Daniel Hamill

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Research Statement

My research is interdisciplinary in river science, hydraulic engineering, environmental engineering, chemistry. I apply methodologies ranging from field surveys and laboratory analysis to machine learning, numerical modeling, and engineering design. Principally, I am interested in developing interdisciplinary techniques to better understand aquatic ecosystems. These techniques have opened up the possibility of mapping sedimentary deposits, surface roughness and depositional sedimentary environments over large areas, and monitoring those areas through time. Compared to a few discrete samples in locations accessed physically, this will provide more fundamental insight into geomorphological and ecological processes, by massively expanding the scope of what time and spatial scales and resolutions can be monitored, and could significantly alter the way in which environmental research is carried out.

Education

M.Sc. (2017), Watershed Sciences, Utah State University, Logan, UT, USA. *Quantifying Riverbed Sediment using Recreational-grade Side Scan Sonar.* Major Advisor: Dr. Joseph M. Wheaton.

B.S.E. (2013), Environmental Engineering with Minor in Chemistry, Northern Arizona University, Flagstaff, AZ, USA. *Paper Pulp Sludge Characteristics and Applications.* Advisor: Dr. Wilbert Odem.

Employment History

March 2016- present. *Research Assistant, Colorado River Sandbar Laboratory, Northern Ariaona University, Flagstaff, AZ, USA. Supervised by: Joseph Hazel.*

December 2014 – present. *Research Assistant, Department of Watershed Sciences, Utah State University, Logan, UT, USA. Supervised by: Dr. Daniel Buscombe*

March 2014 – December 2014. *Physical Science Technician, Grand Canyon Monitoring and Research Center, U.S. Geological Survey, Flagstaff, AZ, USA. Supervised by: Dr. Paul Grams*

May 2013 – March 2014. *Geology Researcher, Colorado River Sandbar Laboratory, Northern Arizona University, Flagstaff, AZ, USA. Supervised by: Joseph Hazel*

April 2012 – May 2013. *Hydrologic Technician, Grand Canyon Monitoring and Research Center, U.S. Geological Survey, Flagstaff, AZ, USA. Supervised by: Dr. Paul Grams*

September 2010 – December 2012. *Math and Science Learning Assistant, Coconino Community College, Flagstaff, AZ, USA.*

Peer-Reviewed Publications

In review/preparation

3 **Hamill, D.**, Buscombe, D., Wheaton, J.M., in preparation, Developing an automated texture segmentation algorithm for broad-scale substrate mapping in an alluvial river using recreational-grade side scan sonar. *Environmental Modelling & Software.*

2 Hazel J. E., Kaplinski M., Grams, P.E., Ross R.P., **Hamill, D.**, Kohl K., Parnell R.A., in review, Sandbar Monitoring at Selected Sites, Colorado River in Glen, Marble and Grand Canyons, Arizona, 1990-2016. *U.S. Geological Survey Open File Report XXXX-XXXX.*

2016

1 **Hamill, D.**, Buscombe, D., Wheaton, J.M., Melis, T.S., Grams. P.E., 2016, Bed texture mapping in large rivers using recreational-grade sidescan sonar. *Proceedings of the 8th International Conference on Fluvial Hydraulics*, St. Louis, Missouri, July 2016.

Conference Publications

2016

Hamill, D., Buscombe D., Wheaton J.M. Transforming a low-cost leisure gadget into a high-resolution riverbed remote sensing tool. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2016.

2015

2 Kaplinski, M.A., Buscombe, D., Ashley, T., Tusso, R.B., Grams. P.E., McElroy, B., Mueller, E., **Hamill, D.**, and Townsend, J. (2015) Observations of sand dune migration on the Colorado River in Grand Canyon using high-resolution multibeam bathymetry. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.

2013

1 Jowers J., Murray G., **Hamill D.**, Lail N., Anderson A., O'Toole A. (2013) Reducing Impact of Large Industrial Waste Streams: Paper Recycling Waste. *Waste-management Education and Research Consortium*, Las Cruces, NM, March 2013.

Reports

1 Jowers J., Murray G., **Hamill D.**, Lail N., Anderson A., O'Toole A. (2013) *SCA Tissue Paper Pulp Sludge Investigations and Determination of Beneficial Use for Cinder Lake Landfill.* Internal Report for Cinder Lake Landfill, Flagstaff, AZ. 106pp.

Software

1 **PyHum.** Software for reading, processing and analysis of Humminbird sidescan data. Source code available in Python/Cython. Webpage `http://dbuscombe-usgs.github.com`

Skills

1 Regulatory Resources: CFR, CWA, SDWA, CAA, A/NPDES, RCRA, CalEPA

2 Numerical Modeling: HEC-RAS, HEC-RMS, EPA-SWMM, HELP, Screen3, Delft 3D, HydraFlow.

3 Programming/Scripting: Python, BASH, Matlab; VB, R, GDAL, LaTeX; Git

4 Licences: Arizona Engineer in Training License.

5 Software: AutoCAD Civil 3D, ArcGIS, QGIS, MS Office, Adobe CS6, TGO Office, Terramodel

Selected Talks

1 *Riverflow 2016: 8th International Conference on Fluvial Hydraulics, St. Louis, MO*, July 2016. Talk entitled 'Bed texture mapping in large rivers using recreational-grade sidescan sonar'.

Awards

2 **June 2013**. NCEES Engineering Award. *Paper Pulp Sludge Characteristics and Applications.*

1 **April 2013**. Freeport-McMoRan's Copper and Gold Award for Innovation and Sustainability at New Mexico State University's WERC Environemnatl Design Contest. *Reducing Impact of Large Industrial Waste Streams: Paper Recycling Waste.*