

## Why an Atlantic DBO?

Michael Karcher (AWI)



More than 40 partner  
institutions and  
Indigenous Communities from  
18 countries

Collaborating towards a better coordinated and  
integrated, more useful and more equitable Arctic  
Observing System



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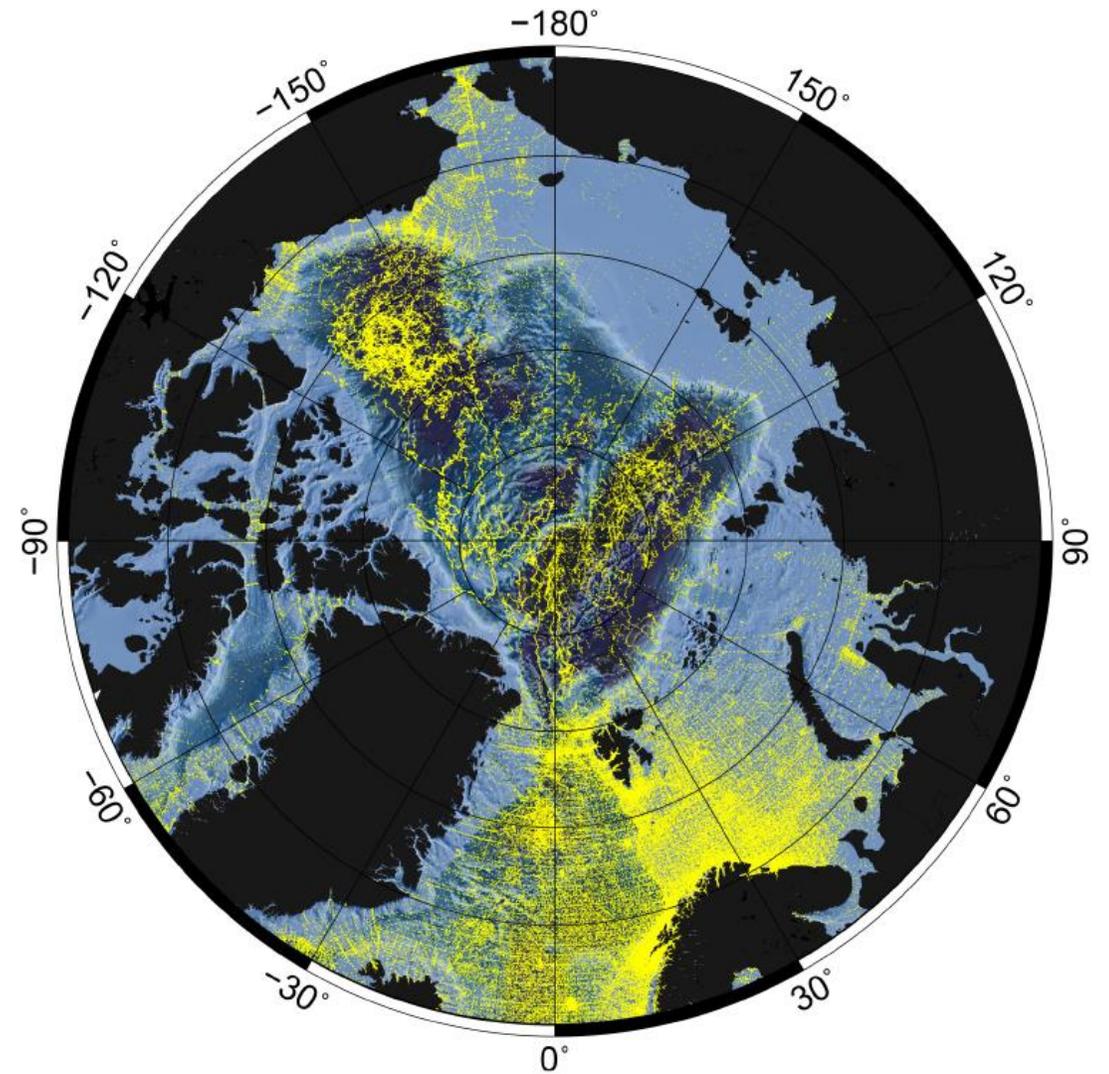


## Observational activity in the Arctic Ocean

The Arctic Ocean is undersampled

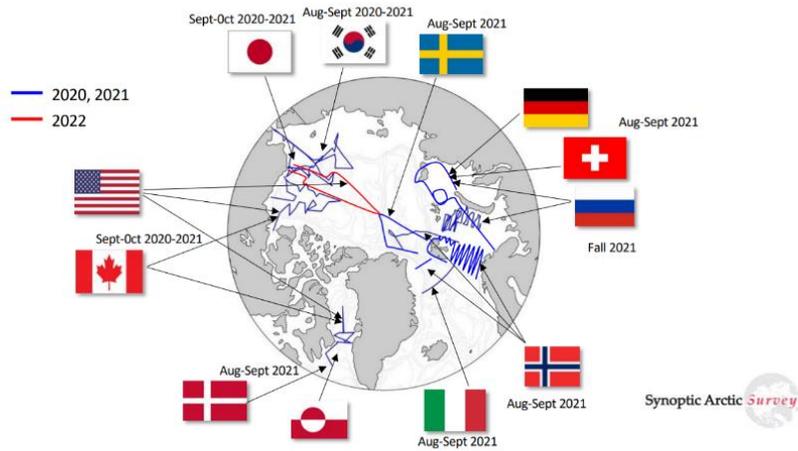
- Long-term monitoring efforts are needed
- Most observations are taken by short-term funded research projects

➔ Coordination



Quality checked hydrography data 1980-2015 (Behrendt et al, 2017)

## Coordinated synoptic cruises



International SAS Cruises (12 Nations)

## Synoptic Arctic Survey (SAS) 2021/22

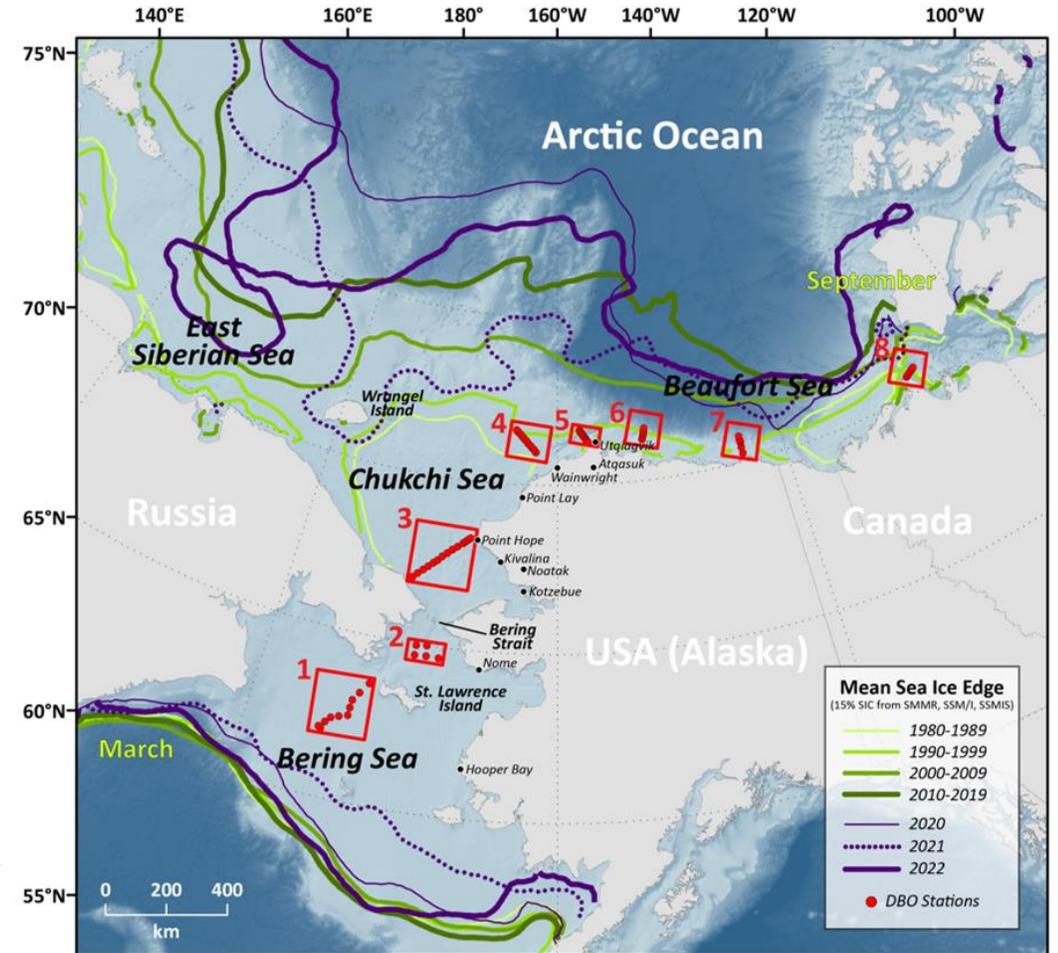


- Araon\_20200808
- Araon\_20210720
- Araon\_20220822
- Armstrong\_20220930
- Bassi\_20210829
- Dana\_20200822
- Hansen\_20210926
- Healy\_20220905
- Hjort\_20210124
- Hjort\_20210303
- Hjort\_20210925
- KP-Haakon\_20210712
- KP-Haakon\_20210824
- Merian\_20220807
- Mirai\_20200919
- Mirai\_20210831
- Mirai\_20220812
- Oden\_20210801
- Rasmussen\_20210810
- St-Laurent\_20200907
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- Tryoshnikov\_20210809
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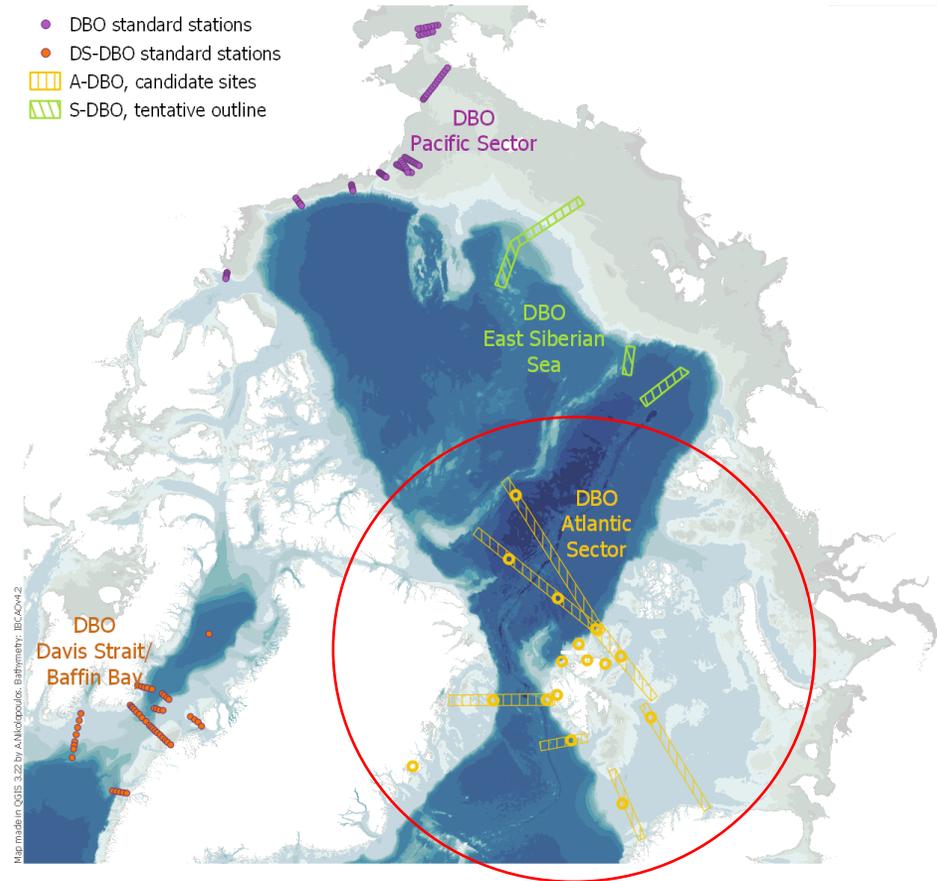
A concept to capture temporal variability

Distributed „Biological“ Observatory DBO

- Pacific DBO – the blueprint for the DBO concept
- More than 10 years of successful operation
- In fact interdisciplinary:  
Distributed Environmental Marine Observatory



## Atlantic-Arctic DBO

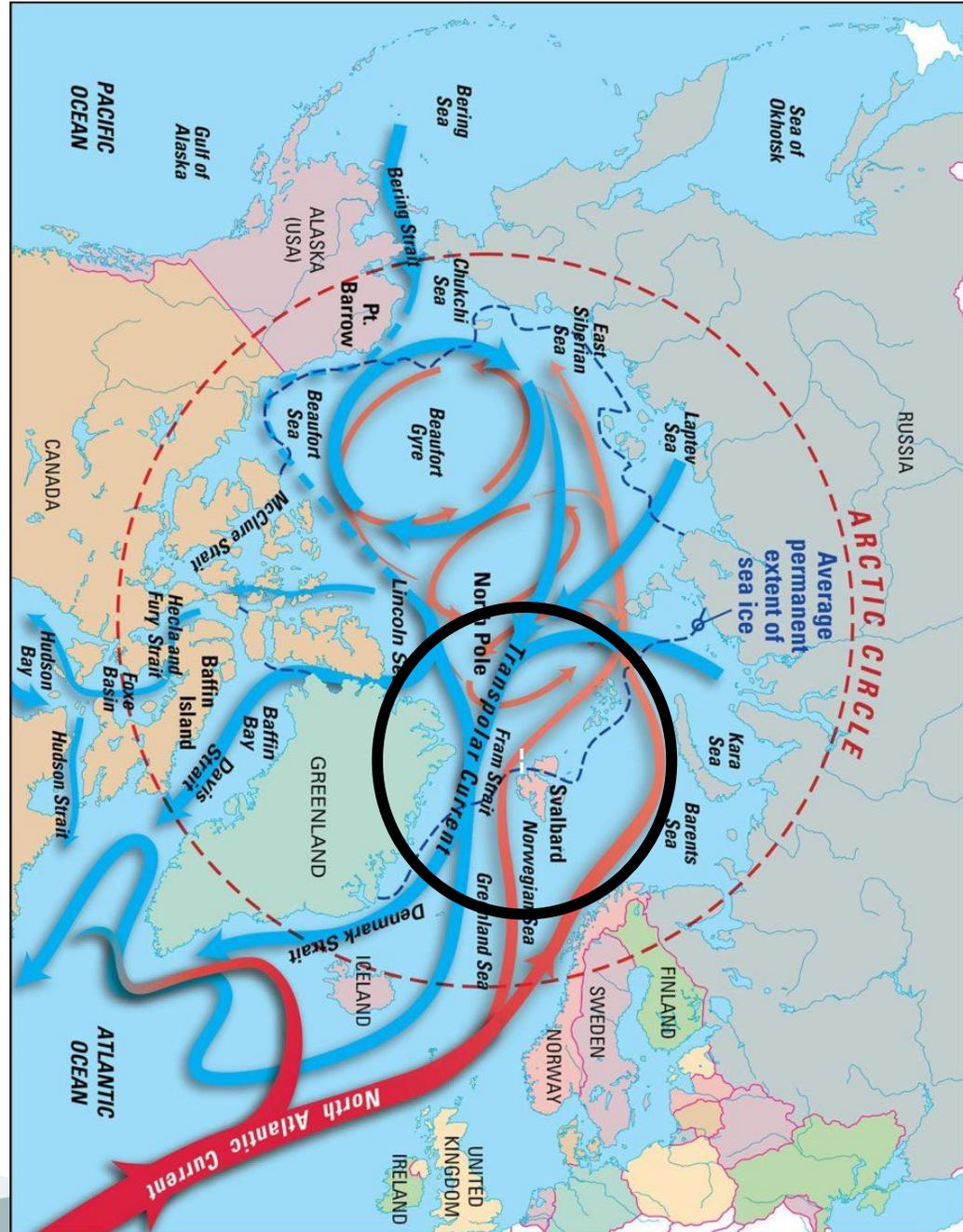


Nicolopoulos, NPI



ARCTIC  
PASSION

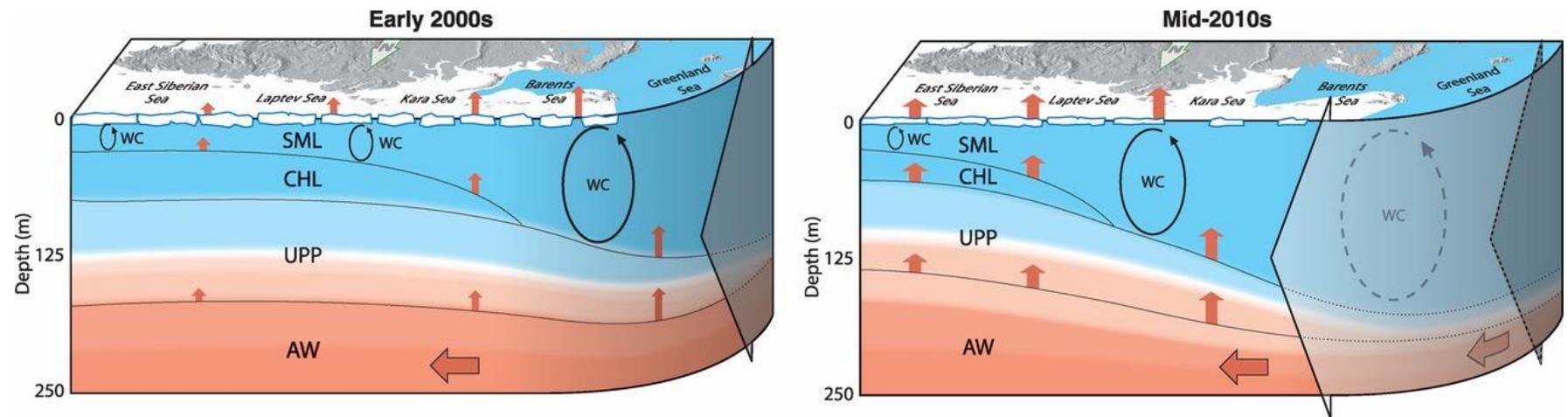
## The region of the A-DBO



WHOI



## Example issue: Atlantification



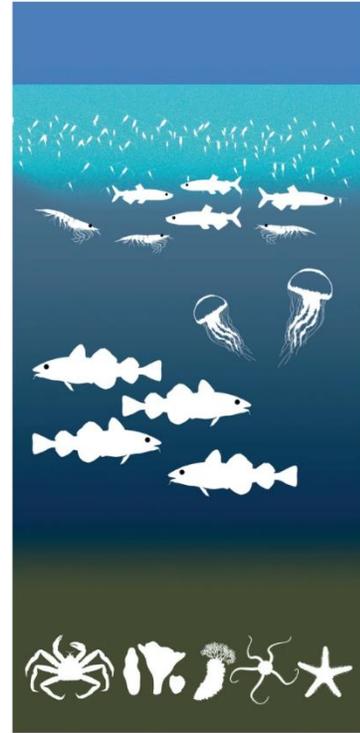
(Polyakov et al, 2017)

- Changes of stratification in the western Eurasian Basin
- Consequences for the vertical heat exchange, sea ice, ecosystem

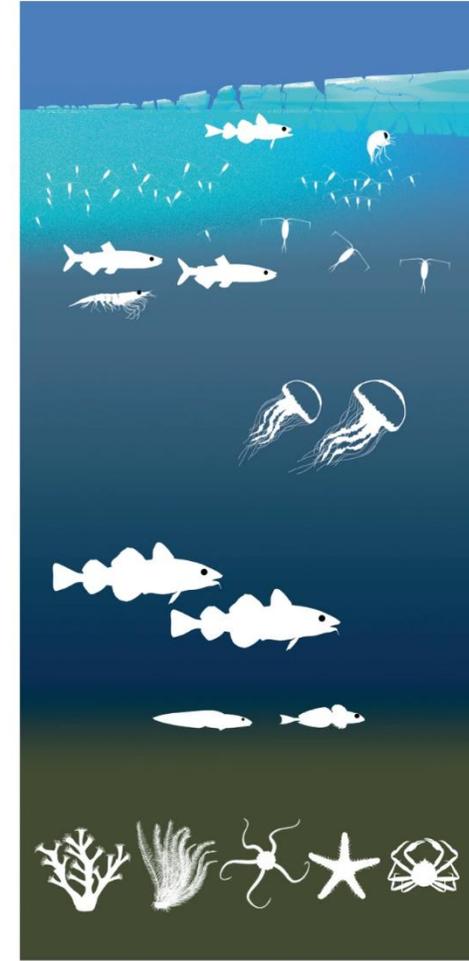
## Ecosystem impacts of Atlantification/borealisation

- a loss of ice habitat, increased pelagic production, boreal species

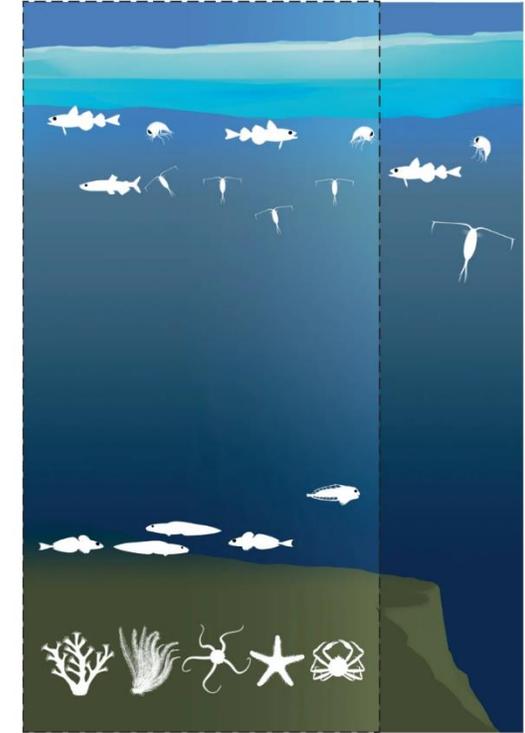
a Southern Barents Sea



b Northern Barents Sea with borealization



c Northern Barents Sea and Eurasian Basin



(Ingvaldsen et al, 2023)

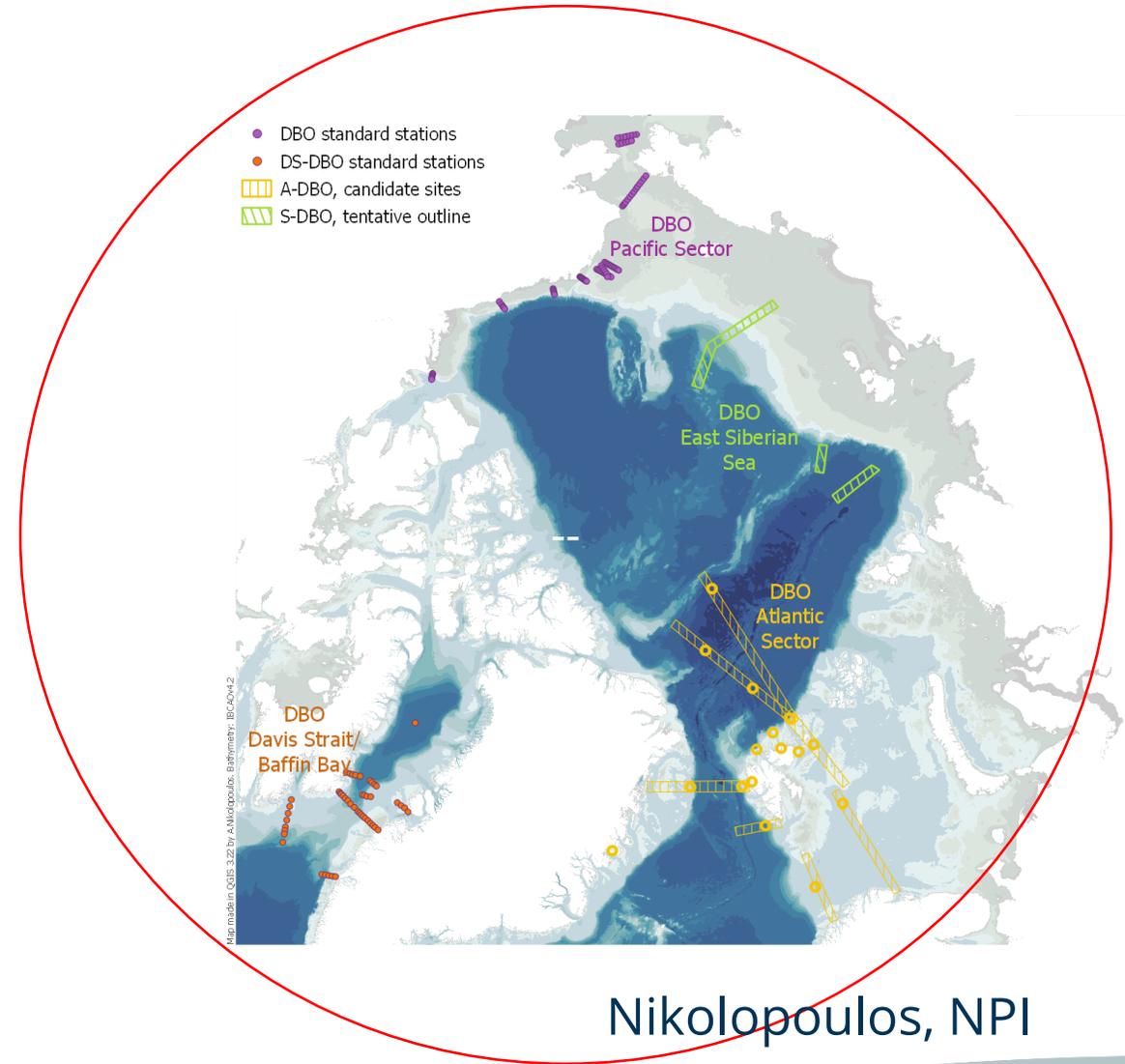
 <i>Calanus finmarchicus</i>	 Krill	 Cod	 Sculpin	 Sponge	 Brittle star	 Arctic soft corals
 <i>Calanus glacialis</i>	 Arctic hyperiids	 Capelin	 Eelpout	 Sea cucumber	 Sea star	 Sea lilies
 <i>Calanus hyperboreus</i>	 Jellyfish	 Polar cod	 Snailfish	 King crab	 Snow crab	

### Wider context:

- Arctic GRA ( a regional alliance for ocean observing) in the Arctic Ocean:  
currently in build up phase of a task force
- Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (CAO) and the  
Joint Program of Scientific Research and Monitoring

## Atlantic-Arctic DBO

- In the framework of the  
pan-Arctic DBO system



Nikolopoulos, NPI



# ARCTIC PASSION

Pan-Arctic Observing  
System of Systems:  
Implementing Observations  
for Societal Needs

Website:

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

