



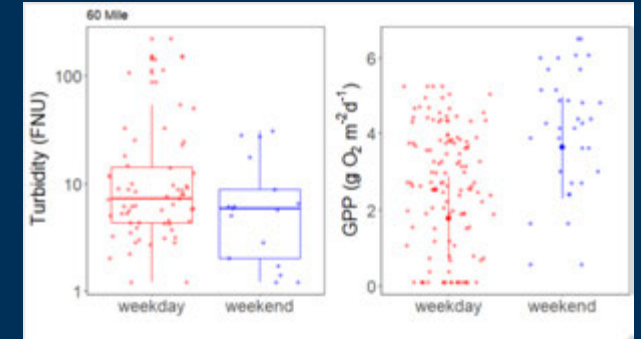
# Discussion of the Anticipated Scope of the Forthcoming Bug Flow Evaluation Document

Ted Kennedy, US Geological Survey, Southwest Biological Science Center, Grand Canyon Monitoring and Research Center

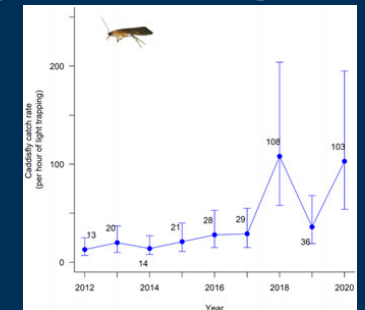


# Bug Flows Key Findings

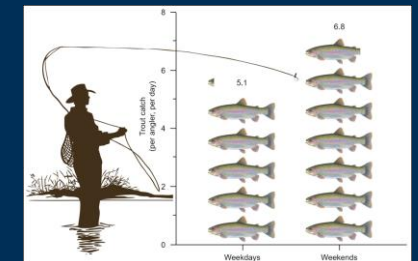
- River-wide increase in algae production →
  - 45% higher during weekends (+100 tons of algae)
- Algae increases greatest in N-S reaches
  - i.e., LCR confluence, Fall Canyon
- 400% increase in caddisflies in 2 of 3 Bug Flow years ('18, '20)
  - Caddis increase greatest in N-S (possible algae link?)
- Midge emergence higher during weekends
- More emergent rocks on weekends
- Angler catch rates higher on weekends
- Diet quality of Rainbow Trout higher on weekends



B. Deemer, unpublished data, do not cite

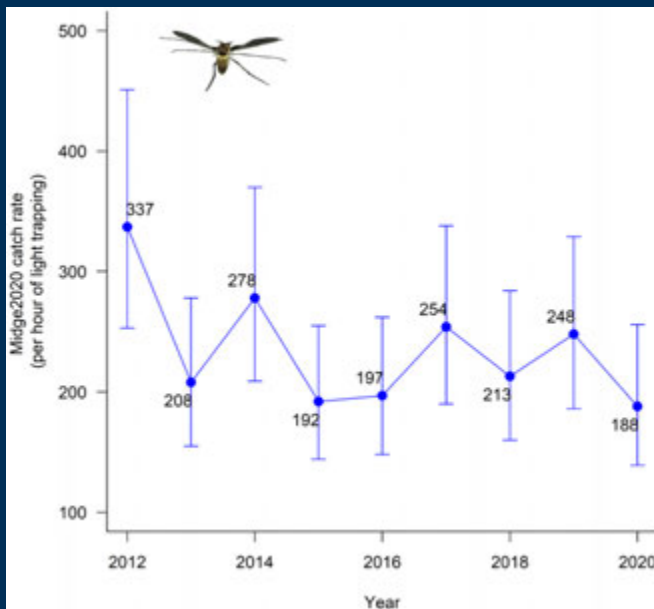


J. Muehlbauer, unpublished data, do not cite

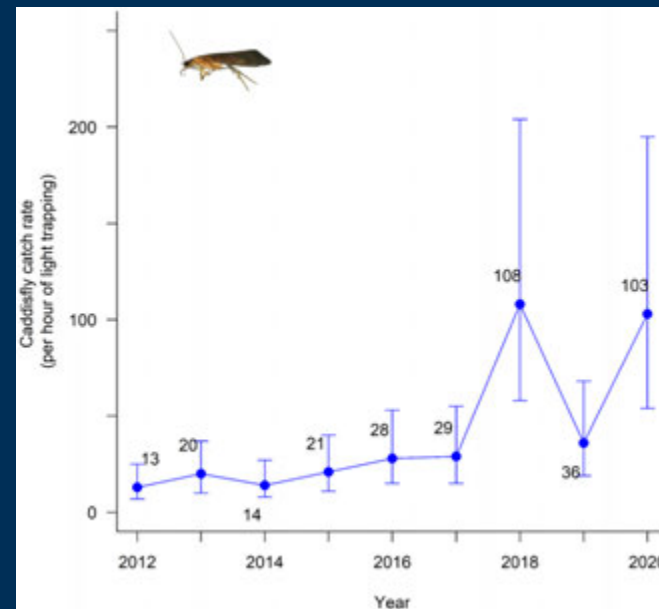


# Bug Flows-Wrinkles & Caveats

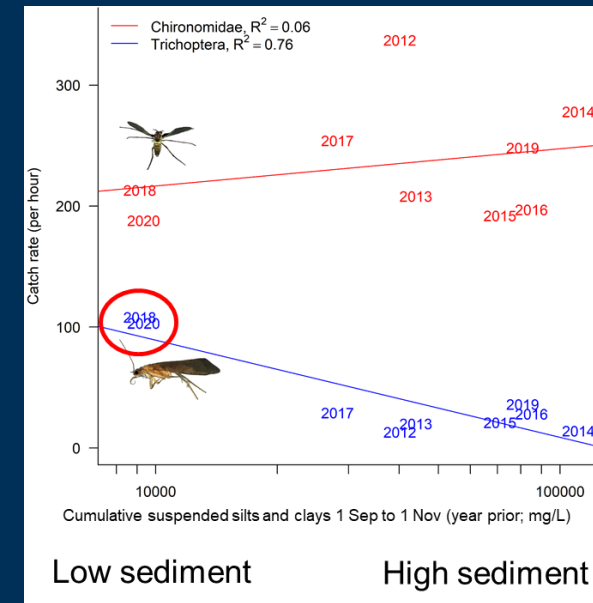
- No increase in midges
- Caddisfly increases can't be from egg-laying benefits alone



Midges



Caddisflies



Caddisflies & sediment



# Bug Flows & Hydropower

- Cost of experiment has increased over time

- FY18 - \$165,000
- FY19 - \$317,000
- FY20 - \$407,000 (estimated)
- FY21 - >\$700k (estimated)

2021 estimates

	Monthly Cost of Bug Flows	
	H1	H750
May	\$6,493	\$1,860
June	-\$16,373	-\$40,109
July	-\$333,800	-\$423,558
August	-\$155,363	-\$267,524
<b>Total</b>	<b>-\$499,042</b>	<b>-\$729,331</b>

