

Climate Change Adaptation & Emergency Management

What...How...Why...When



Outline



The driving force behind climate change



Physical hazards associated with climate change



Climate impacts on society

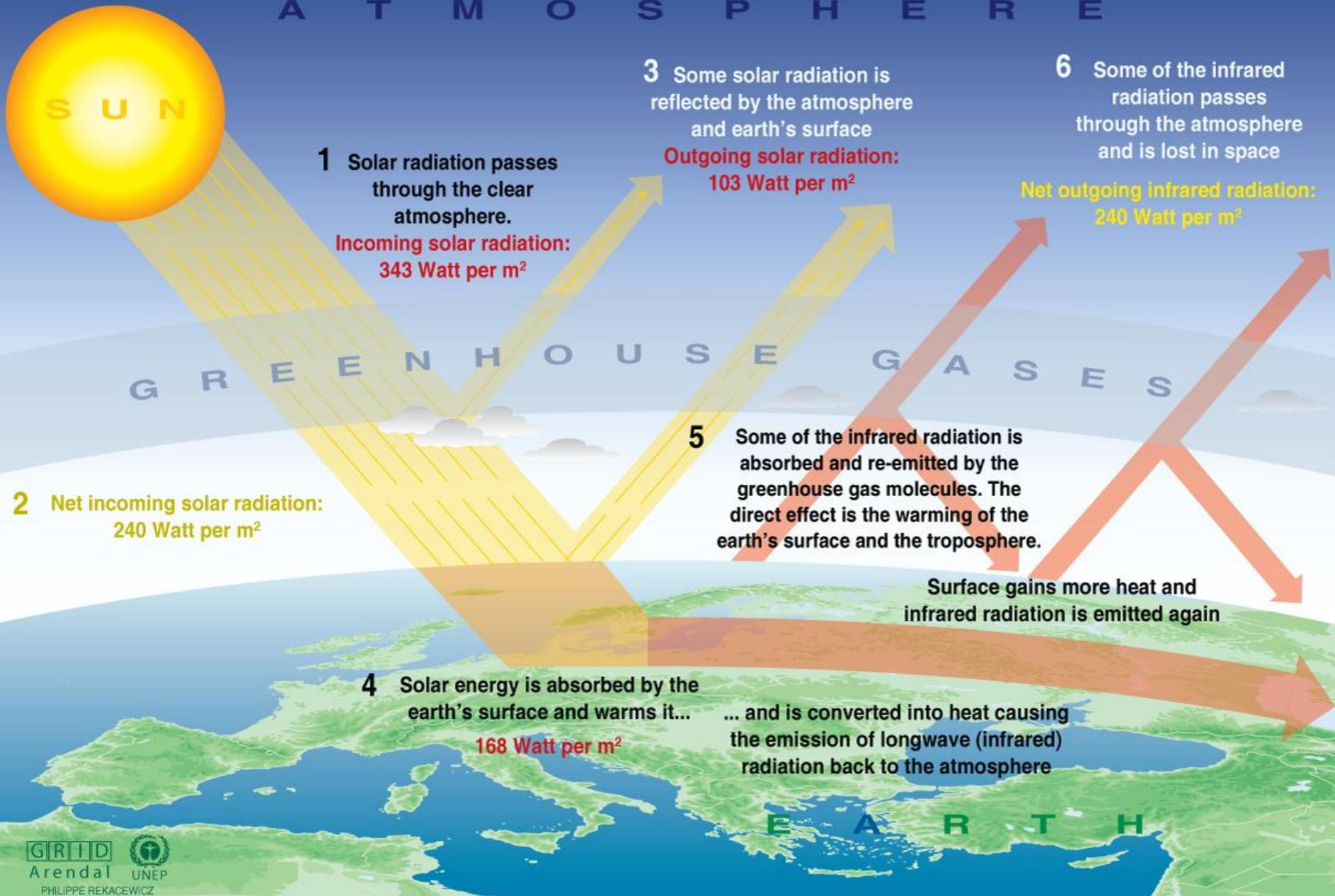


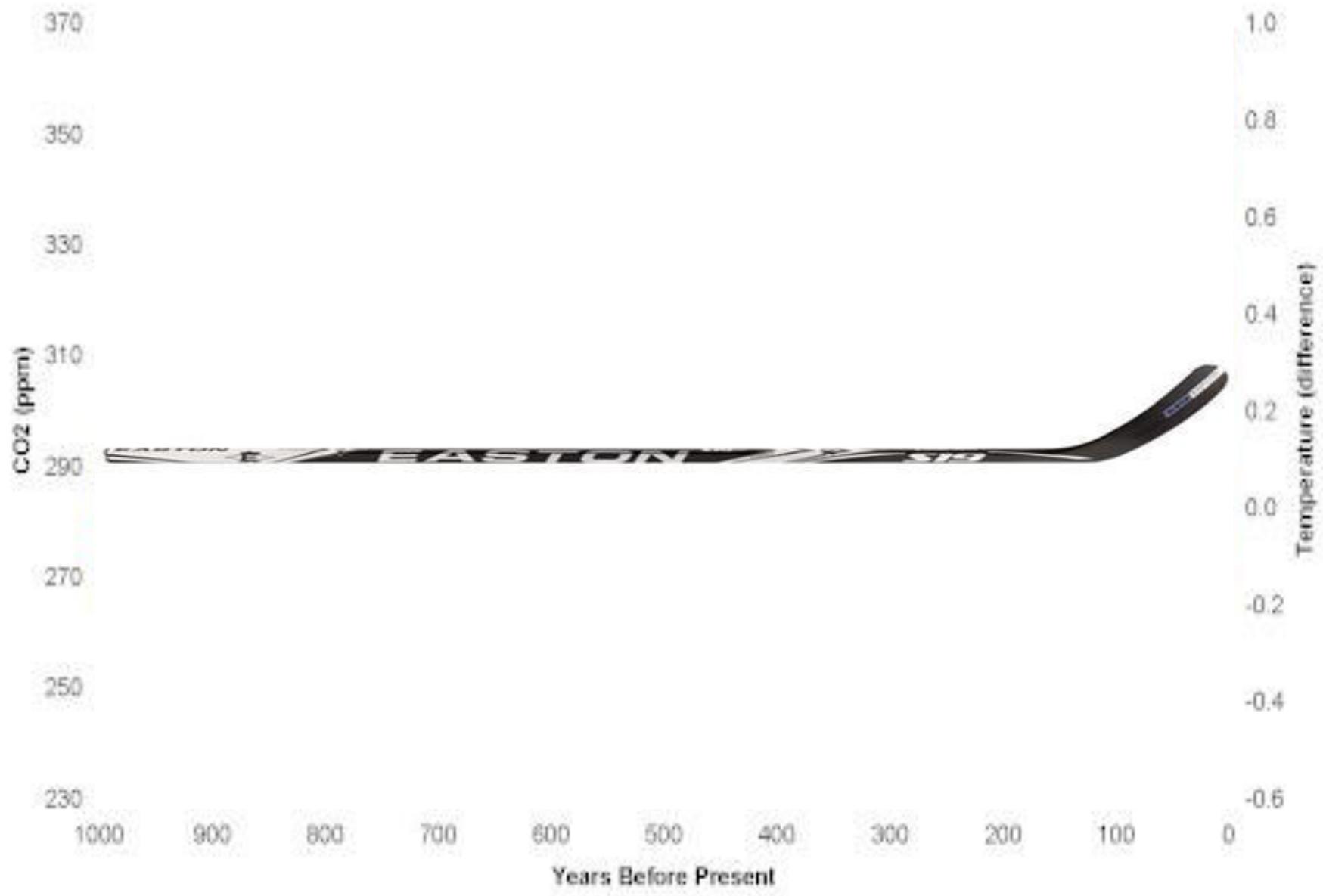
Adaptation to climate change: Is this a function of emergency management

Climate vs Weather

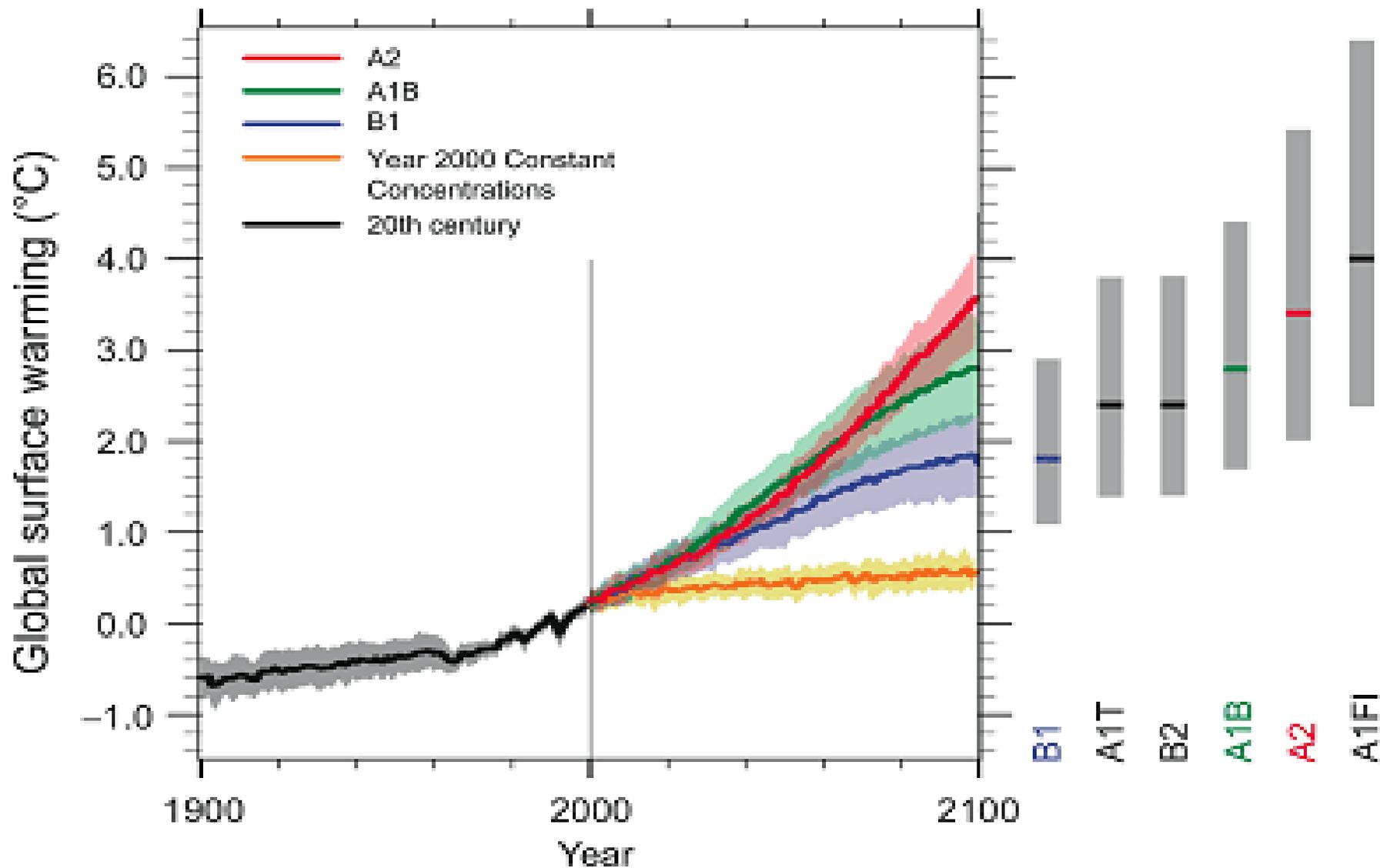
- Climate is the statistics of the weather
 - Global average temperature
 - Average annual Amazonian rainfall
 - Average April temperatures in Victoria
- Wide range of space and time scales involved
- “Climate is what we expect; weather is what we get”
 - Ed Lorenz

The Greenhouse effect





Multi-model Averages and Assessed Ranges for Surface Warming



Climate change will bring about...



An increase in global mean surface temperature



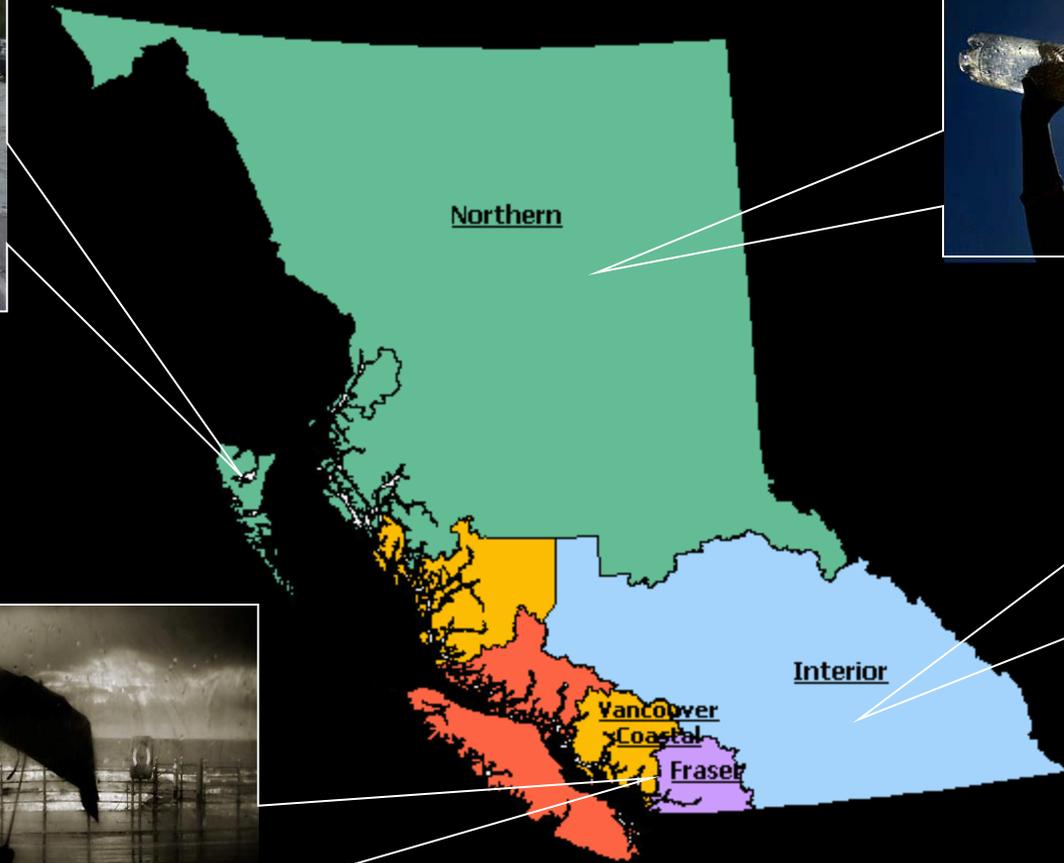
Changes in global mean precipitation



Sea level rise

What physical hazards do you think will result from the impacts of climate change?

The physical hazards of climate change that could be faced in British Columbia

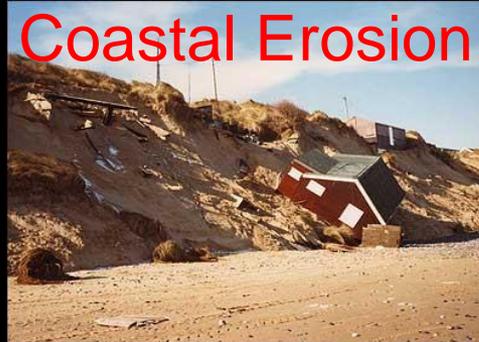


Sea Level Rise

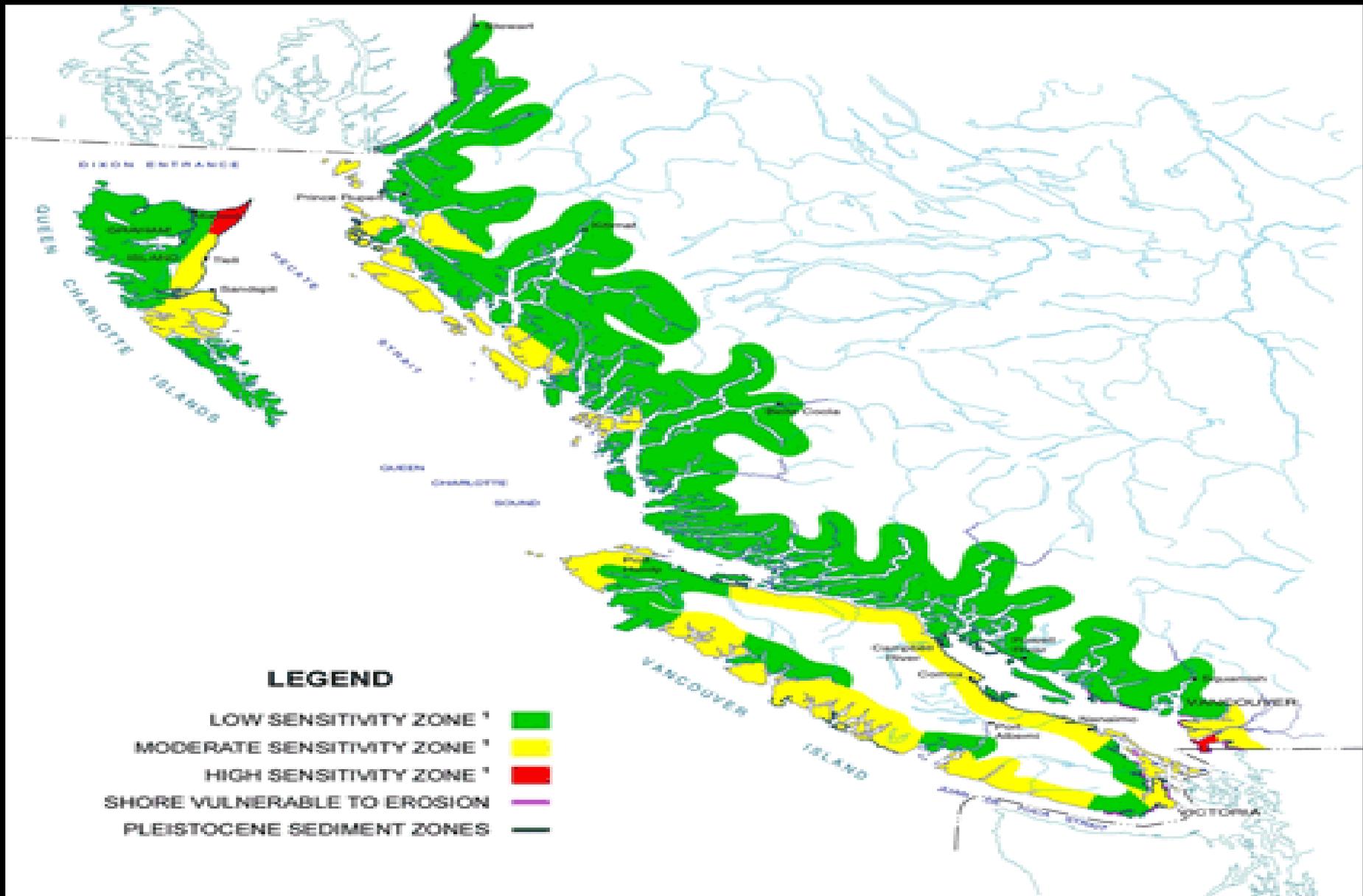
Over the next century, many scientists conservatively predict a global mean sea level rise of 1.3 metres.

Forces contributing to sea level rise:

- Thermal expansion
- The exchange of water between oceans and other reservoirs
- Vertical land movements (glacial isostatic adjustment, tectonics & sedimentation influences)



Sea Level Rise on the B.C. Coast



Changes in Precipitation



Dry areas will get dryer – while wet areas will get wetter.

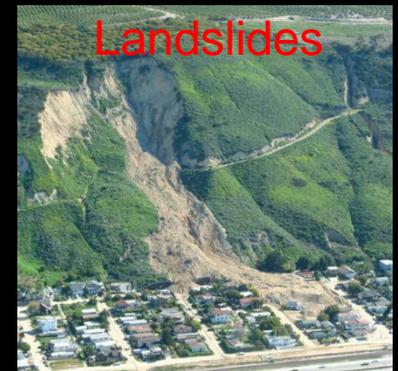
Increased global temperatures cause more evaporation and more moisture in the air.



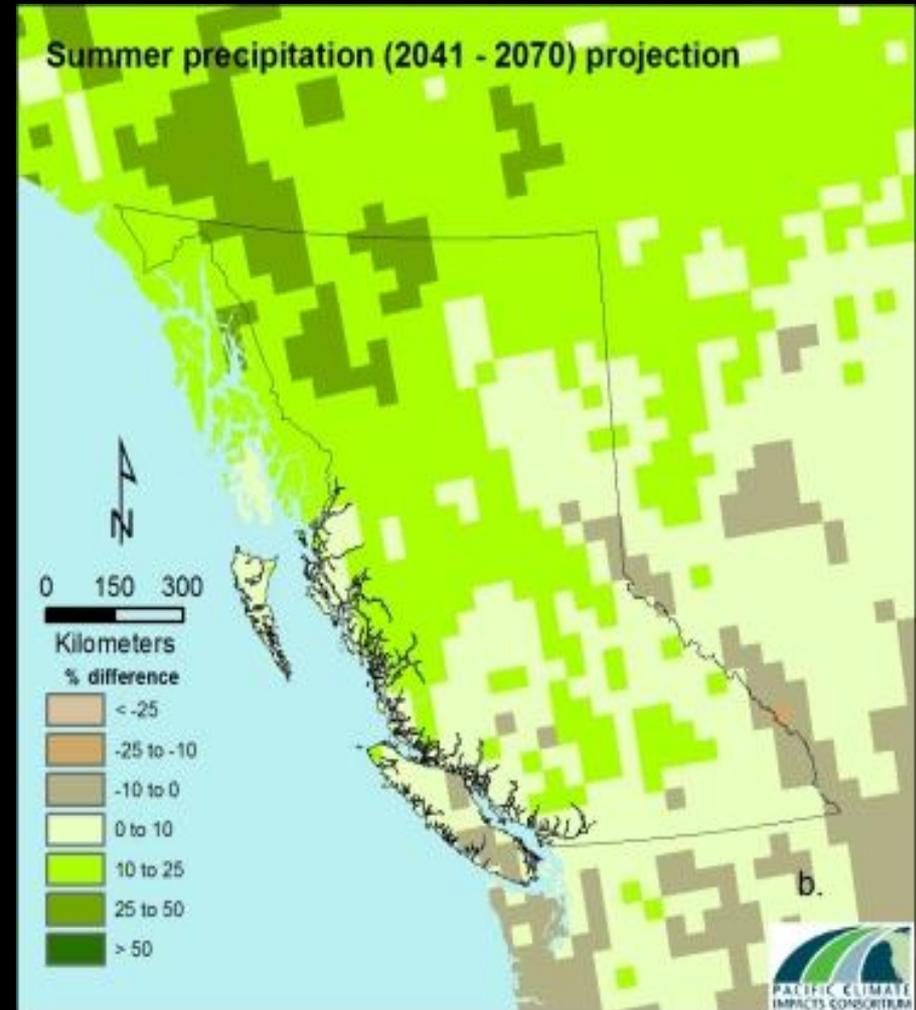
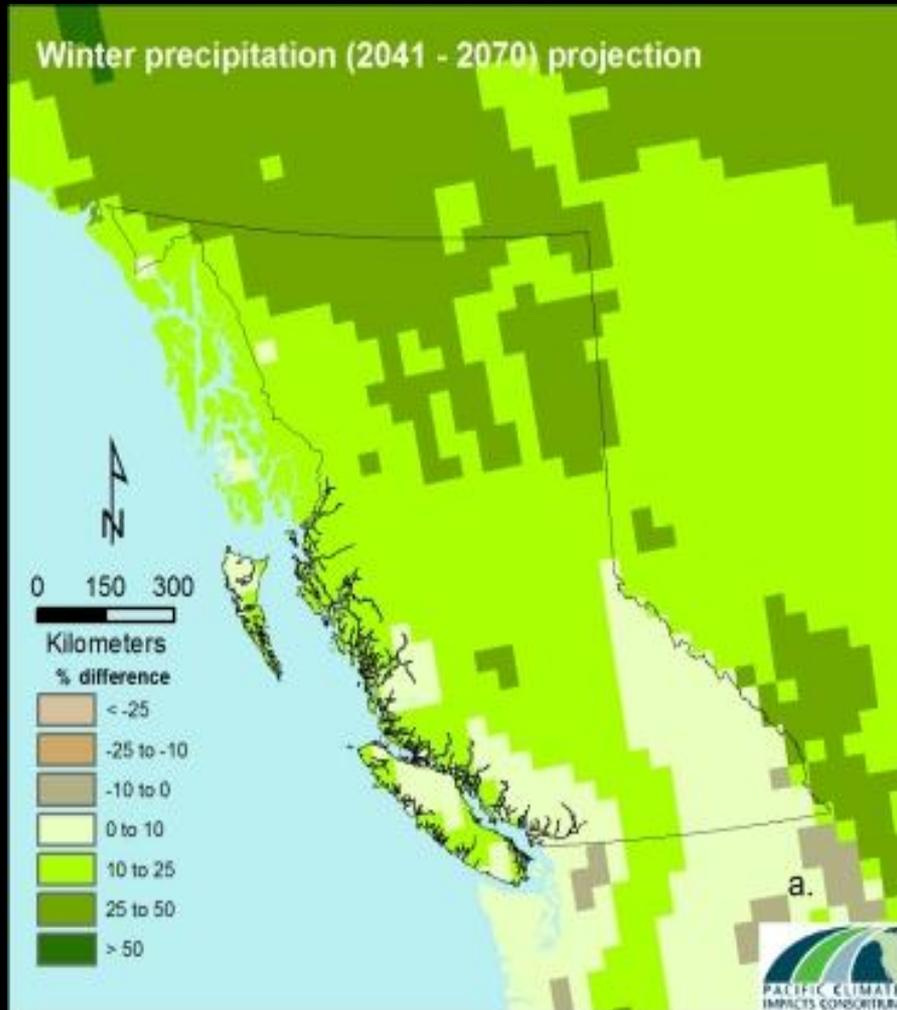
This leads to larger storms which also release their precipitation more quickly in a more concentrated fashion.



So regions which tend to get a lot of rain will often get even more, and regions which tend not to get much rain will often get even less.



Precipitation Changes in British Columbia



Increased Temperatures

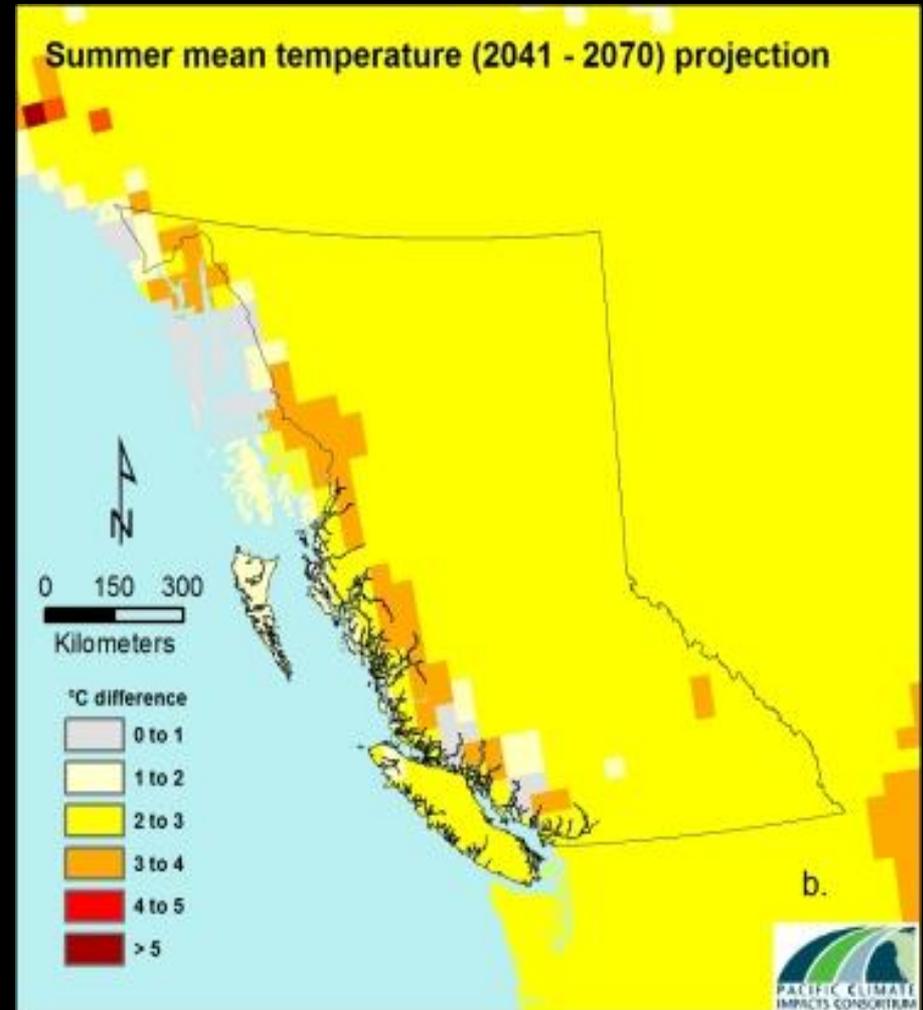
The IPCC has concluded that most of the observed warming in global average surface temperature that has occurred since the mid-20th century is very likely a result of human activities.

Forces contributing to increased temperatures:

- Increased GHG emissions and sulphate particles (aerosols)
- Deforestation
- Natural factors (solar variability, volcanic eruptions and internal variability)



Long-Term Trends in Air Temperature in British Columbia



Source : Pacific Climate Impacts Consortium, SRES-A2 scenario, April 2007

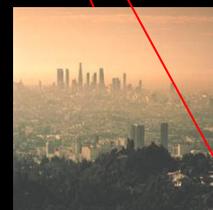
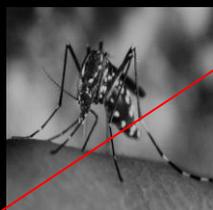
The Intergovernmental Panel on Climate Change (IPCC) concluded in 2007 that warming of the climate system is now “unequivocal,” based on observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.

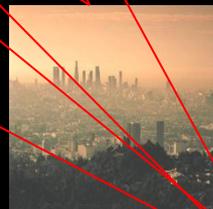
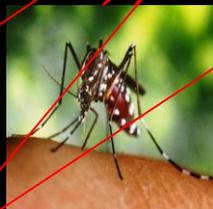
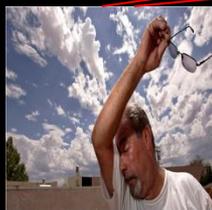


What are the impacts on society from these changing hazards?











Climate change results in complex disasters...



But is this a function of emergency management?



Adaptation to Climate Change and Emergency Management

Enhancing adaptation to climate change through emergency management mitigation measures and the implementation of risk management frameworks.



Strengthening adaptive capacity to climate impacts will ultimately lead to a reduction of exposure and sensitivity to hazards.

Adaptive Strategies



Move people and infrastructure out of threatened areas



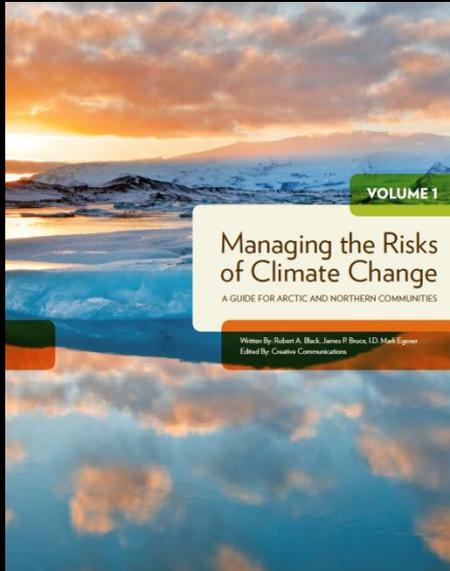
Protect infrastructure to survive changing natural effects



Re-allocate resources to address the hazards posed by climate change

Enhance and increase emergency response capabilities to deal with the effects of climate change

Adaptation Planning Resources

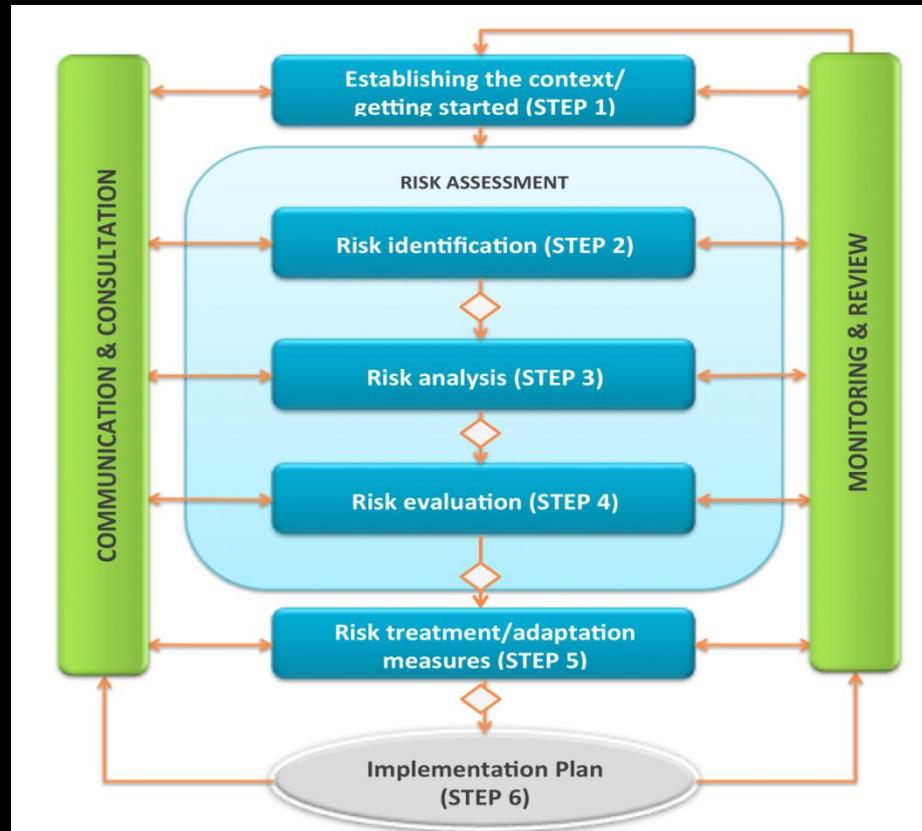


Adapting to Climate Change: A Risk Based Guide for Local Governments (Black, Bruce, Egner)

http://adaptation.nrcan.gc.ca/mun/index_e.php

- *Infrastructure Climate Risk Protocol (Engineers Canada)*
- *Changing Climate, Changing Communities: Guide for Municipal Climate Adaptation (ICLEI Canada)*
- *Canadian Communities' Guidebook for Adaptation to Climate Change (Environment Canada)*

Climate Change Adaptation Risk Management Process (based on CSA Q850 and ISO 31000)



Why Should Emergency Managers Become Involved in Climate Change Adaptation?

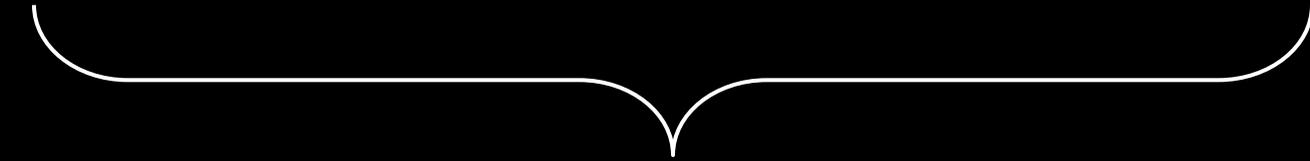
British Columbia



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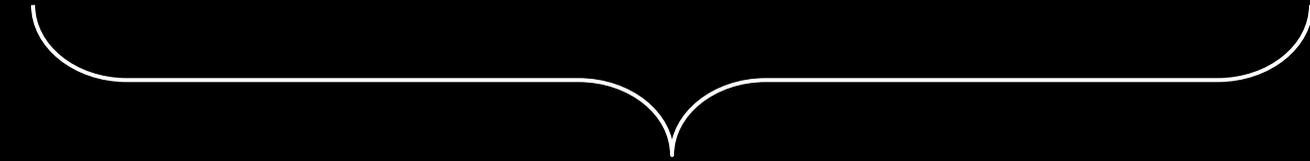
Alberta



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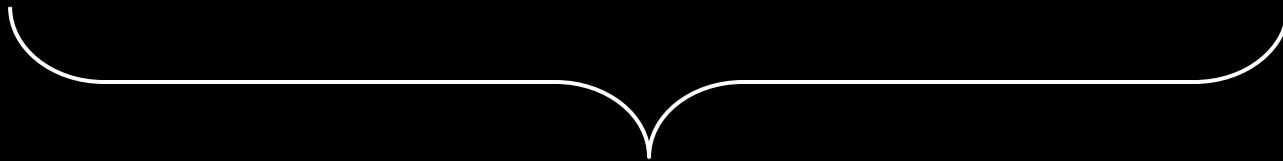
Yukon & Alaska



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The impact of Climate Change on emergency management is not a future prediction, it is a current event.

Barriers to Climate Change Adaptation in Emergency Management

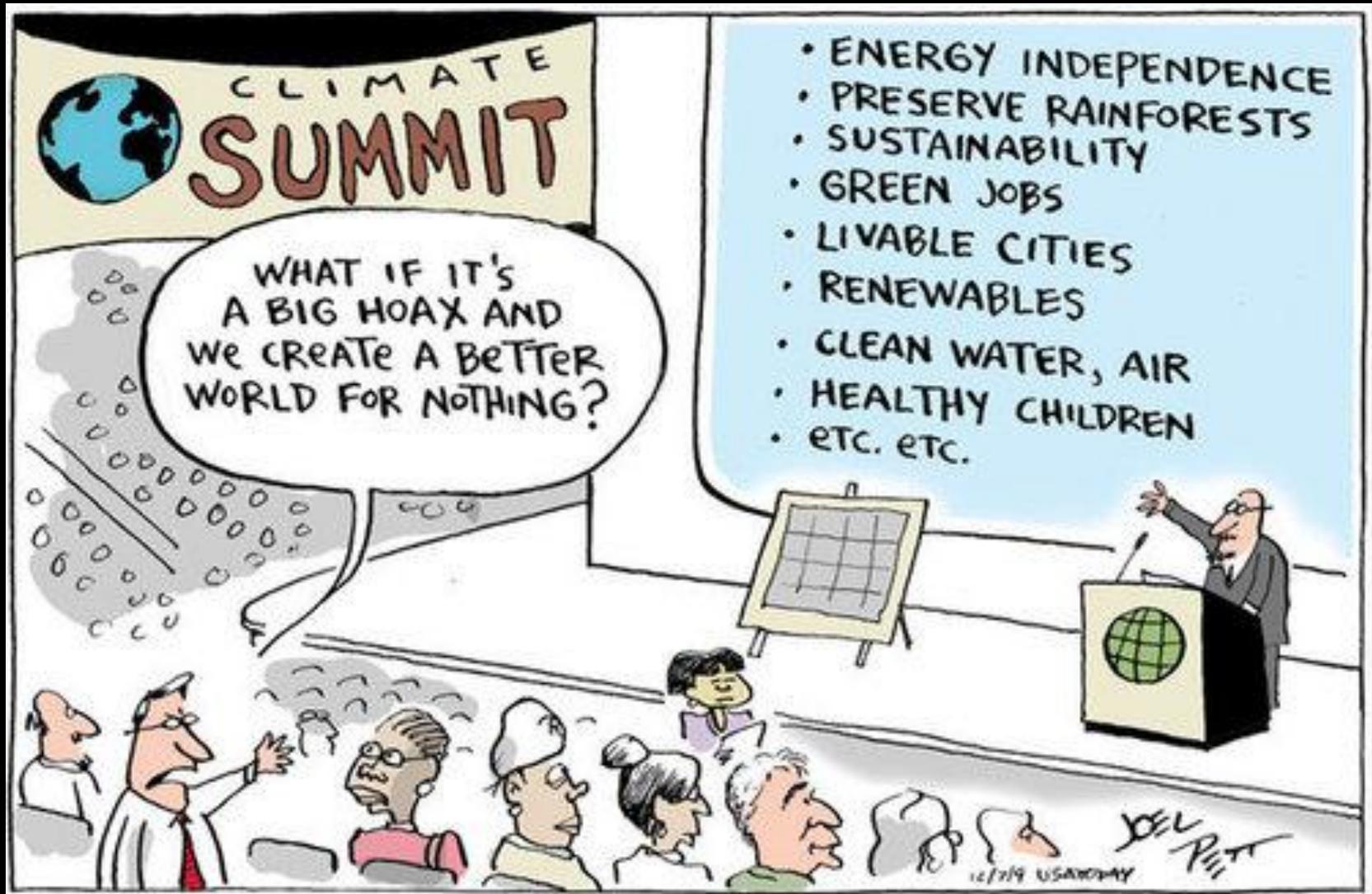
Current challenges make long-term planning difficult



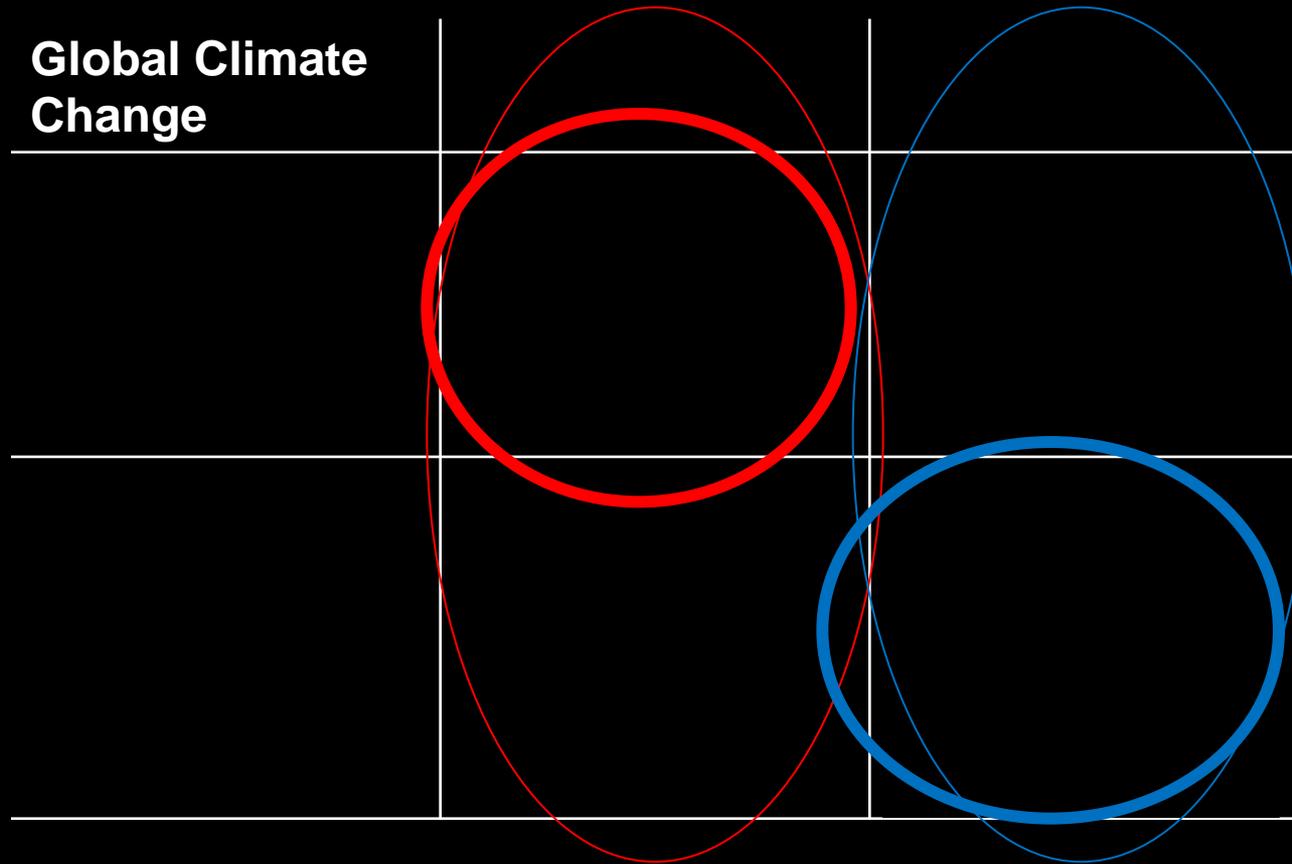
Decision makers with limited timeframes and even more limited resources



The "Deniers"



What is the worst that could happen?



How Can Emergency Managers Become Involved in and Influence Climate Change Adaptation?

Increase your position's focus to include adaptive strategies as well as response tactics.



Join other emergency planners (municipal, environmental, cross-government, etc) to develop a united approach to presenting adaptive strategies across organizations



Where climate change adaptation risk management has not been adopted in your jurisdiction, select a risk management tool and take a leadership role in addressing the challenge





Thank You
and
GO CANUCKS GO