

Sub-Theme 4

**CHANGE:
Adaptation, Vulnerability
&
Resilience
in
Coupled Human-Environment
Systems**

Resilience & Vulnerability

- Resilience

Capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks.

- Vulnerability

The characteristics of a person or a group in terms of their capacity to anticipate, cope with, resist, and recover from the impacts of natural hazard.

Coupled Human-Environment Systems

- Subject to Cumulative & Rapid Change
- Vulnerable and Adapting
- Resilient
- At a Variety of Scales
- Agency

Drivers, Scales, & Perceptions

- Internal & External Drivers
 - Defined in Cooperation with Local Residents
- Multiple Levels & Scales
 - Community/Local
 - Regional/Ecosystems
 - National
- Perceptions of Changes
- Adaptations to Changes
- Mechanisms of Resilience & Vulnerability

Examples of Rapid Change

(Positive or Negative)

- Variation in Fish Stocks
- Oil or Gas Development
- Transportation (Air, Land, & Sea)
- Migration
- Laws and Regulations
- Governance
- Land Tenure
- Technologies

Examples of Drivers

(at different scales)

- Global Scale
 - Climate Change
 - Pollution
 - Globalization
- National Scale
 - National Resource Management
 - Environmental / Developmental Policies
- Local Scale
 - Co-Management
 - Land Use
 - Cultural Traditions & Knowledge

Issues to Consider

- Time Scales
 - Context Dependent
 - Depth (How Far Back?)
- Retrospective Analysis
 - Recall Interviews
- Cycles/Trends
 - Natural Resources
 - Climate

A Case Study Approach

- Pan-Arctic, Cross Cultural
 - Greenland, Russia, Barents Region, Canada, Alaska
 - Indigenous People & Settlers
 - Urban & Rural Communities
 - Non-Arctic Comparables Acceptable
- Relevant Changes
 - Defined for Each Case
 - May Vary Within and Across the Arctic Region
- Multi-Disciplinary Teams
 - Anthropology, Archeology, Economics, Political Science...
 - Ecology, Oceanography, Climatology, Meteorology...
- Include Education, Outreach, & Communications

Data Types

(Social Science Examples)

- Participant Observation, Open-Ended Interviews, Structured Interviews
- Archival Records, Government Records, Statistics, Demographics
- Archeological Data
- ...

Data Types

(Natural Science Examples)

- Trends in Renewable Resource Stocks
- Non-Renewable Resource Availability
- Sea Ice Conditions, Climate Records, Ocean Currents, Thermohaline Circulation, NAOs, AOS
- Permafrost Dynamics
- ...