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Canada

Polar Bear Subpopulation Status in Southern Hudson Bay

A review of population status and recent research

Wildlife Research Division, Science and Technology Branch,
Environment and Climate Change Canada

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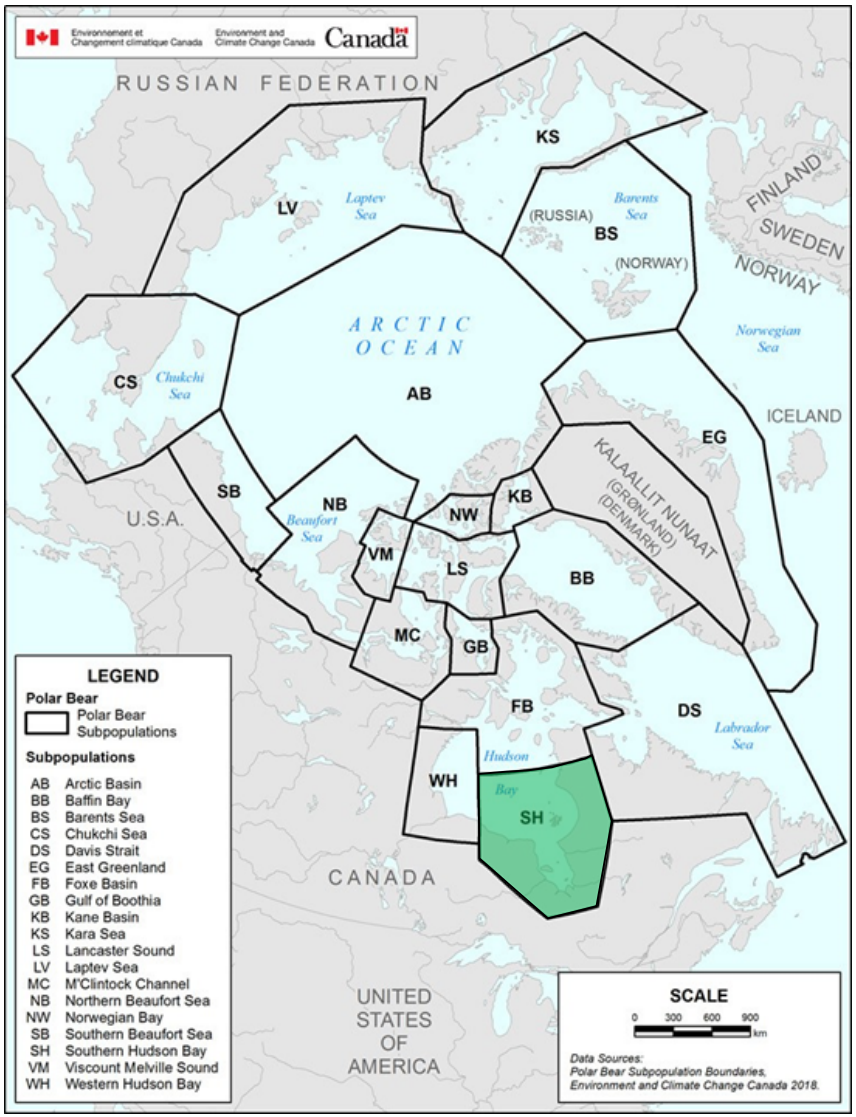
February 4-7, 2025
Nunavik Marine Region and Eeyou Phase II Non-Quota Limitation Hearings
Kuujjuaraapik, Nunavik

Canada's polar bear populations



- Canada is home to approximately 2/3 of the worlds polar bears

- 13 polar bear subpopulations occur in Canada.

- Approximately 5.5-8.5% of Canada's polar bears occur within the southern Hudson Bay subpopulation boundaries and represent the most regular southern distribution of polar bears in Canada.

Southern Hudson Bay Subpopulation Status (2024 PBTC Status Table)

Abundance: 1119 (2021) (aerial survey)

Historical trend (scientific): likely stable

Recent trend (scientific): likely stable

Trend (Indigenous knowledge): stable in James Bay; likely increased in Eastern Hudson Bay

Annual removal (5-year mean): 40

Removals (2022/2023): 33

Maximum removals (2022/2023): QC + ON + 48 (NU: 25, NMR: 23).

Comments*: increased abundance between 2016 and 2021 surveys due to combination of temporary movement from WH and/or improved vital rates

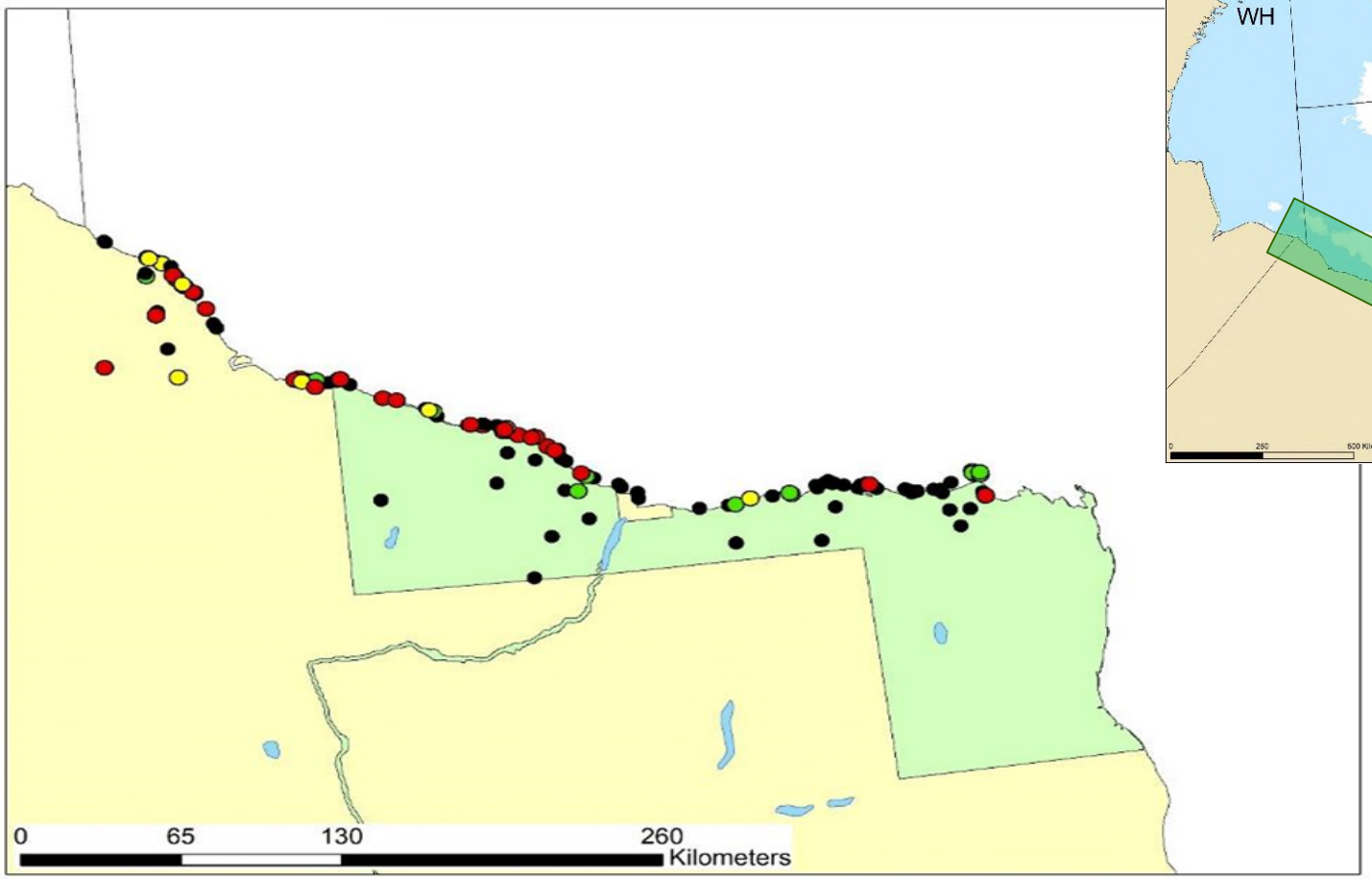
Ongoing biopsy mark-recapture work in western and southern Hudson Bay

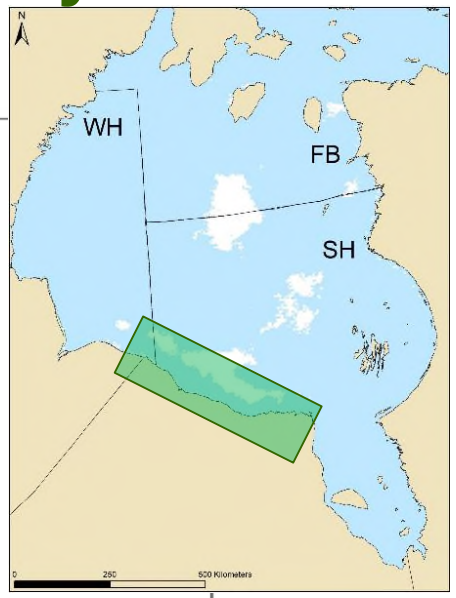
- Biopsy darts are fired remotely from a helicopter and bounce off the bears taking a small skin sample. The bears get a blue mark and walk away.

Genetic sample for individual identification (DNA)

Bears get a blue dot so they are not sampled again.

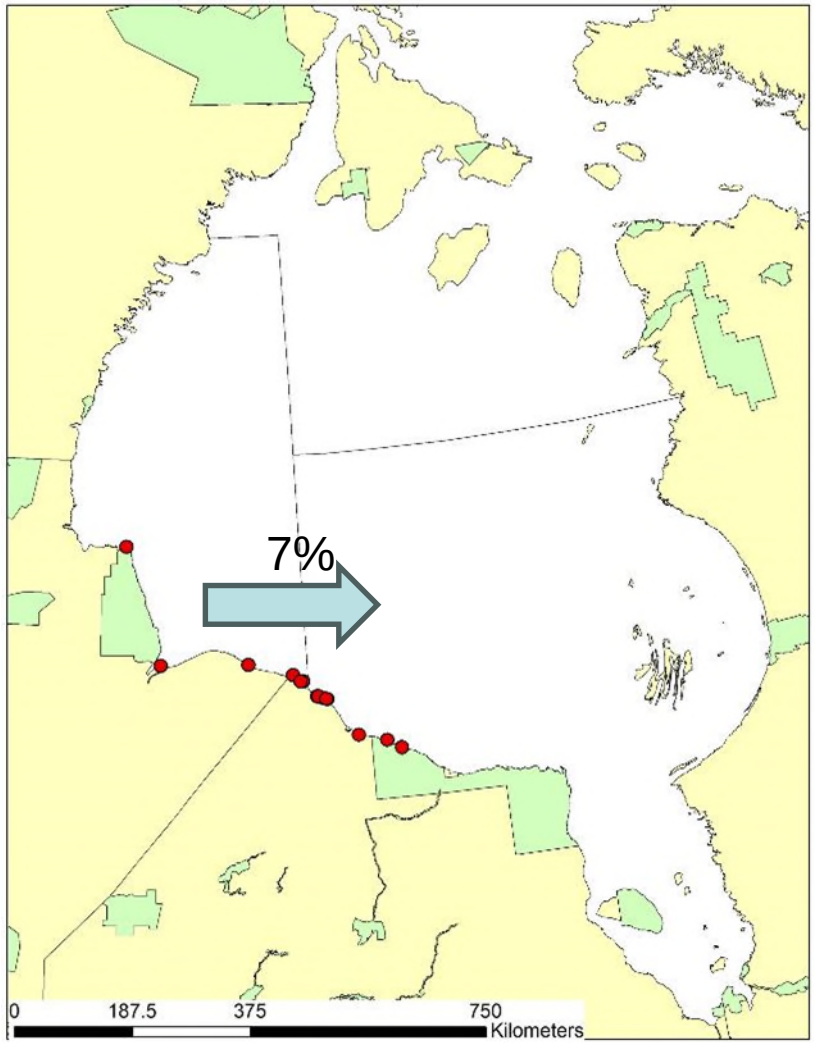
Distribution of previously genetically identified bears – 2021

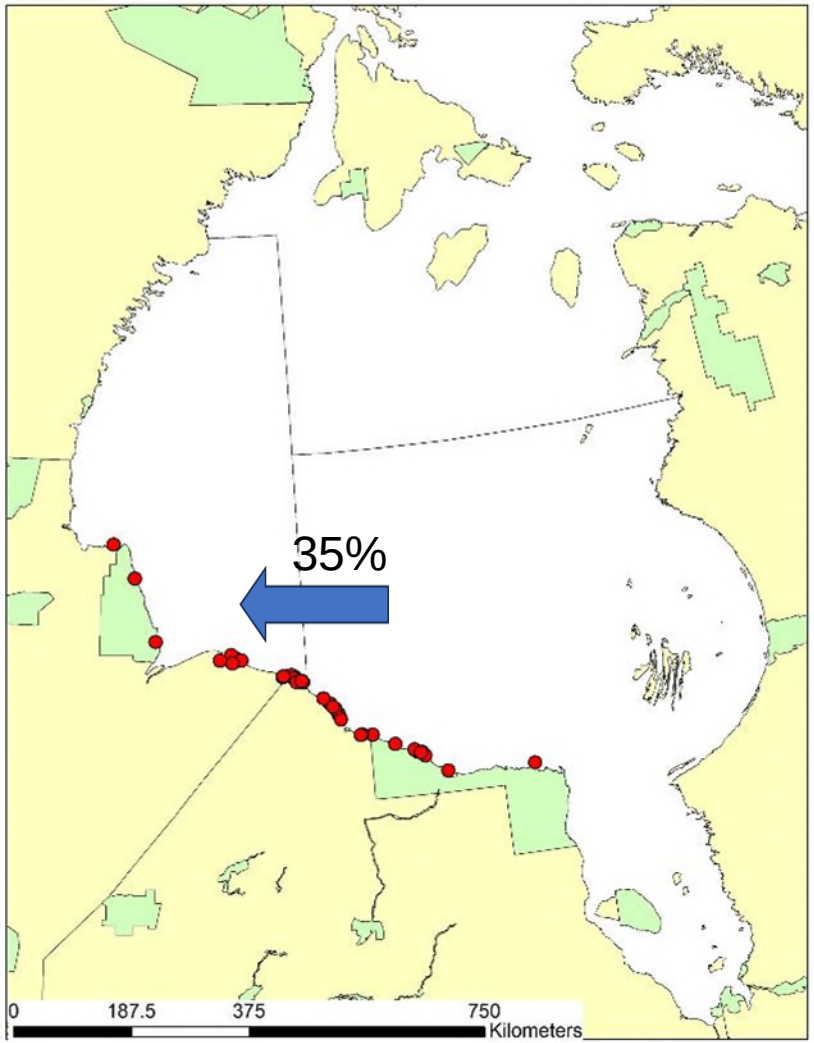




Sampling locations for bears biopsied in 2021 in SH for bears previously sampled in WH (red circles), both WH and SH (yellow circles), only SH (green circles) and first time captures (black circles).

Results – movement of bears from WH to SH and SH to WH 2021/2022





Results – Last area of consolidated ice before summer

2017

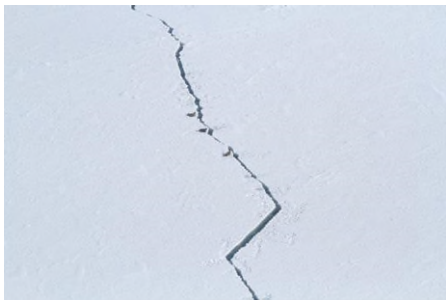
2018

2019

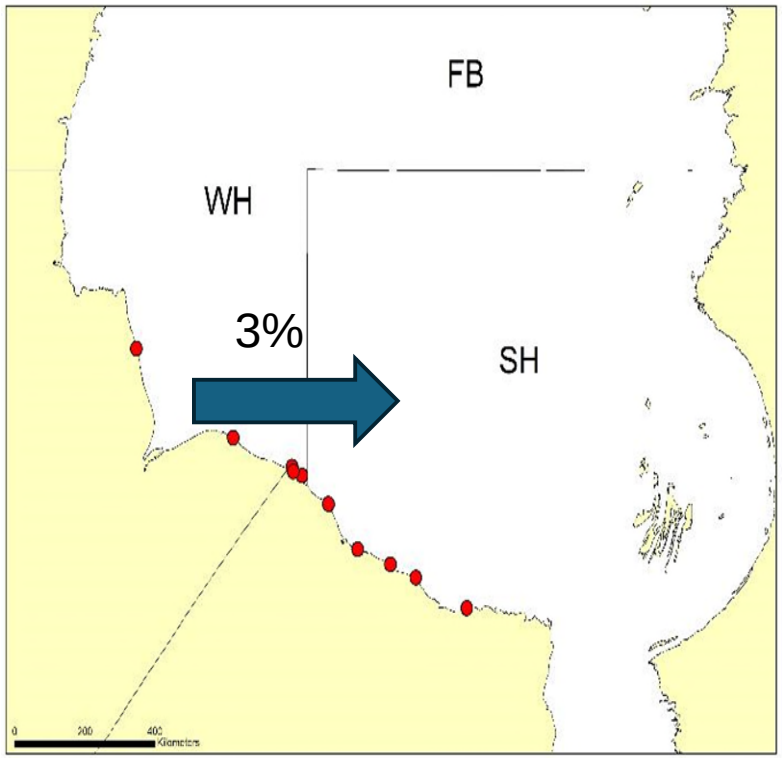
2020

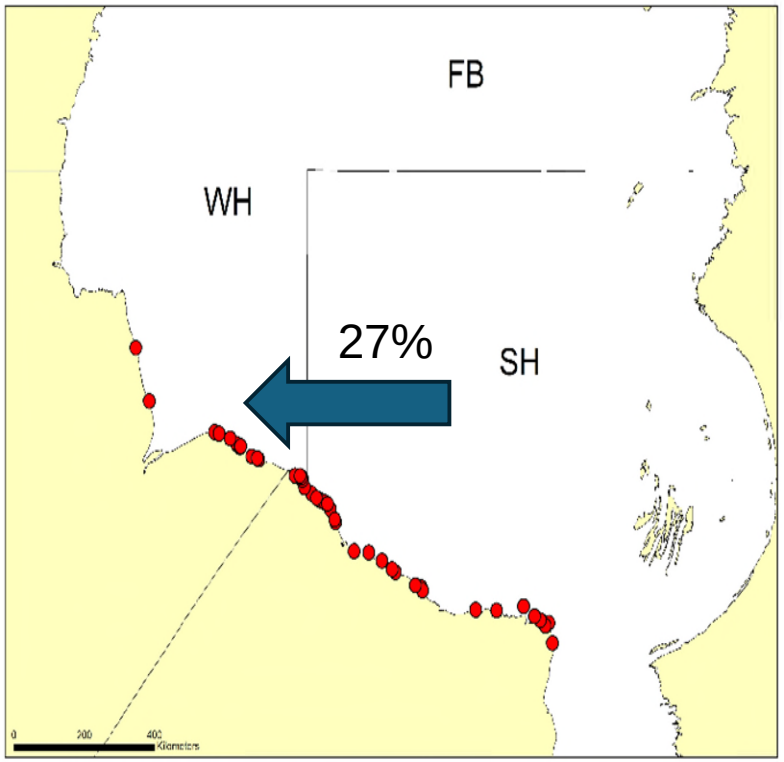
2021

2022

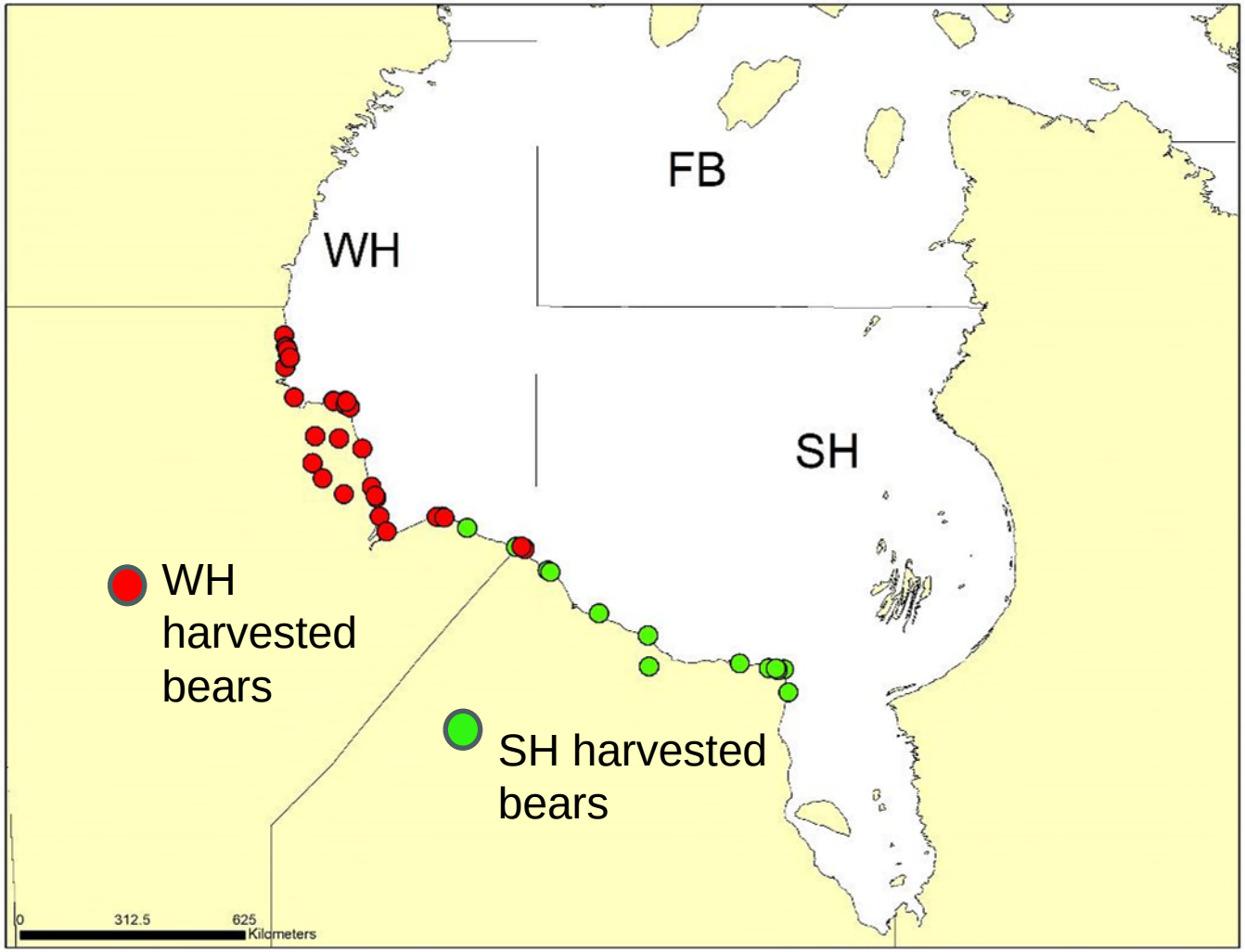


Results – bear movements from WH to SH and SH to WH 2022/2023

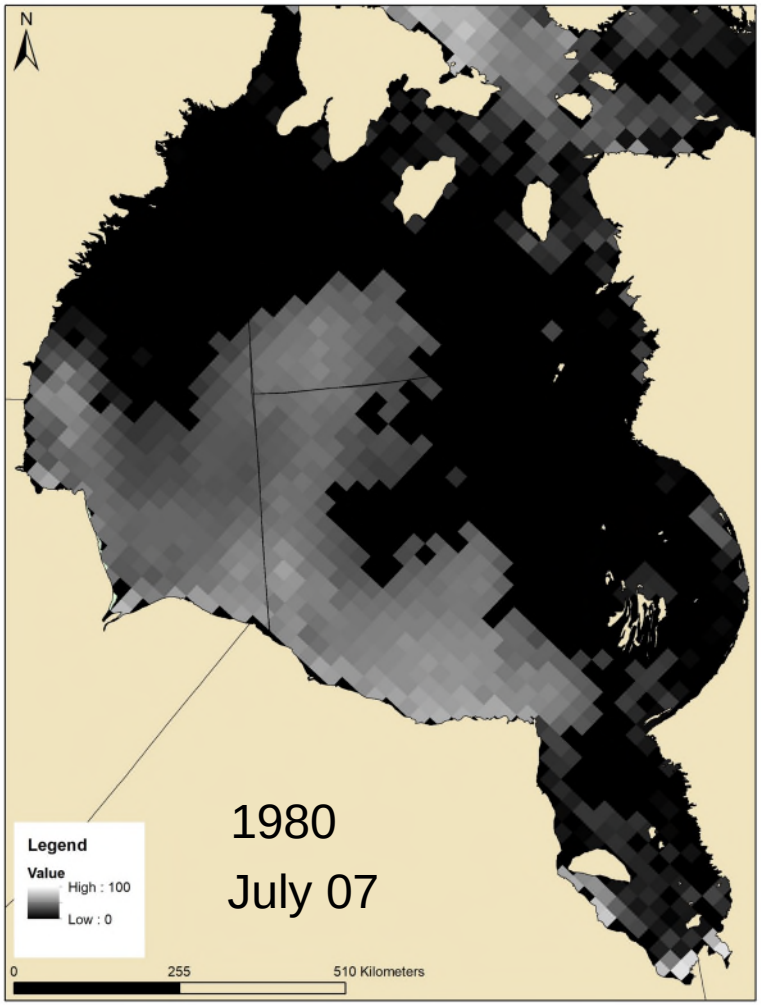


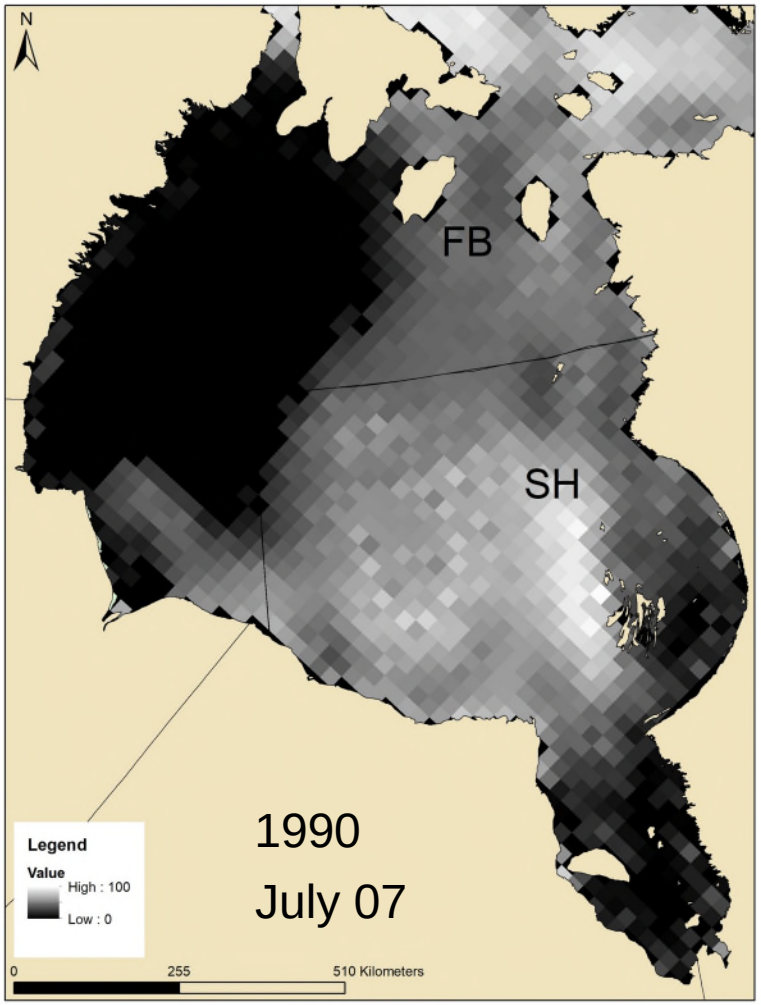


WH and SH live sampling locations of harvested bears from 2017-2023



Historical Sea Ice Conditions in Southern Hudson Bay (1980-2019)





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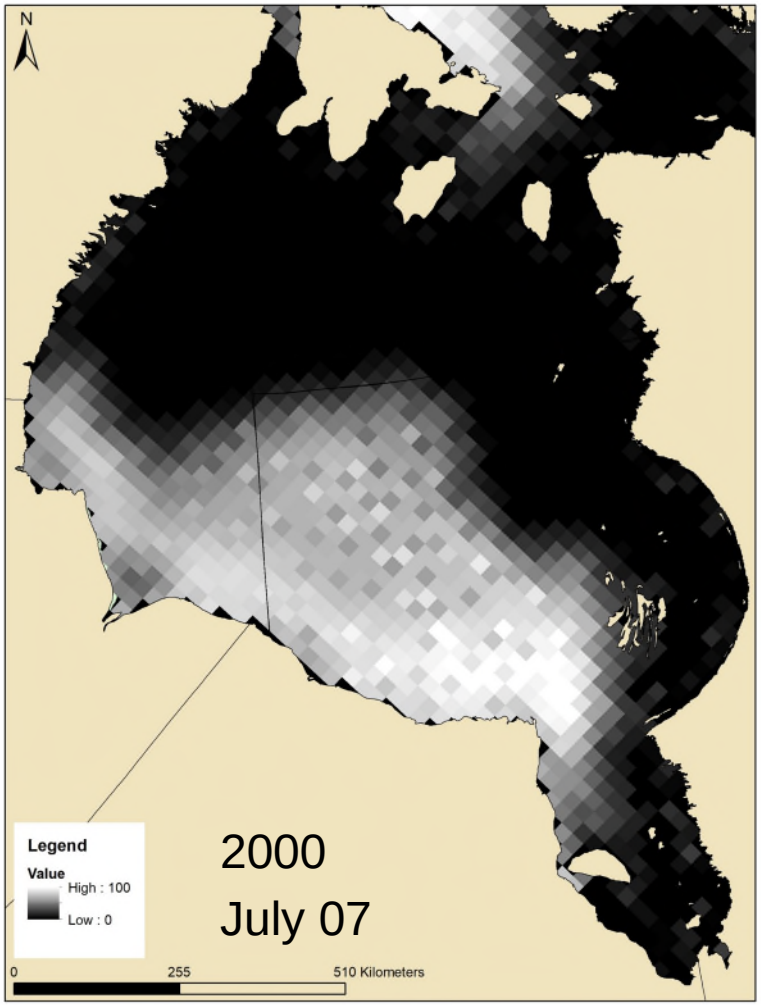

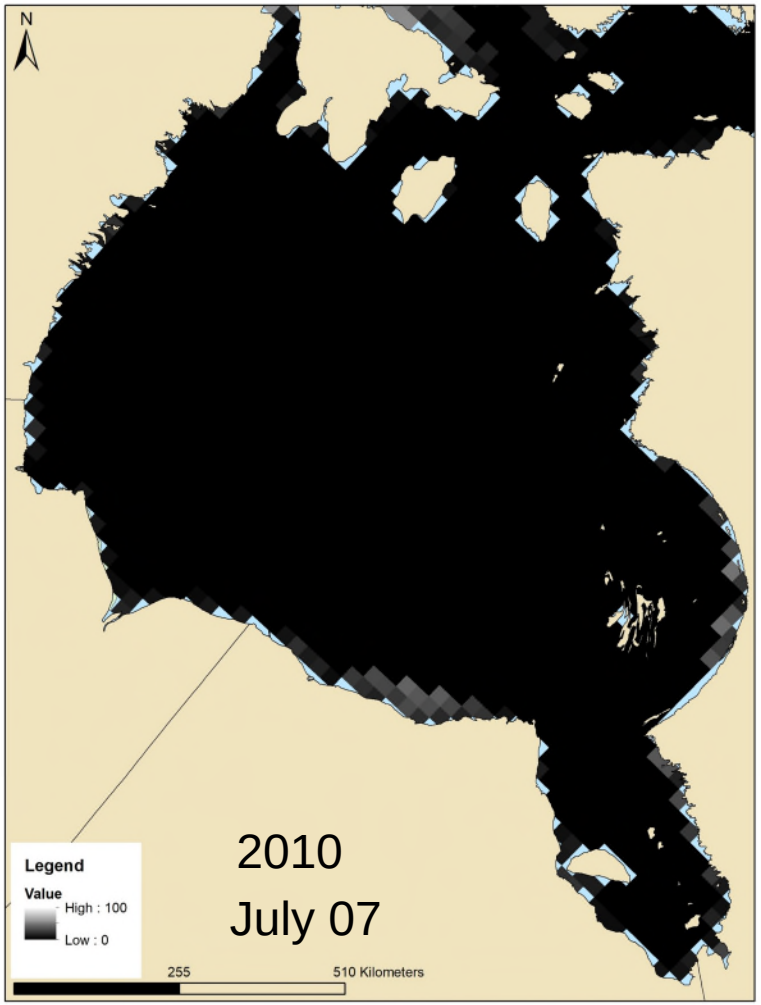

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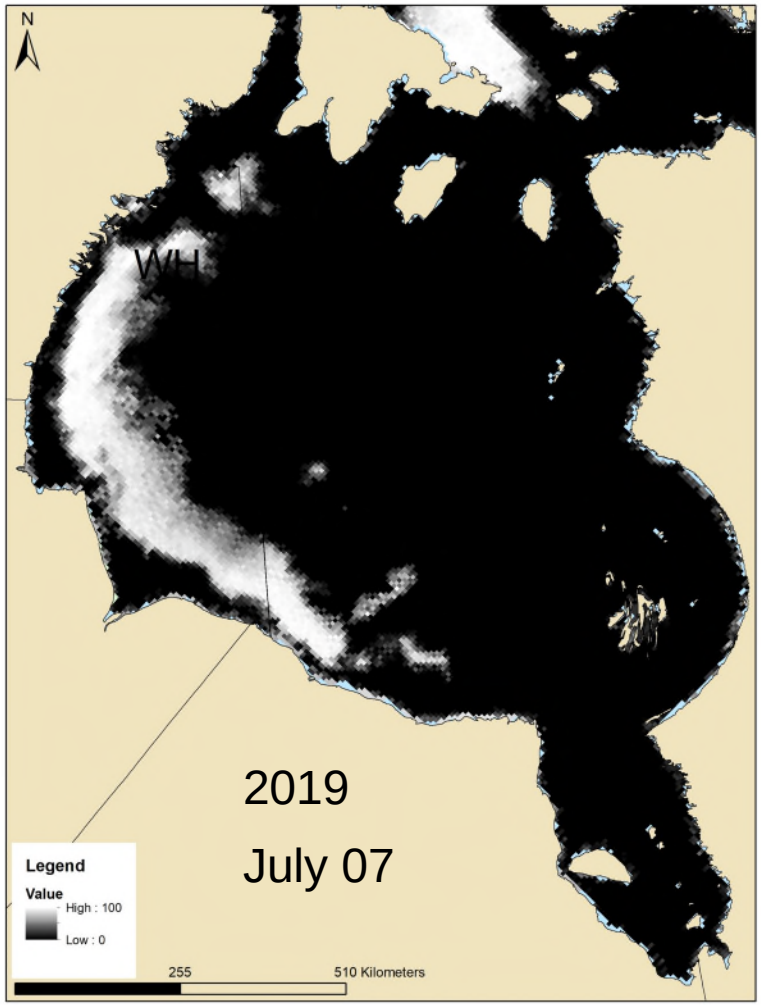
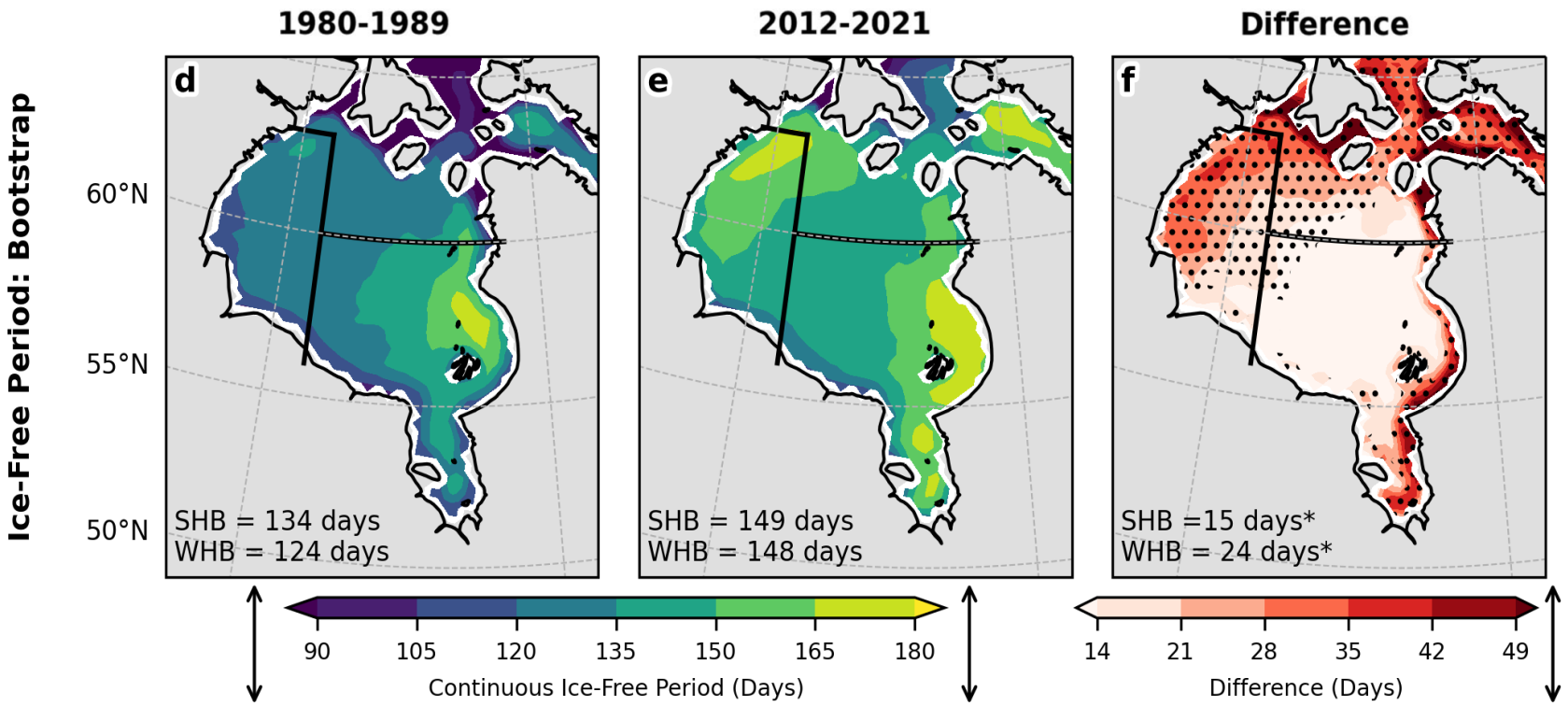


Long-terms trends:

The number of ice covered days in Southern Hudson Bay is declining by about ~ 6.8 days per decade.

Ice-free Period in Hudson Bay is 2 to 3 weeks longer today than in 1980s



Based on Stroeve et al. (2024) "Ice-free" means sea ice concentration < 15%

Data: alex.crawford@umanitoba.ca

Warming climate: less feeding - more time on land

January

December

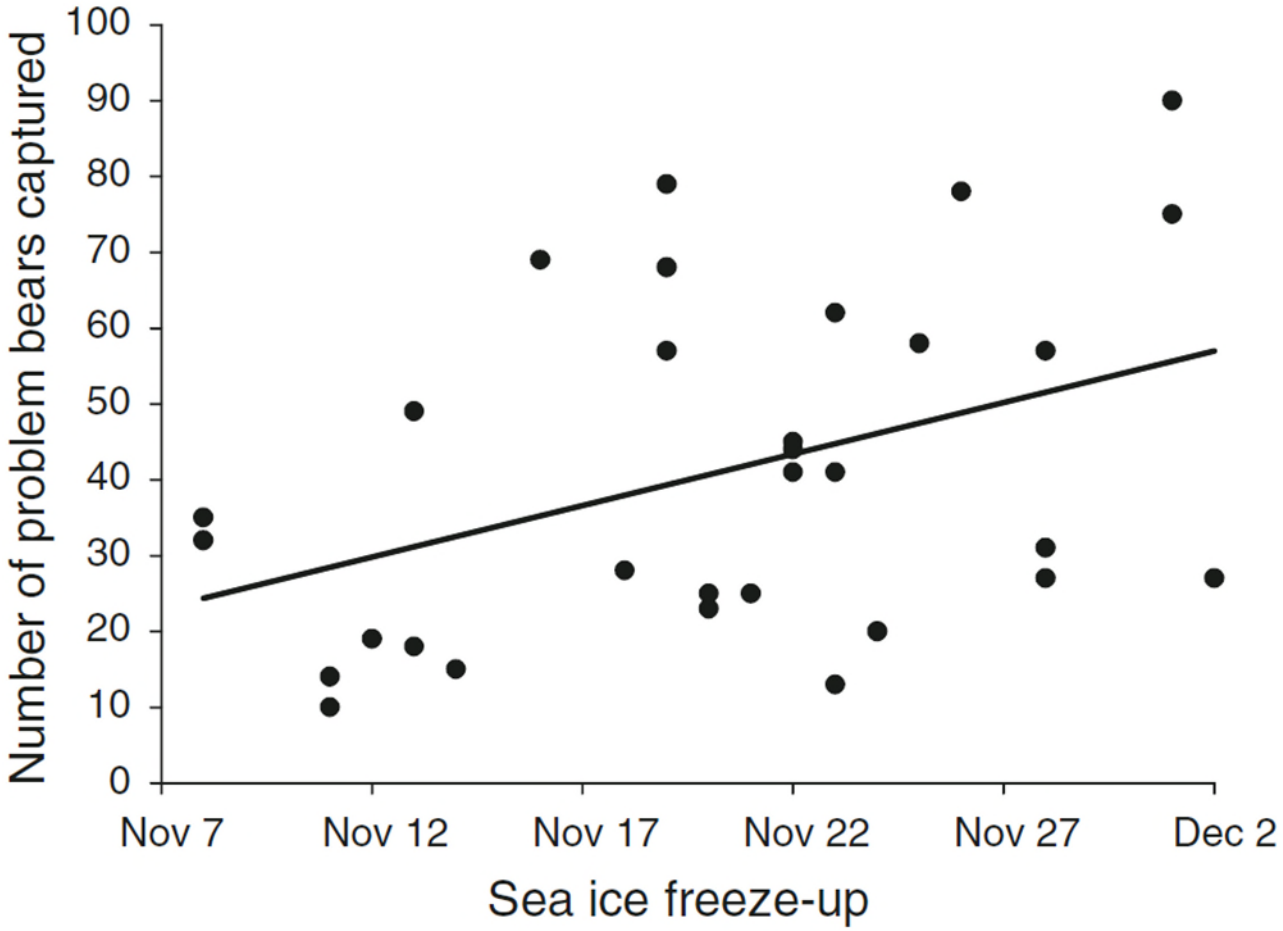
Feeding

Ice-free period

Feeding

Climate warming

Polar Bear Human Interactions



Towns et al. 2009. Spatial and temporal patterns of problem bears in Churchill, Manitoba. Arctic
Heemskerk et al. 2020. Temporal dynamics of human-polar bear conflicts in Churchill, Manitoba. Global Ecology and Conservation

Non-quota limitations and polar bear harvest management

Non-quota limitations play a crucial role in polar bear harvest management, supplementing quota systems to ensure sustainable harvest

General NQL's across jurisdictions (Nationally/Internationally):

- *Protection of females with cubs (Canada, US, Russia, Greenland)
- Established harvest sex ratios (Canada, US, Greenland) (male biased (2:1) harvest allows for greater subsistence take)
- *Protection of females in dens (Canada, US, Russia, Greenland)
- Established harvest season (Canada, US, Greenland)
- Prohibition on trophy hunting (US, Russia, Greenland)

* The 1973 Agreement on the Conservation of Polar Bears provided some of the initial protection for pregnant females and females with cubs. (NQL summaries for each jurisdiction have been submitted by ECCC)

Non-quota limitations and poplar bear harvest management in Canada

Anguvigaq Polar Bear Regulations–1984:

- That a closed season on polar bear hunting be in effect from June 1st to August 31st.
-That female bears with cubs not be killed at any time of the year unless they are problem bears.*
-That polar bears not be killed in their dens. Further, that no one, including scientists and Inuit, disturb a bear in its den unless authorized after consultation with Anguvigaq Wildlife Management Inc. and review by the Hunting, Fishing and Trapping Coordinating Committee.
-That polar bears less than 2 years old not be killed at any time of the year unless they are problem bears.*
-That polar bear cubs not be sold to any person or organization unless authorized after consultation with Anguvigaq Wildlife Management Inc. and review by the Hunting, Fishing and Trapping Coordinating Committee
-That the responsibility for issuing polar bear tags to Inuit hunters rests with the local government municipal corporations in northern Québec.
-That the moratorium on drugging polar bears in northern Quebec be continued.
-That each Inuit community will recognize the right of all other Inuit communities to harvest polar bears and will continue to help each other in matters relating to polar bears.

* Problem bear is defined as any polar bear that is a threat to life or property.

Considerations for total allowable take (TAT) in Southern Hudson Bay

- Models have evolved over the past decades from a one-size-fits-all harvest rate (4.5% of the abundance with 2:1 ratio of males relative to females) to more comprehensive models that reflect subpopulation-specific variation in vital rates.

- Regehr et al. (2021) provide a robust modeling-management framework that informs tradeoffs between protection and sustainable use for wildlife populations in a changing environment.

- Within that framework non-quota limitations on harvest sex ratios (2:1 - male:female) allows for increased harvest opportunities.

- Long-term changes in the availability of sea ice habitat (Stroeve et al. 2024) and declines in polar bear body condition (Obbard et al. 2016) needs to be considered along with TK observations of a healthy growing population (NMRB 2018).

Summary

- The Southern Hudson Bay subpopulation appears to be stable and/or potential increasing based on scientific and traditional knowledge

- Inter-annual movements between southern Hudson Bay and the western Hudson Bay management zones create issues for censusing these two populations using aerial survey methods

- Biopsy mark recoveries do show that most of the harvested bears in SH come from along the Ontario coastline.

- Adoption of non-quota limitations help protect vulnerable components of polar bear subpopulations while providing a safety net for sustainable harvest management.

- The application of robust harvest—management frameworks (Regehr et al. 2021) provide a valuable tool for resource managers to ensure the long-term conservation of polar bears.

Questions?