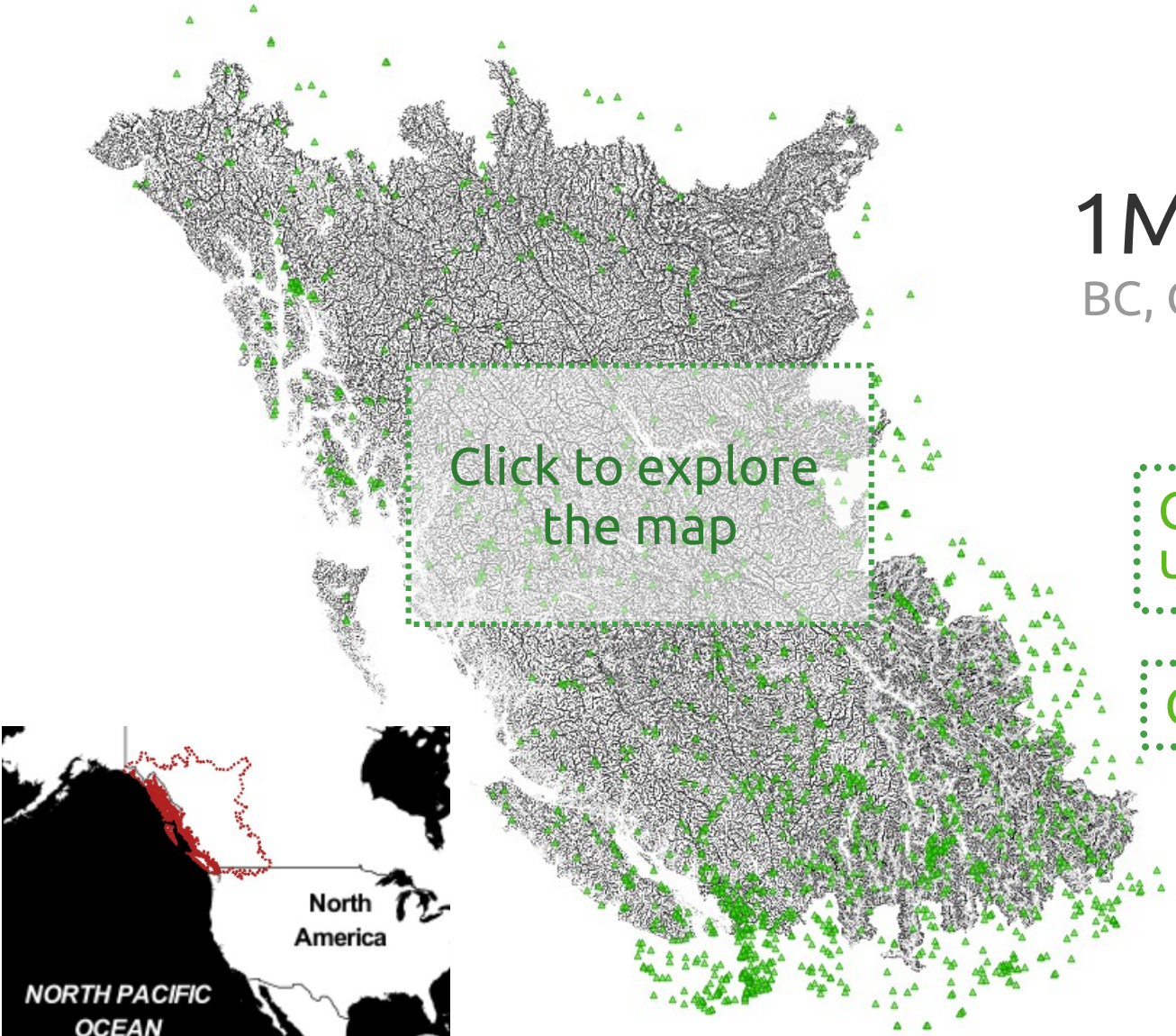


BCUB DB

LSH Database

1M Ungauged Basins

BC, Canada + trans-boundary regions

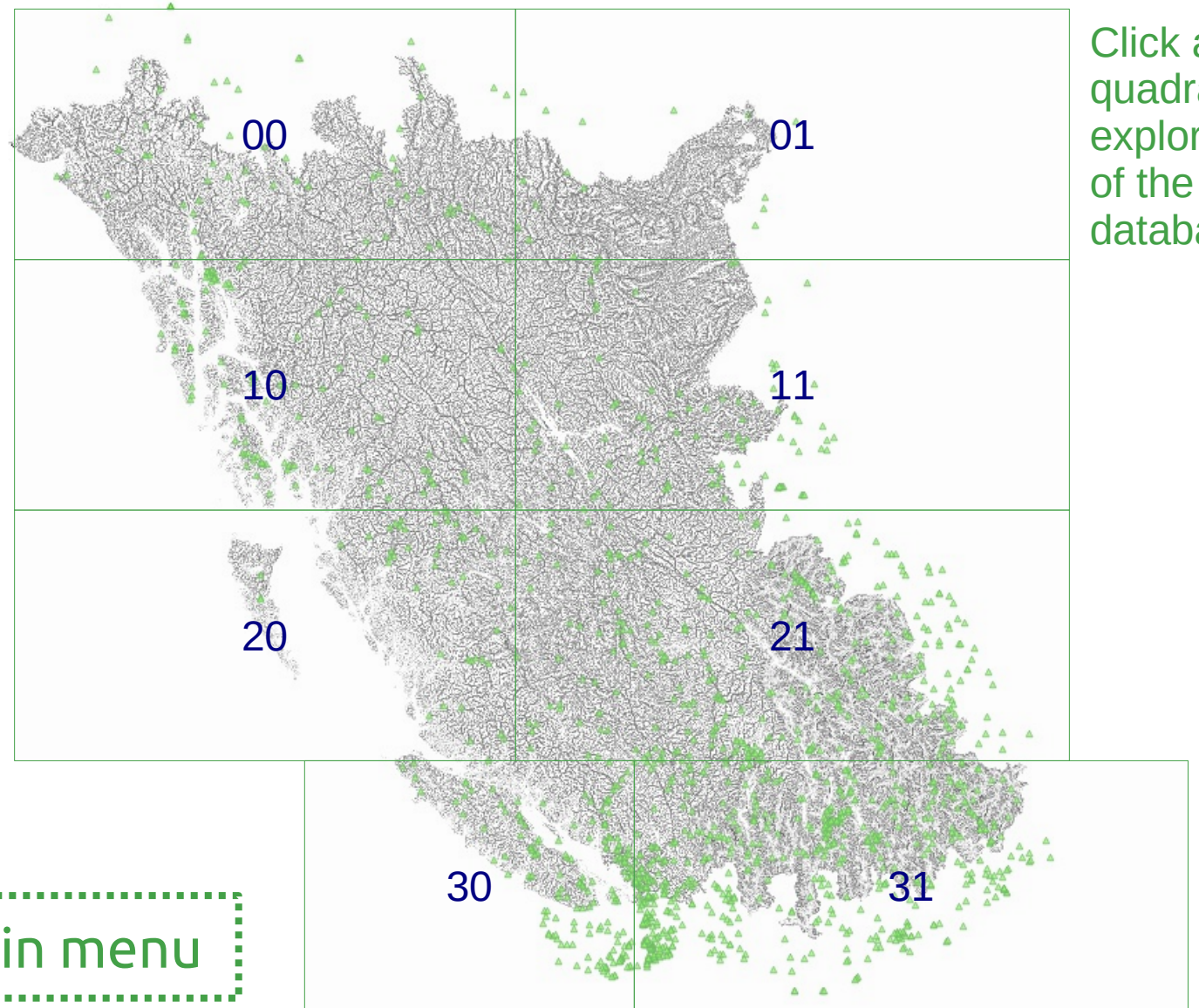
Click for database details

Click to compare gauged vs. ungauged basin properties

Click for acknowledgements

● ungauged basins

▲ streamflow monitoring locations



Click a map quadrant to explore details of the BCUB database

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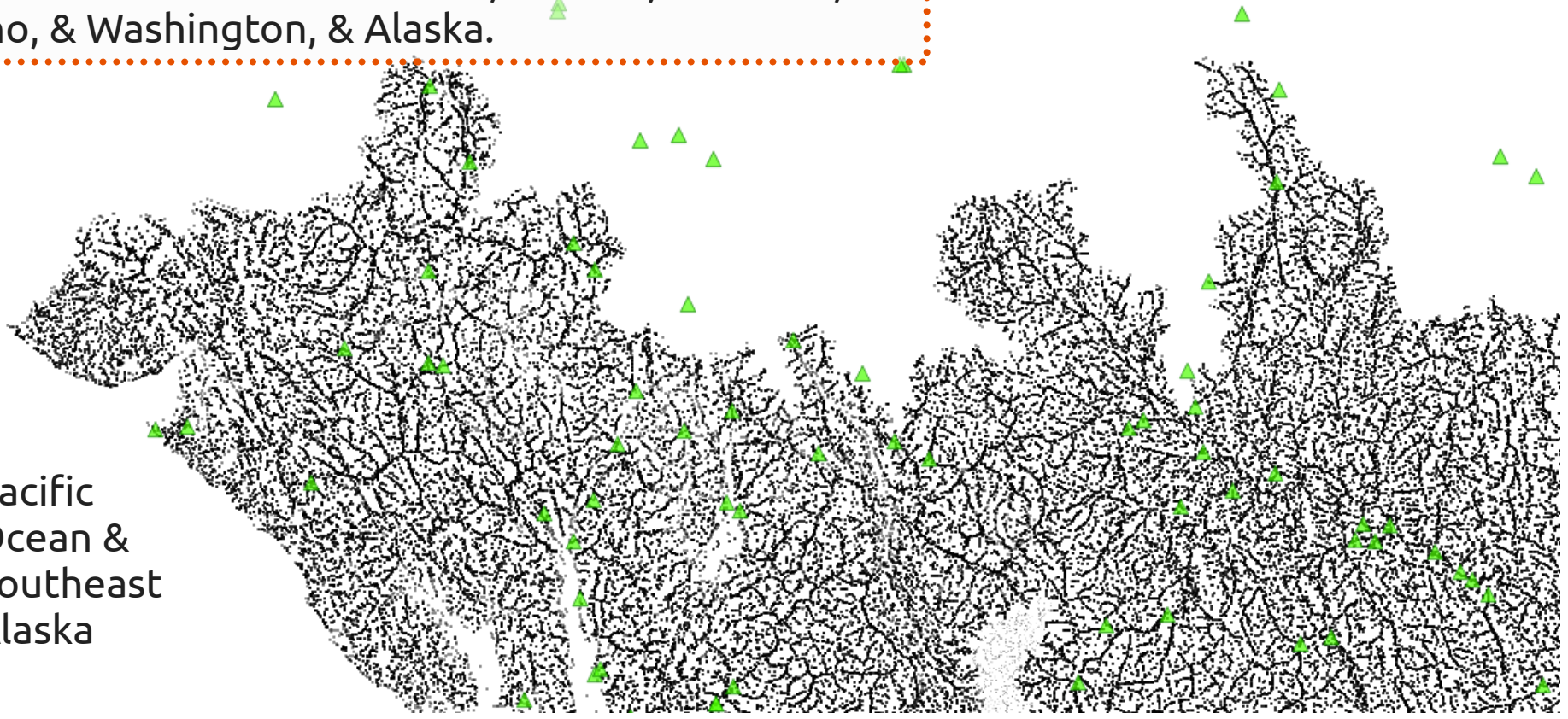
The study region merged basin information across administrative boundaries of British Columbia, Yukon & Northwest Territories, Alberta, Montana, Idaho, & Washington, & Alaska.



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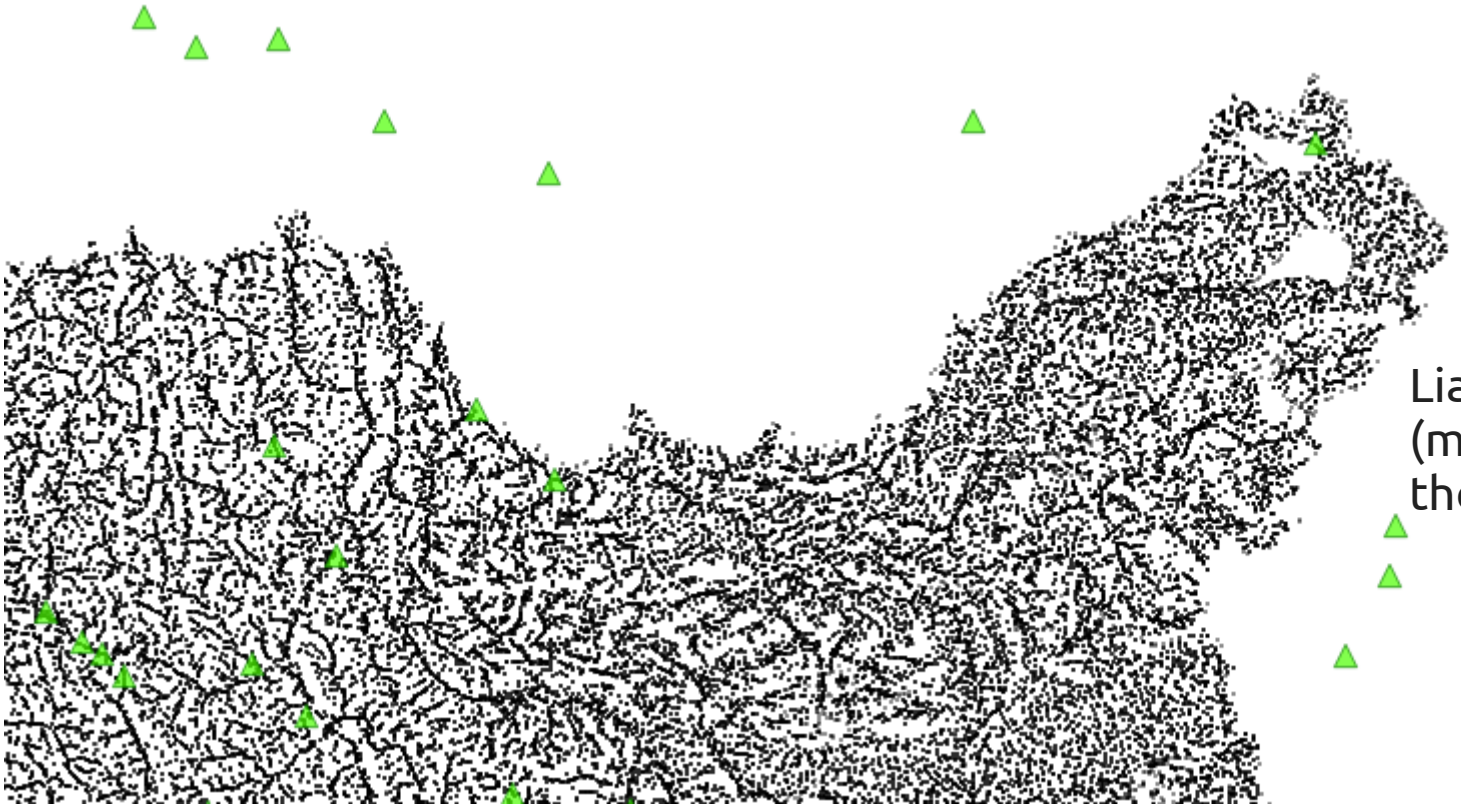
All basins were derived from USGS 3DEP 1 digital elevation data at 1 arcsecond resolution. (USGS, 2019)



Liard River Basin (major tributary of the Mackenzie River)

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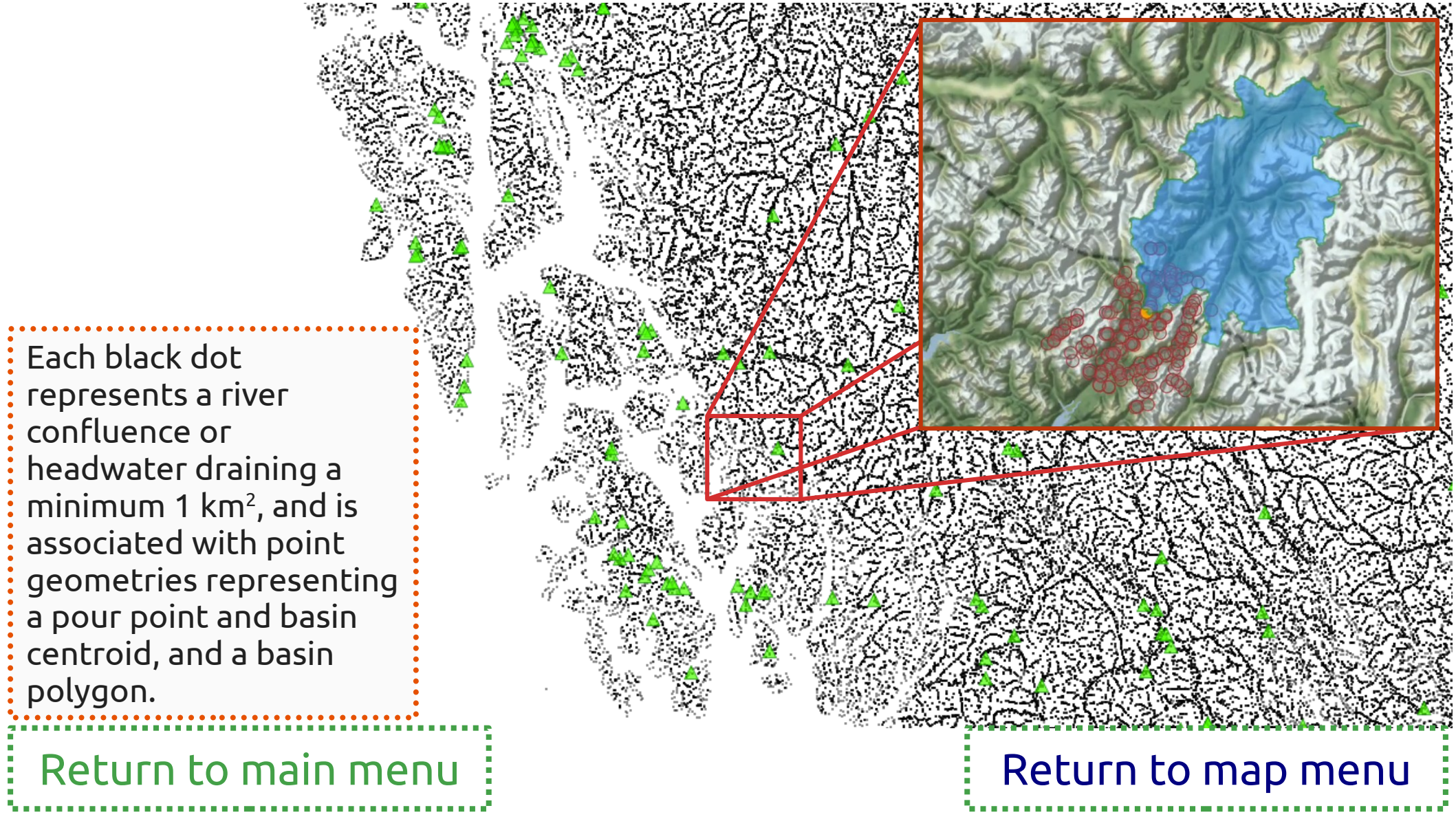

Each black dot represents a river confluence or headwater draining a minimum 1 km^2, and is associated with point geometries representing a pour point and basin centroid, and a basin polygon.

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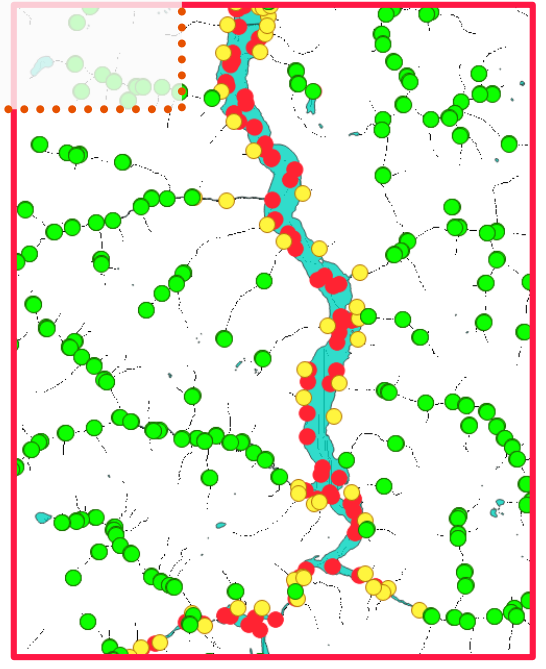
Lake polygons were used to filter out spurious confluence points in lakes (red) and add river-lake confluences (yellow).



Peace River Basin (major tributary of the Mackenzie River)

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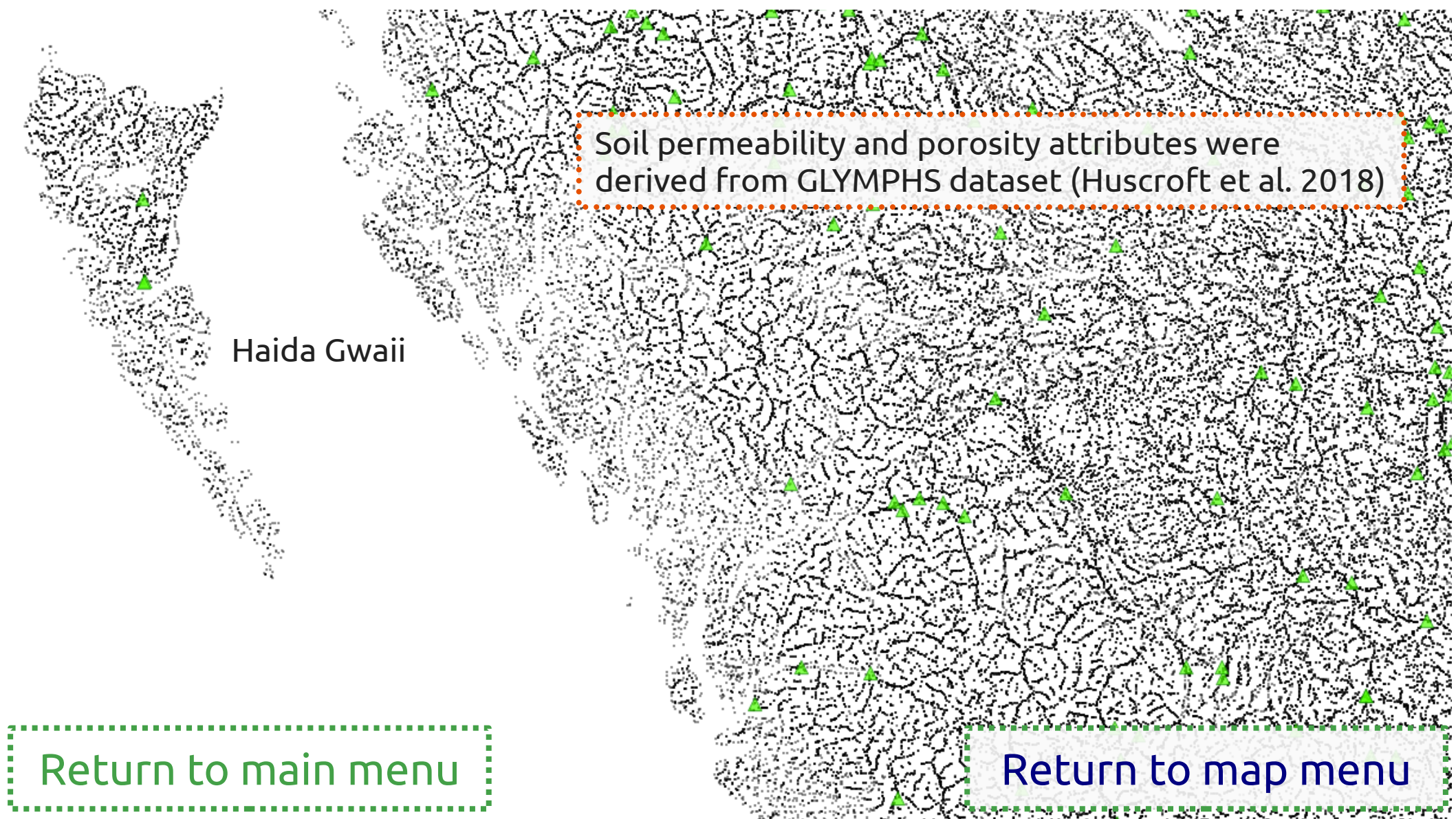
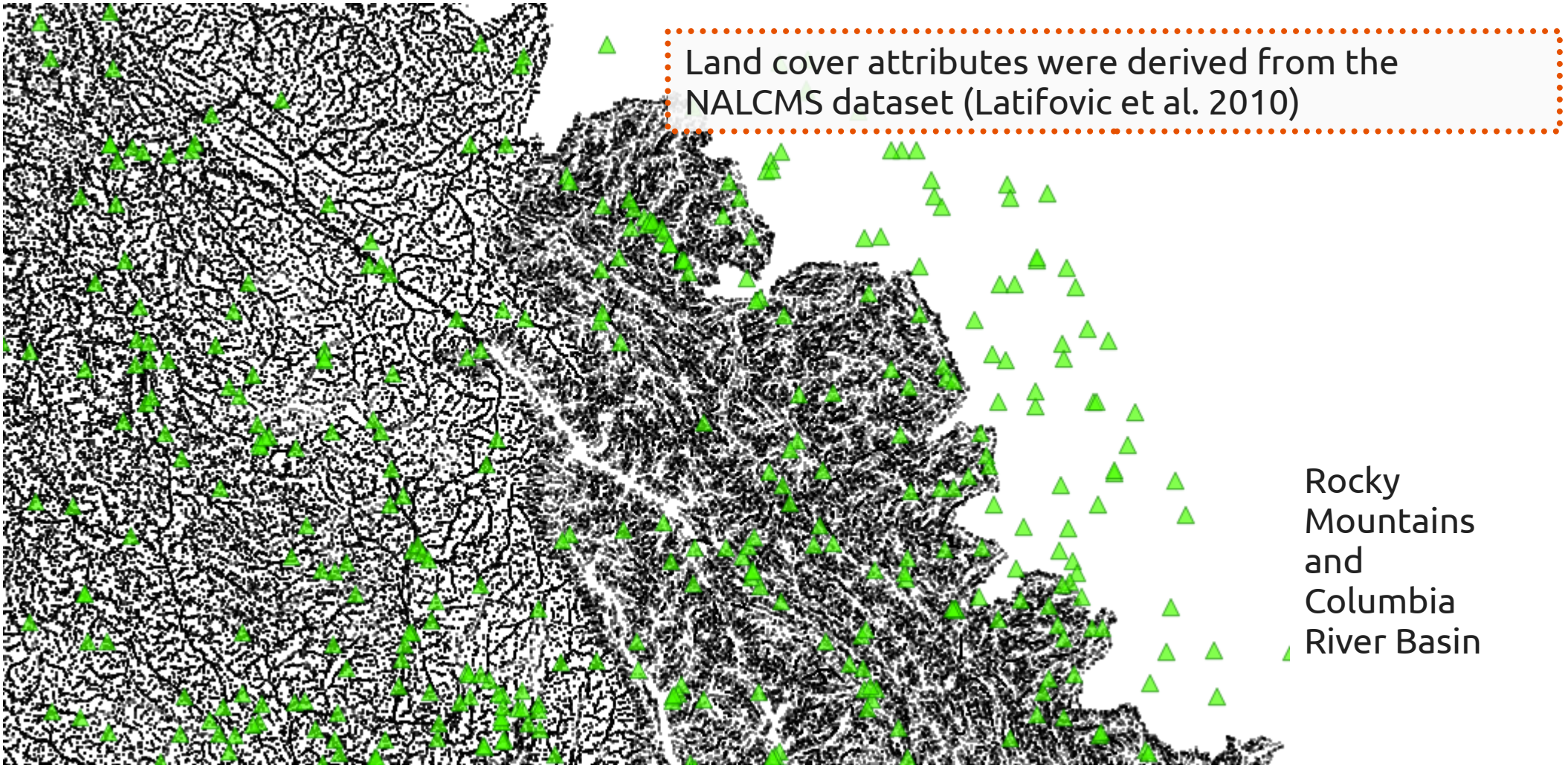

Soil permeability and porosity attributes were derived from GLYMPHS dataset (Huscroft et al. 2018)
Haida Gwaii
Return to main menu
Return to map menu



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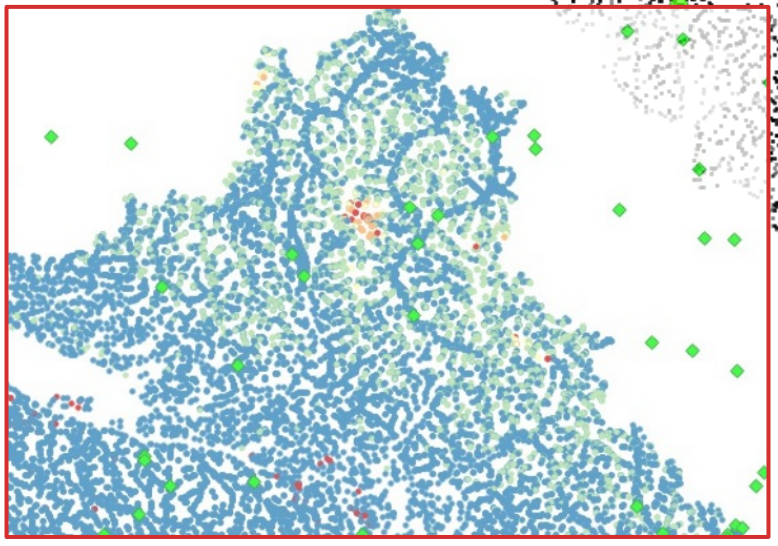
Vancouver Island

The PostGIS format is performant on large spatial computations. Streamflow monitoring network optimization can use the dataset to develop regional information transfer models and calculate distances in higher dimensions (attribute space).



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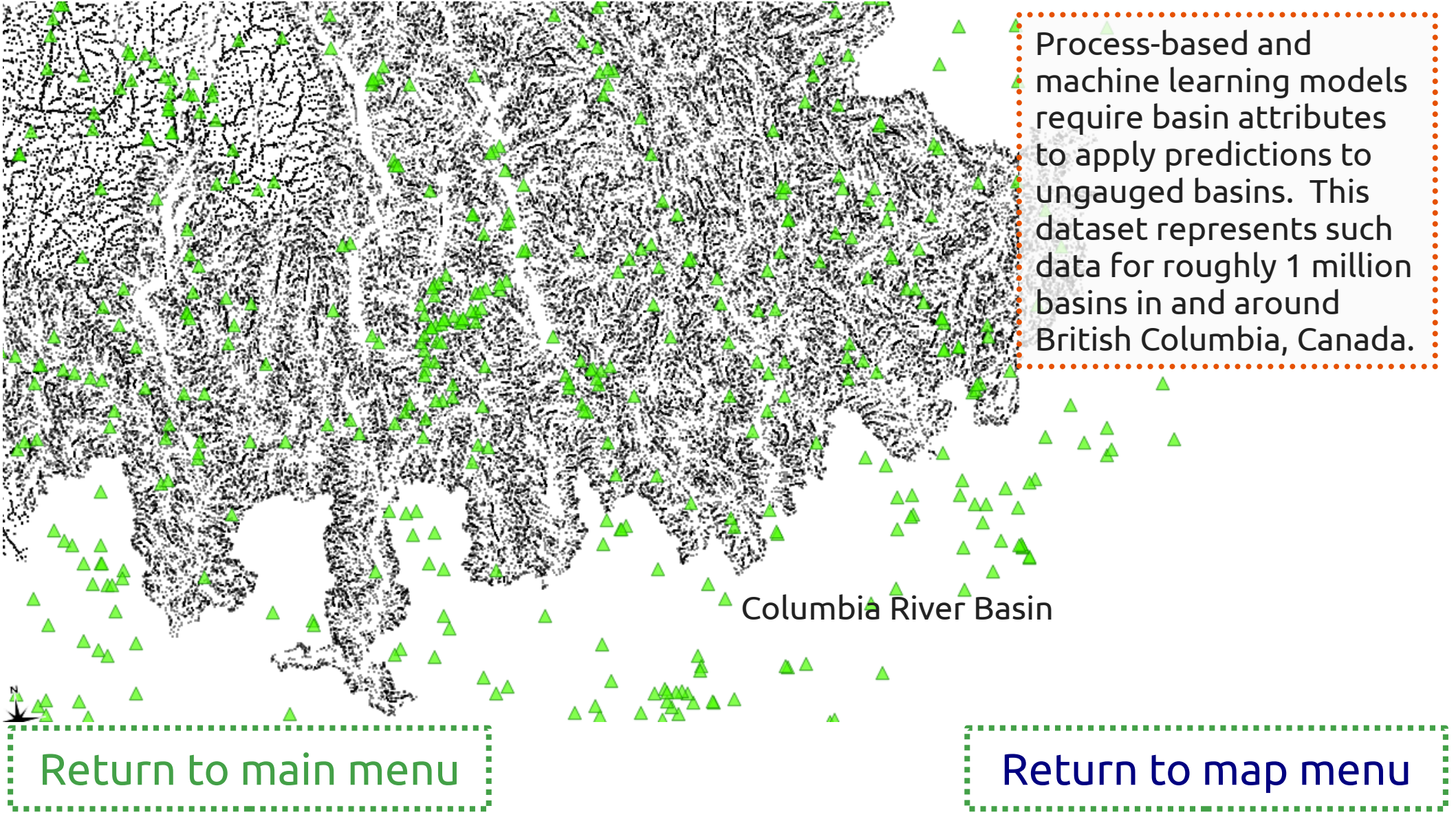
Process-based and machine learning models require basin attributes to apply predictions to ungauged basins. This dataset represents such data for roughly 1 million basins in and around British Columbia, Canada.
Columbia River Basin
Return to main menu
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Large Sample Ungauged Basins

1. Potential uses:
   - prediction in ungauged basins
   - monitoring network optimization
2. PostGIS db, performant on spatial computations
3. Query by multiple geometries:
   - pour point,
   - basin centroid, and
   - basin polygon

Quickly query large areas and generate summary statistics of basin properties

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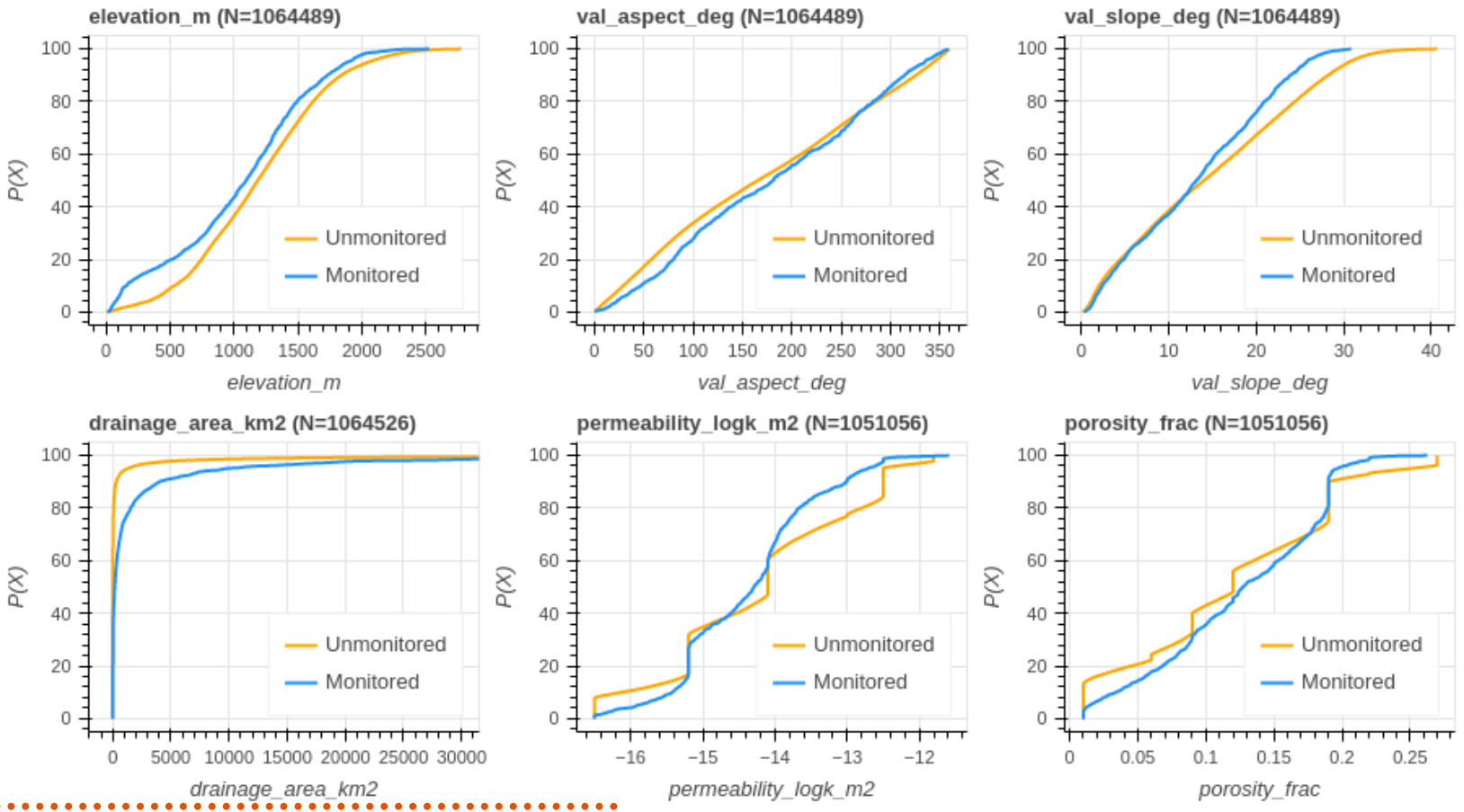
Example attribute CDF Comparisons



Assess monitoring network diversity in terms of basin attributes.

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University of British Columbia

Acknowledgements

1. Huscroft, J., Gleeson, T., Hartmann, J., & Börker, J. (2018). Compiling and mapping global permeability of the unconsolidated and consolidated Earth: GLobal HYdrogeology MaPS 2.0 (GLHYMPS 2.0). Geophysical Research Letters, 45. doi: 10.1002/2017GL075860

2. Latifovic, R., et al. "North American land change monitoring system (NALCMS)." Remote sensing of land use and land cover: principles and applications. CRC Press, Boca Raton (2010).

3. USGS, USGS. "3D Elevation Program Digital Elevation Model." (2019).

4. Arsenault, Richard, et al. "A comprehensive, multisource database for hydrometeorological modeling of 14,425 North American watersheds." Scientific Data 7.1 (2020): 243.

5. Kratzert, Frederik, et al. "Caravan-A global community dataset for large-sample hydrology." Scientific Data 10.1 (2023): 61.

We are highly grateful for the open source software development community for the many tools used in carrying out this work.

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