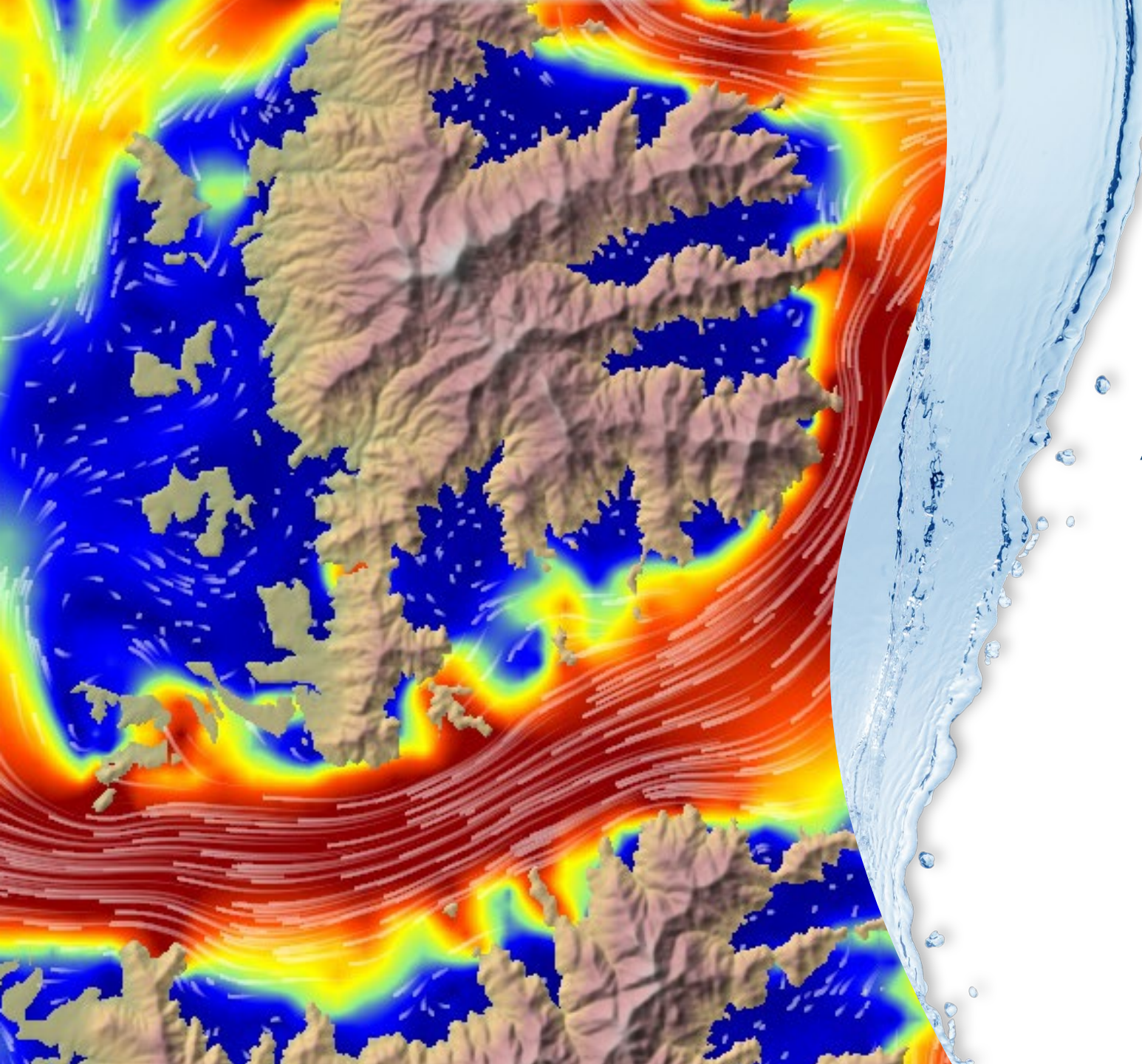


Modeling the Ice Age Missoula Floods

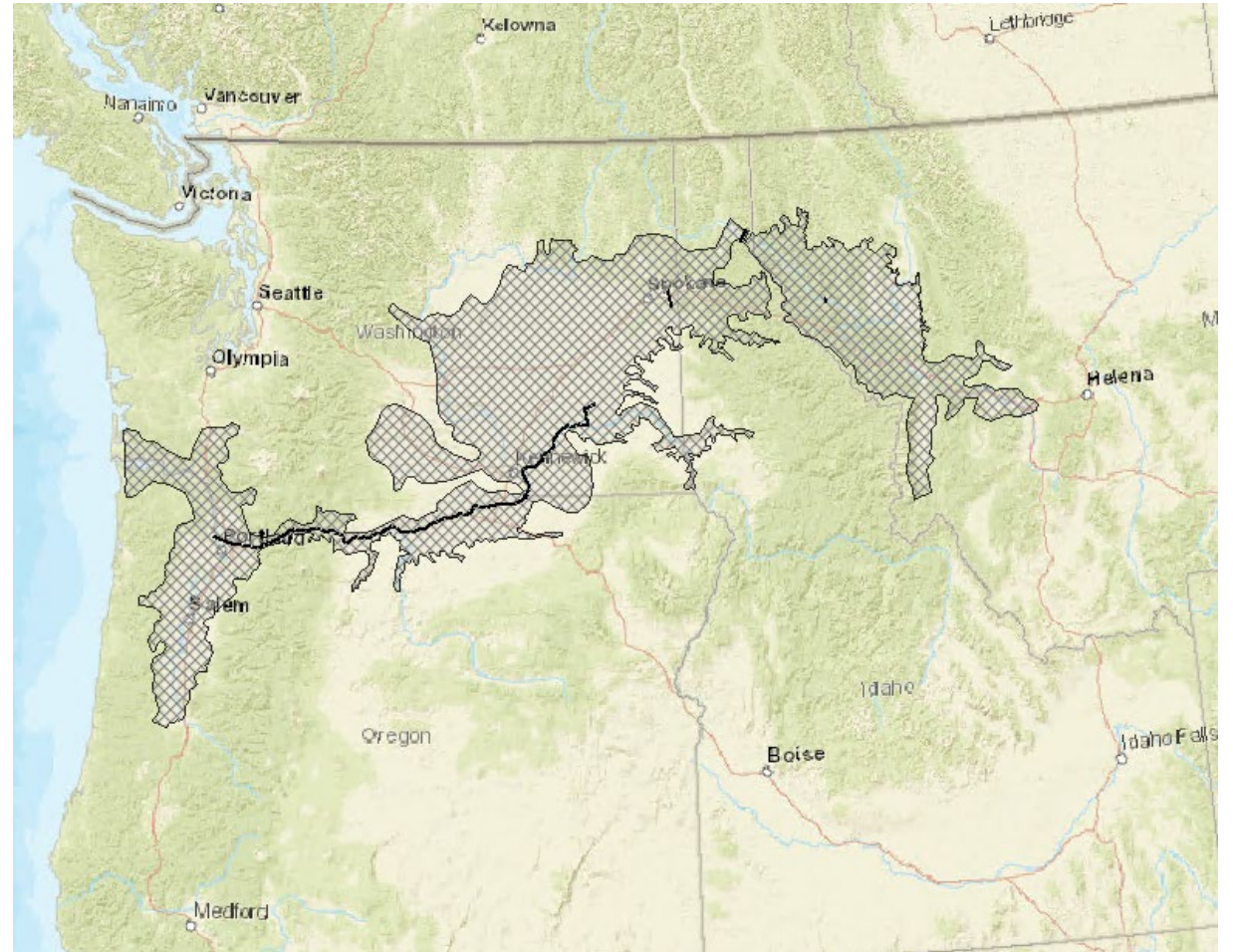
Chris Goodell





Modeling Domain

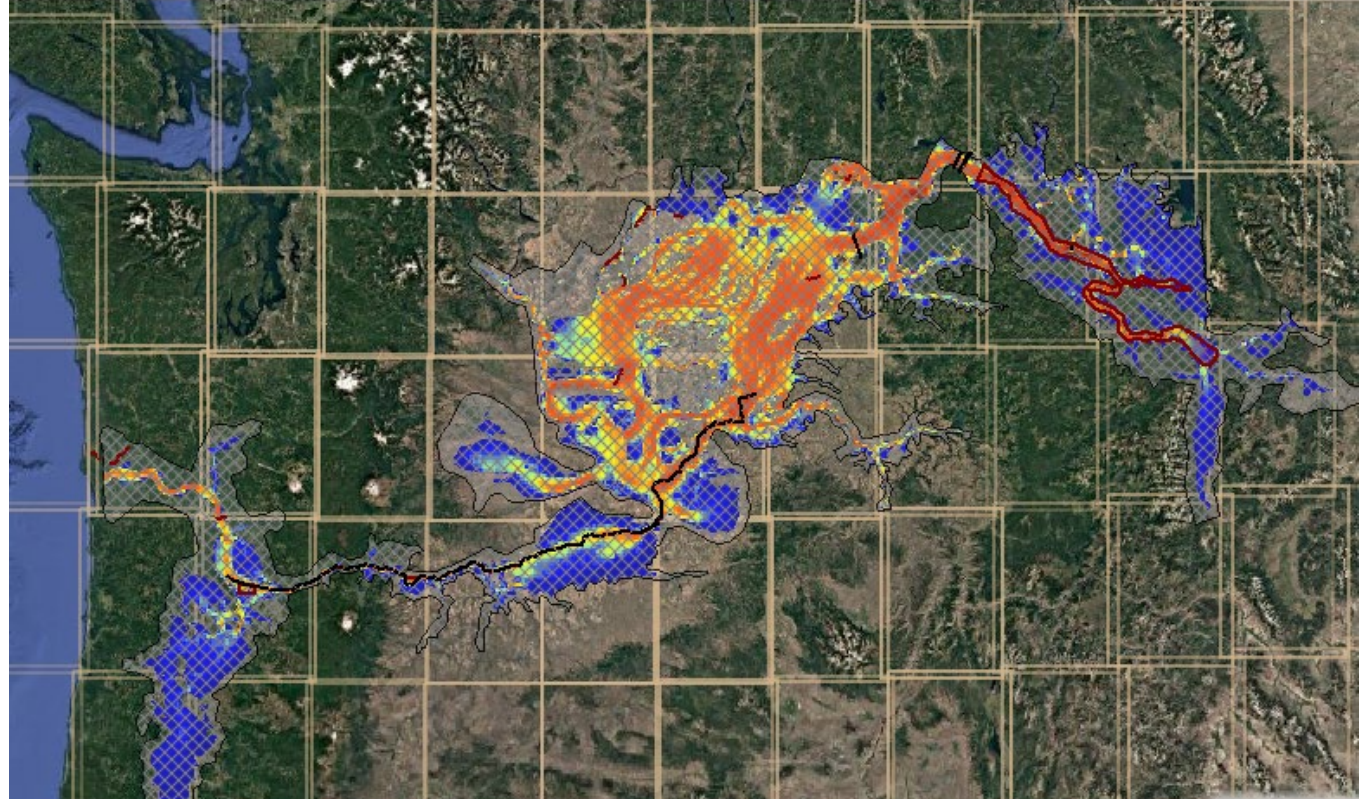
- ~120,000 km²
- ~1,120 km long
- Constrained along the northern boundary to simulate existing glaciers



Challenges

Terrain

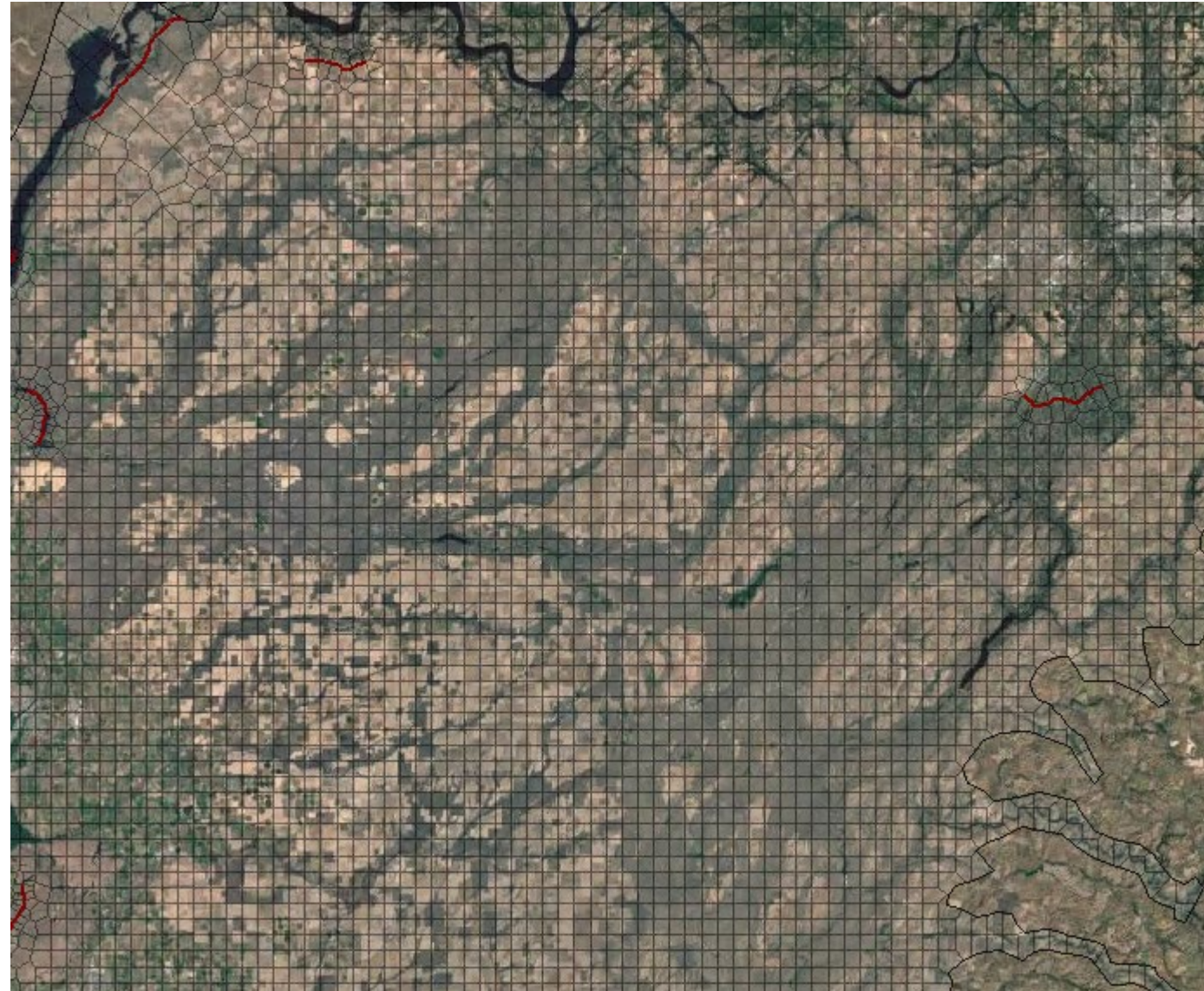
- USGS 30 meter DEMs.
- ~35 tiles stitched together
- 2.1 Gb



Challenges

Run Times

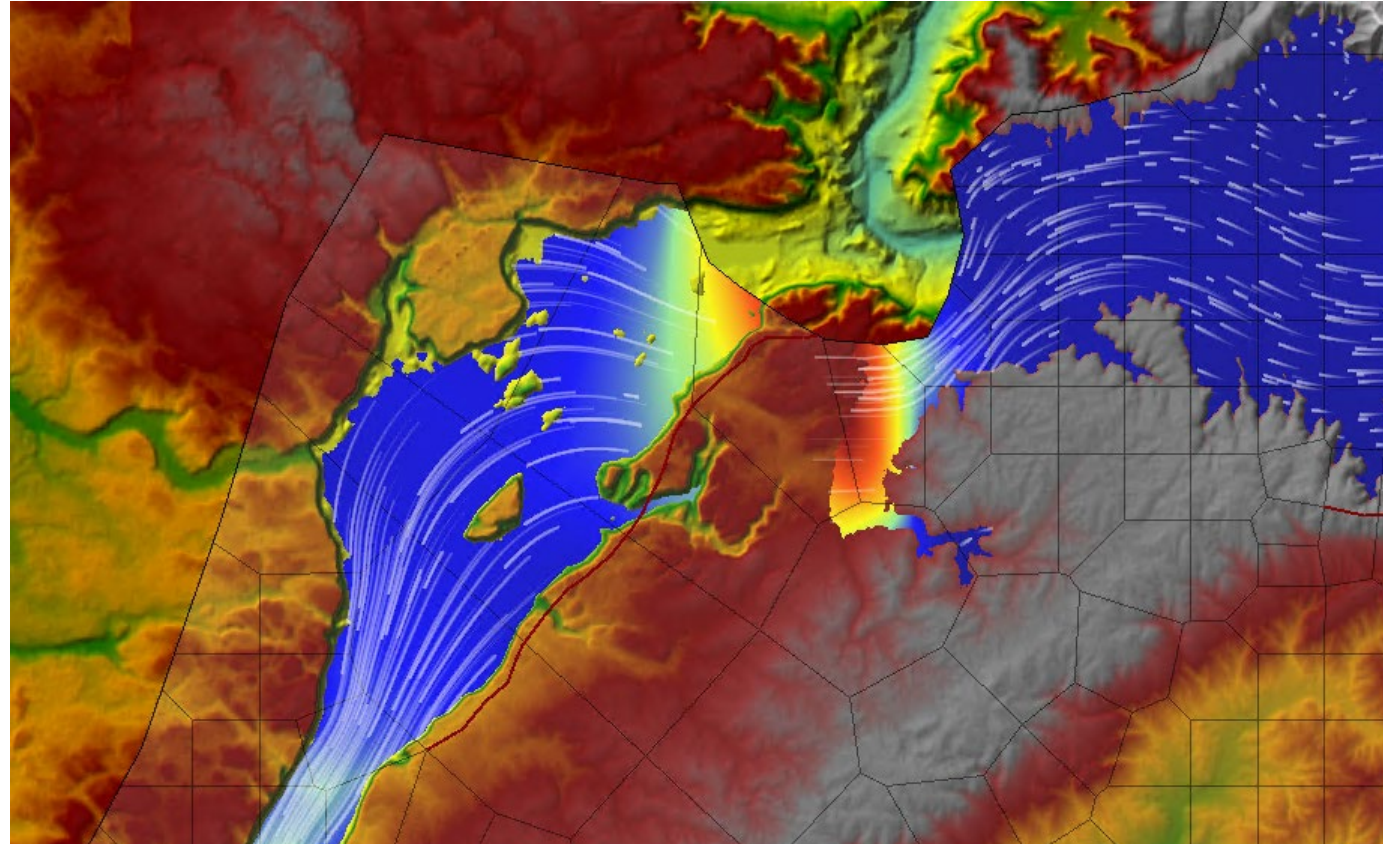
- **Cell Size / Count**
 - Nominal 2km x 2km cells (refinements as needed)
 - 23699 total cells
- **Time Step**
 - 30 Seconds – Courant Numbers ≤ 2
- **Simulation Time**
 - 21 Days
 - Run Time = 50 minutes



Challenges

Steep Terrain

- Waterfalls
- Wedge Depressions
- Can cause significant “nuisance” errors



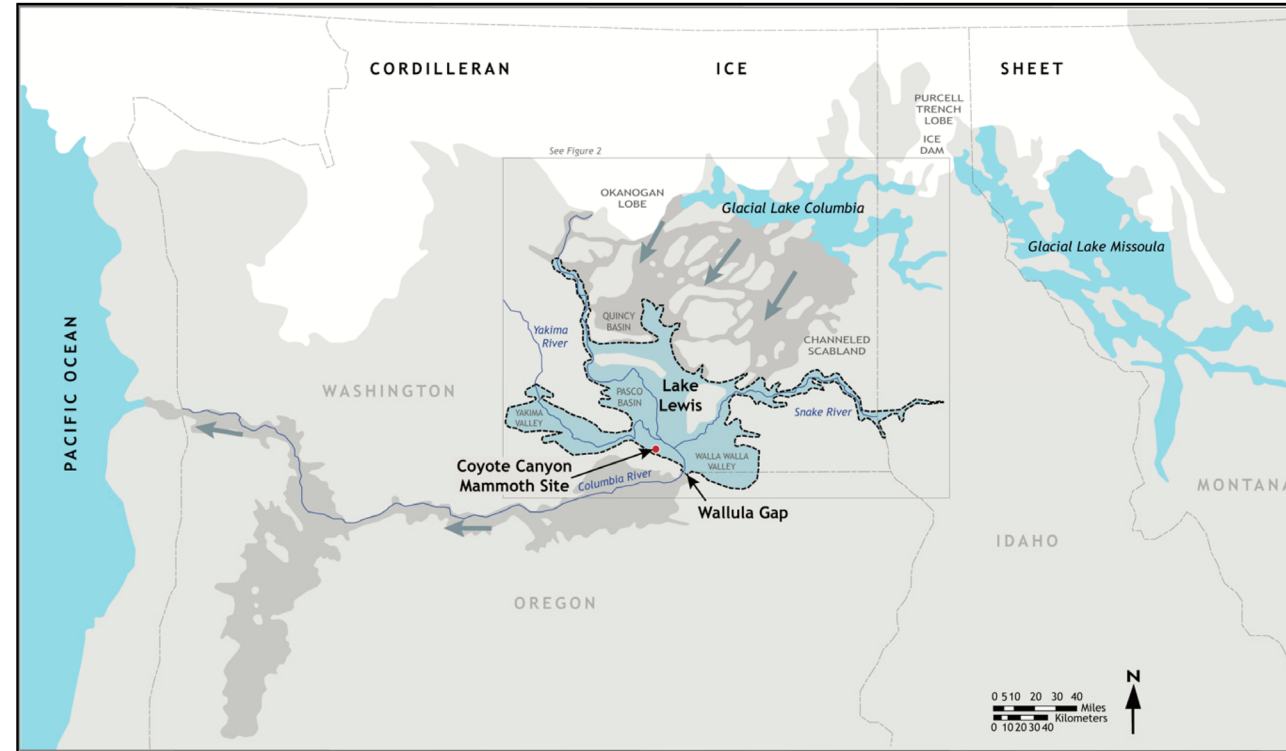
Challenges

Site Conditions

- Sediment transport was a big deal! Not simulated in this model.
 - Probably best simulates the last of roughly 40 floods

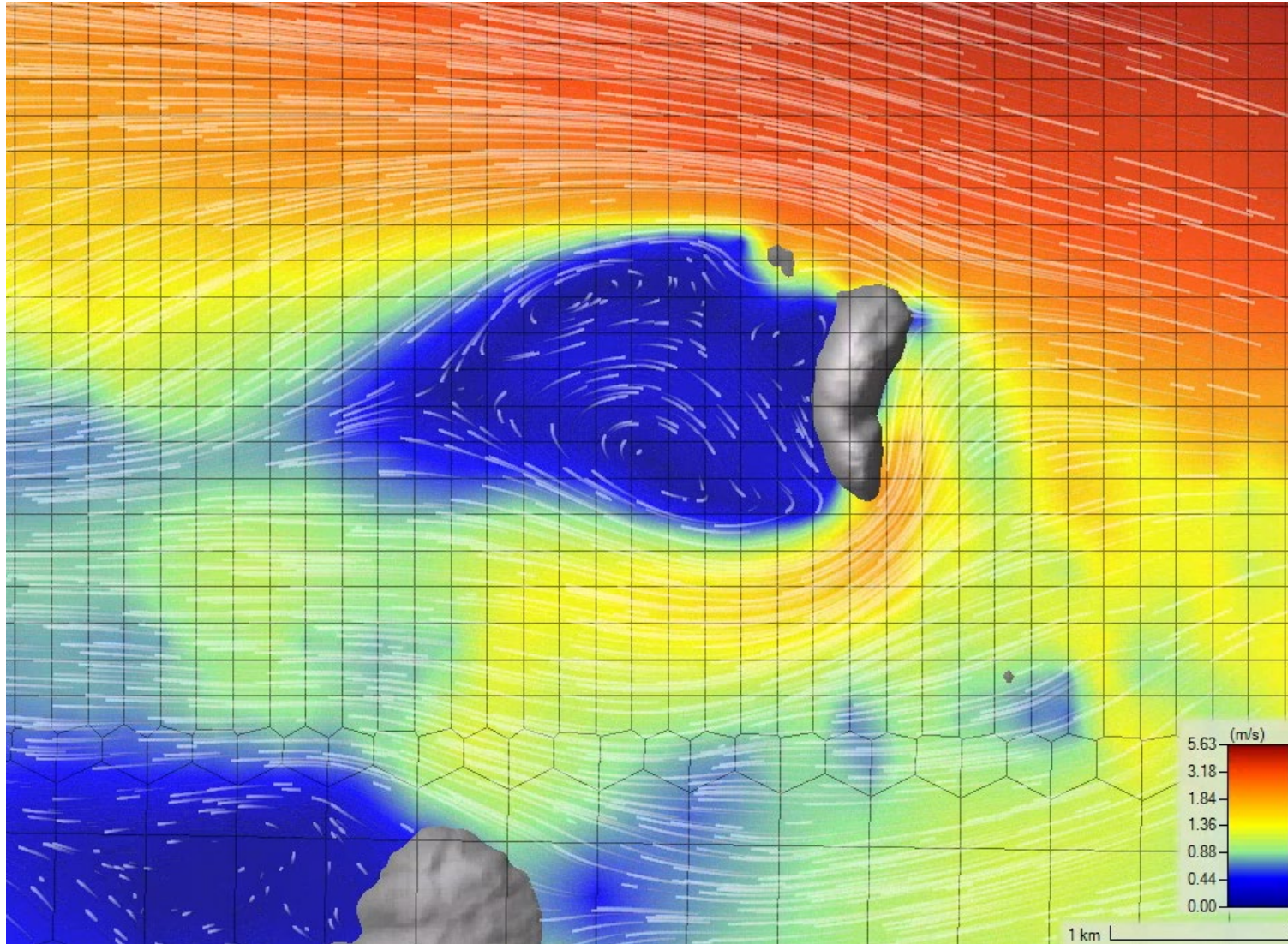
Where were the glaciers impacting flow conditions in the last of the 40 floods?

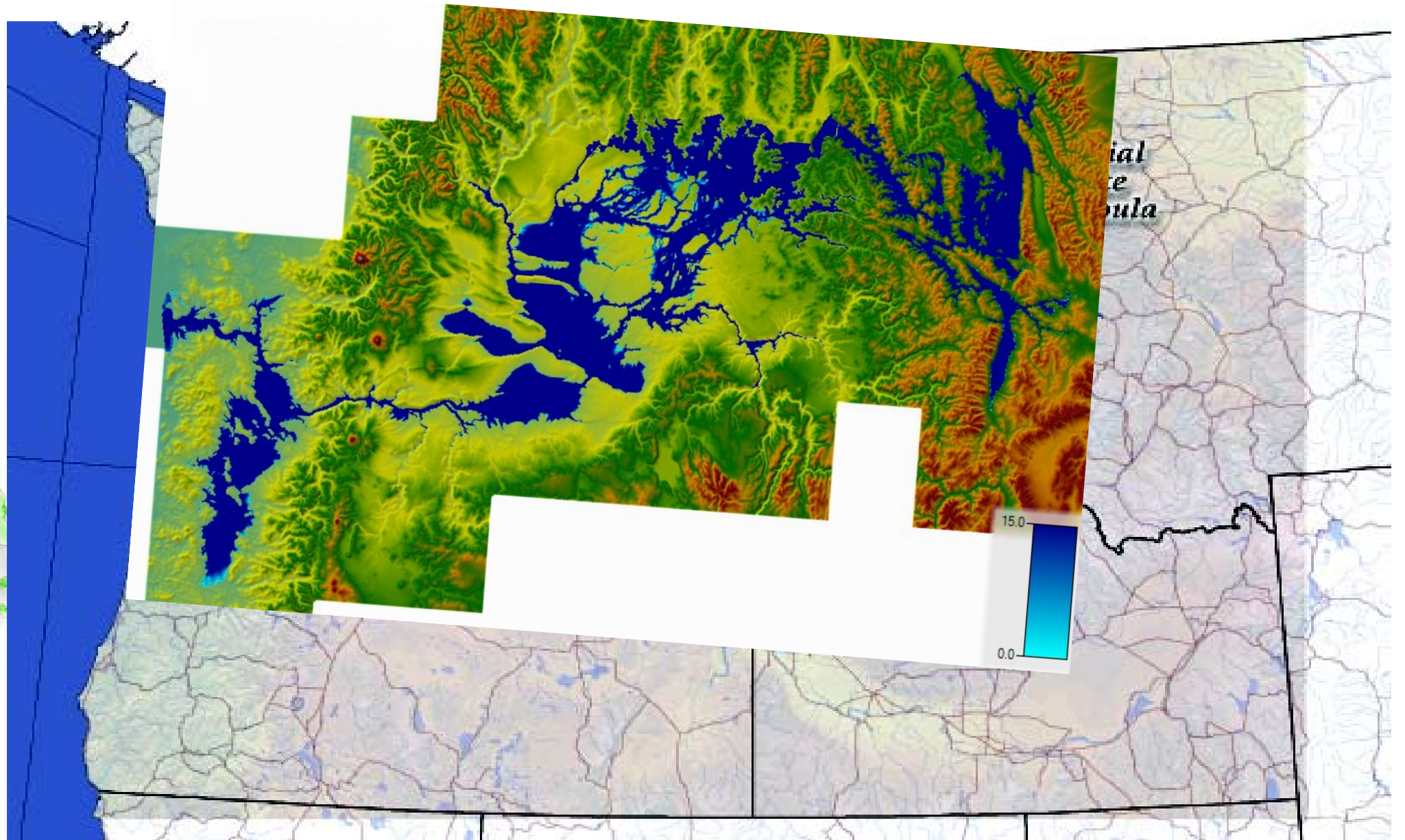
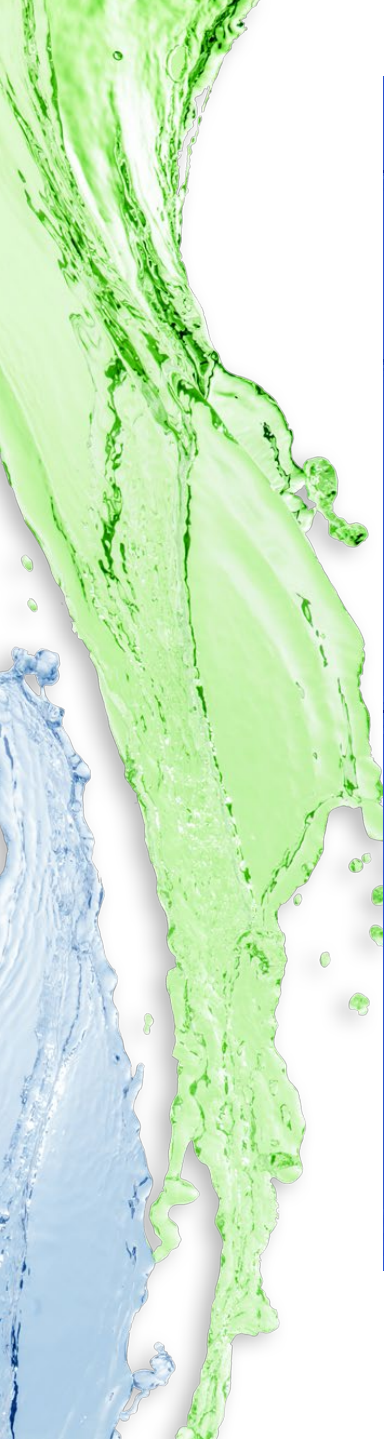
- Much lower ocean elevations in last ice age.

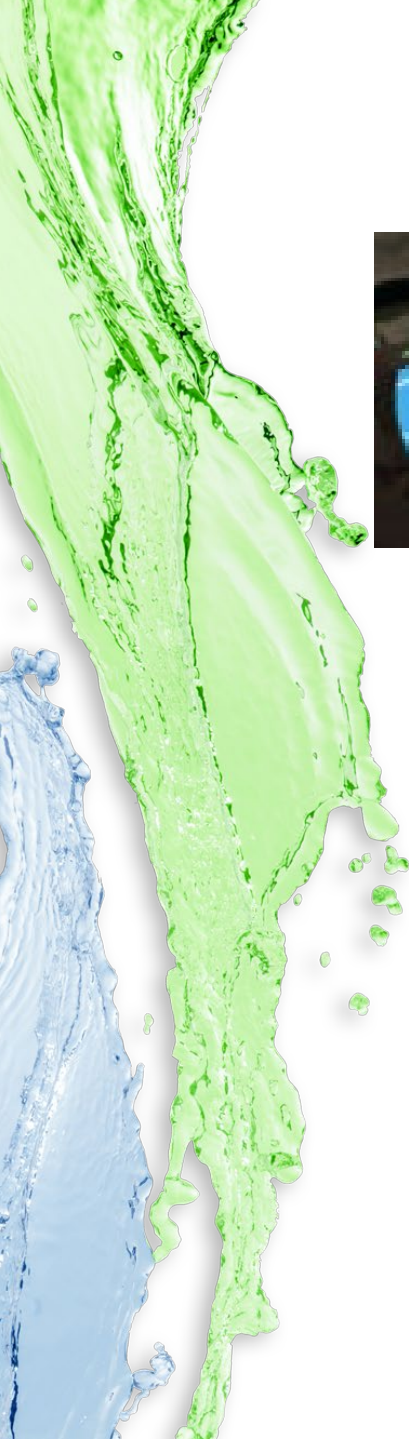


Ice Age Floods Institute (<https://iafi.org/product/ice-age-floods-in-the-pacific-northwest-map/>)

Refinements

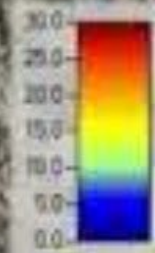






Selected: 'velocity'

04JAN2019 09:05:00



Kleinschmidt