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

<table>
<thead>
<tr>
<th>Resource Areas to be Evaluated and Considered Before Any Experiment</th>
<th>Objectives And Resource Goals Of The LTEMP</th>
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<tbody>
<tr>
<td>Water Quality and Water Delivery</td>
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<td>Hydropower and Energy</td>
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<td>Historic Properties and Traditional Cultural Properties</td>
<td>Other Native Fish</td>
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<td>Hydropower Production and WAPA’s Assessment of the Status of the Basin Fund</td>
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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.
B. Sandbar and Sediment Storage Monitoring and Research

Project Elements
1. Monitoring sandbars using topographic surveys and remote cameras
2. Long-term monitoring and research on sediment storage and physical habitat characteristics of the river channel
3. Sandbar modeling
4. Control network and survey support

LTEMP Resource Areas:
• Sediment
• Natural Processes
• Recreational Experience

FY18: $1,370,000
FY19: $1,416,000
FY20: $1,460,000

Proposed budget amounts are preliminary and subject to change.
C. Riparian Vegetation Monitoring and Research

Project Elements
1. Ground-based riparian vegetation monitoring
2. Imagery-based riparian vegetation monitoring at the landscape scale
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
D. Effects of vegetation management and dam operations for geomorphic condition and sand resources at archaeological sites and source-bordering dunefields

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.

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

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.

LTEMP Resource Areas:
- Water Quality and Water Delivery
- Other Resources (Food Base)
- Natural Processes
Project Elements
1. Continuation of existing food base monitoring programs
2. Monitoring in support of humpback chub and invasive species range expansions
3. Monitoring in anticipation of novel flow experimentation under LTEMP
4. Research to enhance learning from novel flow experiments under LTEMP

F. Aquatic Invertebrate Ecology (Food Base)

LTEMP Resource Areas:
- Other Resources (Food Base)
- Natural Processes

FY18: $1,055,000
FY19: $1,147,000
FY20: $1,180,000

Proposed budget amounts are preliminary and subject to change.
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

Proposed budget amounts are preliminary and subject to change.

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

LTEMP Resource Areas:
• Humpback Chub
• Natural Processes
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

LTEMP Resource Areas:
- Rainbow Trout Fishery
- Humpback Chub
- Other Native Fish
- Recreational Experience
- Natural Processes

Proposed budget amounts are preliminary and subject to change.
I. Aquatic Invasive Species Research and Monitoring

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

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

Proposed budget amounts are preliminary and subject to change.

<table>
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<th>Year</th>
<th>Budget</th>
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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.
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.
## Potential FY2018 – 2020 Budget Summary

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<th>FY2020</th>
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<td><strong>$ 11,888,000</strong></td>
<td><strong>$ 12,200,000</strong></td>
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- **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)

(Amounts rounded to nearest $1,000)

Proposed budget amounts are preliminary and subject to change.
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.

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.
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%

Proposed budget amounts are preliminary and subject to change.
Proportions remain unchanged for FY2019 and change slightly for FY2020.

Potential allocation of FY2020 budget by general categories:

- Salaries: 42%
- Travel & Training: 3%
- Operating Expenses: 6%
- Logistics: 9%
- Cooperators (non-USGS): 18%
- USGS Cooperators: 5%
- USGS Burden: 16%

Overhead rates:
- USGS – est. ~26%
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Proposed budget amounts are preliminary and subject to change.
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
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?