# Climate Change Adaptation & Asset Management

## Perspectives from a Registered Professional Planner (RPP)

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# Session Journey

- ✓ Climate change projections

- ✓ Shared language (definitions)

- ✓ Community Resilience Action Planning

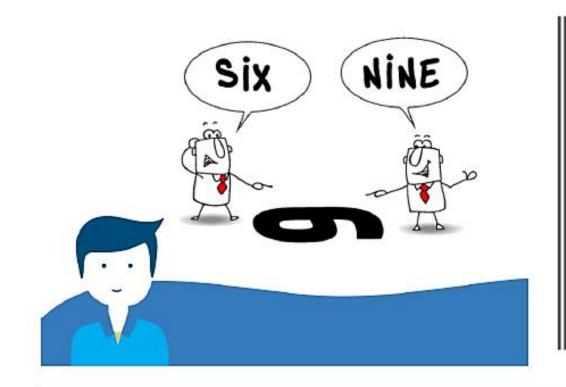- ✓ Storytelling

- ✓ Takeaways



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# Metro Vancouver Climate Change Projections: 2020s, 2050s and 2080s

| Climate Variable | Summary of Change | Snapshot of Anticipated Changes |
|---|---|---|
| ☁ | Increase in average annual precipitation with a decrease in the summer. | **Averages[A]**<br>Increase of 6% and 9% in winter and decrease of 15% and 14% in the summer by the 2050s and 2080s respectively.<br><br>**Wet days[B,C]**<br>By the 2050s, precipitation during extremely wet days is expected to increase 28% relative to the baseline period (1971-2000).<br><br>**Extreme events[C]**<br>By the 2050s, a daily rainfall event that occurred once every 25 years in the past is expected to occur almost 2.5 times as frequently. |
| 🌡 | Increase in average annual temperature with most notable change in night-time lows. | **Averages[A]**<br>Annual increase of 1.7°C by the 2050s and 2.7°C by the 2080s.<br><br>**Warm days**<br>Summer days above approx. 24°C are projected to occur more than twice as frequently in the 2050s than during the baseline period 1971-2000.<br><br>**Extreme events**<br>In the 2050s, an extreme heat event that occurred once every 25 years in the past is expected to occur over 3 times as frequently. |
| 〰 | Rising Seas | **Averages**<br>The Province of B.C. recommends using 0.5m global mean sea level increase to 2050, 1.0m to 2100 and 2.0m to 2200. There is a wide range of projections for sea level rise by 2100 from 45cm to over 2m.<br><br>**Extreme events**<br>Sea level rise will cause problems when experienced together with storm surge. Detailed storm surge projections are not available. |
| ☁ | | An increase in extreme events is projected including windstorms and heavy rainfall. |

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The Metro Vancouver Region can expect changes …. at a broad level as follows:

- warmer temperatures
- a decrease in snowpack
- longer dry spells in summer months
- more precipitation in fall, winter, and spring
- more intense extreme events

# Shared Language (definitions)

# Intergovernmental Panel on Climate Change (IPCC)

Resilience: "The capacity of social, economic, and environmental systems to **cope with** a hazardous event or trend or disturbance, **responding or reorganizing** in ways that maintain their essential function, identity, and structure, while also **maintaining** the capacity for adaptation, learning, and transformation" ...

The 'definition **links resilience with the capacity to adapt**, where adaptive capacity refers to the resilience that reflects **learning, flexibility to experiment and adopt novel** solutions, and **the development of a generalized response to broad classes of** challenges' **OKAY ....so for urban/community resilience .....**

# What is Urban / Community Resilience?



Urban / community resilience is the **sustained ability** of a community to utilize available resources to **respond to, withstand, and recover from** adverse situations **while continuing to deliver** important community services.

# Shared Language

With the changing climate, **natural hazards may increase in frequency, duration and level of impact. The exposure of people, property and other community assets (systems) to natural hazards can result in disasters**, depending on the impacts.
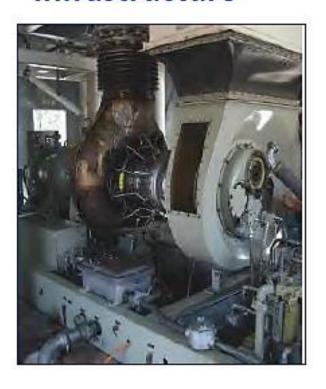
The **type and severity of impacts are based on the extent of the hazard and the vulnerability of the community's assets**, as well as the community's ability to **mitigate, prepare for, respond to, and recover from events; a community's level of resiliency**.

# The Urban / Community Resiliency Challenge

**Aging Infrastructure**

**Urban Growth**

**Changing Climate**

Green and climate-friendly technology is important but insufficient to make societies resilient

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# Insurance Bureau of Canada – Sustainable?

2011: $1.7B
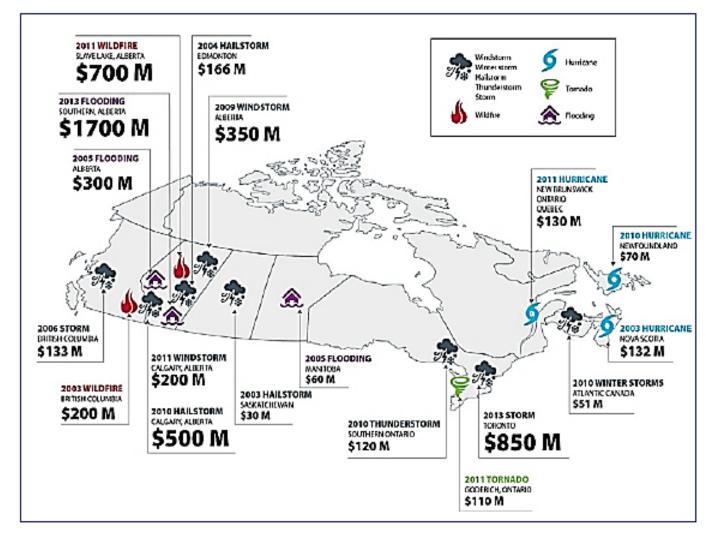
2013: $3.2B

2016: $4.9B

2017: $7.3B

2018: $1.9B

2019: $1.9B



**2011 WILDFIRE** SLAVE LAKE, ALBERTA $700 M

**2004 HAILSTORM** EDMONTON $166 M

**2013 FLOODING** SOUTHERN, ALBERTA $1700 M

**2009 WINDSTORM** ALBERTA $350 M

**2005 FLOODING** ALBERTA $300 M

**2011 HURRICANE** NEW BRUNSWICK ONTARIO QUEBEC $130 M

**2010 HURRICANE** NEWFOUNDLAND $70 M

2006 STORM BRITISH COLUMBIA $133 M

2011 WINDSTORM CALGARY, ALBERTA $200 M

2005 FLOODING MANITOBA $60 M

**2003 HURRICANE** NOVA SCOTIA $132 M

**2003 WILDFIRE** BRITISH COLUMBIA $200 M

2010 HAILSTORM CALGARY, ALBERTA $500 M

2003 HAILSTORM SASKATCHEWAN $30 M

2010 THUNDERSTORM SOUTHERN ONTARIO $120 M

2013 STORM TORONTO $850 M

2010 WINTER STORMS ATLANTIC CANADA $51 M

**2011 TORNADO** GODERICH, ONTARIO $110 M

Legend: Windstorm / Winter storm / Hailstorm / Thunderstorm / Storm — Hurricane — Tornado — Wildfire — Flooding

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# Climate Resilience

In the long run it is nearly always **less challenging and less expensive to build resilience into planning and design prior to development** rather than as a response to a major event.

## But how do we do this?

'The Institute for Building Sciences estimates that **every dollar invested in building resilient infrastructure saves $6 in future costs** including economic disruptions, property damage, public health crises, and deaths caused by extreme weather disasters.'
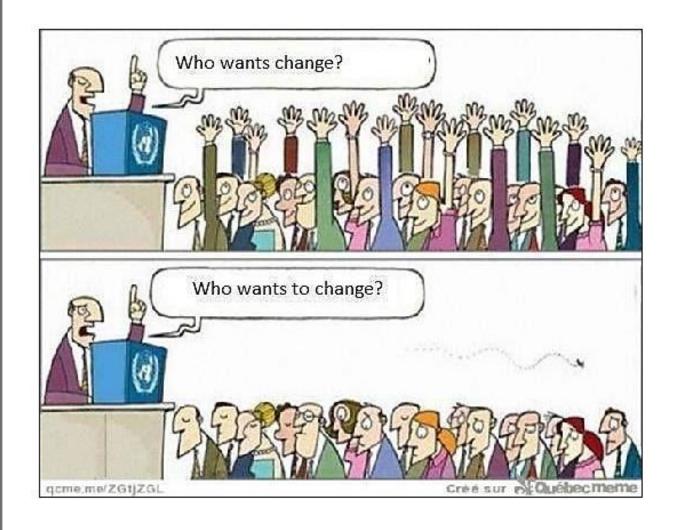
# Questions with Resilience In Mind

- ✓ Have we **incorporated climate projections** into all aspects of our planning, design and development?

- ✓ **Have we considered natural assets and the ecosystem services provided in our planning, design and development?**

- ✓ Have we ensured service **redundancies** for critical services in our planning, design and development?

# Planning Process

**Step 1:** Initiate the process / project

**Step 2:** Articulate and assess the baseline (incl. trends and projections)

**Step 3:** **Identify and prioritize hazards, risks, vulnerabilities and opportunities**
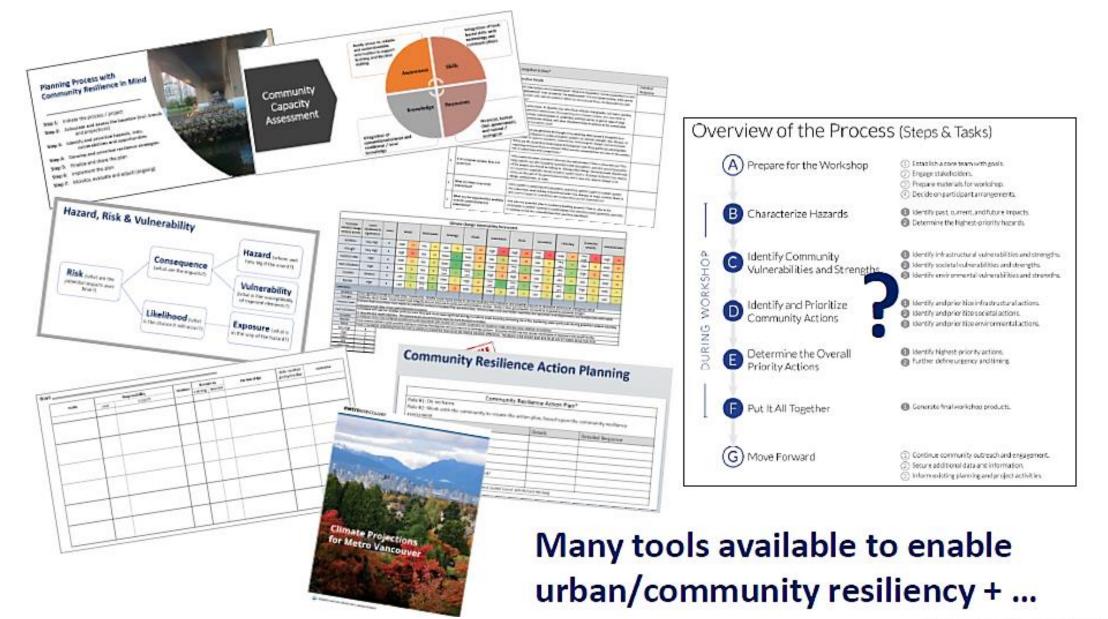
**Step 4:** Develop and prioritize resilience strategies

**Step 5:** Finalize and share the plan

**Step 6:** Implement the plan

**Step 7:** Monitor, evaluate and adjust (ongoing)



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Many tools available to enable urban/community resiliency + ...

Community Resilience Building

Overview of the Process (Steps & Tasks)

DURING WORKSHOP

(A) Prepare for the Workshop
- ① Establish a core team with goals.
- ② Engage stakeholders.
- ③ Prepare materials for workshop.
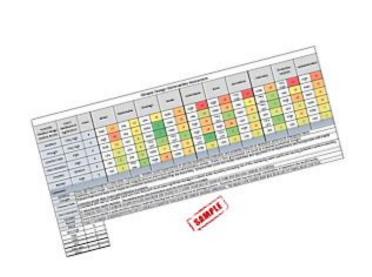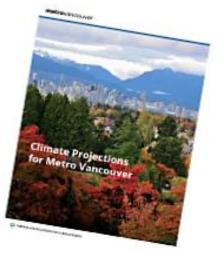- ④ Decide on participant arrangements.

(B) Characterize Hazards
- ① Identify past, current, and future impacts.
- ② Determine the highest-priority hazards.

(C) Identify Community Vulnerabilities and Strengths
- ① Identify infrastructural vulnerabilities and strengths.
- ② Identify societal vulnerabilities and strengths.
- ③ Identify environmental vulnerabilities and strengths.

(D) Identify and Prioritize Community Actions
- ① Identify and prioritize infrastructural actions.
- ② Identify and prioritize societal actions.
- ③ Identify and prioritize environmental actions.

(E) Determine the Overall Priority Actions
- ① Identify highest-priority actions.
- ② Further define urgency and timing.

(F) Put It All Together
- ① Generate final workshop products.

(G) Move Forward
- ① Continue community outreach and engagement.
- ② Secure additional data and information.
- ③ Inform existing planning and project activities.

# Community Resilience Building
## *#1*

## A. Prepare

  1) Establish working group with goals, terms of reference, etc

  2) Communicate and engage

  3) Prepare materials, etc



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# Community Resilience Building
# #2

**B. Characterize Hazards**

    1) Identify past, current and future impacts

    2) Determine the highest priority hazards

# Community Resilience Building
## #3

**C.** **Identify Community Vulnerabilities and Strengths**

   1) Identify **infrastructural** vulnerabilities and strengths

   2) Identify **societal** vulnerabilities and strengths

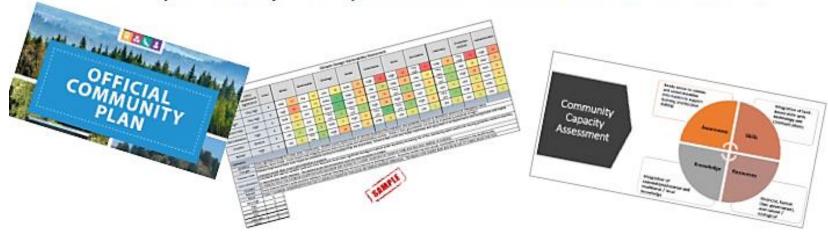   3) Identify **environmental** vulnerabilities and strengths

   **(NATURAL ASSETS)**

# Community Resilience Building #4

**D.** **Identify and Prioritize Community Actions**

1) Identify and prioritize **infrastructural** actions

2) Identify and prioritize **societal** actions

3) Identify and prioritize **environmental** actions

# Community Resilience Building
# *#5*

## E. Determine the Overall Priority Actions

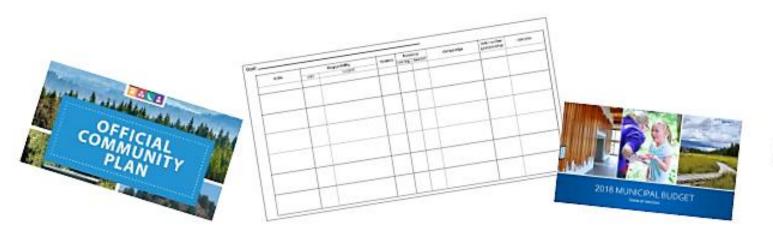1) Identify highest priority actions

2) Further define urgency and timing

# Community Resilience Building #6

## F. Pull It All Together

1) Generate final workshop **ACTION PLAN**

# Community Resilience Building #7

## G. Implement the ACTION PLAN

    1) Communicate and engage

    2) Secure additional data and information
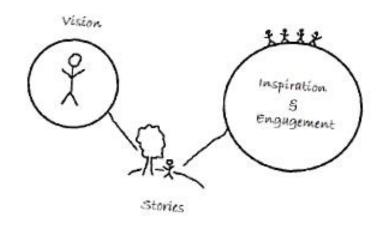
    3) Ongoing monitoring, evaluation and adaptation

# Essential Steps to Enabling Resiliency

## Include:

1) Foundations for Building Community Resilience

2) Tell the Story

# Evidence alone means nothing
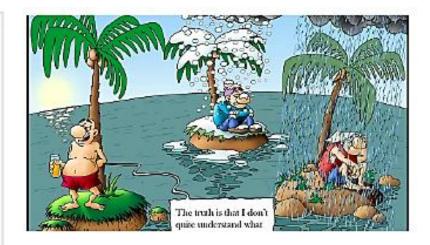
## .... we need to tell the story

*In broaching climate change with the public, don't start by making scientific declarations to people who rarely read or think about science. Far better to* **start with the climate change effects our audience is already aware of**, *particularly in resource-producing areas, and then present the science to help explain.*
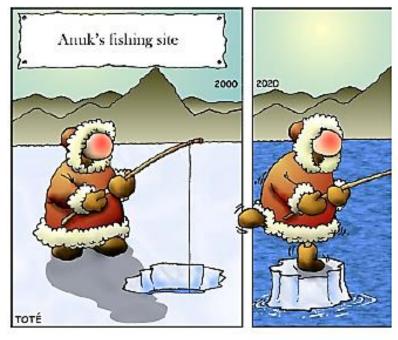
**For example**, *start with a loggers' awareness that winters are no longer cold enough to kill the pine beetle, or oil drill crews' awareness that it's taking longer for muskeg to freeze and allow drilling each fall.*

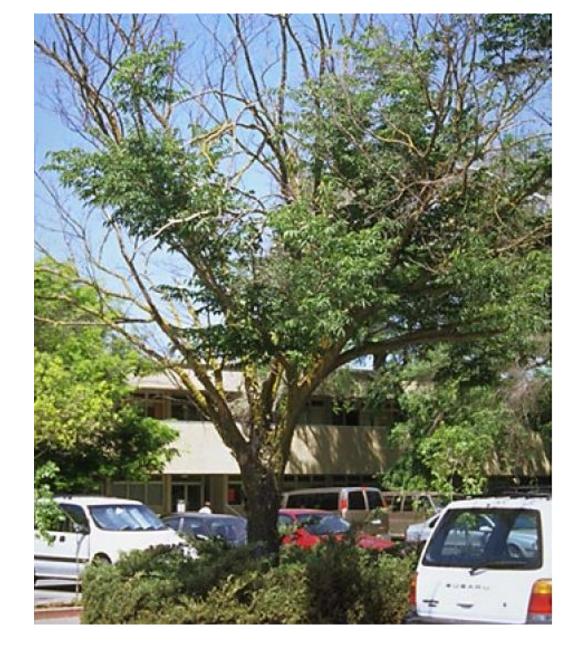**AMONTario**
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## Tell a human story, not a scientific one.

Listeners and readers must relate information on climate change to their daily lives, or to real stories involving real people suffering from climate impacts. We urgently need to shift climate change from a scientific to a social reality.

# Tell the story ....

*Climate projections indicate an increase in duration and intensity of drought*

**VS**

*Our street and park trees are dying due to the stress from increase in drought ... fires within the community are becoming more common ...We're worried about the future due to the increase of drought.*

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# Tell the Story …

Climate projections indicate an decrease in annual precipitation potentially impacting softscape areas / urban green space.

### VS

'Our community's parks and street trees have an estimated value of $22,000 each! That is a lot of money invested in our trees and green space. Let's work together to ensure we can continue to rely on our trees / green space!'



This tree gives back $21,950.00 worth of environmental benefits

# Takeaways

**'Engage your planner early and often!'**

We (registered professional planners; RPPs) are the precursor to all things human development by way of community planning, land use planning, economic development planning, asset management planning, heritage planning, ... these are assets that we are planning for – and the process needs to be in concert with all relevant asset mgmt. and planning personnel.

**For example, engaging planners early and often is to include them on the core asset management steering committees ...**

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# Takeaways

RPPs should consider asset management planning to be a **community planning framework** whereby effective and tangible outcomes in the community planning process can be realized by way of utilizing the asset management planning framework.

**Good governance = transparency + accountability + equity**

**Good governance** can be clearly illustrated via comprehensive community asset management planning.

# Session Journey ..........

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*Questions?*
*Thoughts?*



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