

# Completed 2008 High-Flow Experiment Scientific Reports

(Available at <http://www.gcmrc.gov>)

The 16 reports listed below are referenced to the individual research project numbers (Projects 1–7) and activities described in the December 2007 *Science Plan for a March 2008 High-Flow Experiment*, as recommended by AMWG in January 2008 and approved by the U.S. Department of the Interior for implementation in February 2008. An upcoming USGS report intended to summarize and synthesize all HFE results from 1996, 2004, and 2008 is anticipated by early 2011 in fulfillment of Project 7 (Synthesis of knowledge).

## Project 1—Sediment, archaeological sites, and backwaters

### Project 1.A—Sand budgeting

Topping, D.J., Rubin, D.M., Grams, P.E., Griffiths, R.E., Sabol, T.A., Voichick, N., Tusso, R.B., Vanaman, K.M., and McDonald, R.R., 2010, Sediment transport during three controlled-flood experiments on the Colorado River downstream from Glen Canyon Dam, with implications for eddy-sandbar deposition in Grand Canyon National Park: U.S. Geological Survey Open-File Report 2010-1128, 111 p., at <http://pubs.usgs.gov/of/2010/1128/>.

### Project 1.B—Eddy sandbar studies

Logan, B., Nelson, J., McDonald, R., and Wright, S., 2010, Mechanics and modeling of flow sediment transport and morphologic change in riverine lateral separation zones, *in* Hydrology and sedimentation for a changing future; existing and emerging issues (Joint Federal Interagency Conference 2010—Federal Interagency Hydrologic Modeling, 4th, and Federal Interagency Sedimentation, 9th), Las Vegas, Nev., June 27- July 1, Proceedings: v. ISBN: 978-0-9779007-3-2, CD-ROM.

### Project 1.C—Response of sandbars and select cultural sites

Hazel, J.E., Jr., Grams, P.E., Schmidt, J.C., and Kaplinski, M., 2010, Sandbar response in Marble and Grand Canyons, Arizona, following the 2008 high-flow experiment on the Colorado River: U.S. Geological Survey Scientific Investigations Report 2010-5015, 52 p., at <http://pubs.usgs.gov/sir/2010/5015/>.

Rubin, D.M., Topping, D.J., Chezar, H., Hazel, J.E., Schmidt, J.C., Breedlove, M., Melis, T.S., and Grams, P.E., 2010, 20,000 grain-size observations from the bed of the Colorado River and implications for sediment transport through Grand Canyon, *in* Hydrology and sedimentation for a changing future; existing and emerging issues (Joint Federal Interagency Conference 2010—Federal Interagency Hydrologic Modeling, 4th,

and Federal Interagency Sedimentation, 9th), Las Vegas, Nev., June 27- July 1, Proceedings: v. ISBN: 978-0-9779007-3-2, CD-ROM.

Draut, A.E., Topping, D.J., Rubin, D.M., Wright, S.A., and Schmidt, J.C., 2010b, Grain-size evolution in suspended sediment and deposits from the 2004 and 2008 controlled-flood experiments in the Marble and Grand Canyons, Arizona, *in* Hydrology and sedimentation for a changing future; existing and emerging issues (Joint Federal Interagency Conference 2010—Federal Interagency Hydrologic Modeling, 4th, and Federal Interagency Sedimentation, 9th), Las Vegas, Nev., June 27- July 1, Proceedings: v. ISBN: 978-0-9779007-3-2, CD-ROM.

Draut, A.E., Sondossi, H.A., Hazel, J.E., Jr., Andrews, T., Fairley, H.C., Brown, C.R., and Vanaman, K.M., 2009, 2008 Weather and aeolian sand-transport data from the Colorado River corridor, Grand Canyon, Arizona: U.S. Geological Survey Open-File Report 2009-1190, 98 p., at <http://pubs.usgs.gov/of/2009/1190/of2009-1190.pdf>.

Draut, A.E., Hazel, J.E., Jr., Fairley, H.C., and Brown, C.R., 2010a, Aeolian reworking of sandbars from the March 2008 Glen Canyon Dam high-flow experiment in Grand Canyon, *in* Melis, T.S., Hamill, J.F., Bennett, G.E., Coggins, L.G., Jr., Grams, P.E., Kennedy, T.A., Kubly, D.M., and Ralston, B.E., eds., Proceedings of the Colorado River Basin Science and Resource Management Symposium, November 18-20, 2008, Scottsdale, Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5135, 325-331 p., at <http://pubs.usgs.gov/sir/2010/5135/>.

#### Project 1.D—Biological and physical aspects of backwater habitats

Grams, P.E., Hazel, J.E., Schmidt, J.C., Kaplinski, M., Wright, S.A., Topping, D.J., and Melis, T.S., 2010a, Geomorphic response of sandbars to the March 2008 high-flow experiment on the Colorado River downstream from Glen Canyon Dam, *in* Hydrology and sedimentation for a changing future; existing and emerging issues (Joint Federal Interagency Conference 2010—Federal Interagency Hydrologic Modeling, 4th, and Federal Interagency Sedimentation, 9th), Las Vegas, Nev., June 27- July 1, Proceedings: v. ISBN: 978-0-9779007-3-2, CD-ROM.

Grams, P.E., Schmidt, J.C., and Andersen, M.E., 2010b, 2008 high-flow experiment at Glen Canyon Dam—morphologic response of eddy-deposited sandbars and associated aquatic backwater habitats along the Colorado River in Grand Canyon National Park: U.S. Geological Survey Open-File Report 2010-1032, 73 p., at <http://pubs.usgs.gov/of/2010/1032/>.

Behn, K.E., Kennedy, T.A., and Hall, R.O., Jr., 2010, Basal resources in backwaters of the Colorado River below Glen Canyon Dam—effects of discharge regimes and comparison with mainstem depositional environments: U.S. Geological Survey Open-File Report 2010-1075, 25 p., at <http://pubs.usgs.gov/of/2010/1075/of2010-1075.pdf>.

(This report is not directly tied to HFE reporting, however, the report's findings relate to Projects 1.D and 3.)

### **Project 2—Riparian vegetation**

Ralston, B.E., 2010, Riparian vegetation response to the March 2008 short-duration, high-flow experiment—implications of timing and frequency of flood disturbance on nonnative plant establishment along the Colorado River below Glen Canyon Dam: U.S. Geological Survey Open-File Report 2010-1022, 30 p., at <http://pubs.usgs.gov/of/2010/1022/>.

### **Project 3—Aquatic food base**

Rosi-Marshall, E.J., Kennedy, T.A., Kincaid, D.W., Cross, W.F., Kelly, H.A.W., Behn, K.A., White, T., Hall, R.O., Jr., and Baxter, C.V., 2010, Short-term effects of the 2008 high-flow experiment on macroinvertebrates in the Colorado River below Glen Canyon Dam, Arizona: U.S. Geological Survey Open-File Report 2010-1031, 28 p., at <http://pubs.usgs.gov/of/2010/1031/>.

### **Project 4—Rainbow trout**

#### **Project 4.A—Redds study**

Korman, J., Kaplinski, M., and Melis, T.S., 2010, Effects of high-flow experiments from Glen Canyon Dam on abundance, growth, and survival rates of early life stages of rainbow trout in the Lees Ferry reach of the Colorado River: U.S. Geological Survey Open-File Report 2010-1034, 31 p. <http://pubs.usgs.gov/of/2010/1034/>.

#### **Project 4.B—Movement study**

Hilwig, K.D., and Makinster, A.S., 2010, Evaluating effects of a high-flow event on rainbow trout movement in Glen and Marble Canyons, Arizona, by using acoustic telemetry and relative abundance measures, *in* Melis, T.S., Hamill, J.F., Bennett, G.E., Coggins, L.G., Jr., Grams, P.E., Kennedy, T.A., Kubly, D.M., and Ralston, B.E., eds., Proceedings of the Colorado River Basin Science and Resource Management Symposium, November 18-20, 2008, Scottsdale, Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5135, 219-225 p., at <http://pubs.usgs.gov/sir/2010/5135/>.

### **Project 6—Kanab ambersnail conservation measures**

Sorensen, J.A., Kanab Ambersnail habitat mitigation for the 2008 high flow experiment—August 2009 draft cooperators report from Arizona Game and Fish Department: Phoenix, Arizona Game and Fish Department.

## **Project 7—Synthesis of knowledge**

Melis, T.S., Topping, D.J., Grams, P.E., Rubin, D.M., Wright, S.A., Draut, A.E., Hazel, J.E., Jr., Ralston, B.E., Kennedy, T.A., Rosi-Marshall, E., Korman, J., Hilwig, K.D., and Schmit, L.M., 2010, 2008 High-flow experiment at Glen Canyon Dam benefits Colorado River resources in Grand Canyon National Park: U.S. Geological Survey Fact Sheet 2010-3009, 4 p., at <http://pubs.usgs.gov/fs/2010/3009/>.

## **Pending 2008 High-Flow Experiment Reports**

Anticipated before December 31, 2010

Schmidt, J.C., Valdez, R.A., Melis, T.S. (eds.), The effects of three Glen Canyon Dam high-flow experiments on the Grand Canyon ecosystem: U.S. Geological Survey Circular.

Vernieu, W.S., Effects of the 2008 high-flow experiment on water quality in Lake Powell and Glen Canyon Dam releases, Utah-Arizona: U.S. Geological Survey Open-File Report 2010–1159.

Wright, S.A., and Kaplinski, M., Flow structures and sandbar dynamics in pool-rapid units during a controlled flood, Colorado River, Arizona: *Journal of Geophysical Research-Earth Surface* (accepted pending minor revisions).