Climate Change Adaptation and Governance Responses in BC

Deborah Harford
Executive Director
ACT (Adaptation to Climate Change Team)
SFU
BC Climate Change Impacts: Examples

**Biodiversity:**
- Mountain pine beetle
- Fish: high temps/low water levels
- Tree species shifting ranges
- Health threats, e.g. Cryptococcus gattii

**Extreme weather:**
- Flooding
- Wildfires, heat extremes & drought
- Storms and storm surge
- Water quality, quantity and temperature
- Food supply/crop impacts
- Infrastructure damage/power outages

**Industries affected:**
- Insurance (risk price signal distortion/flooding)
- Mining/oil & gas
- Real estate/development
- Farming
- Forestry
- Utilities
- Tourism
Complicating Factors and Known Needs

**Complicating Factors:**
- Loss of stationarity
- Tipping points?
- Connectedness of events/effects
- Absence of data, e.g. groundwater mapping and water monitoring
- Wholesale dismantling of environmental/science resources in Canada

**Known Needs:**
- Enhanced water storage to offset low summer flows/loss of cryogenic storage
- Flexible approaches that allow for uncertain futures and updating
- Conservation and demand-side management of all consumption
- No regrets responses
- BC Water Act Modernization
Aspects of Vulnerability

The extent of damage from climate change depends to a great extent on **vulnerability**:

**Exposure**
- E.g. geography/energy infrastructure

**Sensitivity**
- E.g. vulnerable population groups/continuity of systems

**Adaptive capacity**
- Information
- Expertise and networks
- Fiscal capacity
- Political support
Key Adaptation Principles

ACT identifies five key principles of adaptation policy:

• Intergovernmental collaboration

• Stakeholder engagement

• Assessment of current and future risk (exposure, sensitivity, adaptive capacity)

• Acting strategically

• Mainstreaming
## Adaptation Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share loss</td>
<td>Spread losses among wider population</td>
<td>Insurance, Relief and rehabilitation programs</td>
</tr>
<tr>
<td>Modify events</td>
<td>Implement measures to control or contain hazards</td>
<td>Flood protection (dykes; levees)</td>
</tr>
<tr>
<td>Prevent effects</td>
<td>Protect people and systems from hazards</td>
<td>Land-use regulation, Warning systems</td>
</tr>
<tr>
<td>Reduce impacts</td>
<td>Build resilient infrastructure; reduce demands on infrastructure to free up capacity</td>
<td>Increase robustness, Plan for swift recovery, Water or energy conservation</td>
</tr>
<tr>
<td>Change location</td>
<td>Relocate people and property from hazard-prone areas</td>
<td>Incentives to relocate, Public acquisition of exposed properties</td>
</tr>
<tr>
<td>Research</td>
<td>Invest in research to identify new adaptation methods</td>
<td>Pilot projects, Engineering research for code development</td>
</tr>
<tr>
<td>Education</td>
<td>Information and public education campaigns to encourage behavioural change</td>
<td>Website; pamphlets, Seminars; workshops</td>
</tr>
</tbody>
</table>

Source: Climate Change and Extreme Weather: Designing Adaptation Policy, Dan Henstra and Gordon McBean
First Nations Climate Change Adaptation

**Challenges – examples:**
- Problems finding traditional plants
- Changing ranges of country food
- Water quality – boil water advisories
- TK not respected by western science
- Not included as partners in decisions
- Lacking resources in face of impacts

**Responses – examples:**
- Hupacasath: fish management
- Changing practices
- Working to improve representation
First Nations Climate Change Adaptation

Ktunaxa CRT statement released July 2012:

- Salmon used to provide an important part of our diet. Efforts to restore salmon need to be linked to the renewal of the CRT.
- Management of the Columbia River system needs to be improved to better protect cultural heritage resources.
- Libby Dam directly affects two Ktunaxa communities: the Tobacco Plains Indian Band and the Lower Kootenay Indian Band and should be brought within CRT co-management arrangements.
- The Columbia River system needs to be managed to protect ecosystems as well as provide power and flood control benefits.
- The Ktunaxa Nation seeks to share in the economic benefits, which currently flow to the government of BC (e.g. downstream power benefits).
Building capacity:
- Pacific Institute for Climate Solutions (PICS)
- Pacific Climate Impacts Consortium (PCIC)

Mainstreaming adaptation into programs and policies:
- Adaptation Strategy (knowledge, mainstreaming, sectoral initiatives)
  - BC Agriculture Climate Action Initiative
- Living Water Smart
- Water Act Modernization?

Working with other governments:
- The thirteen provincial/territorial Premiers working through the Council of the Federation to prepare for climate change, with an emphasis on forests and water.

Federal funding:
- NRCan RAC funding and 2007 National Assessment
- INAC/AANDC Adaptation Fund
Municipal/Regional Adaptation Examples

**Municipal:**
- City of Vancouver: First to ratify adaptation strategy in BC
  - (power, flooding, sewer upgrades, coastal reinforcement, heat)
- City of Elkford (CBT CACCI $): OCP recognized by UNFCCC
- Delta, Richmond, North/West Vancouver: Coastal and riverine reinforcement, emergency planning
- Prince George (RAC $): Forests, flooding, transportation infrastructure

**Regional:**
- Okanagan Basin Water Board (municipal tax $ - FN issues)
- Fraser Basin Council (BC RAC host, lower Fraser mun. group, FN)
- Columbia Basin Trust (CRT/BC Hydro $, FN)
CCA Governance Challenges for BC

- New watershed-scale governance efforts
- Effective (ground)water mapping/monitoring
- Communication and education (e.g. loss of stationarity)
- Overcome endemic lack of capacity
  - Finances for adaptation (e.g. carbon tax?)
  - Compensate for lack of federal leadership/resources
  - Coordination between all four levels of government
- Mobilize profession(al)s as change agents
- Acknowledge First Nations as partners in decision-making
- Understand “social vulnerability”
Key Policy Considerations for CRT

- Healthy ecosystems play a key role in adaptation
- “Salmon forest” (new annual Salmon Festival in Invermere)
  - Climate changes accelerating? Arctic?
  - Population increasing
  - Region shifting from mining to tourism
    - Changes in flows plus energy demand
- Increased flooding/storage = loss of ag/cultural land?
- Supports aspects of proposed BC Water Act Modernization
- Must educate all of BC not just Columbia Basin
- Agreement must be “adaptable” – regular updates on CCA
For more information about ACT, our policy reports, and adaptation resources, please go to:

www.sfu.ca/act

**ACT thanks past and present partners:**
Wilburforce Foundation, Bullitt Foundation, Zurich Insurance, BC Ministry of Environment, AMEC Engineering, BC Hydro, Plutonic Power and the Real Estate Foundation of BC.