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GCMRC FY 2021-23 Triennial Workplan and Budget – 2nd Draft

Adaptive Management Work Group Webinar
May 20, 2020

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U.S. Department of the Interior
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
	Nonnative Invasive Species
Tribal Concerns/Resources	Riparian Vegetation

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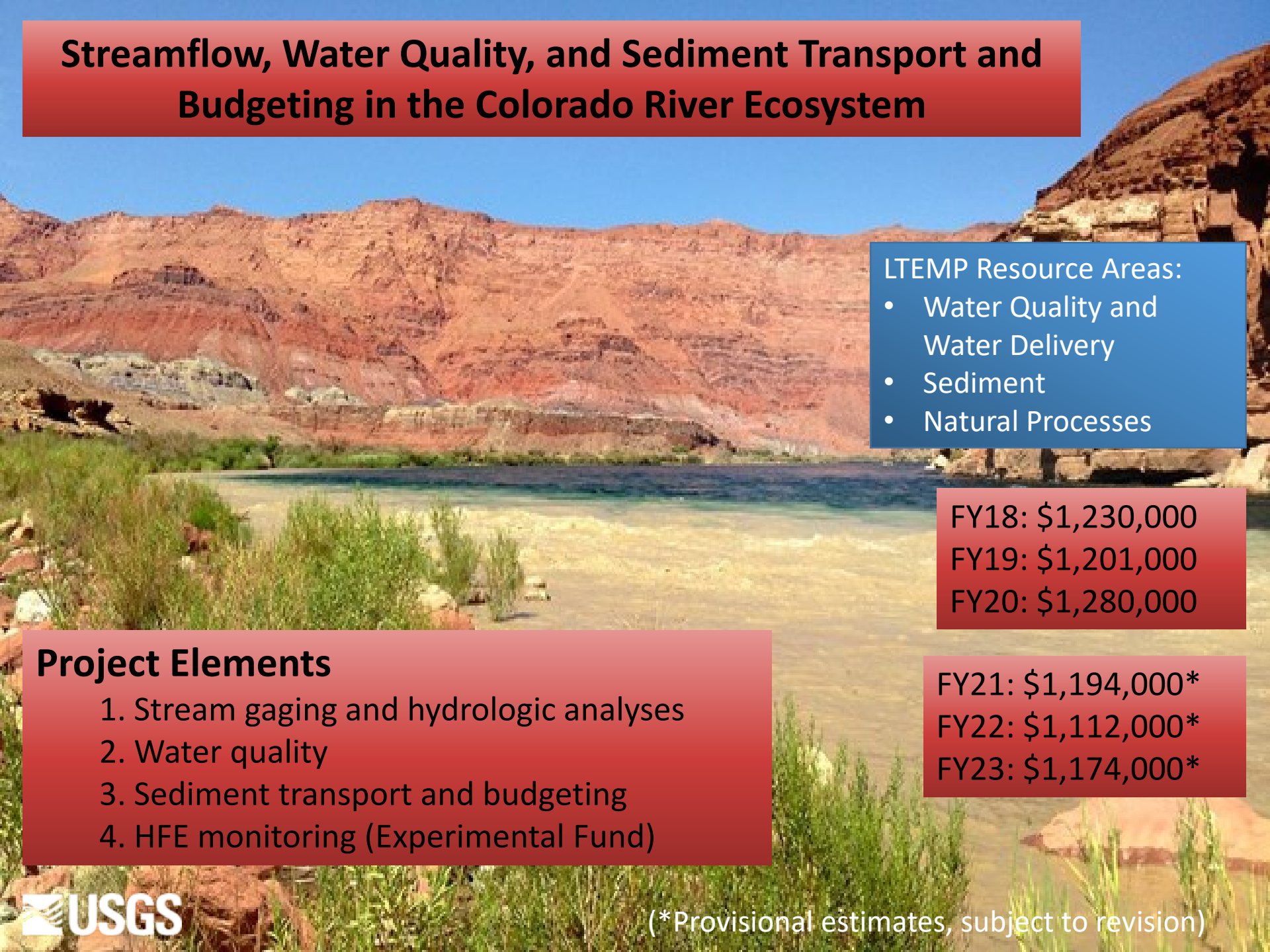
Streamflow, Water Quality, and Sediment Transport and Budgeting in the Colorado River Ecosystem



LTEMP Resource Areas:

- Water Quality and Water Delivery
- Sediment
- Natural Processes

FY18: $1,230,000
FY19: $1,201,000
FY20: $1,280,000

FY21: $1,194,000*
FY22: $1,112,000*
FY23: $1,174,000*

Project Elements

1. Stream gaging and hydrologic analyses
2. Water quality
3. Sediment transport and budgeting
4. HFE monitoring (Experimental Fund)

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(*Provisional estimates, subject to revision)

Sandbar and Sediment Storage Monitoring and Research

Project Elements

1. Monitoring sandbars using topographic surveys and remote cameras
2. Bathymetric and topographic mapping for monitoring long-term trends in sediment storage
3. Control network and survey support
4. Bank erosion, bed sedimentation, and channel change in the Colorado R. arm of the Lake Mead Delta in Grand Canyon**
5. Streamflow modeling**
6-9. Sandbar and riverbed response to experimental actions (Experimental Fund)

FY18: $1,039,000
FY19: $1,050,000
FY20: $1,015,000

FY21: $1,027,000*
FY22: $910,000*
FY23: $990,000*

LTEMP Resource Areas:

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

(*Provisional estimates, subject to revision)
(**Not funded in 2nd draft)

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Riparian Vegetation Monitoring and Research

Project Elements

1. Ground-based riparian vegetation monitoring
2. Mechanistic experiments with plant species of interest
3. Predictive modeling of vegetation responses to dam operations
4. Vegetation management decision support

FY18: $585,000
FY19: $515,000
FY20: $515,000

FY21: $328,000*
FY22: $335,000*
FY23: $345,000*

LTEMP Resource Areas:

- Riparian Vegetation
- Natural Processes
- Recreational Experience

(*Provisional estimates, subject to revision)

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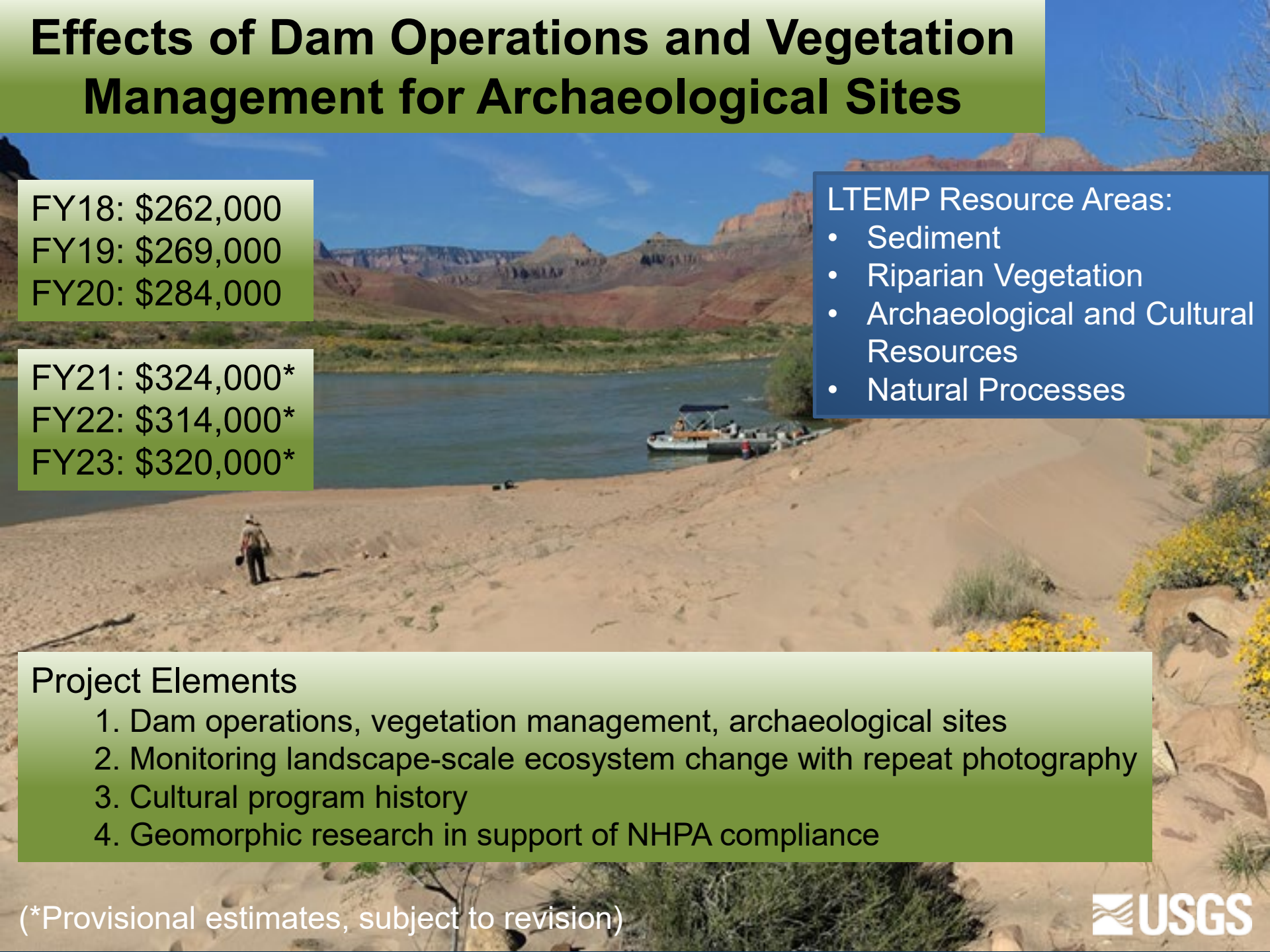
Effects of Dam Operations and Vegetation Management for Archaeological Sites



FY18: $262,000
FY19: $269,000
FY20: $284,000

FY21: $324,000*
FY22: $314,000*
FY23: $320,000*

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

Project Elements
1. Dam operations, vegetation management, archaeological sites
2. Monitoring landscape-scale ecosystem change with repeat photography
3. Cultural program history
4. Geomorphic research in support of NHPA compliance

(*Provisional estimates, subject to revision)

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Controls on Ecosystem Productivity: Nutrients, Flow, and Temperature

Project Elements

1. Phosphorus budgeting in the Colorado River
   Identify the relative importance of different phosphorus sources to the productivity of the Colorado River system
2. Rates and composition of primary producers in the Colorado River
   Identify patterns and controls on primary productivity in the Colorado River
3. Productivity at higher trophic levels
   Fish metabolism and ecosystem modeling

FY18: $343,000
FY19: $254,000
FY20: $284,000

FY21: $408,000*
FY22: $294,000*
FY23: $287,000*

LTEMP Resource Areas:
- Water Quality and Water Delivery
- Other Resources (Food Base)
- Natural Processes

(*Provisional estimates, subject to revision)

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Aquatic Invertebrate Ecology (Food Base)

Project Elements

1. Aquatic invertebrate monitoring in Marble and Grand Canyons
2. Aquatic invertebrate monitoring in Glen Canyon
3. Aquatic invertebrate monitoring of Grand Canyon tributaries
4. Fish diet studies
5. Spring powerplant capacity flow (Experimental Fund)

FY18: $771,000
FY19: $746,000
FY20: $718,000

FY21: $766,000*
FY22: $709,000*
FY23: $700,000*

LTEMP Resource Areas:

- Other Resources (Food Base)
- Natural Processes

Dave Herasimtschuk

FI/USGS

(*Provisional estimates, subject to revision)

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Humpback Chub Population Dynamics Throughout the Colorado River

LTEMP Resource Areas:
- Humpback Chub
- Natural Processes

Project Elements

1. Humpback chub population monitoring
2. Annual spring/fall abundance estimates of humpback chub in the lower 13.6 km of the LCR
3. Juvenile Chub Monitoring near the LCR Confluence
4. Remote PIT Tag Array Monitoring in the LCR
5. Monitoring Humpback Chub Aggregation Relative Abundance and Distribution
6. Juvenile Humpback Chub Monitoring – West
7. Chute Falls Translocations
8. Backwater Seining**
9. Assessing yearly variability in humpback chub hatch dates**

FY18: $1,506,000
FY19: $1,637,000
FY20: $1,632,000

FY21: $1,661,000*
FY22: $1,835,000*
FY23: $1,598,000*

(*Provisional estimates, subject to revision) (**Not funded in 2nd draft)

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Salmonid Research and Monitoring

Project Elements

1. Rainbow Trout Monitoring in Glen Canyon
2. Trout Reproductive and Growth Dynamics
3. Brown Trout early life history stages in Glen Canyon
4. Salmonid modelling

FY18: $683,000
FY19: $717,000
FY20: $667,000

FY21: $757,000*
FY22: $512,000*
FY23: $500,000*

LTEMP Resource Areas:

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

(*Provisional estimates, subject to revision)

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Warm-water Native and Non-Native Fish Monitoring and Research

LTEMP Resource Areas:

- Other Native Fish
- Nonnative Invasive Species
- Recreational Experience
- Natural Processes

Project Elements

1. System-wide native fish and invasive aquatic species monitoring
2. Invasion and colonization dynamics of warm-water invasive fishes
3. Impacts of channel catfish on native fish in the Little Colorado River

FY18: $557,000
FY19: $581,000
FY20: $598,000

FY21: $598,000*
FY22: $651,000*
FY23: $637,000*

(*Provisional estimates, subject to revision)

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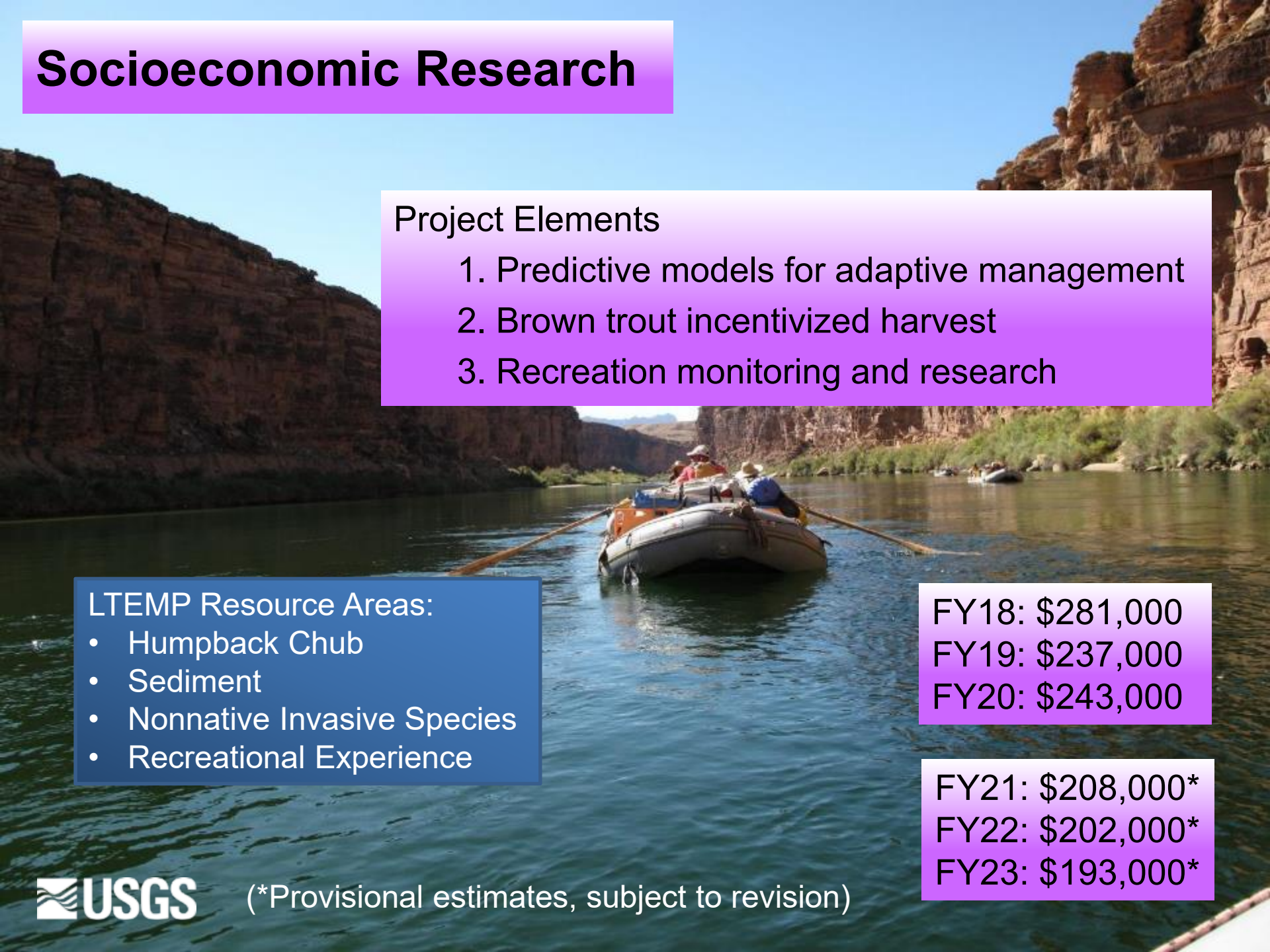
Socioeconomic Research



Project Elements

1. Predictive models for adaptive management
2. Brown trout incentivized harvest
3. Recreation monitoring and research

LTEMP Resource Areas:

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

FY18: $281,000
FY19: $237,000
FY20: $243,000

FY21: $208,000*
FY22: $202,000*
FY23: $193,000*

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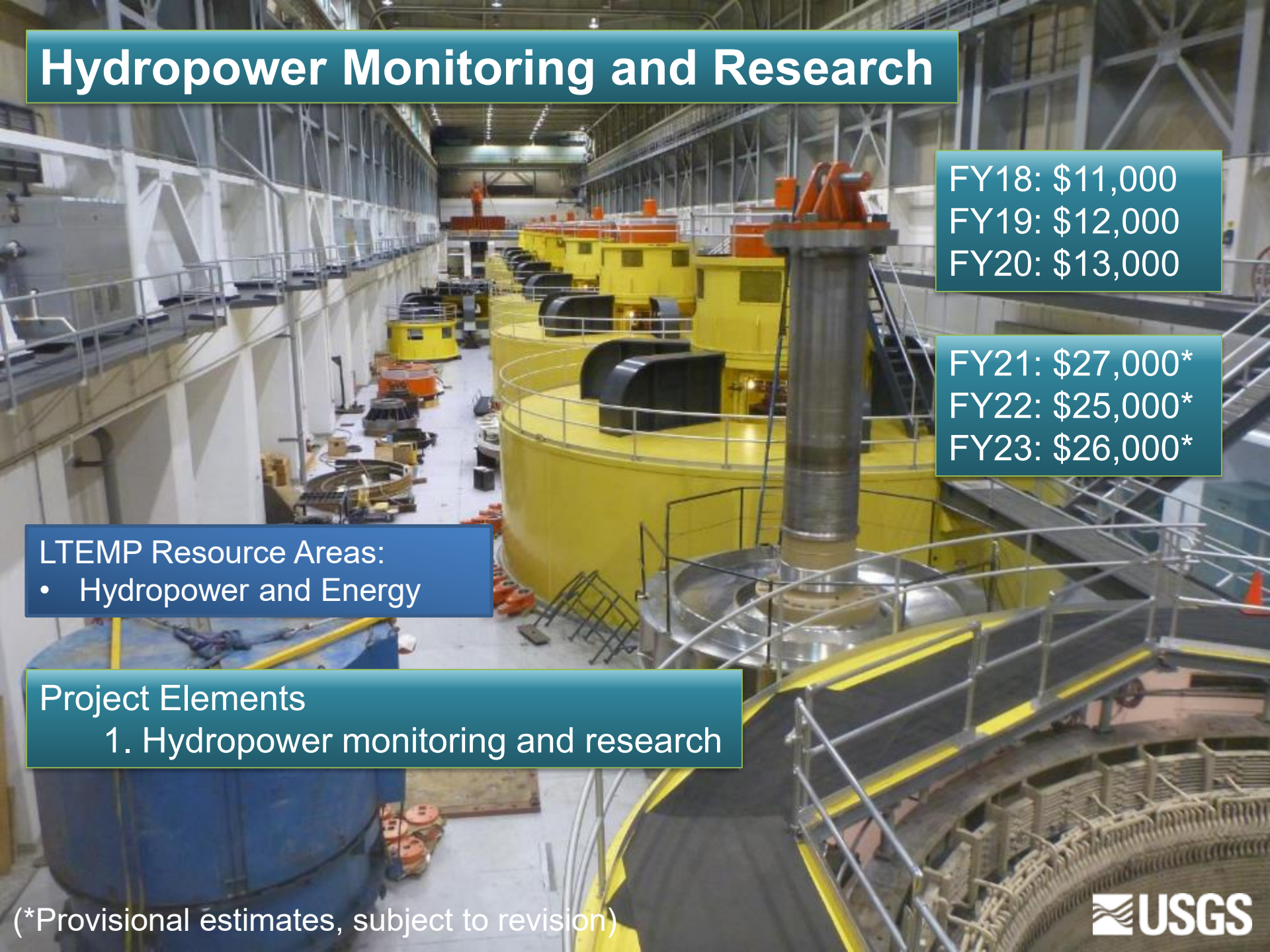
(*Provisional estimates, subject to revision)

Hydropower Monitoring and Research



FY18: $11,000
FY19: $12,000
FY20: $13,000

FY21: $27,000*
FY22: $25,000*
FY23: $26,000*

LTEMP Resource Areas:
- Hydropower and Energy

Project Elements
1. Hydropower monitoring and research

(*Provisional estimates, subject to revision)

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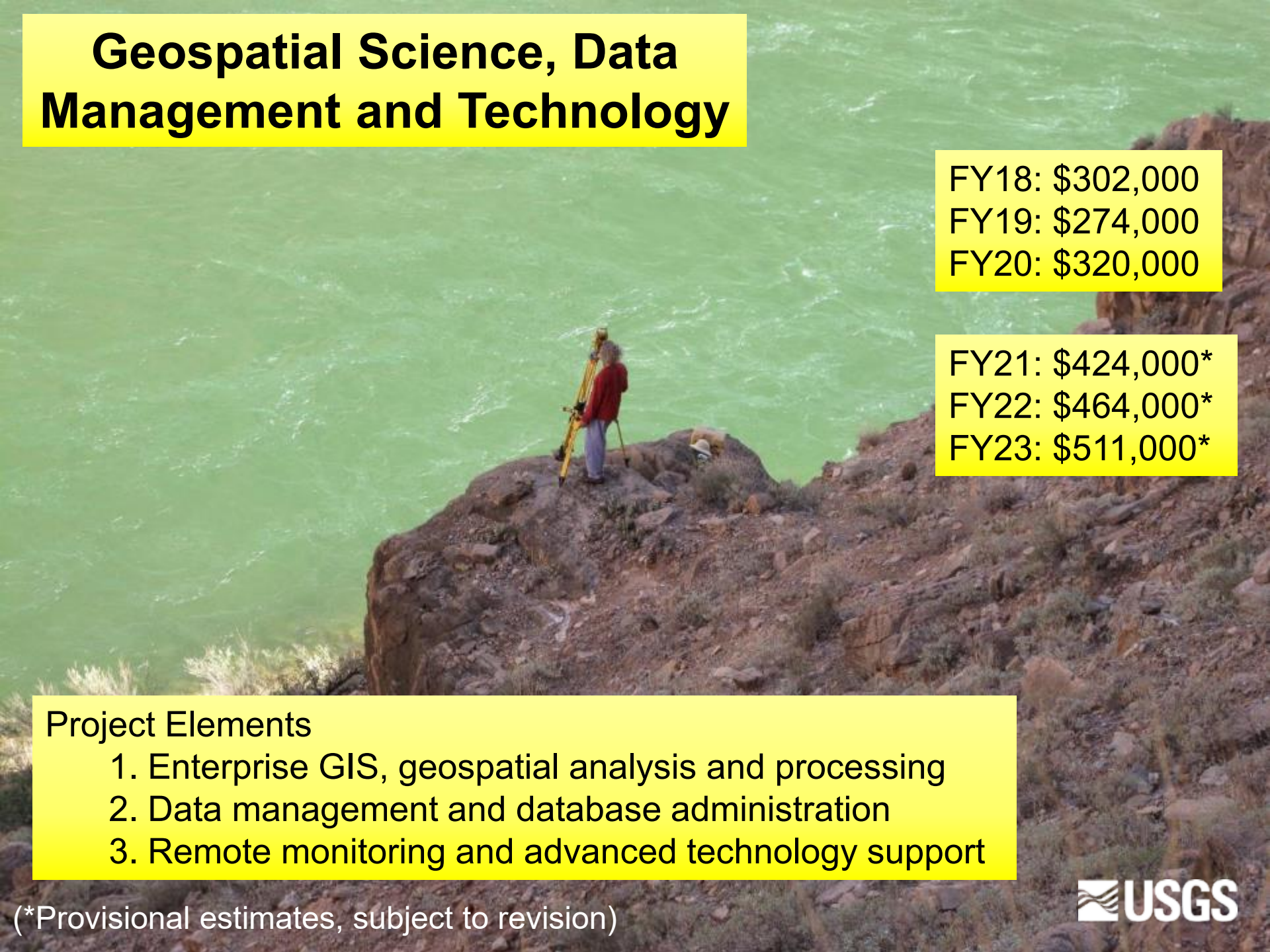
Geospatial Science, Data Management and Technology



FY18: $302,000
FY19: $274,000
FY20: $320,000

FY21: $424,000*
FY22: $464,000*
FY23: $511,000*

Project Elements

1. Enterprise GIS, geospatial analysis and processing
2. Data management and database administration
3. Remote monitoring and advanced technology support

(*Provisional estimates, subject to revision)

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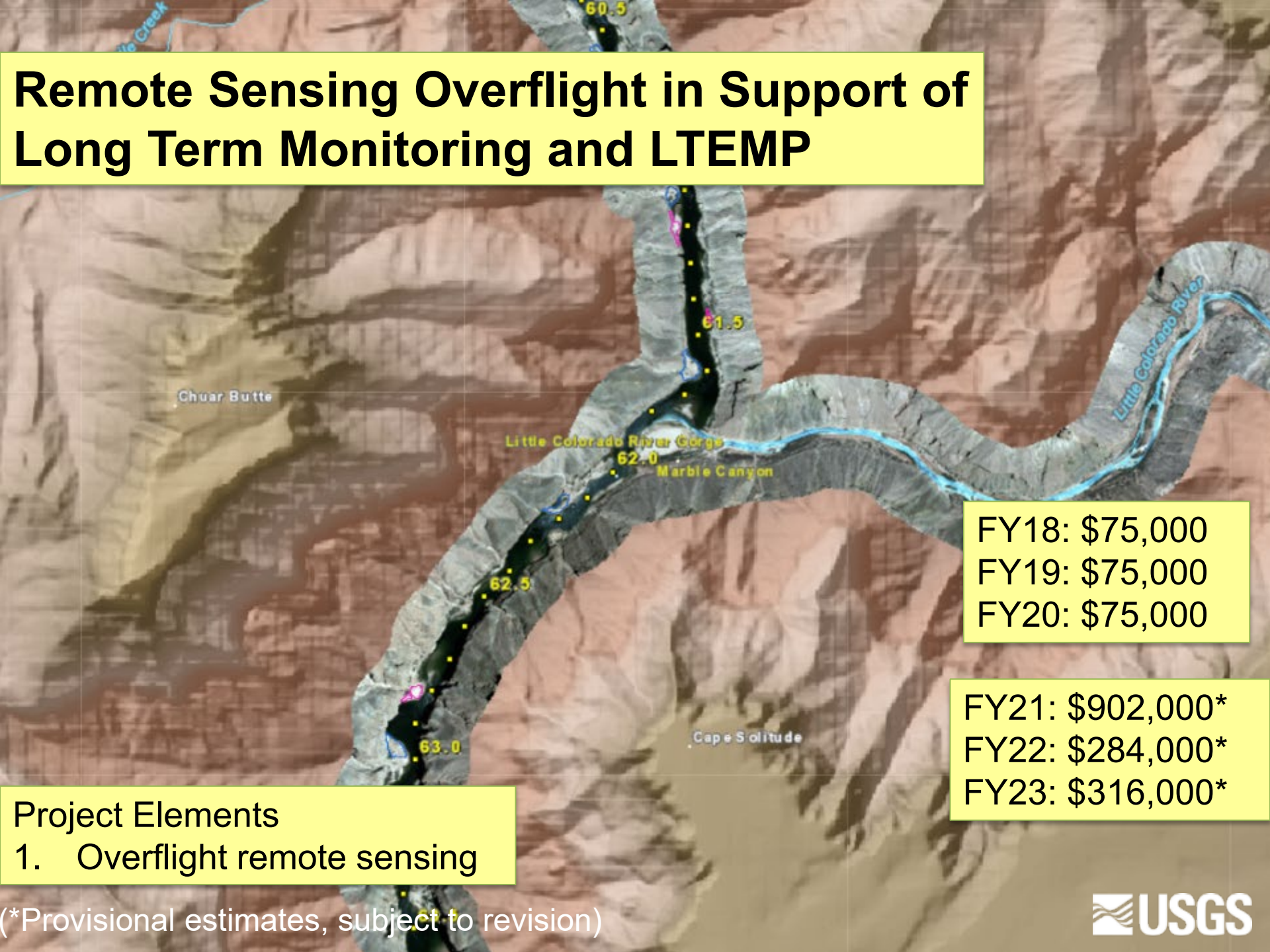
Remote Sensing Overflight in Support of Long Term Monitoring and LTEMP



FY18: $75,000
FY19: $75,000
FY20: $75,000

FY21: $902,000*
FY22: $284,000*
FY23: $316,000*

Project Elements
1. Overflight remote sensing

(*Provisional estimates, subject to revision)

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Leadership, Management, and Support

FY18: $1,375,000
FY19: $1,356,000
FY20: $1,444,000

FY21: $1,407,000*
FY22: $1,427,000*
FY23: $1,492,000*

Project Elements

1. Salaries
   - Leadership
   - Program manager
   - Support staff
   - Logistics staff
2. Travel and training
3. Vehicle costs
4. IT supplies and support

(*Provisional estimates, subject to revision)

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Lake Powell Water Quality*

Project Elements

1. Description of water-quality status and trends in Lake Powell and Glen Canyon Dam releases
2. Documentation of historical record of Lake Powell water-quality conditions

FY18: $197,000
FY19: $208,000
FY20: $212,000

FY21: $216,000**
FY22: $219,000**

*Not Funded by the GCDAMP
(**Provisional estimates, subject to revision)

Stakeholder Feedback

- Feedback received on first draft of TWP sent out April 2, 2020 during BAHG calls, TWG meeting, and in writing
- All comments and suggestion were thoroughly reviewed and considered
- Reponses to comments and suggestions were incorporated into second draft sent out May 19, 2020

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Stakeholder Feedback, cont.

- A few examples of how these were comments and suggestions were addressed are below:
  - Prioritize conservation measures in BiOp such as humpback chub monitoring, foodbase, and primary production – G.1, G.2, G.3, G.7, F.1, E.2
  - Prioritize sediment monitoring and budgeting to support HFE decision-making – A.2, A.3, B.1
  - Eliminate Holocene sediment map – D.4
  - Prioritize experimental vegetation treatment to improve ecosystem function – C.4, D.1
  - Refocus hydropower research to opportunities associated with dam operations and experiments – N.1

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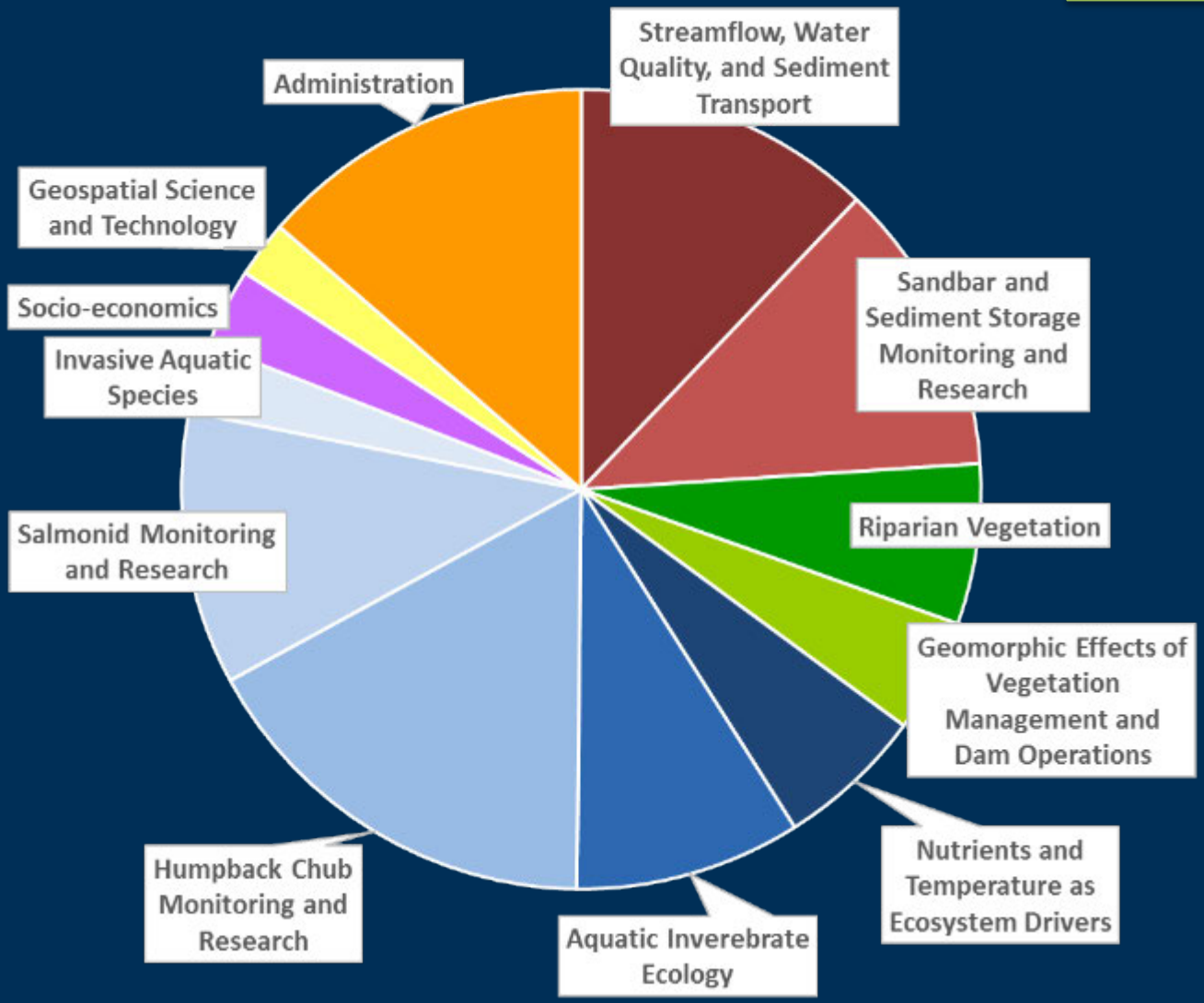
FY2020
Funding $9,088,000



Geophysical sciences	24%
Vegetation & effects of management	11%
Aquatic and fish science	46%
Socioeconomics	3%
GIS and remote sensing	2%
Administration and support	14%

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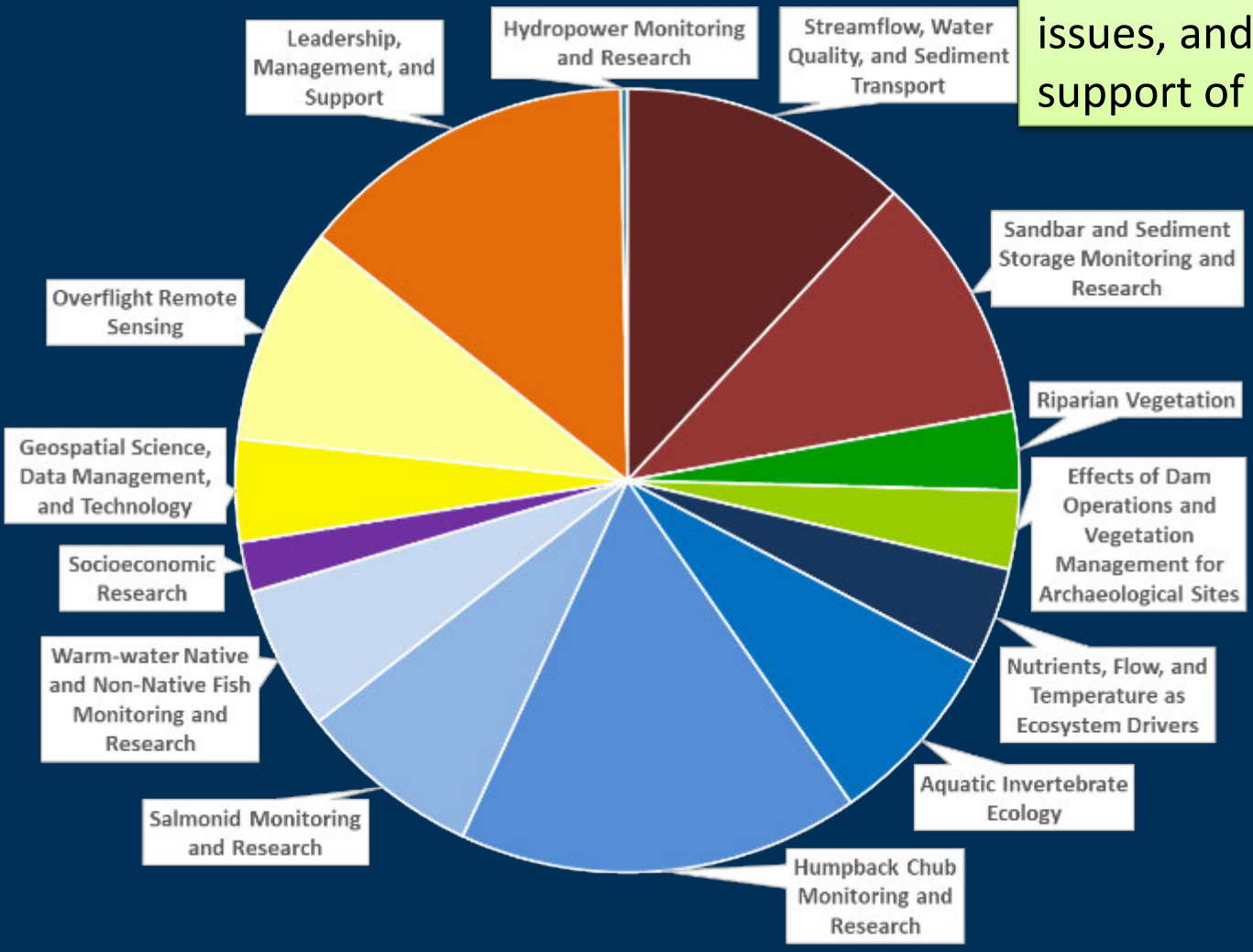
Potential Allocation of FY2021 budget based on GCMRC/agency assessment of stakeholder interests and feedback, scientific issues, and monitoring mandates in support of LTEMP implementation



Geophysical sciences	22%*
Vegetation & effects of management	7%*
Aquatic and fish science	42%*
Socioeconomics	2%*
GIS and remote sensing	13%*
Administration and support	14%*

(*Provisional estimates, subject to revision)

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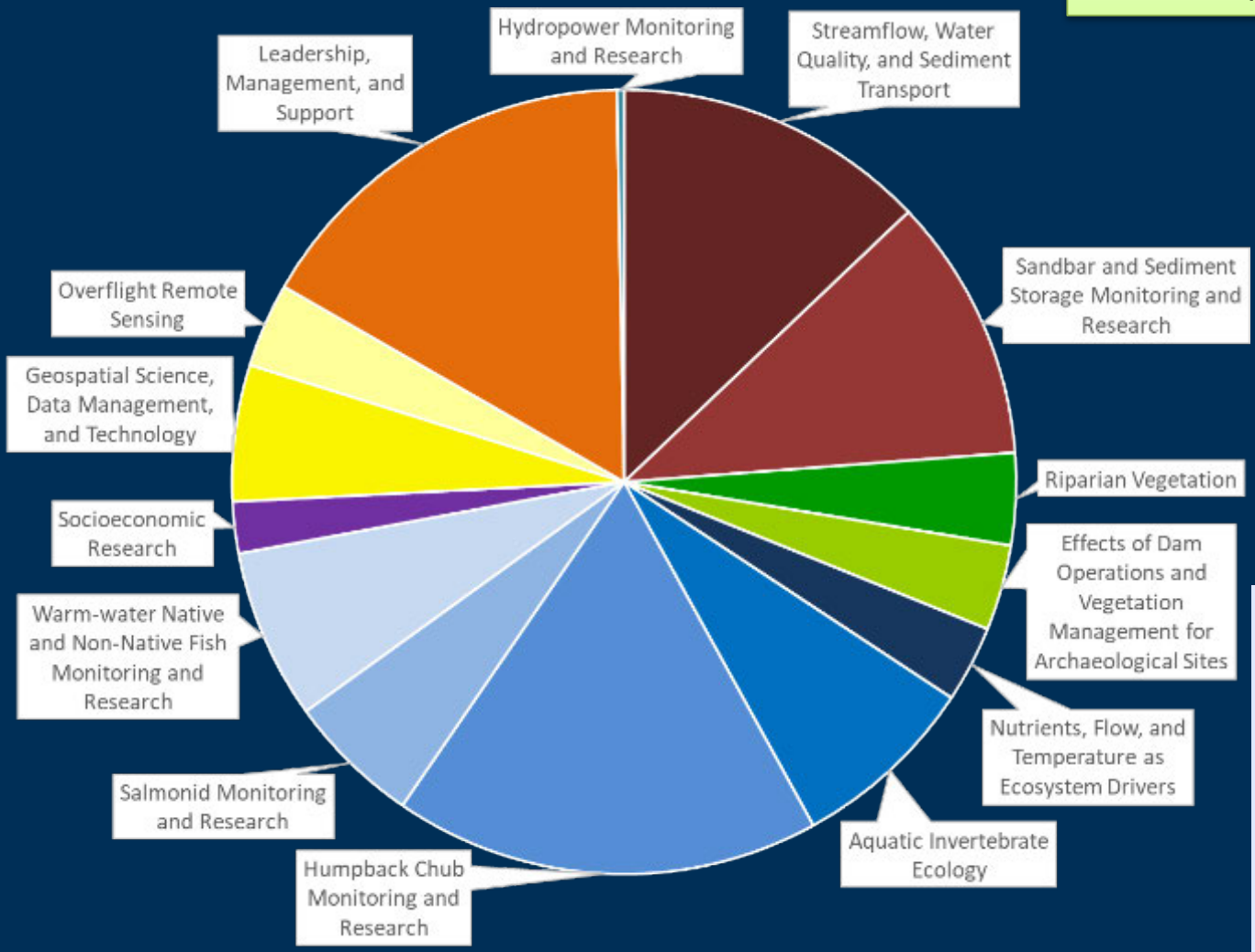
Proportions remain relatively unchanged for potential allocations in FY2022 and FY2023 (FY2023 shown)



Geophysical sciences	24%*
Vegetation & effects of management	7%*
Aquatic and fish science	41%*
Socioeconomics	2%*
GIS and remote sensing	9%*
Administration and support	16%*

(*Provisional estimates, subject to revision)

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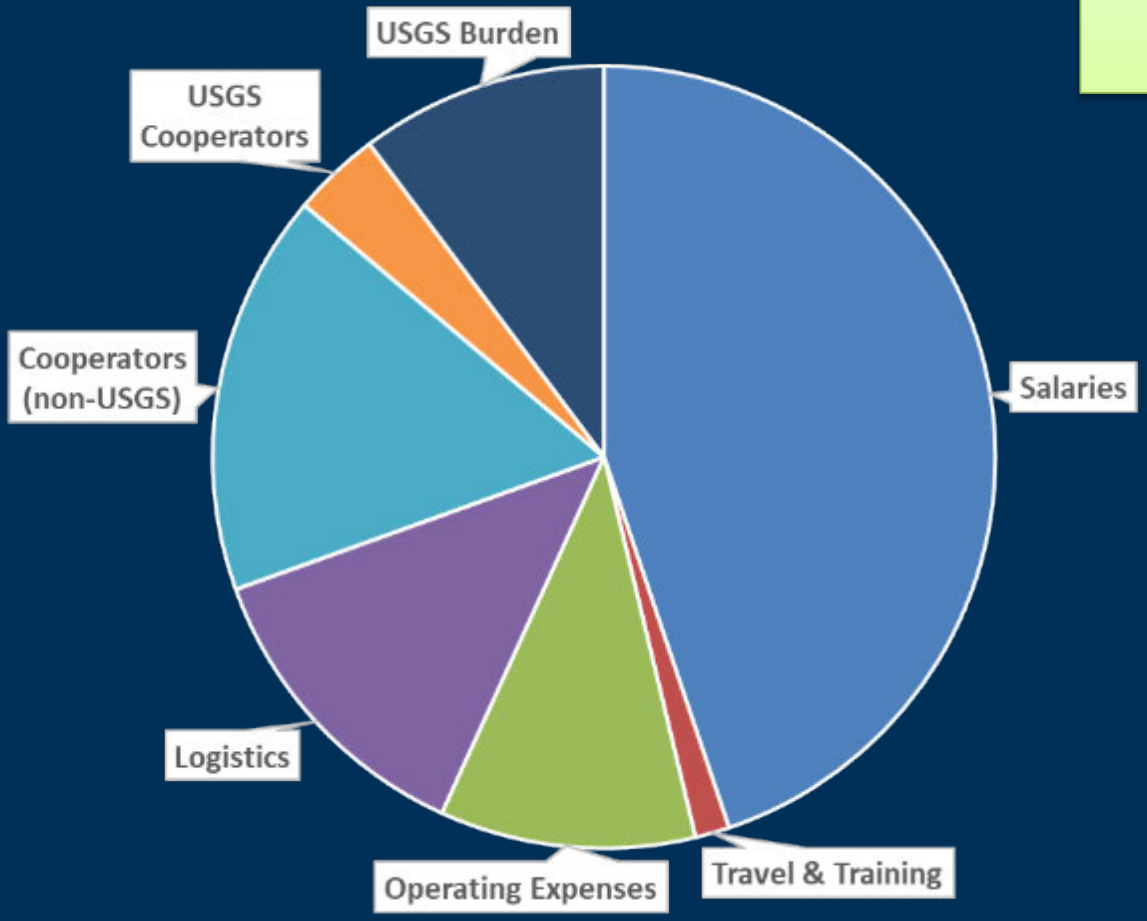
Potential Allocation of FY2021 budget proportions by general categories



Categories	
Salaries	45%*
Travel & Training	1%*
Operating Expenses	10%*
Logistics	13%*
Cooperators (non-USGS)	17%*
USGS Cooperators	4%*
USGS Burden	10%*

Burden rates:
USGS – 14%*
Pass through – 3%*
Sub-allocation – 0%*

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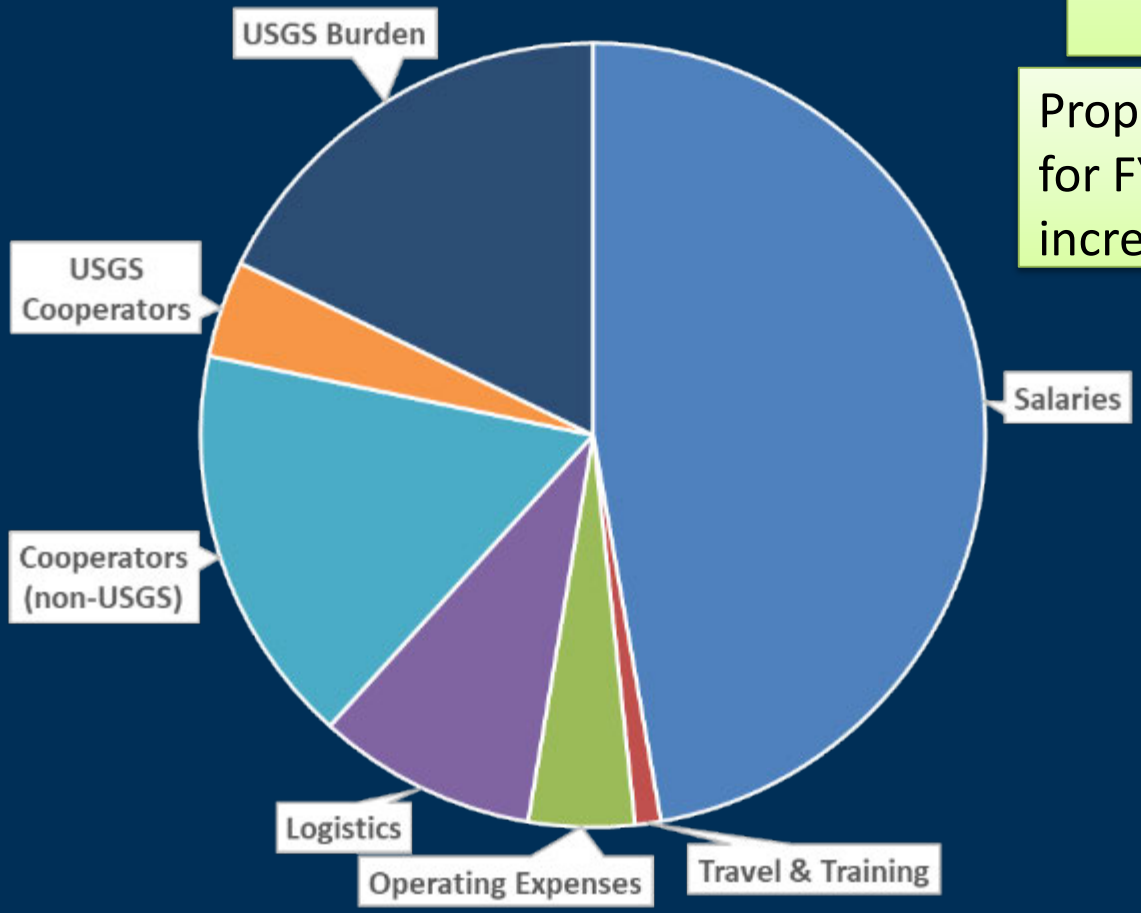
(*Provisional estimates, subject to revision)

Potential Allocation of FY2023 budget proportions by general categories



Proportions are relatively similar for FY2022 and FY2023, with increase in burden rate in FY2023

Categories	
Salaries	47%*
Travel & Training	1%*
Operating Expenses	4%*
Logistics	9%*
Cooperators (non-USGS)	17%*
USGS Cooperators	4%*
USGS Burden	18%*

Burden rates:
USGS – 28%*
Pass through – 3%*
Sub-allocation – 0%*

USGS

(*Provisional estimates, subject to revision)

Proposed FY2021-23 Triennial Workplan*

Project	FY2021	FY2022	FY2023
Streamflow, Water Quality, and Sediment Transport	$ 1,194,000	$ 1,112,000	$ 1,174,000
Sandbar and Sediment Storage Monitoring and Research	$ 1,027,000	$ 910,000	$ 990,000
Riparian Vegetation	$ 328,000	$ 335,000	$ 345,000
Effects of Dam Operations and Vegetation Management for Archaeological Sites	$ 324,000	$ 314,000	$ 320,000
Nutrients, Flow, and Temperature as Ecosystem Drivers	$ 408,000	$ 294,000	$ 287,000
Aquatic Invertebrate Ecology	$ 766,000	$ 709,000	$ 700,000
Humpback Chub Monitoring and Research	$ 1,661,000	$ 1,835,000	$ 1,598,000
Salmonid Monitoring and Research	$ 757,000	$ 512,000	$ 500,000
Warm-water Native and Non-Native Fish Monitoring and Research	$ 598,000	$ 651,000	$ 637,000
Socioeconomic Research	$ 208,000	$ 204,000	$ 193,000
Geospatial Science, Data Management, and Technology	$ 424,000	$ 464,000	$ 511,000
Overflight Remote Sensing	$ 902,000	$ 284,000	$ 316,000
Leadership, Management, and Support	$ 1,407,000	$ 1,427,000	$ 1,492,000
Hydropower Monitoring and Research	$ 27,000	$ 25,000	$ 26,000
Total	$10,033,000	$ 9,078,000	$ 9,087,000
Anticipated AMP Funding Available (80.0% and 0% CPI)	$ 9,088,000	$ 9,088,000	$ 9,088,000
Overflight Carryover: FY2018-20 savings + logistics funding from 2020 cancelled trips	$ 445,000	$ -	$ -
Anticipated Carryover Funding From Previous Fiscal Year	$ 500,000	$ -	$ 10,000
Long/Short	$ -	$ 10,000	$ 11,000
Lake Powell Water Quality Monitoring: NOT GCDAMP Funded	$ 216,000	$ 219,000	N/A
Experimental Fund Proposals	$ 989,000	$ 1,041,000	$ 981,000

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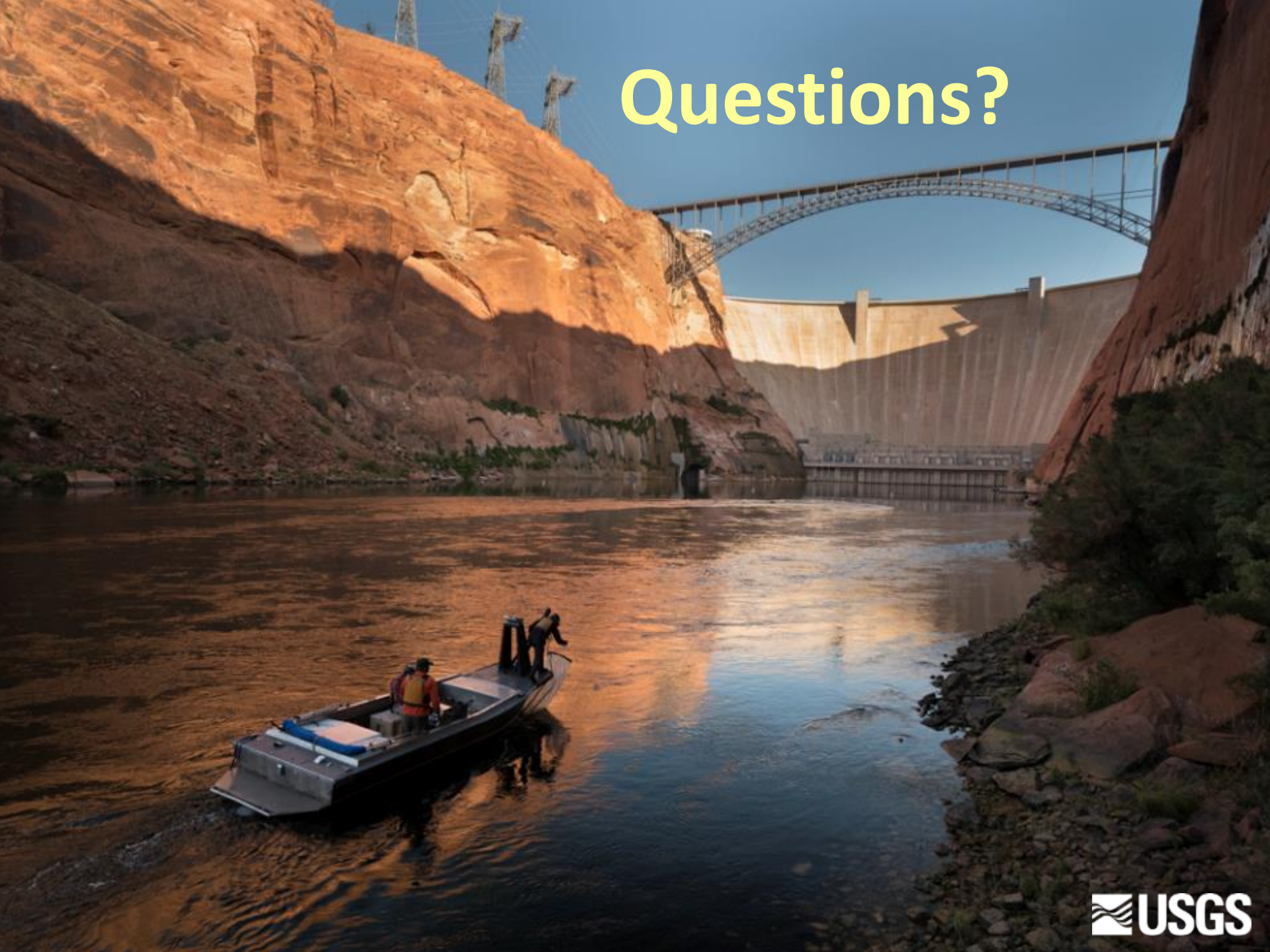
(*All estimates are provisional, subject to revision)

(Amounts rounded to nearest $1,000)


Questions?
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