

Great Lakes Coastal Wetlands Consortium

# Snapping turtle eggs: Excellent Contaminant Indicators

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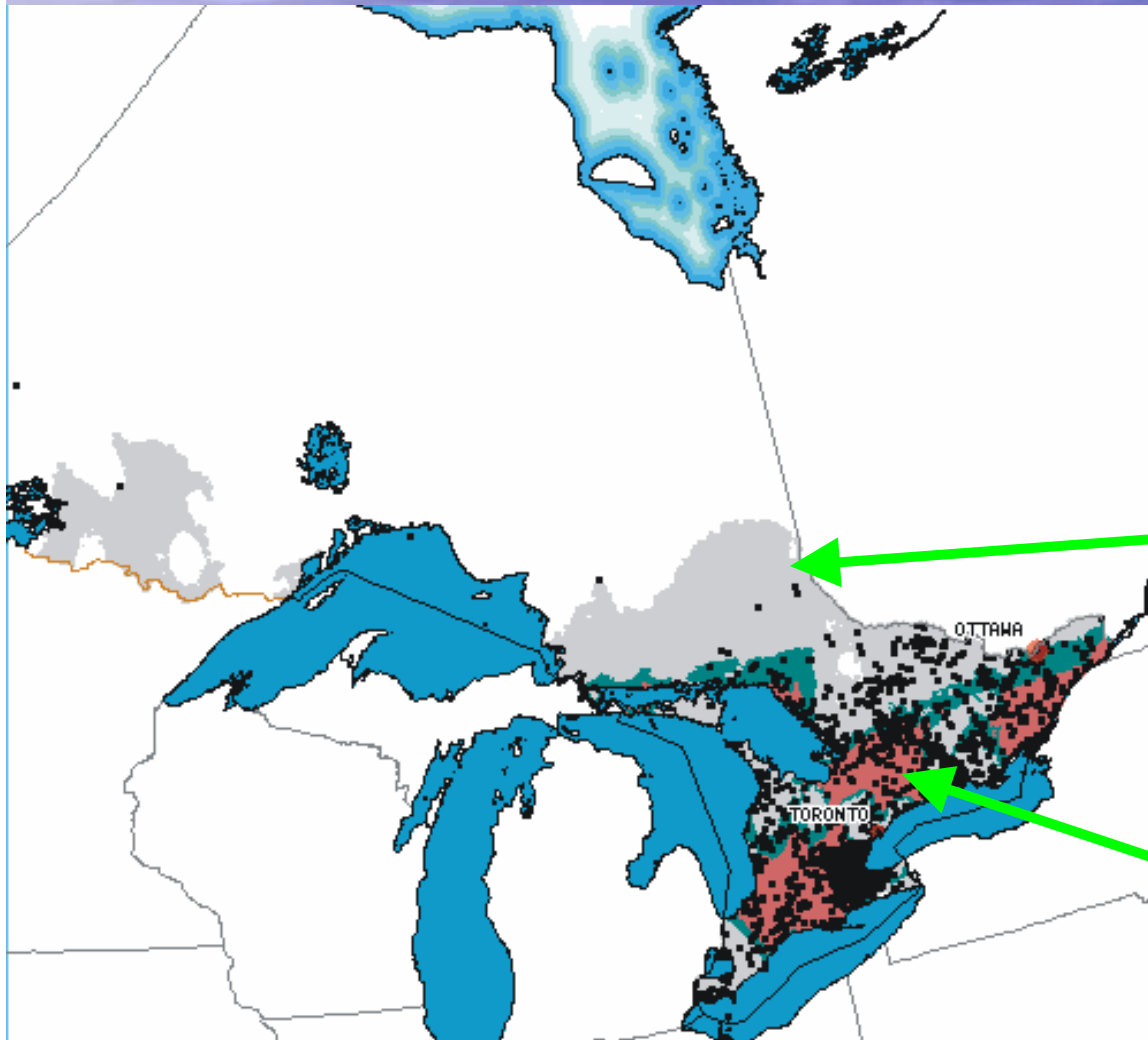
Canadian Wildlife Service

Environment Canada

# Requirements of Indicator Species

- Indicates local contamination
  - Restricted area of exposure
- Sensitive enough to reflect sources
  - Various body tissues should reflect exposure
- Accurately reflect spatial and temporal changes in contaminant levels
- Able to identify trends at both small and large scales

# Snapping turtle range distribution



US range

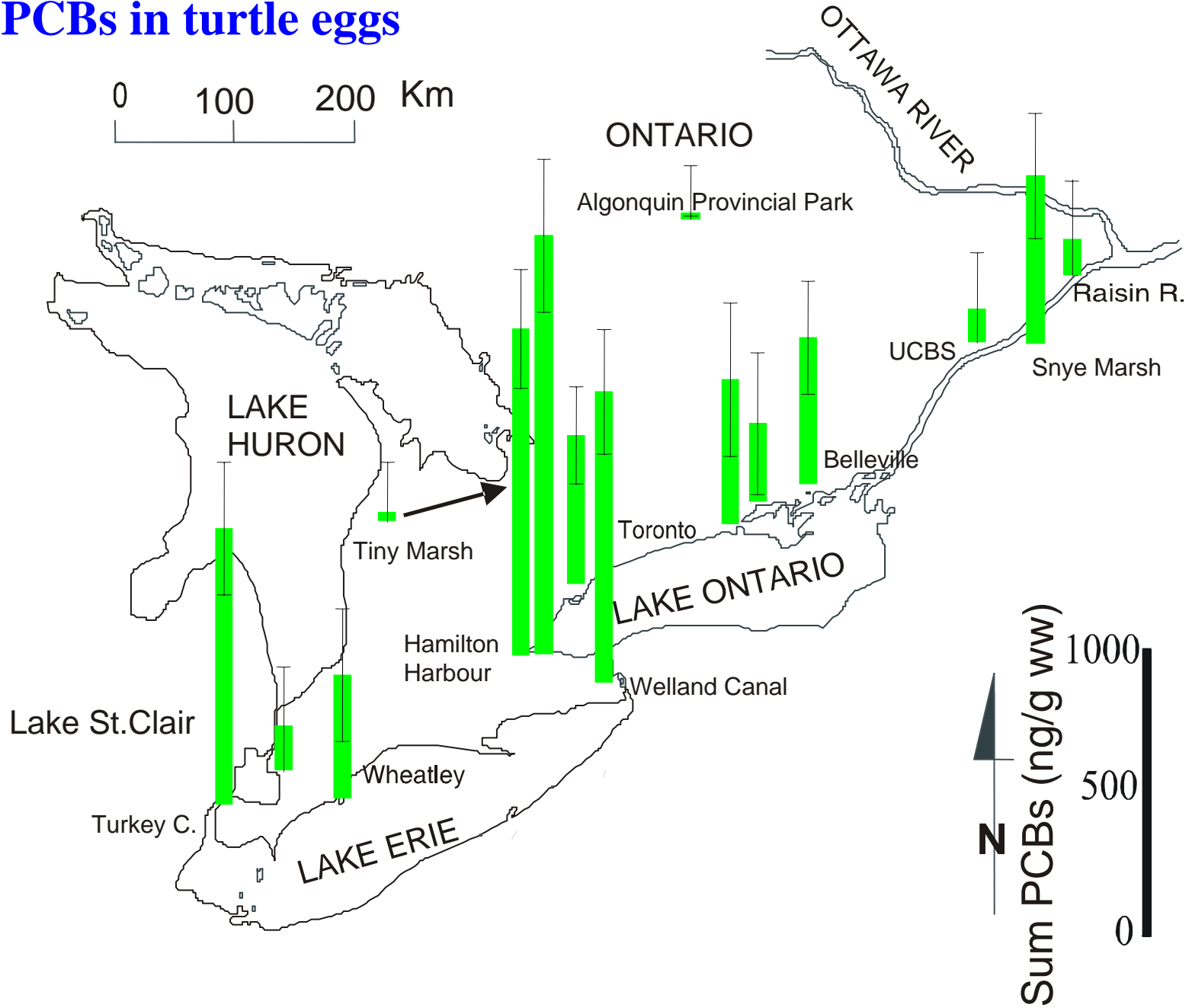


Range

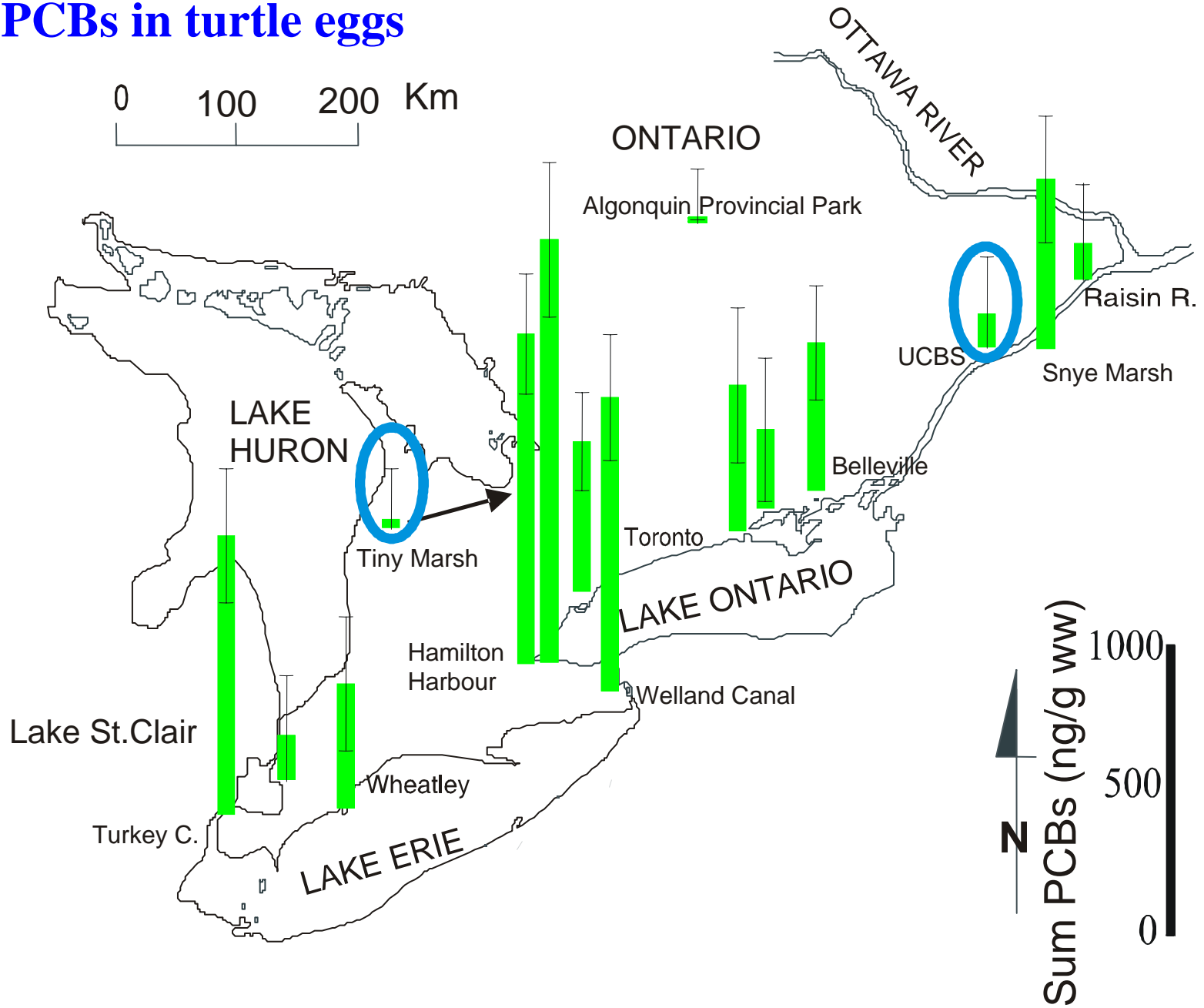
Core areas



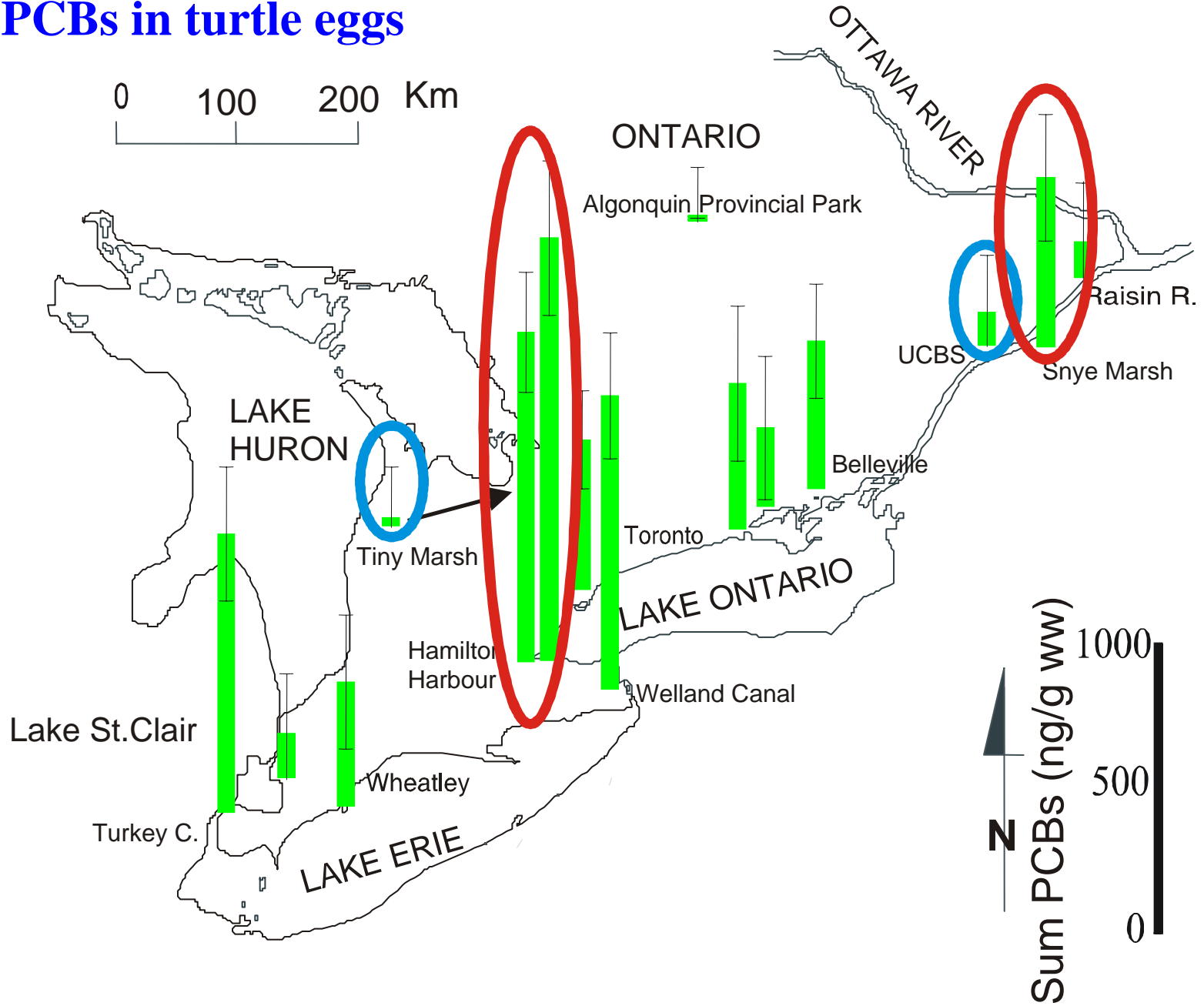
# PCBs in turtle eggs



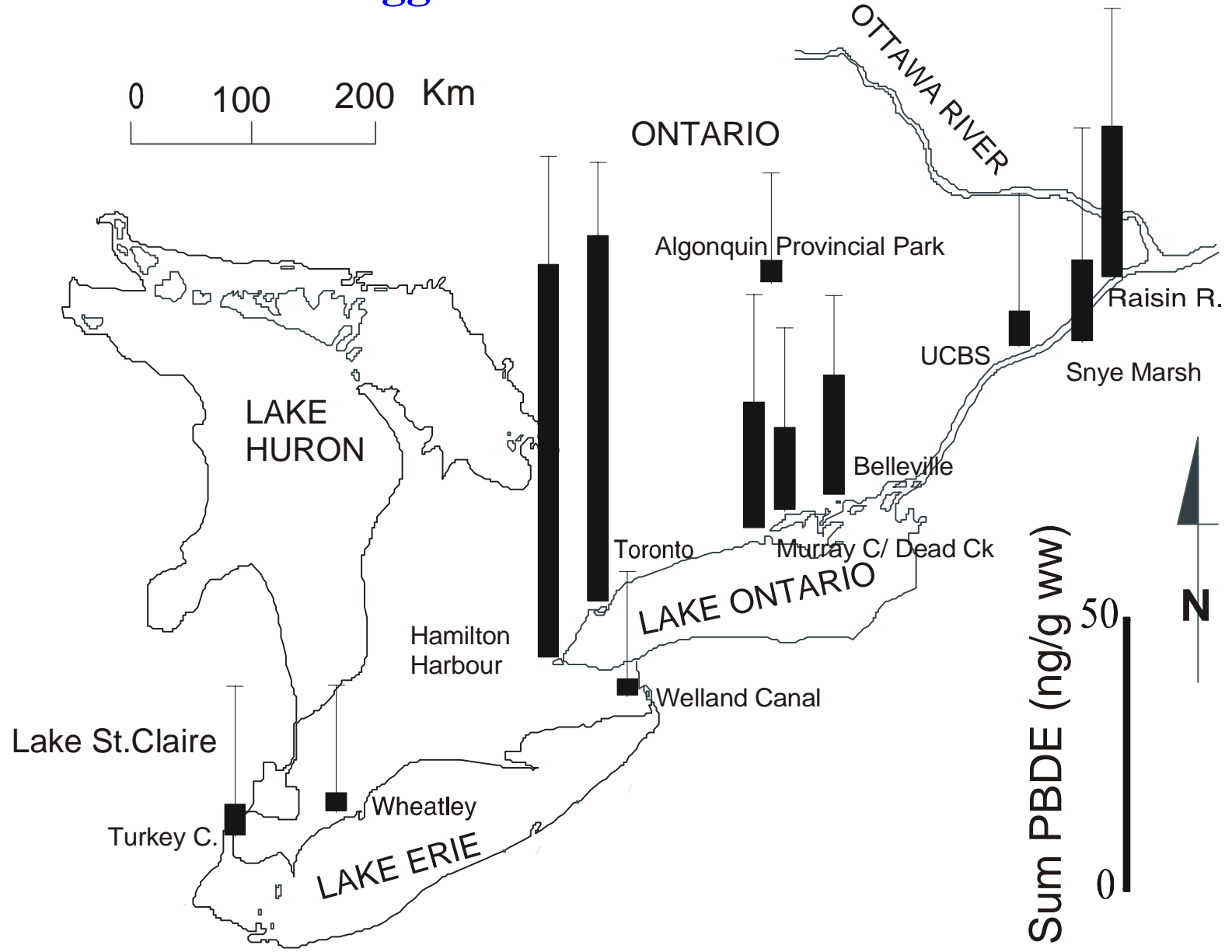
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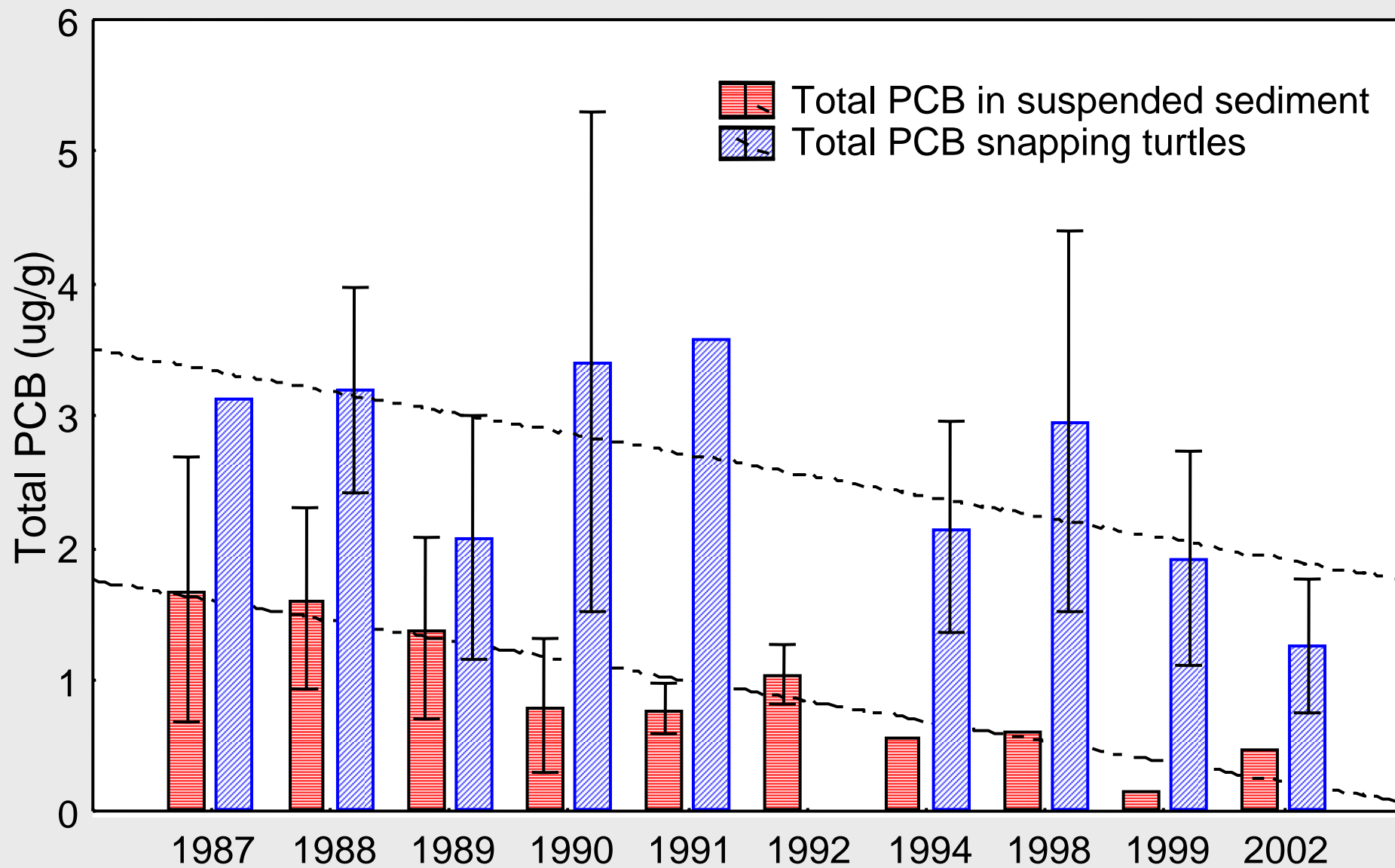
# PCBs in turtle eggs



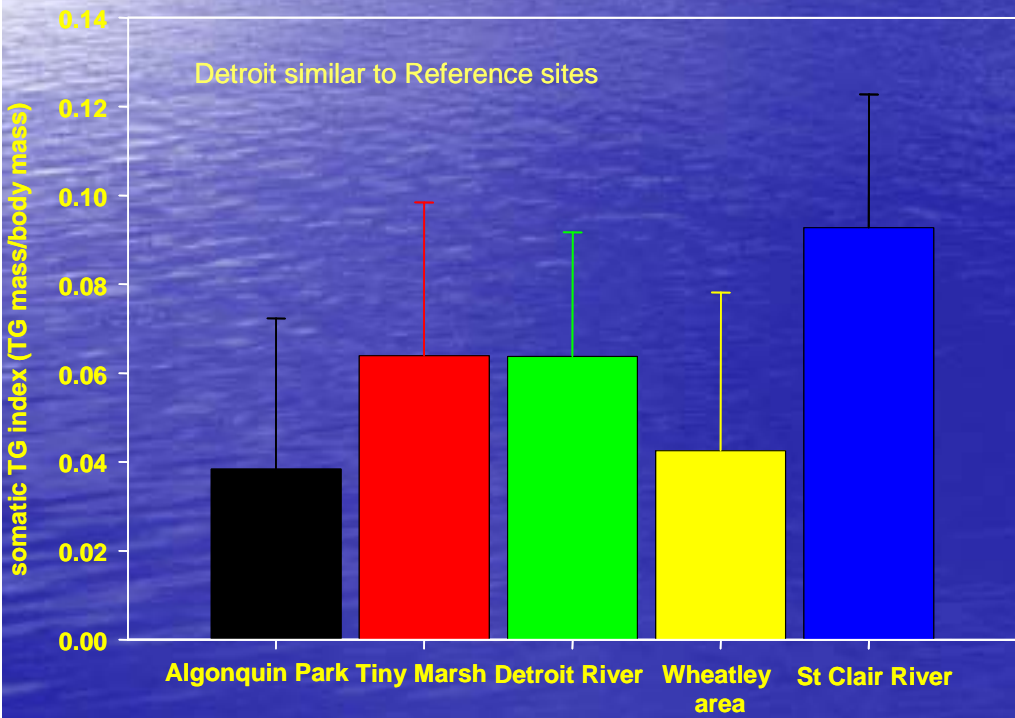
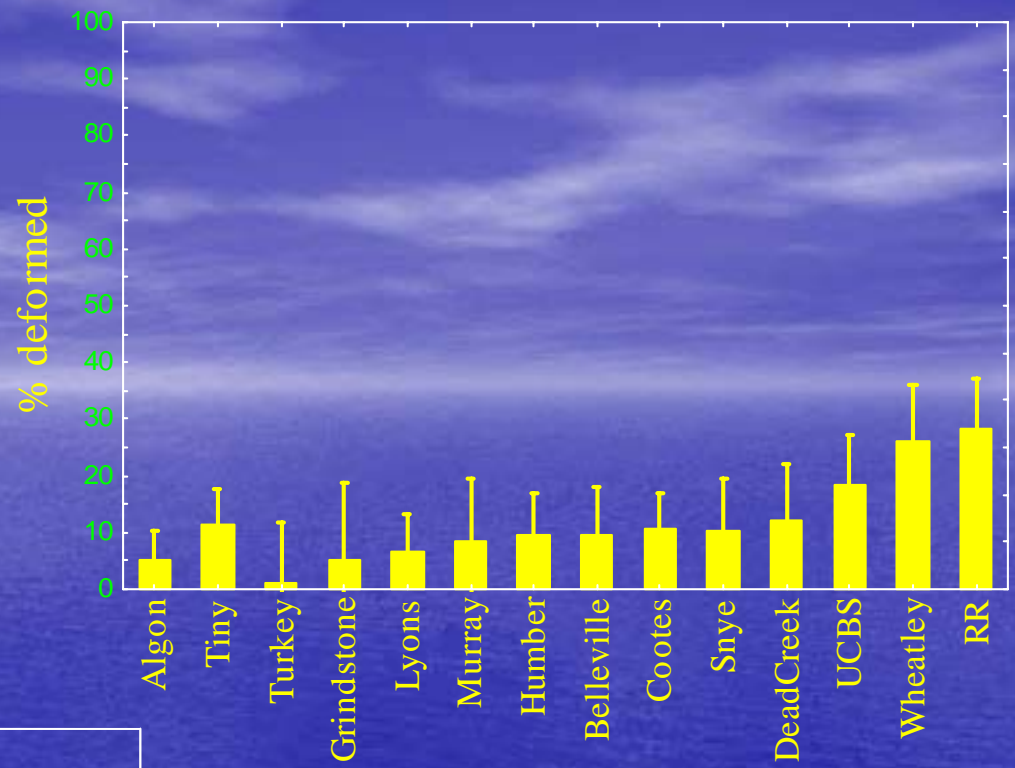
# PBDEs in turtle eggs



# Temporal Trend in Total PCB Concentrations in Snapping Turtles and Suspended Sediment from Hamilton Harbour



# Monitoring health of hatchlings



Health of turtles assessed throughout GLs Areas of Concern

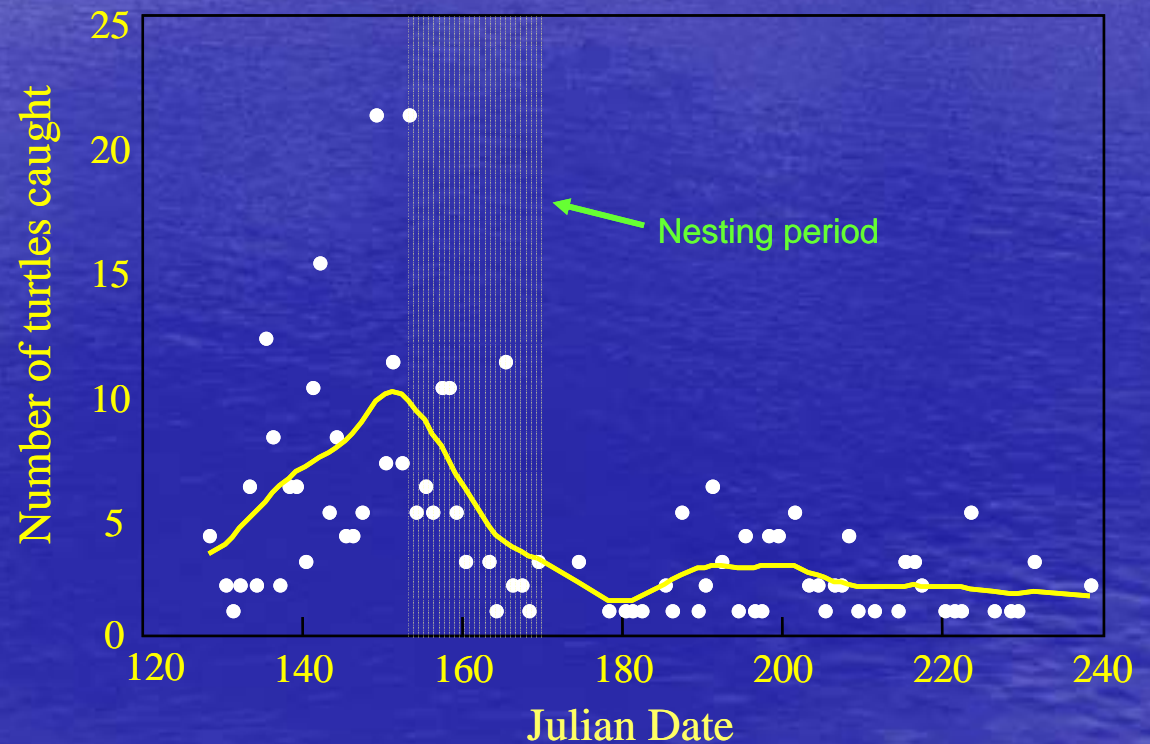
# Sampling periods for snapping turtles

- **Eggs**
  - ~ 2 to 3 weeks, early to late June

## **Plasma (adults)**

Early May to  
early September  
in northern range

Can sample for  
much longer in  
more southern  
latitudes



# Compounds measured in turtle eggs (or plasma)

- POPs
  - PCBs
  - PBDEs (current use flame retardants)
  - OC pesticides (DDT, etc)
- Heavy metals
  - Hg, MeHg, etc.
- Many others
  - Terphenyls, PFOS, PAHs, etc



# Cost per sample of contaminant analysis

- OC pesticides and PCBs
  - ~ \$350 (Can), \$300 (USD)
- OC pesticides, PCBs and PBDEs
  - ~ \$500 (Can), \$425 (USD)
- Hg
  - ~ \$30 (Can), \$25 (USD)
  - MeHg ~\$60 (Can), \$50 (USD)

# Sampling Design

- Often take up to 10 samples per site for contaminant analysis for statistical purposes
- But, can pool samples into a single sample
  - Reduced cost
  - Sufficient for temporal trends
  - Reduced ability for statistical spatial comparisons

# Snapping Turtles as Indicator Species for Contaminants

- Excellent indicators of local contamination
  - As indicators of contaminant exposure
  - As monitors of environmental health
- Accurately reflect spatial and temporal changes in contaminant levels
- Easy to collect egg samples

