WEBINAR SERIES

FPInnovations

Climate tools: What are they good for? Absolutely something… but you can't always get what you want

February 13th 2020

With: **KARI TYLER,** User Engagement and Training Specialist,
Pacific Climate Impacts Consortium, University of Victoria

Notes:

- The webinar will start at 13:00 EST / 10:00 PST
- All lines are muted during the presentation
- Go to slido.com (smartphone or computer) to participate in live polls. **code: pcic**
- Audio connection: 1-844-630-9442; code: 731 447 065

Webinar Series

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Understanding decision-making about climate change impacts at a small watershed scale

FPInnovations

February 6

An Overview of Climate Change Tools Applied to Small Watershed Design Flood Calculations – Matt Kurowski, FPInnovations, Vancouver

PACIFIC CLIMATE IMPACTS CONSORTIUM

February 13

Climate tools: What are they good for? Absolutely something… but you can't always get what you want – Kari Tyler, Pacific Climate Impacts Consortium, University of Victoria

Institute for Catastrophic Loss Reduction

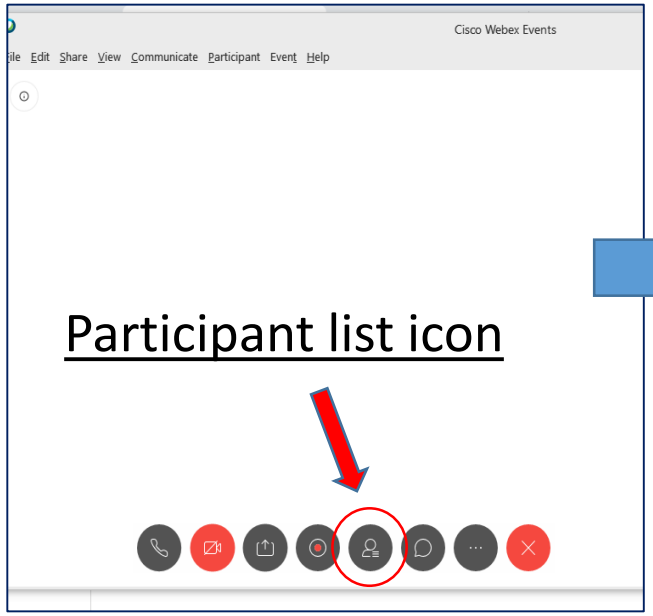
February 27

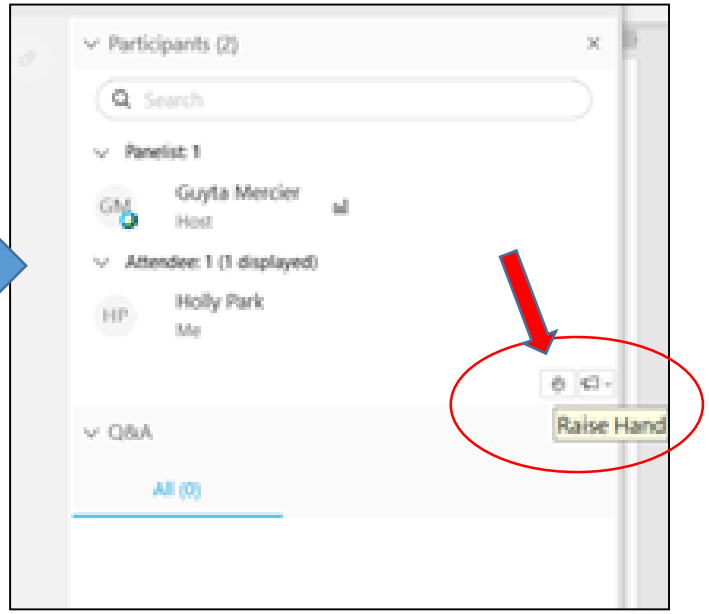
Rainfall Intensity Duration Frequency Curves for Future Climate Scenarios: A Publicly Accessible Computer Tool – Dr. Simonovic, Institute for Catastrophic Loss Reduction, Western University

Asking Questions

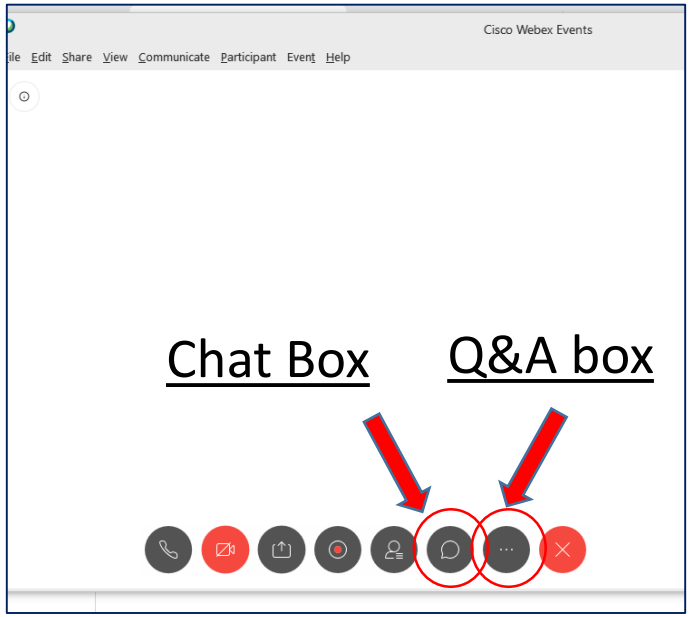
1. Open the participant list at the bottom of the screen to open a new window.

At the bottom right of this new window, use the raise hand icon to indicate that you would like to ask a question using audio.





2. You can also type your question in the Chat Box or the Q&A Box. Both are accessible at the bottom of your screen.



Questions/Discussion

Brian Chow – Chief Engineer, FLNRORD, Victoria

Matt Kurowski – Researcher, FPInnovations, Vancouver

Kari Tyler – User Engagement and Training Specialist, Pacific Climate Impacts Consortium

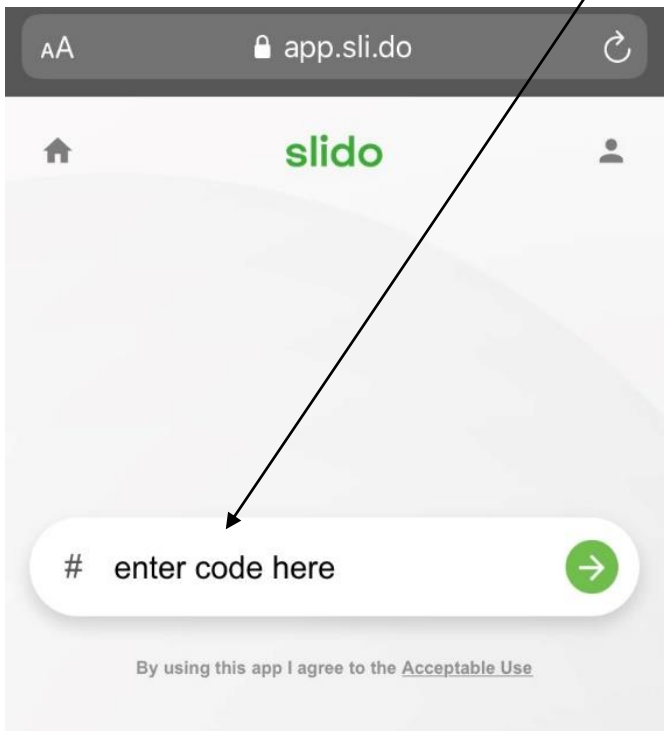
Arelia Schoeneberg – Hydrologist, Pacific Climate Impacts Consortium

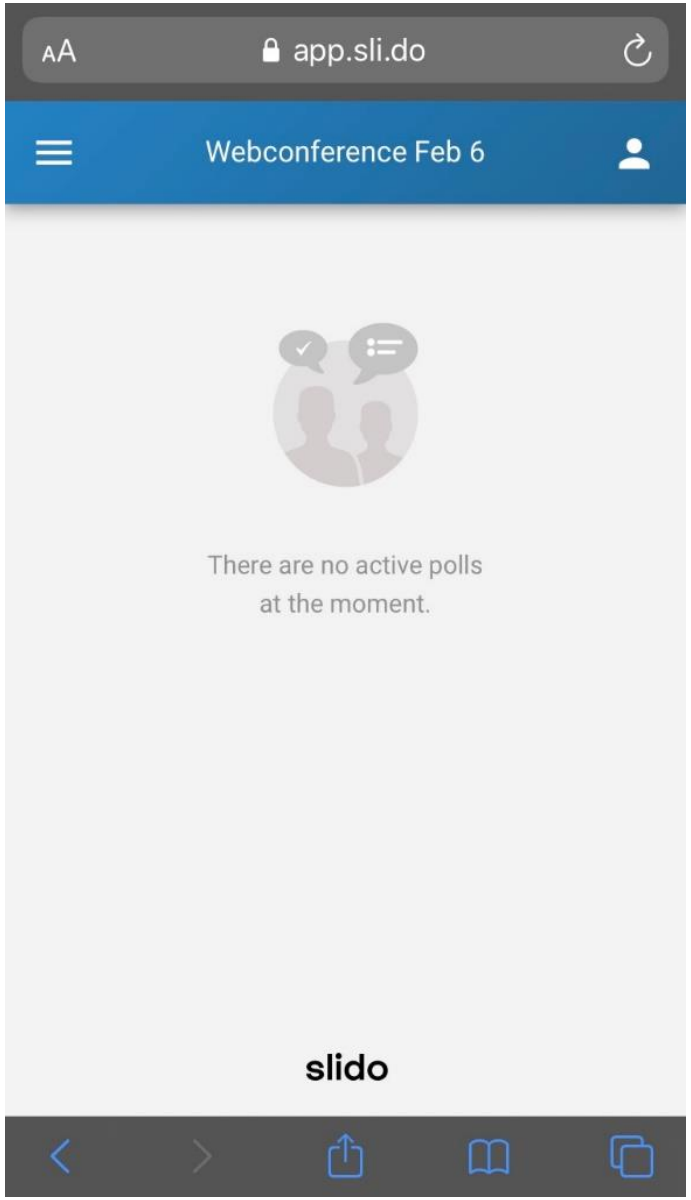
Dr. Slobodan Simonovic – Professor Emeritus, Institute for Catastrophic Loss Reduction, Western University

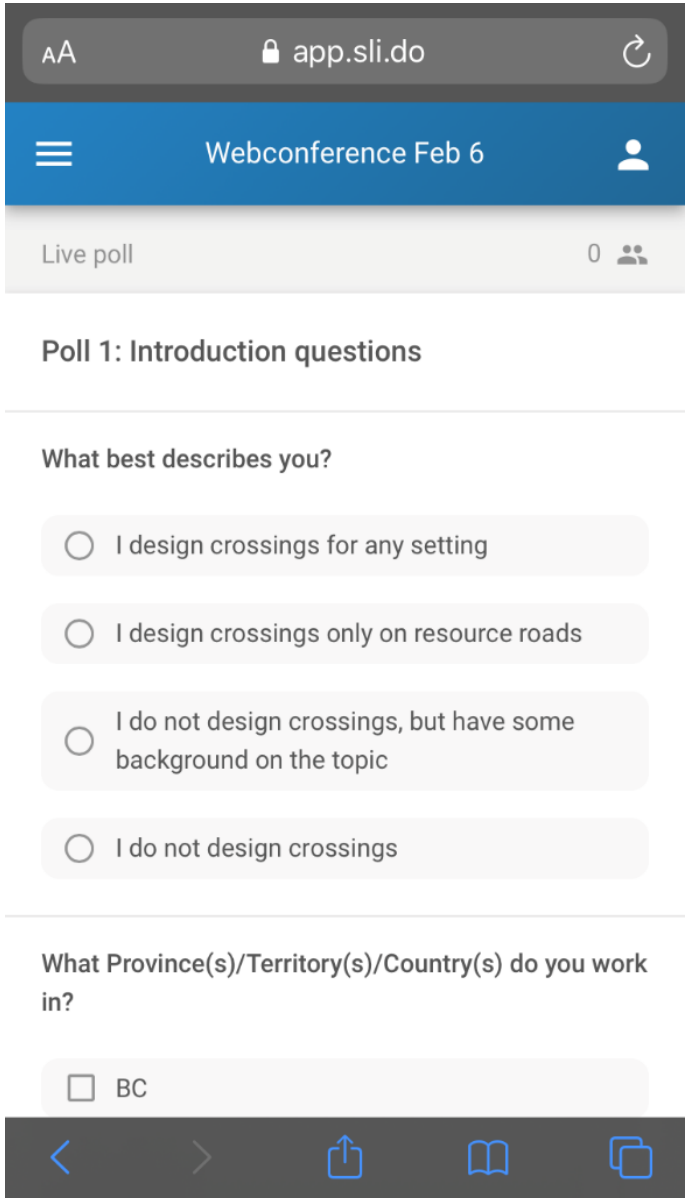
Poll # 1

Learning about who is here

go to: slido.com code: pcic







Why this webinar series?

BRITISH COLUMBIA

Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

Climate Tools: What are they good for?

13 February 2020
FPI Webinar Series; Climate Change tools for Small Watershed Crossings

Kari Tyler

Climate Tools.. What are they good for?

Absolutely something

...But you can't always get what you want

Weather: conditions at a specific location & time

December 2nd 2005

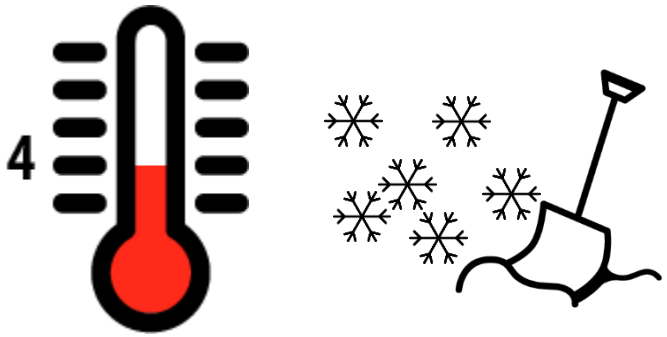
- -1°C snowing in _____
- 19°C sunny in _____

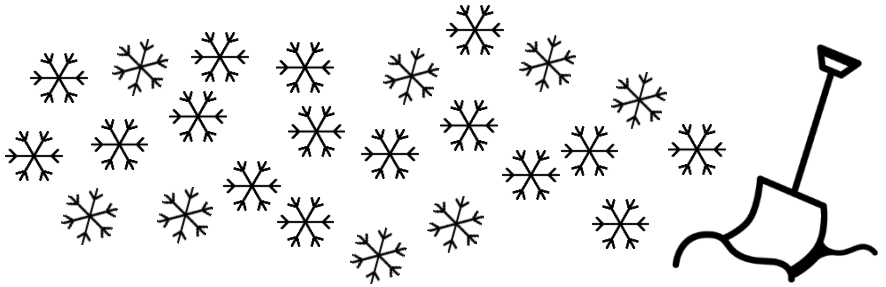
Climate: long term statistics of weather

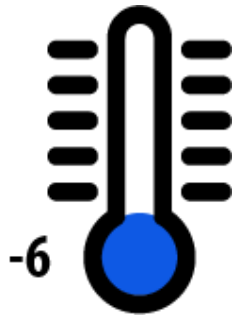
Climate: Long Term Statistics of Weather

- Weather: conditions at a specific location and time
  - December 2nd 2005
    - -1°C snowing in Victoria
    - 19°C sunny in Montreal

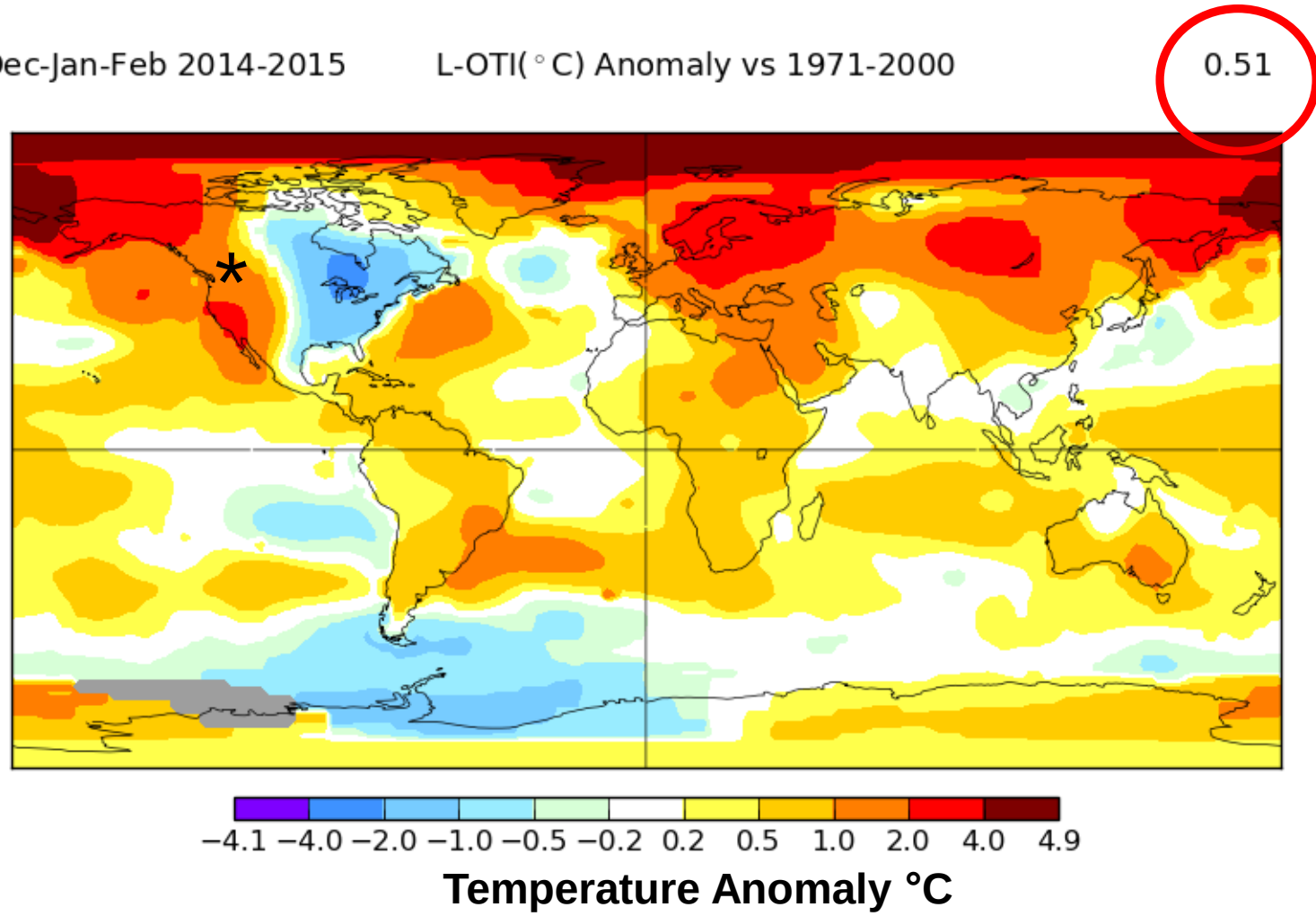
- Climate: long term statistics of weather
  - 1971-2000 average December





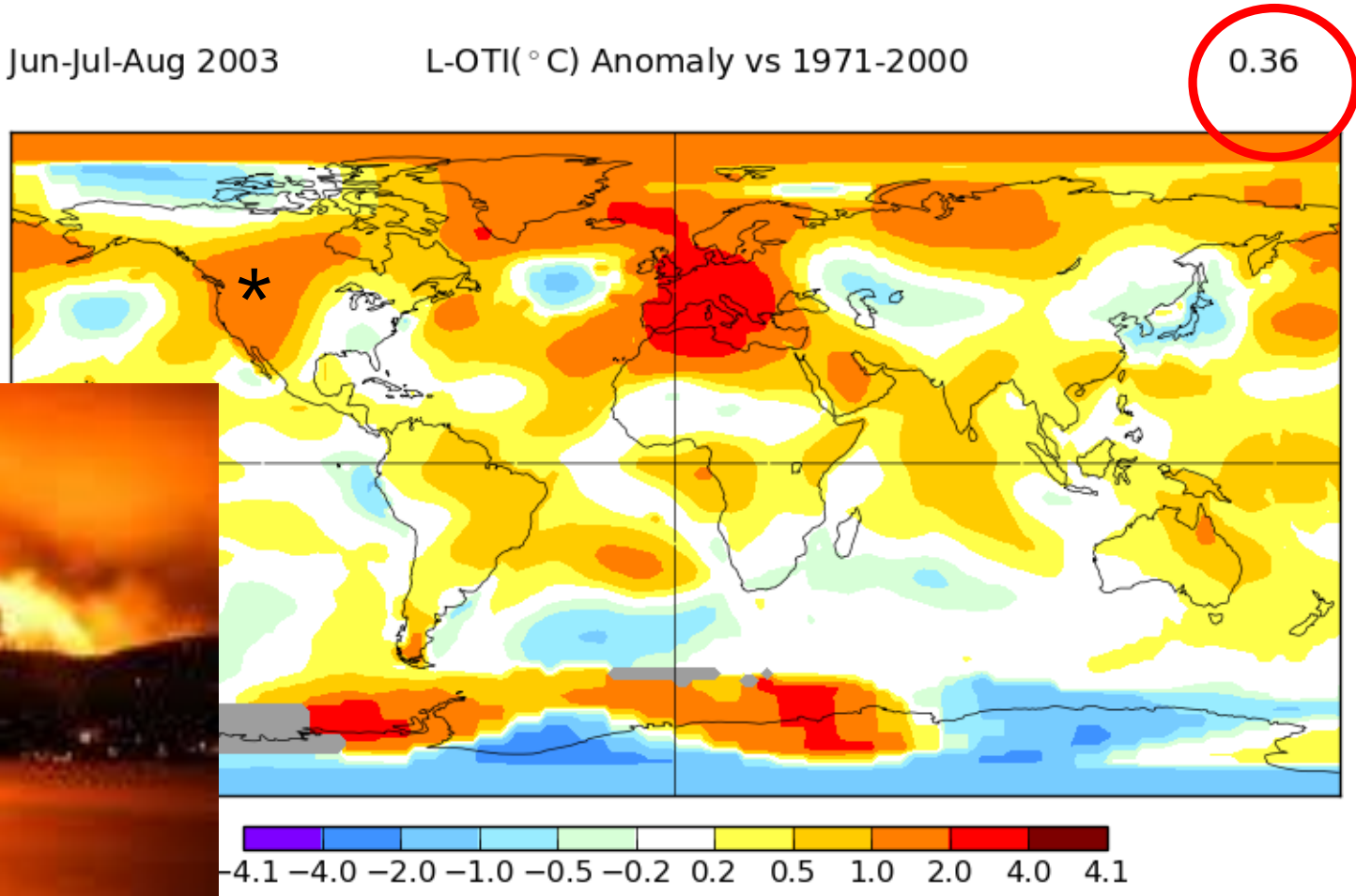


Climate varies by location & with time



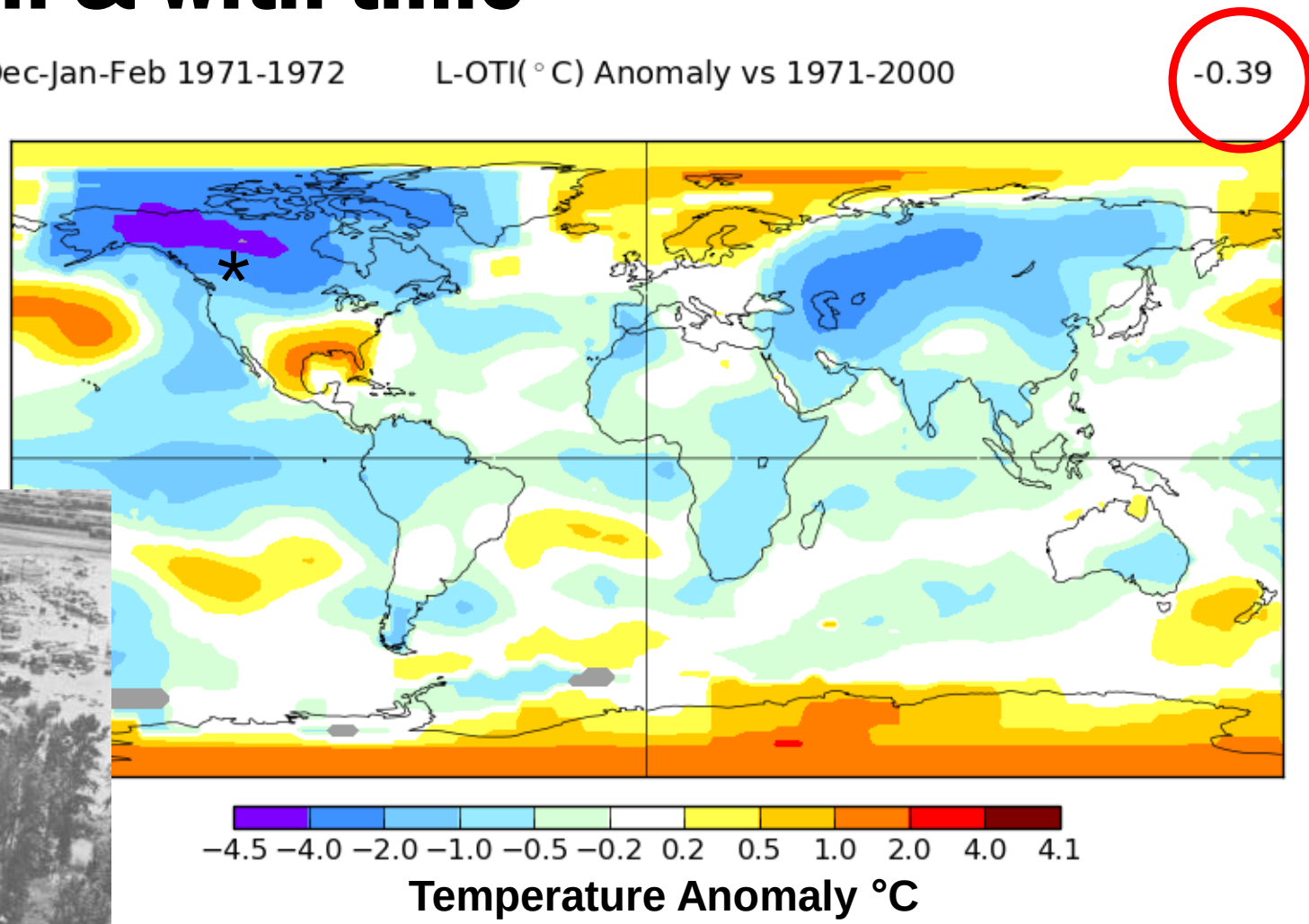
Goddard Institute for Space Studies
New York, N.Y.

Climate varies by location & with time



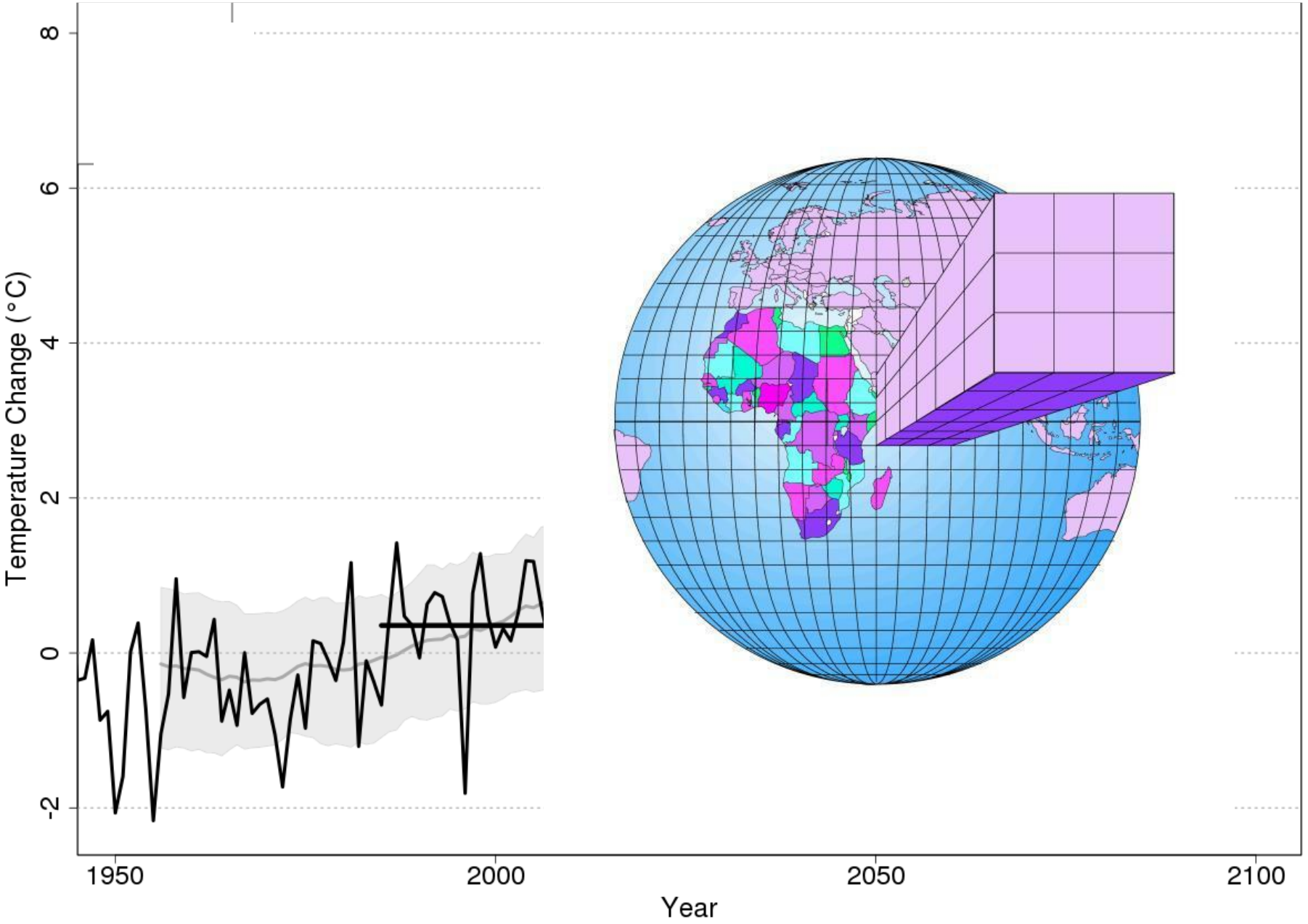
Goddard Institute for Space Studies
New York, N.Y.

Climate varies by location & with time

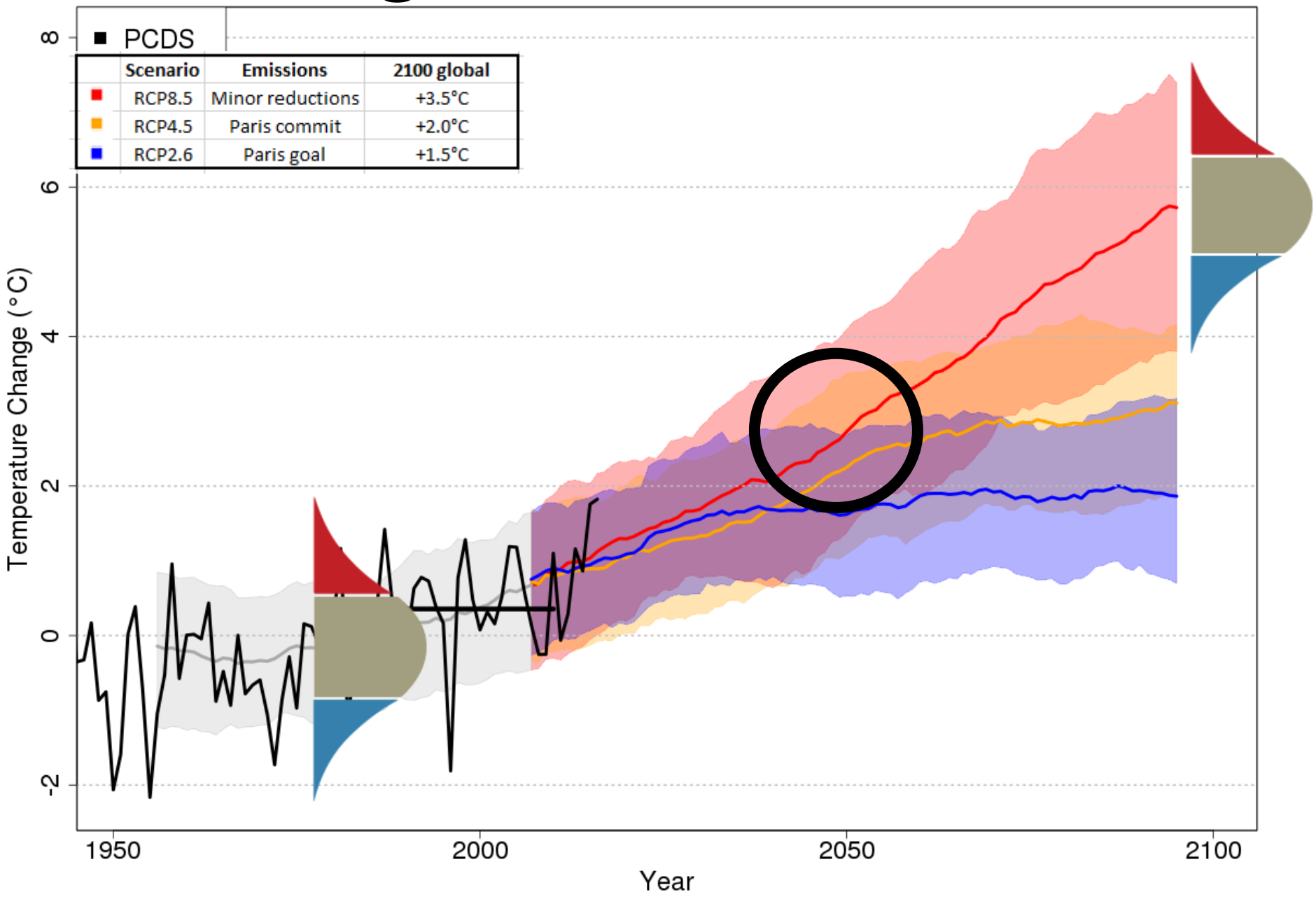


Goddard Institute for Space Studies
New York, N.Y.

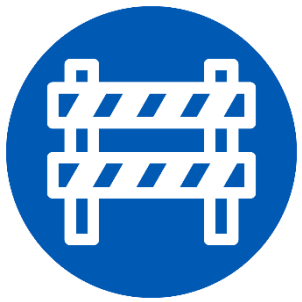
Historical average BC temperature → future

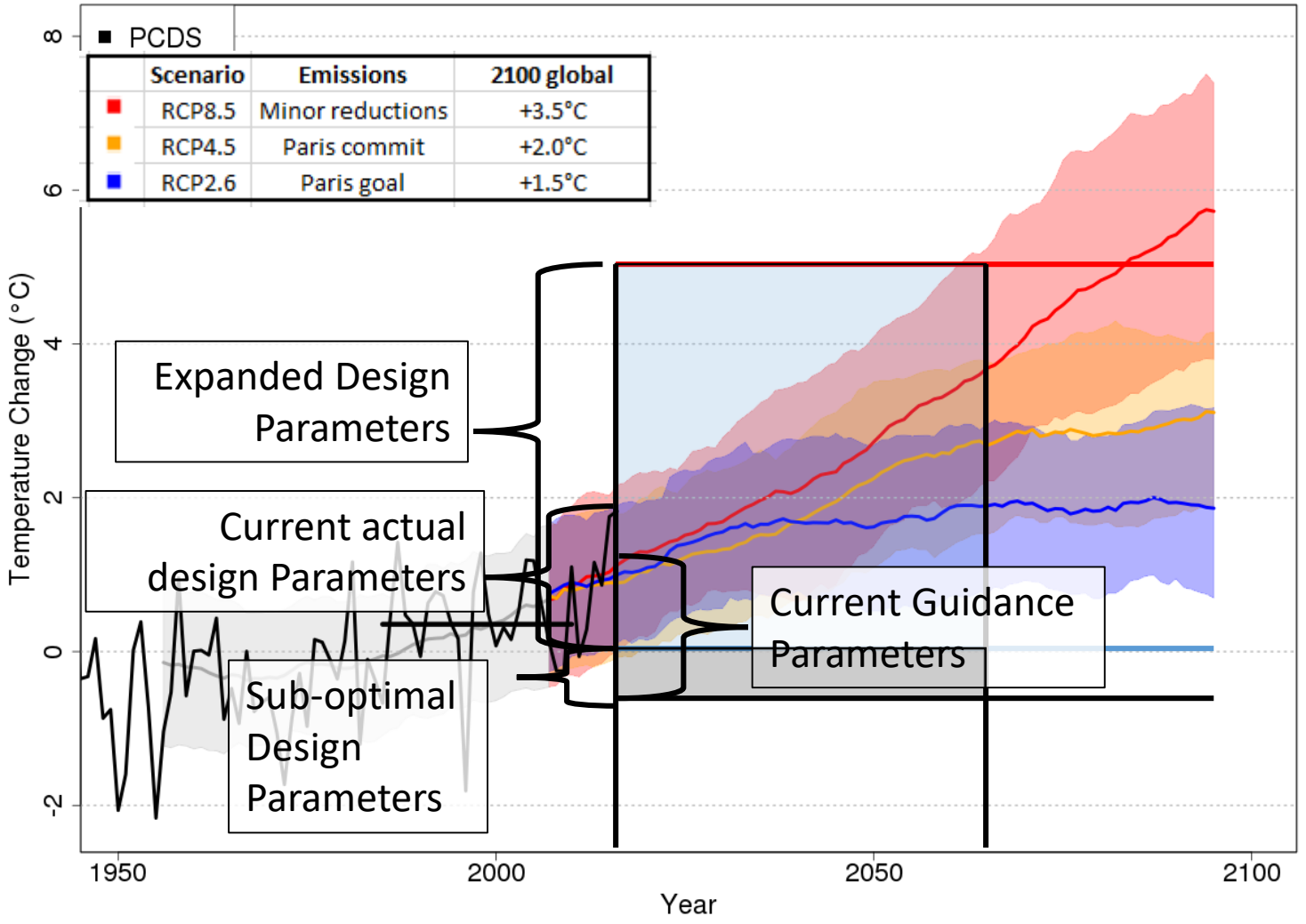


Future Warming in BC



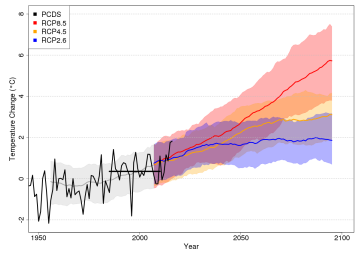
Climate Design Parameters





1. Future will be different from the past
2. The present is different from the past
3. There are a wider range of conditions to design for.
4. Conditions continue to change in all but best case
5. 2050s cautious roughly equals 2070s optimistic

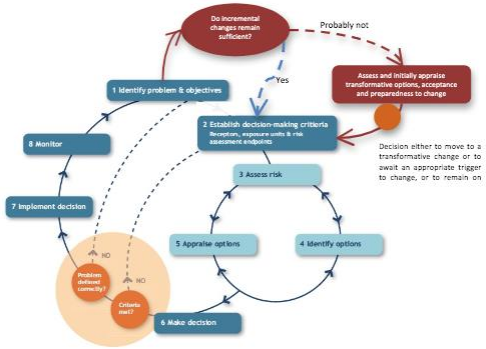
Adaptation Best Practices



- Start using future projections

- Expect future climate information to be different from what you used in the past

- Talk to people with different roles



- Iterate: learn, rinse, repeat, learn, bump, turn, keep going, try again…

Resource – BC climate projections reports

Metro Vancouver

Capital Regional District

Cowichan Valley Regional District

Vancouver Coastal Health

BC Agriculture & Food Climate Action Initiative

PCIC Climate Explorer

https://pacificclimate.org/analysis-tools/pcic-climate-explorer

- Go to the link & try for yourself!

PCIC CLIMATE EXPLORER

PCIC's Climate Explorer (PCEX) is a tool for locating, visualizing and downloading data describing projected future climate conditions for regions of interest within the Pacific and Yukon Region. PCEX uses global climate model output from the fifth phase of the Coupled Model Intercomparison Project (CMIP5), BCCAQv2 10-kilometre resolution downscaled data, and the CLIMDEX indices of climate extremes, with a daily time resolution. PCEX provides visualizations in the form of maps and graphs

PCIC's Climate Explorer allows you to:

- select data from a dozen global climate models, three greenhouse-gas emissions scenarios, and many variables including temperature, precipitation, and climate indices
- select a specific time horizon (e.g., 2050s, 2080s, etc.) for output from each GCM
- define your specific region of interest and generate maps, plots, and data downloads pertaining to the area you specify
- generate maps showing projected changes for a specific region using downscaled data and generated climate extremes indices from each GCM
- compare specific climate variables for each GCM with the results from all of the other models to provide context for each individual model's results
- plot how climate variables change over time for each GCM
- display box plots for each future climate projection for the GCM

PCIC's Climate Explorer is a modern replacement for the Regional Analysis Tool (which will be be discontinued) and is a more sophisticated complement to PCIC's Plan2Adapt tool. With a more complex user interface and greater number of configurable options, the Climate Explorer is designed to serve the needs of technical users who need climate change information for engineering and impact studies.

Use PCIC's Climate Explorer.

PCEX VIDEOS

Use the following links for help on how to use the PCEX Tool:

Watch a video tour of the basic features of PCEX.
Watch a video tutorial demonstrating how to determine the 1-in-50 return period maximum 1-day precipitation at a specific location.

Dataset Filter

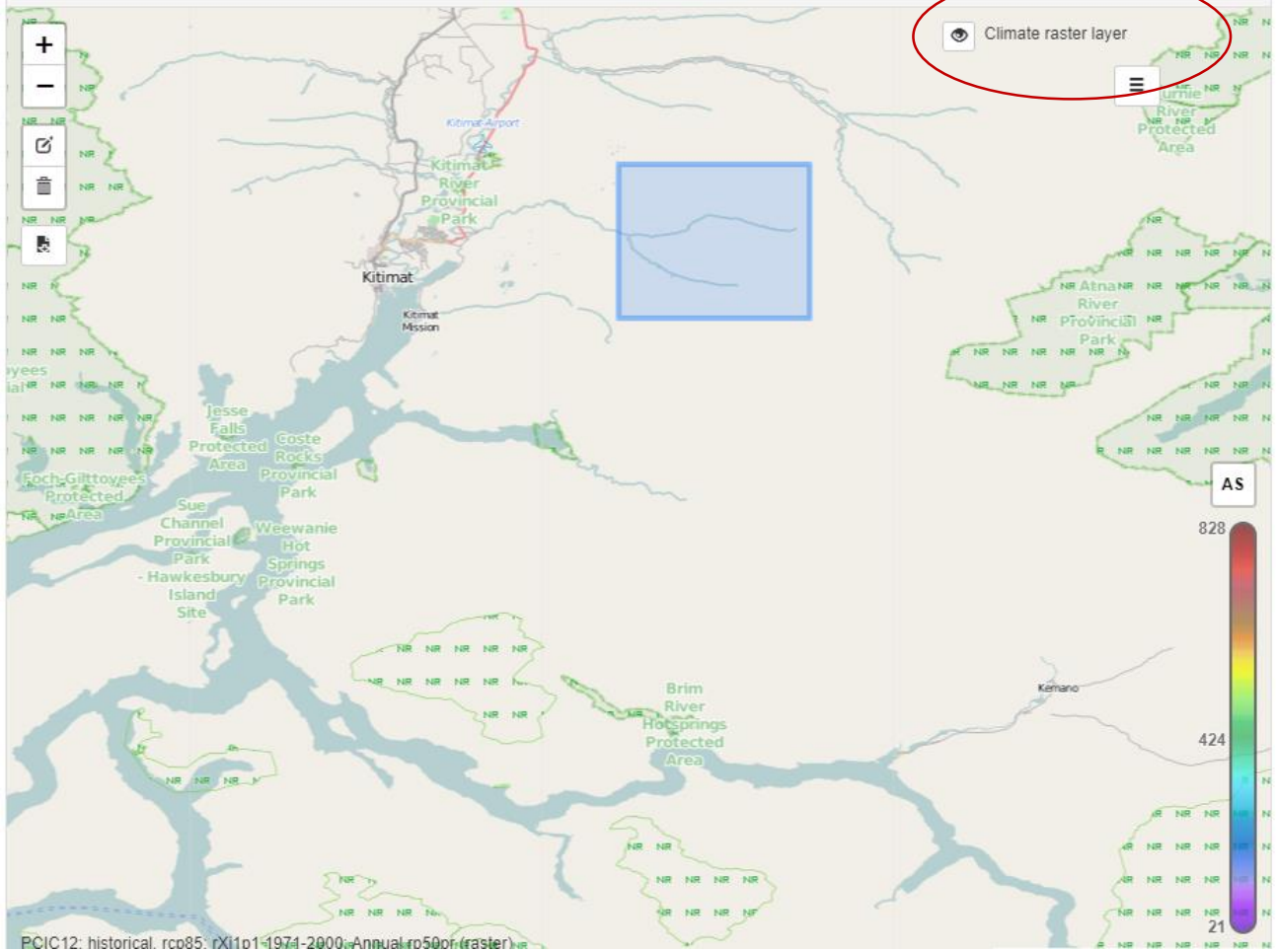
Model PCIC12

Emissions Scenario Historical, then RCP 8.5

Variable rp50pr - 50-year annual maximum one day precipitation amount

Filtered Datasets Summary — PCIC12 historical, rcp85: rp50pr → 4 datasets

Data Map — PCIC12; historical, rcp85; rXi1p1 1971-2000: Annual rp50pr (raster)

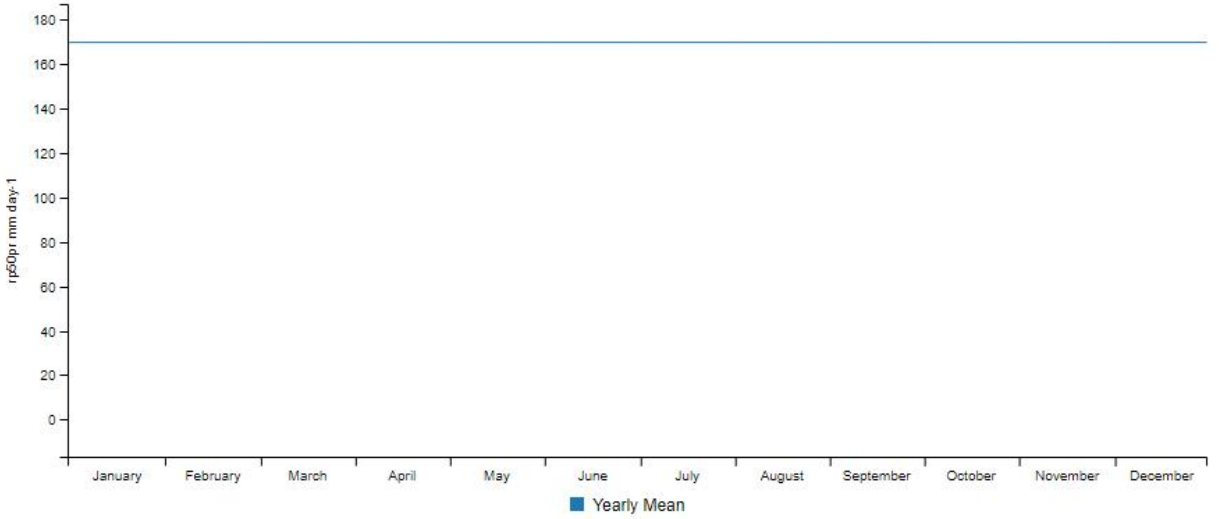


PCIC12; historical, rcp85; rXi1p1 1971-2000: Annual rp50pr (raster)

Data Graphs — PCIC12 historical, rcp85: rp50pr

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset Run 1 (rXi1p1), 1971–2000 **Export Data** XSLX CSV



filtered datasets

Statistical Summary — PCIC12 historical, rcp85: rp50pr

Time of Year Annual **Export Data** XSLX CSV

Run	Averaging Peri...	Min	Max	Mean	Median	Std.Dev	Units

Model: PCIC12

Emissions Scenario: Historical, then RCP 8.5

Variable: rp50pr - 50-year annual maximum one day precipitation amount

Filtered Datasets Summary: PCIC12 historical, rcp85: rp50pr ⟶ 4 datasets

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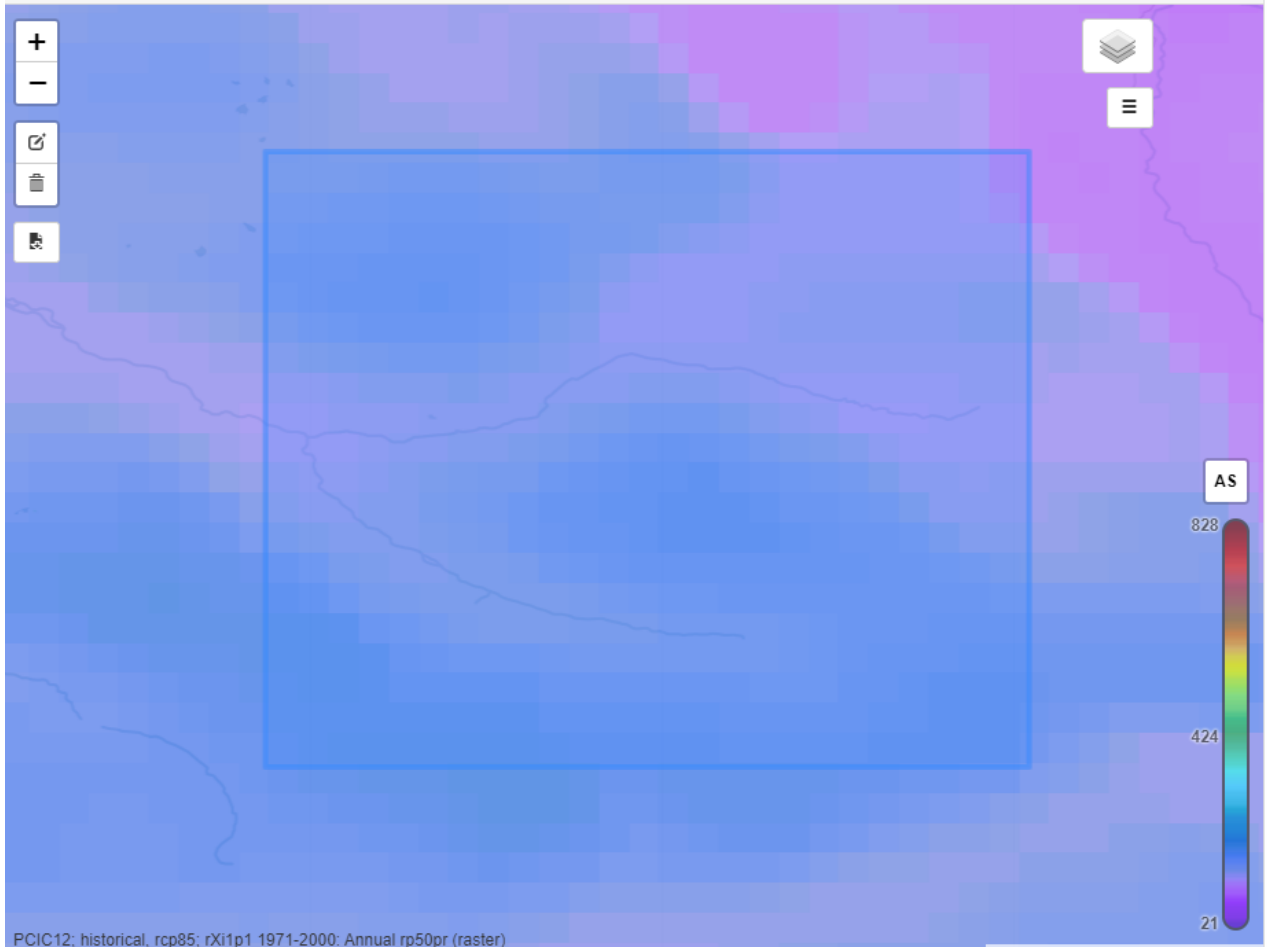
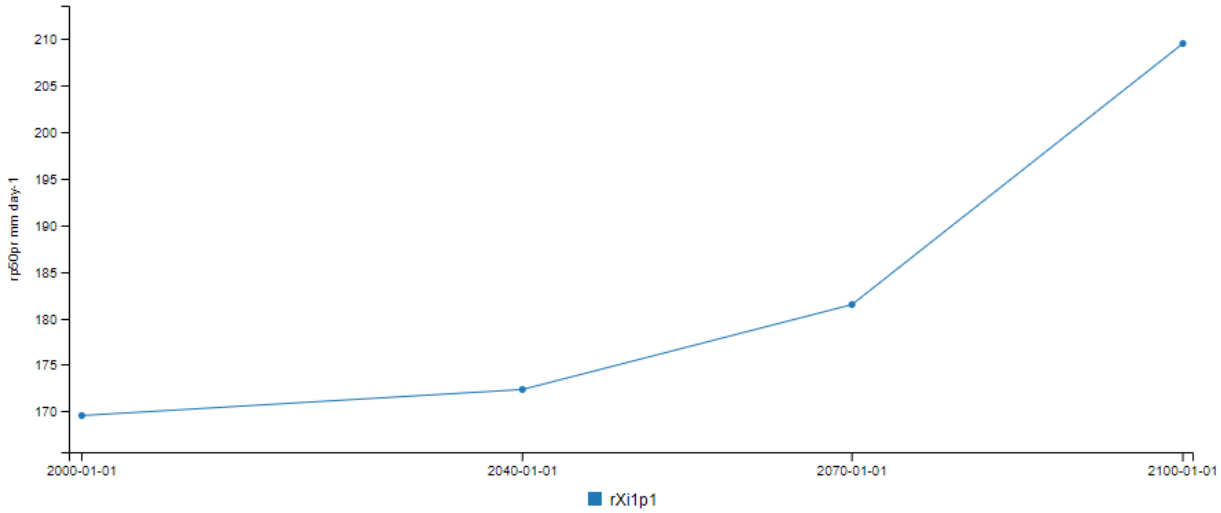


Data Graphs: PCIC12 historical, rcp85: rp50pr

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Time of Year: Annual

Export Data: XSLX CSV



filtered datasets

Statistical Summary: PCIC12 historical, rcp85: rp50pr

Time of Year: Annual

Export Data: XSLX CSV

Run	Averaging Peri...	Min	Max	Mean	Median	Std.Dev	Units

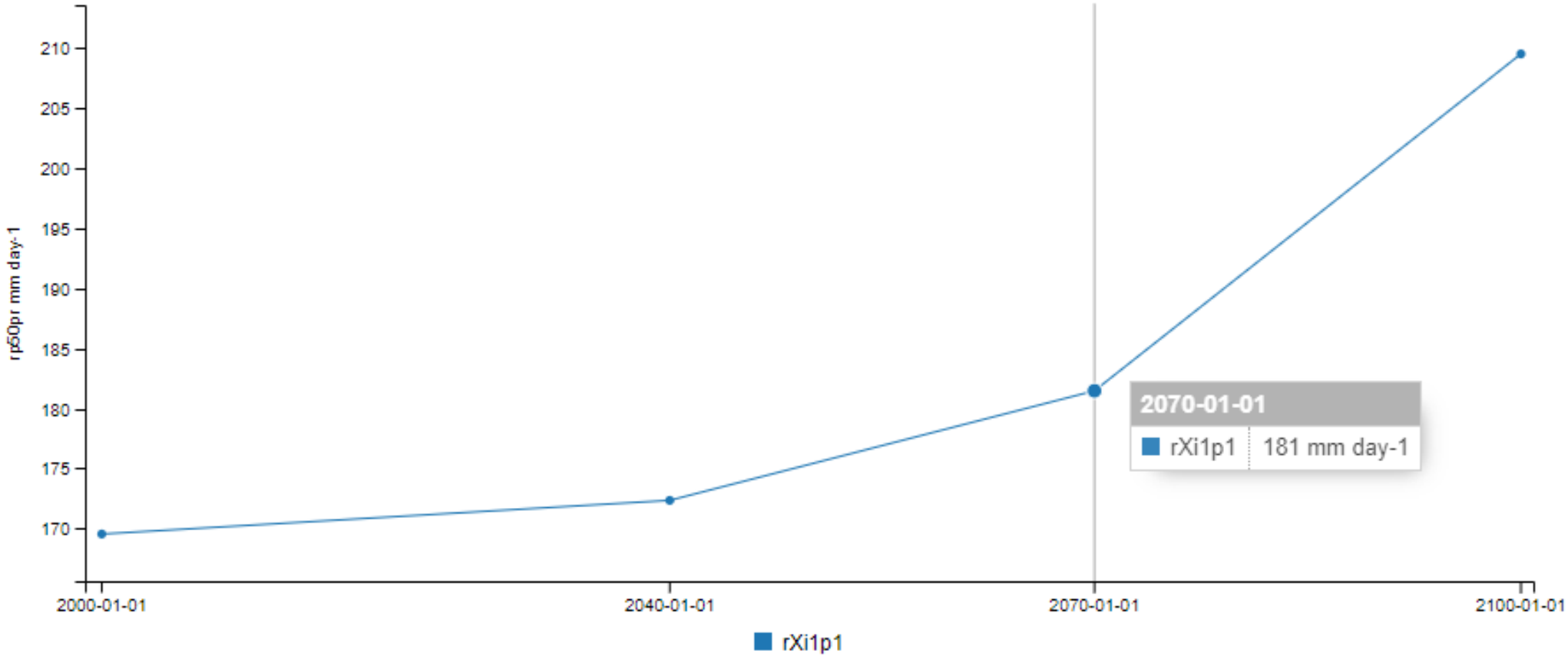
Data Graphs

PCIC12 historical, rcp85: rp50pr

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Time of Year Annual

Export Data XSLX CSV



Data Graphs

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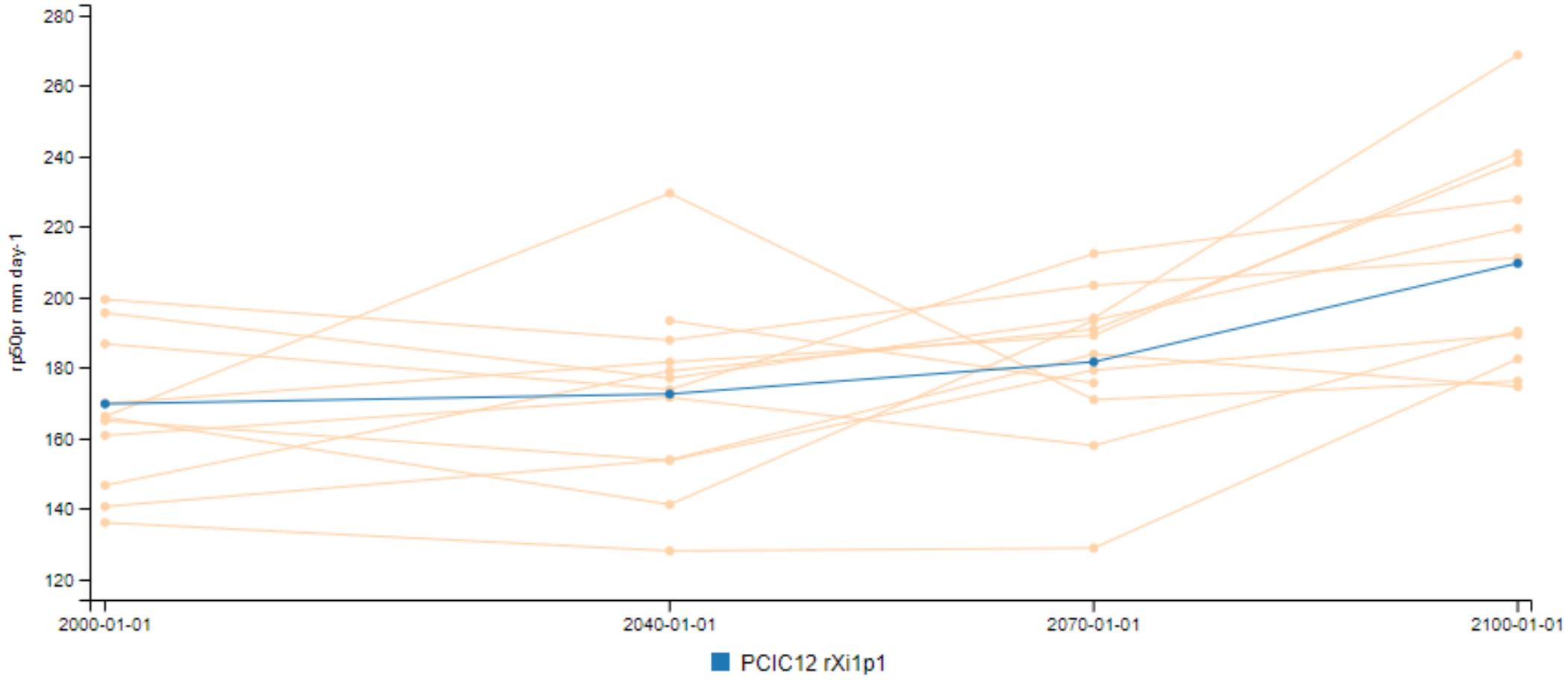

Data Graphs

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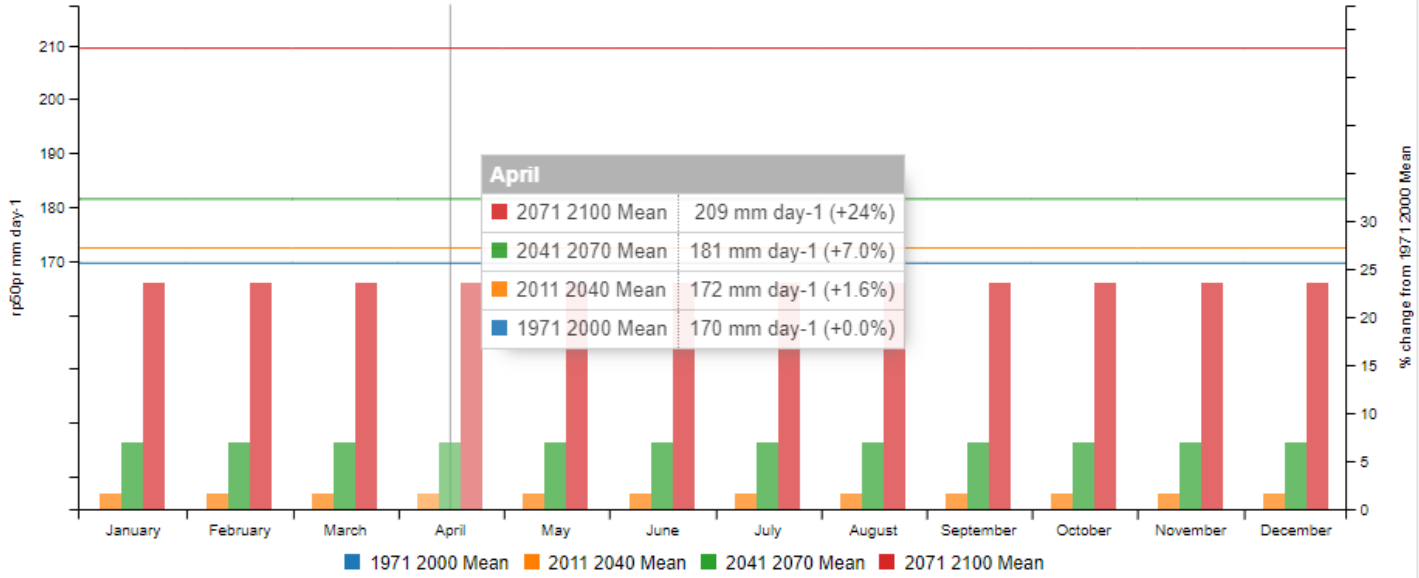
Dataset Run 1 (rXi1p1), 1971–2000

Export Data XSLX CSV



filtered datasets

Statistical Summary

PCIC12 historical, rcp85: rp50pr

Time of Year Annual

Export Data XSLX CSV

Run	Averaging Peri...	Min	Max	Mean	Median	Std.Dev	Units
rXi1p1	1971 - 2000	120.68	205.46	169.56	169.67	18.44	mm day-1
rXi1p1	2011 - 2040	124.99	208.74	172.36	171.86	17.67	mm day-1
rXi1p1	2041 - 2070	127.91	223.83	181.46	181.81	20.43	mm day-1
rXi1p1	2071 - 2100	147.66	253.5	209.44	208.94	21.89	mm day-1

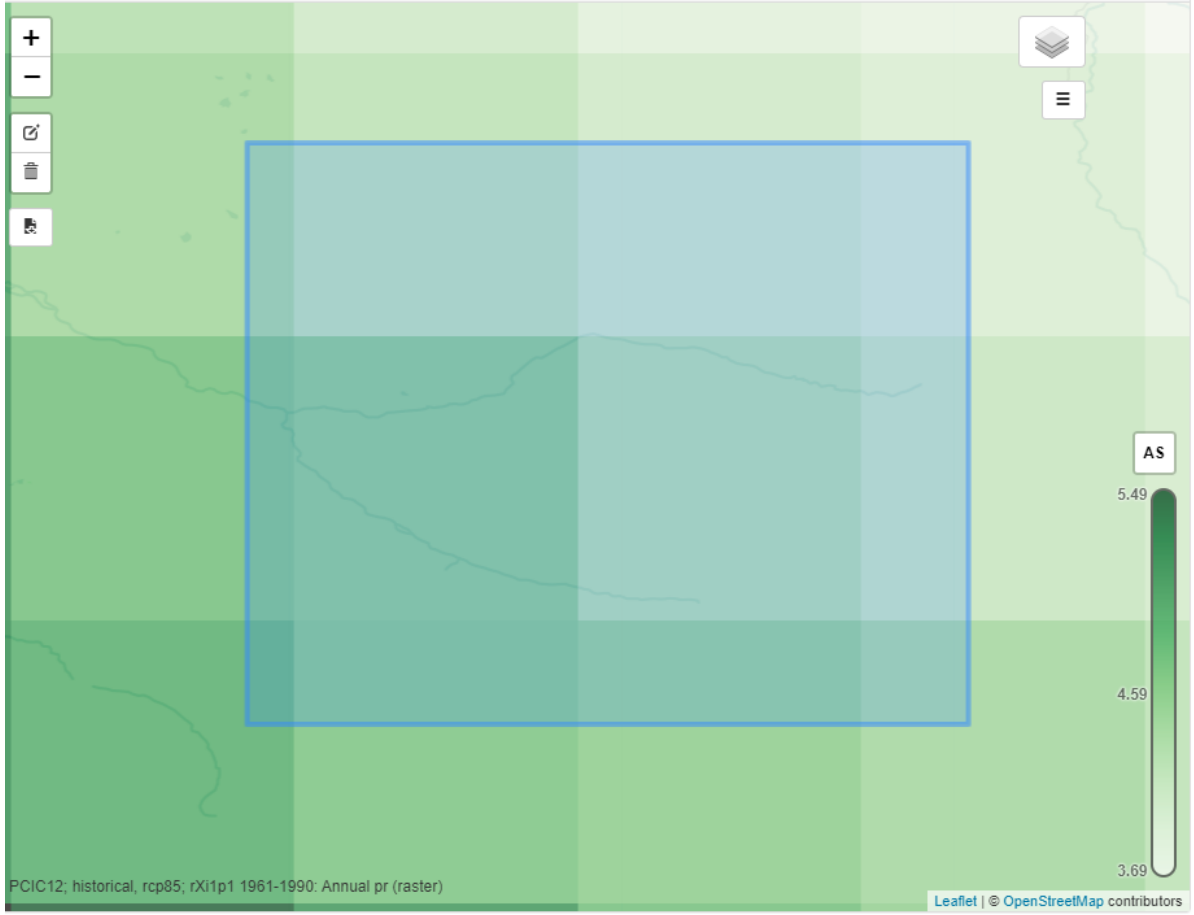
Model: PCIC12

Emissions Scenario: Historical, then RCP 8.5

Variable: pr - Precipitation

Filtered Datasets Summary: PCIC12 historical, rcp85: pr ⟶ 18 datasets

Data Map: PCIC12; historical, rcp85; rXi1p1 1961-1990: Annual pr (raster)

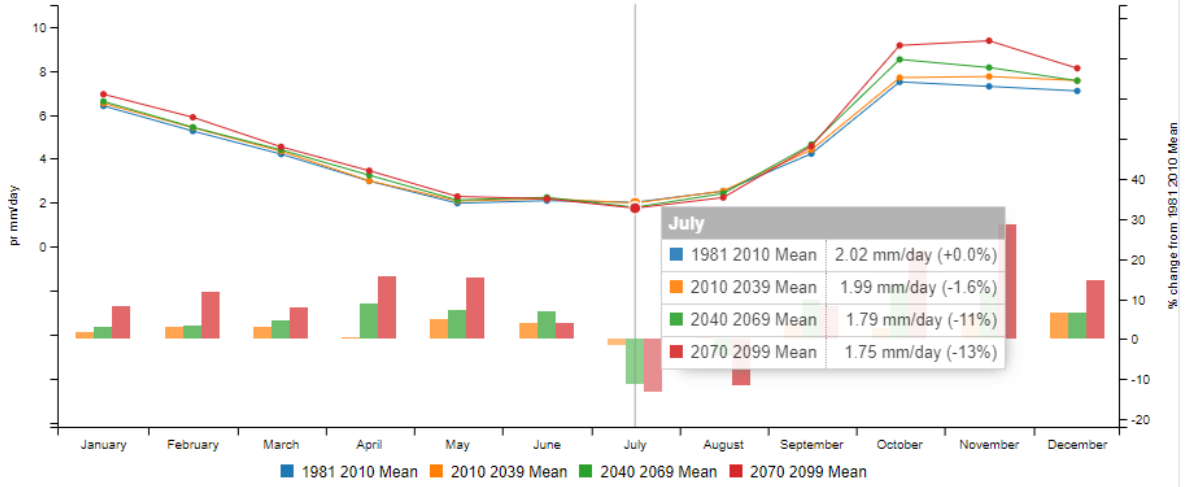


Data Graphs: PCIC12 historical, rcp85: pr

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset: Run 1 (rXi1p1), 1961–1990

Export Data: XSLX CSV



filtered datasets

Statistical Summary: PCIC12 historical, rcp85: pr

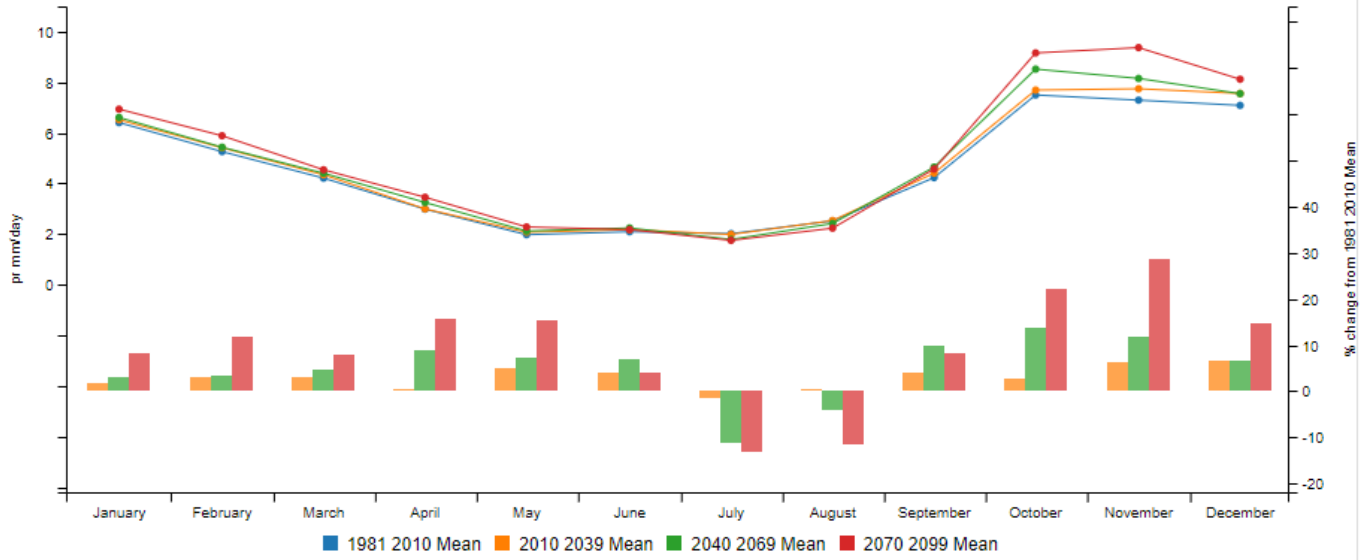
Time of Year: Annual

Export Data: XSLX CSV

Run	Averaging Peri...	Min	Max	Mean	Median	Std.Dev	Units

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset Run 1 (rXi1p1), 1961–1990 **Export Data** XSLX CSV



filtered datasets

Statistical Summary — PCIC12 historical, rcp85: pr

Time of Year October **Export Data** XSLX CSV

Run	Averaging Peri...	Min	Max	Mean	Median	Std.Dev	Units
rXi1p1	1961 - 1990	6.63	8.31	7.42	7.45	0.56	mm/day
rXi1p1	1981 - 2010	6.71	8.4	7.5	7.53	0.56	mm/day
rXi1p1	2010 - 2039	6.88	8.61	7.69	7.72	0.58	mm/day
rXi1p1	2040 - 2069	7.63	9.53	8.52	8.56	0.64	mm/day
rXi1p1	2070 - 2099	8.2	10.24	9.16	9.2	0.68	mm/day
rXi1p1	1971 - 2000	6.6	8.28	7.39	7.42	0.56	mm/day

All Datasets Summary | 10805 datasets total

Dataset Filter

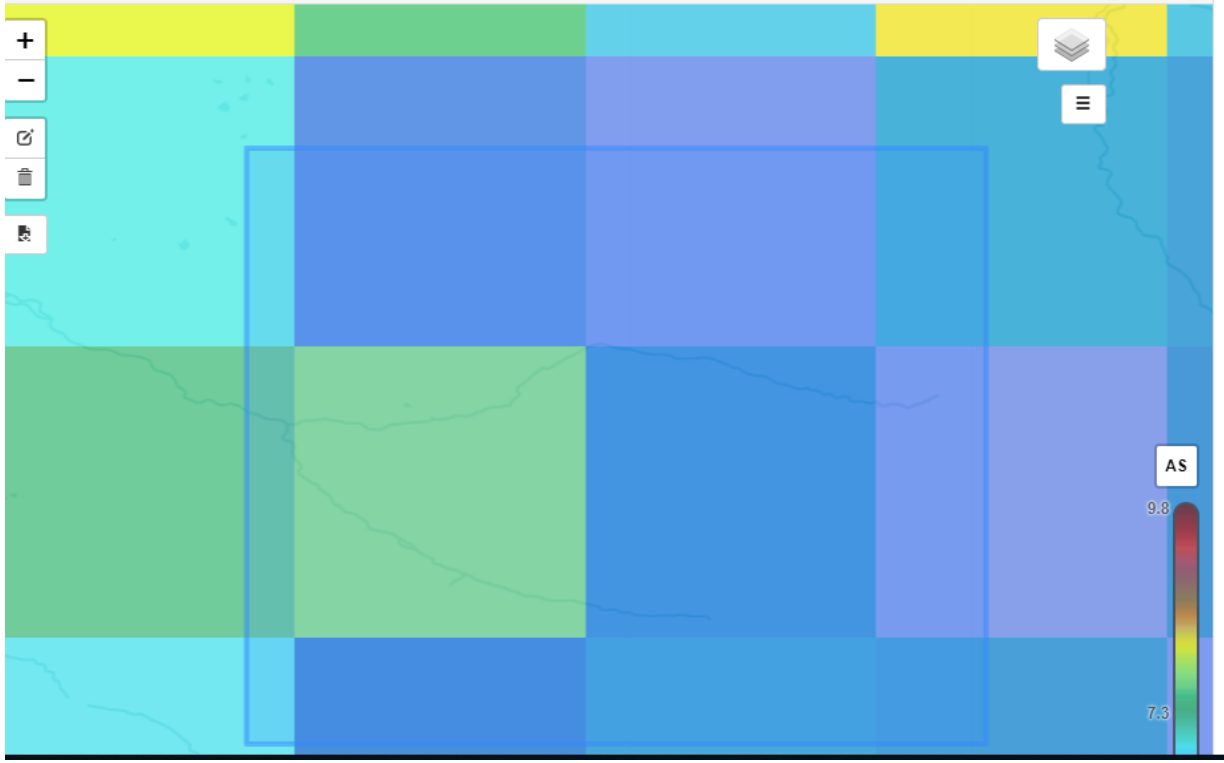
Model PCIC12

Emissions Scenario Historical, then RCP 8.5

Variable tasmax - Daily Maximum Near-Surface Air Temperature

Filtered Datasets Summary | PCIC12 historical, rcp85: tasmax ⟶ 18 datasets

Data Map | PCIC12; historical, rcp85; rXi1p1 1961-1990: Annual tasmax (raster)

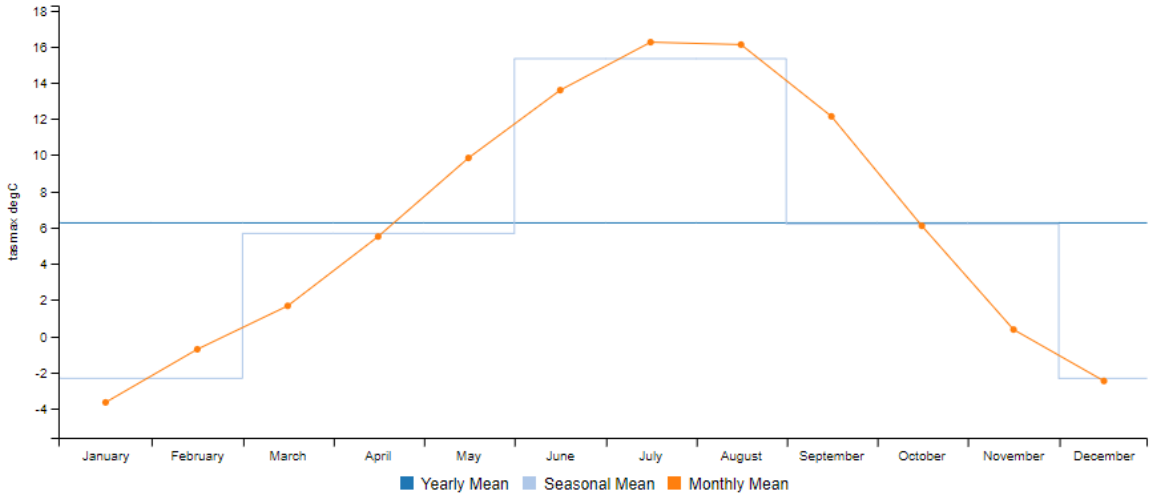


Data Graphs | PCIC12 historical, rcp85: tasmax

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset Run 1 (rXi1p1), 1961–1990

Export Data XSLX CSV

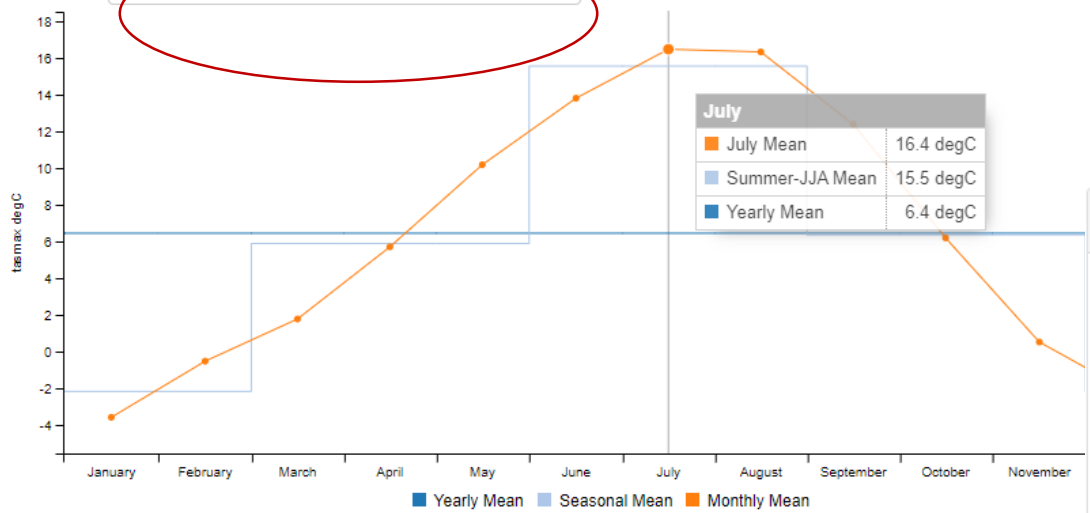


filtered datasets

Data Graphs PCIC12 historical, rcp85: tasmax

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

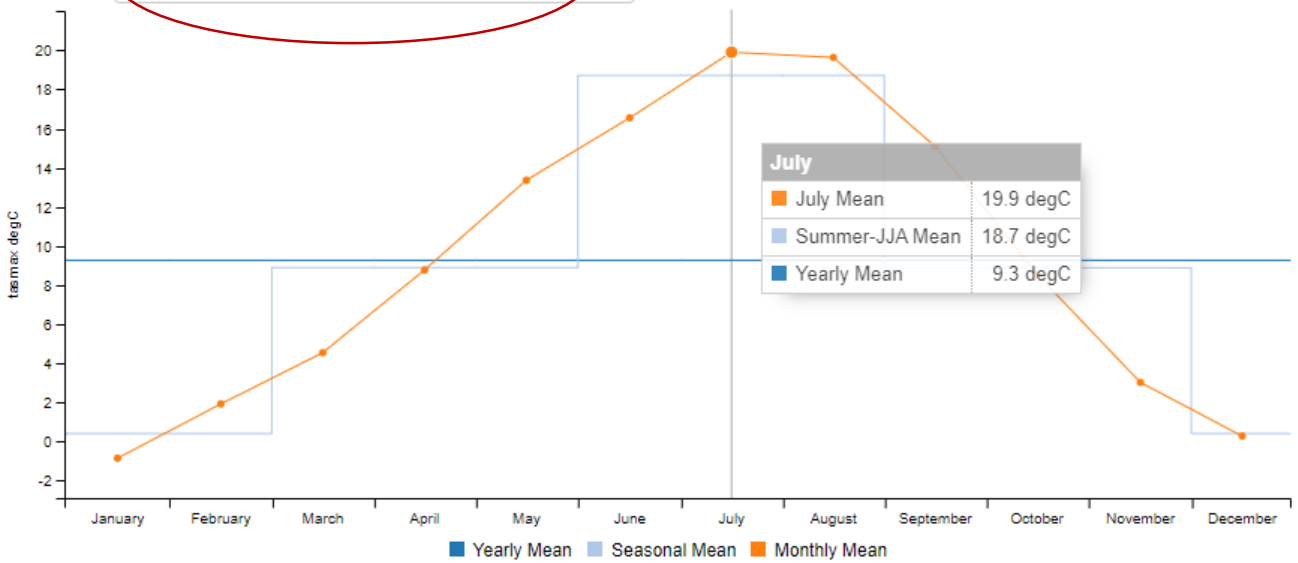
Dataset: Run 1 (rXi1p1), 1971–2000 Export Data: XSLX CSV



Data Graphs PCIC12 historical, rcp85: tasmax

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset: Run 1 (rXi1p1), 2040–2069 Export Data: XSLX CSV



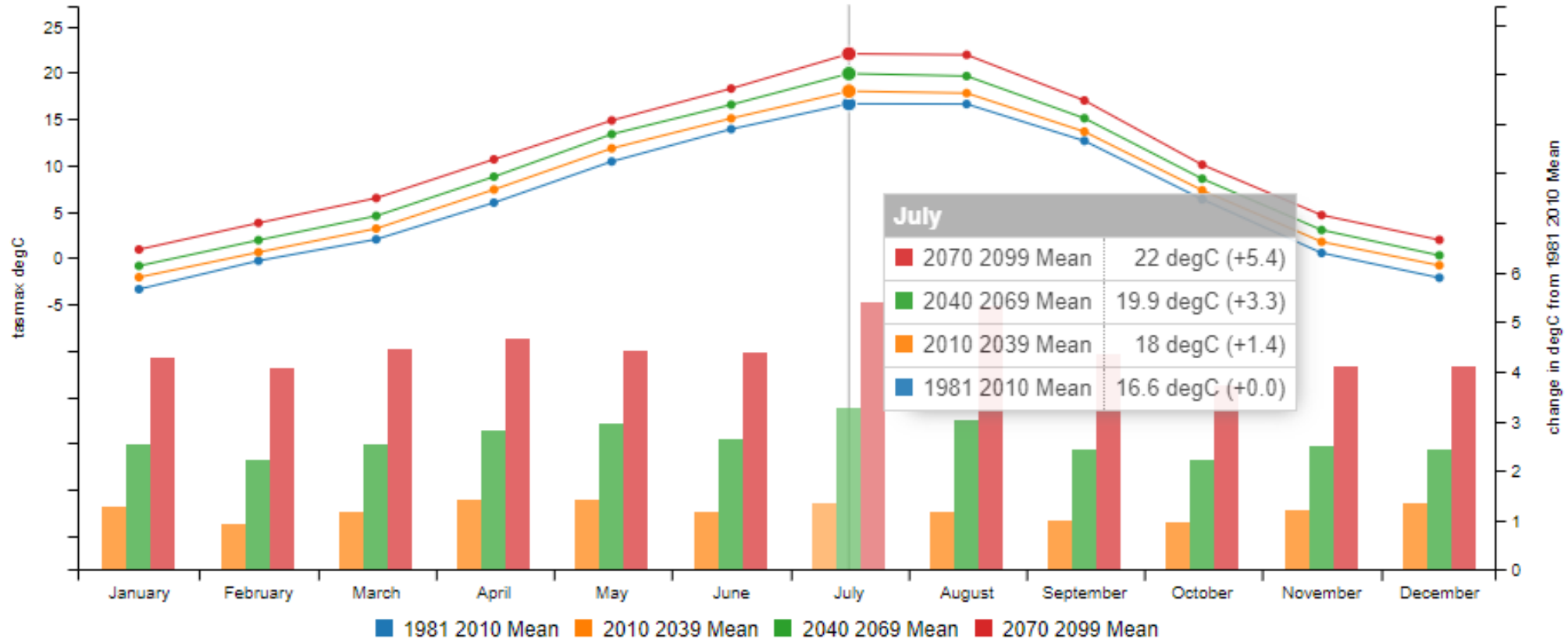
Data Graphs

PCIC12 historical, rcp85: tasmax

Annual Cycle | Long Term Average | Model Context | Change from Baseline | Snapshot

Dataset Run 1 (rXi1p1), 1961–1990

Export Data XSLX CSV



PCIC Hydrology Tools (https://pacificclimate.org/data)

GRIDDED HYDROLOGIC MODEL OUTPUT

- Provides access to gridded ~30 km^2 projections of hydrologic states for the Peace, Fraser and Columbia
- Future simulations with VIC-GL model using 12 GCMs from CMIP5, 6 models and both RCP 4.5 and RCP8.5
- Data includes: Baseflow, Evapotranspiration, Glacier Area, Glacier Mass Balance, Glacier Outflow, Potential Evapotranspiration, Precipitation, Rainfall, Snow Melt, Snow Water Equivalent, Surface Runoff, Total Column Soil Moisture and Transpiration.

STATION HYDROLOGIC MODEL OUTPUT

- Provides access to simulated streamflow data for locations throughout British Columbia
- Streamflow data were simulated using the Variable Infiltration Capacity (VIC) model
- Simulated data includes daily streamflow time series for over 120 sites located in the Peace, upper Columbia, Fraser and Campbell River watersheds
- GCMs from CMIP3, SRES emissions scenarios A1B, A2, B1

Resource: online tools

Resources to accompany BC Regional Adaptation Collaborative webinar 30 November 2016

Plan2Adapt http://pacificclimate.org/analysis-tools/plan2adapt

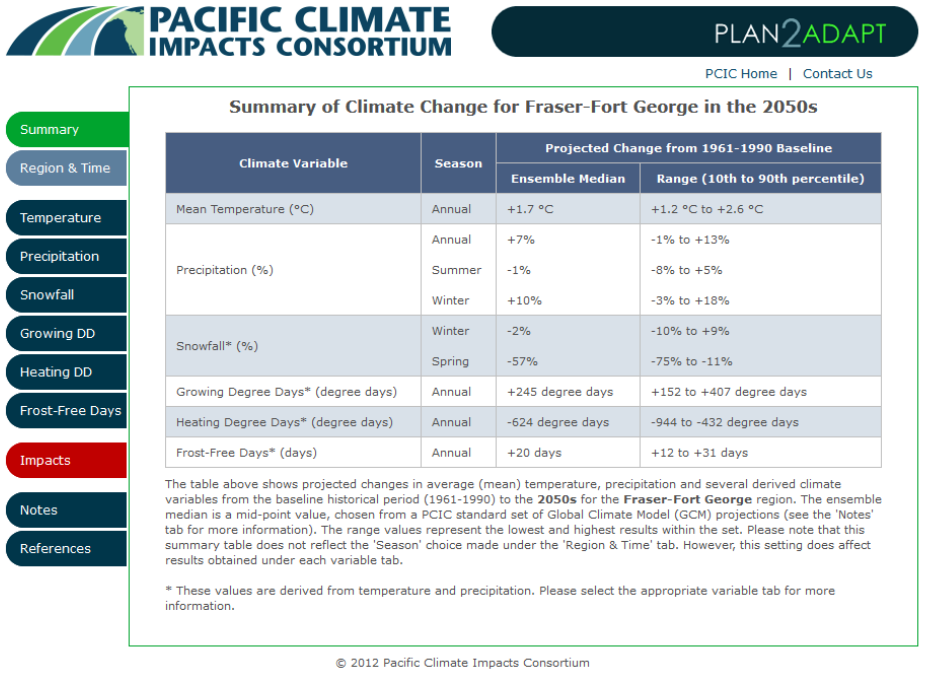
PICS short course http://pics.uvic.ca/education/climate-insights-101#quicktabs-climate_insights_101=1

ClimateBC

- **HectaresBC** http://www.hectaresbc.org
- **ClimateWNA** http://genetics.forestry.ubc.ca/cfgc/ClimateWNA/ClimateWNA.html
- **ClimateBC Online** http://www.genetics.forestry.ubc.ca/cfcg/ClimateBC40/Default.aspx
- **BC Climate Explorer** http://www.bc-climate-explorer.org/

PCIC Data Portals https://pacificclimate.org/data

Data Basin
https://nplcc.databasin.org/galleries/5a3a424b36ba4b63b10b8170ea0c915e#expand=105363%2C106698%2C106712%2C110010%2C105359%2C105364



https://pacificclimate.org/news-and-events/news/2016/webinar-climate-tools

Resource – guidance documents

BC Ministry of Transportation and Infrastructure Technical Circular

EGBC guidance document

National guidebook on climate scenarios

Resource: climate change adaptation fundamentals

The ResiliencebyDesign Lab's **Inspiring Climate Action (ICA)** project has just launched its website. This site will be a hub for connecting those interested in climate adaptation in BC and beyond.

https://secure.royalroads.ca/cscourses/climate-change-adaptation-fundamentals

Resource: climate change in BC

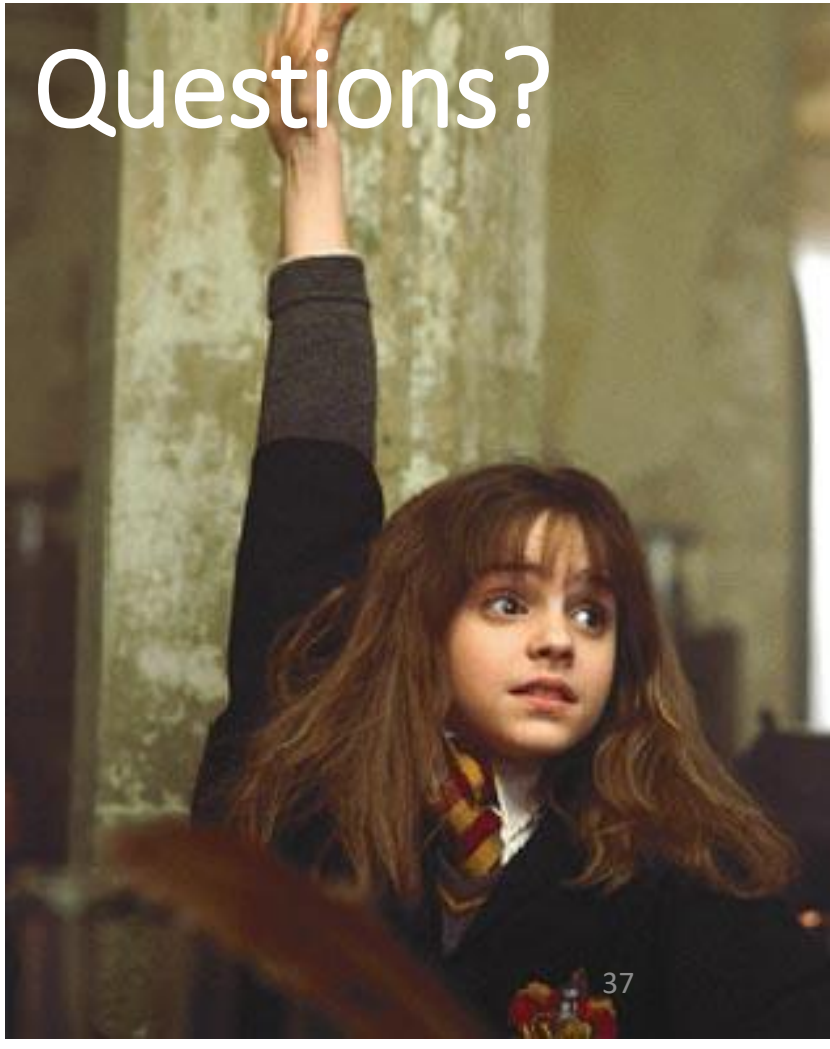
www.bcacarn.com/educationseries/module-1-using-future-climate-projections/

PACIFIC CLIMATE IMPACTS CONSORTIUM

University of Victoria
British Columbia • Canada

Thank you

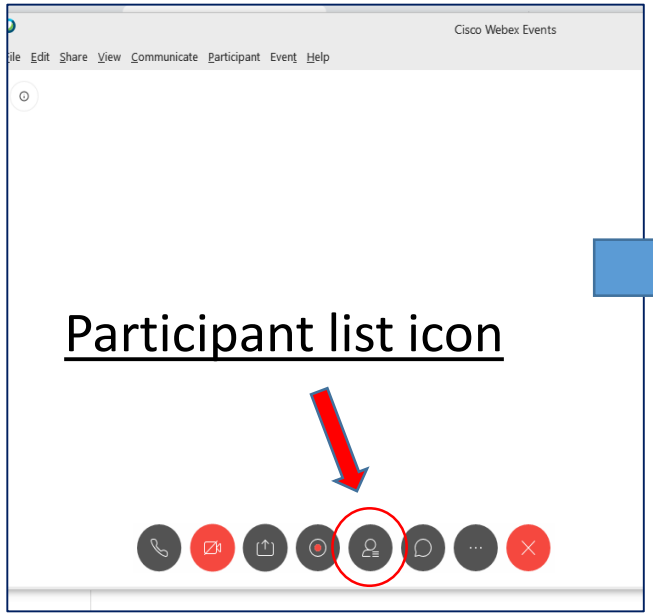
Kari Tyler
ktyler@uvic.ca

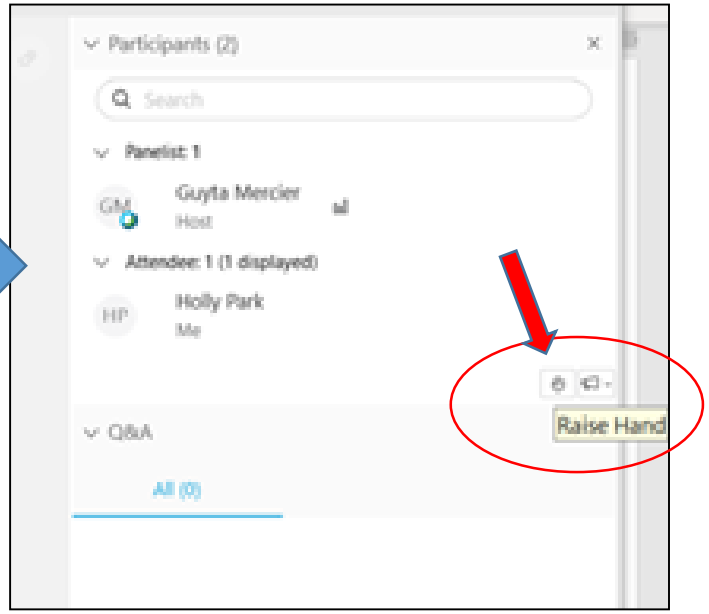


Asking Questions

1. Open the participant list at the bottom of the screen to open a new window.

At the bottom right of this new window, use the raise hand icon to indicate that you would like to ask a question using audio.





2. You can also type your question in the Chat Box or the Q&A Box. Both are accessible at the bottom of your screen.