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GCMRC FY 2025-27 Triennial Workplan and Budget – First Draft

Technical Work Group Meeting
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U.S. Geological Survey

LTEMP Implementation

Resource Areas to be Evaluated and Considered Before Any Experiment	Objectives And Resource Goals Of The LTEMP
Water Quality and Water Delivery	Archaeological and Cultural Resources
Humpback Chub	Natural Processes
Sediment	Humpback Chub
Riparian Ecosystems	Hydropower and Energy
Historic Properties and Traditional Cultural Properties	Other Native Fish
Hydropower Production and WAPA's Assessment of the Status of the Basin Fund	Recreational Experience
Rainbow Trout Fishery	Sediment
Recreation	Tribal Resources
Other Resources	Rainbow Trout Fishery
Tribal Concerns/Resources	Nonnative Invasive Species
	Riparian Vegetation

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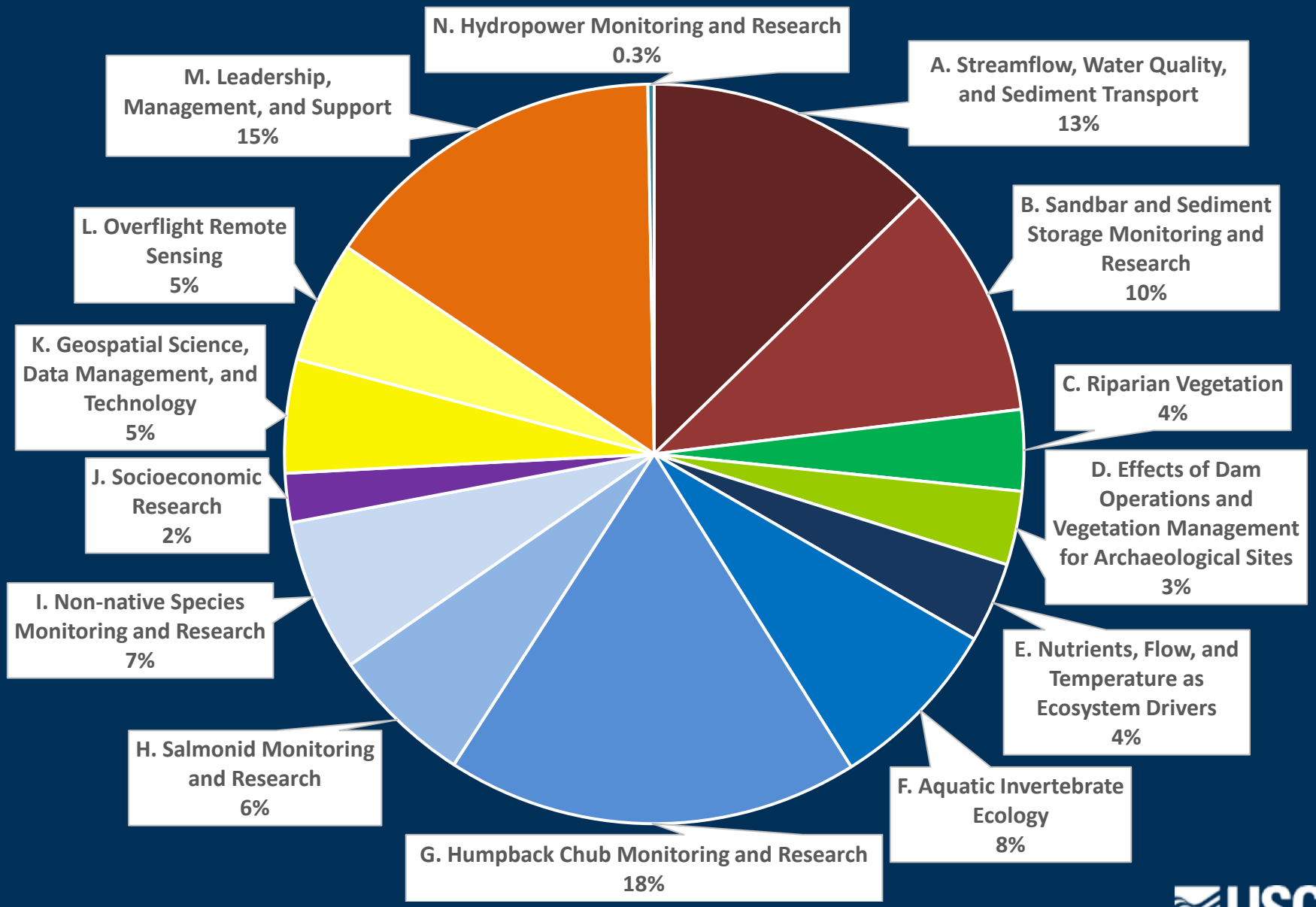
FY21-23 Final Budget Allocation by Project



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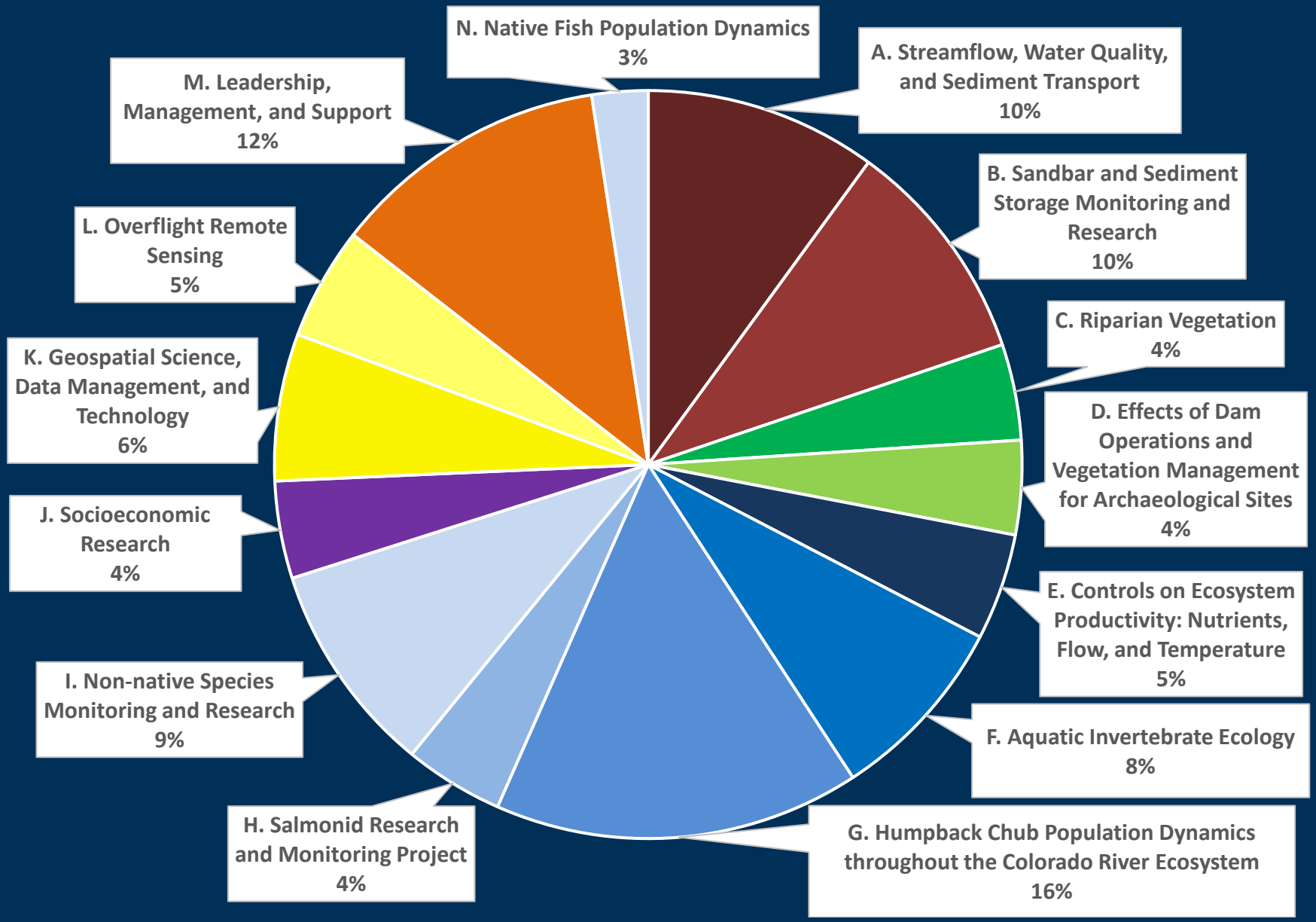
FY25-27 Proposed Budget Allocation by Project



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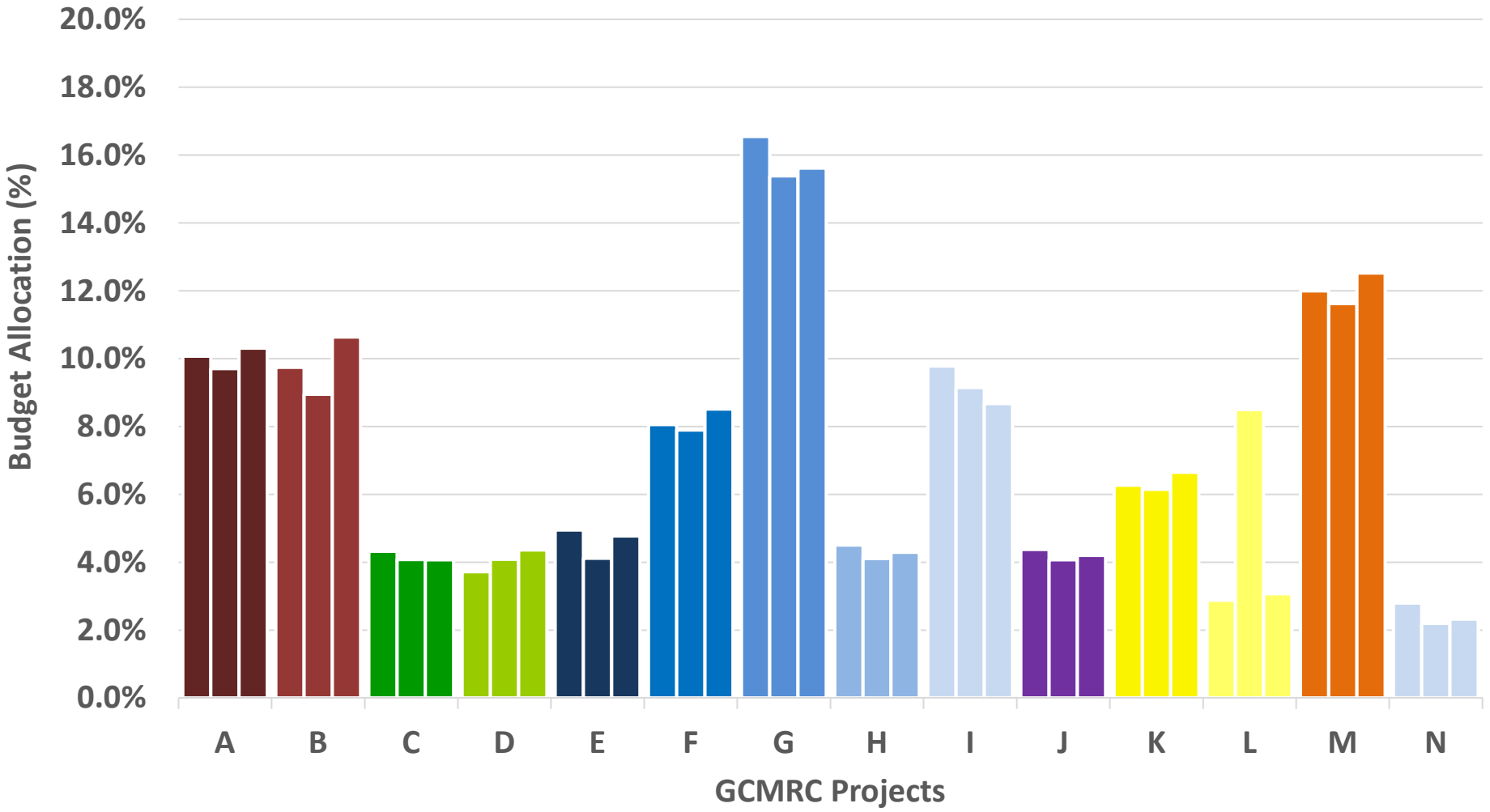
FY25-27 Proposed Budget Allocation Across Projects



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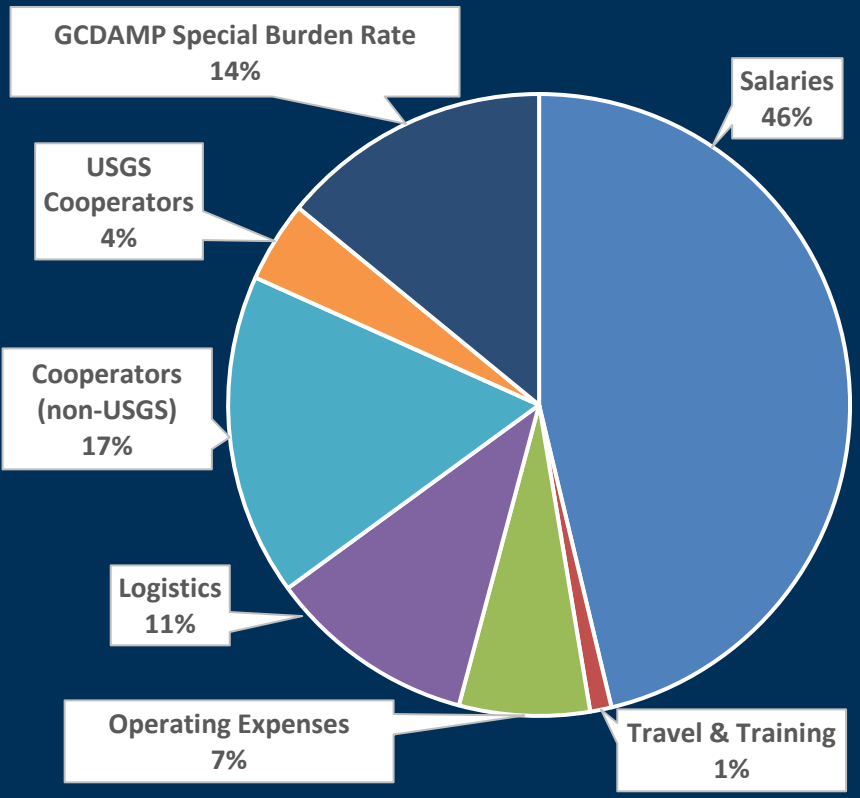
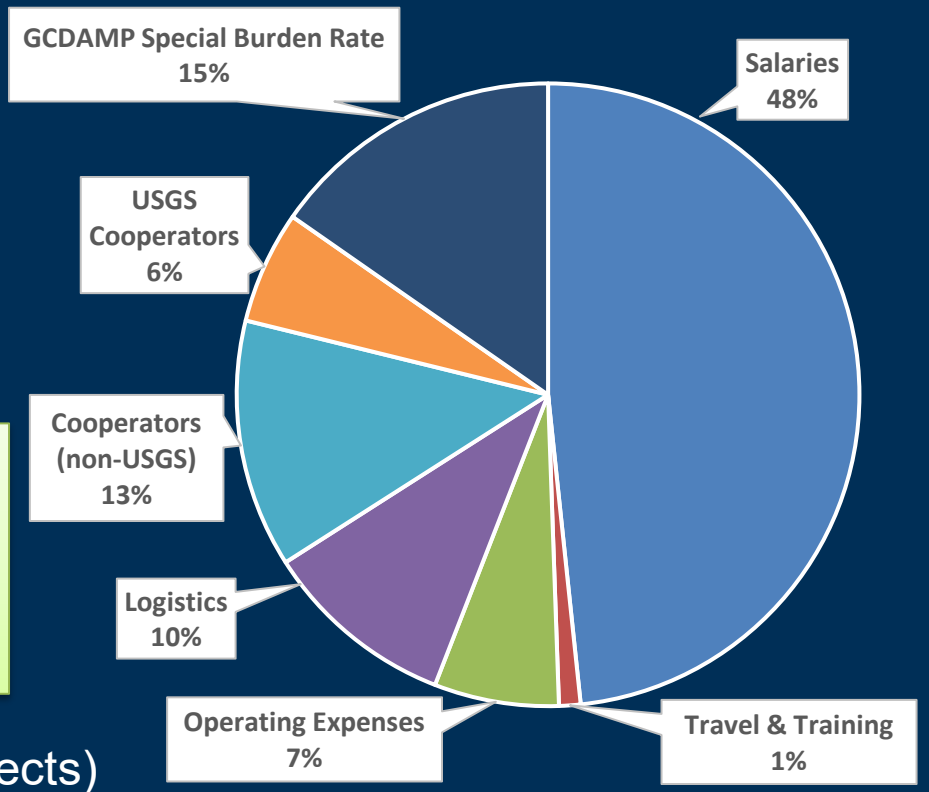
Comparison of FY21-23 Final Budget and Proposed FY25-27 Budget, by general categories*

FY21-23 Budget by Category



FY25-27 Proposed Budget by Category



Estimated GCDAMP special burden rates:

FY25 = 21.8%

FY26 = 22.6%

FY27 = 23.4%

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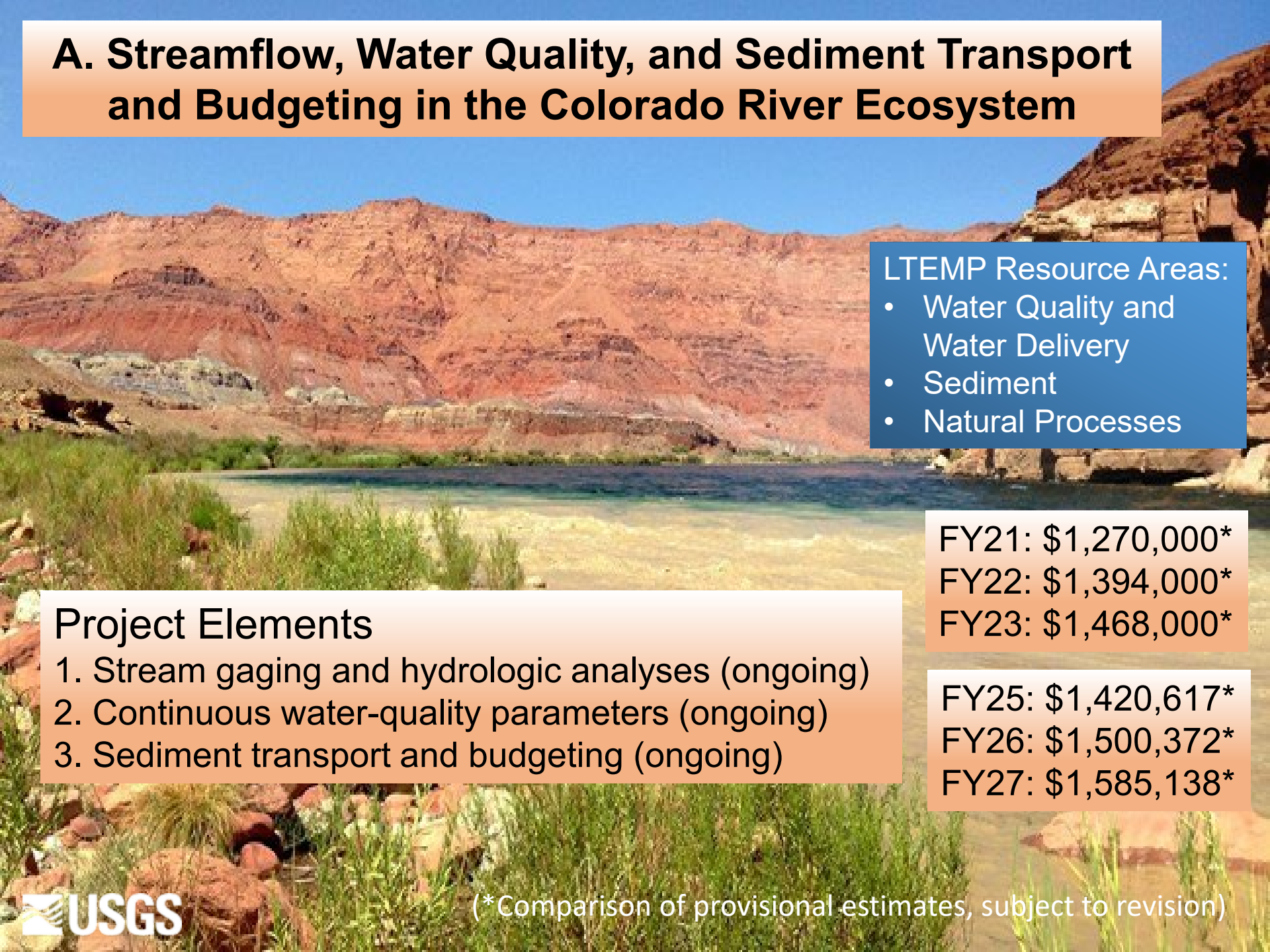
(*Colors do not relate to projects)

A. Streamflow, Water Quality, and Sediment Transport and Budgeting in the Colorado River Ecosystem



LTEMP Resource Areas:
- Water Quality and Water Delivery
- Sediment
- Natural Processes

FY21: $1,270,000*
FY22: $1,394,000*
FY23: $1,468,000*

FY25: $1,420,617*
FY26: $1,500,372*
FY27: $1,585,138*

Project Elements

1. Stream gaging and hydrologic analyses (ongoing)
2. Continuous water-quality parameters (ongoing)
3. Sediment transport and budgeting (ongoing)

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(*Comparison of provisional estimates, subject to revision)

B. Sandbar and Sediment Storage Monitoring and Research

FY21: $1,281,000*
FY22: $1,197,000*
FY23: $1,371,000*

FY25: $1,374,683*
FY26: $1,383,150*
FY27: $1,634,752*

Project Elements

1. Sandbar and Campsite Monitoring with Topographic Surveys and Remote Cameras (ongoing)
2. Bathymetric and topographic mapping for monitoring sediment storage and riverbed dynamics (ongoing)
3. Control network and survey support (ongoing)
4. Streamflow, sediment, and sandbar modeling (modified)

LTEMP Resource Areas:

- Sediment
- Archaeological and Cultural Resources
- Natural Processes
- Recreational Experience

(*Comparison of provisional estimates, subject to revision)

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C. Riparian Vegetation Monitoring and Research

Project Elements

1. Ground-based riparian vegetation monitoring (ongoing)
2. Mechanistic experiments with plant species of interest (ongoing)
3. Predictive modeling of vegetation responses to dam operations (ongoing)
4. Biogeomorphic linkages between streamflow, sediment transport, and vegetation composition (new)
5. Vegetation management decision support (modified)

FY21: $345,000*
FY22: $395,000*
FY23: $405,000*

FY25: $609,310*
FY26: $629,694*
FY27: $625,984*

LTEMP Resource Areas:
- Riparian Vegetation
- Natural Processes
- Recreational Experience

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(*Comparison of provisional estimates, subject to revision)

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D. Effects of Dam Operations and Vegetation Management for Archaeological Sites

FY21: $349,000*
FY22: $359,000*
FY23: $363,000*

FY25: $524,953*
FY26: $631,699*
FY27: $670,798*

LTEMP Resource Areas:
- Sediment
- Riparian Vegetation
- Archaeological and Cultural Resources
- Natural Processes

Project Elements
1. Monitoring the effects of dam operations on archaeological sites (modified)
2. Monitoring landscape-scale ecosystem change with repeat photography (ongoing)
3. Evaluating effects of LTEMP Non-Flow Actions and other experimental vegetation management on archaeological sites (modified)
4. Pilot study to evaluate potential to extract cultural and ecological information from Colorado River deposits using eDNA and pollen (new)
5. Monitoring rock art (petroglyphs, pictographs) with photogrammetry and lidar (new)

(*Comparison of provisional estimates, subject to revision)

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E. Controls on Ecosystem Productivity: Nutrients, Flow, and Temperature

Project Elements

1. Phosphorus budgeting in the Colorado River (modified)
2. Rates and composition of primary producers in the Colorado River (ongoing)
3. Understanding the energetic basis of the food web in Western Grand Canyon (new)
4. Linking ecosystem metabolism to higher trophic levels (ongoing)

FY21: $481,000*
FY22: $499,000*
FY23: $509,000*

FY25: $697,967*
FY26: $636,664*
FY27: $733,389*

LTEMP Resource Areas:

- Water Quality and Water Delivery
- Other Resources (Food Base)
- Natural Processes

(*Comparison of provisional estimates, subject to revision)

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F. Aquatic Invertebrate Ecology (Food Base)

Project Elements

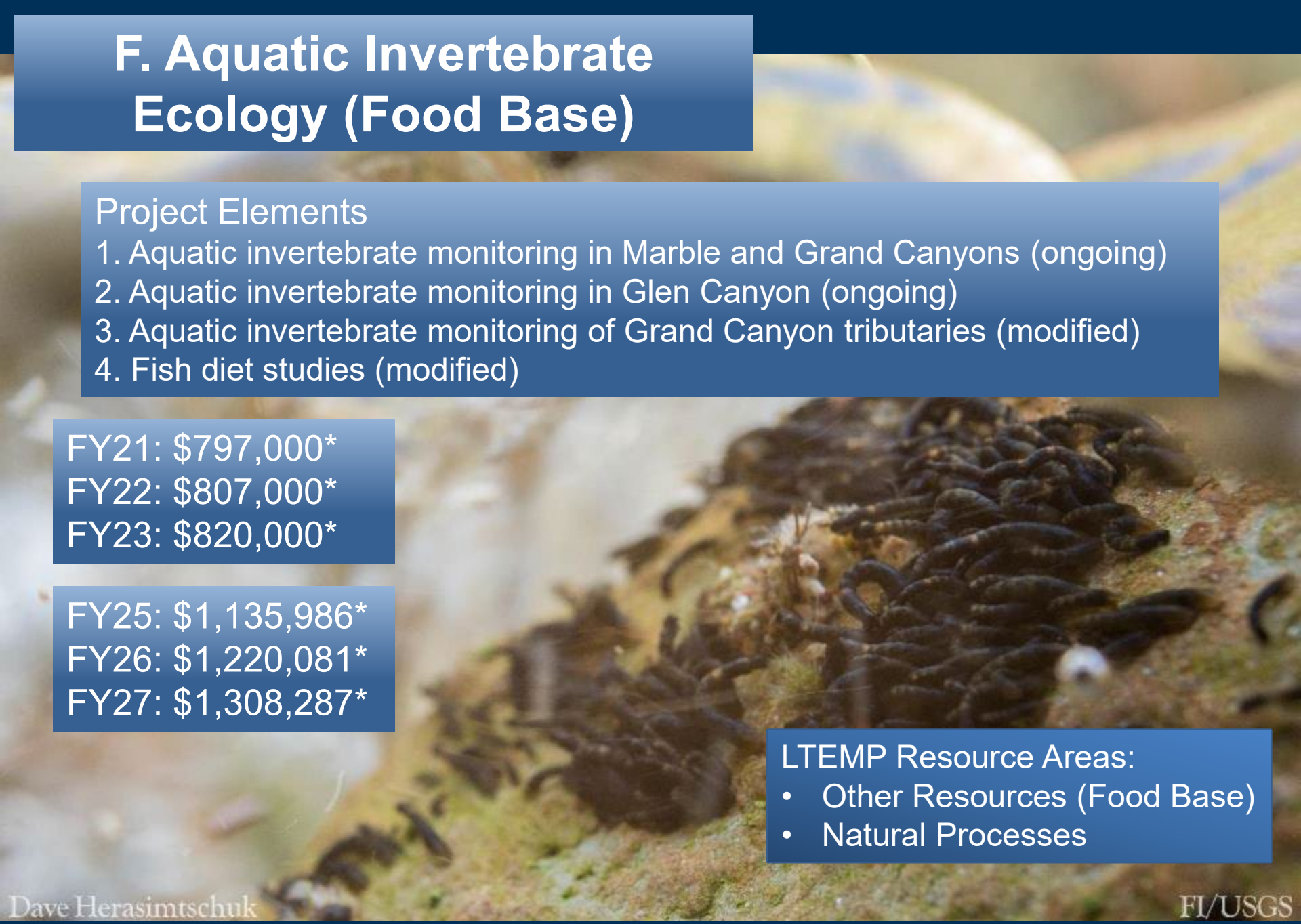
1. Aquatic invertebrate monitoring in Marble and Grand Canyons (ongoing)
2. Aquatic invertebrate monitoring in Glen Canyon (ongoing)
3. Aquatic invertebrate monitoring of Grand Canyon tributaries (modified)
4. Fish diet studies (modified)

FY21: $797,000*
FY22: $807,000*
FY23: $820,000*

FY25: $1,135,986*
FY26: $1,220,081*
FY27: $1,308,287*

LTEMP Resource Areas:

- Other Resources (Food Base)
- Natural Processes



(*Comparison of provisional estimates, subject to revision)

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G. Humpback Chub Population Dynamics Throughout the Colorado River

LTEMP Resource Areas:
- Humpback Chub
- Natural Processes

Project Elements

1. Humpback Chub population monitoring (ongoing)
2. Annual spring/fall abundance estimates of Humpback Chub in the lower 13.6 km of the LCR (ongoing)
3. Juvenile Chub Monitoring (JCM) near the LCR confluence (ongoing)
4. Remote PIT Tag array monitoring in the LCR (ongoing)
5. Monitoring Humpback Chub aggregation relative abundance and distribution (ongoing)
6. Juvenile Humpback Chub monitoring – West (ongoing)
7. Chute Falls translocations (ongoing)
8. Sampling springs in the upper LCR (new)
9. Movement in Western Grand Canyon from system-wide antenna monitoring (new)

FY21: $1,780,000*
FY22: $2,012,000*
FY23: $1,956,000*

FY25: $2,333,232*
FY26: $2,378,202*
FY27: $2,399,963*

(*Comparison of provisional estimates, subject to revision)

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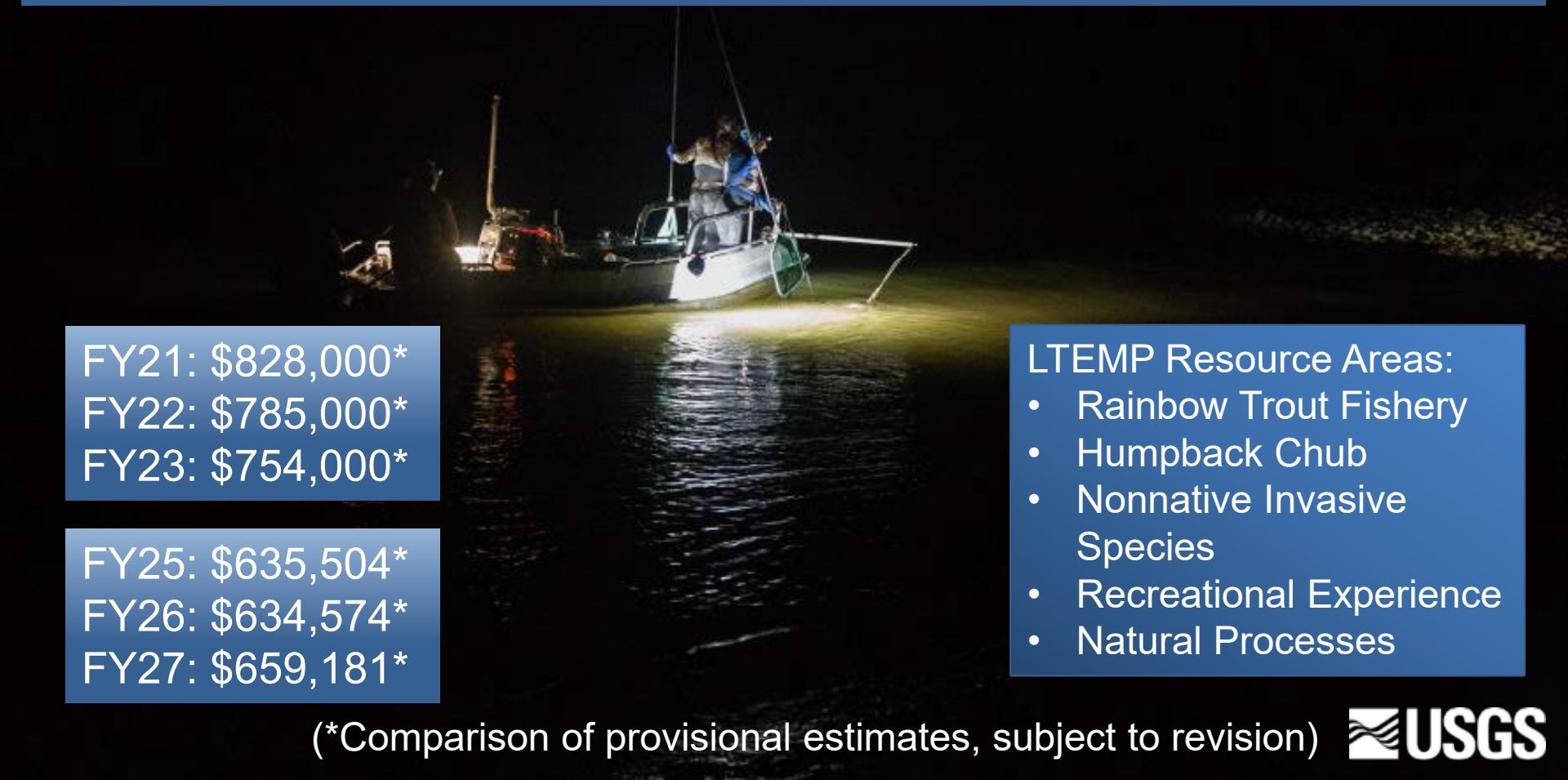
H. Salmonid Research and Monitoring

Project Elements

1. Trout monitoring in Glen Canyon (modified)
2. Trout reproductive and growth dynamics fieldwork (modified)
3. Salmonid modeling (modified)



FY21: $828,000*
FY22: $785,000*
FY23: $754,000*

FY25: $635,504*
FY26: $634,574*
FY27: $659,181*

LTEMP Resource Areas:

- Rainbow Trout Fishery
- Humpback Chub
- Nonnative Invasive Species
- Recreational Experience
- Natural Processes

(*Comparison of provisional estimates, subject to revision)

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I. Non-Native Species Monitoring and Research

FY21: $619,000*
FY22: $730,000*
FY23: $725,000*

LTEMP Resource Areas:
- Nonnative Invasive Species
- Recreational Experience
- Natural Processes

FY25: $1,379,402*
FY26: $1,411,036*
FY27: $1,333,846*

Project Elements
1. System-wide native fishes and non-native aquatic species monitoring (modified)
2. Estimating kinship and spawner abundance of warmwater non-natives (new)
3. Identifying emerging threats to the Colorado River Ecosystem using environmental DNA (new)
4. Modeling population dynamics and improving forecasting tools for Smallmouth Bass and other non-native fishes (new)

(*Comparison of provisional estimates, subject to revision)

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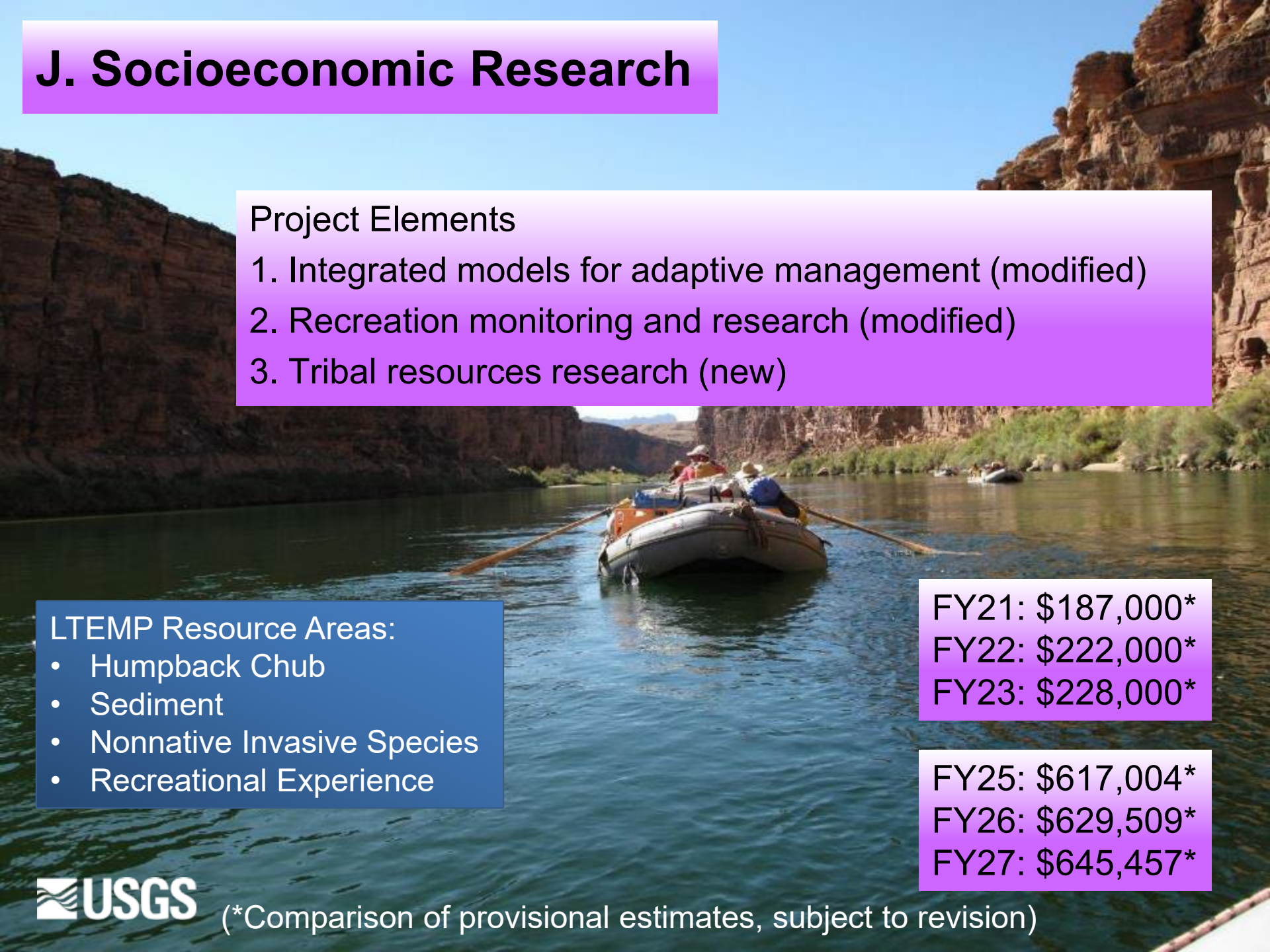
J. Socioeconomic Research



Project Elements

1. Integrated models for adaptive management (modified)
2. Recreation monitoring and research (modified)
3. Tribal resources research (new)

LTEMP Resource Areas:

- Humpback Chub
- Sediment
- Nonnative Invasive Species
- Recreational Experience

FY21: $187,000*
FY22: $222,000*
FY23: $228,000*

FY25: $617,004*
FY26: $629,509*
FY27: $645,457*

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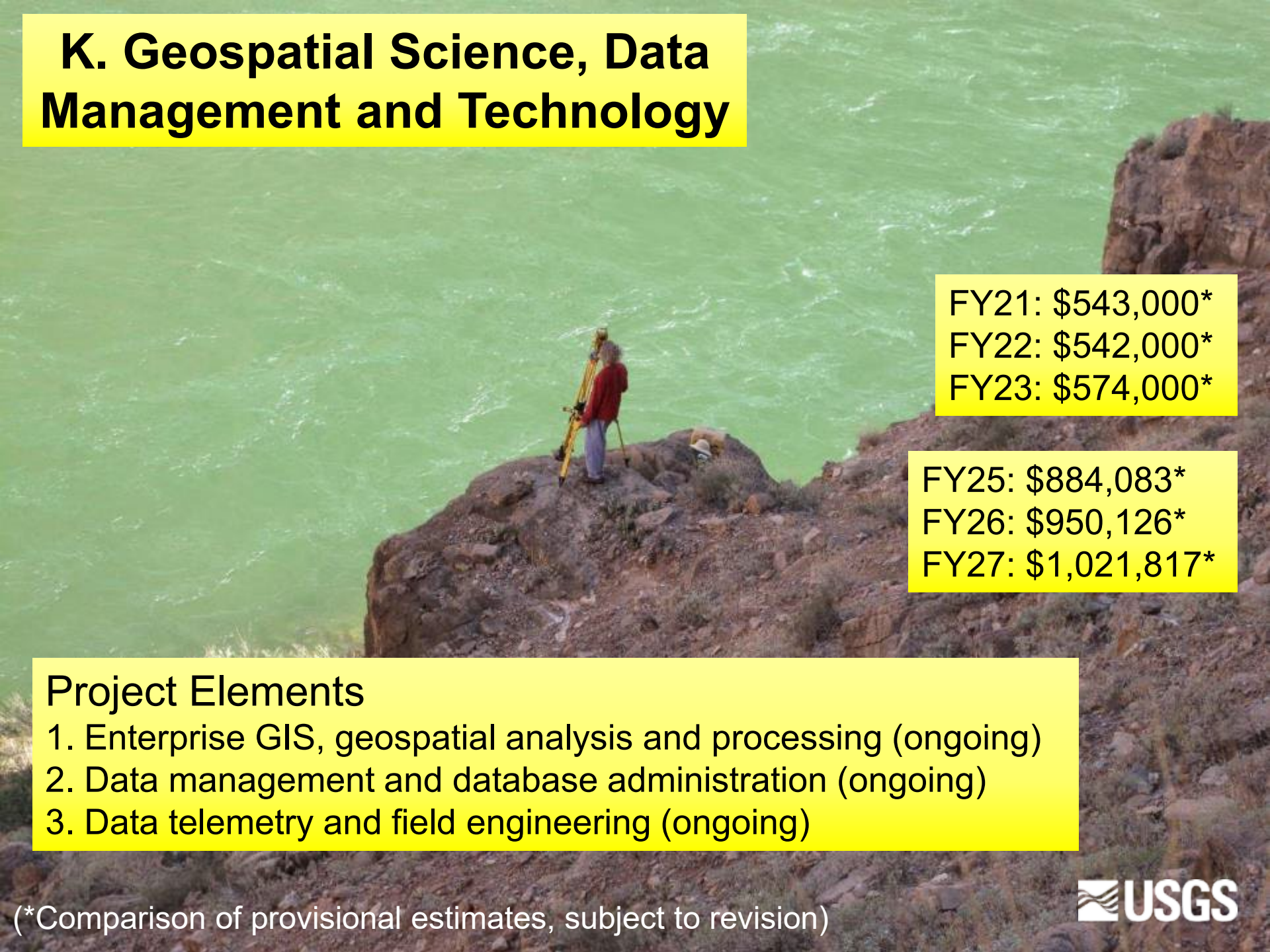
(*Comparison of provisional estimates, subject to revision)

K. Geospatial Science, Data Management and Technology



FY21: $543,000*
FY22: $542,000*
FY23: $574,000*

FY25: $884,083*
FY26: $950,126*
FY27: $1,021,817*

Project Elements

1. Enterprise GIS, geospatial analysis and processing (ongoing)
2. Data management and database administration (ongoing)
3. Data telemetry and field engineering (ongoing)

(*Comparison of provisional estimates, subject to revision)

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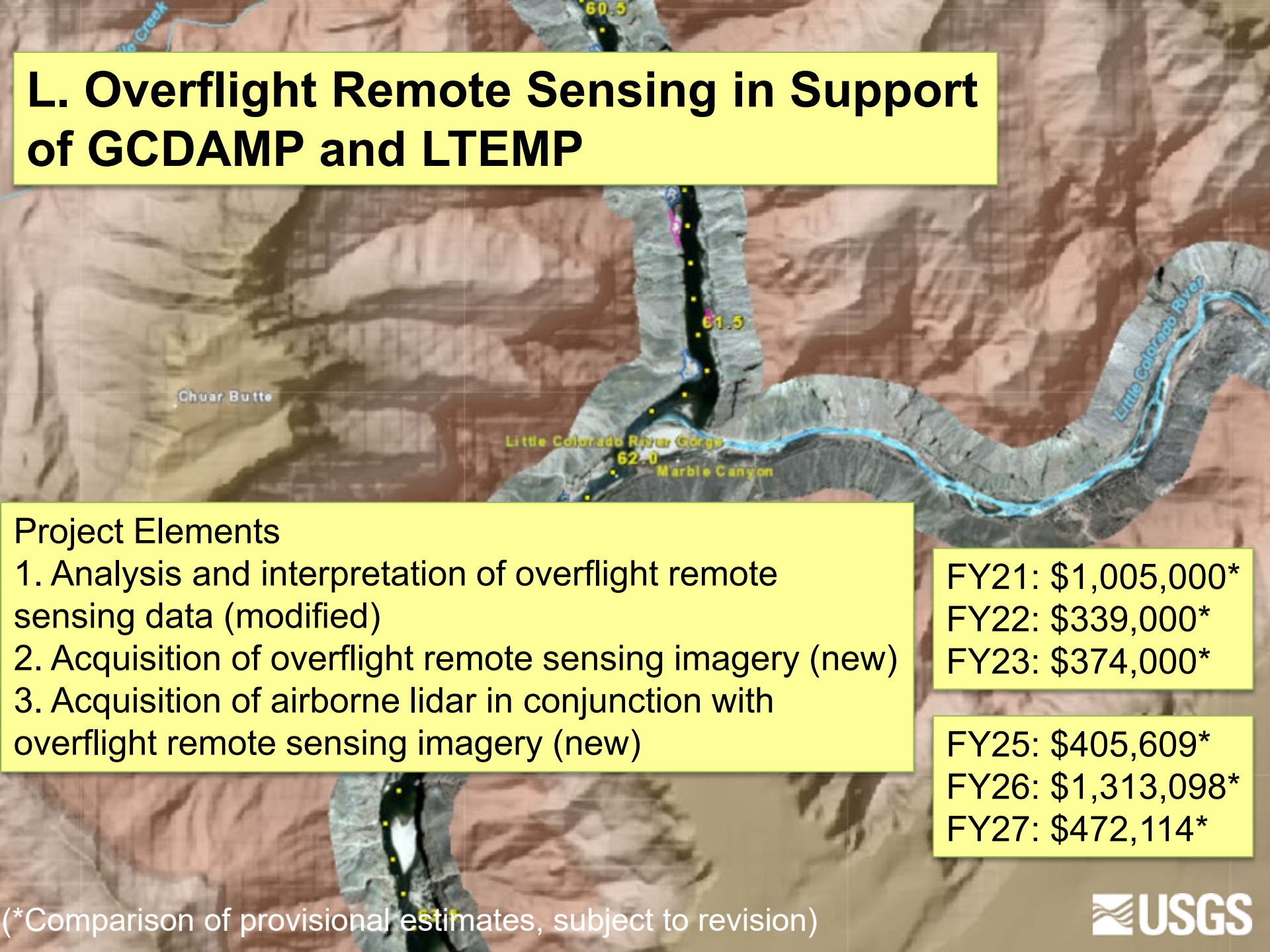
L. Overflight Remote Sensing in Support of GCDAMP and LTEMP



Project Elements

1. Analysis and interpretation of overflight remote sensing data (modified)
2. Acquisition of overflight remote sensing imagery (new)
3. Acquisition of airborne lidar in conjunction with overflight remote sensing imagery (new)

FY21: $1,005,000*
FY22: $339,000*
FY23: $374,000*

FY25: $405,609*
FY26: $1,313,098*
FY27: $472,114*

(*Comparison of provisional estimates, subject to revision)

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M. Leadership, Management and Support

FY21: $1,505,000*
FY22: $1,674,000*
FY23: $1,763,000*

FY25: $1,691,553*
FY26: $1,796,312*
FY27: $1,924,467*

Project Elements

1. Leadership, management, and support
   a. Salaries (leadership; support staff)
   b. GCMRC travel and training
   c. GCMRC operating costs (vehicles, supplies/equipment, maintenance, etc.)
2. Logistics staff
   a. Salaries
   b. Grand Canyon Youth
3. Information Technology
   a. Equipment
   b. Support costs

(*Comparison of provisional estimates, subject to revision)

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N. Native Fish Population Dynamics (New Project)

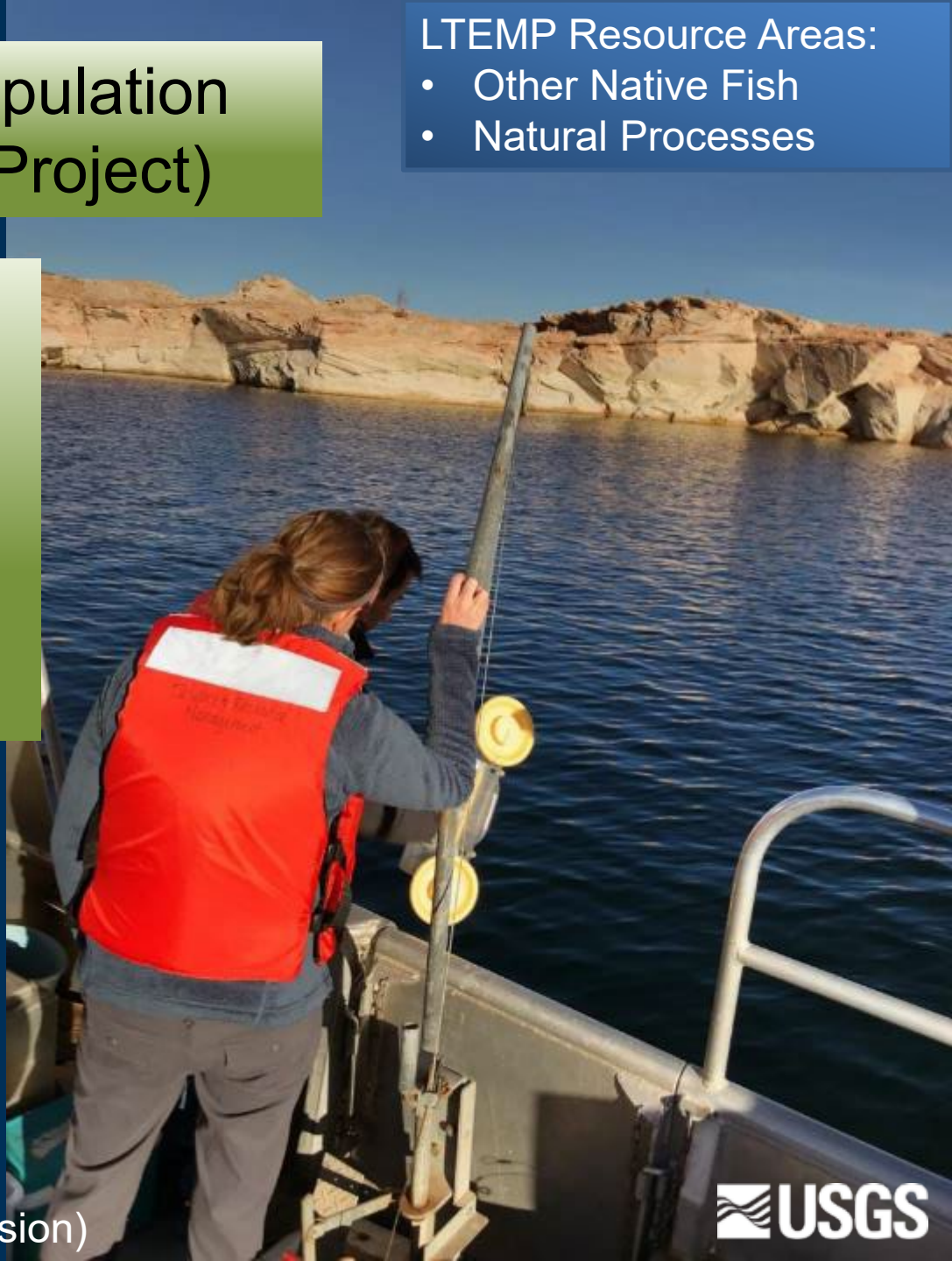
LTEMP Resource Areas:
- Other Native Fish
- Natural Processes

Project Elements (all new)

1. Sucker and dace distribution and demographic modeling
2. Predictive modeling and decision support for native fishes
3. Evaluating dispersal and sources of mortality of razorback sucker using new technology

FY25: $393,958*
FY26: $339,377*
FY27: $356,609*

(*Provisional estimates, subject to revision)



Proposed FY25-27 TWP Budget Summary by Project*

Project	Project Description	Project Lead	FY25 Totals	FY26 Totals	FY27 Totals
A	Streamflow, Water Quality, and Sediment Transport and Budgeting	David Topping	$ 1,420,617	$ 1,500,372	$ 1,585,138
B	Sandbar and Sediment Storage Monitoring and Research	Paul Grams	$ 1,374,683	$ 1,383,150	$ 1,634,752
C	Riparian Vegetation Monitoring and Research	Emily Palmquist	$ 609,310	$ 629,694	$ 625,984
D	Effects of Dam Operations and Vegetation Management for Archaeological Sites	Joel Sankey	$ 524,953	$ 631,699	$ 670,798
E	Controls on Ecosystem Productivity: Nutrients, Flow, and Temperature	Bridget Deemer	$ 697,967	$ 636,664	$ 733,389
F	Aquatic Invertebrate Ecology	Ted Kennedy	$ 1,135,986	$ 1,220,081	$ 1,308,287
G	Humpback Chub Population Dynamics throughout the Colorado River Ecosystem	Maria Dzul	$ 2,333,232	$ 2,378,202	$ 2,399,963
H	Salmonid Research and Monitoring	Brian Healy	$ 635,504	$ 634,574	$ 659,181
I	Non-Native Species Monitoring and Research	Kim Dibble	$ 1,379,402	$ 1,414,036	$ 1,333,846
J	Socioeconomic Research	Lucas Bair	$ 617,004	$ 629,509	$ 645,457
K	Geospatial Science, Data Management, and Technology	Tom Gushue	$ 884,083	$ 950,126	$ 1,021,817
L	Overflight Remote Sensing in Support of GCDAMP and LTEMP	Joel Sankey	$ 405,609	$ 1,313,098	$ 472,114
M	Leadership, Management, and Support	Andrew Schultz	$ 1,691,553	$ 1,796,312	$ 1,924,467
N	Native Fish Population Dynamics	Brian Healy	$ 393,958	$ 339,377	$ 356,609
		Grand Totals	$ 14,103,861	$ 15,456,894	$ 15,371,802

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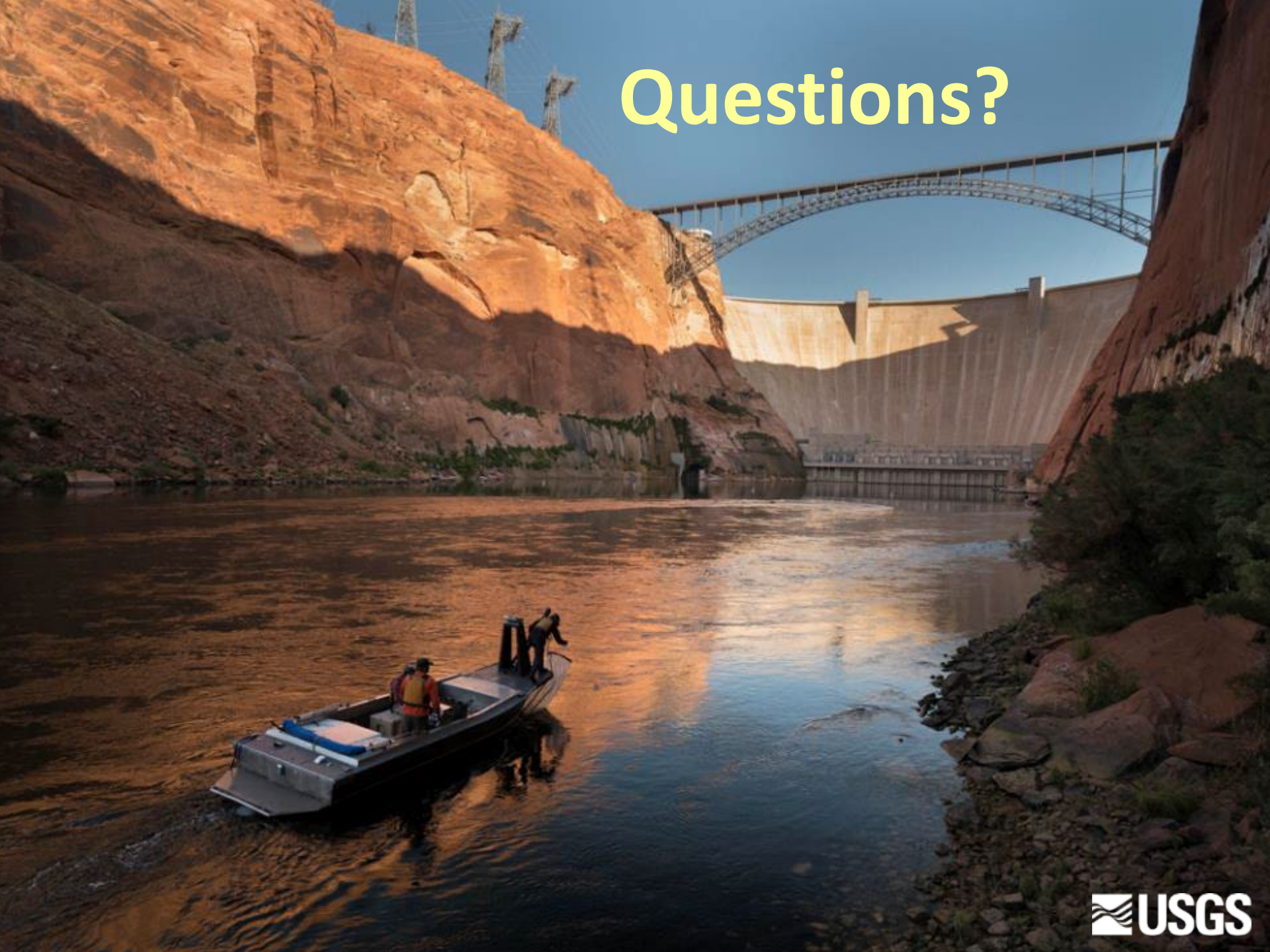
(*All estimates are provisional, subject to revision)


Questions?
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