Jon J. Major

Research Hydrologist
U.S. Geological Survey
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EDUCATION: University of Washington Ph.D. 1996 Geology, Geomorphology
The Pennsylvania State University M.S. 1984 Geology
University of Dayton B.S. 1980 Geology

PROFESSIONAL EXPERIENCE: USGS Hydrologist (1983-2000)
USGS Research Hydrologist (2000-present)

RESEARCH INTERESTS: My primary research interests focus on hydrologic hazards and responses associated with volcanic eruptions and landscape (fluvial) responses to large sediment inputs. Projects focus on: (1) identifying hydrogeomorphic processes altered by landscape disturbances; (2) evaluating hydrogeomorphic consequences of disturbances; and (3) quantifying characteristic hydrogeomorphic response times and durations. Research highlights include studies of: hydrogeomorphic processes in volcanically disturbed watersheds; hydrogeomorphic responses to dam removal; depositional characteristics of debris flows; geomorphic processes inducing lahars and floods at volcanoes in Washington, Oregon, Alaska, El Salvador, Chile, and the Philippines; groundwater flow in large earthflows; rheology of natural sediment slurries.

MEMBERSHIPS:

- Geological Society America (Fellow)
- American Geophysical Union
- American Avalanche Association
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

SYNERGISTIC ACTIVITIES

- Elected panel member, Geological Society of America Quaternary Geology and Geomorphology (GG&G) Division (2003–04)
- Secretary, GSA QG&G Division, (2006–2012)
- Associate Editor, Geological Society of America Bulletin (2000–2011)
- Associate Editor, Journal of Geophysical Research–Earth Surface (2010–2014)
- Review editorial board member Frontiers in Volcanology (2014–present)
- Co-editor, Geological Society of America Special Paper 375 *Natural Hazards in El Salvador*
- Co-editor, *Debris Flow Hazards Mitigation*, Proceedings of 4th International Conference (2007)
- Chief guest editor, issue of *Andean Geology* focused on Chaitén volcano (2013, v. 40(2))
- Member, International Organizing Committee, quadrennial Debris Flow Hazards Mitigation Conference Series (2008–2015); chair (2008–2012)
- Co-chair local organizing committee, quadrennial IAVCEI International Assembly (2017)

AWARDS AND HONORS:

- DOI Superior Service Award for IAVCEI Scientific Assembly organizational activities (2018)
- GSA Kirk Bryan Award (QG&G distinguished publication award) (2008)
- GSA E.B. Burwell Award (Eng. Geol. Division distinguished contribution award) (1991)
- Fellow, Geological Society of America (1993)
- Public Works Research Institute (Japan) Award for visiting Foreign Scientists (2000)
- University of Dayton Alumni Achievement Award for Professional Excellence (1999)
- Department of Interior Unit Award for Excellence of Service (1991) (Pinatubo response team)

PUBLICATIONS:

Iverson, R.M., and Major, J.J., 1987, Rainfall, groundwater flow, and seasonal movement at Minor Creek landslide, northwestern California: physical interpretation of empirical relations: *Geol Soc Am Bull* 99, 579-594.

Major, J.J., and Pierson, T.C., 1992, Debris flow rheology: Experimental analysis of fine-grained slurries: *Wat Res Research* 28, 841-857

Major, J.J., Janda, RJ, and Daag, A., 1996, Watershed disturbance and lahars on the east side of Mount Pinatubo during the mid-June 1991 eruptions, in *Fire and Mud: Eruptions and Lahars of Mount Pinatubo*: Seattle, University of Washington Press, 895-919.

Major, J.J., 1997, Depositional processes in large-scale debris-flow experiments: *J. Geol.* 105, 345-366.

Major, J.J., and Iverson, R.M., 1999, Debris-flow deposition—Effects of pore-fluid pressure and friction concentrated at flow margins: *Geol Soc Am Bull* 111, 1424-1434.

Major, J.J., 2000, Gravity-driven consolidation of granular slurries--Implications for debris-flow deposition and deposit characteristics: *J Sed Research* 70, 64-83.

Major, J.J., Pierson, T.C., Dinehart, R.L., and Costa, J.E., 2000, Sediment yield following severe volcanic disturbance—a two-decade perspective from Mount St. Helens: *Geology* 28, 819-822.

Major, J.J., 2004, Posteruption suspended-sediment transport at Mount St. Helens—Decadal-scale relationships with landscape adjustments and river discharges: *J Geophys Res—Earth Surface* 109, F01002, 22 p.

Major, J.J., and Yamakoshi, T., 2005, Decadal-scale change of infiltration characteristics of a tephra-mantled hillslope at Mount St. Helens, Washington: *Hydrol Processes* 19, 3621-3630.

Swanson, F.J., and Major, J.J., 2005, Physical events, environments, and geological-ecological interactions at Mount St. Helens—March 1980 to 2004, in *Ecological Responses to the 1980 Eruption of Mount St. Helens.* Springer-Verlag, New York, 27-44.

Major, J.J., and Mark, L.E., 2006, Peak flow responses to landscape disturbances caused by the cataclysmic 1980 eruption of Mount St. Helens, Washington: *Geol Soc Am Bull* 118, 938-958.

Major, J.J., + 11 others, 2012, Geomorphic response of the Sandy River, Oregon, to removal of Marmot Dam. *USGS Professional Paper* 1792, 64 p.

Manville, V., Major, J.J., and Fagents, S.A., 2013, Modeling lahar behavior and hazards, in *Modeling Volcanic Processes—The Physics and Mathematics of Volcanism*. Cambridge University Press, 300-330.

Pierson, T.C., Major, J.J., Amigo, A., and Moreno, H., 2013, Acute sedimentation response to rainfall following the explosive phase of the 2008–2009 eruption of Chaitén volcano, Chile: *Bull Volcanology* 75(5), paper 723, 17 p.

Pierson, T.C., and Major, J.J., 2014, Hydrogeomorphic effects of explosive volcanic eruptions on drainage basins. *Ann Rev Earth Planetary Sciences* 42, 469-507.

Wilcox, A.C., O'Connor, J.E., Major, J.J., 2014, Rapid reservoir erosion, hyperconcentrated flow, and downstream deposition triggered by breaching of 38-m-tall Condit Dam, White Salmon River, Washington. *J Geophys Res—Earth Surface* 119(6), 1376-1394.

Major, J.J., + 7 others, 2017, Geomorphic responses to dam removal in the United States—a two-decade perspective, in *Gravel Bed Rivers: Processes and Disasters*. Wiley and Sons, p. 355-383.

Foley, M.A., + 20 others, 2017, Dam removal—listening in. *Wat Res Research* 53, 5229-5246.

Major, J.J., + 5 others, 2019, Multi-decadal geomorphic evolution of a profoundly disturbed gravel-bed river system—a complex, nonlinear response and its impact on sediment delivery. *J Geophys Res—Earth Surface* 124, 1281-1309.

Major, J.J., Grant, G.E., Sweeney, K.R., Mosbrucker, A.R., 2020, A multidecade analysis of fluvial geomorphic evolution of the Spirit Lake blockage, Mount St. Helens, Washington. *USGS Scientific Investigations Report* 2020-5027, 54 p.

Major, J.J., Crisafulli, C.M., and Swanson, F.J., 2020, Lessons from a post-eruption landscape: *Eos—Earth and Space Science News* 101(5), 34-40.

Major, J.J., 2020, Mount St. Helens at 40. *Science* 368(6492), 704-705.