

# ARICE Webinar

## Pre-cruise preparation and risk reduction

19 February 2019



Grant agreement No 730965

# ARICE Webinar

## Pre-cruise preparation and risk reduction

Organized by APECS and IOPAN

Moderation: Josefine Lenz (APECS, AWI)



**Agnieszka Beszczynska-Möller (IOPAN)**

Planning ship-based & long-term oceanographic field studies and pre-cruise logistics

**Allison Fong (AWI)**

The rewards and challenges of multi-disciplinary research – building linkages and increasing impact

**Monika Kedra (IOPAN)**

Biological oceanographer/marine ecologist perspective

**Q&A**

# ARICE Webinar

## Part I. Planning ship-based and long-term oceanographic field studies and pre-cruise logistics

Agnieszka Beszczynska-Möller, IOPAN



[www.arice.eu](http://www.arice.eu)



Grant agreement No 730965



# MAIN OBJECTIVE OF ARICE

Coordinated trans-national access “free of charge” for all European and international scientists to the ice-covered Arctic Ocean on board the six ARICE European and international research icebreakers:



# GOAL OF THE ARICE WEBINAR



Most Early Career Scientists who have taken part in one or more oceanographic research cruises are not fully aware of the **phases of pre-cruise science** and **logistics planning** that lead to a **successful expedition...**



All research cruises are different (type of research vessel/icebreaker, area of operation, ship operator, lead institution, scope of activities and many others...

**BUT**

...**general rules** and **requirements** are mostly **similar everywhere** when you are planning your research activities and logistics for field operations...

# GOAL OF THE ARICE WEBINAR



Most Early Career Scientists who have taken part in one or more oceanographic research cruises are not fully aware of the **phases of pre-cruise science** and **logistics planning** that lead to a **successful expedition...**



All research cruises are different (type of research vessel/icebreaker, area of operation, ship operator, lead institution, scope of activities and many others...

**BUT**

...**general rules** and **requirements** are mostly **similar everywhere** when you are planning your research activities and logistics for field operations...

# PROPOSAL PLANNING



Show that you will make good use of the capabilities of a research vessel. Even more important when applying for an icebreaker...



Does your **science question** require collection of new field data to answer the question?



Does it require data from a **specific region** or under specific conditions that can be found in different areas?



Is your field work **novel**? **feasible**? **cost-effective**?



Do you need to collect your data **in person** or can you send an instrument/sampler/autonomous device to be operated by **other colleagues**?



Are there **other cruises** already planned in the geographic area?  
Can your research be done as a **side project** or does it need **dedicated cruise**?

# SHIP SCHEDULING AND REQUIREMENTS

---



## Know the organization which is responsible for cruise scheduling

(different models - single institution versus consortium, open calls, government entity which plans an expedition,...)

## Make sure you apply for the right platform:

### NEEDS EQUIPMENT

What kind of equipment you need - sonars, flow-through seawater, data acquisition systems, deck space, load capacity, lab space, oceanographic/mooring winches, right wires, frames, cranes, a moon pool, bunk space - to do your cruise?

### NEEDS PLATFORMS

Is the ship the right 'size' for your work? Does she have the appropriate ice class? Helicopters? Small boats?

### NEEDS PERSONNEL

Does the operator provide marine technicians familiar with operations you want to conduct? Or do you need to build and bring onboard your own team?



# PRELIMINARY CRUISE PLAN IN YOUR PROPOSAL



## WHERE

Where is your **study area**? Define in detail if needed or indicate a region but be specific about how important is the exact location for your work.

## WHEN

Is there a **seasonal component** that requires a specific time at sea?

## HOW LONG

How much **time** at sea is required? How many **stations**? In what **sequence**? Use available cruise planning tools to be as specific as possible.

## HOW STRICT

Is there **flexibility** in the direction that your cruise can be carried out? Does your activity have to be a **continuous** operation or can it be **alternated** with activities of other groups?

## NEEDS

Does your science program require the availability of ship **personnel** or **equipment** (e.g. ship's corer, water carousel or ROV)? Funds?

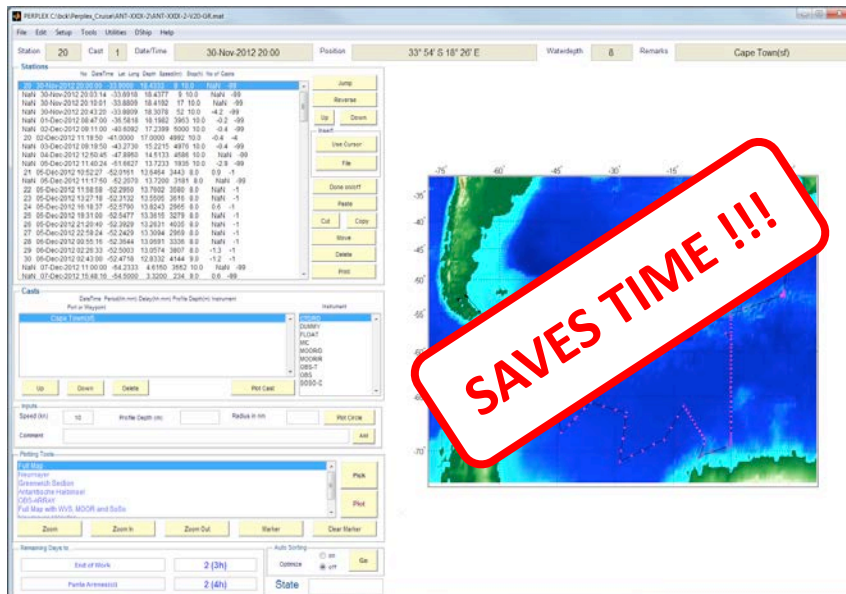
## RISKS

Do you have a **back-up plan**? Bad weather, heavy ice situation, unexpected delays, technical failures, bad luck...

# CRUISE PLANNING TOOLS



- Some operators just require submitting a simple Excel sheet with waypoints...
- A dedicated software or website providing tools to plan a sequence of different activities, on station time, transit time
- There are free tools available for planning and execution of ship expeditions, e.g. **PERPLEX** Program for **E**xpedition **R**oute **P**lanning and **E**xecution (AWI, Rohardt):



- Multi-user data input prior to the survey/research cruise
- Guided creation of cruise schedule with a user-friendly GUI
- Default and customizable parameters for research gear and station work time
- Data bases of sea charts, coast lines, EEZ's, ports, and scientific instruments
- Mapping tools with water depths information and different geodetic projections
- Planning of survey grids (e.g. for geophysical surveys)
- Geographic and bathymetric visualization of planning results
- Automatic schedule update after changes with the adjustment of the ship time
- Weather or ice conditions can be included☑

# SHORT-TERM CRUISE PLANNING – BUILDING SCIENCE TEAM



What **skills** are **needed** for a cruise, over-the side operations, sample processing, data collection & processing?



What **skills** can the **ship's crews** and **technicians** supply?  
What are their daily schedules (does it comply with your plans)?



What education and outreach goals can you accomplish by inviting **students, teachers, press**?



Do you have **enough people** for round-the-clock operations?  
Do you have **enough experienced people** to lead specific activities?  
*(a common mistake of a young cruise leader – I can do everything by myself...)*



Choose people who you can rely on to be **team players**  
(and ask about sea-sickness and physical abilities...)

# SHORT-TERM CRUISE PLANNING – COMMUNICATION LINES



## COMMUNICATION

**Establish** communication lines with Collaborators, Cruise Coordination, Ship Operator, Port Office, and Technical Support Personnel – right after your application for shiptime is accepted.

## COMPREHENSIVENESS

**Learn in detail** about your responsibilities and deadlines as a Chief Scientist (Cruise Leader, Chief Scientist) or a Team Leader – no loose ends! Different institutions/ship operators may have different models.

## COORDINATION

**Work out** your cruise details with leaders of all science teams (if you are CS) or with your CS (if you are a Team Leader) – if planning is not coordinated at this stage, the most likely your activities will clash at some point.

## COLLABORATION

**Meet** all science party members needs - if you are Chief Scientist - it is your responsibility, not a favour. Use planning tools, be realistic, ask if you do not know specifics about other activities, optimize time use...



# SHORT-TERM CRUISE PLANNING – **KNOW YOUR VESSEL**



- **Establish** early what equipment you are bringing, what equipment is supplied by the ship, leased or borrowed, and how will it all be integrated.
- **Visit** the vessel and hold a pre-cruise meeting with the operator.
- **Search** for different sources of information:
  - some operators provide **handbooks** for cruise participants (e.g. Polarstern, Merian, UK vessels JCR and ES) with all technical and life on board details
  - some provide more general **brochures** (Oden, Fennica)
  - other have extensive **on-line information** system (US research vessels)
  - in some cases there is no document or website available but **material from previous cruises** (blogs, movies, reports) can be useful (e.g. Kronprins Haakon)
- **Request** information you cannot find – better asking twice than guessing wrong...

# SHORT-TERM CRUISE PLANNING – **KNOW YOUR VESSEL**



## What is most important to know:

- ➔ general ship information, machinery, ice capability, transit speed
- ➔ crew and their working hours and availability
- ➔ working deck arrangement and rules
- ➔ labs plans (inc. temperature setup, electric supply, pure seawater intakes, etc.)
- ➔ container space and accessibility (and junction boxes)
- ➔ arrangement, max. load and working range of lifting gear (A-frames, movebars, cranes)
- ➔ scientific winch system (friction/moorings/rewinding winches, cables, wires, ...)
- ➔ vessel hydroacoustic systems (sonars, VM-ADCP, deep water echo sounder, multibeam)
- ➔ other measuring systems provided by a ship (CTD system, water carousel, L-ADCP, thermosalinograph, meteo station, positioning systems)
- ➔ ship data management system and on-line data flow
- ➔ communication and life onboard details

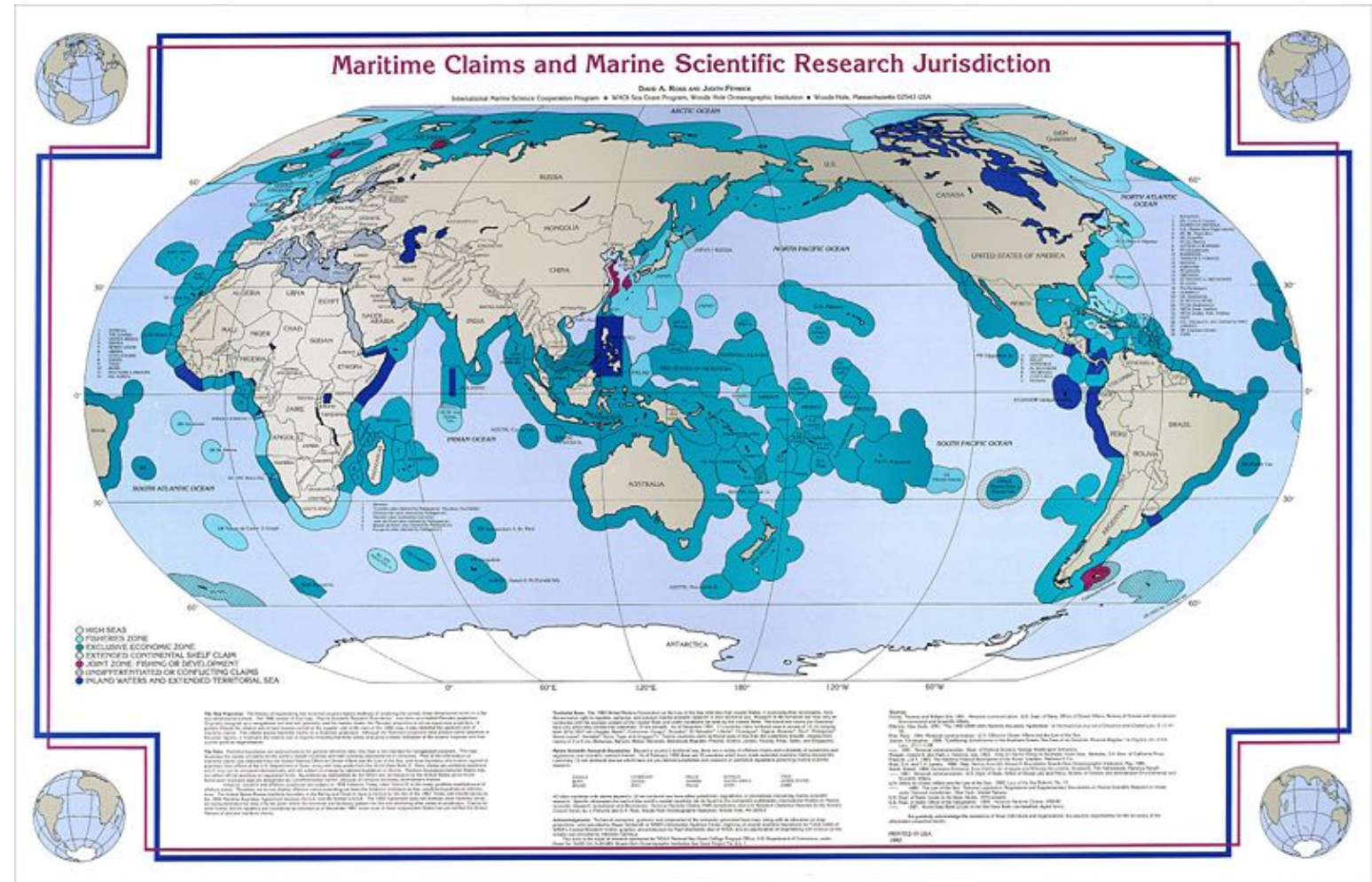
# RESEARCH CLEARANCES AND PERMISSIONS

Countries have jurisdiction over marine scientific research within their territorial seas (TS) and exclusive economic zones (EEZ)

You need to apply for **Research Clearances to Conduct Marine Scientific Research** within the Exclusive Economic Zone

Application lead time for some countries can be up to 7 months

Start **environmental permitting** processes as soon as possible (e.g. for seismic, acoustics, work in protected areas)



# SHIPPING, LOGISTICS, CUSTOM CLEARANCES, AUTHORIZATION



Chief scientist receives **information from the vessel operator** regarding packing and shipping requirements – it is your responsibility that all participants get informed and understand the details.



Choose a **freight-forwarder** who has international experience and ideally, is also a licensed **customs broker**. If vessel operator can recommend an **agent** to the science party - follow that.



**Ship in advance** - cargo should arrive in port approximately two weeks prior to the start of the cruise – better pay the storage than delay your cruise



Have a solid **contingency plan** in case equipment is damaged or lost during shipment or delayed



**Pack** your cargo according to IATA standards and **document** meticulously, in particular "difficult items" as dangerous goods (IMO declaration), ITAR items, lithium batteries, isotopes, gas cylinders, and many other.



# LEADING YOUR CRUISE



Communicate key **objectives**



Set **priorities** (stations, samples, deck operations)

Establish **daily plans** and a watch-schedule



Keep daily **meetings** with participants to update daily operations plan

Have **back-up** plans



Keep tabs on your crew's research needs, health, safety

Respect chain of **command**



Establish a **friendly work environment** but be prepared to handle any personnel conflicts which may arise

Establish a **safety** awareness and culture



Understand and appreciate **cultural differences**

**BUT ALSO - HAVE FUN WITH YOUR CRUISE !!!**

# ARICE Webinar

## Part II. The rewards and challenges of multi-disciplinary research – building linkages and increasing impact

Allison A. Fong, AWI

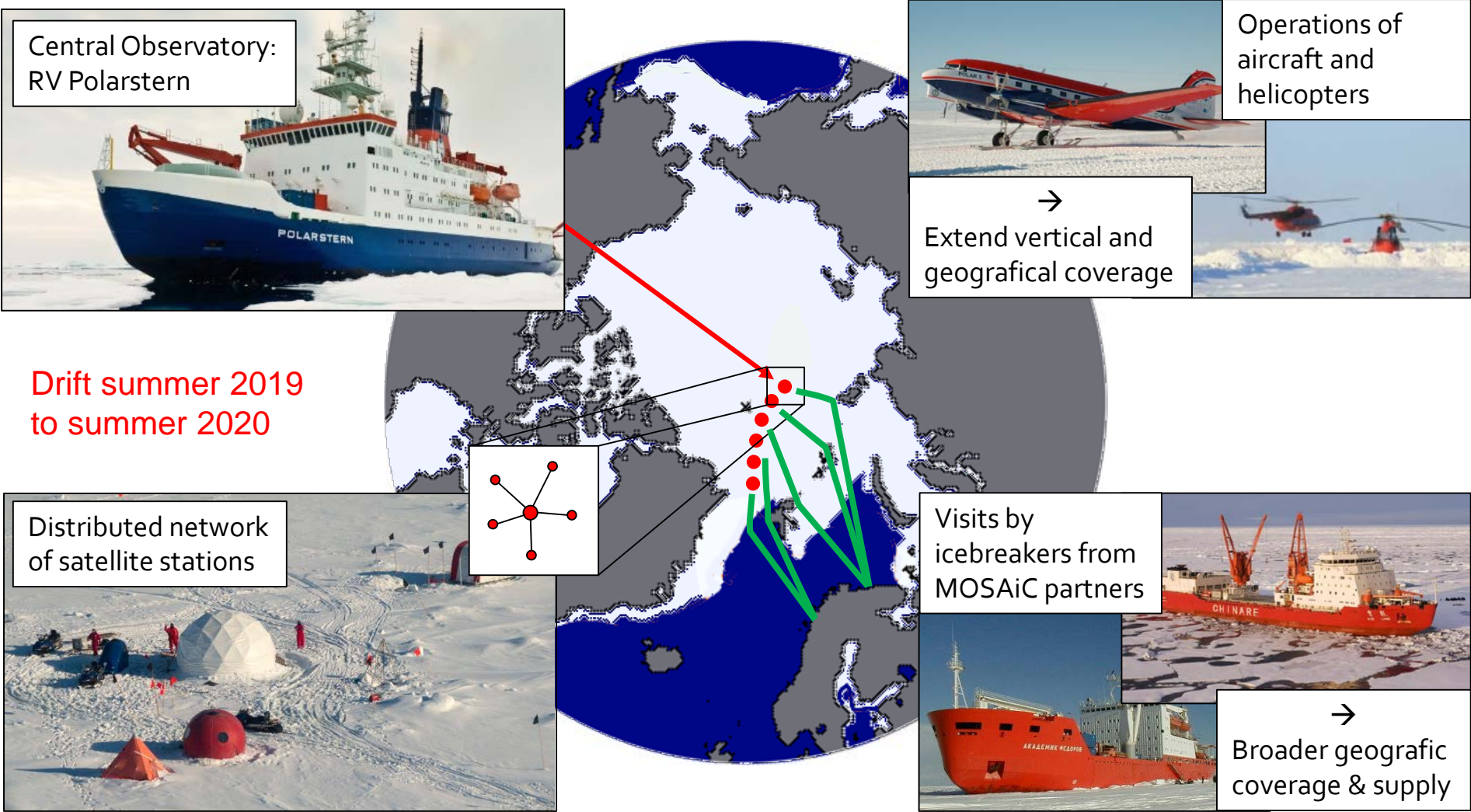


[www.arice.eu](http://www.arice.eu)



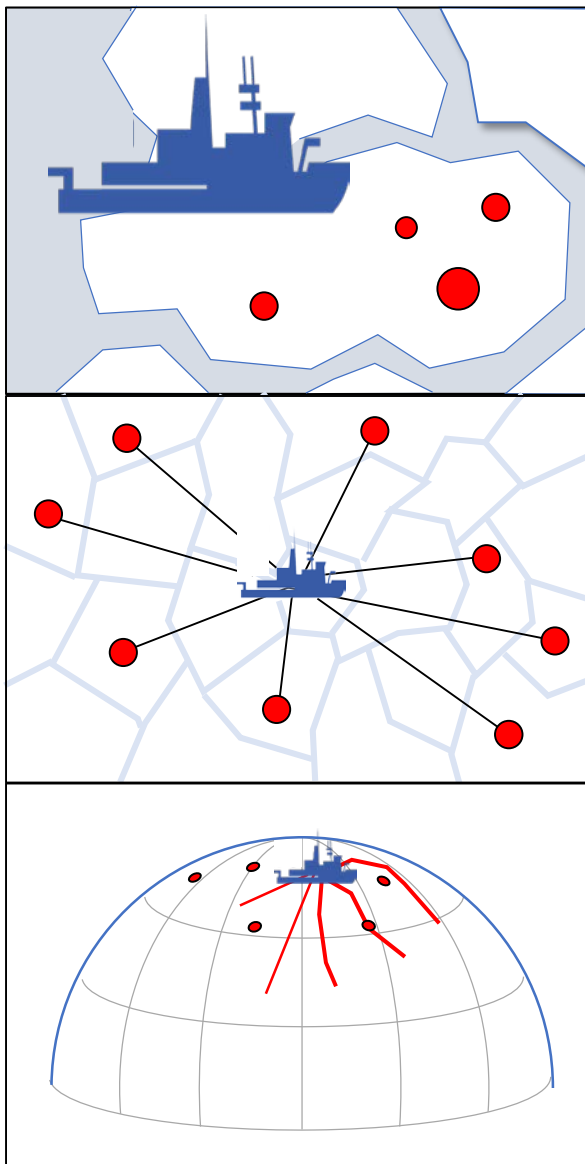
Grant agreement No 730965

# MOSAiC: Multidisciplinary drifting Observatory for the Study of Arctic Climate



**Largest Arctic research expedition ever**

# MOSAiC Experimental Approach: know the goals and strategies



## **Local: Central Observatory**

- Ship based
- Sea ice stations
- Process scale observations

< 5 km

## **Regional: Distributed Network**

- Sea ice stations visited by helicopter
- Unmanned aircrafts
- Process & regional model
- Model grid cell

< 50 km

## **Arctic-wide linkages**

- Collaborating research vessels
- Aircraft (Polar 5,6)
- Arctic buoys, satellites
- Data assimilation studies
- Regional & global climate models

> 1000 km



# From vision to realization – it takes everyone working together





# What does it take to manifest something like MOSAiC?



## Identify BOTH common and unique individualized GOALS

- Why do I need to be onboard?
- What technical/scientific support do I need for success?
- How might my measurements be useful to others?
- Investments and returns – am I making the most of this opportunity?
- Why, how, and when do I build collaborations?

## Initiate communication EARLY and OFTEN

- What are the communication pathways?
- Communication is not just talking, **it's a lot of listening**, too!
- Create direct, but inclusive, paths when possible.
- Keep clear, accessible records of your communications with relevant parties.
- Identify action items, responsible persons, and deadlines.



# COMMUNICATION: **Jump-starting collaborations**

---



- Awareness – maximizing returns on investments
  - Integration
  - +/- impacts of your work and the work of others
  - Prioritize (this is a verb)
  - Reduce [unnecessary] redundancy
  - Time!
  - Money!
  - Sleep?

# COOPERATION: **Jump-starting collaborations**

---



- Roles and responsibilities
  - What are my responsibilities?
  - Do I understand the roles of cruise leader, group leader, and team member AND my relation to these entities?
  - More coordination is needed when multiple parties onboard
  - Common philosophy
  - Common language
  - Coordinated actions
  - Most valuable question: How can I help?

# COLLABORATION: Shared purpose, greater rewards

---



- Transparent and inclusive structures
  - Propose and facilitate open discussion and planning of:
    - data policies
    - sample/data set completion timelines
    - publication plans and policies
- A more inclusive philosophy creates safe space, and therefore, creative space for developing unique ideas
- Everyone has the potential to be a partner

# Collaboration requires dedicated effort!

---



- Doing more is not equal to doing better
- A more intensified focus on coordination and collaboration can yield >>>> greater rewards!
- Clear communication is essential
- Time and energy are the most valuable resources
- Everyone wants a slice of the cake – richer cake, not bigger cake
- Be inspired to share and invest in each other

# ARICE Webinar

## Pre-cruise preparation and risk reduction

### Part III. Biological oceanographer/marine ecologist perspective

Monika Kędra



[www.arice.eu](http://www.arice.eu)



Grant agreement No 730965

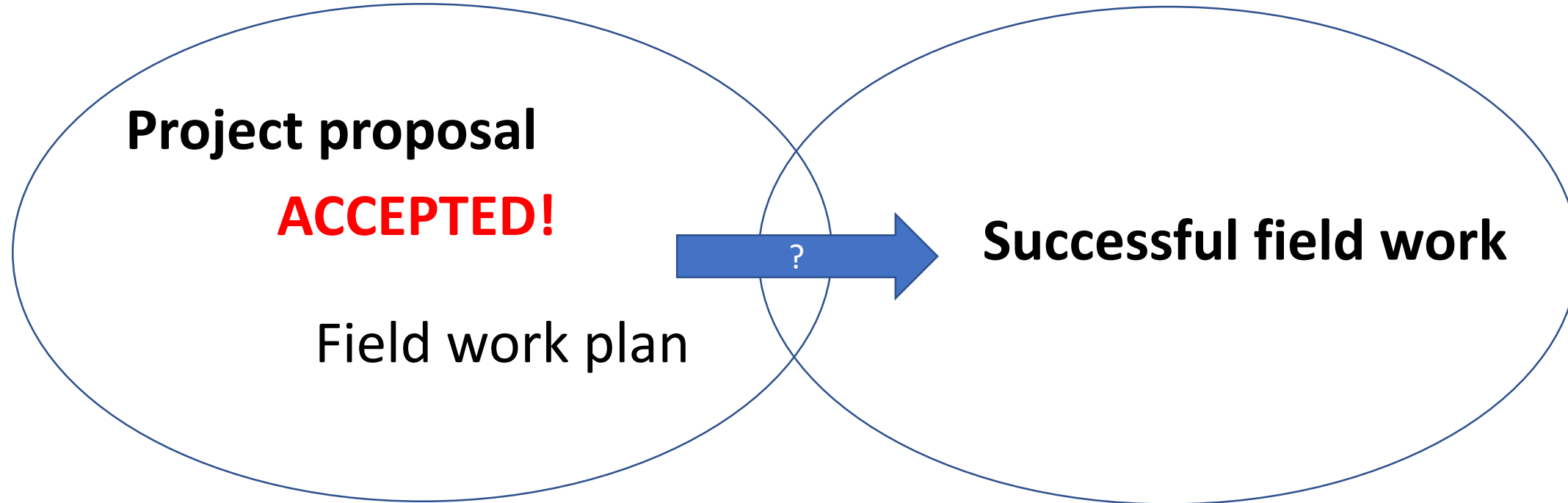


# PRECRUISE PLANNING - how to make sure my plan will work?



Field work planning – proposal versus reality

What do I need to make my field work plan successful field work?



# PRECRUISE PLANNING - how to make sure my plan will work?

---



- Check your plan – can it be improved?
  - do not hesitate to ask more experienced colleagues
- Know your vessel and cruise plan:
  - check what is available on board and what you need to bring
  - check what other teams are bringing and planning to sample – avoid redundancy
- Plan your sampling
  - plan each activity
  - plan each step of your activity
- Remember about small (but crucial!) details
- Be prepared for pesimistic secenario
  - assume things may break or be lost – pack extra supplies



# PRECRUISE PLANNING - how to make sure my plan will work?

---



## Example – benthic sampling

- What kind of gear do I need? Which equipment is available on board? Can I adjust?
- Is everything I need available or only basic things? Think about each step and pack all that is missing onboard
- How many sampling stations and replicates will I sample? Do I know the sample size? How many sampling containers do I need? Prepare more and various sizes
- How do I preserve my samples? Think in advance about permissions and transport of dangerous goods/ chemicals
- How does my sampling affect other teams sampling?
- Remember about personal gear!



# PACKING and SHIPPING

---

- Check your plan again
- Make a detail list of things you need
- Check your vessel/institution/country (customs) requirements
- Check with your shipping agent for limits and rules, including customs
- Pack and tick off
- Make a list of things you packed and recheck
- Label your boxes/equipment clearly and according to rules
- Prepare a freight list/pro-forma invoice



# PACKING and SHIPPING – packing lists



## Box 1

- ✓ Sampling containers 1l x 100

## Box 2

- ✓ Whatmann filters x 200
- ✓ Spatula
- ✓ Water containers x 10
- ✓ Meiofauna sampling kit

## Box 3

- ✓ .....

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	FREIGHT LIST														
2	KIND OF EXPEDITION:		RV POLARSTERN		PARTICIPANT:		Monika Kedra					KIND OF FREIGHT:		NORMAL	
3	CRUISE NO.:		PS 92		E-MAIL ADDRESS:		<a href="mailto:kedra@iopan.gda.pl">kedra@iopan.gda.pl</a>					DATE:		2015-02-20	
4	CRUISE LEG / FLIGHT NO.:		ARK_29_1		PHONE NO.:		+48 58 73 11 779					CONTAINER NO.:			
5	COLOUR CODE:	BLUE	WHITE	GREEN	INSTITUTION:		IOPAN Powstancow Warszawy 55 81-712 Sopot Poland					REQUISITIONER NO.: (ONLY FILLED BY AWI-LOGISTICS)			
7	IDENT-NO.	KIND OF PACKING	STOWAGE (ONLY FILLED BY AWI-LOGISTICS)	ITEM (CONTENT - KEYWORDS)					MEASUREMENTS LxWxH (CM)			VALUE (€)	WEIGHT (KG)	VOLUME (CBM)	
8	MK-1	ALUBOX		macrobenthic sample kit, sieves, cryotubes, gloves, boots, hard hat, personal cloths including Fladen jacket and 2 x pants, 2 x plastic containers, hose handles, bungee cords, tapes, zip-lock bags					80,0	60,0	41,0	1400,00	33,00	0,197	
9	MK-2	ALUBOX		plastic cans, meiofaunal sampling kit, 150 sample containers, plastic buckets, office supplies, small shovels, spatula, small laboratory equipment inc. forceps, scissors, Whatmann filters, 3 x 0,25 kg borax					80,0	60,0	41,0	370,00	26,00	0,197	
10	MK-3	ALUBOX		200 plastic bottles for samples					80,0	60,0	41,0	350,00	15,00	0,197	
11															

Invoice Pro-Forma

Nr	Packing	Content	Value	Dimensions	Weight
1 (MK-1)	Alubox	Macrofaunal sampling kit, sieves, cryotubes, gloves, Fladen pants and jacket, boots, hard hat, 2 plastic water containers, bungee cords, tapes, hose handles, zip-lock bags	1400 euro	80 cm x 60 cm x 41 cm	33 kg
2 (MK-2)	Alubox	Meiofaunal sampling kit, 2 plastic cans, sample containers (150 x 100 ml), round bucket, 3 x square buckets, office supplies, shovels, spatulas, knife, garbage bags, small laboratory equipment (forceps, scissors etc), Whatman filters, 0,75 kg borax	370 euro	80 cm x 60 cm x 41 cm	26 kg
3 (MK-3)	Alubox	Sample containers: 40 x 250 ml, 20 x 500 ml, 20 x 750 ml, 30 x 1000 ml	560 euro	80 cm x 60 cm x 41 cm	13 kg
TOTAL:			2330 euro		82 kg





# PACKING and SHIPPING - labelling



## POLARSTERN-PS 92

Cruise ARK 29\_1 - Project N-398

From (home institution):

Monika Kędra

Institute of Oceanology PAS – IOPAN

Powstańców Warszawy 55

81-712 Sopot, POLAND

kedra@iopan.gda.pl

+48 58 73 11 779



# BOX MK-1

In transit to:

Master of the German Polar Research Vessel  
“Polarstern”

Alfred-Wegener-Institut Helmholtz-Zentrum  
für Polar- und Meeresforschung  
-Hafenlager-  
Brückenstr. 25  
27568 Bremerhaven - GERMANY



In transit to:

Monika Kędra  
Institute of Oceanology Polish  
Academy of Sciences  
Powstańców Warszawy 55  
81-712 Sopot Poland

kedra@iopan.gda.pl  
+48 58 73 11 779

**KEEP  
FROZEN!!!  
-20°C  
FRAGILE!!!**

# PACKING and SHIPPING - dangerous goods



- Check if you can transport your chemicals
  - Not all chemicals can be shipped, transported via deliveries companies, aircrafts etc.
  - If not, check if your chemicals can be packed in the vessel's harbour?
  - Communicate your needs to chief scientist
- Make sure the chemical is labelled correctly
- Make sure is it stored properly
- Make sure it is secured for transport
- Make sure the safety data sheet is attached
- Follow vessel and transport company rules
- IMO declarations



# PACKING and SHIPPING - dangerous goods



## Mercuric Chloride

### Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of Issue: 11/13/2007

Revision date: 11/20/2017

Supersedes: 11/20/2017

Version: 1.2



#### SECTION 1: Identification

##### 1.1. Identification

Product form	: Substance
Substance name	: Mercuric Chloride
CAS-No.	: 7487-94-7
Product code	: LC16590
Formula	: HgCl <sub>2</sub>
Synonyms	: bichloride of mercury / dichloromercury / mercury bichloride chloride

##### 1.2. Recommended use and restrictions on use

Use of the substance/mixture	: Veterinary medicine Laboratory chemical Photographic chemical Chemical intermediate Disinfectant
------------------------------	--

ThermoFisher  
SCIENTIFIC

## SAFETY DATA SHEET

Creation Date 08-Feb-2010

Revision Date 17-Jan-2018

Revision Number 4

### 1. Identification

Product Name	Formaldehyde solution 37%
Cat No. :	F75F-1GAL; F75P-1GAL; F75P-4; F75P-20
Synonyms	Formalin; Methanal; Methylene oxide; Oxymethane; Formic aldehyde; Methyl aldehyde
	Laboratory chemicals.
	Not for food, drug, pesticide or biocidal product use

Safety data sheet

## BEFÖRDERUNGSDOKUMENT FÜR GEFÄHRLICHE GÜTER

nach §8 GGVSee (IMO-ERKLÄRUNG)

### TRANSPORT DOCUMENT FOR DANGEROUS GOODS

(IMO-DANGEROUS GOODS DECLARATION)

Dieses Formular entspricht SOLAS 74, Kapitel VII Regel 4; MARPOL 73/78, Anlage III, Regel 4 und dem IMDG-Code, Kapitel 5.4

This form meets the requirements of SOLAS 74, chapter VII regulation 4; MARPOL 73/78, Annex III, regulation 4 and the IMDG-Code, Chapter 5.4

Versender (Name & Anschrift) Shipper (Name & Address) MONIKA KEDRA IOPAN POWSTANCOW WARSZAWY 55 81-712 SOPOT POLAND	Buchungsnummer(n) Reference number(s)
Empfänger Consignee IN TRANSIT TO MASTER OF RV POLARSTERN C/O MONIKA KEDRA	Beförderer Carrier
CONTAINER/FAHRZEUG-PACKZERTIFIKAT CONTAINER/VEHICLE PACKING CERTIFICATE	Container-/Fahrzeug-Nr.: Container-/Vehicle-Nr.:

00-424-9300  
001-703-527-3887

### 2. Hazard(s) identification

dangerous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Category 3  
Category 3  
Category 3



# PERSONAL GEAR

- Check vessel requirements for safety gear:
  - hats, gloves, floating coat, steel toe boots
- Check what is available onboard
  - check what you should bring
- Remember about warm personal cloths, gloves, hat, socks
- Safety first!
- Safety training



# COMMUNICATION WITH OTHER TEAMS

---

- Are there measurements from other teams that might be useful for my study (e.g. hydrological information, nutrients etc.)?
  - Make arrangements in advance!
- Check what are the plans of other teams
  - Is my sampling affecting other team's measurements?
  - Is other team's sampling affecting my sampling?
  - Avoid sampling duplication
- Communicate, adjust, compromise, be flexible – but make sure your plans are also fulfilled
- Be prepared for ,strange' working hours





# OVERCOMING CHALLENGES – PLAN B

---

- What can go wrong?
  - Weather (strong wind, thick ice etc.)
  - Technical issues e.g. equipment malfunction
  - ....
- Prepare alternative plan
  - Can I sample elsewhere and still answer my scientific question?
  - Can I change my experimental settings?
  - Ask for advice
- Pack additional supplies and spare parts where possible
- Be flexible



**Questions?**

**Have a successful cruise!**

**Have fun doing your science!**



# ARICE Webinar

## Pre-cruise preparation and risk reduction

### Thank you very much!



<https://arice.eu/training>



Suchen



An international collaboration strategy for meeting the needs of marine based research in the Arctic



Webinar recording will be available here!

Home

About

News

Outreach

Training

Apply for Ship Time

Intranet