

Future Climate in BC.

PSO Symposium
February 28, 2019



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

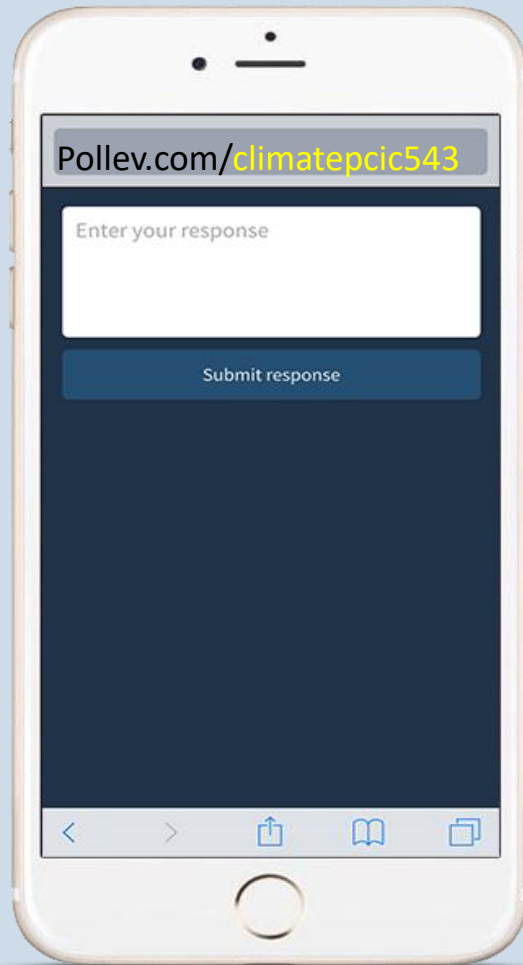
- hydrologic impacts of climate change and variability; streamflow projections



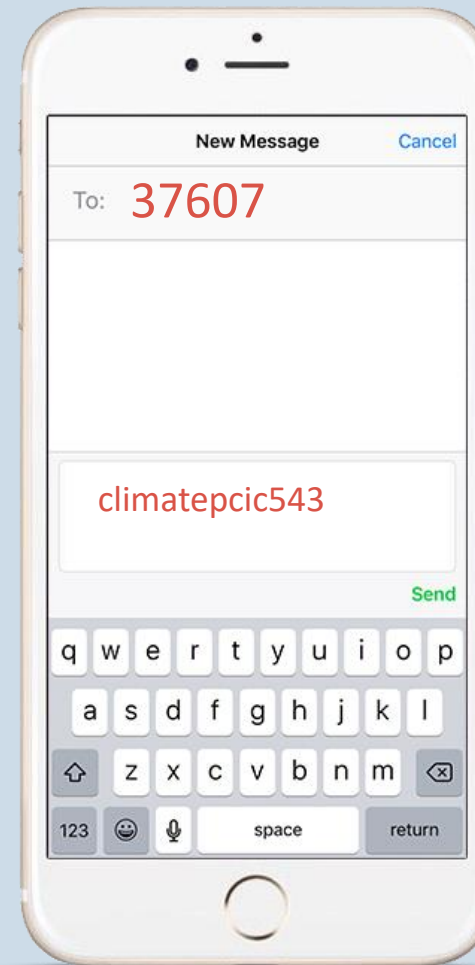
Climate Analysis and Monitoring

- 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 organization today?

What was remarkable in the last 3 years in terms of weather events or unusual seasons? What were the impacts?

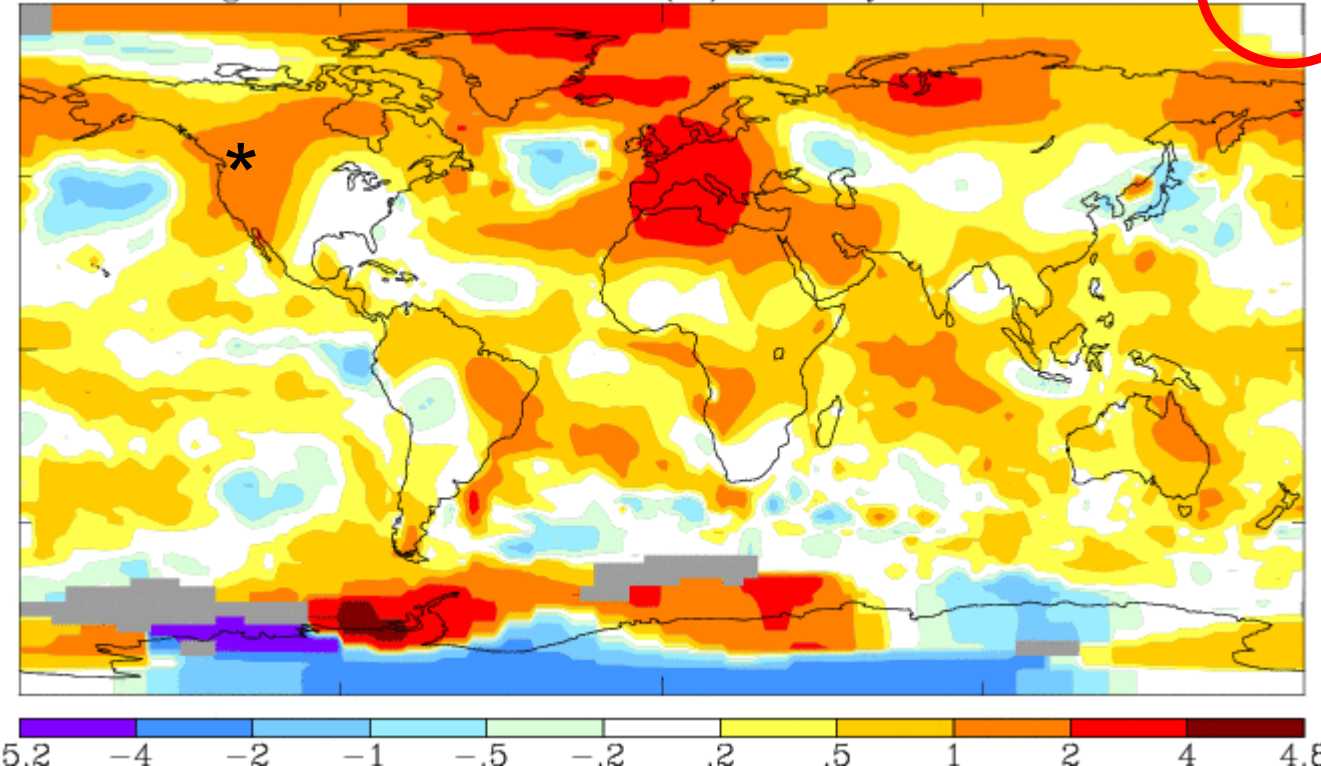
Climate varies by location & with time



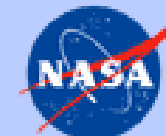
Jun-Jul-Aug 2003

L-OTI(°C) Anomaly vs 1951-1980

.49

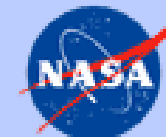
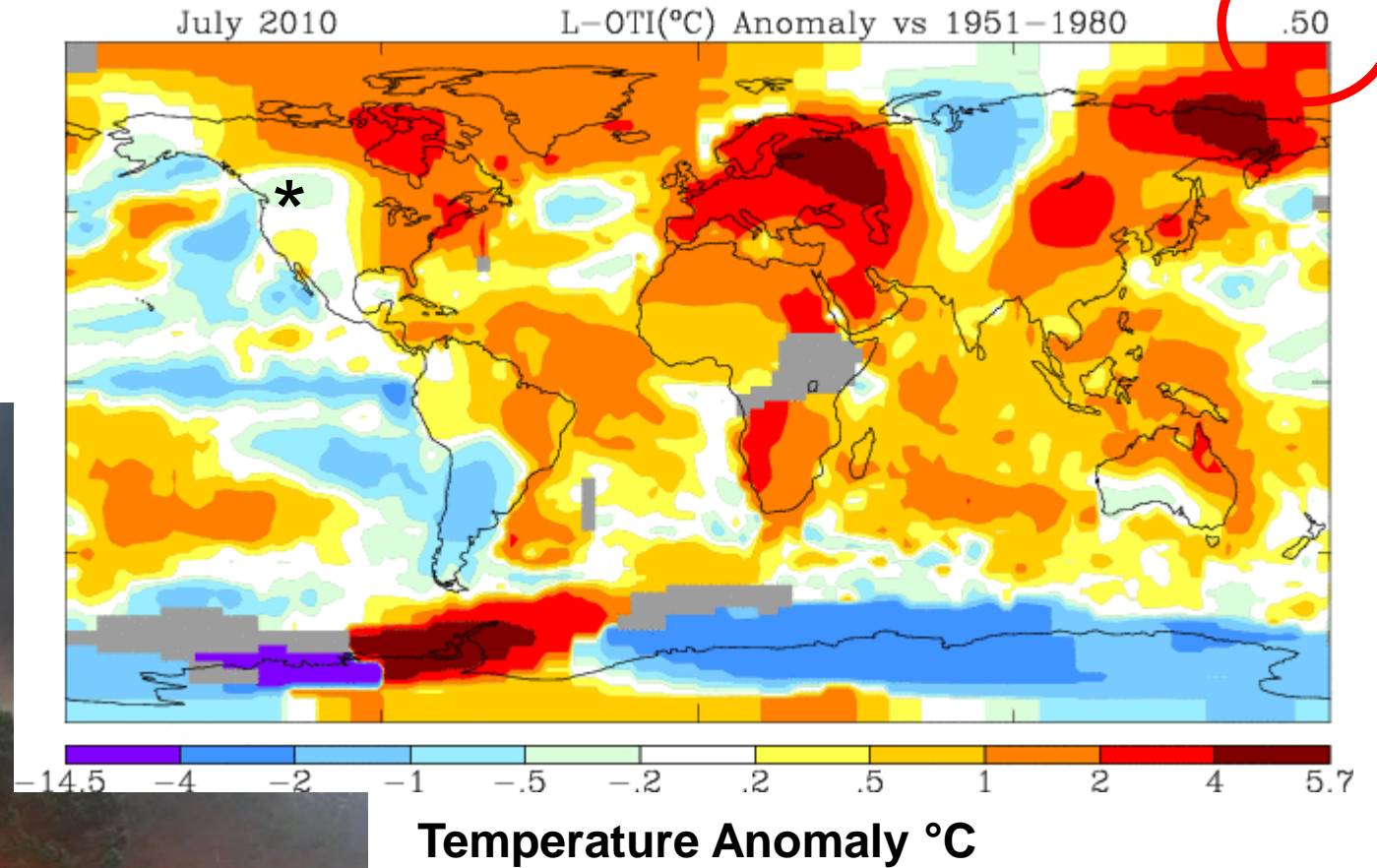


Temperature Anomaly °C



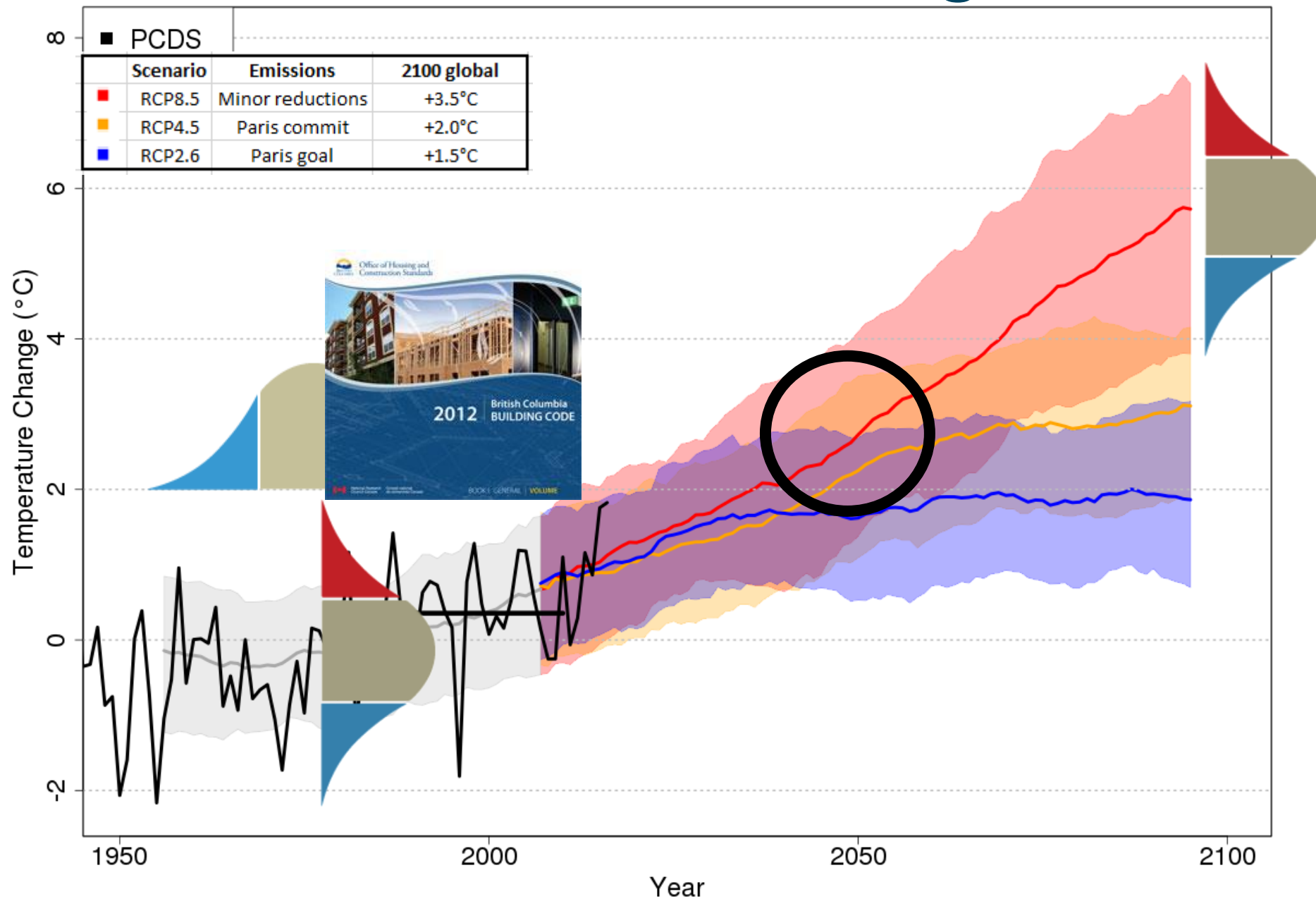
Goddard Institute for Space Studies
New York, N.Y.

Climate Varies by Location and with Time



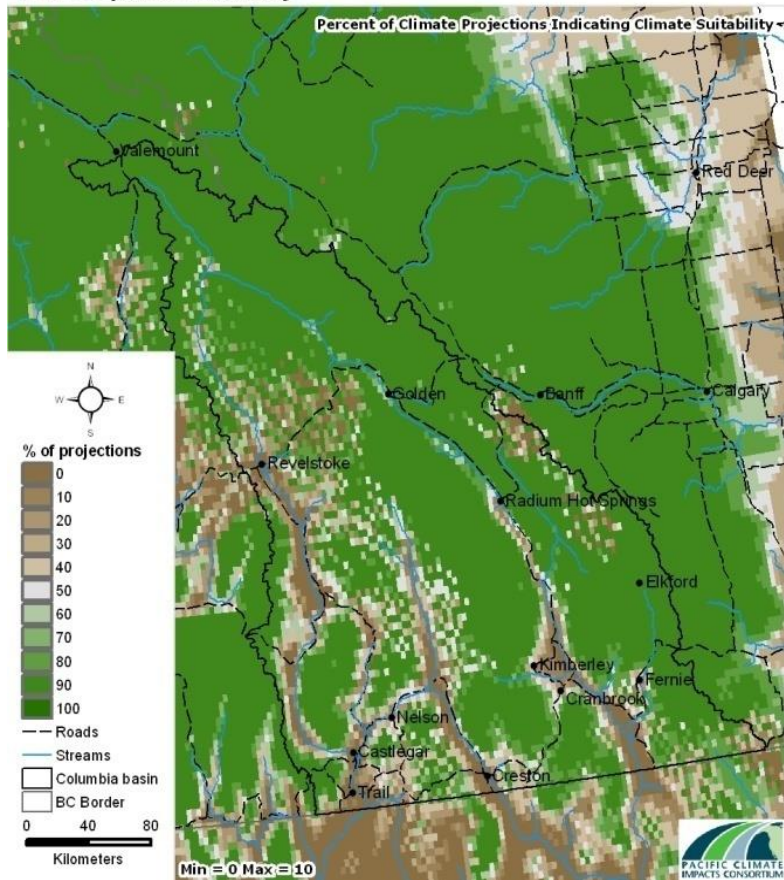
Goddard Institute for Space Studies
New York, N.Y.

Future Warming in BC

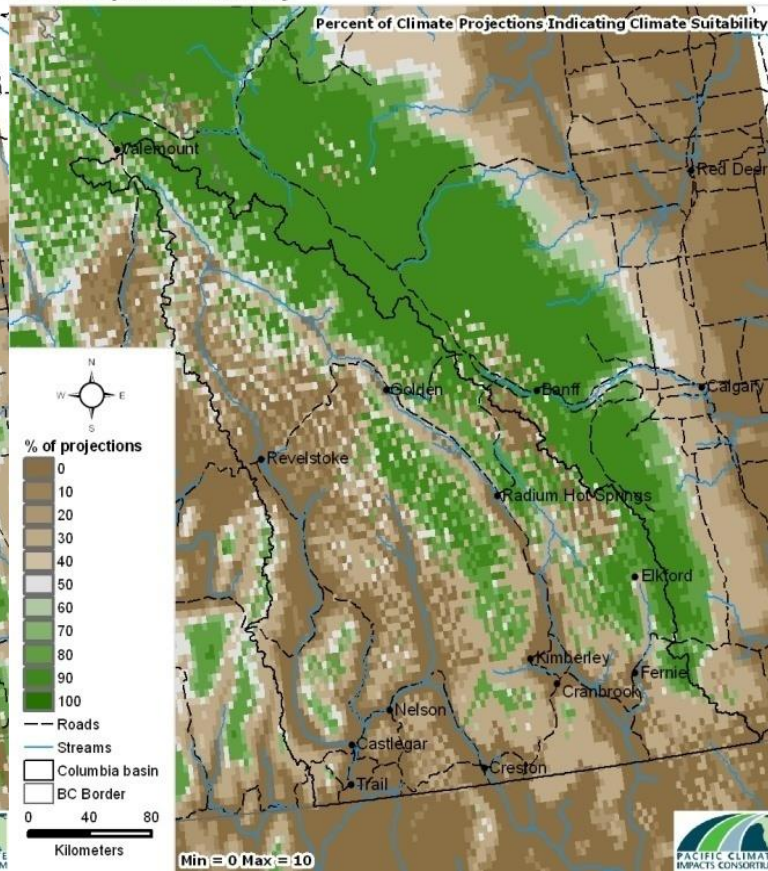


Rate and magnitude of change > oral history

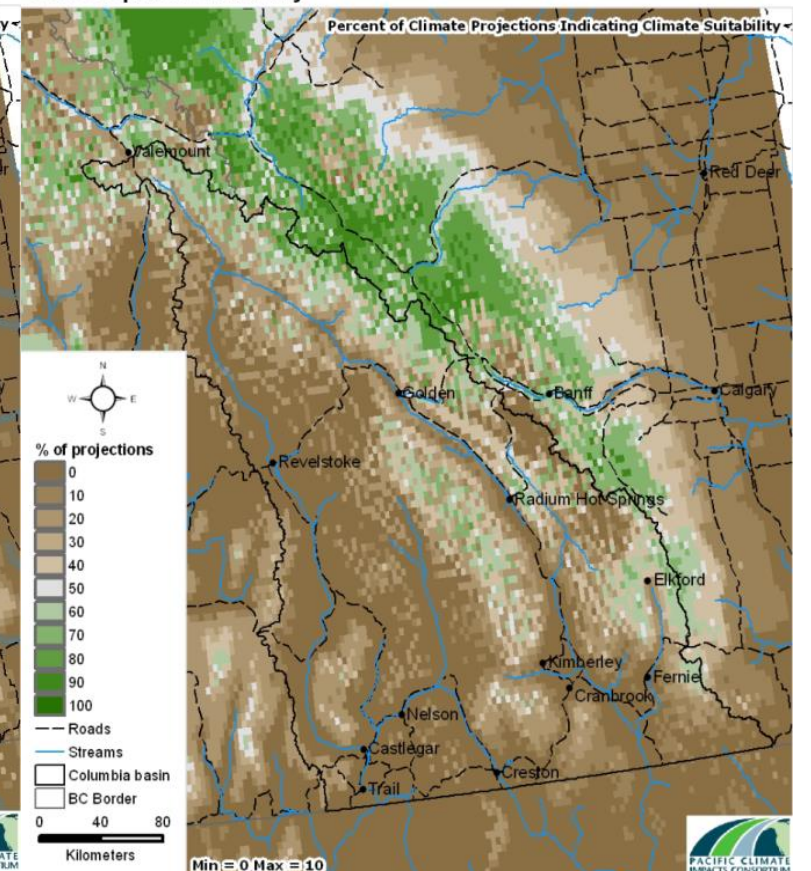
2020s Spruce Suitability



2050s Spruce Suitability



2080s Spruce Suitability



•Climate Projections



Warmer winter temperatures and fewer days below freezing



More extreme hot days in summers and longer dry spells in summer months

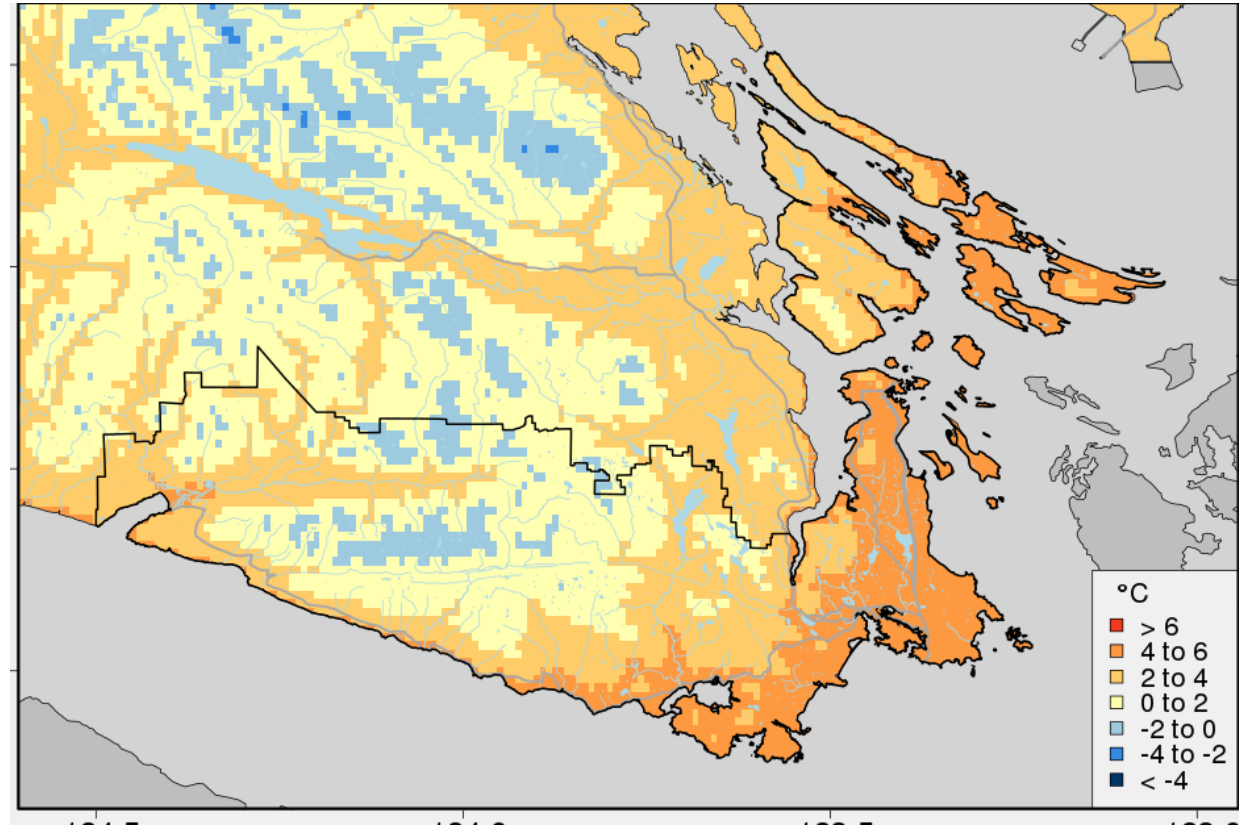
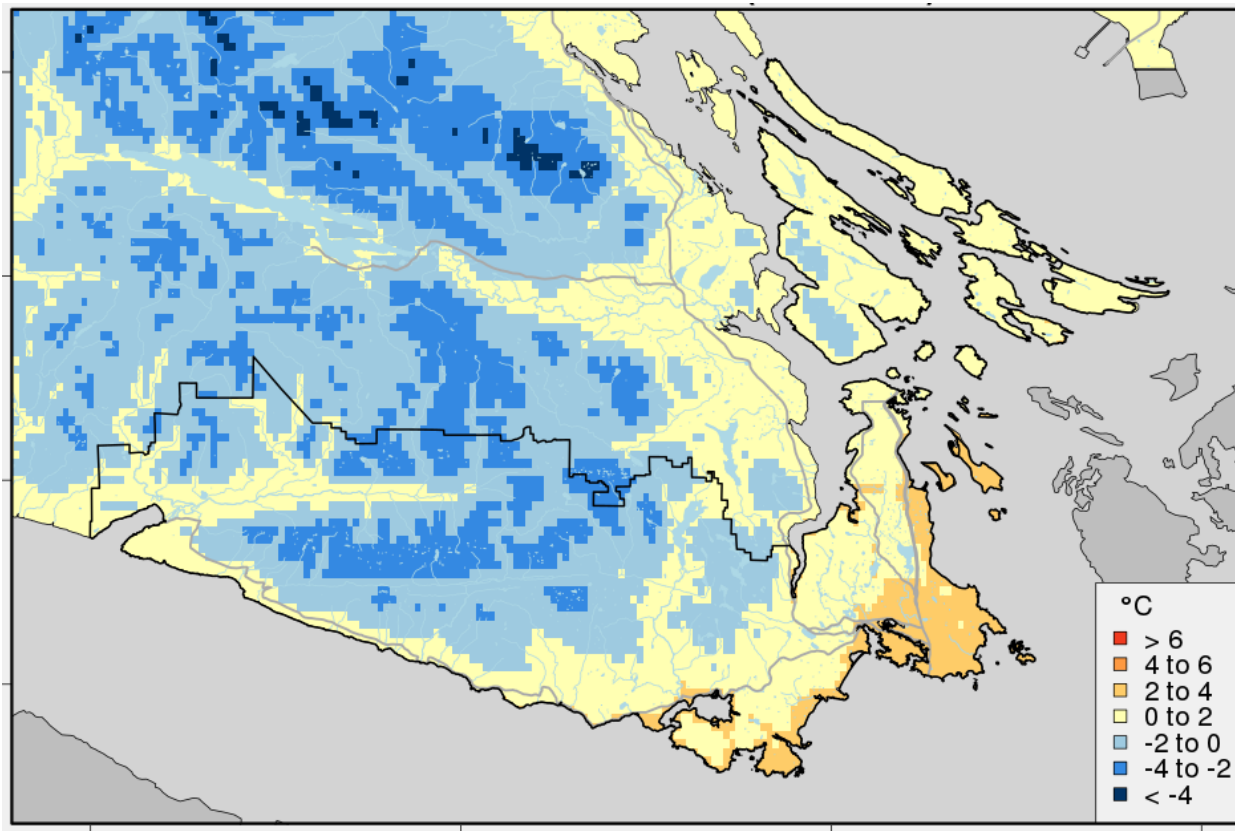


More precipitation in the fall, winter and spring



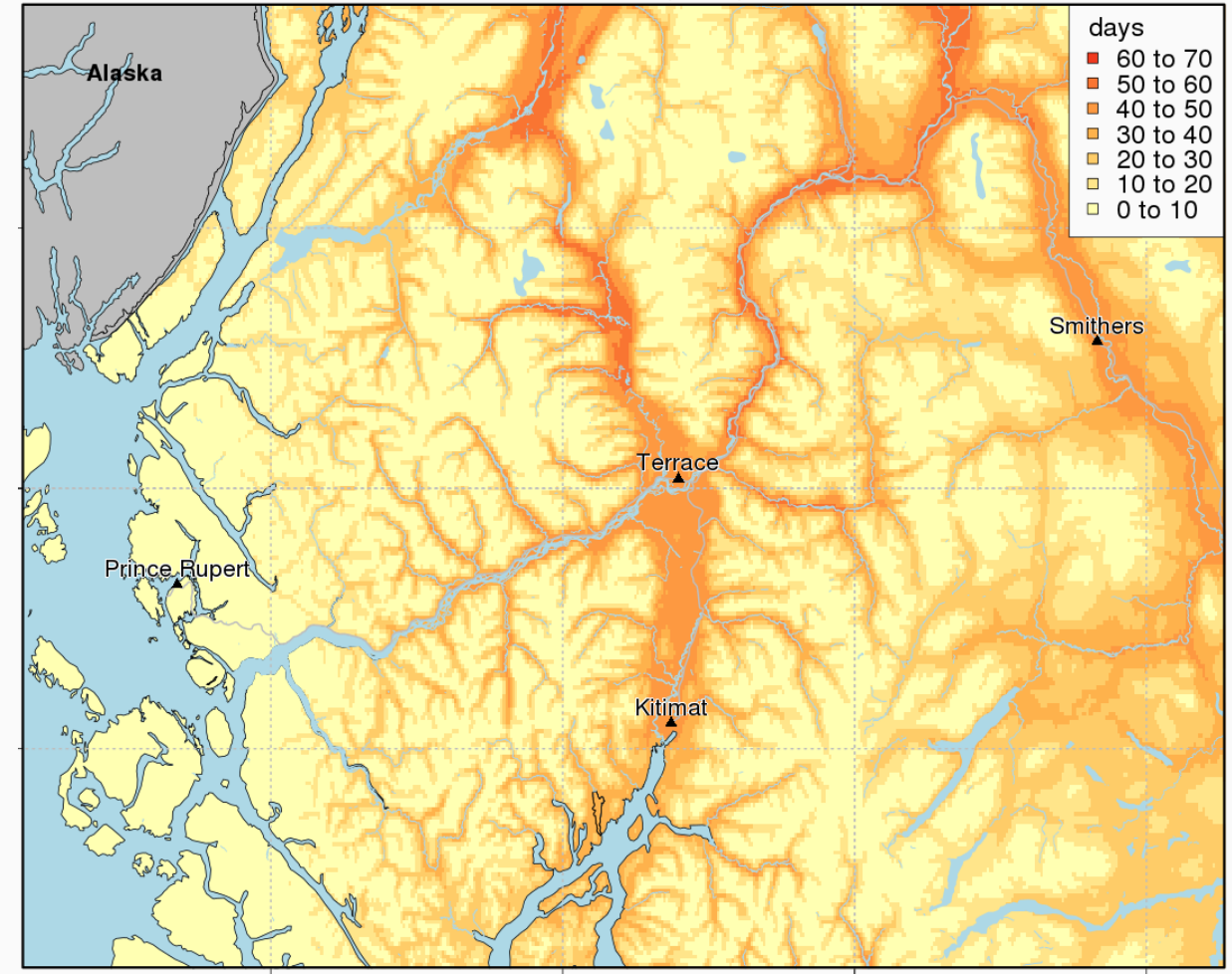
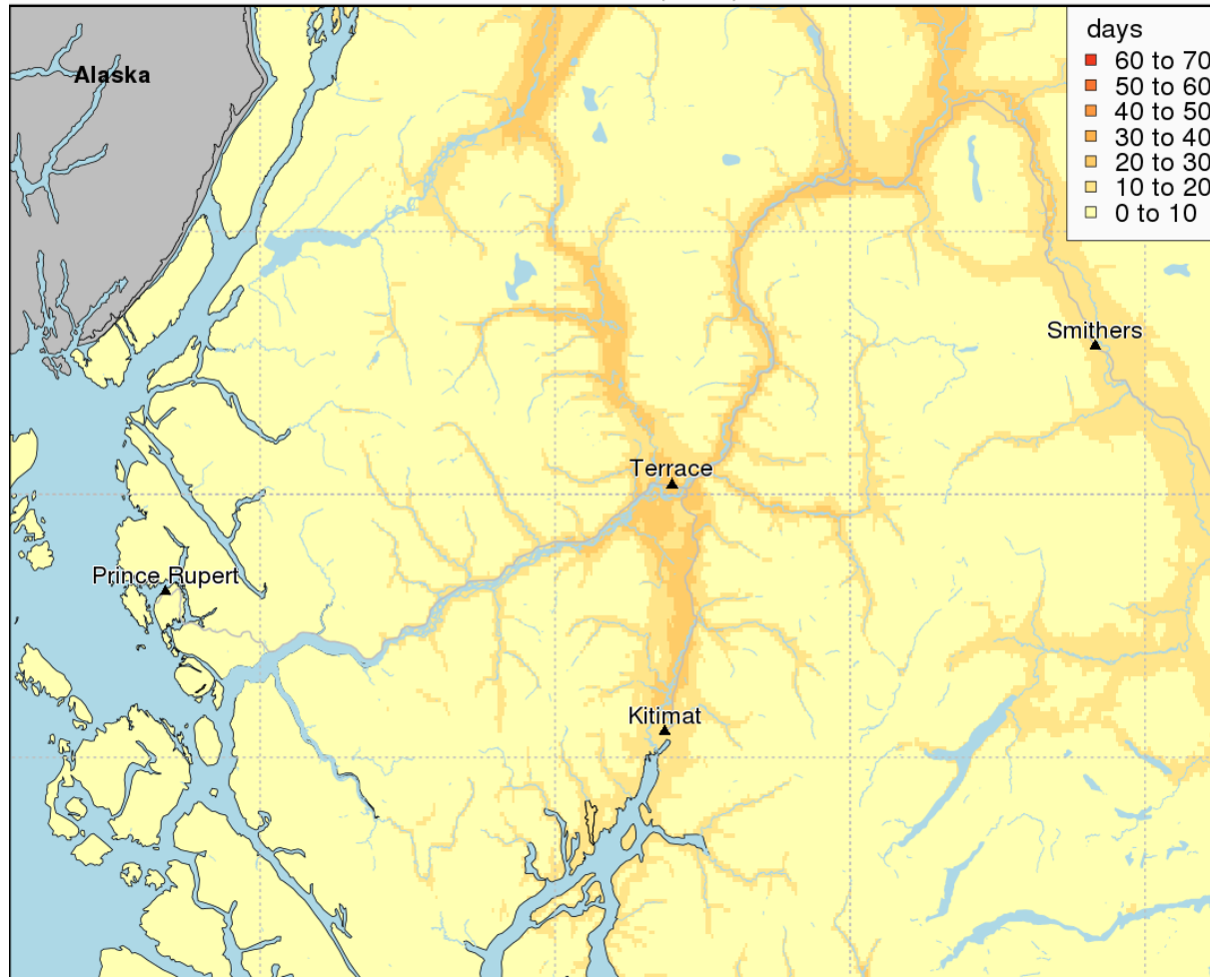
Increased frequency and intensity of precipitation and storm events

Coldest Winter Night



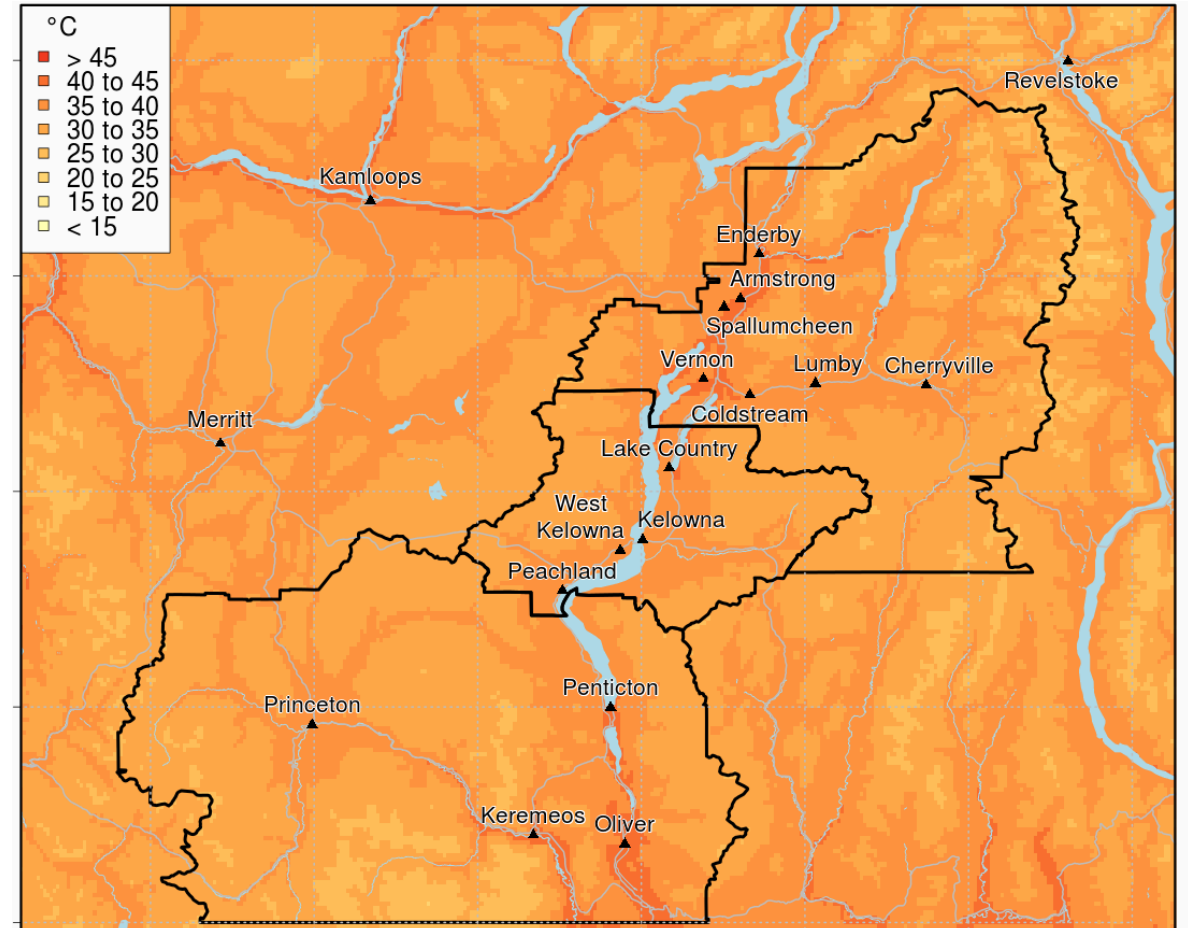
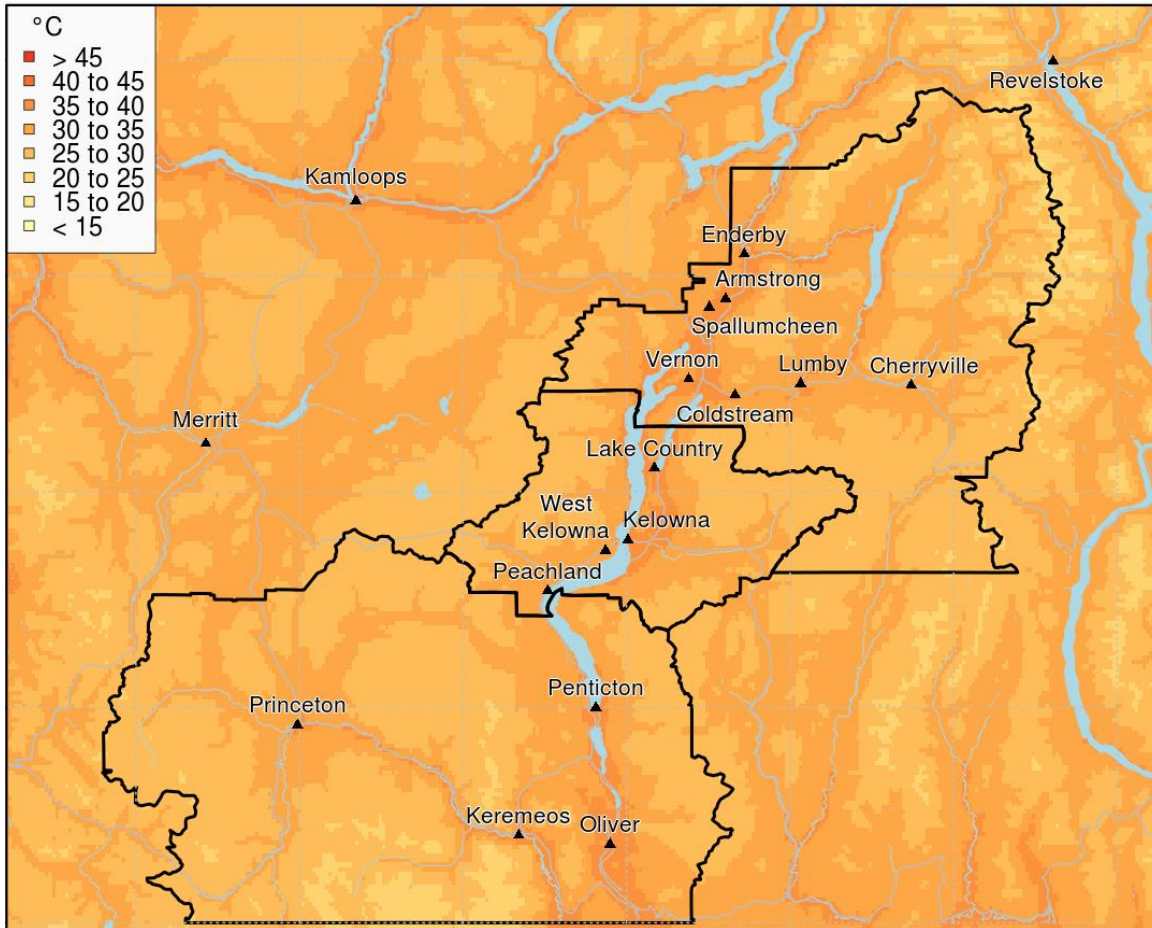
Coldest night: -9°C in 1971-2000 \rightarrow -5°C in 2050s

More hot days



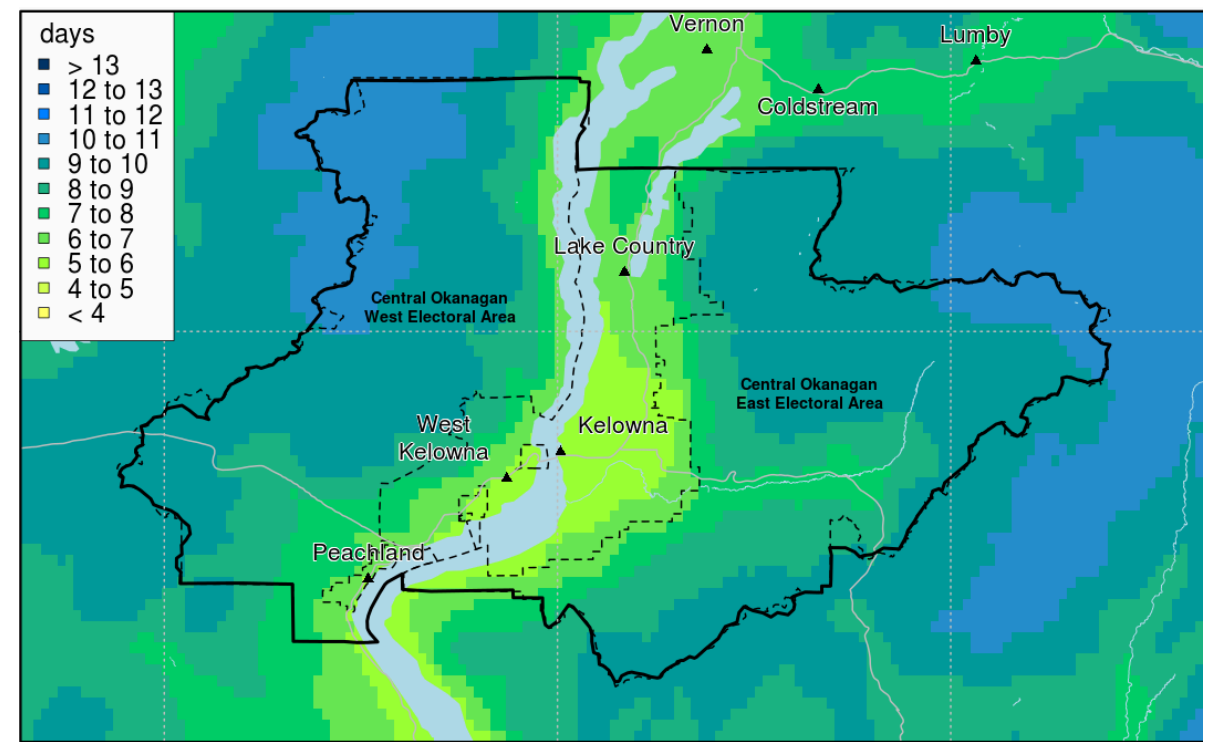
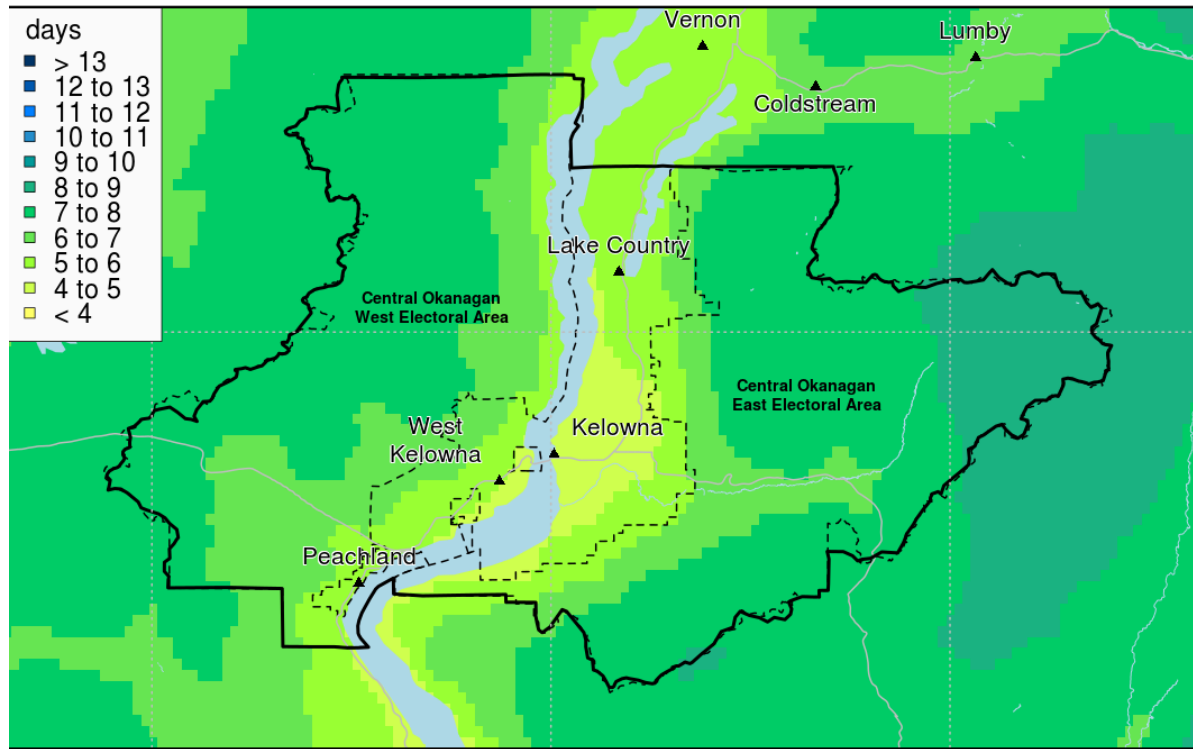
“SU” day-time high >25°C: regional average 1 day 1971-2000 → +7 (+2 to +11) days in 2050s

Hotter hot days



“TXX JJA” hottest summer day: regional average 30°C 1971-2000 → +4.5°C (2.6 to 6.0)°C 2050s

Increased precipitation on wet days



“R95p” precipitation on days > 95th %-ile: ~110 mm 1971-2000 → +28% (15 to 43)% by 2050s

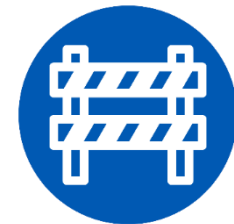
Mindset shifts to plan for climate change

“Stationarity is dead”



Plan for Resilience

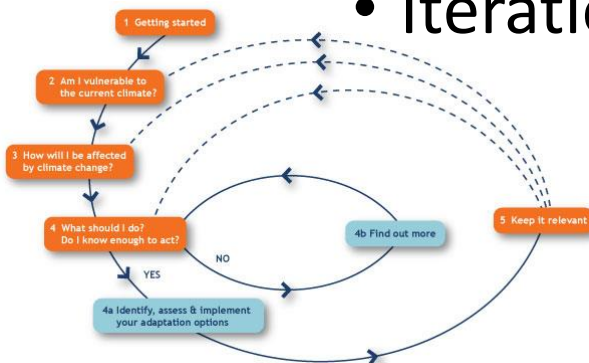
“Restrictions breed creativity”
- *Mark Rosewater*



Best practices for climate risk management



- Make use of available climate information
- Consider a range of future projections
- *Practice cross-disciplinary engagement*
- Iteration, iteration, iteration



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?

Online adaptation tools webinar

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

Resources to accompany BC Regional Adaptation Collaborative webinar

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

PICS short course [http://pics.uvic.ca/education/climate-insights-101#quicktabs-climate insights 101=1](http://pics.uvic.ca/education/climate-insights-101#quicktabs-climate%20insights%20101=1)

ClimateBC

- **HectaresBC** <http://www.hectaresbc.org>
- **ClimateWNA** <http://genetics.forestry.ubc.ca/cfcg/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>



PLAN2ADAPT

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Summary

Region & Time

Temperature

Precipitation

Snowfall

Growing DD

Heating DD

Frost-Free Days

Impacts

Notes

References

Summary of Climate Change for Fraser-Fort George in the 2050s

Climate Variable	Season	Projected Change from 1961-1990 Baseline	
		Ensemble Median	Range (10th to 90th percentile)
Mean Temperature (°C)	Annual	+1.7 °C	+1.2 °C to +2.6 °C
Precipitation (%)	Annual	+7%	-1% to +13%
	Summer	-1%	-8% to +5%
	Winter	+10%	-3% to +18%
Snowfall* (%)	Winter	-2%	-10% to +9%
	Spring	-57%	-75% to -11%
Growing Degree Days* (degree days)	Annual	+245 degree days	+152 to +407 degree days
Heating Degree Days* (degree days)	Annual	-624 degree days	-944 to -432 degree days
Frost-Free Days* (days)	Annual	+20 days	+12 to +31 days

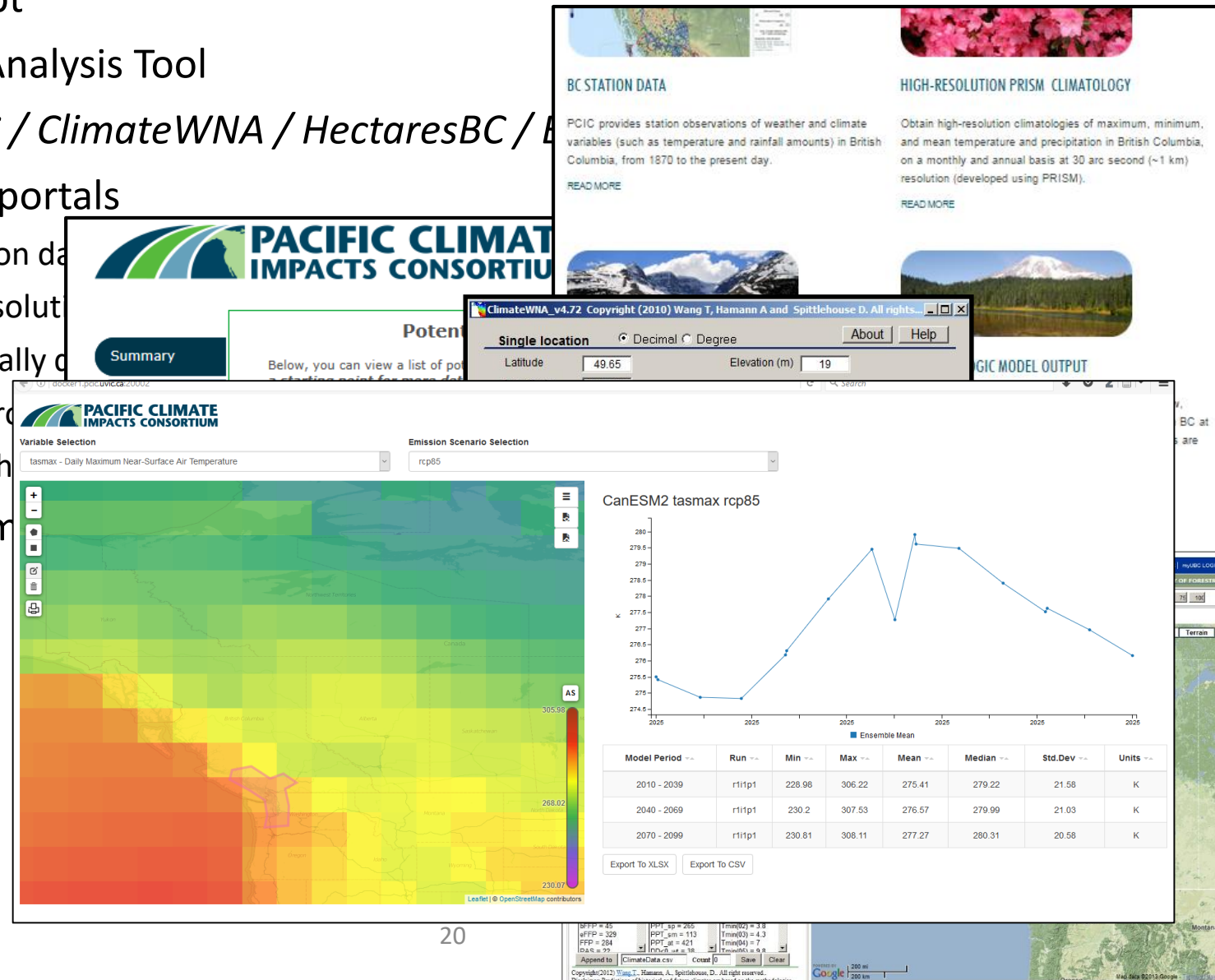
The table above shows projected changes in average (mean) temperature, precipitation and several derived climate variables from the baseline historical period (1961-1990) to the **2050s** for the **Fraser-Fort George** region. The ensemble median is a mid-point value, chosen from a PCIC standard set of Global Climate Model (GCM) projections (see the 'Notes' tab for more information). The range values represent the lowest and highest results within the set. Please note that this summary table does not reflect the 'Season' choice made under the 'Region & Time' tab. However, this setting does affect results obtained under each variable tab.

* These values are derived from temperature and precipitation. Please select the appropriate variable tab for more information.

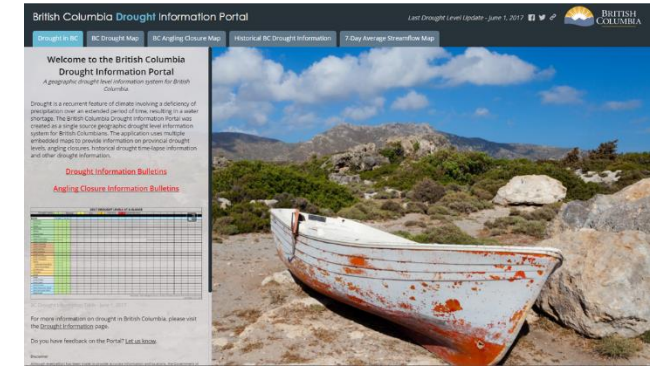
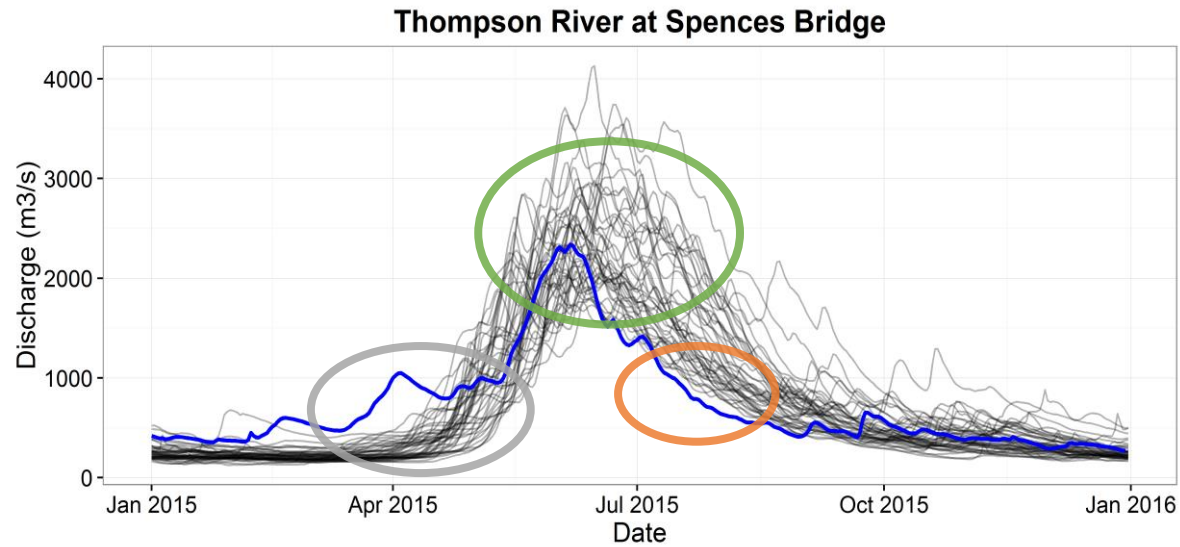
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PCIC* climate tools for BC

- Plan2Adapt
- Regional Analysis Tool
- *ClimateBC / ClimateWNA / HectaresBC /*
- PCIC data portals
 - BC station data
 - High-resolution
 - Statistically d
 - VIC hydro
 - Station h
- Seasonal m



2015 / 2016 /2017 weather events, seasons



2015 https://www.pacificclimate.org/sites/default/files/publications/2015_Year_in_Review-Final.pdf

2016 <https://www.pacificclimate.org/news-and-events/news/2016/bc-track-set-new-temperature-record-2016> and
<https://www.pacificclimate.org/news-and-events/news/2017/climate-variability-hot-cold-winter-%E2%80%9916-%E2%80%9817>

2017 https://www.pacificclimate.org/sites/default/files/publications/PCIC_Update_Mar_2018.pdf

PCIC* climate tools for BC

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

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](#)

And even more resources

- 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>

Questions?

Thank you!

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PCIC