Sea Ice Habitats

Data Availability/Quality by Thematic Group

Pelagic/Plankton

Nikita Platonov

A.N.Severtsov Institute of Ecology and Evolution
Russian Academy of Sciences, Moscow

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(pdf version)

Sea ice characteristics

- Landfast ice occurrence
- Polynya occurrence
- Distribution of old (multi-year) ice
- Probability of marginal ice zone
- Sea ice edge position

– and technique of processing were proposed during Workshop II in Oslo

Data preparation

Processing steps

- Individual Data Layers
- Conservation Features
- Regionalization

Processing steps

- Individual Data Layers (IDL)

  Generalized data set for producing CF
  - Usually time-series of data
  - One IDL is used to produce CF
  - Multiple IDLs are used to produce CF
- Conservation Features (CF)

  Requirements to data for using in MPA planning, *to be*:
  - Persistent
  - Actual
- Regionalization

  Applied to CF only

Metadata (Individual Data Layers)

Individual Data Layer	**Used for CF?**	**year**	**season**	**Data origin**
Landfast ice occurrence	Yes	2009 - 2018	01 Nov - 31 Jul	Ice charts
Polynya occurrence	Yes	2009 - 2018	01 Mar - 31 May	Ice charts
Distribution of old (multi-year) ice	Yes	1979 - 2018	September	Passive microwave
Distribution of old (multi-year) ice	Yes	2009 - 2018	01 Mar - 31 May	Ice charts
Distribution of old (multi-year) ice	No	1989 - 2006	Mar, Jun, Dec	Belchansky *et al.* (2005)
Probability of marginal ice zone	Yes	1979 - 2017	01 Jul - 30 Sep	Passive microwave (Strong and Rigor, 2013)
Sea ice edge position and proximity	No	1979 - 2017	Monthly	Passive microwave

Metadata (Conservation Features)

Conservation Feature	Season	Regionalization
Landfast ice occurrence	01 Nov - 31 Jul	Shore clustering
Polynya occurrence	01 Mar - 31 May	Shore clustering
Distribution of old (multi-year) ice	Summer minimum (September)	LME (PAME-led Group, 2013)
Distribution of old (multi-year) ice	01 Mar - 31 May	LME (PAME-led Group, 2013)
Probability of marginal ice zone	01 Jul - 30 Sep	LME (PAME-led Group, 2013)

Data Source

- Ice charts

IDL, CF	Attribute	Value(s)
Landfast ice occurrence	FA/FB/FC	08
Polynya occurrence	SA/SB/SC	82, 83, 84, 85, 86
Spring distribution of old (multi-year) ice	SA/SB/SC	95
Probability of marginal ice zone (*alternate*)	CT	18

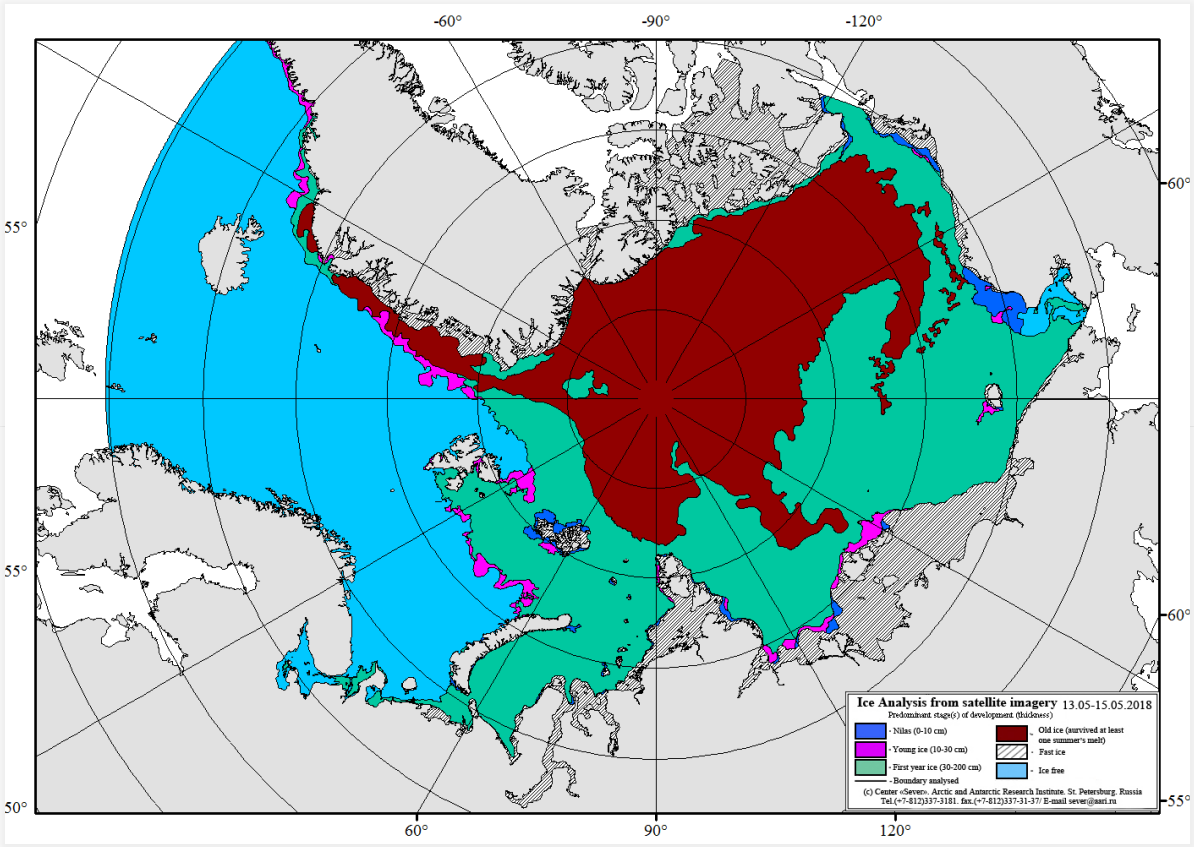
- Passive microwave satellite data: SMMR - SSM/I - SSMIS (since Nov 1978), 25 km grid, not AMSR-E - AMSR2 (since Jul 2002 with gap during Oct 2011 - Jul 2012), 6.25/12.5 km grid

IDL, CF
Probability of marginal ice zone
Distribution of old (multi-year) ice in September
Sea ice edge position and proximity

Ice charts processing

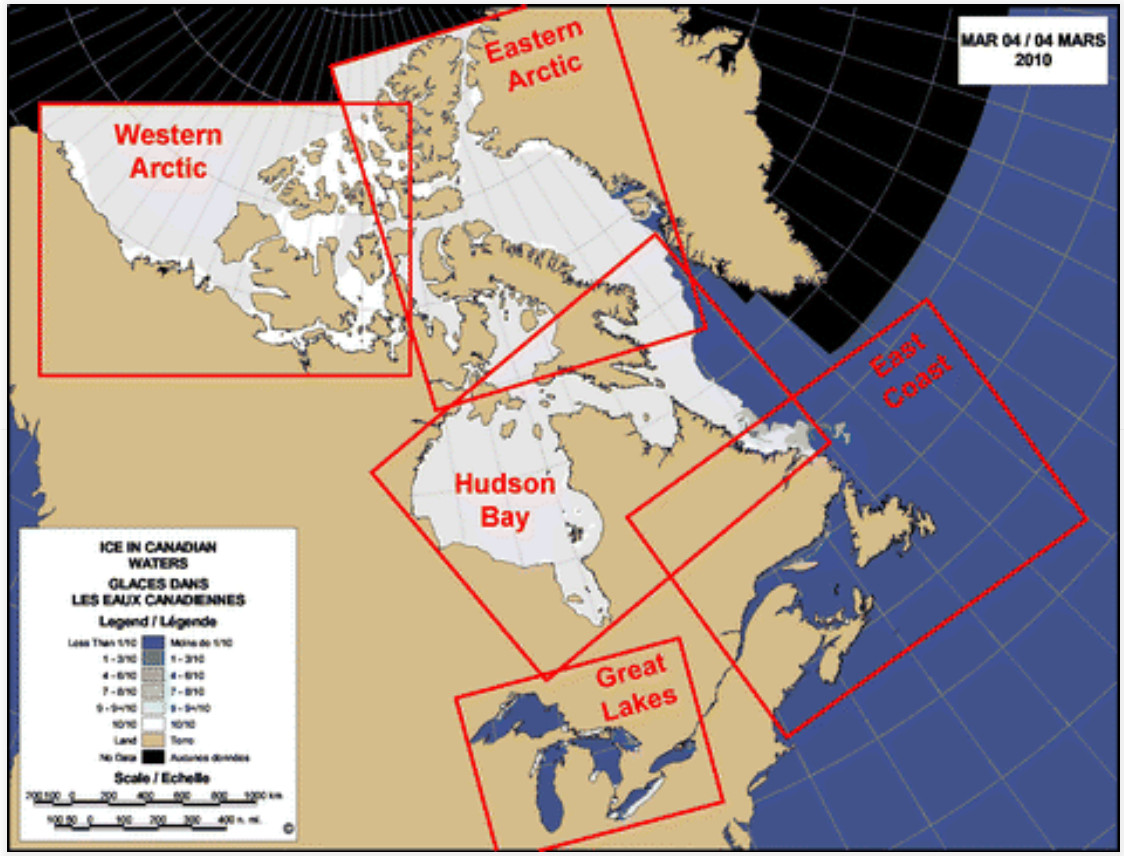
AARI spatial coverage

Arctic and Antarctic Research Institute weekly ice chars (AARI, 2018)



CIS spatial coverage

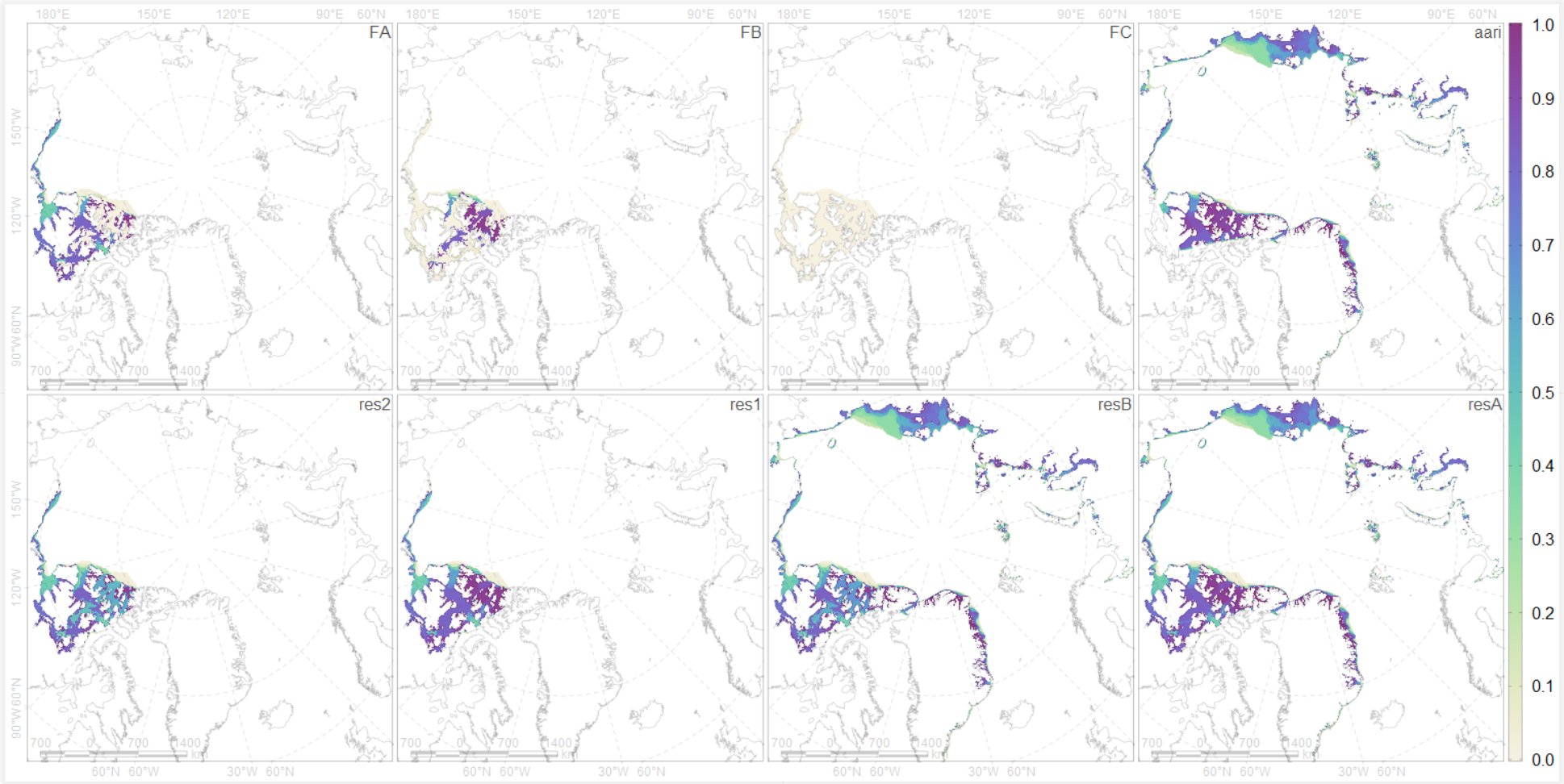
Canadian ice service weekly ice charts (CIS, 2009)



Spatial join

- Reverse ordered weights for SIGRID-3 FA/FB/FC or SA/SB/SC attributes
- Equal weights for 3 out of 5 CIS “Western Arctic”, “Eastern Arctic” and “Hudson Bay” regions
- Individual weights for joined CIS region and AARI region

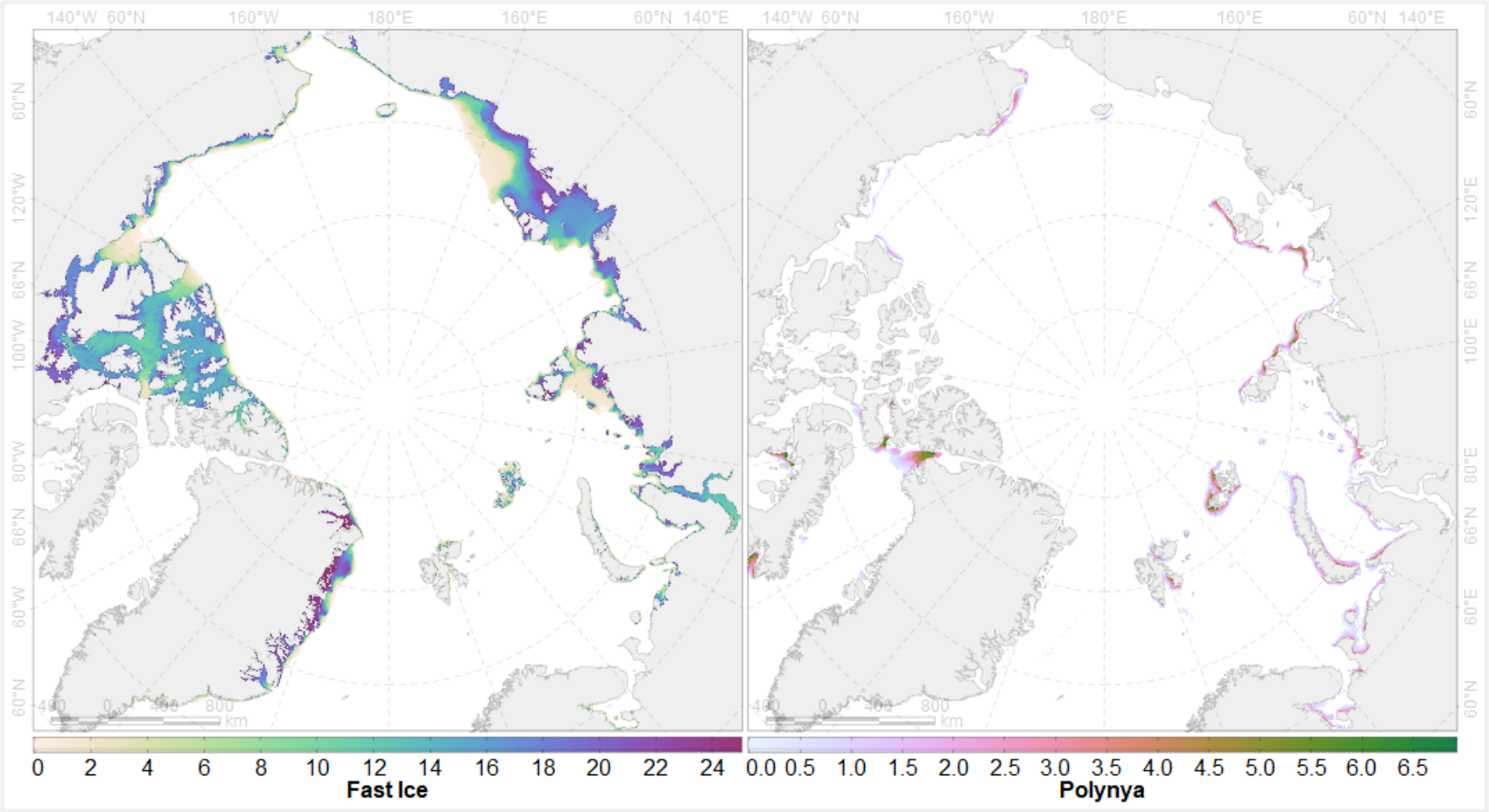
Spatial join



Example for landfast ice for 2016

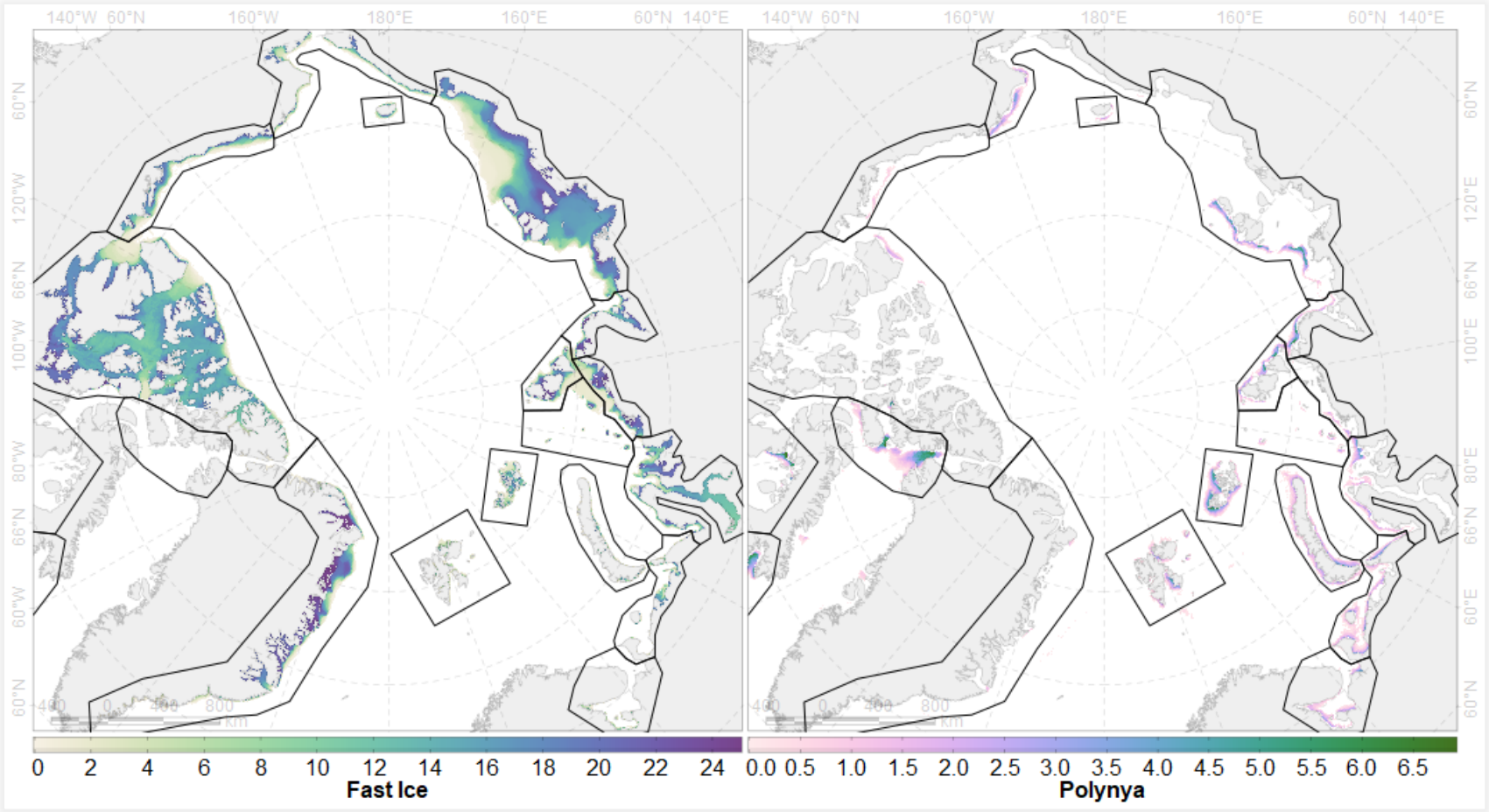
Custom regionalization

Proposed region



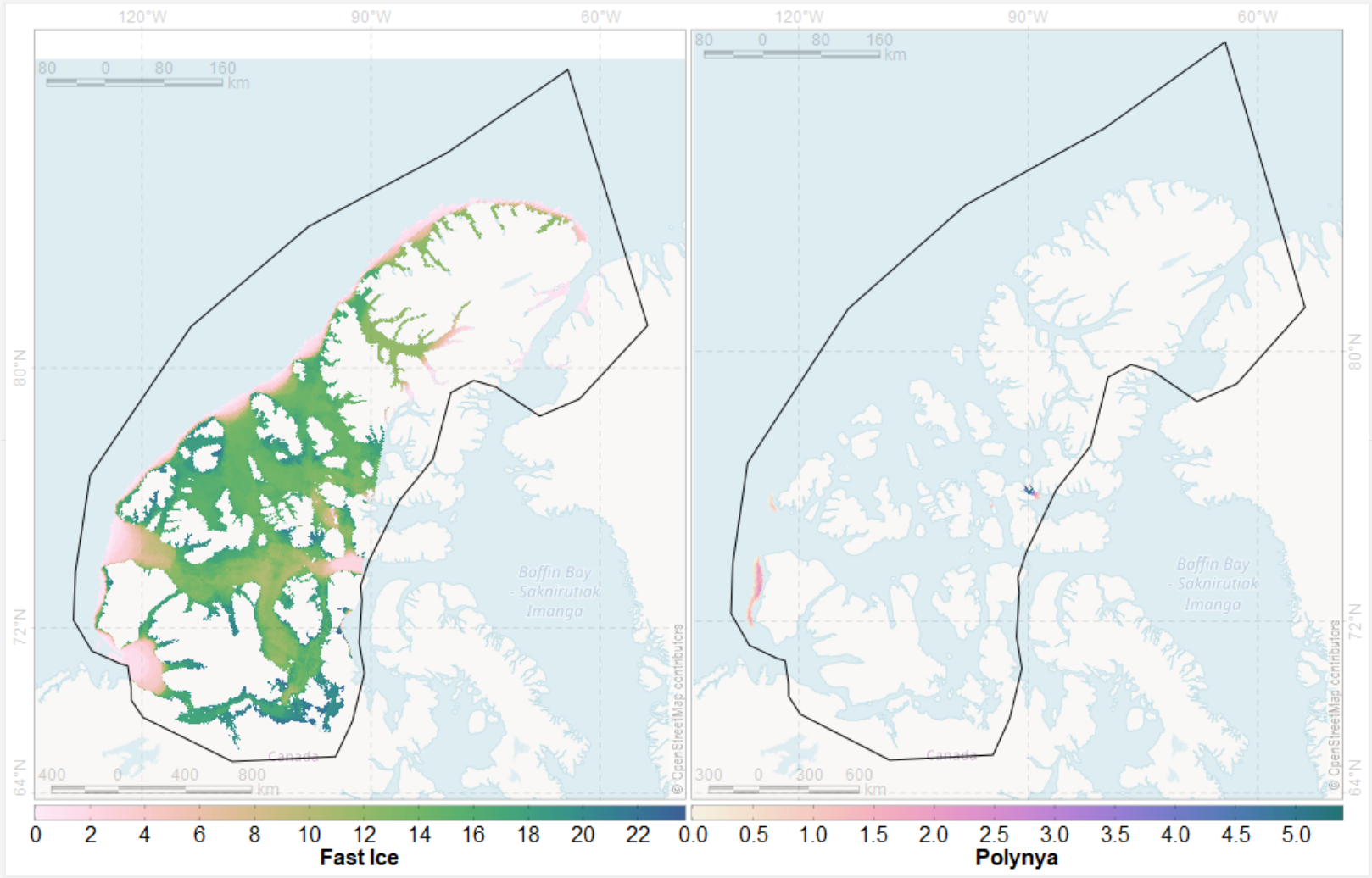
Landfast ice and polynya occurrences

Proposed region



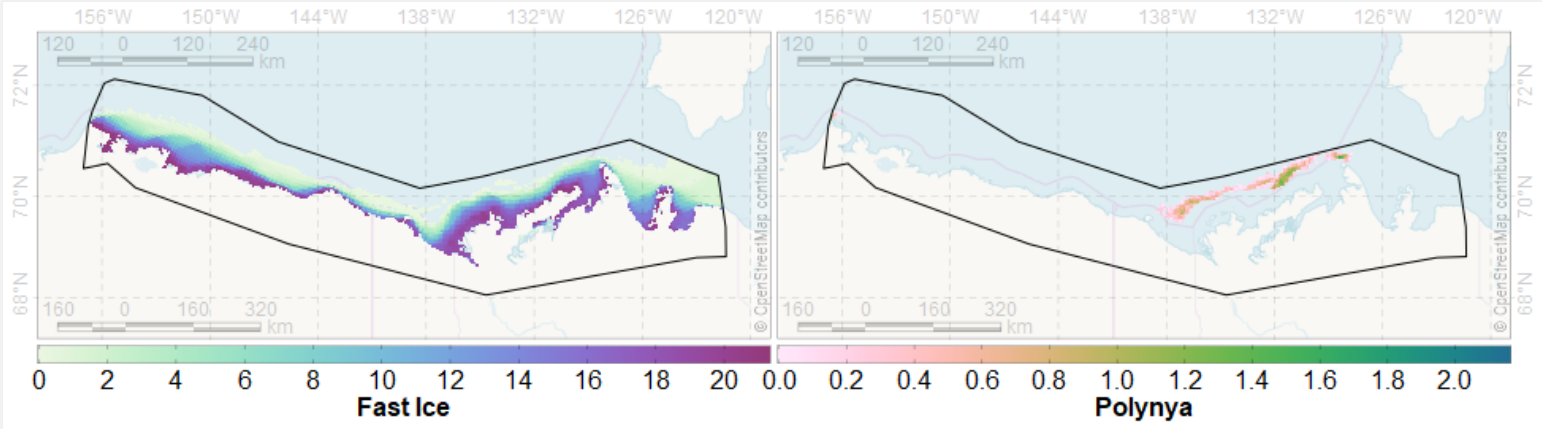
Proposed region over shored ice habitats

Separate regions



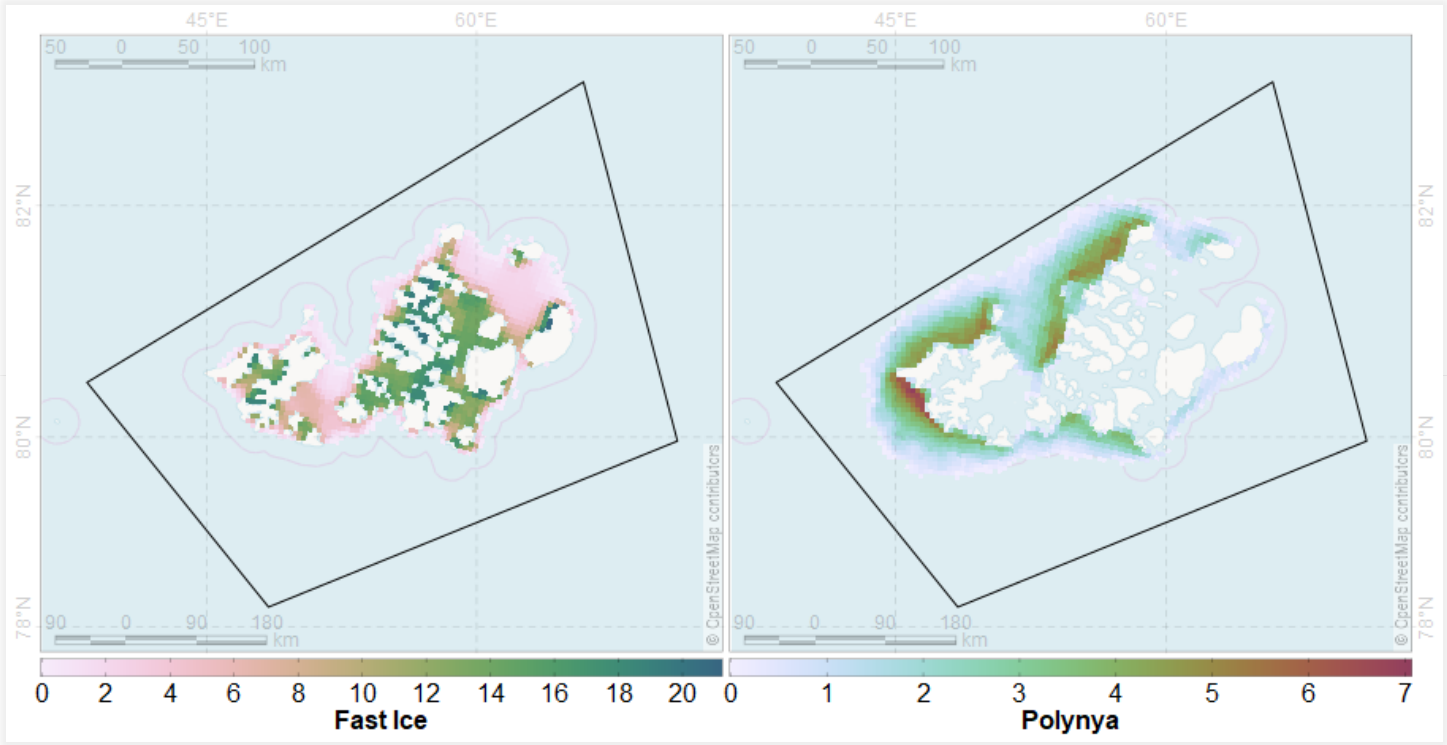
Canadian Archipelago

Separate regions



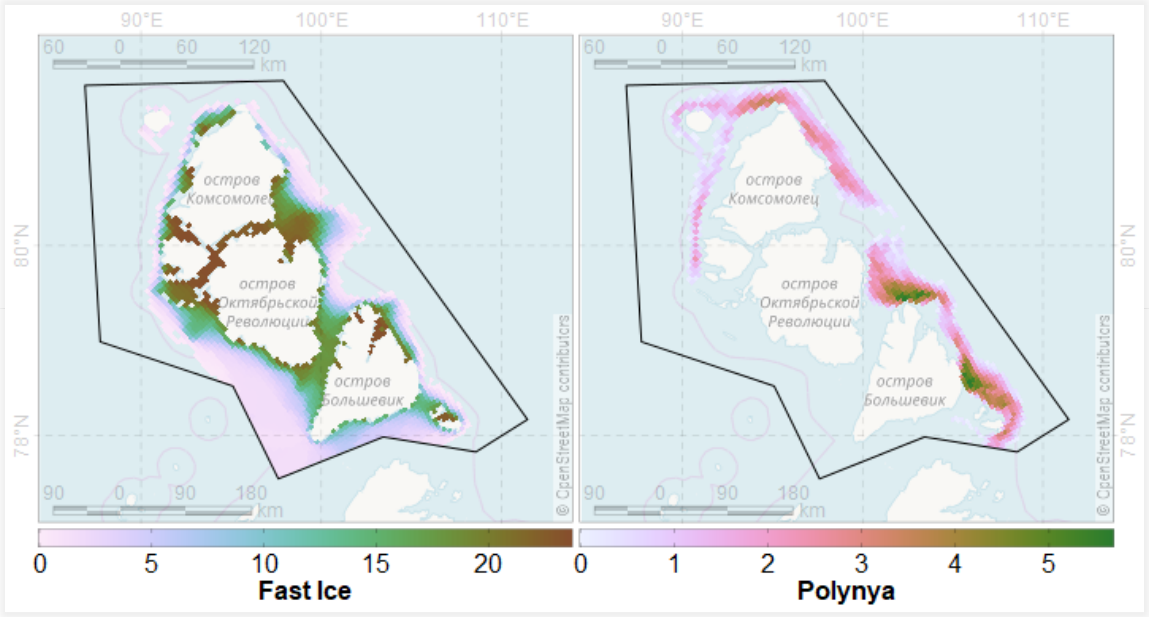
Beaufort Sea

Separate regions



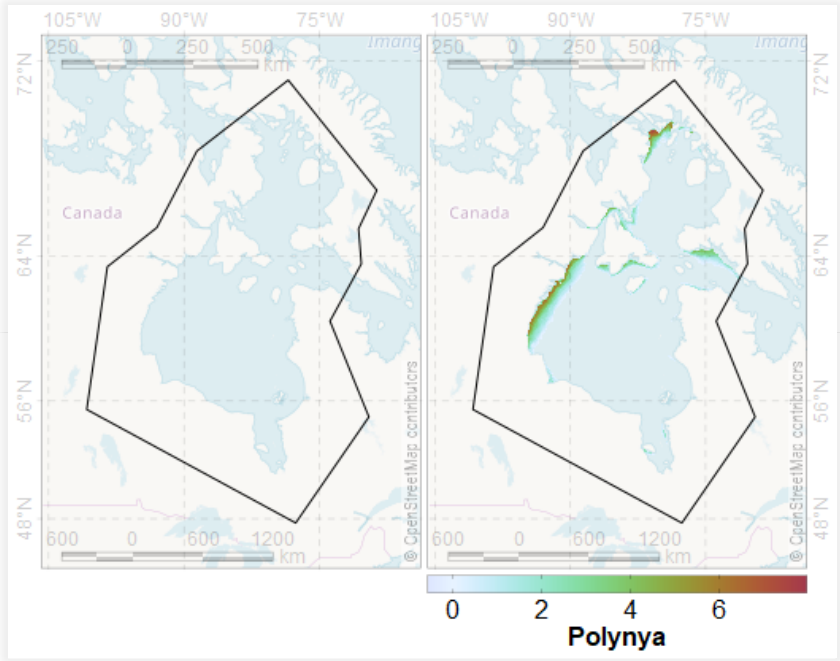
Franz Josef Land

Separate regions



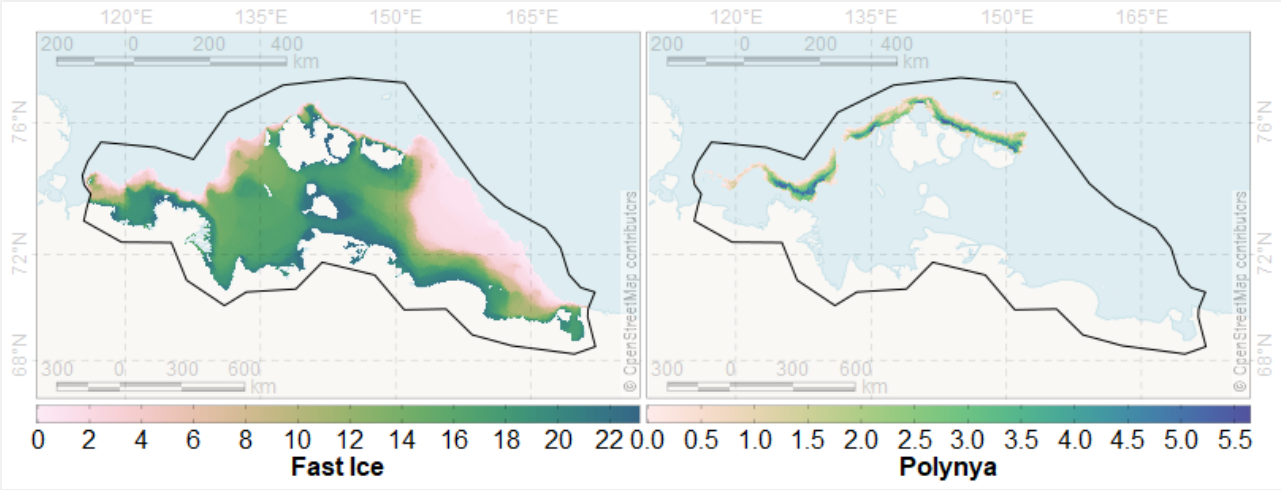
Severnaya Zemlya

Separate regions



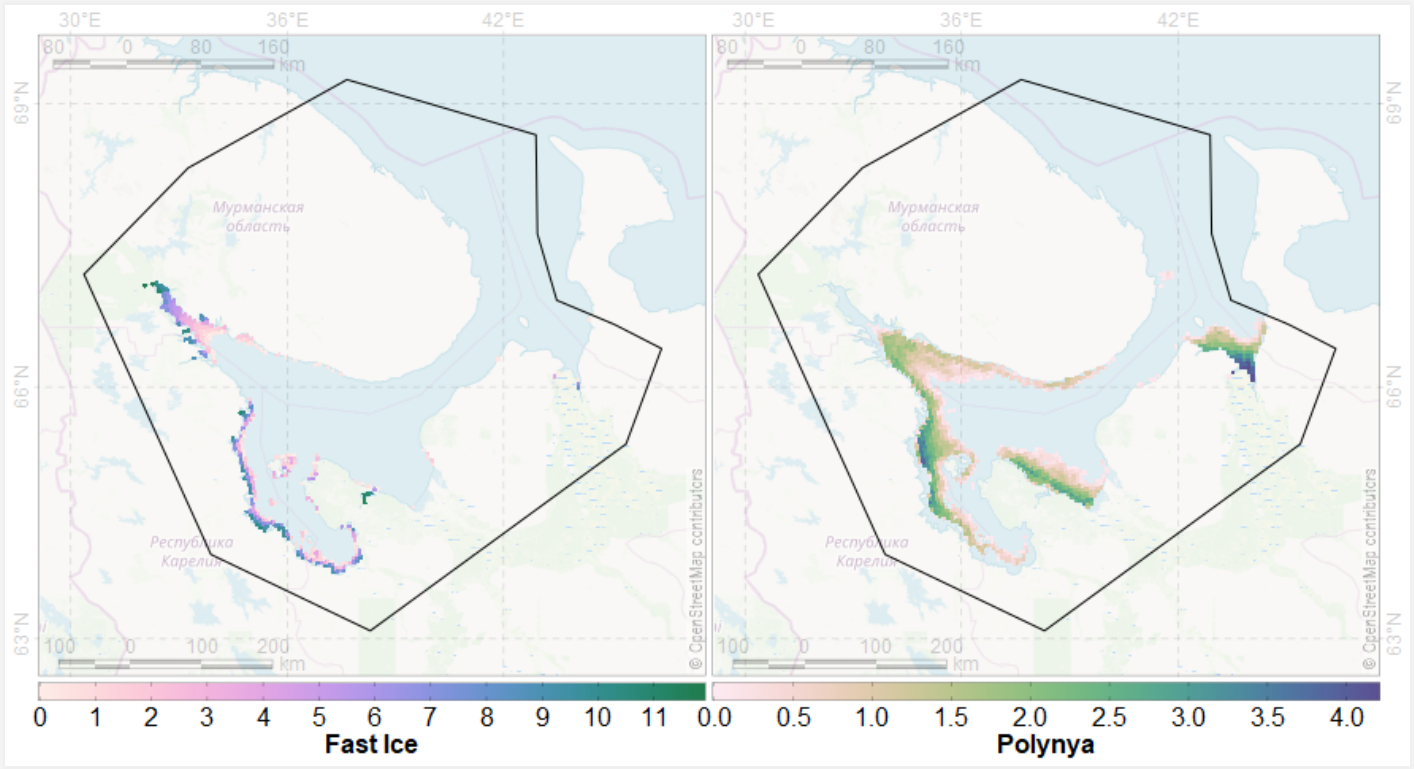
Hudson Bay

Separate regions



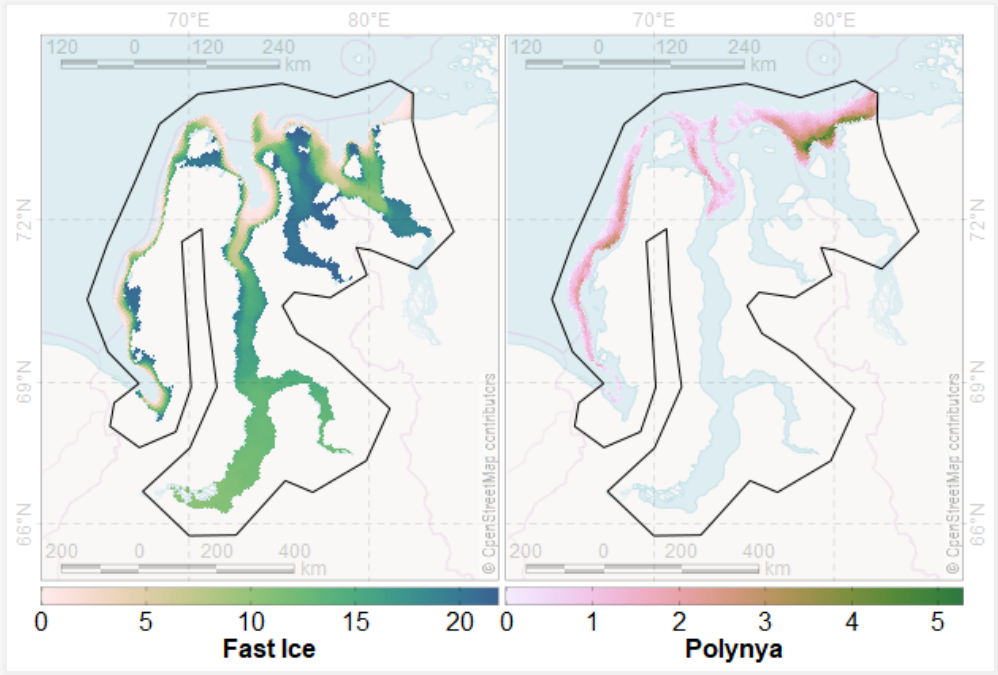
Siberian Shelf

Separate regions



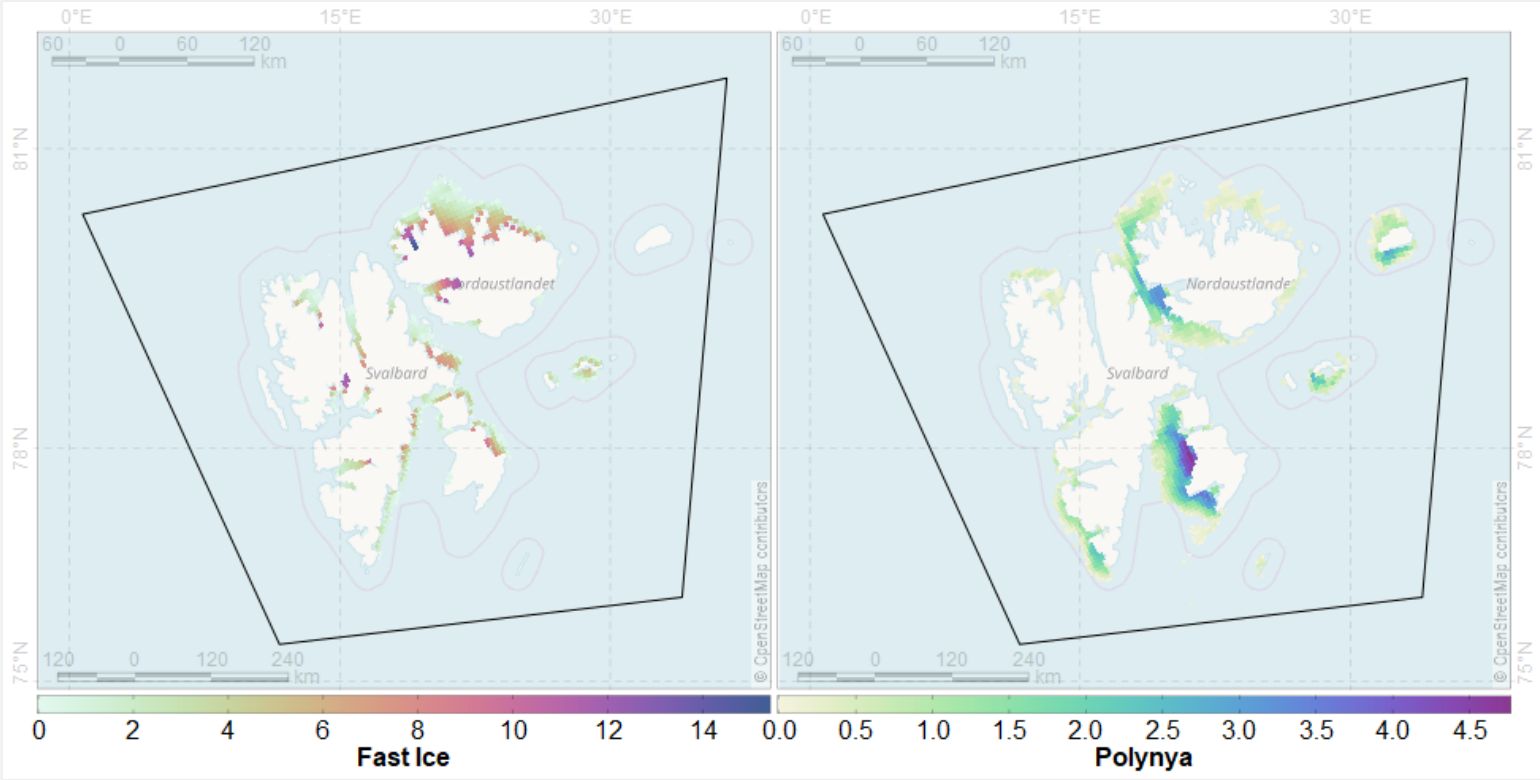
White Sea

Separate regions



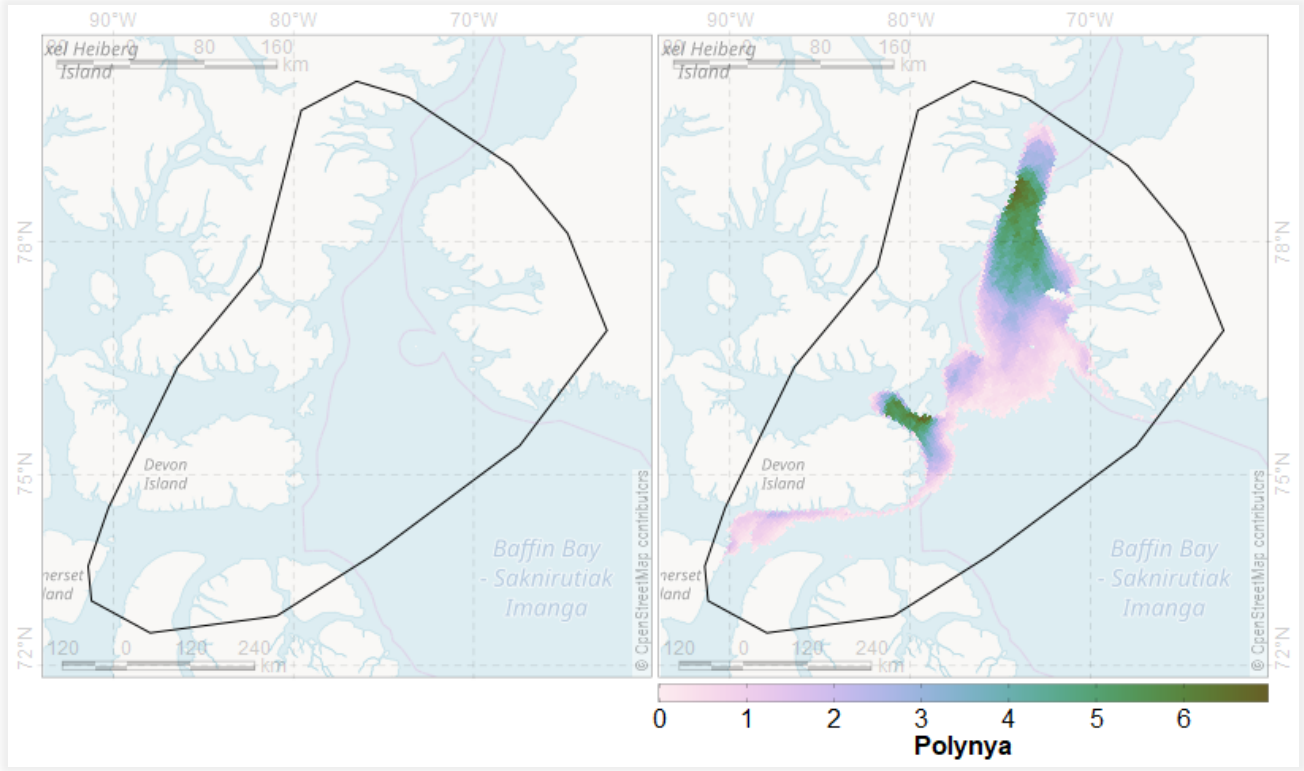
Yamal

Separate regions



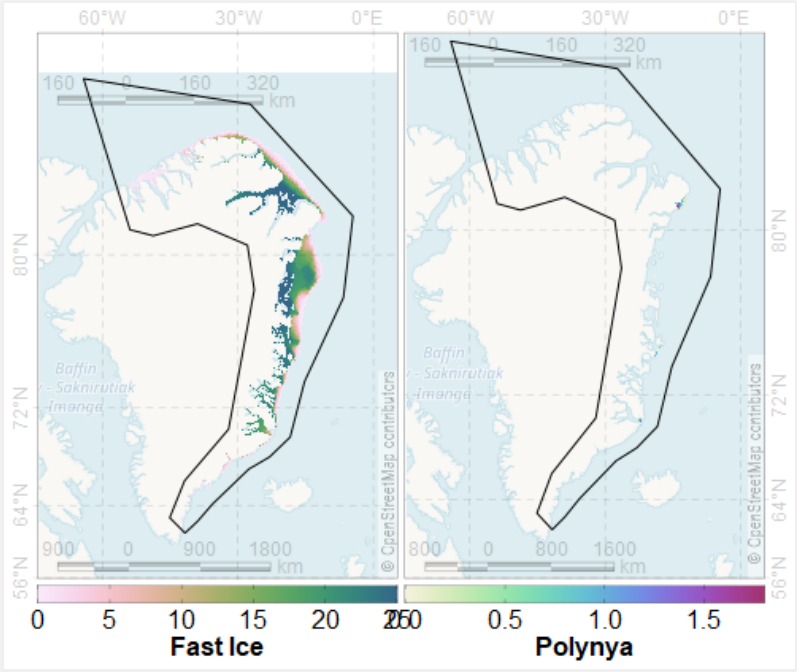
Svalbard

Separate regions



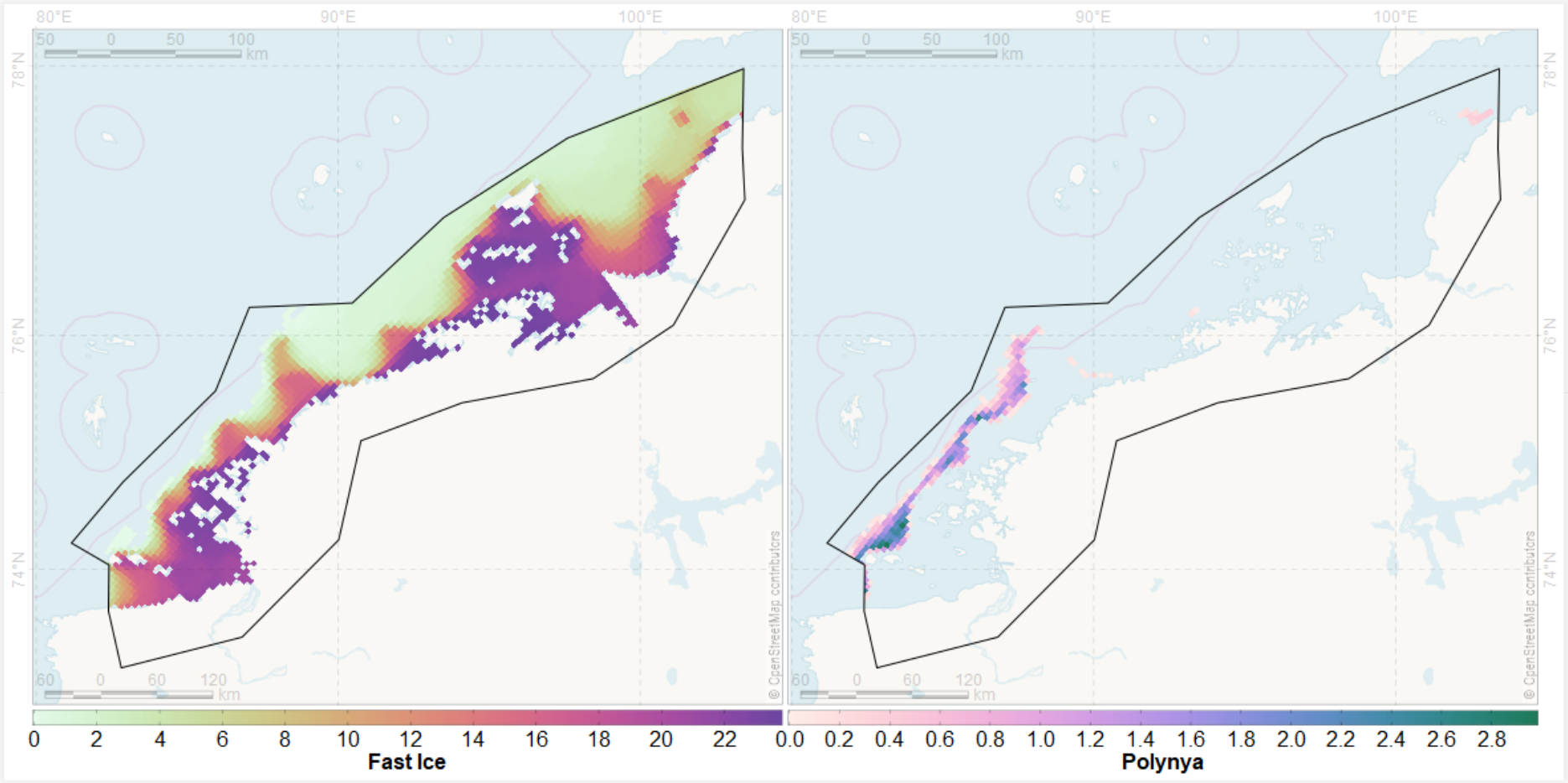
Baffin Bay

Separate regions



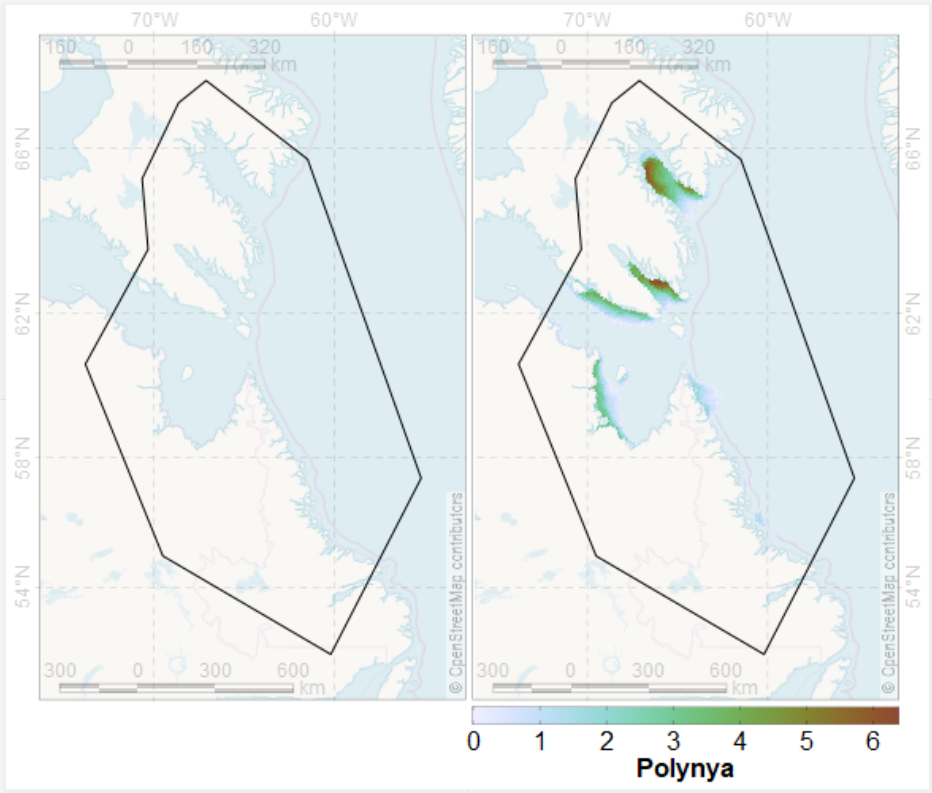
Greenland

Separate regions



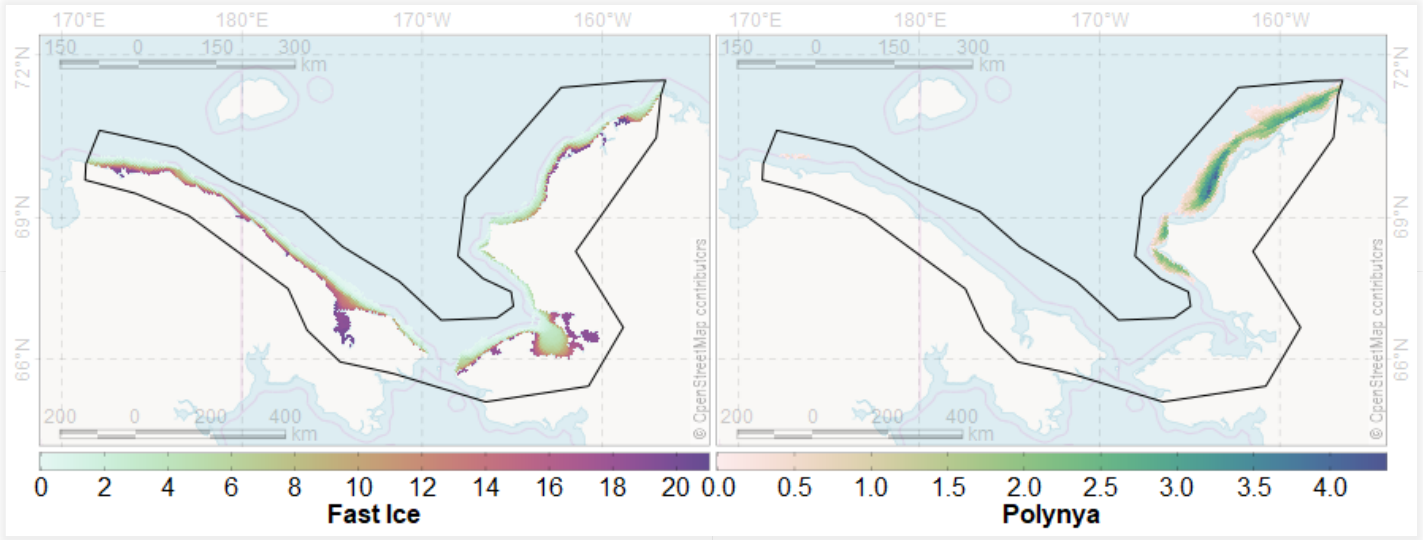
West Taimyr

Separate regions



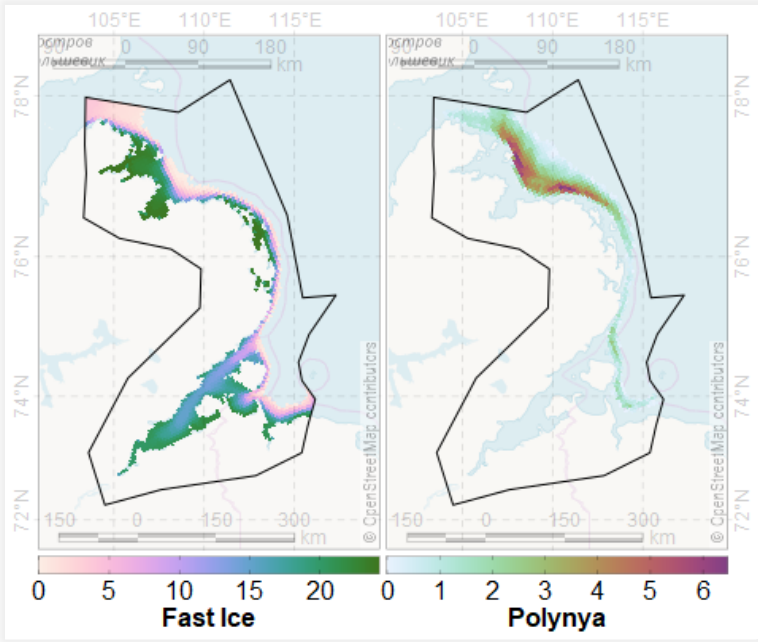
Davis Strait

Separate regions



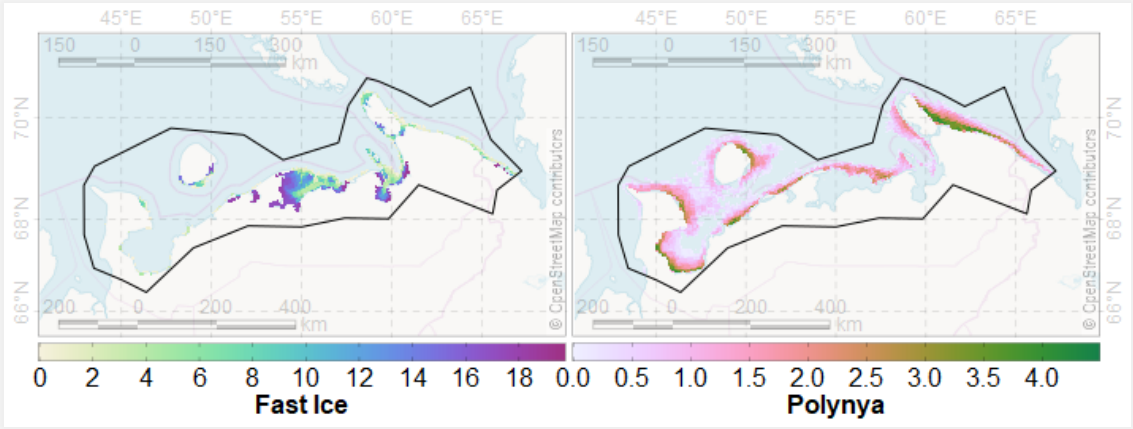
Chukchi Sea

Separate regions



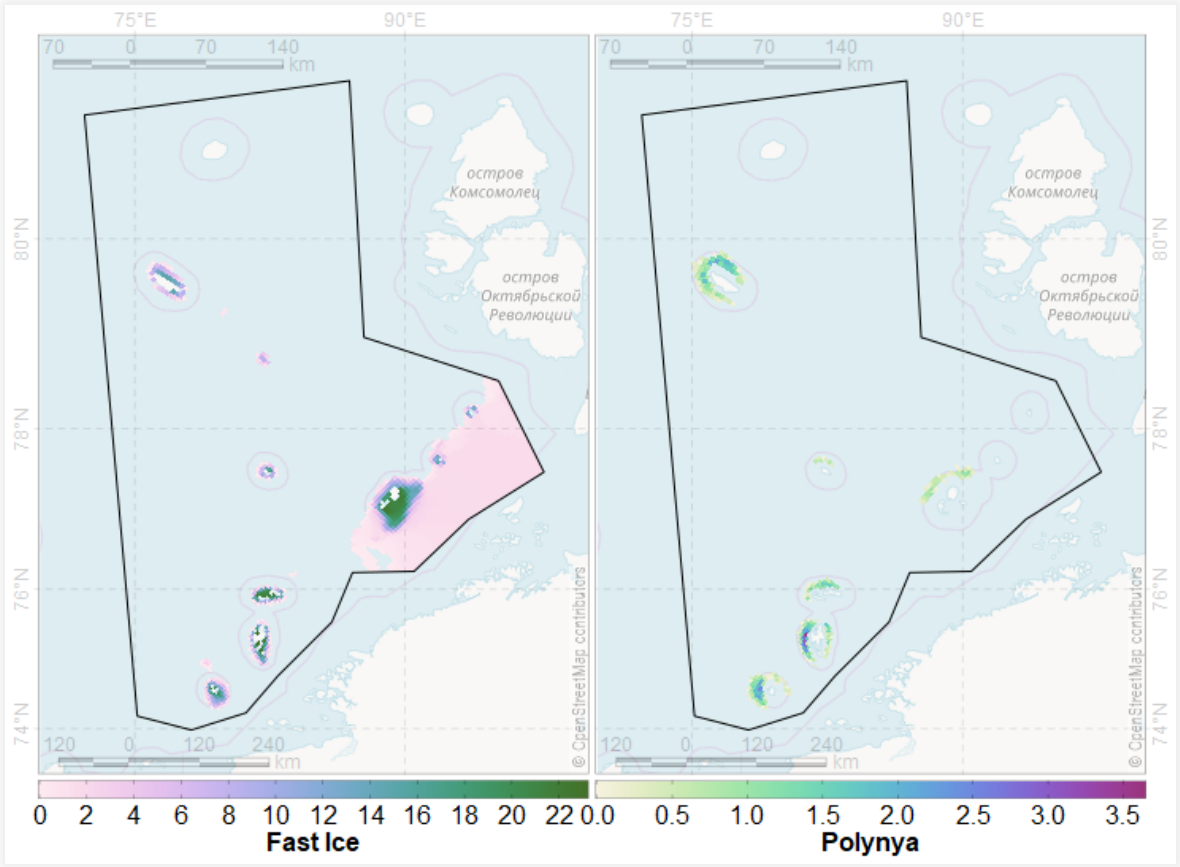
East Taimyr

Separate regions



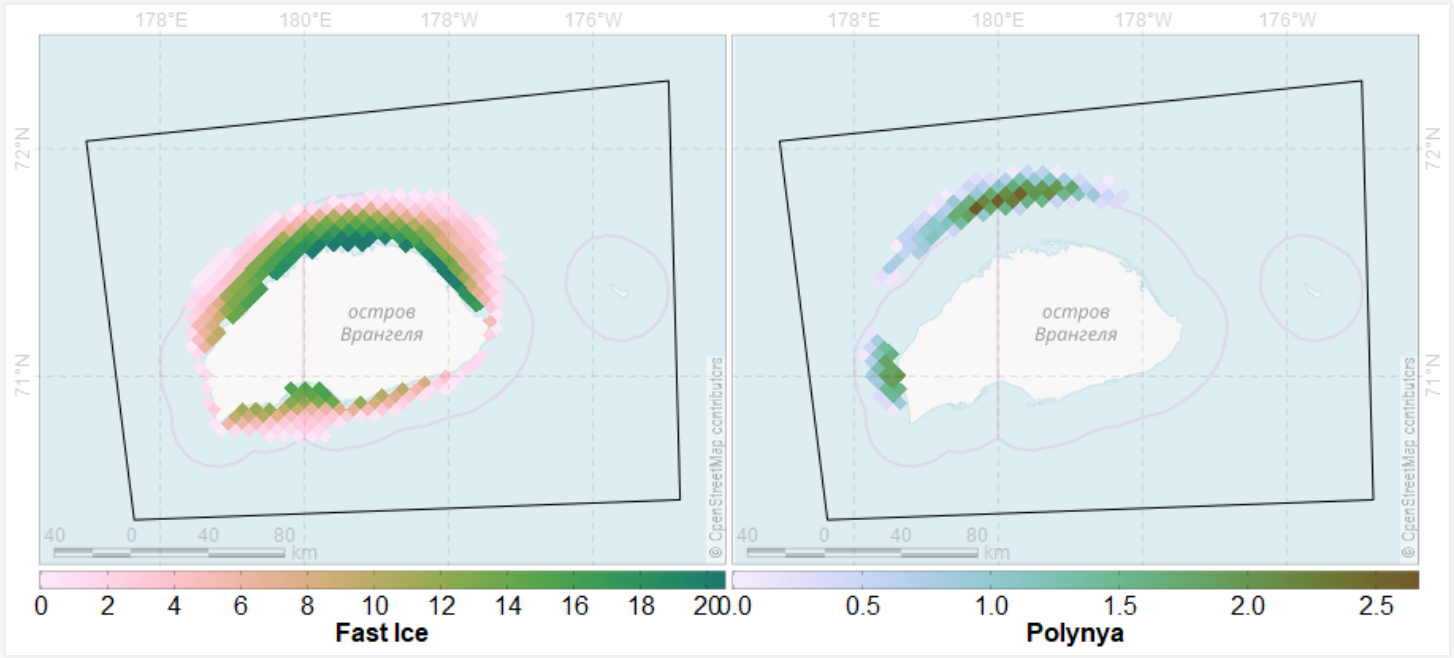
Pechora Sea

Separate regions



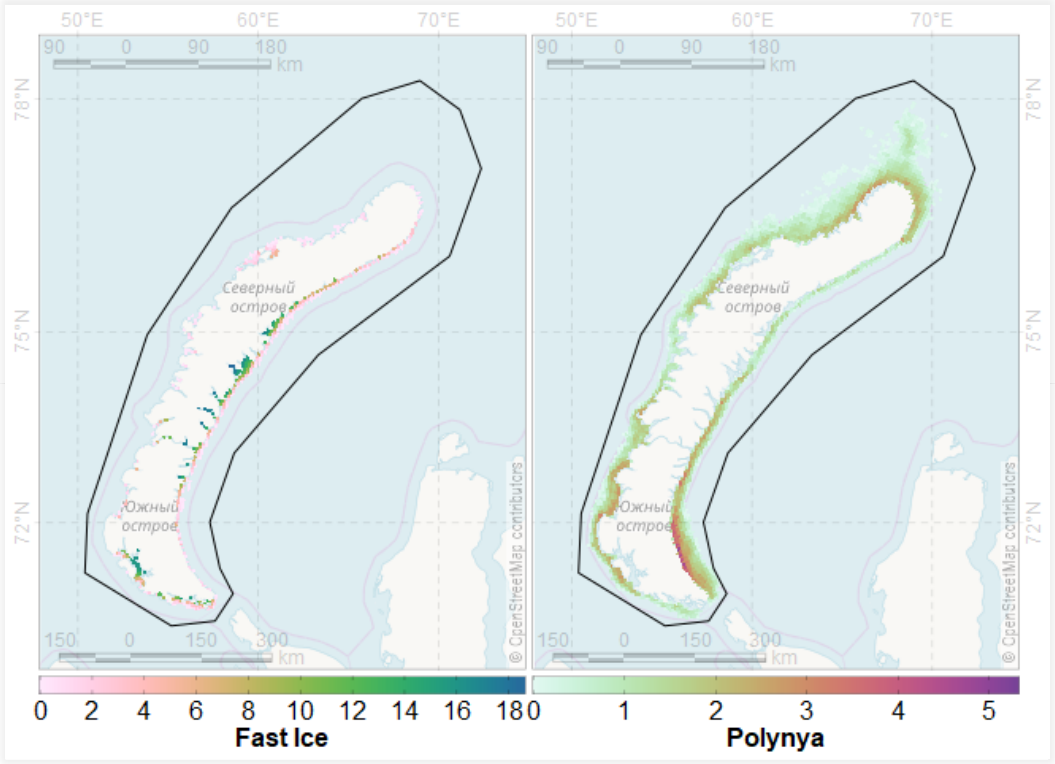
Kara Sea

Separate regions



Wrangel Island

Separate regions



Novaya Zemlya

Obstacles

- Calendar mismatch for communication with thematic group leader
- Lack of oceanographer
- Different WKT standards (OGC, ESRI) for projection specification in QGIS and ArcGIS during “ESRI Shapefile” exchange
- Complicated processing of active microwave data
- Unknown license/copyright/restriction for AARI ice charts data
- Formalized questionnaire for experts to request missed sea ice parameters (IDLs) for their CFs

Parameter	**Spatial extent**	**Years**	**Season**	**Threshold clarification, *etc***
MIZ				

Thank you

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