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Preliminary GCMRC FY 2018-20 Triennial Workplan and Budget

Technical Work Group Meeting
April 20-21, 2017

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Southwest Biological Science Center

Grand Canyon Monitoring and Research Center

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

Project Elements

1. Stream gaging
2. Water quality
3. Sediment transport and budgeting

LTEMP Resource Areas:

- Water Quality and Water Delivery
- Sediment
- Natural Processes

FY18: $1,396,000
FY19: $1,424,000
FY20: $1,453,000

Proposed budget amounts are preliminary and subject to change.

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C. Riparian Vegetation Monitoring and Research

Project Elements

1. Ground-based riparian vegetation monitoring
2. Imagery-based riparian vegetation monitoring at the landscape scale
3. Revisit and update marsh community changes published in 1995 by Stevens et al.
4. Develop predictive models of vegetation responses to LTEMP flow scenarios
5. LTEMP vegetation management planning, monitoring, and research
6. Decadal-scale vegetation monitoring based on replication of historical photographs

FY18: $749,000
FY19: 765,000
FY20: 788,000

Proposed budget amounts are preliminary and subject to change.

LTEMP Resource Areas:

- Riparian Vegetation
- Natural Processes
- Recreational Experience

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D. Effects of vegetation management and dam operations for geomorphic condition and sand resources at archaeological sites and source-bordering dunefields

FY18: $531,000
FY19: $592,000
FY20: $543,000

Proposed budget amounts are preliminary and subject to change.

LTEMP Resource Areas:

- Sediment
- Riparian Vegetation
- Archaeological and Cultural Resources
- Natural Processes

Project Elements

1. Monitoring archaeological site, dunefield, and their sand supply condition as a function of vegetation management and dam operations
2. Assess terrace erosion in Glen Canyon.
3. Reach-scale erosion of terraces and other pre-dam river sediment deposits in Glen, Marble and Grand Canyons.
4. Quantify the influence of vegetation encroachment and dam operations on altering the areal extent of bare sand available for fluvial and aeolian transport

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E. Nutrients and temperature as ecosystem drivers: understanding patterns, establishing links and developing predictive tools for an uncertain future

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

Project Elements

1. Model development
   - Predictive model of nutrient concentrations in Lake Powell
   - Improved temperature model for the CRe
   - Aquatic ecosystem models of drivers of ecosystem change
2. Improved monitoring of nutrients in Lees Ferry, and longitudinal studies of nutrients in the Colorado River
3. Monitoring, modelling and research on the patterns and drivers of ecosystem metabolism in the CRe
4. Develop cost-effective aquatic vegetation monitoring scheme
5. Artificial stream experiments to determine how primary producers and invertebrates respond to variation in temperatures and nutrients.

FY18: $689,000*
FY19: $551,000*
FY20: $514,000

* Up to $200,000 in Lake Powell funding available for FY18-19

Proposed budget amounts are preliminary and subject to change.

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Project Elements

FY18: $1,055,000

G. Humpback chub population dynamics throughout the Colorado River

Project Elements

1. Humpback chub monitoring and population modelling
2. Research of humpback chub population dynamics, development, natal origins, and habitat use
3. Translocations and associated research

FY18: $1,949,000
FY19: $1,940,000
FY20: $2,060,000

Proposed budget amounts are preliminary and subject to change.

LTEMP Resource Areas:

- Humpback Chub
- Natural Processes

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H. Salmonid Research and Monitoring

Project Elements

1. System Wide Electrofishing
2. Rainbow Trout Monitoring in Glen Canyon
3. Lees Ferry Creel Survey & AGFD Citizen Science Project
4. Experimental Flow Assessment for Rainbow Trout
5. Rainbow Trout Recruitment and Outmigration Model
6. Young-Of-Year Brown Trout Otolith Study

FY18: $1,274,000
FY19: $1,378,000
FY20: $1,430,000

Proposed budget amounts are preliminary and subject to change.

LTEMP Resource Areas:

- Rainbow Trout Fishery
- Humpback Chub
- Other Native Fish
- Recreational Experience
- Natural Processes

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I. Aquatic Invasive Species Research and Monitoring

LTEMP Resource Areas:

- Nonnative Invasive Species
- Recreational Experience
- Natural Processes

FY18: $323,000
FY19: $394,000
FY20: $421,000

Proposed budget amounts are preliminary and subject to change.

Project Elements

1. Improve early detection of aquatic invasive species
2. Assess risks posed by warm-water invasive fishes
3. Evaluate existing management strategies and new tools

J. Socioeconomic Monitoring and Research in the Colorado River Ecosystem

Project Elements

1. Recreation economics research
2. Tribal member population survey
3. Applied decision and scenario analysis

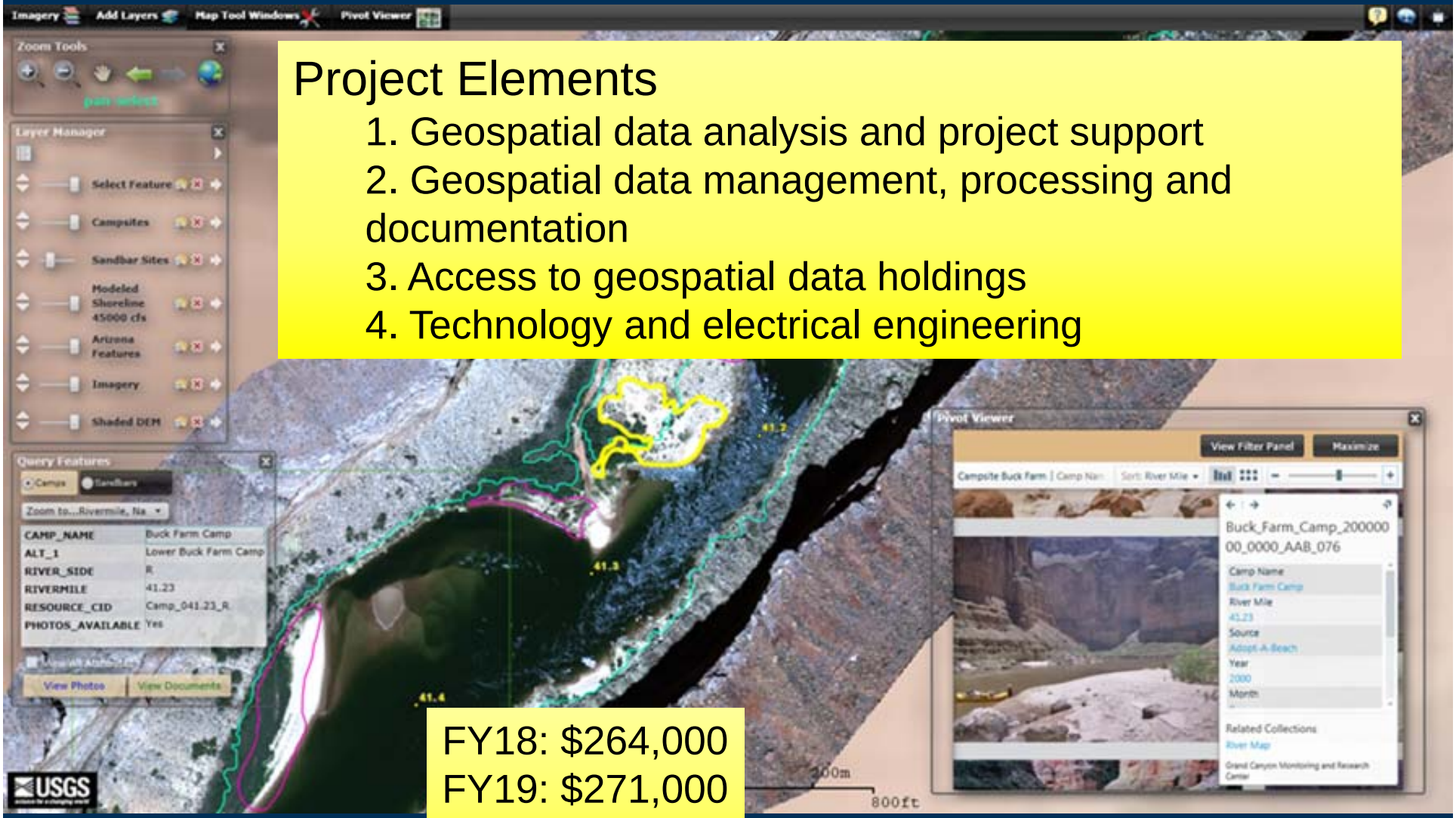
LTEMP Resource Areas:

- Recreational Experience
- Tribal Concerns/Resources
- Rainbow Trout Fishery
- Humpback Chub
- Hydropower and Energy

FY18: $369,000
FY19: $389,000
FY20: $400,000

Proposed budget amounts are preliminary and subject to change.

K. Geospatial Science and Technology



Project Elements

1. Geospatial data analysis and project support
2. Geospatial data management, processing and documentation
3. Access to geospatial data holdings
4. Technology and electrical engineering

FY18: $264,000
FY19: $271,000
FY20: $278,000

Proposed budget amounts are preliminary and subject to change.

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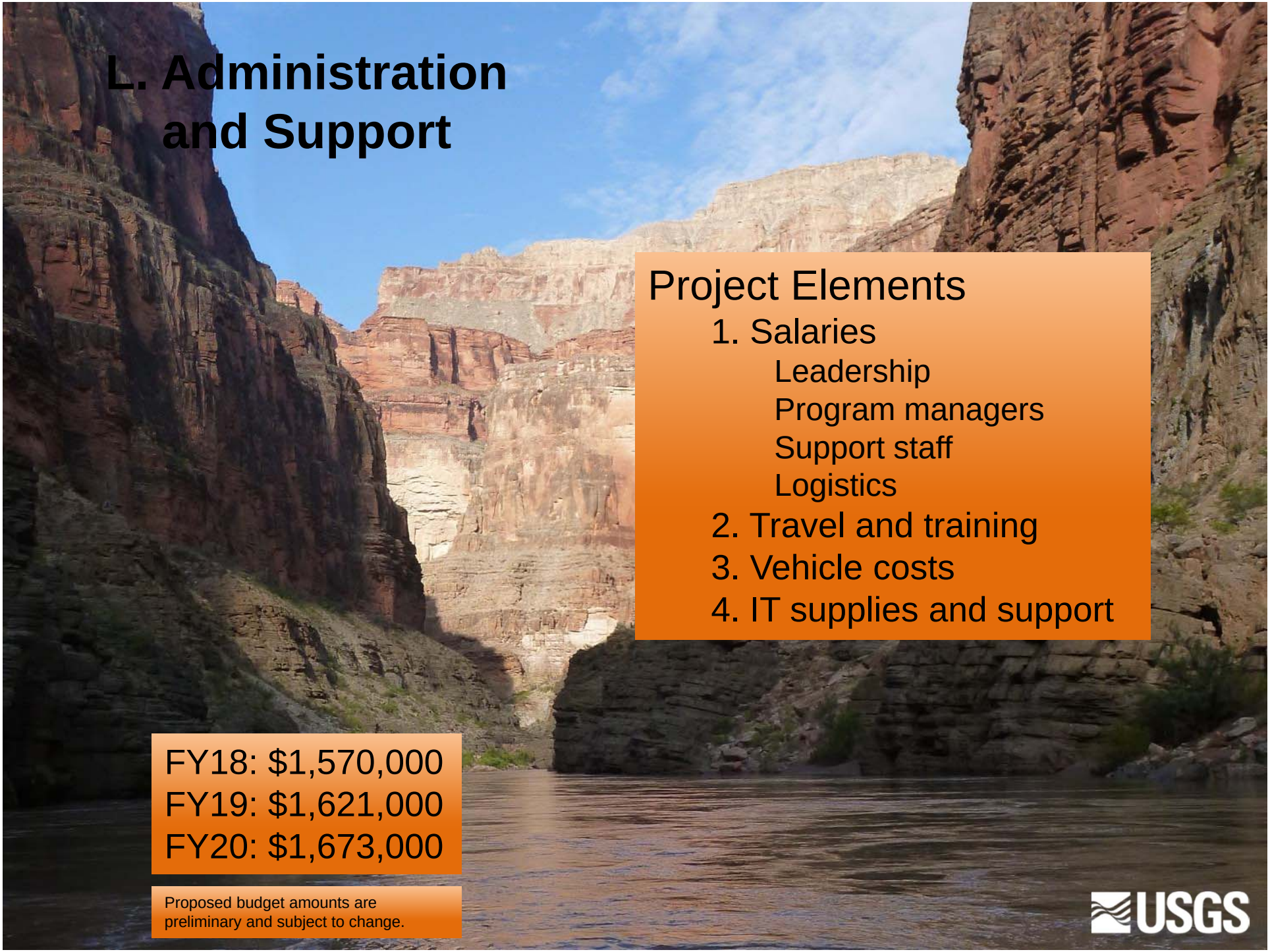
L. Administration and Support



Project Elements

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

FY18: $1,570,000
FY19: $1,621,000
FY20: $1,673,000

Proposed budget amounts are preliminary and subject to change.

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Potential FY2018 – 2020 Budget Summary

Project	FY2018	FY2019	FY2020
Streamflow, Water Quality, and Sediment Transport	$1,396,000	$1,424,000	$1,453,000
Sandbar and Sediment Storage Monitoring and Research	$1,370,000	$1,416,000	$1,460,000
Riparian Vegetation	$749,000	$765,000	$788,000
Geomorphic Effects of Vegetation Management and Dam Operations	$531,000	$592,000	$543,000
Nutrients and Temperature as Ecosystem Drivers	$689,000	$551,000	$514,000
Aquatic Invertebrate Ecology	$1,055,000	$1,147,000	$1,180,000
Humpback Chub Monitoring and Research	$1,949,000	$1,940,000	$2,060,000
Salmonid Monitoring and Research	$1,274,000	$1,378,000	$1,430,000
Invasive Aquatic Species	$323,000	$394,000	$421,000
Socio-economics	$369,000	$389,000	$400,000
Geospatial Science and Technology	$264,000	$271,000	$278,000
Administration	$1,570,000	$1,621,000	$1,673,000
Total	**$ 11,539,000**	**$ 11,888,000**	**$ 12,200,000**
Anticipated AMP Funding Available (80.63% and 1% CPI)	**$8,890,000**	**$8,979,000**	**$9,069,000**
Long/Short	**($2,649,000)**	**($2,909,000)**	**($3,131,000)**

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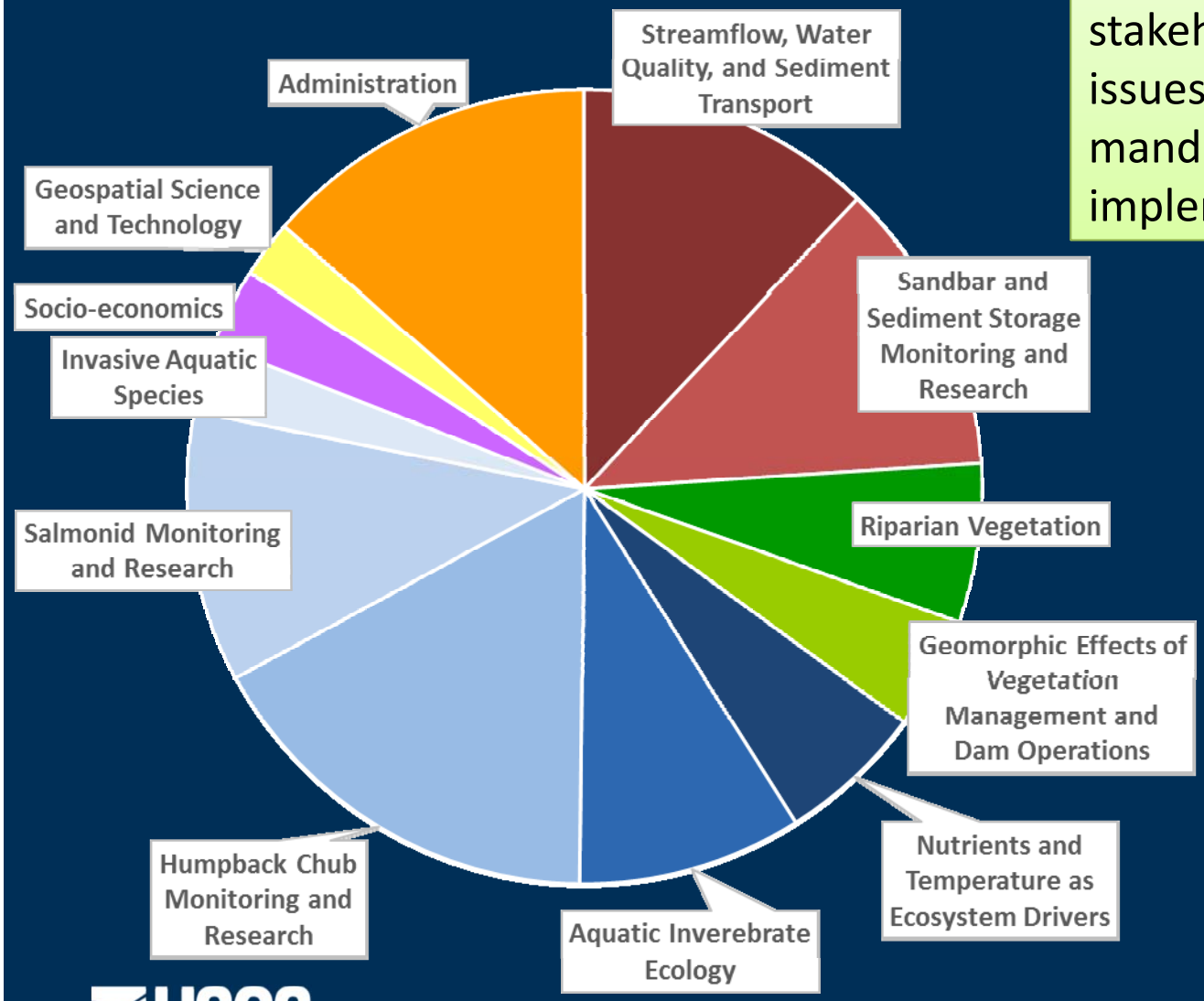
Proposed budget amounts are preliminary and subject to change.

(Amounts rounded to nearest $1,000)

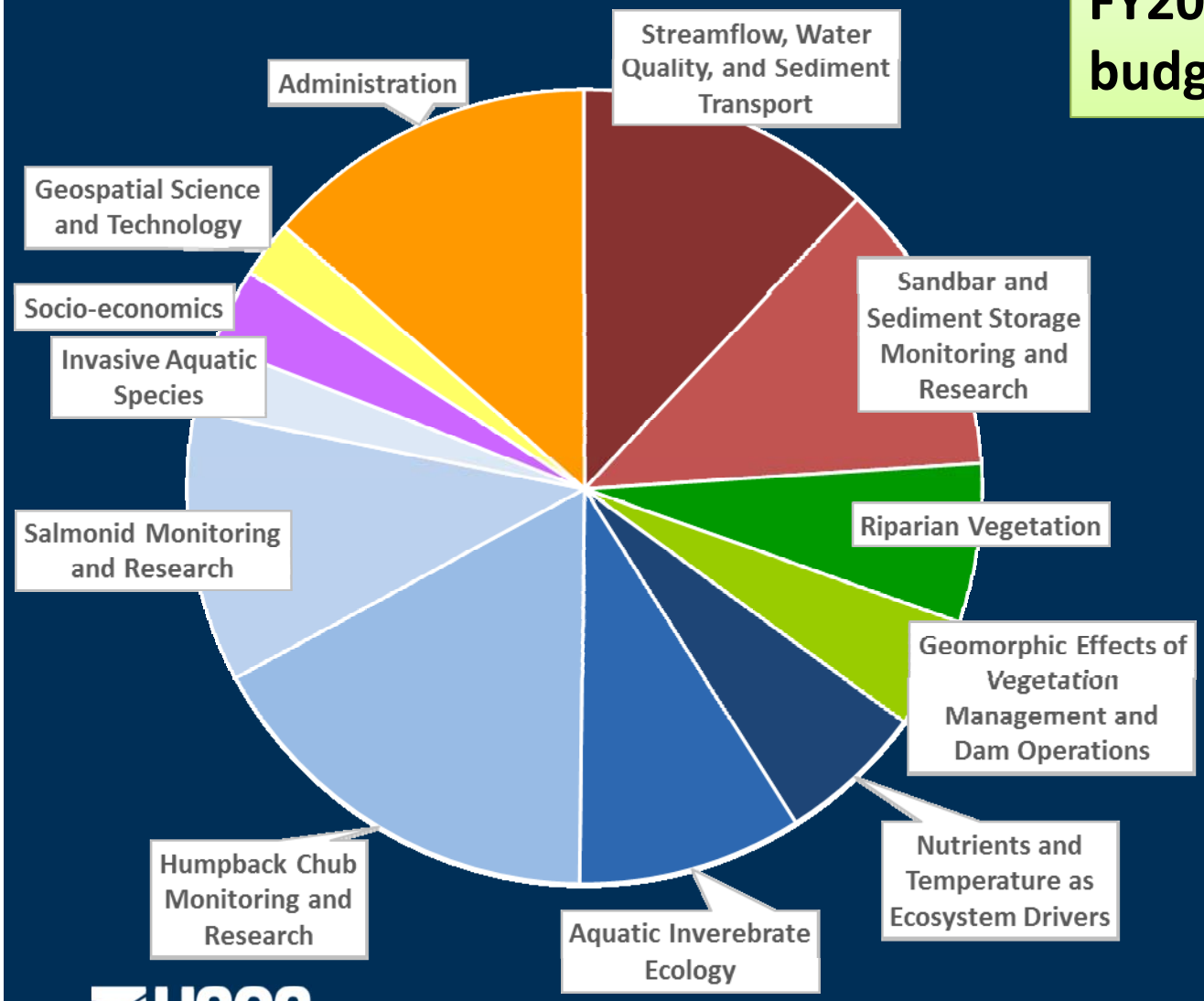
Potential allocation of FY2018 budget based on initial GCMRC/agency assessment of stakeholder interests, scientific issues, and monitoring mandates in support of LTEMP implementation



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

Proposed budget amounts are preliminary and subject to change.

Proportions remain unchanged for FY2019 and FY2020 preliminary budgets



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Vegetation & effects of management	11%
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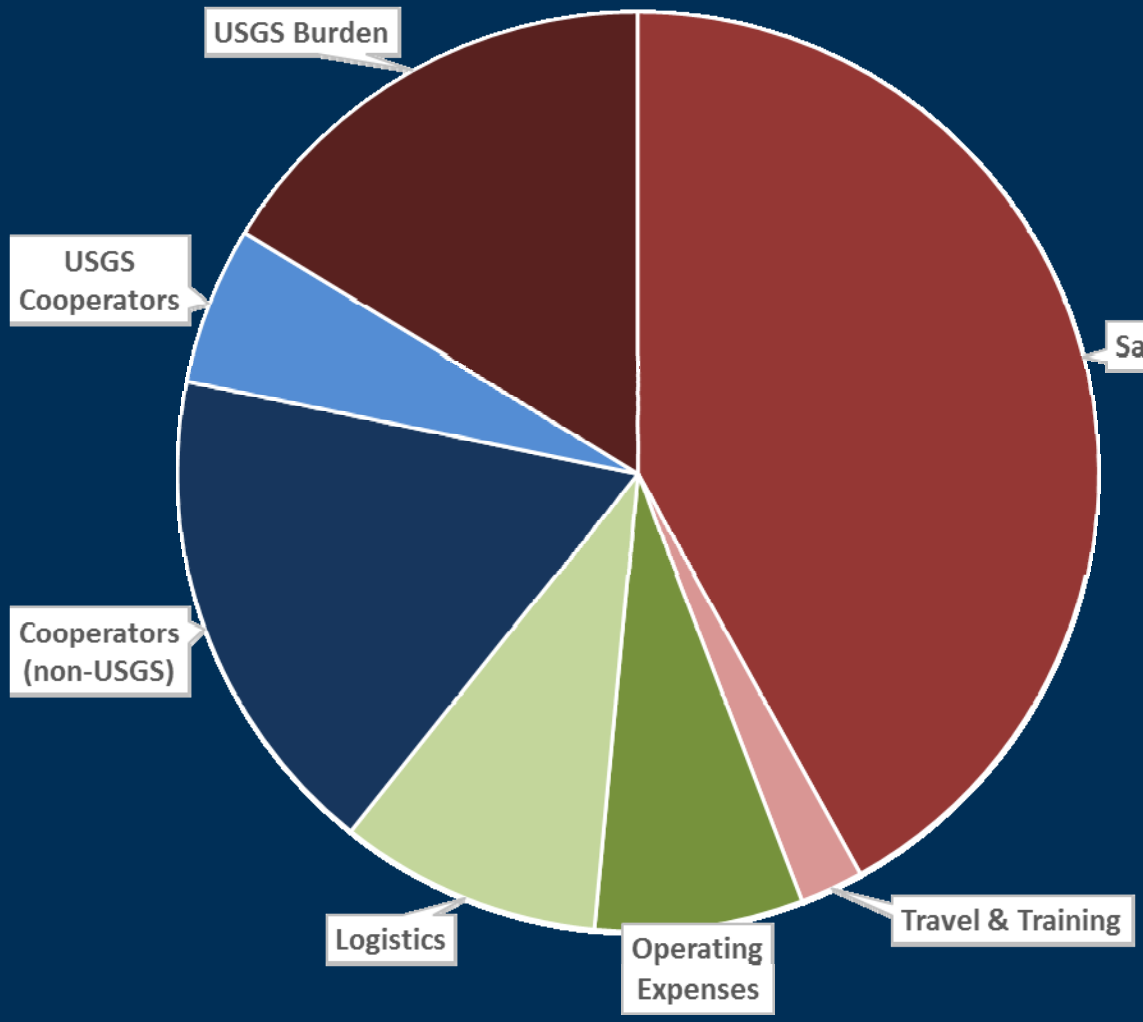
Potential allocation of FY2018 budget by general categories



Salaries	42%
Travel & Training	2%
Operating Expenses	7%
Logistics	9%
Cooperators (non-USGS)	18%
USGS Cooperators	5%
USGS Burden	16%

Overhead rates:
USGS – est. ~26%
Pass through – 3%
Sub-allocation – 0%

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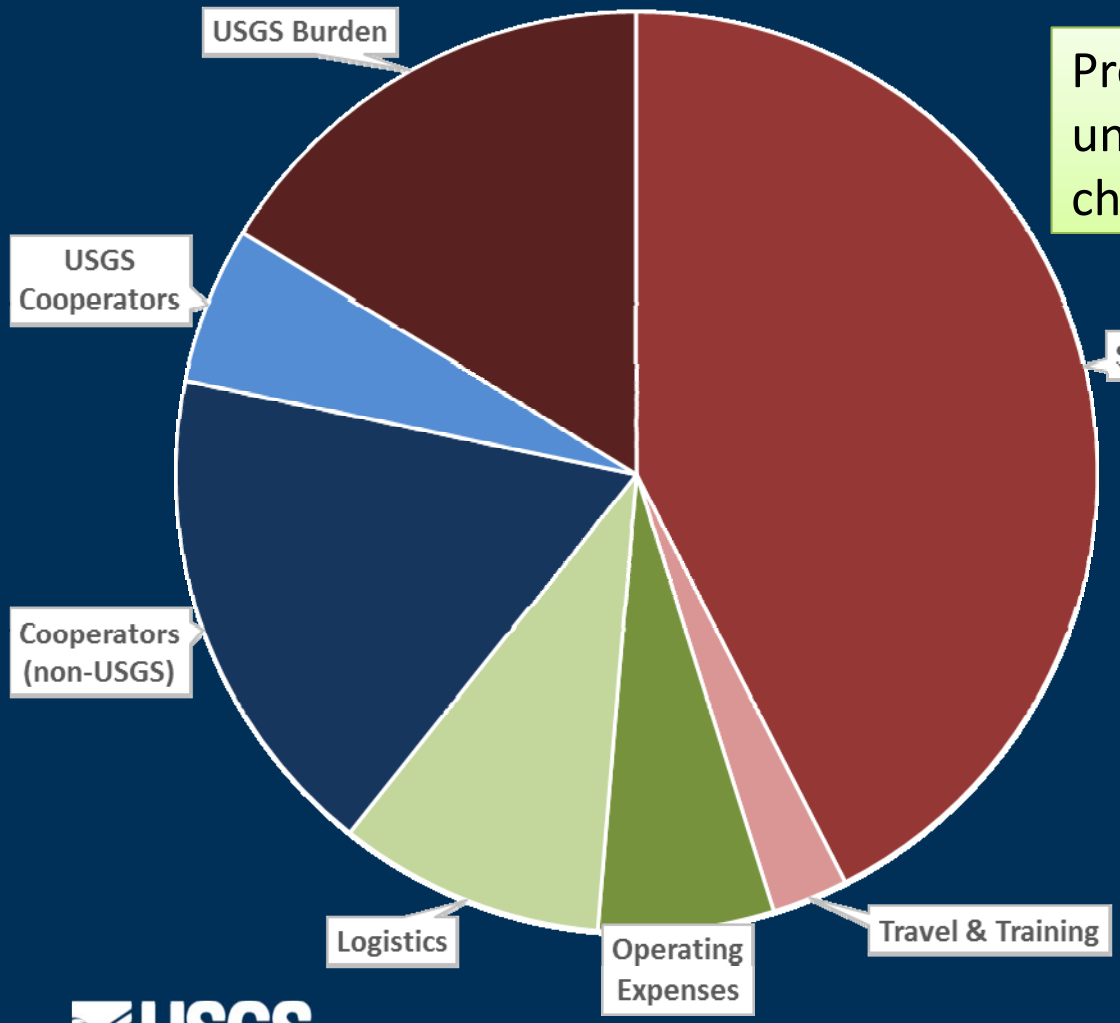
Proposed budget amounts are preliminary and subject to change.

Potential allocation of FY2020 budget by general categories



Proportions remain unchanged for FY2019 and change slightly for FY2020

Salaries	42%
Travel & Training	3%
Operating Expenses	6%
Logistics	9%
Cooperators (non-USGS)	18%
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USGS Burden	16%

Overhead rates:
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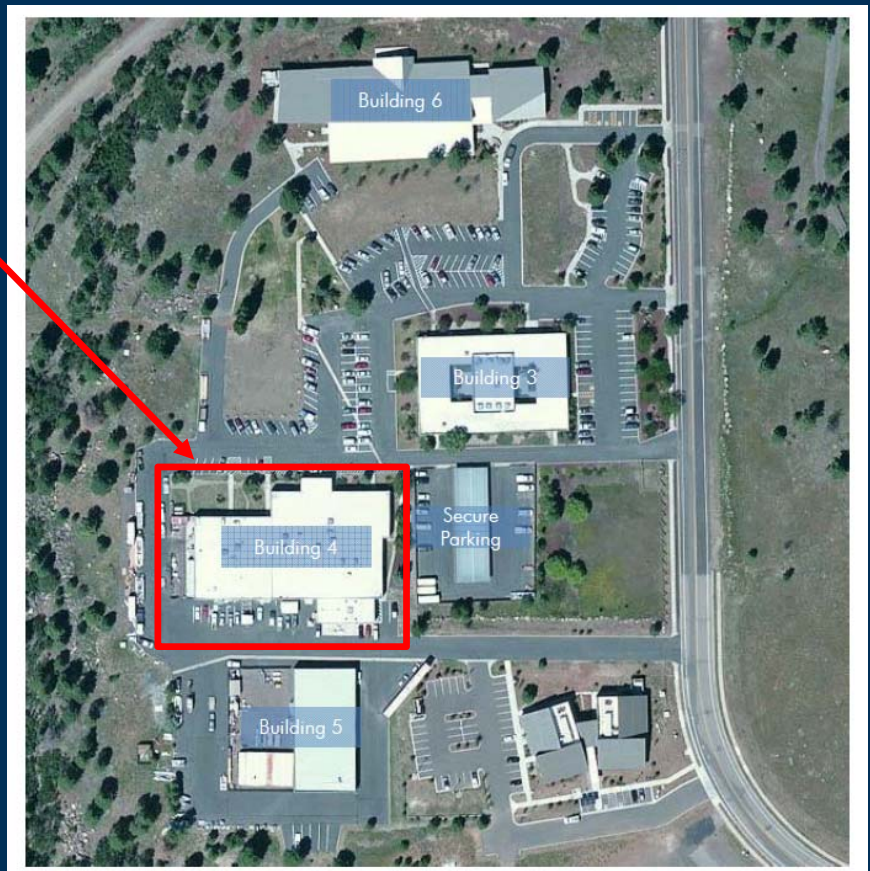
Current Southwest Biological Science Center Facilities in Flagstaff

- SBSC leases space from the City of Flagstaff
- Current facilities are beyond design life
- City of Flagstaff will not enter into a new long-term lease



Current Flagstaff Campus Site Map

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Overhead will be Increasing Due to New Facilities – Planned for 2018

SW Biological Science Center overhead:

- Bureau-level overhead (12%)
  - By policy, this charge is waived for AMP funds
- Center-level overhead (26%)
  - By policy, this overhead rate is set at 7.5% for AMP funds
  - Cost to SBSC offset by USGS appropriated funds ($875,000 in FY16)
- Facilities overhead
  - Currently 4.6%
  - Will increase to ~19%

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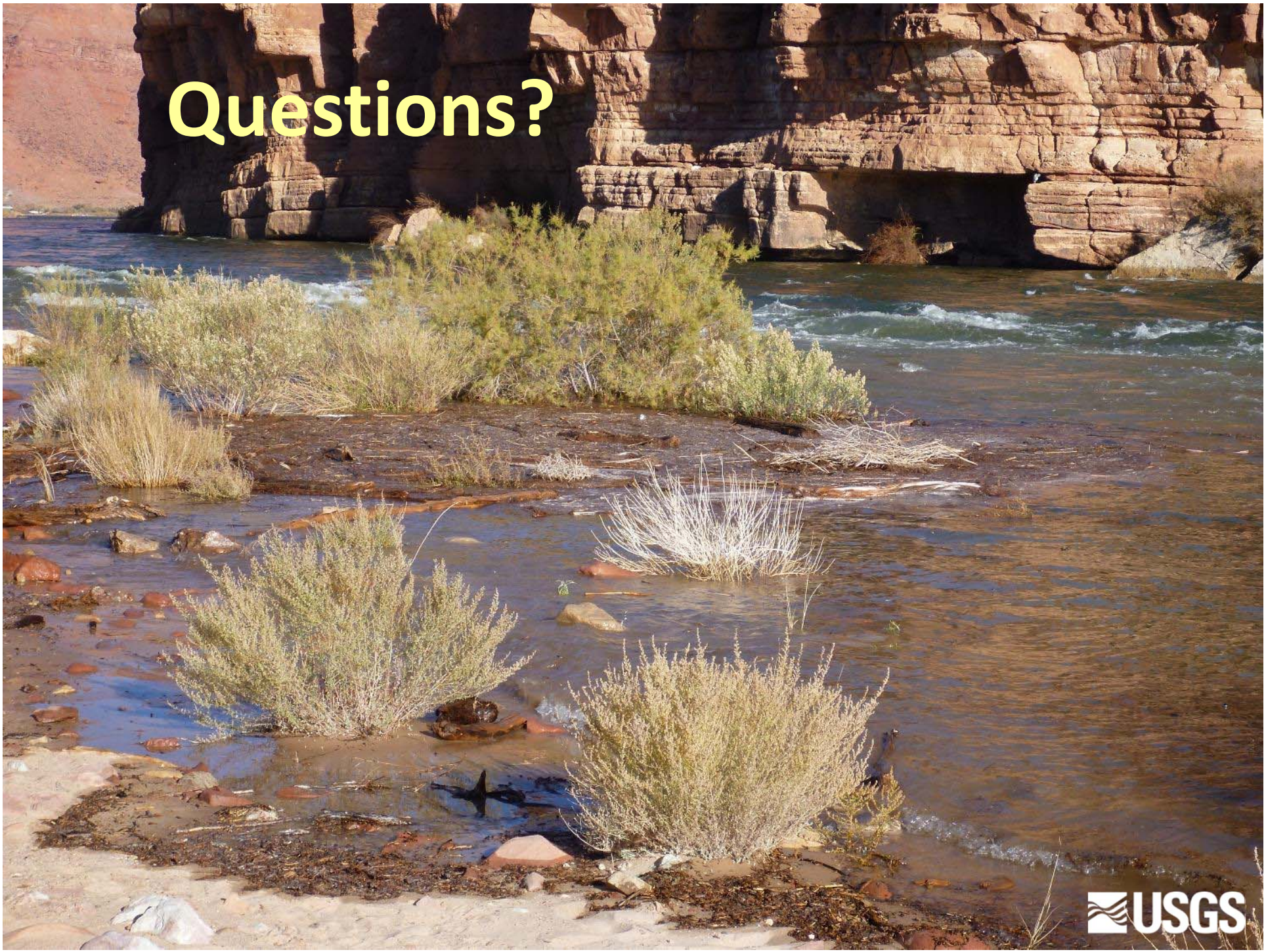
Questions?
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