

## **Glen Canyon Dam Adaptive Management Program Published Research on Experimental Activities**

### **Published Papers and Reports**

- Andersen, M.E., 2007, Grand Canyon humpback chub population improving: U.S. Geological Survey Fact Sheet 2007-3113, 2 p., <http://pubs.usgs.gov/fs/2007/3113/>, accessed on February 1, 2010.
- Andersen, M.E., 2009, Status and trends of the Grand Canyon population of humpback chub: U.S. Geological Survey Fact Sheet 2009-3035, 2 p., <http://pubs.usgs.gov/fs/2009/3035>, accessed on February 1, 2010.
- Coggins, L.C., Jr., 2008, Abundance trends and status of the Little Colorado River population of humpback chub--an update considering 1989-2006 data: U.S. Geological Survey Open-File Report 20071402, 53 p., <http://pubs.usgs.gov/of/2007/1402/>, accessed on January 28, 20 10.
- Coggins, L.C., Jr., and Waters, C.J., 2009, Abundance trends and status of the Little Colorado River population of humpback chub--an update considering data from 1989-2008: U.S. Geological Survey Open-File Report 2009-1075, 18 p., <http://pubs.usgs.gov/of/2009/1075>, accessed on February 1, 2010.
- Coggins, L.G., Pine, W.E., III, Walters, C.J., Van Haverbeke, D.R., Ward, D., and Johnstone, H.C., 2006, Abundance trends and status of the Little Colorado River population of humpback chub: North American Journal of Fisheries Management, v. 26, no. 1, p. 233-245,p., [http://www.usbr.gov/uc/rm/amp/twg/mtgs/06may24/Attach\\_06f.pdf](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06may24/Attach_06f.pdf), accessed on January 27, 2010.
- Collins, B.D., Brown, K.M., and Fairley, H.C., 2008, Evaluation of terrestrial LIDAR for monitoring geomorphic change at archeological sites in Grand Canyon National Park, Arizona: U.S. Geological Survey Open-File Report 2008-1384, 60 p., <http://pubs.usgs.gov/of/2008/1384/>, accessed on February 1, 20 10.
- Collins, B.D., Minasian, D., and Kayen, R., 2009, Topographic change detection at select archeological sites in Grand Canyon National Park, Arizona--2006-2007: U.S. Geological Survey Scientific Investigations Report 2009-5116, 58 p.,p., <http://pubs.usgs.gov/sir/2009/5116/index.html>, accessed on February 1, 20 10.
- Draut, A.E., Andrews, T., Fairley, H.C., and Brown, C.R., 2009a, Weather and aeolian sand-transport data from the Colorado River corridor, Grand Canyon, Arizona: U.S. Geological Survey Open-File Report 2009-1098, 110p., <http://pubs.usgs.gov/of/2009/1098/>, accessed on February 1, 2010.
- Draut, A.E., and Rubin, D.M., 2005, Measurements of wind, aeolian sand transport, and precipitation in the Colorado River corridor, Grand Canyon, Arizona--November 2003 to December 2004: U.S. Geological Survey Open-File Report 2005-1309, 70 p., <http://pubs.usgs.gov/of/2005/1309/>, accessed on February 1, 2010.
- Draut, A.E., and Rubin, D.M., 2006, Measurements of wind, aeolian sand transport, and precipitation in the Colorado River corridor, Grand Canyon, Arizona--January 2005 to January 2006: U.S. Geological Survey Open-File Report 2006-1188, p., <http://pubs.usgs.gov/of/2006/1188/>, accessed on February 1, 2010.
- Draut, A.E., and Rubin, D.M., 2007, The role of aeolian sediment in the preservation of archaeological sites in the Colorado River corridor, Grand Canyon, Arizona, in Van Riper, C., III, and Sogge, M.K.,

eds., Integrating science and management on the Colorado Plateau: Tucson, University of Arizona Press.

- Draut, A.E., and Rubin, D.M., 2008, The role of eolian sediment in the preservation of archeologic sites along the Colorado River in Grand Canyon National Park, Arizona: U.S. Geological Survey Professional Paper 1756, 71 pp., <http://pubs.usgs.gov/pp/1756/pp1756.pdf>, accessed on January 12, 2010.
- 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 2009-1290, 98 p., p., <http://pubs.usgs.gov/of/2009/1190/of2009-1190.pdf>, accessed on January 12, 2010.
- Gartner, J.W., and Ganju, N.K., 2007, Correcting acoustic Doppler current profiler discharge measurement bias from moving-bed conditions without global positioning during the 2004 Glen Canyon Dam controlled flood on the Colorado River: Limnology and Oceanography--Methods, v. 5, p. 156-162.p.
- Grams, P.E., 2006, Sand transport over a coarse and immobile bed: Baltimore, Johns Hopkins University, Ph.D. dissertation, 177 p.p.,
- Hamill, J.F., 2008, Science activities associated with proposed 2008 high-flow experiment at Glen Canyon Dam: U.S. Geological Survey Fact Sheet 2008-3011, 2 p.,p., <http://pubs.usgs.gov/fs/2008/3011>, accessed on February 1, 20 10.
- Hamill, J.F., 2009, Status and trends of resources below Glen Canyon Dam update--2009: U.S. Geological Survey Fact Sheet 2009-3033, 4 p.p., <http://pubs.usgs.gov/fs/2009/3033/> , accessed on February 1, 2010.
- Hazel, J.E., Grams, P.E., Schmidt, J.C., and Kaplinski, M., 20 10, Sandbar response following the 2008 high-flow experiment on the Colorado River in Marble and Grand Canyons: U.S. Geological Survey Scientific Investigations Report 2010-5015, 52 p. <http://pubs.usgs.gov/sir/2010/5015/>
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- Kaplinski, M., Hazel, J.E., Jr., Parnell, R., Breedlove, M.J., Kohl, K., and Gonzales, M., 2009, Monitoring fine-sediment volume in the Colorado River ecosystem, Arizona--bathymetric survey techniques: U.S. Geological Survey Open-File Report 2009-1207, 33 p., <http://pubs.usgs.gov/of/2009/1207/of2009-1207.pdf>, accessed on January 28, 2010.
- Korman, J., Kaplinski, M., Hazel, J.E.J., and Melis, T.S., 2005, Effects of the experimental fluctuating flows from Glen Canyon Dam in 2003 and 2004 on the early life history stages of rainbow trout in the Colorado River--final report: submitted to U.S. Geological Survey, Grand Canyon Monitoring and Research Center, cooperative agreement no. 04-WRAG-0006 and modification no. 002, 183 p. [http://www.gcmrc.gov/library/reports/Biological/Fish\\_Studies/Korman2005.pdf](http://www.gcmrc.gov/library/reports/Biological/Fish_Studies/Korman2005.pdf)
- Korman, J., Wiele, S.M., and Torizzo, M., 2004, Modelling effects of discharge on habitat quality and dispersal of juvenile humpback chub (*Gila cypha*) in the Colorado River, Grand Canyon: River Research and Applications, v. 20, p. 379-400.p.

- Melis, T.S., Martell, S.J.D., Coggins, L.G., Pine, W.E.I., and Andersen, M.E., 2006, Adaptive management of the Colorado River ecosystem below Glen Canyon Dam, Arizona--using science and modeling to resolve uncertainty in river management, *in* Specialty Summer Conference on Adaptive Management of Water Resources--CD Rom Proceedings: Missoula, Mont. 2006, American Water Resources Association.
- Melis, T.S., Topping, D.J., Rubin, D.M., and Wright, S.A., 2007, Research furthers conservation of Grand Canyon sandbars: U.S. Geological Survey Fact Sheet fs2007-3020, 2 pp., <http://pubs.usgs.gov/fs/2007/3020/>, accessed on February 1, 20 10.
- 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 20101022, 30 p. <http://pubs.usgs.gov/of/2010/1022/>
- Ralston, B.E., Davis, P.A., Weber, R.M., and Rundall, J.M., 2008, A vegetation database for the Colorado River ecosystem from Glen Canyon Dam to the western boundary of Grand Canyon National Park, Arizona: U.S. Geological Survey Open-File Report 2008-1216, 37 p., <http://pubs.usgs.gov/of/2008/1216/>, accessed on February 1, 2010.
- Rubin, D.M., Chezar, H., Harney, J.N., Topping, D.J., Melis, T.S., and Sherwood, C.R., 2006, Underwater microscope for measuring spatial and temporal changes in bed-sediment grain size: U.S. Geological Survey Open-File Report 2006-1360, 15 p., p., <http://pubs.usgs.gov/of/2006/1360/>, accessed on January 27, 2010.
- Rubin, D.M., Topping, D.J., Schmidt, J.C., Hazel, J., Kaplinski, M., and Melis, T.S., 2002, Recent sediment studies refute Glen Canyon Dam hypothesis: *Eos, Transactions, American Geophysical Union*, v. 83, no. 25, p. 273, 277-278.p.
- Speas, D.W., Walters, C.J., Ward, D.L., and Rogers, S.R., 2004, Effects of intraspecific density and environmental variables on electrofishing catchability of brown and rainbow trout in the Colorado River, Arizona: *North American Journal of Fisheries Management*, v. 24, no. 2, p. 586-596, p., <http://afsjournals.org/doi/pdf/10.1577m02-193.1>, accessed on February 1, 2010.
- Topping, D.J., Rubin, D.M., and Melis, T.S., 2007, Coupled changes in sand grain size and sand transport driven by changes in the upstream supply of sand in the Colorado River--relative importance of changes in bed-sand grain size and bed-sand area: *Sedimentary Geology*, v. 202, no. 3, p. 538-561 p.
- Topping, D.J., Rubin, D.M., Schmidt, J.C., Hazel, J.E., Jr., Melis, T.S., Wright, S.A., Kaplinski, M., Draut, A.E., and Breedlove, M.J., 2006, Comparison of sediment-transport and bar-response results from the 1996 and 2004 controlled-flood experiments on the Colorado River in Grand Canyon, *in* CDROM Proceedings of the 8th Federal Interagency Sedimentation Conference: Reno, Nev., April 26,2006.p.
- Topping, D.J., Wright, S.A., Melis, T.S., and Rubin, D.M., 2007, High-resolution measurements of suspended-sediment concentration and grain size in the Colorado River in Grand Canyon using a multi-frequency acoustic system, *in* International Symposium on River Sedimentation: 10th, Moscow, August 1-4, 2007.
- Topping, D.J., Wright, S.A., Rubin, D.M., and Melis, T.S., 2006, High-resolution monitoring of suspended sediment concentration and grain size in the Colorado River using laser diffraction instruments and a three-frequency acoustic system in CD-ROM Proceedings of the 8th Federal Interagency

Sedimentation Conference: Reno, Nev., April 2-6, 2006.

Wiele, S.M., Wilcock, P.R., and Grams, P.E., 2007, Reach-averaged sediment routing model of a canyon river: *Water Resources Research*, v. 43, no. W02425, p. 1-16, <http://www.agu.org/journals/wr/wr0702/2005WR004824/>, accessed on February 1, 2010.

Wright, S.A., and Gartner, J.W., 2006, Measurements of velocity profiles and suspended sediment concentrations in a Colorado River eddy during high flow, *in* Federal Inter-Agency Sedimentation Conference--CD Rom Proceedings: 8th, Reno, Nev., 2006.

Wright, S.A., Melis, T.S., Topping, D.J., and Rubin, D.M., 2005, Influence of Glen Canyon Dam operations on downstream resources of the Colorado River in Grand Canyon, *in* Gloss, S.P., Lovich, J.E., and Melis, T.S., *The state of the Colorado River ecosystem in Grand Canyon: U.S. Geological Survey Circular 1282*, p. 17-31. <http://pubs.usgs.gov/circ/1282/>

Wright, S.A., Schmidt, J.C., Melis, T.S., Topping, D.J., and Rubin, D.M., 2008, Is there enough sand? evaluating the fate of Grand Canyon sandbars: *GSA Today*, v. 18, no. 8, p. 4-10.

### **Reports and Papers (includes papers in Proceedings of the 2008 Colorado River Basin Science and Resource Management Symposium)**

Behn, K.E., Kennedy, T.A., and Hall, R.O., Jr., 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. <http://pubs.usgs.gov/of/2010/1075/>

Davis, P.A., and Melis, T.S., Mapping fill-channel geometry in the Grand Canyon using airborne bathymetric LiDAR-the Lees Ferry test case, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular*. <http://pubs.usgs.gov/sir/2010/5135/>

Draut, A.E., Hazel, J.E., Jr., Fairley, H.C., and Brown, C.R., Aeolian reworking of sandbars from the March 2008 Glen Canyon Dam high-flow experiment in Grand Canyon, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular*. <http://pubs.usgs.gov/sir/2010/5135/>

Fairley, H.C., and Sondossi, H., Applying an ecosystem framework to evaluate archaeological site condition along the Colorado River in Grand Canyon National Park, Arizona, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular*. <http://pubs.usgs.gov/sir/2010/5135/>

Grams, P.E., Schmidt, J.C., and Andersen, M.E., 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 OpenFile Report. <http://pubs.usgs.gov/of/2010/1032/>

Grams, P.E., Schmidt, J.C., and Topping, D.J., Bed incision and channel adjustment of the Colorado River in Glen Canyon National Recreation Area downstream from Glen Canyon Dam, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Hall, R.O., Jr., Kennedy, T.A., Rosi-Marshall, E.J., Cross, W.F., Wellard, H.A., and Baxter, C.F., Aquatic production and carbon flow in the Colorado River, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular. <http://pubs.usgs.gov/sir/2010/5135/>

Hilwig, K.D., and Makinster, 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., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Kaplinski, M., Hazel, J.E., Jr., Colorado River Campsite Monitoring, 1998 - 2006, Grand Canyon National Park, Arizona, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Korman, Josh, Kaplinski, M, and Melsi, T.S., 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. <http://pubs.usgs.gov/of/2010/1034/>

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., Baxter, C.V., Short-term effects of a high-flow experiment on macroinvertebrates in the Colorado River below Glen Canyon Dam: U.S. Geological Survey Open-File Report.

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Schmidt, John, C., A Watershed Perspective of Changes in Stream Flow, Sediment Supply, and Geomorphology of the Colorado River, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Tusso, R.B., Rubin, D.M., Topping, D.J., Chezar, H., and Breedlove, B., Using changes in bed surface grain size as a proxy for changes in bed sand storage, Colorado River, Grand Canyon, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Voichick, N., and Topping, D.J., Use of specific conductance in estimating salinity and as a natural tracer of water parcels in the Colorado River between Glen Canyon Dam and Diamond Creek, northern Arizona, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular.

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Yard, M.D., Coggins, L.G., and Baxter, C.V., Predator prey interactions-nonnative trout predation on native fishes in the Colorado River, Grand Canyon, *in* Melis, T.S., Hamill, J.F., Coggins, L.C., 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: U.S. Geological Survey Circular. <http://pubs.usgs.gov/sir/2010/5135/>

### **Abstracts Presented at Professional Meetings**

- Akahori, R., Schineeckle, M.W., and Topping, D.J., 2004, Erosion characteristics of fine-grained, beach building sediment along the Colorado River in Grand Canyon: EOS, Transactions, American Geophysical Union, v. 85, n. 47, F906.
- Breedlove, M.J., Hazel, J.E., Kaplinski, M.A., Schmidt, J.C., Topping, D.J., Rubin, D.M., Fuller, A.E., Tusso, R., and Gonzales, F.M., 2005, Using an integrated, remote-sensing methodology to evaluate the effects of dam operations on fine-grained sediment storage and sand bar restoration in Marble Canyon: EOS, Transactions, American Geophysical Union, v. 86, no., 52, p. F614.
- Hazel, J., Kaplinski, M., and Parnell, R., Monitoring arroyos with conventional survey techniques in Grand Canyon: 1996-2004: Grand Canyon Monitoring and Research Center Geomorphology Symposium (February 9, 2005).
- Rubin, D.M., Topping, D.J., Wright, S.A., and Melis, T.S., 2006, Incorporating bed-sediment grain size in predictions of suspended-sediment concentration: three approaches tested using 20,000 bed sediment grain-size measurements from the Colorado River in Grand Canyon: Fall AGU.
- Schmidt, J.C., Topping, D.J., Grams, P.E., and Hazel, J.E., 2005, System-wide changes in the distribution of fine sediment in the Colorado River corridor of Grand Canyon National Park: Geological Society of America Abstracts with Programs, v. 37, n. 7, p. 331.
- Schmidt, J.C., Topping, D.J., Rubin, D.M., Breedlove, M.J., Hazel, J.E., Kaplinski, M.A., Wright, S.A., Fuller, A.E., and Melis, T.S., 2005, High releases from Glen Canyon Dam cause short-term eddy bar aggradation if timed to coincide with significant input of sediment from tributaries: EOS, Transactions, American Geophysical Union, v. 86, n., 52, p. F913.
- Topping, D.J., Rubin, D.M., Schmidt, J.C., Hazel, J.E., Wright, S.A., Melis, T.S., and Kaplinski, M., 2005, Comparison of sediment-transport and bar-response results from the 1996 and 2004 controlled flood experiments on the Colorado River in Grand Canyon: EOS, Transactions, American Geophysical Union, v. 86, n., 52, p. F906.

### **2005 Grand Canyon Monitoring and Research Center Science Symposium, Tempe, Ariz.**

- Coggins, L.G., Jr., Yard, M.D., and Gwinn, D., 2005, Mechanical removal of nonnative fishes in the Colorado River within Grand Canyon: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Draut, A.E., and Rubin, D.M., 2005, Investigating effects of the November 2004 high-flow release from Glen Canyon Dam on Aeolian sand-transport rates in the Colorado River corridor, Grand Canyon, AZ: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Hazel, J.E., Jr., Kaplinski, M., Parnell, R., Schmidt, J.C., Topping, D.J., 2005, A tale of two floods: comparing sandbar responses to the 1996 and 2004 high-volume experimental flow on the Colorado River in Grand Canyon: Colorado River Ecosystem Science Symposium, Tempe, Ariz.

- Korman, J., and Campana, S., 2005, Effects of 2003-04 fluctuating flows from Glen Canyon Dam on the early life history stages of rainbow trout in the Colorado River: Part 2: Effects on young-of-year habitat use, growth, and survival: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Korman, J., Kaplinski, M., Hazel, J.E., Jr., and Melis, T.S., 2005, Effects of 2003-04 fluctuating flows from Glen Canyon Dam on the early life history stages of rainbow trout in the Colorado River: Part 1: Effects on the survival of eggs and alevins: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Pahner, S.C., Burbidge, C., and Cook, W., 2005, The electrical power economic impacts of liberalizing Glen Canyon Dam operational constraints: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Palmer, S.C., and Patrio, H., 2005, Three years of experimentation at Glen Canyon Dam: the electrical power economic costs: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Schmeeckle, M., and Akahori, R., 2005, Flow, deposition, and stability or recirculation eddy bars in response to beach/habitat-building flows: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Schmidt, J.C., 2005, One hundred years of sand in Grand Canyon: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Topping, D.J., Rubin, D.M., Schmidt, J.C., Hazel, J.E., Jr., Melis, T.S., Wright, S.A., Kaplinski, M., 2005, Sediment transport and budget during the November 2004 controlled-flood experiment, with comparisons to the 1996 controlled-flood experiment: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Voichick, Nicholas, 2008, Specific conductance in the Colorado River between Glen Canyon Dam and Diamond Creek, northern Arizona, 1988-2007: U.S. Geological Survey Data Series 364, 16 p.  
<http://pubs.usgs.gov/ds/364/>
- Walters, C., 2005, Surprise and opportunity in Grand Canyon adaptive management: Colorado River Ecosystem Science Symposium, Tempe, Ariz.
- Yard, M.D., Coggins, L.G., Ralston, B.E., Kennedy, T.A., and Persons, W.R., 2005, Response of drifting invertebrates and organic matter to disturbance from high experimental flows prescribed for the Colorado River, Grand Canyon, AZ: Colorado River Ecosystem Science Symposium, Tempe, Ariz.

### **Presentations at Recent TWG and AMWG Meetings**

- October 25, 2004 AMWG, Melis and others, 1) WY 2004 sediment experimental update Paria River inputs and 41,000 vs. 45,000 cfs sand bar simulations, 2) Summary Paria River sand inputs July 1-Oct. 24, 2004, Coggins and others 3) Update on mechanical removal treatments [PowerPoint presentations].
- February 3, 2005 TWG, Melis and others, Experimental update on fine-sediment, 1) Review of Paria River sediment trigger and activity (2004-05), 2) Preliminary results of sand-bar area and volume changes as measured in the long-term monitoring sites measured repeatedly by the Northern Arizona University, Geology Department, 3) Preliminary results of the suspended-sediment mass balance for Marble Canyon for July 2004 through January 2005, as estimated by the USGS [PowerPoint presentation].
- March 2, 2005 AMWG, Melis and others, 1) Update on preliminary experimental results associated with the November 2004 high-flow test at Glen Canyon Dam, Coggins and others 2) Results of hoop net sampling to examine changes in juvenile humpback chub abundance and size before and after the

2004 experimental high flow, Korman and others 3) Review of conclusions from final report on rainbow trout studies in Lees Ferry reach [PowerPoint presentations].

August 30, 2005 AMWG, Melis and others, 1) WY 2004 experimental fine-sediment update between Lees Ferry and Diamond Creek, Sponholtz and others 2) Update on humpback chub translocation above Chute Falls (PowerPoint presentations].

March 8, 2006 AMWG, Wright and others, 1) Update on 2005/2006 tributary sand inputs and mainstem export-sand mass balance, 2) Update on specific experimental elements: 2a) Non-native fish suppression flows (5,000-20,000 cfs), 2b) Alternating low steady and low fluctuating flows (6,500-9,000 cfs versus steady 8,000 cfs), 2c) November 2004 High Experimental Flow, 3) summary of mass balance and experimental findings, Andersen and others, 4) Update on mechanical removal treatments, 5) Lees Ferry trout fishery summary, 6) Age structured mark recapture model of Grand Canyon HBC population using data through 2004, 7) Chute Falls translocation update [PowerPoint presentations].

May 2006 TWG, Topping and others, 1) Comparison of sediment-transport and bar-response results from the 1996 and 2004 controlled-flood experiments on the Colorado River in Grand Canyon, Draut and Rubin, 2) Final results of aeolian sediment-transport study: Implications for future weather monitoring in the Colorado River ecosystem [PowerPoint presentations].

August 1, 2006 TWG, Wright and others, 1) Sand transport during steady and low fluctuating flows in September/October 2005, Kennedy and others, 2) Comparison of food base data collected under steady versus low-fluctuating flows, Ralston and others, 3) Comparison of steady versus lowfluctuating flow aquatic sampling within backwaters, Anderson and others, 4) Update on nearshore temperature data collected under steady versus low-fluctuating flows [PowerPoint presentations].

November 9, 2006 TWG, Melis and others, 1) Status of sand supplies in the Colorado below Glen Canyon Dam, 2) Review of recommendations from Rubin and others memorandum of October 19, 2006, 3) perspectives on BHBF influence on biological and socio-cultural resources, Wohl and others, 4) Report of the physical resources monitoring peer review panel, with recommendation for ongoing high-flow sediment experimentation [PowerPoint presentations].

December 6, 2006 AMWG, Andersen and others, 1) Update on rainbow trout experimental studies in Lees Ferry reach, 2) Update on mechanical removal treatments, 3) Chute Falls translocation, Melis and others, GCMRC's experimental research update "sediment," 4) Update on 2004 sediment test findings, 5) 2006 status of sand supplies in the Colorado Below Glen Canyon Dam, 6) Beachihabitat building flow in FY2007, Overview of science recommendations, status of reports and update on BHBF science planning [PowerPoint presentations].