Project E

LTEMP & Management

- All aspects of project E address the Natural Processes LTEMP resource goal and provide context for various Fish LTEMP resource goals.

- In specific case of diatom survey, this would also provide baseline distributional information regarding nuisance diatom taxa, which relates to the Recreational Experience resource goal.

- Experimental Action Analysis
  - GPP modelling suggests a moderate increase in GPP at downriver sites during Macroinvertebrate Improvement Flows (Deemer et al., 2022) and smaller effect on GPP in Lees Ferry (Bishop et al., 2024).
  - Current GPP research focused on quantifying impact of HFEs and changing reservoir releases (e.g., water temperature) and volumes.

- Past work has illustrated that relative role of flows versus water quality in driving aquatic ecosystem responses.
  - LTEMP models assumed daily fluctuations were important driver of rainbow trout production (Korman et al., 2011) – work through project E and H has illustrated that other factors (phosphorous, temperature) are far more important (Yackulic et al., 2021; Korman et al., 2022; Yard et al., 2023).
  - GPP has been linked to growth in both flannelmouth sucker (Hansen et al., 2023) and humpback chub (Hansen et al., 2024).

FY 2025

	Project Description	Salaries	Travel & Training	Operating Expenses	Logistics Expenses	Cooperative Agreements	To other USGS Centers	Burden	Total
E.1	Phosphorus budgeting in the Colorado River	$50,468	$1,000	$17,995	$1,225	$0	$0	$15,410	**$86,098**
E.2	Rates and composition of primary producers in the Colorado River	$158,122	$4,000	$63,045	$3,150	$0	$0	$49,773	**$278,090**
E.3	Understanding the energetic basis of the food web in Western Grand Canyon	$63,884	$2,000	$53,435	$4,725	$0	$39,780	$27,042	**$190,866**
E.4	Productivity at higher trophic levels	$112,343	$0	$3,000	$0	$0	$0	$25,145	**$140,488**
	Total E	**$384,817**	**$7,000**	**$137,475**	**$9,100**	**$0**	**$39,780**	**$117,369**	**$695,541**

FY 2026

	Project Description	Salaries	Travel & Training	Operating Expenses	Logistics Expenses	Cooperative Agreements	To other USGS Centers	Burden	Total
E.1	Phosphorus budgeting in the Colorado River	$61,322	$0	$13,010	$700	$0	$0	$16,957	**$91,990**
E.2	Rates and composition of primary producers in the Colorado River	$159,029	$5,250	$19,092	$1,750	$0	$0	$41,837	**$226,959**
E.3	Understanding the energetic basis of the food web in Western Grand Canyon	$63,029	$3,000	$50,159	$4,200	$0	$40,860	$27,208	**$188,456**
E.4	Productivity at higher trophic levels	$102,432	$0	$3,000	$0	$0	$0	$23,828	**$129,260**
	Total E	**$385,813**	**$8,250**	**$85,261**	**$6,650**	**$0**	**$40,860**	**$109,830**	**$636,664**

FY 2027

	Project Description	Salaries	Travel & Training	Operating Expenses	Logistics Expenses	Cooperative Agreements	To other USGS Centers	Burden	Total
E.1	Phosphorus budgeting in the Colorado River	$120,112	$2,000	$3,500	$0	$0	$0	$29,393	**$155,005**
E.2	Rates and composition of primary producers in the Colorado River	$156,110	$6,500	$18,044	$1,750	$0	$0	$42,683	**$225,087**
E.3	Understanding the energetic basis of the food web in Western Grand Canyon	$85,333	$2,000	$47,889	$4,200	$0	$42,300	$32,625	**$214,346**
E.4	Productivity at higher trophic levels	$109,602	$0	$3,000	$0	$0	$0	$26,349	**$138,951**
	Total E	**$471,157**	**$10,500**	**$72,433**	**$5,950**	**$0**	**$42,300**	**$131,049**	**$733,389**

If you had 10% (or 15%) less, what would you cut?

- **Reduce salary, reduce scope.**
  - **Reduce staff and/or find outside work**

- **E1 – Reduce replication in experiments - ~ 4 – 5 k**

- **E.2 – Reduce scope of diatom surveys - ~ 9 – 10k**

- **GPP estimates come from analyzing DO, Temp and Turbidity collected under A.2. All data collected through this project occurs over short time periods (typically one year experiments or directed field research).**

- **Except for occasional Lees Ferry work, data collection take place in conjunction with trips planned under other projects.**