

Eurofleets 2



New operational steps towards an
alliance of
European research fleets



Overview on Marine Research Infrastructures, Scientific capacities, areas of research operations

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Technical
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ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR-
UND MEERESFORSCHUNG



POLARFORSKNINGS
SEKRETARIATET
SWEDISH POLAR RESEARCH SECRETARIAT

OBJECTIVES

Polar Vision



General:

Polar Vision within **EUROFLEETS2** aiming at **integrating the European Polar Research Vessel (PRV) establishing models for implementing a joint coordination** of PRV, together with the collaboration of other Nations.

Objectives

Main Aims:

- **determining the available capacities of Polar Research Vessels,**
- comparing that with the scientific demand, in accordance with IASC (International Arctic Science Committee) and SCAR (Scientific Committee on Antarctic Research), for research in the Polar Oceans and
- **establishing models for optimization of this fleet by better coordination of the vessels' scheduling and by harmonizing the deployment of ice-strengthened research vessels with the heavy icebreakers.**

WP3 main deliverables contributions from EF2

DELIVERABLES:

- **D3.1** Survey of the **existing polar research data systems and infrastructures**, including their architectures, standards/good practice baselines, policies and scopes (M12) (CNR-DTA)
- **D3.2 European Polar Infrastructure Catalogue incl. all types of polar infrastructures**, facilities and large instruments (such as AUV's and ROV's) based on the model of the INTERACT Arctic station catalogue and with the agreement and participation of the INTERACT community. It will provide all necessary information on the capacities of European Arctic and Antarctic infrastructures to support science and their availability to international scientists. (M16) (IPEV)
- **D3.3** Survey of **existing use of space assets by European polar operators**, including recommendations for improved coordination (M24) (NERC-BAS).

Report on the feasibility of year round, regular research operations in ice-covered areas:

Related to :

- A.- Determination on the available capacities for PRV's
- B.- Summer and Winter Operations
- C.- Areas access Polar Areas

New IMO Polar categories and its equivalents in IACS.



Category	Ice Class	Upper Limit of Ice Thickness (cm)									
		New	10	15	30	50	70	120	200	300	Old/ > 3m
A ¹	PC1	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	PC2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	PC3	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	PC4	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	PC5	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
B ¹	PC6	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	PC7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C ²	1B	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	1C	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	II	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	O/W	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
			Green	Green	Green	Green	Green	Green	Green	Green	Green

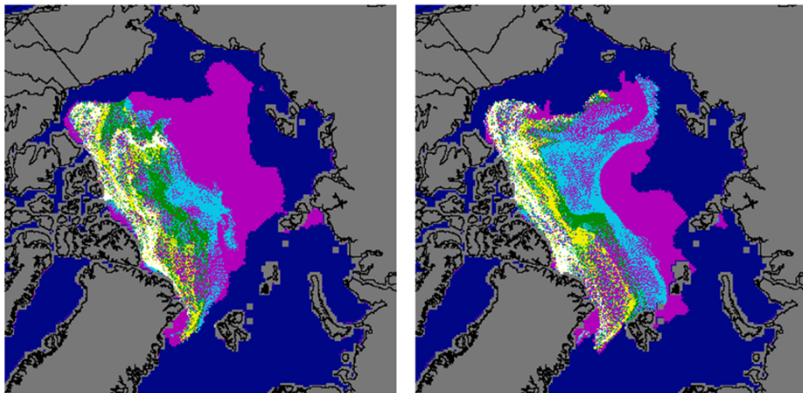
■ Within capability
■ Marginal capability
■ Outside standard capability

Multiyear covered ice for Arctic 2013-2014

September Arctic Sea Ice Age

2013

2014



NSIDC courtesy M. Tschudi, University of Colorado Boulder

■ First-year ice (<1 year old) ■ Second-year ice (1-2 years old) ■ Third-year ice (2-3 years old)
■ Fourth-year ice (3-4 years old) ■ Fifth-year ice (4+ years old)

Category	Ice Class	Limiting Ice Thickness (m)	Threshold ice Thickness for Low Speed Operation (m)	Code
A	PC1	Any ice		A1
	PC2	Any ice		A2
	PC3	Ice >3m	Any ice	A3
	PC4		3	A4
	PC5		1.2	A5
B ¹	PC6		0.7	B1
	PC7		0.7	B2
C ²	1B		0.5	C1
	1C		0.3	C2
	1D		0.15	C3
	O/W		0.1	C4

Revised Icebreakers compilation under new Polar Code (PC1-PC5)

Region	Polar Code Category	IACS Class	Ship Name	Picture	Country	Length	Built year	Operator	Ice Class	Research Equipment	Operating area	Major Refit	Supply Station	
EUROPE	A	PC1 to PC3	Polarstern		Germany	118	1982	AWI	100 A5	100/100	Antarctic Arctic	2002	Yes	
			Oden		Sweden	108	1988	SMA	DNV-Polar 20	60/100	Arctic	Yes		
			Akademik Federov		Russia	141	1987	AARI	KM * ULA [2]A2	50/100	Antarctic Arctic	Yes		
WORLDWIDE	A	PC1 to PC3	Healy		USA	128	1997	USACGC	PC2	60/100	Antarctic Arctic		Yes	
			Polar Sea		USA	122	1978	USACGC	PC2	25/100	Antarctic Arctic		Yes	
			Louis S. St-Laurent		Canada	120	1969	CCG	A4	60/100	Arctic	decom m. 2017	No	
			Amundsen		Canada	98	1979	CCG	100 A3	50/100	Arctic	2003	No	
			Shirase II		Japan	138	2008	Ministry of Defence & JARE	PC3	50/100	Antarctic Arctic		Yes	
			Sikuliaq		USA	80	2014	U. of Alaska UNOLS	PC5	100/100	Arctic			
EUROPE	A	PC4 to PC5	James Clark Ross		UK	99	1990	BAS	Lbyds IAS	100/100	Antarctic Arctic		No	
			Akade. Tryoshnikov		Russia	134	2011	AARI	PC4-PC5	50/100	Antarctic Arctic		Yes	
WORLDWIDE	A	PC4 to PC5	Xue Long		China	167	1993	CAA	CCS B1	50/100	Antarctic Artic	2013	Yes	
			N.I.B. Palmer		USA	94	1992	USAP	A2	100/100	Antarctic		Yes	
			Agulhas II,		Souht Africa	134	2012	SANAP	PC5	60/100	Antarctic		Yes	
			Araon		South Korea	110	2009	KOPRI	PC5	100/100	Antarctic Arctic		Yes	
			Aurora Australis		Australia	95	1989	P & O / ADD	A1	60/100	Antarctic		2013	Yes
			Almirante Irizar		Argentina	121	1978	Argentina Navy	PC5	60/100	Antarctic		underway	Yes

Revised Icebreakers compilation under new Polar Code (PC6-PC7)

Region	Polar Code Category	IACS Class	Ship Name	Picture	Country	Length	Built year	Operator	Ice Class	Research Equipment	Operating area	Major Refit	Supply Station
EUROPE	B	PC6 to PC7	Aranda		Finland	59,2	1989	Finnish Env. Insti. Tromso/Unive	1A Super	100/100	Artic		No
			Helmer Hanssen		Norway	64	1988	rsity of Tromso	Dnv 1A	100/100	Artic	1992	No
			Lance		Norway	61	1978	Tromso/Norw	Dnv 1A	100/100	Antarctic	Artic	No
			Maria S Merian		Germany	95	2005	egin Polar Ins. IOW_Warne	PC 7	100/100	Artic		No
			Sanna		Greenland	32,3	2012	munde GINR	Ice 1A	100/100	Artic		No
WORLD	B	PC6 to PC7	L. M. Gould		USA	70,2	1997	USAP	ABS A1	50/100	Antarctic		Yes
EUROPE	C	ICE CLASSIFIED	Arni Fridriksson		Iceland	69,9	2000	MRI	1B	100/100	Artic		No
			Dana		Denmark	78	1981	DTU Aqua	1C	100/100	Artic	1992	No
			Ernest Shackleton		UK	80	1995	BAS	DNV; ICE05	25/100	Antarctic	2001	Yes
			G.O. Sars		Norway	77,5	2003	UiB	Ice 1C	100/100	Antarctic	Artic	No
			Hesperides		Spain	82,5	1991	Spain Navy/UTM	Ice 1C	100/100	Antarctic	Artic	Yes
			OGS-Explora		Italy	73	1973	OGS -Trieste	1c	100/100	Antarctic	Artic	No
WORLD	C	ICE CLASSIFIED	Almi. Maximiniano		Brasil	93,4	1974	Brasil Navy	Ice 1C	100/100	Antarctic		Yes
			Oscar Viel		Chile	90	1969	Chile Navy	Ice 1C	25/100	Antarctic		Yes
			Sagar Kanya		India	100	1983	NACAOR		100/100	Antarctic	Artic	
			Tangaroa		New Zealand	70	1991	NIWA	Ice 1C	100/100	Antarctic		

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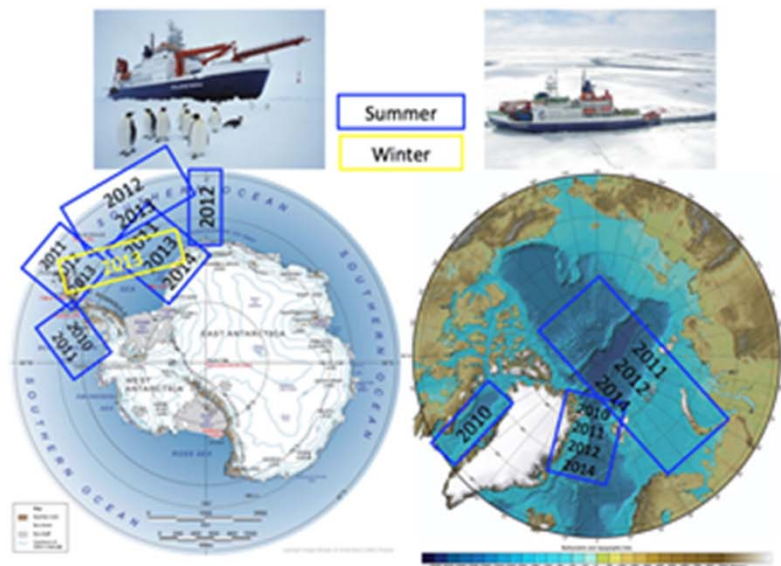
POLAR RESEARCH VESSELS		IACS	
World	Europe		
Healy, Polar Sea, L. S. St. Laurent, Amundsen, Shirase II	Polarstern, Oden, Akademik Fedorov	PC1 PC2 PC3	Year-Round navigation in Polar Waters
Xue Long, N. B. Palmer, Agulhas II, Araon, Aurora Australis, Alm. Irizar	J. Clark Ross, Akademik Tryoshnikov	PC4 PC5	
Winter navigation in Sub-Polar waters	IA Super	PC6 PC7	Summer Navigation in Polar waters
	IA		
	IB IC		
	F-SICR Finnish-Swedish Class Rules		

Icebreakers & Ice Classified RV's for research Polar Regions



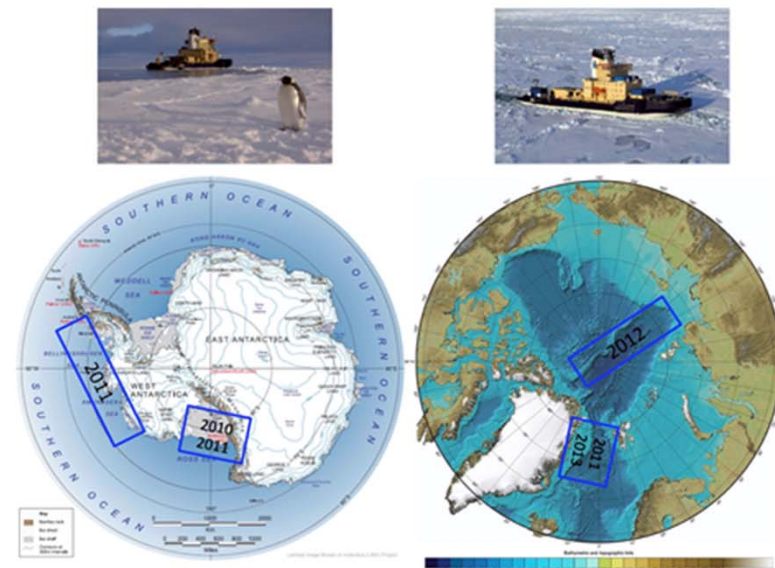
OPERATIONAL AREA'S FROM THE LAST 5 YEARS AT ARCTIC AND ANTARCTIC POLAR REGIONS

PRV POLARSTERN

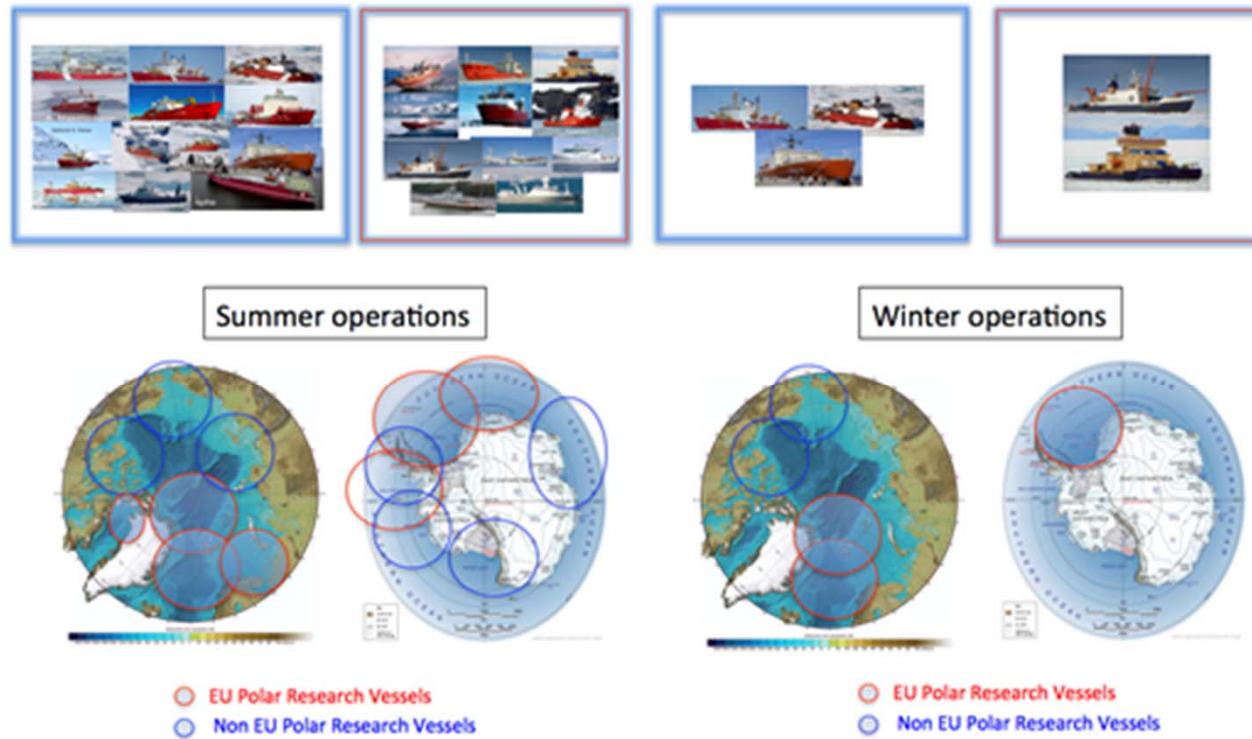


These pictures show that in summer time PC1-PC3 PRV's like Polarstern and Oden are capable to reach almost anywhere of multi-year ice.

PRV ODEN



WORLD WIDE OPERATIONAL AREAS FROM THE LAST 5 YEARS AT ARCTIC AND ANTARCTIC POLAR REGIONS.



Summary

Status of the European and International Polar Research Fleets & equipment

Compilation of PRV's

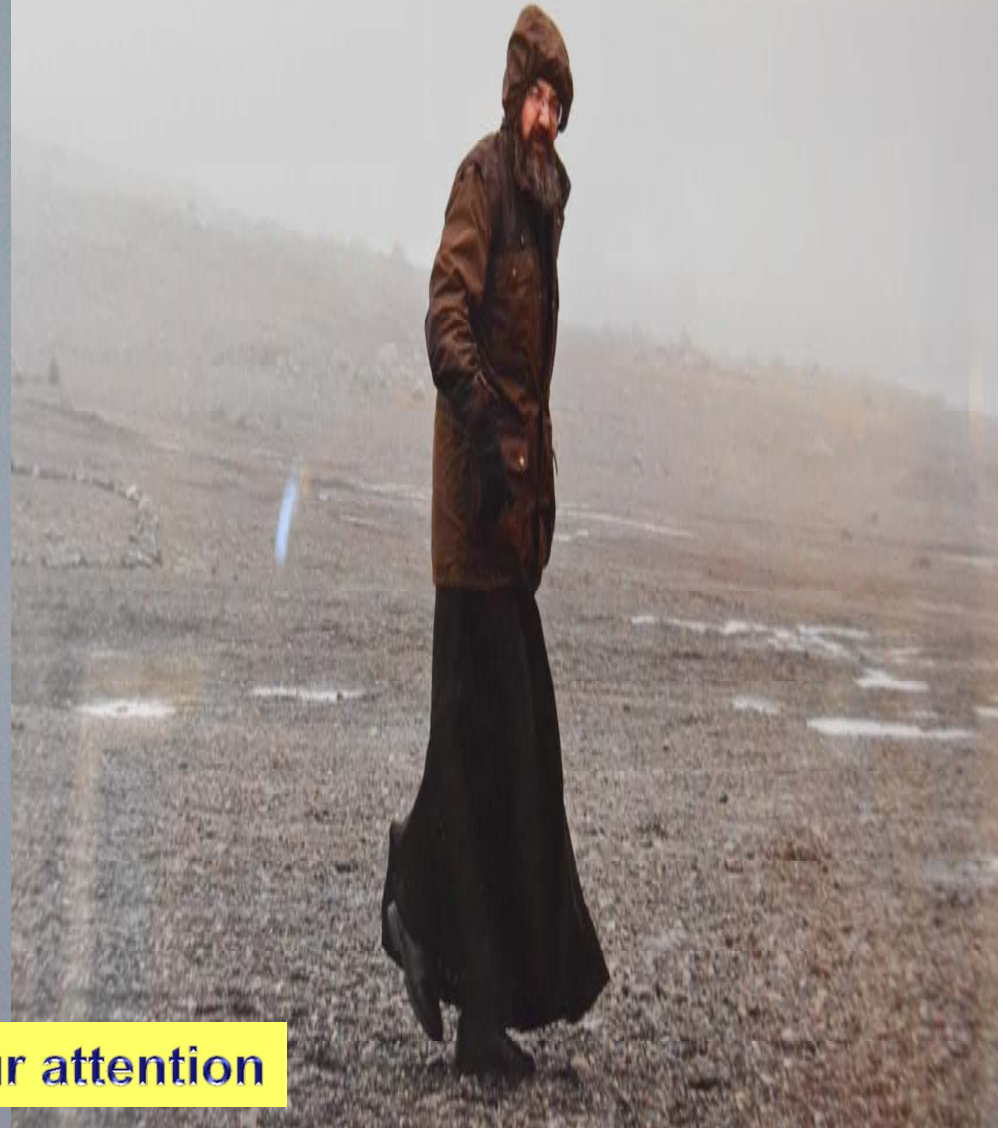
- **Characteristics of Full Range Icebreakers (Arctic & Antarctic)**
Ship Capabilities, including scientific equipment's, laboratories type, cargo capacity, etc.
- **Characteristics of Ice Classified Vessels (Arctic & Antarctic)**
Ship Capabilities, including scientific equipment's, cargo capacity, etc.

- Ice Type and Ice extent PRV's at both Poles**
- Areas of Activity, Cruises and Research**
- PRV'S Seasonal Operations (winter, summer) Worldwide**
- Overview of EU PRV'S Operations within the last 5 years**

ARTIC



ANTARCTIC



Thanks for your attention