Summary of activities and main achievements to date

INTAROS WEBINAR ON INFRASTRUCTURES






Verónica Willmott, AWI

www.arice.eu

Arctic Research Icebreaker Cons.
ARICE

Grant agreement No 730965

ARICE project – Main Goal

To provide Europe with better capacities for marine-based research in the ice-covered Arctic Ocean by:

- **better coordinating the existing polar research fleet,**
- **offering transnational access** to a set of international High Arctic research icebreakers,
- collaborating with maritime industry in a "**programme of ships and platforms of opportunity**".

ARICE Objectives

Objectives

1. Harmonisation of the European Arctic research fleet
2. Develop an International Arctic Research Icebreaker Consortium
3. Establish a regular dialogue with the maritime industry
4. Educate a new generation of polar researchers and professionals
5. Provide access to European and international research icebreakers in the Arctic Ocean
6. Expand the monitoring and observation capacities in the Arctic Ocean (SOP programme)
7. Enhance virtual and remote access to data

Networking activities:
Achievements to date

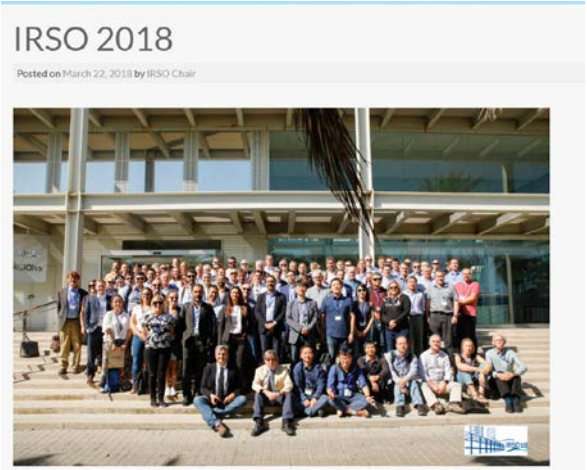
Objective 1: The harmonisation of the European Arctic Research fleet

Improve the coordination of the available heavy icebreakers, the ice-strengthened RVs and the ice-classified RVs across Europe

ARICE Operational Liaison Panel (OLP)

Overview of resources and benefits of enhanced collaboration

Workshops



Workshop: Towards an European Network of Polar Research Vessels in the Arctic **(IRSO/Barcelona, 04.10.2018)**

ERVO 2019

Workshop: on facilitating long term sharing on planning information of the European PRVs with OLP (**ERVO meeting in Hamburg, 11.-13.6.2019)**

Objective 1: The harmonisation of the European Arctic Research fleet

Key outcomes to date:

1. **Obstacles and possibilities** for transnational access to PRVs (D1.2.)

2. **Identification** of beneficiaries of a better coordinated European PRV fleet (D1.3.)

3. **Report on European research priorities** in the Arctic Ocean and how the coordination of PRVs would contribute to fulfilling them (D1.4.)

Objective 2: Development of an International Research Icebreaker Consortium

Multi-national collaboration on the planning and implementation of Arctic research cruises with heavy icebreakers

A European Consortium able to fund and implement cruises in the High Arctic

- MoU or similar among nations
- Barter system
- National contributions through a similar IODP quota system (*in cash* or *in kind* contributions)

Objective 2: Development of an International Research Icebreaker Consortium

Key outcomes to date:

1. **Report on present and future investments** in Arctic icebreaker capacity for research (D1.5)

2. **Report on modalities of ship-time collaborations** and exchanges (D1.6)

Objective 3: Establishing a regular dialogue with the maritime industry

To identify opportunities for collaboration between the science community and industry

Implementation of the Industry Liaison Panel (ILP)

4 meetings between the Maritime Industry and members of the Arctic Science Community

Objective 3: Establishing a regular dialogue with the maritime industry

Key outcomes to date:

1. A regular dialogue science-industry has been established

2. Identification of **joint industry and science community priorities** for Arctic research and observations (D2.3)

3. Inventory of specific opportunities for technology transfer and innovation (D2.4)

Objective 4: Educating a new generation of polar researchers and professionals

Targeted to PhD students, postdoctoral researchers, technicians and engineers

Key outcomes to date

1. Online Training & resources for multiple audiences

Webinars:

- Pre-cruise preparation (AWI, IOPAN) *19 February 2019*
- Ship-time proposal writing (AWI)
- Webinar data management (AP)

2. In person/on-site training courses (M12 – M40)

MOSAiC School 2019 (20 international M.Sc./PhD students selected from **~250 applications**)

MOSAiC International Arctic Drift Expedition

6-week training on board of of RV Akademik Fedorov during 1st leg of MOSAiC expedition **(+multiple training material, videos, …)**

ARICE SUMMER School 2020 & technician training

-Planned for summer 2020 on board of RV Heincke & at AWI Helgoland, **RV Heinke funded**

Objective 5: Provide access to European and international RI in the Arctic Ocean

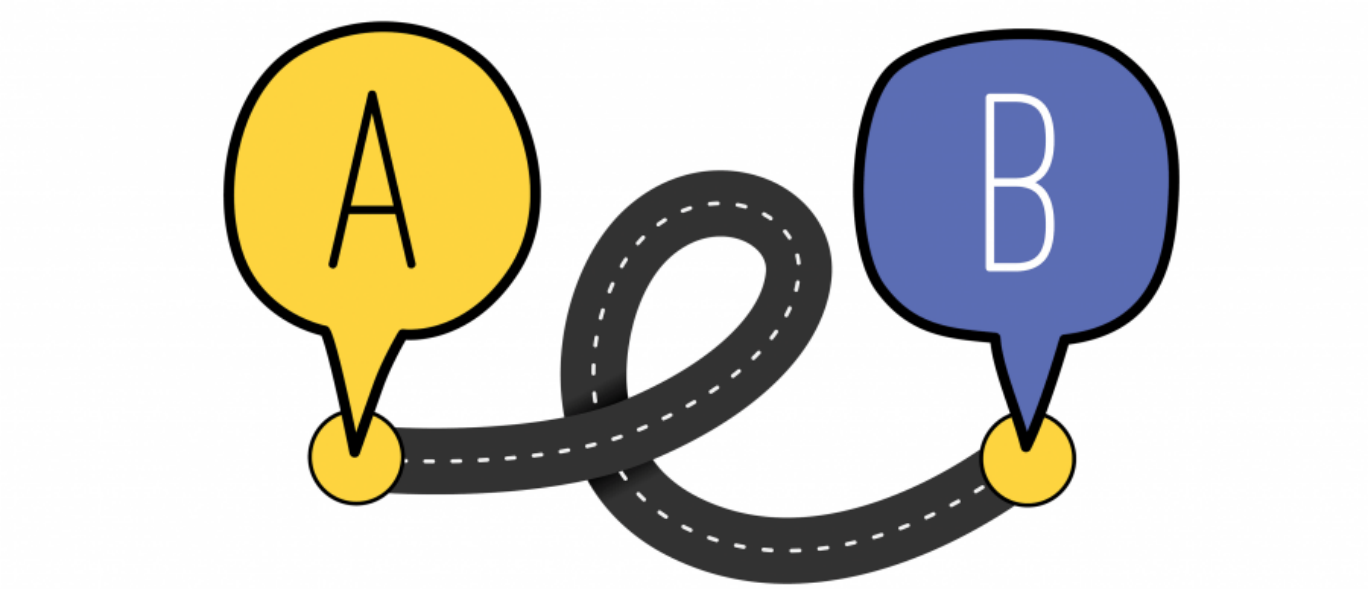
Key outcomes to date

ARICE 2018 call for ship-time proposals – CLOSED / Results available online

ARICE 2019 call for ship-time proposals – CLOSED / Results available online

19 proposals submitted / 8 selected for funding / success rate : 43%

Transnational Access:
Achievements to date



Objective 5: Provide access to European and international RI in the Arctic Ocean

Proposal acronym	Vessel	Vessel Country	PI institution	PI Country	PI Gender	PI ECS	Cruise dates
Go-WEST	**RV Sikuliaq**	**USA**	**AWI**	**Germany**	**M**	**N**	**Nov. 2019**
DEARice	**PRV Polarstern**	**Germany**	**WSL Institute**	**Switzerland**	**M**	**N**	**Sep. 2019-Oct. 2020**
PECABEAU	CCGS Amundsen	Canada	Vrije U.	The Netherlands	F	N	Sep. 2020
NoTAC(1)	**PRV Kronprins Haakon**	**Norway**	**DTU**	**Denmark**	**M**	**Y**	**Aug. 2020**
NoTAC(2)	PRV Kronprins Haakon	Norway	DTU	Denmark	M	Y	Aug. 2021
VACAO	IB Oden	Sweden	GEOMAR	Germany	M	Y	Sep. 2020
TRACE	IB Oden	Sweden	GeoMAR	Germany	M	Y	Sep. 2020
PROMIS	IB Oden	Sweden	Marine Biological Association	United Kingdom	F	Y	Sep. 2020
CASE	RV Sikuliaq	USA	OGS	Italy	M	N	Sep. 2020

ARICE funded cruises - operational areas

GO-WEST – Sikuliaq

CASE - Sikuliak

DEARice - Polarstern

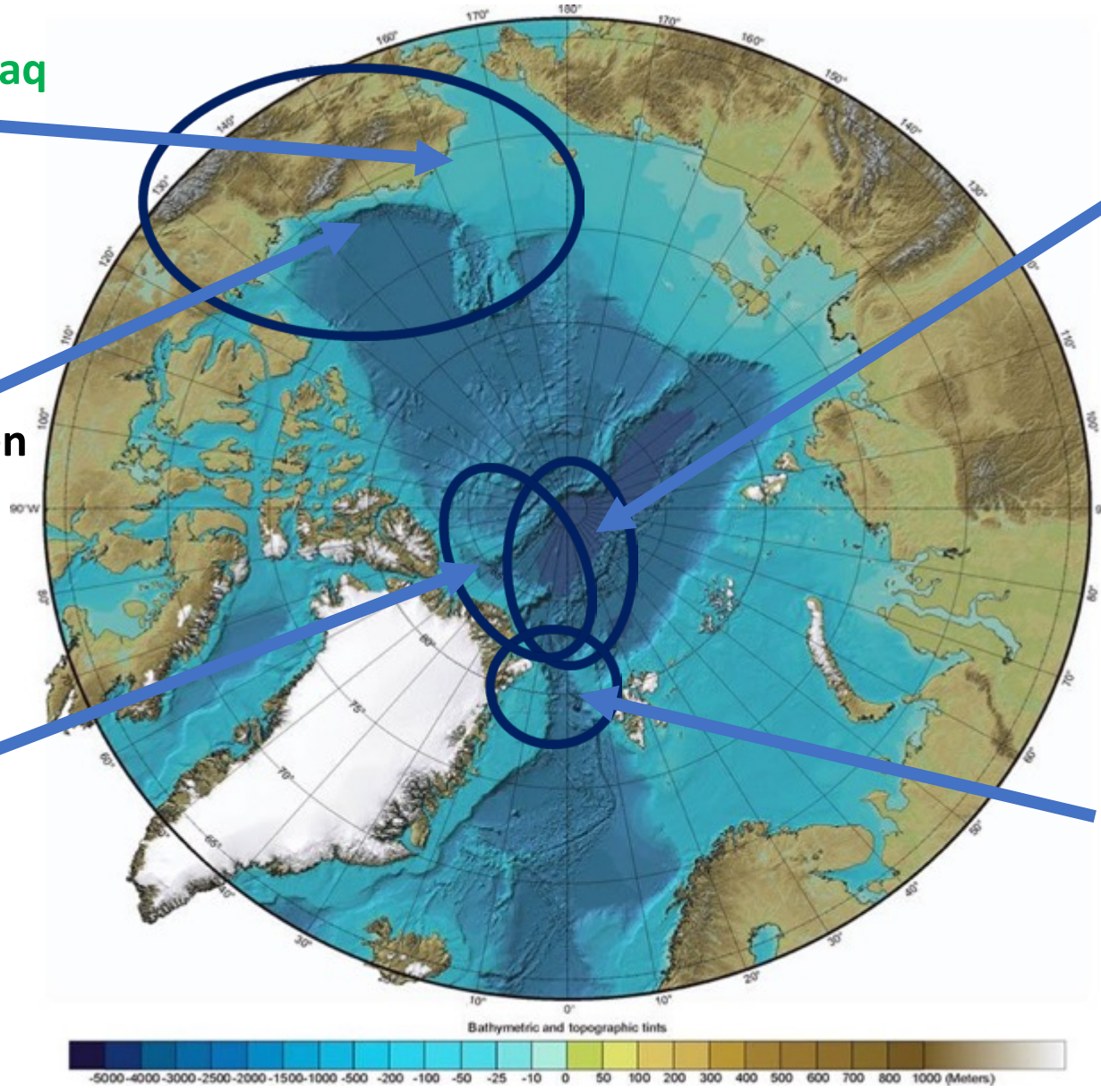
PECABEAU - Amundsen

VACAO - Oden

PROMIS - Oden

TRACE - Oden

NoTAC – Kronprins Haakon



Proposals selected for funding – Implementation confirmed

Accomplished

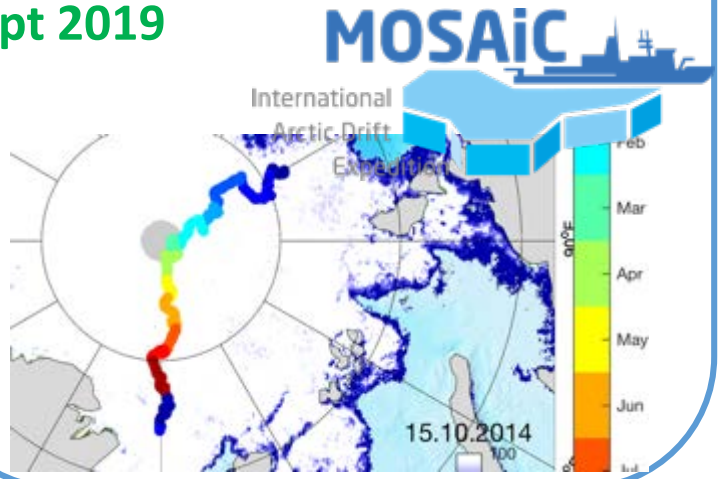
MOSAiC-PRV Polarstern, DE

DEARice

Development of snow/ice/ Ecosystem models using winter-to-summer ARctic observations of coupled snow, ice, and ecosystem processes

PI: Dr. Martin Schneebeli, WSL Institute, **CH**

5 participants in 4 MOSAiC legs Sept 2019



RV Kronprins Haakon, NO

NoTAC

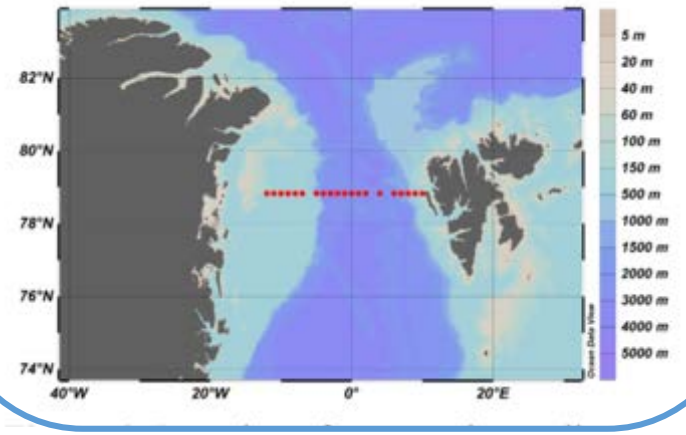
Season 1 Accomplished as remote access

"Novel Tracers of Arctic Carbon and water exchange in the Fram Strait "

PI: Rafael Gonçalves-Araujo

DTU, Denmark

7 days in two seasons (2020-2021) (3,5 days and 5 berths per year) Aug 2020



Cruises selected for funding – Implementation confirmed

RV Sikuliaq, USA

GO-WEST

Sea-ice association of polar cod and its prey in the western Arctic Ocean

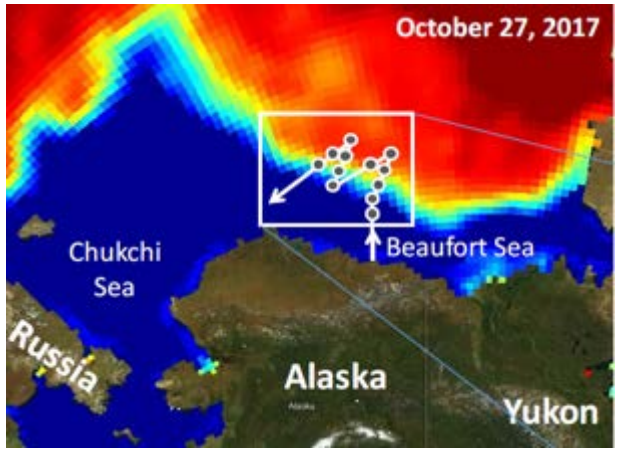
PI: Dr. Hauke Flores

Alfred Wegener Institut, **DE**

10 participants/7 working days

Nov 2019

Accomplished



RV Sikuliaq, USA

CASE

"Contourites of the Arctic Slope Environment"

PI: Michele Rebesco

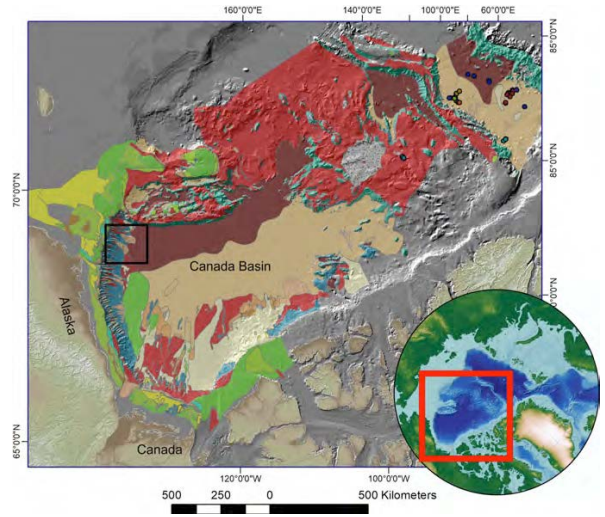
OGS, **IT**

7 days and 7 berths

Fall 2020

Beaufort/Alaska margin (Canada Basin)

Postponed to 2021



CCGS Amundsen, CA

PECABEAU

How coastal erosion, fluvial export and submarine permafrost Degradation impact the carbon budget on the Canadian Beaufort Shelf

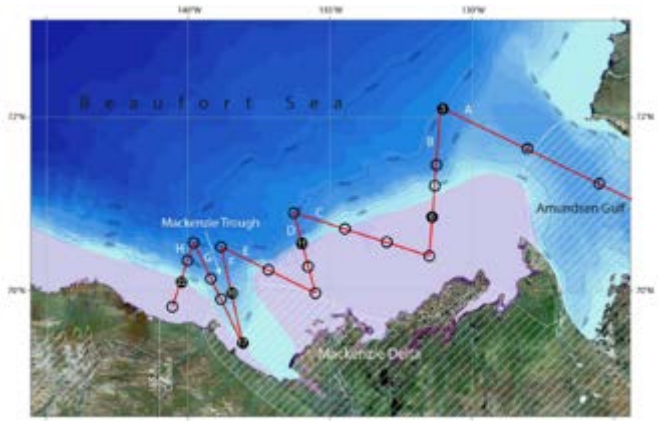
PI: Dr. Jorien Vonk

Vrije Universiteit Amst

10 participants/7 working days

Fall 2020

Postponed to 2021 or 2022



Proposals selected for funding – Implementation confirmed

IB Oden, SE

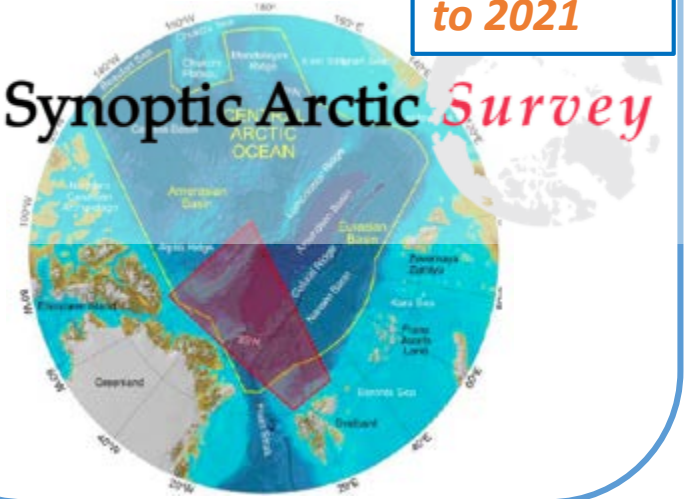
VACAO

Ventilation and Anthropogenic Carbon in the Arctic Ocean-Supporting measurements of noble gases and ^{39}Ar in the Central Arctic Ocean

PI: **Dr. Tim Stöven,** Early Career Scientist, GEOMAR, DE

2 berths in 2020

Postponed to 2021



IB Oden, SE

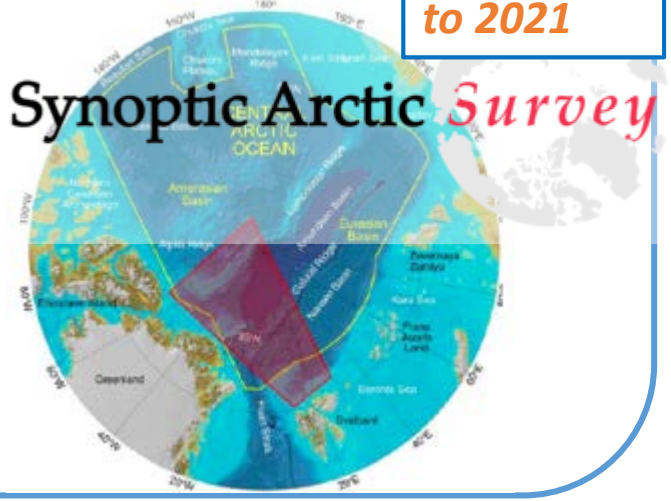
TRACE

TRace gAses (N2O, CO) Cycling in the Arctic marine Ecosystem

PI: **Damian L. Arévalo-Martínez,** Early Career Scientist, GEOMAR, DE

2 berths in 2020

Postponed to 2021



IB Oden, SE

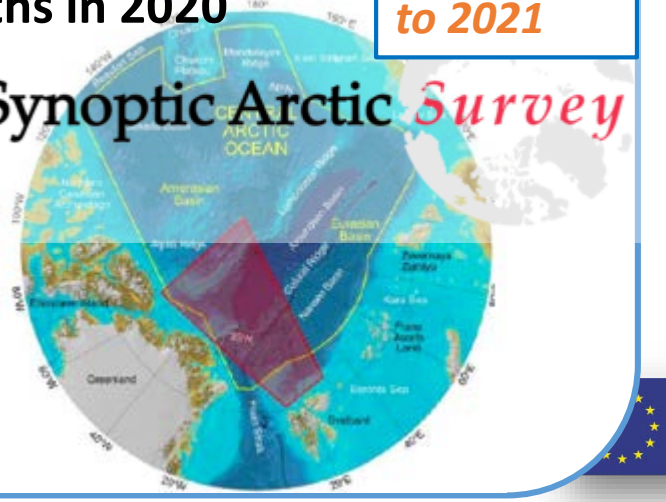
PROMIS

Production and export of phytoplankton-derived organic matter in the changing Arctic Ocean – Role of parasites, saprotrophs and mineral ballasting

PI: **Birthe Zaenker,** Early Career Scientist, The Marine Biological Association of the UK ,

2 berths in 2020

Postponed to 2021



Joint Research Activities:
Achievements to date

Objective 6: Expanding the monitoring and observation capacities in the Arctic Ocean

Use the increase in marine traffic in the Arctic to

1) implement a **“programme of ships and platforms of opportunity”** in the Arctic Ocean and

2) to **identify key technologies** that could lead to an improvement of ship-based and autonomous measurements in ice-covered seas.

Objective 6: Expanding the monitoring and observation capacities in the Arctic Ocean

Key outcomes to date

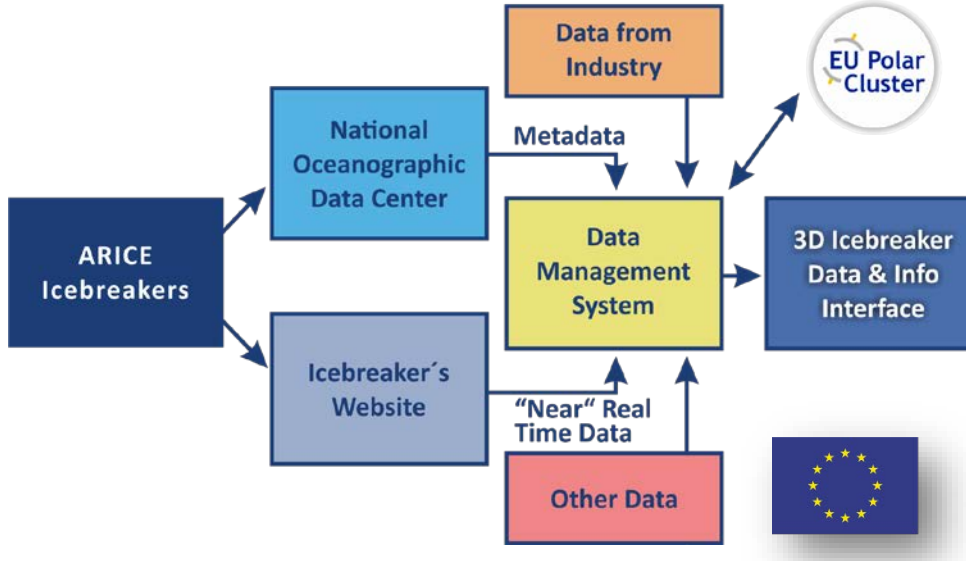
1. **Information** about the measurement capabilities of both research and merchant vessels (D6.1).
2. **Recommendations** of the variables for underway ship-born data collection (D6.2).
3. **Guidelines** for recommended technology, data collection and transmission systems for environmental data collection to support the “programme of ships and platforms of opportunity” (D6.3)
4. **Identifying new technologies:** understanding the monitoring capabilities and limitations of autonomous underwater vehicles (AUVs) in the Arctic Ocean (D6.4).

Objective 7: Enhancing virtual and remote access to data

Establish the project data management system and develop and adapt strategies and tools for efficient data access and data dissemination.
Development of a “novel” 3D icebreaker to visualize data and research equipment.

Key outcomes to date

- **ARICE Data Management Plan**: Describes the data that will be produced, collected or processed during the project, with plans for sharing and preservation of the data **(D7.1)**
- **Feedback** from data providers to evaluate the current status and identify potential gaps **(D7.2).**
- **Feedback** from the icebreakers’ operators to evaluate the possibilities and limitations in adopting the ARICE data management plan **(D7.3)**
- **Scheme** of data management system **(D7.4)**
- **Agreement** on procedures for virtual access **(D7.5)**



Cooperation with other projects, programmes and networks

Arctic Research Icebreaker Cons. ARICE

EU Polar Cluster

INTER ⇄ ACT

ARCSAR
Arctic and North Atlantic Security and Emergency Preparedness Network

EXTREME EARTH

INTAROS

EU-PolarNet

KEPLER

ervo
european research vessel operators

R S I O International Research Ship Operators

FORUM OF ARCTIC RESEARCH OPERATORS
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FARO

WORLD METEOROLOGICAL ORGANIZATION

European Polar Board
EUROPEAN POLAR BOARD

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