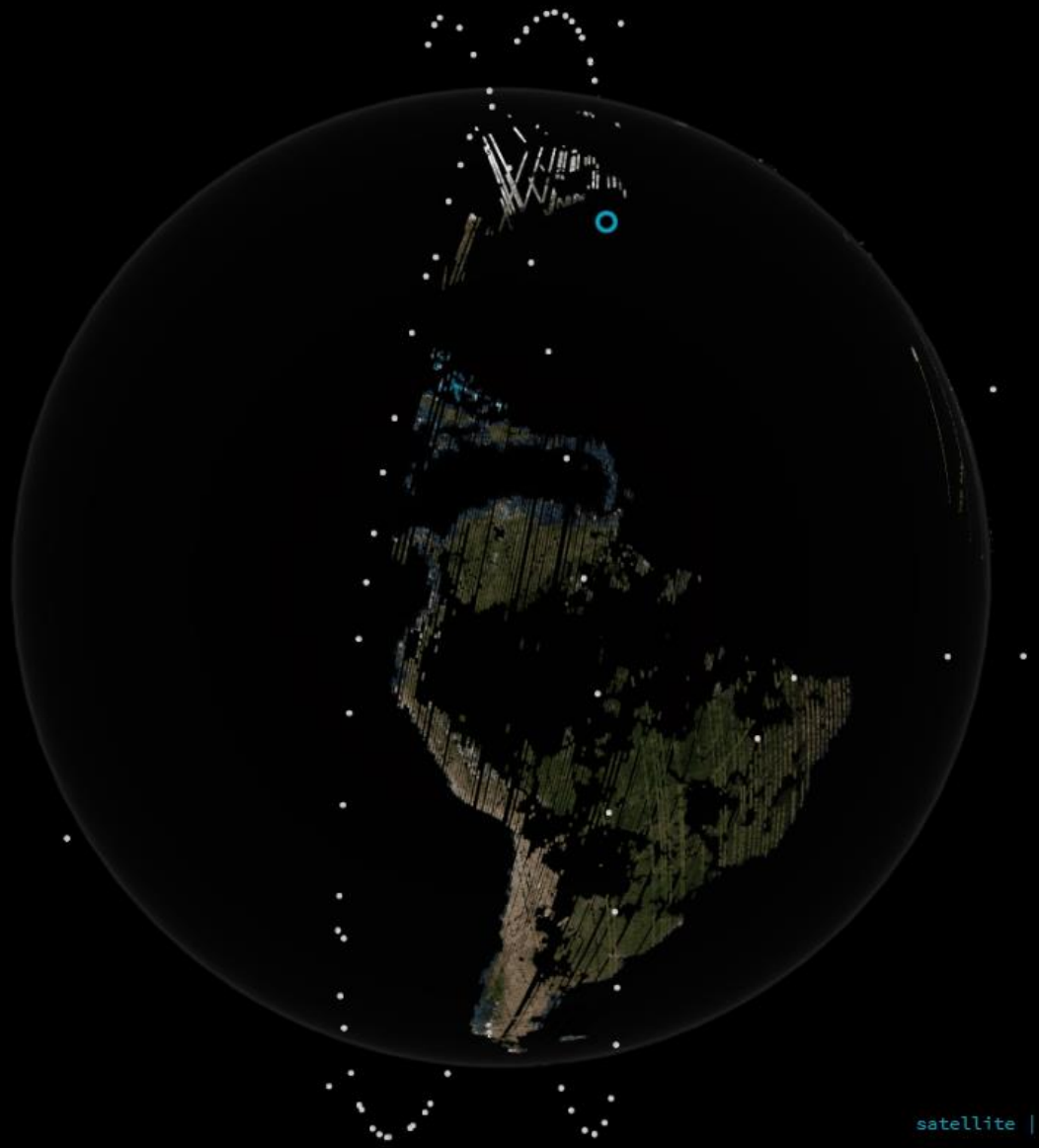
GEOG 450/650
Advanced Geospatial Analysis

Instructor: Alex Bevington
alex.bevington@unbc.ca

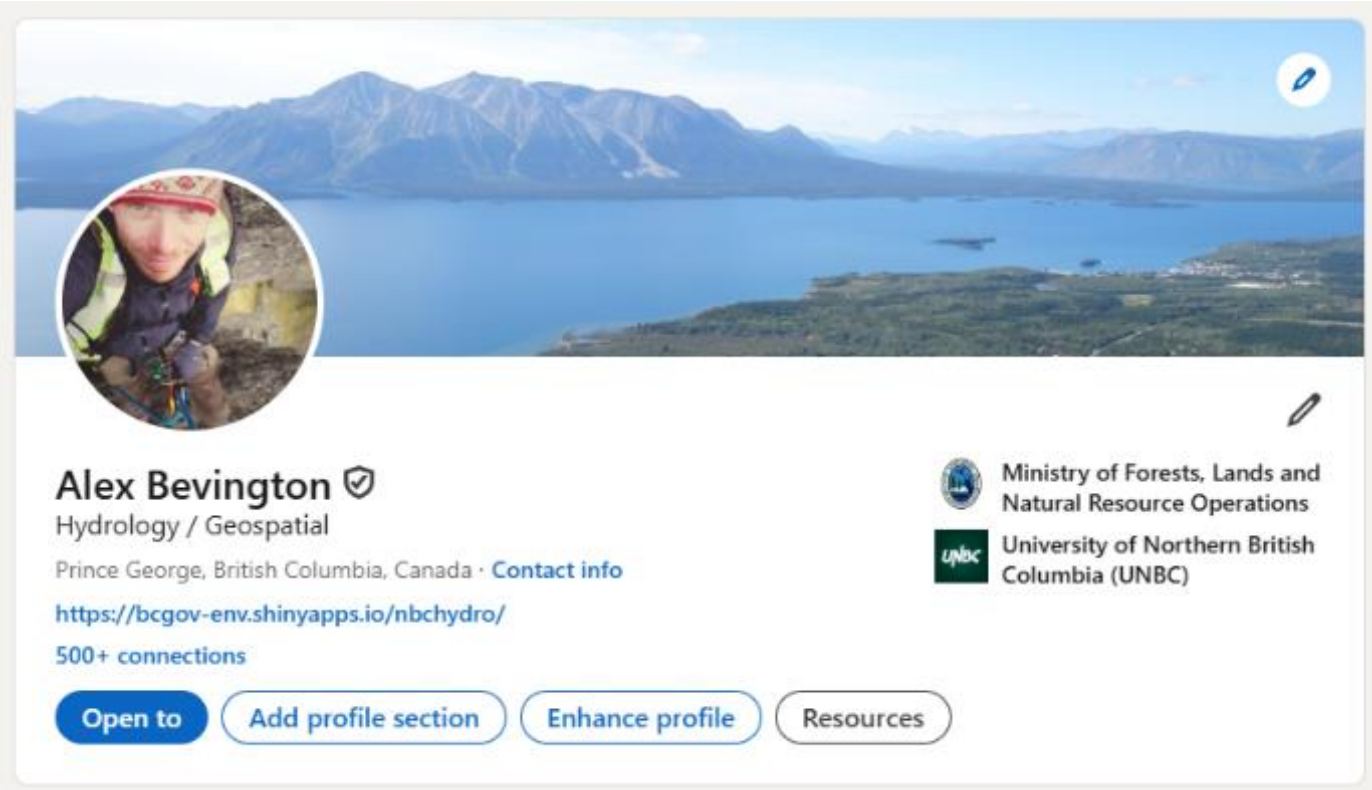
Introductions

- Graduate / Undergraduate
- Why are you in this class
- Program of study / Research interests
- Coding / geospatial experience
  - 250 – Introduction to Geospatial Analysis
  - 300 – Intermediate GIS
  - 357 – Introduction to Remote Sensing
  - 413 – Advanced GIS
  - 457 – Advanced Remote Sensing
- Favorite thing about PG?



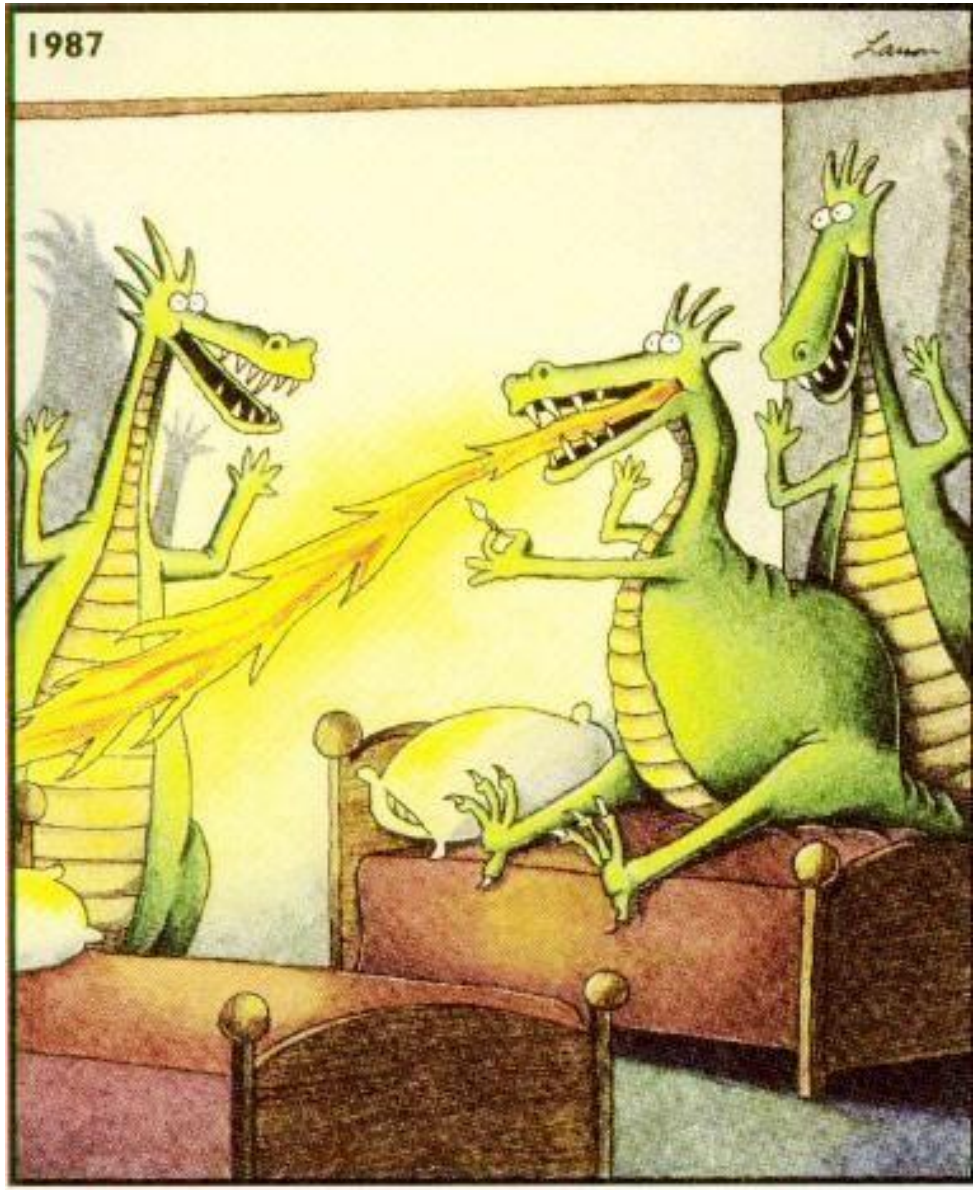
A bit about me

- Education
- Work Experience
- Research Interests
- Personal Interests



Night hawks

- Tuesdays
  - 5:30-6:20 PM – Lecture (8-129)
  - 6:30-7:20 PM – Office Hours (8-129)
- Thursdays
  - 5:30-6:20 PM – Lecture (8-129)
  - 6:30-9:30 PM – Lab (GIS Lab 8-125)
- Website
  - https://gis.unbc.ca/courses/geog-450/
- Email
  - alex.bevington@unbc.ca



With their parents away, the young dragons would stay up late lighting their sneezes.

This class…

- Seminar-style class
  - Workflows
  - Analysis
  - Research
- Objectives:
  - Build advanced GIS skills.
  - Geospatial programming
  - Tackle big datasets
  - Group activities

The edge of the (flat) Earth: Here There Be Monsters. *Image courtesy of www.john-howe.com*

Schedule

Jan 7 Introduction,
Jan 9 Geospatial data (**Lab 1:** Digitizing data)
Jan 14 Programming and reproducible workflows
Jan 16 Geospatial programming
Jan 21 Geospatial programming
Jan 23 Guest lecture – *Watershed computation*
Jan 28 Cloud computing
Jan 30 Guest lecture – *Wildfire mapping*
Feb 4 Spatial databases
Feb 6 Guest lecture – *Hyperspectral*
Feb 11 Automation and web GIS
Feb 13 Mid term

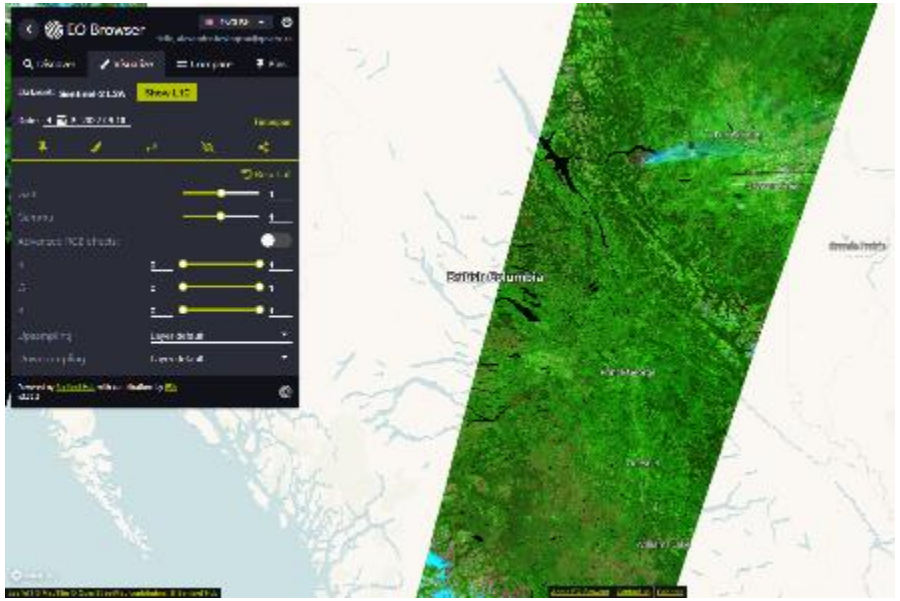
Feb 25 Spatial statistics
Feb 27 Guest lecture – Open source data portal
Mar 4 Machine learning
Mar 6 Guest lecture – River forecast centre
Mar 11 AI
Mar 13 Guest lecture – Geospatial for Hire
Mar 18 Advanced visualizations
Mar 20 Guest lecture – Modern Geospatial
Mar 25 Final project presentations
Mar 27 Final project presentations
Apr 1 Exam review
Apr 3 Exam
Apr 10 Project deadline

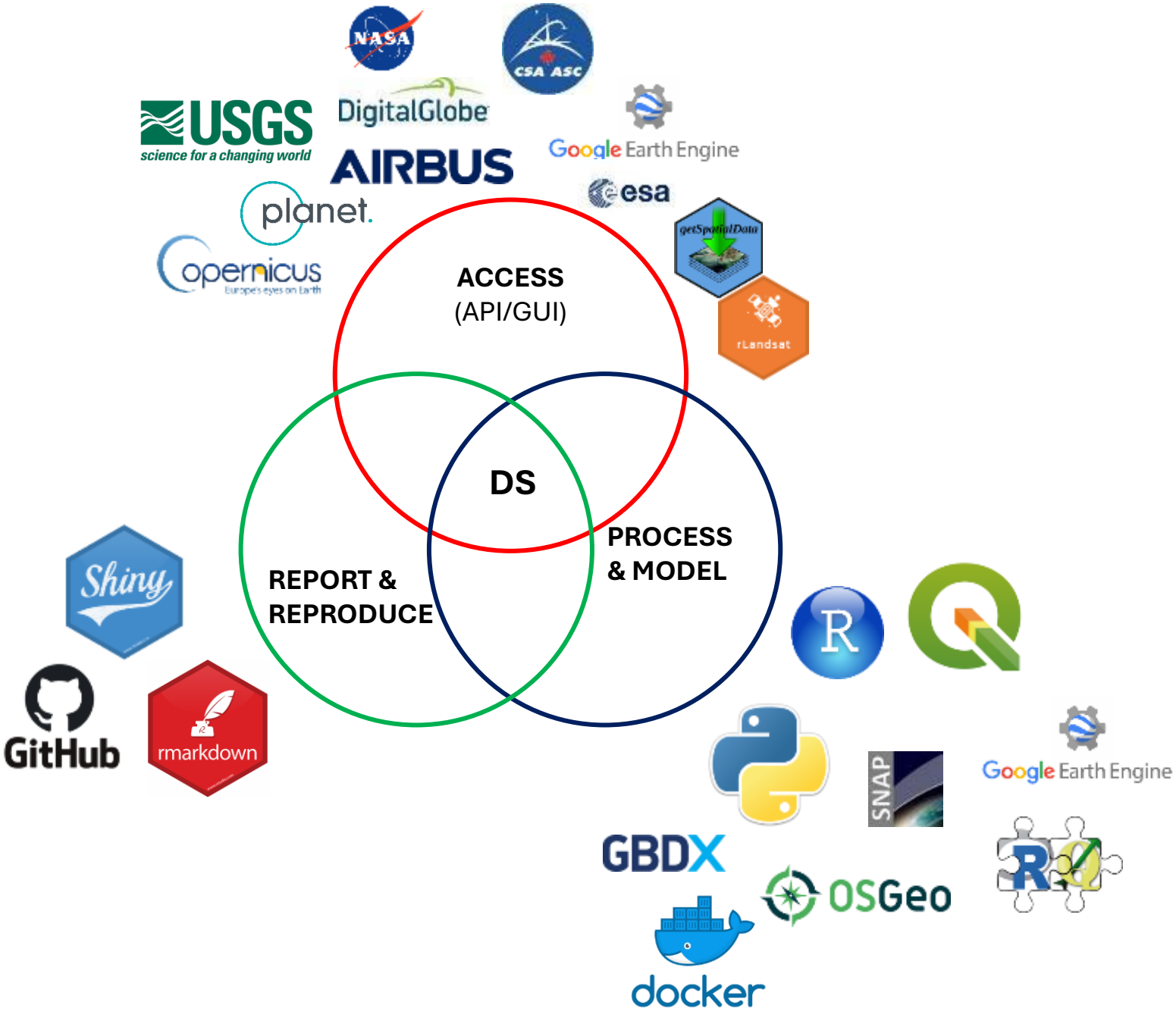
Split class 450/650

- Grading
  - Labs (50%)
  - Participation (10%)
  - Midterm exam (5%)
  - Final exam (10%)
  - Final project (25%)

Homework

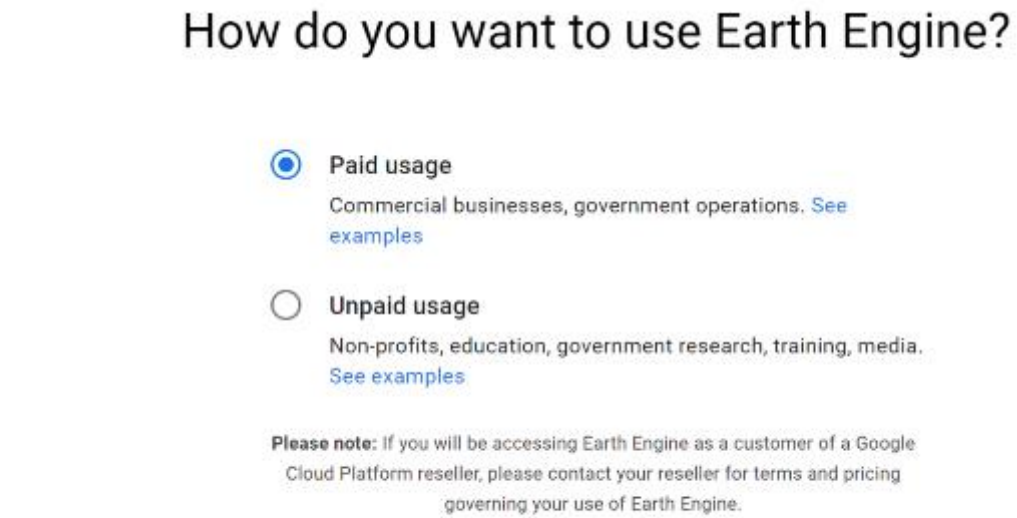
- For next lecture be ready to discuss (1 minute elevator pitch) about a piece of geospatial technology in your life




NASA
CSA ASC
USGS
science for a changing world
DigitalGlobe
AIRBUS
Google Earth Engine
esa
planet.
opernicus
Europes eyes on Earth
getSpatialData
rLandsat
ACCESS
(API/GUI)
DS
REPORT &
REPRODUCE
PROCESS
& MODEL
Shiny
GitHub
rmarkdown
R
SNAP
Google Earth Engine
GBDX
OSGeo
docker

Big data computation… Free or $

Google Earth Engine (GEE)
Planetary Computer
NASA's EarthData
Sentinel Hub
AWS Open Data (Landsat, Sentinel)
OpenEO
ESRI's ArcGIS Online
Open Data Cube (ODC)
Copernicus DIAS
Jupyter Notebooks + Cloud (AWS, etc.)

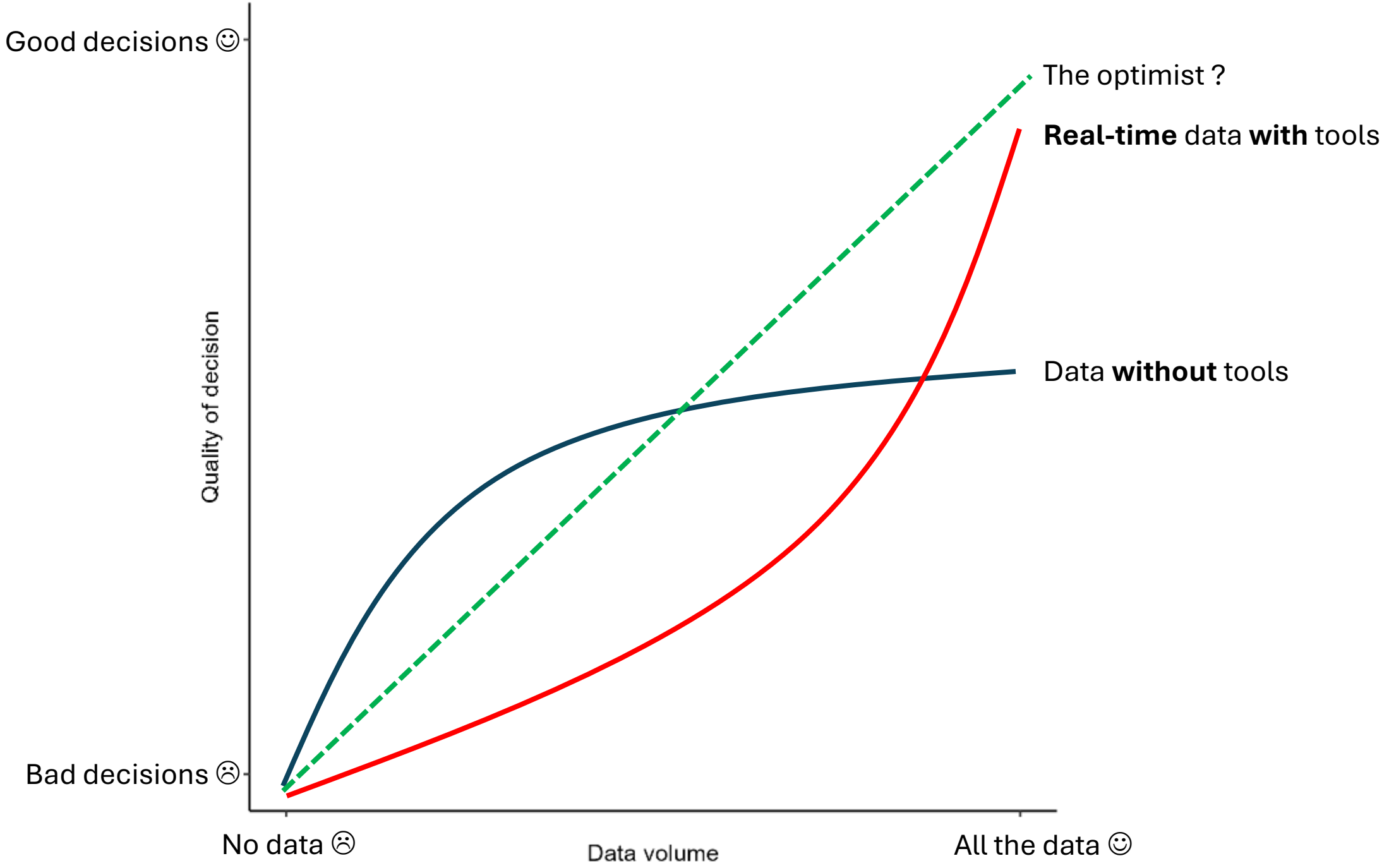


Pricing Plans

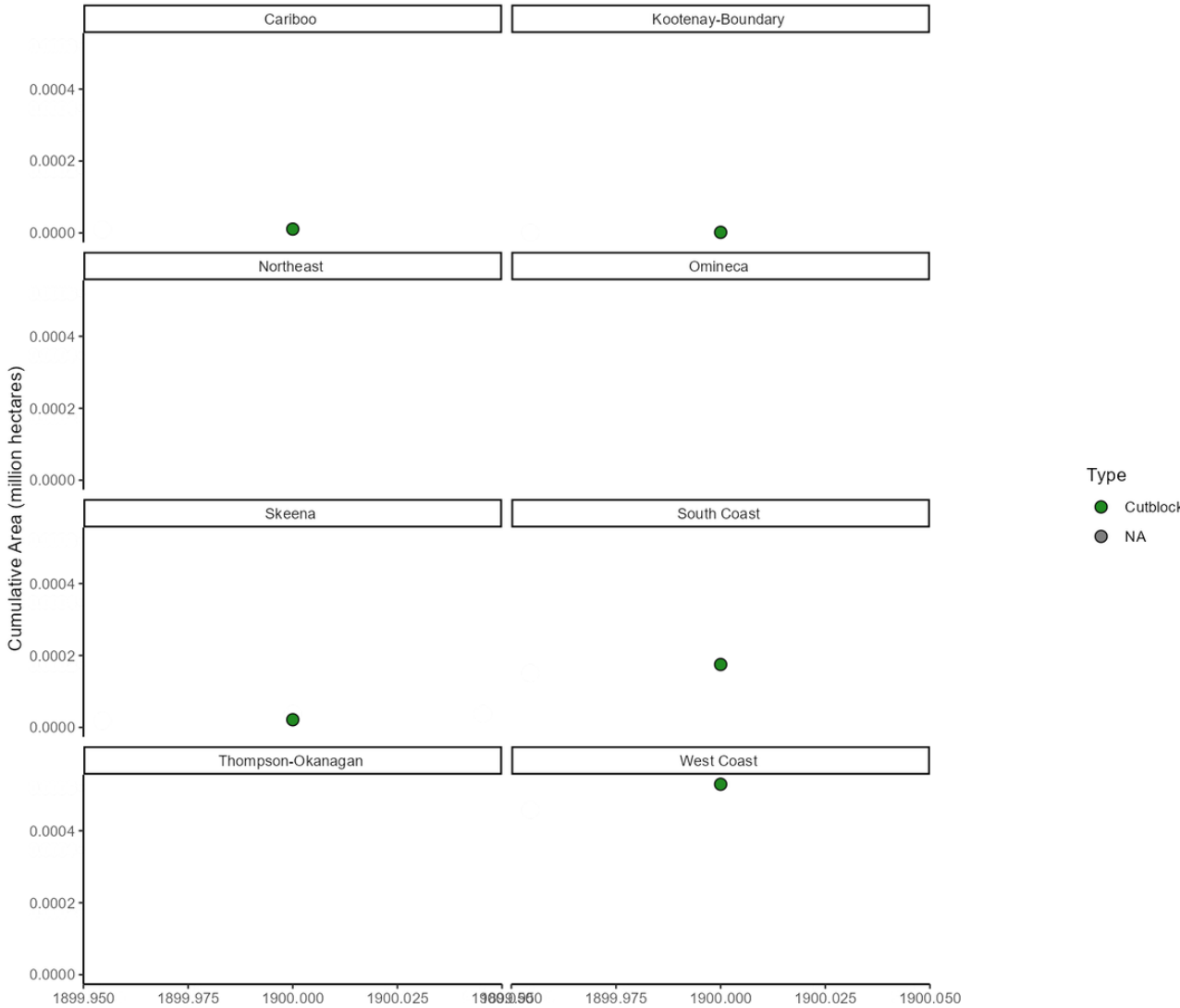
Earth Engine offers the following pricing plans based on planned level of usage

	Basic	Professional	Premium
Monthly Platform Fee	$500 per month	$2000 per month	Contact us
User (developer) allowance	2*	5*	Contact us

https://cloud.google.com/earth-engine/pricing

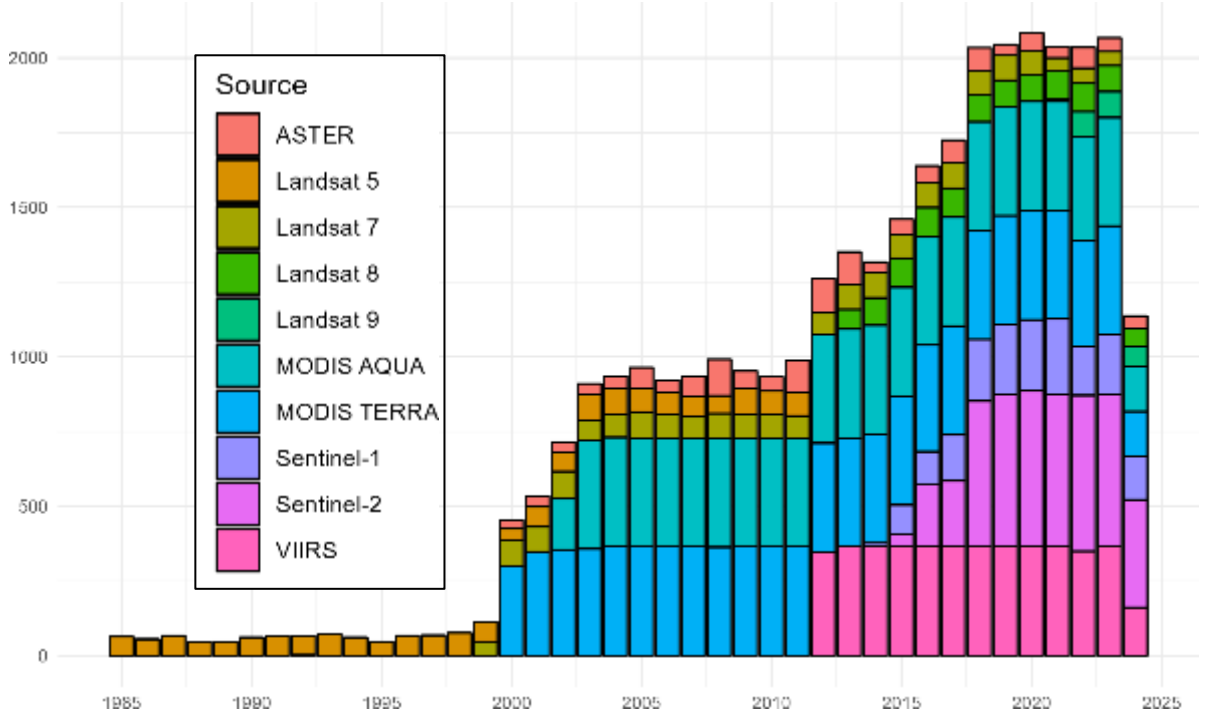

Good decisions ☺
Bad decisions ☹
Quality of decision
No data ☹
Data volume
All the data ☺
The optimist ?
Real-time data with tools
Data without tools

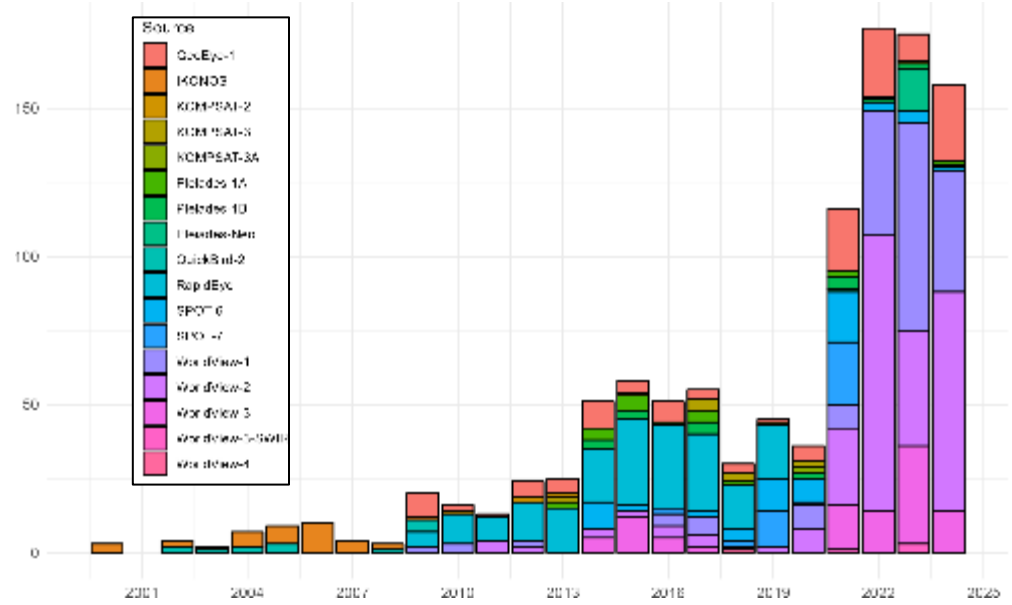
1900

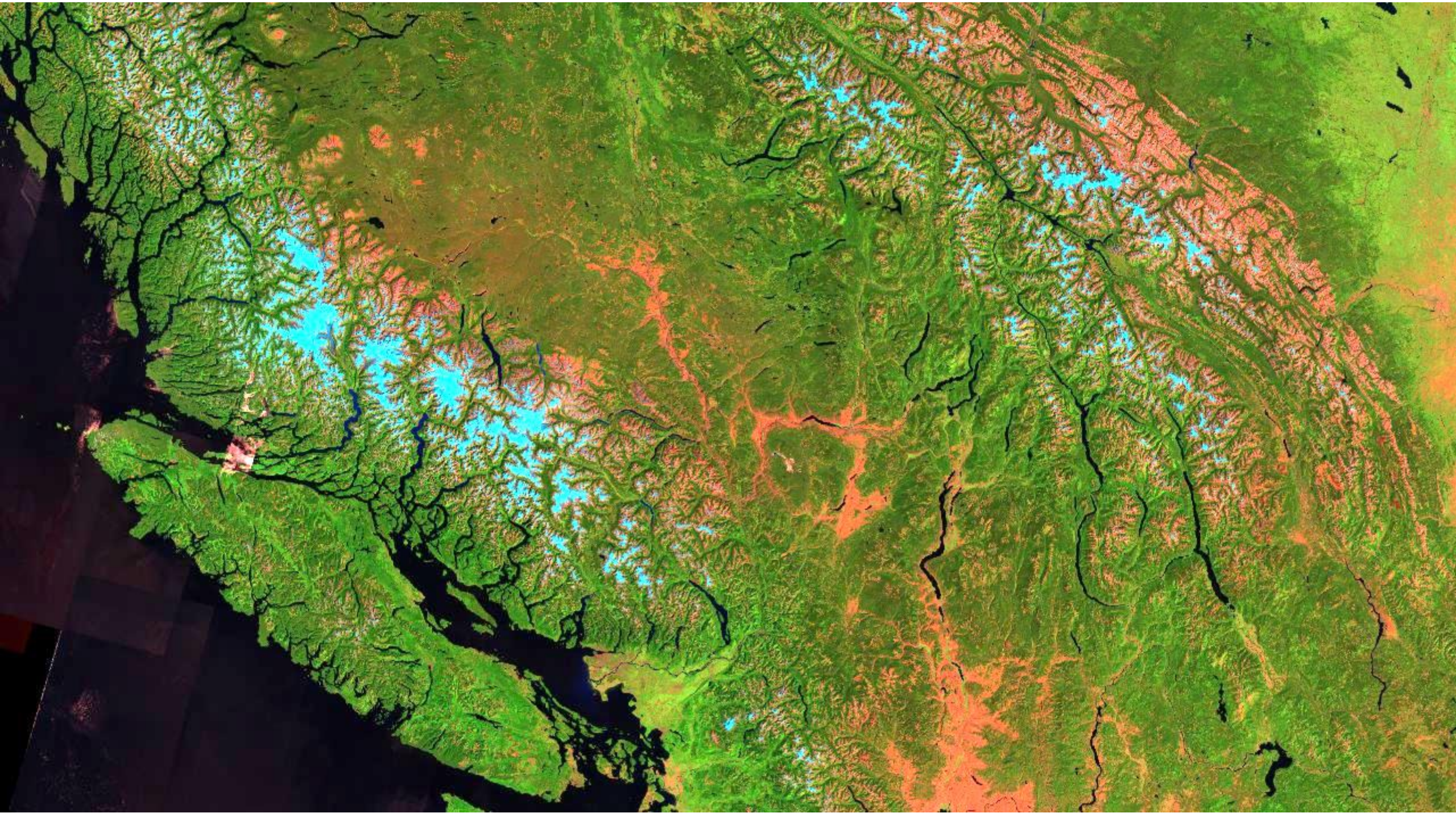

Cariboo
Kootenay-Boundary
Northeast
Omineca
Skeena
South Coast
Thompson-Okanagan
West Coast
Cumulative Area (million hectares)
0.0000
0.0002
0.0004
1899.950
1899.975
1900.000
1900.025
1900.050
Type
Cutblock
NA

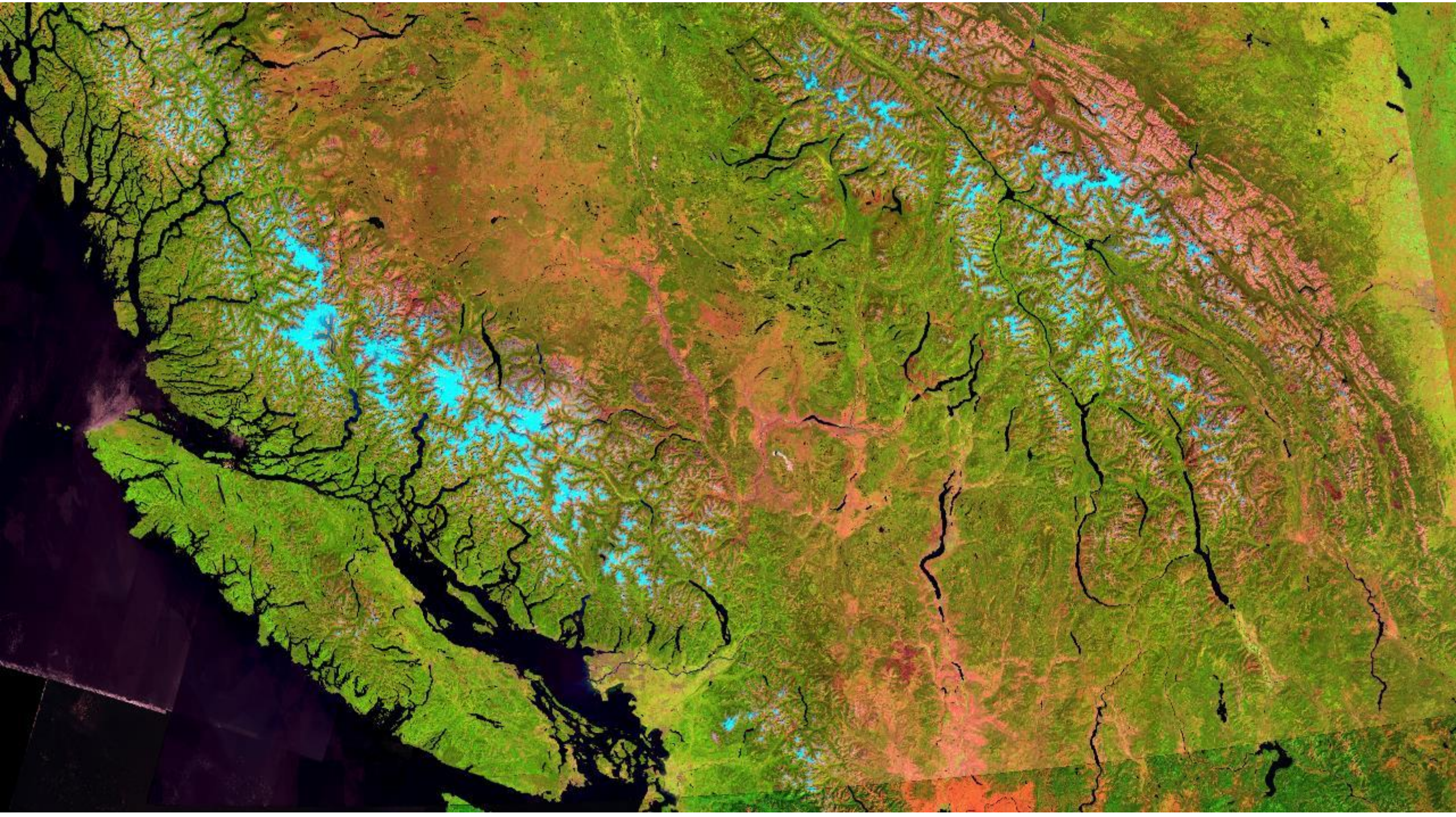
Satellite EO

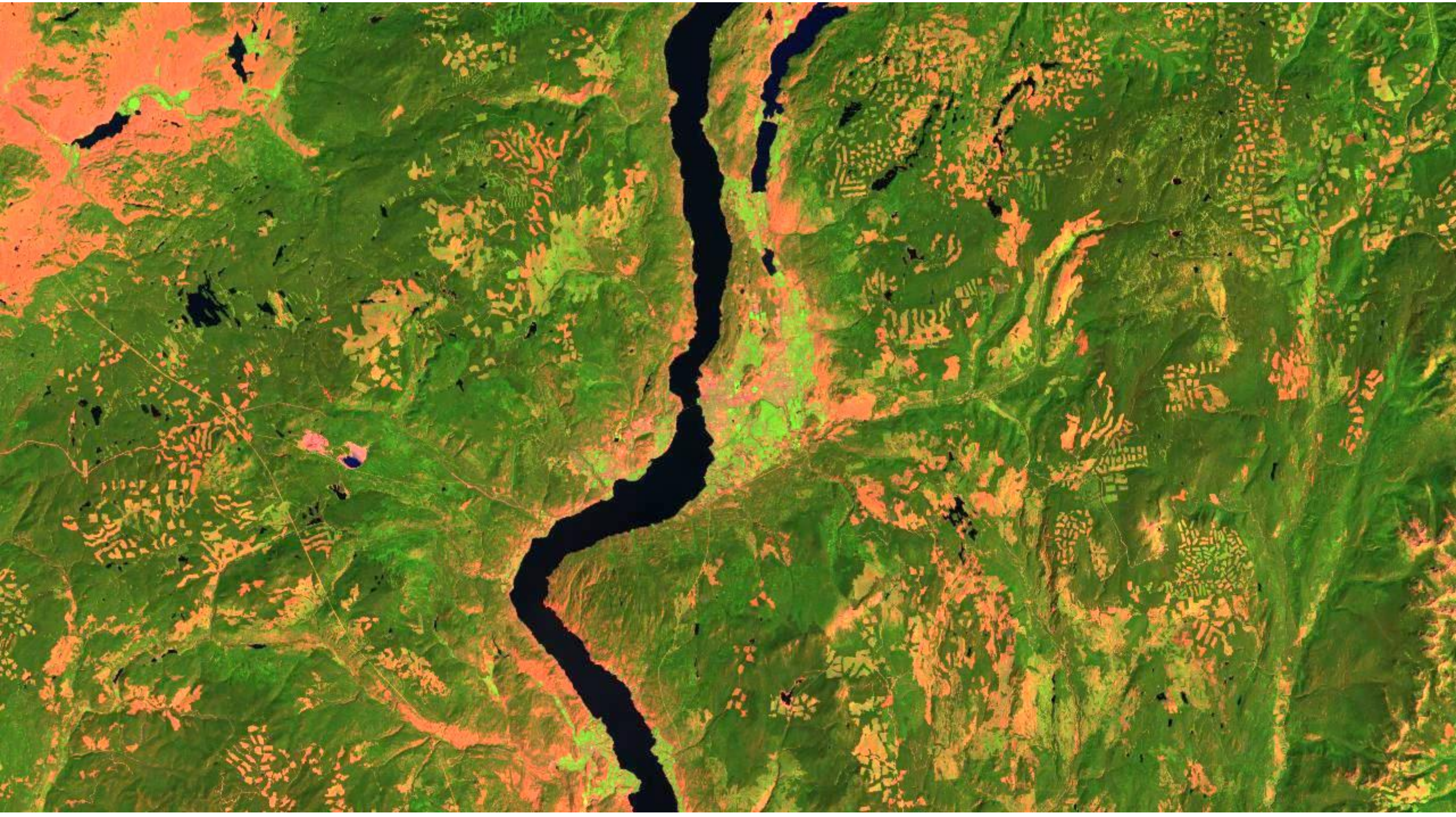
- Volume of data
- Optical, hyperspectral, thermal, radar, lidar
- Big sats, small sats, wildfireSat
- Next 5 years



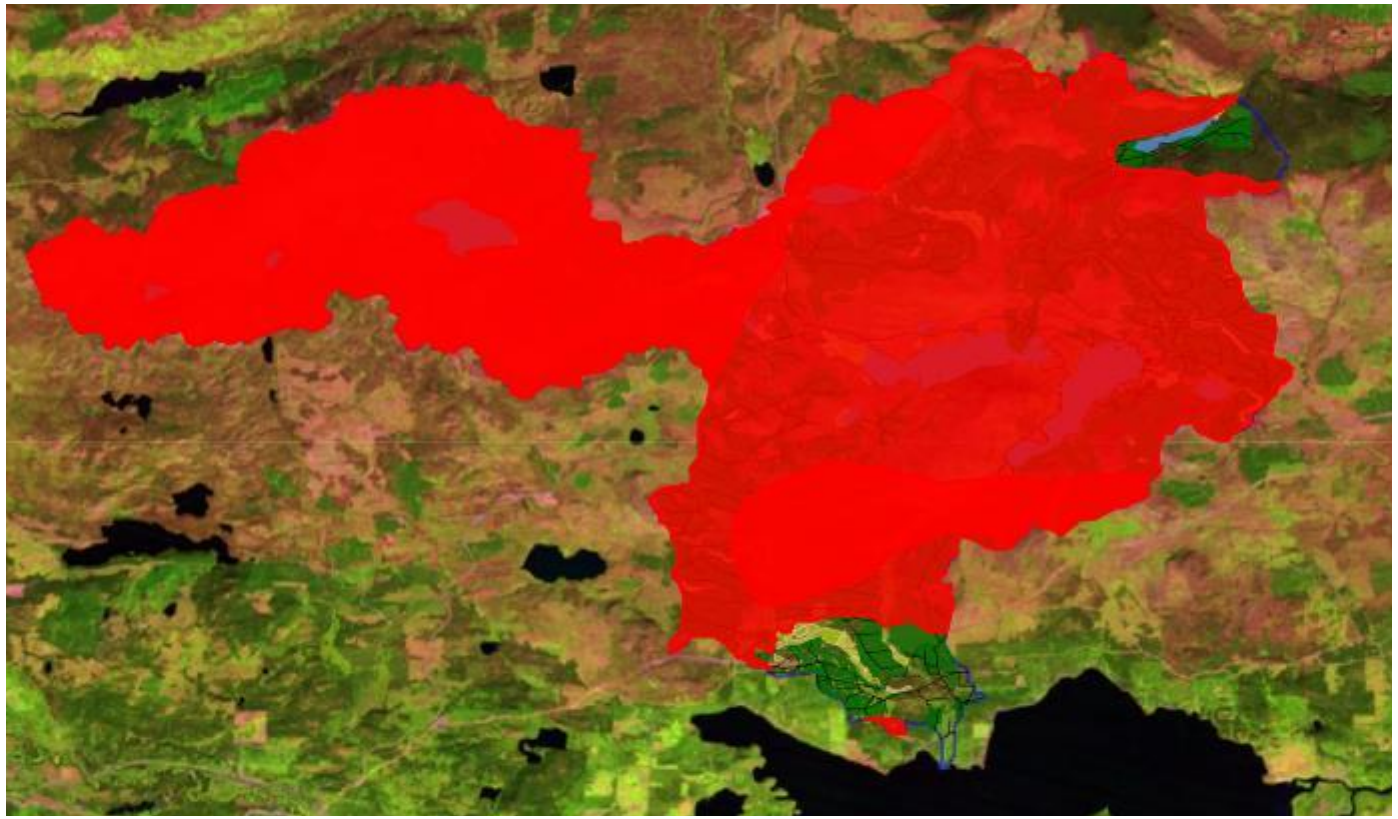


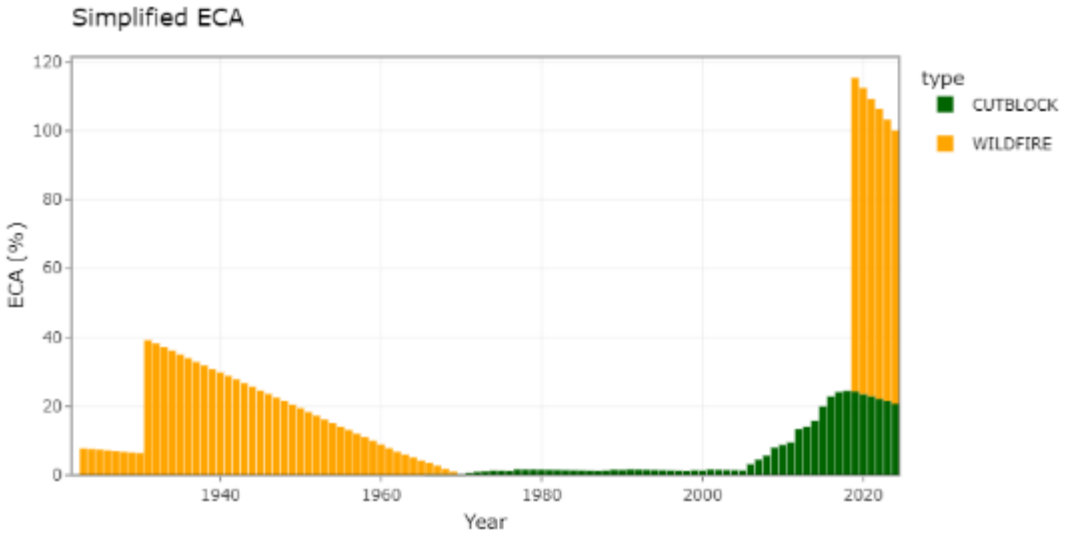






watershedBC





https://bcgov-env.shinyapps.io/watershedBC/