C-CIARN
Canadian Climate Impacts and Adaptation Research Network
Réseau canadien de recherche sur les impacts climatiques et l'adaptation

Adaptation to Climate Change:

An Introduction for Canadian Municipalities

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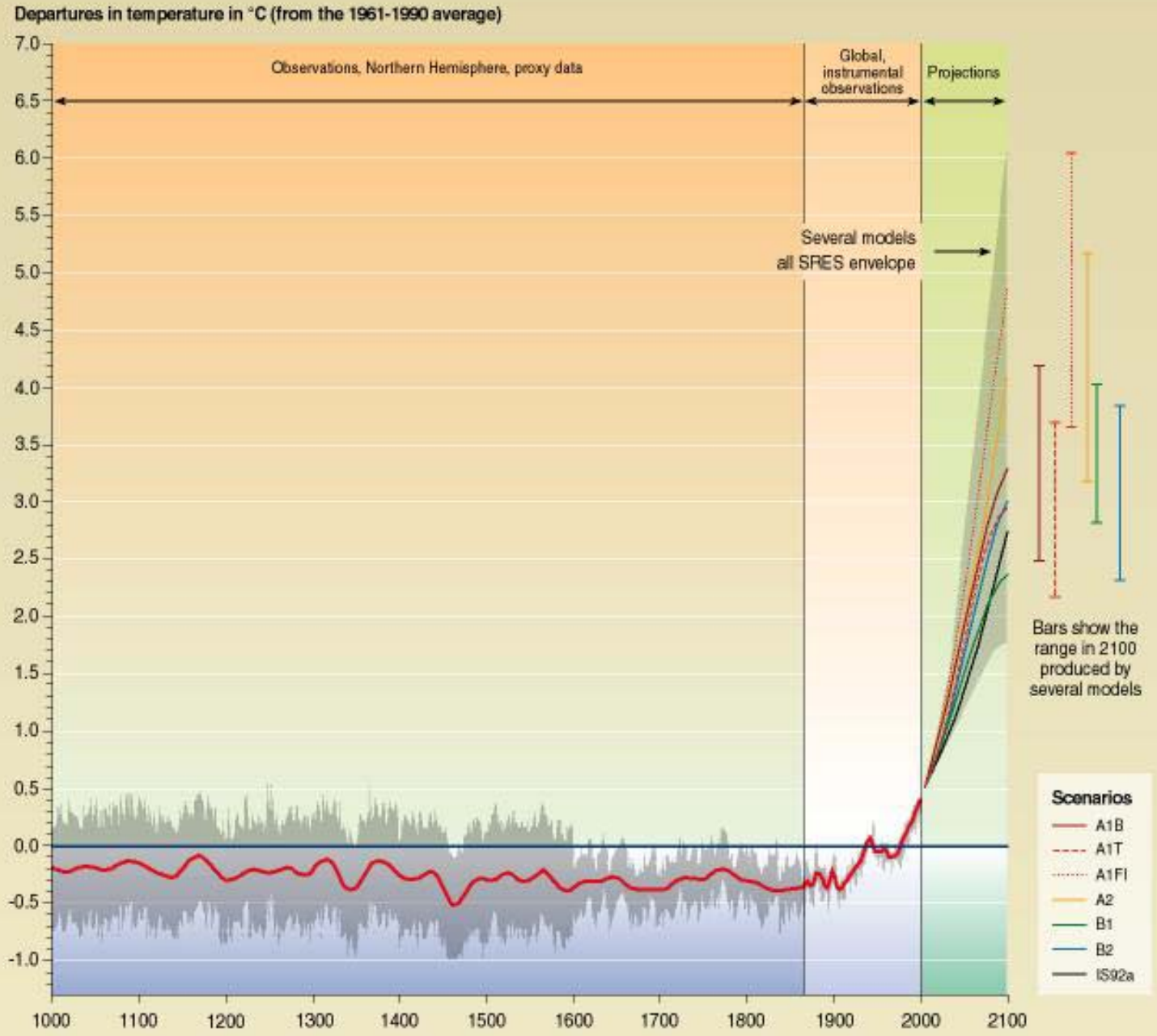
Information needed!

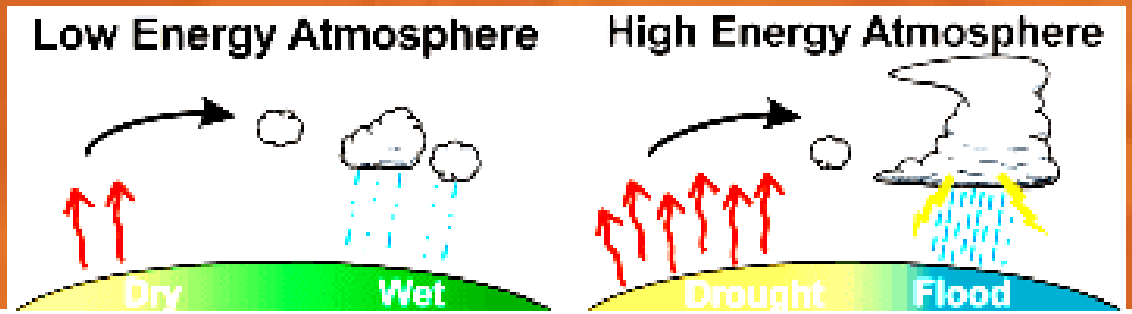
- Municipal leaders across Canada are concerned about the impacts of climate change
- Little information exists for municipalities
- Adaptation is an issue of sustainable development
- Document for commencing the adaptation process

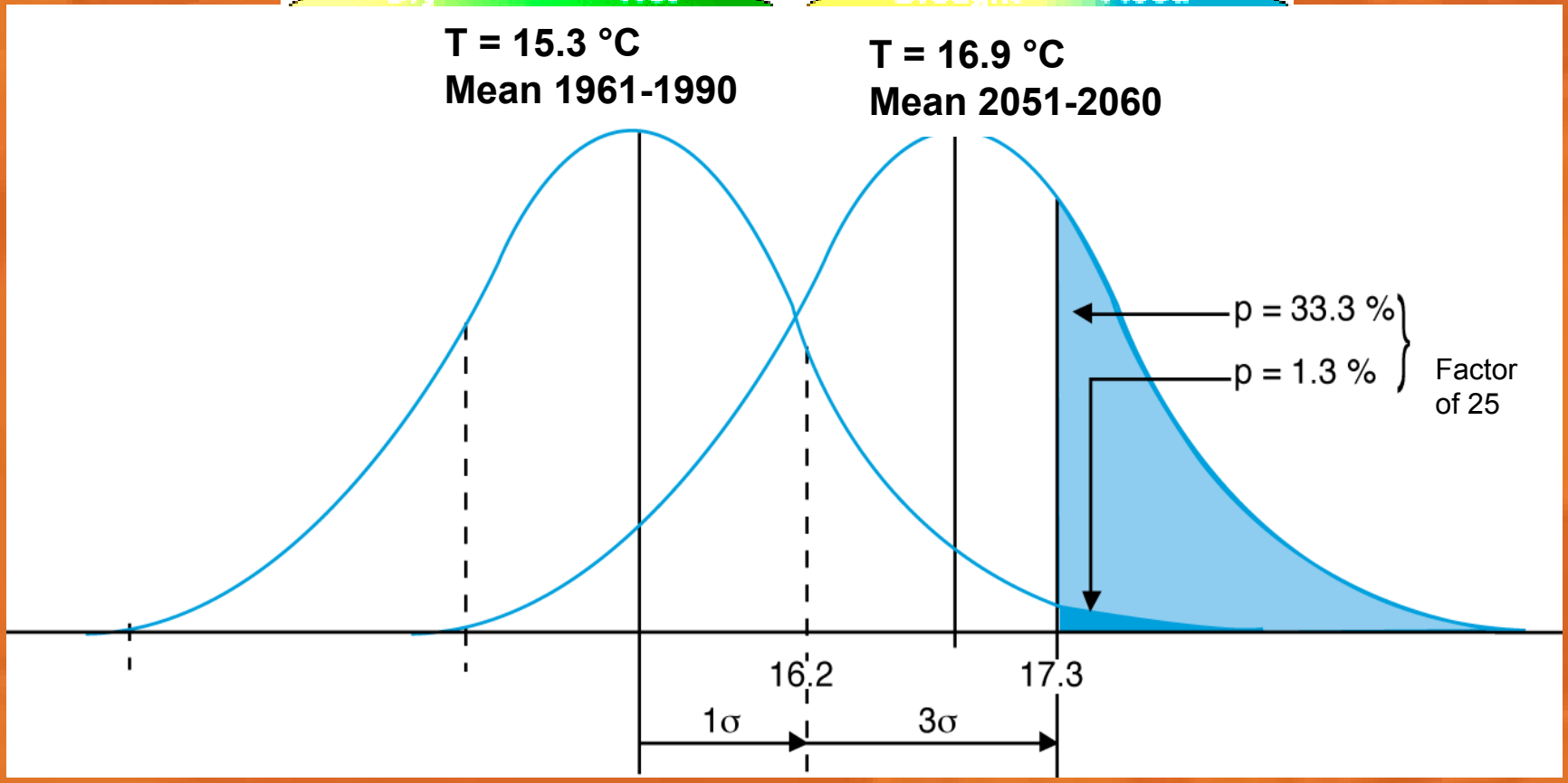
Variations of the earth's surface temperature: 1000 to 2100



IPCC, 2001

Impacts of Climate Extremes: Frequency / Intensity of Events

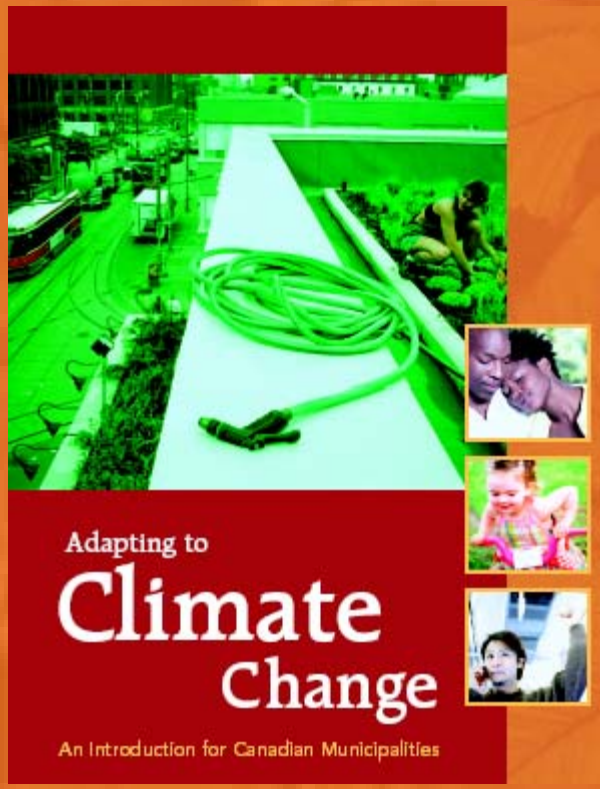




Source: Environment Canada

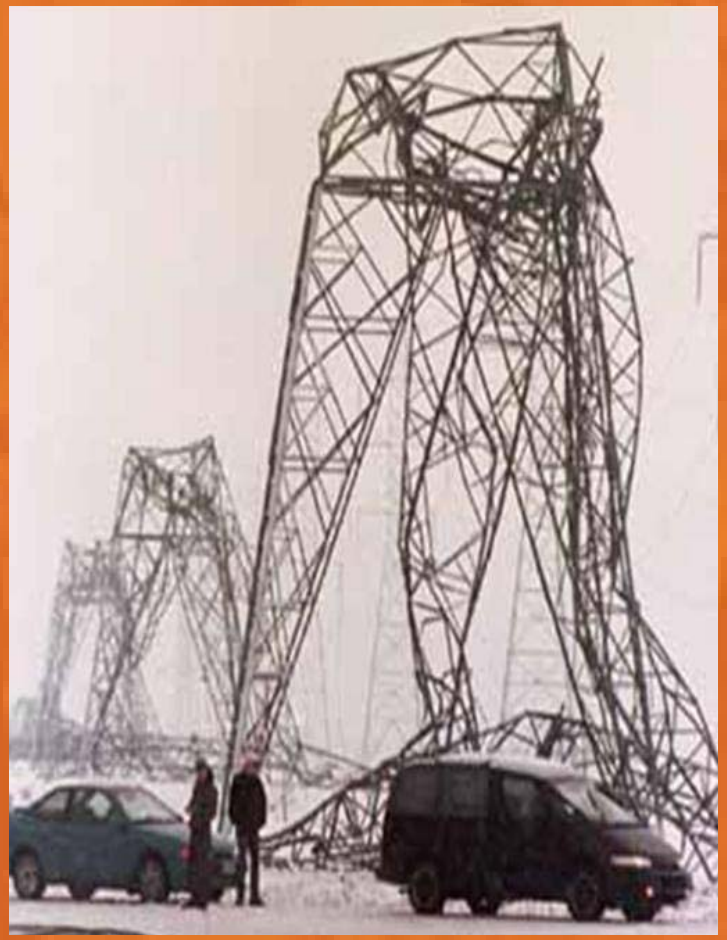
Adapting to climate change for municipalities

- Principally a tool to assist municipalities to develop a better understanding of adaptation
- Goal is to help municipalities to make better informed decisions about adaptation



Who is the Introduction intended for?

- Elected officials
- Senior staff
- Management staff
- Administration staff
- Planning staff



Objectives of Introduction

- Provide decision makers with information on climate change adaptation
- Reduce vulnerability to impacts
- Address decision making processes for adaptation
- Teach by example: showcase examples of municipal adaptation

Why municipal decision makers need to consider climate change

- Climate change is expected to bring increases in the frequency and intensity of extreme weather events (flooding, droughts and storms)
- Affect services, assets and infrastructure of communities
- Current planning and future development should incorporate climate change risks

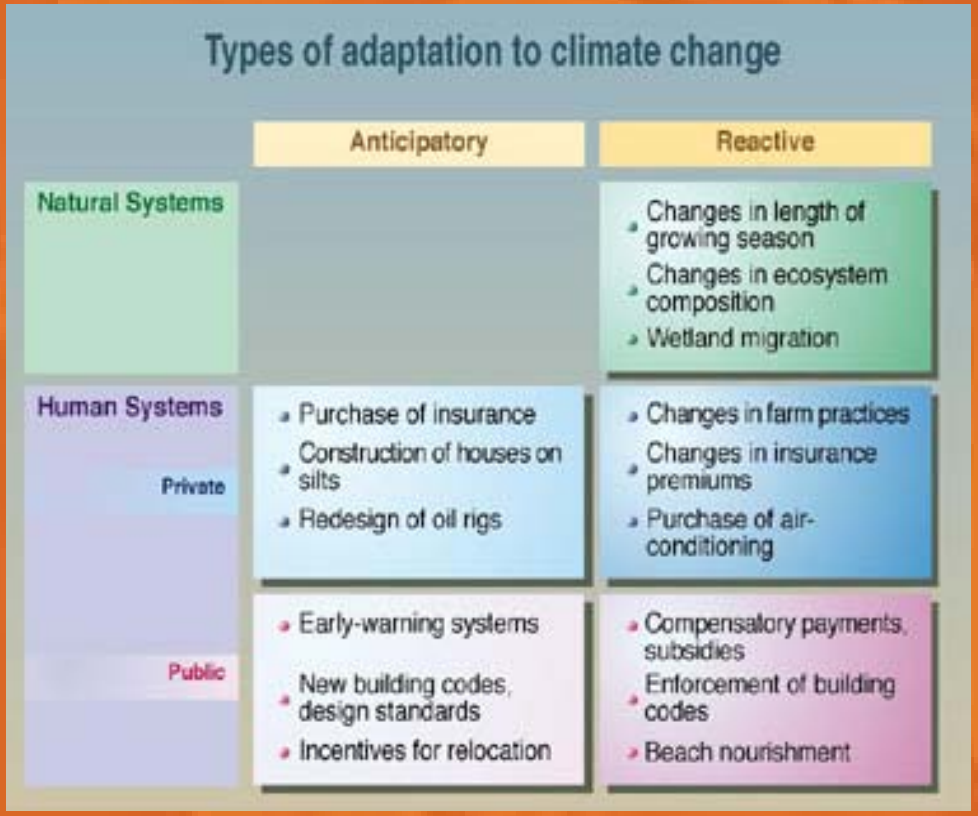
Areas of con

Infrastructure includes:
- Built systems
- Human systems
- Natural systems

- Municipalities are particula in adapting infrastructure to climate extremes and climate variability, e.g.
  - Safeguarding buildings
  - Safeguarding water supply / sanitation
  - Improving air quality / and reducing the negative effects of increasing temperatures
  - Emergency preparedness
  - Environmental protection
  - Land use-planning

Adaptation and decision making

- Climate change is one of a multiple of stressors to which municipalities are vulnerable
- Vulnerability is a dynamic concept (changes with time)
- Adaptation is part of a planning process



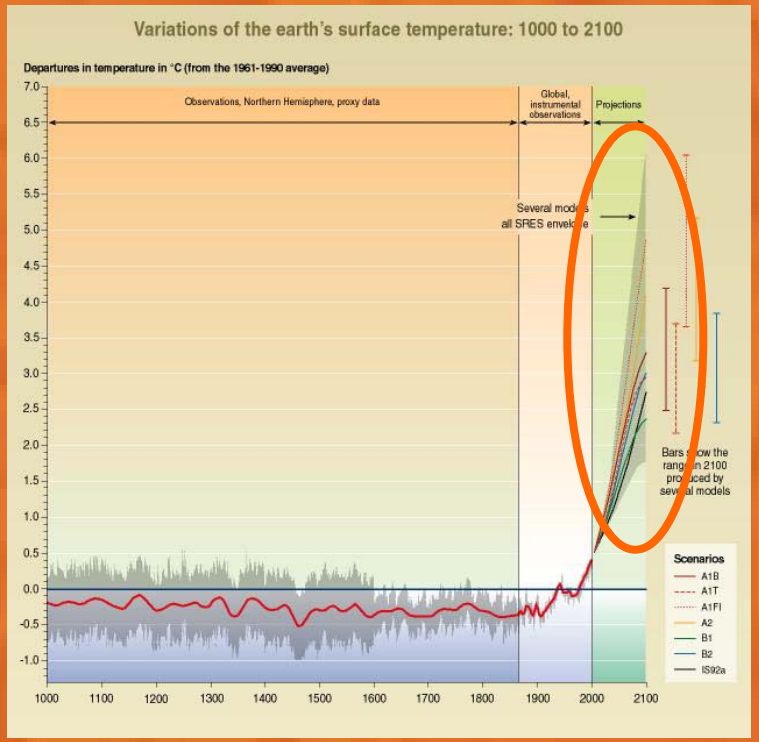
IPCC, 2001

Types of adaptation measures
e.g. for a storm surge

Category	Explanation	Example of ensuing adaptation
Business as usual	Do nothing to reduce vulnerability and absorb losses	Abandon affected structures
Prevent the loss	Adopt measures to reduce vulnerability	Engineer buildings to withstand heavier winds, precipitation, and more frequent flooding
Spread or share the loss	Spread burden of losses across different systems or populations	Purchase flood insurance
Change the activity	Stop activities that are not sustainable under the new climate, and substitute with other activities	Make family tourist beach resort an attraction facility for extreme weather watchers
Change the location	Move the activity or system	Move houses further inland, away from the coast
Enhance adaptive capacity	Enhance the resiliency of the system to improve its ability to deal with stress	Reduce non-climatic stresses, such as developing the coast, beach pollution, and shoreline erosion

Adaptation and decision making

- Different levels of certainty associated with the impacts of climate change
- One way of coping with different levels of certainty is the **no regrets/ low regrets** approach
- Determine the **adaptive capacity**

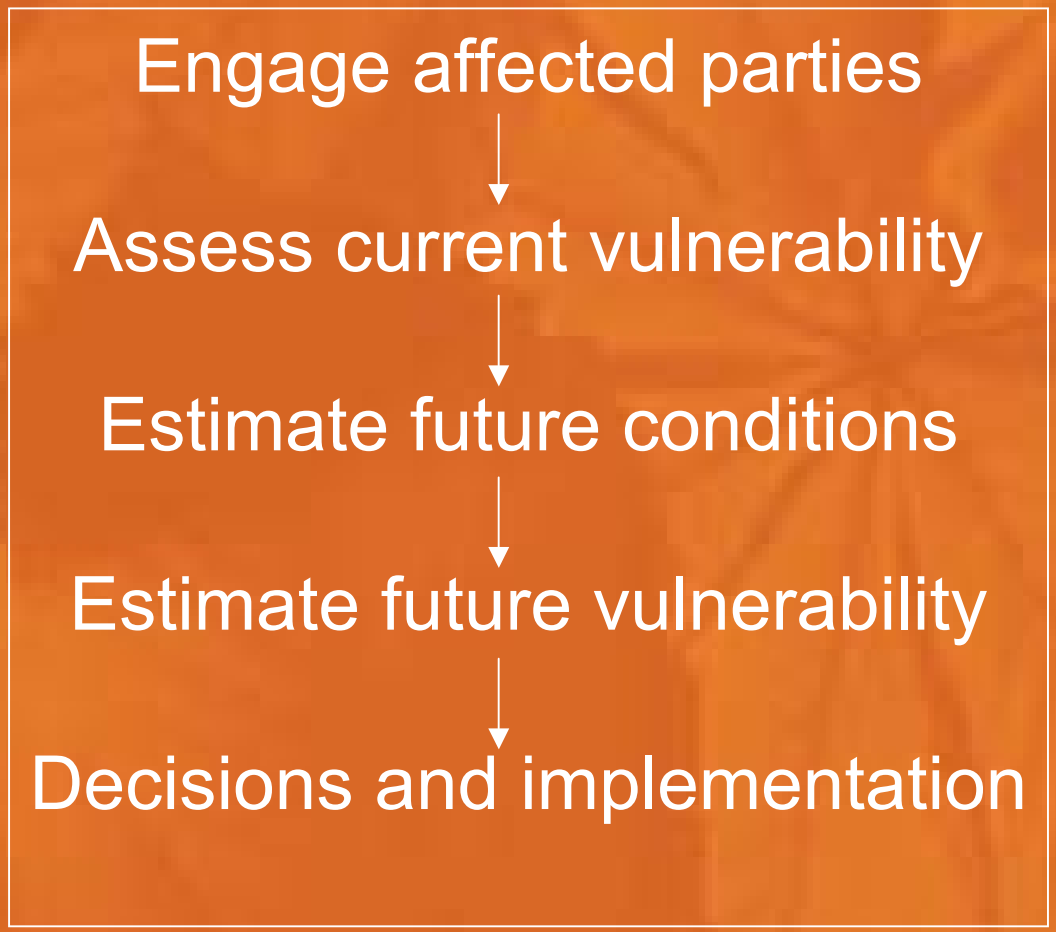


IPCC, 2001

Determining adaptive capacity

- the degree to which a municipality is able to deal with impacts of climate change
- Vulnerability of the human and physical systems can be assessed as part of risk-management

Vulnerability Assessment Approach
(example of one approach to adaptation)



Costs to adapting?

- Integrating into existing programs
  - Emergency risk management assessment
- Regional alliances
- Sources of available funding

Adaptation Examples

- Larger municipalities:
  - Toronto: heat wave
  - Vancouver: water supply
- Medium-sized municipality:
  - Halifax: Climate SMART
  - Sept- Îles: coastal erosion
- Small-sized municipalities:
  - Iqaluit: sustainable development
  - Annapolis Royal: storm surge protection

Moving forward with adaptation

- Mainstreaming climate change into decision making
- Anticipatory (proactive) approach may avert need for higher costs associated with reactive measures
- Vulnerability assessment is an example of one approach to adaptation

Conclusion & Future steps

- The Introduction will introduce the concept of adaptation, so that local governments can begin to address the recent concern of climate change for municipalities

- Expected release for April 2006

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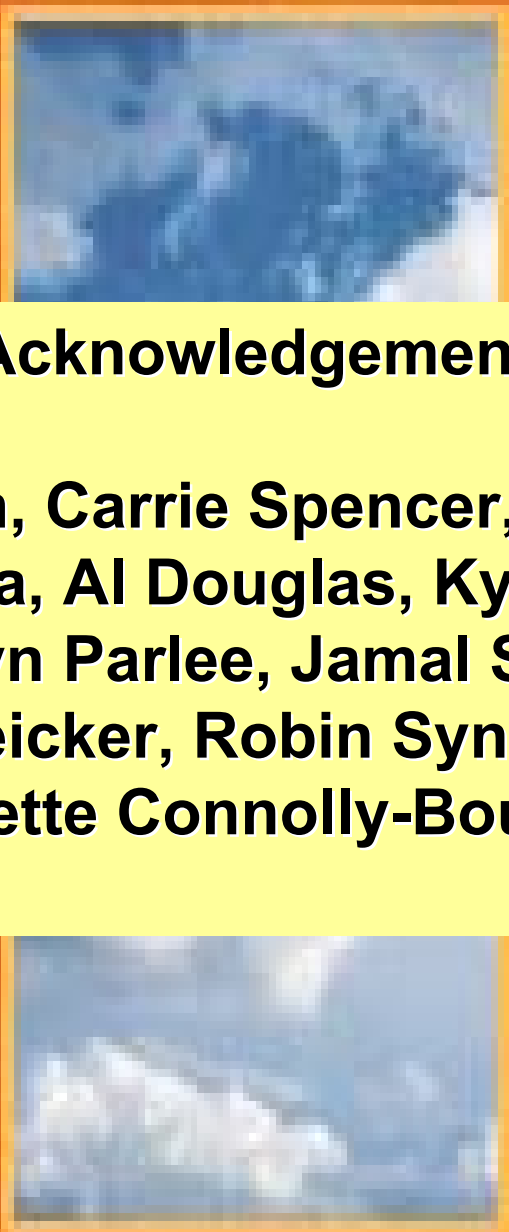


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