What’s Climate Got to Do With It?
Pacific Climate Impacts Consortium

Founded in 2005; sister organization to Pacific Institute for Climate Solutions (PICS)
Make use of recent findings in climate research
Applications to planning, design, decision-making

Regional Climate Impacts
- developing, providing, interpreting future projections of regional climate change
- statistical downscaling, indices of extremes

Hydrologic Impacts
- hydrologic impacts of climate change and variability; streamflow projections

Climate Analysis and Monitoring
- historical climate data and interpretation, seasonal climate predictions
Responding with Poll Everywhere

Web voting

Text voting
What are the most pressing issues / most common challenges facing your community today?
NE (1) word or phrase, what was a remarkable weather event or climate impact in the past 3 or 4 years?
<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Minutes 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slides 28</td>
<td></td>
</tr>
<tr>
<td>Maps 4</td>
<td>200%</td>
</tr>
<tr>
<td>Plots 2</td>
<td>80%</td>
</tr>
<tr>
<td>Photos 9</td>
<td>50%</td>
</tr>
<tr>
<td>Cartoons 0</td>
<td>0%</td>
</tr>
<tr>
<td>Humour</td>
<td>5% ?</td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a diet of one professional development workshop.
Taking future climate into account is necessary possible
Climate varies by location & with time
Climate Varies by Location and with Time
By the 2050s Vancouver will have

**WARMER WINTERS**

- 58% decrease in snowpack
- Learn more: vancouver.ca/climateadaptation

By the 2050s Vancouver will have

**HOTTER SPRINGS**

- Mountain snow melts earlier
- More frequent heat waves
- Increased health risks to vulnerable people
- Learn more: vancouver.ca/climateadaptation
Taking future climate into account is necessary and possible.
Climate Projections

- Warmer winter temperatures and fewer days below freezing
- More extreme hot days in summers and longer dry spells in summer months
- More precipitation in the fall, winter and spring
- Increased frequency and intensity of precipitation and storm events
Fewer frost days

https://news.ubc.ca/2013/03/26/mountain-pine-beetle-genome-decoded/
Fewer days with frost

Days with night-time low below 0°C: ~188 for 1971-2000 → -51 (-37 to -64) days in 2050s
Increased hot days
More hot days

Day-time high >25°C: regional average 25 days 1971-2000 → +28 (+15 to +41) days in 2050s
More frequent and more intense wet days

Bella Coola Sept 2010
Increased precipitation on wet days:

- Precipitation on wet days: ~155 mm for 1971-2000 → +33% (+21% to +52%) in 2050s.
Decreased snowpack

2015 Metro Vancouver
www.nsnews.com/news/dry-summer-puts-focus-on-water-use-1.2012407
Decreased Snow Pack – Increasing spring temp overnight low temperature: -1.6°C for 1971-2000 → 1.5°C (0.4°C to 2.6°C) in 2050s
Changes to streamflow

Lower and earlier peak

Lower in summer

• **Climate Projections**

  - Warmer winter temperatures and fewer days below freezing
  - More extreme hot days in summers and longer dry spells in summer months
  - More precipitation in the fall, winter and spring
  - Increased frequency and intensity of precipitation and storm events
Rate and magnitude of change

Spruce Suitability

2050s Spruce Suitability

2080s Spruce Suitability
Share one (1) word to describe how you're feeling right now.
Taking future climate into account is necessary and possible.
Now what: What is a challenge to taking climate change into account in your organization?
Now what: What is a step you can take toward considering future climate in your organization?
Mindset shifts to plan for climate change

“Stationarity is dead”

Plan for Resilience

“Restrictions breed creativity”
- Mark Rosewater
Start anywhere
Focus on what you know
Identify a team
Expect surprises
Embed in processes
Collaborate
Use resilience principles
Try things out
Be shovel-ready
Explore your own data
Plan action!
Iterate
Learn
Revisit processes
Best Practices

Make use of available climate information

Consider a range of future projections

Practice cross-disciplinary engagement

Iteration, iteration, iteration
Online adaptation tools webinar

https://www.youtube.com/watch?v=jxj-3gPkDW4

Resources to accompany BC Regional Adaptation Collaborative webinar
November 2016

Adapt http://pacificclimate.org/analysis-tools/plan2adapt

Short course http://pics.uvic.ca/education/climate-insights-101#quicktabs-insights_101=1

e-BC

HectaresBC http://www.hectaresbc.org

ClimateWNA http://genetics.forestry.ubc.ca/cfgc/ClimateWNA/ClimateWNA.html

ClimateBC Online http://www.genetics.forestry.ubc.ca/cfgc/ClimateBC40/Default.aspx

BC Climate Explorer http://www.bc-climate-explorer.org/

Data Portals https://pacificclimate.org/data

Basin

https://nplcc.databasin.org/galleries/5a3a424b36ba4b63b10b8170ea0c915e#expand=105363%2C1061067%2C110010%2C105359%2C105364
Questions?

ktyler@uvic.ca

www.PacificClimate.org
IC* climate tools for BC

- Plan2Adapt
- Regional Analysis Tool
- ClimateBC / ClimateWNA / HectaresBC / BC Climate Explorer
- PCIC data portals
  - BC station data
  - High-resolution PRISM climatology
  - Statistically downscaled climate scenarios
  - VIC hydrological model output (gridded)
  - Station hydrological model output
- Seasonal maps
## IC* climate tools for BC

<table>
<thead>
<tr>
<th>Tool</th>
<th>Primary* audiences</th>
<th>Ease of use</th>
<th>Flexibility</th>
<th>Type of output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan2Adapt</td>
<td>Planners, Decision-makers, Consultants</td>
<td>Easy</td>
<td>Low</td>
<td>Summary table, Maps, Possible impacts</td>
</tr>
<tr>
<td>Regional Analysis Tool</td>
<td>Impacts researchers, Engineers</td>
<td>Difficult → Medium</td>
<td>High</td>
<td>Maps, Plots, Regional analysis</td>
</tr>
<tr>
<td>PCIC data portals</td>
<td>Impacts researchers, Hydrologists, Consultants</td>
<td>Medium</td>
<td>Medium</td>
<td>Data</td>
</tr>
<tr>
<td>Seasonal maps</td>
<td>Managers</td>
<td>Easy</td>
<td>Low</td>
<td>Maps</td>
</tr>
<tr>
<td>ClimateBC</td>
<td>Foresters</td>
<td>Medium</td>
<td>High</td>
<td>Data, Maps</td>
</tr>
<tr>
<td>ClimateWNA</td>
<td>Ecologists</td>
<td>Medium</td>
<td>High</td>
<td>Maps, Data</td>
</tr>
<tr>
<td>HectaresBC</td>
<td>Impacts researchers</td>
<td>Medium</td>
<td>High</td>
<td>Maps, Data</td>
</tr>
<tr>
<td>Databasin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC Climate Explorer</td>
<td>Foresters, general</td>
<td>Easy</td>
<td>Medium</td>
<td>Maps, Plots</td>
</tr>
</tbody>
</table>
More resources

• Educational/background
  • CBC podcast mini series
  • Pacific Institute for Climate Solutions (PICS): Climate Insights 101
  • What if climate change is real? – Katherine Hayhoe Ted Talk

• Adaptation guidance
  • PICS adaptation in buildings infographic
  • Infrastructure Canada Climate Lens
  • BC Ministry of Transportation and Infrastructure Technical Circular
  • EGBC guidance document
  • Climate / engineering language primer
  • National guidebook on climate scenarios
Climate Projections Reports released by regional districts

- Climate Projections for the Cowichan Valley Regional District
- Climate Projections for the Capital Region
- Climate Projections for Metro Vancouver
  - Climate Projections for Whistler
  - City of Vancouver Climate Impacts Summary

Webinar: Three important factors for adaptation: location, location, location
https://goo.gl/cVWJZ1
2015 / 2016 /2017 weather events, seasons

[Image of Thompson River at Spences Bridge]


Adaptation and Mitigation – Discussion

Increasing Mitigation

N-C + Future Climate

Net Zero

Net Carbon

Increasing Adaptation

PIEVC

Maladaptation

Low Carbon Resilience

Unsustainability

New Vulnerabilities

Existing Bldgs

Code Minimum

High AFUE

PH w/ Fossil Fuel

PH

All Electric

Clean Grid

All Electric

Cohen and Waddell, 2008 / Harford, 2018 / LePage 2018
Climate is not static”
Past and ongoing... greenhouse gas emissions are expected to alter most climatic regimes in the future”
... buildings will need to be designed, maintained, and operated to adequately withstand ever changing climate loads.”
Climate is not static”
Past and ongoing... greenhouse gas emissions are expected to alter most climatic regimes in the future”
... buildings will need to be designed, maintained, and operated to adequately withstand ever changing climate loads.”
The analysis generally assumes that the past climate will be representative of the future climate”
Energy Use

- Past

Unmet Cooling Hours

- Past (updated)

Source: UBC (Campus and Community Planning) with RDH Building Science