Sergey Naidenko, Nikita Platonov, Ilya Mordvintsev, Evgeny Ivanov, Svetlana Artemieva
Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences

Polar Bear Research in Russia in 2023-2025

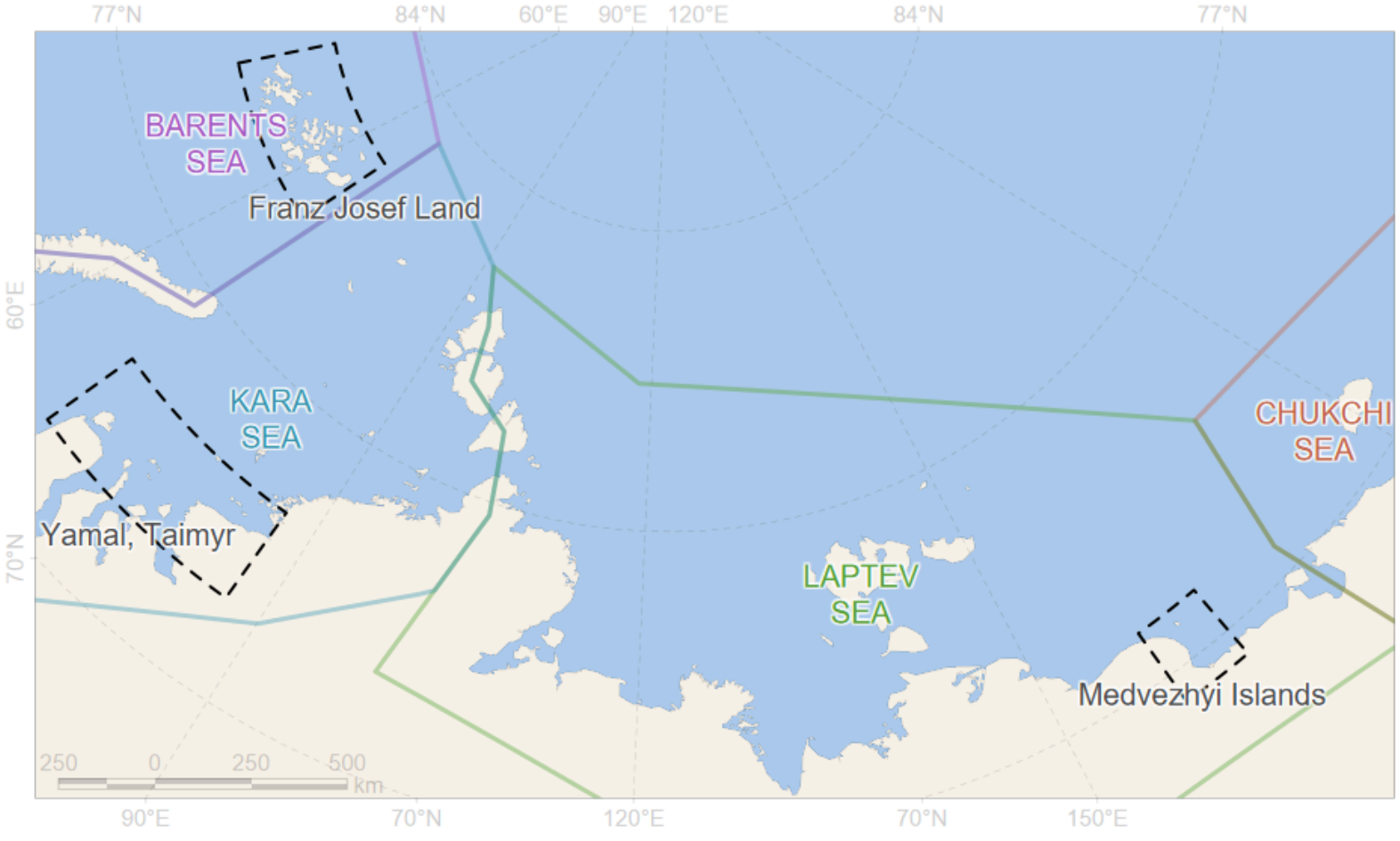
conducted by the Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences

Polar Bear Range States Meeting of the Parties

December 2-5, 2025

Updated: 2025-11-13 18:19

Program of polar bear study in the Russian Arctic



The Institute of Ecology and Evolution of the Russian Academy of Sciences (IEE RAS) continues polar bear research in the Russian Arctic, which began in 2010 under the Program of the Russian Academy of Sciences. Research is being conducted in accordance with the Strategy for the Conservation of Polar Bears in the Russian Federation for the period until 2030.

In 2023-2025, we carried out polar bear monitoring on the Franz Josef Land Archipelago, islands in the Kara Sea near by Yamal and Taimyr Peninsulas, and the Medvezhyi Islands (*Bear Islands*) Archipelago in the East Siberian Sea.

Program of polar bear study in the Russian Arctic

During 2023-2025 period, the main focus was on research and monitoring of the Kara Sea polar bear subpopulation (IUCN Red List Category – VU - Vulnerable)

Main methods of polar bears research

- Study of abundance and distribution of polar bears
  - Field survey and observations
  - Aerial and ship survey and observations
- Satellite telemetry for evaluating the polar bear movement, behaviour and resource use
- Health assessment of polar bears and study of the influence of natural and anthropogenic factors on the animal health
  - Dangerous diseases (serological study)
  - Hematological study
  - Toxicological study
- Polar bear population structure studies by molecular genetic methods

Field work results in 2023-2025

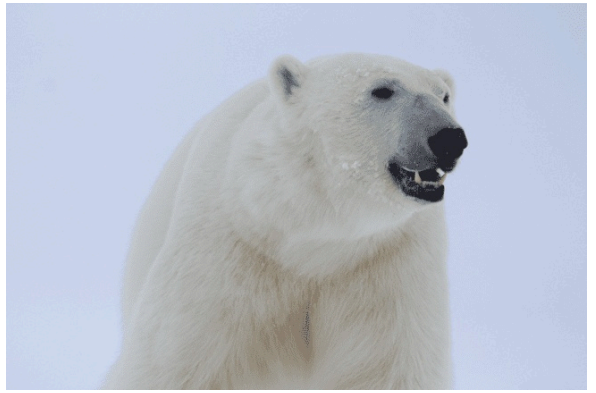
11 expeditions to the Barents, Kara and East Siberian Seas were carried out in spring and summer-autumn seasons;

338 polar bears were recorded during observations;

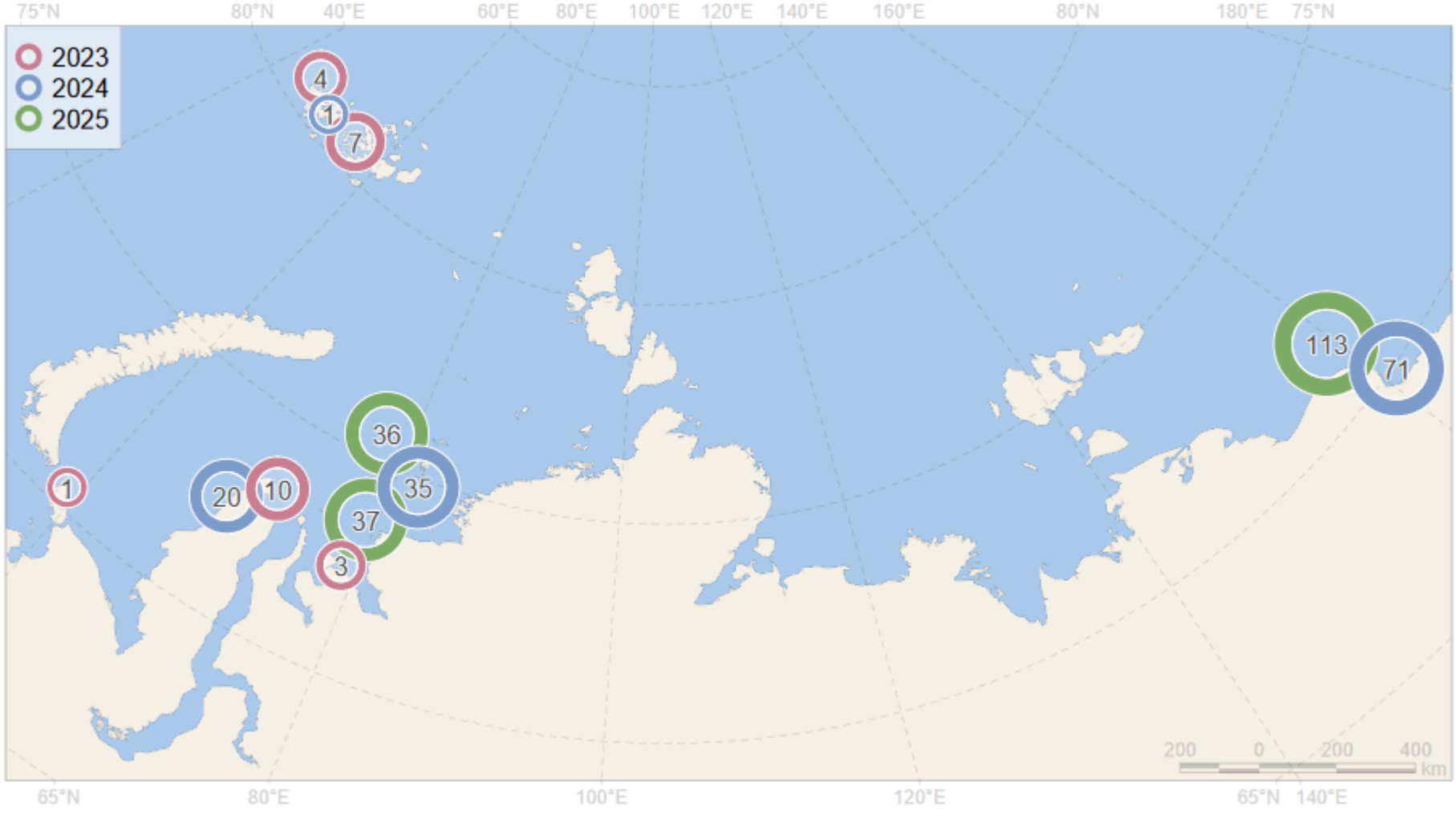
34 polar bears were captured during this period;

13 females and **6** males were tagged with satellite transmitters;

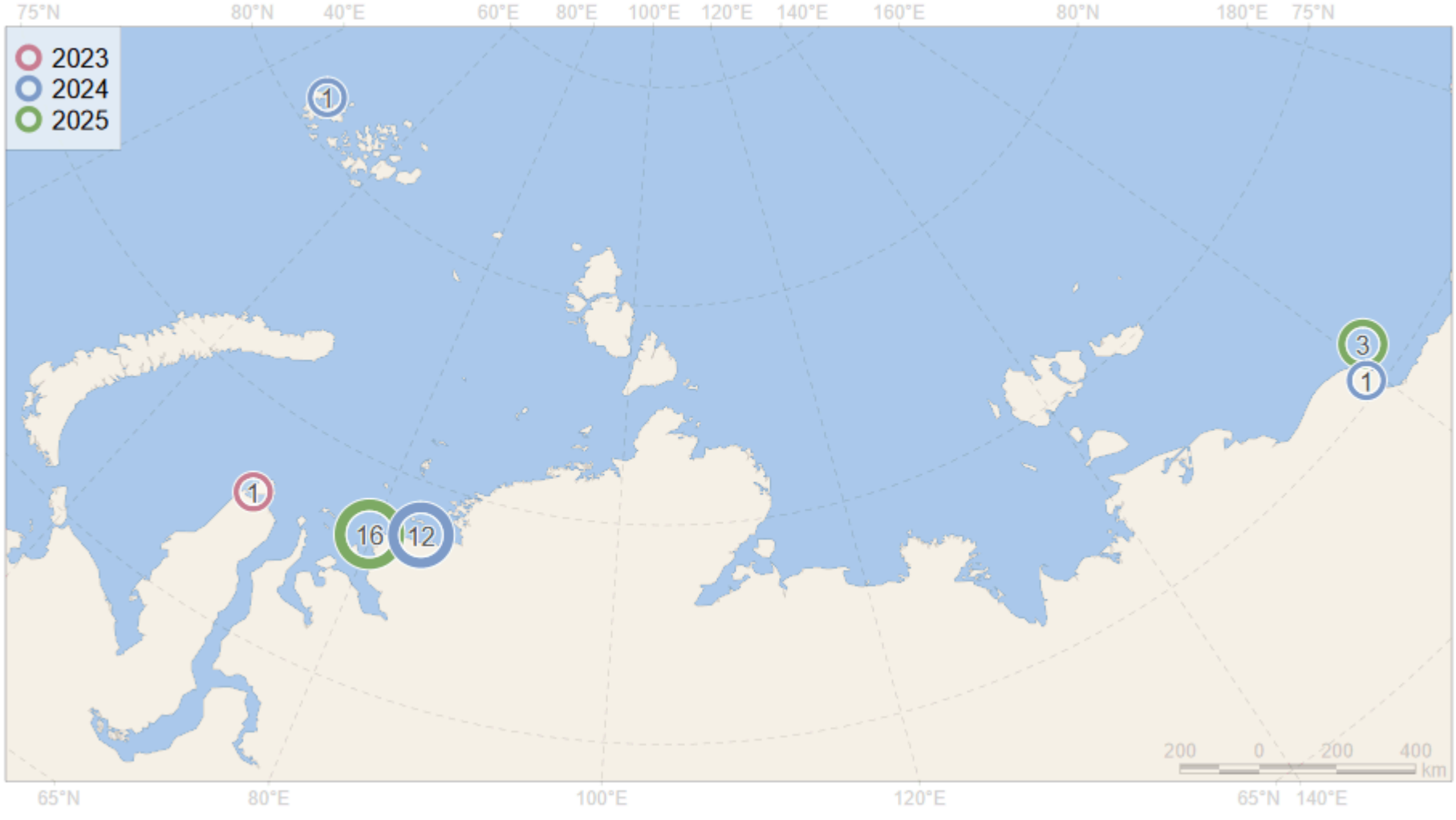
102 biological samples were taken from immobilized individuals (blood, hair, excrement);



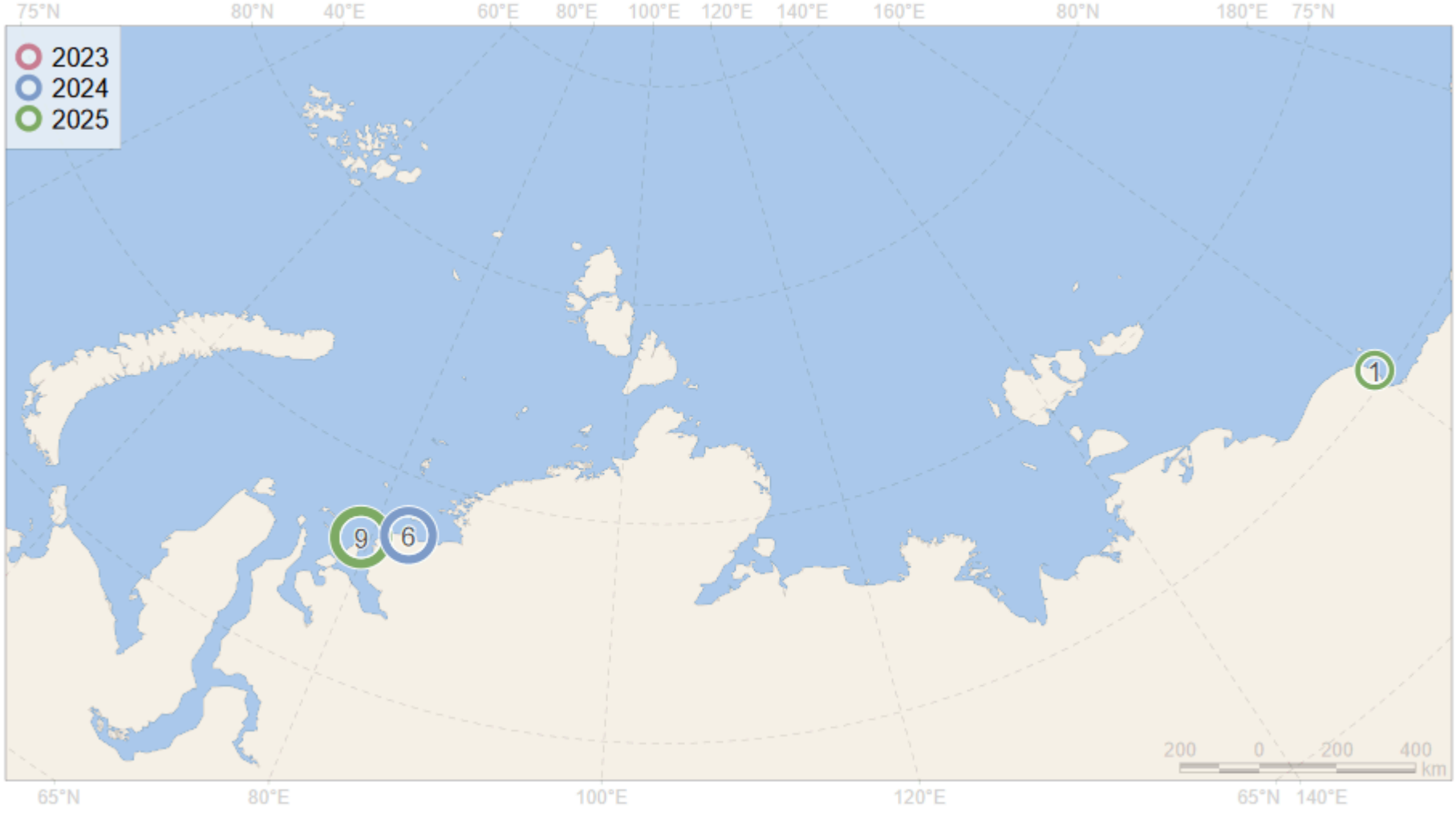
Number of polar bears observed, 2023-2025



Number of polar bears captured, 2023-2025

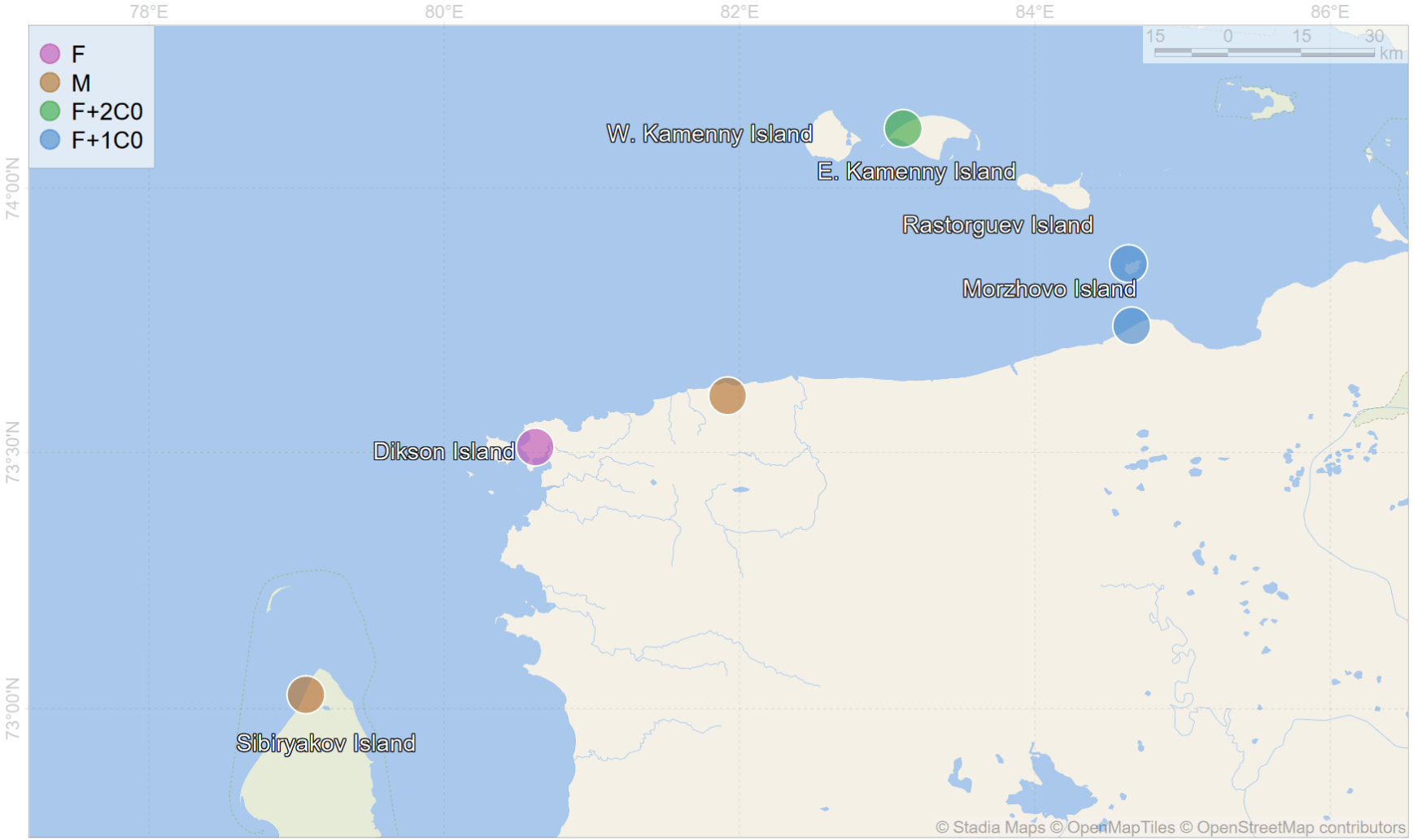


Number of polar bears tagged, 2023-2025



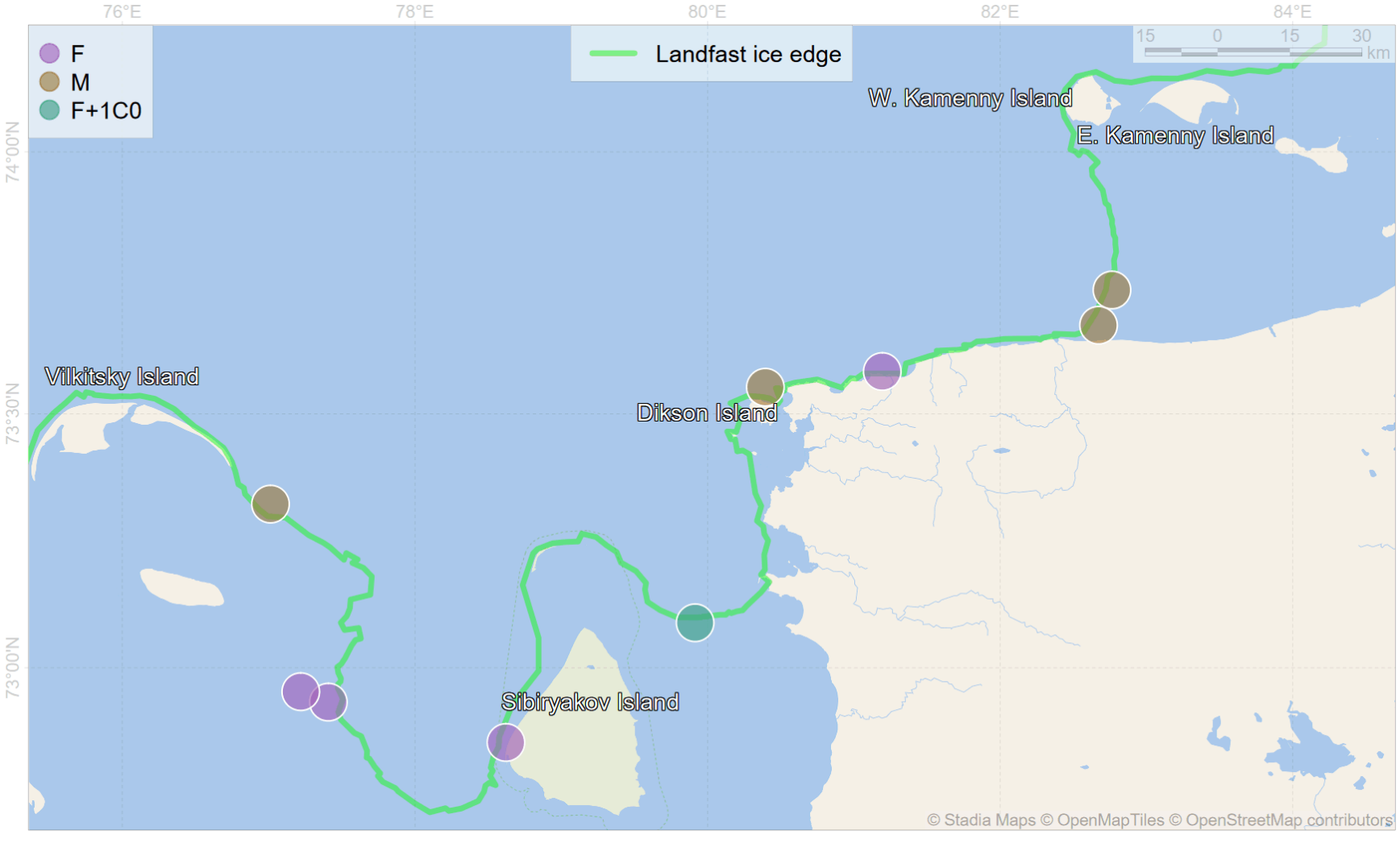
We use satellite-linked radio and GPS collars for females and ear-mounted satellite tags for male, produced by the Russian company "EsPas".

Satellite tagging of polar bears in the Kara Sea, 2024-2025



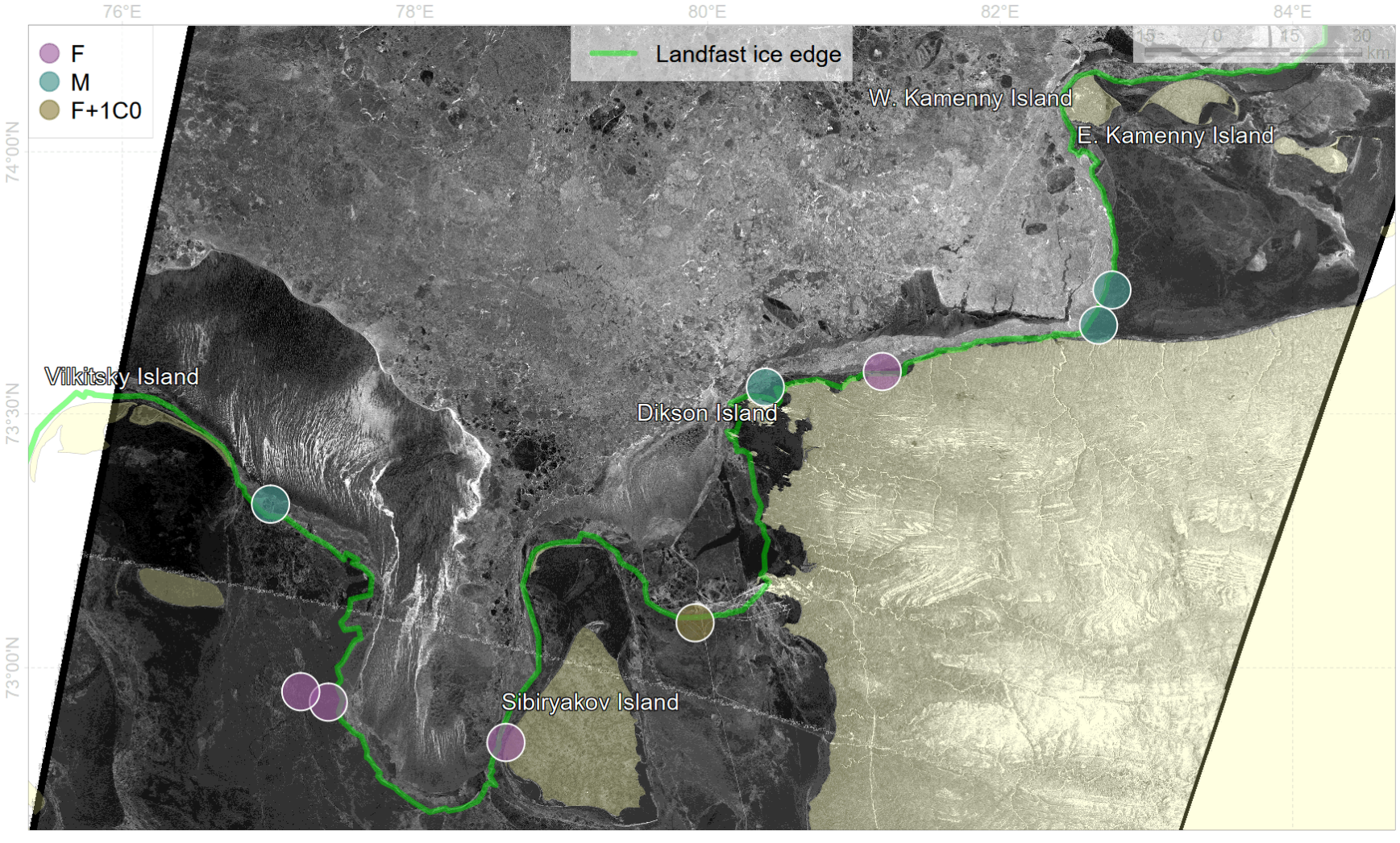
August-September, 2024. 6 polar bears (4 females and 2 males) were tagged on land during the ice-free period

Satellite tagging of polar bears in the Kara Sea, 2024-2025

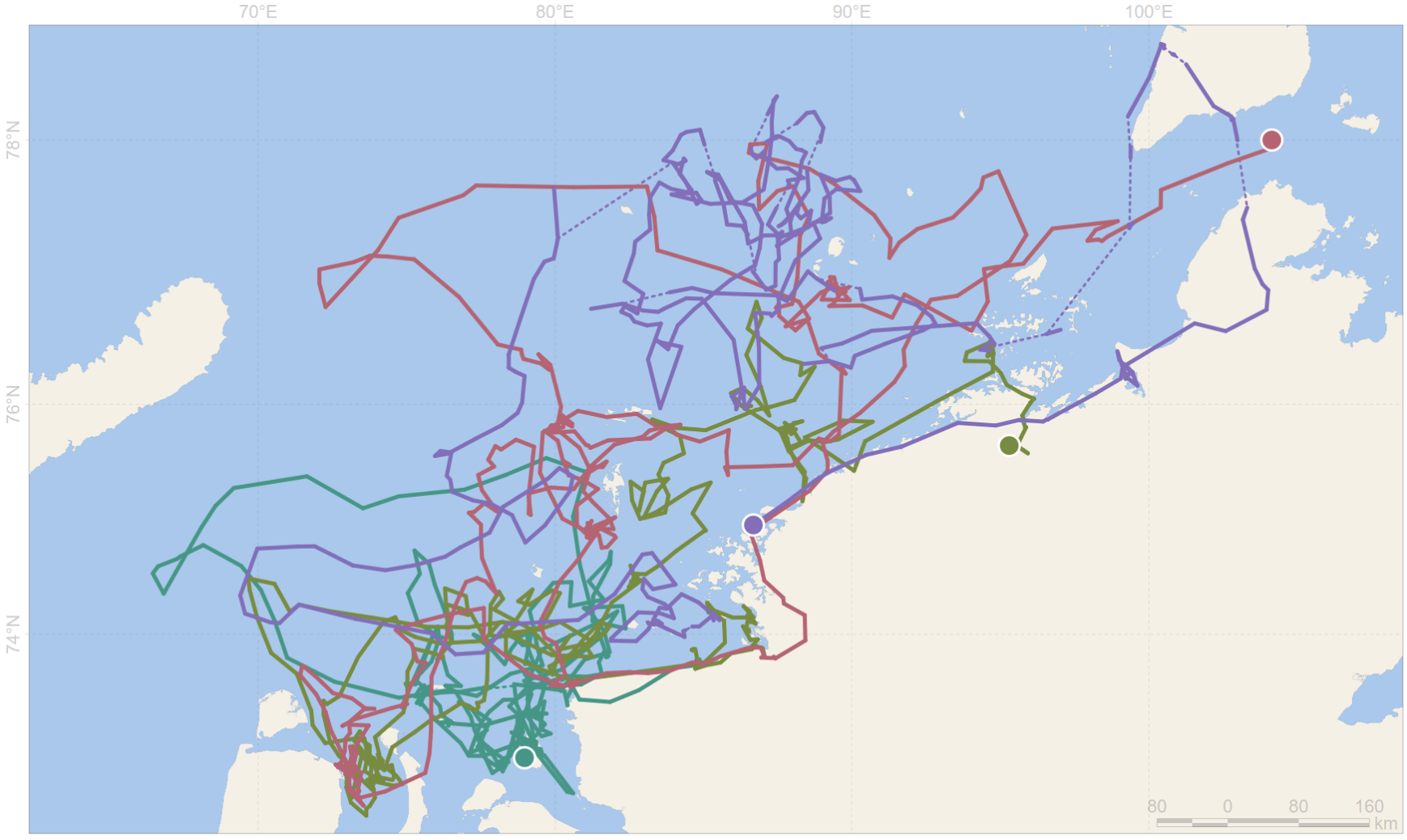


April-May, 2025. 9 polar bears (5 females and 4 males) were tagged on fast ice

Satellite tagging of polar bears in the Kara Sea, 2024-2025

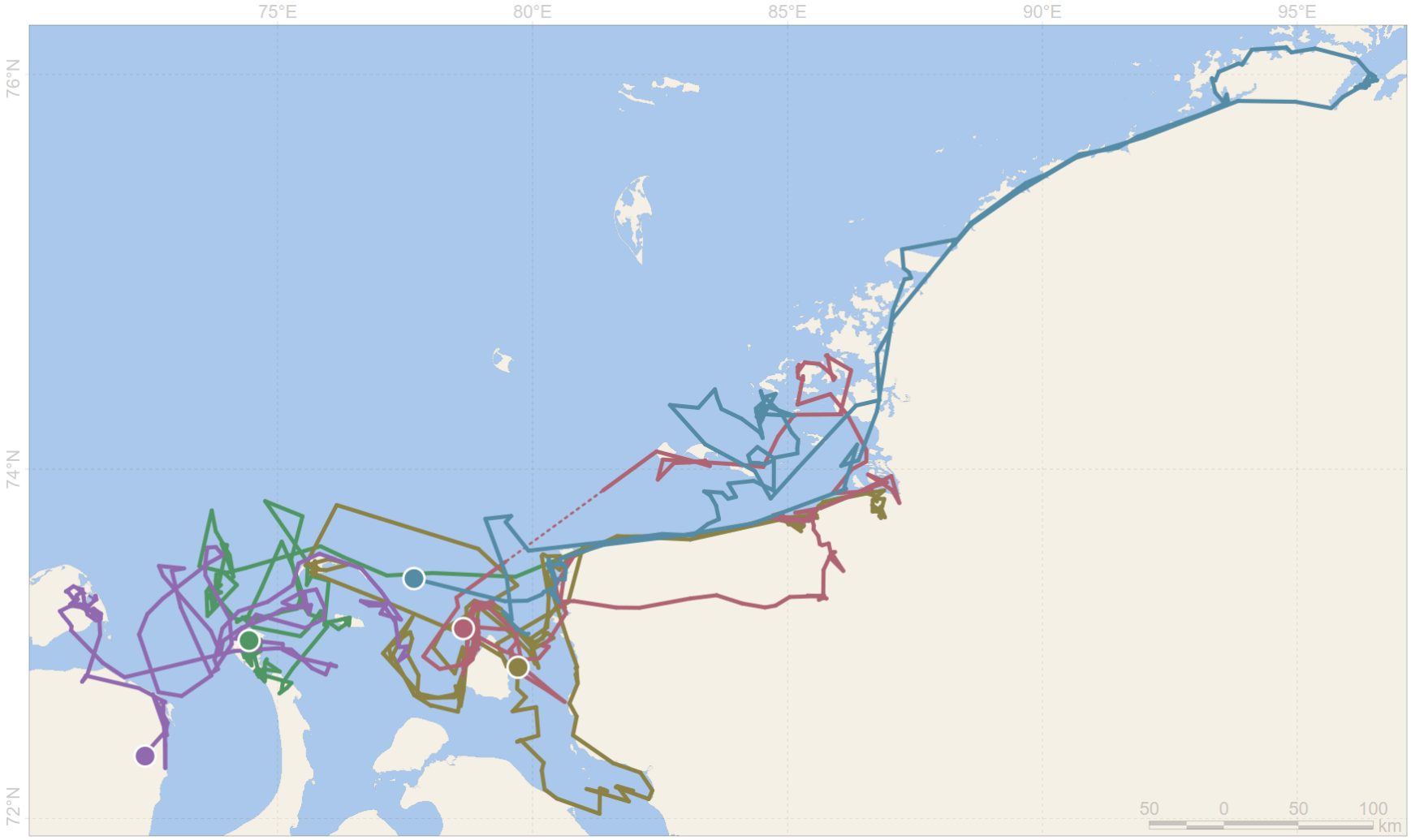


Evaluating of the polar bear movements by satellite telemetry



Movement trajectories of 4 polar bear females in the Kara Sea, captured in 2024 on the islands and coast of Taimyr.

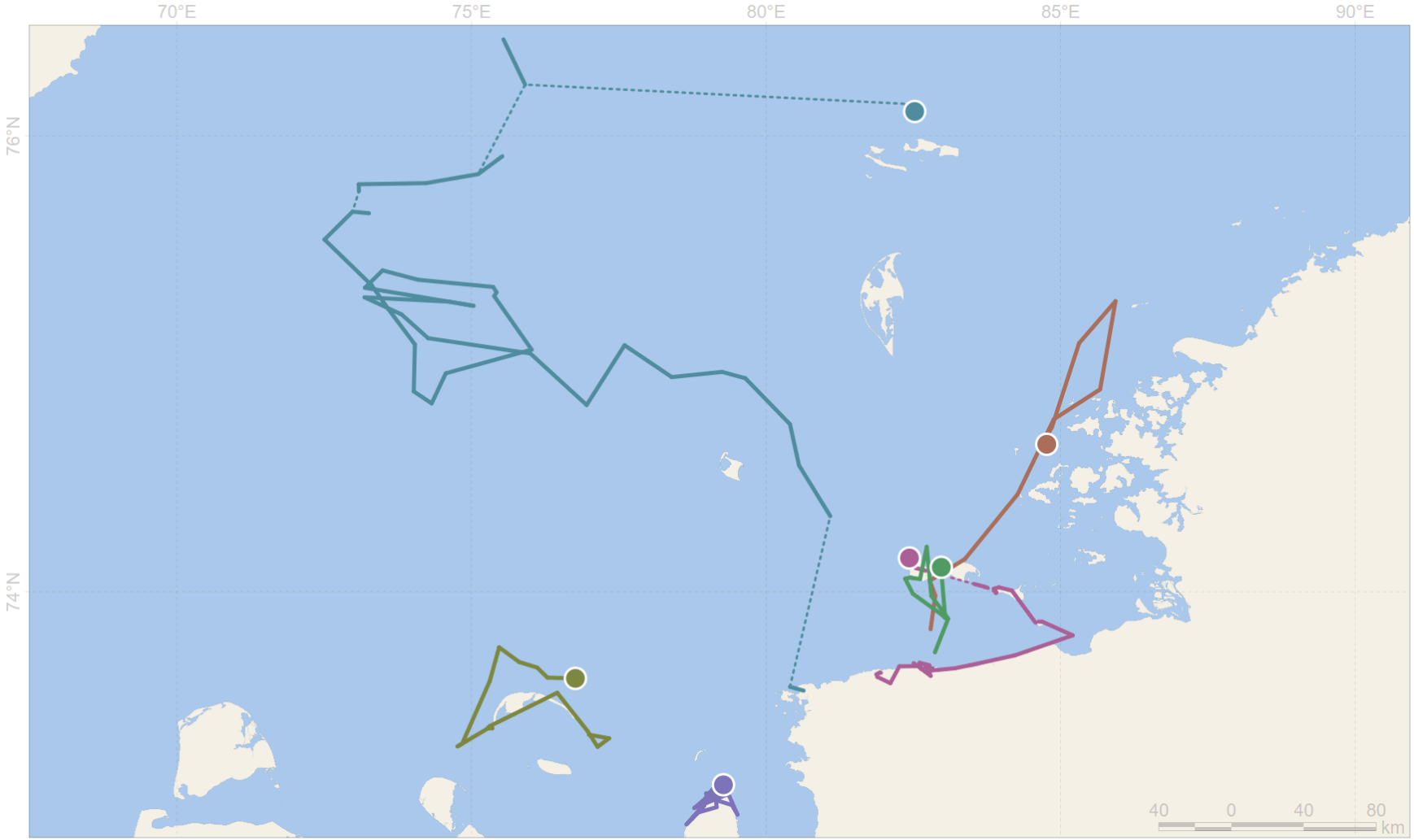
Evaluating of the polar bear movements by satellite telemetry



During the tracking period in 2025 females moved only in the southern part of the Kara Sea water area (aquatory).

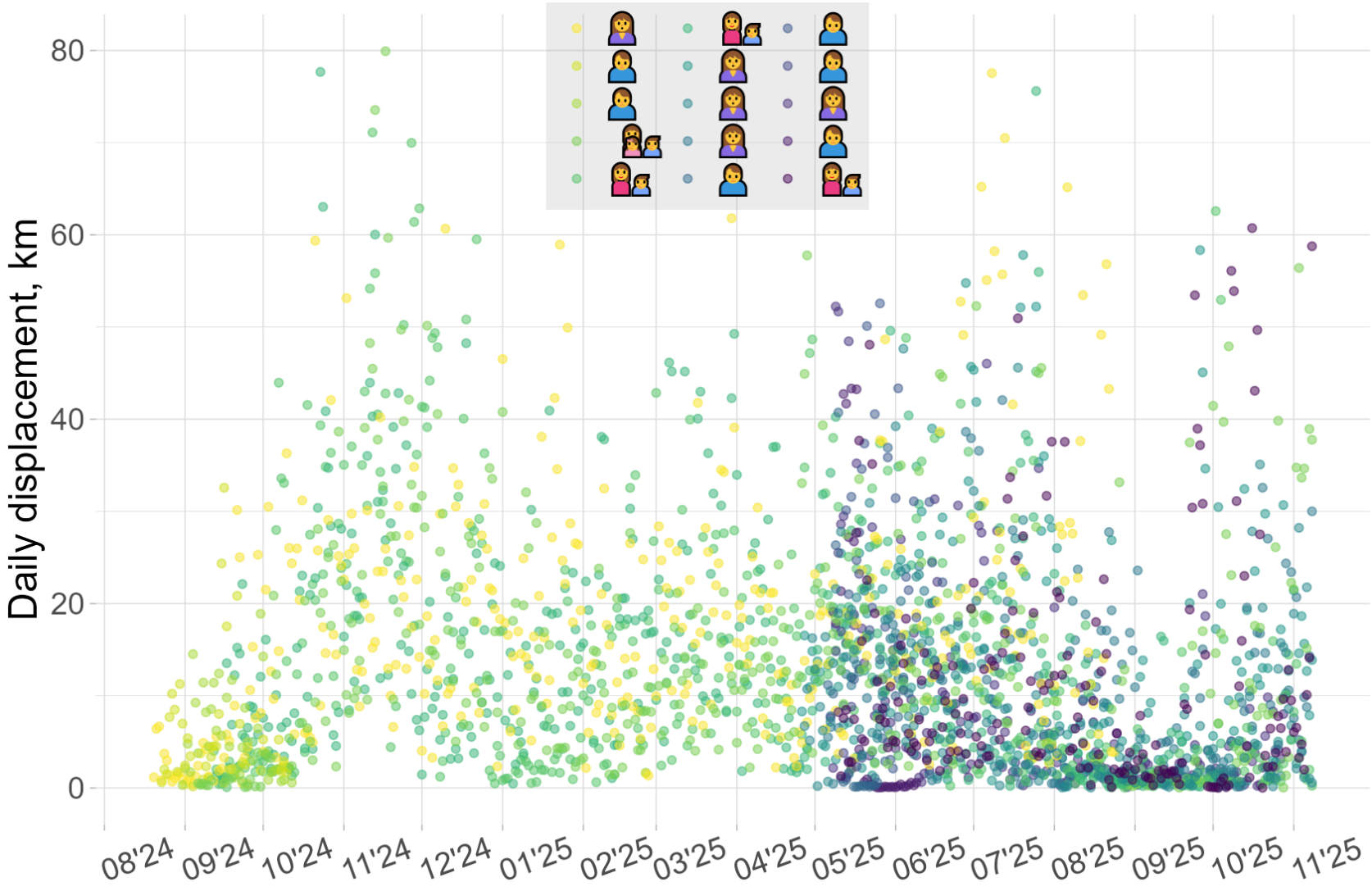
Movement trajectories of 5 polar bear females in the Kara Sea, captured in 2025 on fast ice

Evaluating of the polar bear movements by satellite telemetry



Movement trajectories of polar bear males in the Kara Sea, captured in 2024 on shoreline and in 2025 on fast ice.

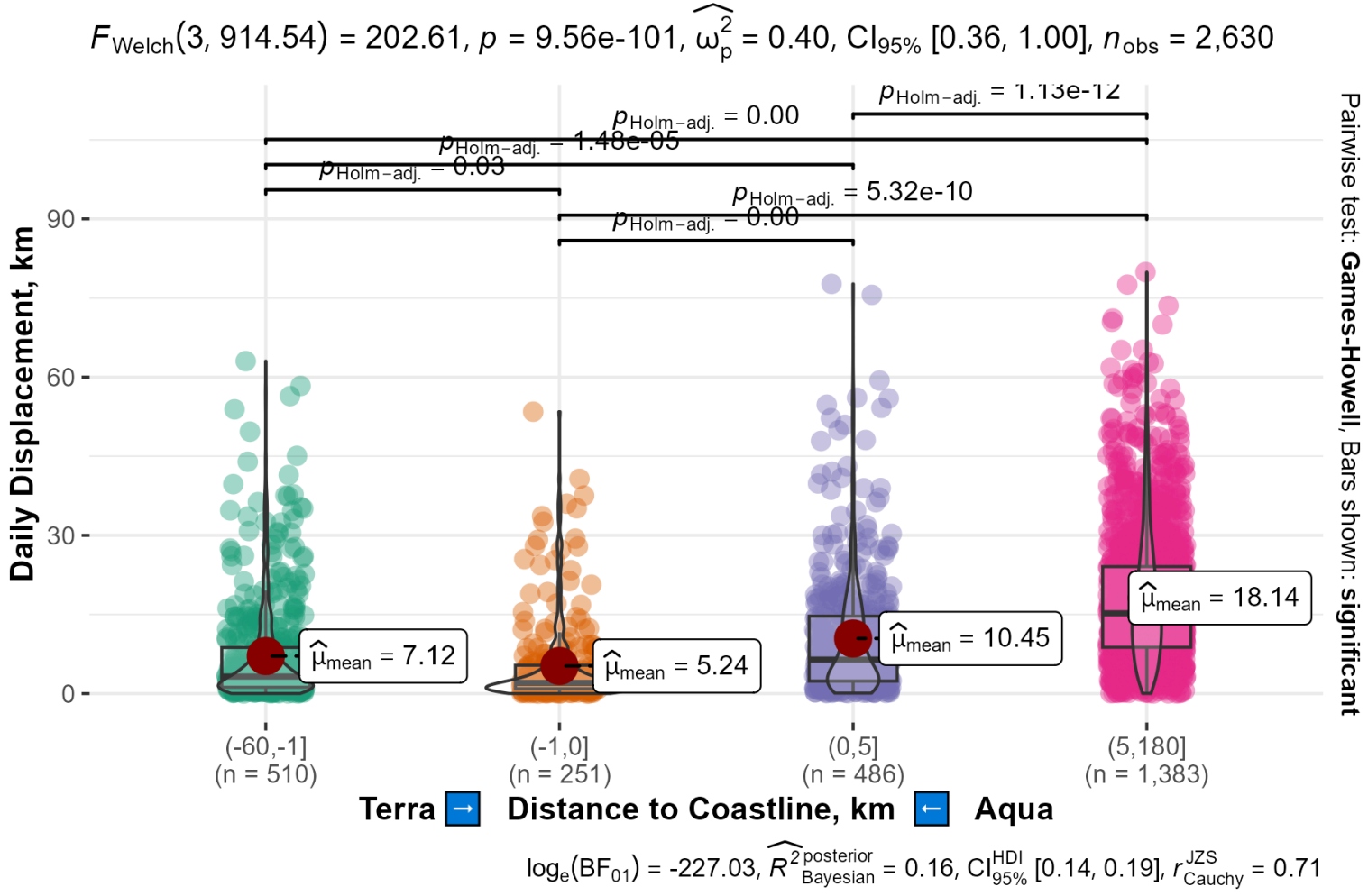
Polar bears daily displacement



Daily displacement was low before middle of October 2024 with values values, close to zero. Then the polar bears mobility was increased, with missed zero values until December 2024. Next active period was between February and April. In May number of points was increased in result of new tagging.

Daily movements of 15 polar bears over a period of more than 12 months

Polar bears daily displacement



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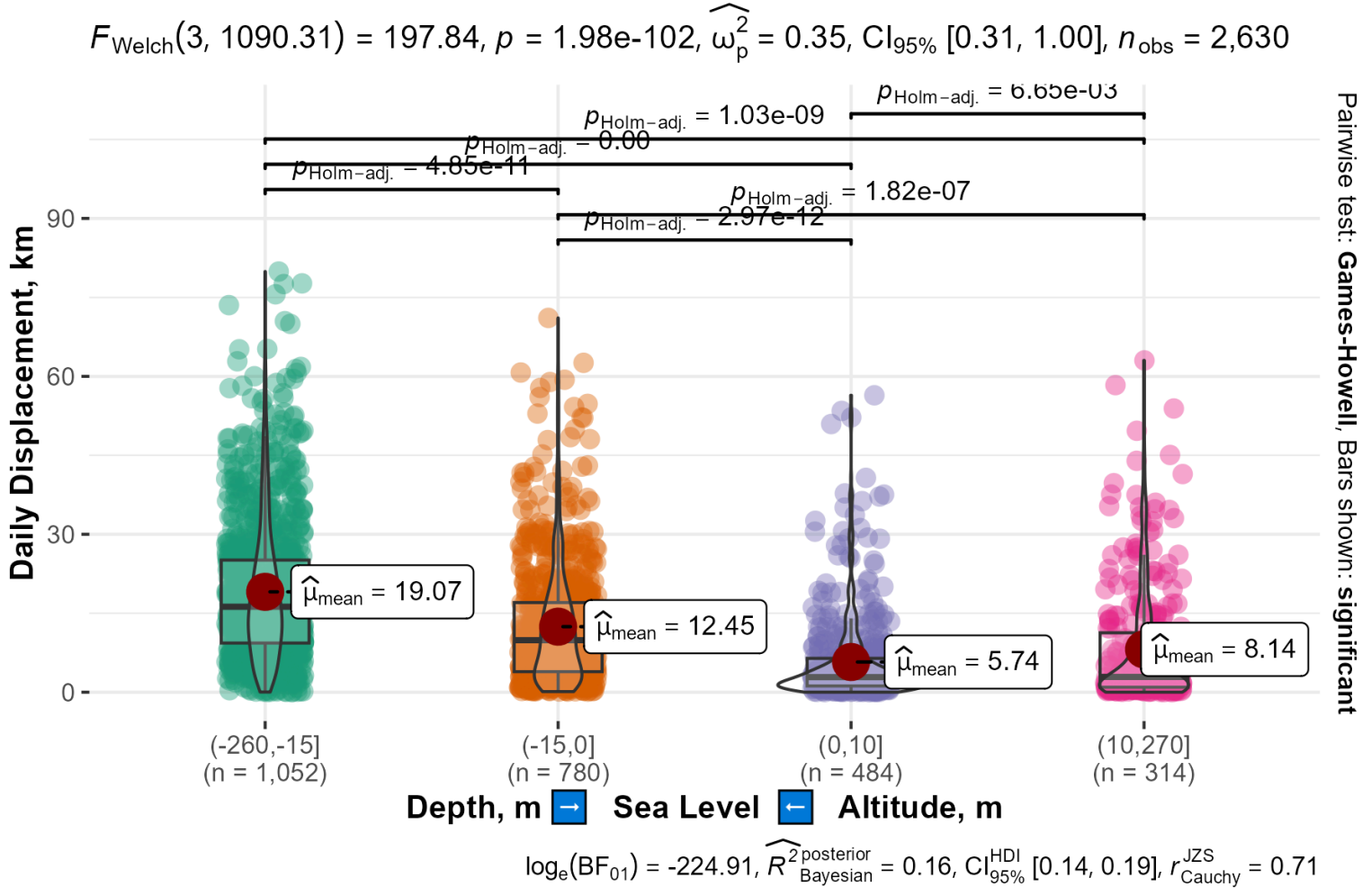
Pearson's product-moment correlation

$$\rho(log(\text{daily}), log(|\text{dist2land}|)) = 0.43, df = 2628, p < 0.001.$$

Polar bears daily displacement



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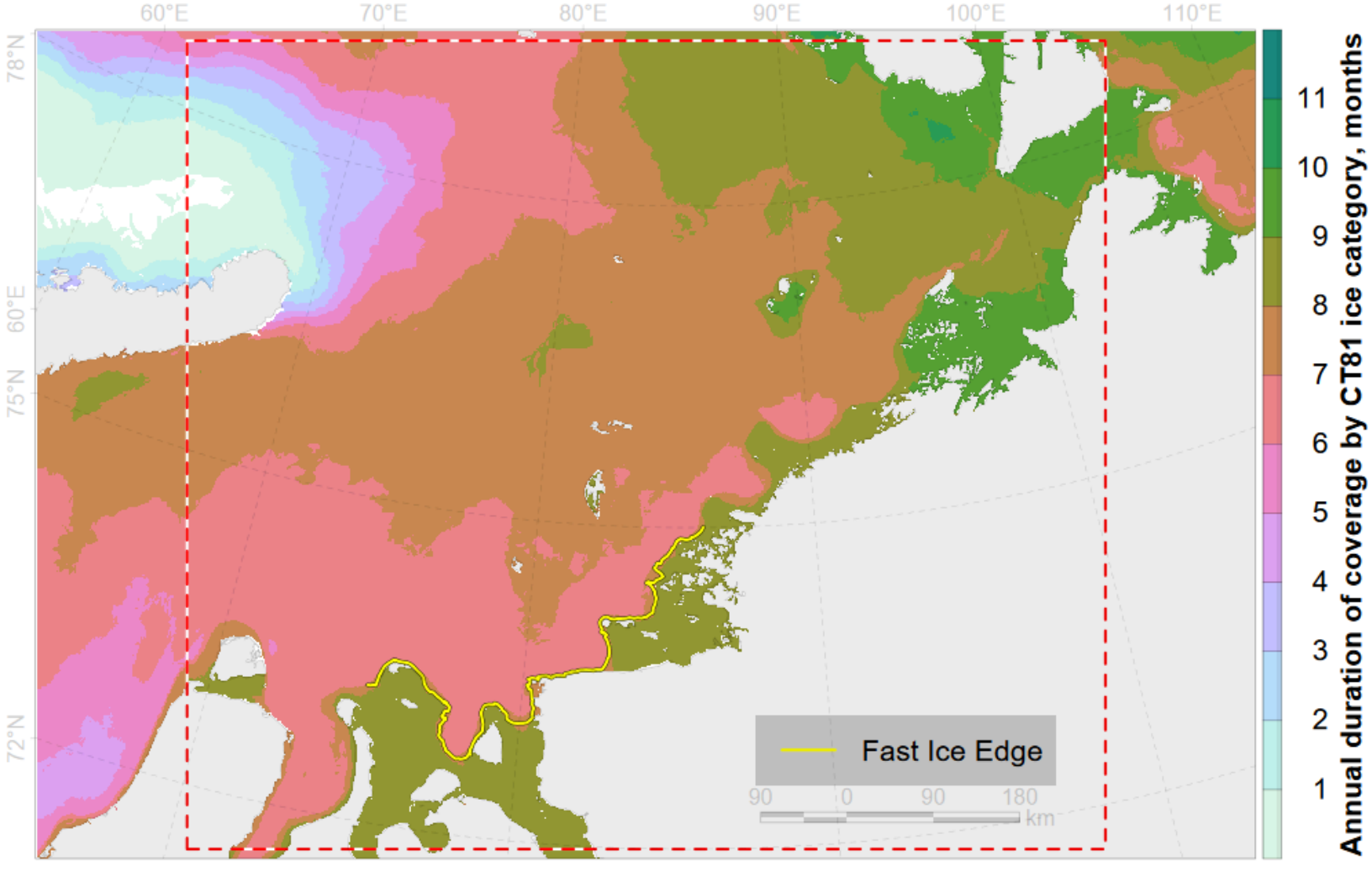
Pearson's product-moment correlation

$\rho(log(\text{daily}), \text{topo}) = -0.34, df = 2628, p < 0.001.$

Sea ice habitat availability and use



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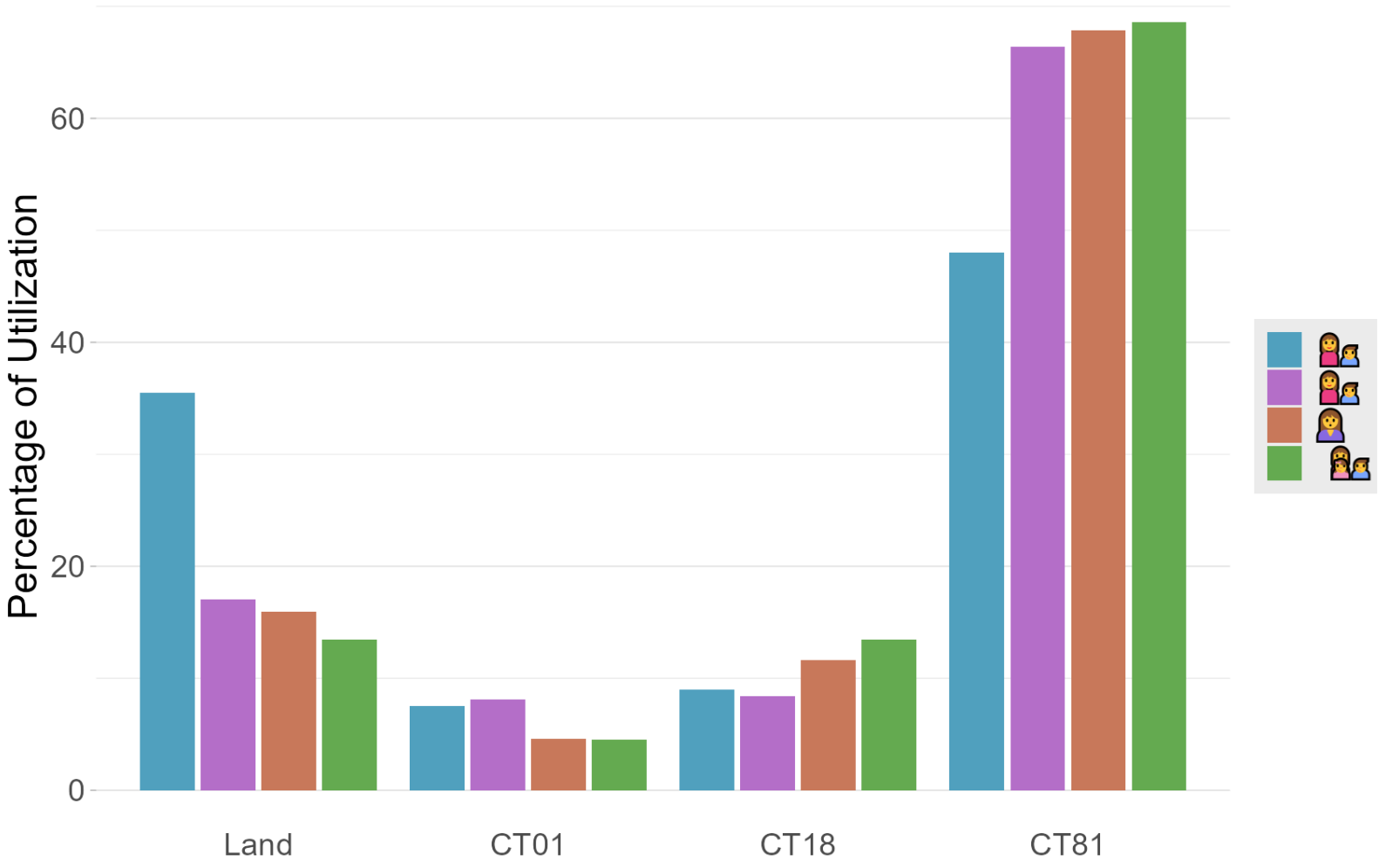
Close sea ice CT81 (ice concentration 80-100 %) is absent longer than half year on 11 % of aquatory.

Sea ice habitat availability and use



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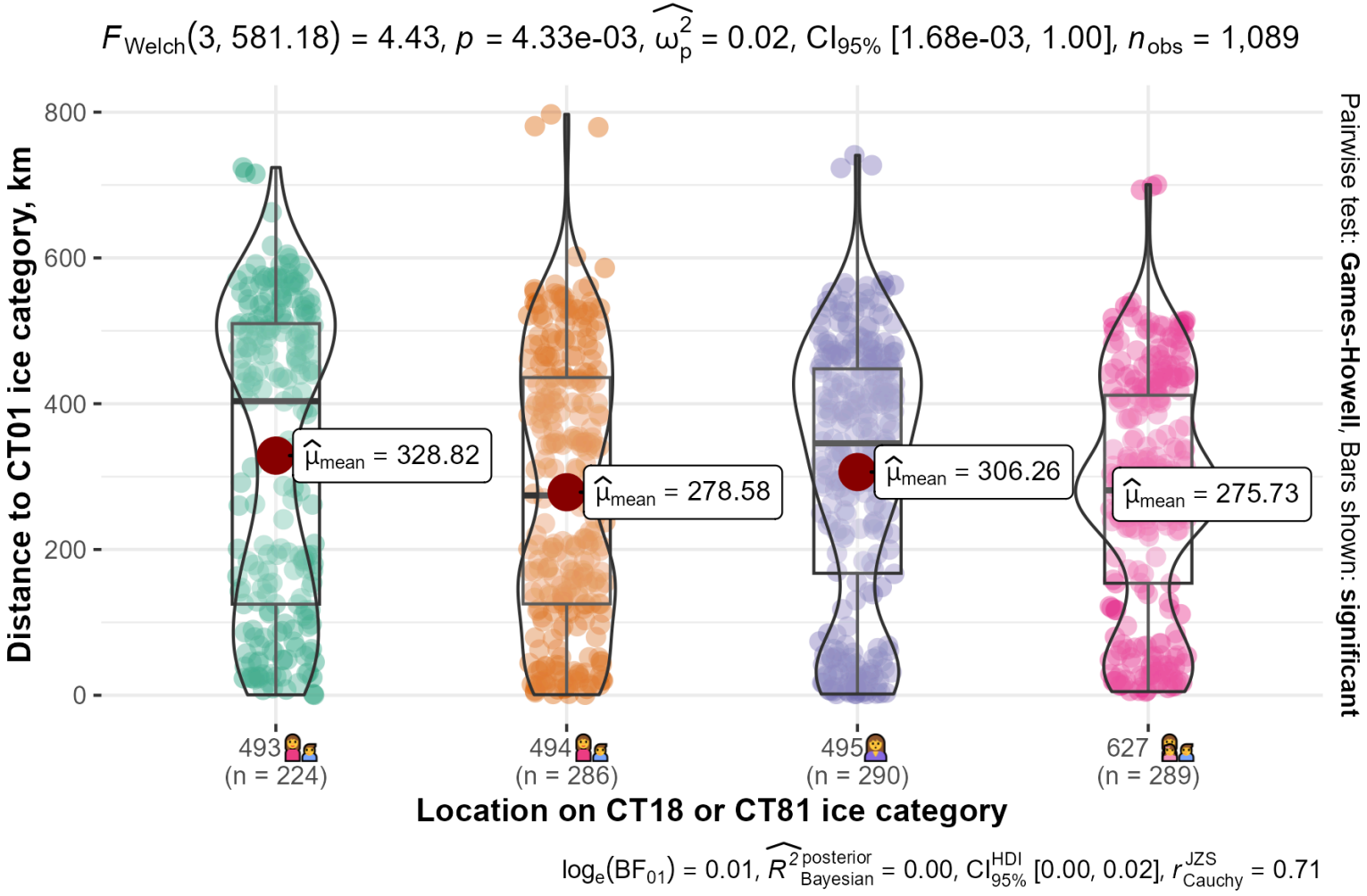
Polar bears' preferred ice concentration, % The high left column (0%) may indicate the use of small ice fields.

Sea ice habitat availability and use



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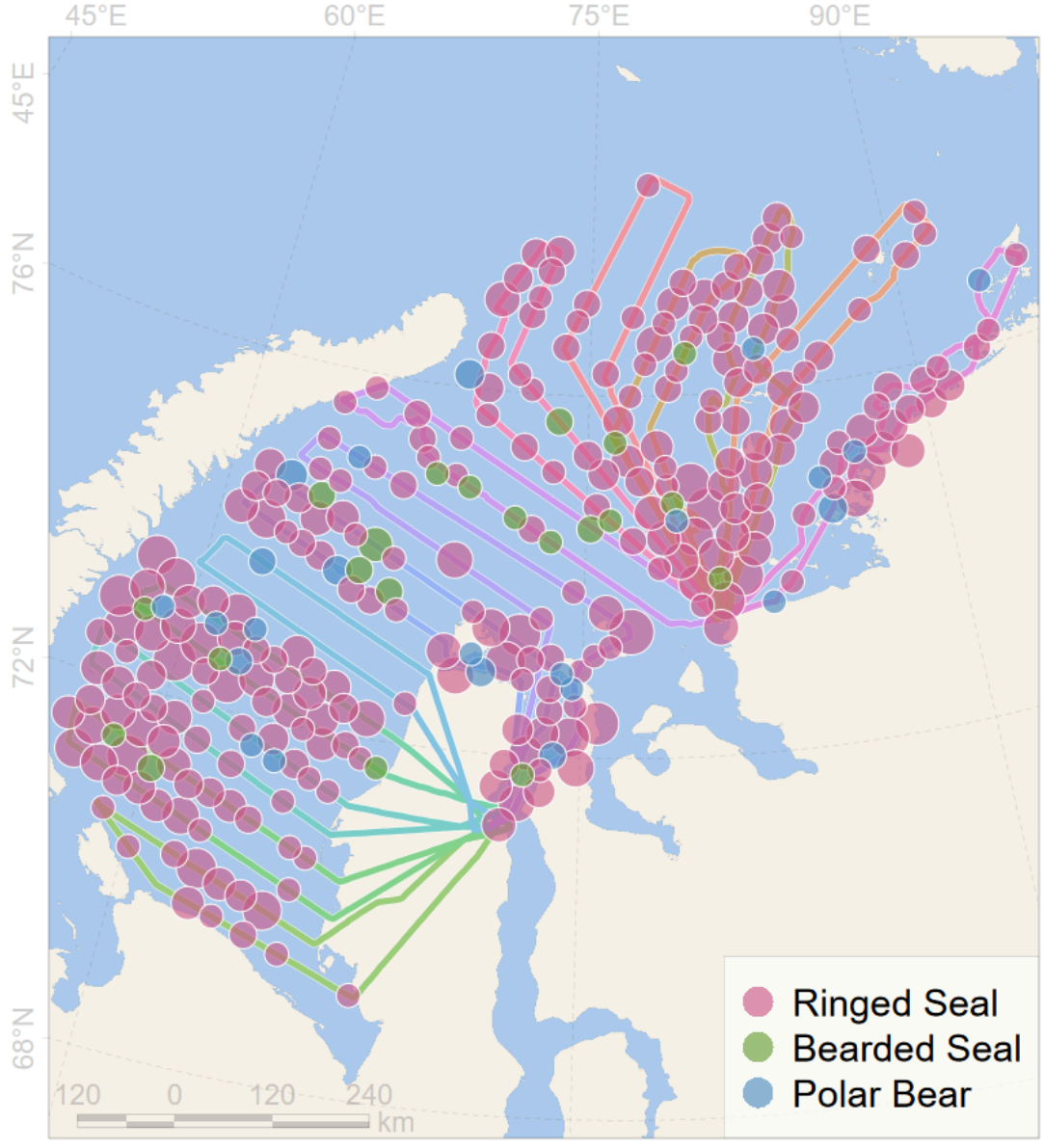
For polar bears in the Kara Sea region the distance to sea ice edge is not important abiotic parameter.

Aerial survey of the Kara Sea polar bear subpopulation in 2025



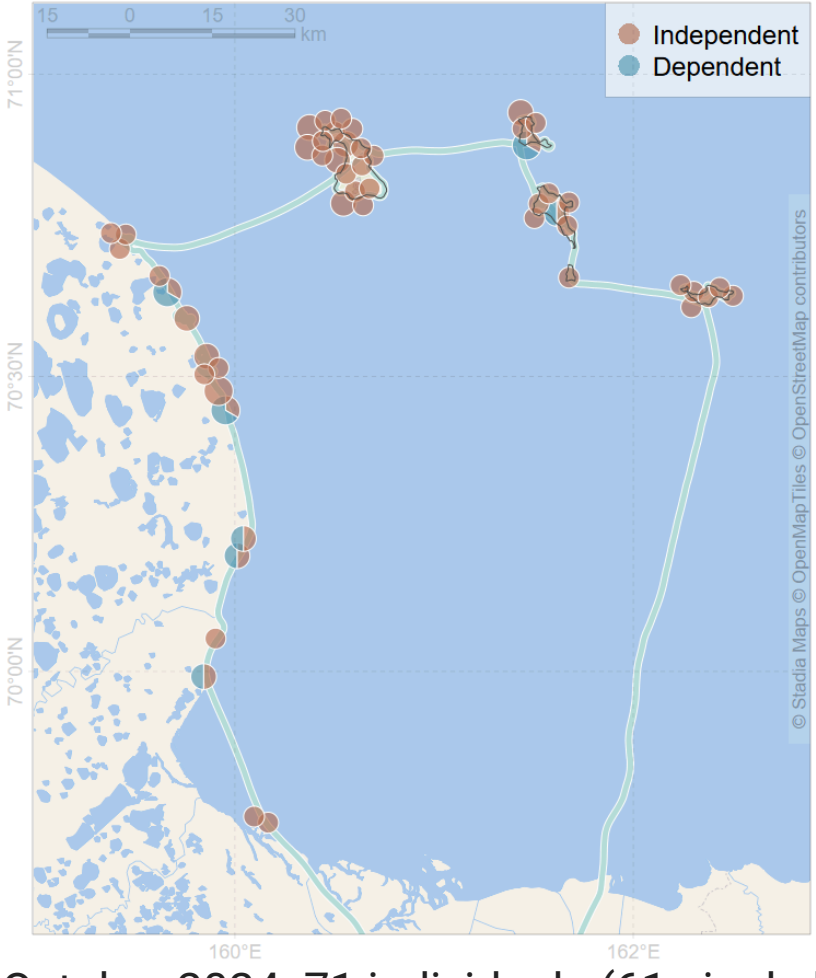
Polar bears and other marine mammals were counted from an AN-28 aircraft using visual and instrumental (surveying in visible- and infrared- ranges) methods in April-May 2025.

37 polar bears (24 adults and 13 cubs), 1097 ringed seals, 32 bearded seals and were visually recorded.

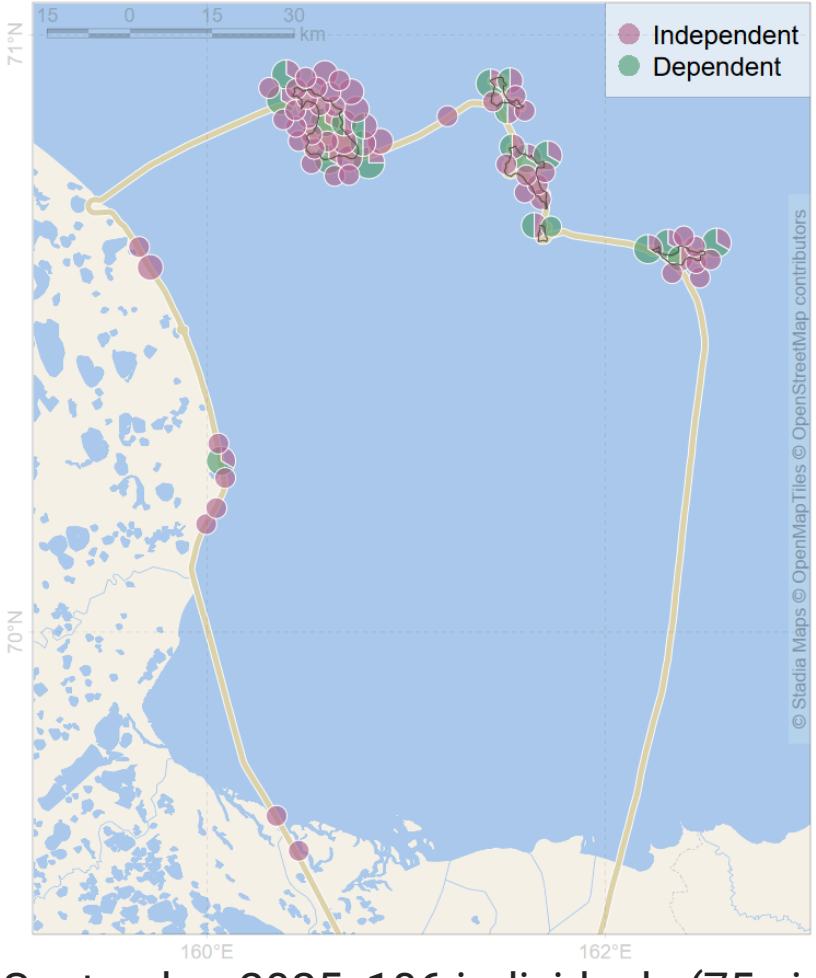
Results of the instrumental survey and population estimates will be available in 2026.

Aerial survey in the Medvezhyi Islands (East Siberian Sea)

Helicopter aerial monitoring performed by National Park «Lensky Pillars». Instrumental survey provided by «Ecofactor». Results after visual surveys:

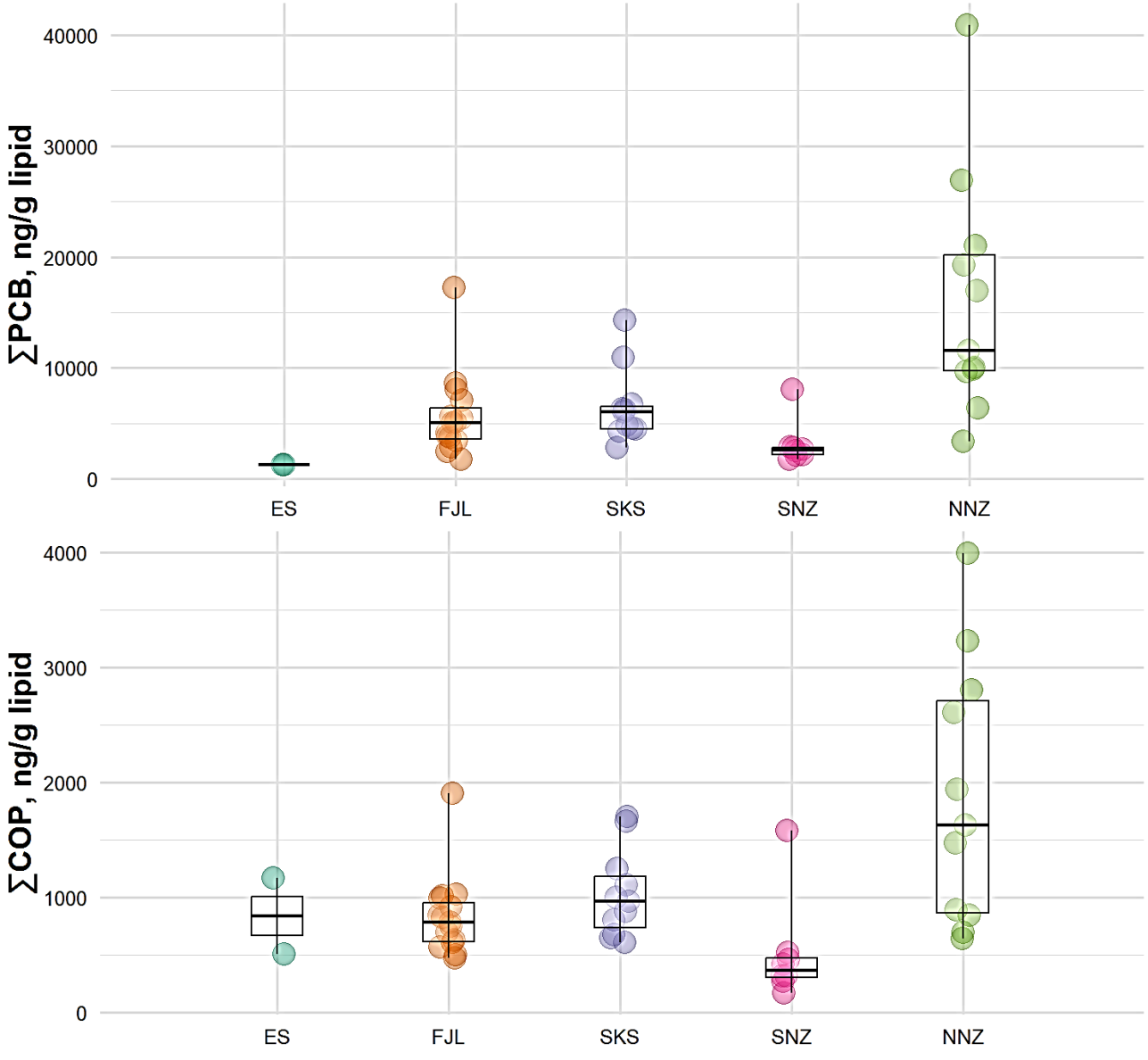


October 2024: 71 individuals (61 single bears and 10 females with cubs).



September 2025: 106 individuals (75 single bears and 31 females with cubs).

Organic pollutants in serum samples



Organic pollutants in serum samples from polar bears in Kara-Barents region and East Siberian Sea.

ES – East Siberian Sea

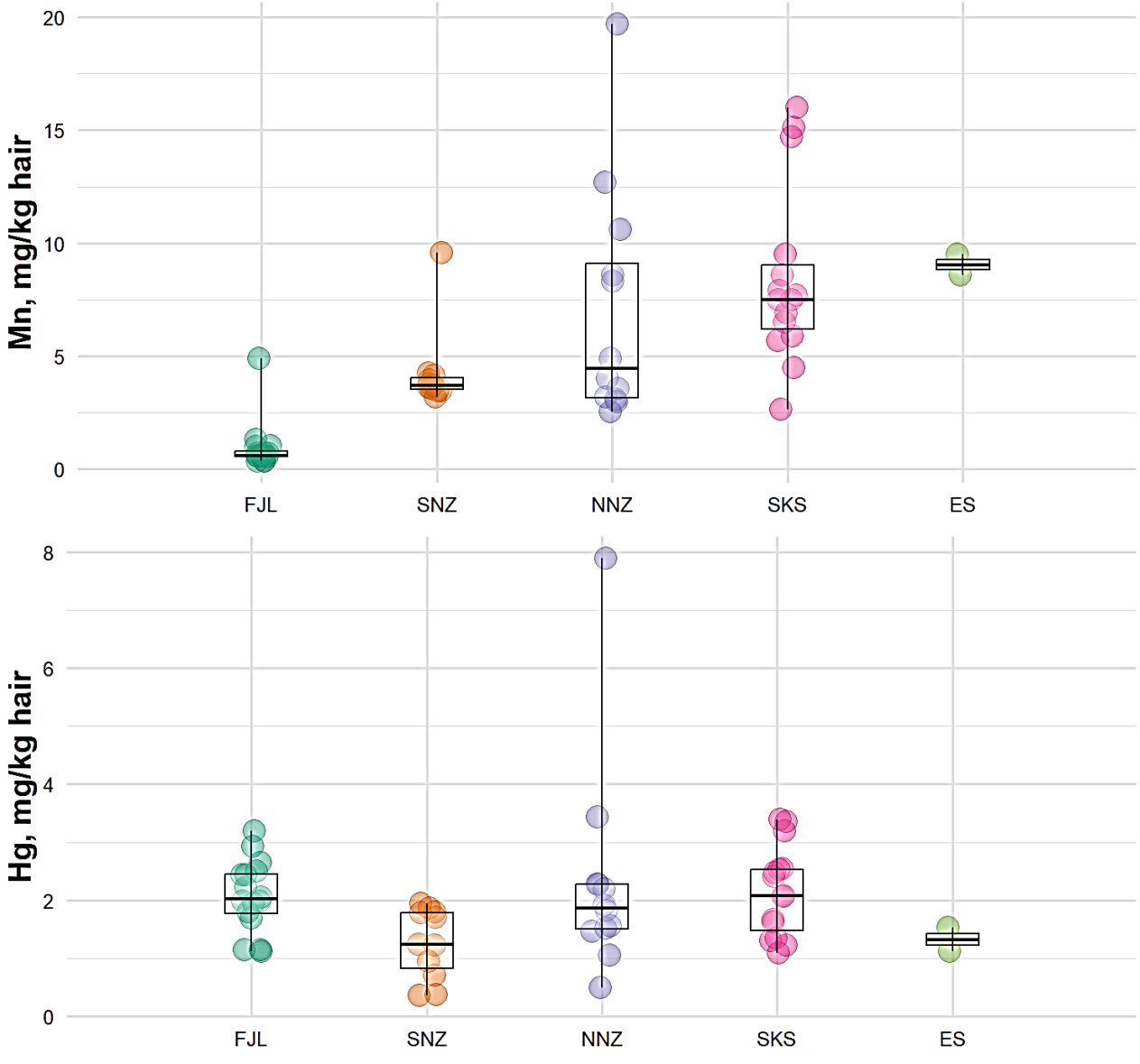
FJL – Franz Josef Land

SKS – southern Kara Sea

SNZ – southern Novaya Zemlya

NNZ – northern Novaya Zemlya

Heavy metals in hair damples



Heavy metals in hair damples from polar bears in Kara-Barents region and East Siberian Sea

Mercury samples are expanded from (Gremyachikh et al., 2025).

ES – East Siberian Sea

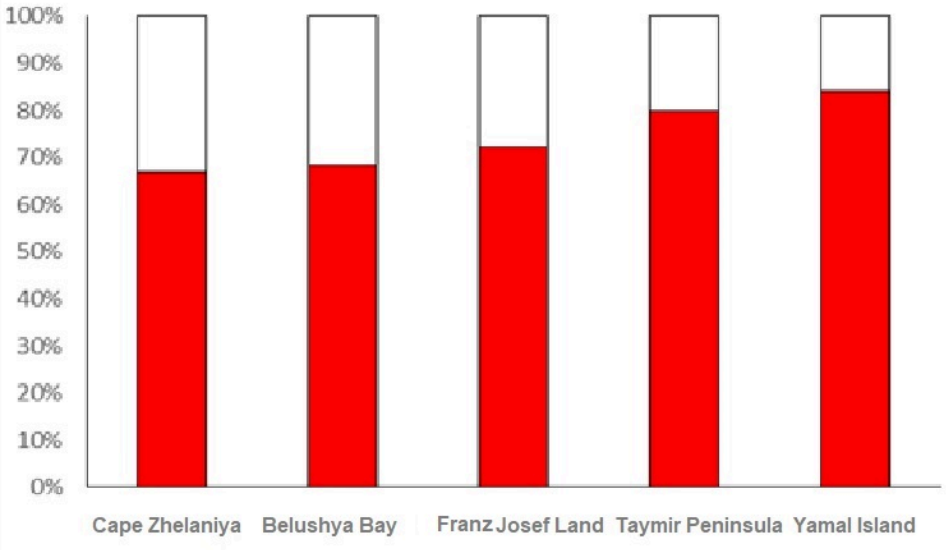
FJL – Franz Josef Land

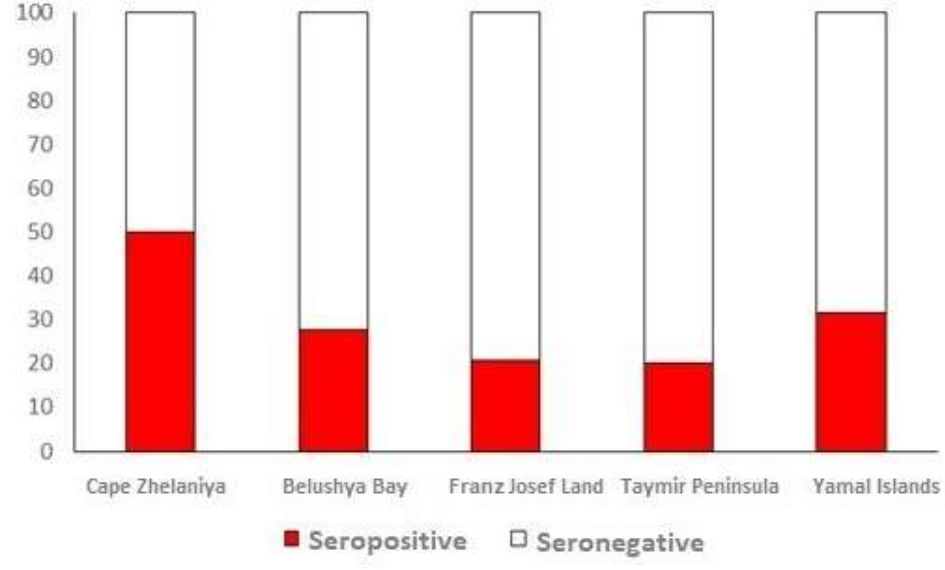
SKS – southern Kara Sea

SNZ – southern Novaya Zemlya

NNZ – northern Novaya Zemlya

Analysis of polar bears seropositivity





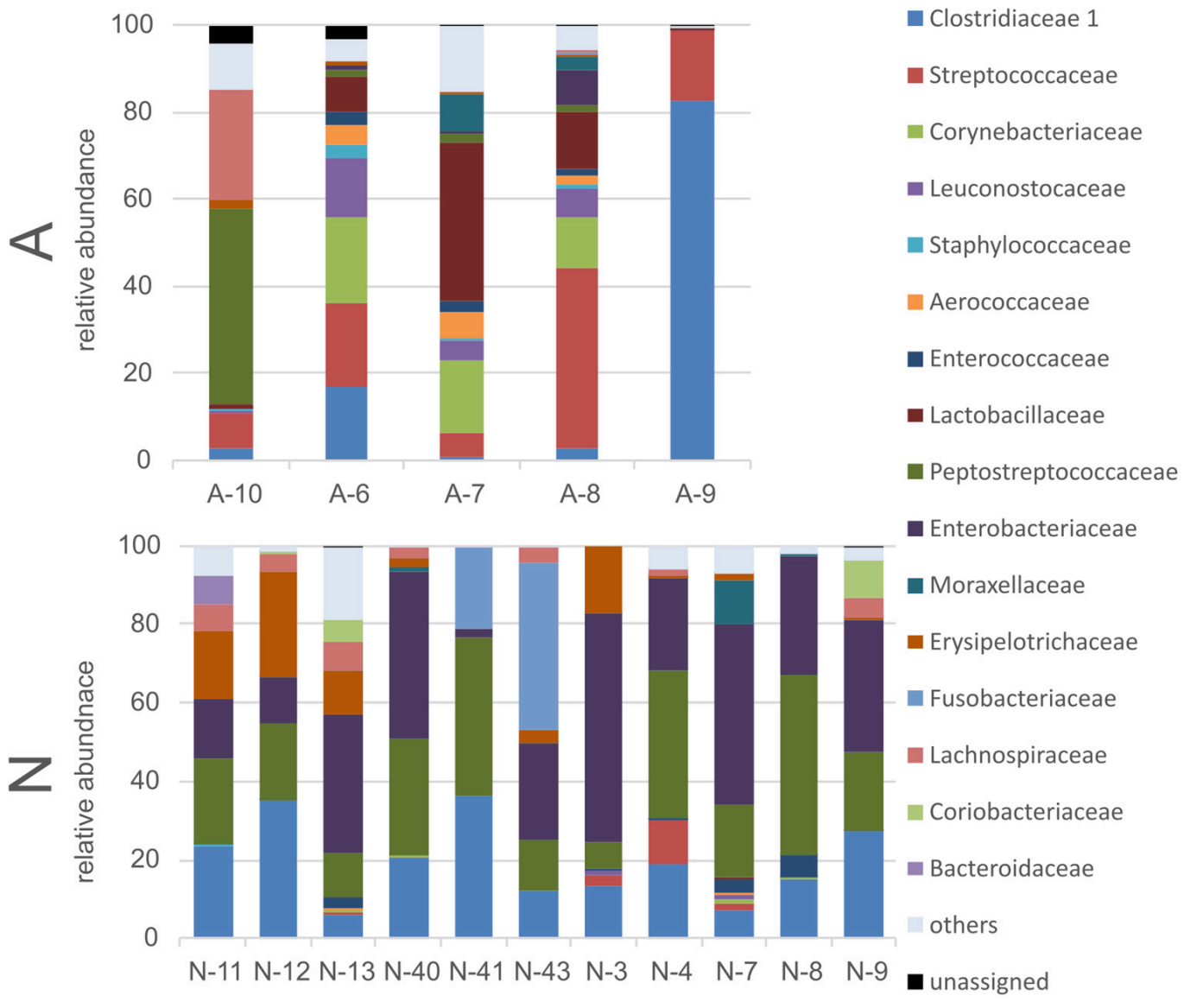
Main results are published (Naidenko et al., 2023).

Pathogens:

- Canine distemper virus
- Herpes simplex virus
- Parvovirus
- Toxoplasma
- Trichinella (*Trichinella sp.*)
- Mycoplasma (*Mycoplasma sp.*)
- Candida (*Candida sp.*)
- Chlamydia (*Chlamydia sp.*)

Seropositive proportion for Trichinella (*top*) and Canine distemper virus (*bottom*)

Bacterial and fungal community

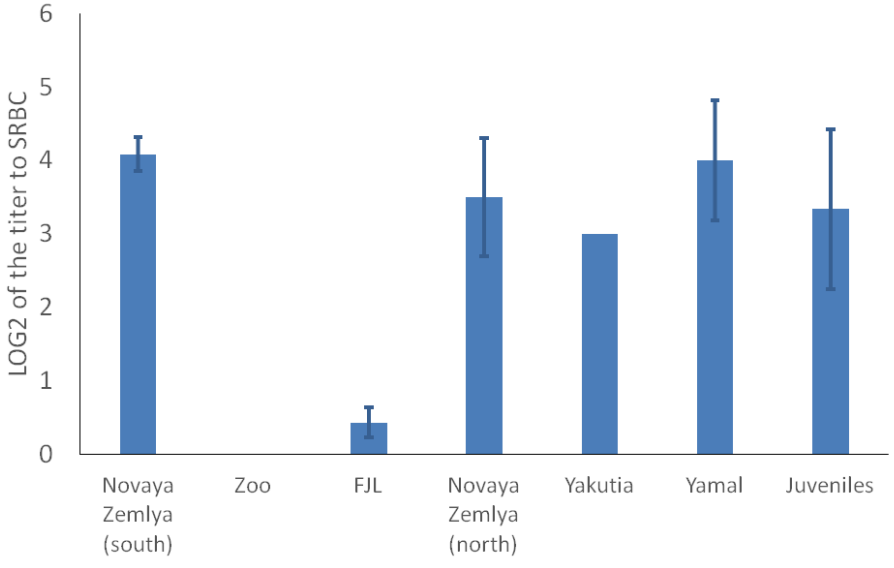


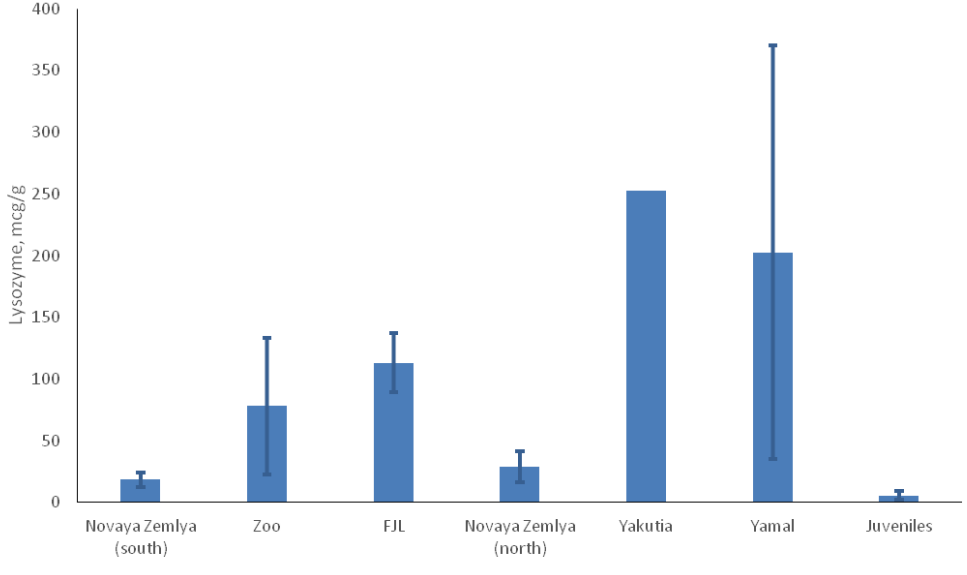
Feeding on human waste does not cause any signs of dysbiosis and probably leads to adaptive changes in the bacterial microbiome.

Emergence of fungal facultative pathogens increases the risk of infections.

Details in (Vecherskii et al., 2023)

Analysis of polar bears immunity at different points





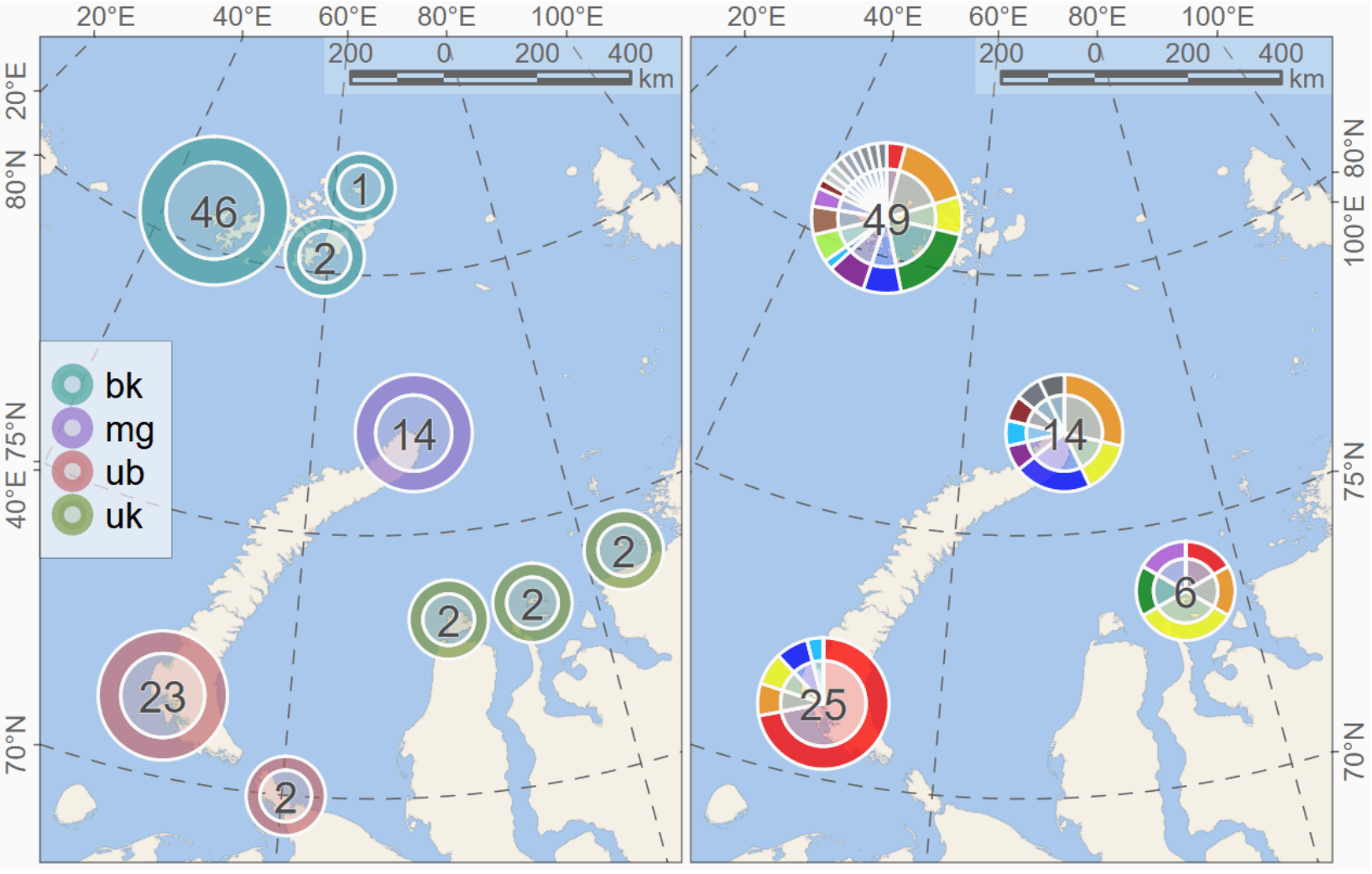
Total amount of natural antibodies was extremely low in zoos and on Franz-Josef Land.

The concentration of Lysozyme concentration (antibacterial protein) was very low at the Novaya Zemlya islands.

An activity of the system of complement was very low in all populations.

Details in (Alekseeva et al., 2025).

Population structure



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Homogeneity for Kara Sea and northern Barents Sea. Heterogeneity for South-Eastern Barents Sea. Details in (Sorokin et al., 2023).

Publications 2023-2025

Alekseeva, G. S., E. A. Ivanov, I. A. Mizin, N. G. Platonov, I. N. Mordvintsev, V. V. Rozhnov, and S. V. Naidenko (2025). "Hematological differences in Barents and Kara Seas polar bears (*Ursus maritimus*): what factors matter?" In: *Polar Biology* 48.1. ISSN: 1432-2056. DOI: 10.1007/s00300-024-03326-w.

Gremyachikh, V. A., V. T. Komov, E. A. Ivanov, I. N. Mordvintsev, S. V. Naidenko, N. G. Platonov, I. A. Mizin, A. I. Isachenko, R. E. Lazareva, E. S. Ivanova, L. S. Eltsova, and V. V. Rozhnov (2025). "Total Mercury and Stable Nitrogen and Carbon Isotope Content in Polar Bear Hair in the Russian Arctic". In: *Russian Journal of Ecology* 56.4. (*IN PRINT*), pp. 366-374. ISSN: 1067-4136.

Naidenko, S. V., P. S. Klyuchnikova, E. A. Ivanov, I. N. Mordvintsev, N. G. Platonov, A. I. Isachenko, R. E. Lazareva, and V. V. Rozhnov (2023). "Occurrence of Pathogens in the Barents Sea Polar Bear (*Ursus maritimus*) Subpopulation". In: *Biology Bulletin* 50.9, p. 2454–2459. ISSN: 1608-3059. DOI: 10.1134/s106235902309025x.

Sorokin, P. A., E. Y. Zvychaynaya, E. A. Ivanov, I. A. Mizin, I. N. Mordvintsev, N. G. Platonov, A. I. Isachenko, R. E. Lazareva, and V. V. Rozhnov (2023). "Population Genetic Structure in Polar Bears (*Ursus maritimus*) from the Russian Arctic Seas". In: *Russian Journal of Genetics* 59.12, p. 1320–1332. ISSN: 1608-3369. DOI: 10.1134/s102279542312012 8.

Vecherskii, M. V., T. A. Kuznetsova, D. R. Khayrullin, A. A. Stepankov, S. M. Artemieva, P. V. Chukmasov, E. A. Ivanov, I. A. Mizin, I. N. Mordvintsev, N. G. Platonov, A. A. Pashali, A. I. Isachenko, R. E. Lazareva, K. M. Shestakova, and V. V. Rozhnov (2023). "Anthropogenic Neighborhood Impact on Bacterial and Fungal Communities in Polar Bear Feces". In: *Animals* 13.13, p. 2067. ISSN: 2076-2615. DOI: 10.3390/ani13132067.