



Department of Environment

Avatiliqiyikkut

Ministère de l'Environnement

POLAR BEAR RESEARCH GROUP

Government of Nunavut – Department of Environment

Western Hudson Bay Polar Bear Aerial Survey 2016

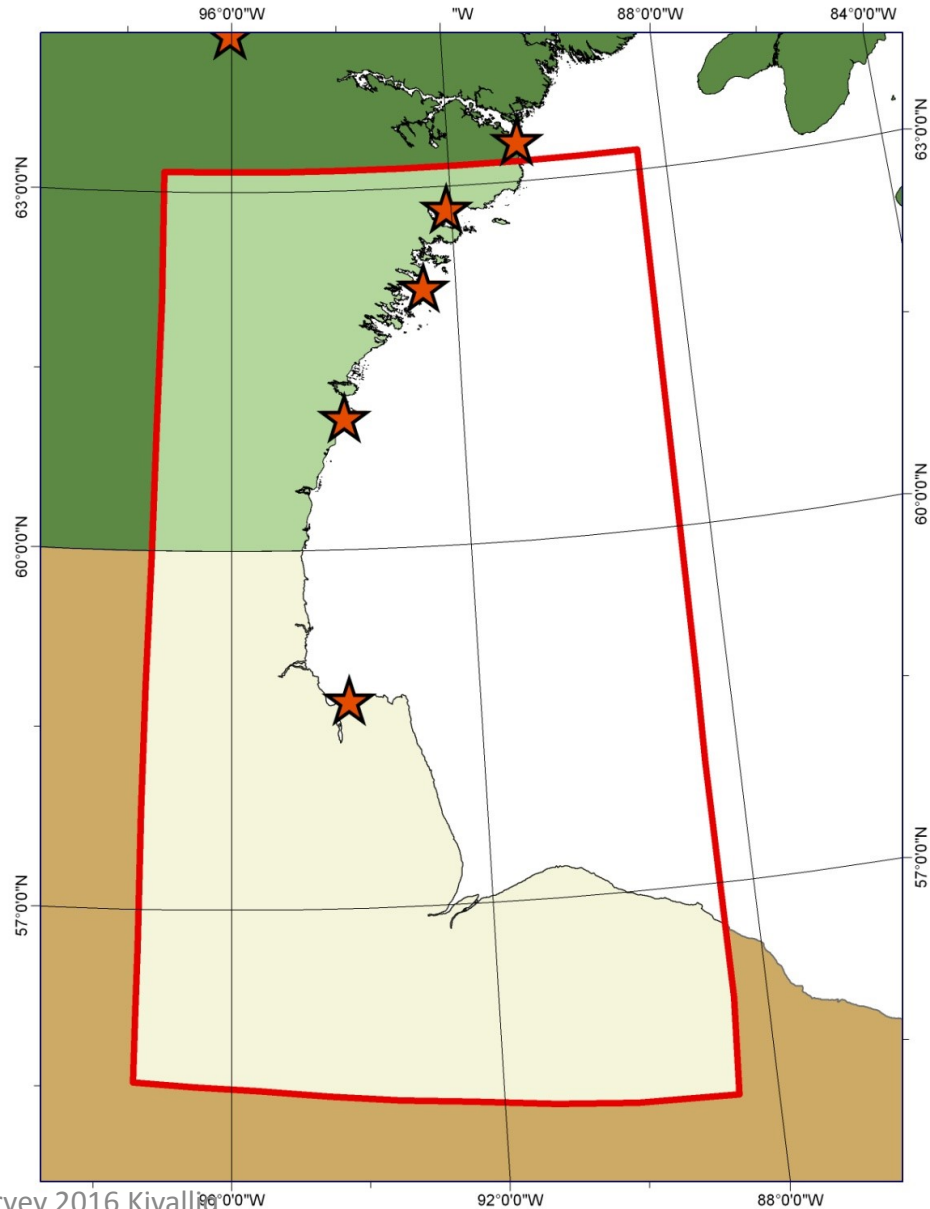


Wildlife Research Section
GN - Department of Environment



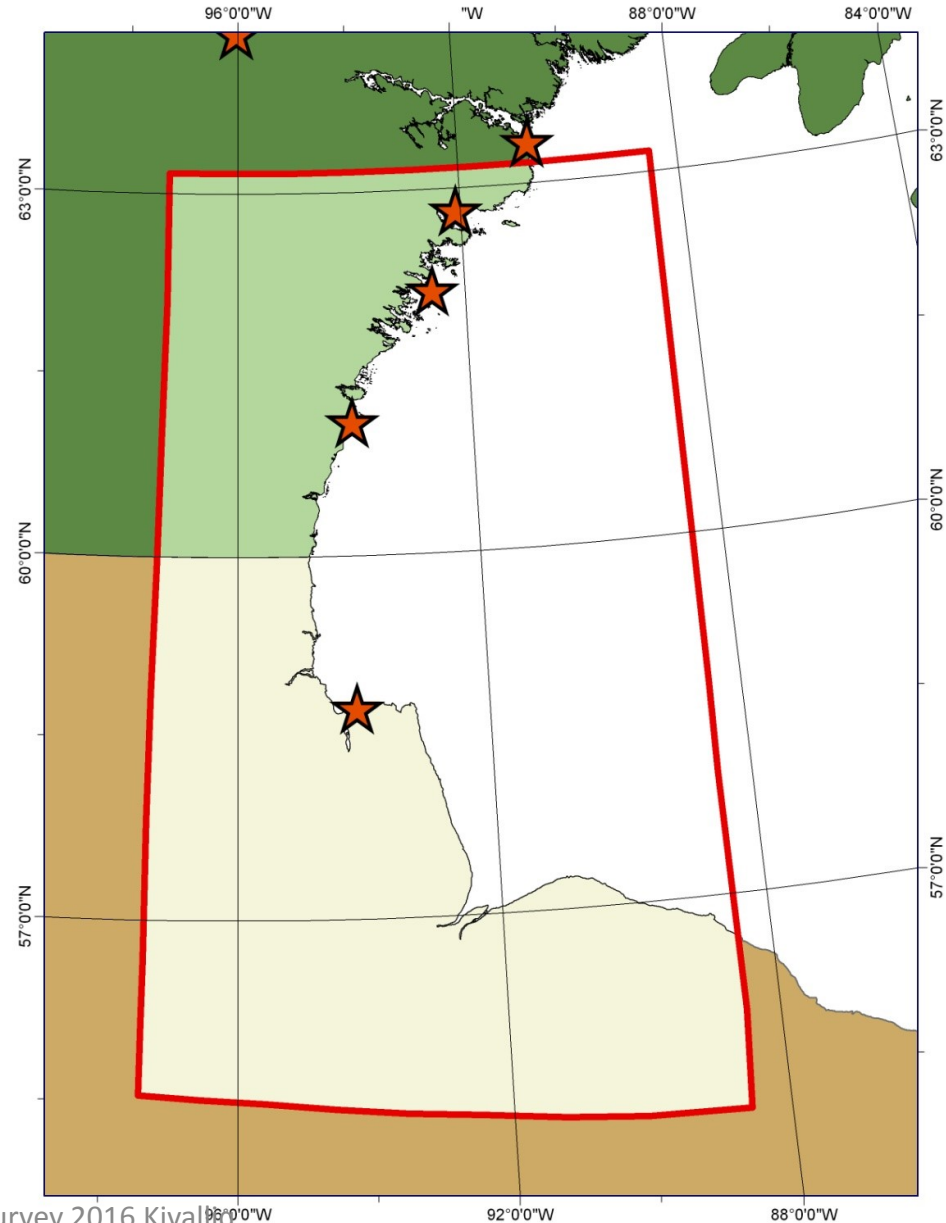
Background

- Concern about status of sub-population
- Science:
 - 1030 bears (last GN-led aerial survey [2011])
 - EC results agree that WH has been stable for last decade
- IQ and local observations:
 - More bears seen
 - Increasing numbers & range
 - Concern about accuracy & impacts of tagging studies



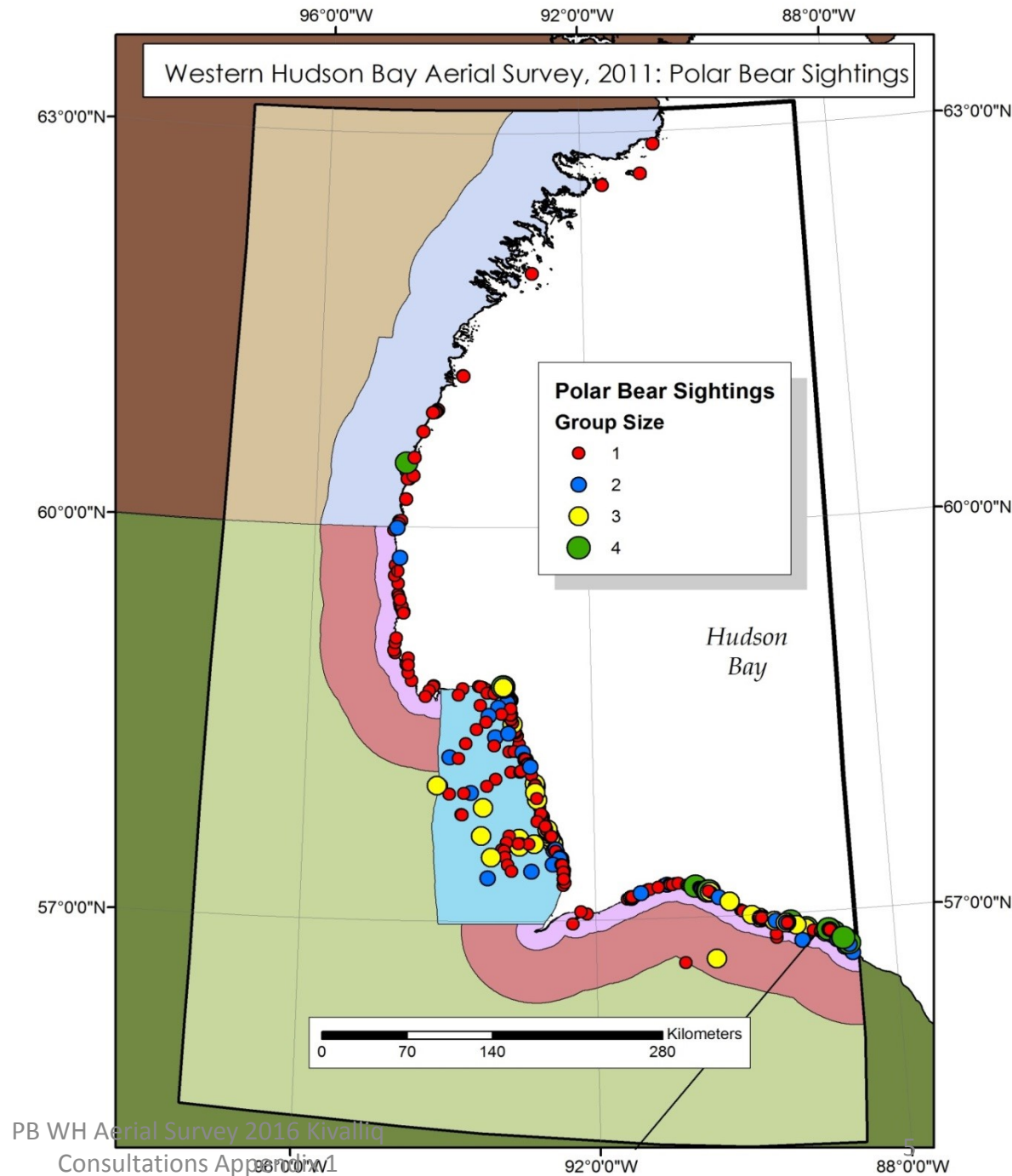
Background

- Disagreement between science and IQ
- Need for new study
 - Tried new non-invasive method = aerial survey
 - Resolve disagreement
 - Continue to monitor population to establish trend



Aerial Survey 2011: Results

- 1030 polar bears
- High densities in southeast WH
- Large portion of the population outside area where tagging studies occur
- Evidence of poor reproductive performance



Mark-recapture Studies and Sea-ice Monitoring

- Environment Canada long-term study
- Analysis of data for 1987 to 2011
- Key Results:
 - Survival linked to sea-ice conditions
 - Estimated 806 bears (in 2011)
 - Long-term declines in sea-ice and bears numbers but stability over the last decade
 - No recent trends in sea-ice or bear numbers
 - Predictions of future trend highly dependent on sea-ice conditions

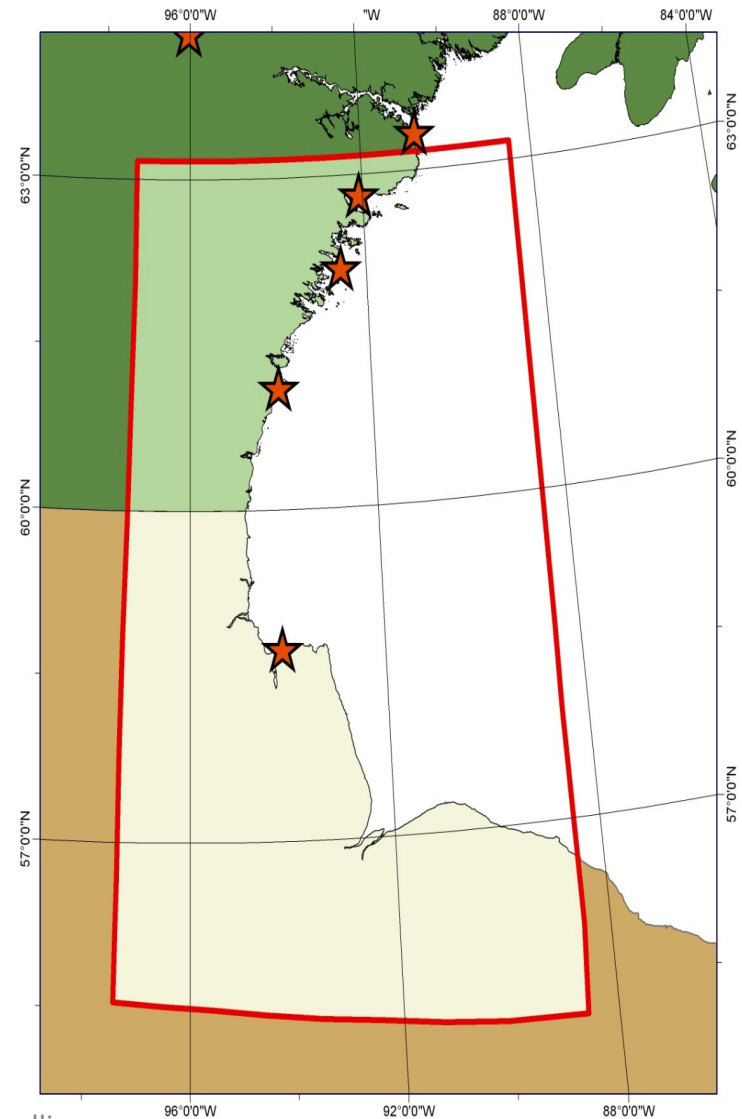
Using Aerial Surveys to Monitor WH

- Adaptive management requires more frequent monitoring
- Methods like aerial survey are well suited
- Fast, less invasive, cost effective, community involvement
- Can detect trends in populations and respond accordingly
- Scope of information limited: Trade-off

Aerial Survey 2016

Objectives:

- Estimate abundance of PB in WH
- Comparison with last aerial survey (2011)
- Evaluate as a monitoring method
- PB distribution in relation to habitat & environmental conditions where possible



Research Plans 2016

- Aerial survey
 - Alternative to tagging
 - used in 2011

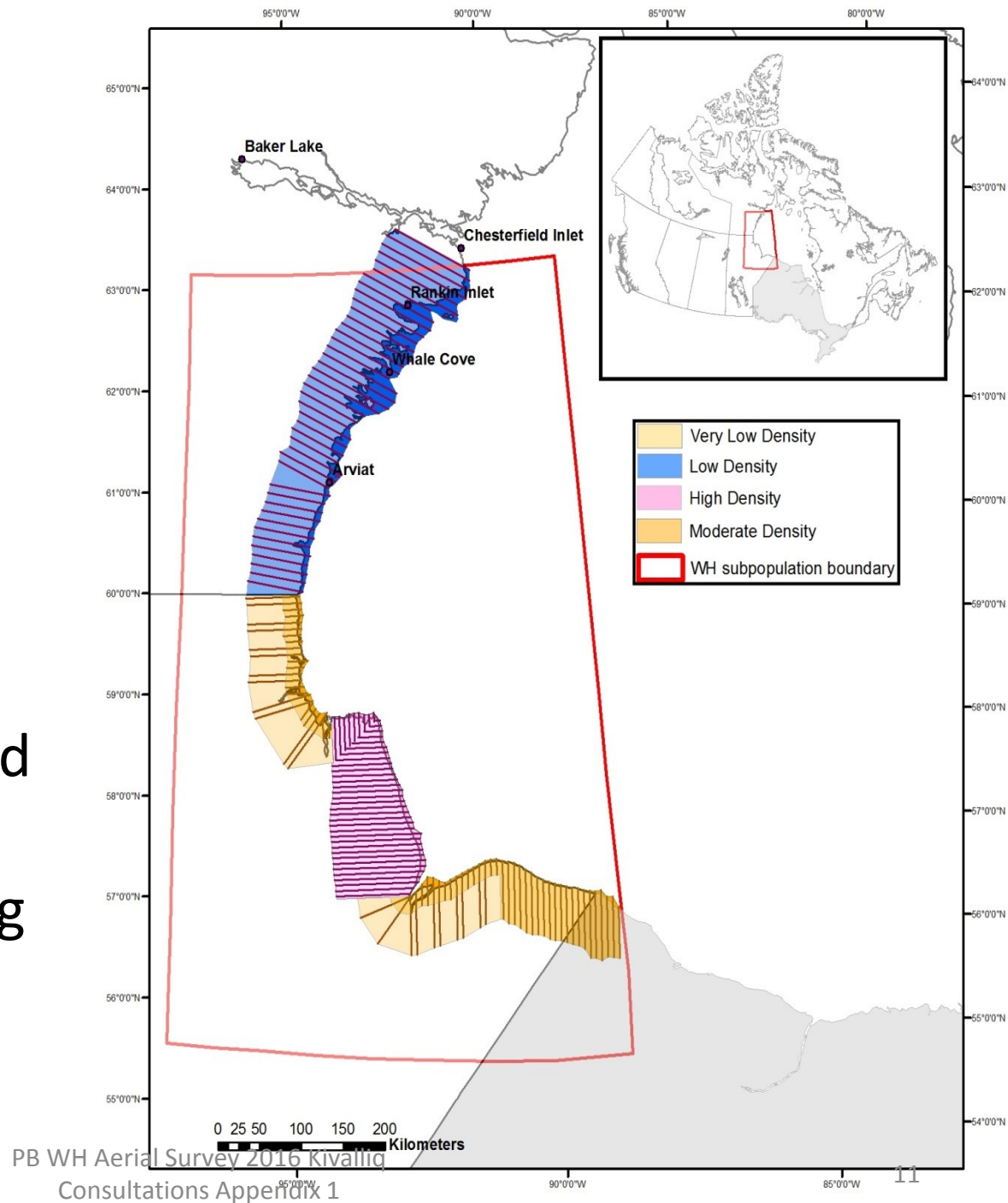
- On-going collection of IQ and hunter observations
 - HTO's, NTI, GN

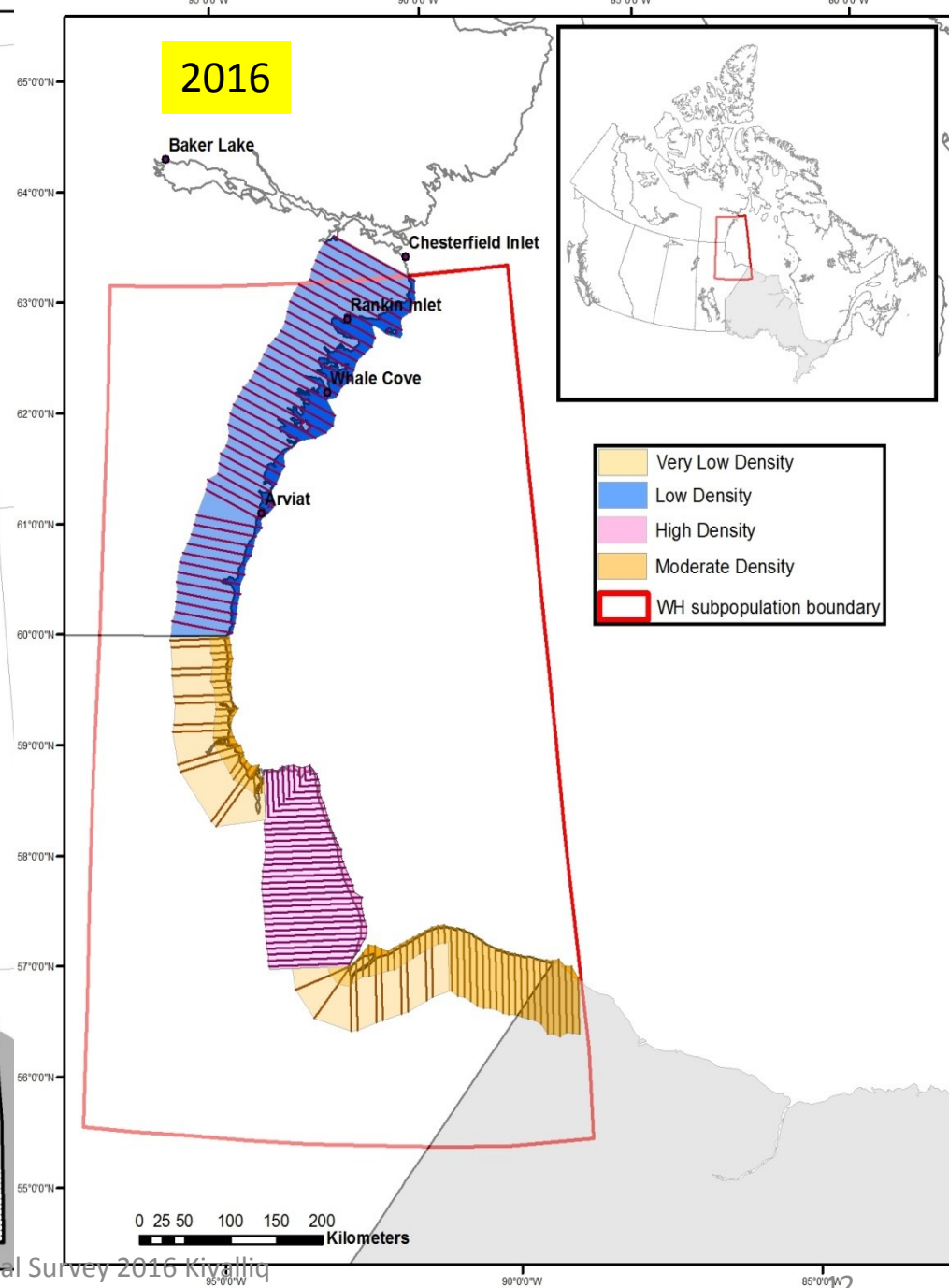
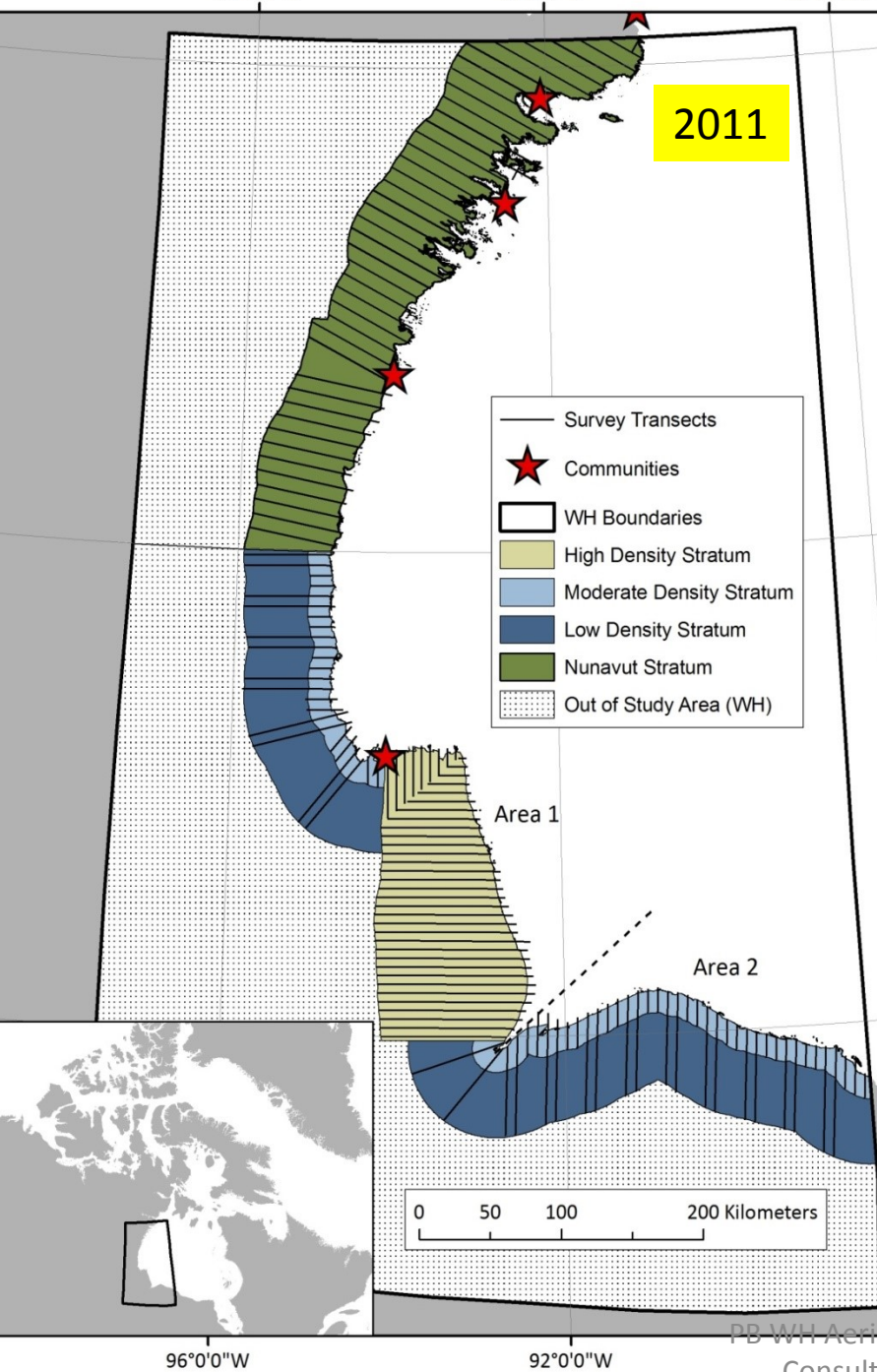
Design

Sources of Information:

- Tagging Studies in Manitoba (>40 years)
- Coastal surveys in Manitoba (>40 years)
- Movements on satellite collared bears
- Workshop with HTO members, 2010*
- Tested aerial survey in Nunavut, 2010 and 2011*

- All of this information was used to divide the study area into blocks ('strata') based on density of bears
- Transects extended 60-100 km inland in places and along coast





Timing of Survey: Late August

Why?

- All bears are off the sea-ice and it is before they return (e.g., concentrated on land)
- Minimize number of denned bears
- Good sighting conditions (i.e. lack of snow cover, longer days, weather, light conditions)
- Coincides usually with timing of tagging studies

How we flew the last survey

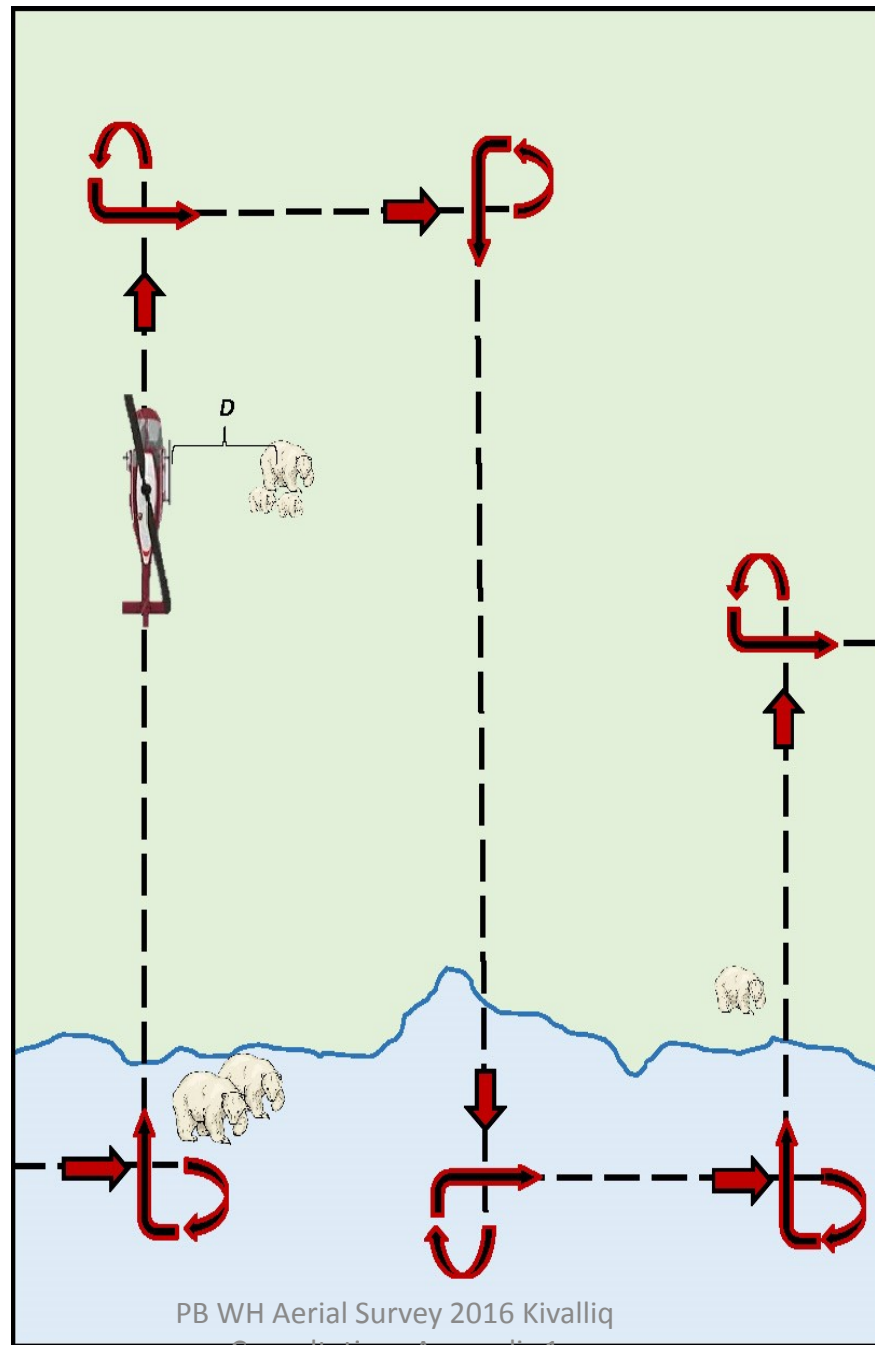
- Survey teams: Nunavut - Twin Otter (13-17 Aug 2016)
- 2 Helicopters (17-22 August 2016) in Manitoba
- 4 observers per team
- Front and back observers working independently
- Recording type and location of bears seen, habitat



flying transects



flying transects



Challenges

➤ Islands and offshore waters



➤ Tidal flats



Challenges

➤ Vegetation



➤ Glare



Challenges

➤ Vegetation



Challenges

➤ Denning



Results

- Survey flown August 12 – 22nd
- More than 130 hours of flying
- Over 9500 km of inland transects flown plus extended over water

Participants

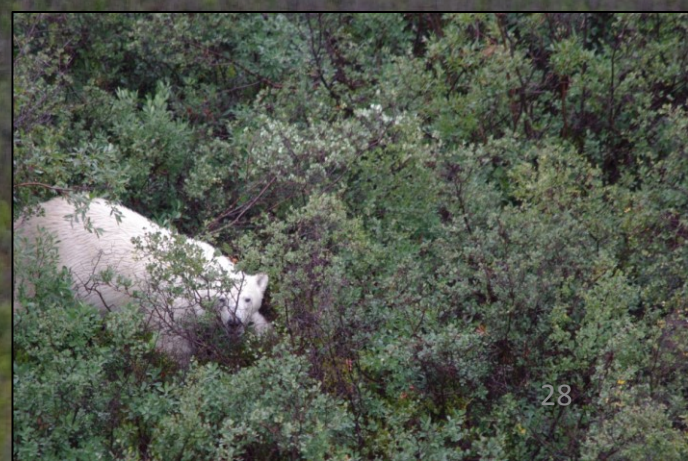
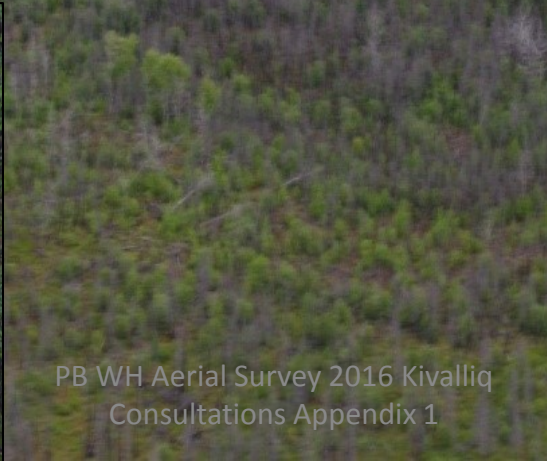
- Mitch Campbell, Kelly Owlijoot, M. Dyck (GN Dept. Of Environment)
- David Lee, Robert Karetak (NTI)
- Leo Ikakhik (Arviat HTO)
- Louis Tattuinee (Rankin HTO)
- Daryll Hedman, Vicki Trim (Manitoba Conservation)
- Kevin Burke, Chantal Ouimet (Parks Canada)







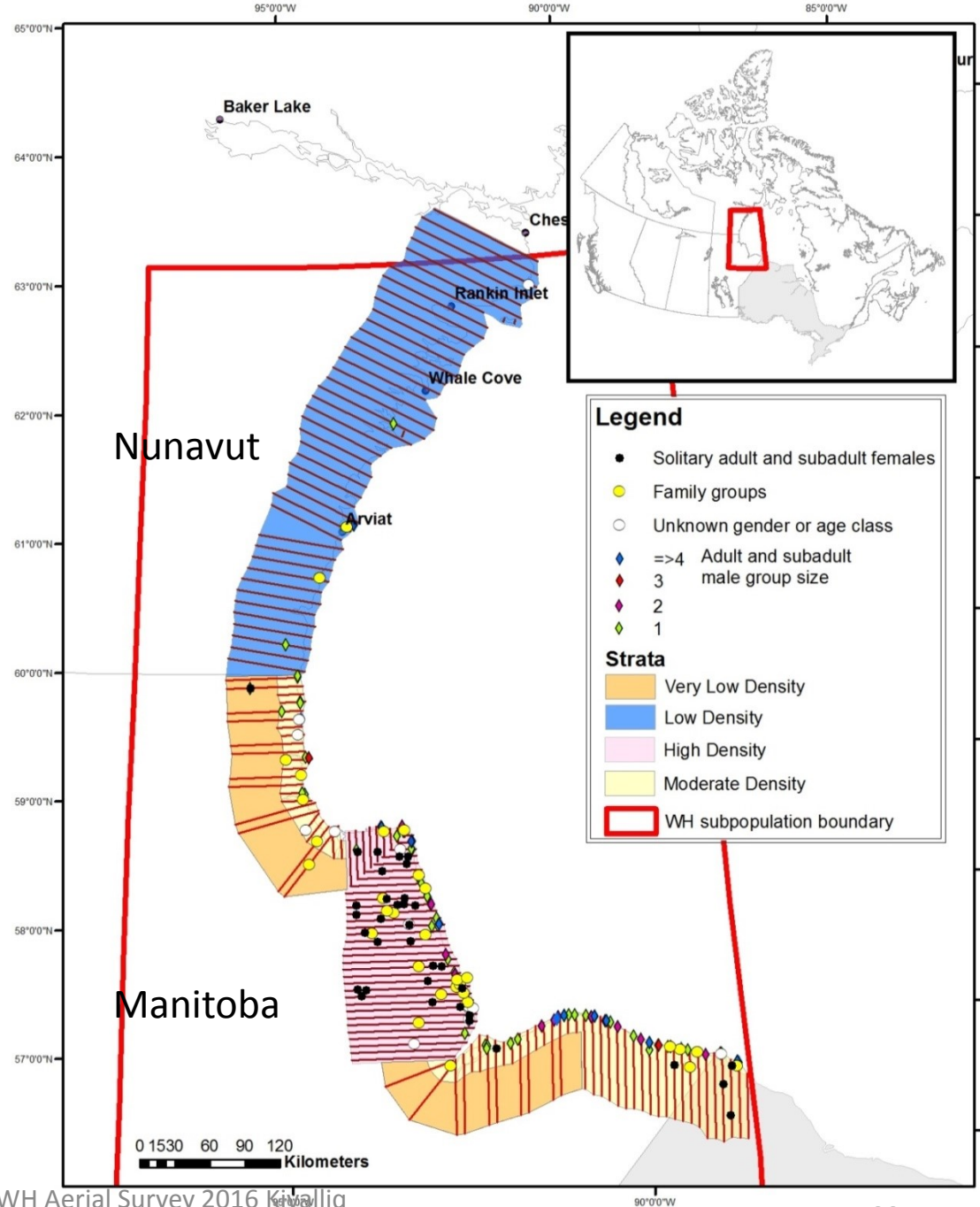






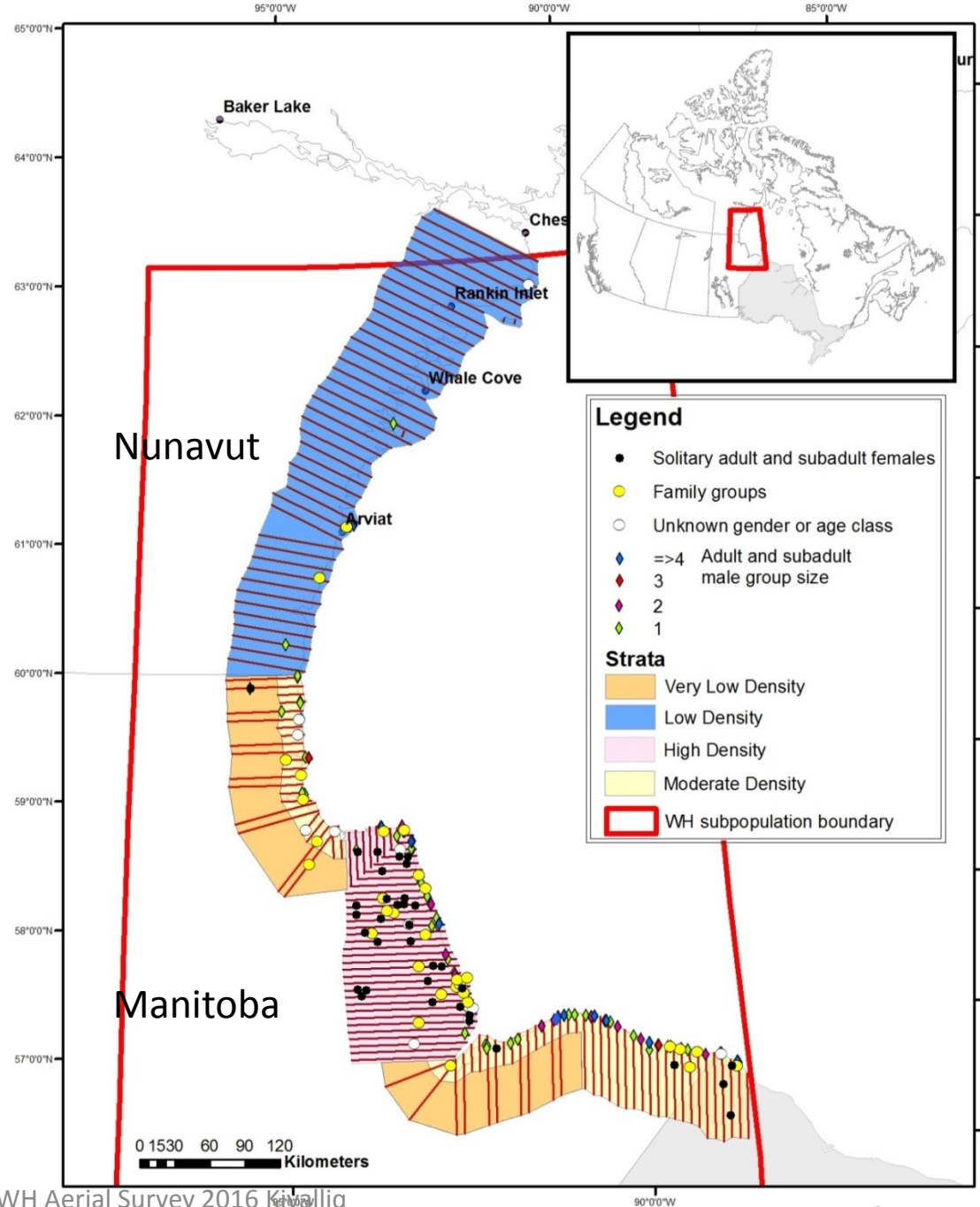
Results

- 339 polar bear sightings
 - 18 in Nunavut
 - 321 in Manitoba
- Groups of 1 to 11
- Includes swimming bears



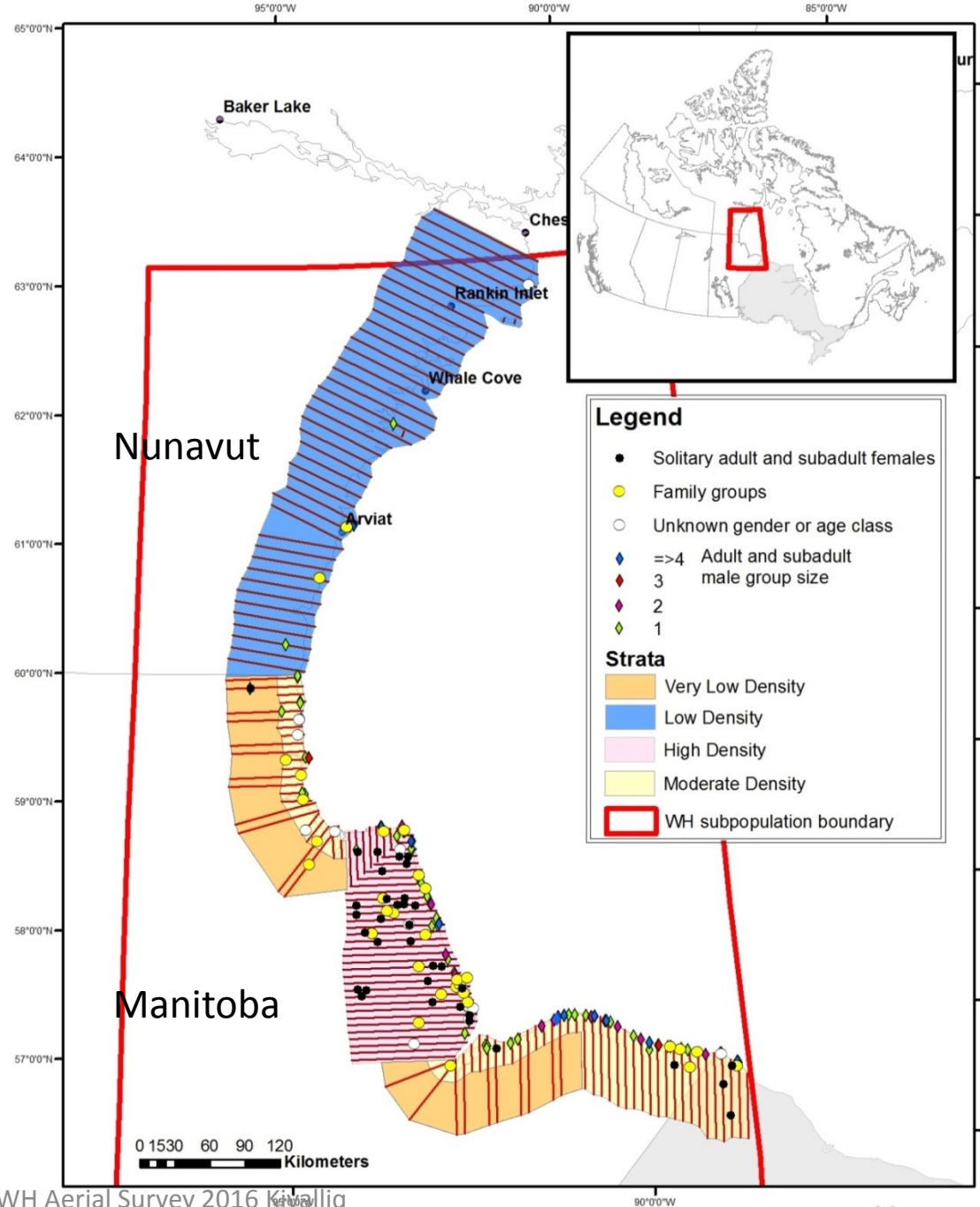
In Nunavut

- Distribution similar to 2007, 2010, 2011
- Low densities during August
- Most bears south of Arviat (coast, islands)



In Manitoba

- Distribution similar to previous studies
- Over 80km inland in Wapusk (family groups, pregnant females)
- High density in southeast WH (many adult males)



Subpopulation	Litter size		Proportion of total observations		Source
	COY	YRLG	COY	YRLG	
Western Hudson Bay (2016)	1.63 (0.10)	1.25 (0.16)	0.11	0.03	GN (unpublished data)
Western Hudson Bay (2011)	1.43 (0.08)	1.22 (0.10)	0.07	0.03	Stapleton et al. (2014)
Southern Hudson Bay (2011)	1.56 (0.06)	1.49 (0.08)	0.16	0.12	Obbard et al. 2015
Foxe Basin (2009-2010)	1.54 (0.04)	1.48 (0.05)	0.13	0.10	Stapleton et al. (2015)

Western Hudson Bay has some of the lowest yearling litter sizes recently recorded in Hudson Bay, and low proportions of offspring



Body Condition

- Variable across WH
- Best body condition in southeast WH



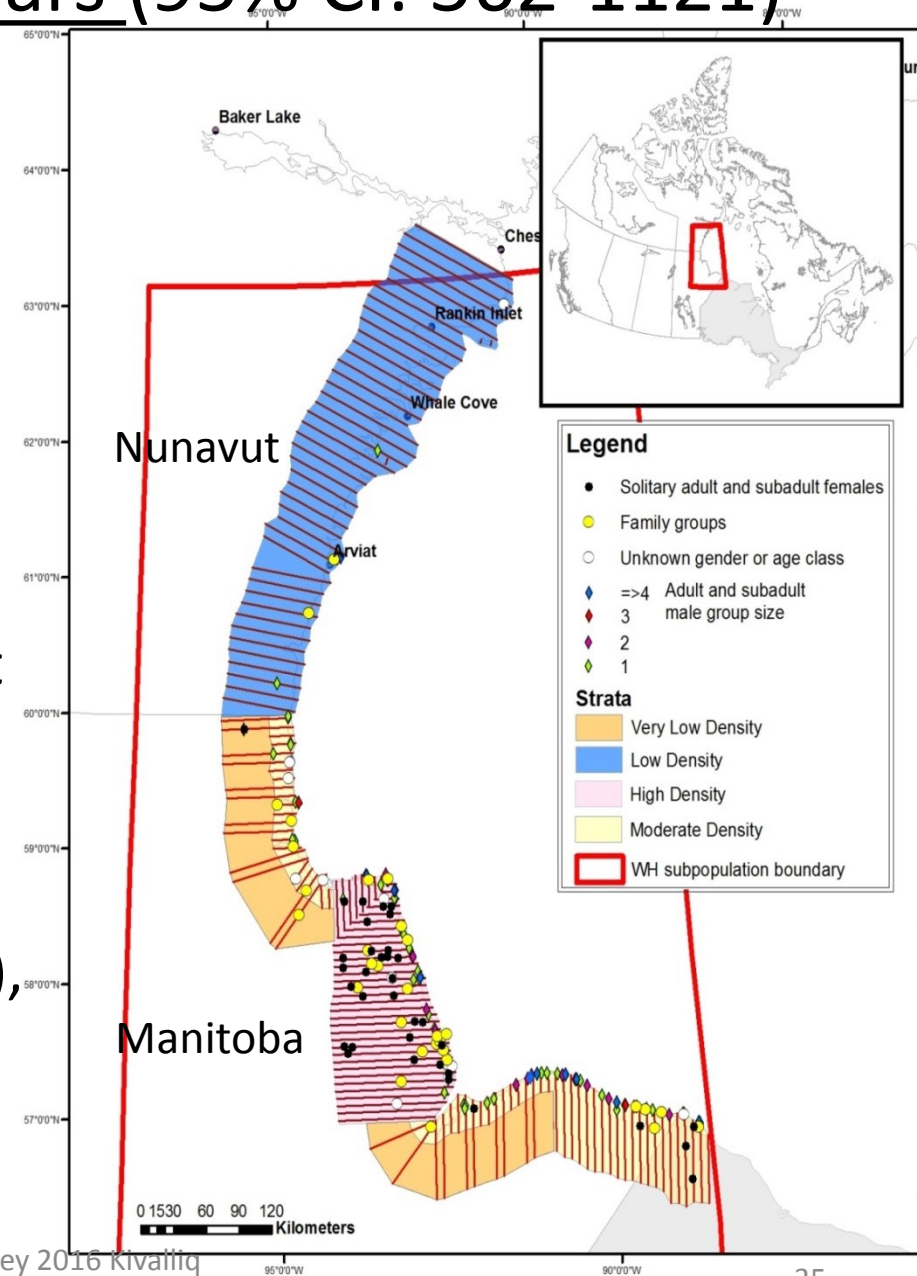
2016 Estimate of 842 bears (95% CI: 562-1121)

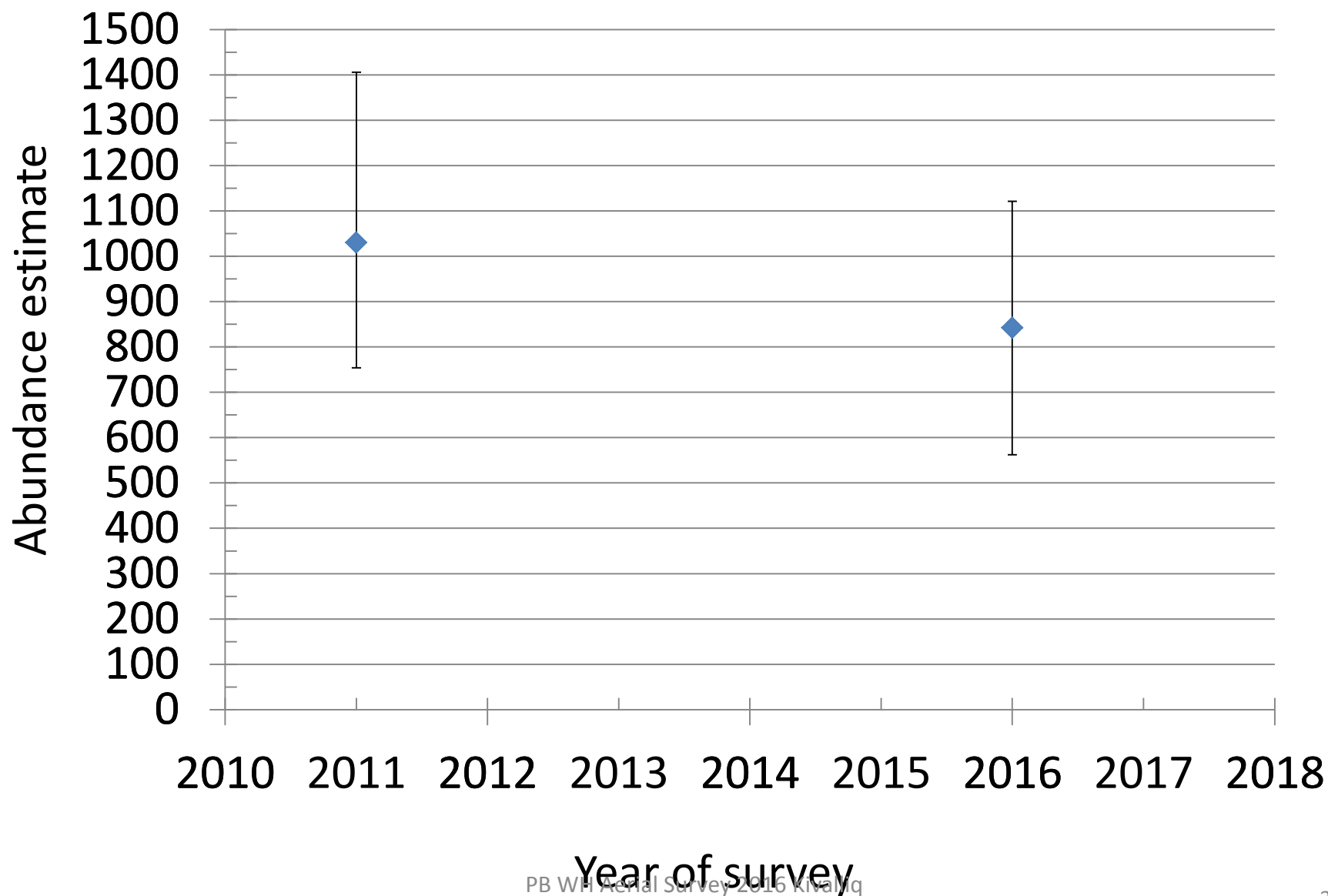
Precision

- Met expectations
- Coefficient of Variation = 16.9%

Accuracy

- Near 100% detection on transect
- Bears outside study area
 - Far inland bears (unlikely)
 - Swimming bears
- Other factors: Dens (checked all), habitat (trees)
- Tendency to underestimate abundance





Summary

- Estimated 842 bears in 2016 (August) (not sig. different than 2011 study)
- Low densities and distribution in Nunavut during August consistent with 2 previous studies
- Majority of bears are in Manitoba during August
- 2016 aerial survey estimate similar to 2011 estimate

Summary

- Evidence of low offspring production in 2016 as in previous aerial survey study
- Body condition variable across WH

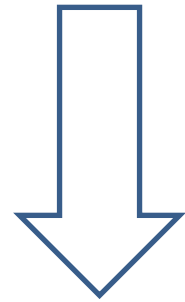
Next Steps

Further analyses:

- Comparison between aerial survey & future mark-recapture?
- Comparison with 2016 aerial survey in SH

Collect more available IQ

Sea ice monitoring

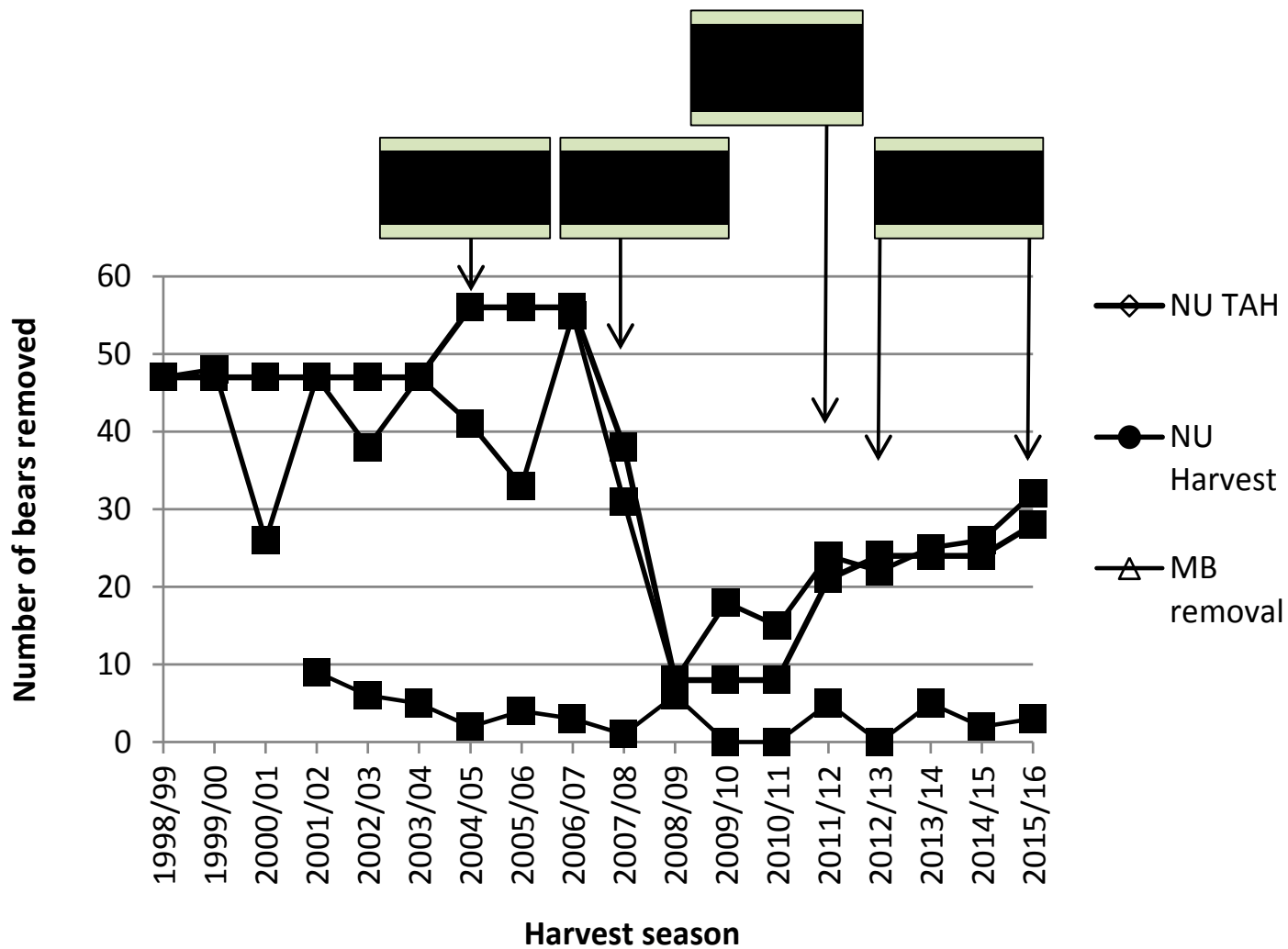


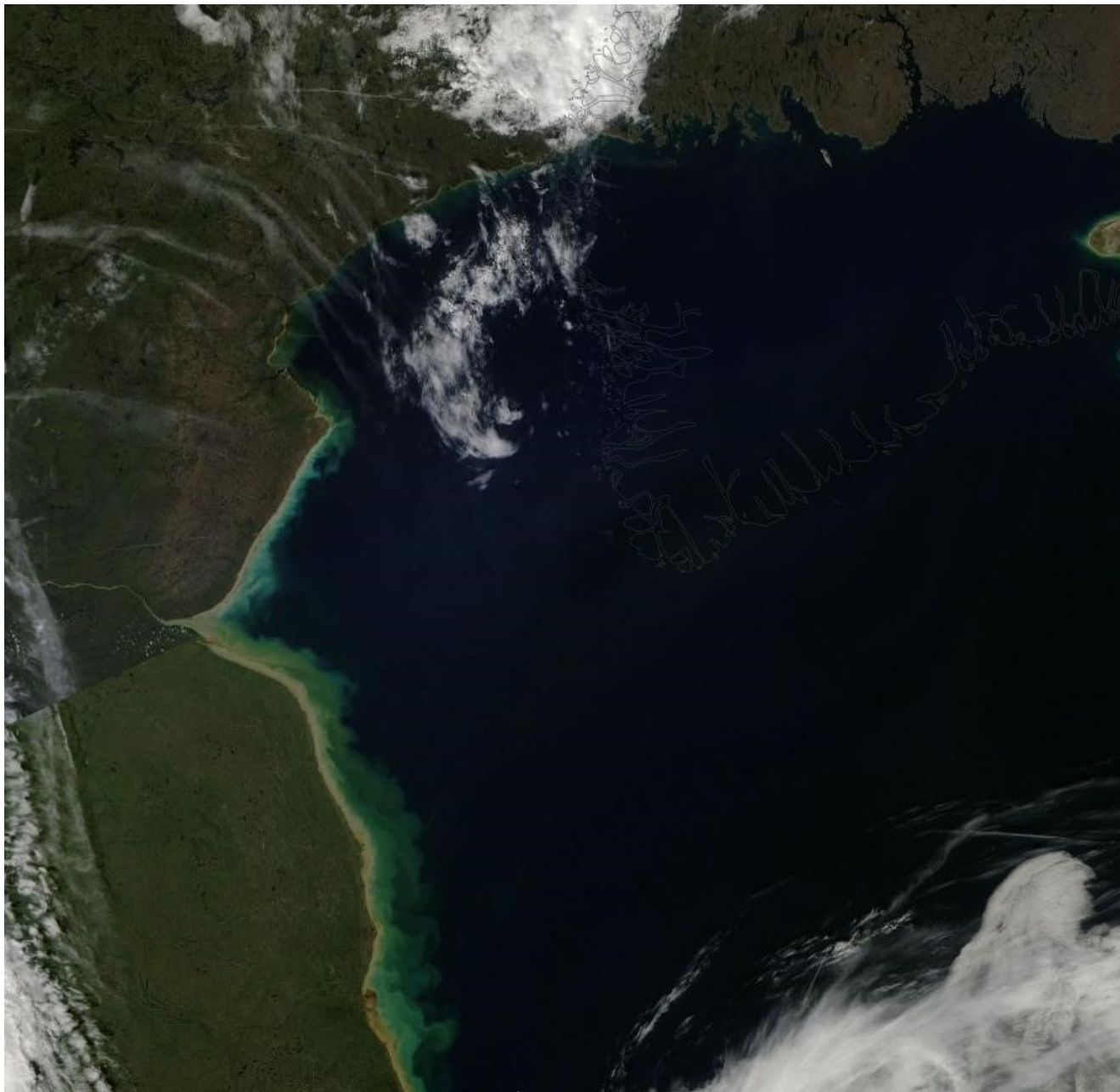
Assessment of
status

Thank you – Questions?

Explanation of variation and estimate







PB WH Aerial Survey 2016 Kivalliq
Consultations Appendix 1