



Organic Contaminants in Ulukhaktok Male Ringed Seals

Ashley Gaden & Gary Stern
University of Manitoba

IPY-NWT

January 19, 2011



Acknowledgements

- Support, resources and data:
 - John and Emma Alikamik and the Hunters and Trappers Committee in Ulukhaktok, NT
 - Lois Harwood, Humfrey Melling, Tom Smith
 - FWI-DFO staff

- Funding:
 - IPY
 - Fisheries Joint Management Committee
 - Northern Contaminants Program
 - NSERC
 - ArcticNet



Martin





Ringed seal
(*Phoca hispida*)



What are organic contaminants?

They come from pesticides and industrial emissions (pollution)

- Production:
 - agricultural and industrial processes release contaminants into the atmosphere and water (i.e. DDTs, PCBs)



Farmer spraying crops



Pesticides



Factory smoke stack

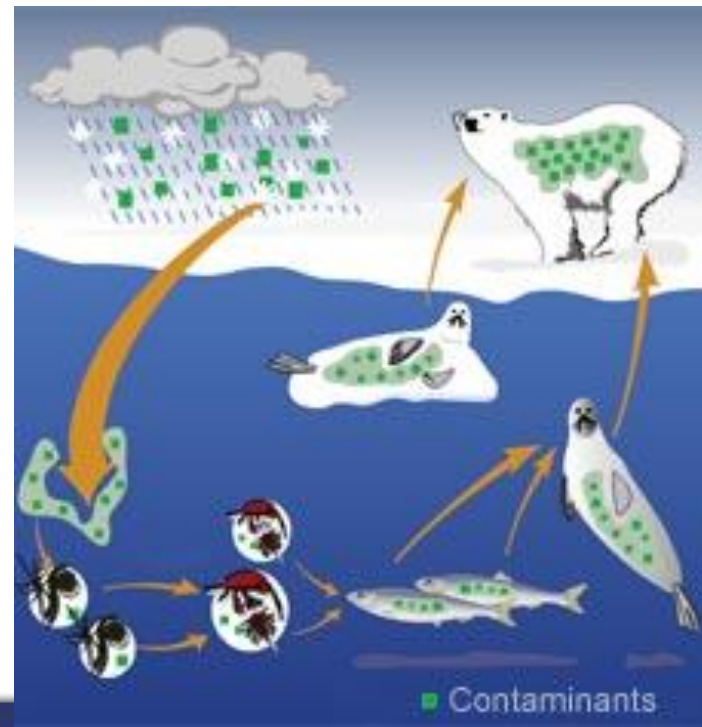


How do organic contaminants reach the Arctic?

■ Distribution:

- Winds and ocean currents carry pollutants to the Earth's poles
- Contaminants settle in the ocean and attach to organic matter (i.e. plankton)
- they move upward through the food chain, becoming more concentrated at each trophic level

Green dots = contaminants
Biomagnification process





Ringed seals are a key species in the Arctic

- Subsistence for northern communities
- Major prey for polar bears
- Source of food for Arctic fox, wolverines, wolves, killer whales





Monitoring location: Ulukhaktok (Holman), NT





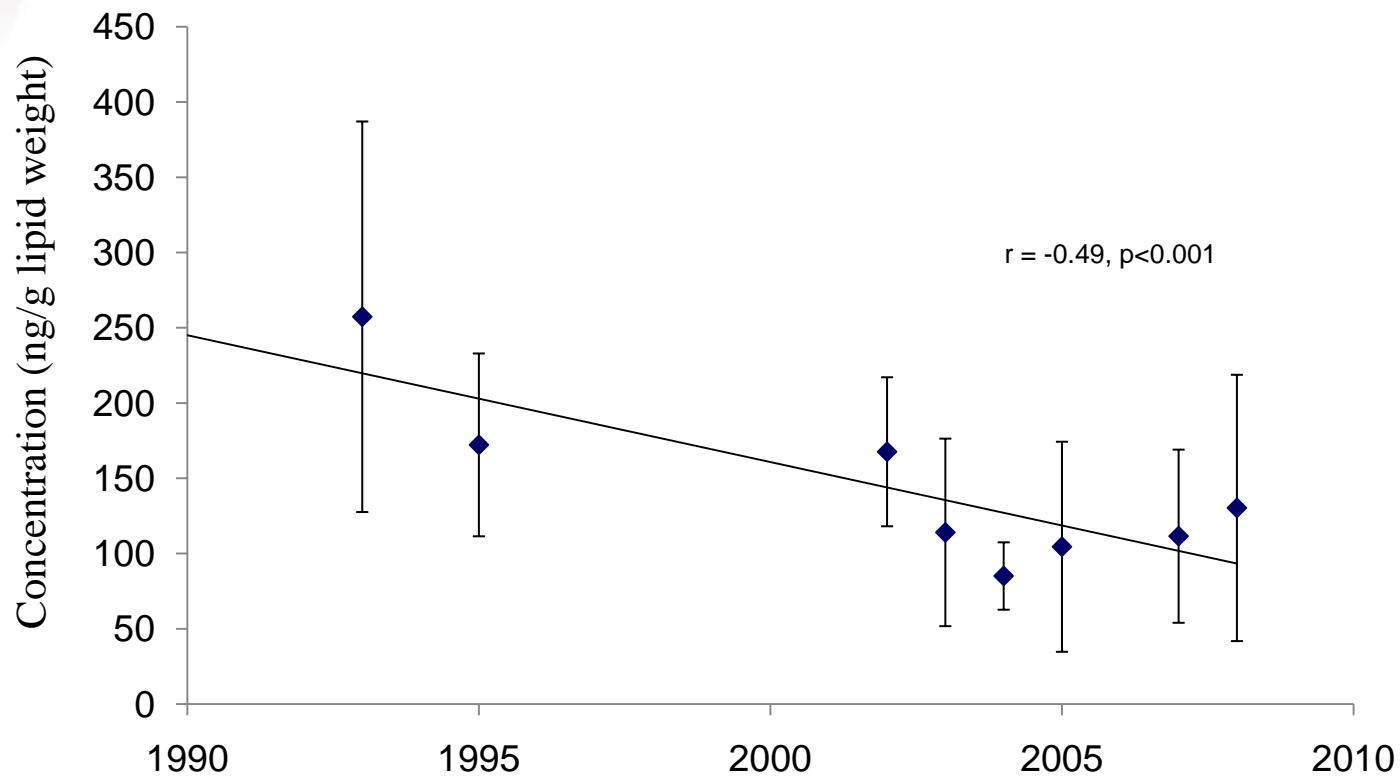
Sampling and research objectives

- 91 male adult ringed seals
- Samples from 1993, 1995, 2002-2005, 2007, 2008
- Analyzed blubber samples for organic contaminants
- Determine the association of contaminants with
 - 1) Time (results in this presentation)
 - 2) Climate/ice data

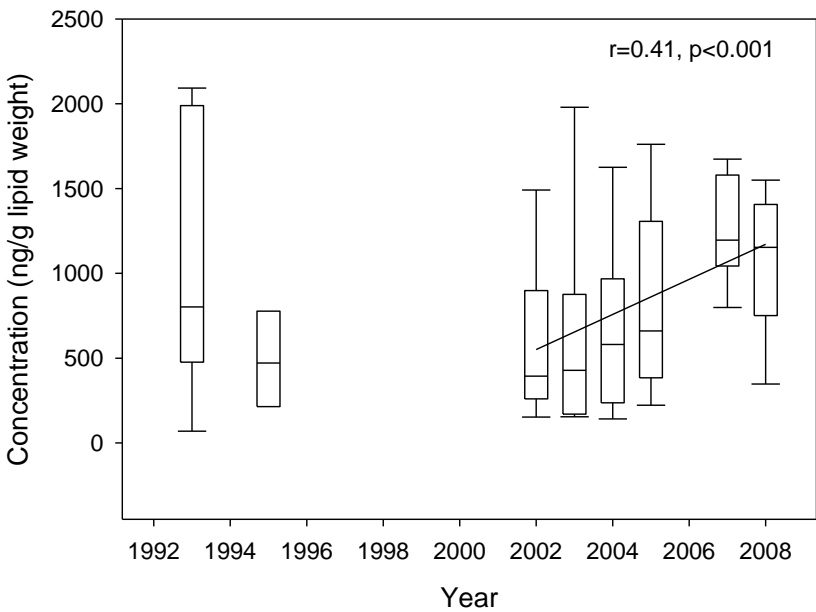




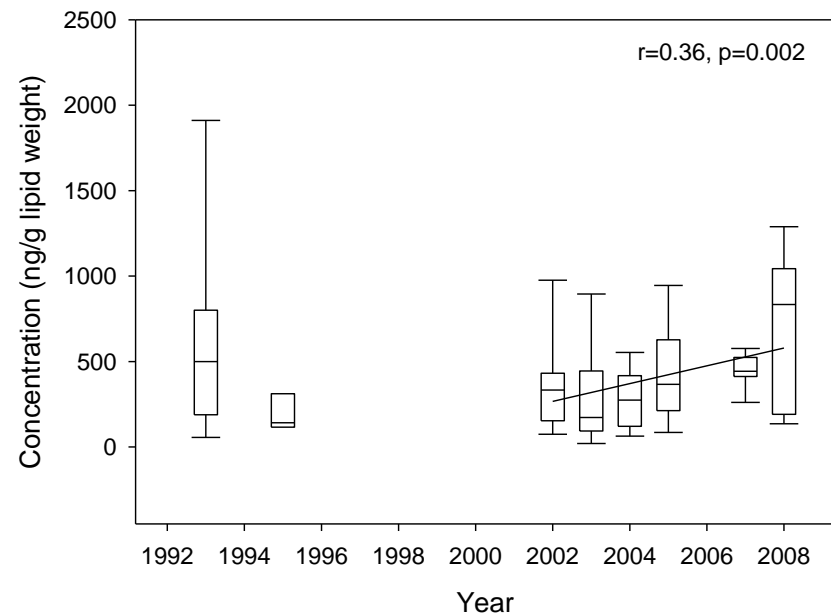
α -HCH



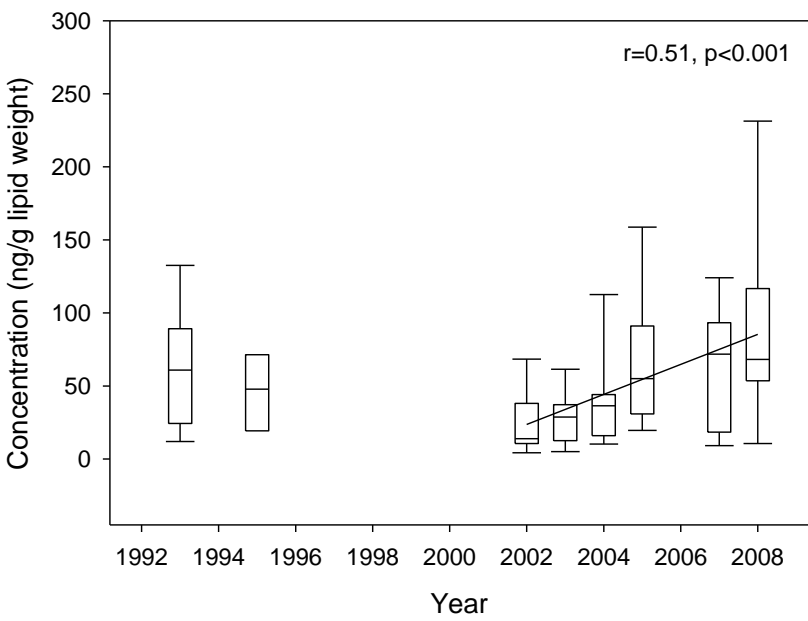
p,p-DDE



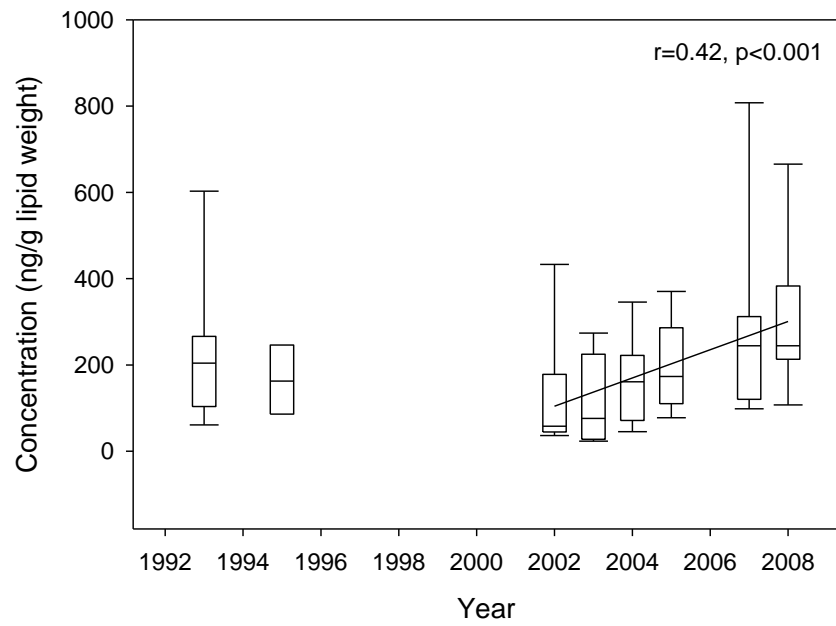
Oxychlordan



PCB 101



PCB 153



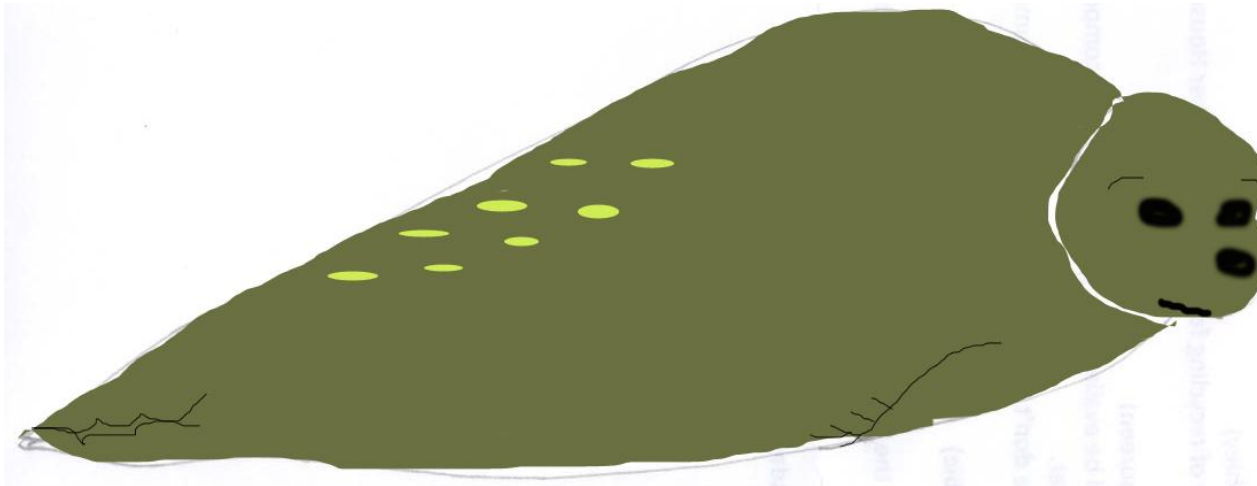


Condition

Seals appeared to become skinnier (less blubber thickness) over time

Seals are in a healthy condition when they are fat.

When they lose weight, their contaminant concentrations increase.



Dots = Organic contaminants

Blubber

Low contaminant concentration in blubber

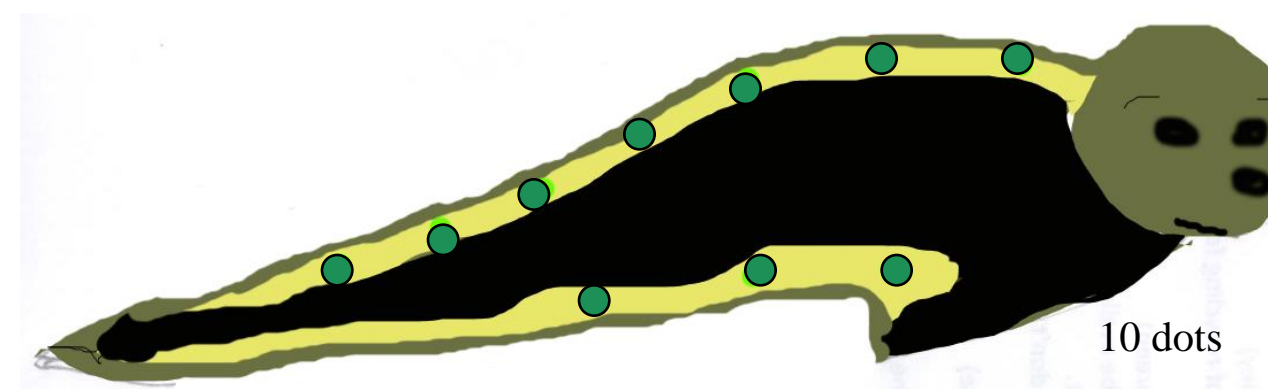
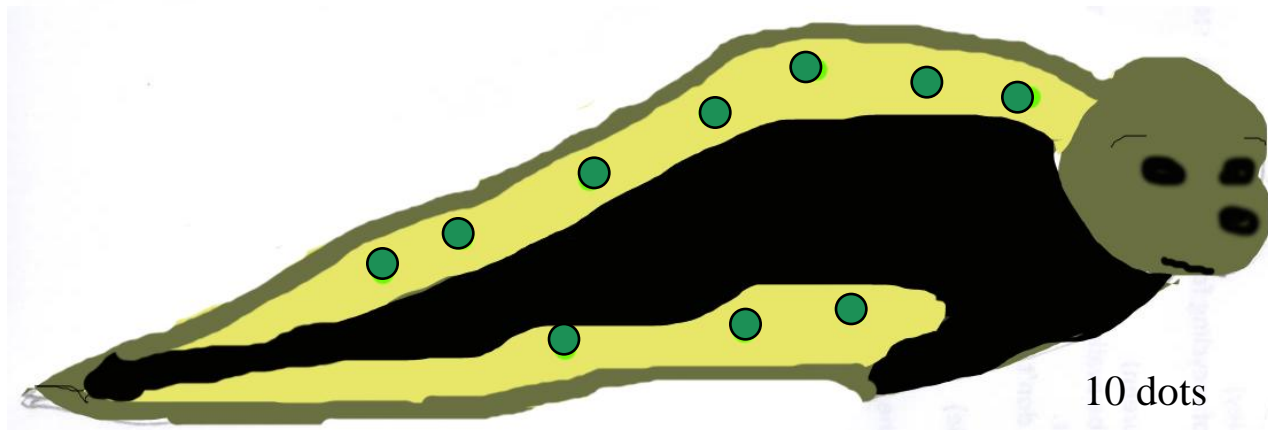
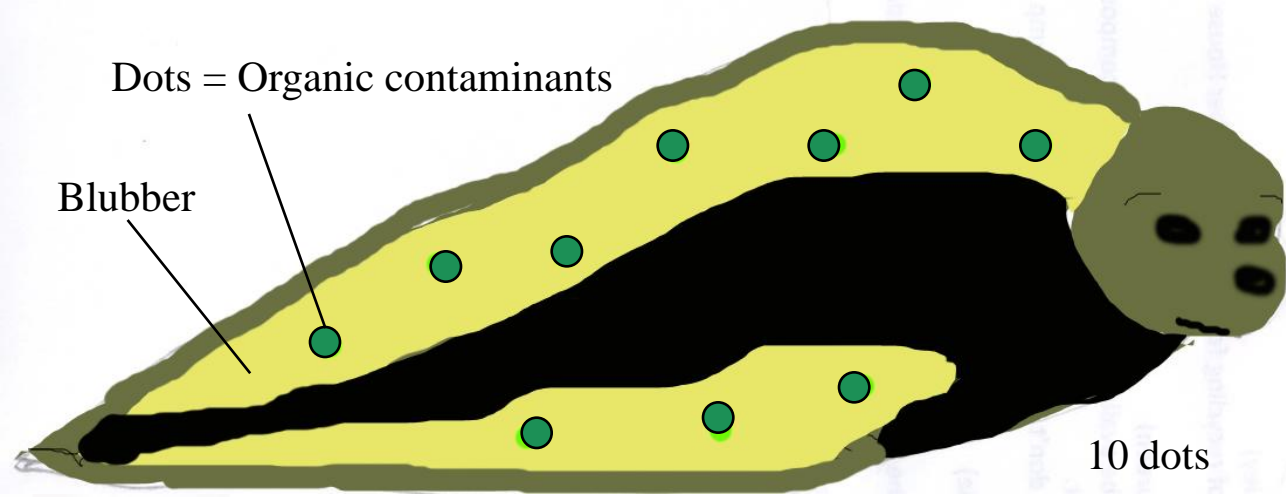
10 dots

10 dots

10 dots

High contaminant concentration in blubber

“Bioconcentration”





To be continued....

- The diminishing blubber thickness of the seals appears to be contributing to the rising trends of some contaminants
- When data was adjusted for blubber thickness, trends disappeared.
- Next up: looking at environmental conditions

