

Paul E. Grams

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U.S. Geological Survey
Grand Canyon Monitoring and Research Center
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Fields of Specialty: Sediment transport, fluvial geomorphology, hydrology, geomorphology, human impacts on watersheds and river systems.

Education:

Ph. D., 2006, Geography, Johns Hopkins University, Baltimore, Maryland. Advisor: Peter R. Wilcock.
Dissertation: Sand transport over a coarse and immobile bed.

M.S., 1997, Geology, Utah State University, Logan, Utah. Advisor: John C. Schmidt. Thesis:
Geomorphology of the Green River in Dinosaur National Monument.

B.A., cum laude, 1991, Geology, Middlebury College, Middlebury, Vermont. Senior thesis:
Degradation of alluvial sand bars along the Snake River below Hells Canyon Dam.

Professional Experience/Employment History:

January 2012 – present: Research Hydrologist, U.S. Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff, AZ.

January 2008 – January 2012: Supervisory hydrologist and physical science program manager, U.S. Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff, AZ.

January 2006 – December 2007 : Post-Doctoral Research Associate, Department of Watershed Sciences, Utah State University, Logan, Utah, 84322.

January 2002 – December 2005: Graduate student, Department of Geography and Environmental Engineering, The Johns Hopkins University, Baltimore, Maryland.

December 1996 – December 2001: Research Associate, Department of Geography and Earth Resources, Utah State University, Logan, Utah, 84322. Managed research lab and field research activities for Dr. John C. Schmidt. Responsibilities included setting up and managing GIS computing lab, managing sediment lab, obtaining and maintaining external funding for research, planning and supervising field research expeditions on large rivers in the Western U.S., conducting and supervising data analysis and reduction efforts, and producing technical reports and manuscripts for publication.

September 1993 – November 1996: Graduate Research Assistant, Department of Geography and Earth Resources, Utah State University, Logan, Utah, 84322.

April 1992 – August 1993: River Ranger, U.S. Department of Interior, Bureau of Land Management, Price River Resource Area, Price, Utah.

Publications:

Grams, P. E., J. C. Schmidt, S. A. Wright, D. J. Topping, T. S. Melis, and D. M. Rubin (2015), Building Sandbars in the Grand Canyon, EOS, Trans. Am. Geophys. Union, 96(11), 12–16.

- Buscombe, D., P. E. Grams, and M. A. Kaplinski (2014), Journal of Geophysical Research : Earth Surface Characterizing riverbed sediment using high-frequency acoustics : 1 . Spectral properties of scattering, , 2674–2691, doi:10.1002/2014JF003189.Received.
- Buscombe, D., P. E. Grams, and M. A. Kaplinski (2014), Journal of Geophysical Research : Earth Surface Characterizing riverbed sediment using high-frequency acoustics : 2 . Scattering signatures of Colorado River bed sediment in Marble and Grand Canyons, , 2692–2710, doi:10.1002/2014JF003191.In.
- Mueller, E.R., Grams, P.E., Schmidt, J.C., Alexander, J.S., Hazel, J.E., Jr, and Kaplinski, M., 2014, The influence of controlled floods on fine sediment storage in debris fan-affected canyons of the Colorado River basin, *Geomorphology*.
- Grams, P. E., and P. R. Wilcock, 2013, Transport of fine sediment over a coarse, immobile river bed, *Journal of Geophysical Research: Earth Surface*, 2013JF002925.
- Grams P. E., D. J. Topping, J. C. Schmidt, J. E. Hazel Jr., and M. Kaplinski, 2013, Linking morphodynamic response with sediment mass balance on the Colorado River in Marble Canyon: Issues of scale, geomorphic setting, and sampling design, *J. Geophys. Res. Earth Surf.*, 118, 361–381, doi:10.1002/jgrf.20050. <http://onlinelibrary.wiley.com/doi/10.1002/jgrf.20050/full>
- Grams P. E., 2013, A sand budget for Marble Canyon, Arizona--implications for long-term monitoring of sand storage change, U.S. Geological Survey Fact Sheet 2013–3074, 4 p., <http://pubs.usgs.gov/fs/2013/3074/>.
- Kennedy, T. A., Yackulic, C. B., Cross, W. F., Grams, P. E., Yard, M. D. and Copp, A. J., 2013, The relation between invertebrate drift and two primary controls, discharge and benthic densities, in a large regulated river. *Freshwater Biology*. doi: 10.1111/fwb.12285
- Ross, R., and Grams, P.E., 2013, Nearshore thermal gradients of the Colorado River near the Little Colorado River confluence, Grand Canyon National Park, Arizona, 2010: U.S. Geological Survey Open-File Report 2013–1013, 65 p. (Available at <http://pubs.usgs.gov/of/2013/1013/>.)
- Schmidt, J.C. and Grams, P.E., 2011, Chapter 2: Understanding Physical Processes of the Colorado River *in* Melis, T. S., ed., 2011, Effects of three high-flow experiments on the Colorado River ecosystem downstream from Glen Canyon Dam, Arizona: U.S. Geological Survey Circular 1366, 147 p.
- Schmidt, J.C. and Grams, P.E., 2011, Chapter 3: The High Flows—Physical Science Results *in* Melis, T. S., ed., 2011, Effects of three high-flow experiments on the Colorado River ecosystem downstream from Glen Canyon Dam, Arizona: U.S. Geological Survey Circular 1366, 147 p.
- Melis, T.S., Grams, P.E., Kennedy, T.A., Ralston, B.E., Robinson, C.T., Schmidt, J.C., Schmit, L.M., Valdez, R.A., and Wright, S.A., 2011, Three experimental high-flow releases from Glen Canyon Dam, Arizona—Effects on the downstream Colorado River ecosystem: U.S. Geological Survey Fact Sheet 2011-3012, 4 p.
- Grams, P.E., Hazel, J.E., Schmidt, J.C., Kaplinski, M., Wright, S.A., Topping, D.J., and Melis, T.S., 2010, 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., 2010, 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., accessed on July 27, 2010, at <http://pubs.usgs.gov/of/2010/1032/>.
- Grams, P.E., Schmidt, J.C., and Topping D.J., 2010, 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., 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.
- Hazel, J.E., Jr., Grams, P.E., Schmidt, J.C., and Kaplinski, M., 2010, Sandbar response following the 2008 high-flow experiment on the Colorado River in Marble and Grand Canyons, Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5015, 52 p.
[<http://pubs.usgs.gov/sir/2010/5015/>].
- Melis, T.S., Hamill, J.F., Coggins, L.G., Bennett, G.E., Grams, P.E., Kennedy, T.A., Kubly, D.M., and Ralston, B.E., 2010, Proceedings of the Colorado River Basin Science and Management Symposium, November 18-20, 2008, Scottsdale, Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5135, 372 p.
- 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, Emma, Korman, Josh, Hilwig, K.D., and Schmit, Lara 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.
[<http://pubs.usgs.gov/fs/2010/3009/>].
- Rubin, D.M., Topping, D.J., Chezlar, 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.
- 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.
- Wright, S.A. and Grams, P.E., 2010, Evaluation of water year 2011 Glen Canyon Dam flow release scenarios on downstream sand storage along the Colorado River in Arizona: U.S. Geological Survey Open-File Report 2010-1133, 18 p.
- Grams, P.E., and Wilcock, P.R., 2007, Water Resources Research. Entrainment of fine sediment into suspension over a coarse immobile bed in equilibrium transport.
- 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, W02425, doi:10.1029/2005WR004824.
- Grams, P.E., Schmidt, J.C., and Topping, D.J., 2007, The Degraded Reach: Rate and Pattern of Bed and Bank Adjustment of the Colorado River in the 25 km Immediately Downstream from Glen Canyon Dam, GSA Bulletin, v. 119, no.5/6, p. 556-575; doi: 10.1130/B25969.1.
- Grams, P.E., Wilcock, P.R., and Wiele, S.M., 2005, Entrainment and non-uniform transport of fine-sediment in coarse-bedded rivers. proceedings, River Coastal and Estuarine Morphodynamics, Urbana, Illinois.
- Grams, P.E. and Schmidt, J.C., 2005. Equilibrium or indeterminate? Where sediment budgets fail: Sediment mass balance and adjustment of channel form, Green River downstream from Flaming Gorge Dam, Utah and Colorado. *Geomorphology*, 71: 156-181.
- Grams, P.E. and Schmidt, J.C., 2002. Streamflow regulation and multi-level flood plain formation: Channel narrowing on the aggrading Green River in the eastern Uinta Mountains, Colorado and Utah. *Geomorphology*, 44: 337-360.

- Grams, P.E. and Schmidt, J.C., 1999. Geomorphology of the Green River in the eastern Uinta Mountains, Dinosaur National Monument, Colorado and Utah. In: A.J. Miller and A. Gupta (Editors), *Varieties of Fluvial Form*. John Wiley & Sons Ltd, Chichester, pp. 81-111.
- Schmidt, J.C., Parnell, R.A., Grams, P.E., J.E. Hazel, M.A. Kaplinski, L.E. Stevens, and T.L. Hoffnagle, 2001, The 1996 controlled flood in Grand Canyon: hydrology, hydraulics, sediment transport, and geomorphic change: *Ecological Applications*, 11(3): 657-671.
- Schmidt, J.C., Grams, P.E. and Leschin, M.F., 1999. Variation in the magnitude and style of deposition and erosion in three long (8-12 km) reaches as determined by photographic analysis. In: R.H. Webb, J.C. Schmidt, R.A. Valdez and G.R. Marzolf (Editors), *The Controlled Flood in Grand Canyon*. Geophysical Monograph 110. American Geophysical Union, pp. 185-203.
- Schmidt, J.C., Grams, P.E. and Webb, R.H., 1995. Comparison of the magnitude of erosion along two large regulated rivers. *Water Resources Bulletin*, 31: 617-631.

Theses:

- Grams, P.E., 2006, Sand transport over a coarse and immobile bed. Ph.D. dissertation, Johns Hopkins University, Baltimore, Maryland.
- Grams, P.E., 1997. Geomorphology of the Green River in Dinosaur National Monument. MS Thesis, Utah State University, Logan, Utah, 140 pp.
- Grams, P.E., 1991. Degradation of alluvial sand bars along the Snake River below Hells Canyon Dam, Hells Canyon National Recreation Area, Idaho, Middlebury College, Middlebury, Vermont, 98 pp.

Technical Reports:

- Grams, P.E., Schmidt, J.C., and Majerova, M., 2008, Disruption of sediment flux in a channel network affected by water withdrawals, Cub River, Idaho: Draft Final Report Submitted to U.S Forest Service, Stream Systems Technology Center, Fort Collins, Colorado, 86 p.
- Grams, P.E., Schmidt, J.C., Topping, D.J., and Goeking, S., 2004. The degraded reach: Rate and Pattern of bed and bank adjustment of the Colorado River in the 25 km immediately downstream from Glen Canyon Dam, Final Report, Grand Canyon Monitoring and Research Center, Flagstaff, Arizona.
- Schmidt, J.C., Topping, Grams, P.E., and Hazel, J.E., 2004, System-wide changes in the distribution of fine sediment in the Colorado River corridor between Glen Canyon Dam and Bright Angel Creek, Arizona, Final Report, Grand Canyon Monitoring and Research Center, Flagstaff, Arizona, 117 p, http://www.gcmrc.gov/library/reports/Physical/Fine_Sed/Schmidt2004.pdf.
- Grams, P.E., Schmidt, J.C., and Naumann, T., 2002, Geomorphic adjustment of the Green River and habitat distribution of the Ute-Ladies' Tresses orchid in Red Canyon and Browns Park, Colorado and Utah, Draft Final Report, U.S. Bureau of Reclamation, Salt Lake City.
- Wilcock, P. R., Schmidt, J. C., and Grams, P. E., 2002, Review of Idaho Power Company documents concerning sediment-related impacts of the Hells Canyon Complex of dams on the Snake River in Hells Canyon. Report to U. S. Forest Service, 40 p.
- O'Brien, L.E., Coleman, A., Blank, B.L., Grams, P.E., and Schmidt, J.C., 2000. Testing the Application of Digital Photogrammetry to Monitor Topographic Changes of Sandbars in the Colorado River Ecosystem, Final Report, Grand Canyon Monitoring and Research Center, Flagstaff
- Grams, P.E., Gaeuman, D. A., Blank, B.L., and Schmidt, J.C., 1999. Geomorphic Change in the Canyon of Lodore during the 1999 Bypass Flows, Draft Report, U.S. Bureau of Reclamation, Salt Lake City.
- Grams, P.E. and Schmidt, J.C., 1999. Integration of photographic and topographic data to develop temporally and spatially rich records of sand bar change in the Point Hansbrough and Little

- Colorado River confluence reaches, Final Report, Grand Canyon Monitoring and Research Center, Flagstaff.
- Grams, P.E. and Schmidt, J.C., 1999. Sand Bar Erosion and Deposition on the Snake River in Hells Canyon Between 1990 and 1998, Final Report, U.S. Forest Service, Wallowa-Whitman National Forest, Baker City, Oregon.
- Grams, P.E. and Schmidt, J.C., 1999. Sand Bar and Terrace Erosion Between 1964 and 1996 at the Tin Shed and Camp Creek Cultural Resource Sites on the Snake River in Hells Canyon, Final Report, U.S. Forest Service, Wallowa-Whitman National Forest, Baker City, Oregon.
- Martin, J.A., Grams, P.E., Kammerer, M.T., Schmidt, J.C., 1998. Sediment transport and channel response of the Green River in the Canyon of Lodore between 1995-1997, including measurements during high flows, Dinosaur National Monument, Colorado, Final Report, U.S. Bureau of Reclamation, Salt Lake City.
- Grams, P.E., 1997. Geomorphology of the Green River in Dinosaur National Monument. Final Report to the National Park Service, Dinosaur National Monument, Dinosaur, Colorado, 140 pp.

Presentations with Published Abstracts:

- Grams, P.E., Topping, D.J., Schmidt, J.C., Kaplinski, M.A., Hazel, J.E., 2011, Linking Morphodynamic Response with Sediment Mass Balance: Issues of Scale, Geomorphic Setting, and Sampling Design, Abstract EP31F-04 presented at 2011 Fall Meeting, American Geophysical Union San Francisco, CA, 5-9 Dec. **PRESENTED**
- Czarnomski, N., Wheaton, J.M., Grams, P.E., Hazel, J.E., Kaplinski, M.A., Schmidt, J.C., 2011, Untangling Geomorphic Processes in the Grand Canyon with Topographic Time Series from Hybrid Surveys, Abstract H51I-1322 presented at 2011 Fall Meeting, American Geophysical Union San Francisco, CA, 5-9 Dec.
- Kilham, N.E., Schmidt, J.C., Wheaton, J.M., Grams, P.E., 2010, Evidence for the evacuation of fine sediment and fine gravel of the Colorado River below Glen Canyon Dam, Abstract EP51B-0558 presented at 2010 Fall Meeting, American Geophysical Union San Francisco, CA, 13-17 Dec.
- Schmidt, J.C., Grams, P.E., Hazel, J.E., Kaplinski, M.A., 2010, Topographic Analyses of Reaches of the Colorado River in Grand Canyon Reveal Focused Locations of Fine-Sediment Accumulation and Evacuation, Abstract EP31C-0756 presented at 2010 Fall Meeting, American Geophysical Union San Francisco, CA, 13-17 Dec.
- Rubin, D.M., Topping, D.J., Chezar, H., Hazel, J.E., Schmidt, J.C., Breedlove, M., Melis, T.S., Grams, P.E., 2010, 20,000 grain-size observations from the bed of the Colorado River, and implications for sediment transport through Grand Canyon, Joint Federal Interagency Conference, Las Vegas, NV, June 27 – July 1.
- Grams, P.E., Hazel, J.E., Schmidt, J.C., Kaplinski, M., Wright, S.A., Topping, D.J., Melis, T.S., 2010, Geomorphic response of sandbars to the march 2008 high-flow experiment on the Colorado River downstream from Glen Canyon Dam, Joint Federal Interagency Conference, Las Vegas, NV, June 27 – July 1. **PRESENTED**
- Grams, P.E., Melis, T.S., Wright, S.A., Schmidt, J.C., Topping, D.J., 2008, Process-based reference conditions: An alternative approach for managed river systems, EOS Transactions American Geophysical Union, 89(53) Fall Meeting Supplement, Abstract H11A-0787. **PRESENTED**
- Grams, P.E., Schmidt, J.C., and Larson, G., 2008, Large-Scale Geomorphic Organization of the Colorado River System: Connections with Channel Change and Riverine Ecology, Abstract presented at Colorado River Basin Science and Resource Management Symposium, Scottsdale, AZ, 18-20 Nov. **PRESENTED**

- Grams, P.E., Schmidt, J.C., and Topping, D.J., 2008, A Comprehensive History of Bed Degradation and Channel Adjustment for the Colorado River Within Glen Canyon National Recreation Area Downstream from Glen Canyon Dam, Abstract presented at Colorado River Basin Science and Resource Management Symposium, Scottsdale, AZ, 18-20 Nov. **PRESENTED**
- Grams, P.E., Schmidt, J.C., and Majerova, M., 2007, Coupling annual and decadal patterns of sediment flux with channel morphology in gravel- bedded mountain streams, EOS Transactions American Geophysical Union, 88(52) Fall Meeting Supplement, Abstract H41D-0771. **PRESENTED**
- Grams, P.E., Majerova, M., and Schmidt, J.C., 2007, Disruption of water and sediment flux caused by streamflow diversions, Cub River, Idaho: a network perspective, Abstract presented at Utah State University Spring Runoff Conference, Logan, UT, 5-6 April. **PRESENTED**
- Grams, P.E., Majerova, M, and Schmidt, J.C. Episodic sediment transport caused by flow disruption at stream flow diversions. EOS, Transactions American Geophysical Union, Annual Meeting, Fall 2006. **PRESENTED**
- Grams, P.E. and Wilcock, P.R. Order and disorder in starved sandy bedforms. EOS, Transactions American Geophysical Union, Spring Meeting, May 2006. **PRESENTED**
- Grams, P.E., Wilcock, P.R. and Wiele, S.M., 2005. A formulation for the entrainment of fine-sediment in coarse-bedded rivers. EOS, Transactions American Geophysical Union, Annual Meeting, Fall 2005. **PRESENTED**
- Wiele, S.M., Wilcock, P.R., Grams, P.E., 2005. Large-Scale Sediment Routing: Development of a One-Dimensional Model Incorporating Sand Storage. EOS, Transactions American Geophysical Union, Annual Meeting, Fall 2005.
- Grams, P.E., Wilcock, P.R, and Wiele, S.M., 2005, Entrainment and non-uniform transport of fine-sediment in coarse-bedded rivers. River Coastal and Estuarine Morphodynamics, Urbana, Illinois. **PRESENTED**
- Grams, P.E., Wilcock, P.R. and Wiele, S.M., 2004. Sand in the cobbles: Laboratory measurements of fine-sediment transport over a coarse and immobile bed. EOS, Transactions American Geophysical Union, Annual Meeting, Fall 2004. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 2002, Channel bed and bank adjustment in sediment-deficit and sediment-surplus reaches of the Green River downstream from Flaming Gorge Dam, Colorado and Utah. Binghampton Geomorphology Symposium, Bloomsburg, Pennsylvania. **INVITED**
- Grams, P.E. and Schmidt, J.C., 2001. Strategies and techniques for measuring historical channel change using spatially robust data and detailed site measurements, Green River in Colorado and Utah and Colorado River in Arizona. EOS, Transactions, American Geophysical Union, 2001 Fall Meeting. **PRESENTED**
- Goeking, S.A., Sondossi, H., Schmidt, J.C., Grams, P.E., 2001. Quantification of long-term trends in sand storage at site-specific and reach scales in Grand Canyon National Park. EOS, Transactions, American Geophysical Union, 2001 Fall Meeting.
- Grams, P.E. and Schmidt, J.C., 2000. The degraded reach: A 48-year record of the rate and pattern of bed and bank adjustment in the first 25-km downstream from Glen Canyon Dam. EOS Transactions American Geophysical Union, 81(48), Fall Meeting Suppl., Abstract H11C-33. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1999. Geomorphic effectiveness of the 1999 Green River flood in the Canyon of Lodore, Colorado. EOS, Transactions, American Geophysical Union, 1999 Fall Meeting, Vol. 80, No. 46, November 16, 1999/Supplement, p. 447. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1999. Streamflow regulation, multi-level flood plain formation, and riparian vegetation: Channel narrowing on the aggrading Green River in the eastern Uinta

- Mountains, Colorado and Utah. Shanghai Conference of the International Association of Geomorphologists Working Group on Large Rivers, Shanghai, China. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1998. Temporal and spatial variability in sand storage along the Colorado River in Grand Canyon. EOS, Transactions, American Geophysical Union, 1998 Fall Meeting, Vol. 79, No. 45, November 10, 1998/Supplement, p. 305. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1997. Indirect lithologic control on channel form of the Green River in the Eastern Uinta Mountains, Colorado and Utah. EOS, Transactions, American Geophysical Union, 1997 Fall Meeting, Vol. 78. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1997. Degree of channel narrowing related to complete and partial flow regulation in canyon and meandering reaches of the Green River, Utah and Colorado. Geological Society of America, Abstracts with Programs, 1997 Fall Meeting. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1994. Fine-grained alluvial deposits in canyons of the Green (Eastern Uinta Mountains) and Colorado (Grand Canyon) Rivers. EOS, Transactions, American Geophysical Union, 1994 Fall Meeting, Vol. 75, No. 44, November 1, 1994/Supplement, p. 272. **PRESENTED**
- Grams, P.E. and Schmidt, J.C., 1991. Response of recirculating-current alluvial sand bars to operations of Hells Canyon Complex Dams, Snake River, Idaho and Oregon. EOS, Transactions, American Geophysical Union, 1991 Fall Meeting, Vol. 72, No. 44, October 29, 1991/Supplement, p. 219. **PRESENTED**

Awards and Grants:

- Utah State University Water Initiative, 2006, Proposal to Initiate linkages between geomorphology and Fisheries ecology research on the Cub River, Idaho and Logan River, Utah (\$20,000).
- USDA Forest Service, 2005, Effects of stream diversions on coarse-bedded streams and their associated aquatic and riparian ecosystems, Cub River basin, Idaho and Utah, (\$93,000).
- National Center for Earth-surface Dynamics, an NSF Science and Technology Center, 2003, Sand routing over a coarse immobile streambed, co-PI (\$25,000).
- U.S. Geological Survey, 2001, Grand Canyon Monitoring and Research Center, Development of a management tool for predicting multi-dimensional sand-bar evolution and 1-dimensional sand transport in the Colorado River Ecosystem, co-PI with lead responsibility in proposal development (\$633,000).
- U.S. Bureau of Reclamation, 1999, Evaluation of the effects of reoperation of Flaming Gorge Dam on the threatened Ute ladies-tresses orchid, co-PI (\$72,000).
- U.S. Forest Service, 1999, Sand bar and terrace erosion at cultural resource sites of the Snake River in Hells Canyon, co-PI (\$9,000).
- Hells Canyon Preservation Council, 1998, Sand bar erosion between 1990 and 1998 on the Snake River in Hells Canyon, Idaho, co-PI (\$2,000).
- Recipient of Jack White award for outstanding senior in Geology, Department of Geology, Middlebury College.

Technical Skills:

Modelling/computer skills: Proficient with use of Windows-based, UNIX, and Mac operating systems. Proficient with use of basic software such as Microsoft Office (Word, Excel, Access, PowerPoint, and Outlook), internet communications software, and web browsing and web-composition software. Proficient with use of specialized graphics and mapping software including Adobe Illustrator, Adobe Photoshop, Arc/INFO, ArcMap, ArcView, Erdas Imagine (image rectification and mapping), Surfer (3D graphics), ForeSight (surveying), and TecPlot (visualization and animation). Proficient with use of Maple, MATLAB, and Visual Basic for programming and numerical modelling.

Field and Technical Skills: Mapping/surveying with auto-level, geodetic total stations, and survey-grade RTK GPS; aerial photo interpretation; stream gaging; bedload sampling and suspended-sediment sampling; boat operation (motor and oar powered). Extensive experience using acoustic (Sontek ADV and Nortek EZQ), and laser-diffraction (Sequoia Scientific LISST-100 and LISST 25X) streamflow and sediment monitoring instruments.

Professional Affiliations:

Geological Society of America

American Geophysical Union

International Association of Geomorphologists Working Group on Large Rivers

Provide Peer Review for Following Journals:

Earth Surface Processes and Landforms, Geomorphology, Journal of Coastal Research, Journal of Geophysical Research-Earth Surface, Journal of Hydraulic Engineering, River Research and Applications