

USGS SBSC GCMRC
Experimental Flows of 2000
Brief Summary of Associated Scientific Studies
4 April 2008
Preliminary Summary, Subject to Change

Physical Resources

- **Lake Powell Studies: Effects of low summer steady flow experiment on the stratification, composition, and hydrodynamics of Lake Powell, and the downstream effects of that limnology – Vernieu –**
- **Effect of discharge and flows on temperatures in aquatic habitats. P.I. GCMRC biology program – Vernieu nearshore water temperature data – incorporated into mainstem temperature model being developed by Wright and Anderson. Report on nearshore temperatures being completed by Anderson.**
- **Effect of discharge on shoreline channel and tributary. P.I. - Frank Protiva, Shephard-Wesnitzer Inc. – analysis completed, waiting on figure completion for a paper submission to Regulated Rivers for end of year.**

Sediment storage and transport

- **Additional Monitoring of Effects of flow on suspended sediment and turbidity levels in the main channel of the Colorado River. – WRD, Rubin, Anima, Topping**
- **Effects of short duration high releases and long duration low steady flows on deposition and erosion of fine-sediment at selected eddy complexes utilizing the 34 Northern Arizona University (NAU) long-term eddy complex and sand bar study sites, plus 4 newly established channel margin monitoring sites. – NAU Sandbar Group (Melis and others, 2007?)**
- **Remote sensing component to investigate change detection of suspended sediment concentration, turbidity, and river-bottom cover type. Pat Chavez**
- **QTC Acoustics Data Investigation – status unknown**
- **Aerial CIR Investigation - status unknown**
- **Additional Sediment and Streamflow Modeling Along the Colorado River Ecosystem Between Glen Canyon Dam and Phantom Ranch in Support of Low Summer Steady Flow Testing. PI - S. Wiele - completed?**

- A collaborative research project before, during, and after the 33,000 ft³/s fall test flow with integrated and alternative methods to monitor sand storage. – FIST inaugural run. – Completed – part of FIST report?

Biological resources

Terrestrial vegetation

- Effects of steady vs. fluctuating flows on creation of “vegetated shoreline” for juvenile fish and exotic recruitment into newly available habitat. Porter/Kearsley - completed

Primary/secondary aquatics

- Effect of a 31,000-cfs spike flow and low steady flows on drift and benthic mass and composition in the Lees Ferry reach – AGFD -completed
- Algal colonization and recolonization response rates during experimental Low Summer Steady Flows M. Yard. – completed.
- Effect of Low steady flows on drift and benthic mass and composition in the Lees Ferry Reach and downstream – drift and benthic density values? - completed

Fish

- Effect of steady flows on growth, relative abundance and distribution of young-of-year fish along shoreline below the Little Colorado River. P.I. - R. Valdez and S. Carothers, SWCA. - Seining backwaters - completed
- Monitoring of Colorado River fish community. P.I. Native Fish monitoring workgroup Monitoring program development – sampling approaches – incorporated into subsequent annual reports by cooperators.
- Coupling Hydrodynamic and Individual-Based Fish Movement Models for the Evaluation of the Effects of Flow and Temperature Releases from Glen Canyon Dam on the Accessibility of Suitable Habitat for Humpback Chub Juveniles in the Colorado River – Completed - Published
- Effect of LSSF on Lees Ferry trout – AGFD - completed
- Native fish population information 2000-2006 (Coggins dissertation chapters/Open File Reports)

Socio-cultural resources

Economics

- Economic Impacts to power customers - Immediate effects on power costs. submitted
- Whitewater boating safety studies below Lees Ferry NPS – L. Jalbert - Downstream recreation and boat incidents – not completed
- Economic impacts to whitewater and angling concessionaires. PI –?
- Economic impacts to private whitewater boaters and anglers. PI – TBD

- **Effects on Recreational River Trip Characteristics.** – Jalbert and Robert (NAU) - ?
- **Changes in Campable Beach Areas.** – Ruth Lambert ?

Overflights

- **Topographic Base Mapping of the Colorado River Corridor from Glen Canyon Dam to Lake Mead – Horizons Flight in April 2006**
- 1) Black & White and Color Infrared Aerial Photography, Orthophotography, and Thermal Infrared Imagery of the Colorado River Corridor in Support of Research and Monitoring associated with Low Summer Steady Flows -
- 2) Pre-experiment CIR orthorectified digital photomosaic of the Colorado River corridor from Glen Canyon Dam to Lake Mead at 8,000 cfs steady flows and 30 cm resolution. Same physical area as number 1
- 3) Steady flow (late June) CIR aerial photography of the Colorado River corridor from Glen Canyon Dam to Lake Mead at 8,000 cfs steady flows and 10 cm pixel resolution. (mile –15 to 277).
- 4) Steady flow (late June) thermal infrared imagery of the Colorado River corridor from Glen Canyon Dam to approximately Phantom Ranch at 8,000 cfs steady flows and one meter pixel resolution. (mile –15 to 277).
- 5) Pre fall-spike B&W stereo digital and hardcopy orthophotography with 60% overlap of the first 100 miles of the Colorado River corridor from Glen Canyon Dam to Phantom Ranch (mile –15 to 85) at 8,000 cfs and 10 cm pixel resolution.
- 6) Peek fall-spike 1:4800 CIR stereo aerial photography of the first 100 miles of the Colorado River corridor from Glen Canyon Dam to Phantom Ranch (mile –15 to 85) at 8,000 cfs and 10 cm pixel resolution.
- 7) Post fall-spike 1:4800 B&W stereo digital and hardcopy orthophotography with 60% overlap of the first 100 miles of the Colorado River corridor from Glen Canyon Dam to Phantom Ranch (mile –15 to 85) at 8,000 cfs and 10 cm pixel resolution.
- 8) High resolution (25 cm) topography of twenty miles of sand bars yet to be determined within the first 100 miles of the Colorado Canyon corridor up to 300,000 cfs before and after fall spike. This product to be derived from pre- and post-spike orthophotography collected above or high resolution LIDAR yet to be determined.
- 9) High resolution (25 cm) topography of twenty campable beach sites yet to be determined within the first 100 miles of the Colorado Canyon corridor.