




Results from 2017/2016 and future planning: the East Siberian Arctic Shelf

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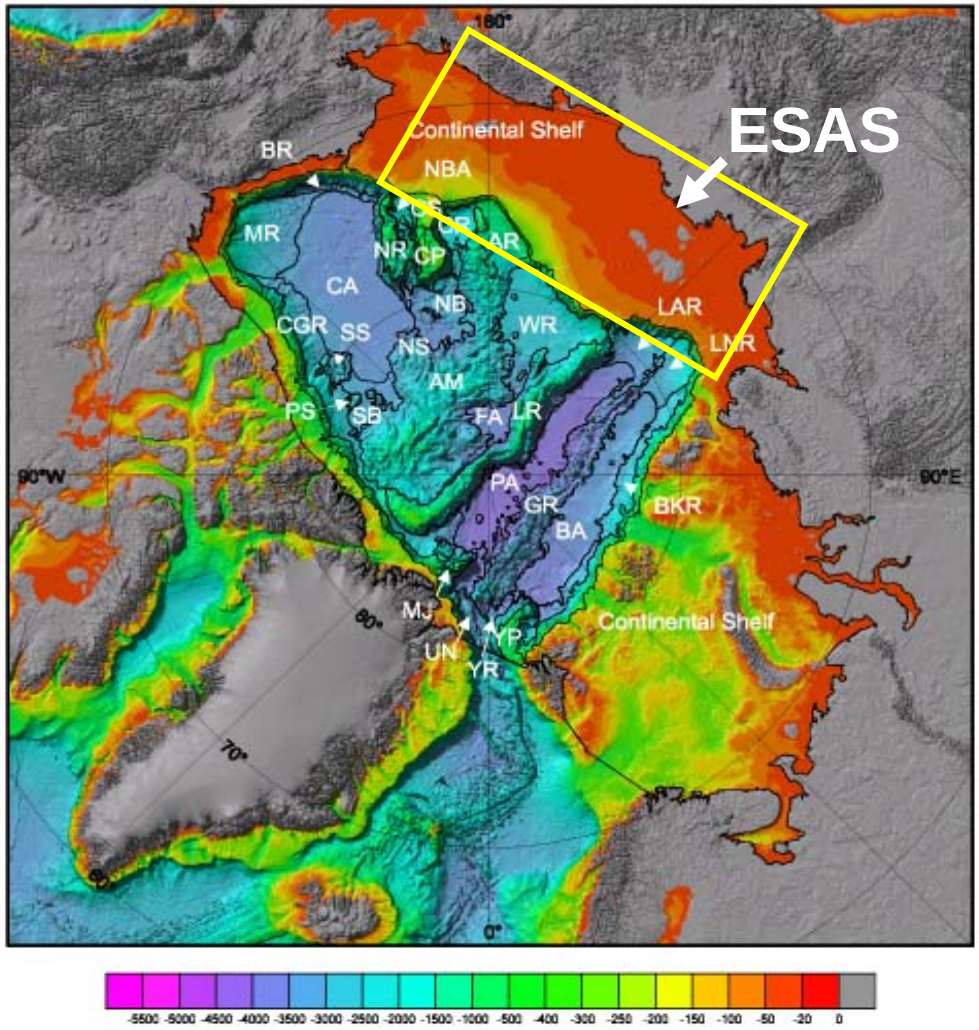
PAG Meeting

Seattle

7-8 November 2017

Study area



- The total area is **2.1×10^6 km^2** area **(~25%** of the Arctic Shelf, **~8%** of the World Ocean's continental shelf;

- **~75%** is shallower than **50 m** (mean depth of the continental shelf is **130 m**); sedimentary basins are up to **20 km** thick; C_{org} content is up to **12%.**

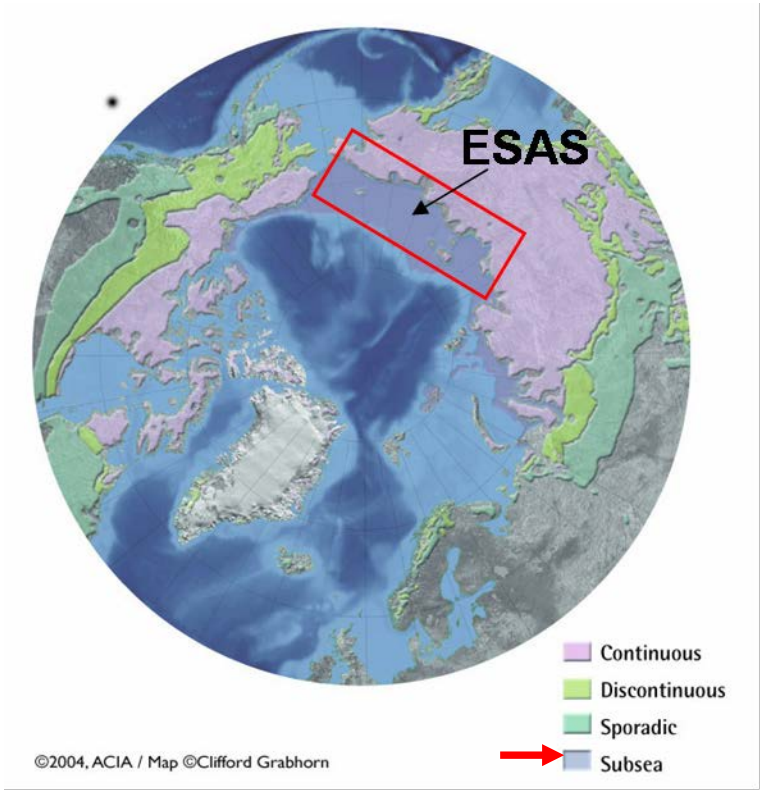
- shallowness determines alteration of dry position (cold epochs)/ submerged position (warm epochs), which occurs due to lea level fluctuation

The ESAS accumulates fresh water from 6 Arctic Siberian Rivers and it is major ice factory of the Arctic Ocean

- 6 Siberian Rivers – Khatanga, Olenek, Lena, Yana, Indigirka and Kolyma bring their waters to the ESAS – 7×10^{11} m^3

- Total area of watershed of the Lena River alone is comparable with that of the ESAS (2.5×10^6) km^2

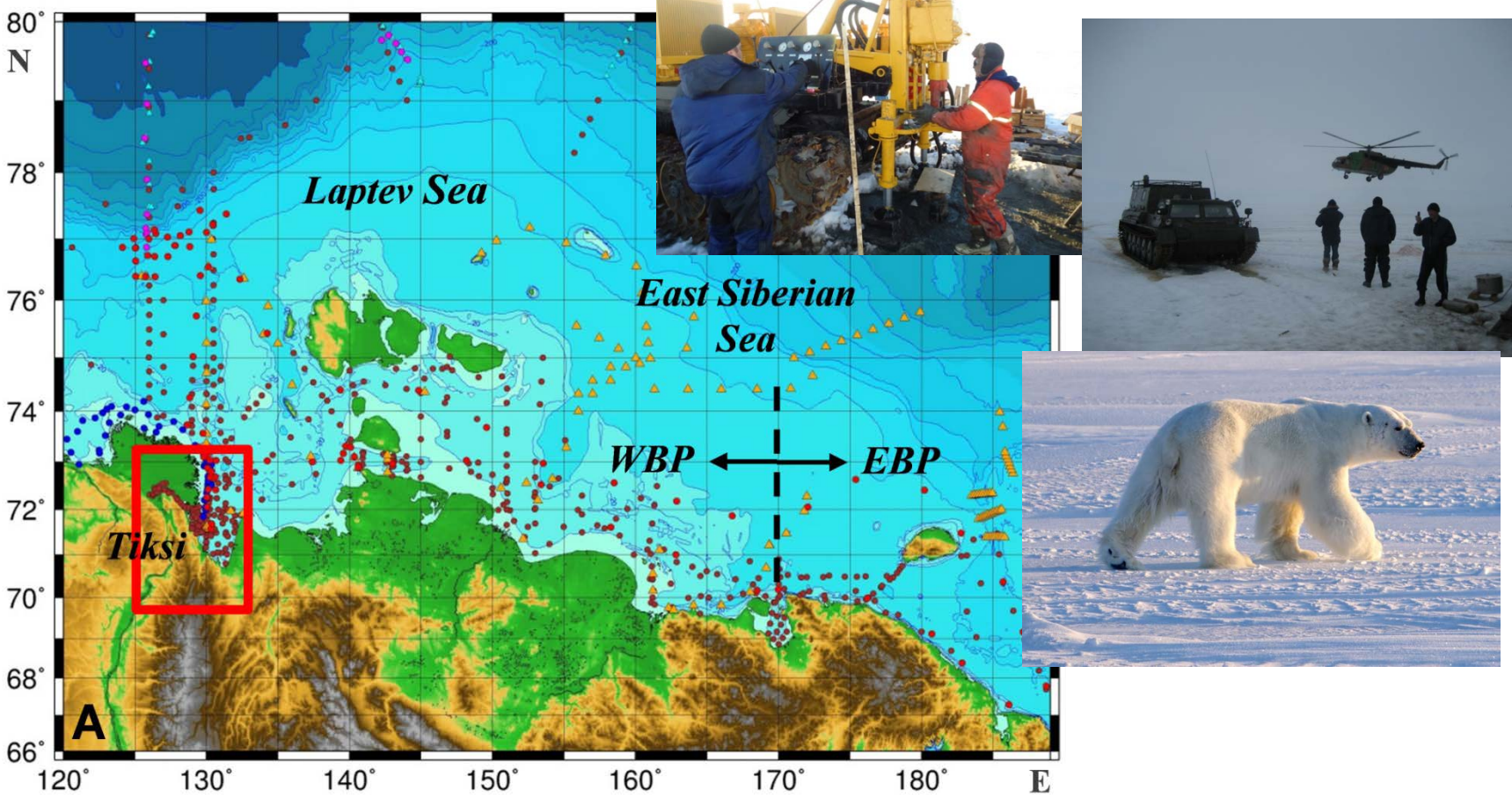
Basic component of the ESAS environment is sub-sea permafrost



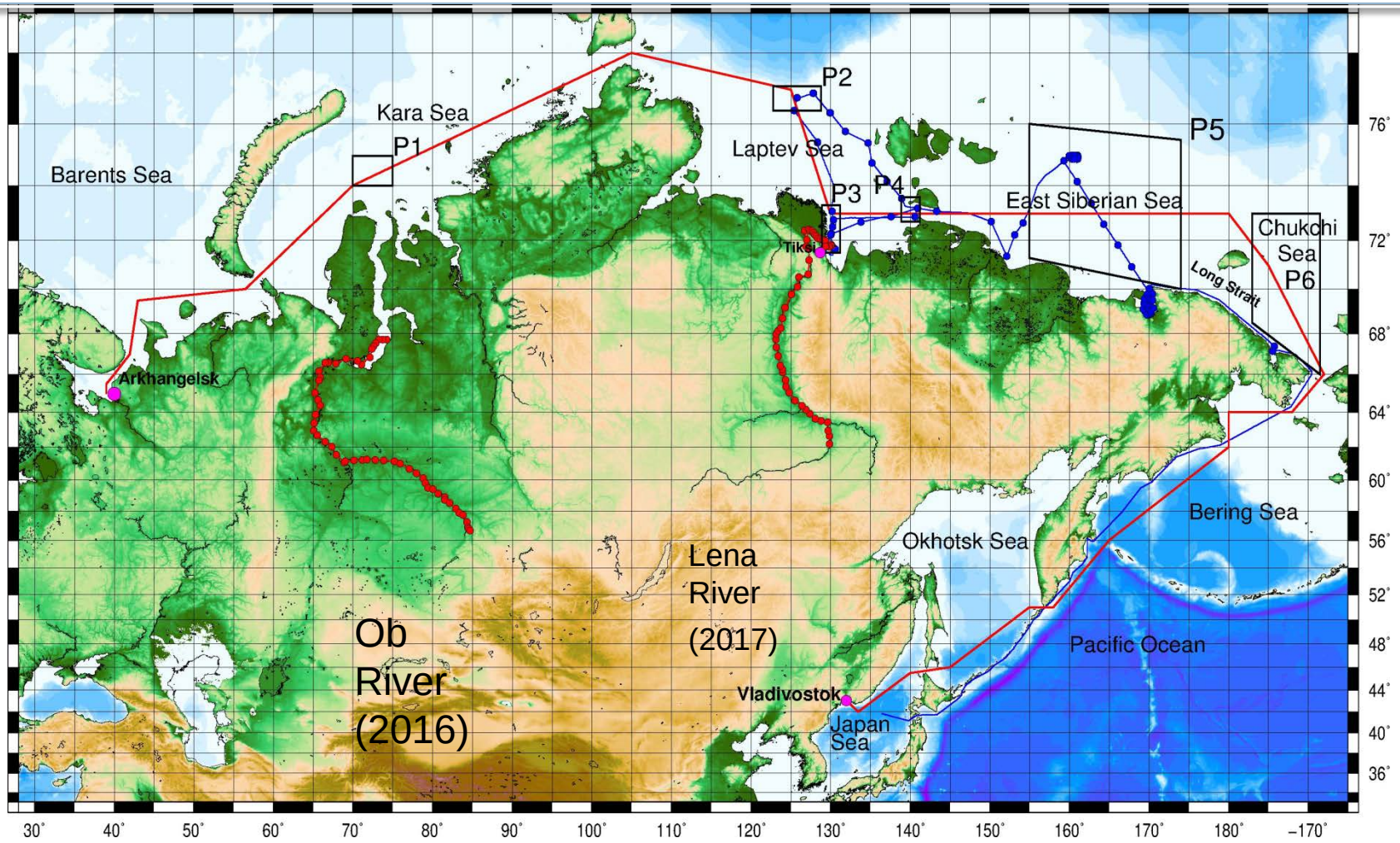
A) 80% of the total area of sub-sea permafrost (shown in lilac) is in the ESAS;

B) Shallow hydrates underlain more than 80% of the ESAS area (shown in grey).

Accomplishment in (2003-2015): In total, ~30 all-seasonal expeditions, >2,000 oceanographic stations, >10,000 n. miles of geophysical survey, 15 deep-boreholes drilled

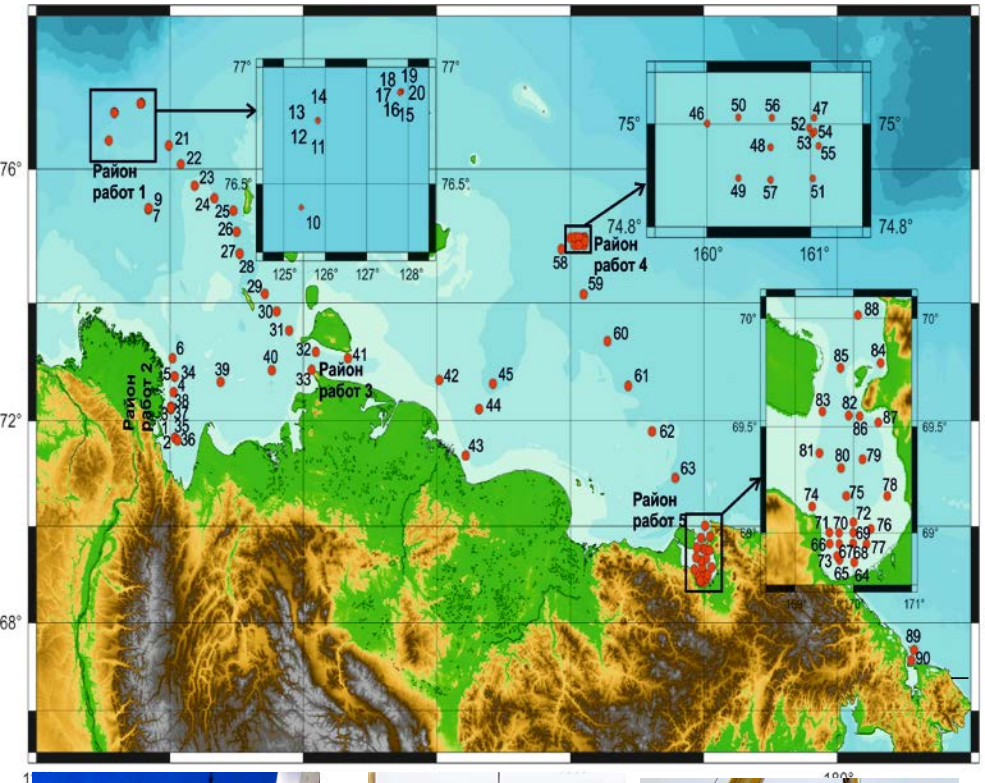


In 2016–2020, our main focus is to study contribution of marine Siberian sources of CH4 and CO2 vs their terrestrial sources.



Planning cruise-2018 track is marked by red line; accomplished cruise-2016 by blue line. To compare the role of the Great Siberian Rivers: Lena (basin is almost completely in the permafrost area) vs Ob (basin is almost outside of the permafrost zone). Location of already accomplished riverine stations is marked by red circles

Expedition onboard RV Academician Lavrentiev was accomplished in 24 September–2nd November 2016



We used the same techniques working at the sea and on land, including:

- Continuous measurements of CH4 content in air (Li-7700: DLT-100; PicarroG3132i)- and surface water (GC-FID).
- Seismo-acoustical profiling.
- --Sediment coring.
- Continous PAR, T, S measurements in the surface water
- Complex biogeochemical studies at stations
- CH4 triple isotope sampling (measurements in different labs in Europe)

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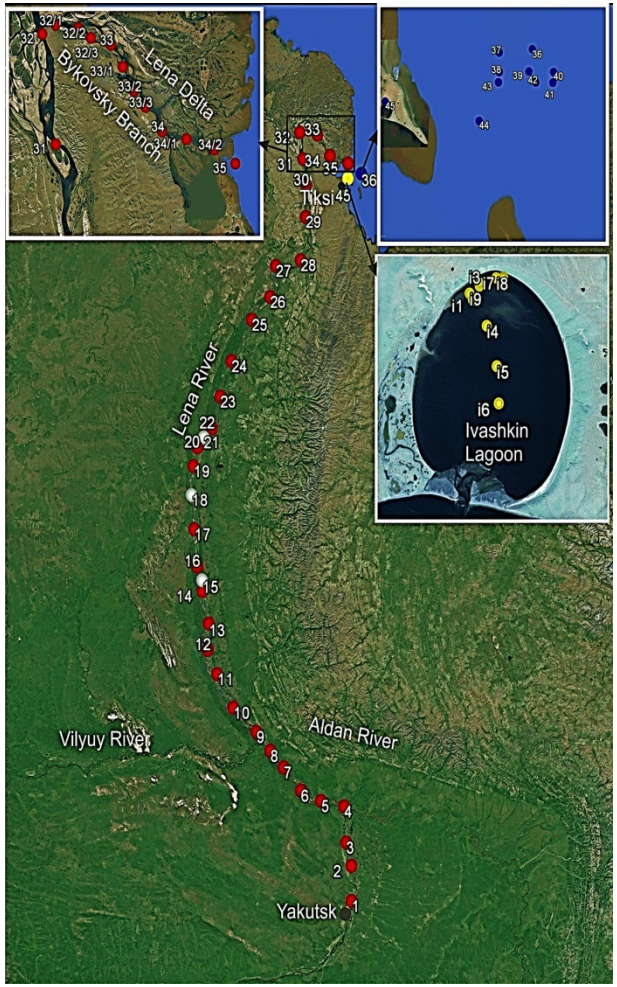
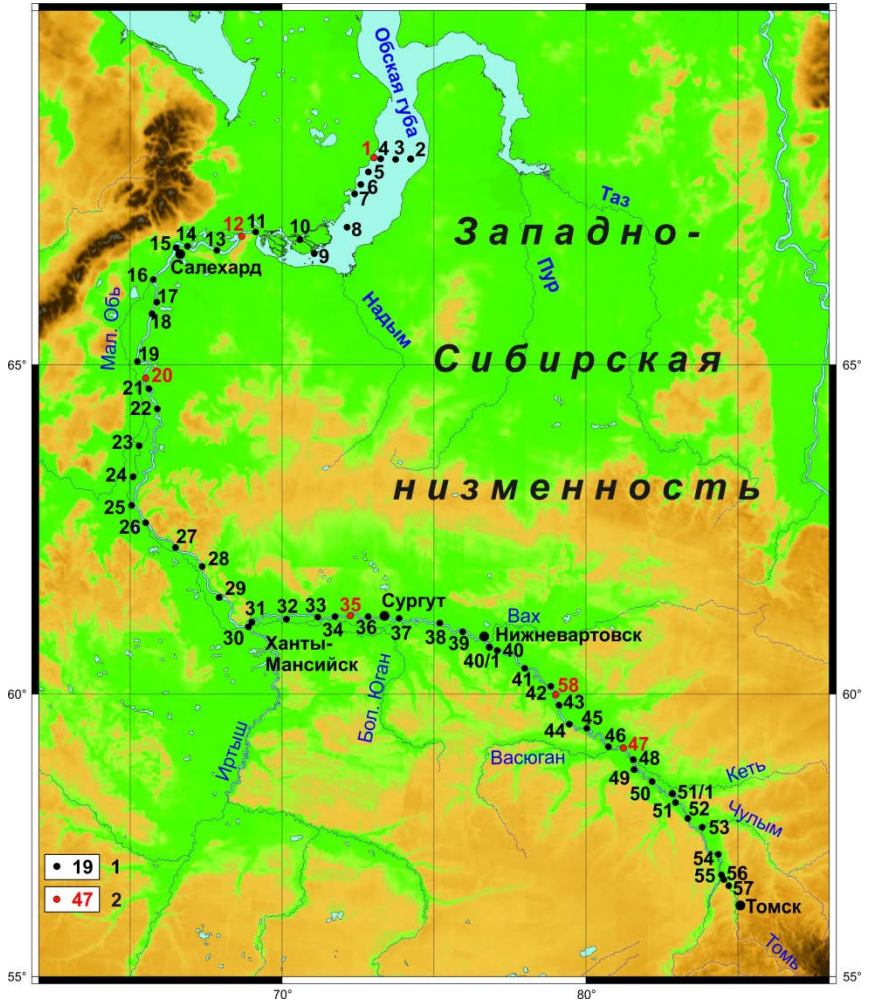
Detail location of stations accomplished along the Great Siberian Rivers



Lena River and Ivashkina lagoon in the Laptev sea



Ob River


Thank You!