George H. Allen

Virginia Tech

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Google Scholar Profile
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Appointments

Virginia Tech

2025–pres. Associate Professor, Department of Geosciences
2022–2025 Assistant Professor, Department of Geosciences

Texas A&M

2018–2022 Assistant Professor, Department of Geography

NASA Jet Propulsion Laboratory

2017–2018 Caltech Postdoc, Terrestrial Hydrology Group

Education

2017 **University of North Carolina at Chapel Hill**
PhD Geological Sciences

2012 **University of North Carolina at Chapel Hill**
MS Geological Sciences

2008 **University of California at Davis**
BS Geology

Honors, Awards and Fellowships

2025 Clarivate Highly Cited Researcher
2024 NASA Early Career Investigator Award
2024 Universities Council on Water Resources Early Career Award
2022 NSF CAREER Award
2016 UNC Royster Society Inductee
2016 Paul C. Hardin Dissertation Year Fellowship
2016 North Carolina Space Grant Graduate Research Fellowship
2015 G. H. Stout Award for Innovative Student Papers, NC GIS Conference
2015 UNC Future Faculty Fellowship Award

This CV is abridged. Full CV is available here

External Grants

Pending Co-PI, NASA Water Resources Applications, "Operational Satellite Reservoir Monitoring System: Evaporation, Storage, and Drought Across the CONUS"

Pending Co-I, NASA Water Quality Applications Program, "Integrating Earth observations into automated water quality forecasts to improve drinking water management"

2025 (Canceled) Co-PI, NASA AIST (PI: Dani Selva), "3D-CHESS FO: Autonomous sensor web for inland water monitoring", $1,398,092, $459,231 to VT, $183,822 to Allen

2024 Co-I, NASA SWOT Science Team (PI: Jida Wang), "Harnessing Lake-River Continuum (LARIC) for improving SWOT hydrological products and deciphering global reservoir water management", $1,038,372, $252,750 to Allen

2024 PI, NASA Early Career Investigator Program, "Assessing river surface light availability at the global scale", $299,266, $299,266 to Allen

2023 PI, Virginia Space Grant Consortium (Graduate Student Fellow: Carter Boyd), "Quantifying the size-distribution of rivers across scales: advancing estimates of global river surface area", $5,500, $5,500 to Allen

2022 PI, NASA FINESST (FI: Emily A. Ellis), "Remote Sensing of River Temperature and Discharge: Defining Connections and Assessing Changes", $150,000, $150,000 to Allen

2022 Co-I, NASA AIST (PI: Dani Selva), "3D-CHESS: Decentralized, distributed, dynamic and context-aware heterogeneous sensor systems", $600,000, $82,238 to Allen

2022 Co-I, NASA Earth Science Applications: Water Resources (PI: Huilin Gao), "Satellite Assisted Operational Reservoir Evaporation Monitoring and Forecasts for the Western U.S." $985,548, $87,376 to Allen

2022 PI, NSF CAREER, "CAREER: Integrating river hydrology across scales: advancing understanding of the global river-atmosphere interface", $535,242, $535,242 to Allen

2021 Co-PI, Jet Propulsion Laboratory Strategic University Research Program (SURP), "Assessing altimetry and optical remote sensing products to study global sediment transport dynamics in Earth's inland water bodies", $180,000, $122,794 to Allen

2020 Co-PI, NASA SWOT Science Team (PI: Jida Wang), "Integrating reservoirs into SWOT's global surface water storage and discharge monitoring", $799,644, $140,055 to Allen

2018 Co-PI, NASA Terrestrial Hydrology Program (PI: Cedric David), "Filling the space/time gaps between surface water retrievals", $479,978, $78,830 to Allen

Internal Grants

2023 PI, VT Presidential Postdoctoral Fellowship (Postdoc: Katie McQuillan), "Estimating reservoir evaporation loss using novel SWOT satellite radar observations for water resources management" $107,570, $107,570 to Allen

2020 PI, TAMU X-Grants 2020, "Developing a SmallSat Mission to Track the Global Movement of Water, Carbon, and Sediment across Landscapes", $324,957, $140,285 to Allen

2019 PI, TAMU PESCA Grant Program, "Developing a Method for the Rapid Detection of Freshwater Plastic Pollution", $25,000, $25,000 to Allen

Journal Articles (Selected)

*Allen Group Student/Postdoc

Google Scholar Profile

2026 *Riggs, R.M., Dickinson, J.E., Brinkerhoff, C.B., Sikder, M.S., Wang, J., Gao, H., **Allen, G.H.** Characterizing operational signatures of reservoirs with the SWOT satellite by comparing natural lake and reservoir dynamics. *Environmental Research Letters*, https://doi.org/10.1088/1748-9326/ae436e

2026 *McQuillan, K.A., **Allen, G.H.**, Pearson, C., Homan, K.D., Huntington, J., Yadav, A., Gao, H., Improving the spatial representation of reservoir evaporation using SAR-based wind fields. *IEEE Geoscience and Remote Sensing Letters*. https://doi.org/10.1109/LGRS.2026.3652374

2025 *Stroud, M., **Allen, G.H.**, Minear, J.T., Cisneros, J., Smith, L.C., SWOT Satellite: A New Tool for Fluvial Geomorphology, *GSA Today*. https://doi.org/10.1130/GSATG630A.1 (**cover story, December issue**)

2025 *Boyd, C.A., **Allen, G.H.**, The Widths of Rivers and Streams Across Spatial Scales: A Framework for Improving River-Atmosphere Biogeochemical Exchange Estimates. *Geophysical Research Letters*. https://doi.org/10.1029/2025GL115713

2025 *Thurman, H.R., **Allen, G.H.**, Williams, B., Cerbelaud, A., David, C.H., SWOT captures hydrologic waves traveling down rivers. *Geophysical Research Letters.* https://doi.org/10.1029/2024GL113875

2025 Saunois, M., Martinez, A., Poulter, B., Zhang, Z., Raymond, P., Regnier, P., Canadell, J.G., Patra, P.K., Bousquet, P., Jackson, R.B., Ciais, P., Dlugokencky, E.J., Lan, X., **Allen, G.H.**, et al., Global Methane Budget 2000-2020. *Earth System Science Data.* https://doi.org/10.5194/essd-17-1873-2025

2025 *McQuillan, K.A., **Allen, G.H.**, Fayne, J., Gao, H., Wang, J., Estimating wind direction and wind speed over lakes with SWOT and Sentinel-1 satellite observations. *Earth and Space Science.* https://doi.org/10.1029/2024EA003971

2024 Langhorst, T., Konstantinos, K., **Allen, G.H.**, Global Cloud Biases in Optical Satellite Remote of Rivers. *Geophysical Research Letters.* https://doi.org/10.1029/2024GL110085

2024 Collins, E.L., David, C.H., *Riggs, R.M., **Allen, G.H.**, Pavelsky, T.M., Lin, P., Pan, M.,Yamazaki, D., Meentemeyer, R.K., Sanchez, G.M., Residence time is a prominent driver of global river water storage. *Nature Geoscience*. https://doi.org/10.1038/s41561-024-01421-5

2024 Gorr, J.B., Selva, D. Gao, H., *Ellis, E., *Morgan, J., *Stroud, M., **Allen, G.H.**, Li, Y., Design of a satellite constellation for monitoring inland water quality. *Acta Astronautica*. https://doi.org/10.1016/j.actaastro.2024.03.062

2024 *Ellis, E.A., **Allen, G.H.**, *Riggs, R.M., Gao, H., Li, Y., Carey, C., Bridging the divide between inland water quantity and quality with satellite remote sensing: An interdisciplinary review. *WIREs Water*. https://doi.org/10.1002/wat2.1725

2024 *Stroud, M., **Allen, G.H.**, Simard, M., Jensen, D.J., Gorr, J.B., Selva, D., Optimizing satellite mission requirements to measure total suspended solids in rivers. *IEEE Transactions on Geoscience and Remote Sensing*. https://doi.org/10.1109/TGRS.2023.3337641

2023 *Riggs, R.M., **Allen, G.H.**, Wang, J., Pavelsky, T.M., Gleason, C.J., David, C.H., Durand, M., Extending Global River Gauge Records Using Satellite Observations. *Environmental Research Letters*. https://doi.org/10.1088/1748-9326/acd407

2023 *Riggs, R.M., **Allen, G.H.**, Brinkerhoff, C.B., Sikder, S.M., Wang, J., Turning lakes into river gauges using the LakeFlow algorithm. *Geophysical Research Letters*. https://doi.org/10.1029/2023GL103924 (**top viewed article**)

2022 **Allen, G.H.**, Cause of the 2020 surge in atmospheric methane clarified. *Nature News and Views*. https://doi.org/10.1038/d41586-022-04352-6

2022 Liu, S., Kuhn, C., Amatulli, G., Aho, K., Butman, D.E., **Allen, G.H.**, Lin, P., Pan, M., Yamazaki, D., Brinkerhoff, C., Gleason, C., Raymond, P.A., The importance of hydrology in routing terrestrial carbon to the atmosphere via global streams and rivers. *Proceedings of the National Academy of Sciences*. (**highlighted in *Nature***) https://doi.org/10.1073/pnas.2106322119

2021 Rosentreter, J.A., Borges, P.A., Deemer, B.R., Holgerson, Liu, S., C.M., Song, M.A., Melack, J., Raymond, P.A., Duarte, C.M., **Allen, G.H.**, Olefeldt, Poulter, B., D., Battin, T.I., Eyre, B.D., Half of global methane emissions come from highly variable aquatic ecosystem sources. *Nature Geoscience*. https://doi.org/10.1038/s41561-021-00715-2

2020 **Allen, G.H.**, Yang, X., Gardner J., *Holliman, J., David., C.H., Ross, M., Timing of Landsat overpasses effectively captures flow conditions of large rivers. *Remote Sensing*. https://doi.org/10.3390/rs12091510

2020 Yang, X., Pavelsky, T.M., **Allen, G.H.**, The past and future of global river ice. *Nature*. https://doi.org/10.1038/s41586-019-1848-1

2019 Lin, P., Pan, M., Beck, H., Yang, Y., Yamazaki, D., Frasson, R.P.d.M, David, C.H., Durand, M., Pavelsky, T.M., **Allen, G.H.**, Gleason, C., Wood, E., Global reconstruction of naturalized river flows at 2.94 million reaches. *Water Resources Research*. **(Editor's Choice Award)** https://doi.org/10.1029/2019WR025287

2019 Yamazaki, D., Ikeshima, D., Sosa, J., Bates P.D., **Allen, G.H.**, Pavelsky, T.M., MERIT Hydro: A high-resolution global hydrography map based on latest topography datasets. *Water Resources Research*. (**Editor's Choice Award)** https://doi.org/10.1029/2019WR024873

2018 **Allen, G.H.**, David, C.H., Andreadis, K.M., Hossain, F., Famiglietti, J.S., Global estimates of river flow wave travel times and implications for low-latency satellite data. *Geophysical Research Letters*. https://doi.org/10.1029/2018GL077914

2018 **Allen, G.H.**, Pavelsky, T.M., Global extent of rivers and streams. *Science*. (**cover story August 10**) https://doi.org/10.1126/science.aat0636

2018 **Allen, G.H.**, Pavelsky, T.M., Barefoot, E.A., Lamb, M.P., Butman, D., Tashie, A., Gleason, C.J., Similarity of stream width distributions across headwater systems. *Nature Communications.* https://doi.org/10.1038/s41467-018-02991-w

2015 **Allen, G.H.**, Pavelsky, T.M., Patterns of river width and surface area revealed by the satellite-derived North American River Width data set. *Geophysical Research Letters.* https://doi.org/10.1002/2014GL062764

2013 **Allen, G.H.**, Barnes, J.B., Pavelsky, T.M., Kirby, E., Lithologic and tectonic controls on bedrock channel form at the northwest Himalayan front. *Journal of Geophysical Research Earth Surface.* https://doi.org/10.1002/jgrf.20113

University Teaching

2023–pres.	**Virginia Tech**	
	Instructor	GEOS/GEOG/CSES 3304 Geomorphology
	Instructor	GEOS 4984/6104 Remote Sensing of Hydrology
	Instructor	GEOS 6104 Advanced Remote Sensing in Geosciences
	Instructor	GEOS 6204 Advanced Topics: Surface Processes
2018–2022	**Texas A&M University**	
	Instructor	GEOG 312 Data Analysis in Geography
	Instructor	GEOG 361/651 Remote Sensing in Geosciences
	Instructor	GEOG 696 Geomorphology and Remote Sensing
2016	**UNC Chapel Hill**	
	Instructor	GEOL 483 GIS and Remote Sensing

Graduate Student Supervision

Exp. 2029	Steve Yoon, PhD Geosciences, TBD
Exp. 2029	David Go, PhD Geosciences, River surface dynamics
Exp. 2028	Hana Thurman, PhD Geosciences, SWOT remote sensing of river flow waves
Exp. 2027	Yohtaro Kobayashi, PhD Geosciences, River light availability
Exp. 2026	Emily Ellis, PhD Geosciences, Satellite remote sensing of river temperature
2021–2025	Molly Stroud, PhD Geosciences, Dissertation title: Exploring Innovative Methods to Study Inland Waters Using Remote Sensing. Job after graduation: Postdoctoral Researcher at Virginia Tech (Cayelan Cary and Quinn Thomas)
2023–2025	Luisana Rodriguez Sequeira, MS Geosciences, Thesis title: Estimating microplastic concentrations in surface water using satellite-based turbidity measurements: a case study on the New River, VA, Job after graduation: World traveler
2022–2024	Carter Boyd, MS Geosciences, Thesis title: Quantifying the Size Distribution of Rivers Across Spatial Scales. Job after graduation: Balance Hydrologics Consultant
2019–2024	Ryan Riggs, TAMU PhD Geography, Dissertation title: Improving Access to River Discharge Data Through Satellite Remote Sensing. Job after graduation: USGS Postdoc
2020–2022	John Morgan, TAMU MS Geography, Thesis title: Characterizing River Width Across Spatial Scales in the Mississippi River Basin. Job after graduation: PhD at Virginia Tech
2019-2021	Ennis Rios (co-chair), TAMU MS Water Management & Hydrological Science, non-thesis. Job after graduation: Research Associate at the TX Water Resources Institute

Postdoc Supervision

2023–pres.	Katie McQuillan, Radar remote sensing of lake wind and evaporation

Recent Professional Activities & Service

2020–pres. Member, NASA SWOT Science Team

2020–pres. Convener of 23 AGU Annual Meeting sessions

2023–pres. Guest Editor, *Journal of Remote Sensing* Special Issue, Remote Sensing of Hydrology: Emerging Techniques and Applications

2023 Invited Participant, Global River Observing Network (RIOS) Workshop, Bristol, UK

2022 Panelist, Proposal peer review panel for NSF

2020–2023 Panelist, Proposal peer review panels for NASA (2x)

2020–pres. Ad-hoc proposal reviewer for NASA, NSF (2x), and USGS

2019–2024 Member, NSF Dry Rivers Research Coordination Network
Member, DEI & Justice Working Group

2019–2023 Contributor, Inland Waters Group, Global Carbon Project, RECCAP2

2013–pres. Journal referee of >60 manuscripts for publications

2011–pres. Member, American Geophysical Union (AGU)

Data Products & Software (Selected)

2025 Wang, J., Pottier, C., Cazals, C., Battude, M., Sheng, Y., Song, C., Sikder, M.S., Yang, X., Ke, L., Gosset, M., Oliveira, R., Grippa, M., Girard, F., **Allen, G.H.**, Biancamaria, S., Smith, L., Crétaux, J-F, Pavelsky, T. SWOT Prior Lake Database (PLD). https://hydroweb.next.theia-land.fr

2024 Lehner, B., Anand, M., Fluet-Chouinard, E., Tan, F., Aires, F., **Allen, G.H.**, Bousquet, P., Canadell, J.G., Davidson, N., Finlayson, C.M., Gumbricht, T., Hilarides, L., Hugelius, G., Jackson, R.B., Korver, M.C., McIntyre, P.B., Matthews, E., Nagy, S., Olefeldt, D., Pavelsky, T., Pekel, J.-F., Poulter, B., Prigent, C., Wang, J., Worthington, T.A., Yamazaki, D., Thieme, M. Global Lakes and Wetlands Database V2 (GLWD v2), https://www.hydrosheds.org/products/glwd

2023 *Riggs, R., Moulds, S., Wortmann, M. Slater, L., **Allen, G.H.**, RivRetrieve R Package for downloading global river gauge data https://cran.r-project.org/web/packages/RivRetrieve

2022 Wang, J., Walter, B.A., Yao, F., Song, C., Ding, M., Maroof, A.S., Zhu, J., Fan, C., Xin, A., McAlister, J.M., Sikder, S., Sheng, Y., **Allen., G.H.**, Crétaux, J., Wada, Y., GeoDAR https://zenodo.org/records/6163413

2021 Lin, P., Pan, M., Wood, E.F., Yamazaki, D., **Allen, G.H.**, MERIT Hydro–Vector https://doi.org/10.6084/m9.figshare.c.5052635

2020 Yang, X., Pavelsky, T.M., **Allen, G.H.**, Global River Ice Dataset (GRID) http://doi.org/10.5281/zenodo.3372709

2019 Lin, P., Pan, M., Beck, H.E., Yang, Y., Yamazaki, D., Frasson, R., David, C.H., Durand, M., Pavelsky, T.M., **Allen, G. H.**, Gleason, C. J., Wood, E. F., Global Reach-Level A Priori Discharge Estimates for SWOT (GRADES) https://www.reachhydro.org/home/records/grades

2019 Yamazaki, D., Ikeshima, D., Sosa, J., Bates P.D., **Allen, G.H.**, Pavelsky, T.M., MERIT Hydro http://hydro.iis.u-tokyo.ac.jp/~yamadai/MERIT_Hydro

2018 **Allen, G.H.**, Pavelsky, T.M., Global River Widths from Landsat (GRWL) https://doi.org/10.5281/zenodo.1297434

Invited Talks (Selected)

2024 Department of Earth, Marine and Environmental Sciences Colloquium, University of North Carolina at Chapel Hill, NC, Apr. 17

2024 New River Symposium, New River Conservancy, Radford, VA Apr. 11-12

2024 Department of Earth Science Seminar, Southern Methodist University, Dallas, TX, Feb. 9

2023 Departmental of Environmental Science Seminar, Duquesne University, Virtual, Mar. 17

2022 USGS Water Mission Area Seminar, Virtual, Oct. 12

2022 Department of Earth, Environmental and Planetary Sciences Seminar, Rice University, Houston, TX, Sep. 29

2022 Department of Marine, Earth and Atmospheric Sciences Seminar, North Carolina State University, Virtual, Mar. 30

2021 Remote Sensing Interdisciplinary Graduate Education Program Seminar Series, Virtual, Mar. 8 (Student-nominated speaker)

2019 Distinguished Speaker Series, Institute for Sustainable Communities, TAMU, College Station, TX, Nov. 19

2019 South American Water from Space Conference, Manaus, Brazil, Nov. 4-7

2019 Crosscurrents Seminar, University of North Texas Department of Geography and the Environment, Denton, TX, Oct. 18

2018 Whole Earth Seminar, University of California at Santa Cruz, Department of Earth and Planetary Sciences, Santa Cruz, CA, Jan. 23