Arctic Wildlife Observatories Linking Vulnerable EcoSystems (ArcticWOLVES)  
A study of the impact of climate change on tundra wildlife

Gilles Gauthier and Dominique Berteaux

Overview
- ArcticWOLVES is an international initiative
- The project will build a network of circumpolar wildlife observatories in order to assess the current state of arctic terrestrial food webs over a large geographical range
- Major aims:
  - To determine the relative importance of bottom-up (resources) and top-down (predators) forces in structuring arctic food webs
  - To examine how climate affects these trophic linkages and may impact terrestrial animal biodiversity
- The project will also provide baseline information to evaluate current and future population trends for several species

Scope of the project
- The project is a Canadian-lead initiative
- It currently involves more than 40 researchers from 9 countries:
  - Canada, USA, Norway, Sweden, Denmark, Netherlands, Finland, UK and Russia
  - Over 12 field sites in the circumpolar world (6 in Canada)
- In Canada:
  - 13 principal investigators
  - Over 20 scientific and northern collaborators
  - More than a dozen graduate students and post-doctoral researchers

Investigators in Canada
- Gilles Gauthier  Université Laval (leader)
- Dominique Berteaux  Université du Québec à Rimouski (co-leader)
- Joël Béty  Université du Québec à Rimouski
- Charles Krebs  University of British Columbia
- Douglas Morris  Lakehead University
- Robert Jefferies  University of Toronto
- Donald Reid  Wildlife Conservation Society of Canada
- Kenneth Abraham  Ontario Ministry of Natural Resources
- Esther Levesque  Université du Québec à Trois-Rivières
- Joseé Lefebvre  Canadian Wildlife Service
- Guy Morrison  Canadian Wildlife Service
- Suzanne Carrière  Government of the Northwest Territories
- Robert Rockwell  American Museum of Natural History

Primary study sites in Canada
- Herschel Island
- Bylot Island
- Cape Churchill
- First ArcticWOLVES meeting, Quebec City, 13-15 April 2007

To learn more about the project, visit:  www.cen.ulaval.ca/arcticwolves/

Originality of the project
- Inclusion of a large array of key wildlife species (e.g. geese, shorebirds, avian predators, lemmings, foxes, weasels)
- Focus on INTERACTIONS among these species
  - Predator-prey
  - Herbivore-plant
- Spatial replicates over a large latitudinal and longitudinal gradient
- Use of standard protocols across all sites

Management of the project
- The project is run by a management committee composed of:
  - 6 researchers (1 per field site)
  - 3 representatives from communities (Pond Inlet, Aklavik and Churchill)
- Regular meetings and workshops in northern communities
- Extensive interactions with northern agencies managing wildlife
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Theme 1: Trophic dynamics of food webs
- A dominant view is that resource abundance controls Arctic terrestrial food webs
- An alternative hypothesis is that top-down processes driven by predators are the primary forces structuring arctic communities
- Response to climate change will differ according to how food webs are structured

Approach 1
- Intensive studies manipulations on key species
  - Grazing impact
  - Habitat use
  - Functional response
  - Demography
  - Movements

Approach 2
- Extensive monitoring (all species)
  - Primary production
  - Extensive interactions with northern agencies managing wildlife
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Theme 2: Climate change and biodiversity
- Study of the impacts of climate change on terrestrial animal biodiversity
  - Measure the abundance, distribution, and phenology of reproduction of several wildlife species to build a spatially-explicit database
  - Assess recent changes in wildlife abundance and use by northern people in relation to climatic change
  - Conduct field experiments to measure the effects of key climatic events on herbivores
  - Combine western science with traditional knowledge

Funding and supporting agencies