



Fish populations and aquatic ecosystems in Lees Ferry through the Little Colorado River

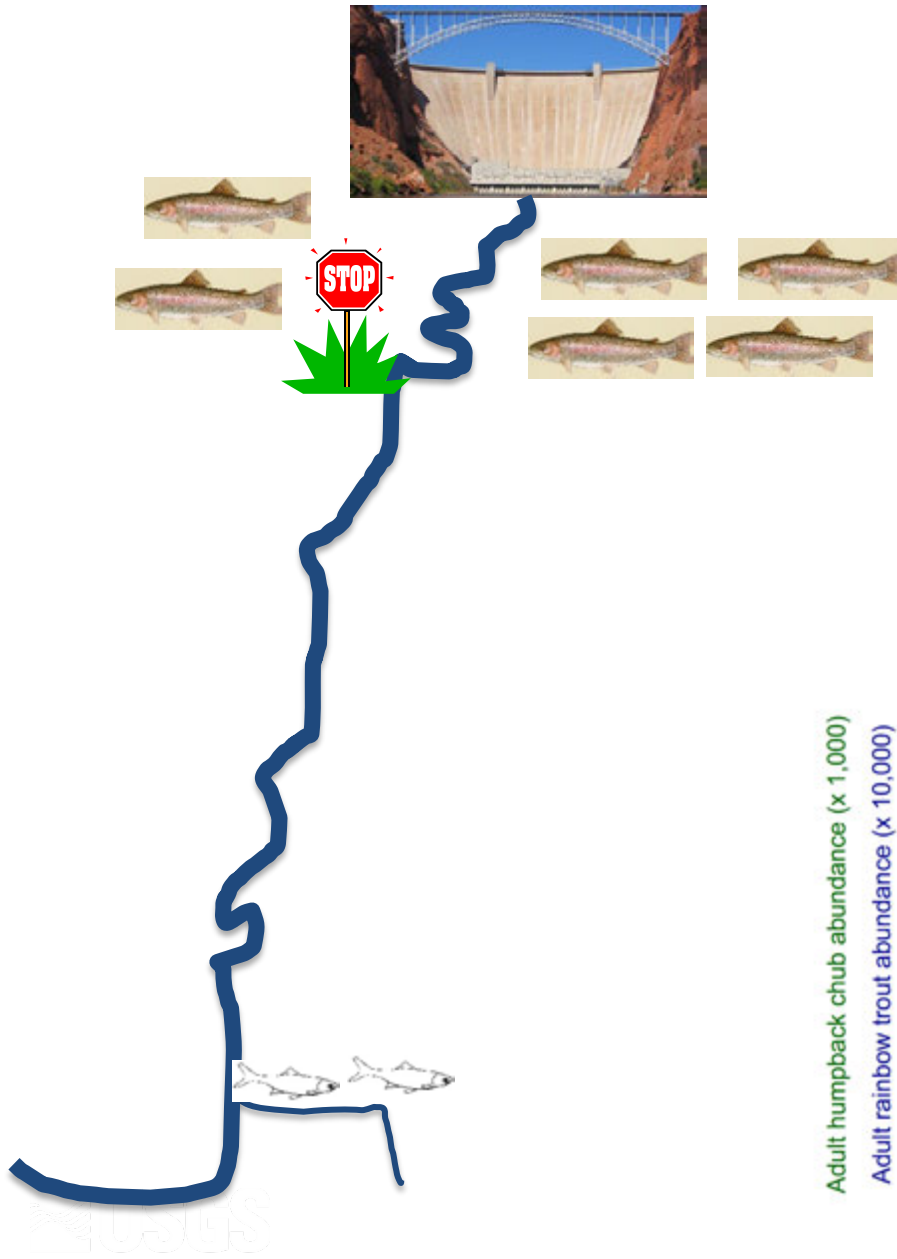
Project elements: Projects A & E – I data
E.2 Ecosystem modelling (\$50K)
H.2 RBT recruitment and BNT modelling (\$7K)
G.1 HBC population modelling (\$110K)
(J.2 Decision science)

Resource Goals: Humpback Chub, Rainbow trout, Invasive Species,
Natural Processes,

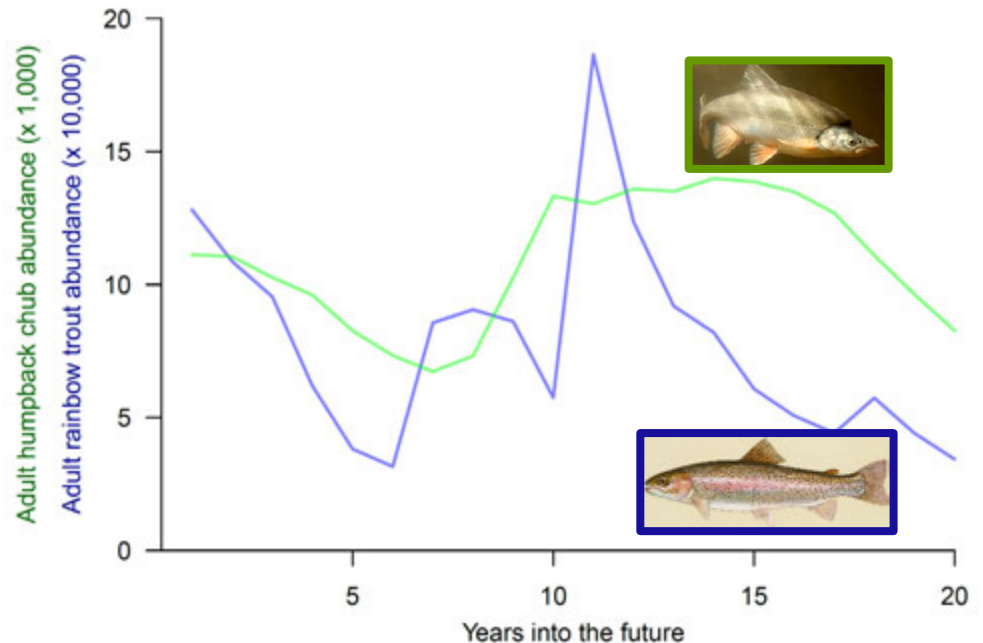
Annual Reporting
January 20, 2021

What was done?

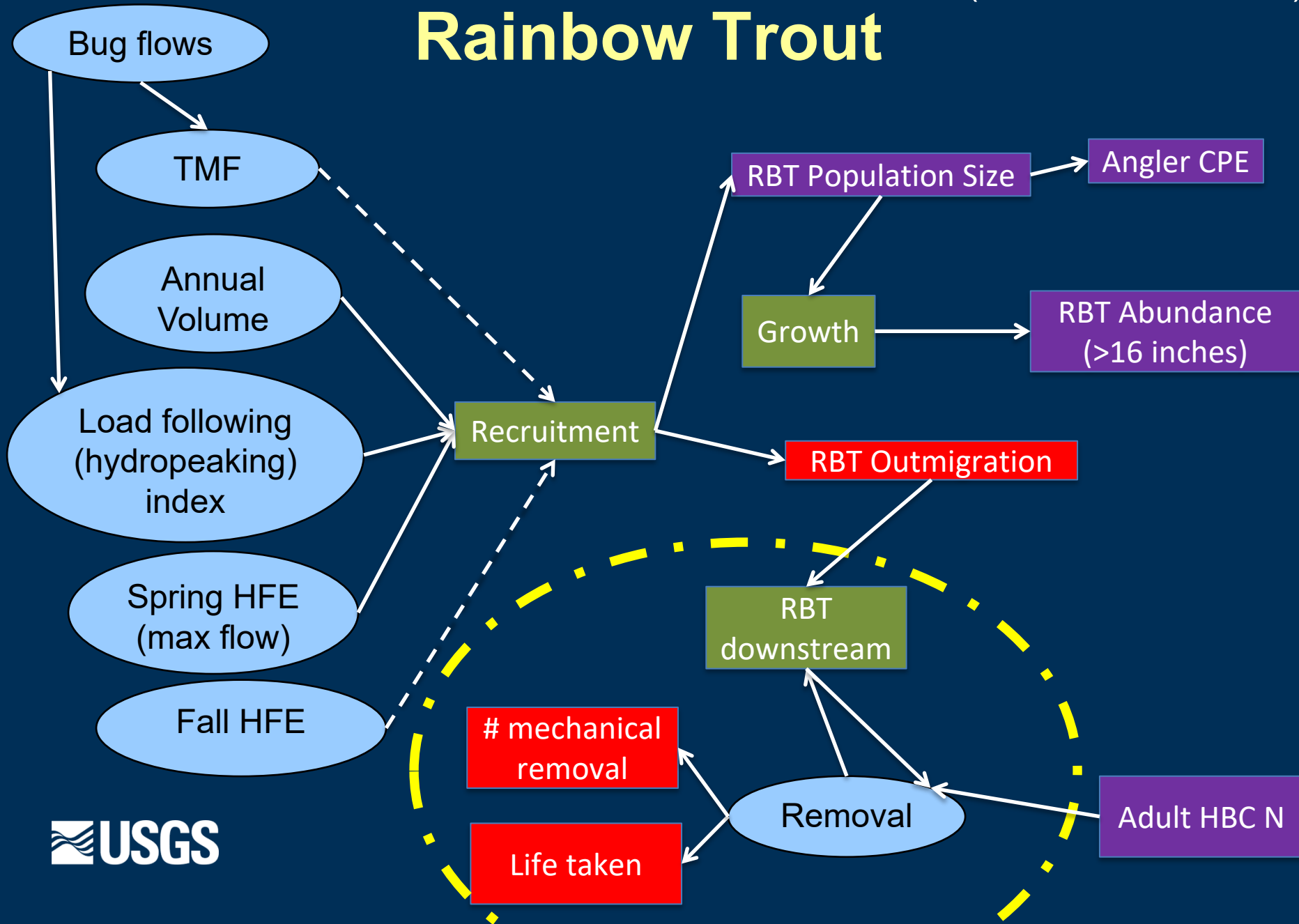
Broad overview of coupled Itemp models



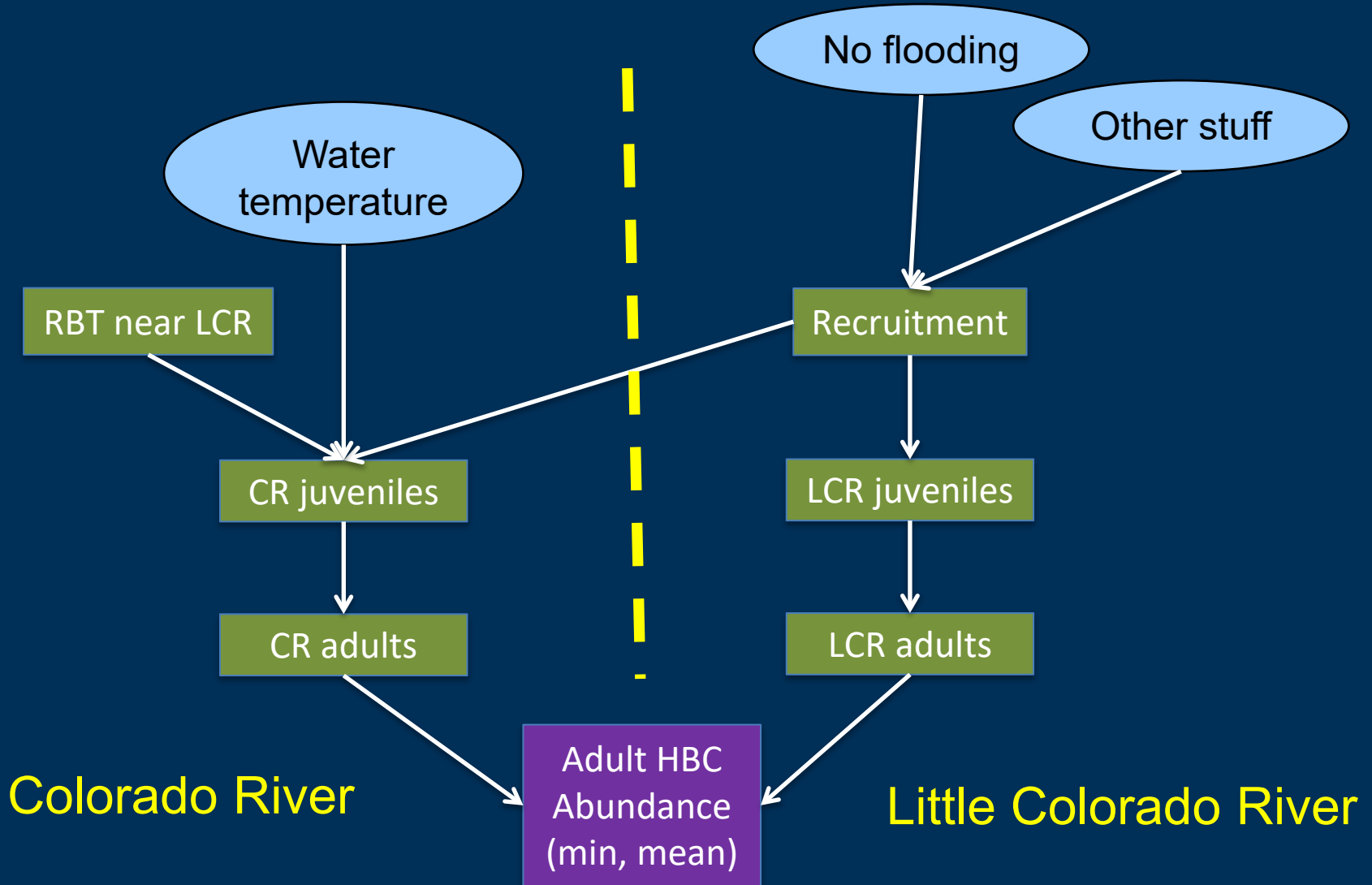
- Rainbow trout dynamic in Lees Ferry and outmigration driven by flows.
- Movement to LCR and mechanical removal.
- Chub dynamics driven by water temp, rainbow trout, and other drivers.



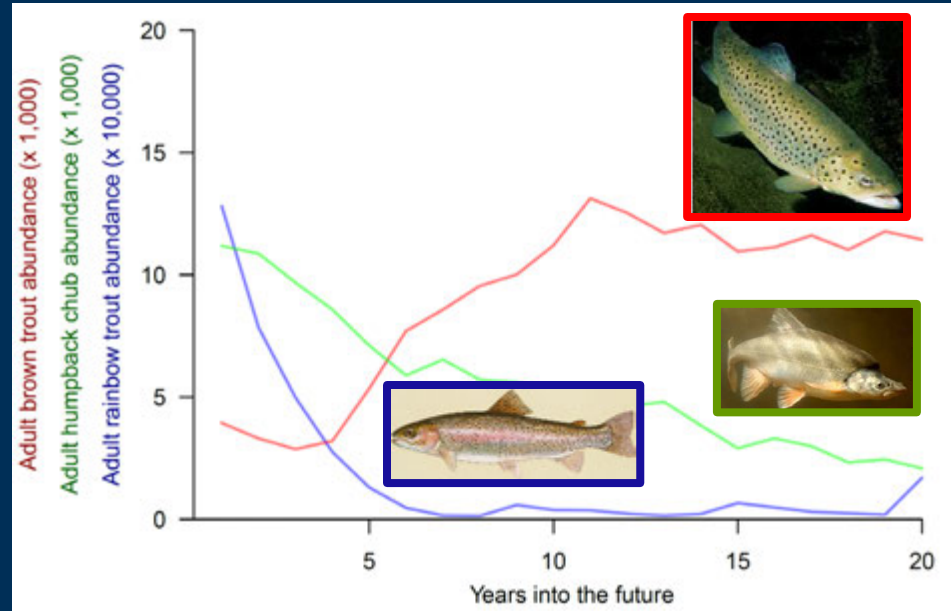
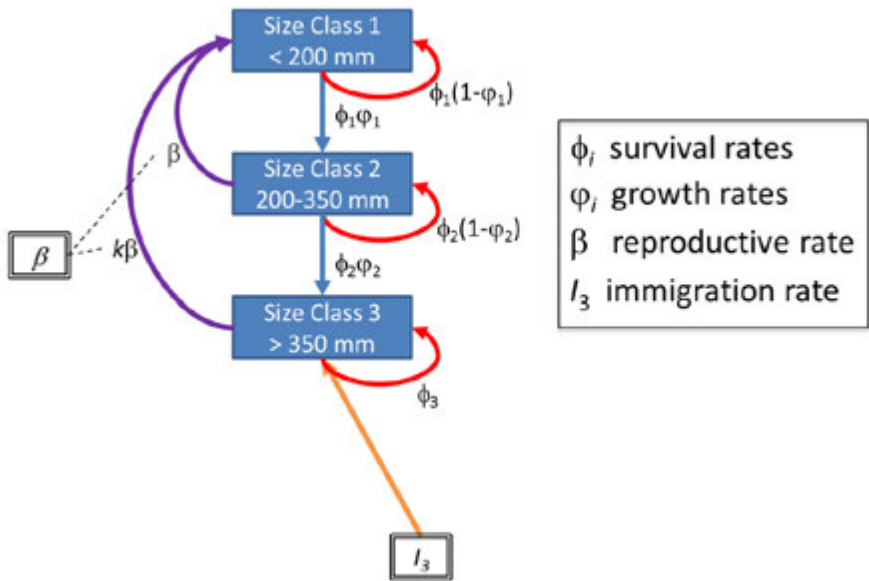
Rainbow Trout



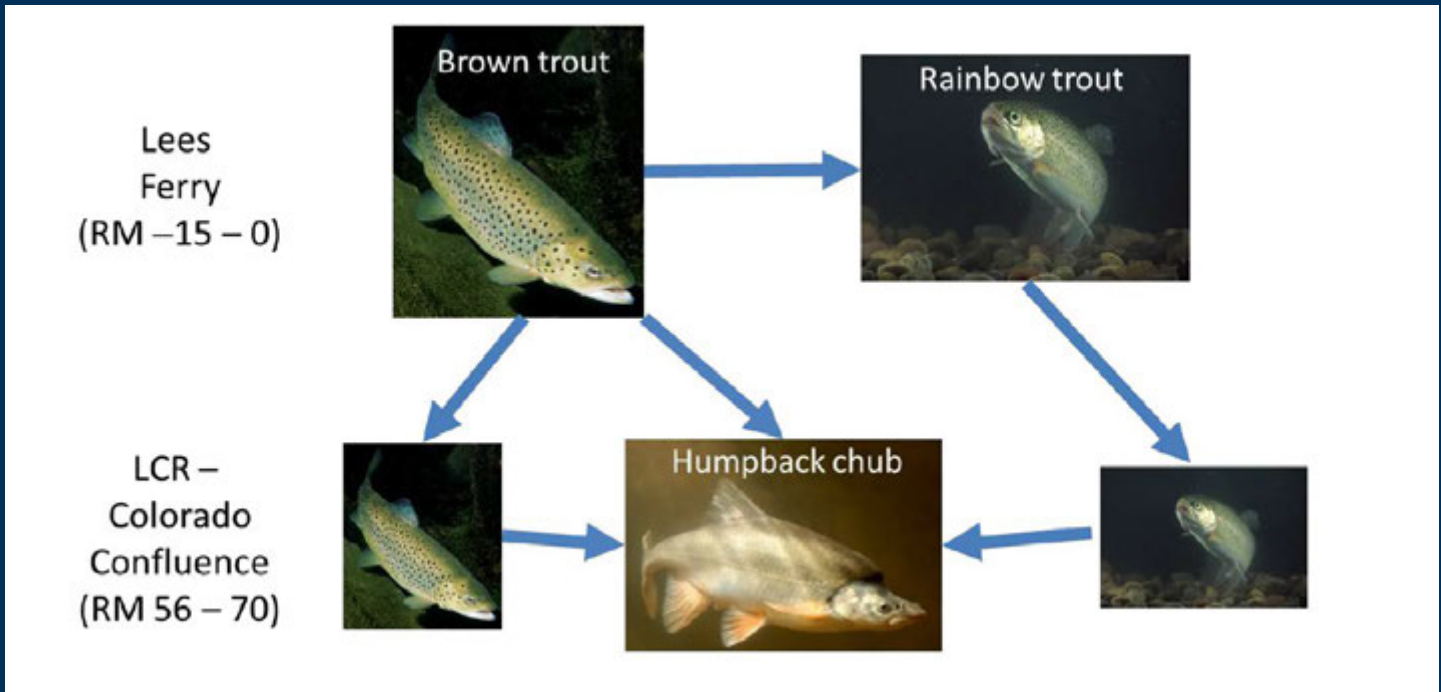
Humpback chub



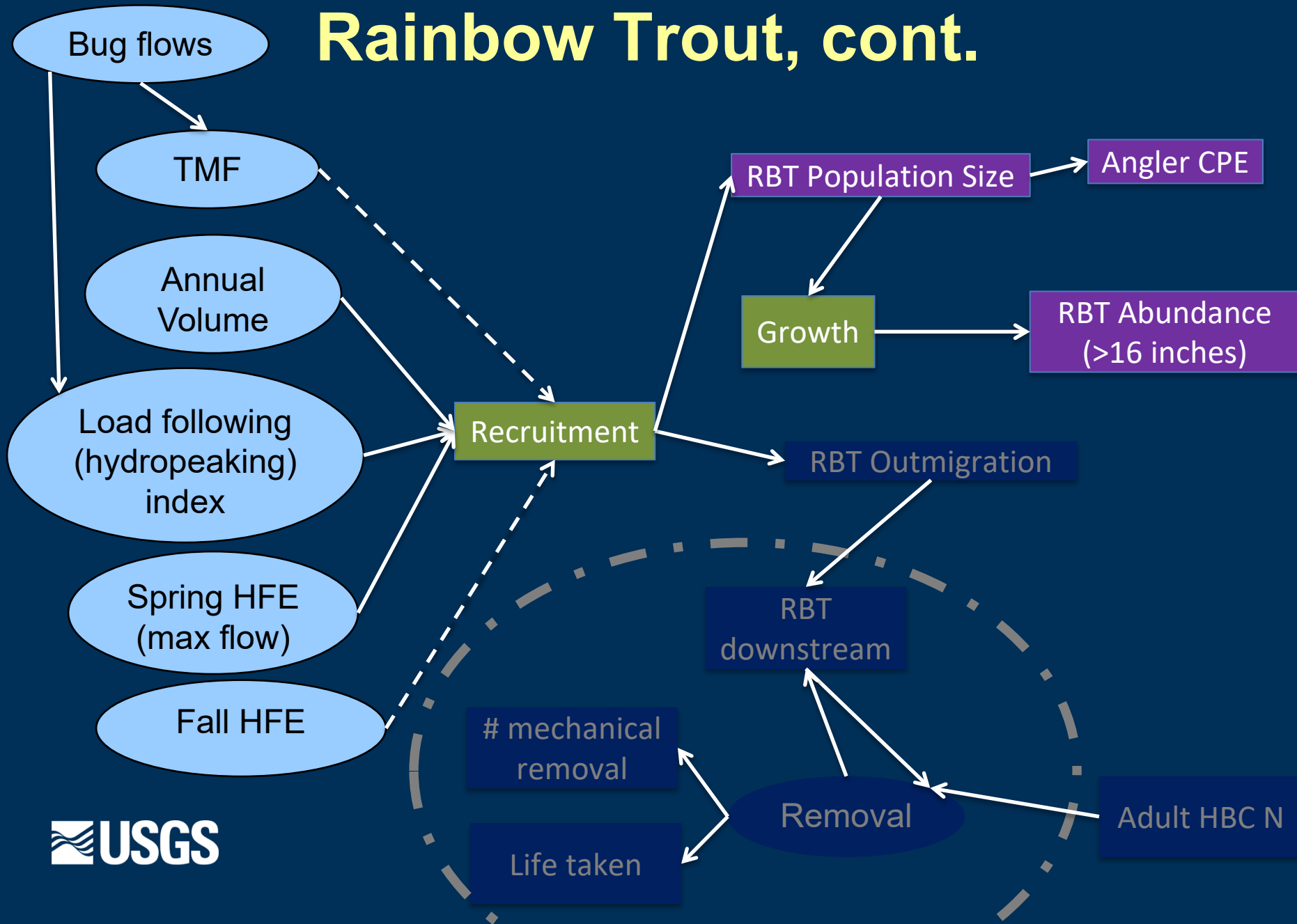
Recent changes

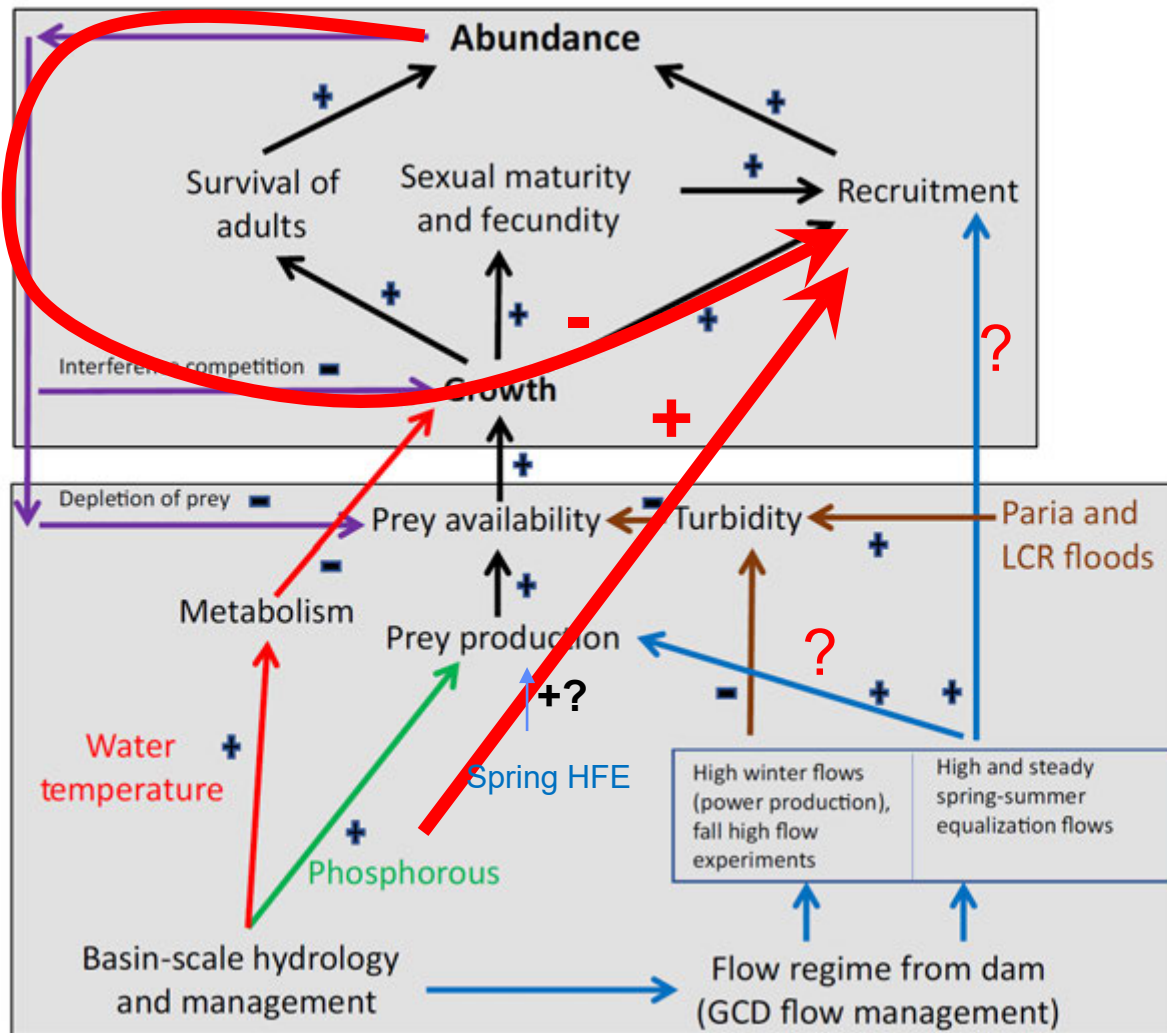


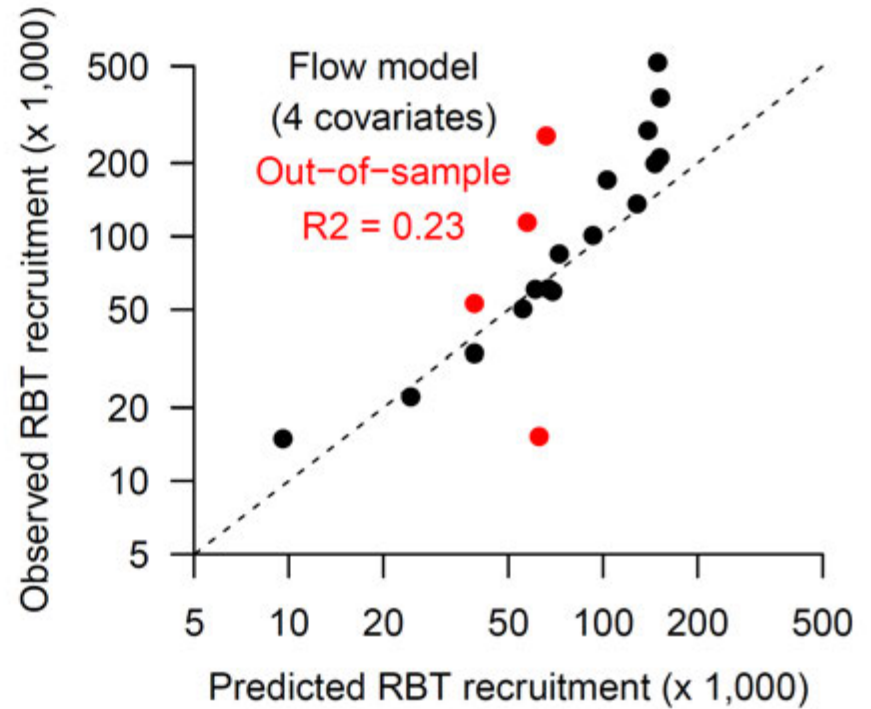
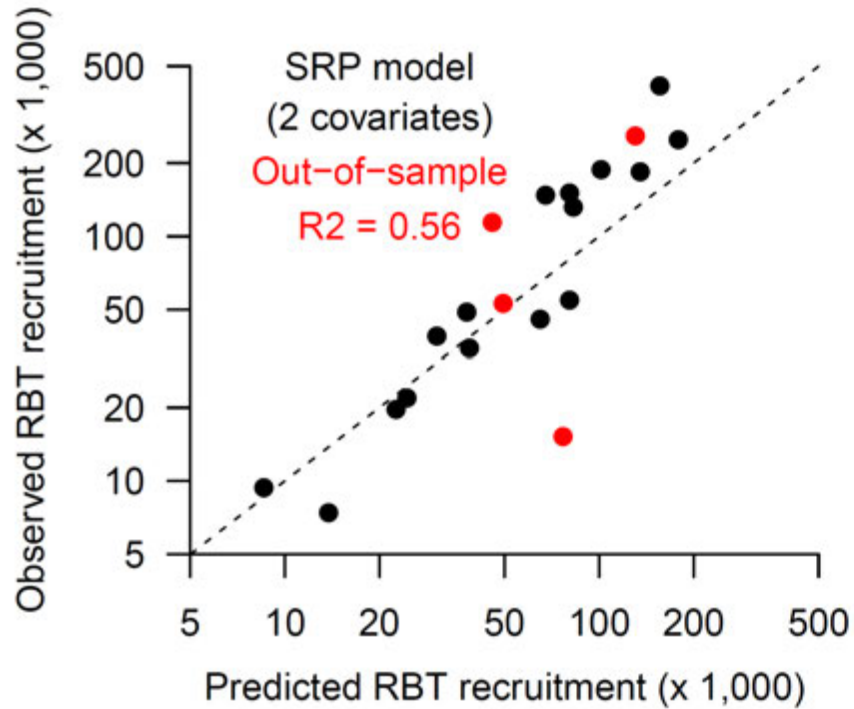
(Runge et al. 2018)



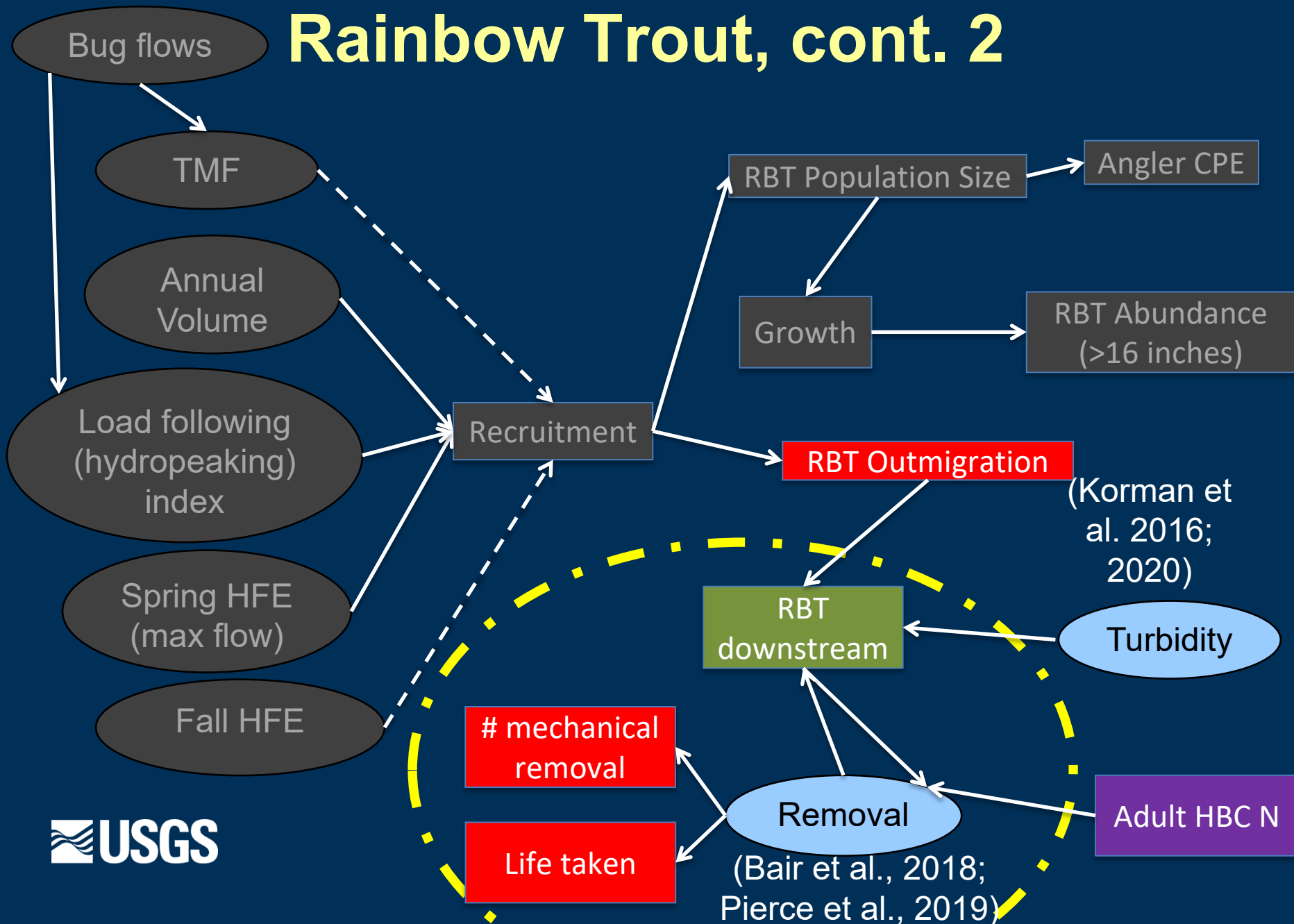
Rainbow Trout, cont.



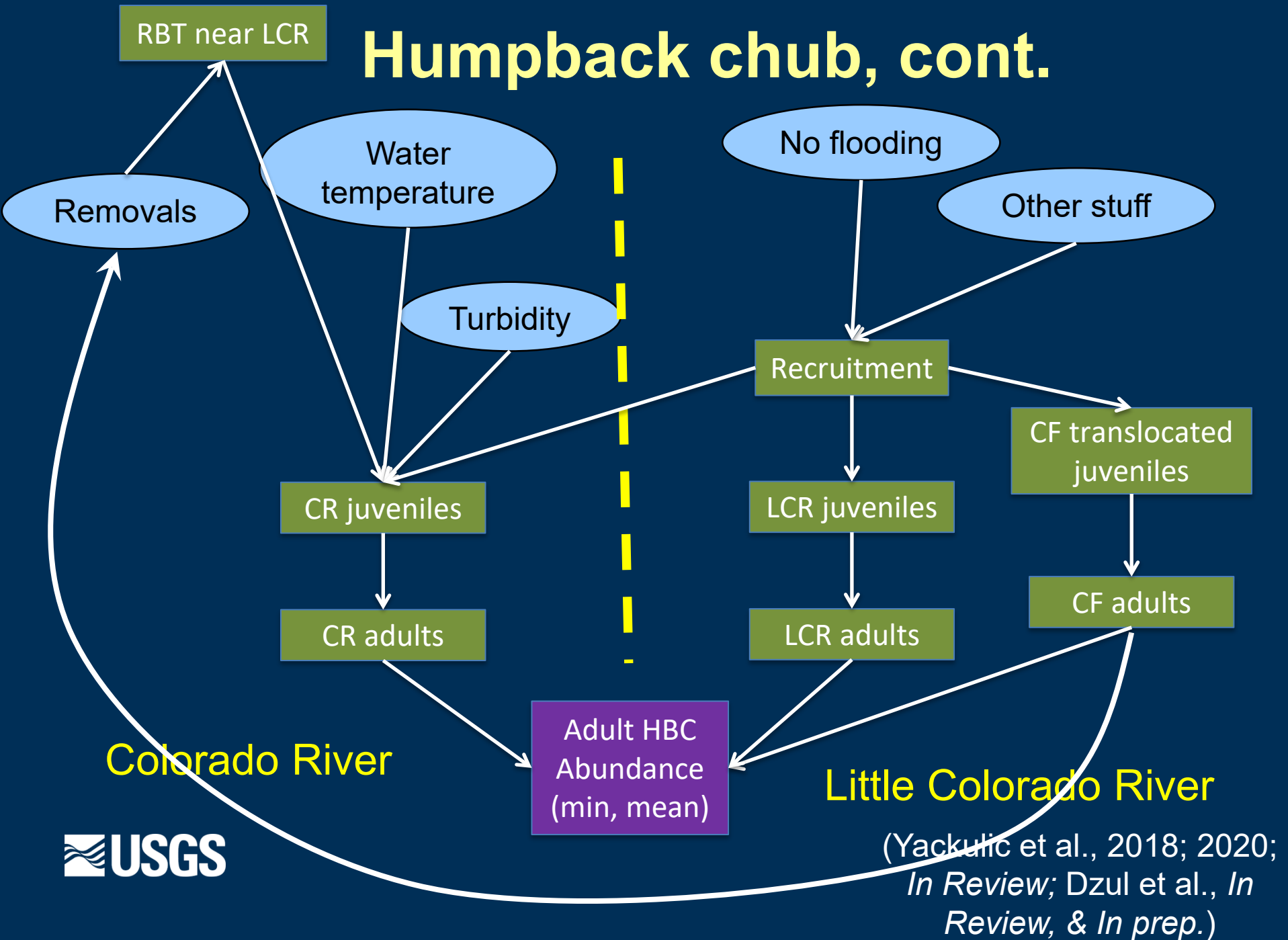




Rainbow Trout, cont. 2



Humpback chub, cont.



**How does research and monitoring
inform these models?**

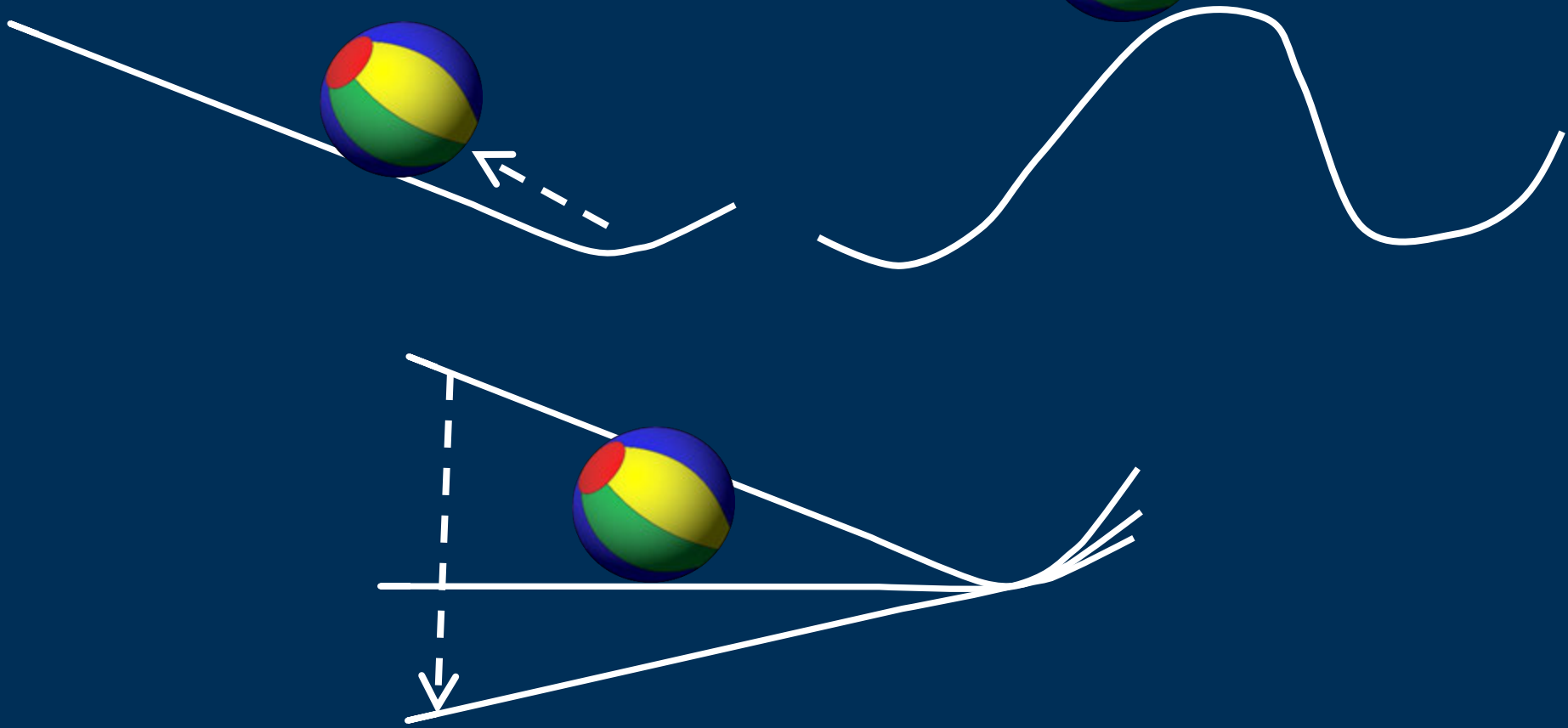
Ties to monitoring and research

- Annually we report on most of the quantities of concern based on data collected through monitoring and research.
- At the same time, we are updating parameter estimates for models.
- In theory, we could update predictions, but lack capacity to develop such a framework.
- Monitoring and research projects are not equally informative.

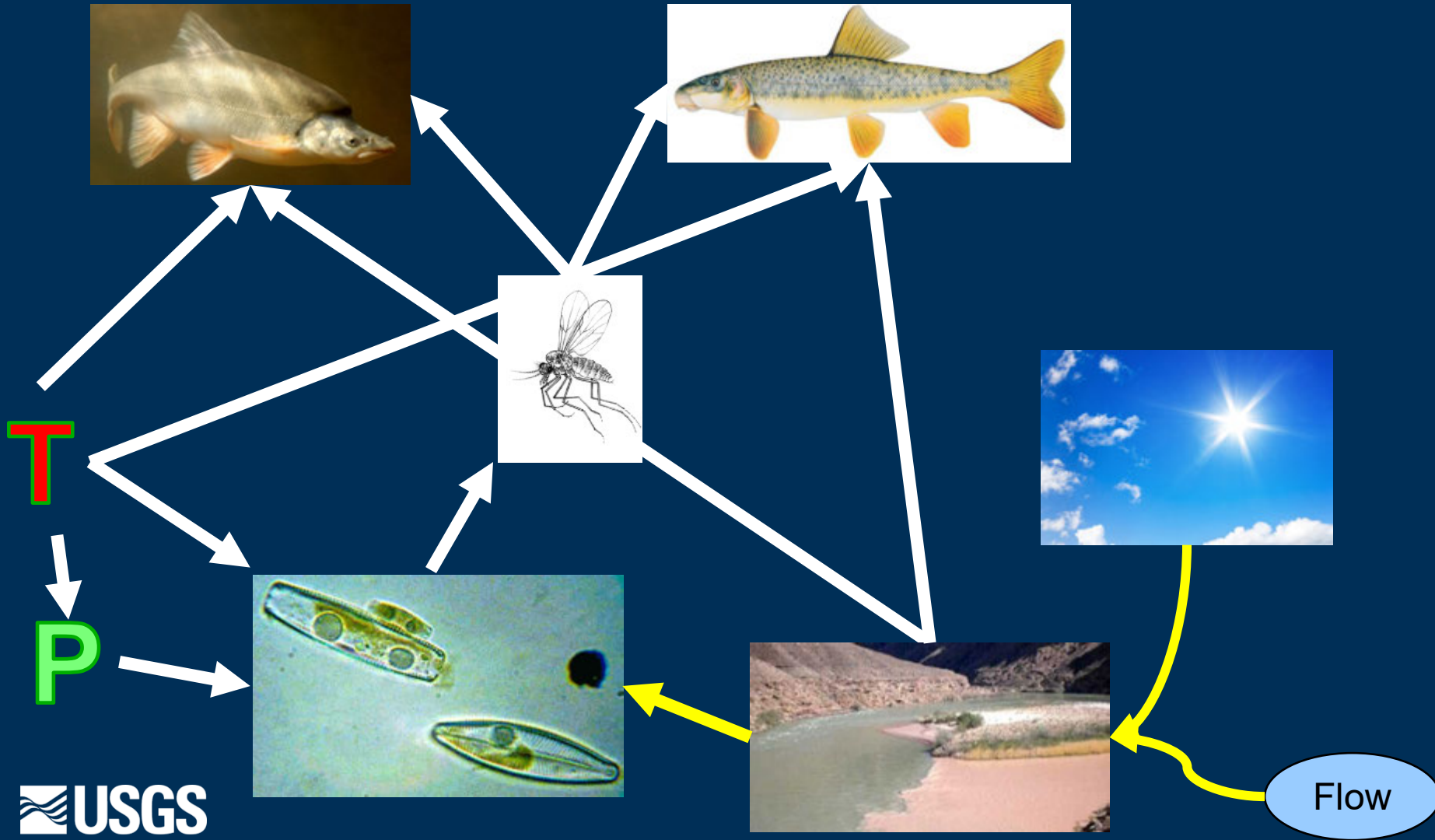
Budgetary issues: failure to prioritize

- Value of monitoring and research projects to predictive fisheries models is rarely considered during budget process.
- Never make decision to cut fish-related modelling elements – instead decrease budgets substantially without changing expectations.
- Emerging fish modelling issues are not funded – exacerbates issue #2.

What's on the horizon?



Turning conceptual ecosystem models into quantitative models



Questions

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