Suspended Sediment Surrogate Testing in Idaho

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

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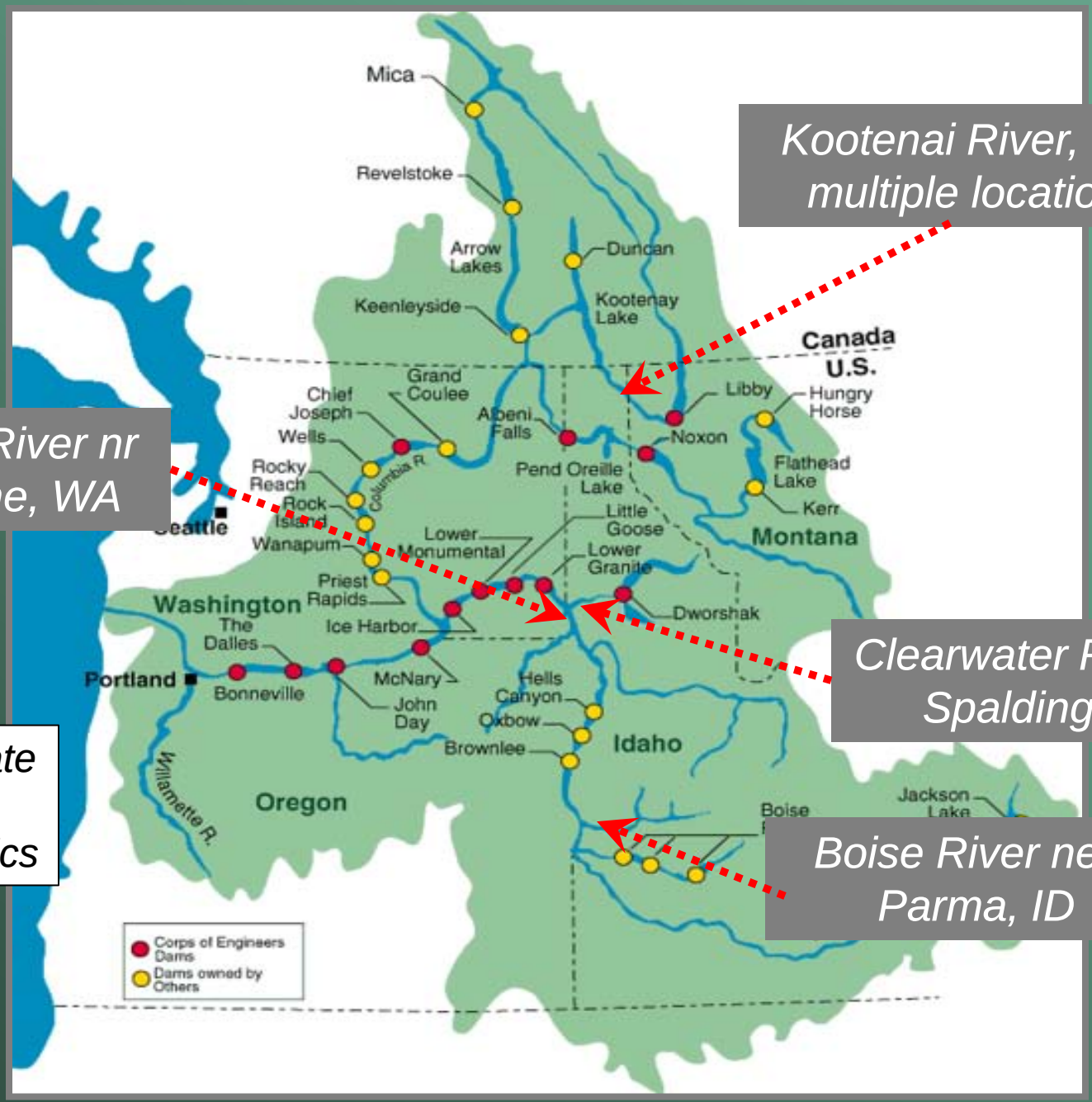
Kootenai River, ID – multiple locations
Snake River nr Anatone, WA
Clearwater River at Spalding, ID
Boise River near Parma, ID
6 surrogate gages w/acoustics
Mica
Revelstoke
Arrow Lakes
Duncan
Keenleyside
Kootenay Lake
Canada
U.S.
Grand Coulee
Chief Joseph
Wells
Rocky Reach
Rock Island
Wanapum
Priest Rapids
Columbia R.
Albeni Falls
Libby
Hungry Horse
Noxon
Pend Oreille Lake
Flathead Lake
Kerr
Little Goose
Lower Monumental
Lower Granite
Dworshak
Montana
Seattle
Washington
The Dalles
Ice Harbor
Portland
Bonneville
McNary
John Day
Hells Canyon
Oxbow
Brownlee
Idaho
Willamette R.
Oregon
Jackson Lake
Boise
Corps of Engineers Dams
Dams owned by Others

Gages

Results

- Multi-frequency acoustics, laser diffraction, turbidity
- Testing since 2007
- Acoustics – best surrogate technology
  - 1.5 to 3MHz generally work best
  - R^2 ranges 0.87 to 0.93
  - Total, fine, and coarse fractions
- LISST: $R^2 = 0.62$ (when working)
- Turbidity: $R^2 = 0.65 – 0.92$
- Improvement over traditional transport curves

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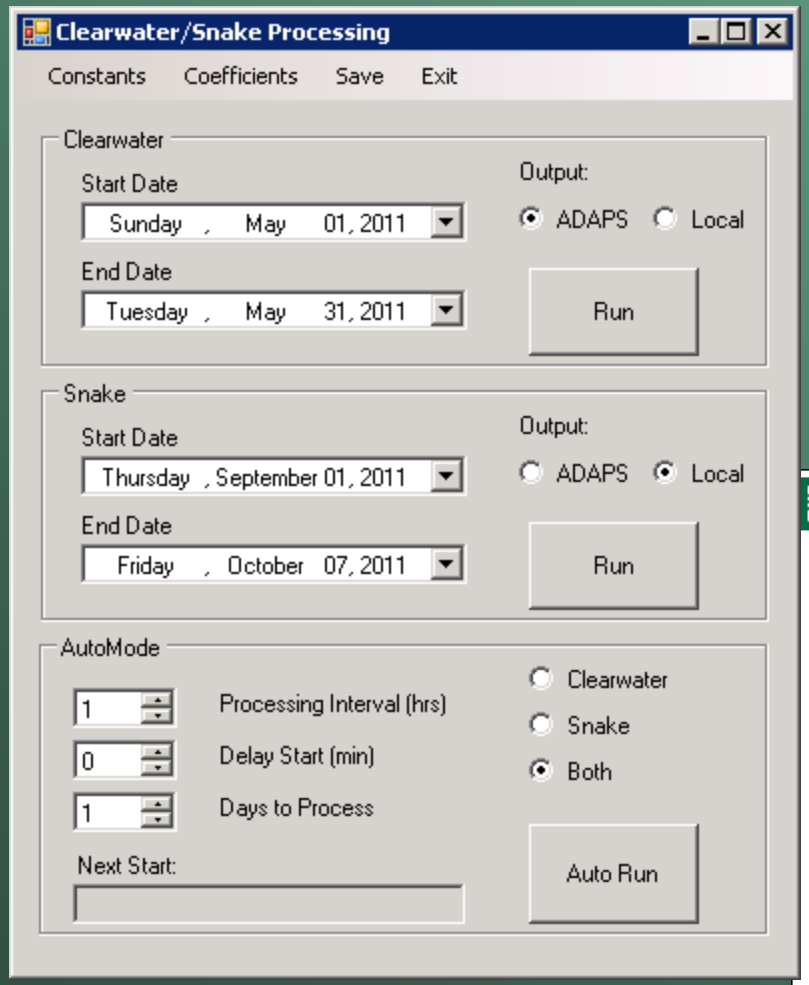
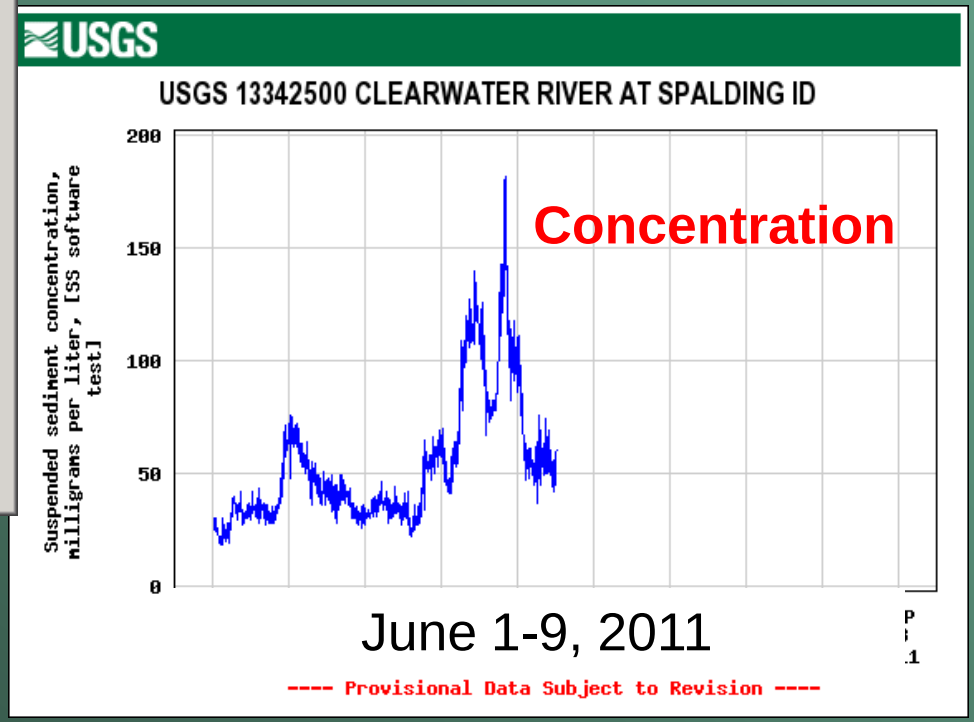
Real-Time Estimates on the Web



Automation is key!

GUI for computations,
Written by Gary Wall, NY WSC



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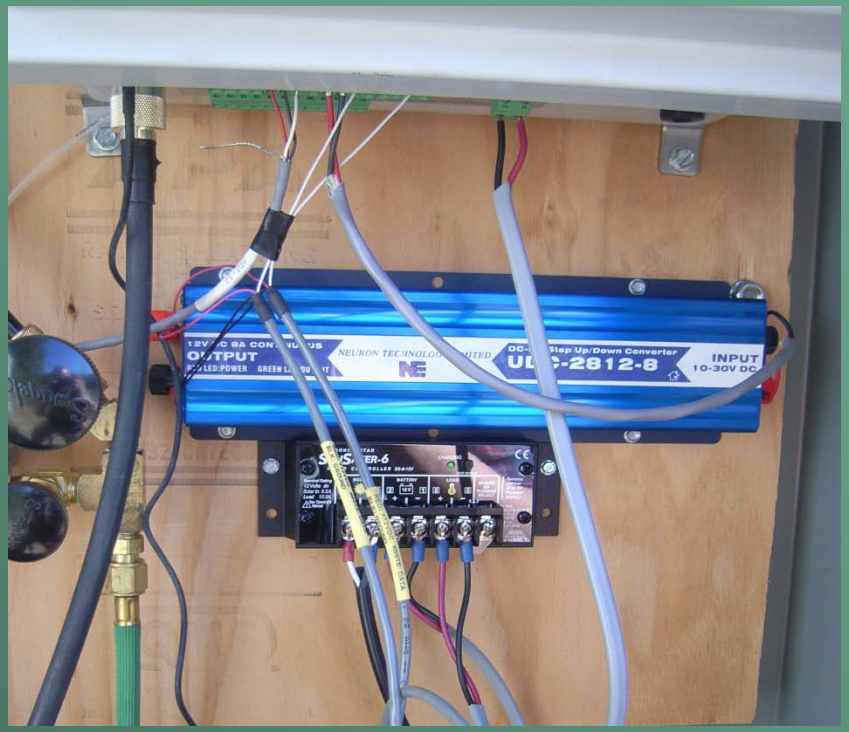
Moving forward

- Need for automated processing software
- Ability to market real-time sediment
- Agreeing on methodology:
  - SNR vs Signal Strength
  - # of cells needed (and SDI-12 limitations)
  - Negative attenuation
  - Voltage regulation



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QUESTIONS?
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