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
- **ALL** 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
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

- **Barriers** 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 **significant**
  - 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,