The SEAMONSTER Geowiki:
Embedding a Sensor Web in Virtual Globes

Matt Heavner, Associate Professor of Physics, University of Alaska Southeast
Eran Hood (UAS), Dennis (Rob) Fatland (Vexcel), Cathy Connor (UAS)

Acknowledgements

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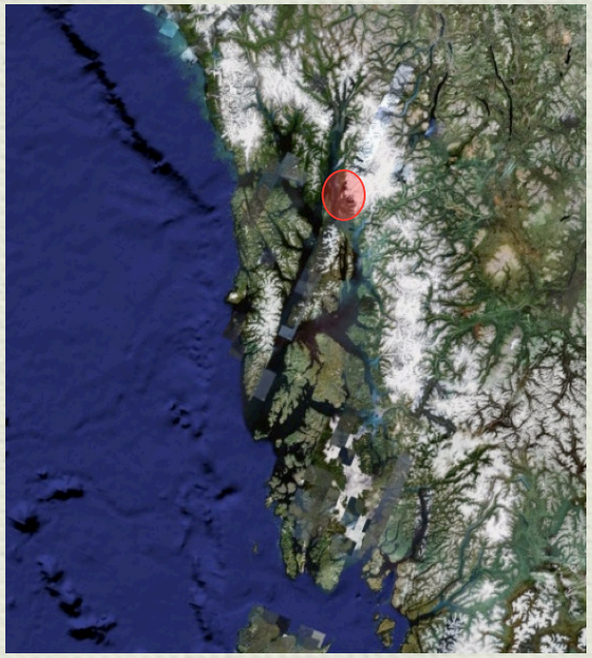
- Numerous UAS and UAF/GI students, staff, faculty
- North Star, Era, Coastal, Temsco

SEAMONSTER

- South
- East
- Alaska
- MOnitoring
- Network for
- Science
- Technology
- Education &
- Research




N
23.1 km
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Water on Ice

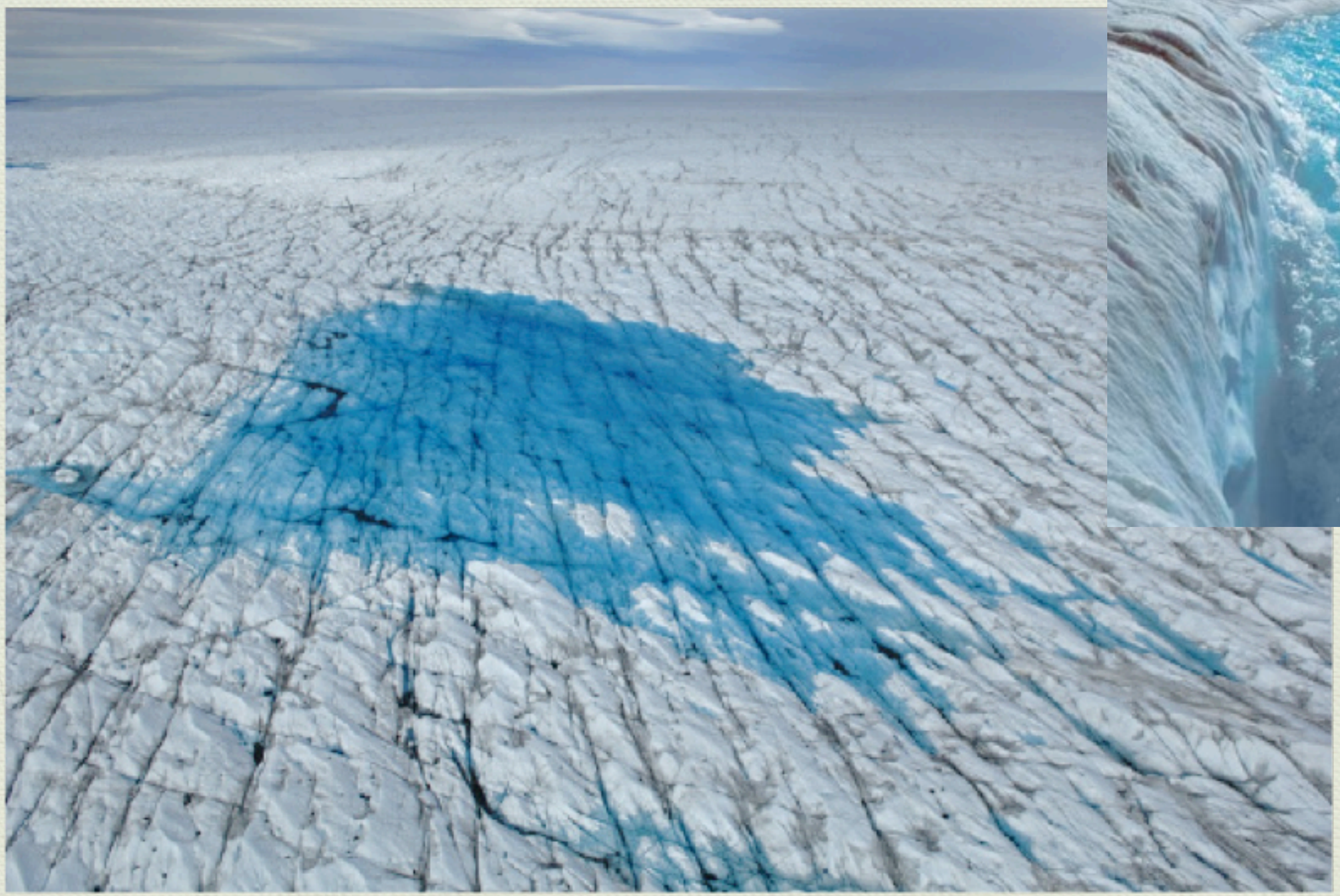
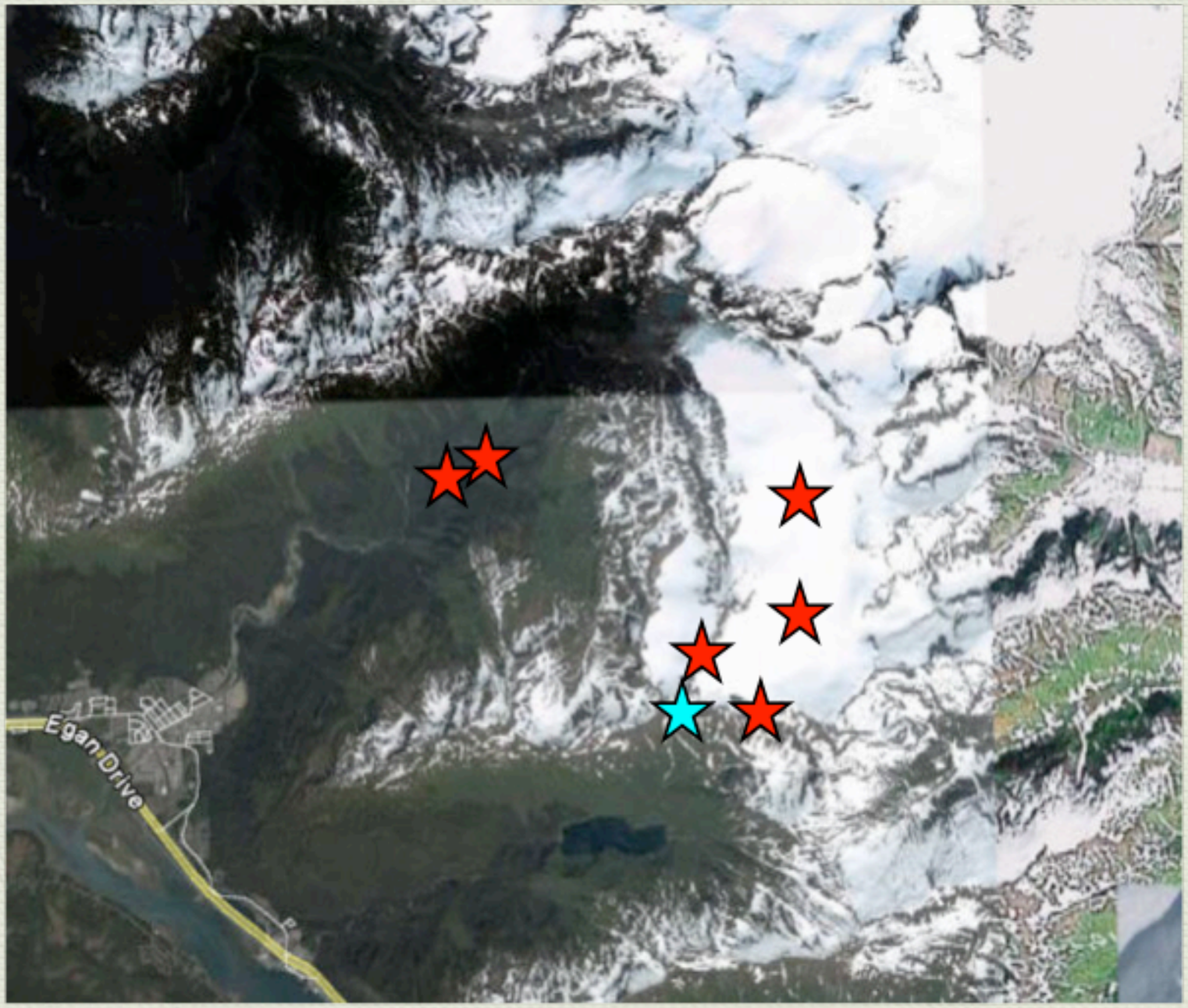


Photo Credit: James Balog

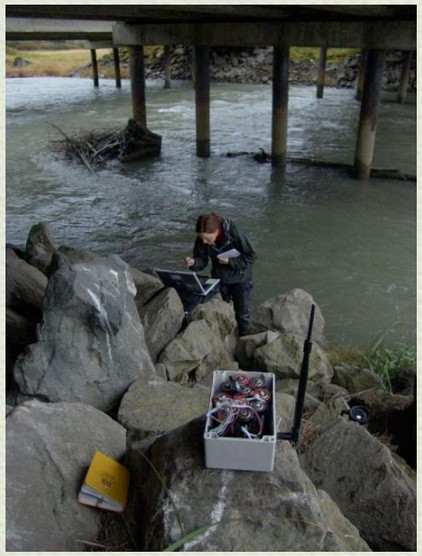
Lemon Creek Sensor Web



Instrumentation

Lake Level

Weather



Water Quality

GPS/Seismic

Web Cams

Heading Up Lemon Creek

Lower Lemon Met Station

Lemon Creek Glacier

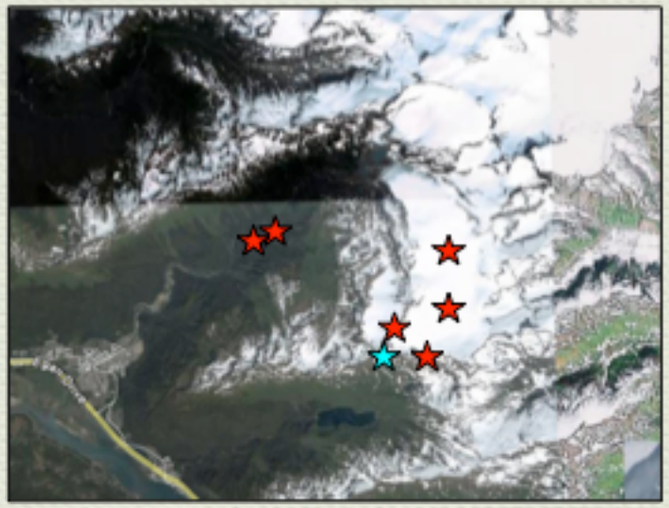
Heading Up the Glacier

Lake pre-drainage

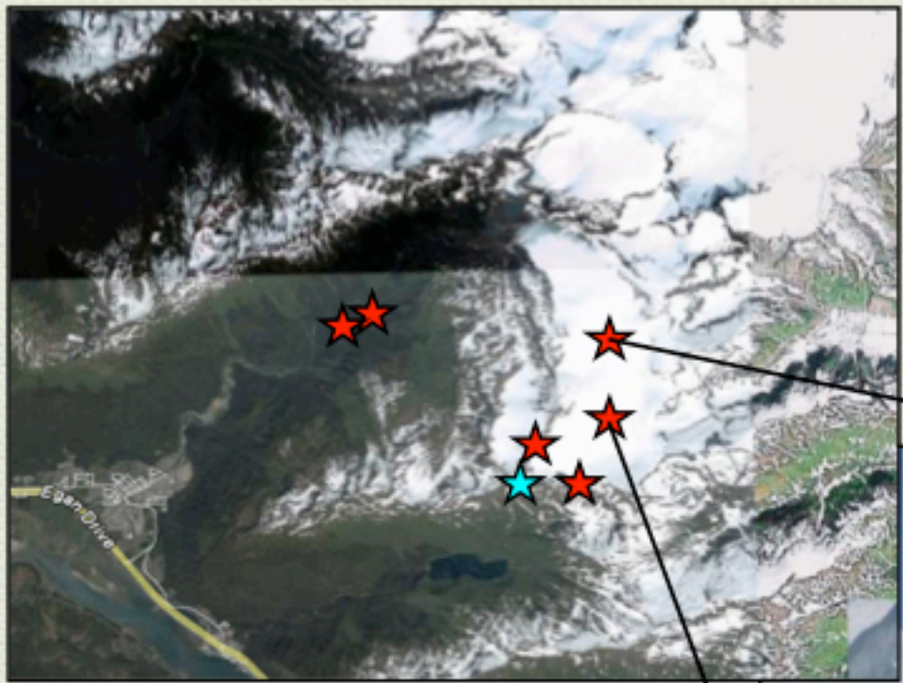
Lake post-drainage

Top of the Glacier

Communication



15 km range

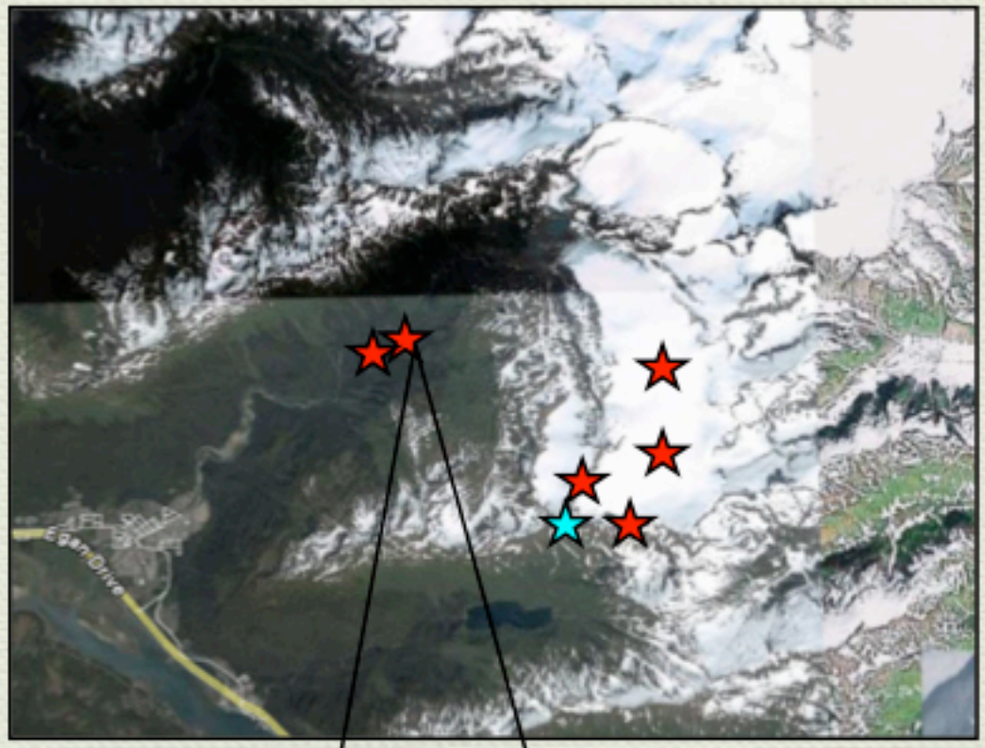


Glacial Motion

Trimble netRS GPS

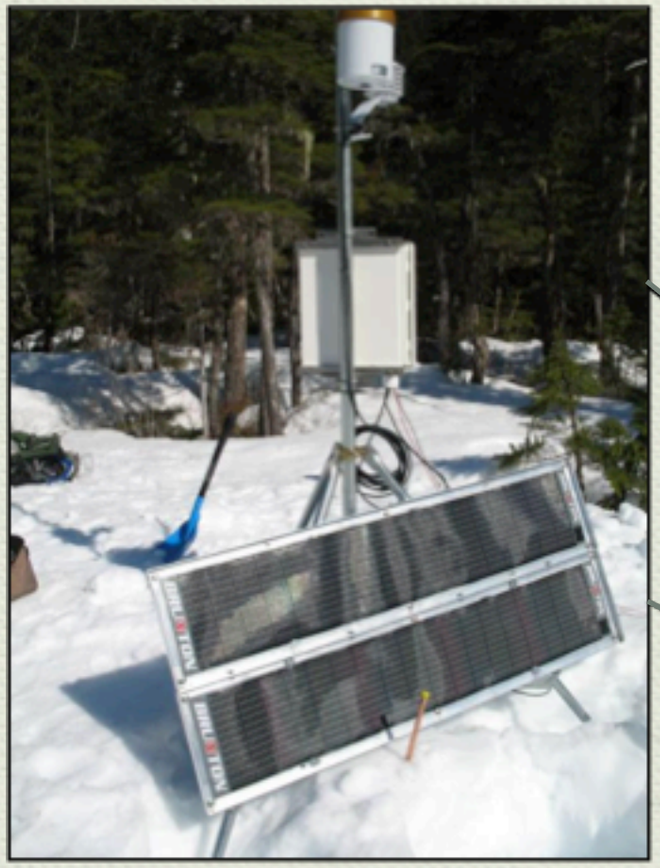
cm accuracy

Seismics



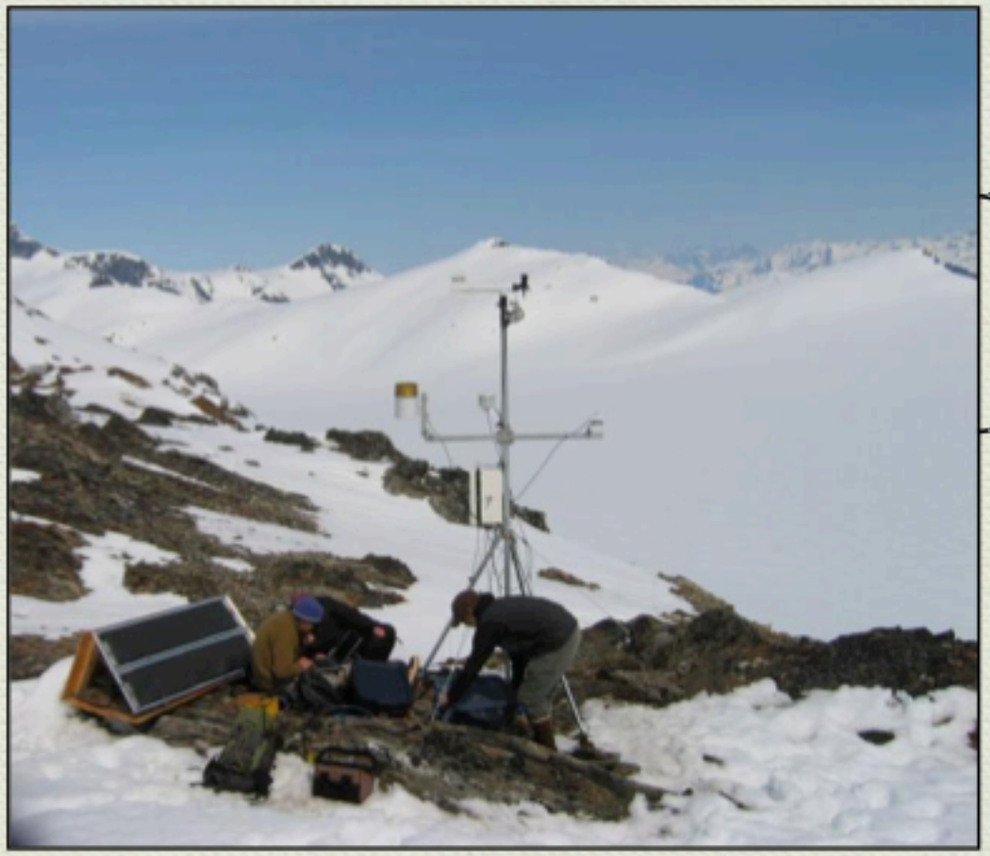
Water Quality

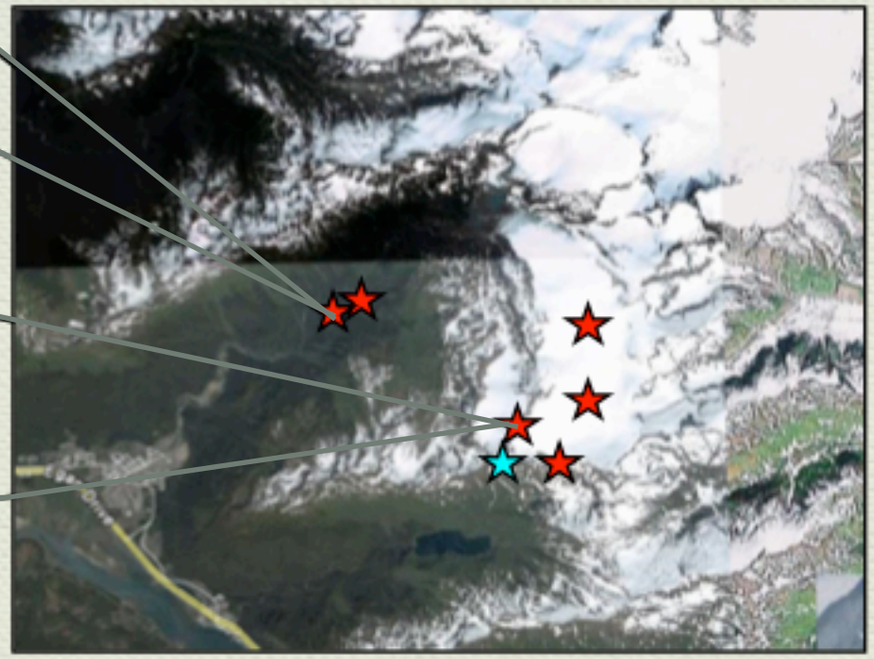
Water Temp
Turbidity
Dissolved Oxygen
Conductivity

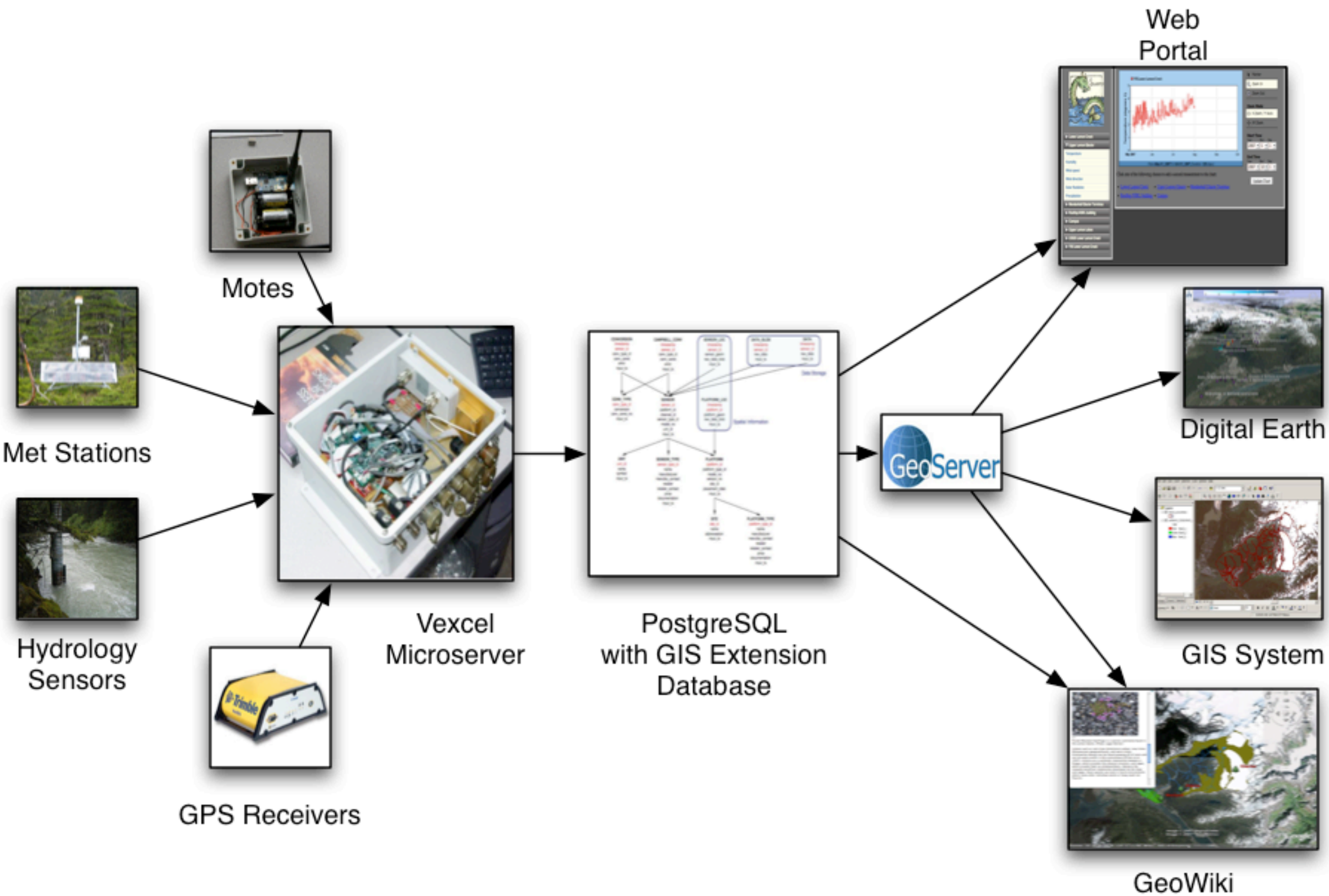


Climate Stations

Temperature
Wind
Precipitation
Solar Radiation





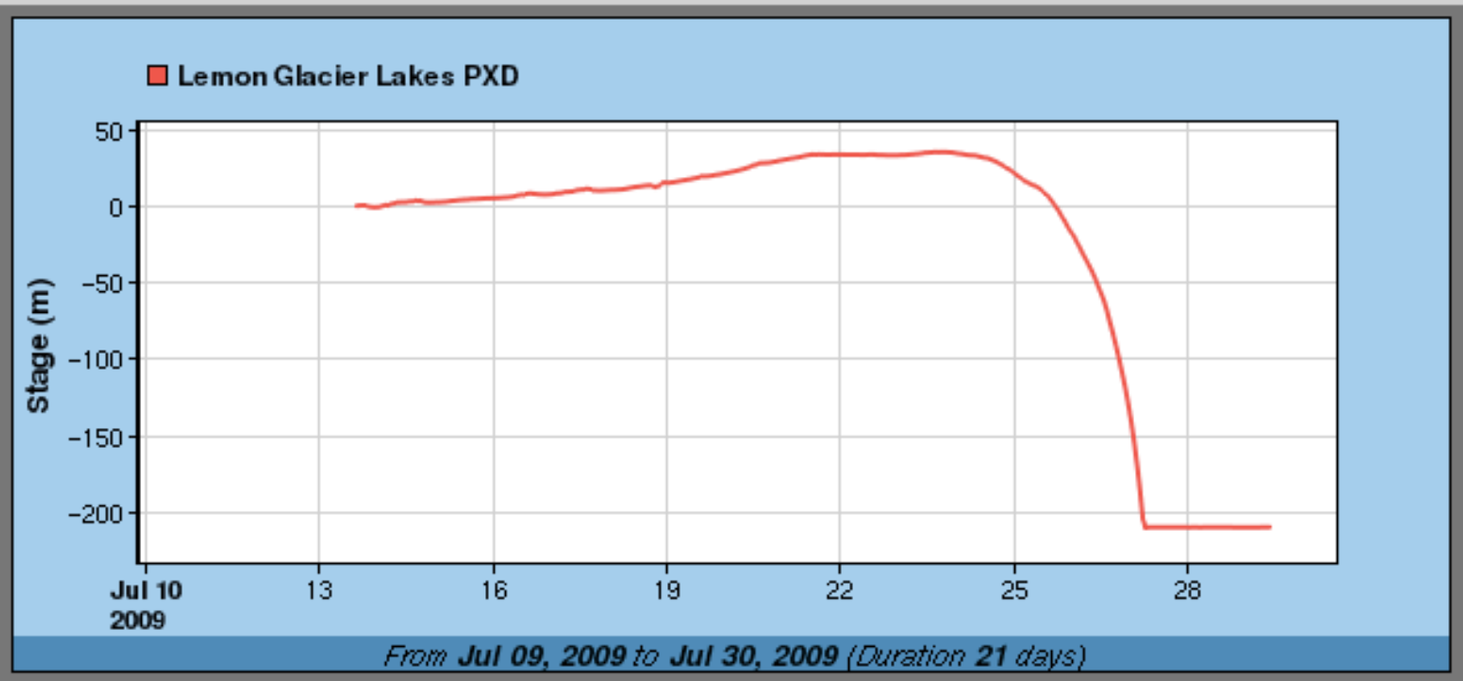

Web
Portal
Motes
Met Stations
Hydrology
Sensors
GPS Receivers
Vexcel
Microserver
PostgreSQL
with GIS Extension
Database
GeoServer
Digital Earth
GIS System
GeoWiki

Seamonster Data Browser

http://seamonster.jun.alaska.edu/browser/

Seamonster Data Browser

- ▶ Auke Lake PXD
- ▶ Eaglecrest MET
- ▶ Georgia Tech Snowmobile Robot
- ▼ Lemon Glacier Lakes PXD
  - Stage
  - Voltage
- ▶ Lower Lemon Creek MET
- ▶ Lower Lemon Creek USGS
- ▶ Lower Lemon Creek YSI
- ▶ Mendenhall Glacier Terminus MET
- ▶ Montana Creek YSI
- ▶ Natural Science Research Lab MET
- ▶ UAS Campus MET
- ▶ Upper Lemon Glacier MET



Pointer

Zoom In

Zoom Out

Zoom Mode

X Zoom / Y Auto

XY Zoom

Start Time

Year	Mon	Day
2009	7	9

End Time

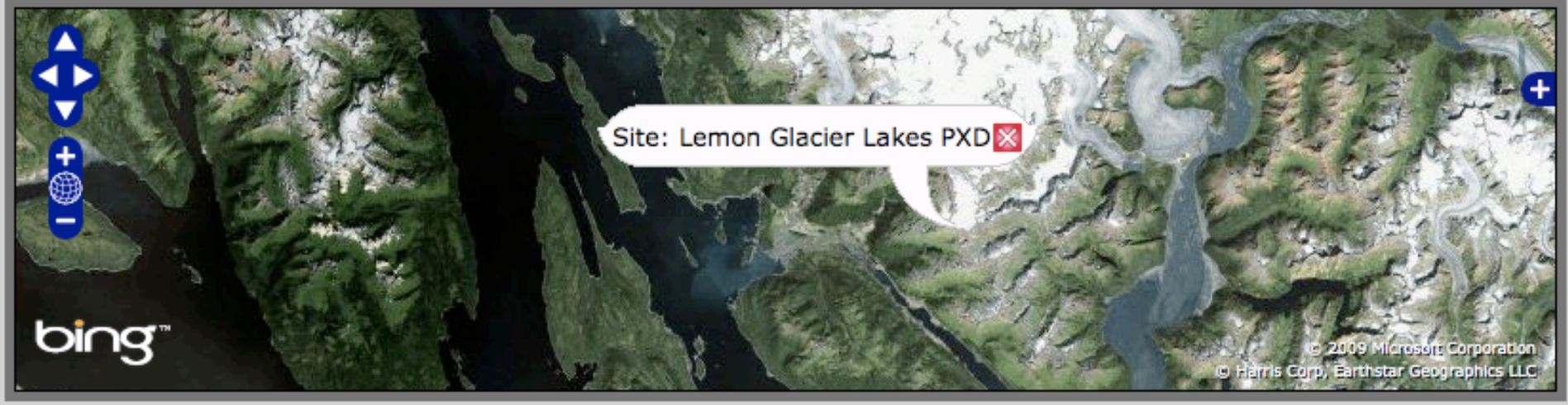
Year	Mon	Day
2009	7	30

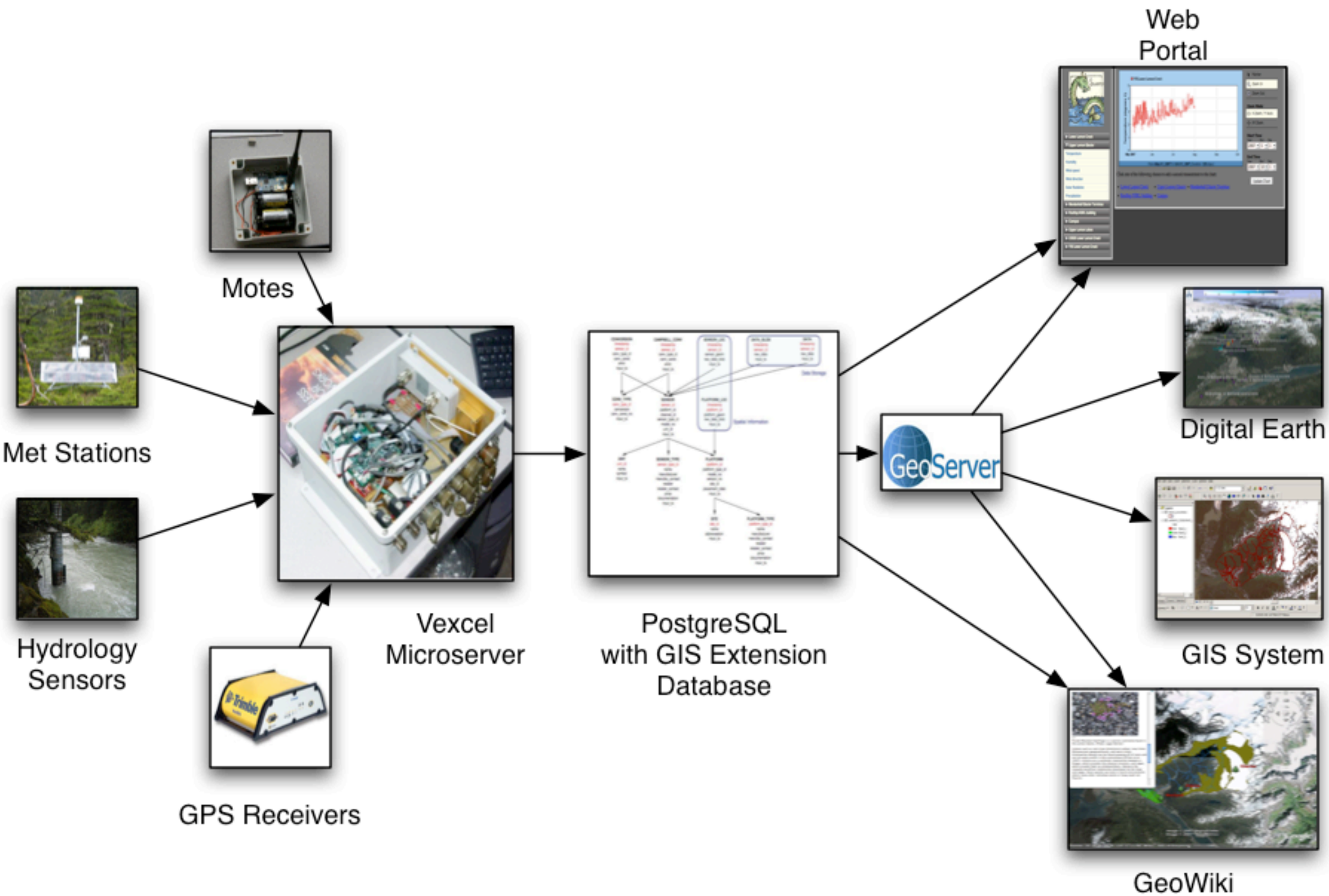
Update Chart

Data Download Page

Click one of the following choices to add a second measurement to the chart:

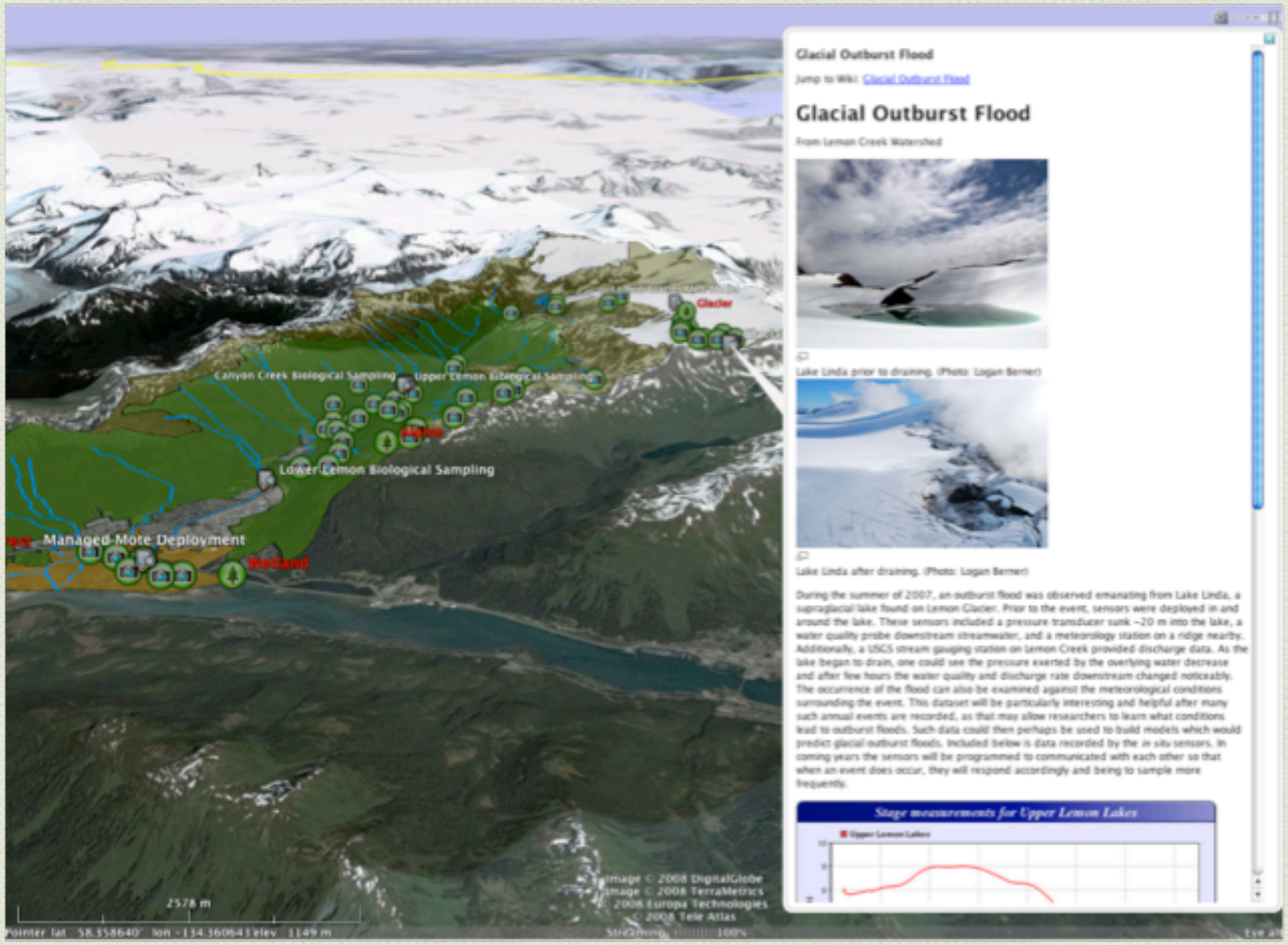
- Auke Lake PXD




Web
Portal
Motes
Met Stations
Hydrology
Sensors
GPS Receivers
Vexcel
Microserver
PostgreSQL
with GIS Extension
Database
GeoServer
Digital Earth
GIS System
GeoWiki

SEAMONSTER GeoWiki

http://seamonsterak.com/



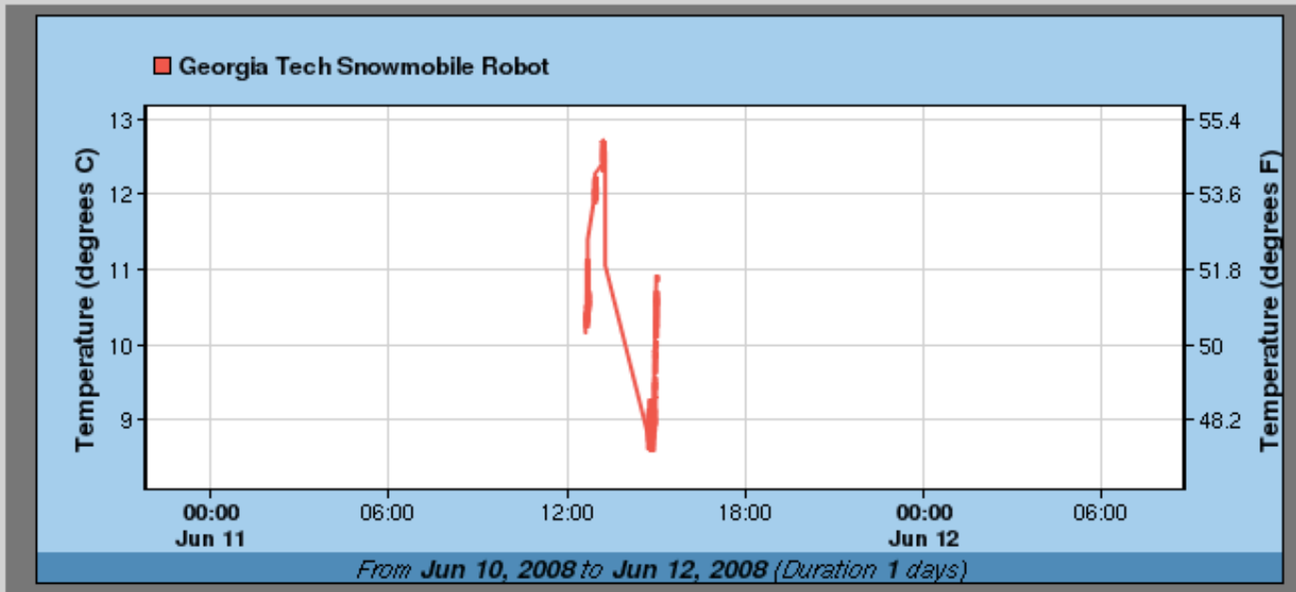

NASA

Seamonster Data Browser

http://seamonster.jun.alaska.edu/browser/

Google

- Auke Lake PXD
- Eaglecrest MET
- Georgia Tech Snowmobile Robot
  - Temperature
  - Humidity
  - Pressure
- Lemon Glacier Lakes PXD
- Lower Lemon Creek MET
- Lower Lemon Creek USGS
- Lower Lemon Creek YSI
- Mendenhall Glacier Terminus MET
- Natural Science Research Lab MET
- UAS Campus MET
- Upper Lemon Glacier MET



Pointer

Zoom In

Zoom Out

Zoom Mode

X Zoom / Y Auto

XY Zoom

Start Time

Year	Mon	Day
2008	6	10

End Time

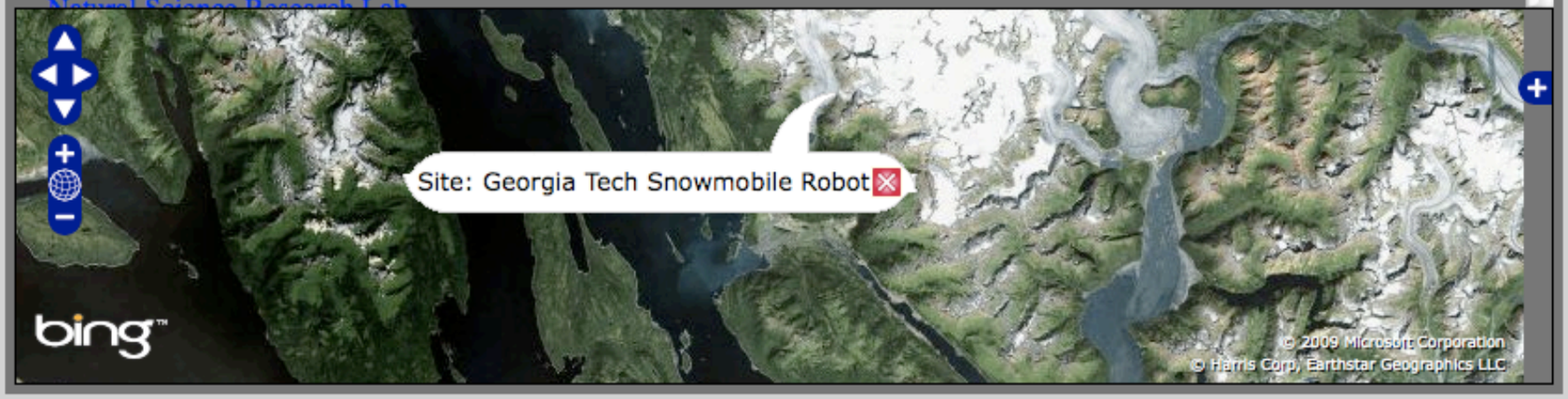
Year	Mon	Day
2008	6	12

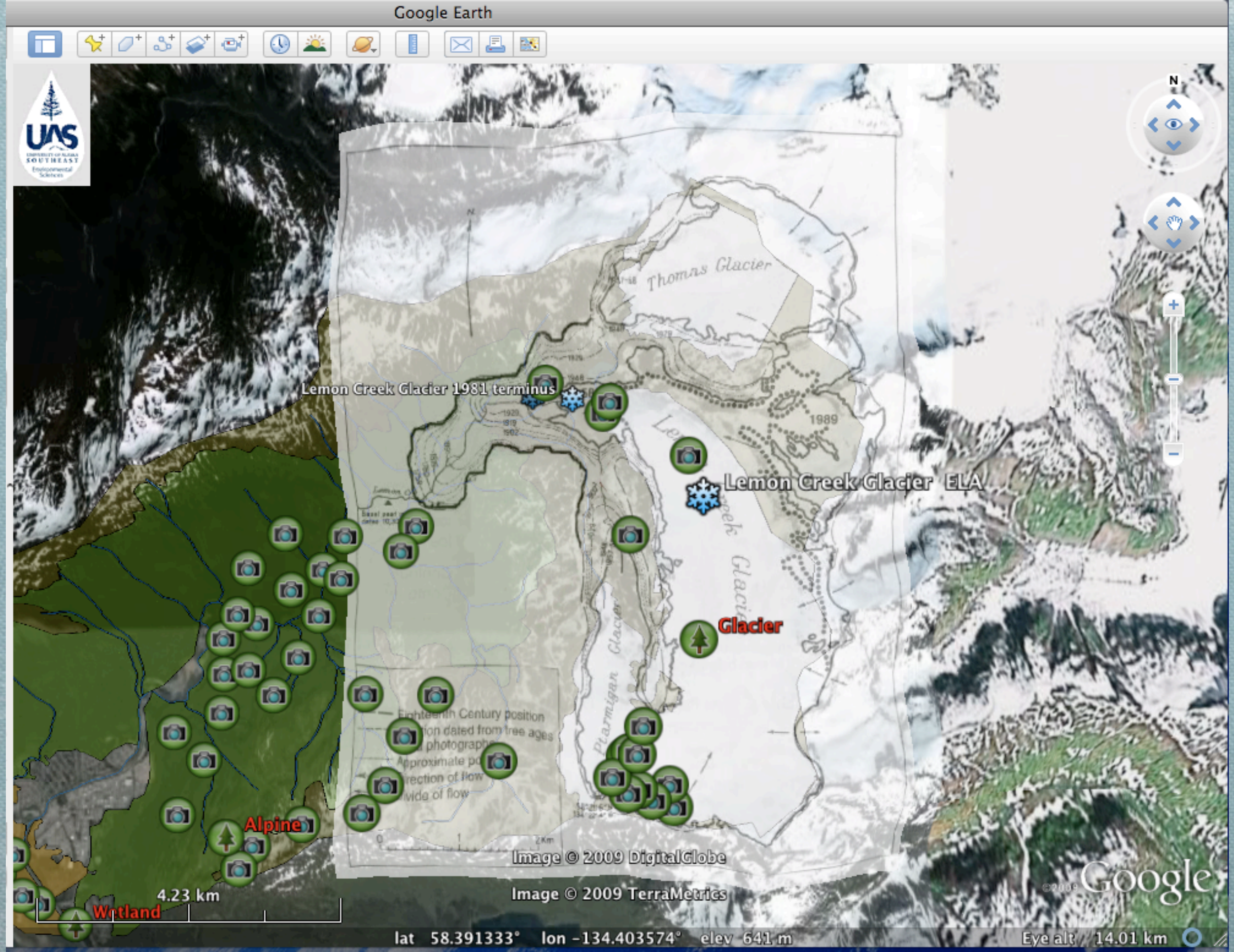
Update Chart

Data Download Page

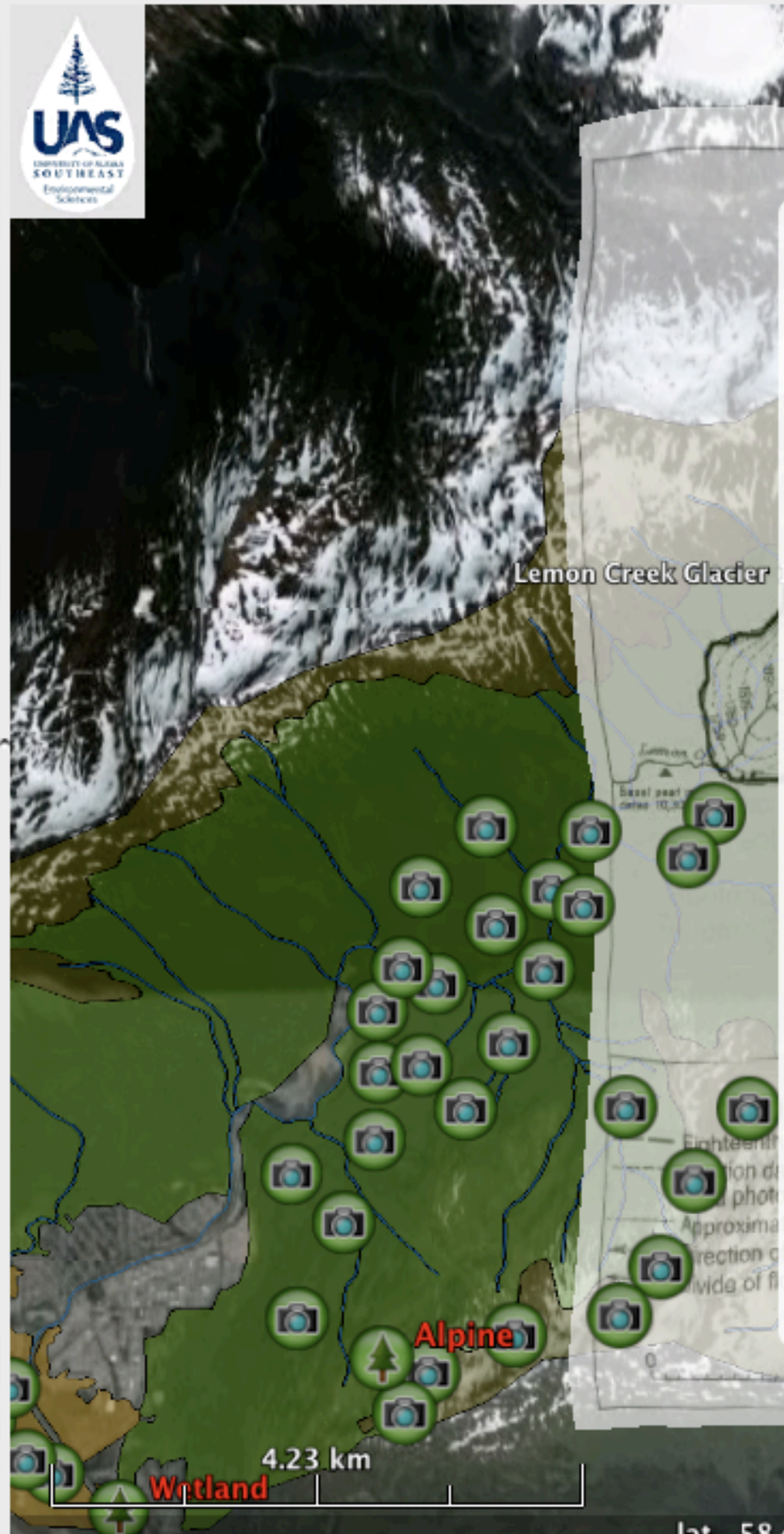
Click one of the following choices to add a second measurement to the chart:

- Lower Lemon Creek MET
- Upper Lemon Glacier MET
- Mendenhall Glacier Terminus MET



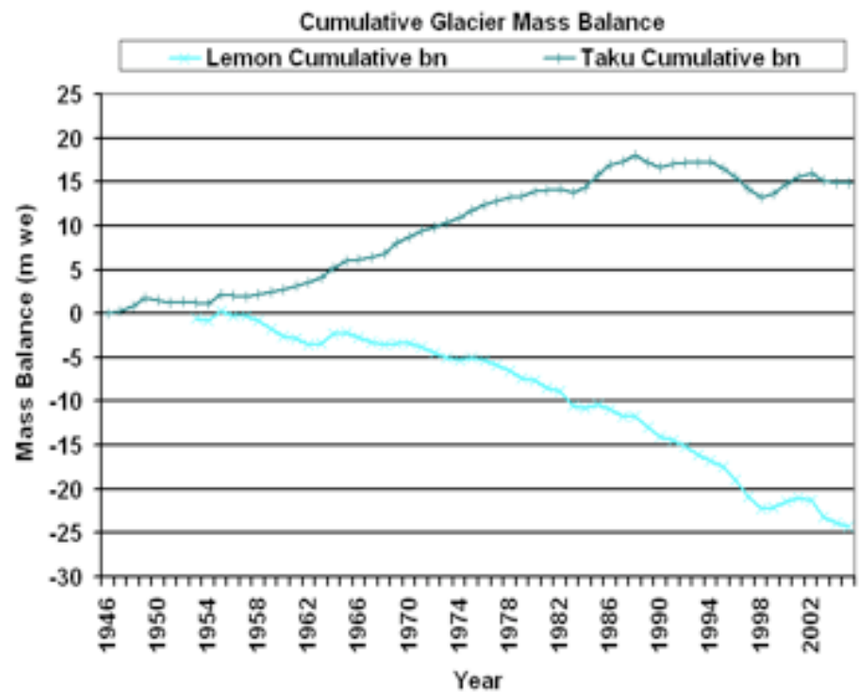

Google Earth
Thomas Glacier
Lemon Creek Glacier 1981 terminus
1989
Lemon Creek Glacier ELA
Glacier
Ptarmigan Glacier
Eighteenth Century position
Approximate position
Direction of flow
Divide of flow
Alpine
Wetland
4.23 km
Image © 2009 DigitalGlobe
Image © 2009 TerraMetrics
Google
lat 58.391333° lon -134.403574° elev 641 m
Eye alt 14.01 km

Google Earth



Lemon Creek Glacier ELA

The equilibrium line altitude represents the snowline at the end of the summer. Marking the location of where melting for the year equals accumulation. Snowpack and melting has been measured across the Lemon Creek Glacier since 1953 yielding the second longest mass balance record in North America. A positive mass balance, resulting from greater snowfall than melt leads to glacier advance. A negative balance with melt dominating leads to retreat.



The graph indicates dominantly negative mass balance from 1953-1986 and strongly negative balance since 1987. This has led to dramatic thinning of the glacier and retreat. The thinning in excess of 25 m represents 25% of the glaciers volume gone in this period.
Directions: To here - From here

Image © 2009 DigitalGlobe

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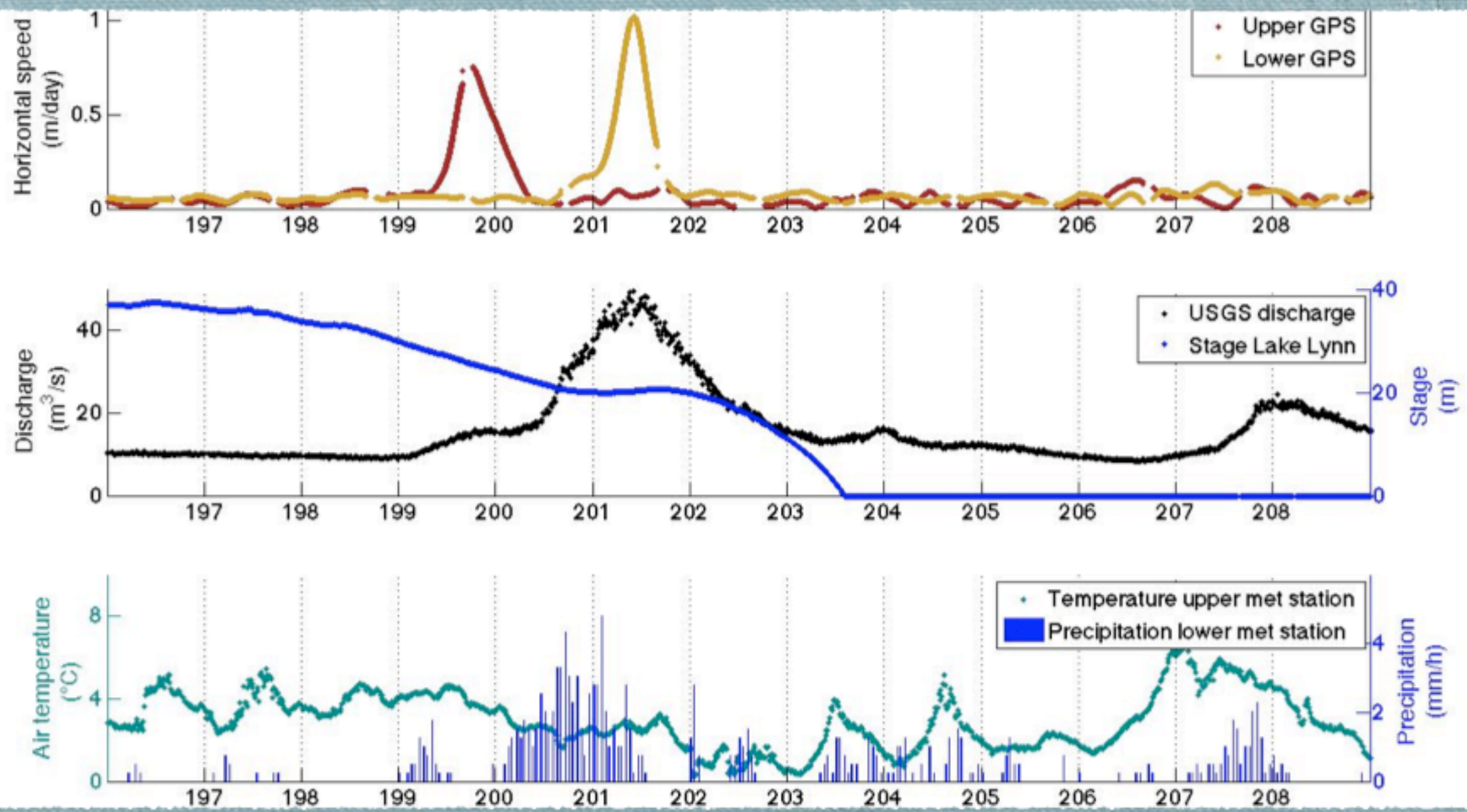
lat 58.423006° lon -134.406828° elev 922 m Eye alt 14.01 km

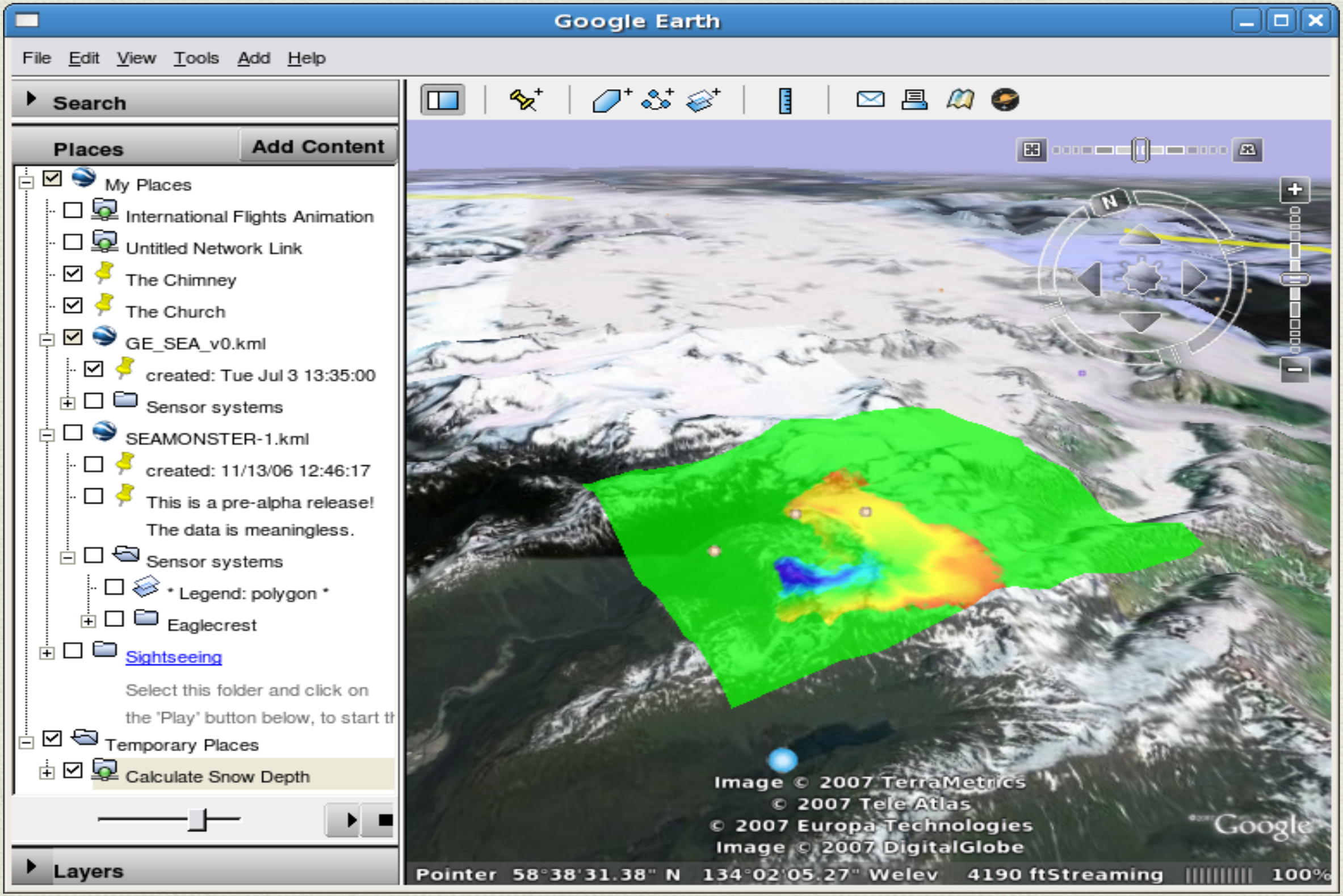
Thank you for your attention!

Thank you for your attention!

Questions?



Glacier Velocity and Hydrologic Forcing(s)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Places
Add Content
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Untitled Network Link
The Chimney
The Church
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created: Tue Jul 3 13:35:00
Sensor systems
SEAMONSTER-1.kml
created: 11/13/06 12:46:17
This is a pre-alpha release!
The data is meaningless.
Sensor systems
* Legend: polygon *
Eaglecrest
Sightseeing
Select this folder and click on
the 'Play' button below, to start th
Temporary Places
Calculate Snow Depth
Layers
Image © 2007 TerraMetrics
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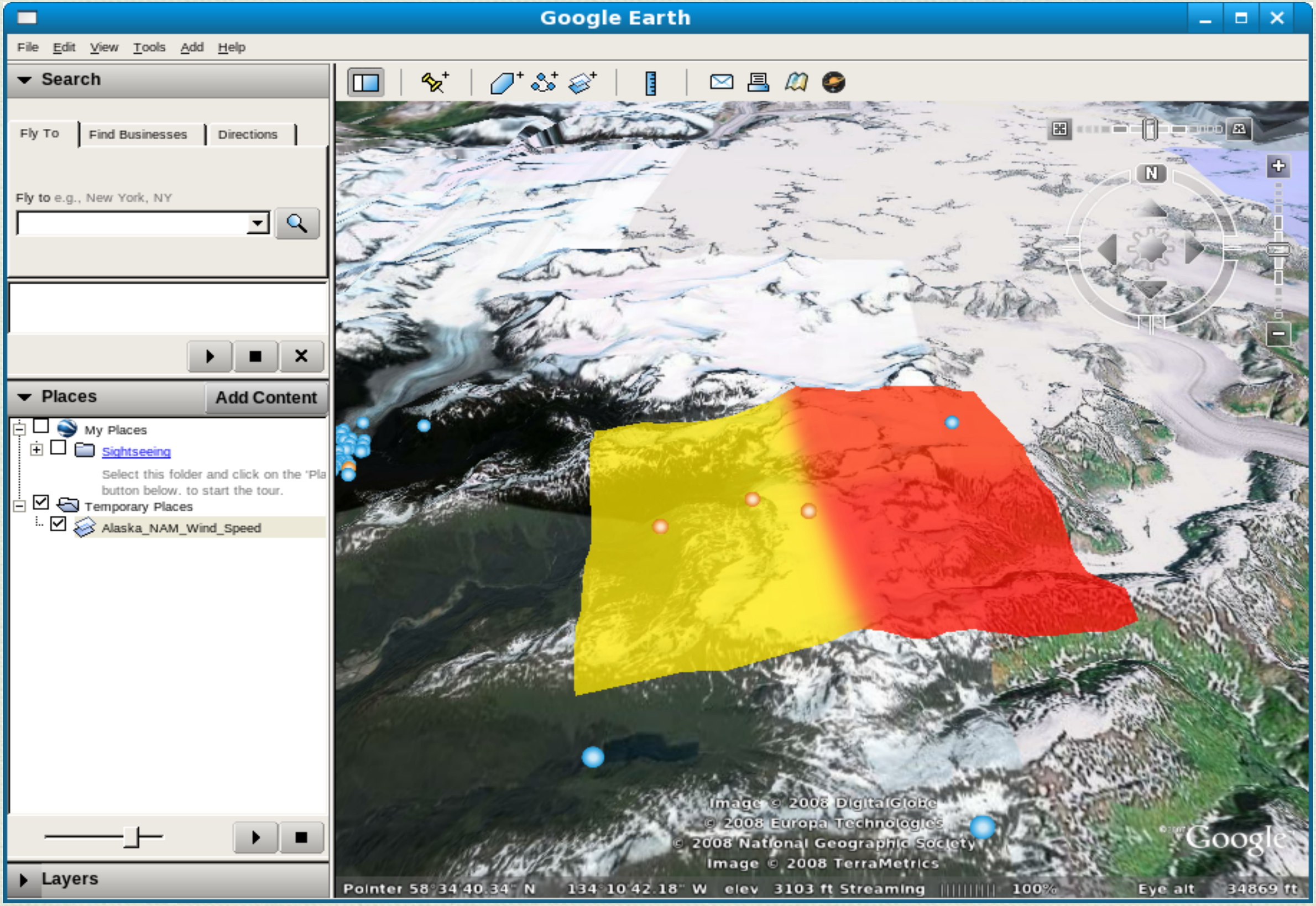
Google
Pointer 58°38'31.38" N 134°02'05.27" W elev 4190 ft Streaming 100%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Temporary Places
Alaska_NAM_Wind_Speed
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N
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Image © 2008 TerraMetrics
Google
Pointer 58°34'40.34" N 134°10'42.18" W elev 3103 ft Streaming 100% Eye alt 34869 ft