

The Arctic Biodiversity Congress 2018
Rovaniemi, Finland

Polar bear life in the Russian Arctic in the light of recent research results

ANDREI BOLTUNOV

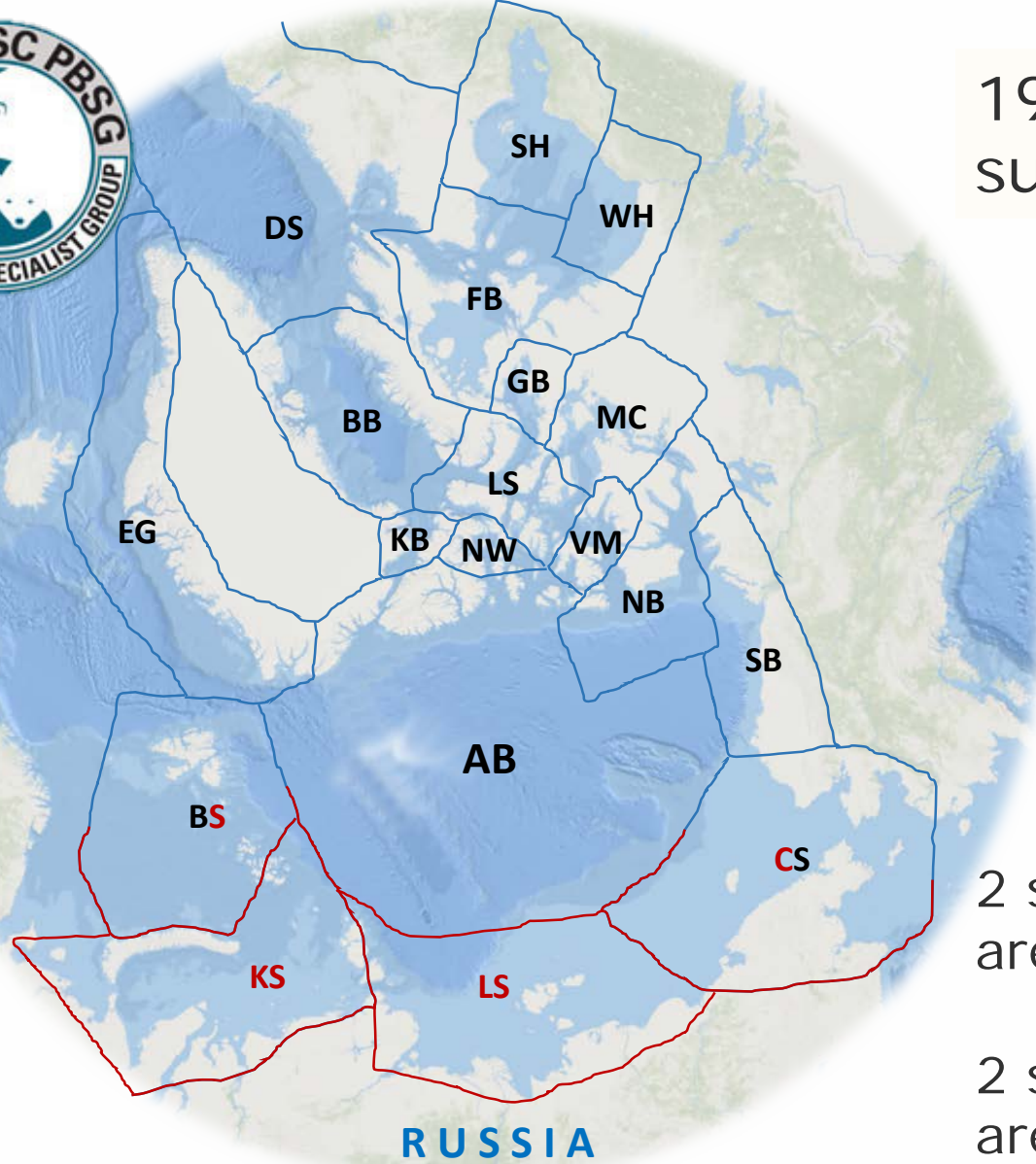


Semenova V., Nikiforov V., Kochi K., Belikov S., Denisenko T.,
Illarionova N., Shitova M.





19 relatively discrete subpopulations

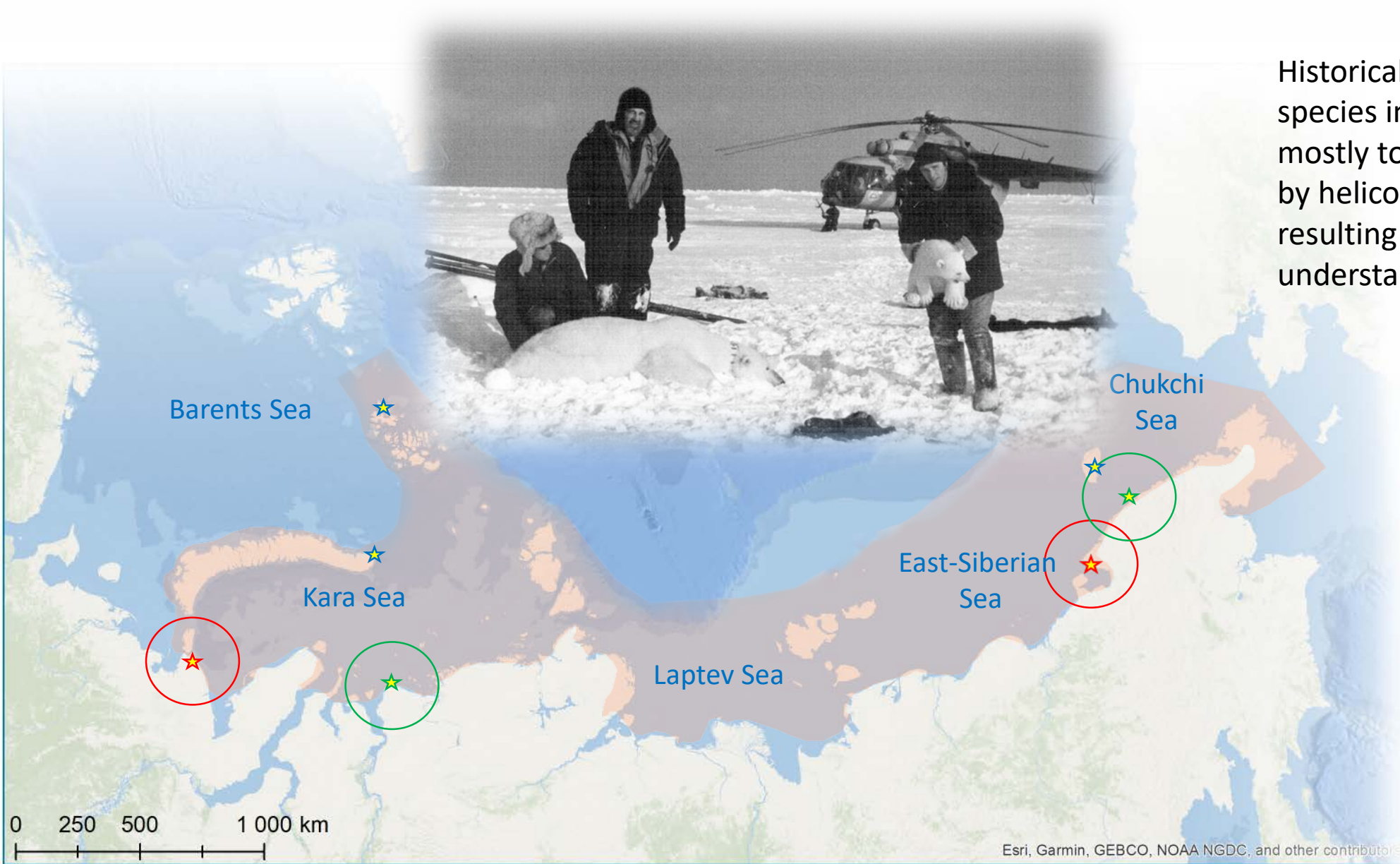


2 subpopulations are entirely in Russia

2 subpopulations are shared with US and Norway



Historically, the study of the species in Russia was restricted mostly to coastal areas accessible by helicopters from a few airports, resulting in a biased understanding of these animals.



Atomic icebreaker



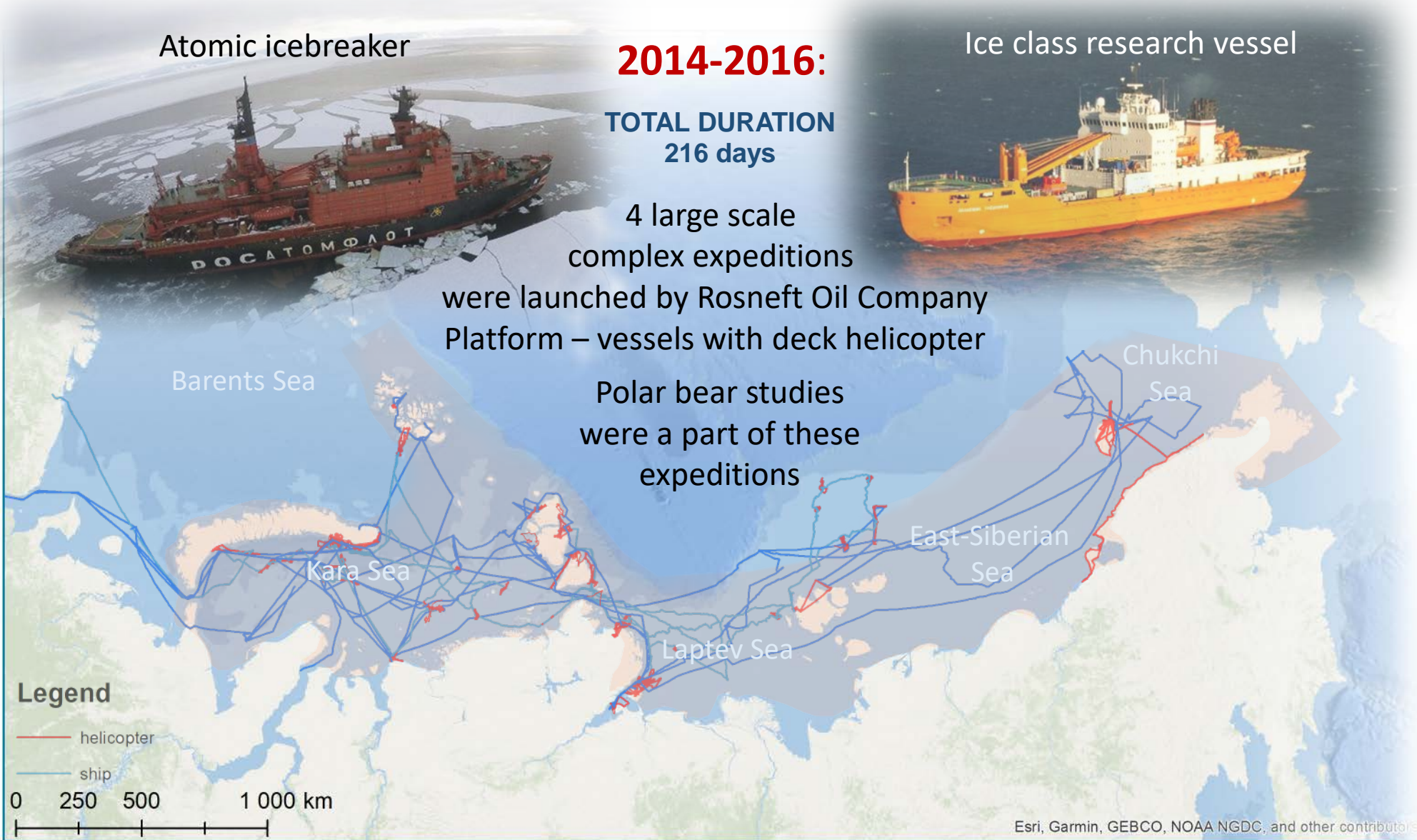
2014-2016:

TOTAL DURATION
216 days

4 large scale
complex expeditions
were launched by Rosneft Oil Company
Platform – vessels with deck helicopter

Polar bear studies
were a part of these
expeditions

Ice class research vessel





**495 observations
(769 bears)**

**Skin biopsy
was taken distantly
from 26 polar bears**



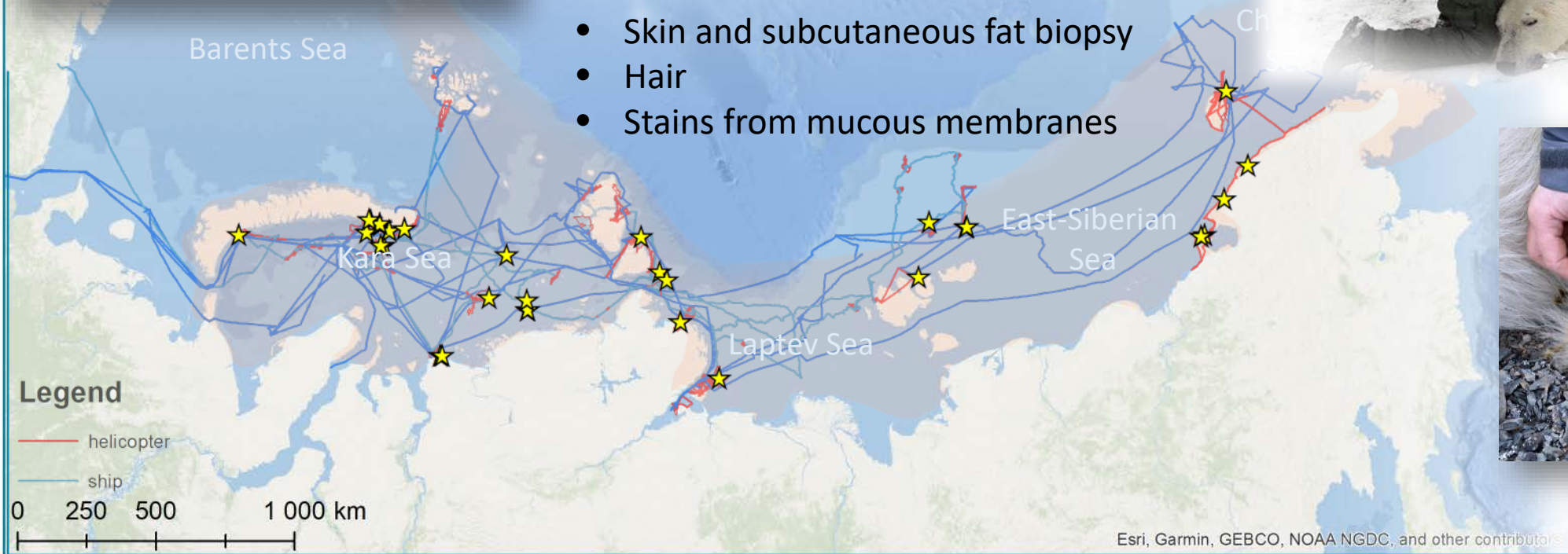
**32 polar bears
were temporally
immobilized
(14 males
18 females)**



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Measurements
and the following biological samples
were taken:

- Blood
- Skin and subcutaneous fat biopsy
- Hair
- Stains from mucous membranes





20 POLAR BEARS
(5 males and 15 females)
were tagged with Platform
Terminal Transmitters (ARGOS)

Transmitters worked
in average **120±46** days
(max **787** days)



Laboratory studies

Toxicological analysis -

6 METALS in hair samples:

- Mercury (Hg);
- Cadmium (Cd);
- Nickel (Ni);
- Lead (Pb);
- Copper (Cu);
- Arsenic (As).

Persistent organic pollutants (**POPs**) in subcutaneous fat and blood:

- PCBs;
- Planar PCBs;
- PBDEs;
- Chlorinated pesticides;
- Dioxins
- Toxaphens

DNA analysis -

mtDNA control region (391 NP)

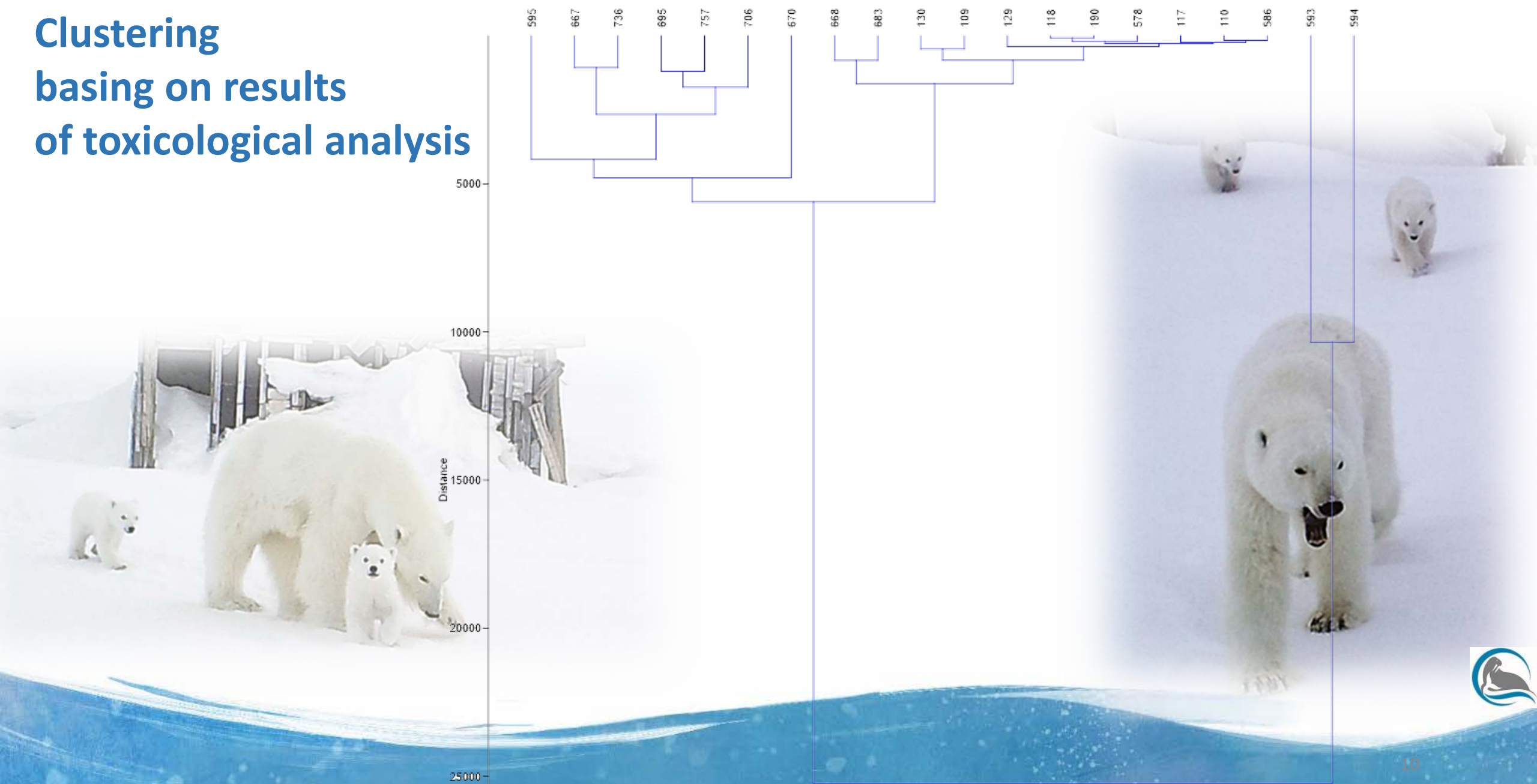
Hematological analysis -

blood formula

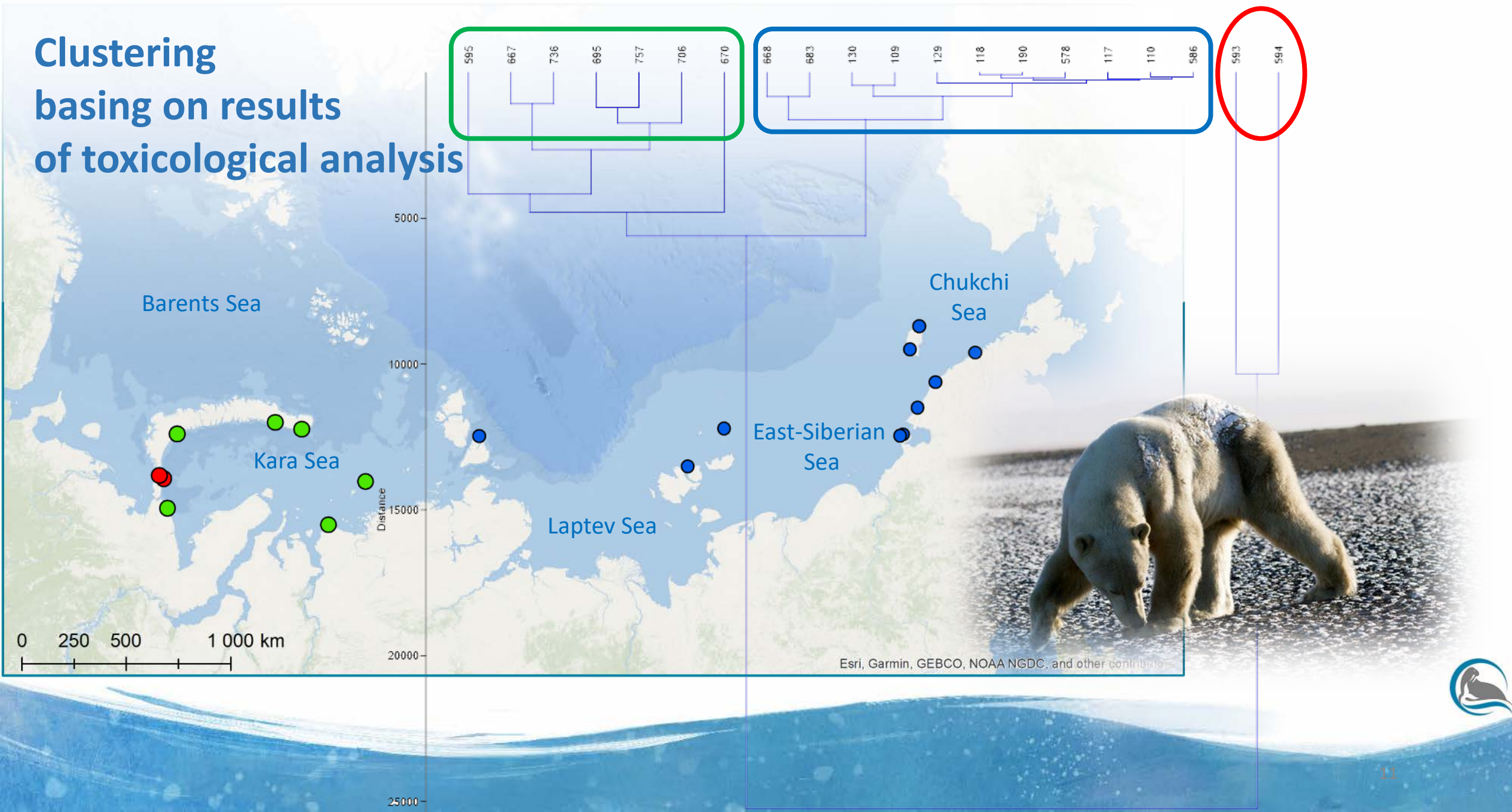
Microbiological analysis



Clustering basing on results of toxicological analysis



Clustering basing on results of toxicological analysis





DNA studies

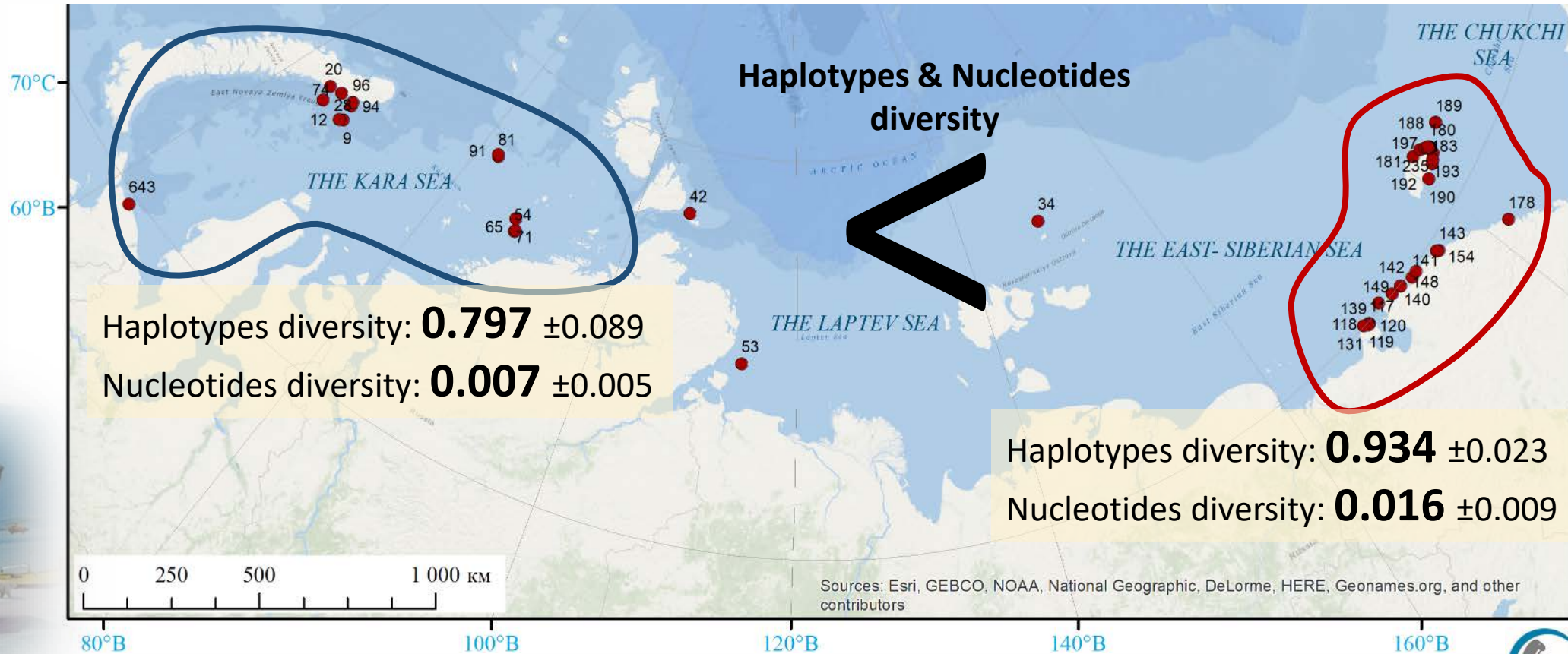
61 samples
(hair, skin biopsy,
muscles)

25 haplotypes of the
mtDNA control region
have been
distinguished

Grouping according to location

1. "Kara Sea" – 13 samples
2. "Laptev Sea" – 3 samples
3. "Chukotka" – 45 samples

The "**Chukotka**" sample group has
significantly higher diversity of
haplotypes and nucleotides than the
"Kara Sea" group

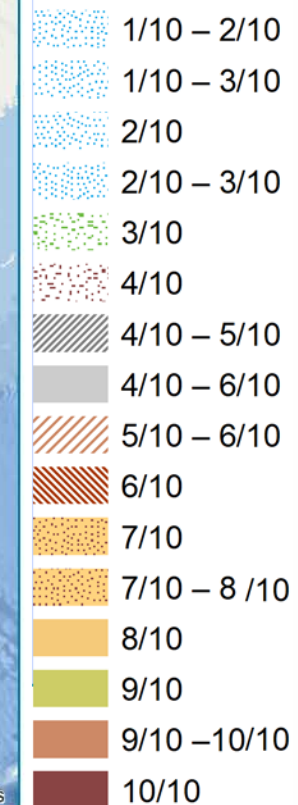




MAY, 2017

Legend

Ice concentration

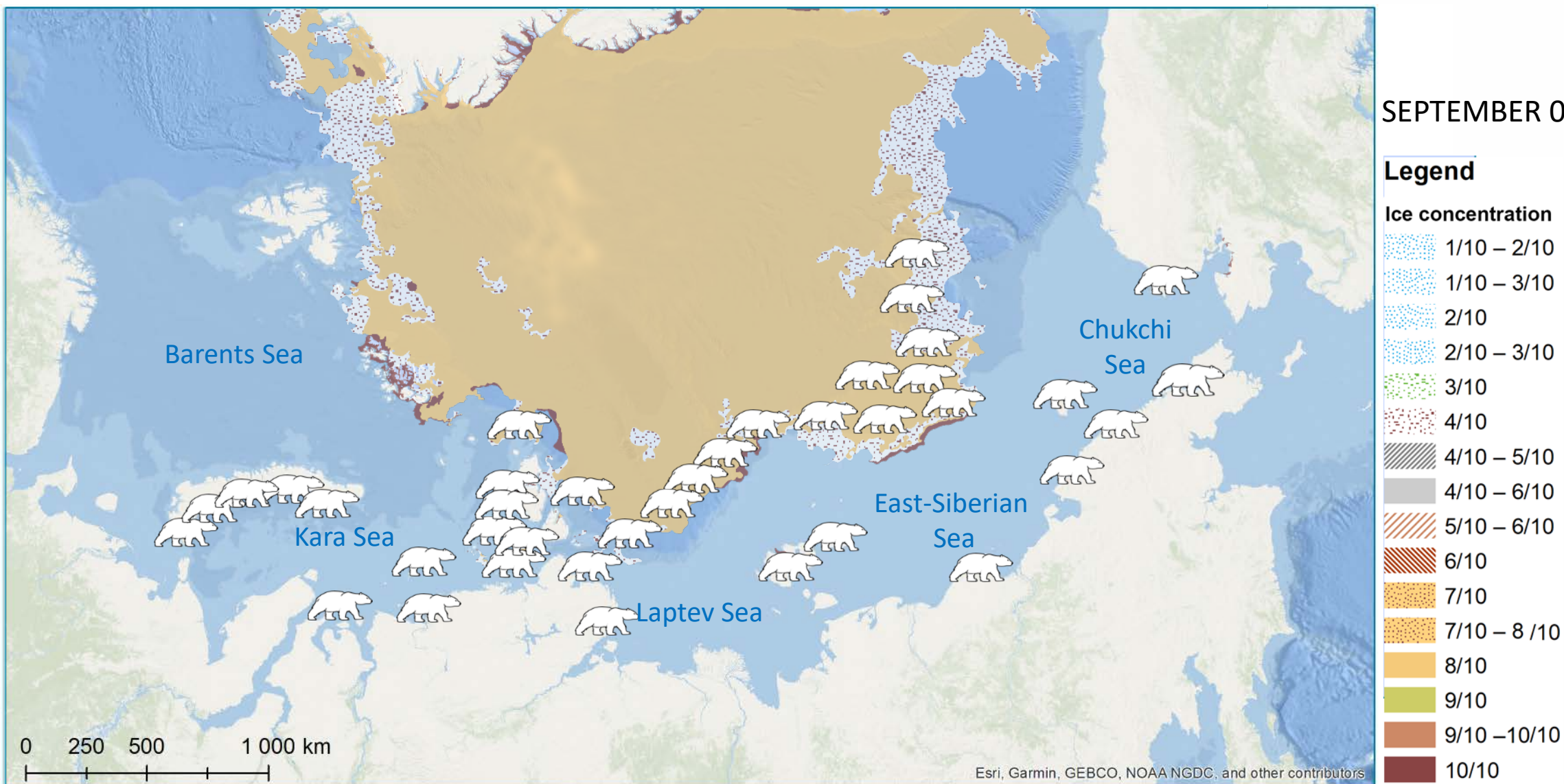


Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Ice charts from State Research Center "Arctic and Antarctic Research Institute"



SEPTEMBER 05, 2017



Ice charts from State Research Center "Arctic and Antarctic Research Institute"





CONCLUSION

- In every part of the polar bear range there is certain balance of local resident and more large-scale nomad parts of one overall population.
- We assume that the Kara Sea has the biggest proportion of resident bears while the Chukchi Sea being reach feeding area seasonally attracts considerable numbers of bears from adjacent regions. A vast area between these two distinct habitats is a kind of buffer or intermediate zone.
- These suggestions have to be tested through further studies with special effort on getting data from central Russian Arctic as far as currently this is the least studied part of the species range in the region (and may be in the world).
- Dynamism of population structure in different parts of the species range must be under consideration during efforts on population size estimates, and during development and implementation of management and conservation measures on the polar bear.



THANK YOU!

