



THE TYEE

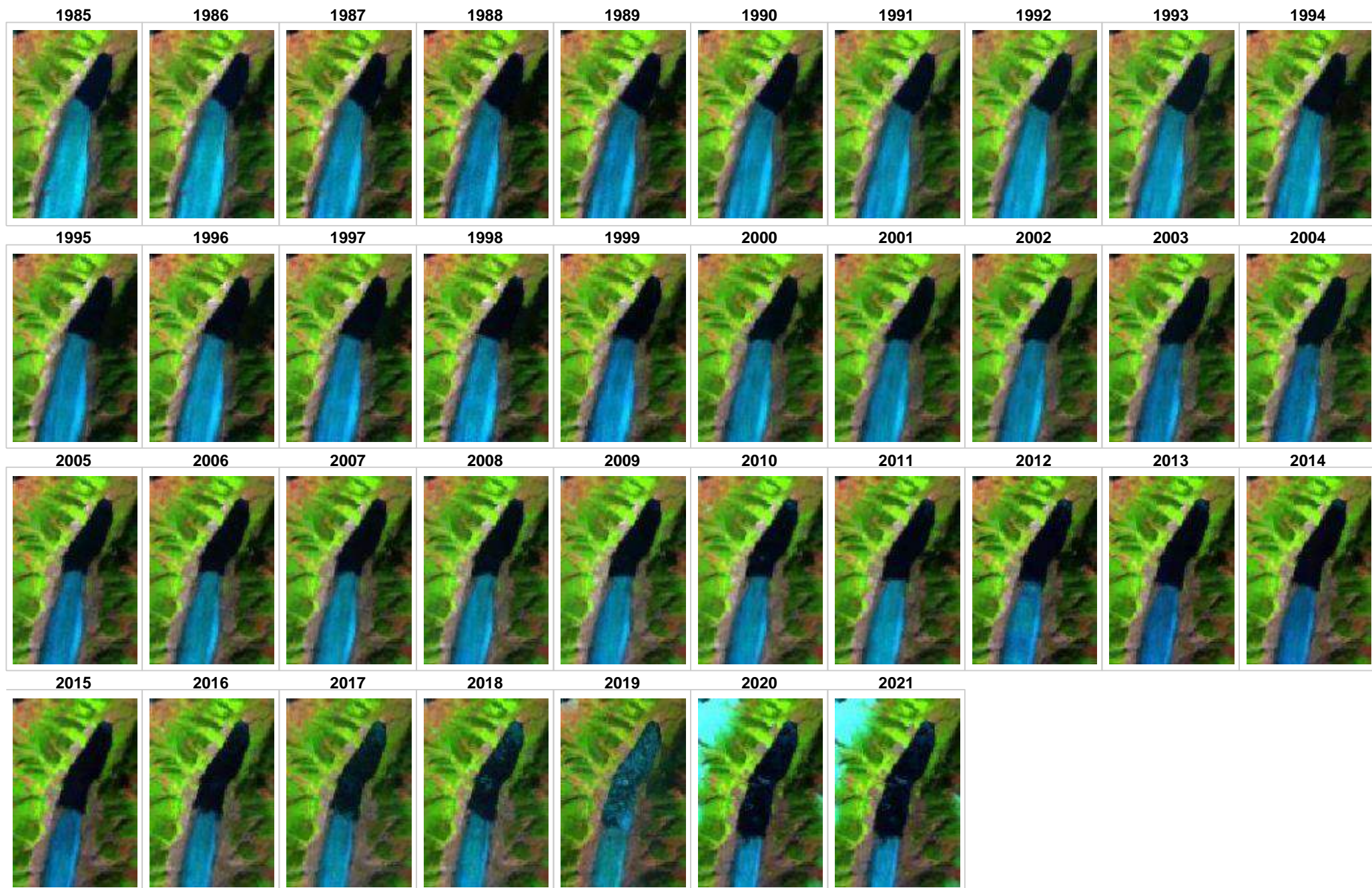
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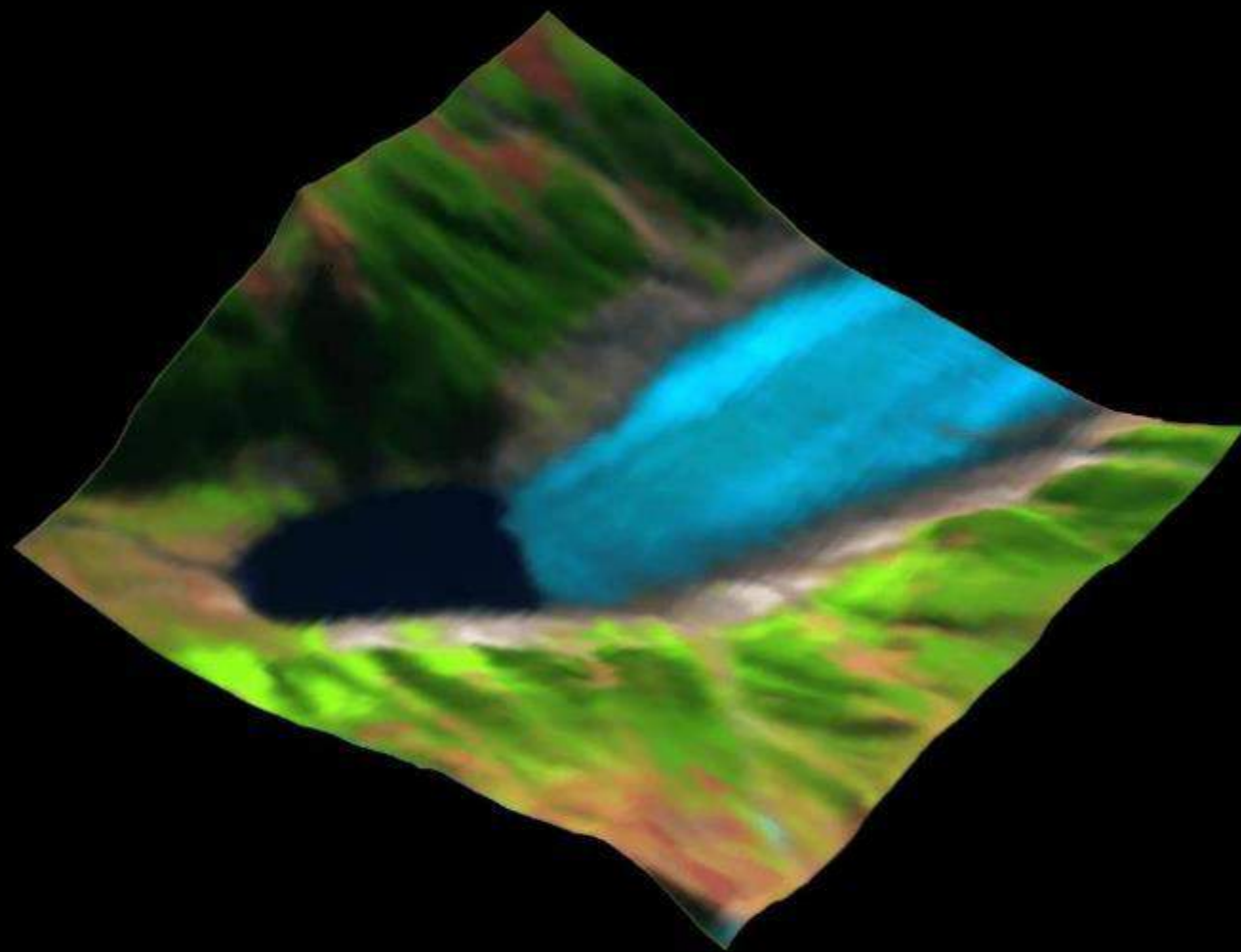
A Massive Landslide Sends a Wake-Up to BC's Mining Sector

Melting glaciers in the 'Golden Triangle' expose new deposits. And pose huge risks.

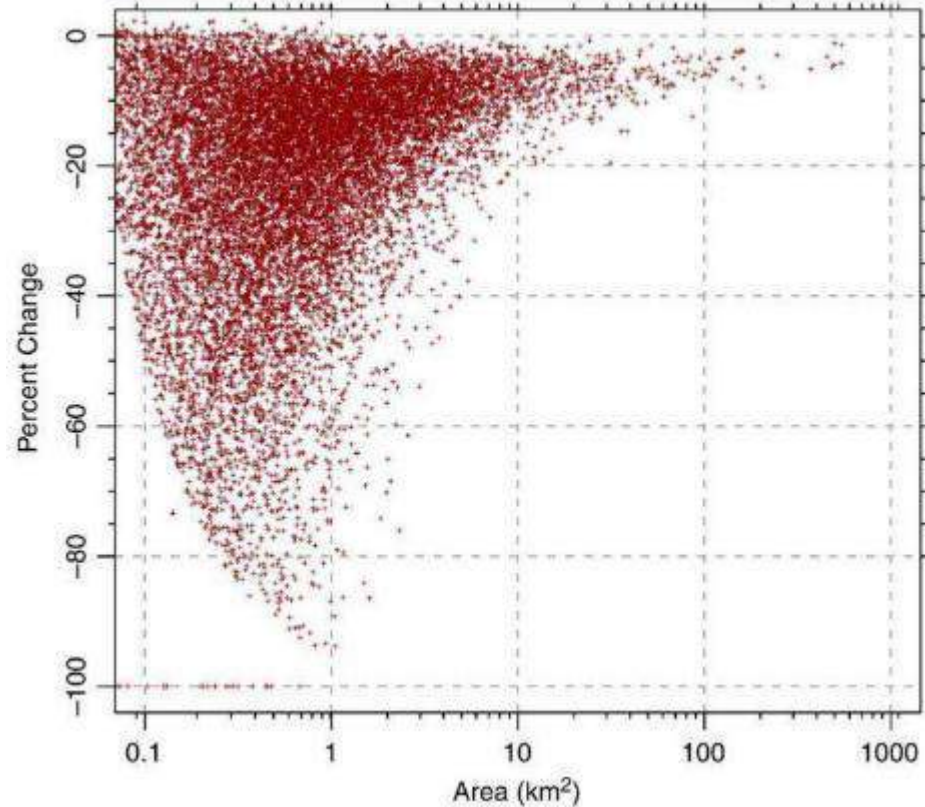




1986

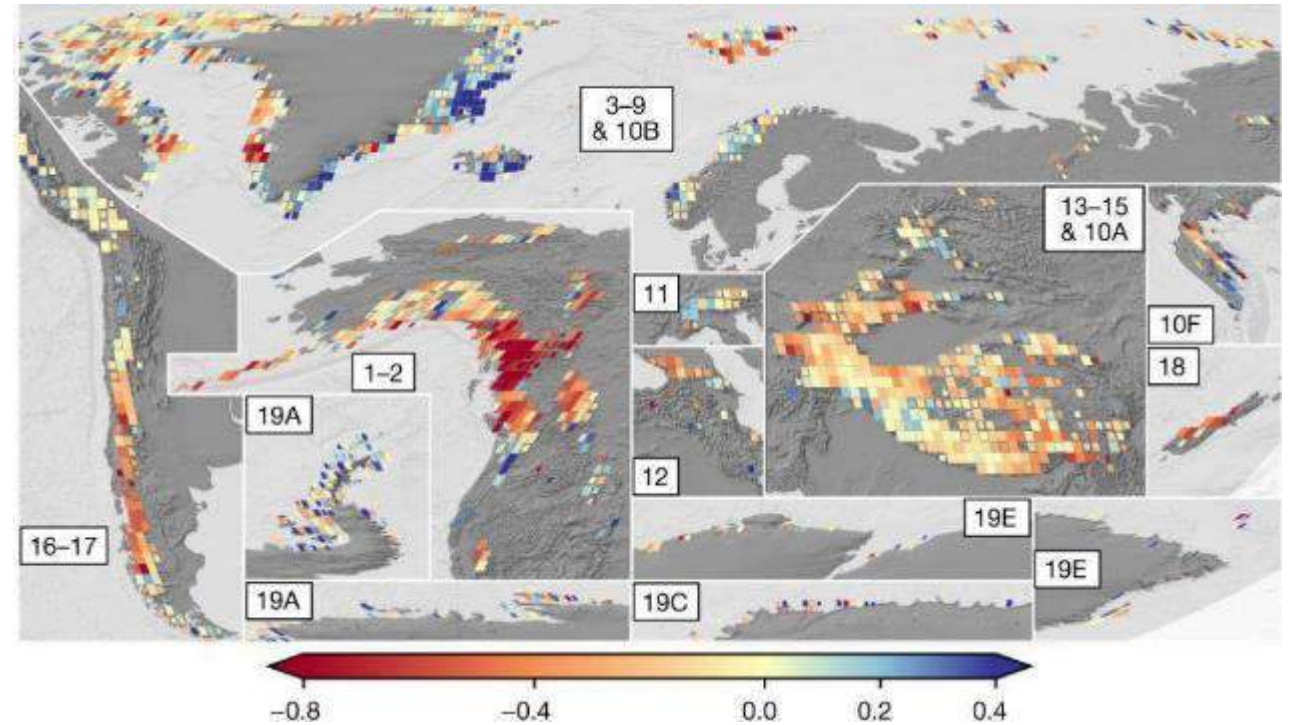


Area (1985 and 2005)



Glacier are change from 1985 to 2005. Smaller glaciers see the greatest percent change. Total of -3056 ± 990 km² (-153 ± 41 km² yr⁻¹) (Bolch et al. 2010)

Surface elevation (2000-2020)



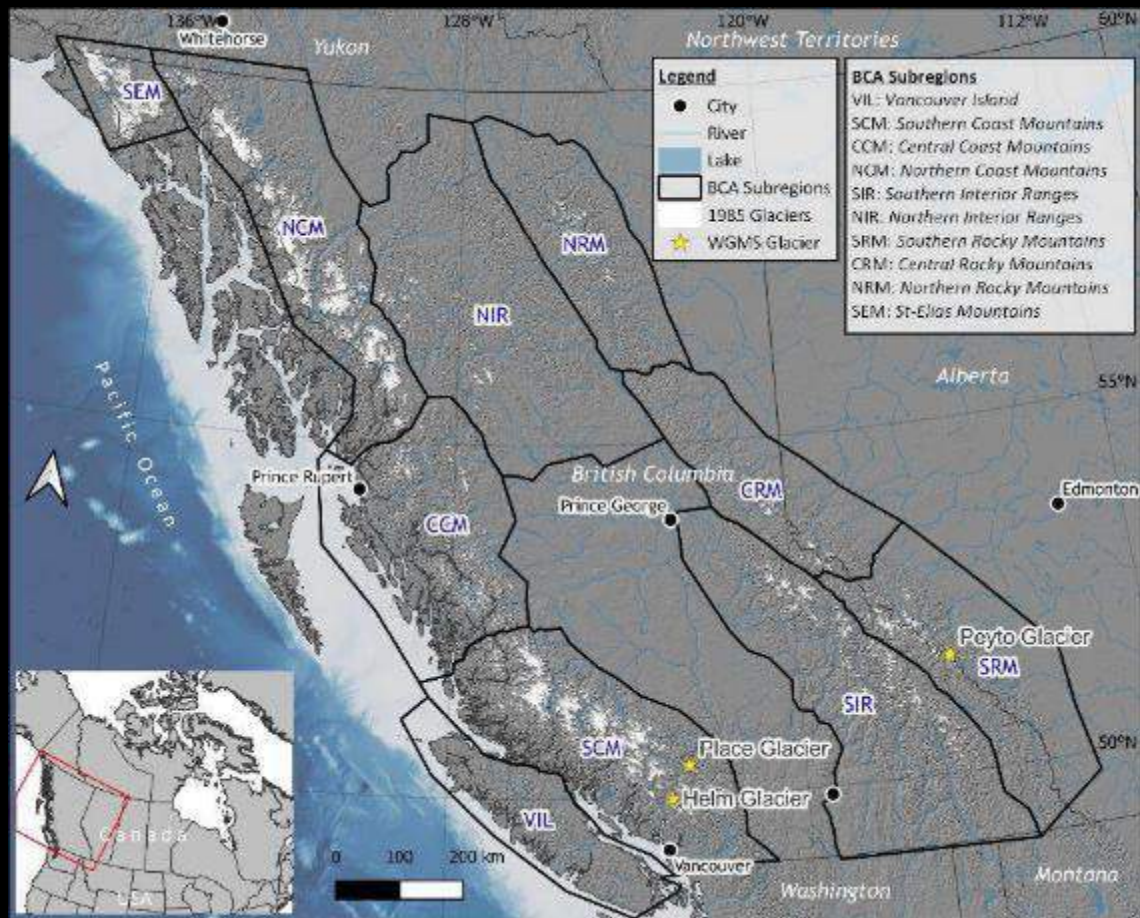
2000-2020 decadal difference in mean glacier surface elevation (m yr⁻¹)
(Hugonnet et al. 2021)



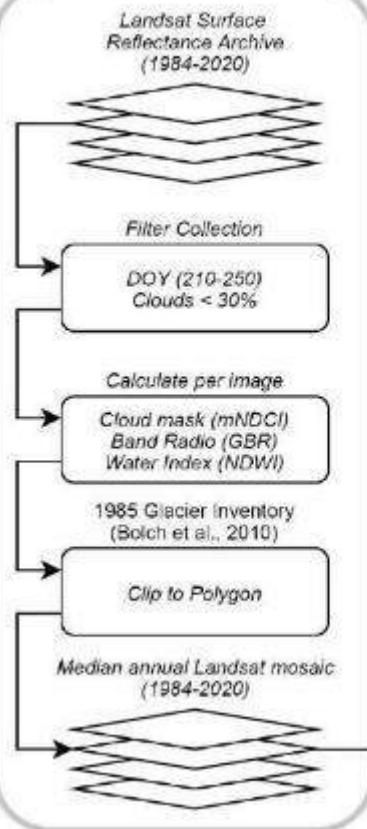
The motivation of our study is to:

- a) map glaciers automatically;
- b) update Bolch et al. (2010)
- c) assess drivers of glacier shrinkage

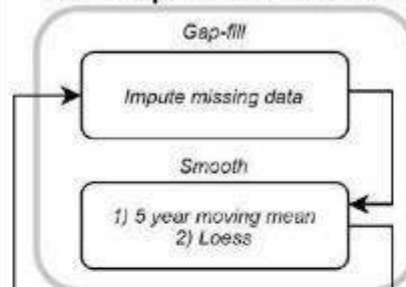
Brucejack



4.1: Annual mosaics



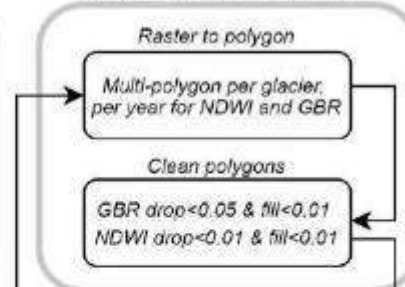
4.2: Gap-fill and smooth



4.3: Thresholds



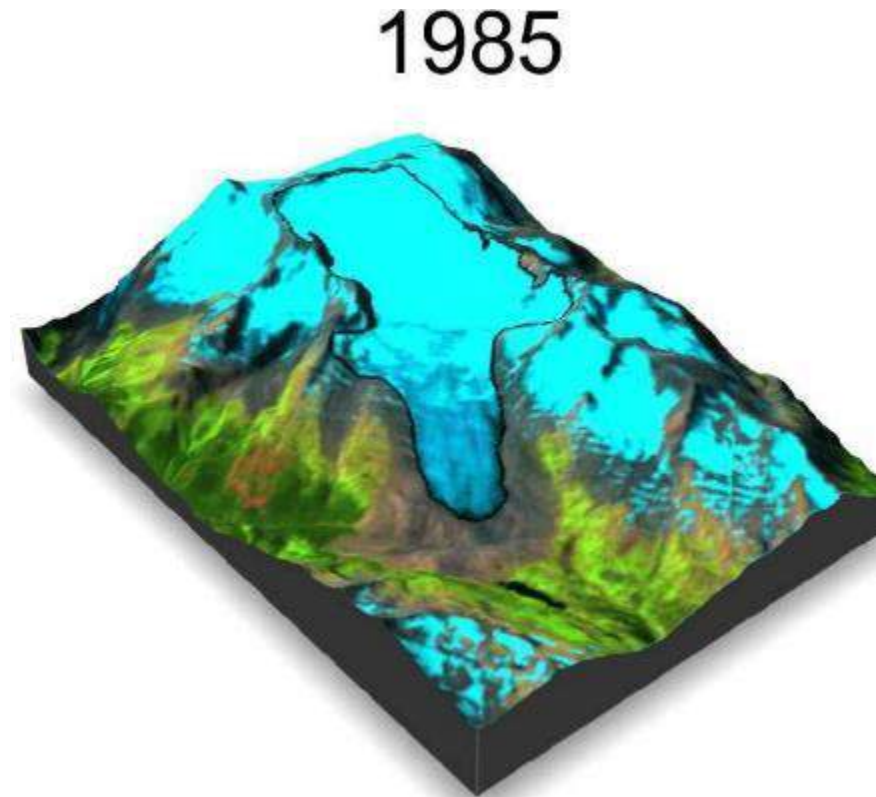
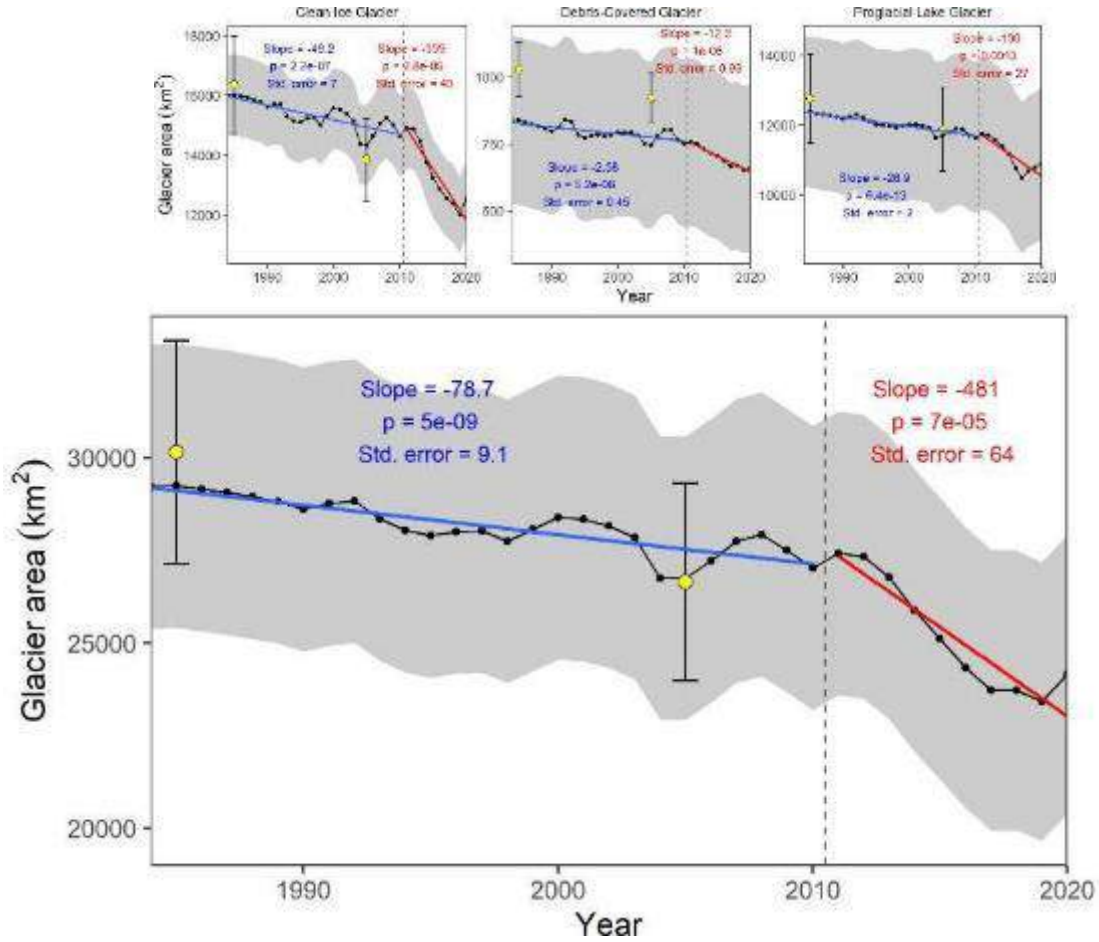
4.4: Clean and filter



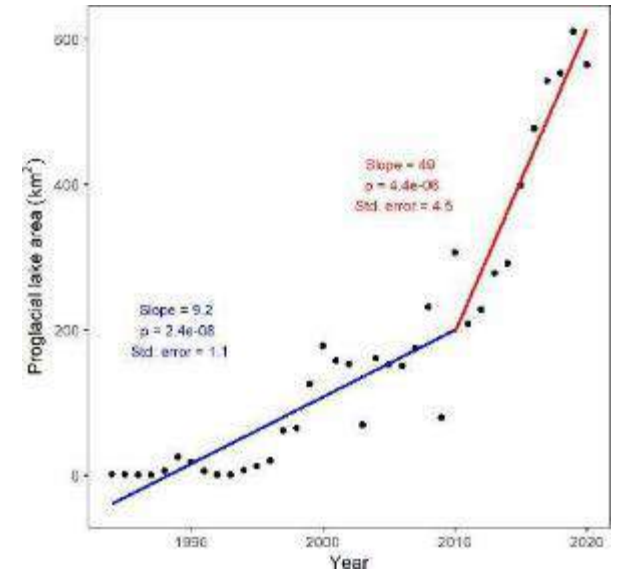
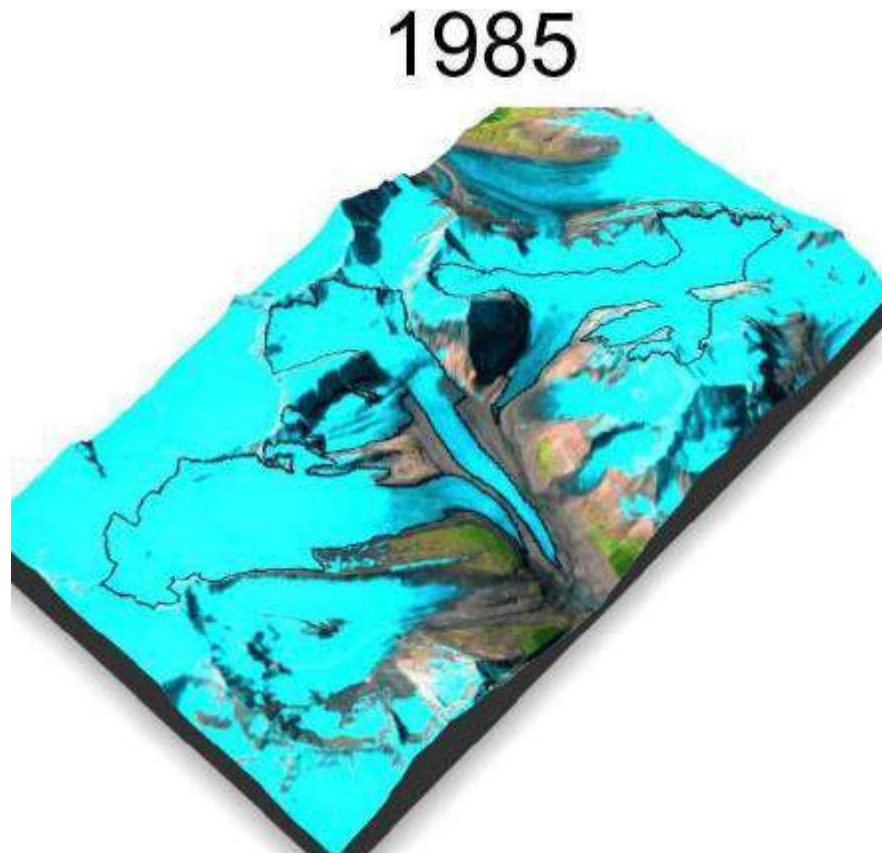
4.5: Attributes



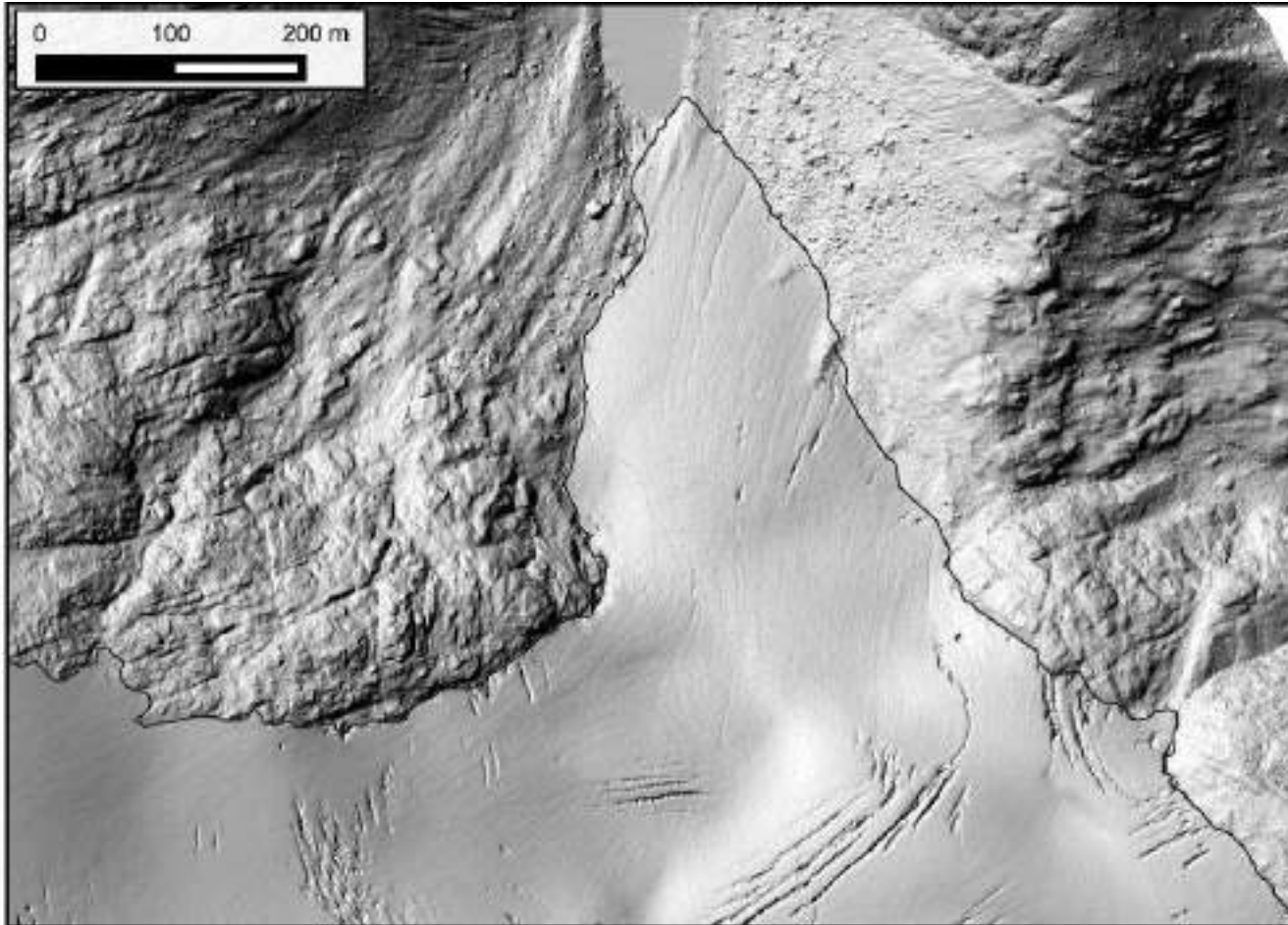
Every glaciers in BC and Alberta is retreating
That retreat is accelerating ($\sim 7\times$)



Proglacial lakes are growing 49 km² per year

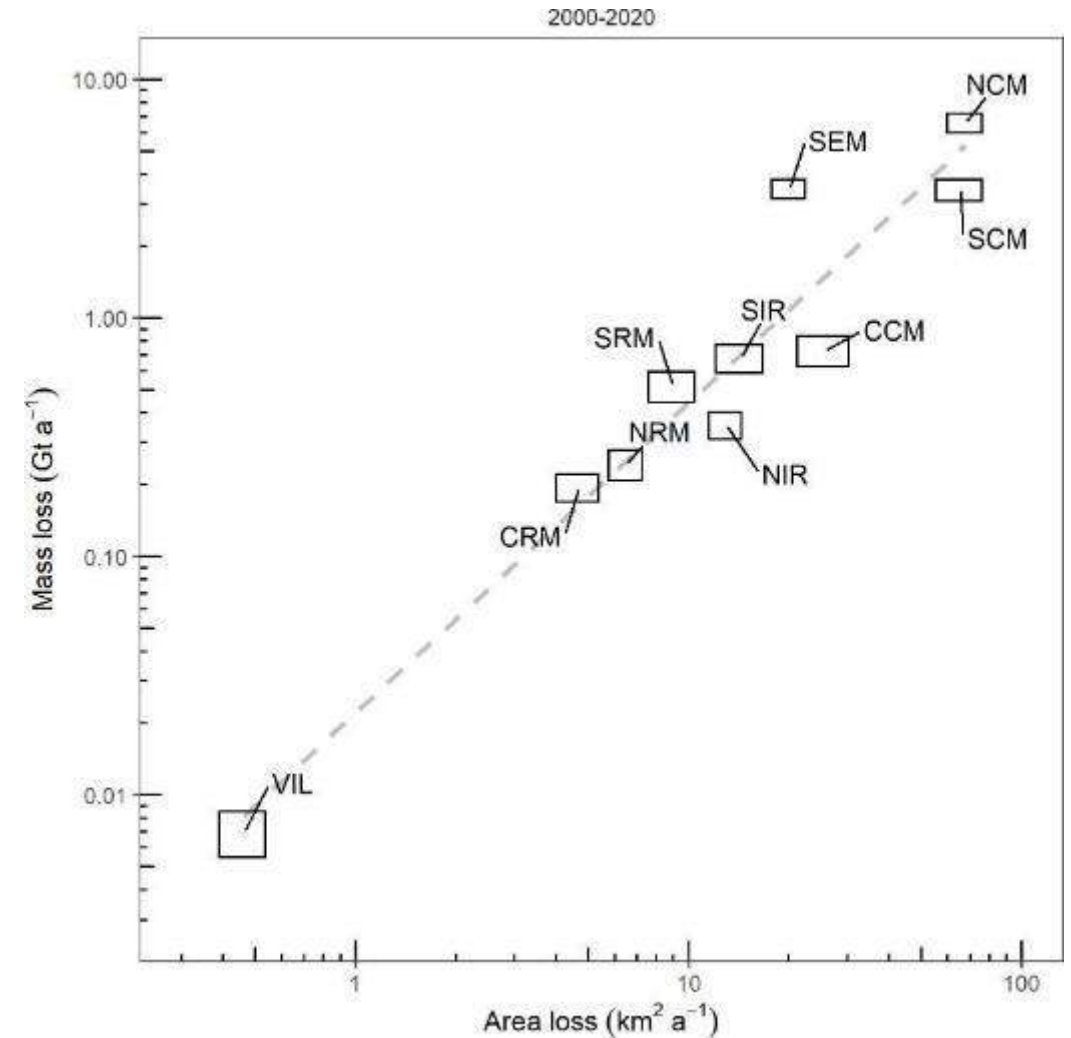


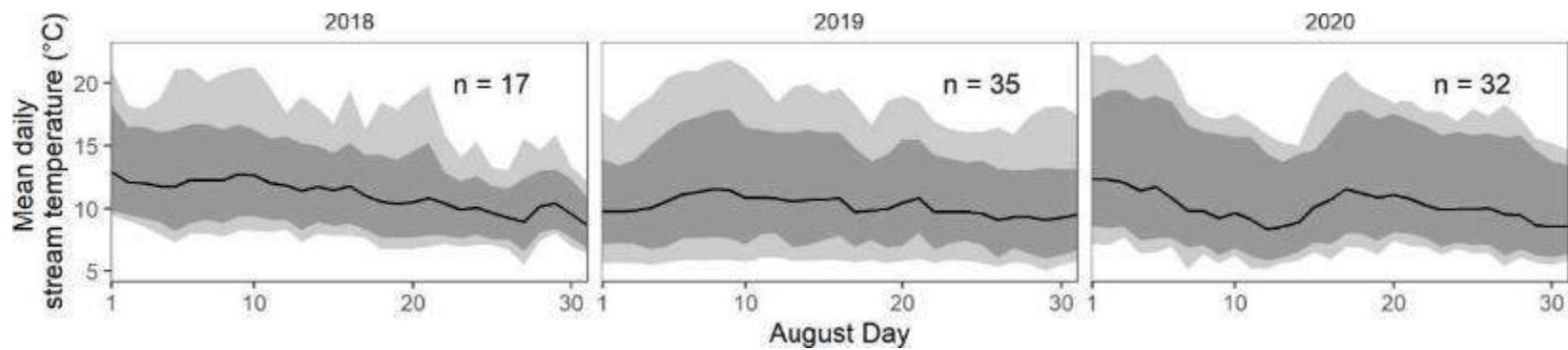
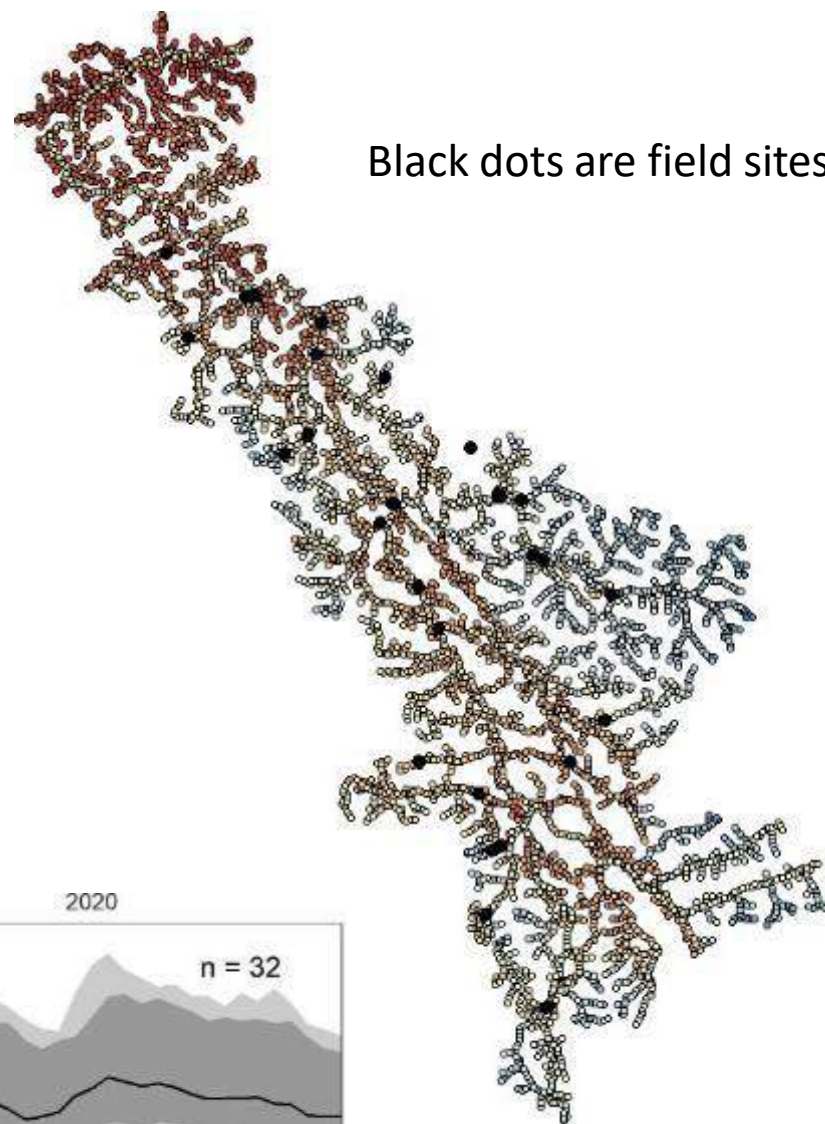
**Glacier area can be measured every year,
Agrees well with mass change which cannot
be measured every year**



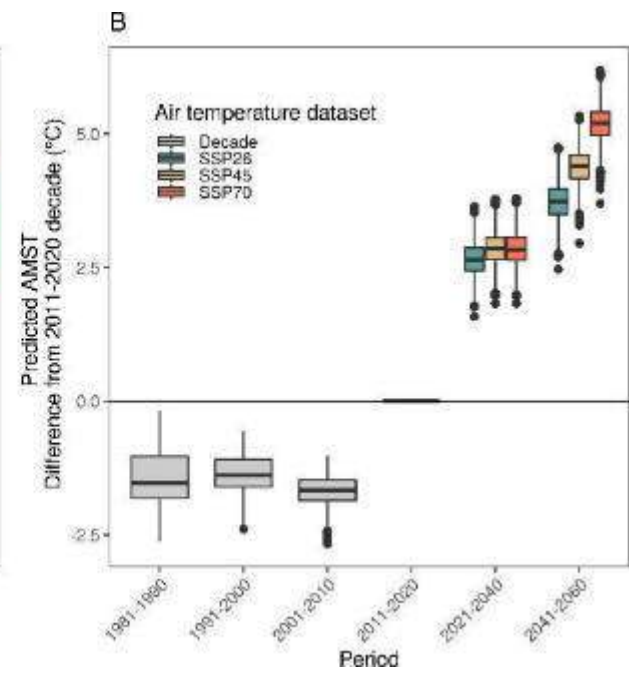
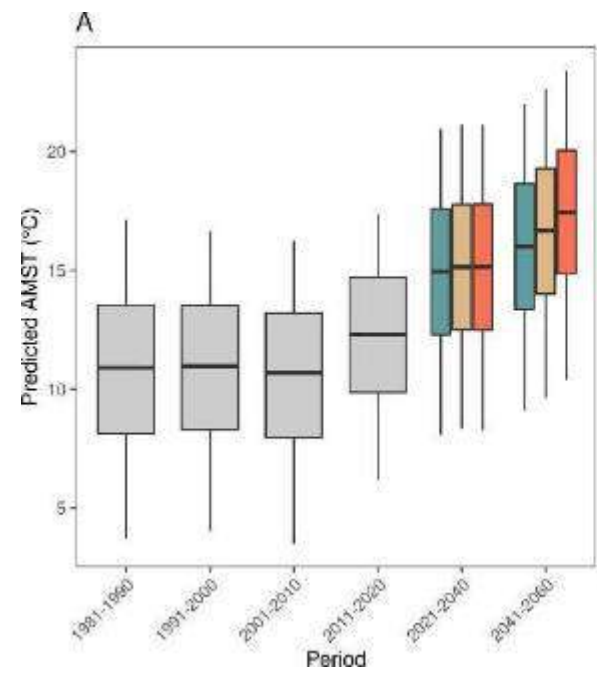
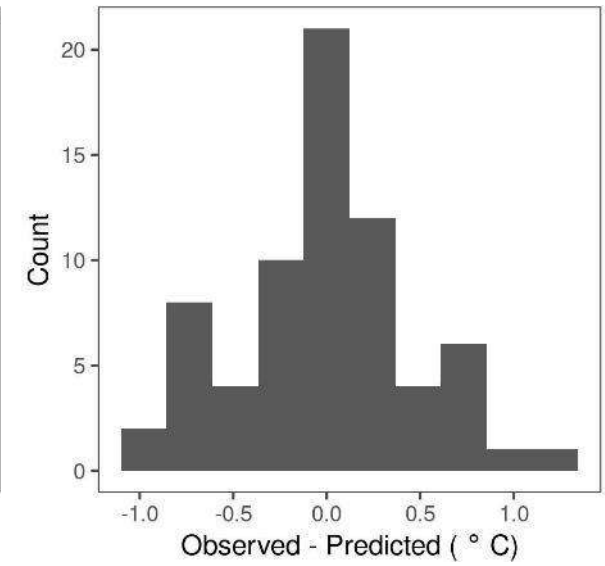
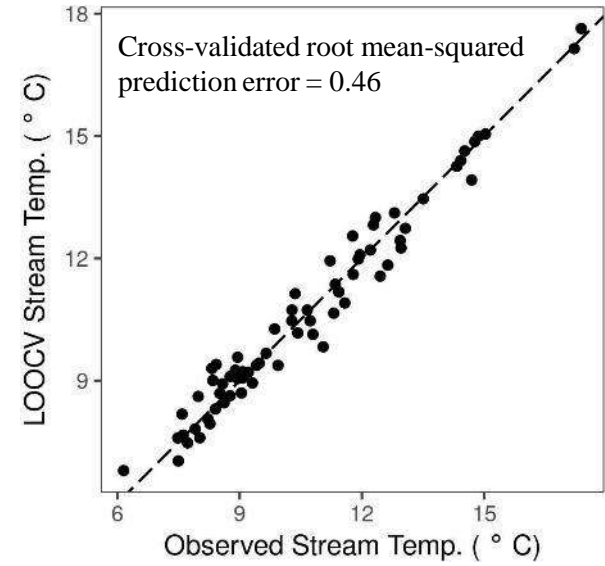
Kokanee Glacier terminus from 2015 to 2021. 140 meters of retreat for 23 m/yr. Data in the GIF are from Hakai Institute and Brian Menounos of UNBC ACO glacier surveys.

<https://blogs.agu.org/fromaglaciersperspective/2021/09/28/kokanee-glacier-2021-slash-and-burn/>

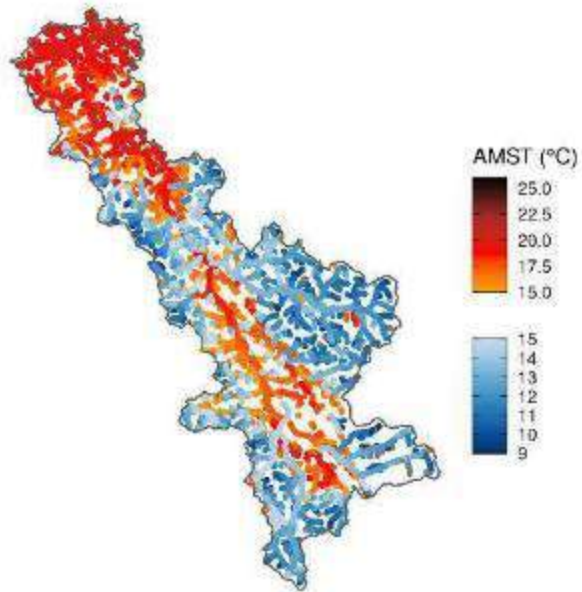




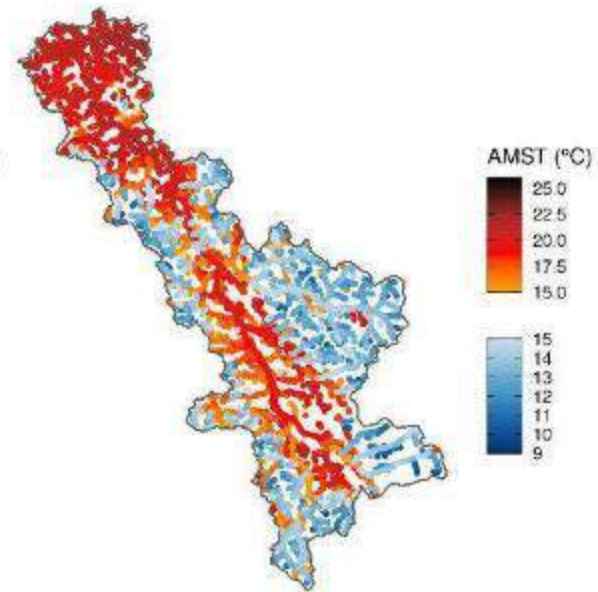
Input	Coef.	Std. Error	Std. Coef	t-value	P
avgTemp	0.97	0.057	0.67	16.87	< 2e-16 ***
avgTotlPpt	-0.18	0.034	0.025	-5.29	< 2e-16 ***
PrctLk	60.47	8.97	0.40	6.75	< 2e-16 ***
BasinArea	0.0013	0.00033	0.26	4.04	0.00014 ***
avgTemp:avgTotlPpt	0.014	0.0029	0.067	4.97	< 2e-16 ***
avgTemp:avgGradt	-1.69	0.48	-0.010	-3.52	0.00079 ***



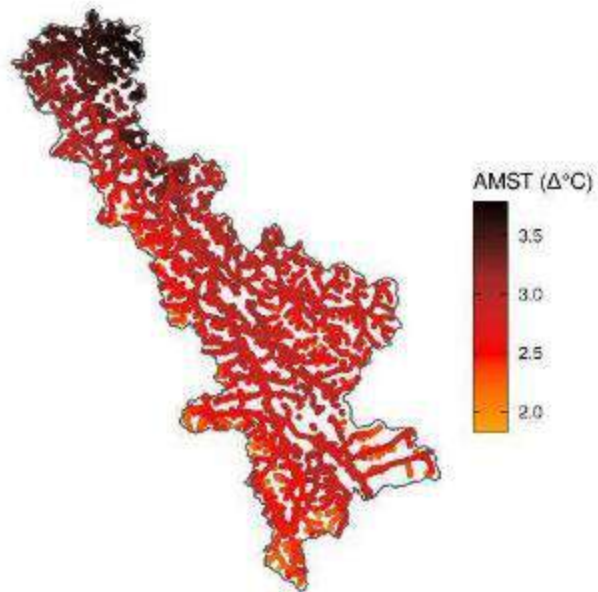
A
SSP45 2021-2040



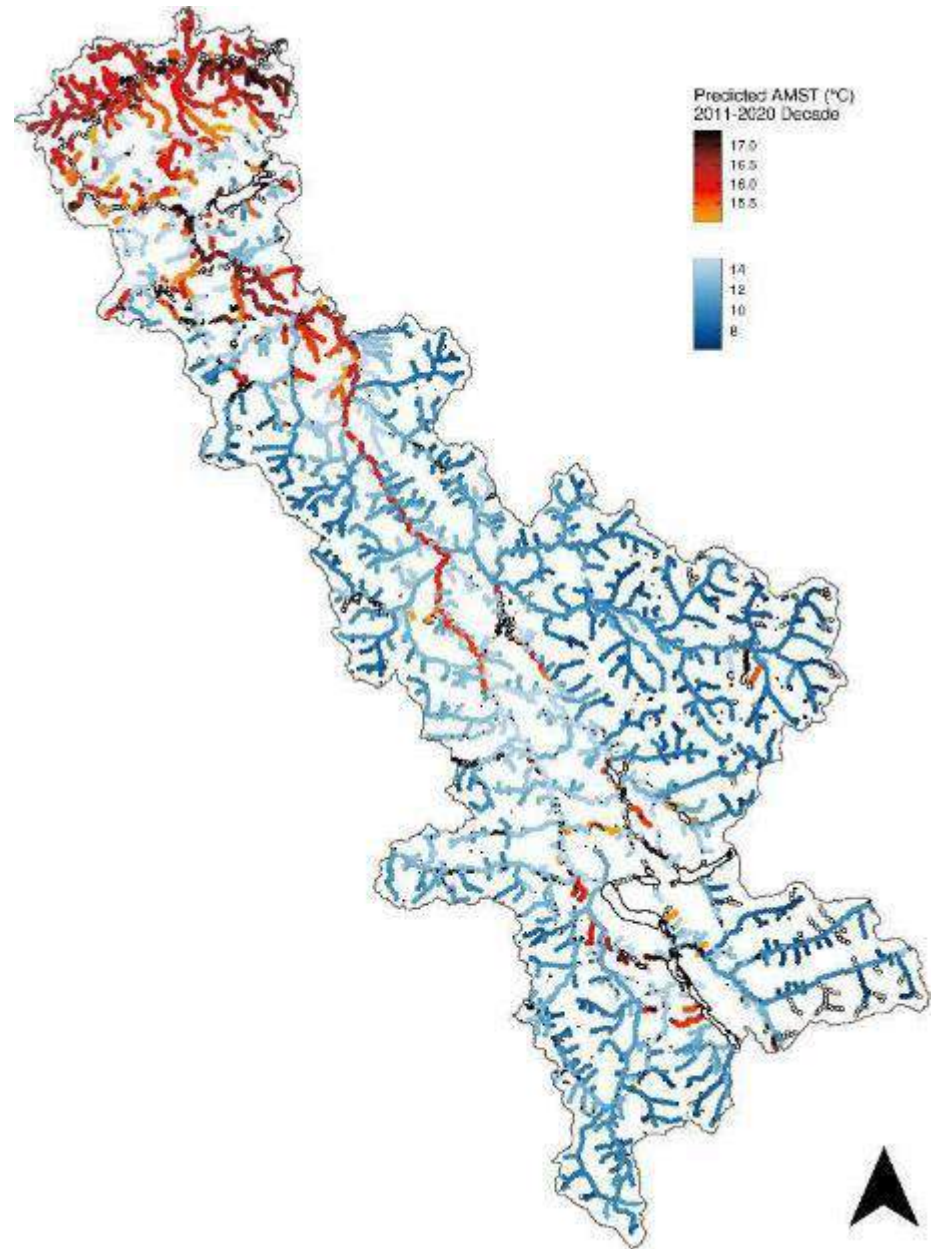
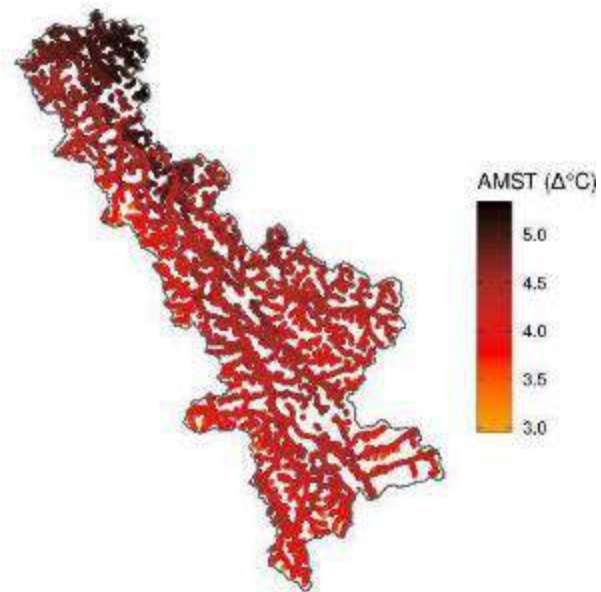
B
SSP45 2041-2060

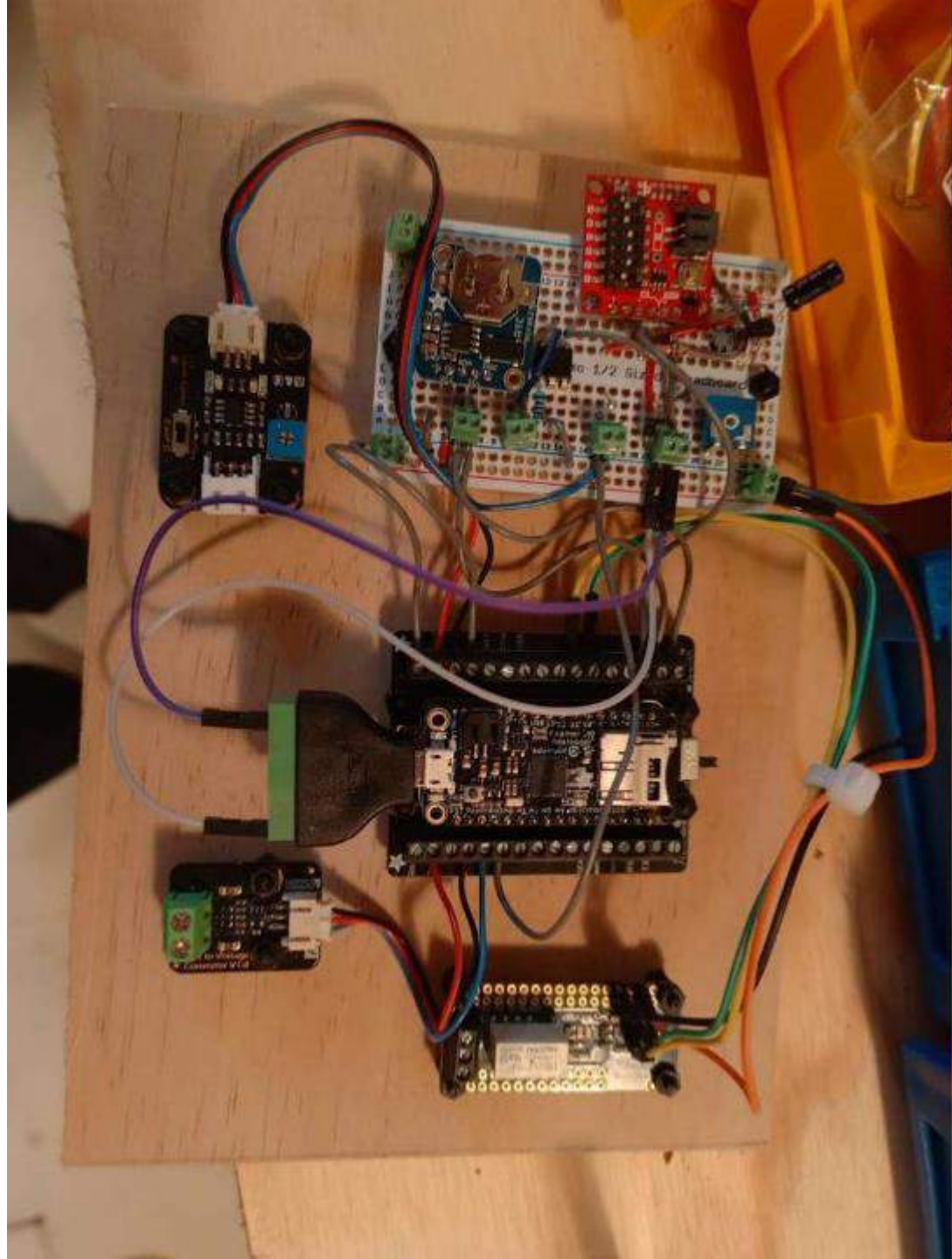


C
SSP45 2021-2040

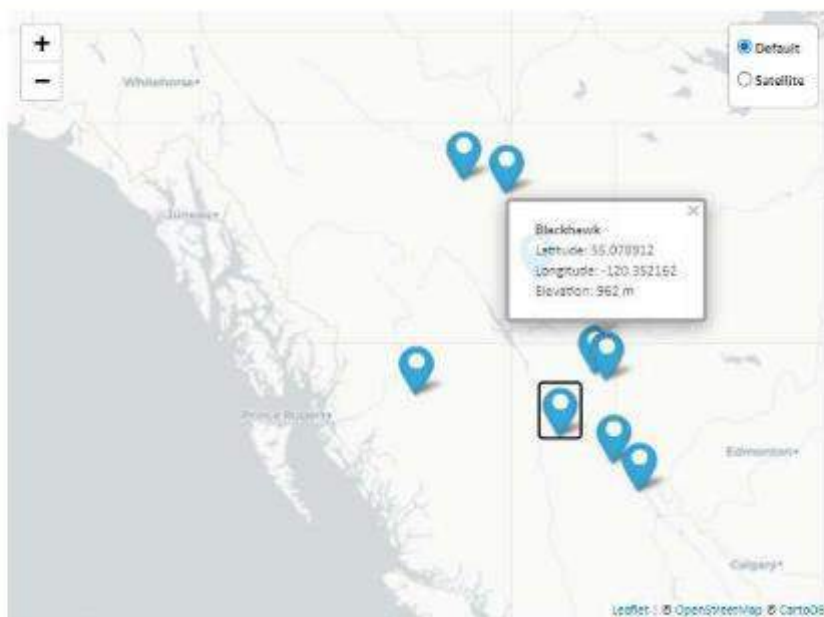


D
SSP45 2041-2060









Click on a station to view or download real-time data.

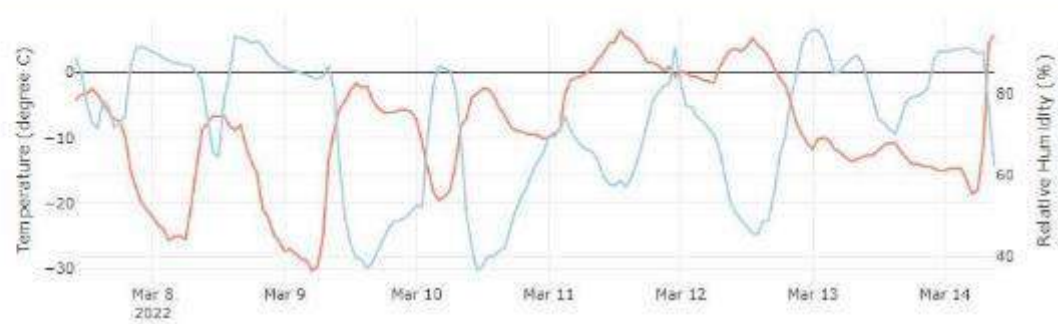
Blackhawk

Plots display the last available 7 days of records. For complete records, please see About page.

[Refresh](#) plots by opening DTF.

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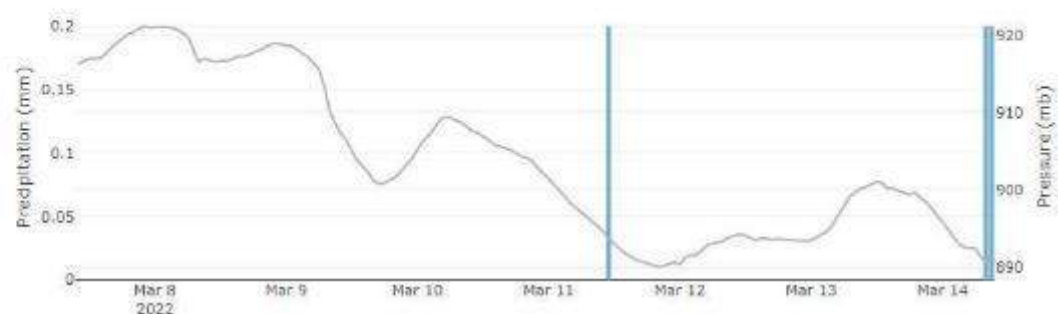


Temperature

5.8°C

Relative Humidity

61.9%

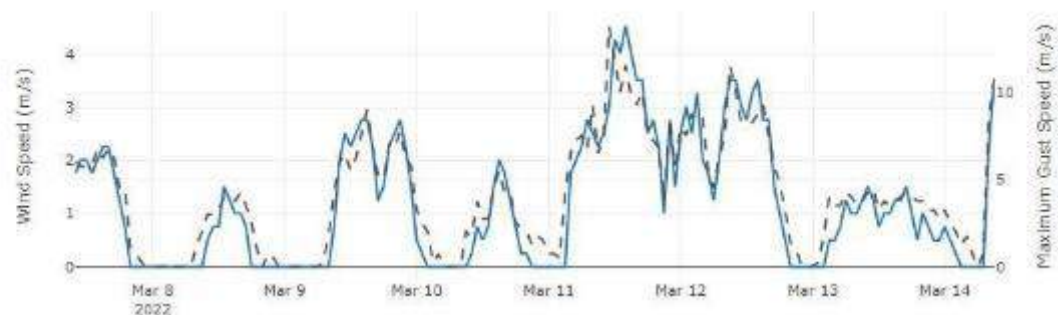


Precipitation

0.2 mm

Pressure

891.4 mb



Wind Speed

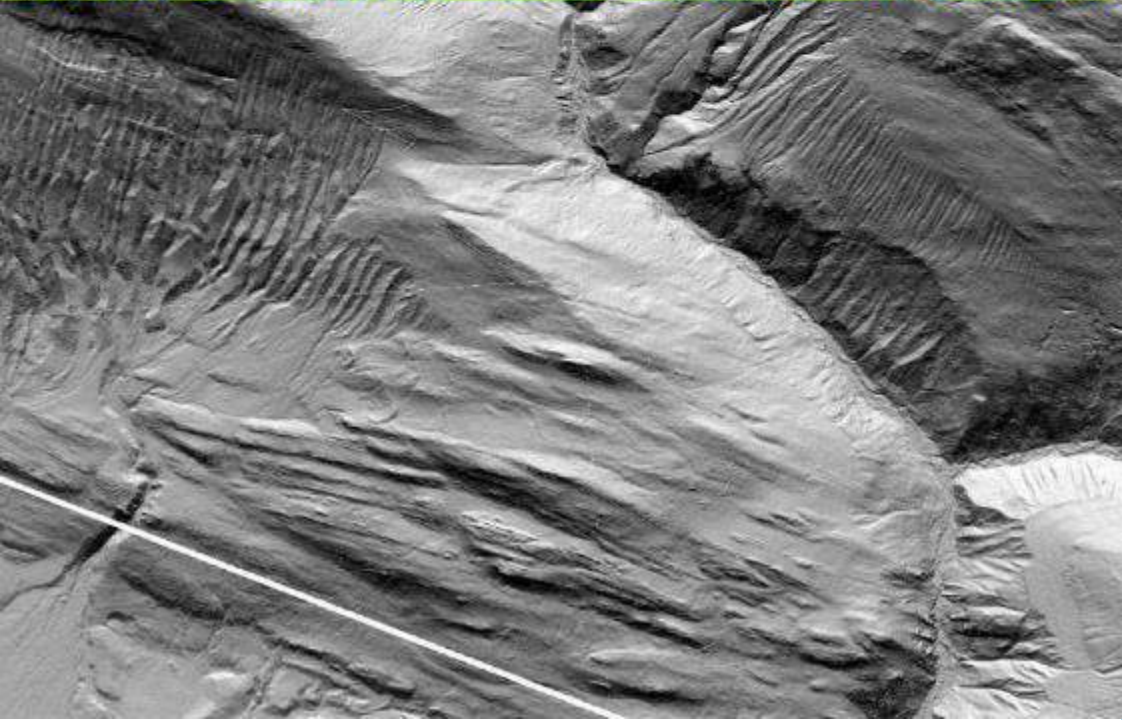
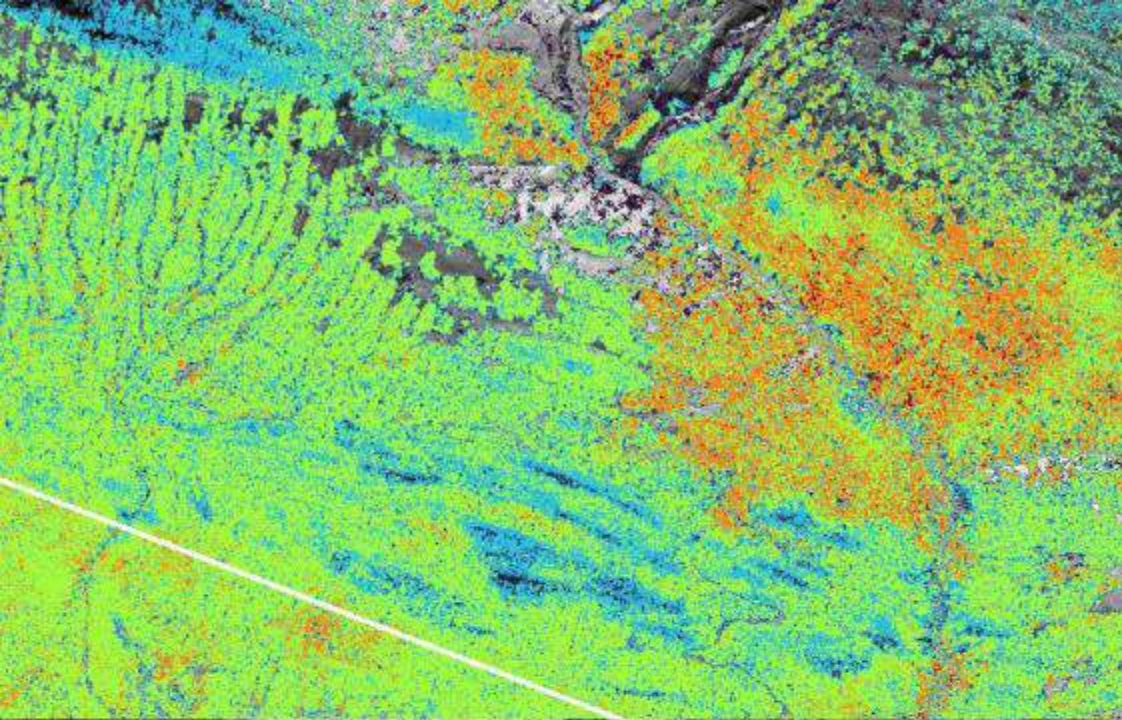
3.5 m/s

Wind Direction

SSW

Gust Speed

10.8 m/s



LidarBC - Open LiDAR Data Portal

Home

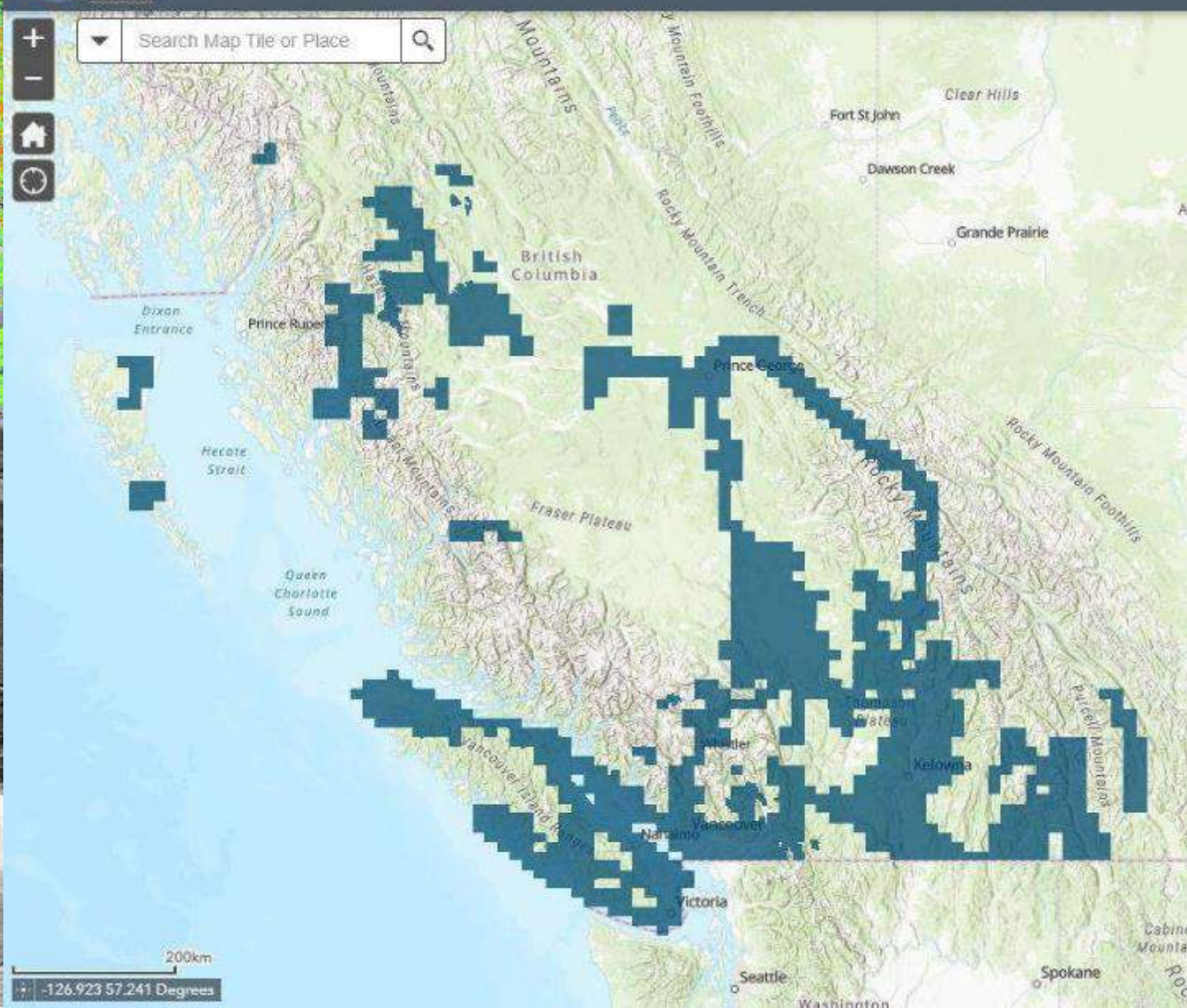
Discovery and Download



BRITISH COLUMBIA



Search Map Tile or Place



Conclusion

1. Remote sensing is increasingly used in provincial operations
2. There is a lag in our geospatial services
3. Still a need for custom-per-project analysis
4. Research and development continues to be needed for: Climate change, drought, floods, wildfire, landslides, watershed science ...

