

David L George

Research Mathematician

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Research Interests

Keywords:

- **General:** applied mathematics; scientific computation; geophysics; HPC & software
- **Mathematical Focus:** hyperbolic PDEs; wave-propagation algorithms; finite volume methods; adaptive mesh refinement (AMR); well-balanced numerical methods
- **Application Focus:** Earth-surface flows (tsunamis, flooding, landslides, debris flows); granular-fluid physics; fluid dynamics & geophysical wave-propagation

Summary:

I research and develop novel mathematical models, numerical methods, and open-source software for wave-propagation problems, particularly shallow earth-surface flows with varying sediment concentrations. I collaborate on the open-source software, Clawpack (general hyperbolic problems), and founded the software packages GeoClaw (tsunamis, overland flooding) and D-Claw (landslides, debris flows). I pursue models, methods, and software that generalize and unify surface-flow applications.

Appointments

- 2008-present: **Research Mathematician, U.S. Geological Survey**
 - 2008-2011: Mendenhall Postdoctoral Fellow
- 2007-2008: **Acting Assistant Professor, Dept. Applied Math, University of Washington**
 - NSF-VIGRE Postdoctoral Fellow
- 2006-2007: **Acting Assistant Professor, Mathematics Dept., University of Utah**
 - NSF-RTG Postdoctoral Fellow

Education

- Ph.D. Applied Mathematics, *University of Washington, Seattle*, 2006
 - Advisor: Randall LeVeque. Thesis: *Finite volume methods and adaptive refinement for tsunami propagation and inundation.*
- M.S. Applied Mathematics, *University of Washington, Seattle*, 2004
- B.S.&B.A. Physics and Biological Sciences, *High Honors, U.C. Santa Barbara*, 1999
- B.A. Anthropology, *High Honors, U.C. Santa Barbara*, 1997

Publications

(google scholar profile: <https://scholar.google.com/citations?user=p9fuq1oAAAAJ&hl=en>)

- Xu, Y., **George, D.L.**, Kim, J., Lu, Z., Riley, M., Griffin, T., and Fuente, J., 2020: Landslide monitoring and runout hazard assessment by integrating multi-source remote sensing and numerical models: An application to the Gold Basin landslide complex, northern Washington, ***Landslides***, to appear.
- **George, D.L.**, Iverson, R.M. and Cannon, C.M., 2020: Modeling the dynamics of lahars that originate as landslides on the west side of Mount Rainier: Preliminary results, ***USGS open file report***, to appear.
- O'Connor, J.E., Baker, V.R., Waitt, R.B., Smith, L.N., Cannon, C.M., **George, D.L.** and Denlinger, R.P., 2020: The Missoula and Bonneville Floods – A review of Ice-Age megafloods in the Columbia River Basin, ***Earth Science Reviews***, 103181.
- Denlinger, R.P., **George, D.L.**, and Cannon, C.M., 2020: Diverse cataclysmic floods from Pleistocene Glacial Lake Missoula, ***Geological Society of America Special Paper 548***.
- **George, D.L.**, Iverson, R.M. and Cannon, C.M., 2020: Seamless numerical simulation of a hazard cascade in which a landslide triggers a dam-breach flood and consequent debris flow, ***J. Mountain Sci.***
- Iverson, R.M. and **George, D.L.**, 2019: Basal stress equations for granular masses on smooth or discretized slopes, ***J. Geophys. Res.: Earth Surface*** V. 124(6), 1464–1484.
- Xu, Y, Kim, J., **George, D.L.**, and Lu, Z., 2019: Characterizing seasonally rainfall-driven movement of a translational landslide using SAR imagery and SMAP soil moisture. ***Remote Sensing***, V. 11(20), 2347.
- Navarro, M., Le Maître, O.P., Hoteit, I., **George, D.L.**, Mandli, K.T., and Knio, O.M., 2018: Surrogate-based parameter inference in debris-flow model. ***Comp. Geosci.***, V. 22(6), 1447-1463.
- Hu, X*, Lu, Z., Pierson, T.C., Kramer, R. and **George, D.L.**, 2018: Combining InSAR and GPS to determine transient movement and thickness of a seasonally active low-gradient translational landslide. ***Geophys. Res. Lett.***, V. 45(3), 1453–1462.
- **George, D.L.**, Iverson, R.M. and Cannon, C.M., 2017: New methodology for computing tsunami generation by subaerial landslides: application to the 2015 Tyndall Glacier Landslide, Alaska. ***Geophys. Res. Lett.***, V. 44(14), 7276-7284.
- Iverson, R.M. and **George, D.L.**, 2016: Discussion of “The relation between dilatancy, effective stress and dispersive pressure in granular avalanches” by P. Bartelt and O. Buser. ***Acta Geotech***, 11(6), 1465-1468.
- Iverson, R.M., **George, D. L.** and Logan, M., 2016: Debris flow runup on vertical barriers and adverse slopes. ***J. Geophys. Res.: Earth Surface*** V. 121(12), 2333–2357.
- Mandli, K.T., Ahmadi, A.J., Berger, M.J., Calhoun, D., **George, D.L.**, Hadjimichael, Y., Ketcheson, D.I., Lemoine, G.I. and LeVeque, R.J., 2016: Clawpack: building an open source ecosystem for solving hyperbolic PDEs, ***Peer J Computer Science***, 2, e68.

- Iverson, R.M. and **George, D.L.**, 2016: Modeling landslide liquefaction, mobility bifurcation, and the dynamics of the 2014 Oso disaster. *Geotechnique*, V. 66(3), 175-187.
- Iverson, R.M., **George, D.L.**, et al., 2015: Landslide mobility and hazards: implications of the 2014 Oso disaster. *Earth Planet. Sci. Lett.*, V. 412, 197-208.
- **George, D.L.** and Iverson, R.M., 2014: A depth-averaged debris-flow model that includes the effects of evolving dilatancy: 2. Numerical predictions and experimental tests. *Proc. R. Soc. A*, 470 (2170).
- Iverson, R.M. and **George, D.L.**, 2014: A depth-averaged debris-flow model that includes the effects of evolving dilatancy: 1. Physical basis, *Proc. R. Soc. A*, 470 (2170).
- **George, D.L.**, 2013: Modeling hazardous, free-surface geophysical flows with depth-averaged hyperbolic systems and adaptive numerical methods, Computational Challenges in the Geosciences, *The IMA Volumes in Mathematics and its Applications*, V. 156, 25-48, *Springer*.
- LeVeque, R.J., **George, D.L.** and Berger, M.J., 2011: Tsunami modeling with adaptively refined finite volume methods. *Acta Numerica* 20, 211-289. Arieh Iserles, ed.
- Berger, M.J., **George, D.L.**, LeVeque, R.J. and Mandli, K.T., 2011: The GeoClaw software for depth-averaged flows with adaptive refinement, *Advances in Water Resources*, 34: 1195-1206. doi: 10.1016/j.advwatres.2011.02.016.
- **George, D.L.** and Iverson, R.M., 2011: A two-phase debris-flow model that includes coupled evolution of volume fractions, granular dilatancy, and pore-fluid pressure. In R. Genevois, D. Hamilton and A. Prestininzi, editors, 415-424, *Italian Journal of Engineering, Geology and Environment*.
- Zhang, S., Yuen, D.A., Zhu, A., Song, S., and **George, D.L.**, 2011: Parallelization of GeoClaw code for modeling geophysical flows with adaptive mesh refinement on many-core systems, *Proc. 14th IEEE Int. Conf. on Computational Science and Engineering*, CSE, 573-579.
- **George, D.L.**, 2010: Adaptive finite volume methods with well-balanced Riemann solvers for modeling floods in rugged terrain: application to the Malpasset dam-break flood (France, 1959). *Int. J. Numer. Methods Fluids*, 66(8): 1000-1018. doi: 10.1002/fld.2298.
- **George, D.L.**, 2008: Augmented Riemann solvers for the shallow water equations over variable topography with steady states and inundation. *J. Comput. Phys.*, 227(6): 3089-3113.
- **George, D.L.** and LeVeque, R.J., 2008: High-resolution methods and adaptive refinement for tsunami propagation and inundation. In S. Benzoni-Gavage and D. Serre, editors, *Hyperbolic Problems: Theory, Numerics, Applications*, 541-549, Springer.
- LeVeque, R.J. and **George, D.L.**, 2008: High-resolution finite volume methods for the shallow water equations with topography and dry states. In P. L. Liu, C. Synolakis, and H. Yeh, editors, *Advanced Numerical Models for Simulating Tsunami Waves and Runup*, vol. 10 of *Advances in Coastal and Ocean Engineering*, 43-73. World Scientific.
- **George, D.L.** and LeVeque, R.J., 2006: Finite volume methods and adaptive refinement for global tsunami propagation and inundation. *Science of Tsunami Hazards*, Vol. 24. No. 5, 319-328.

Awards

- **U.S. Geological Survey Director's Award for Exemplary Service to the Nation.** Oso landslide response, 2014. Awarded individually to USGS Oso landslide team members.
- **SIAM-NSF Early Career Travel Award**, 2007. Awarded stipend for travel in 2007-2008.
- **Boeing Award for Excellence**, University of Washington, Seattle, 2003. Awarded stipend by the Departments of Mathematics, Applied Mathematics and the Boeing Company, for excellence in research by a doctoral student.

Professional and Academic Service

Courses taught

- **Pan-American Advanced Studies Institutes**, Valparaiso, Chile, Jan. 2013.
 - **Lecturer & lab instructor:** "Tsunami Modeling," short course.
 - NSF funded program for students from Pan-American institutions.
- **University of Washington, Department of Applied Mathematics**, 2007-2008.
 - **Instructor:** *Applied and Numerical Linear Algebra* (graduate course), Fall 2007; *Applied Partial Differential Equations* (graduate course), Spring 2008.
- **University of Utah, Department of Mathematics**, 2006-2007.
 - **Instructor:** *Partial Differential Equations for Engineers*, Fall 2006; *Calculus III*, Spring 2007.
- **University of Washington, Mathematics and Applied Mathematics Depts.**, 2001-2006.
 - **Teaching Assistant:** *Pre-Calculus*, Fall 2001; *Calculus II*, Spring 2002; *Introduction to Differential Equations*, Winter 2002; *Introduction to PDEs*, Winter 2003; *Introduction to Scientific Computing*, Fall 2003; *Numerical Linear Algebra*, Fall 2004.

Students and Postdocs Advised

- Colton Conroy, PhD., **Columbia University and Southern Methodist University**.
 - Postdoctoral advisor and co-PI, 2018-2020. Supported by NASA-funded project, *Development of an incorporated platform to characterize hydrologically driven landslide hazards in the Northwest USA*, PI Z. Lu, co-PIs, D.L. George & J. Kim.
 - Postdoctoral co-advisor, USGS, 2020-present.
- Yuankun Xu, **Department of Earth Sciences, Southern Methodist University**, 2018-present.
 - PhD thesis committee member and co-advisor.
- Xie Hu, PhD., **Dept. of Earth Sciences, Southern Methodist Univ.**, 2017-2018.
 - Committee member/examiner, PhD thesis: *Characterization of ground deformation associated with shallow groundwater processing using satellite radar interferometry*
- Paulina Sepulveda, PhD., **Dept. of Mathematics, Portland State Univ.**, 2016-2018.
 - Committee member/examiner, MS thesis:
 - USGS internship advisor: *computational seismic-wave propagation*.

- Francis Griswold, **Dept. of Earth Sciences, Central Washington Univ.**, 2014-2015.
 - Committee member/examiner, MS thesis: *Field Observations and Modeling of the 1957 Earthquake and Tsunami on the Islands of the Four Mountains, Aleutian Islands, Alaska.*
- Christopher Zoppou, PhD., **Applied Math. Dept., Australian National Univ.**, 2013-2014.
 - Committee member/examiner, PhD thesis: *Numerical solution of the one-dimensional and cylindrical Serre Equations for rapidly varying free-surface flows.*

Workshops and mini-symposia organized

- **Geophysical Flow Modeling in Natural Hazards**, in *Society for Industrial and Applied Mathematics (SIAM) Annual Meeting*, Portland, OR, July 2018.
 - Organizing and Scientific Committee (mini-symposium)
- **Impact of Waves along Coastlines, Hot-topics Workshop**, Institute for Mathematics and its Applications (IMA), University of Minnesota, Minneapolis, Oct. 2014.
 - Organizing and Scientific Committee (1-week workshop)
 - funding awarded by IMA
- **Debris Flow Workshop**, University of Washington, Seattle, March 2009.
 - Organizing and Scientific Committee Chair (1-week workshop)
 - supported by USGS and UW
- **Advances in Computation of Avalanches, Debris Flows, and Floods**, in *Society for Industrial and Applied Mathematics (SIAM) Annual Meeting*, San Diego, July 2008.
 - Organizing and Scientific Committee (mini-symposium)

Other professional service and synergistic activities

- **USGS Debris-flow flume, H.J. Andrews Experimental Forest, Oregon.**
 - Collaborative design and execution of large-scale experiments, 2008-present.
 - Co-chair, 3-person Steering Committee, 2018-present.
- **Development of an incorporated platform to characterize hydrologically driven landslide hazards in the Northwest USA.**
 - Funded by NASA
 - Co-PI, 2017-2020
- **Silver Jackets Team:** multi-agency (USACE-led) flood-risk analysis (silverjackets.nfrmp.us).
 - Lead modeler, 2017-2020, for lake outburst-flood assessment, Sisters, OR.
- **Spirit Lake outflow Team:** multi-agency effort for assessing hazard mitigation strategies
 - Modeler, 2018-2020, for joint USACE-USFS-USGS project, Spirit Lake, Washington.
- **Clawpack and GeoClaw hackathons and software carpentry workshops**
 - Participant & lecturer: Seattle, 2009, 2013; KAUST University, 2015; New Orleans, 2017; Rocky Mountain Research Station, CO, 2018; Virtual, 2020.
- **National Tsunami Hazard Mitigation Program (NTHMP)** (nws.weather.gov/nthmp)
 - Participant, panel member, multiple workshops, 2011-2016.
- **Nuclear Regulatory Commission Program for Probabilistic Landslide Generated Tsunami Hazards**

- Panel member & lecturer, Woods Hole Oceanographic Institute, 2011.
- **Literature Reviews:**
 - Journals: *J. Comp. Phys.*, *Int. J. Comp. Math.*, *J. Eng. Mech.*, *J. Fluid Mech.*, *J. Geophys. Res.*, *Acta Mech.*, *Phys. Fluids*, *J. Ocean Eng.*, *Int. J. Numer. Meth. Fluids.*, *J. Hydraulic Res.*, *Geophys. Res. Letters*, *Science Adv.*, *Science Reports*, *Water Res. Research*, *Bull. Volcanology*, *Env. Fluid Mech.*, *Bull. Eng. Geol. Env.*, *Canada Geotech. J.*, *J. Disaster Res.*, *ESAIM Math. Mod. Numer. Analysis*, *Mech. Res. Comm.*, *J. Mountain Sci.*, *Geo. Sci. Mod. Devel.*, *Minerals Eng.*, *J. Earth Sci.*, *Mountain Res. Develop.*
 - Proposals: *National Science Foundation (NSF)* 2012, *National Fund for Scientific and Tech. Devel. Chile (FONDECYT)*, 2015, *State of Alaska DGGs*, 2017.
 - Textbooks: *Applied PDEs*, Chapman & Hall, 2008

Outreach and media coverage

- **USFS Spirit Lake Planning Meeting**, Vancouver, WA, June 2019. Presented modeling results to multi-agency stakeholders for ongoing hazard-mitigation project.
- **Sisters, OR, Community Planning Meeting**, June 2018. Presented invited lecture for stakeholders and public at the Deschutes County fire department.
- **Killer Landslides**, NOVA, PBS, Nov. 2014. Featured D-Claw landslide simulations and a segment about our experimental work at the USGS debris-flow flume.
- **The Oso Landslide**, King-5 TV Seattle, April 9, 2014. Showcased D-Claw landslide simulations and gave a brief interview about the mathematics of landslide modeling.
- **Pixeldust Studios**, 2014. Worked with graphics team to produce animations of the Oso Landslide for various media outlets, appearing on national broadcasts (NBC news, MSNBC) and online news sites (*Wired Magazine*, and others).
- **Chicago Museum of Science and Industry**, appeared in museum's video exhibit *Science Storms*, documenting our landslide experimental work at the USGS debris-flow flume, 2010.

Presentations

(*invited, #presented)

Invited conference presentations

- **George, D.L.***, Iverson, R.M., Conroy, C.J., Cannon, C.M. and M. Benage, M. 2020. "Using D-Claw to model landslides, debris flows, water bodies, and their interactions," **American Geophysical Union Annual (AGU) Fall Meeting**, San Francisco, 2020.
- **George, D.L.***. Plenary Keynote Lecture: "Modeling geophysical flow hazards in the Pacific Northwest," **SIAM 2019 Pacific Northwest Section Meeting**, Seattle University, Seattle, Oct. 2019.
- **George, D.L.*#**, "Fifteen years of modeling shallow earth-surface flows: the evolution of D-Claw and beyond," **Applied Mathematics: The Next 50 Years**, University of Washington, Seattle, June 2019.
- **George, D.L.*** and Iverson, R.M.#. **Keynote Lecture**: "Seamless numerical simulation of a hazard cascade in which a landslide triggers a dam-breach flood and consequent debris

flow,” *Seventh International Conference on Debris-Flow Hazards, Colorado School of Mines*, Golden, CO, June 2019.

- **George, D.L.*#**, **Plenary Keynote Lecture**: “Modeling earth-surface flow hazards with D-Claw,” *Community Surface Dynamics Modeling System (CSDMS)*, University of Colorado, Boulder CO, May 2018.
- **George, D.L.*#** and Iverson, R.M., “Simulating shallow earth-surface flows with two-phase granular fluid models.” *SIAM 2017 Pacific Northwest Section Meeting*, Oregon State University, Oct. 2017.
- **George, D.L.*#**, “Modeling cascading and coupled hazards,” *M9 Earthquake Hazards Meeting*, University of Washington, Dec. 2017.
- **George, D.L.*#**, “Simulating shallow earth-surface flows with a two-phase granular fluid model,” *The Clifford Lectures*, Tulane University, April 2017.
- **George, D.L.*#**, “Mathematical models and software for simulating landslides, tsunamis and landslide-tsunamis,” *National Tsunami Hazard Mitigation Program Workshop*, Boulder CO, Feb. 2016.
- **George, D.L.*#**, “PDEs on Manifolds: Depth-averaged models for flows on rugged terrain,” *SIAM Conference on Math in the Geosciences*, Stanford University, July 2015.
- **Iverson, R.M.*#** and George, D.L. Keynote Lecture: “Dynamics of the disastrous debris-avalanche flow near Oso, USA, March 2014.” *Sixth International Conference on Debris-flow Hazards Mitigation*, Tsukuba, Japan, June 2015.
- **Allstadt, K.*#**, Moran, S.C., Malone, S.D., Iverson, R.M. and George, D.L., “Seismic signals of the 2014 landslide near Oso Washington,” *American Geophysical Union Annual (AGU) Fall Meeting*, San Francisco, 2014.
- **George, D.L.*#** and Iverson, R.M. “Modeling landslides and debris flows: case study of the Oso, Washington, disaster (2014),” *Annual Pacific Northwest Numerical Analysis Seminar (PNWNAS)*, Portland State University, Oct. 2014.
- **Iverson, R.M.*#** and George, D.L., “Landslides that liquefy: implications of the 2014 Oso disaster.” *Geological Society of America Annual Meeting*, 2014.
- **George, D.L.*#**, “Modeling geophysical flows, from tsunamis to landslides,” *Society for Industrial and Applied Mathematics (SIAM) Annual Meeting*, Chicago, July 2014.
- **Iverson, R.M.*#** and George, D.L., “Modeling the dynamics of volcanic debris avalanches and lahars,” *Association of Engineering and Environmental Geologists Annual Meeting*, Seattle, WA 2013.
- **George, D.L.*#**, “Introduction to tsunami modeling with GeoClaw,” *Pan-American Advanced Studies Institutes*, Valparaiso, Chile, Jan. 2013.
- **George, D.L.*#**, “Modeling landslides and landslide-generated tsunamis,” *SIAM Conference on Nonlinear Waves*, Seattle, WA, June 2012.
- **Iverson, R.M.*#** and George, D.L., “Granular dilatancy and its effects on debris-flow dynamics,” *American Geophysical Union (AGU) Annual Fall Meeting*, San Francisco, 2012.
- **George, D.L.*#** and Iverson, R.M., “Computing debris-flow mobilization and runout with a two-phase depth-averaged model,” *American Geophysical Union (AGU) Annual Fall Meeting, San Francisco*, 2011.

- Iverson, R.M.*# and George, D.L., "The role of dilatancy in debris-flow dynamics," **American Geophysical Union (AGU) Annual Fall Meeting**, San Francisco, 2011.
- George, D.L.*#, "Modeling and simulation of hazardous earth-surface flows from tsunamis to landslides," **Center for Advanced Energy Studies (CAES): Idaho Modeling, Simulation and Visualization Workshop**, Boise, ID, Sept. 2011.
- George, D.L.*#, "A nonconservative hyperbolic system for two-phase granular-fluid mixtures," **Workshop on Numerical Approximations of Hyperbolic Systems with Source Terms**, Roscoff, France, Sept. 2011.
- George, D.L.*# and Iverson, R.M., "Modeling tsunamigenic landslides," **Nuclear Regulatory Commission Meeting for Probabilistic Landslide Generated Tsunami Hazards**, Woods Hole, MA, Aug. 2011.
- George, D.L.*#, LeVeque, R.J. and Berger, M.J., "Tsunami modeling with Adaptive mesh refinement," **WAVES Conference (ICIAM)**, Vancouver, B.C. July 2011.
- George, D.L.*#, "Depth-averaged equations and numerical methods for modeling debris flows and shallow landslides," **Seventh International Congress for Industrial and Applied Mathematics (ICIAM)**, Vancouver, B.C. July 2011.
- George, D.L.*#, "Modeling tsunamis, landslides and other hazardous geophysical flows," **Societally Relevant Mathematics Workshop, Institute for Mathematics and its Applications (IMA)**, University of Minnesota, March 2011.
- George, D.L.*#, "Implementing a landslide debris-flow model for GeoClaw," **National Tsunami Hazard Mitigation Program (NTHMP)**, Texas A&M, Galveston, March 2011.
- George, D.L.*#, "Tsunamis, landslides and other inland flow hazards," **Attack of Planet Earth Lecture Series**, Cornell University, Oct. 2010.
- Iverson, R.M.*# and George, D.L., "Modeling landslide and debris-flow motion: confronting the dirty little secret." **Geological Society of America Annual Meeting Abstracts with Programs**, V.41 No. 7, Denver, 2010.
- George, D.L.*#, "Numerical methods and depth-averaged hyperbolic equations for water flooding, landslides and debris flows," **Symposium on Mathematical Models and Numerical Methods for Hazardous Geophysical Mass Flows**, National Taiwan University, Taipei, June 2010.
- George, D.L.*#, "The importance (or not) of dispersion," **ISEC Community Workshop: Simulation and Large-scale Testing of Nearshore Wave Dynamics**, NEES Tsunami Research Facility, Oregon State University, July 2009.
- George, D.L.*# and LeVeque, R.J., "Adaptive-mesh-refinement interpolation for tsunami modeling," **SIAM Conference on Computational Science and Engineering**, Miami, March 2009.
- George, D.L.*#, "Computation of large-scale geophysical problems," **Debris Flow Workshop**, University of Washington, Seattle, March 2009.
- George, D.L.*#, "Software and methods for hazardous free-surface geophysical flows," **American Mathematical Society/Mathematical Association America (AMS/MAA) Joint Annual Meeting**, Washington DC, January 2009.
- George, D.L.*#, Session Chair: "Advances in Computation of Avalanches, Debris Flows, and Floods." Speaker: "Generalizing methods for the shallow water equations to debris-flow

models.” ***Society for Industrial and Applied Mathematics (SIAM) Annual Meeting***, San Diego, July 2008.

- **George, D.L.*#**, “Well-balanced Riemann solvers and the steady-state wave approach,” ***SIAM Conference on Computational Science and Engineering***, Special Session on Wave Propagation Algorithms, Costa Mesa, CA, February 2007.
- **George, D.L.*#**, LeVeque, R.J., “High-resolution methods and adaptive refinement for tsunami propagation and inundation,” ***Eleventh International Conference on Hyperbolic Problems, Theory, Numerics, Applications***. Ecole Normale Supérieure de Lyon, France, July 2006.
- **George, D.L.*#**, LeVeque, R.J., and Berger, M.J., “Numerical modeling: finite volume methods and adaptive refinement allowing both global propagation and local inundation,” ***Third Tsunami Symposium of the Tsunami Society***, University of Hawaii, Honolulu, May 2006.
- **George, D.L.*#**, Keynote Student Talk: “Tsunami Modeling,” ***Pacific Northwest Numerical Analysis Annual Seminar (PNWNAS)***. Western Washington University, Bellingham, WA, October 2005.
- **LeVeque, R.J.*#**, George, D.L., and Berger, M.J., “Finite Volume Methods for Tsunami Modeling,” ***Society for Industrial and Applied Mathematics (SIAM) Annual Meeting***, New Orleans, July 2005.
- **George, D.L.*#**, LeVeque, R.J. and Berger, M.J., “Tsunami modeling with adaptive mesh refinement,” ***NSF Workshop on Tsunami Deposits and Their Role in Hazard Mitigation***, University of Washington, June 2005.

Contributed conference presentations

- Jones, R.P., Barnhart, K.R., **George, D.L.**, Rengers, F.K., Staley, D.M., and Kean, J.W., “Evaluating the sensitivity of debris flow inundation patterns to upstream initiation characteristics: Do initial conditions matter?” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2020.
- Barnhart, K.R., Jones, R.P., **George, D.L.**, McArdeil, B.W., Rengers, F.K., Staley, D.M., and Kean, J.W., “Cross model sensitivity analysis of debris flow inundation for the 9 January 2018 event at Montecito, CA,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2020.
- Benage, M., **George, D.L.**, Gardner, C., and Cannon, C.M., “Using D-Claw to inform lahar hazard assessment at Mount Baker volcano, Washington, USA,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2020.
- Xu, Y., **George, D.L.**, Kim, J., Lu, Z., Riley, M., Griffin, T. and Fuente, J.D.L., “Movement monitoring and runout simulations of the Gold Basin landslide complex using LiDAR, SAR, and numerical models,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2020.
- Conroy, C. # and **George, D.L.**, Lu, Z., Kim, J. and Xu, Y., “Incorporating Rainfall Infiltration and pore -pressure diffusion models for simulating landslide initiation and runout.” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2019.

- Iverson, R.M. # and **George, D.L.**, “The case for including pore-pressure evolution equations in depth-averaged models of debris flows and related phenomena.” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2019.
- Allstadt, K.E. # et al. (10 authors). “Overcoming barriers to progress in seismic monitoring and characterization of debris flows and lahars.” ***Association of Engineering and Environmental Geologists***, special publication 28, 2018.
- **George, D.L.** # and Yeh, H., “Overview: Geophysical flow modeling in natural hazards,” ***Society for Industrial and Applied Mathematics (SIAM) Annual Meeting***, Portland, OR, July 2018.
- McCoy, S.W. #, et al. (9 authors), “Hydrologic and Geomorphic Impacts of glacial lake outburst floods from low-order tributaries.” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2017.
- Denlinger, R.P. #, **George, D.L.**, Cannon, C.M., Waitt, R.B. and O’Connor, J.E., “Modeling cataclysmic outburst floods from Pleistocene glacial Lake Missoula.” ***Geological Society of America Annual Meeting***, Seattle, WA, 2017.
- Cripps, J.E. #, Brennand, T.A., Denlinger, R.P, **George, D.L.**, “Geomorphological evidence and numerical modelling of a late-glacial megaflood, south-central British Columbia.” ***Geological Society of America Annual Meeting***, Seattle, WA, 2017.
- **George, D.L.** # and Iverson, R.M., “New methodology for computing subaerial landslide-tsunamis: application to the 2015 Tyndall Glacier Landslide, Alaska.” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2016.
- Iverson, R.M. # and **George, D.L.**, “Modeling landslide runout dynamics and hazards: crucial effects of initial conditions,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2016.
- **George, D.L.** #, and Iverson, R.M., “Modeling Debris Flows Given Sensitivities, Uncertainty and Mobility Bifurcation,” ***SIAM Mathematics of Planet Earth***, Philadelphia, October 2016.
- **George, D.L.** # and Iverson, R.M., “Debris-flow runup on vertical barriers and adverse slopes,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2015.
- **George, D.L.** # and Iverson, R.M., “Numerical modeling of the 2014 Oso, Washington, Landslide,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2014.
- Iverson, R.M. #, **George, D.L.** and 11 others, “Landslide mobility and hazards: A geophysical overview of the Oso disaster.” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2014.
- **George, D.L.** # and Iverson, R.M., “Predicting debris-flow initiation and run-out with a depth-averaged two-phase model and adaptive numerical methods,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2012.
- **George, D.L.** # and Iverson, R.M., “Computing debris-flow mobilization and run-out with a two-phase depth-averaged model,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2011.
- Sevre, E.O. #, Yuen, D.A., **George, D.L.** and Lee, S., “Visualizing geophysical flow problems with adaptive mesh refinement,” ***American Geophysical Union Annual Fall Meeting***, San Francisco, Dec. 2011.

- **George, D.L.** # and Iverson, R.M., "A two-phase debris-flow model with granular dilatancy and pore-fluid pressure," ***Fifth International Conference on Debris-Flow Hazards***, University of Padua, Italy, June 2011.
- **George, D.L.** # and Iverson, R.M., "Two-phase debris-flow computations that include the evolution of dilatancy and pore-fluid pressure." ***The 3rd USGS modeling Conference***, Denver, June 2010.
- **George, D.L.** #, "GeoClaw: Adaptive finite volume methods for tsunami propagation and inundation. Case Study: South Pacific hazards," ***American Geophysical Union (AGU) Western Pacific Meeting***, Taipei, Taiwan, June 2010.
- Iverson, R.M. #, **George, D.L.** and Henderson, S., "Elements of an improved model of debris-flow motion." ***Geological Society of America Annual Meeting Abstracts with Programs***, V.41 No. 7., 2009.

Department seminars

- "Geophysical surface-flow modeling and simulation: from tsunamis to debris flows," ***Department of Mathematics, Pontifical Catholic University, Valparaiso, Chile***, Oct. 2020.
- "Lahar hazards on Cascade volcanos," ***Seismology Seminar, Department of Earth Sciences, University of Oregon***, Feb. 2020.
- "Computational modeling of landslides, debris-flows and more general coupled flows with D-Claw," ***USGS Landslide Program Weekly Seminar***, Golden, CO, May 2018.
- "Two-phase shallow-flow models for landslides," ***Applied and Computational Mathematics Seminar, Portland State University***, Nov. 2016.
- "Mathematical models and computational software for simulating landslides: implications of the 2014 Oso, Washington disaster," ***Fall Lecture Series, Department of Earth Sciences, Southern Methodist University***, Dallas, Nov. 2015.
- "1. Modeling tsunamis with GeoClaw. 2. Modeling landslides with D-Claw," ***Department of Earth Sciences Seminar, Central Washington University***, May 2015.
- "Landslide stability and bifurcation: a mathematical model and software for simulating landslides and debris flows from initiation to deposition," ***Applied Mathematics and Computation Seminar, Oregon State University***, April 2015.
- "Modeling landslide initiation and stability," ***Geosciences Weekly Seminar, Department of Earth Sciences, University of Minnesota***, Nov. 2013.
- "Two-phase models for geophysical flows," ***Department of Mathematics, Portland State University***, May 2013. D. L. George.
- "Models, algorithms and software for large-scale free-surface environmental flows," ***Mathematical Institute, Oxford University***, UK, March 2012.
- "Derivation and considerations for depth-averaged flow models," ***OCCAM Math Student Seminar, Oxford University***, UK, March 2012.
- "Developing Algorithms and software for Geophysical flows," ***Department of Mathematics, Boise State University***, February 2010.
- "Riemann solvers for wave propagation problems," ***Department of Mathematics and Statistics Seminar, Simon Fraser University***, Vancouver, B.C., January 2006.

- “A Wave-propagation method for tsunami modeling,” ***Department of Mathematics, University of Victoria***, B.C., November 2004.