

***Grand Canyon Monitoring and  
Research Center***

***Physical Resources Program***

***FY 2000***

***Total Budget: \$700,000***

TJG  
11-16-98  
T. Melia  
attachment 4c

***1-Extend Synthesis – Glen Canyon Reach [\$50,000],  
(Modification of USU Agreement (Schmidt et al.) for One Year)***

***2-Conceptual Model – Physical Sub-Model [\$50,000],  
(Modification of Ecometric Inc. (Korman) Contract for One Year)***

***3-Monitoring Protocols – Field Testing + Capital Investments [\$250,000],  
(RFPs, In-House and Collaborative Efforts with Existing Cooperators)***

***4-Verify Tributary Models – Paria and Little Colorado Rivers [\$20,000],  
(Modification of USGS Agreement (Topping et al.) for One Year)***

***5- Monitor Streamflow/Sediment Transport – Sand Budget, [\$320,000],  
(Modification of USGS Agreement (Anderson et al.) for One Year)***

***6-Monitoring of Debris Fans and Rapids – Change Detection [\$10,000],  
(In-House Activity)***

***Total \$700,000***

***1-Extend Synthesis – Glen Canyon Reach [\$50,000],  
(Modification of USU Agreement [Schmidt et al.] for One Year)***

- Mapping of Historical Sandbar Changes (Remote Sensing)***
- Bureau of Reclamation Channel Changes (X-Sections)***
- Interpretation of Lees Ferry Gage Record (Sand Transport)***
- Integration with Lees Ferry to Phantom Ranch Synthesis***

***2-Conceptual Model – Physical Sub-Model [\$50,000],  
(Modification of Ecometric Inc. Contract for One Year)***

- Better Estimated Sand Storage in Main Channel***
- Improved Sand Exchange [Main Channel and Eddies]***
- Introduction of Stochastic Hydrologic Forecasts***
- Development of Physical Geomorphology Sub-Model***
- Improved Linkage with Socio-Economic Sub-Model***

***3-Monitoring Protocols – Field Testing + Capital Investments  
[\$250,000], (RFPs, In-House and Collaborative Efforts with  
Existing Cooperators)***

- Field Test - Monitoring of Channel-Margin Bars (volumes)***
- Field Test - Monitoring of Sand in Pools (volumes)***
- Pilot Test – R/S Change Detection in Sand Bars/Fans***
- Capital Investment in New Bathymetric Technology***
- Design and Construction of New Hydrography Vessel***
- Draft Long-Term Monitoring Plan for Physical Resources***

***4-Verify Tributary Models – Paria and Little Colorado Rivers  
[\$20,000], (Modification of USGS Agreement [Topping et al.] for  
One Year)***

***-Compare Model Estimates with Measured Loads for  
Sediment Transport (Sand and Silt/Clay)***

***-Design Long-Term Monitoring Protocols for Model  
Verification Based on Physical Parameters***

***-Develop User Guides and Linkages with Gage Records***

***-Refinement of Real-Time Sediment Input Estimates***

***5- Monitor Streamflow/Sediment Transport – Sand Budget,  
[\$320,000], (Modification of USGS Agreement [Anderson et al.]  
for One Year)***

***-Sediment and Streamflow Measurements for Paria and  
Little Colorado Rivers***

***- Sediment and Streamflow Measurements for Main  
Channel***

***-Main Channel Sand Storage Volume Changes***

***-Main Channel Grain-Size Evolution***

***6-Monitoring of Debris Fans and Rapids – Change Detection  
[\$10,000], (In-House Activity)***

- Annual Assessment of Impacts from Tributary Debris Flows***
- Assess Reworking of Controlled Flood Flows on Navigation***
- Reworking of Aggraded Debris Fans and Rapids***
- Develop Protocols for Assessing Coarse Sediment Budget***
- Integration of Tributary Influences with Biologic Processes***