U.S. Geological Survey – Southwest Biological Science Center

FY 2005 Grand Canyon Monitoring and Research Center Update

Project A. Integrated Quality-of-Water Program

Project A.1.a (R&D)

Title:	Provisional Monitoring – IQWP – Upstream Monitoring of Lake Powell Water Quality. Funding from Bureau of Reclamation (BNE0A)
Description:	Water-quality monitoring of Lake Powell and Glen Canyon Dam releases to determine status and trends of physical, chemical and biological conditions with respect to reservoir hydrodynamics, climatology and dam operations. This includes continuous tail water monitoring with monthly sample collection, monthly forebay monitoring and quarterly reservoir-wide monitoring.
Contract Let:	NA
Work / Reports Due (date):	Monthly web-based updates, Annual WY reports, Open-File Reports with physical water quality and biological data.
Current Status:	Monitoring program on track and database up-to-date. Annual Report for Water Year 2003 in review, WY 2004 report in draft. Annual report for WY 2005 to be developed in WY 2006
Completion Date:	Reports expected to be completed October 1, 2005

Project A.1.b (R&D)

Title:	Provisional Monitoring – IQWP – Downstream Monitoring of Quality-of-Water for Physical, Biological, and Chemical Sampling (BNE2A)
Description:	This project is focused on monitoring of the non-sediment elements of quality-of-water monitoring below the dam (specific conductivity, temperature, etc.)
Source:	GCMRC staff (Wright and Voichick et al.)
Work / Reports Due (date):	Annual database updates with data availability intended through the GCMRC web page in 2006 and Open-File Reports to publish these data.
Current Status:	In FY2005, this project was combined with the Streamflow & SS Transport project (see below) as a step in better integrating downstream QW activities in support of monitoring & research.
Completion Date:	This project as it had previously been implemented no longer appears as a stand alone budget item after 2005, but elements will continue in combination with suspended-sediment monitoring within the Downstream Integrated Quality-of-Water project conducted within USGS.

Project A.1.c (R&D)

Title:	Provisional Monitoring – Streamflow & Suspended-Sediment Transport (BNE2B / BNE2I)
Description:	Surface water and suspended-sediment transport measurements made at key locations downstream from Glen Canyon Dam to the gage above Diamond Creek.
Source:	USGS (GCMRC in collaboration with AZ District and National Research Program of Water Resources Discipline; Drs. Topping, Rubin, Wright, Melis, Wiele et al.)
Work / Reports Due (date):	Continuous surface water and sediment-transport data sets, USGS publications, journal articles, etc. Final draft reports assessing options for long-term monitoring protocols are due in spring 2006, with final review and reports by December 2006. Recommendations about strategies for monitoring in ways that will support proposed future research and provide managers with status and trends data related to conservation of fine-sediment and related physical habitats.
Current Status:	Research and Development funding in support of monitoring protocols studies was scheduled to end in FY 2005, but Experimental activities were funded in FY2005 and completion of that work extends through FY 2006, as it now includes major contingency research elements related to implementation of the November 2004 High-Flow Sediment test
Completion Date:	Draft report(s) by spring 2006, external peer review in summer 2006 and Final reports by end of 2006.

Project A.1.c (EXP)

Title:	Research – Fine-Sediment Mass Balance – Exp. Support (BNE2C)
Description:	Additional R&D activities in support of the November 2004, High-Flow Sediment Experiment (see above)
USGS Management Agreement:	Water Resources Discipline – AZ District and National Research Program, Geological Discipline (Coastal and marine Geology), plus GCMRC (Drs. Topping, Wright, Melis, Rubin and Wiele)
Work / Reports Due (date):	Data on suspended-sediment transport around High-Flow Test and pre- and post-test tributary enrichment and efflux from Marble Canyon, as well as peer-reviewed reports, etc. Draft final reports in spring 2006, peer review (SEDS-PEP) in summer 2006, and final reports by December 2006.
Current Status:	Sample and data processing for sediment-transport measurements are still ongoing, but expected to be complete by winter 2005-06. Preliminary results were reported to AMWG in March 2005, and additional detailed preliminary findings will be presented at the 2005 Science Symposium in October.
Completion Date:	End of 2006.

Project A. Aquatic & Terrestrial Ecosystem Activities

Project A.2 (R&D)

Title:	Provisional Monitoring – Coarse-Grained Inputs (BNE2F)
Description:	Coarse-Grained Sediment Inputs and Impacts on Main Channel Resources from Tributary Debris Flows in Grand Canyon. The role of tributary flood events in the evolving geomorphic framework of the post-dam CRE, gravel fluxes, debris-fan/eddy and rapids evolution under MLFF operations. The non-experimental Research and Development phase of this project funding ended in FY 2004.
USGS Management Agreement:	Dr. R.H. Webb, US Geological Survey
Work / Reports Due (date):	Several final reports (two master's theses and other journal articles/publications) have already been produced by these researchers since the project start date in 2001. A chapter in the upcoming SCORE report will focus on this research and monitoring project. Presentations on this study will be made at the upcoming 2005 Science Symposium.
Current Status:	Pending draft final reports and external peer review participation in spring/summer 2006 (SEDS-PEP Phase II)
Completion Date:	Not scheduled for additional funding in FY 2006, but completion in December 2006, tied to PEP review.

Project A.2 (EXP)

Title:	Research - Coarse Sediment – Debris-Fan Reworking under High-Flow Release (BNE2F)
Description:	Coarse-Grained Sediment Inputs and Impacts on Main Channel Resources from Tributary Debris Flows in Grand Canyon. The role of tributary flood events in the evolving geomorphic framework of the post-dam CRE, gravel fluxes, debris-fan/eddy and rapids evolution under MLFF operations. The non-experimental Research and Development phase of this project funding ended in FY 2004, but Experimental activities were funded in FY2005, related to studies of debris-fan reworking during the November 2004 High-Flow Sediment test
USGS Management Agreement:	Dr. R.H. Webb, US Geological Survey
Work / Reports Due (date):	Several final reports (two master's theses and other journal articles/publications) have already been produced by these researchers since the project start date in 2001. A chapter in the upcoming SCORE report will focus on this research and monitoring project. Presentations on this study will be made at the upcoming 2005 Science Symposium. Currently in the data processing and preliminary analysis stages are underway related to the experimental element of the project that occurred as a result of the 2004 high-flow testing.

Current Status:	Field efforts tied to the 2004 experimental release were completed in March 2005, and post-processing of field data and analyses are underway in Tucson.
Completion Date:	Draft report(s) by spring 2006, external peer review in summer 2006 and final reports by end of 2006.

Project A.3 (R&D)

Title:	Provisional Monitoring – Fine-Sediment Storage (BNE2D / BNE2E)
Description:	Research and Development funding was scheduled to end in FY 2005, but Experimental activities were funded in FY2005 and completion of that work extends through FY 2006, as it now includes major contingency research elements related to implementation of the November 2004 High-Flow Sediment test
Cooperative & Management Agreements:	Utah State University (Schmidt et al.), Northern Arizona University (Parnell and Springer et al.), Arizona State University (Dr. Schmeeckle et al.), US Geological Survey (Drs. Rubin and Topping et al.) and GCMRC (Gushue and Gonzales et al.)
Work / Reports Due (date):	Annual progress reports, technical presentations to TWG and AMWG, fact sheets, journal articles, plus preliminary presentations at the 2005 Science Symposium.
Current Status:	The project is currently ongoing in it final phase of data reduction, analysis and draft reporting and the study team is presently working to complete all field data processing of tied to project efforts from summer 2000 (LSSF), through experimental data collected in spring 2005 (tied to the 2004 High-Flow test).
Completion Date:	December 2006

Project A.3 (EXP)

Title:	Research - Fine-Sediment Storage – Extra EXP. Elements (BNE2E)
Description:	See above.
Contract Let:	See above.
Work / Reports Due (date):	See above. Annual progress reports and final at end of project.
Current Status:	Post fieldwork, processing of data collected through spring 2005 tied to May overfight, etc.
Completion Date:	December 2006

Project A.3 (EXP)

Title:	Research - Fine-Sediment – Sand Deposition in Arroyos (BNE3B)
Description:	Tied to above Experimental FIST components related to November 2004 High-Flow test
Cooperative Agreement:	Northern Arizona University (Dr. Parnell et al.)

Work / Reports Due (date):	Draft reports in summer 2006, participation in peer review (SEDS-PEP) and final reporting by year's end
Current Status:	Data processing, analysis and draft report completion
Completion Date:	December 2006

Sociocultural components of Fine Sediment Storage (EXP)

Title:	Fine-Sediment – Sand Deposition in Arroyos (BNE3B)
Description:	This project is part of the November, 2004 experiment. NAU surveyors mapped sediment deposition in the Palisades area arroyos prior to, immediately following and six months after the November high flow test to evaluate extent of sediment deposition in arroyo mouths compared with the 1996 experiment results, and also to track the fate of these newly deposited sediments due to erosion and wind redeposition in relation to nearby archaeological sites. Results will be incorporated into the final FIST report relating to the 2004 high flow experiment.
Cooperative Agreement:	Northern Arizona University, January 2005
Work / Reports Due (date):	This will be an addendum to the final FIST report on experimental results; June 2006
Current Status:	Analysis of data is ongoing
Completion Date:	December 2006

Project A.3 (EXP)

Title:	Research - Fine-Sediment – Camping Beach Changes (BNE3A)
Description:	Tied to above Experimental FIST components related to November 2004 High-Flow test
Contract Let:	Northern Arizona University (Dr. Parnell et al.)
Work / Reports Due (date):	Draft reports in summer 2006, participation in peer review (SEDS & REC PEP) and final reporting by year's end
Current Status:	Data processing, analysis and draft report completion
Completion Date:	December 2006

Sociocultural components of Fine Sediment Storage (EXP)

Title:	Fine-Sediment – Camping Beach Changes (BNE3A)
Description:	This project is part of the November, 2004 experiment. NAU surveyors mapped campable areas at the NAU sand bar sites six months after the November high flow test to evaluate the extent to which camping area was enhanced by the November 2004 experiment compared with the 1998-2003 campable area surveyors. Results will be incorporated into a separate report relating to the 2004 high flow experiment results to past and future camping area surveyor results.
Cooperative Agreement:	Northern Arizona University, January 2005
Work / Reports Due (date):	Results will be incorporated into a report summarizing 2004-2005 camping area changes; June 2006

Current Status: In progress
Completion Date: June 2006

Project A.4 a/b (R&D)

Title: Provisional Monitoring – Terrestrial Ecosystem (BNE1A / BNE3G)
Description: Terrestrial vegetation monitoring to assess relationships between the hydrograph and vegetation abundance and structure.
Cooperative Agreement: Northern Arizona University
Work / Reports Due (date): Annual report that incorporates previous 4 years of vegetation abundance and structure data/Science symposium presentation. December 2005
Current Status: Field collection Sept 3-16, 2005
Completion Date: March 2006, following review.

Sociocultural components of Terrestrial Ecosystem Monitoring (R&D)

Title: Monitoring – Terrestrial Ecosystem (BNE3G)
Description: Funding was set aside in the FY05 terrestrial ecosystem monitoring budget for tribal participation. Specifically, funding was allocated for tribes to conduct a detailed review of the final TEM report and report back to GCMRC about the utility and applicability of the TEM studies as it relates to tribal interests and information needs. Three tribes submitted proposals to participate in the program, and two tribes received funding, based on the responsiveness of their proposals to the original project description: Zuni and Hopi.
Cooperative Agreements: Hopi and Zuni Tribes, August 2005
Work / Reports Due (date): Written reports will be prepared by the tribes evaluating the TEM final report and associated data. In addition, Hopi is developing a model for translating scientific terrestrial ecosystem data into formats appropriate for dissemination to other tribal (Hopi) members. June 2006
Current Status: Final TEM report from NAU has not yet been received by GCMRC, and therefore the tribes have not yet started their review of it.
Completion Date: August 30, 2006

Project A.5 (R&D)

Title: Provisional Monitoring – Kanab Ambersnail (BNE1B)
Description: Data collection of snail numbers, and size and habitat for quantifying snail abundances and available habitat at Vaseys Paradise. Data collection occurs in Spring and Fall.
Cooperative Agreement: Arizona Game and Fish Department, November 2005
Work / Reports Due (date): Data delivery in excel spreadsheet to GCMRC includes copies of data sheets. December 2005

Current Status:	Field collection scheduled for September 3-16
Completion Date:	Ongoing

Project A.8 (R&D)

Title:	Research to identify Provisional Monitoring – Aquatic Food base (BNE9A / BNE9B)
Description:	Request for Proposal for food base initiative. A solicitation for the request for proposals was released April 2005 with a 60 day period for responses. A review panel was convened in August 2005 to recommend proposal for funding.
Contract Let:	Cooperative agreement will be set-up in FY2006 pending approval of budget
Work / Reports Due (date):	TBD
Current Status:	P.I. identified, but awaiting agreement
Completion Date:	FY 2009

Project A.9 (R&D)

Title:	Provisional Monitoring – Status and Trends of DS Fish (BNE8A)
Description:	Data collection in the mainstem and Little Colorado River to assess the abundance and distribution of native and non-native fish below the Paria River. Population estimates for humpback chub in the LCR takes place in the spring and fall and requires two field efforts each season for a total of 4 trips each year. The lower 1200 m of the LCR uses hoop nets from May through June for small sized fish moving into and out of the LCR. Mainstem trips focus on cold water non-natives (trout and carp), though all fish encountered through electro-fishing efforts are recorded. These trips take place twice per year, in the spring and early summer (May/June). Native fish abundance and distribution trips that utilize hoop net and trammel net sets occur in July. Lastly, a fall seining trip is conducted to census return channel habitats.
Cooperative & Interagency Agreements:	Fish cooperative effort with Arizona Game and Fish Department, U.S. Fish and Wildlife Service and SWCA Consultants Inc.
Work / Reports Due (date):	8 trips and 4 annual reports following field effort and February 2006
Current Status:	Field efforts through October 2005; February 2006
Completion Date:	Ongoing

Project A.10 (R&D)

Title:	Provisional Monitoring – Status and Trends of LF Trout (BNE8B)
Description:	Data collection and analysis associated with the proportional stock density, condition, and health of rainbow trout in the Lees Ferry reach. The project includes sampling three times per year in the fall, early spring and summer. Sampling is done at fixed and randomly stratified sites based on shoreline habitat. Update of stock assessment model for Lees Ferry based on sampling data.
Cooperative Agreement:	Arizona Game and Fish Department
Work / Reports Due (date):	Reports, trip and annual reports; February 2006
Current Status:	In progress
Completion Date:	Ongoing

Project A.13 (EXP)

Title:	Research - Kanab Ambersnail Population EHF Impacts (BNE1C)
Description:	Removal of snail habitat prior to high flow test and subsequent replacement of snail habitat following high flow test with follow-up associated with KAS monitoring
Cooperative Agreement:	Arizona Game and Fish Department
Work / Reports Due (date):	Report; December 2005
Current Status:	Pending
Completion Date:	December 2005

Project A.14 (EXP)

Title:	Research - Food base Impacts of EHF Flows (BNE9C)
Description:	Data collection of drift around the confluence of the LCR related to experimental high flow test
Cooperative Agreement:	Arizona Game and Fish Department
Work / Reports Due (date):	Draft and final report; February 2006
Current Status:	Data processing ongoing
Completion Date:	February 2006

Project A.17 (EXP)

Title:	Research - Mechanical Removal of Non-native Fish (BNE8D)
Description:	Removal of non-native fish around the confluence of the LCR to determine the extent of predation on native fish by rainbow and brown trout and to determine if a recruitment signal can be elicited by native fish in the absence of predators and competitors. Trips are 18 days of length and take place 6 times per year from January through March and July through September.
Cooperative Agreement:	Arizona Game and Fish Department
Work / Reports Due (date):	Data delivery and trip reports; Data are delivered within 30 days of the completion of each trip.
Current Status:	Ongoing field collection
Completion Date:	December 2006

Project A.18 (EXP)

Title:	Research - Rainbow Diet Analysis & Predation of Chubs (BNE8E)
Description:	Analysis of gut contents of rainbow and brown trout to determine temporal and spatial patterns of diet of predators collected around the LCR confluence. Fish are from the mechanical removal effort. Two years of stomach were collected 2003-2004.
Cooperative Agreements:	Northern Arizona University CESU agreement, Arizona Game and Fish Department with subcontract
Work / Reports Due (date):	Draft and final report; February 2006
Current Status:	Ongoing data analysis
Completion Date:	February 2006

Project A.20 (HBC)

Title:	Conservation Measure - Translocation of Humpback Chub (BNE8F)
Description:	Moving YOY fish from the confluence area upstream to above Chute Falls in summer. Includes monitoring the status of these fish in the spring and fall.
Interagency Agreement:	U.S. Fish and Wildlife Service
Work / Reports Due (date):	Annual report; February 2006
Current Status:	Ongoing
Completion Date:	Undetermined

Project A.21 (HBC)

Title:	Conservation Measure - Dam Operations Experiment (BNE8P)
Description:	Facilitation of meetings to discuss long-term experimental flow planning.
Source:	GCMRC planning
Work / Reports Due (date):	Long-term experimental plan; January 2006
Current Status:	In progress
Completion Date:	January 2006

Project A.22 (HBC)

Title:	Conservation Measure - Scientific, Recreation Impact Assessment (BNE8G)
Description:	Pending further input from HBCCP
Contract Let:	
Work / Reports Due (date):	
Current Status:	
Completion Date:	

Project A.23 (HBC)

Title:	Conservation Measure - Fish Monitoring Below Diamond Creek (BNE8H)
Description:	Sampling of fish below Diamond Creek using all available gear types.
Cooperative & Interagency Agreements:	Arizona Game and Fish Department, SWCA, Inc. and U.S. Fish and Wildlife Service
Work / Reports Due (date):	Annual report; February 2006
Current Status:	In Progress
Completion Date:	February 2006

Project A.24 (HBC)

Title:	Conservation Measure - Monitoring Parasites and Diseases (BNE8I)
Description:	Survey of native and non-native fish for parasites and diseases and the development of monitoring protocols for mainstem fish monitoring program
Cooperative & Management Agreements:	Arizona Game and Fish Department, USGS
Work / Reports Due (date):	Draft and final report; 2007

Current Status:	In progress
Completion Date:	2007

Project A.26 (HBC)

Title:	Conservation Measure - Concurrent LCR, Mainstem HBC Pop Est. (BNE8K)
Description:	Evaluation of sampling effort with respect to effort vs. additional information gained from concurrent estimate effort.
Management Agreement:	USGS – University of Iowa (Dr. David Otis)
Work / Reports Due (date):	Update at Science Symposium, report to AMWG, final report; January 2006
Current Status:	In progress
Completion Date:	January 2006

Project A.29 (RES)

Title:	Research - Temperature Control Device (TCD) (BNE8Q
Description:	Tasks to evaluate effects of warming associated with a temperature control device. The project involves three tasks in 2005 and revolves around the fall flows in September and October 2005. Temperature modeling, sampling method evaluation and exchange of drift between backwaters and mainstem, and downstream backwater parameter data collection are tasks that will be the focus of data collection and analysis.
Cooperative, Interagency & Management Agreements:	SWCA, USGS, BOR
Work / Reports Due (date):	Data collection and draft and final reports; March 2006
Current Status:	In progress
Completion Date:	March 2006

Project A.30 (HBC)

Title:	Conservation Measure - Sediment, Turbidity Augmentation (BNE8M)
Description:	Engineering study to assess feasibility for augmenting fine0-sediment supplies below Glen Canyon Dam to levels that might be of benefit to native fishes on a seasonal to annual time scale. Work has been undertaken as a collaborative process between USGS and BuRec engineers. Sediment source areas throughout Lake Powell have been evaluated for quantity and quality relative to potential for augmenting supplies below the dam.
Interagency Agreement:	Bureau of Reclamation, Denver Technical Center

Work / Reports Due (date):	Technical report on project feasibility and options for sediment augmentation sufficient to manage for turbidity below Lees Ferry, with appraisal cost estimates
Current Status:	Draft report currently being prepared by BuRec, Denver Technical Center staff (Randle)
Completion Date:	December 2005

Project A.30 (HBC)

Title:	Conservation Measure - Sediment Augmentation Feasibility Study (BNE8L)
Description:	Similar to above, with the exception that sand sized materials are included in the report evaluation to estimate levels of augmentation required to achieve sustainable sand-bar habitats restoration.
Interagency & Management Agreements:	Bureau of Reclamation, Denver Technical Center (Tim Randle and Joe Lyons), GCMRC (Drs. Wright and Melis, as well as Coggins), WRD (Dr. Topping) and GD (Dr. Rubin). Funds were awarded to BuRec, but USGS involvement was covered by existing projects related to Mass-Balance of Suspended-Sediment project.
Work / Reports Due (date):	Same as above. Both studies are integrated into a single report.
Current Status:	Draft report currently being prepared by BuRec, Denver Technical Center staff (Randle)
Completion Date:	December 2005

Project A. DASA Activities

Project A.31.a (R&D)

Title:	Provisional Monitoring - Air-Remote Sensing (BNE4A / BNE4B)
Description:	Remote imagery flights over the CRE
Contract Let:	1) Airborne 1, Inc. (reach-based LiDAR); and 2) 3001, Inc. (system-wide, digital, orthorectified imagery)
Work / Reports Due (date):	Analysis of data sets will appear in FIST reports and as part of other change-detection projects in the next 1-4 years.
Current Status:	Delivery of digital imagery and LiDAR has occurred in stages throughout summer 2005.
Completion Date:	September 2005, all data delivered by contractors to the GCMRC DASA staff and cooperators.

Project A.32 a, b (Technical Support)

Title:	Science Support - Data Base Management System (BNE4C)
Description:	This project is aimed at developing a focused and customized database design that will meet the science needs of the GCMRC and it various cooperators and clients interested in the Colorado River Ecosystem.

Cooperative Agreement:	CF Technologies (design support) in collaboration with GCMRC DBMS & GIS Coordinators and DASA staff
Work / Reports Due (date):	Annual progress reports and updates on the design progress, additional data made available through the Oracle database via the GCMRC web site.
Current Status:	Work continues toward making real-time surface water data available through the GCMRC website, historical flow data are currently being served. Current efforts are underway to populate the database with sediment-transport data, while additional efforts are planned to make quality-of-water data accessible, as well as Lake Powell data. Work on the fisheries database sub-element has been ongoing with assistance from fishery cooperative partners.
Completion Date:	Ongoing

Project A.33 a, b (Technical Support)

Title:	Science Support - Geographic Information System (BNE4D / BNE4E)
Description:	Technical support for GCMRC staff and cooperators in the realm of GIS related activities
Source:	GCMRC staff within the DASA
Work / Reports Due (date):	Annual work plans assigned by the program staff.
Current Status:	Work is underway to complete the remote-sensing procurements of 2005 in support of research related to the November 2004 sediment experiment, as well as provisional change detection monitoring throughout the ecosystem.
Completion Date:	Ongoing, completion of remote-sensing procurement by September 30, 2005, with quality assurance of remote-sensing data sets to continue into 2006.

Project B. Sociocultural Program

Project B.2 (R&D)

Title:	1st Year Geomorph. Model, Process Study (BNE3D)
Description:	Only one year of funding for this anticipated 3-year project was approved by AMWG in the FY05 budget cycle. Constraints on the FY 2006 budget did not permit funding the second and third years of this project, therefore the project was temporarily put on hold, and the project funding was reallocated to cover unprogrammed expenses associated with the FY 2005 strategic science planning effort.
Cooperative Agreements:	N/A
Work / Reports Due (date):	N/A
Current Status:	Project postponed to FY 2007- 2009
Completion Date:	NA

Project B.3 (R&D)

Title:	Implementation of Recreation PEP & Recommendations (BNE3E)
Description:	Between June 2-17, 2005, the USGS Grand Canyon Monitoring and Research Center Sociocultural Program, working in cooperation with staff from Grand Canyon National Park Science Center, sponsored an in-depth review of recreation-related research and monitoring for the Glen Canyon Dam Adaptive Management Program. The review panel consisted of specialists in recreation research and management from the University of Vermont (Dr. Robert Manning), University of Montana (Dr. Neil Moisey), Colorado State University (Dr. John Loomis), Northern Arizona University (Dr. Pamela Foti), Bureau of Land Management (Mr. Robert Ratcliffe) and US Forest Service (Dr. David Cole). The panel attended a series of presentations by recreation researchers, federal program managers, and park stakeholders, and reviewed numerous reports on past and current monitoring and research activities related to ascertaining the effects of Glen Canyon Dam on the Glen Canyon sport fishery, Glen Canyon day use, and white water rafting and camping in Grand Canyon National Park A report summarizing the review findings will be forthcoming at the end of the fiscal year.
Contract Let:	NA
Work / Reports Due (date):	Final PEP report underway; September 30, 2005
Current Status:	In progress
Completion Date:	It is anticipated that the final PEP report will be presented to TWG in late September, 2005 and to AMWG at their January, 2006 meeting.

Project B.4 (R&D)

Title:	Implementation of Socioeconomic PEP & Recommendations (BNE3F)
Description:	Due to the need to focus on science planning and other program priorities in FY05 (e.g., geomorphology workshop, tribal monitoring workshop, recreation PEP), the socioeconomic PEP has been deferred to spring, 2006. It is intended that funding for the socioeconomic PEP will be transferred to NAU to cover anticipated travel and logistical costs associated with hosting the PEP in FY06.
Contract Let:	September 2005 -- planned
Work / Reports Due (date):	Final socioeconomic PEP report; September 30, 2006
Current Status:	Deferred to spring, 2006
Completion Date:	September 30, 2006

Project B.5 (EXP)

Title:	Tribal Participation in Experiment
Description:	This project was approved by AMWG as an add-on line item to the FY05 budget, without a work plan or any specific guidance on how to apply these funds. GCMRC received an unsolicited proposal from the Hualapai Tribe in 2005, requesting use of these funds to evaluate the effects of the experiment on Hualapai terrestrial ecosystem resources. With modifications, this proposal was funded in summer, 2005. A small amount of funding was also allocated to the Hualapai Tribe to support redistribution of fish remains resulting from the ongoing experimental mechanical trout removal project.
Cooperative Agreements:	Hualapai Tribe
Work / Reports Due (date):	Final project report due: May, 2006
Current Status:	Ongoing
Completion Date:	May 2006

Project C. Logistics and Survey Support

Project C.1 (L&S)

Title:	Logistics (Dispersed Throughout Projects (BNE6A)
Description:	GCMRC provides all technical and logistical support for monitoring and research projects conducted by GCMRC staff and contracted Principal Investigators (PIs) whose work is administered by GCMRC Program Managers in physical, biological and social-cultural resource programs. The GCMRC also supports logistical needs for the Bureau of Reclamation's activities conducted by Native American groups under the Programmatic Agreement program and activities conducted to meet Reclamation's needs concerning endangered species. In addition, GCMRC provides support for any contingency plans or experimental floods. GCMRC provides all technical and logistical support for monitoring and research projects conducted by GCMRC staff and contracted Principal Investigators (PIs) whose work is administered by GCMRC Program Managers in physical, biological and social-cultural resource programs. The GCMRC also supports logistical needs for the Bureau of Reclamation's activities conducted by Native American groups under the Programmatic Agreement program and activities conducted to meet Reclamation's needs concerning endangered species. In addition, GCMRC provides support for any contingency plans or experimental floods.
Contracts Let:	HSS, Namtek
Work / Reports Due (date):	Ongoing

Current Status: Ongoing
Completion Date: NA

Project C.2 (L&S)

Title: Survey Operations (BNE6B)
Description: The Survey department's mission is to provide survey support for spatial measurement and referencing of scientific data collected in the Colorado River ecosystem by GCMRC programs. This support may be in the form of precise measurement of geographic coordinates of a sample collected in the Canyon or in the generation of topographic maps used for erosion monitoring of terraces adjacent to the Colorado River. The Survey department is also responsible for establishing and maintaining accurate geographic control in the Canyon that is essential for accurate geo-referencing of remotely sensed data and change detection of resource data using modern image processing and GIS technologies. These technologies are critical to the integration and analysis of the diverse scientific data that have been collected in the Canyon over the past 15 years. Products of the Survey department include precise sample location coordinates, topographic maps, river channel maps and cross sections, digital elevation models, and digital terrain models. This information provides the basis for spatial analysis of data within the ecosystem using GIS software that in turn provides area and volumetric change detection capabilities.
Contract Let: NA
Work / Reports Due (date): NA
Current Status: Ongoing
Completion Date: NA

Project C.3 (L&S)

Title: Control Network (BNE6C)
Description:

Survey control in the Colorado River ecosystem is required to meet the demands of any spatial measurements for scientific monitoring and research. Survey control also supports the spatial positioning of hydrographic and bathymetric channel mapping as well as ground control for aerial mapping or remote sensing applications. The geodetic control network serves as the foundation for all spatial measurements necessary for long term monitoring. This control network also serves as the spatial framework for the Geographic Information System (GIS). The referencing of spatial data must be consistent in order to perform accurate change detection. All spatial data collected within the CRE requires georeferencing to the primary geodetic control network established by the GCMRC and the National Geodetic Survey. While current remote sensing and long-term monitoring sites have

	been referenced to this network, additional GCMRC monitoring activities require expanded network control efforts.
Contract Let:	Shephard-Wesnitzer
Work / Reports Due (date):	Annual Progress Report; December 1, 2005
Current Status:	Ongoing
Completion Date:	December 2005

Project D. Information Office

Project D.1 (IPO)

Title:	Web Page and Product Development (BNE5D)
Description:	Refresh of the GCMRC website based upon input from the committee established for this purpose. The committee consisted of two AMWG/TWG members, tow GCMRC staff members, and two IT Program members. The committee met once in July of 2004 and developed an outline for the new website using a technique developed by Knowledge Solutions called Information Mapping.
Contract Let:	Student contract for web programming skills.
Work / Reports Due (date):	The updated website can be viewed at www.gcmrc.gov ; October 30, 2005
Current Status:	Complete
Completion Date:	NA

Project D.2 (IPO)

Title:	Systems Administration (BNE5A)
Description:	System administration services for GCMRC computing environment. This project is responsible for implementing, maintaining, and troubleshooting the GCMRC computing environment including World Wide Web infrastructure and services.
Contract Let:	N/A – In-house
Work / Reports Due (date):	N/A - Service activity
Current Status:	Ongoing
Completion Date:	NA

Title:	Technical Support – Computer (BNE5A)
Description:	Student help with systems administration services. This person (project) assists the GCMRC Systems Administrator with implementing, maintaining, and troubleshooting the GCMRC computing environment.
Contract Let:	Student contract for systems administration services.
Work / Reports Due (date):	N/A - Service activity
Current Status:	Ongoing

Completion Date: NA

Project D.3 (IPO)

Title:	Library (BNE5B)
Description:	Library support and peer review services for GCMRC. This project facilitates monitoring and research activities in the Grand Canyon by providing a centralized repository for hard copy information such as books, reports, maps, photographs, and videos. This project also coordinates peer review of scientific products that helps ensure quality, credibility, and objectivity of GCMRC science activities.
Contract Let:	Part-time support person
Work / Reports Due (date):	N/A - Service activity
Current Status:	Ongoing
Completion Date:	NA

Note: The administrative costs will not be reflected in this document because they are not tracked as specific projects.