



Challenges and successes of the first Changing Arctic Ocean cruise

Barents Sea

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Cruise objectives

Benthic community function
 Nitrogen cycling
 Bioturbation

Physics
 Hydrography, currents,
 meteorology

Water column nutrients and isotopes
 Concentration and isotopic
 composition of macronutrients and
 particulate organic matter
 Food-web tracer measurements

Benthic fauna
 Community structure
 and biodiversity
 Reproductive state
 Microbial community
 and diversity

Multiple data sets to start addressing NERC's
 challenge of understanding the impact of climate
 change on Arctic ecosystem structure and
 biogeochemical functioning

**Primary production and
 phytoplankton**
 physiology, taxonomy,
 abundance, pigments,
 fatty acids
 Microbial ID and
 community structure

**Sediment and pore water
 geochemistry**
 Organics and inorganics
 Sediment particle size

Zooplankton
 ID and community
 Food web tracer
 measurements

Compatibility of requirements

Diverse sets of activities that don't usually share
 the same ship

Water column nutrients and isotopes
 Concentration and isotopic
 composition of macronutrients and
 particulate organic matter
 Food-web tracer measurements

Clean water column
 Maximum spatial coverage

**Primary production and
 phytoplankton**
 physiology, taxonomy, abundance,
 pigments, fatty acids
 Microbial ID and community structure

Midday sampling
 Radio active isotopes

Physics
 Hydrography, currents,
 meteorology

Don't loose the glider

Zooplankton
 ID and community
 Food web tracer
 measurements

Midday and midnight
 sampling

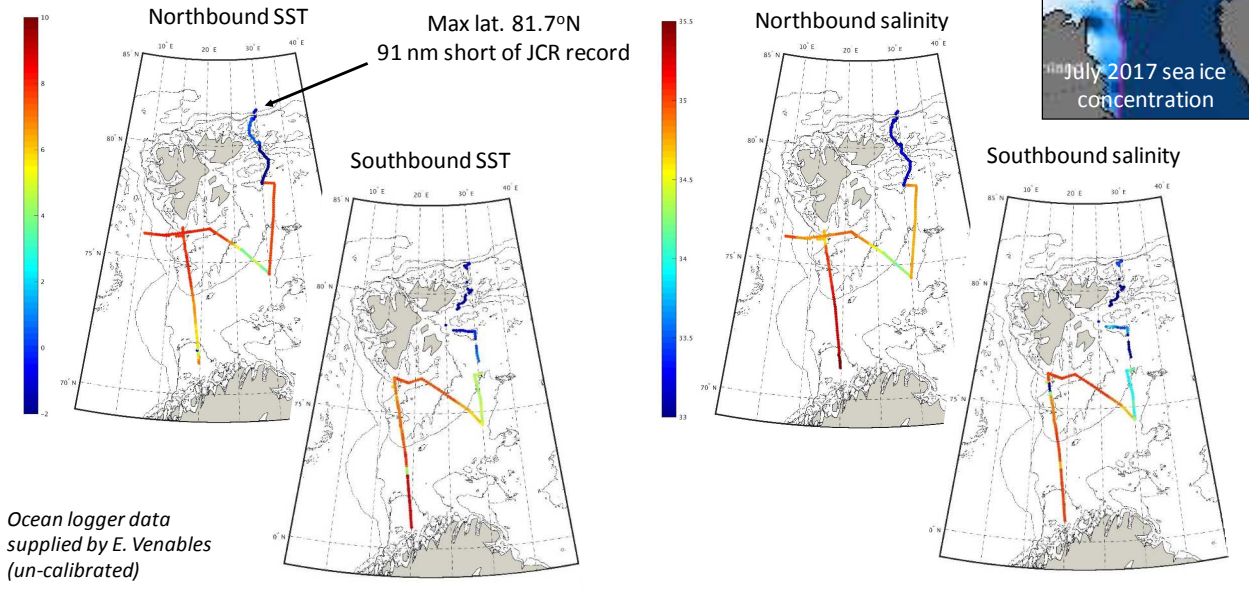
Benthic community function
 Nitrogen cycling
 Bioturbation

Benthic fauna
 Community structure and biodiversity
 Reproductive state
 Microbial community and diversity

**Sediment and pore water
 geochemistry**
 Organics and inorganics
 Sediment particle size

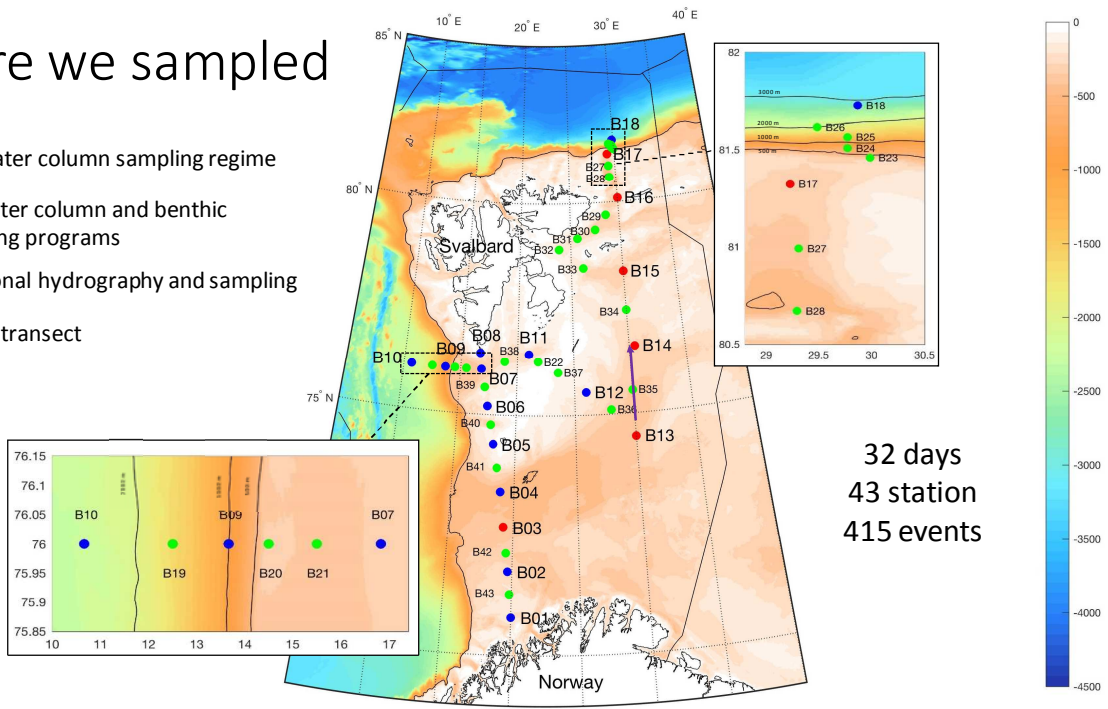
5 intense sampling sites across sea ice
 gradients
 Dirty water column
 24 hr operations
 Heat and light sensitive experiments

Where we went - 3970 km

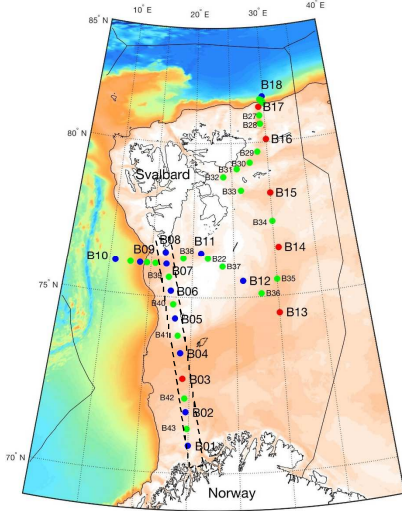


Where we sampled

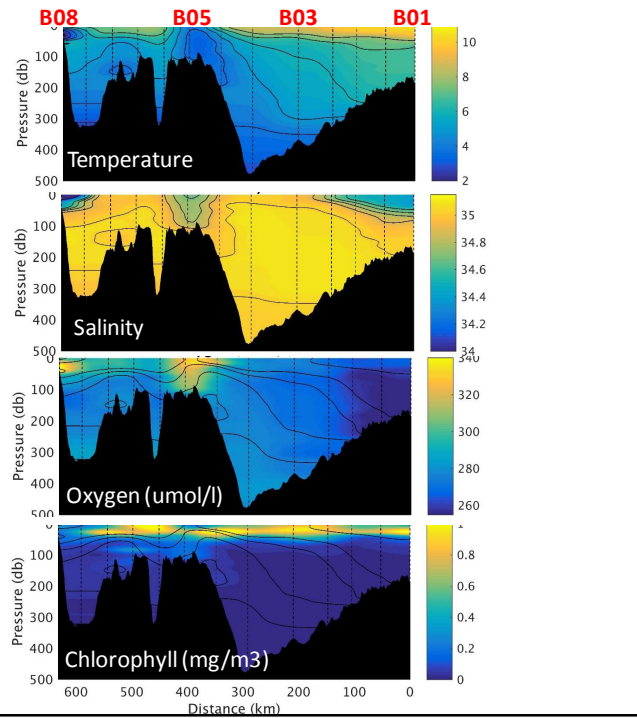
- Full water column sampling regime
- Full water column and benthic sampling programs
- Additional hydrography and sampling
- Glider transect



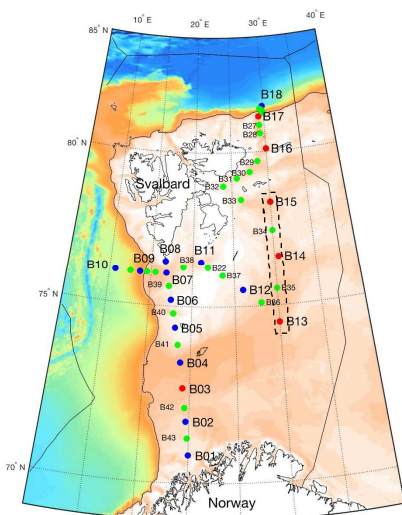
Norway to Svalbard



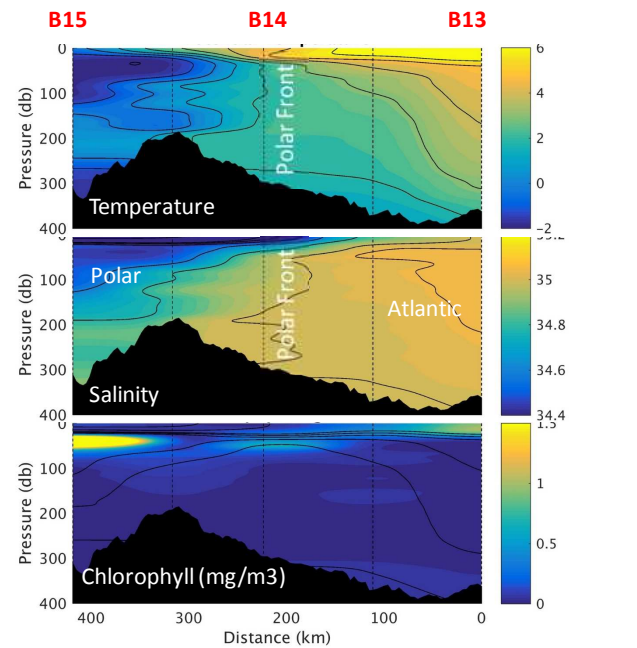
CTD data supplied by E. Dumont (uncalibrated)



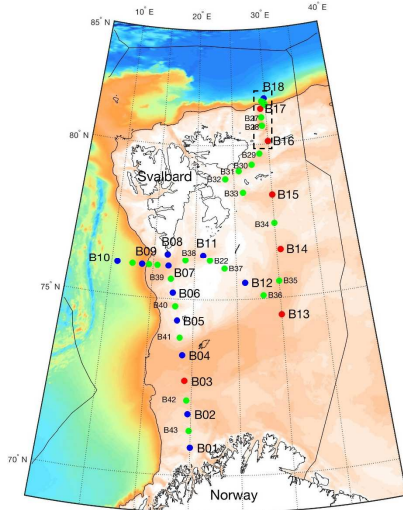
Across the Polar Front



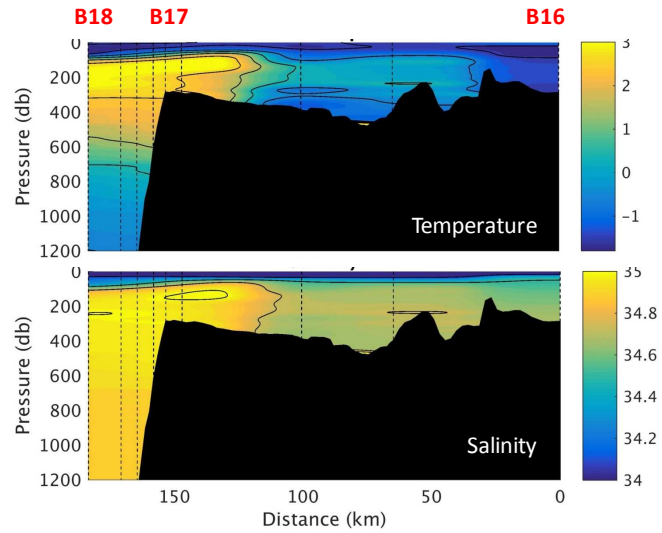
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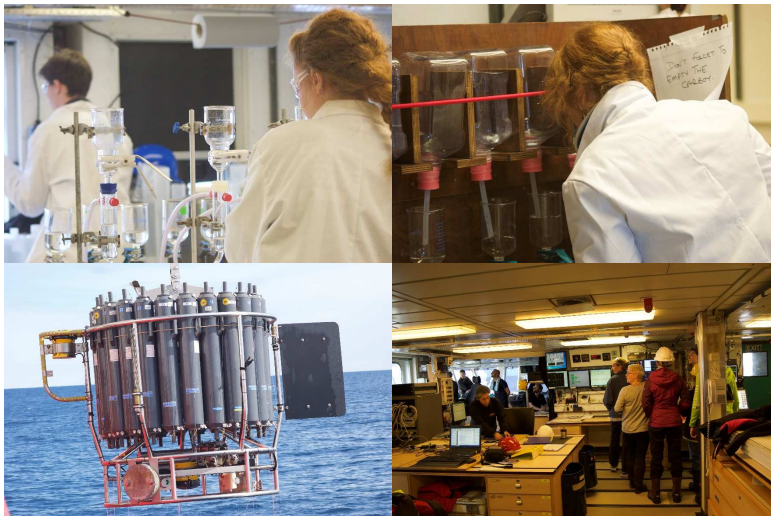
Into the ice and across the shelf edge



CTD data supplied by E. Dumont (uncalibrated)



A typical days work



CTD cast and sampling

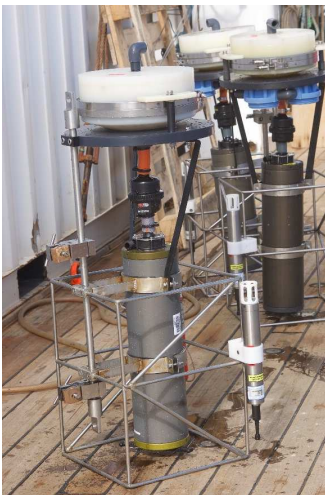
A typical days work



CTD cast and sampling

Midday zooplankton nets

A typical days work



CTD cast and sampling

Midday zooplankton nets

Stand Alone Pumps

A typical days work



CTD cast and sampling

Midday zooplankton nets

Stand Alone Pumps

Benthic camera / grab

A typical days work



CTD cast and sampling

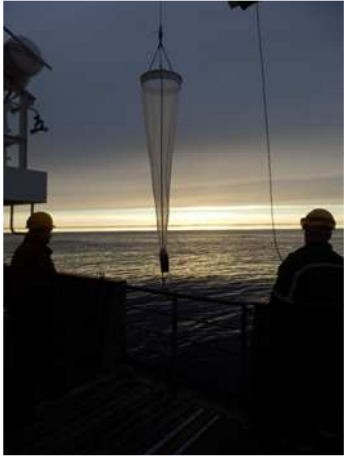
Midday zooplankton nets

Stand Alone Pumps

Benthic camera / grab

Multi-corer

A typical days work



CTD cast and sampling

Midday zooplankton nets

Stand Alone Pumps

Benthic camera / grab

Multi-corer

Midnight zooplankton nets

A typical days work

ChAOS and 24 hr operations

Benthic camera

Multicorer

Box coring



A typical days work

ChAOS and 24 hr operations

Benthic camera

Multicorer

Box coring

Trawling

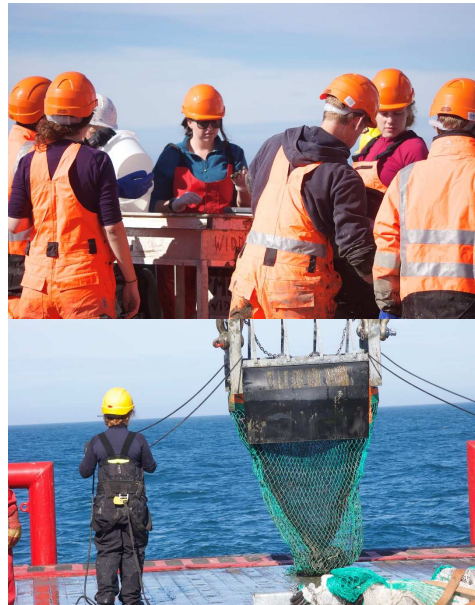


Glider deployment and recovery



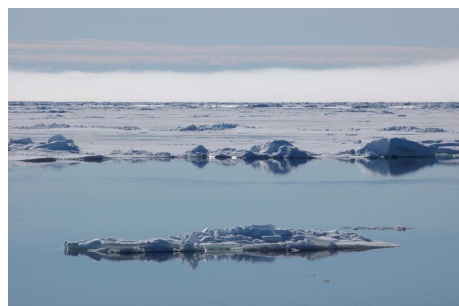
Collaborative effort

- Projects helped each other
- Training opportunities
- UIC team logging



Wildlife and scenery

- Polar bears
- Walrus
- Hump backs, fin whales, orca...
- Puffins
- A few lonely seals



Zooplankton vs. camera



66 Zooplankton Nets
9375 Copepods picked



25 camera deployments
595 photos



Box cores vs. trawls



48 Agassiz trawls



95 USNL + 42 SMBA cores
= 137 box cores



Gliders vs. ice



1 glider
(14 days, 372 dives)



11 days in the ice
(6 polar bears)



SAPS vs. CTD



59 CTDs
(20,700 L collected)

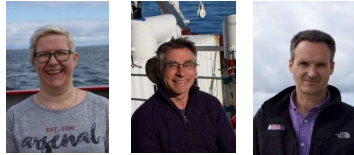


18 SAPS
(29,057 L filtered)





A successful first cruise and strong start to the CAO programme



Thanks to the JCR Captain and crew