

# Climate Change Adaptation – From Projections to Practice

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# Future Forest Ecosystems Centre (FFEC)



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Team Lead, Research  
Climatologist

# The CCISS Tool - Climate Change Informed Species Selection

The [CCISS tool](#) shows site-specific changes in tree species feasibility at user-selected locations (Fig. 4). It is designed to support operational reforestation decisions and the development of climate-informed reforestation policy.

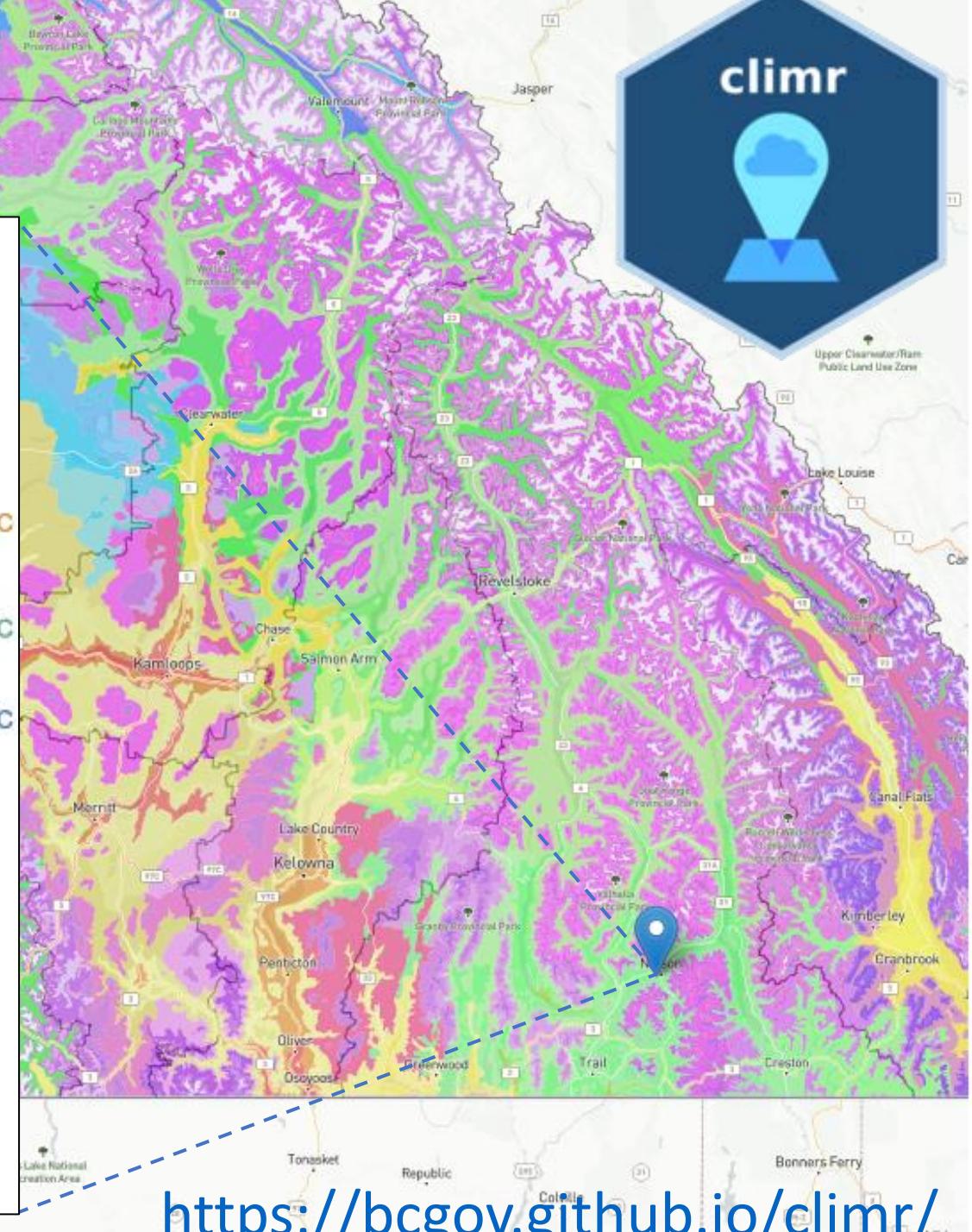
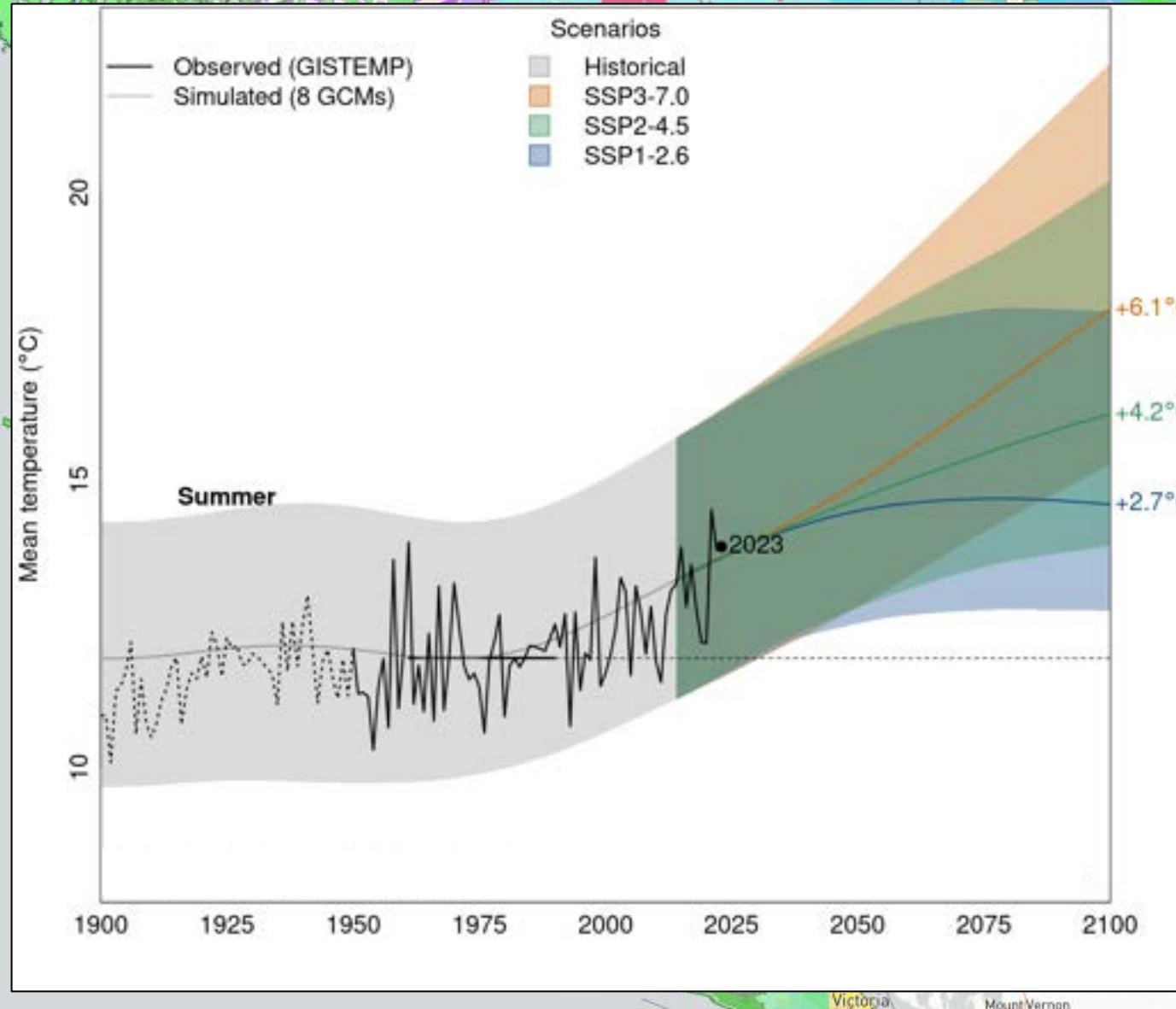
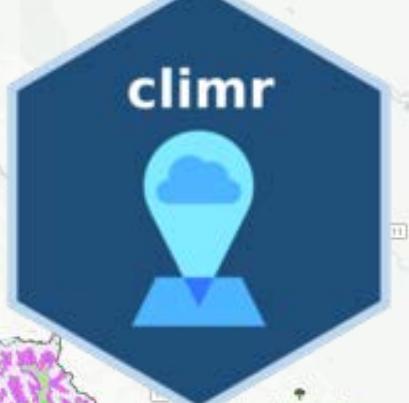
The screenshot shows the CCISS Tool interface. At the top, there's a navigation bar with the BC logo, 'The CCISS Tool', and links for 'SELECT SITES', 'FEASIBILITY REPORT', 'SEC FUTURES', 'SILVICS & ECOLOGY', 'EXPORT', and 'APP INFO'. Below the navigation is a map of British Columbia with various colored regions (green, blue, yellow, grey) representing different climate projections or feasibility levels. A legend on the left indicates what each color means. There are two main buttons: 'CLEAR SELECTIONS' (red) and 'GENERATE RESULTS' (dark blue). Below these are 'MODEL PARAMETERS' and a 'Report averaged by BGC' button. A section titled 'Add Sites Using One of the 3 Methods Below' contains 'Method 1. Click on map to add points'. At the bottom, a table lists 5 entries with columns for ID, Lat, Long, Elev, and BGC. The first entry is highlighted with a blue border.

ID	Lat	Long	Elev	BGC
1	51.50874	-121.90357	1101	IDFdk3
2	51.50874	-121.90357	1101	IDFdk3
3	51.50874	-121.90357	1101	IDFdk3
4	51.50874	-121.90357	1101	IDFdk3



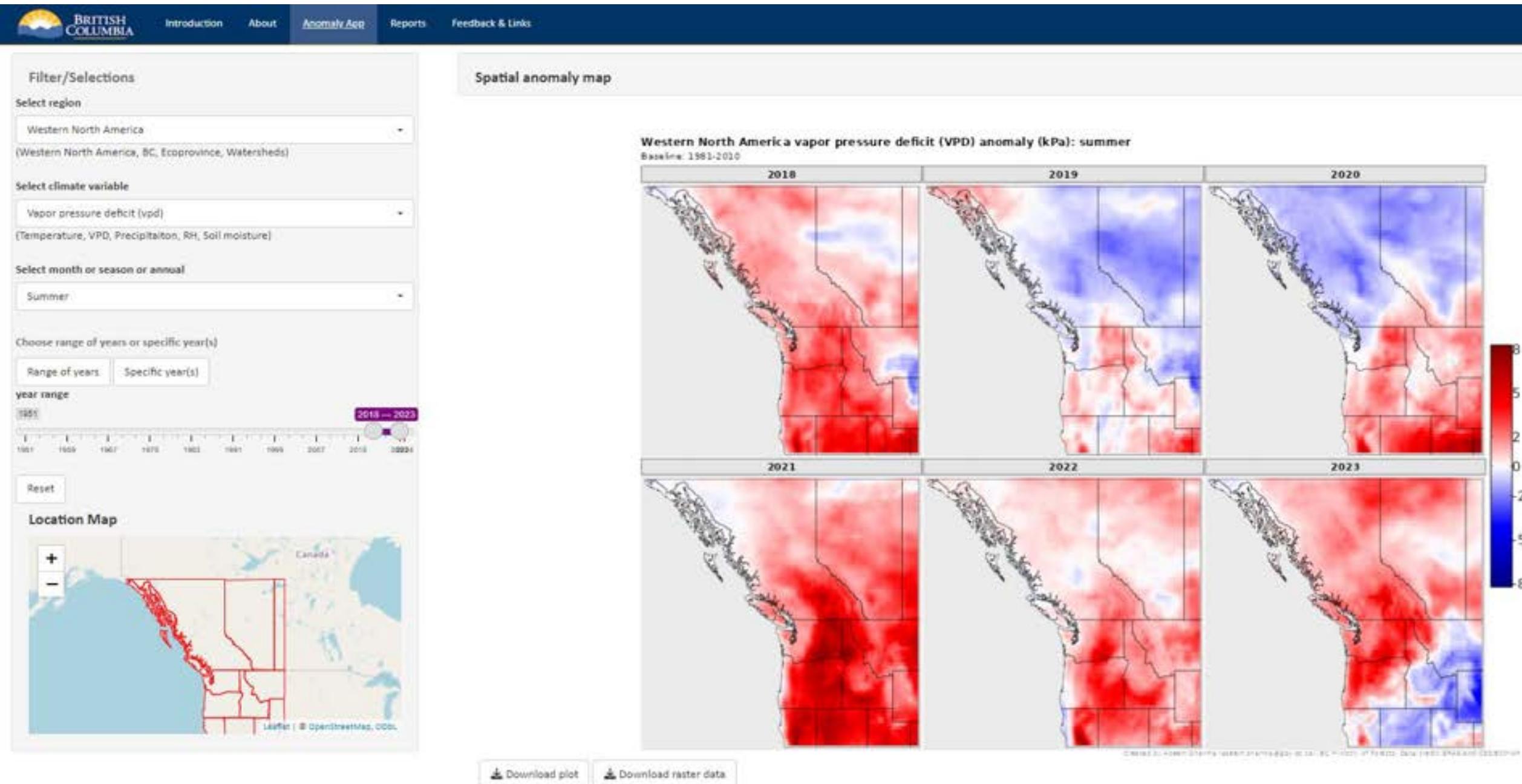
CCISS tool output indicating the proportion of the climate model ensemble projecting high (green), medium (blue), low (yellow), and nil (grey) reforestation feasibility of tree species for a selected location.

Tree Species	Period	Modelled Feasibility		
Fd: Douglas-fir	Mapped	100%		
	1991-2020 (obs)	52%	48%	
	2001-2020 (mod)	28%	75%	
	2021-2040	42%	58%	
	2041-2060	41%	58%	
	2061-2080	55%	45%	
Pt: lodgepole pine	Mapped	100%		
	1991-2020 (obs)	46%	32%	22%
	2001-2020 (mod)	32%	17%	21%
	2021-2040	12%	24%	64%
	2041-2060	26%	24%	51%
	2061-2080	28%	29%	43%
Sa: interior spruce	Mapped	100%		
	1991-2020 (obs)	46%	54%	
	2001-2020 (mod)	58%	42%	
	2021-2040	2%	88%	
	2041-2060	29%	29%	51%
	2061-2080	29%	25%	46%
Py: ponderosa pine	Mapped	100%		
	1991-2020 (obs)	22%	30%	48%
	2001-2020 (mod)	38%	75%	
	2021-2040	68%	30%	3%
	2041-2060	12%	58%	40%
	2061-2080	28%	17%	54%
	2081-2100	41%	52%	47%



<https://bcgov.github.io/climr/>

# BC Climate Anomaly App - [https://bcgov-env.shinyapps.io/bc\\_climate\\_anomaly/](https://bcgov-env.shinyapps.io/bc_climate_anomaly/)



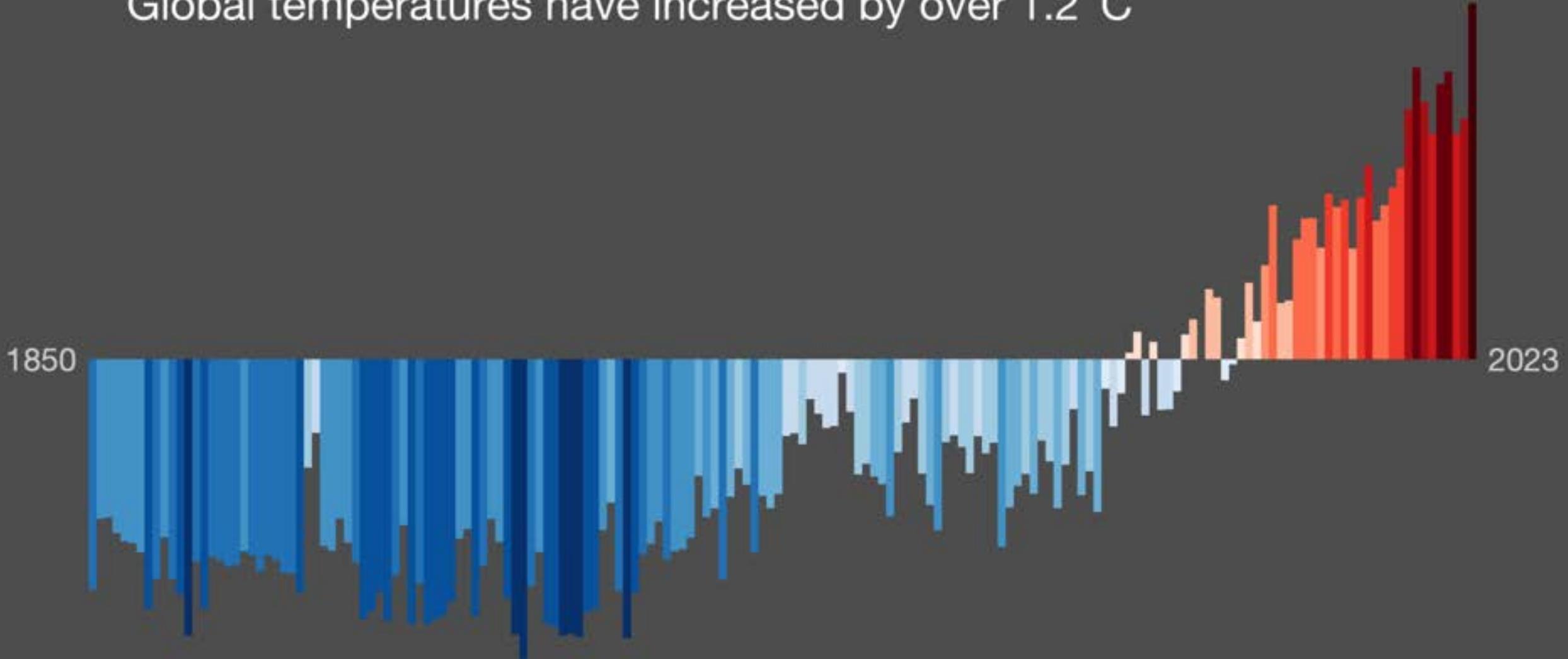
**Looking forward 10 years...**

**what climate risks are you  
concerned about?**

**Looking forward 10 years...**

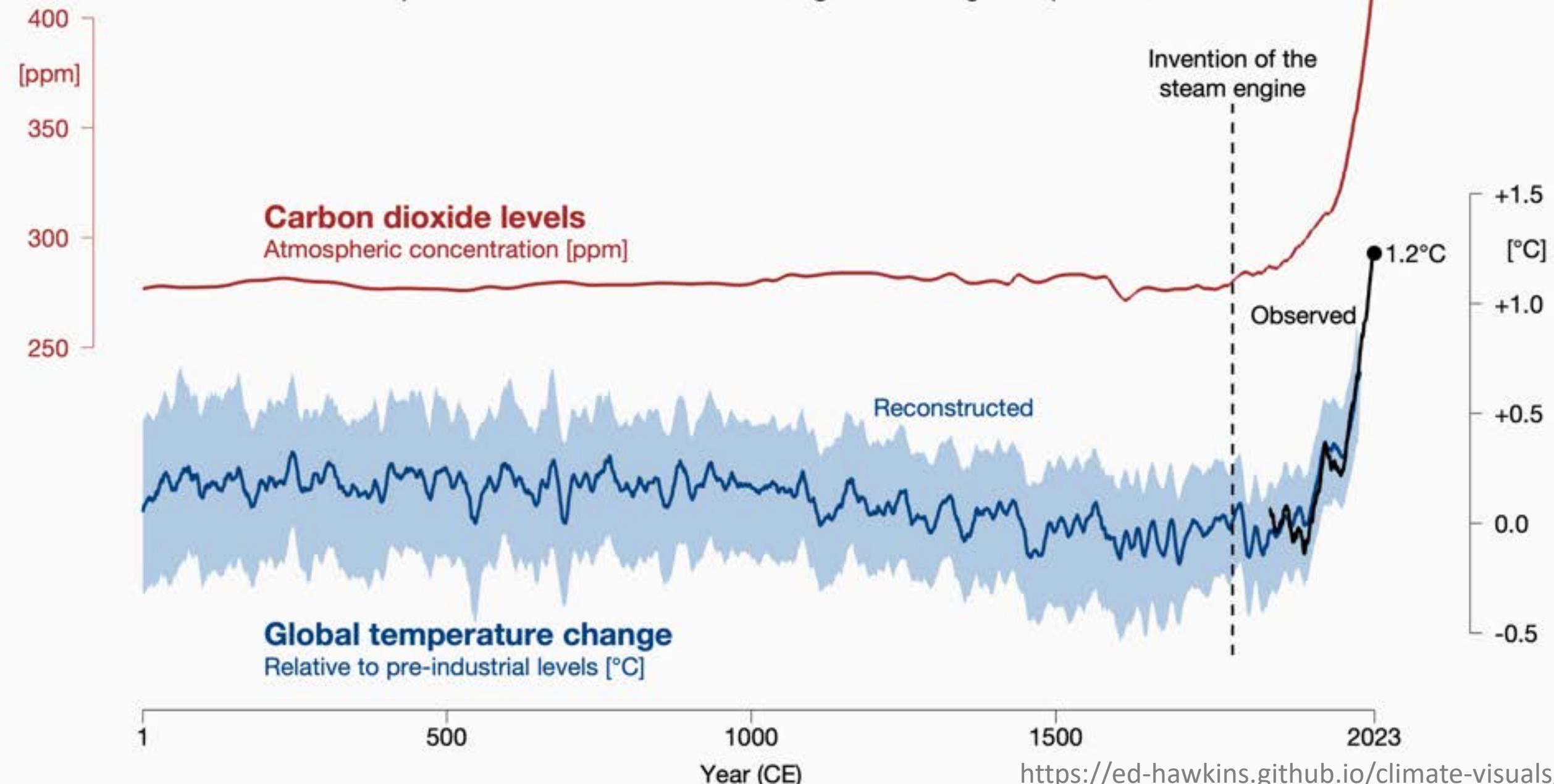
**How could we be more  
resilient than today?**

Global temperatures have increased by over  $1.2^{\circ}\text{C}$

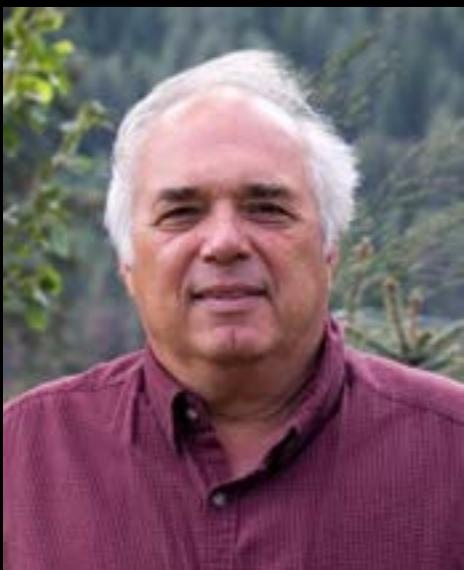


# Observed changes in climate over the last 2023 years

Variations in atmospheric carbon dioxide levels and global average temperature



“I’m 60, and I thought climate change was a problem for the next generation. Now, I’m mayor of a town that no longer exists.”



Jan  
Polderman,  
Former  
Mayor of  
Lytton, BC



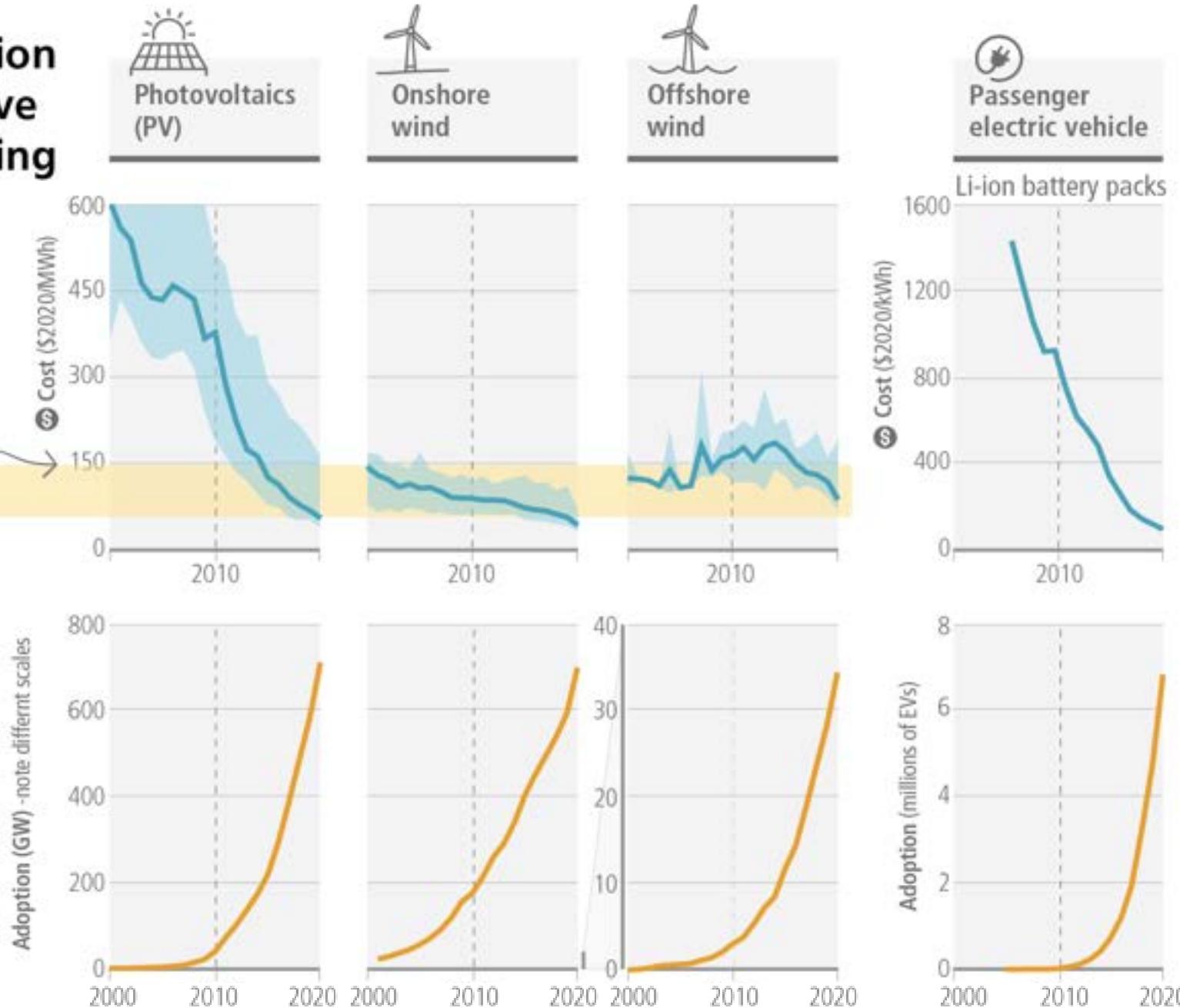
# Renewable electricity generation is increasingly price-competitive and some sectors are electrifying

## a) Market Cost

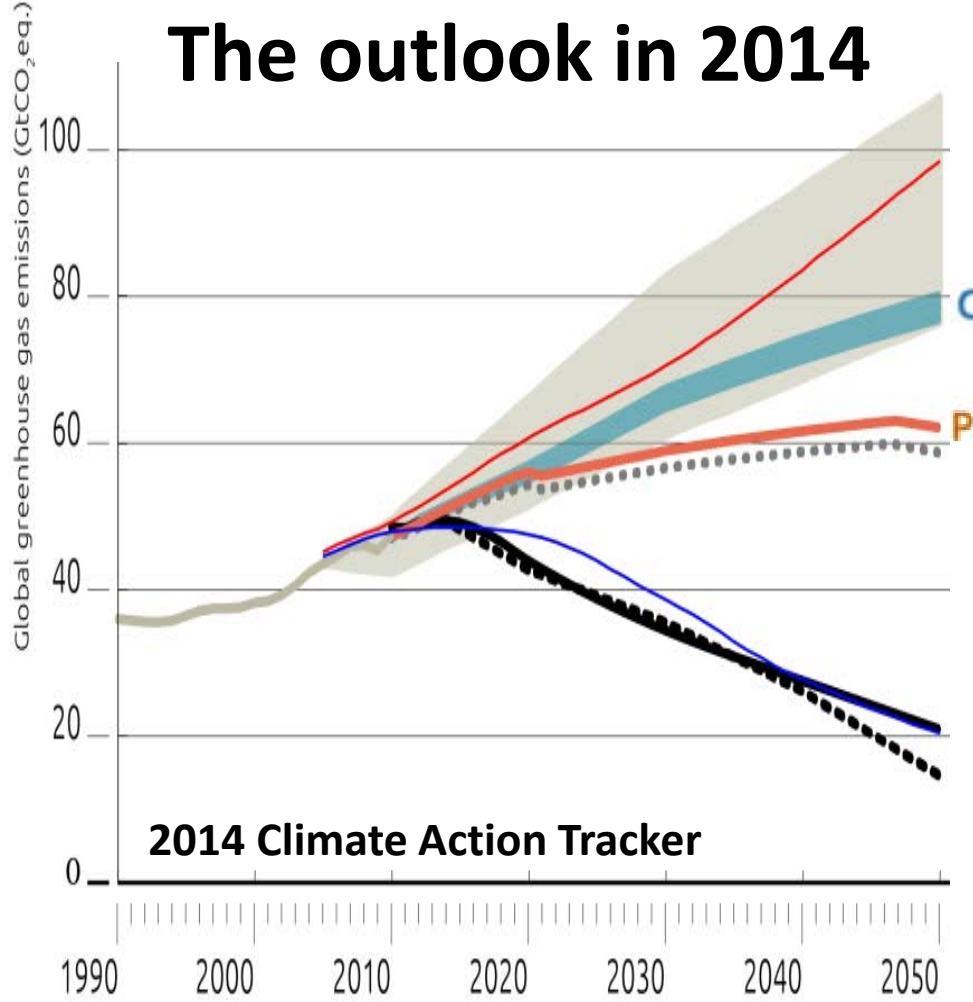
Since AR5, the unit costs of some forms of renewable energy and of batteries for passenger EVs have fallen.

below this point, costs can be less than fossil fuels

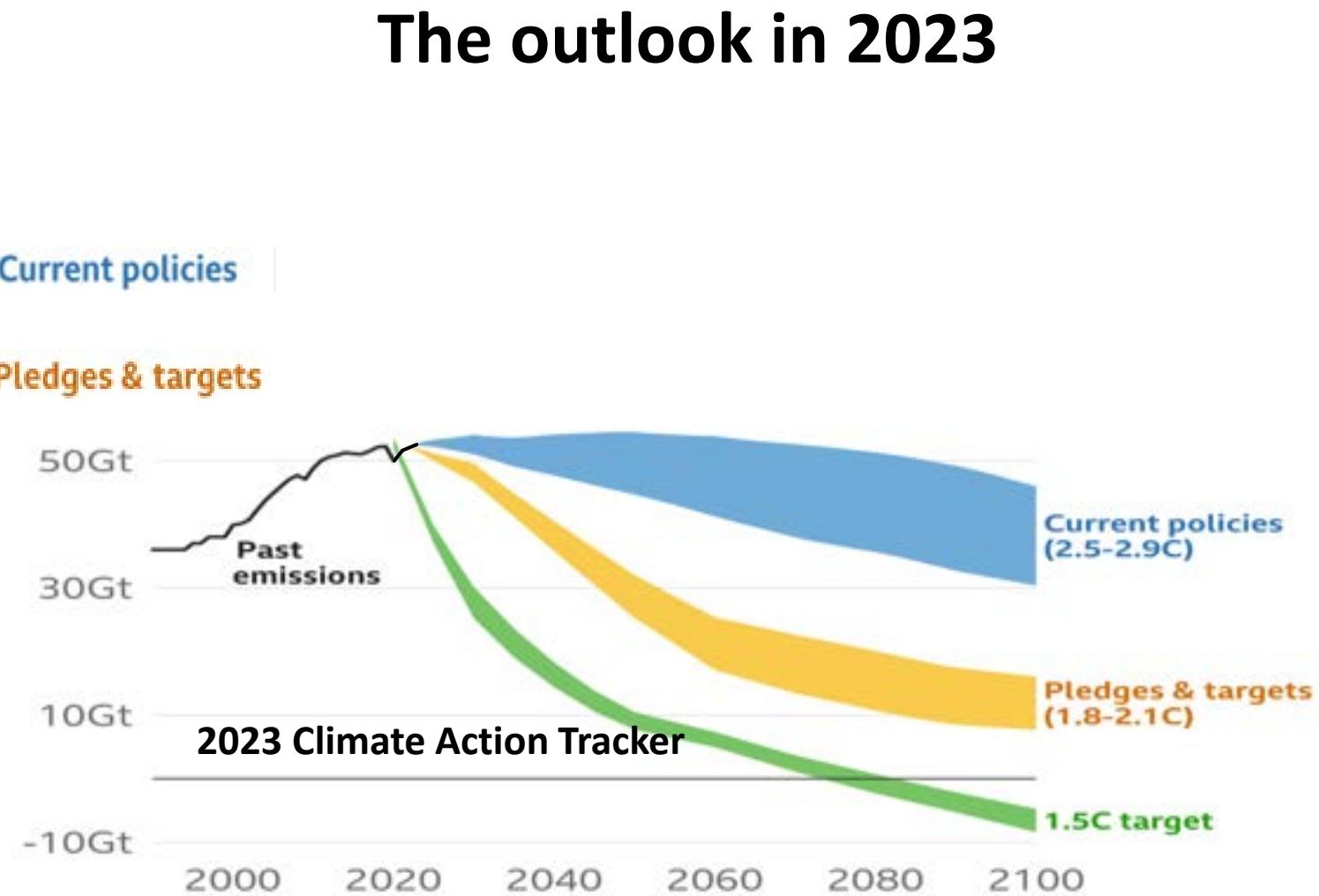
Fossil fuel cost (2020)



## The outlook in 2014



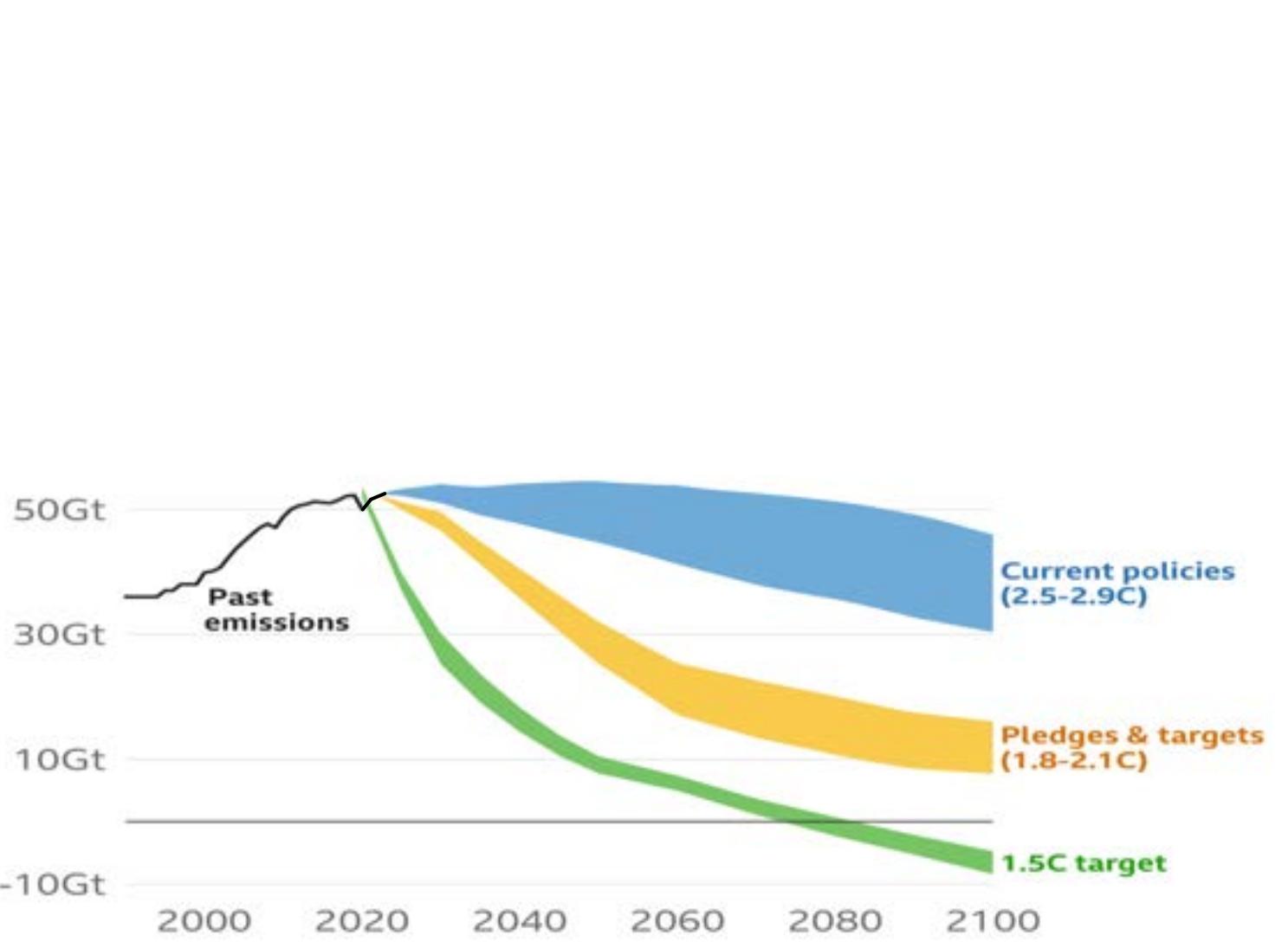
## The outlook in 2023



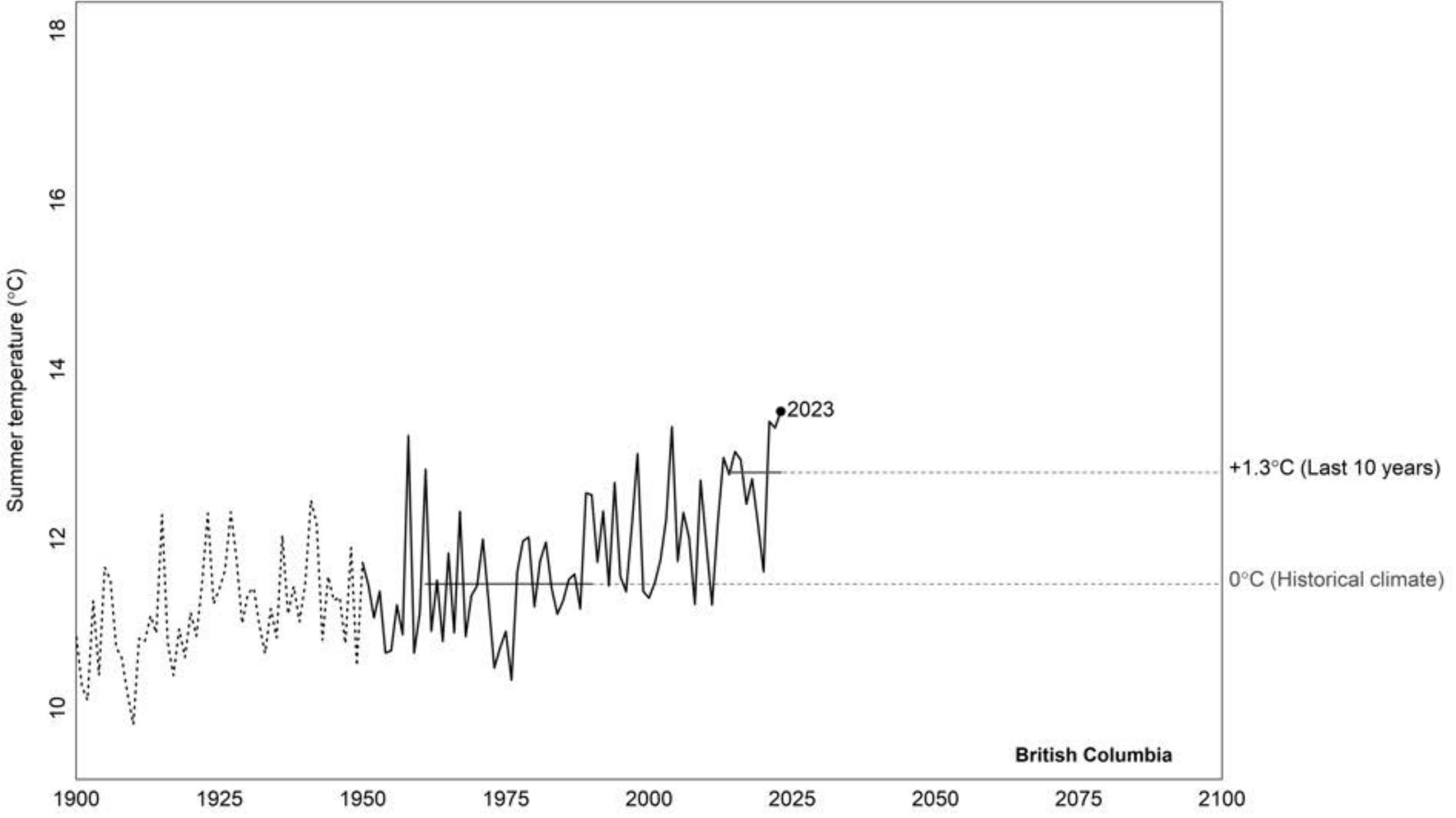
- Historic emissions
- Reference range\*
- Pledge pathway (CAT assessment)
- Likely below 2°C
- 50% chance below 1.5°C in 2100
- RCP2.6
- RCP8.5
- ... Action incl. conditional pledges & national policies
- Current policy projections (CAT assessment)

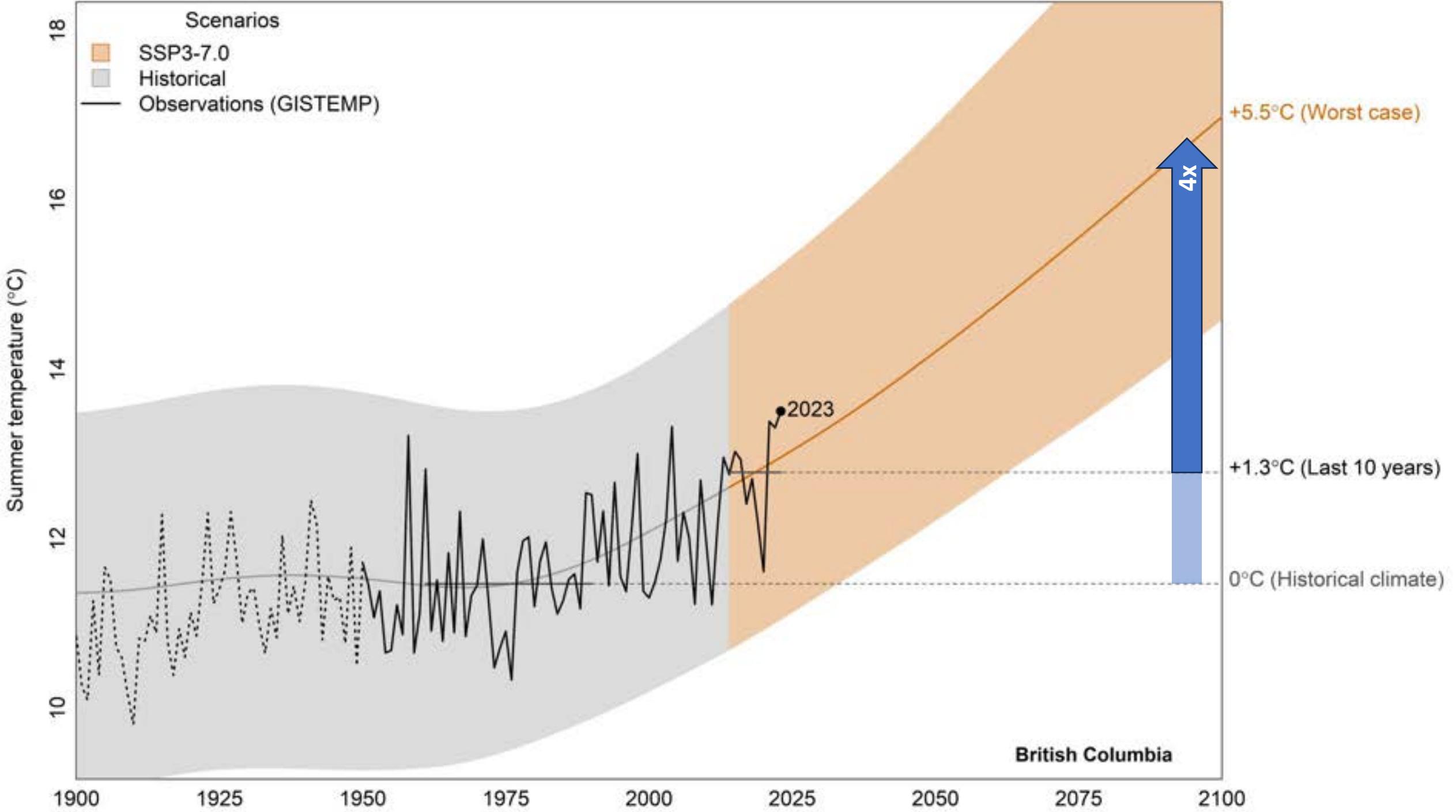
© www.climateactiontracker.org/  
Ecofys/Climate Analytics/PIK

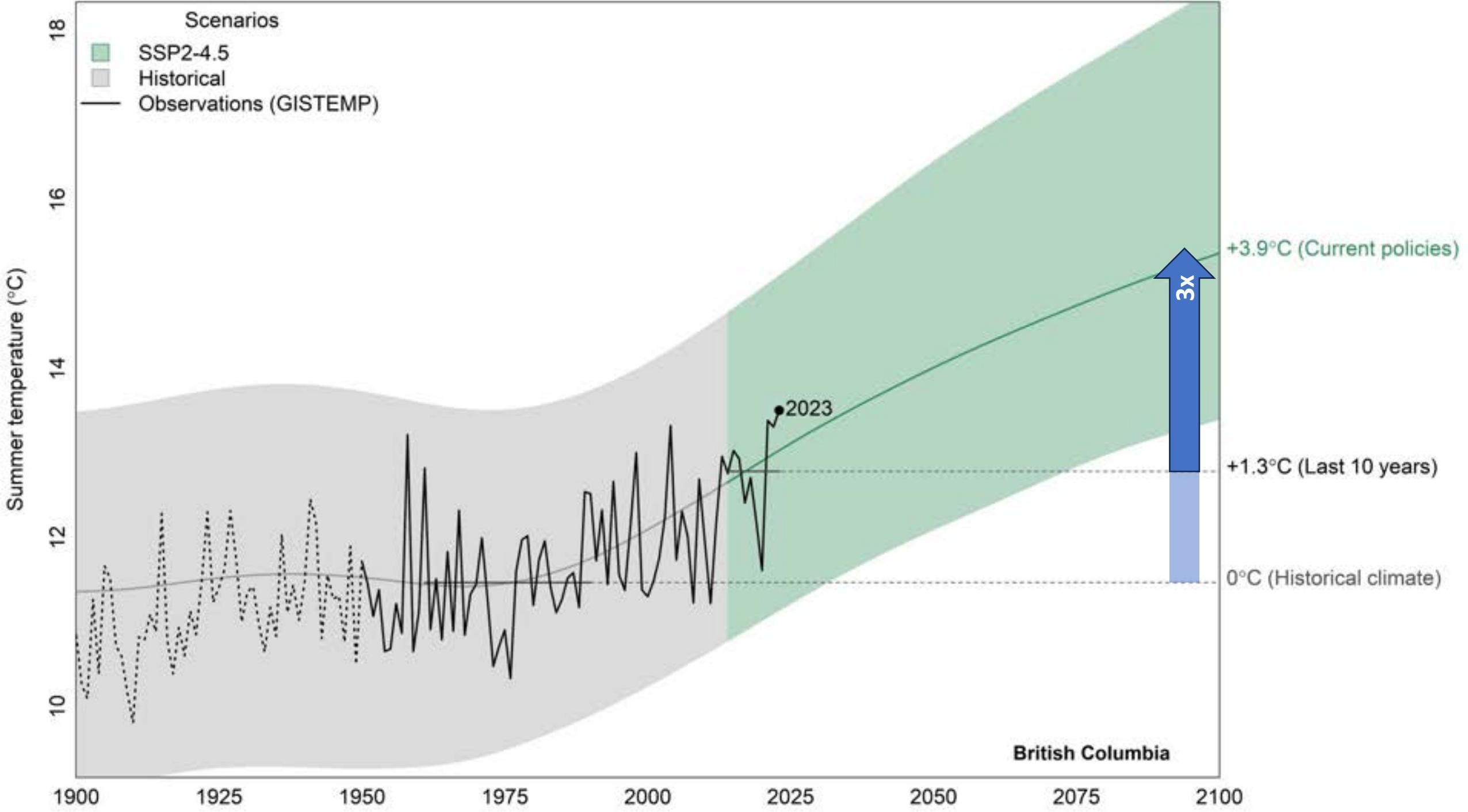
Boehm et al. 2023. State of Climate Action 2023.  
<https://doi.org/10.46830/wrirpt.23.00010>.

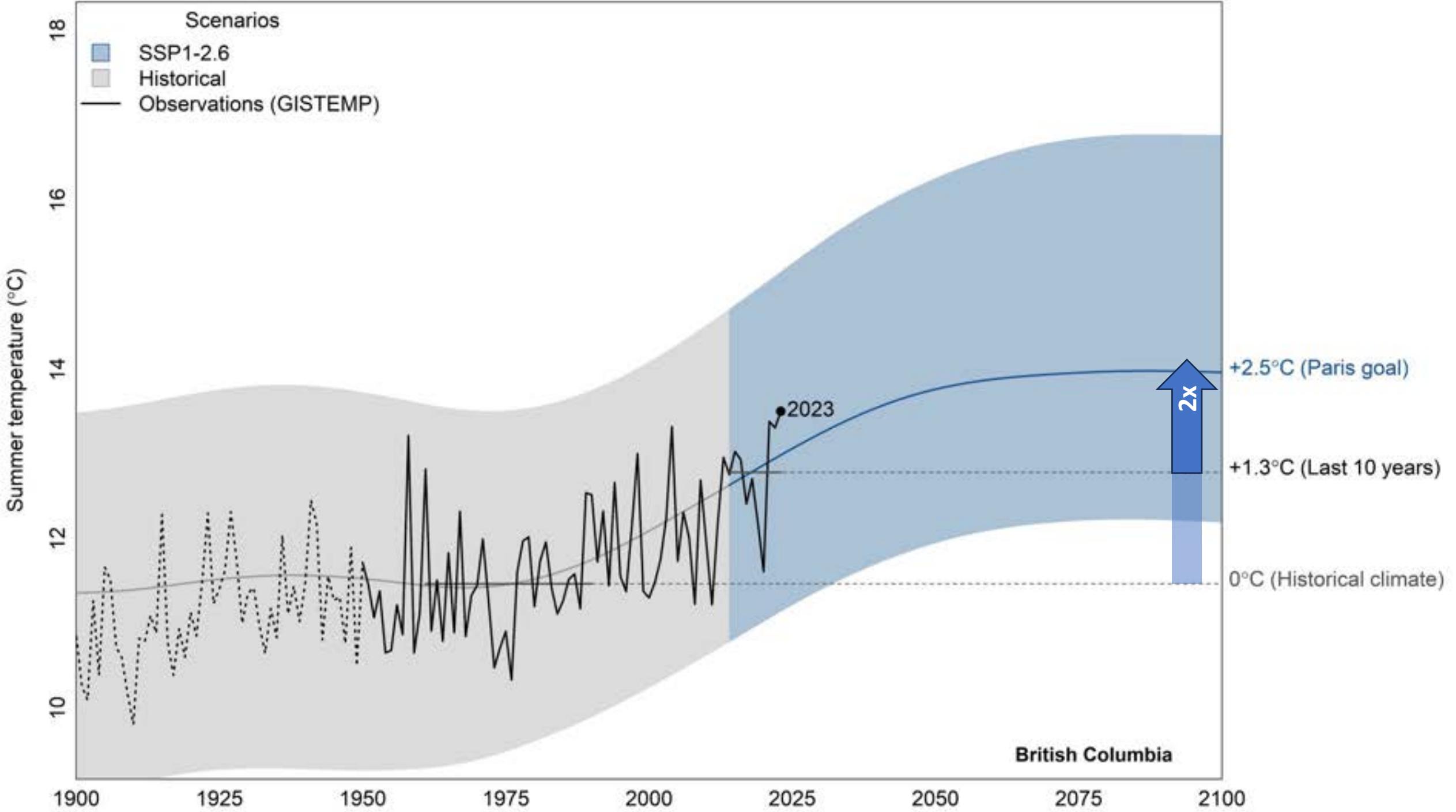


Boehm et al. 2023. State of Climate Action 2023.  
<https://doi.org/10.46830/wrirpt.23.00010>.









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“We basically have three choices:  
**mitigation, adaptation and suffering.**  
We’re going to do some of each. The  
question is what the mix will be.”

16

John Holdren. President of the American Association  
for the Advancement of Science (2008-2009)

14

Summer temperature (°C)

12

10

1900

1925

1950

1975

2000

2025

2050

2075

2100

British Columbia

2014 global action

**Mitigation**

2023 action

Limits to  
Adaptation

**Adaptation**

18



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We’re going to do some of each. The  
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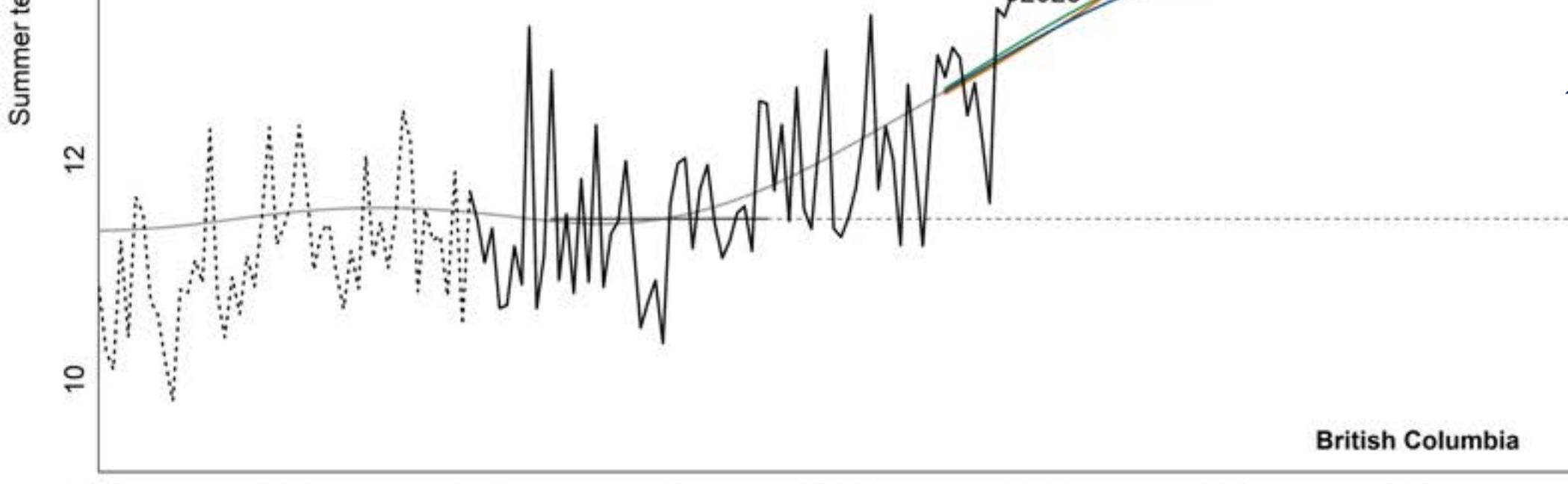
British Columbia

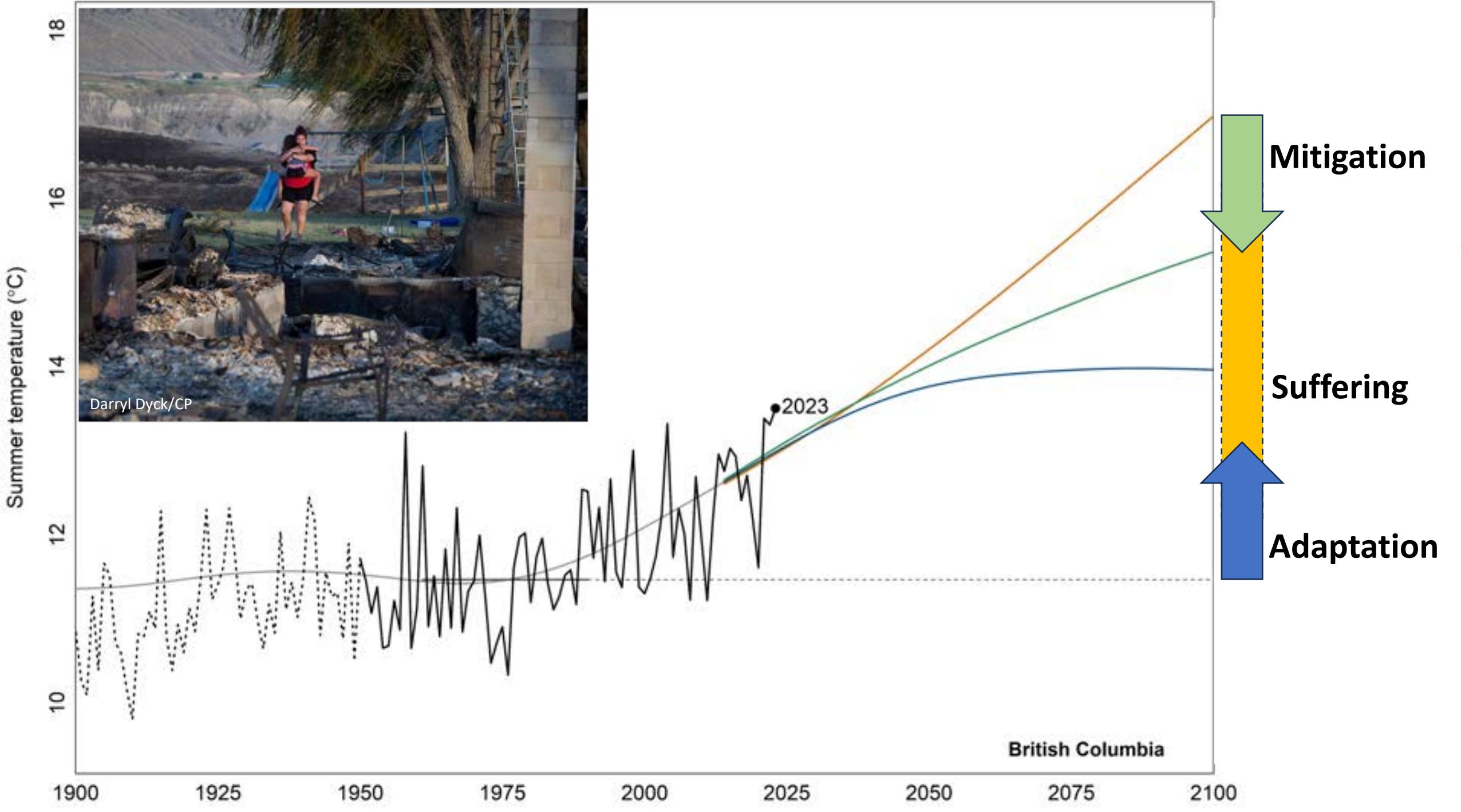
Mitigation

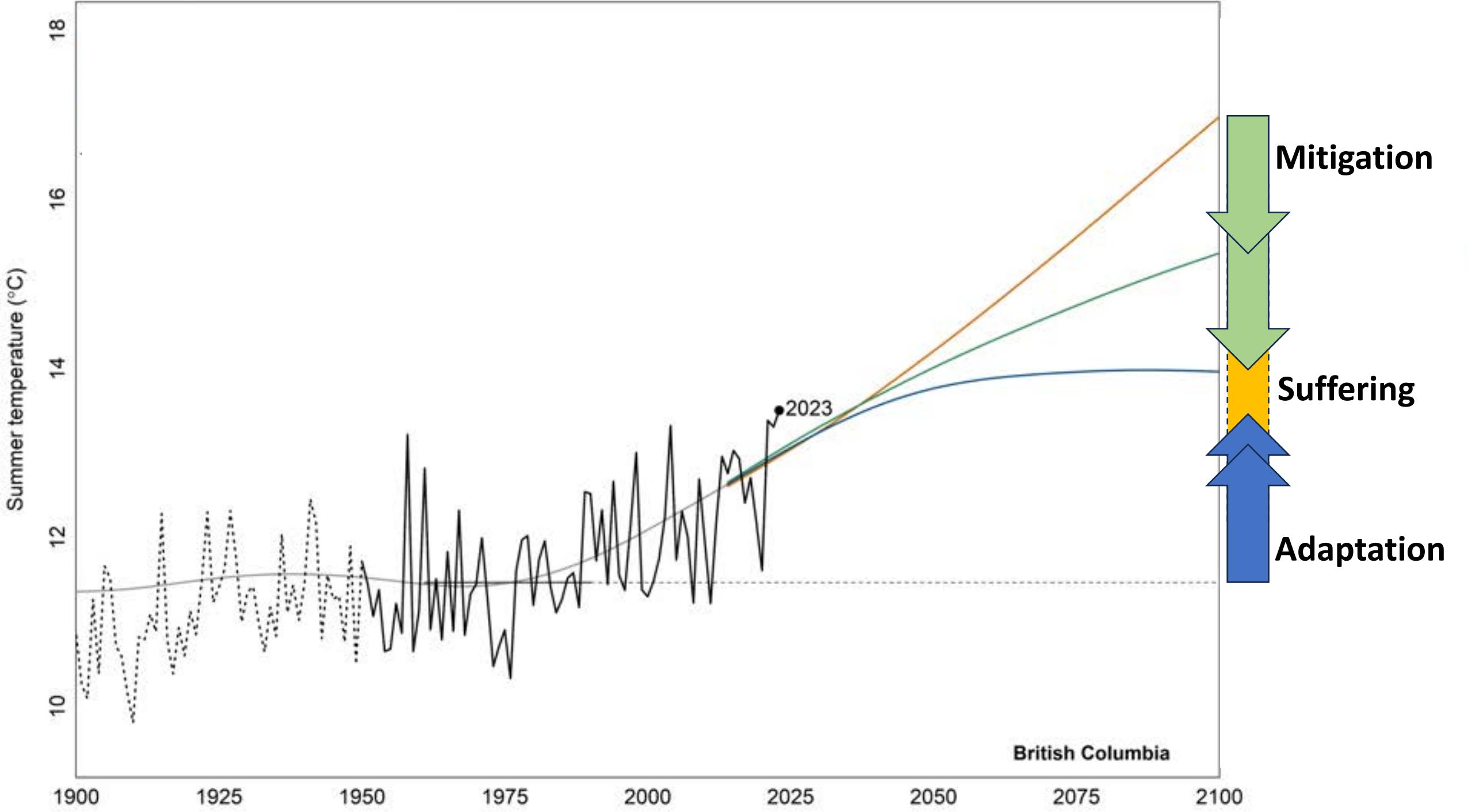
Suffering

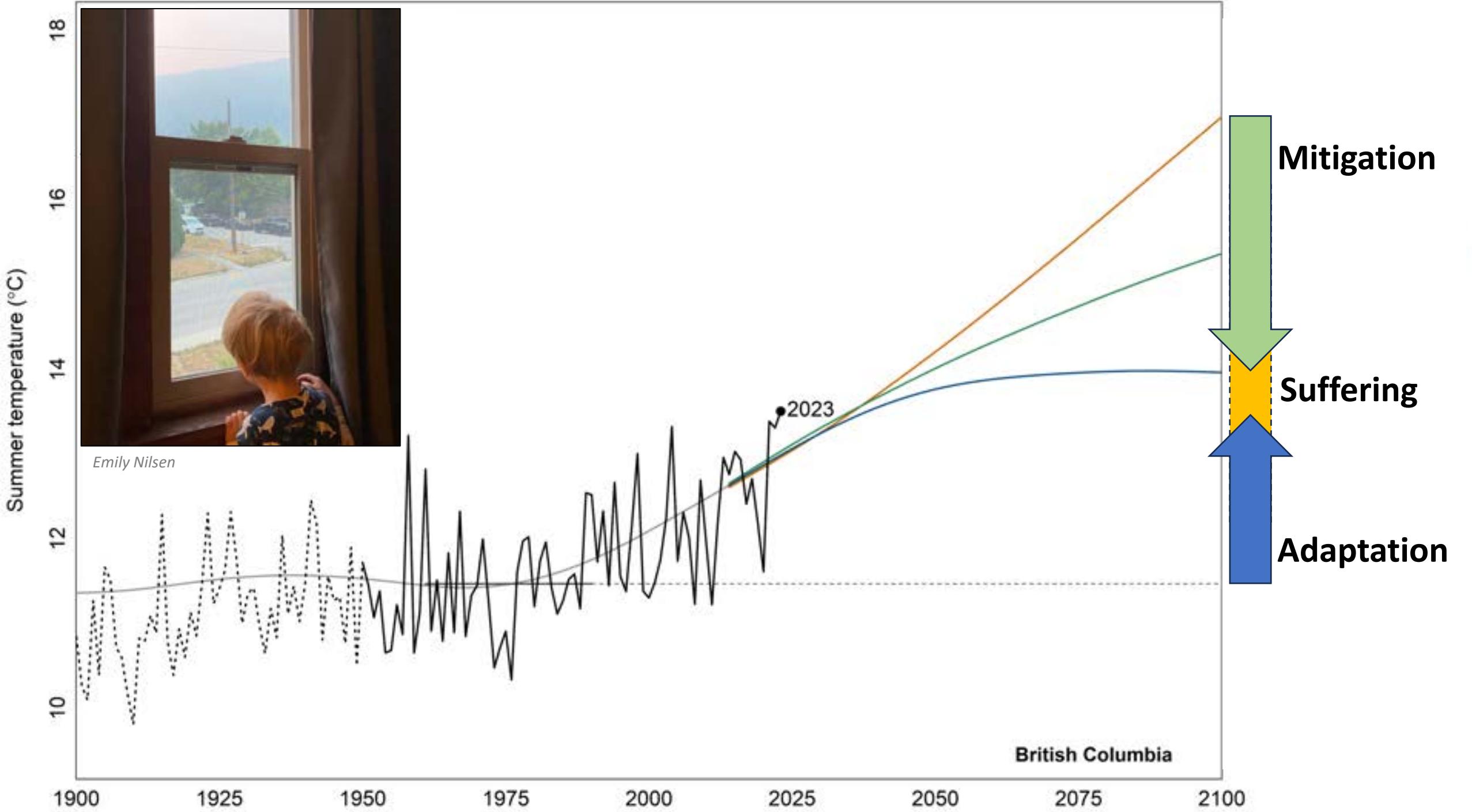
Adaptation

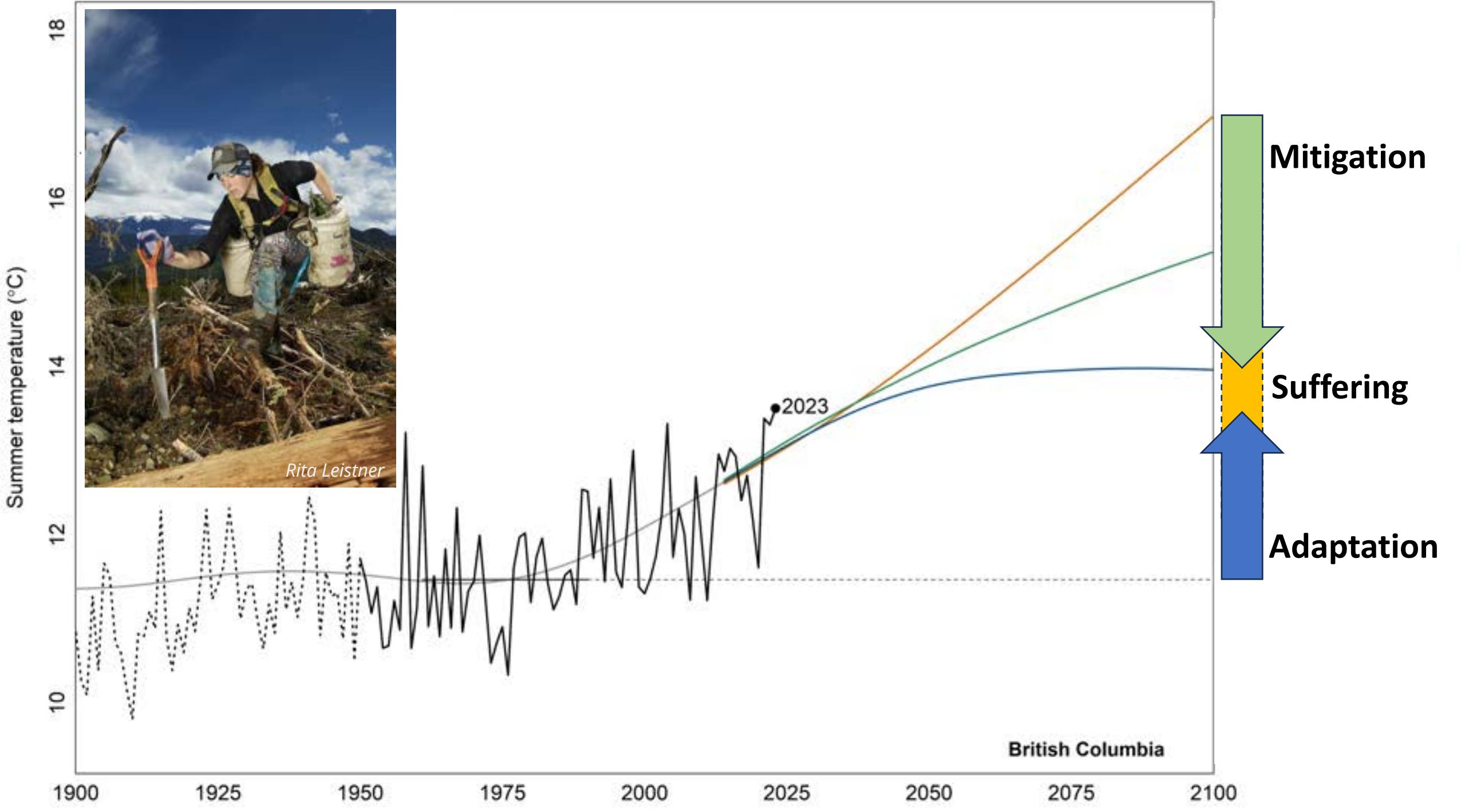
2023

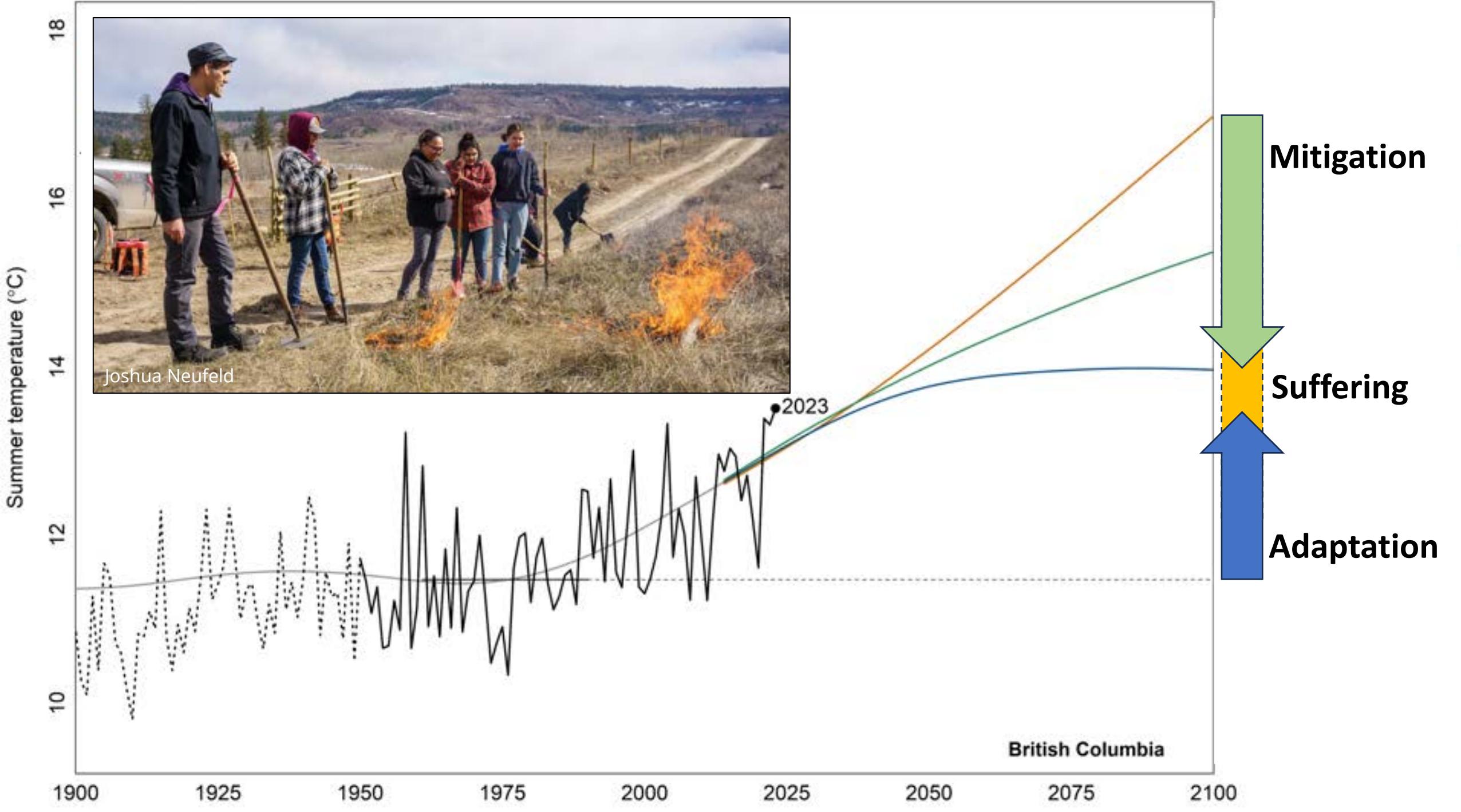








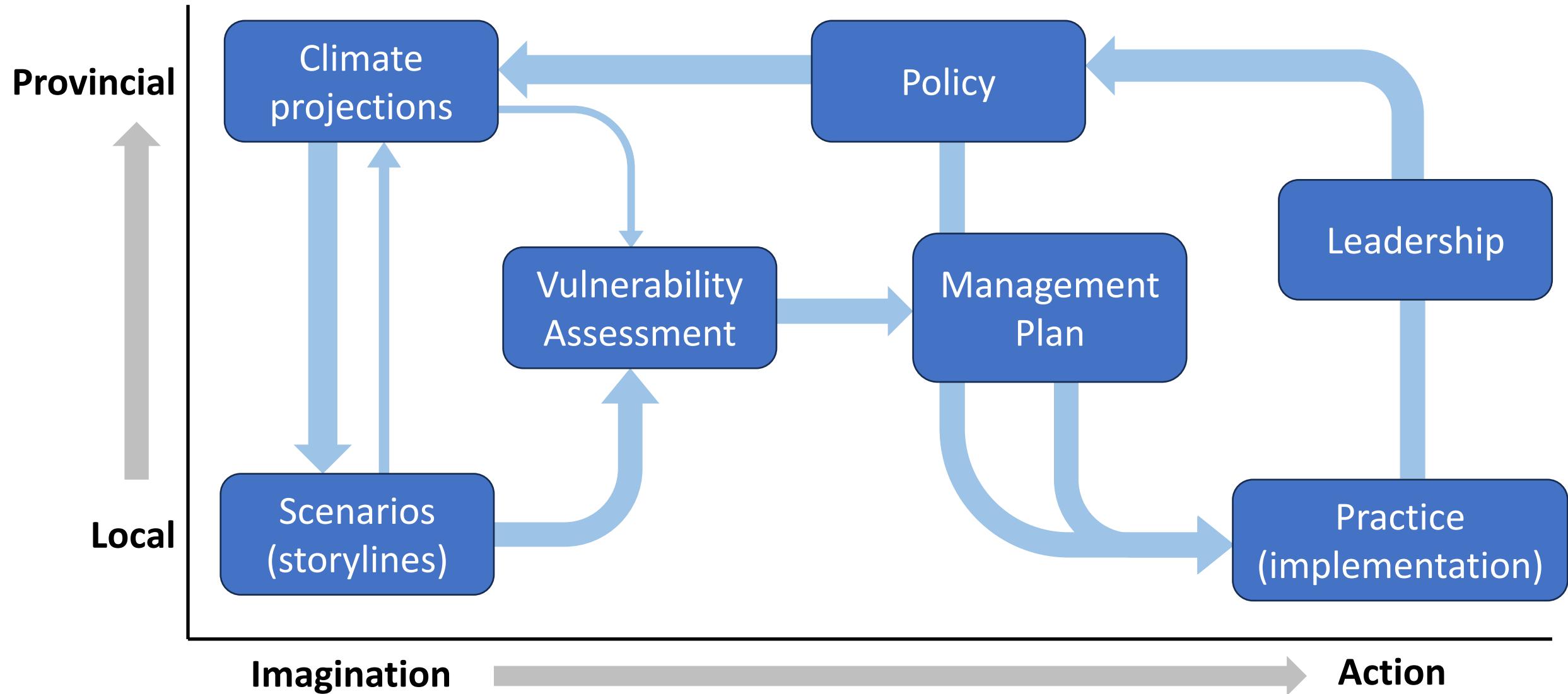




# Overcoming barriers to adaptation



# Adaptation – from projections to practice



## Key messages

1. **The future is not written.** Adaptation is made possible by the phaseout of fossil fuels.
2. **Local knowledge and imagination is central** in adapting to climate change in forest management

# Make your own projections

<https://bcgov-env.shinyapps.io/cmip6-BC/>



Intro About Time Series Choose models Maps Guidance Model Info

Compare CMIP6 climate model simulations to each other and to observations. Compile custom ensembles with and without bias correction. See projections for subregions (ecoprovinces) of BC. The 8-model subset of the ClimateBC/NA ensemble is the default selection. Shaded areas are the minimum and maximum of the multiple simulation runs for each climate model; a line indicates there is only one simulation for that scenario.

GCM selection mode:

Single GCM  Ensemble

Default Ensemble

13-model (ClimateBC/NA)  8-model subset

Reset

Compile into ensemble projection

Choose global climate models:

- ACCESS-ESM1-5  AWI-CM-1-1-MR  BCC-CSM2-MR  CanESM5  CNRM-CM6-1
- CMH-ESM2-1  EC-Earth3  GFDL-ESM4  GISS-E2-1-G  HadGEM3-GC3A-L
- INM-CM5-0  IPSL-CM6A-LR  MIROC-ES2L  MIROC6  MPI-ESM1-2-HR
- MPI-ESM1-2-LR  MRI-ESM2-0  NESM3  UKESM1-0-L

Bias correction (match 1961-90 model climate to observations)

Choose emissions scenarios:

- SSP1-2.6  SSP2-4.5  SSP3-7.0  SSP5-8.5

Show 1961-1990 baseline for models

Show range of projections  Show mean of projections  Simplify

Show 5-year gridlines  Fit y axis to visible data

Compare to a predefined ensemble:

- None  13-model (ClimateNA)  8-model subset

Choose observational datasets:

- Stations (PCIC)  Stations (ClimateBC)  ERAS  ERAS-land  GISTEMP

Choose the climate element:  Mean temperature  Summer

Compare two variables

Choose an ecoprovince:

British Columbia

