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CURRICULUM VITAE

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EDUCATION

Ph.D.	University of California Los Angeles, Department of Geography	6/13/2008
M.A.	University of California Los Angeles, Department of Geography	6/11/2004
B.A.	Middlebury College, Department of Geography	5/27/2001

PROFESSIONAL EXPERIENCE

Associate Chair *January 2019 – Present*
Professor *July 2020 – Present*
Associate Professor *July 2015 – June 2020*
Assistant Professor *July 2009 – June 2015*
Department of Geological Sciences
University of North Carolina, Chapel Hill

U.S. Hydrology Science Lead *December 2013—Present*
NASA Surface Water and Ocean Topography (SWOT)
Satellite Mission

Postdoctoral Researcher *August 2008 – June 2009*
Department of Atmospheric and Oceanic Sciences
University of California, Los Angeles
Mentor: Dr. Alex Hall

HONORS, AWARDS, AND FELLOWSHIPS

2019	Water Resources Research Editor's Choice Award (for Yamazaki et al., 2019)
2019	Water Resources Research Editor's Choice Award (for Lin et al., 2019)
2018	Make Our Planet Great Again Court Sejour Award, Government of France
2014	Presidential Early Career Award for Scientists and Engineers (PECASE)
2012	NASA New Investigator Award (Equivalent to NSF CAREER)
2012	UNC Junior Faculty Development Award
2011	UNC Department of Geological Sciences Walter H. Wheeler Undergraduate Teaching Award
2007	UCLA Dissertation Year Fellowship
2006	UCLA Department of Geography Outstanding Student Research Publication Award
2002	NASA Earth Systems Science Fellowship (Equivalent to NSF GRFP)

REFEREED JOURNAL ARTICLES *UNC Student/Postoc

*Yang, X., **T.M. Pavelsky**, L.P. Bendezu, and S. Zhang (in press), Simple method to extract lake ice condition from Landsat images, *IEEE Transactions in Geoscience and Remote Sensing*.

*Gomez, A., M. Serre, E. Wise, and **T.M. Pavelsky** (in press), Integrating community science research and space-time mapping to determine depth to groundwater in a remote rural region, *Water Resources Research*.

*Tashie, A.K., **T.M. Pavelsky**, L.E. Band, and *S.N. Topp (in press), Effective Hydraulic Conductivity and Drainable Storage for the Continental United States, *Journal of Advances in Modeling of Earth Systems*.

International Altimetry Team; **T.M. Pavelsky** one of several hundred authors (in press), Altimetry for the future: Building on 25 years of progress, *Advances in Space Research*.

Frasson, R.P.M., M.T. Durand, K. Larneir, C.J. Gleason, K. Andreadis, M. Hagemann, R. Dudley, D. Bjerklie, H. Oubanas, P.-A. Garambois, P.-O. Malaterre, P. Lin, **T.M. Pavelsky**, J. Monnier, C. Brinkerhoff, and C. David (in press), Exploring the factors controlling the error characteristics of the Surface Water and Ocean Topography mission discharge estimates, *Water Resources Research*.

*Zhang, S., **T.M. Pavelsky**, C.D. Arp, and X. Yang (2021), Remote sensing of lake ice phenology in Alaska, *Environmental Research Letters*, *16* (6), 064007.

*Topp, S.N., **T.M. Pavelsky**, H. Dugan, *X. Yang, *J. Gardner, and M.R.V. Ross (2021) Shifting patterns of lake color phenology in over 26,000 US lakes, *Water Resources Research*, *57*(5), e2020WR029123.

Harlan, M., C.J. Gleason, *E.H. Altenau, D. Butman, T. Carter, V. Chu, S. Cooley, *W. Dolan, M.T. Durand, E. Eidam, J. Fayne, D. Feng, Y. Ishitsuka, C. Kuhn, E. Kyzivat, *T. Langhorst, J.T. Minear, **T.M. Pavelsky**, D. Peters, A. Pietroniro, L. Pitcher, and L.C. Smith, (2021), Discharge Estimation from Dense Arrays of Pressure Transducers, *Water Resources Research*, *57*(3), e2020WR028714.

*Little, S.B., **T.M. Pavelsky**, F. Hossain, S. Ghafoor, G. Parkins, S.K. Yelton, M. Rodgers, *X. Yang, J.-F. Cretaux, C. Hein, M.A. Ullah, D.H. Lina, H. Thiede, D. Kelly, D. Wilson, and *S.N. Topp (2021), Monitoring variations in lake water storage with satellite imagery and citizen science, *Water, 13*(7), 949.

*Topp, S.N., **T.M. Pavelsky**, E.H. Stanley, *X. Yang, C.G. Griffin, and M.R.V. Ross (2021), Multi-Decadal Improvement in U.S. Lake Water Clarity, *Environmental Research Letters*, *16*(5), 055025.

Ishitsuka, Y., C.J. Gleason, M.W. Hagemann, E. Beighley, G.H. Allen, D. Feng, P. Lin, M. Pan, K. Andreadis, and **T.M. Pavelsky** (2021), Combining big-data remote sensing and global hydrologic modelling improves daily discharge estimates across an entire large watershed, *Water Resources Research*, *57*(3), e2020WR027794.

*Gardner, J., *X. Yang, *S.N. Topp, M.R.V. Ross, and **T.M. Pavelsky** (2021), The Color of Rivers, *Geophysical Research Letters*, *48*(1), e2020GL088946.

*Whittemore, A., M.R.V. Ross, *W. Dolan, *T. Langhorst, *X. Yang, S. Pawar, M. Jorissen, E. Lawton, S. Januchowski-Hartley, and **T.M. Pavelsky** (2020), A Participatory Science Approach to Expanding Instream Infrastructure Inventories, *Earth's Future, 8*(11), e2020EF001558.

Pitcher, L.H., L.C. Smith, S.W. Cooley, A. Zaino, R. Carlson, J. Pettit, C.J. Gleason. J.T. Minear, J.V. Fayne, M. Harlan, *T. Langhorst, *S.N. Topp, *W. Dolan, E. Kyzivat, A. Pietroniro, D. Yang, T. Carter, C. Onclin, D. Moreira, M. Burge-Nguyen, J-F. Cretaux, and **T.M. Pavelsky** (2020), Advancing field-based GPS surveying for validation of remotely sensed water surface elevation products, *Frontiers in Earth Science, 8*, 278.

Fayne, J.V., L.C. Smith, L.H. Pitcher, E.D. Kyzivat, S.W. Cooley, M.G. Cooper, M. Denbina, A. Chen, C. Chen, and **T.M. Pavelsky** (2020), Advancing field-based GPS surveying for validation of remotely sensed water surface elevation products, *Environmental Research Letters, 15*(10), 105005.

Ryan, J.C., L.C. Smith, S.W. Cooley, L.H. Pitcher, and **T.M. Pavelsky** (2020), Global characterization of inland water reservoirs using ICESat-2 altimetry and climate reanalysis, *Geophysical Research Letters, 47*(17), e2020GL088543.

Ahmad, S., F. Hossain, **T.M. Pavelsky**, G. Parkins, S.K. Yelton, M. Rodgers, *S.B. Little, S. Ghafoor, D. Haldar, R.H. Khan, N.A. Shawn, A. Haque, and R.K. Biswas (2020), Understanding Volumetric Water Storage in Monsoonal Wetlands of Northeastern Bangladesh, *Water Resources Research*, *56* (12), e2020WR027989.

Gerson, J., *S.N. Topp, C. Vega, *J. Gardner, *X. Yang, L. Fernandez, E. Bernhardt, and **T.M. Pavelsky** (2020), Artificial lake expansion amplifies mercury pollution from gold mining, *Science Advances, 6*(48), eabd4953.

Durand, M.T., C. Chen, R. Frasson, **T.M. Pavelsky**, B. Williams, *X. Yang, and A. Fore (2020) How will radar layover impact SWOT measurements of water surface elevation and slope, and estimates of river discharge?, *Remote Sensing of Environment, 247*, 111883.

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*Holtzman, N.M., **T.M. Pavelsky**, J.S. Cohen, *M.L. Wrzesien, and J.D. Herman (2020), Tailoring WRF and Noah-MP to improve process representation of Sierra Nevada runoff: Diagnostic evaluation and applications, *Journal of Advances in Modeling Earth Systems, 12*(3), e2019MS001832.

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*Barefoot, E., **T.M. Pavelsky**, G.H. Allen, M.A. Zimmer, and B.L. McGlynn (2019), Temporally Variable Stream Width and Surface Area Distributions in a Headwater Catchment, *Water Resources Research*, *55*(8), 7166-7181.

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*Gardner, J.R., **T.M. Pavelsky**, and M.W. Doyle (2019), The abundance, size, and spacing of lakes within river networks, *Geophysical Research Letters*, *46*(5), 2592 - 2601.

*Altenau, E.H., **T.M. Pavelsky**, D.K. Moller, L.H. Pitcher, P.D. Bates, M.T. Durand, and L.C. Smith (2019), Temporal Variations in River Water Surface Elevation and Slope Captured by AirSWOT, *Remote Sensing of Environment, 224*, 304-316.

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*Allen, G.H. and **T.M. Pavelsky** (2018), Global Extent of Rivers and Streams, *Science, 361*(6402), 585-588. <*Science* cover story August 10>

Domeneghetti, A. G. Schumann, R.P.M. Frasson, R. Wei, **T.M. Pavelsky**, A. Castellarin, A. Brath, and M.T. Durand (2018), Characterizing water surface elevation under different flow conditions for the upcoming SWOT mission: application to the Po River, *Water Resources Research, 561*, 848-861.

Dai, C., Durand, M., Howat, I.M., *Altenau, E.H., and **T.M. Pavelsky** (2018), Estimating river surface elevation from ArcticDEM, *Geophysical Research Letters, 45*(7), 3107-3114.

*Allen, G.H., **T.M. Pavelsky**, *E.A. Barefoot, M.P. Lamb, D. Butman, *A. Tashie, and C.J. Gleason (2018), Similarity of Stream Hydromorphology Across Headwaters Systems, *Nature Communications, 9*(1), 610.

Wrzesien, M.L., M.T. Durand, **T.M. Pavelsky**, S. Kapnick, Y. Zhang, J. Guo, and C.K. Shum (2018), A new estimate of North American mountain snow accumulation from regional climate model simulations, *Geophysical Research Letters, 45*(3), 1423-1432.

Pavelsky, T. M., and J. P. Zarnetske (2017), Rapid decline in river icings detected in Arctic Alaska: Implications for a changing hydrologic cycle and river ecosystems, *Geophysical Research Letters, 44*, 3228-3235. <*GRL* cover story/highlighted article>

Frasson, R.P., R. Wei, M. Durand, J.T. Minear, A. Domeneghetti, G. Schumann, B.A. Williams, E. Rodriguez, C. Picamilh, *C. Lion, **T.M. Pavelsky**, and P.A. Garambois

(2017), Automated river reach definition strategies: Applications for the Surface Water and Ocean Topography Mission, *Water Resources Research*,*53*(10), 8164-8186.

*Altenau, E. H., **T. M. Pavelsky**, P. D. Bates, and J. C. Neal (2017), The effects of spatial resolution and dimensionality on modeling regional-scale hydraulics in a multichannel river, *Water Resources Research*,*53*, 1683–1701.

*Altenau, E. H., **T. M. Pavelsky**, D. Moller, *C. Lion, L. H. Pitcher, *G. H. Allen, P. D. Bates, S. Calmant, M. Durand, and L. C. Smith (2017), AirSWOT measurements of river water surface elevation and slope: Tanana River, AK, *Geophysical Research Letters*, *44*, 181–189.

Wrzesien, M.L., M.T. Durand, **T.M. Pavelsky**, I.M. Howat, S.A. Margulis, and L.S. Huning (2017), Comparison of Methods to Estimate Snow Water Equivalent at the Mountain Range Scale: A Case Study of the California Sierra Nevada, *Journal of Hydrometeorology*, *18*, 1101-1119.

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*Cooley, S.W. and **T.M. Pavlesky** (2016), Spatial and temporal patterns in Arctic river ice breakup revealed by automated ice detection from MODIS imagery, *Remote Sensing of Environment*, *175*, 310-322.

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*Long, C.M. and **T.M. Pavelsky** (2013). Remote sensing of suspended sediment concentration and hydrologic connectivity in a complex wetland environment, *Remote Sensing of Environment*, *129*, 197-209.

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MANUSCRIPTS IN REVIEW PROCESS

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Ross, M. R. V. and **T.M. Pavelsky** (2017), Hyperspectral imaging of water quality - past applications and future directions, *AGU Fall Meeting Abstracts*, B33D-2105.

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Altenau, E.H., **T.M. Pavelsky**, D. Moller, C. Lion, L.H. Pitcher, G.H. Allen, P.D. Bates, S. Calmant, M. Durand, J.C. Neal, and L.C. Smith (2017), AirSWOT observations versus hydrodynamic model outputs of water surface elevation and slope in a multichannel river, *EGU General Assembly Conference Abstracts*, 19.5381.

Pavelsky, T.M. and J.P. Zarnetske (2016), Rapid Declines in Aufeis Means Major Changes for Many Arctic Rivers, *AGU Fall Meeting Abstracts*, GC23A-1230.

Allen, G.H., **T.M. Pavelsky**, E.A. Barefoot, A. Tashie, and D.E. Butman (2016), Similarity of Stream Width Distributions Across Headwater Systems, *AGU Fall Meeting Abstracts*, H23I-1691.

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***Pavelsky, T.M.** and G.H. Allen (2015), Recent Advances in Global Measurement and Application of River Widths, *AGU Fall Meeting Abstracts*, H52D-01.

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Srinivasan, M., A. Andral, M. Dejus, F. Hossain, C. Peterson, E. Beighley, **T.M. Pavelsky**, Y. Chao, B. Doorn, E. Bronner, and L. Houpert (2015), Engaging the Applications Community of the future Surface Water and Ocean Topography (SWOT) Mission, *ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XL7.1497S.

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Humphries, E., **T.M. Pavelsky**, and P.D. Bates (2014), Two dimensional hydrodynamic modeling of a high latitude braided river, *AGU Fall Meeting Abstracts*, H43H-1042.

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Wrzesien, M., M.T. Durand, **T.M. Pavelsky**, S.B. Kapnick, and T.H. Painter (2014), Comparison of Microphysics Schemes for Simulation of Snow Cover Fraction in the Sierra Nevada, *AGU Fall Meeting Abstracts*, C43A-0368.

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Rodriguez, E., A. Behar, J. Carswell, V. Chu, G. Farquharson, C.J. Gleason, S. Hensley, J.T. Minear, D. Moller, **T.M. Pavelsky**, D. Perkovic-Martin, L.H. Pitcher, M. Sanchez-Barmetty, L.C. Smith, and X. Wu (2013), AirSWOT: A New Airborne Instrument for Hydrology, *AGU Fall Meeting Abstracts*, EP43C-0872.

Pavelsky, T.M., D.B. Haine, and M. Drostin (2013), Using partnerships with scientists to enhance teacher capacity to address the NGSS, *AGU Fall Meeting Abstracts*, ED11D-08.

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Allen, G.H., **T.M. Pavelsky**, and Z. Miller (2013), Quantifying River Widths of North America from Satellite Imagery, *AGU Fall Meeting Abstracts*, H31F-1242.

Pavelsky, T.M., M.T. Durand, K. Andreadis, E. Beighley, G.H. Allen, and Z. Miller (2013), Assessing the Global Extent of Rivers Observable by SWOT, *AGU Fall Meeting Abstracts*, H24E-07.

Pavelsky, T.M., K. Andreadis, S. Biancamaria, M. Durand, D. Moller, E. Rodriguez, and L.C. Smith (2013), Recent Progress in Development of SWOT River Discharge Algorithms, *20 Years of Progress in Radar Altimetry*, 710E.112.

Sobolowski, S. and **T.M. Pavelsky** (2012), Evaluation of present and future North American Regional Climate Change Assessment Program (NARCCAP) regional climate simulations over the southeast United States, *AGU Fall Meeting Abstracts*, GC14C-02.

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Durand, M.T., Y. Yoon, E. Rodriguez, J.T. Minear, K. Andreadis, **T.M. Pavelsky**, D.E. Alsdorf, L.C. Smith, and J. D. Bales (2012), Exploring SWOT discharge algorithm accuracy on the Sacramento River, *AGU Fall Meeting Abstracts*, H34E-02.

Pavelsky, T.M. and M.T. Durand (2012), Developing new algorithms for estimating river discharge from SWOT, *AGU Fall Meeting Abstracts*, H34E-01.

Kustu, M.D. and **T.M. Pavelsky** (2012), Analysis of River Widths in the Amazon River Basin, *AGU Fall Meeting Abstracts*, H31E-1170.

Miller, Z., **T.M. Pavelsky**, and G.H. Allen (2012), Quantifying channel widths and hydraulic geometry of the Mississippi River Basin with remotely sensed imagery, *AGU Fall Meeting Abstracts*, H31E-1166.

Pavelsky, T.M., S. Sobolowski, S.B. Kapnick, and J.B. Barnes (2012), Changes in orographic precipitation patterns caused by a shift from snow to rain, *AGU Fall Meeting Abstracts*, A41I-0092.

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Allen, G.H., J.B. Barnes, E. Kirby, and **T.M. Pavelsky** (2011), Steady-state bedrock river response to tectonic and lithologic variations across active folds at the northwest Himalayan front, *AGU Fall Meeting Abstracts*, EP23C-0781.

Long, C. and **T.M. Pavelsky** (2011), Investigating changes in suspended sediment concentrations in the Peace-Athabasca Delta, Canada using MODIS satellite imagery, *AGU Fall Meeting Abstracts*, H43G-1314.

Sobolowski, S. and **T.M. Pavelsky** (2010), A multivariate Bayesian space-time approach to modeling Southeast United States regional hydroclimate: comparisons with RCMs and potential for probabilistic near-term projections, *AGU Fall Meeting Abstracts*, GC13-C0720.

Pavelsky, T.M. (2010), Accuracy and Classification of River Form and Extent from Remote Observations in Support of the SWOT Satellite Mission, *AGU Fall Meeting Abstracts*, H42B-05.

Rodriguez, E., D. Moller, L.C. Smith, **T.M. Pavelsky**, and D.E. Alsdorf (2010), AirSWOT: An Airborne Platform for Surface Water Monitoring, *AGU Fall Meeting Abstracts*, H32D-06.

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Pavelsky, T.M., J. Boé, A. Hall, and E.J. Fetzer (2010), Atmospheric inversion strength over polar oceans in winter regulated by sea ice, presented at AAG 2010 Spring Meeting, Washington, DC, April 14-18.

Singerling, S.A., A.F. Glazner, S.J. Singletary, **T.M. Pavelsky**, and R.C. Tacker (2010), Textural Mineral Mapping of the Farmville Meteorite Using GIS Software, *Lunar and Planetary Science Conference*, 41.1884.

Pavelsky, T.M., J. Boe, A. Hall, and E. Fetzer (2009), Atmospheric Inversion Strength over Polar Oceans in Winter Regulated by Sea Ice, *AGU Fall Meeting Abstracts*, GC51A-0716.

Durand, M.T., M.A. Fonstad, **T.M. Pavelsky**, and D. Alsdorf (2009), Intercomparison of algorithms to estimate river depth from SWOT observations of slope and width, *AGU Fall Meeting Abstracts*, H51A-0749.

*Hall, A., J. Boe, X. Qu, **T.M. Pavelsky**, and E. Fetzer (2009), A strategy to improve projections of Arctic climate change, *AGU Fall Meeting Abstracts*, A22A-01.

Pavelsky, T.M. and L.C. Smith (2008), Remote sensing of suspended sediment concentration, flow velocity, and lake replenishment in the Peace-Athabasca Delta, Canada, *AGU Fall Meeting Abstracts*, H53C-1063.

Pavelsky, T.M. and L.C. Smith (2008), Remote Sensing of Hydrologic Recharge in the Peace Athabasca Delta, Canada, presented at *AAG 2008 Spring Meeting*, Boston, MA, April 14-18.

Smith, L.C., **T.M. Pavelsky**, G.M. MacDonald, A.I. Shiklomanov, and R.B. Lammers (2007), Rising minimum flows in northern Eurasian rivers suggest a growing influence of groundwater in the high-latitude water cycle, *AGU Fall Meeting Abstracts*, U41C-0624.

Pavelsky, T.M. and L.C. Smith (2007), RivWidth: A Software Tool for the Calculation of River Width from Remotely Sensed Imagery, *AGU Fall Meeting Abstracts*, H31A-0118.

Pavelsky, T.M. and L.C. Smith (2007), Intercomparison of four global precipitation data sets and their correlation with increased Eurasian river discharge to the Arctic Ocean, Presented at *AAG 2007 Spring Meeting*, San Francisco, April 12-16.

Shiklomanov, A., R. Lammers, L. Smith, and **T.M. Pavelsky** (2006), Changes in Maximum Discharge From a new River Flow Dataset for the Eurasian pan- Arctic, *AGU Fall Meeting Abstracts*, U33A-0001.

***Pavelsky, T.M.** and L.C. Smith (2006), The Peace-Athabasca Delta: A Potential Testbed for Hydrologic Altimetry, *AGU Fall Meeting Abstracts*, H43F-07.

Hamski, J., G. Lefavour, D. Alsdorf, and **T.M. Pavelsky** (2006), Estimating Water Slope in Amazon River Tributaries Using the Shuttle Radar Topography Mission Digital Elevation Model, *AGU Fall Meeting Abstracts*, H23A-1461.

Kiel, B., D. Alsdorf, and **T.M. Pavelsky** (2006), Along Stream Profiles of Ohio River Discharge from Satellite Elevation Mapping, *AGU Fall Meeting Abstracts*, H23A-1460.

Pavelsky, T.M., L.C. Smith, K. Sampson, R. Lammers, A. Shiklomanov, and G. MacDonald (2005), A Statistical Analysis of Precipitation and River Discharge Variability in the Eurasian Arctic, *AGU Fall Meeting Abstracts*, U41A-0807.

Pavelsky, T.M. and L.C. Smith (2004), Spatial and temporal patterns in river ice breakup observed with MODIS and AVHRR time series, presented at *AAG Spring Meeting*, Denver, CO, April 5-9.

Pavelsky, T.M. and L.C. Smith (2004), Spatial and temporal patterns in river ice breakup observed with MODIS and AVHRR time series, *AGU Fall Meeting Abstracts*, H23E-1174.

Sampson, K. M., **T.M. Pavelsky**, L.C. Smith, R.B. Lammers, and A.I. Shiklomanov (2004), A Statistical Examination of Spatial and Temporal Trends in Eurasian Arctic River Discharge, *AGU Fall Meeting Abstracts*, C41A-0185.

Hendricks, G.A., D.E. Alsdorf, **T.M. Pavelsky**, and Y. Sheng (2003), Channel Slope From SRTM Water Surface Elevations in the Amazon Basin, *AGU Fall Meeting Abstracts*, H12D-1016.

Pavelsky, T.M. and L.C. Smith (2003), Satellite Observation of Spring Ice Breakup on Large Northern Rivers, *AGU Fall Meeting Abstracts*, C41C-1000.

Alsdorf, D., L. Hess, Y. Sheng, C. Souza, **T.M. Pavelsky**, J. Melack, T. Dunne, G. Hendricks, A. Ballantine, and K. Holmes (2003), Hydrology, secondary growth, and elevation accuracy in two preliminary Amazon Basin SRTM DEMs, *EGS - AGU - EUG Joint Assembly*, 4836.

Pavelsky, T.M. and L.C. Smith (2002), Historical and Satellite Observations of Spring Ice Breakup, Mackenzie River, Canada, *AGU Fall Meeting Abstracts*, H51A-0773.

TEACHING EXPERIENCE (LAST 5 YEARS)

Term	Course No.	Title	Enrollment
2021 Spring	GEOL508	Global Hydrology: Remote Sensing of Water	13
2020 Fall	ENEC324	Water in our World	60
2020 Spring	GEOL580	Writing Grant Proposals	6
2019 Fall	ENEC324	Water in our World	48
2019 Spring	ENEC324	Water in our World	55
2018 Spring	GEOL508	Global Hydrology: Remote Sensing of Water	8
	GEOL701	Graduate Seminar in Earth Surface Processes	5
2017 Fall	ENEC324	Water in our World	49
	GEOL701	Graduate Seminar in Earth Surface Processes	6
2017 Spring	GEOL508	Global Hydrology: Remote Sensing of Water	13
	GEOL701	Graduate Seminar in Earth Surface Processes	5
2016 Fall	ENEC324	Water in our World	48
	GEOL701	Graduate Seminar in Earth Surface Processes	6

THESES SUPERVISED (In progress in *italics*)

Marissa Dudek (Ph.D. in Geology, expected 2025): focused on understanding distributions of craters on inner solar system planets

Julianne Davis (Ph.D. in Geology, expected 2024): focused on modeling and remote sensing of sediment processes in northern rivers

Theodore Langhorst (Ph.D. in Geology, expected 2023): focused on remote sensing of river discharge

Wayana Dolan (Ph.D. in Geology, expected 2023): focused on understanding the dynamic evolution of deltas in the Arctic using remote sensing.

Angélica Gomez (Ph.D. in Geography, expected 2021): focused on examining the hydrological impact of oil palm cultivation in South America

Simon Topp (Ph.D. in Geology 2021): "Mulitdecadal remote sensing of inland water dynamics"

Arik Tashie (Ph.D. in Geology, 2020): "Estimating the effective hydraulic properties of the subsurface and their spatiotemporal response to climate using a modified streamflow recession analysis."

Sarina Basile (M.S. in Geology, 2020): "Monitoring change in lake water storage over time using satellite imagery and citizen science"

Theodore Langhorst (M.S. in Geology, 2019): "Anticipated improvements to water surface DEMs from the Surface Water and Ocean Topography mission"
Wayana Dolan (M.S. in Geology, 2019): "Detecting Patterns and Drivers of Ice On and Ice Off Timing in Alaskan Rivers Wider than 150 m Using MODIS"
Aidan Buie (B.S. Honors Thesis in Geology, 2019): "An Analysis of Martian Crater Mineralogy and Morphology Using CRISM Imagery"
Ekaterina (Katia) Lezine (B.S. Honors Thesis in Environmental Science, 2019): "Evaluating North American Mountain Snowpack Extent in Regional Climate Models Using MODIS Satellite Imagery"
Elizabeth H. Altenau (Ph.D. in Geology, 2018): "Analysis of Surface Water Dynamics Along the Tanana River, AK Using In Situ Observations, AirSWOT Measurements, and Hydrodynamic Modeling"
George Allen (Ph.D. in Geology, 2017): "Global Abundance and Morphology of Rivers and Streams"
Natan Holtzman (B.S. Honors Thesis in Geology, 2016): "Predicting Lake Depths from Topography to Map Global Lake Volume"
Arik Tashie (M.S. in Geology, 2016): "Identifying Long Term Empirical Relationships Between Storm Characteristics and Episodic Groundwater Recharge"
Eric Barefoot (B.S. Honors Thesis in Geology, 2016): "Dynamic Stream Width Distributions in a Headwaters Catchment"
Sarah Cooley (B.S. Honors Thesis in Geology, 2015): "Detection and Analysis of Arctic River Ice Breakup Patterns from Daily Satellite Imagery"
Kevin Quinlan (M.S. in Geology, 2014): "Controls on Fluvial Geomorphology in the Canadian Rocky Mountains"
Zachary Miller (M.S. in Geology, 2013): "Quantifying river form variations in the Mississippi Basin using remotely sensed imagery"
Melissa Wrzesien (B.S. Honors Thesis in Environmental Science, 2013): "Validation of Snow Cover Fraction for Regional Climate Simulations in the Sierra Nevada"
Gabriel Parrish (B.S. Honors Thesis in Geology, 2012): "Strontium Isotope Compositions of Water and Hydrology of the Peace-Athabasca Delta, Canada: A Geochemical Approach"
Colleen Long (M.S. in Geology, 2012): "Remote Sensing of Suspended Sediment Concentration and Hydrologic Connectivity in a Complex Wetland Environment"

POSTDOCTORAL RESEARCHERS MENTORED

Jing Wang, 2021-Present
John Mallard, 2020-Present
Chao Yang, 2019-Present
Elizabeth Altenau, 2018-Present
Xiao Yang, 2017-Present
Arik Tashie, 2021 now postdoc at U. Alabama
John Gardner, 2018-2020 now assistant professor at U. Pittsburgh
Melissa Wrzesien, 2018-2020 now research scientist at NASA GSFC
Shuai Zhang, 2017-2020 now postdoc at U. South Florida
Matthew Ross, 2017-2018 now assistant professor at Colorado St. U.
Christine Lion, 2014-2016 now senior geospatial scientist at PSM, Australia
Deniz Kustu, 2011-2012 now report manager, BESST, Inc., California

Stefan Sobolowski, 2010-2011 now research professor, Bjerknes Centre, Norway

EXTERNALLY FUNDED GRANTS AND CONTRACTS

Total funding: As PI: $5,385,553 As Co-I: $27,331,831(to Pavelsky: $1,979,452)

(Co-I) NASA Commercial SmallSat Data Analysis Program $193,974 (UNC: $34,005)
Evaluation of SmallSat Data for Mapping Surface Water Resources (PI: L. Pitcher, U. Colorado; Co-Is Pavelsky, S. Cooley, U. Oregon) This grant will use field measurements of inundation extent to evaluate how well commercial satellite imagery can be used to map water surfaces in a range of different conditions, including braided rivers and wetlands. Dates Active: 7/1/2021-12/31/2022
Pavelsky Effort: 2.1% total over 2021, 2022

(PI) NASA SWOT Science Team $895,675
Integration of A Priori Datasets, Validation, and First Science Returns from the SWOT Satellite Mission (PI: Pavelsky). This grant funds continued work as the hydrology science lead for the SWOT mission, with a particular focus on using optical satellite imagery to improve SWOT hydrology products in the areas of river ice detection, river discharge, and monitoring of inundation extent in rivers and lakes. Dates Active: 6/1/2021-5/31/2025
Pavelsky Effort: 30.8% effort in 2022-2025

(Co-I) NASA Terrestrial Hydrology Program $611,392 (UNC: $80,757)
Towards global flooding dynamics in near real-time: a multi-sensor fusion approach based on public domain time-series of optical and radar data (PI: M. Tulbure, NCSU; Co-I Pavelsky) this grant will create a fusion data product for flood monitoring from optical and radar satellite imagery. The UNC portion of the project will focus on validating the data product using field data and high-resolution airborne remote sensing. Dates active: 7/1/2021-6/31/2024
Pavelsky Effort: 2.1%/yr in 2022-2024

(PI) NASA Citizen Science for Earth Systems Program $359,886
Lake Observations from Citizen Scientists and Satellites: Validation of Satellite Altimetry to Support Hydrologic Science (PI: Pavelsky; Co-Is F. Hossain, UW, S. Ghafoor, TTU) This grant funds research using measurements of lake water levels collected by citizen scientists to validate satellite measurements lake elevation and water storage. Dates Active: 6/25/2021-12/24/2022
Pavelsky Effort: 4.2% in 2021, 2.1% in 2022

(Co-I) NASA Earth Ventures: Suborbital $15,000,000 (UNC: $351,091)
Delta-X: Enabling Deltas to Thrive in a Century of Rising Seas
(PI: M. Simard, NASA JPL, Pavelsky one of many Co-Is) This proposal aims to understand the vulnerability of river deltas to sea level rise. It uses multiple NASA airborne sensors to understand the transport of water through river deltas and how those deltas are likely to thrive or fail. Dates Active: 5/21/2019-5/20/2022.
Pavelsky Effort: 8.3%/yr 2020, 2021; 4.2% 2022

(Co-I) NASA Terrestrial Ecology Program $914,579 (UNC: $263,361)
Crossing the divide: Inundation drives hotspots of carbon flux (PI: D. Butman, U. Washington) This grant focuses on understanding the relationship between terrestrial hydrology and the carbon cycle in the Arctic. Preliminary evidence suggests that inundated margins of lakes may be hotspots of methane emission, and we will seek to test this hypothesis using remote sensing and field studies. Dates Proposed: 2/1/2019-1/31/2022
Pavelsky Effort: 4.2%/yr

(PI) NASA/Jet Propulsion Laboratory $318,147
SWOT Algorithm Definition Team Hydrology Activities for A Priori River Database Phase 3 (PI: Pavelsky) This contract funds ongoing development of a global river database that is central to algorithms and data products for the NASA Surface Water and Ocean Topography (SWOT) Satellite Mission. Dates Active: 10/1/2018-9/30/2021
Pavelsky Effort: 2.1%/yr

(PI) NASA Citizen Science for Earth Systems Program Implementation Phase $1,476,564
Tracking Water Storage in Lakes: Citizens and Satellites Implementation Phase (PI: Pavelsky) This grant funds a program designed to build lake monitoring networks around the world based on citizen science and satellite measurements. Using these networks, we will seek to understand the spatial scales at which lake water storage varies. Dates Active: 5/1/2018-4/30/2021
Pavelsky Effort: 8.3%/yr

(Co-I) NSF Chemical Oceanography $86,768 ($0 to Pavelsky)
Hurricane Harvey Impacts on Local and Landscape Scale Salt Marsh Carbon Storage (PI: J. Cable, UNC, Co-Is: Pavelsky, J. Arriola) This NSF RAPID grant funded work to characterize changes to salt marshes along the coast of the Gulf of Mexico associated with Hurricane Harvey. Pavelsky advised on remote sensing work. Dates Active: 10/1/2017-9/30/2018
Pavelsky Effort: 0%/yr

(PI) NASA Citizen Science for Earth Systems Program Prototype Phase $152,674
Tracking Water Storage in Lakes: Citizens and Satellites (PI: Pavelsky) This grant funded development of a program designed to recruit citizens in eastern North Carolina to measure variations in water level in local natural lakes. These measurements are then combined with satellite-derived measurements of lake area to measure variations in total water storage. If successful, this grant will lead to a 3-year award. Dates Active: 2/1/2017-2/28/2018
Pavelsky Effort: 4.2%

(Co-I) NASA Arctic Boreal Vulnerability Experiment $933,800 (UNC: $156,617)
Sensitivity of Arctic-Boreal surface water to permafrost state (PI: L. Smith, UCLA, Co-Is: Pavelsky, D. Lettenmaier) This grant funds data collection and analysis to understand how permafrost conditions are reflected in variations in water levels across the Canadian and Alaskan Arctic regions. Dates Active: 1/1/2017-12/31/2020
Pavelsky Effort: 4.2%/yr in 2017-2020

(PI) NASA/Jet Propulsion Laboratory $148,492

SWOT Algorithm Team 2016-2018 (PI: Pavelsky) This contract from JPL funded work to develop hydrology algorithms for the SWOT mission, including an algorithm to produce a consistent raster data product from raw SWOT data. Dates Active: 10/01/2016 to 9/30/2018
Pavelsky Effort: 0%

(Co-I) NSF Integrated Food, Energy, and Water Systems $2,958,028 (Pavelsky: $341,579)
The sustainability-productivity tradeoff: Water supply vulnerabilities and adaptation opportunities in California's coupled agricultural and energy sectors (PI: G. Characklis, UNC). This proposal would fund development of an integrated modeling system to assess how climate change and other factors are likely to affect food, energy, and water markets in the Central Valley of California. Pavelsky's role will be to model the future climate of California using a regional climate model. Dates Active: 10/1/2016-9/30/2019
Pavelsky Effort: 8.3% in 2017, 4.2%/yr in 2018-2019

(Co-I) NASA JPL Research & Technology Development $1,160,000 (UNC: $158,571)
Flow of water, carbon, and sediment within the land-sea continuum (PI: M. Simard, JPL). This grant funds work to understand how well we can use remotely sensed data to measure the movement of water, sediment, and carbon through the Mississippi Delta. Dates Active: 10/1/2016-9/30/2019
Pavelsky Effort: 2.1%/yr

(PI) NASA SWOT Science Team $843,980
Improving hydrologic measurements from SWOT with optical satellite imagery (PI: Pavelsky). This grant funds continued work as the hydrology science lead for the SWOT mission, with a particular focus on using optical satellite imagery to improve SWOT hydrology products in the areas of river ice detection, river discharge, and monitoring of inundation extent in rivers. Dates Active: 6/20/2016-6/19/2020
Pavelsky Effort: 22.5%/yr in 2016, 2020; 8.3%/yr in 2017- 2019

(PI) NASA/Jet Propulsion Laboratory $50,000
Hydrologic science from the NASA Surface Water and Ocean Topography Mission II (PI: Pavelsky). This contract from the NASA Jet Propulsion Lab funded research and organizational activities related to the PI's role as the U.S. Lead Hydrologic Scientist for the SWOT mission. Dates Active: 9/16/2015-4/16/2016
Pavelsky Effort: 4.2%/yr

(Co-I) NASA/Jet Propulsion Laboratory $487,560 (UNC: $100,577)
Hydrology Algorithms for the NASA Surface Water and Ocean Topography Mission (PI: M. Durand, Ohio State). This contract from the Jet Propulsion Lab funded development of algorithms for measuring river discharge from SWOT. Dates Active: 9/1/2014-2/28/2016
Pavelsky Effort: 0%

(PI) NASA/Jet Propulsion Laboratory $96,610
Hydrologic science from the NASA Surface Water and Ocean Topography Mission (PI: Pavelsky). This contract from the NASA Jet Propulsion Lab funded research and organizational activities related to the PI's role as the U.S. Lead Hydrologic Scientist for the

SWOT mission. Dates Active: 3/26/2014-3/25/2015
Pavelsky Effort: 4.2%/yr

(PI) NASA Terrestrial Hydrology Program $742,042
Airborne imaging of water level and inundation extent in high-latitude hydrologic systems to address SWOT mission science and validation goals (PI: Pavelsky, Co-Is: L. Smith and D. Moller) This grant uses a new airborne instrument to validate key technology for the SWOT satellite mission and addresses questions regarding how water moves through complex flow environments such as braided rivers and floodplains. Dates Active: 1/1/2013-12/31/2017
Pavelsky Effort: 8.3%/yr

(Co-I) NASA Terrestrial Hydrology Program $573,093 (UNC: $57,956)
Decomposing the water storage signal from basins with varied climates using remote sensing and modeling (PI: R.E. Beighley, Northeastern U.; Co-Is: Pavelsky, H. Lee) This three-year study used a combination of remote sensing observations and hydrologic models to develop estimates of different components of the water cycle in large river basins, including the Amazon, Mackenzie, and Mississippi. Dates Active: 10/1/2012-3/16/2016
Pavelsky Effort: 4.2%/yr

(PI) NASA New (Early Career) Investigator Program $273,723
Analysis of global river width distribution and provision of core knowledge for the SWOT satellite mission (PI: Pavelsky). This grant funded development of a global map of river widths from remotely sensed imagery and analysis of global patterns in river form. In addition, it provided key knowledge to the SWOT mission, a major NASA satellite mission currently under development for launch in 2020. Dates Active: 9/18/2012-12/17/2015
Pavelsky Effort: 8.3%/yr

(PI) NASA Topical Workshops, Symposia, and Conferences $26,979
A workshop on SWOT river discharge algorithms
(PI: Pavelsky) This grant funded a workshop held at UNC in June, 2012 on improving river discharge algorithms from data acquired by the NASA Surface Water Ocean Topography (SWOT) satellite mission. Dates Active: 1/1/2012-12/31/2012
Pavelsky Effort: 4.2%

PROFESSIONAL ACTIVITIES AND SERVICE

Professional Membership: American Geophysical Union (AGU)
Manuscript reviewer: *Science, Proceedings of the National Academy of Sciences, Nature Geoscience, Geophysical Research Letters, Water Resources Research, Journal of Geophysical Research, Reviews of Geophysics, Remote Sensing of Environment, Journal of Hydrology, Journal of Hydrometeorology, IEEE TGRS, IEEE JSTARS, Journal of River Basin Management, International Journal of Remote Sensing, The Journal of Geology, River Research and Applications, PLoS One, Climate Research, Hydrological Processes, Earth-Science Reviews, AGU Books, Environmental Research Letters, Computers and Geosciences, Remote Sensing, Earth's Future, Earth Science Reviews*.
Proposal reviewer: NSF, NASA, NSERC (Canada), U.S. Army Research Office.

Member: AGU Hydrology Section Remote Sensing Technical Committee (2005-2008)
Conference Session Chair/Co-Chair:

- "The SWOT Mission: Oceanography, Hydrology, and Their Interaction at the Estuaries." AGU Fall Meeting, 2020
- "The SWOT Mission: Oceanography, Hydrology, and Their Interaction at the Estuaries." AGU Fall Meeting, 2018
- "Remote Sensing of Rivers and Lakes," AGU Fall Meeting, 2017
- "Science and Applications in Preparation for the Surface Water and Ocean Topography (SWOT) Satellite Mission," AGU Fall Meeting, 2016
- "Remote Sensing of Rivers: Advancing Fluvial Science," AGU Fall Meeting, 2015
- "Remote Sensing of Rivers: Observations Across Scales," AGU Fall Meeting, 2014
- "Recent Advances in Remote Sensing and Modeling in Rivers and Streams for Understanding and Predicting Riverine Dynamics," AGU Fall Meeting, 2011
- "Remote Sensing of Rivers," AGU Fall Meeting, 2010
- "Land, Ocean, and Atmosphere in a Changing Arctic," AAG Annual Meeting, 2010
- "The Carbon and Water Cycles in a Changing Arctic," AAG Annual Meeting, 2008
- "The Changing Arctic" at Association of American Geographers (AAG) Annual Meeting, 2007

International Workshops and Conferences Organized or Co-Organized:

- 8 meetings of the NASA/CNES SWOT Science Team or Science Definition Team between January 2014 and June 2019; Each meeting included 80-200 participants, and all were co-organized with Jean-Francois Cretaux, Rosemary Morrow, and Lee-Lueng Fu.
- Workshop on Global Remote Sensing of Inundation Extent, Boulder, CO, May 23-25, 2018, Organized with J. Toby Minear (18 participants, Funding: NASA)
- Symposium on Remote Sensing of Lakes, LEGOS, Toulouse, France, June 1-2, 2017, Organized with Jean-Francois Cretaux (~40 participants, Funding: CNES)
- Workshop on Remote Sensing of River Discharge, UNC Chapel Hill, June 2012 (20 participants, Funding: NASA)

External Review Panel Member, Laboratoire D'Etudes en Geophysique et Oceanographie Spatiales 5 Year Review, Toulouse, France, February 2019.

SERVICE TO THE UNIVERSITY OF NORTH CAROLINA

May 2020—May 2021	Co-Chair, Geological Sciences/Marine Sciences/IMS Merger Committee
Jan. 2019—Present	Associate Chair, UNC Department of Geological Sciences
Jan. 2019—Present	Member, Dept. of Geol. Sciences Executive Committee
Oct 2018—Feb 2019	Member, New Faculty Search Committee in Environment, Ecology, and Energy Program
Nov 2017—Jan 2018	Member, Search Committee, Director of UNC Institute for the Environment
Oct 2016 – Nov 2016	Member, Dept. of Geo. Sciences Strategic Planning Committee
Apr 2015 – Dec 2016	Member, Provost's Environmental Task Forces
Jul 2013 – Jul 2018	Director of Graduate Admissions, Dept. of Geol. Sciences
Nov 2013 – May 2014	Member, Dept. of Geol. Sciences Executive Committee
Oct 2012 – Mar 2013	Chair, New Faculty Search Committee in Geological Sciences

Jan 2012 – Apr 2014	Member, University Water Theme Steering Committee
Dec 2010 – Sep 2012	Director of Graduate Admissions, Dept. of Geol. Sciences
Oct 2010 – Dec 2016	Member, Faculty Advisory Comm., UNC Inst. for the Environ.
Sep 2010 – Sep 2012	Member, Dept. of Geol. Sciences Executive Committee
Sep 2010 – Sep 2012	Member, Dept. of Geol. Sciences Student Grants Committee
Jan 2009 – May 2010	Chair, Dept. of Geological Sciences Colloquium Committee

INVITED SEMINARS AND COLLOQUIA

Oct. 2021	Appalachian St Department of Earth and Environmental Science (invited)
Sep. 2020	UNC Department of Marine Sciences Colloquium
Jan. 2020	UCLA Department of Geography Colloquium
Oct. 2019	University of Oregon Department of Geography Seminar Series
Oct. 2018	Laboratoire D'Etudes en Geophysique et Oceanographie Spatiales, France
Nov. 2017	Boston University Seminar Series on Climate Change
Feb. 2017	UCLA Department of Geography Colloquium Series
Mar. 2016	University of Arizona Department of Geosciences
Oct. 2015	Duke University Nicholas School Division of Earth and Ocean Sciences
Apr. 2015	UNC Department of Geography
Mar. 2014	University of Colorado CIRES Special Seminar
Sep. 2014	NASA Goddard Space Flight Center Terrestrial Water Cycle Seminar
Feb. 2014	Duke University Nicholas Institute Seminar on Remote Sensing of Hydrology
Feb. 2013	UNC Royster Society Seminar on Global Water Resources
Oct. 2012	UNC Friday Center for Continuing Education, "What's the Big Idea?" Series
Mar. 2012	Duke University Nicholas School Division of Earth and Ocean Sciences
Sep. 2011	UNC Institute for the Humanities, Seminar on Global Water Resources
Apr. 2011	UNC Charlotte Department of Geology and Geography
Apr. 2011	Duke University Fuqua School of Business, Seminar on Water Markets
Sep. 2010	University of South Carolina Department of Earth and Ocean Sciences
Jul. 2010	Durham University (UK) Department of Geography
Apr. 2010	NC State Department of Marine, Earth, and Atmospheric Sciences
Mar. 2010	Augustana College Institute of Polar Studies and Dept. of Geography
Feb. 2010	UNC Department of Geography
Oct. 2009	UNC Department of Marine Sciences
Apr. 2009	UCLA Department of Civil and Environmental Engineering