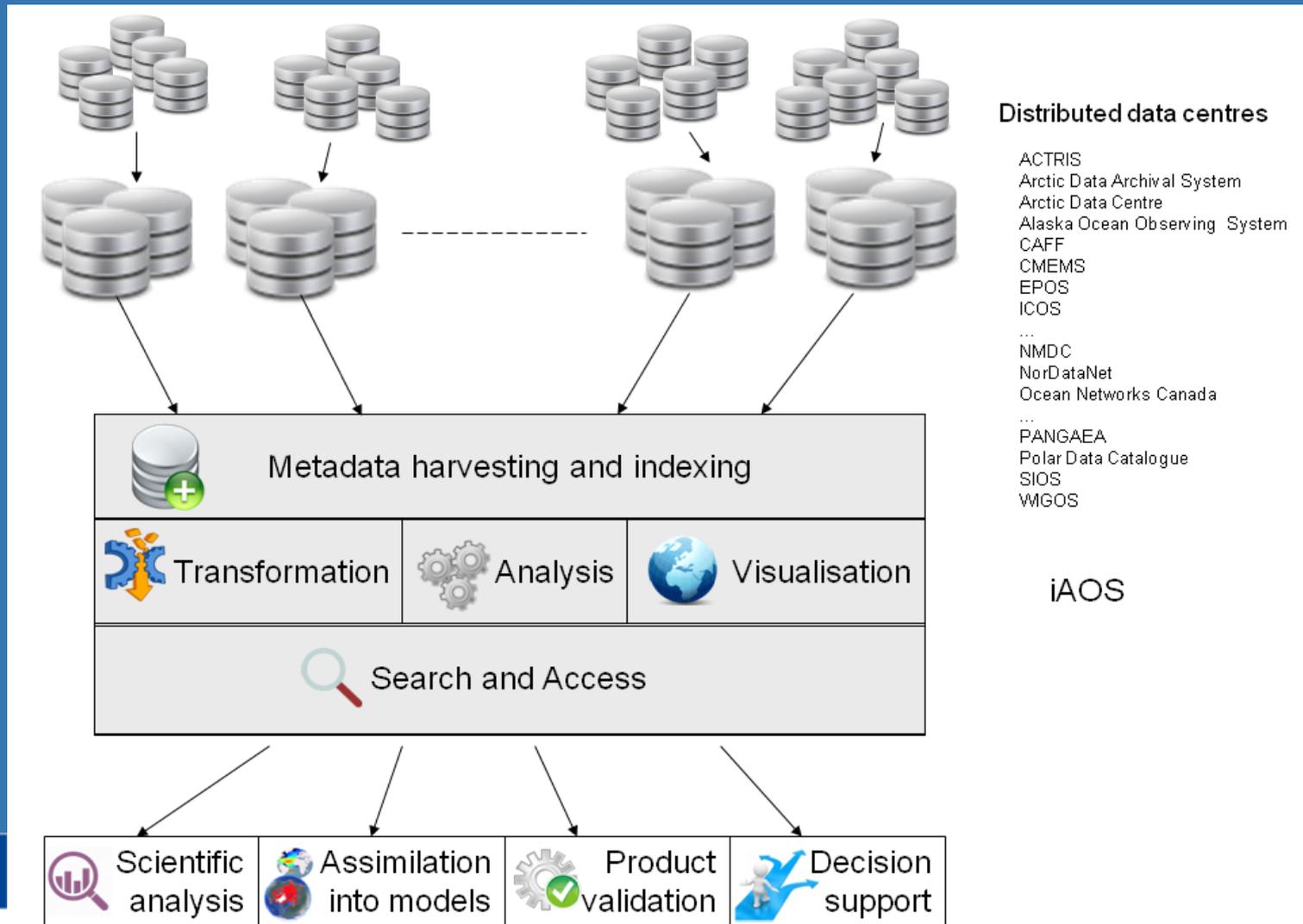
Task 4.3 Pilot community-based observing networks of relevant parameters for communities in Svalbard and Greenland to support local and national decision-making processes

Task 4.4 Make community-based observations accessible for iAOS

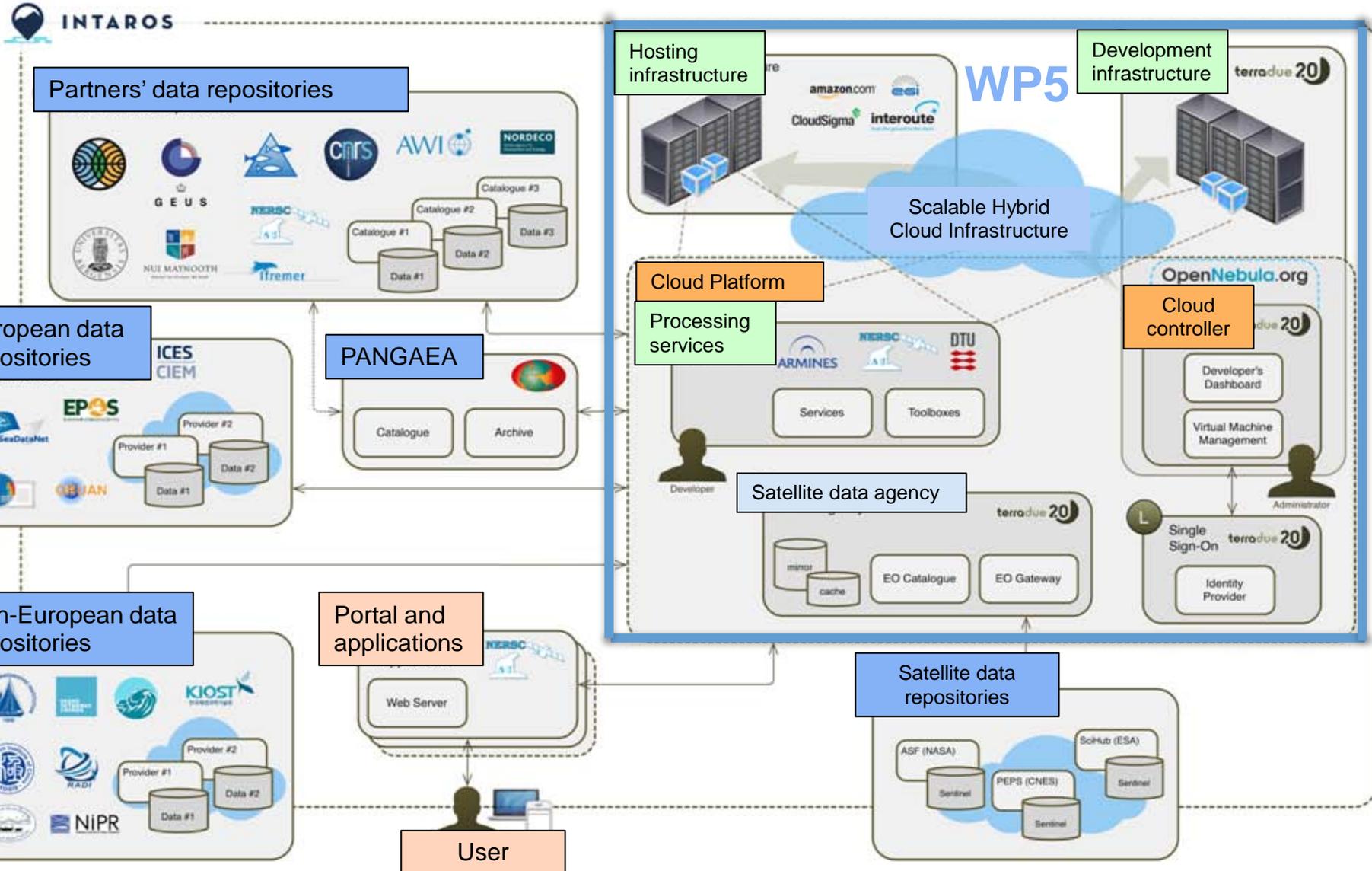


WP5: Data integration and management

Concept of the integrated Arctic Observation System - iAOS



iAOS – Systems Overview

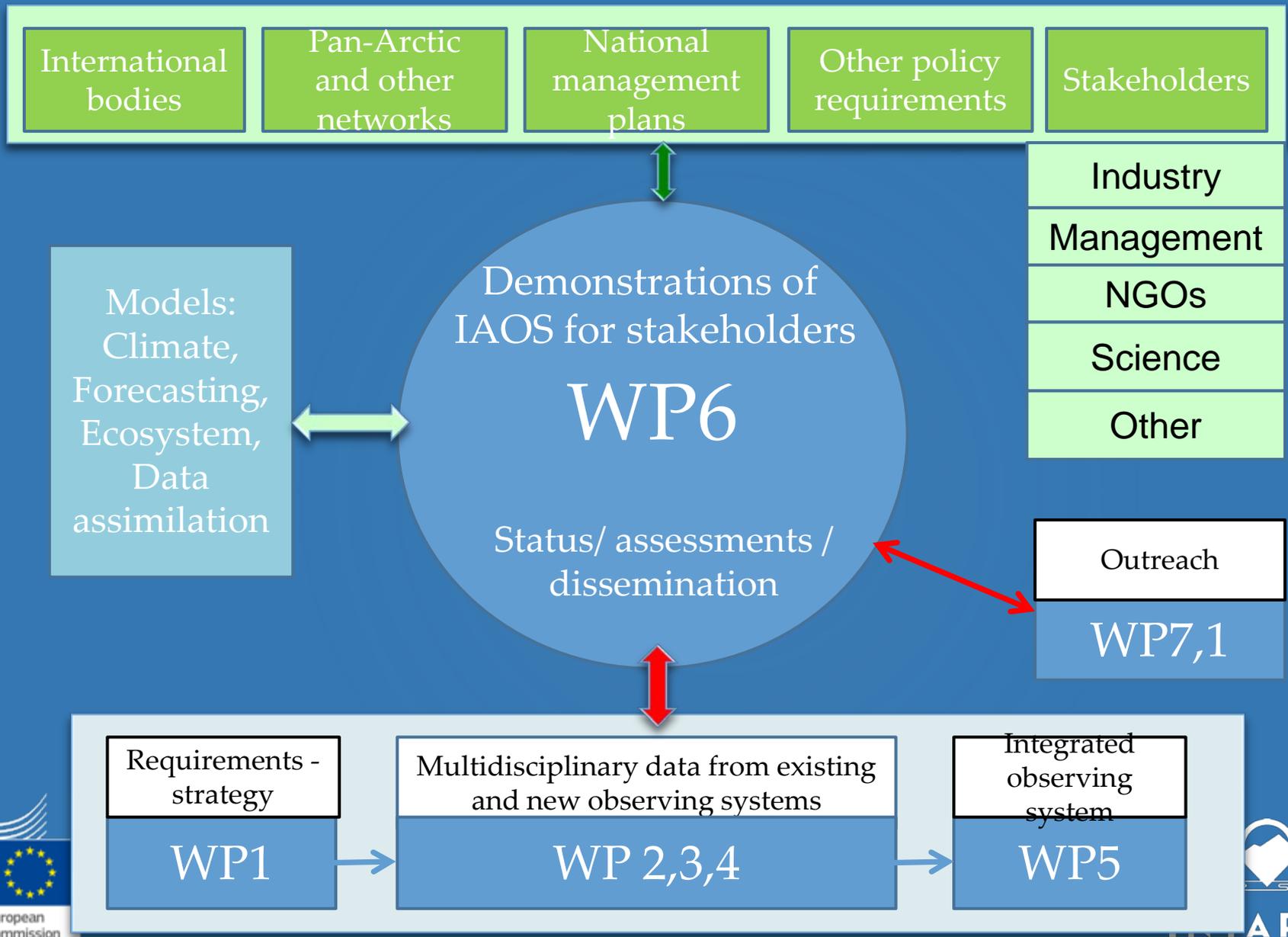


WP6 Demonstrate iAOS towards stakeholder groups

Main objective

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

INTAROS concept, seen from WP6



EU's Arctic project cluster 2016-2017

EU PolarNET
Coordination action (AWI)

INTAROS
observing systems
(NERSC)

APPLICATE
Modelling – forecasting
(AWI)

**Arctic
permafrost**
(start in 2017)

BLUE ACTION
Modelling – forecasting
(DMI)

Infrastructure projects: ENVRI, INTERACT,
ACTRIS, ICOS, EPOS, ++