RIMORPHIS – Discussion about next steps

River Morphology Information System

1st Annual Stakeholder Workshop

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IOWA

PURDUE UNIVERSITY

SAINT LOUIS UNIVERSITY

Discussion: Next steps and potential RIMORPHIS tools

One idea for a potential chain of tools

- mostly to get us thinking

Period for thought

- Google doc

Discussion

- Google doc

Discussion: Next steps and potential RIMORPHIS tools

Based on survey feedback and lightning talks, a potential RIMORPHIS processing chain of tools:

1. Tool to filter and display planview imagery
    - based on a range in flow, exceedance probabilities, event(s), season, time-period
    - interact with StreamStats, USGS gauges and Landsat/Sentinel/NAIP

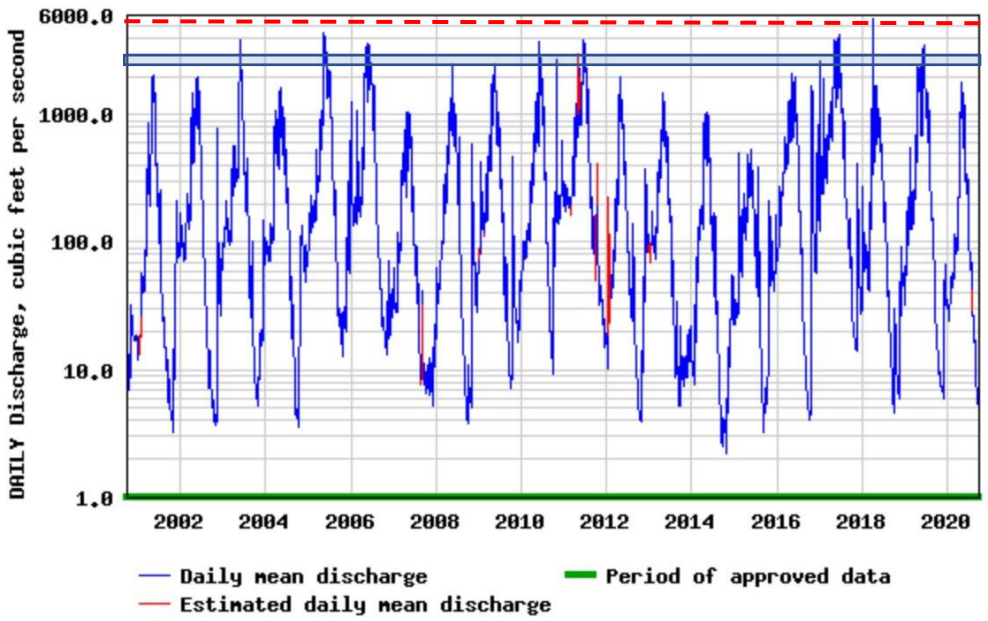
2. Tool to extract river geometry
    - interact with aerial imagery, lidar
    - surface water polygon, water edge, centerline, top of bank, edge of floodplain, cross sections
    - additional filtering or sorting by feature characteristic (e.g. surface water area)

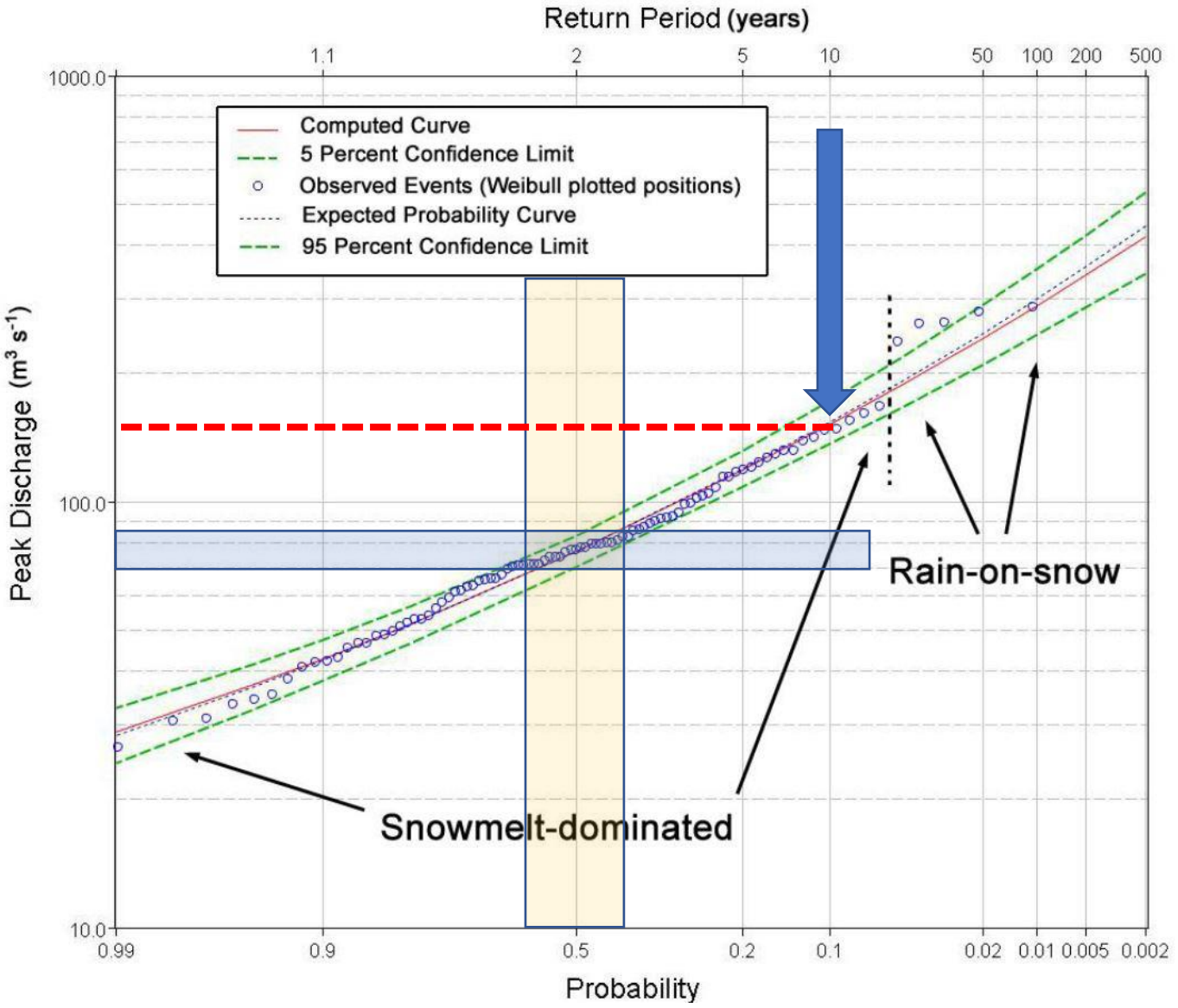
3. Tool to overlay river geometry with topography/bathymetry or topo:topo comparisons
    - interact with aerial lidar, ehydro, FEMA cross-sections, surveyed cross sections
    - add elevation to geometry data (e.g. comparison of topography with flood extents, XS through time)

This chain of tools could be to used answer river morphology research questions related to:

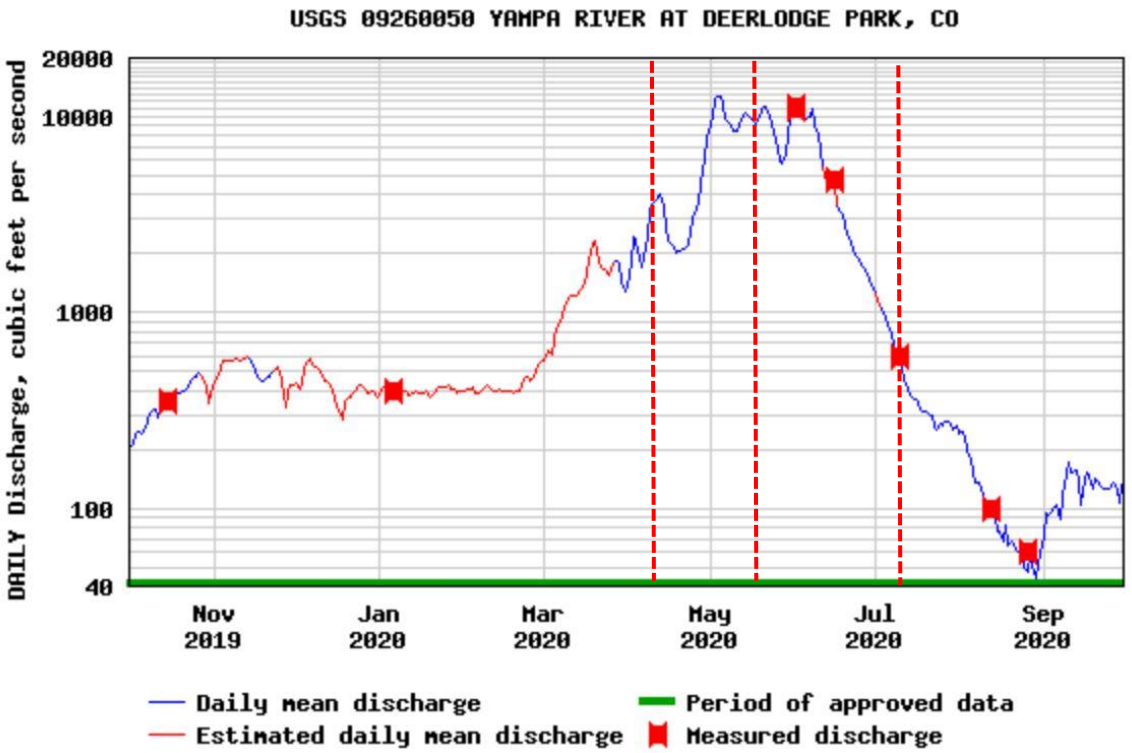
Flood modeling/mapping
Sediment budgets
Geomorphic event history
Temporal and spatial trends in river morphology
Magnitude-frequency analysis

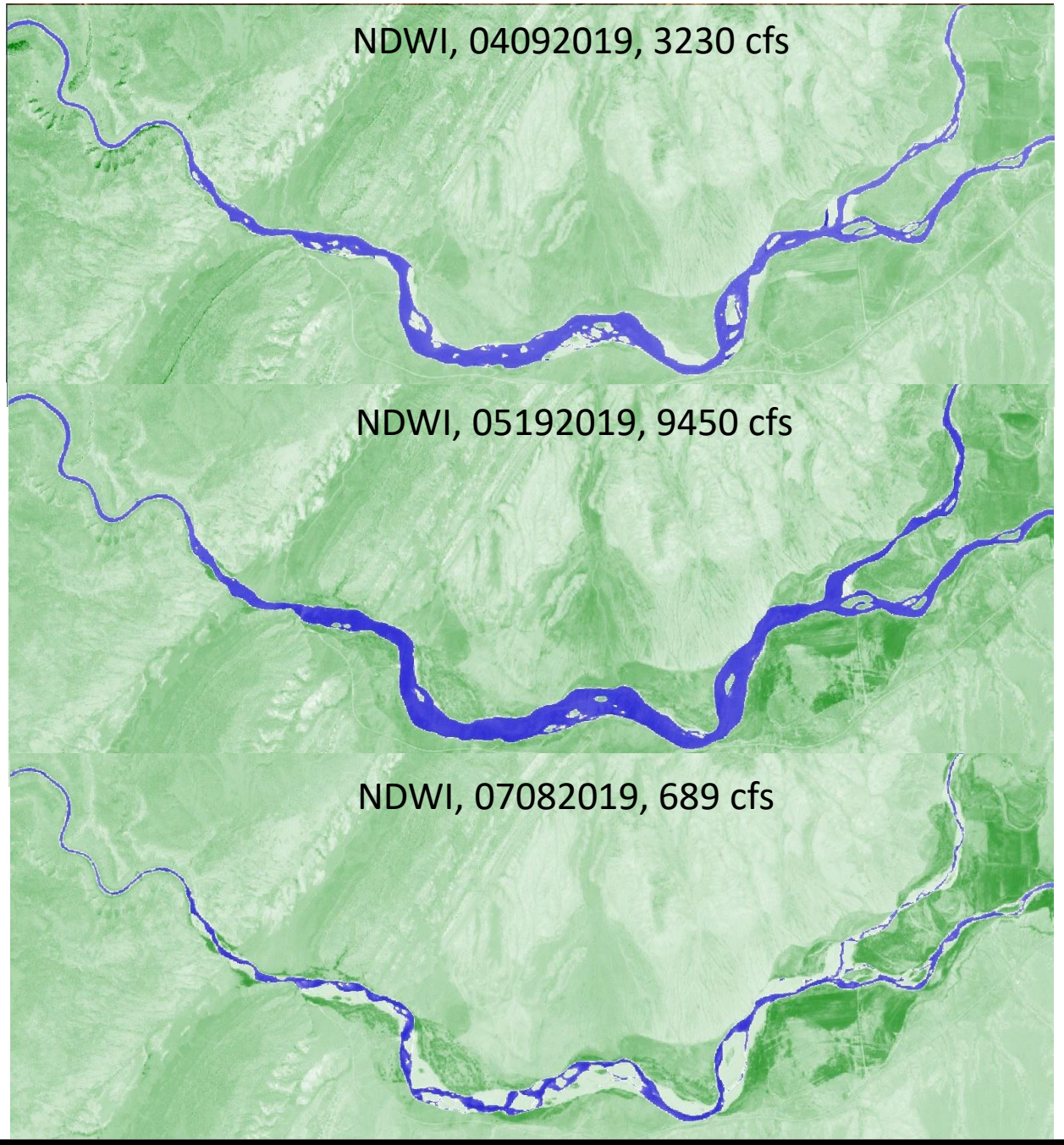
1. Tool to filter and display imagery



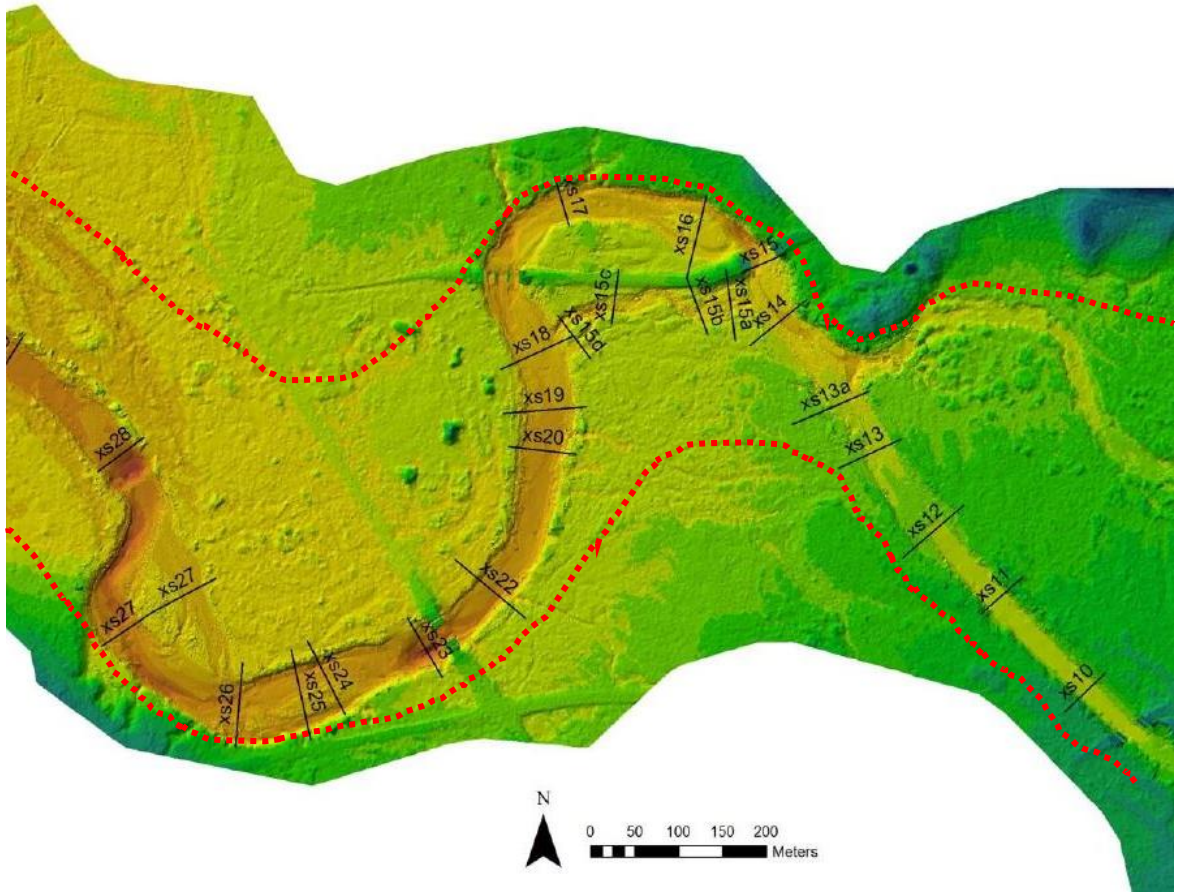


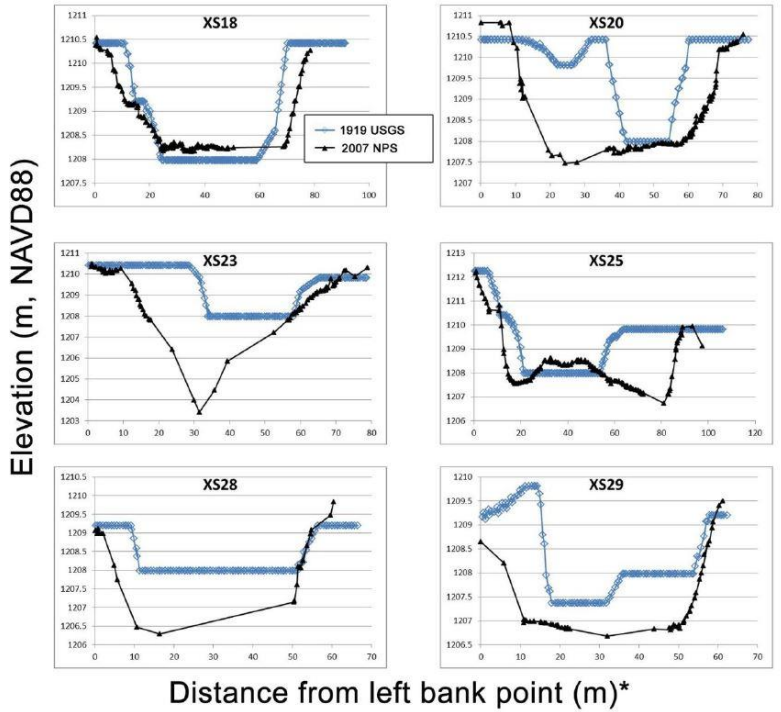
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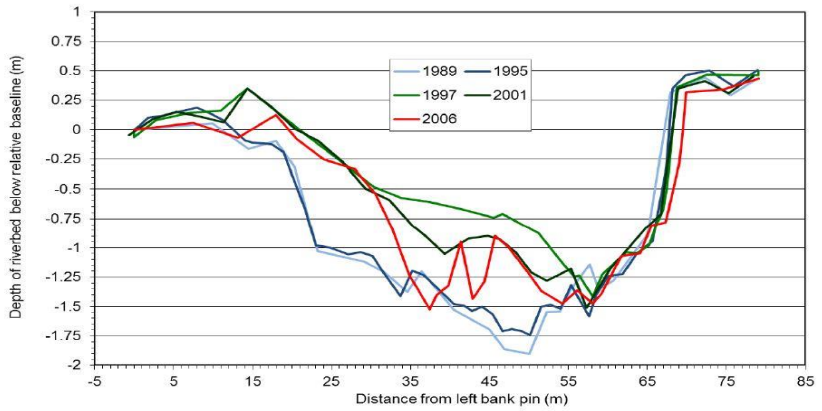




3. Tool to overlay imagery with topobathy or topo:topo







Minear and Wright, 2013

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Flood modeling/mapping
Sediment budgets
Geomorphic event history
Temporal and spatial trends in river morphology
Magnitude-frequency analysis

Discussion

- Take 5 minutes to write in the Google Doc
  - Some ideas to write about:
    - Bottlenecks in your processing chain
    - Possible tools that would help you be more productive
    - Thoughts about other chains of tools that would be helpful
    - Data publishing and sharing

- What are other river morphology research areas that these tools could be used for?

  Here is the previous list:
    - Flood modeling/mapping
    - Sediment budgets
    - Geomorphic event history
    - Temporal and spatial trends in river morphology
    - Magnitude-frequency analysis

What derived measurements would be useful?

- Some could be pre-processed
- Is there channel bathy data?
- List of 'good' imagery dates
- Water surface area, water edge,
- Bank migration rates
- If multiple DEMs, deposition/erosion per reach?

What about other data types:

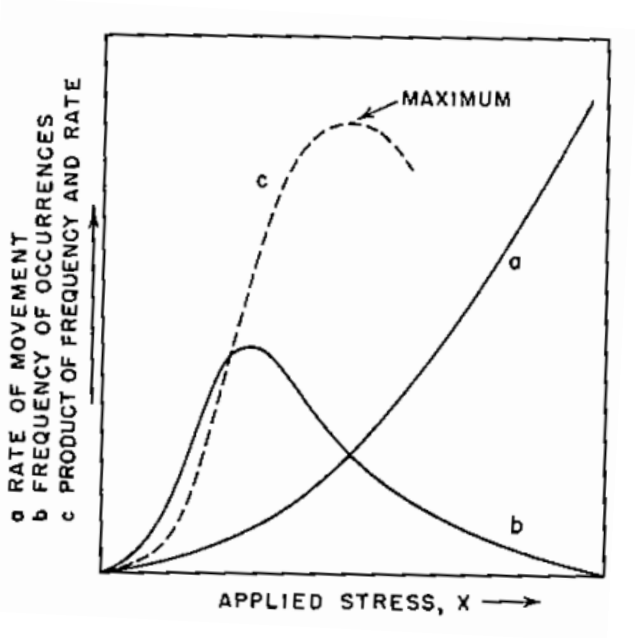
- Georeferenced historical maps
- Grain size data (bed material, suspended sediment, bedload)
- Sediment cores
- Soil data
- Reservoir sedimentation/long-term sediment yield/ CRN yield

THANK YOU !

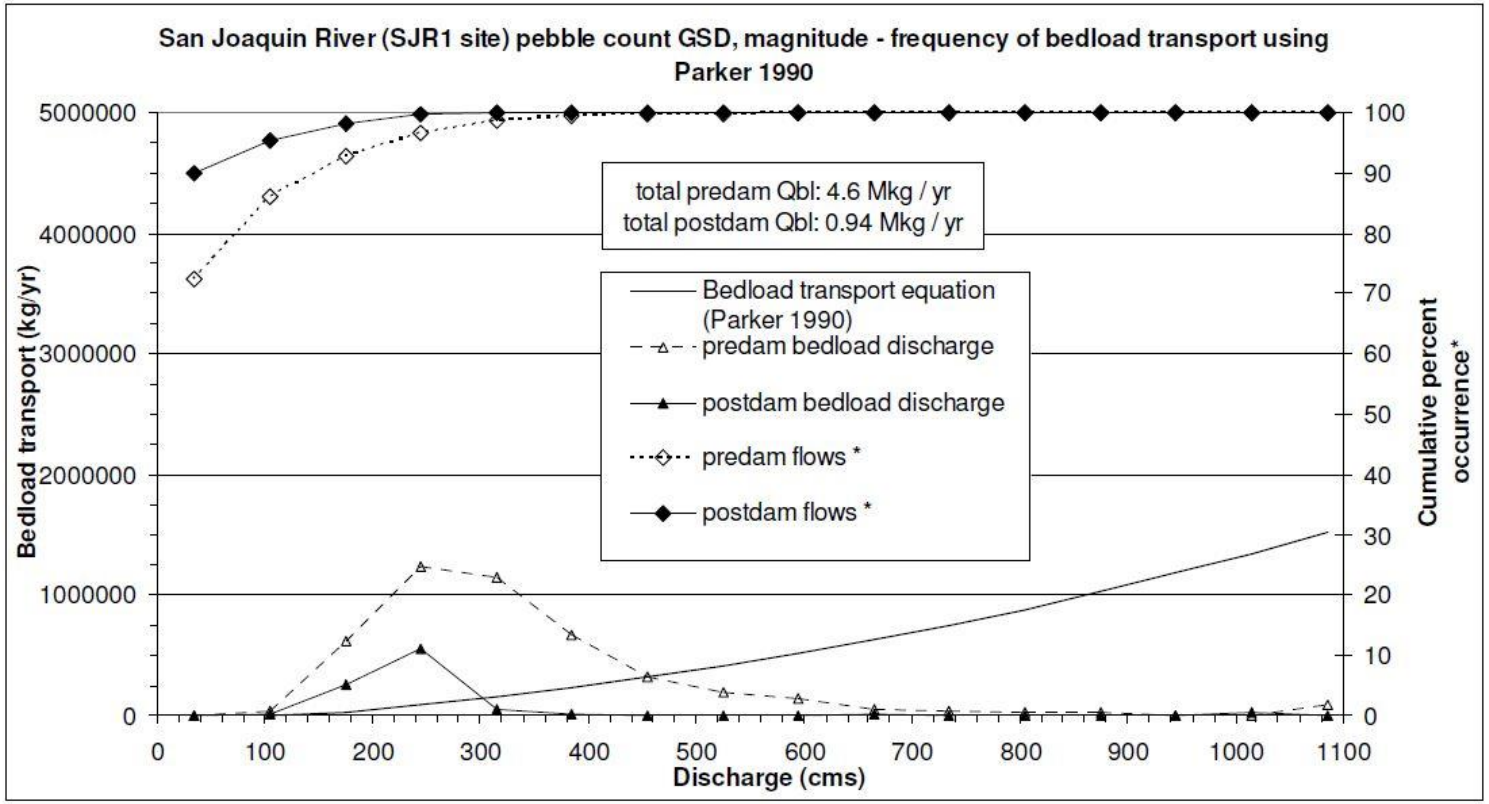
Supplemental slides

Magnitude-frequency of channel forming flows

Wolman and Miller, 1960



Effects of dams (pre- and post-dam)



Minear, 2010