# Can we adapt to climate change in the Canadian Arctic?

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**And**

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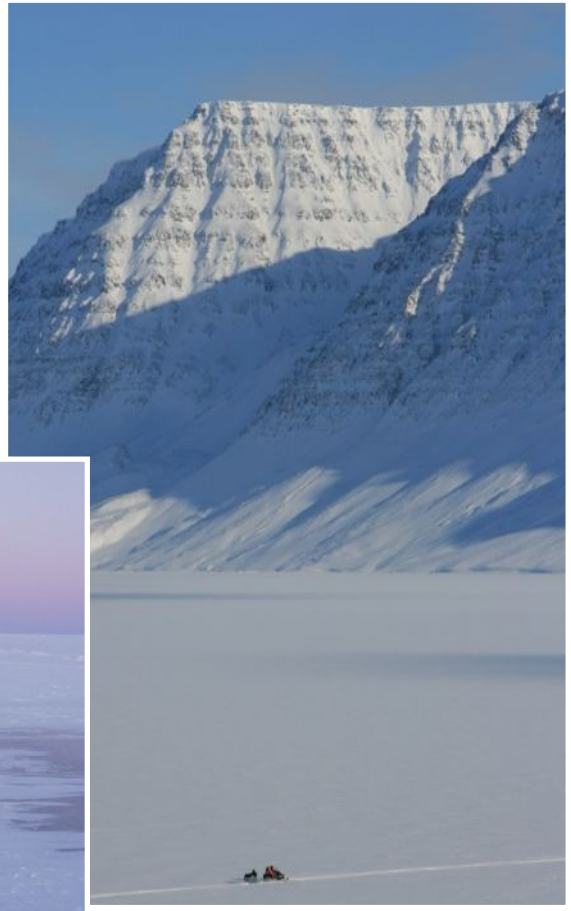
# Canada the Frontline of Arctic Change

- Temperature
- Sea ice
- Coastal erosion
- Animals
- <u>ALL</u> scenarios predict accelerated change

# Implications

- Human systems
  - Negative
  - Benefits too



(Lemmen et al., 2008; Furgal, 2008; Prowse et al., 2009; Ford et al., 2010)

# How do we address these risks?

- Mitigation
- Adaptation

# Can we adapt?

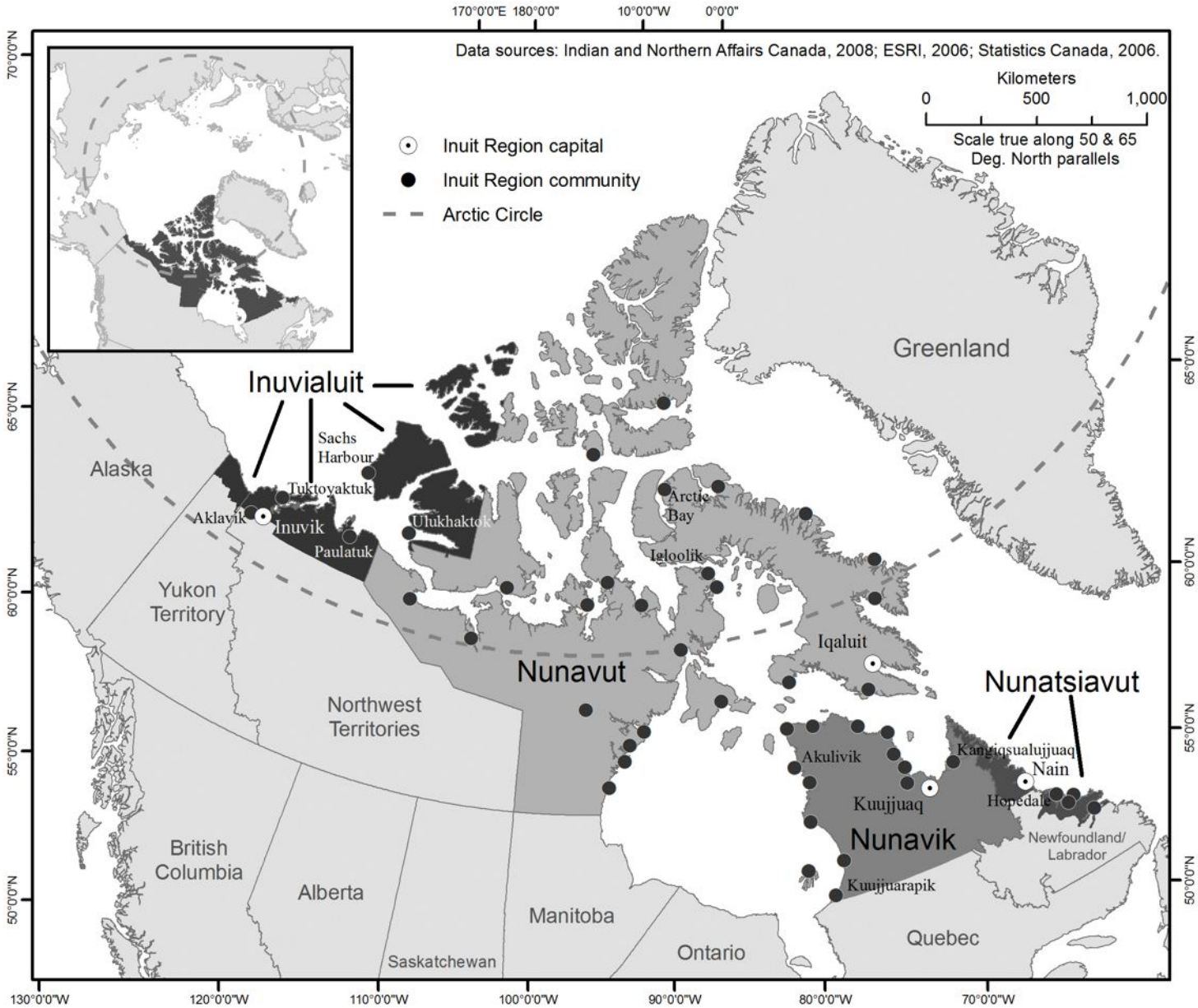
- **Need to understand vulnerability**
  - Can determinants be addressed?
- **I am interested in this question for Canada's Inuit population**
  - Majority of vuln. research = individual case studies
  - Only tell us if we can adapt at a specific location
  - What about the bigger picture?
    - Can we generalize?

# Meta-analysis

- **Meta-analysis involve multiple case studies to identify system wide or underlying determinants of vulnerability**
  - Utilized in deforestation literature
  - Increasingly in CC
- **PROJECT AIM: meta-analysis to synthesize findings from vulnerability research to identify key determinants and trends for Canadian Inuit population**

# Inuit vulnerability meta-analysis

- **ArcticNet & IPY research**
  - 15 case study communities



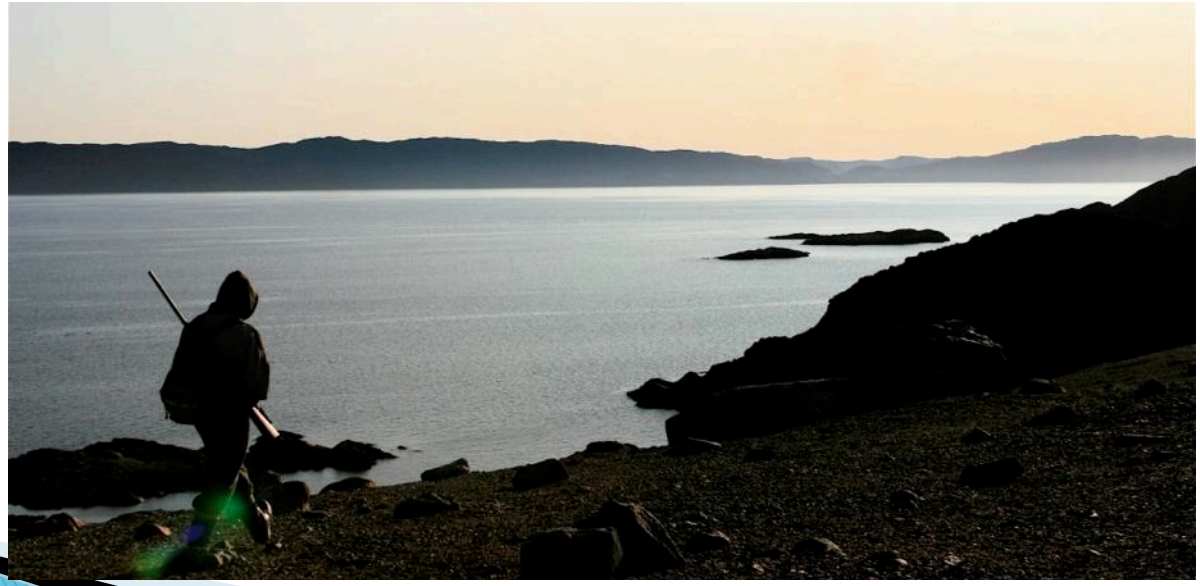

Ford et al., (2010)

# Inuit vulnerability meta-analysis

- **ArcticNet & IPY research**
  - 15 case study communities
  - ~500 in-depth interviews
  - Modeling of future risks
- **Reanalyze the data:**
  - What makes Inuit communities sensitive to climate change and affects their ability to adapt, both today and in the future

# Inuit vulnerability meta-analysis

- **Can we adapt?**
  - Subsistence harvesting
  - Health
  - Community viability



# Can we adapt? Subsistence sector

- **Importance of subsistence economy to Inuit**
- **Sensitive to CC effects**
  - Constrained access
  - Constrained availability
  - Increased danger
- **Documented adaptations**
  - New transportation routes
  - New technology
  - Altered hunting behavior
- **Long history of Inuit adaptation**
  - Resource use flexibility
  - Traditional knowledge

Igloolik = 2x distance

Boat = $20k
ATV = $10k

Time availability / Danger

Quota systems, permanent settlements

Erosion of land skills

# Non-climatic stressors

- **Not climate change *per se***
  - Non-climatic determinants ↑ sensitivity and ↓ adaptive capacity
- **<u>Barriers</u> to adaptation, not limits**
  - Harvester support
  - Co-management
  - Land skills training
  - Emergency response
- **All have benefits regardless of CC**

# Climatic stressors

- **Non-climatic stressors dominate today**
- **Important in future**
  - Dangers can be adapted to
  - Access issues can be adapted to
- **BUT animal availability:**
  - Animal population #s and health
    - Polar bears (Derocher et al., 2004; Stirling et al., 2006; McLoughlin et al., 2008)
    - **Seals** (Burek et al., 2008; Moore and Huntington, 2008)
    - **Caribou** (Miller and Gunn, 2003; Tews et al., 2007)
    - Muskox (Tews et al., 2007)
    - Narwhales (Laidre et al., 2005)
  - Main issue = can #s support hunting?
  - If multiple species affected = multiplied impacts

# Can we adapt? Inuit health

- **WHO: "Health is a state of complete physical, mental and social well-being"**
- **Inuit health sensitive to CC**
  - Imp. of traditional foods
  - Cultural ties to the land
  - Inherent danger of Arctic travel
  - Burden of ill-health

# Food security

- **Constrained food security documented**
  - Access to hunting areas
  - Specific temporal characteristics
  - **BUT** acute for at risk
    - Rely on sharing networks
    - Limited household income

# Food security

- **Documented adaptations**
  - Food sharing
  - Food switching to store foods
  - Use of food bank / freezer
- **Long history of Inuit adaptation**
  - Social networks
  - Resource use flexibility

Only when availability

Cost, preference, health

Only when open

Weakening of social networks

Decline in camps

# Climatic & Non-climatic stressors

- **Not climate change *per se***
- **Barriers are <u>significant</u>**
  - High rates of poverty
  - High baseline food insecurity
  - Sharing networks
- **Intervention possible**
  - Community hunters
  - Outpost camps
- **Climatic stressors potential to be important**

# Conclusion

- **Can we adapt to climate change in the Canadian Arctic?**
- **Analysis of 2 sectors:**
- **YES**
  - Adaptation is taking place
  - Adaptation interventions are possible
  - Interventions needed to target non-climatic determinants
- **BUT**
  - Some adaptations difficult (e.g poverty alleviation)
  - Nature of climate change (animals)


Ford, J., Pearce, T., Furgal, C. Duerden F., Smit, B (2010). Climate change policy responses for Canada's Inuit population: The importance of and opportunities for adaptation. *Global Environmental Change,* 20, 177-191,