

Climate Change and Asset Management 101

IAMA Workshop October 2019

Aaron Coelho, M.Sc., P.Ag.
Christina Hopkins, P.Eng.

Today's Presentation:

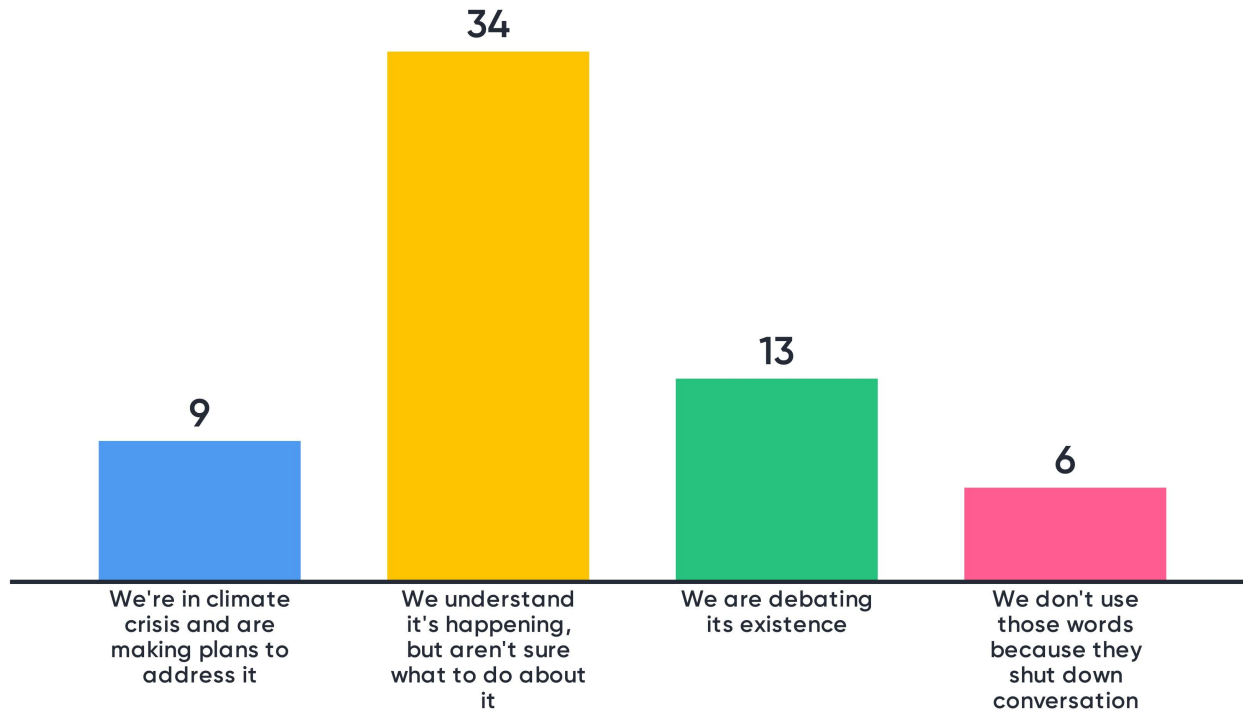
Climate Change

- Climate Change 101
- Effects of Climate Change in Alberta
- Tools for Understanding Climate Change
- Local Experiences and Climate Change
- Mitigation and Adaptation

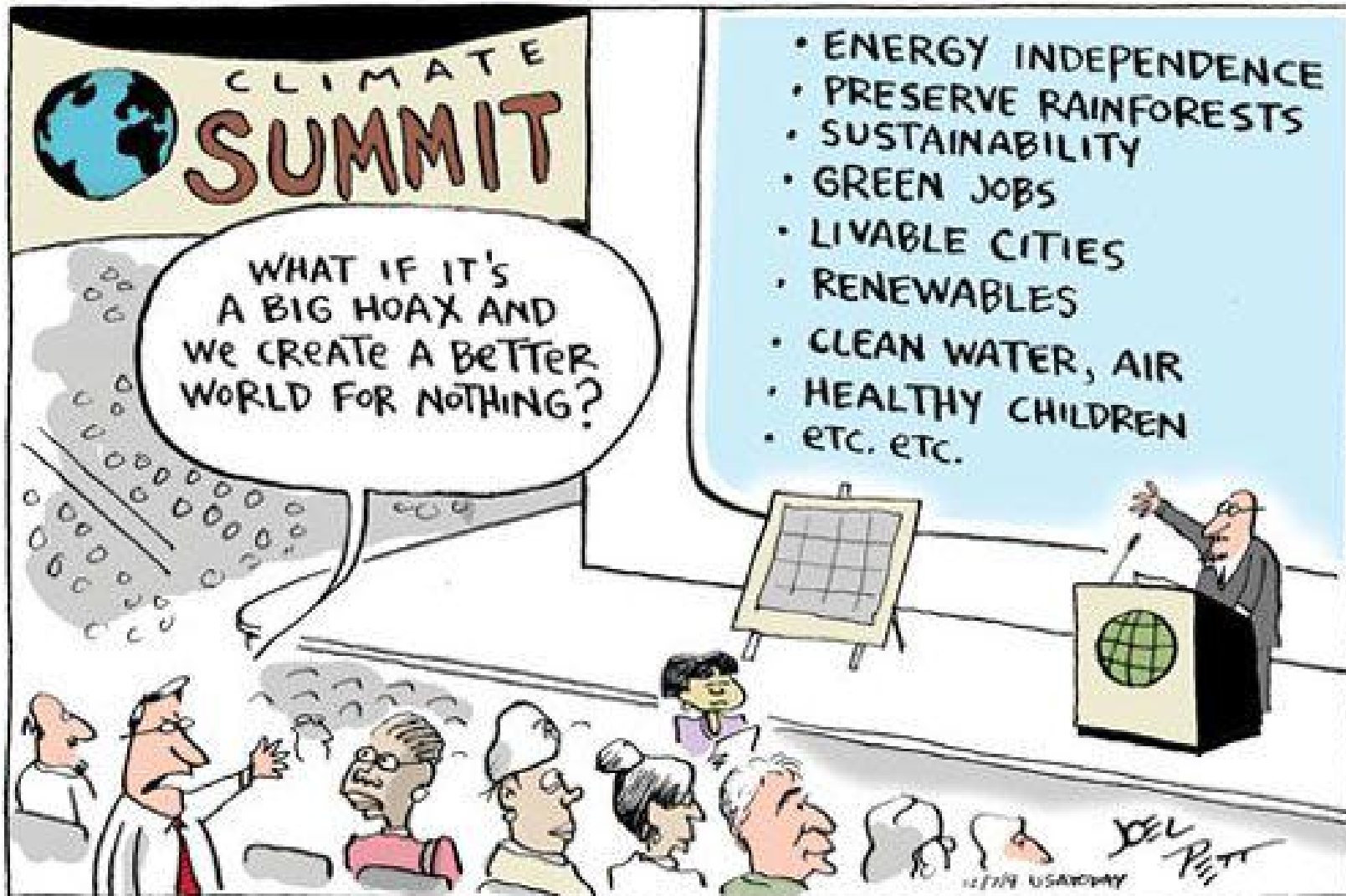
Connections to Asset Management

- Climate change considerations
- Natural Asset Management
- Risk/Vulnerability assessment frameworks
- Climate change and service Delivery
- Climate change and liability
- Having the climate change discussion in Alberta

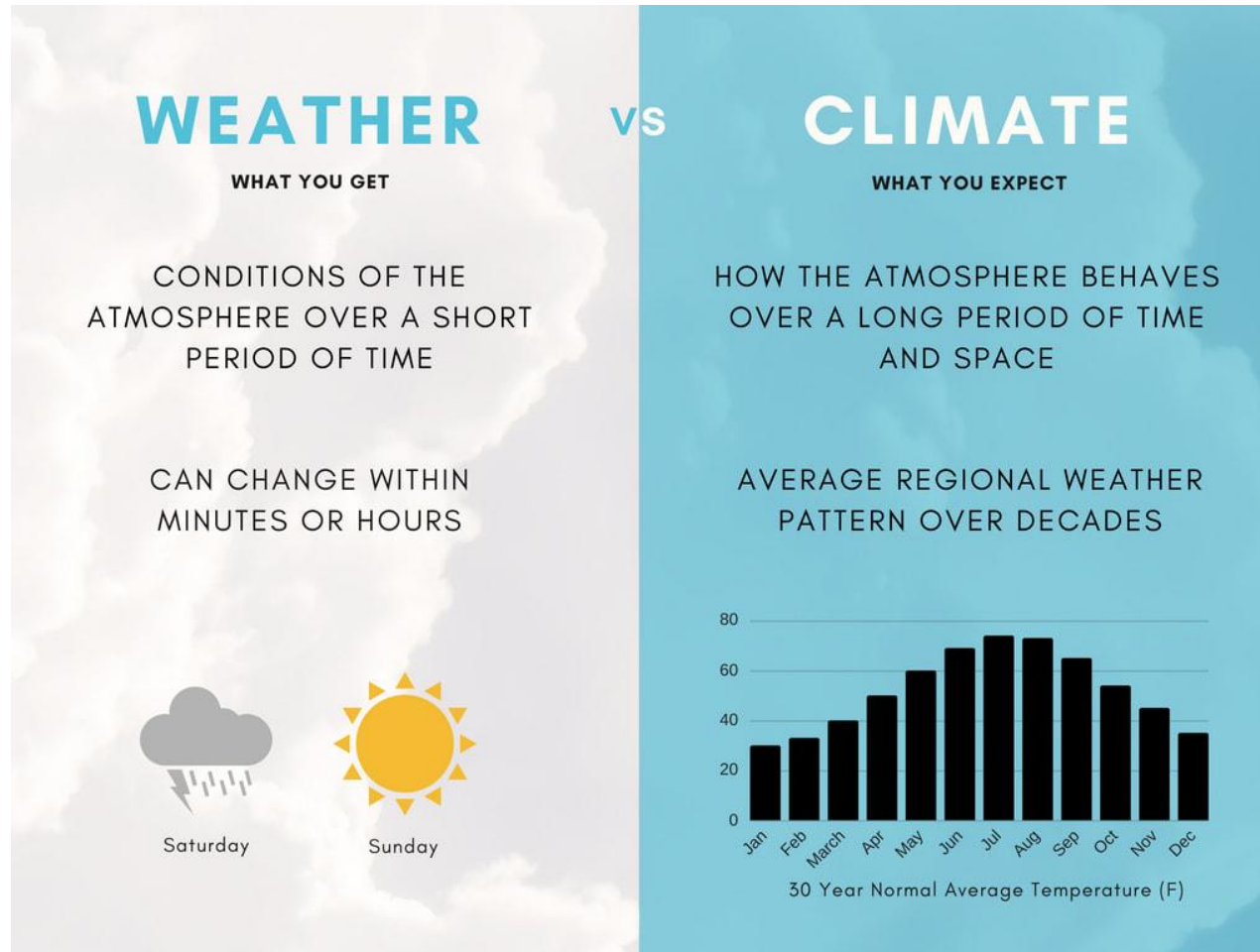
How does your community talk about climate change?



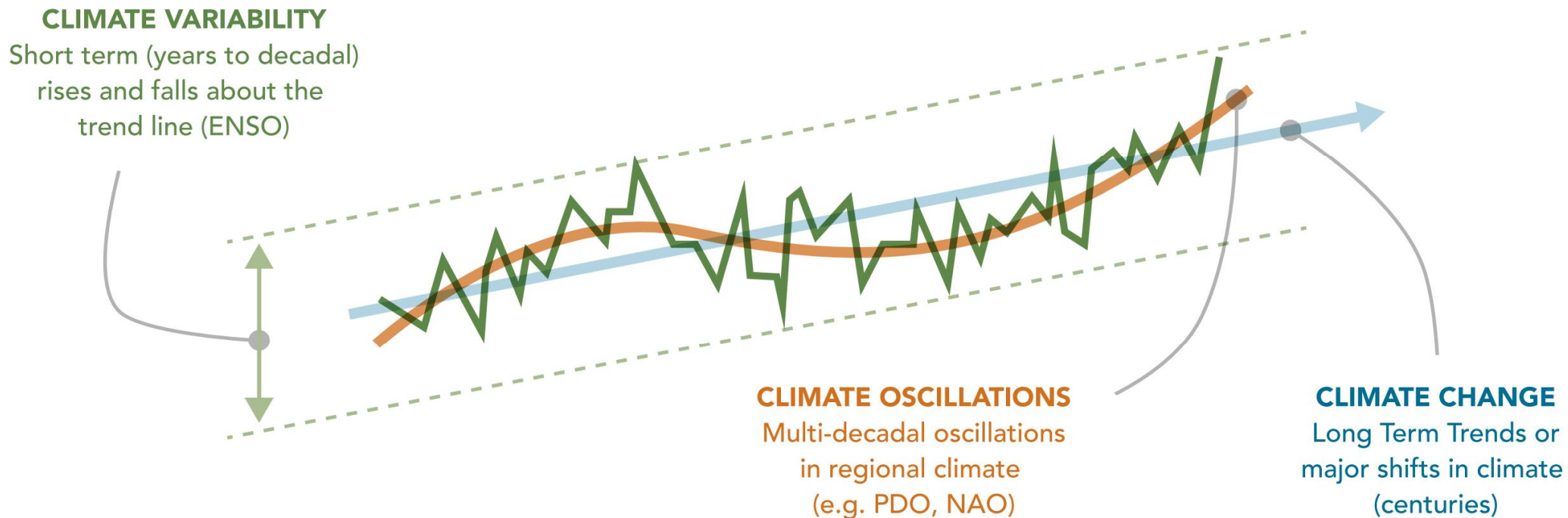
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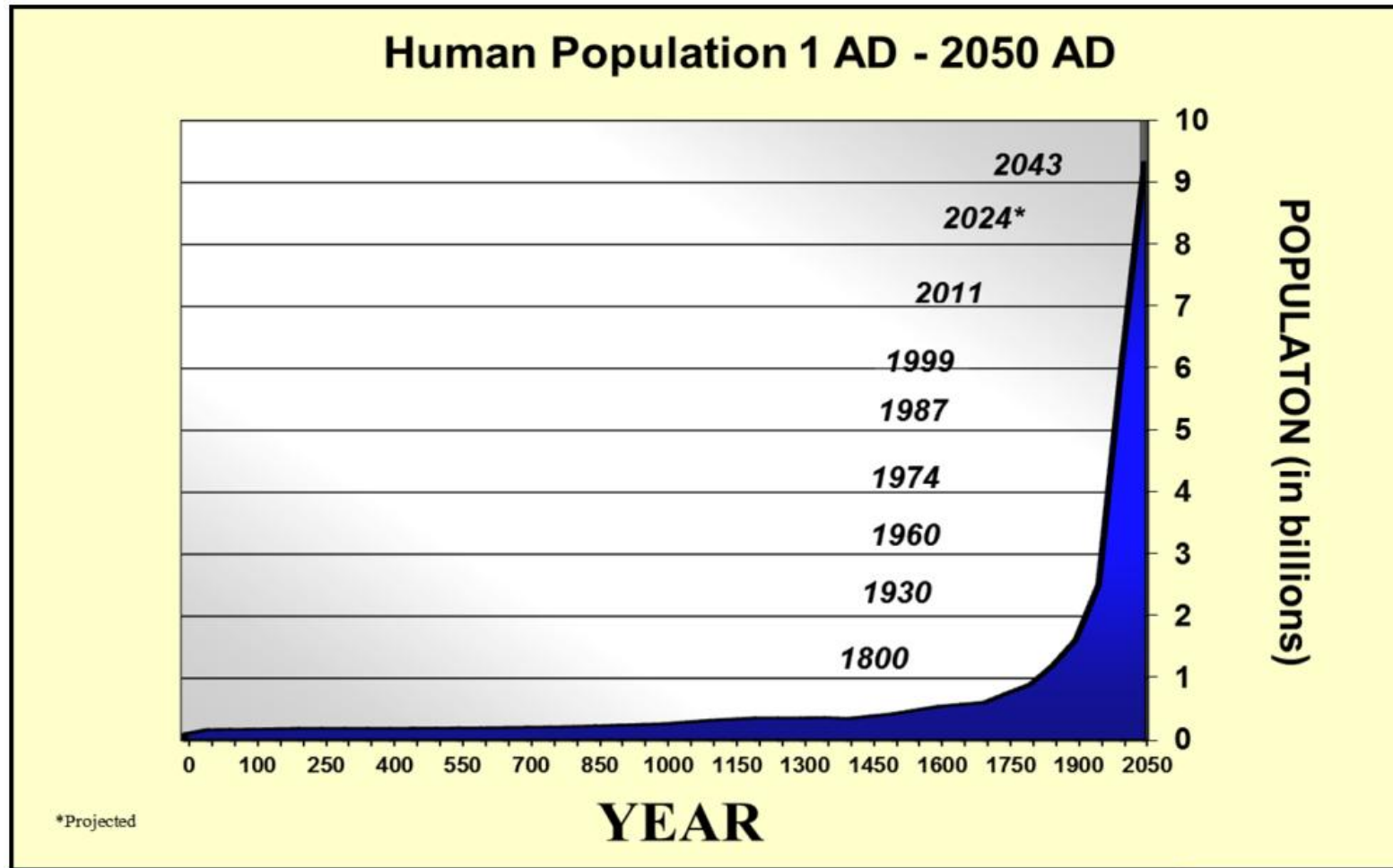
Weather VS Climate



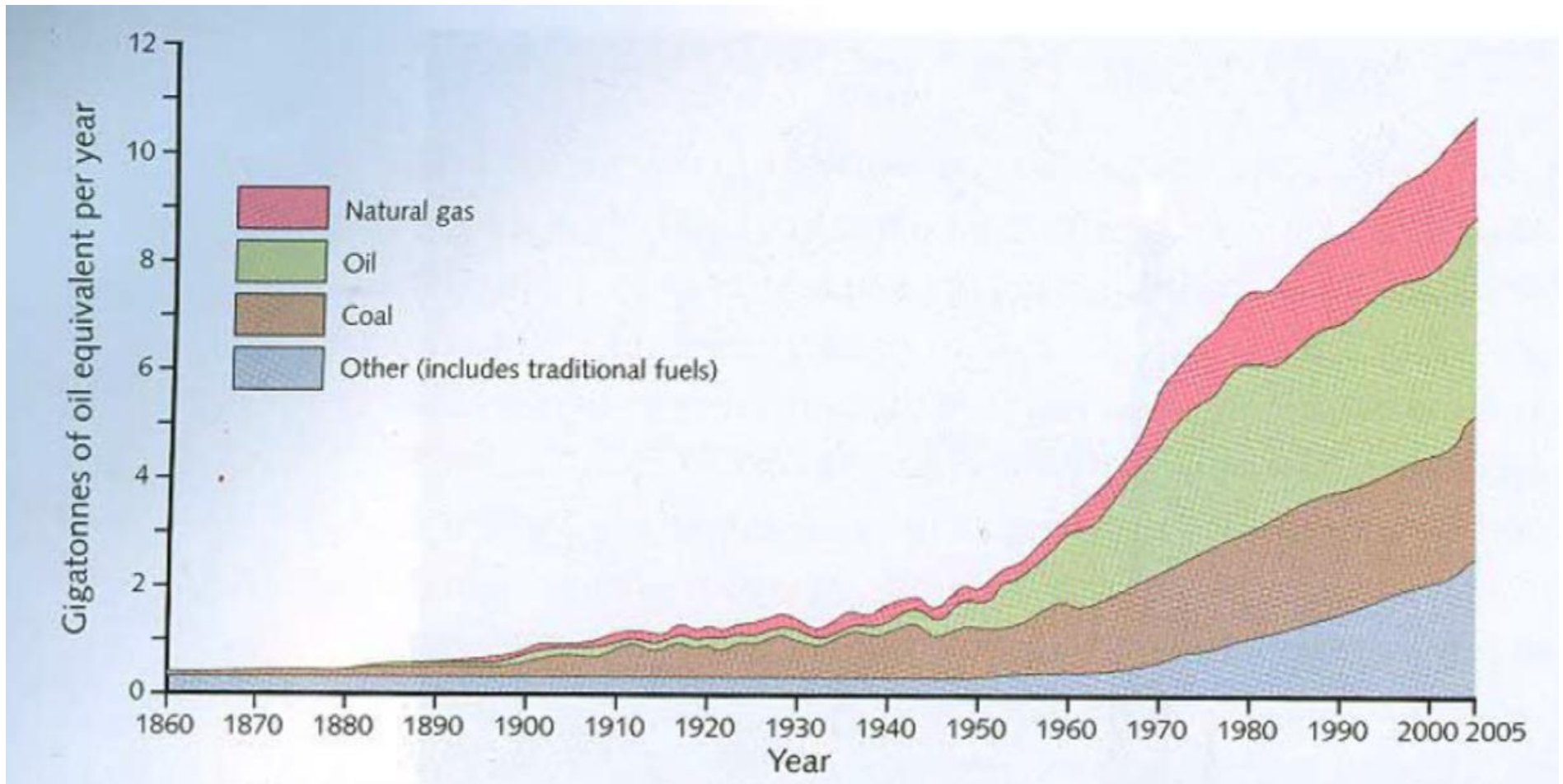
Natural Variability and Climate Change



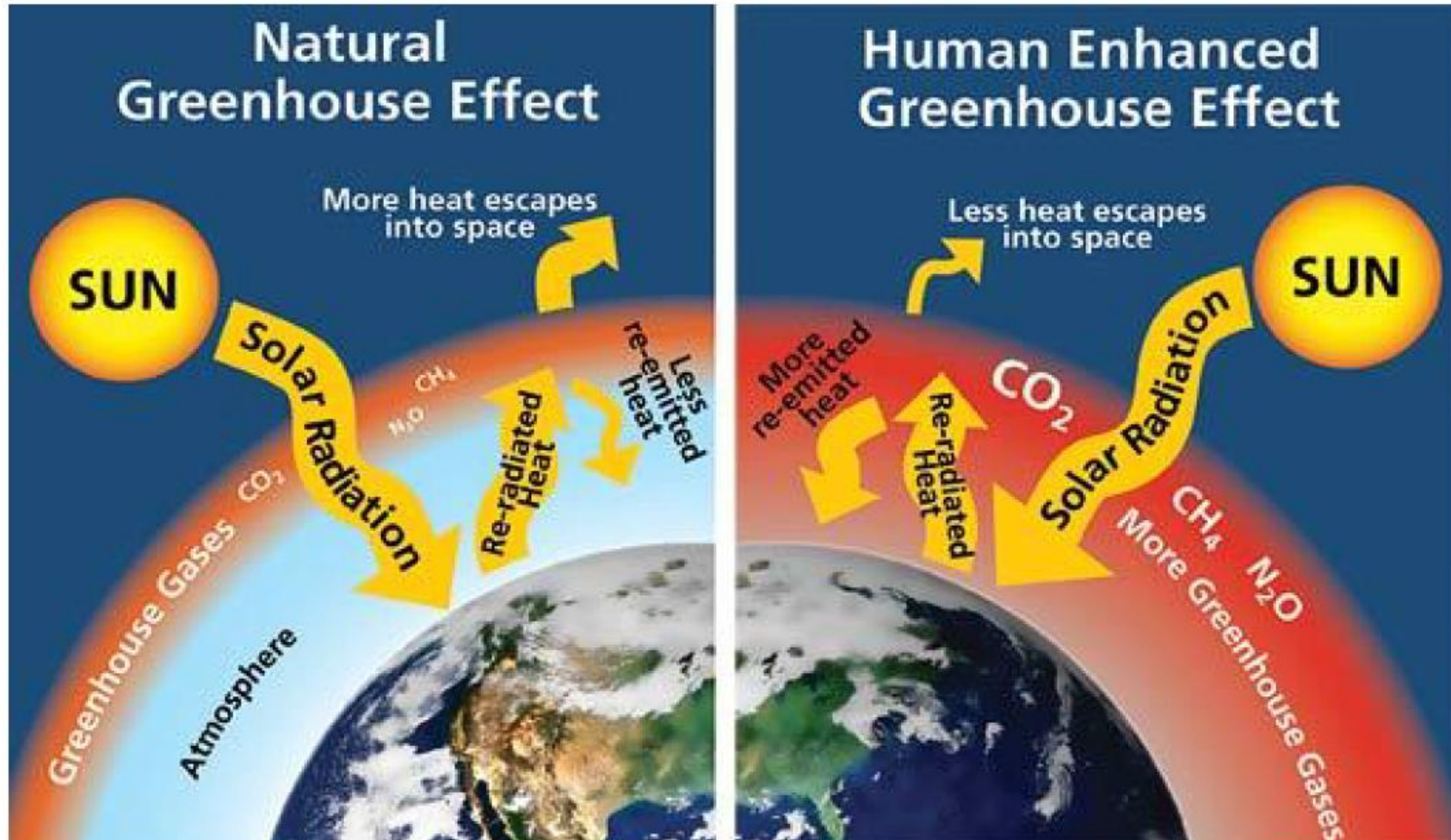
Population Growth



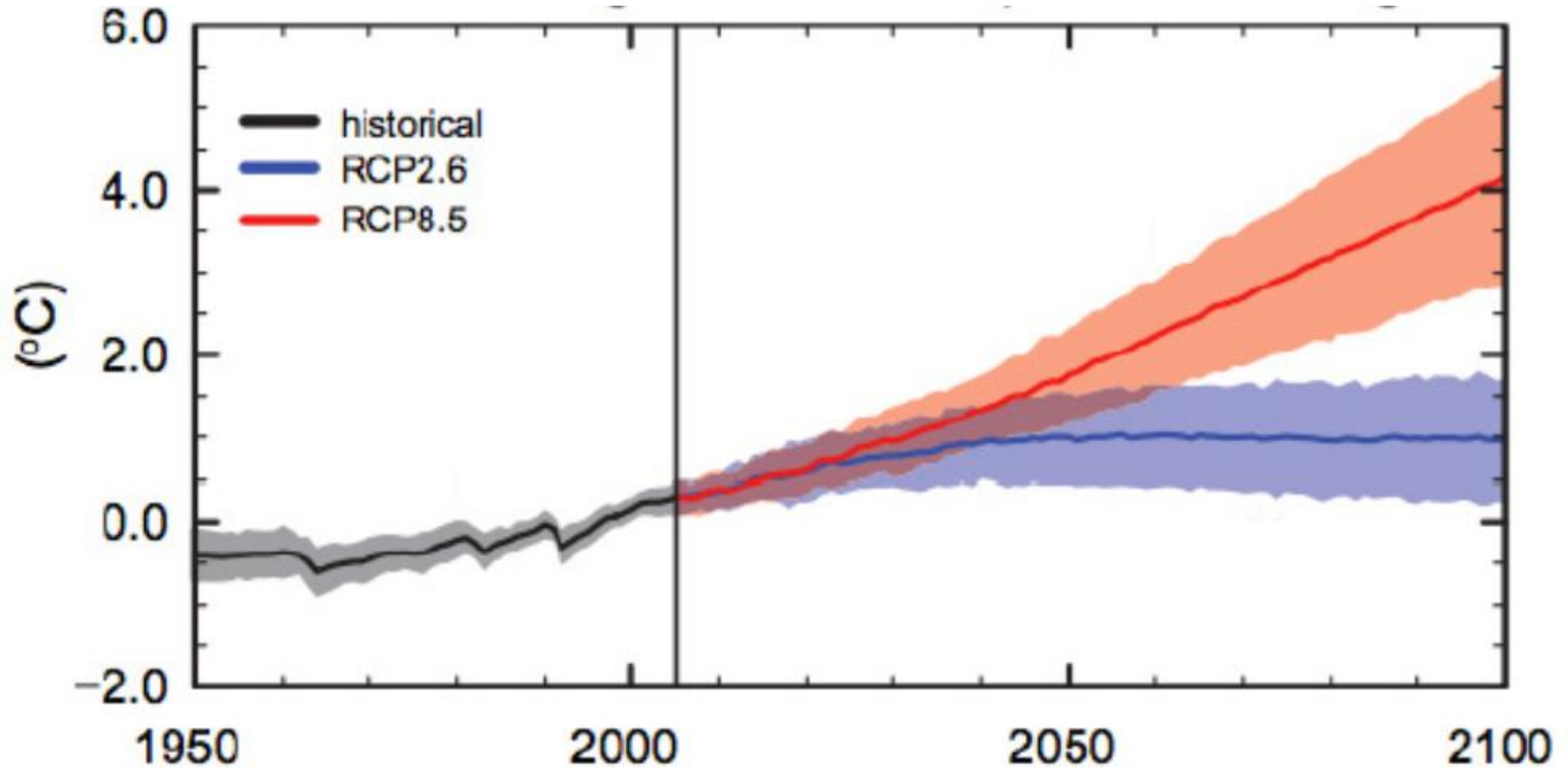
Global Energy Use



The Greenhouse Effect



Global Average Temperature Projection



Anticipated Climate Change Impacts in Alberta

- Dependent on area
- Higher temperatures
- More frequent droughts and floods
- Extreme weather events
- Extended growing season
- Specific impacts – like *when* a drought may occur – are unpredictable

Albertan Experiences

- 2016 Fort McMurray Wildfire

Human induced global warming has been attributed to increased fire risk in Alberta (Kirchmeier-Young et al., 2017).

- 2013 Southern Alberta Floods

Likelihood of extreme precipitation events that lead to floods are increased by anthropogenic climate change in this region (Teufel et al., 2017).

Kirchmeier-Young, M.C., Zwiers, F.W., Gillett, N.P. and Cannon, A.J. (2017): Attributing extreme fire risk in Western Canada to human emissions; Climatic Change, v. 144, p. 365–379. doi:10.1007/s10584-017-2030-0

Teufel, B., Diro, G.T., Whan, K., Milrad, S.M., Jeong, D.I., Ganji, A., Huziy, O., Winger, K., Gyakum, J.R., de Elia, R., Zwiers, F.W. and Sushama, L. (2017): Investigation of the 2013 Alberta flood from weather and climate perspectives; Climate Dynamics, v. 48, p. 2881–2899. doi:10.1007/s00382-016-3239-8

Tool for Understanding Projections: Climate Atlas

- A useful tool for understanding climate change impacts
- Provides climate projections for areas across Canada for low carbon and high carbon scenarios
- Provides information about precipitation and temperature projections for periods 2021-2050 and 2051-2080
- Let's take a look...

https://climateatlas.ca/map/canada/plus30_2030_85#

How is Climate Data Being Used: Examples from Other Communities

- Saddle Lake Cree Nation – Source Water Vulnerability Assessment
- Cowichan Valley Regional District – Asset Management Plan
- City of Vernon – Storm Water Infrastructure Assessment

Climate Change Mitigation and Adaptation

Mitigation: actions that help reduce human contribution to climate change.

Examples- Reducing greenhouse gas emissions, increasing green cover

Adaptation: actions that help us adjust to current or expected climate and its effects.

Examples- Building flood protective structures, setting up cooling centers, installing fire breaks

Connections to Asset Management

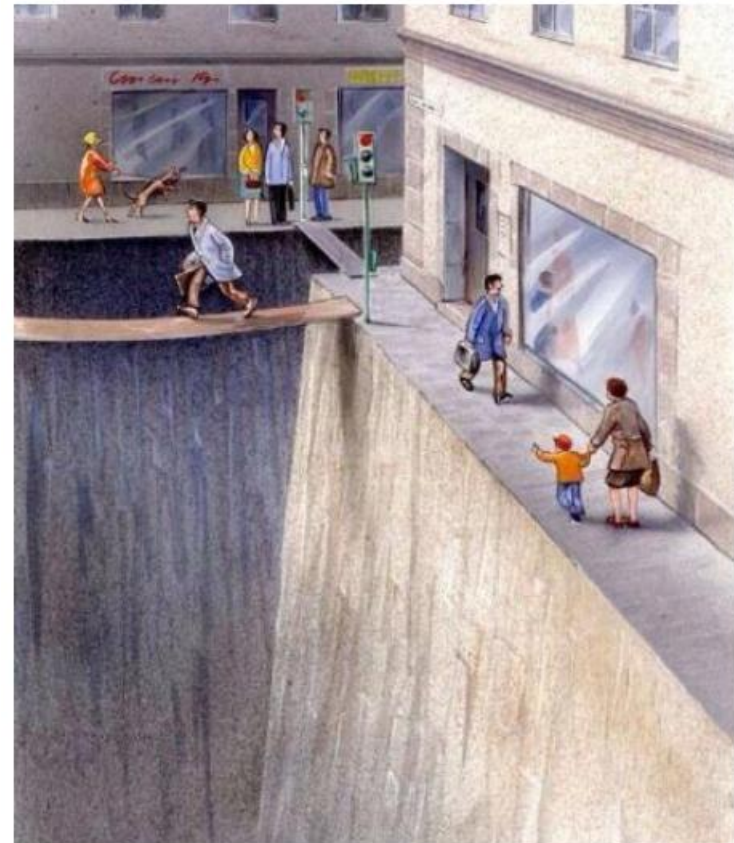
Asset management is “The process of making decisions about the use and care of infrastructure to deliver services in a way that considers **current and future needs**, **manages risks** and opportunities and makes the best use of resources”

Source: Building Community Resilience Through Asset Management: A Handbook & Toolkit for Alberta Municipalities

- Asset management combines both adaptive and mitigative actions.
- Asset Management considers long-term capital projects and operations and maintenance tasks
- Asset Management identifies infrastructure vulnerability and risks to service delivery

Connections to Asset Management

- Asset = a component of a system that enables a service
- Pipes, pumps, bridges roads... anything we understand the construction and behaviour of
- AM incorporates a systematic approach to risk management
- What about natural assets?



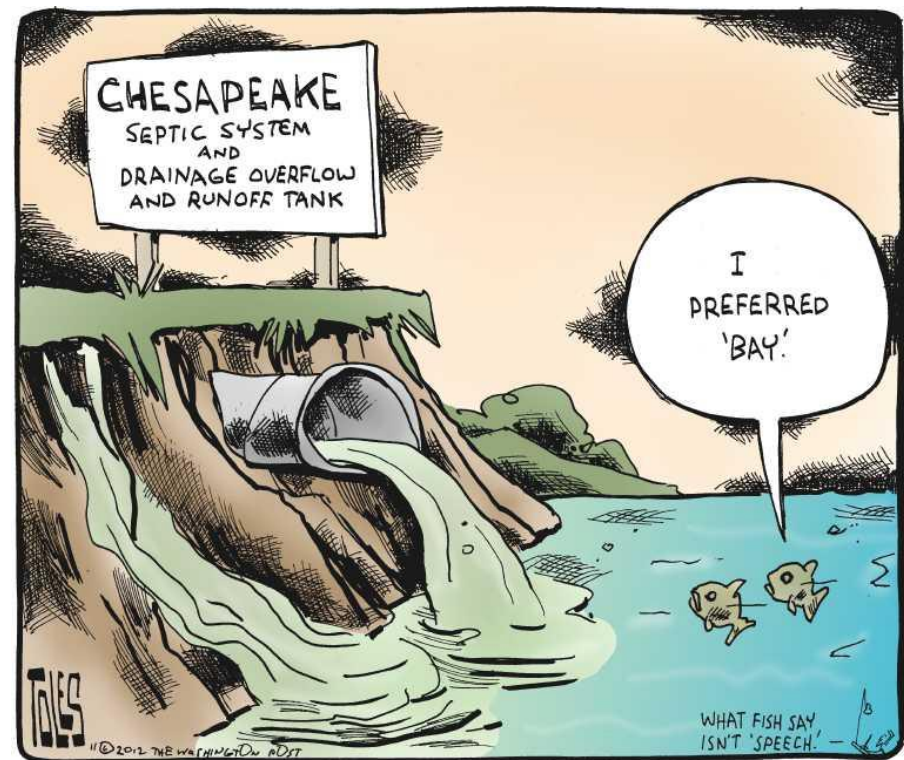
Twitter, via @ThinkCritical12.



Natural Asset Management

“Municipal Natural Assets include all natural assets that support our communities but the MNAM approach only considers those assets that fall directly within the mandate of a local government”

-Municipal Natural Assets Initiative



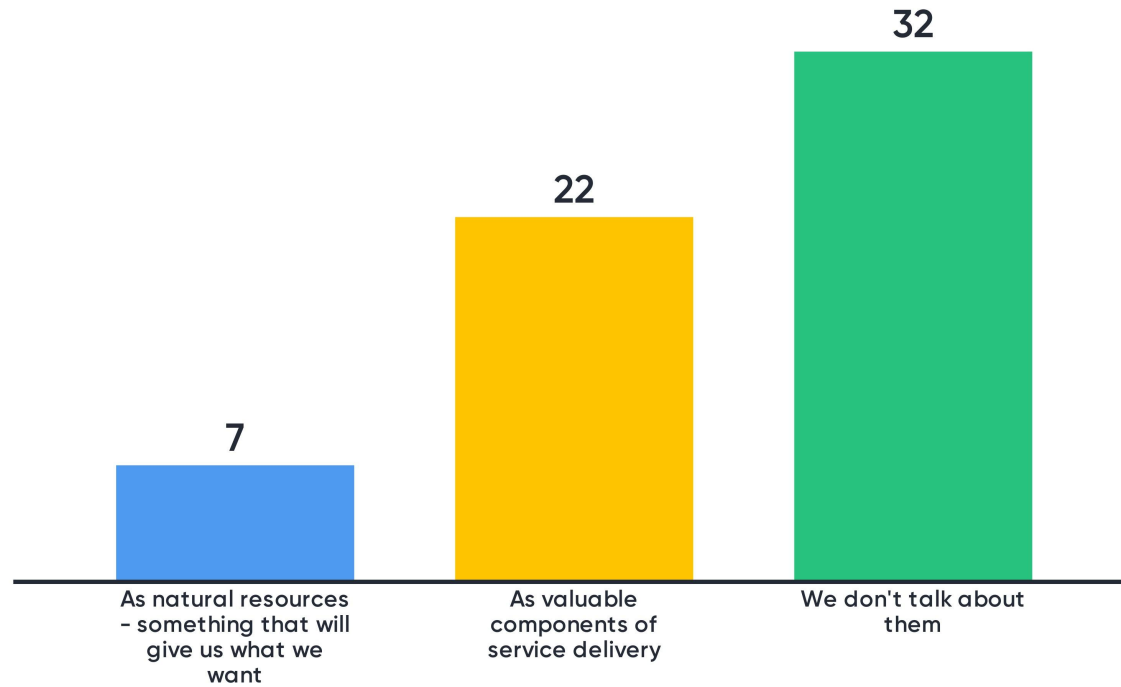
Natural Asset Management

- Promotes a focus on services, rather than engineered assets (emphasized by CNAM, AMBC, AB Handbook & Toolkit)
- Identifies services offered by natural assets that would otherwise be expected to be provided.
- Potential cost savings for municipalities through, enhancing, protecting and maintaining identified natural assets

MNAM Case Study: Town of Gibsons

- Town of Gibsons, BC was the first municipality to use MNAM approach.
- Groundwater aquifer was identified as an asset because of the service it provides
- Long term savings on water purification costs is anticipated by maintaining and monitoring this valuable asset with limited expenditure
- Understanding service enabled progressive conversation with neighbours about the aquifer's future

How does your community talk about natural assets?

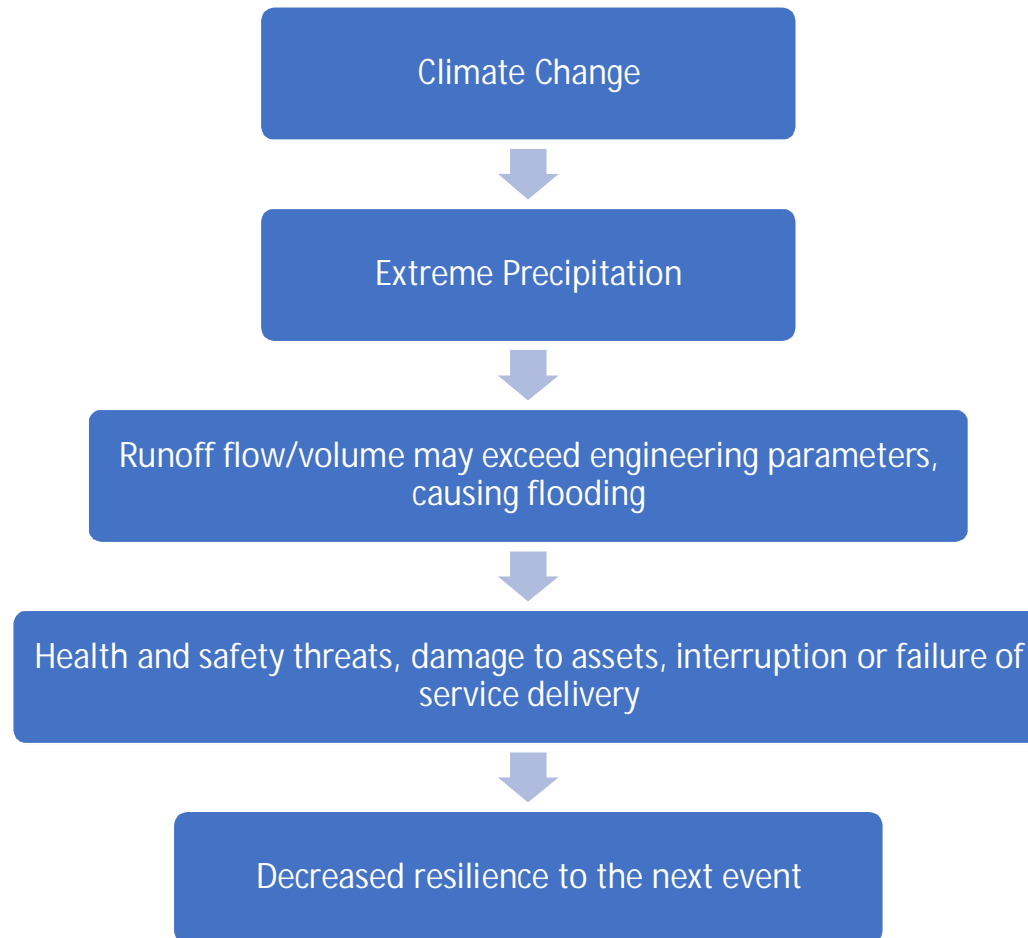


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Climate Change and Risk

- Climate change is both an asset and strategic risk
- Asset risk: effects of climate change may negatively impact an asset's ability to enable a service (eg intense rain events that overwhelm infrastructure)
- Strategic risk: effects of climate change may hinder the ability to achieve service delivery objectives (eg changes to aquifer may threaten long-term water security)

Impacts to Service Delivery



Frameworks for Evaluating Risk and Vulnerability

- PIEVC
 - Systematic, rigorous process for evaluating risks to infrastructure due to climate change
 - Information is used to make engineering judgements on adaptations to infrastructure or O&M procedures
 - Geared towards evaluation of catastrophic impacts vs. chronic
- ICLEI BARC

Other Considerations

- Emergency response
 - Identifying highest risks (and prioritizing resources for response plans)
 - Supporting communication with responders as well the community members
- Politics
 - Addressing climate change through asset management as a base requirement for reducing/preventing long term risks to service delivery
- Liability
 - Insurance Bureau of Canada is leading the way in considering climate change

Discussion

- What effects of climate change have you seen in your community?
- What are some ways your community is addressing climate change through asset management?
- What natural assets do you have in your community?

First Steps Checklist

- q Are natural assets included in the scope of AM? In your AM policies, strategies, plans?
- q Does your AM team have representation from departments that focus on natural assets? (Parks, stormwater, sustainability, etc)
- q When identifying climate change risks, ask:
 - What are the expected impacts of climate change in our community?
 - How will these events impact our infrastructure systems?
 - What will the service impact be?
 - Are there some areas that are more vulnerable than others?
 - What can we do to mitigate these risks and vulnerabilities?

Resources

- Climate Atlas: <https://climateatlas.ca/>
- FCM
 - The Cost of Climate Change Adaptation: <https://data.fcm.ca/documents/focus/investing-in-canadas-future-the-cost-of-climate-adaptation-summary.pdf>
 - Green Municipal Fund: <https://fcm.ca/en/programs/green-municipal-fund>
- Municipal Natural Assets Initiative: <https://mnai.ca/>
- Pacific Climate Impacts Consortium (PCIC): <https://pacificclimate.org/>
- Climate Change and Asset Management a Sustainable Service Delivery Primer: https://www.assetmanagementbc.ca/wp-content/uploads/The-BC-Framework_Primer-on-Climate-Change-and-Asset-Management.pdf

Questions?

acoelho@urbansystems.ca
chopkins@urbansystems.ca

