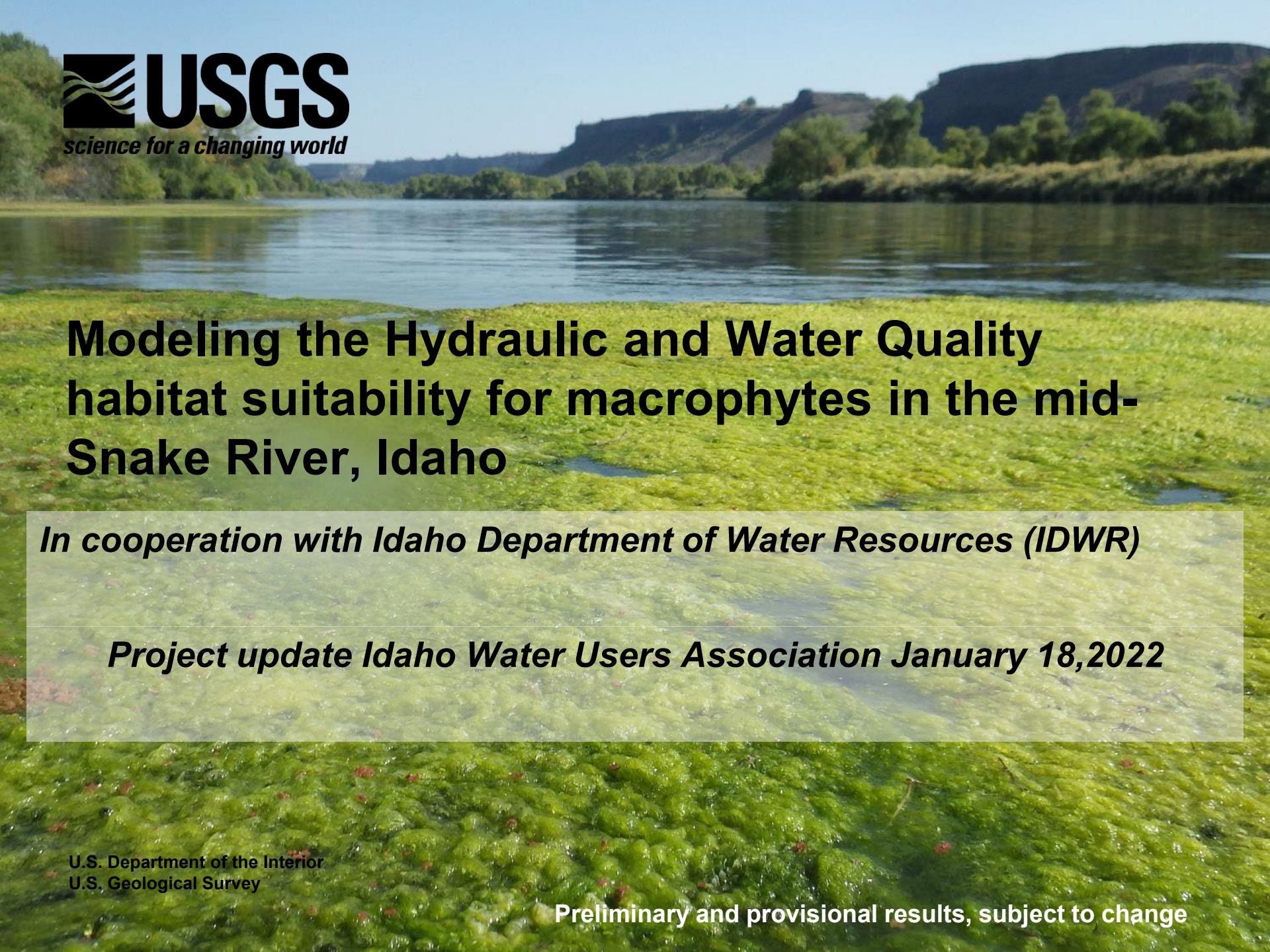


USGS
science for a changing world

Modeling the Hydraulic and Water Quality habitat suitability for macrophytes in the mid-Snake River, Idaho

In cooperation with Idaho Department of Water Resources (IDWR)

Project update Idaho Water Users Association January 18,2022

U.S. Department of the Interior
U.S. Geological Survey

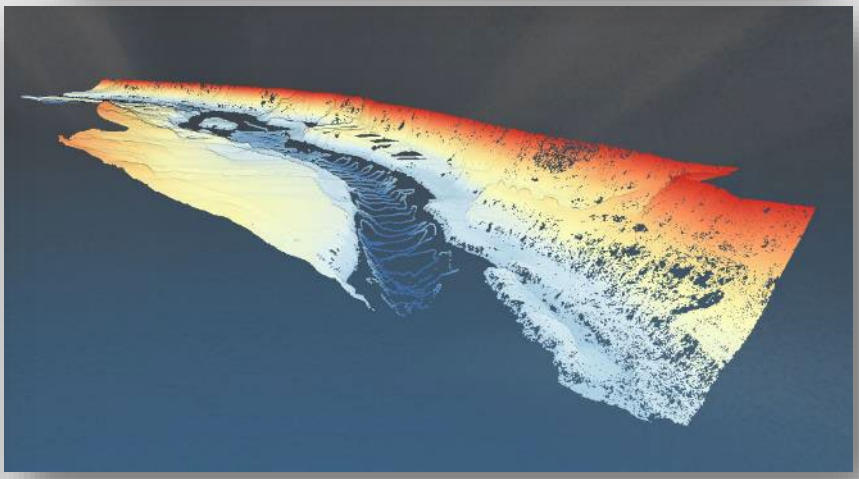
Preliminary and provisional results, subject to change

Goals

1) *Better understand the interplay of nutrients and flow on plant beds in the mid-Snake*
2) *Develop model that could inform different flow scenarios on beds*

Preliminary and provisional results, subject to change

Bathymetry & Topography

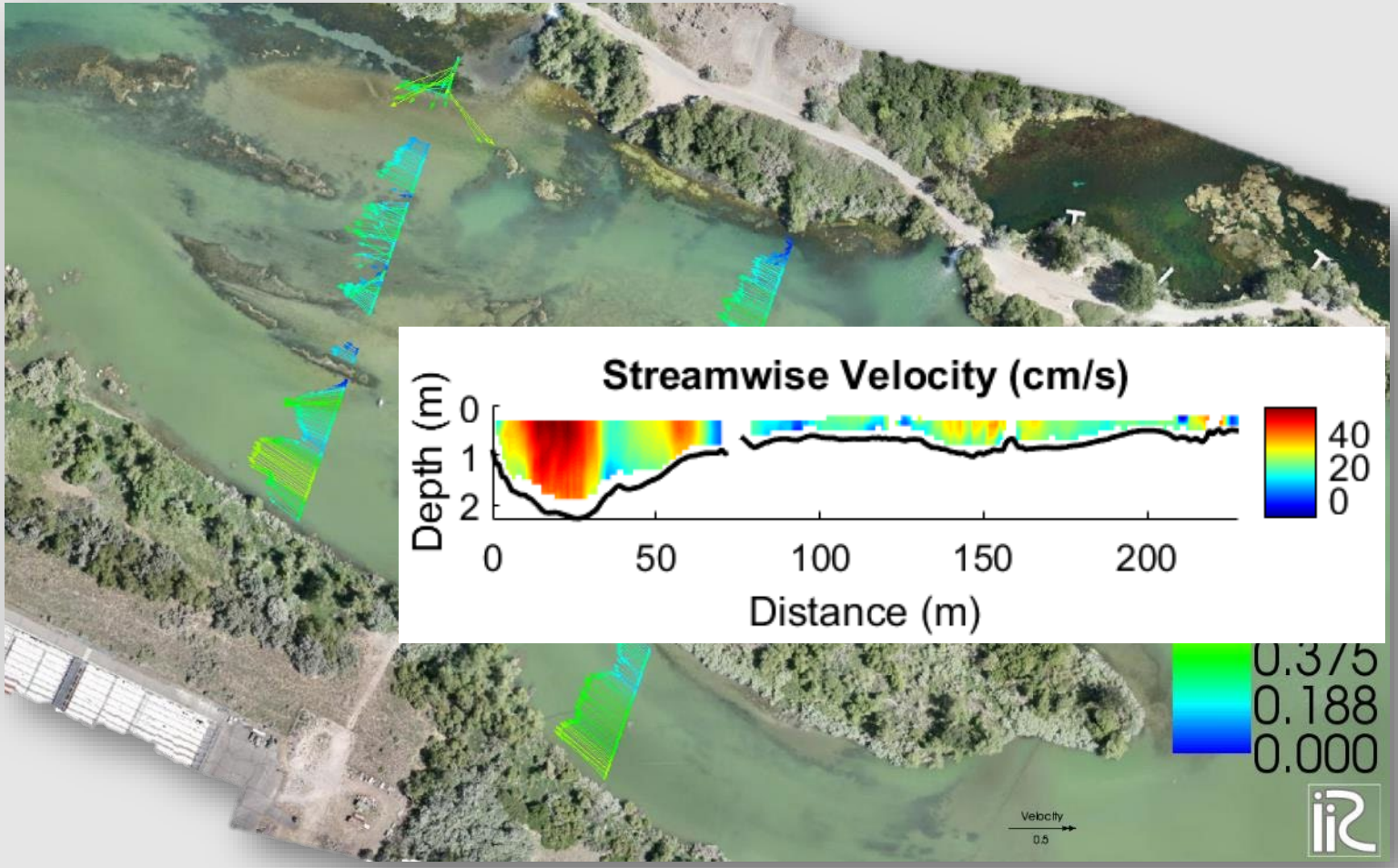


USGS

Real-time Stage and Discharge

USGS

Drone Imagery & Velocity Mapping



USGS

NAIP Imagery – 9/9/2004

USGS

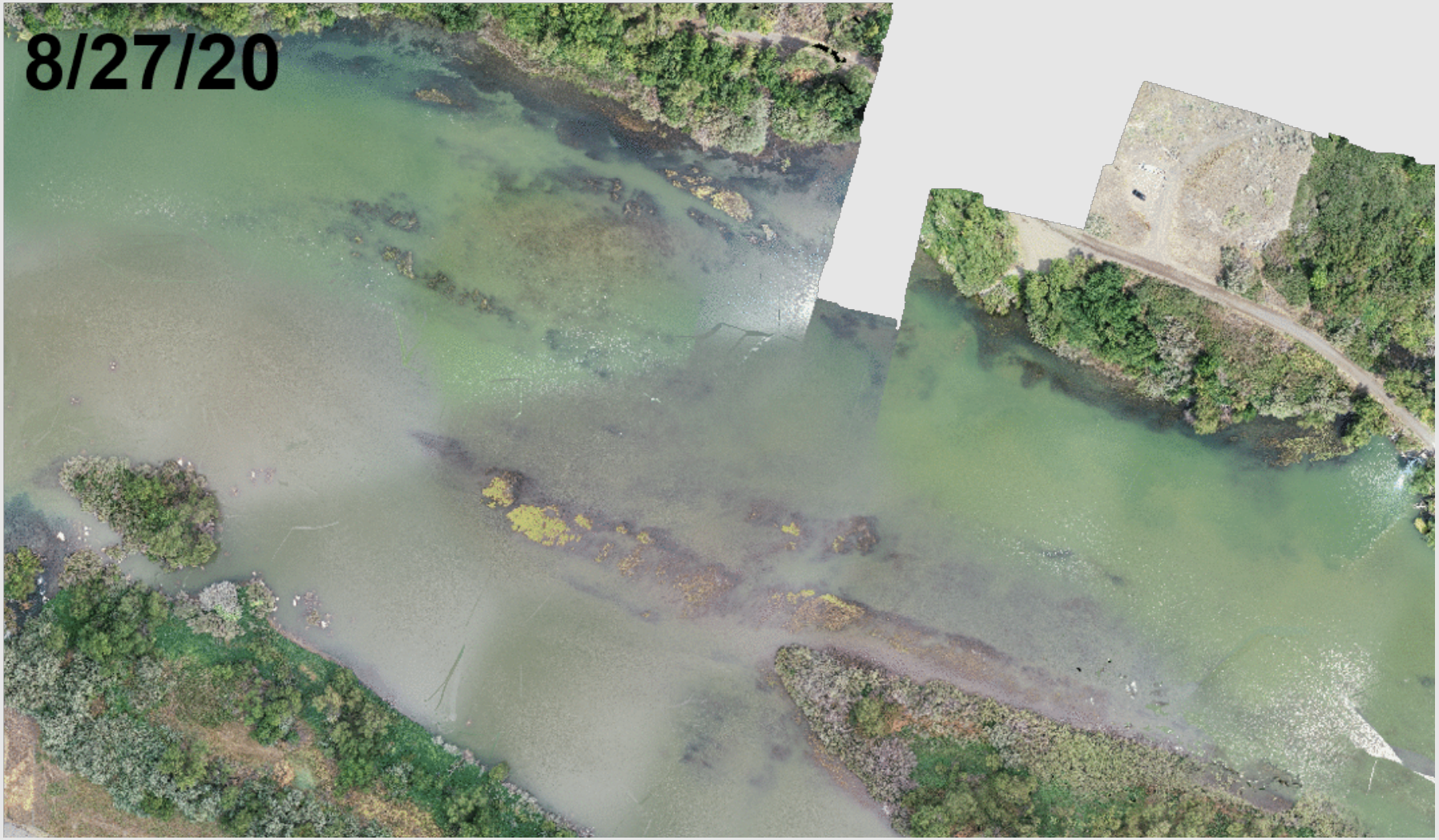
NAIP = National Agriculture Imagery Program

NAIP Imagery – 8/26/2017

USGS

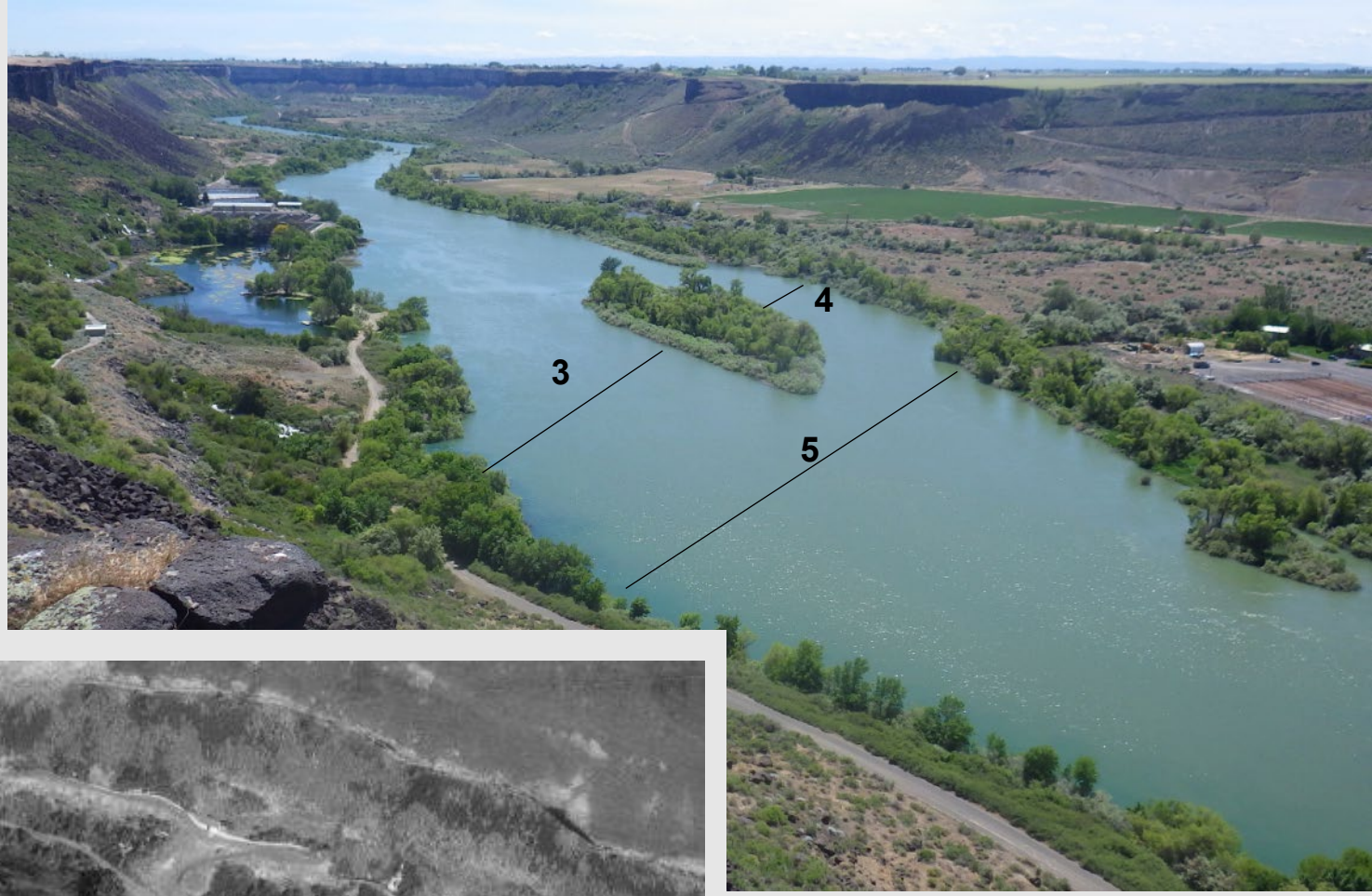
NAIP = National Agriculture Imagery Program

Drone Imagery – 2020 vs. 2021



USGS

Macrophyte Sampling



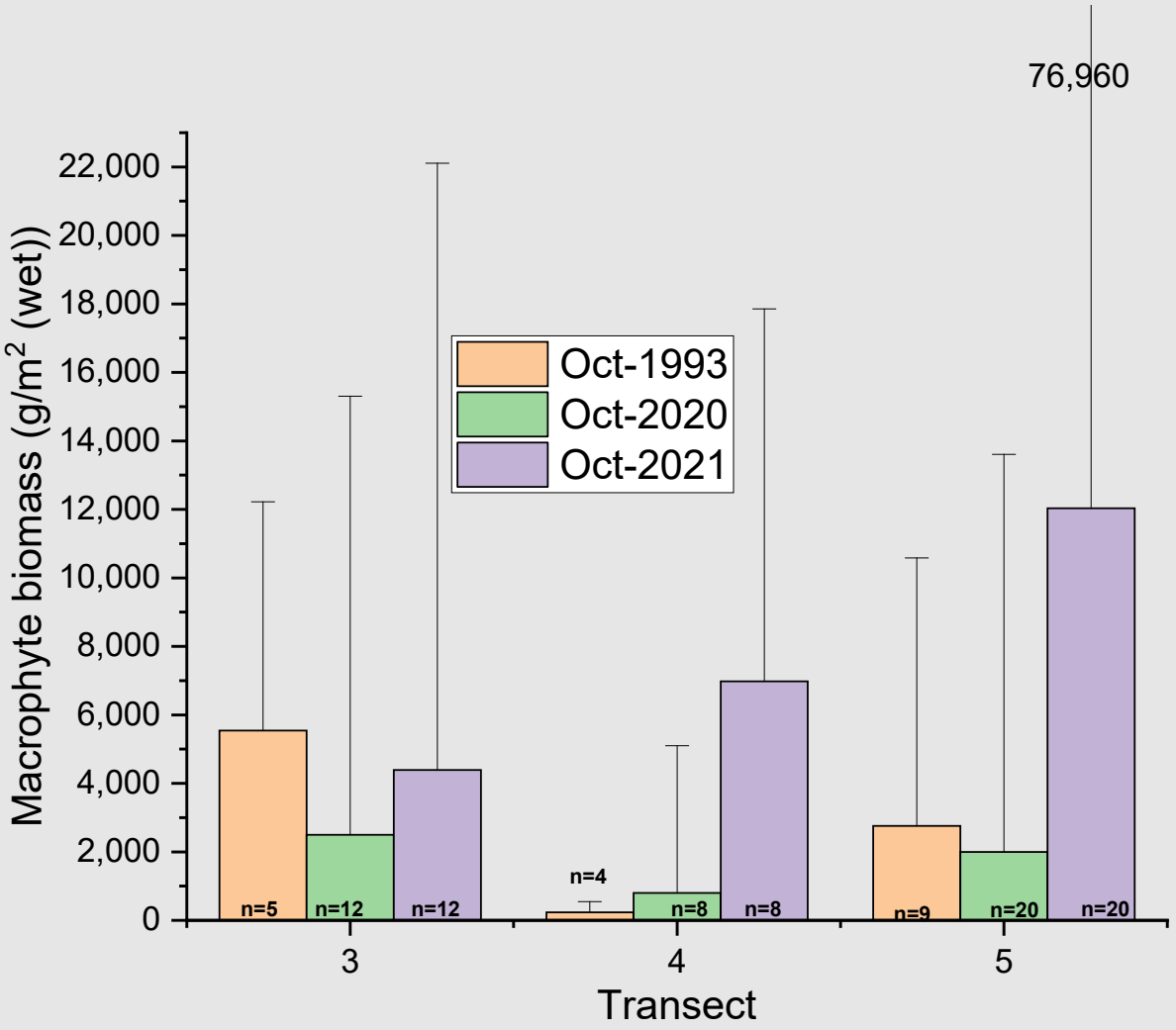
Macrophytes
1993→ 2020, 2021

Results are Preliminary and Provisional

Macrophytes 1993→ 2020, 2021

October 2021, highest biomass reported ever, downstream of island

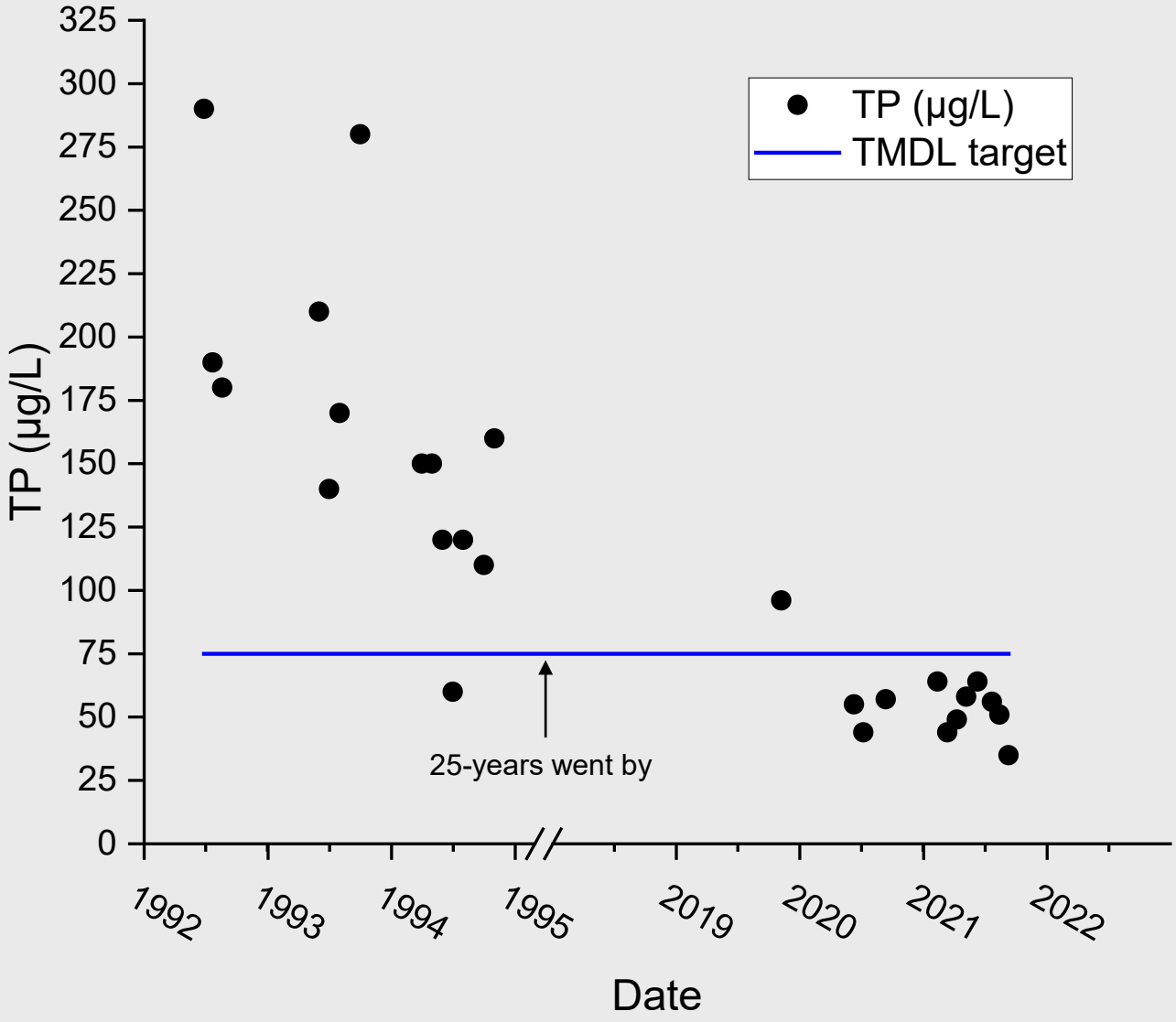
Why?



Error bars show maximums

Results are Preliminary and Provisional

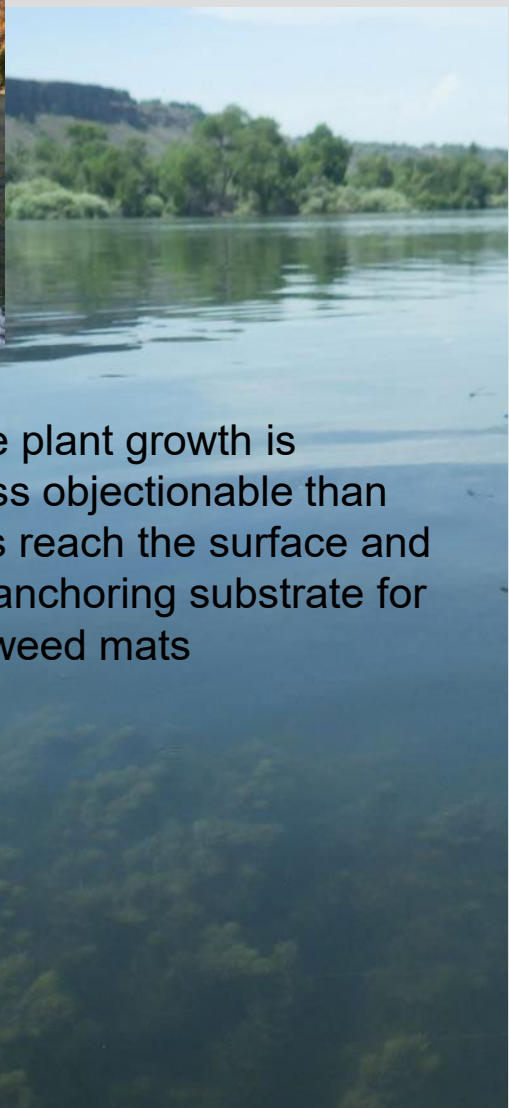
Phosphorus concentrations, Crystal Springs reach, upstream of the island and upstream of the plant beds



Results are Preliminary and Provisional

Modeling objectives for a subjective target

What's nuisance growth?

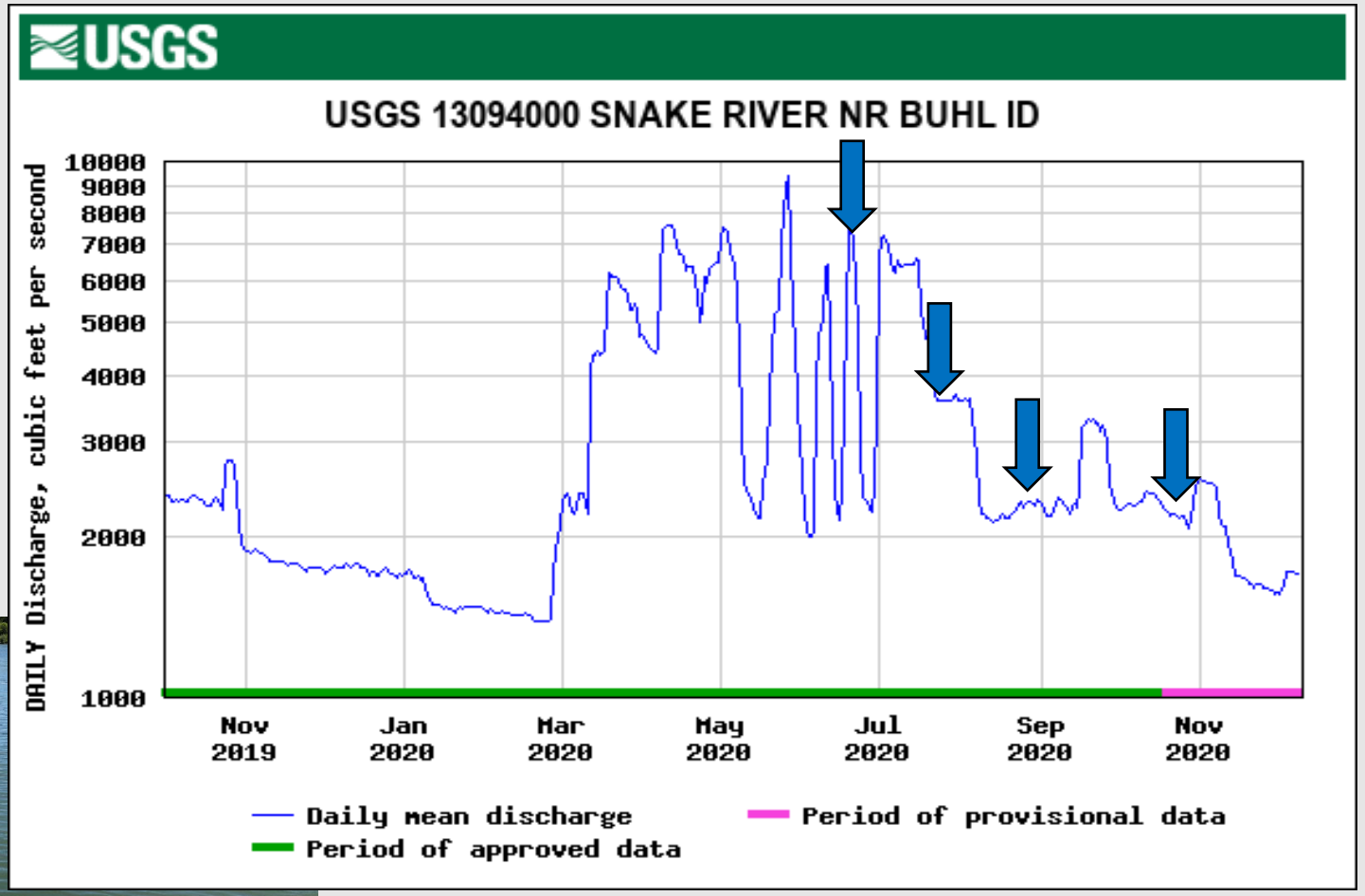


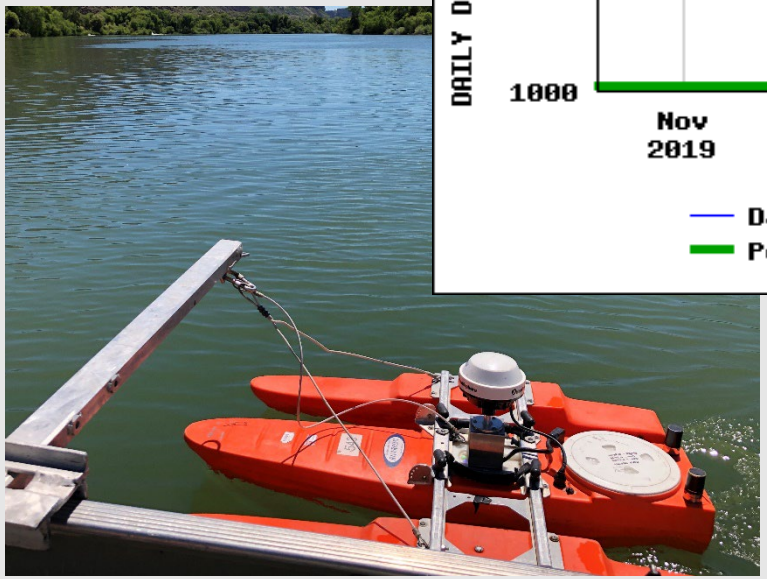
Sub-surface plant growth is probably less objectionable than when plants reach the surface and provide an anchoring substrate for algae/duckweed mats

Weakness: no measured high flow events

Max measured: 7,000 cfs

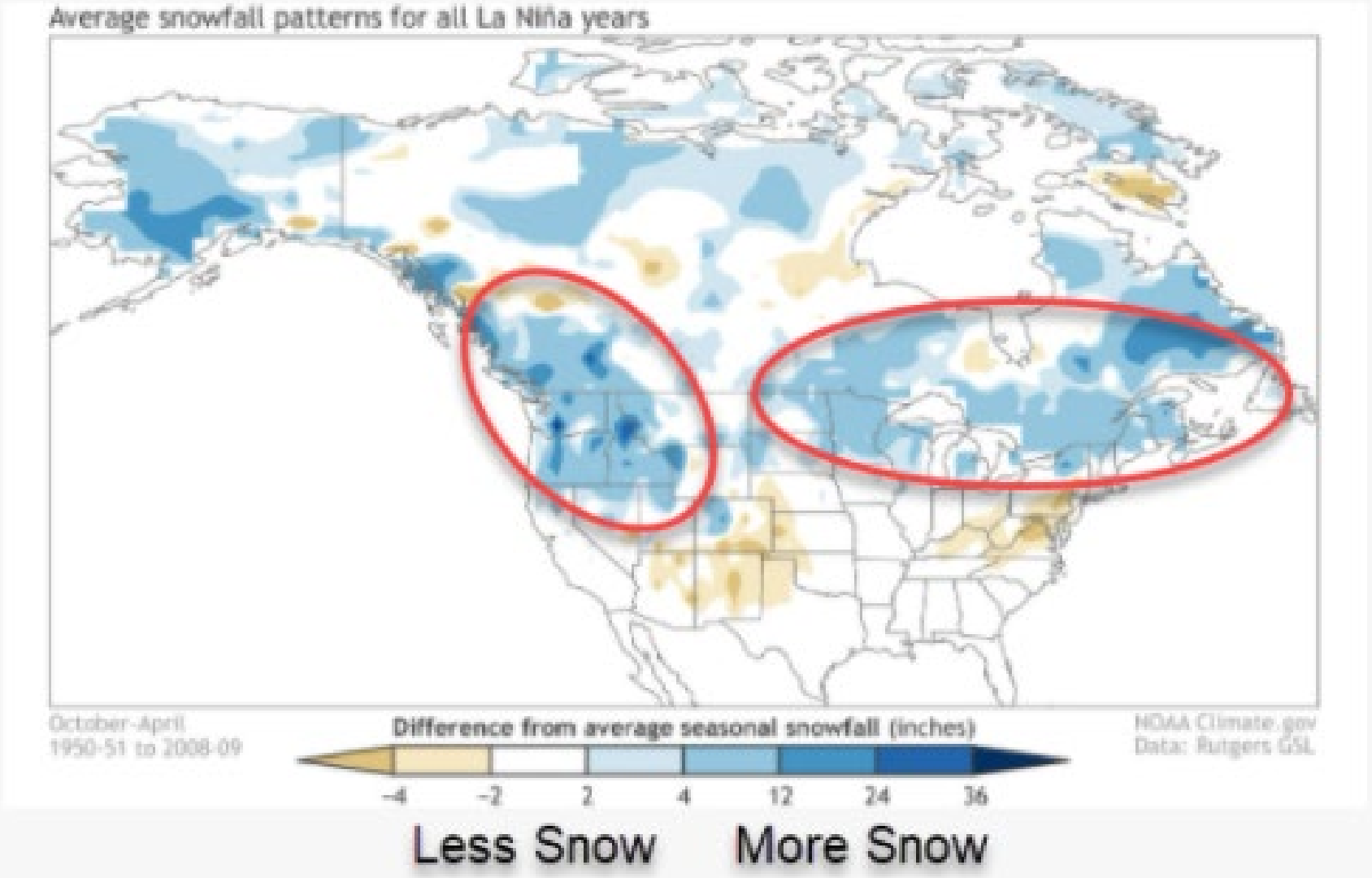
Hoped for: Sustained >10,000





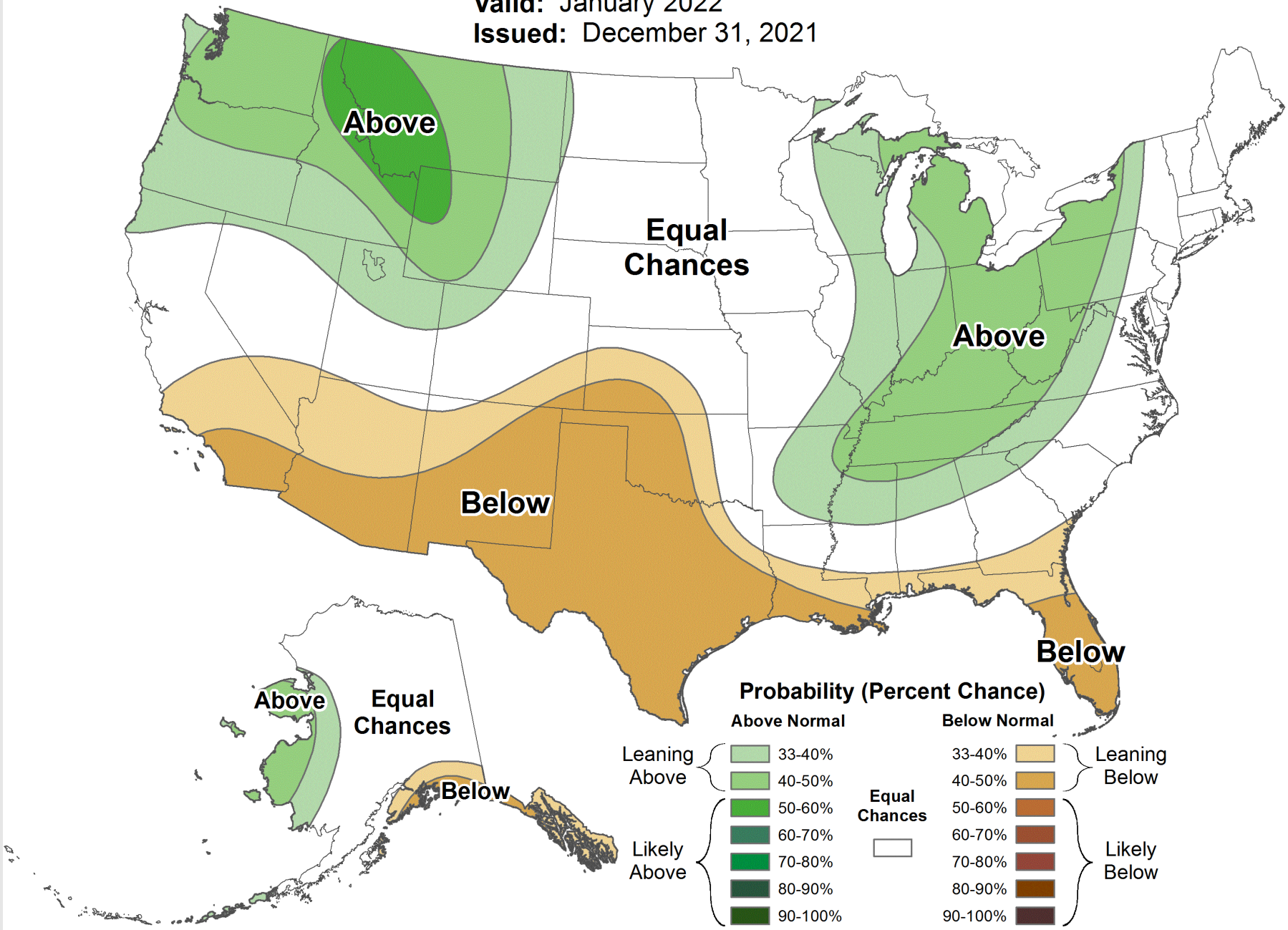
Results are Preliminary and Provisional

Need higher flows to true up the model



Monthly Precipitation Outlook

Valid: January 2022
Issued: December 31, 2021



Next steps

- Hopefully get a high flow event to calibrate model
- Better relate flow duration to macrophyte extent: historical imagery
- Continued sampling in 2022
- Deliver model & report in 2023