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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

Professor *July 2021 – Present*
Department of Earth, Marine and Environmental Sciences
University of North Carolina, Chapel Hill

Professor *July 2020 – June 2021*
Associate Chair *January 2019 – June 2021*
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

2023	Journal of Water Resources Planning and Management Editor's Choice Award (for Neville et al., 2023)
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 PUBLICATIONS (n=142) *UNC Student/Postdoc

*Dolan, W., **T.M. Pavelsky**, J. Davis, N. Laframboise, C.A. Polik, and R.M. Cory (in press), Constraints on photomineralization of dissolved organic matter across the Lake-to-channel connectivity spectrum in the Peace-Athabasca Delta, Canada, *JGR Biogeosciences*.

*Kica, S., **T.M. Pavelsky**, J.V. Fayne and B. Williams (2025), SWOT Water Surface Elevation in Herbaceous Wetlands of Florida's Everglades, *Geophysical Research Letters, 52*(9), e2025GL114956.

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Daroya, R., L.V. Lucchese, T. Simmons, P. Prum, **T.M. Pavelsky**, J.R. Gardner, C.J. Gleason, and S. Maji (2025), Improving Satellite Imagery Masking using Multi-task and Transfer Learning, *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing, 18*, 8777-8796.

Culpepper, J., S. Sharma, G. Gunn, and 23 other authors including **T.M. Pavelsky**, One-hundred fundamental, open questions to integrate methodological approaches in lake ice research (2025), *Water Resources Research, 61*(5), e2024WR039042.

Wade, J., C.H. David, *E.H. Altenau, *E.L. Collins, H. Oubanas, S. Coss, A. Cerbelaud, M. Tom, M.T. Durand, and **T.M. Pavelsky** (2025), Bidirectional translations between observational and topography-based hydrographic datasets: MERIT-Basins and the SWOT River Database (SWORD) (2025), *Water Resources Research, 61*(5), e2024WR038633.

Andreadis, K.M., S.P Coss, M.T. Durand, and 39 additional authors including **T.M. Pavelsky** (2025), A first look at river discharge estimation from SWOT satellite observations, *Geophysical Research Letters, 52*(9), e2024GL114185.

J. Wang, C. Pottier, C. Cazals, 17 additional authors, and **T.M. Pavelsky** (2025), The Surface Water and Ocean Topography (SWOT) Mission Prior Lake database (PLD): Lake mask and operational auxiliaries, *Water Resources Research, 61*(3), e2023WR036896.

Lehner, B., M. Anand, E. Fluet-Chouinard, and 23 other authors including **T.M. Pavelsky** (2025), Mapping the world's inland surface waters: An update to the Global Lakes and Wetlands Database (GLWD v2) (2025), *Earth System Science Data, 17*(6), 2277–2329.

Buzzanga, B., B. Hamlington, D. Bekaert, **T.M. Pavelsky**, A.L. Handwerger, C. Lee, and M. Bonnema (2025), Monitoring water from space: An illustration in Death Valley, California, *Geophysical Research Letters, 52*(5), e2024GL110250.

Simoes-Sousa, I.T., C.M. Camargo, J. Tavora, A.P. Braga, J.T. Farrar, and **T.M. Pavelsky** (2025), SWOT Satellite Reveals Devastating Flood Impact in Rio Grande do Sul, Brazil, *Geophysical Research Letters, 52*(4), e2024GL112442.

Vinogradova, N.T., **T.M. Pavelsky**, J.T. Farrar, F. Hossain, and L.L. Fu (2025), A new look at Earth's water, energy, and climate with SWOT, *Nature Water, 3*, 27–37.

Prajapati, R., J. Gardner, **T.M. Pavelsky**, and R. Talchabhadel (2024), Longitudinal recovery of suspended sediment downstream of large dams, *Water Resources Research*, *60*(6), e2023WR036759

Arp, C.D., A.C. Bondurant, S. Clement, E. Eidam, *T. Langhorst, **T.M. Pavelsky**, *J. Davis, and K. Spellman (2024), Observations of high sediment concentrations entrained in jumble river ice, *River Research and Applications, 40*(8), 1560-1570.

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*Dolan, W., **T.M. Pavelsky**, and A. Piliouras (2024), Remote sensing of multitemporal functional lake-to-channel connectivity and implications for water movement through the Mackenzie River Delta, Canada, *Water Resources Research*, *60*(4), e2023WR036614.

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Battin, T.J., R. Lauerwald, E.S. Bernhardt, E. Bertuzzo, L.G. Gener, R.O. Hall, E.R. Hotchkiss, T. Maavara, **T.M. Pavelsky**, L. Ran, P. Raymond, J.A. Rosentreter, and P. Regnier (2023), River ecosystem metabolism and carbon biogeochemistry in a changing world, *Nature, 613*, 449.

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*Wrzesien, M., **T.M. Pavelsky**, S.P. Sobolowski, L.S. Huning, J.S. Cohen, and J.D. Herman (2022), Tracking the impacts of precipitation phase changes through the hydrologic cycle in snowy regions: from precipitation to reservoir storage, *Frontiers in Earth Science*, *1723*.

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*Tashie, A., **T.M. Pavelsky**, & M. Kumar (2022), A Calibration-Free Groundwater Module for Improving Predictions of Low Flows, *Water Resources Research*, *58*(3), e30800.

*Wang, C., **T.M. Pavelsky**, F. Yao, *X. Yang, S. Zhang, B. Chapman, C. Song, A. Sebastian, B. Frizzelle, E. Frankenberg, and N. Clinton (2022), Flood Extent Mapping During Hurricane Florence With Repeat-Pass L-Band UAVSAR Images, *Water Resources Research*, *58*(3), e30606.

Tulbure, M. G., M. Broich, V. Perin, M. Gaines, J. Ju, S.V. Stehman, **T.M. Pavelsky**, J. G. Masek, S. Yin, J. Mai, & L. Betbeder-Matibet (2022), Can we detect more ephemeral floods with higher density harmonized Landsat Sentinel 2 data compared to Landsat 8 alone?, *ISPRS Journal of Photogrammetry and Remote Sensing*, *185*, 232.

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*Yang, X., **T. M. Pavelsky**, M. R. V. Ross, S. R. Januchowski-Hartley, *W. Dolan, *E. H. Altenau, *M. Belanger, *D. Byron, M. Durand, I. Van Dusen, *H. Galit, M. Jorissen, *T. Langhorst, E. Lawton, R. Lynch, *K.A. Mcquillan, S. Pawar, and A. Whittemore (2022), Mapping Flow-Obstructing Structures on Global Rivers, *Water Resources Research, 58*(1), e30386.

*Yang, X., **T.M. Pavelsky**, *L.P. Bendezu, and S. Zhang (2022), Simple method to extract lake ice condition from Landsat images, *IEEE Transactions in Geoscience and Remote Sensing, 60*, 3088144.

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*Dolan, W., **T. M. Pavelsky**, and X. Yang (2021), Functional Lake-to-Channel Connectivity Impacts Lake Ice in the Colville Delta, Alaska, *JGR: Earth Surface, 126*(12), e06362.

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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.

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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.

OTHER PUBLICATIONS

Jasinski, M., J. Stoll, D. Hancock, J. Robbins, J. Nattala, J. Morison, B. Jones, M. Ondrusek, **T.M. Pavelsky**, C. Parrish, and C. Carabajal (2023), Algorithm Theoretical Basis Document (ATBD) for Along Track Inland Surface Water Data ATL13 Release 006. ICESat-2 Project, DOI: 10.5067/03JYGZ0758UL.

Christensen, A.L., *J.M. Mallard, M. Simard, **T.M. Pavelsky**, and A. Rovai, Delta-X: In-situ Water Surface Elevation, MRD, Louisiana, USA, 2021 (2023). ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2086

Christensen, A.L., *J.M. Mallard, J. Nghiem, J. Harringmeyer, M. Simard, **T.M. Pavelsky**, M.P. Lamb, and C.G. Fichot (2022). Delta-X: Sonar Bathymetry Survey of Channels, MRD, Louisiana, 2021. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2085

Christensen, A.L., *J.M. Mallard, J. Nghiem, M. Simard, **T.M. Pavelsky**, and M.P. Lamb (2022). Delta-X: Acoustic Doppler Current Profiler Channel Surveys, MRD, Louisiana, 2021, V2. ORNL DAAC, Oak Ridge, Tennessee, USA https://doi.org/10.3334/ORNLDAAC/2081

Jensen, D.J., M. Simard, C.G. Fichot, and **T.M. Pavelsky** (2021). Pre-Delta-X: AVIRIS-derived Total Suspended Solids Maps for MRD, LA, USA, 2015-2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1822

Kyzivat, E.D., L.C. Smith, C. Huang, *C. Wang, *T. Langhorst, J.V. Fayne, M.E. Harlan, Y. Ishitsuka, D. Feng, L.H. Pitcher, and **T.M. Pavelsky** (2021). ABoVE: Lake and Wetland Classification from L-band SAR, Alaska and Canada, 2017-2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1883

Christensen, A.I., **T.M. Pavelsky**, D.J. Jensen, and K. Liu (2020). Pre-Delta-X: River Discharge Channel Surveys across Atchafalaya Basin, LA, USA, 2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1806

Denbina, M.W., M. Simard, **T.M. Pavelsky**, A.I. Christensen, K. Liu, and C. Lyon (2020). Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1807

Pavelsky, T.M., S. Ghafoor, F. Hossain, G.M. Parkins, S.K. Yelton, *S.B. Little, *S.N. Topp, M. Rodgers, and *X. Yang (2019), Monitoring the World's Lakes: Progress from Citizen Science and Remote Sensing, *EM: The Magazine for Environmental Managers*, November, pp. 13-18.

Pavelsky, T.M. (2019), Satellites reveal a new view of Earth's water from space, *TheConversation.com*, February 13.

Pavelsky, T.M. (2018), News and Views: World's Landlocked Basin Drying, *Nature Geoscience, 11* (12), 892-93.

Pavelsky, T.M. and J.T. Minear (2018), Meeting Report: Improving Global Measurement of Inundation Extent from Space, *EOS Transactions of AGU, 99*, doi.org/10.1029/2018EO104135.

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Kyzivat, E.D., L.C. Smith, L.H. Pitcher, J. Arvesen, **T.M. Pavelsky**, S.W. Cooley, and *S.N. Topp (2018), ABoVE: AirSWOT Color-Infrared Imagery Over Alaska and Canada, 2017. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1643

Pavelsky, T.M. C.H. David, R. Green, S. Fournier, C. Michailovsky, S. Calmant, J-F. Cretaux, J. Bales, S. Biancamaria, T. Bianchi, C. Dupouy, M. Gierach, C. Jones, B. Laignel, M. Lamb, C. Legleiter, J.-M. Martinez, J. Melack, F. Muller-Karger, J. Richey, E. Rodriguez, M. Simard, and L.C. Smith (2016). From the Mountains to the Sea: Interdisciplinary Science and Applications Driven by the Flow of Water, Sediment, and Carbon II. White Paper for the 2nd round of the *2017 NRC Decadal Survey in Earth Sciences and Applications from Space.*

Pavelsky, T.M., C.H. David, J.D. Bales, M.M. Gierach, L. Giosan, M.P. Lamb, C.J. Legleiter, J.M. Melack, F.E. Muller-Karger, J.E. Richey, E. Rodriguez, M. Simard, and L.C. Smith (2015). From the Mountains to the Sea: Interdisciplinary Science and Applications Driven by the Flow of Water, Sediment, and Carbon. White Paper for *2017 NRC Decadal Survey in Earth Sciences and Applications from Space.*

Pavelsky, T.M. and M. Durand (2012). Meeting Report: Developing new algorithms for estimating river discharge from space, *EOS Transactions of AGU, 93*(45), 457.

*Long, C.M. and **T.M. Pavelsky** (2012). Water Quality and Spectral Reflectance, Peace-Athabasca Delta, Canada, 2012. Data set. Available on-line [http://daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/1133

Pavelsky, T.M., (2012). Section 4.5: Arctic Hydrology, pp. 92-98 in Fu, L.-L., D. Alsdorf, R. Morrow, E. Rodriguez, and N. Mognard, eds., *SWOT: The Surface Water and Ocean Topography Mission: Wide-Swath Altimetric Measurement of Water Elevation on Earth*. JPL-Publication 12-05, Jet Propulsion Laboratory, Pasadena, California, USA, 228 pp.

Pavelsky, T.M. and L.C. Smith, (2009). Surface Water Elevation and Quality, Peace-Athabasca Delta, Canada, 2006-2007. Data set. Available on-line [http://daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/935

Pavelsky, T.M., (2008). *Spatial and Temporal Patterns in High-Latitude Hydrologic Systems*, Ph.D. Dissertation, 217 pp., UCLA.

Pavelsky, T.M., (2004). *MODIS and AVHRR Observations of Spring Ice Breakup on the Ob', Lena, Yenisey, and Mackenzie Rivers*, M.A. Thesis, 79 pp., UCLA.

TEACHING EXPERIENCE (LAST 5 YEARS)

Term	Course No.	Title	Enrollment
2025 Spring	ENEC324	Water in our World	65
2023 Fall	ENEC324	Water in our World	58
2022 Fall	GEOL508	Global Hydrology: Remote Sensing of Water	10
2021 Fall	ENEC324	Water in our World	53
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

THESES SUPERVISED (In progress in *italics*)

Solomon Kica (Ph.D. in Earth, Marine and Environmental Sciences, expected 2028): focused on using data from SWOT to understand grassy wetlands globally.

Alayna Smith (M.S. in Earth, Marine and Environmental Sciences, expected 2026): focused on using high-resolution radar remote sensing to track flooding in E. North Carolina.

J. Daniel Velez Castaño (Ph.D. in Geology, expected 2026): focused on understanding global river width-depth relationships from SWOT.

Marissa Dudek (Ph.D. in Geology, expected 2026): focused on using SWOT to understand streamflow gains and losses in braided river systems.

Isabela Arauz (M.S. in Earth, Marine, and Environmental Sciences, expected 2025): focused on hydrology of ghost forests in Eastern North America.

Julianne Davis (Ph.D. in Geology, expected 2025): focused on modeling and observing sediment processes in northern rivers.

Kat Anderson (B.S. Honors Thesis in EMS, expected 2025): focused on using satellite radar data to study inundation patterns in coastal North Carolina forests.

Trevor Sumlin (B.S. Honors Thesis in EMS, expected 2025): focused on understanding the prevalence of SWOT data collection over water bodies in Orange County, NC

Theodore Langhorst (Ph.D. in Geology, 2023): "Advancing Remote Sensing of Fluvial Sediment Transport and Storage"

Wayana Dolan (Ph.D. in Geology, 2023): "Dynamics of functional lake to channel connectivity in Arctic and Boreal deltas"

Marissa Dudek (M.S. in Geology, 2022): "The Atmospheric Effects Model (AEM):

Estimating Projectile Survivability for Crater Formation on Venus, Earth, and Mars," co-advised with Ryan Mills

Angélica Gómez (Ph.D. in Geography, 2021): "Effects of Extensive Agriculture on the Hydrologic Cycle in the Tropical Lowlands," co-advised with Erika Wise

Simon Topp (Ph.D. in Geology 2021): "Multidecadal 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

Jack Dechow, 2024-present

Lexi Henny, 2024-present
Audrey Thellman, 2023-present
Elyssa Collins, 2023-2024; now research scientist at NASA GSFC
Angélica Gómez, 2021-2024; assistant professor at Universidad Nacional de Colombia
Jing Wang, 2021-2022; now research scientist at NASA GSFC
John Mallard, 2020-2022; now postdoc at US Forest Service
Chao Wang, 2019-2022; now research assistant professor at UNC
Elizabeth Altenau, 2018-2021; now research scientist at UNC
Xiao Yang, 2017-2022; now assistant prof. at Southern Methodist U.
Arik Tashie, 2021; now solutions data scientist at ClimateAI
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 research scientist at Texas A&M
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: $9,097,569 As Co-I: $32,201,174 (to Pavelsky: $2,672,413)

(PI) NASA SWOT Science Team $927,917
Hydrology Leadership for the NASA SWOT Hydrology Science Team (PI: Pavelsky)
This grant funds the PI to serve as the lead hydrologist on the NASA SWOT Science Team, including organizing science team activities, interfacing between the NASA mission and the science team, and conducting cross-cutting research using the mission's data
Dates Active: 3/1/2025-2/28/2029
Pavelsky Effort: 15%/yr in 2025-2028

(PI) NASA/JPL SWOT Calibration & Validation Team $617,342
SWOT Inland Hydrology Calibration and Validation 2023-2026 (PI: Pavelsky)
This contract funds work to calibrate and validate the NASA Surface Water and Ocean Topography Mission before and during the science phase of the mission (i.e. through the first half of 2026).
Dates Active: 9/1/2023-8/31/2026
Pavelsky Effort: 25% in 2024 (1 course buyout), 8% in 2025, 4% in 2026

(Co-I) yet2 (via a contract from NASA) $250,000 ($31,400 to UNC)
NASA Women's Aqua Boost (yet 2 is lead agency, Pavelsky is UNC PI) This contract funds work designed to link NASA satellite data (especially SWOT) with the needs of women who manage household water resources in the global south. The UNC role is focused on installation of gauges in Kenya.
Dates Active: 8/1/2023-7/31/2025
Pavelsky Effort: 1% in 2024

(PI) NASA Commercial SmallSat Data Analysis Program $99,279

Evaluation of SmallSat Data for Mapping Surface Water Resources (PI: Pavelsky; Co-Is A. Sebastian, UNC, Miyuki Hino, UNC) This grant will use field measurements of inundation extent to evaluate how well commercial radar satellite imagery can be used to map sunny day flooding in coastal regions of North Carolina
Dates Active: 3/6/2023-3/5/2025
Pavelsky Effort: 2.1%

(Co-I) NASA Coastal Resilience $1,006,265 (UNC: $308,455)
THELORACS: Tree Health Evaluated using LiDAR, Optical, and Radar Applications across Coastal Systems (PI: X. Yang, UVA; Co-Is Pavelsky, E. Bernhardt and R. Emanuel, Duke U.) This grant focuses on using satellite remote sensing to understand where ghost forests associated with salt water intrusion in the North American Coastal Plain occur and what factors predict their extent and formation.
Dates Active: 12/1/2022-11/31/2025
Pavelsky Effort: 2.1%/yr

(PI) NASA Citizen Science for Earth Systems Program $1,579,280
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, G. Parkins, UNC) 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: 12/25/2022-12/24/2025
Pavelsky Effort: 8.3%/yr

(Co-I) NSF Geomorphology and Land Dynamics $336,638 (UNC: $112,736)
Collaborative Research: Sediment fluxes in boreal rivers: determining relative seasonal loads and expanding long-term monitoring capability (PI: E. Eidam, Oregon St; Co-Is Pavelsky, C. Arp and K. Spellman, UAF) This grant focuses on using inexpensive, custom-built turbidity sensors to understand the full annual transport of sediment in subarctic rivers, with a particular focus on the Tanana River, Alaska.
Dates Active: 9/1/2022-8/31/2024
Pavelsky Effort: 2.1%/yr

(PI) NASA/JPL SWOT Calibration & Validation Team $283,658
SWOT Inland Hydrology Calibration and Validation 2022-2023 This contract funds work to calibrate and validate the NASA Surface Water and Ocean Topography Mission before and during the initial phase of the mission (i.e. through the first half of 2023)
Dates Active: 1/1/2022-8/31/2023
Pavelsky Effort: 25% in 2023 (1 course buyout)

(Co-I) NASA Advanced Information Science & Technology $2,141,731 (UNC: $65,050)
A hosted analytic collaborative framework for global river water quantity and quality from SWOT, Landsat, and Sentinel-2 (PI: C. Gleason, UMass; Co-Is Pavelsky, M. Durand, Ohio State, J. Gardner, U. Pitt, S. Vannan NASA JPL) This grant aims to develop a new operational tool for simultaneously estimating river discharge and suspended sediment concentration from NASA satellite data.

Dates Active: 8/1/2022-7/31/2025
Pavelsky Effort: 2.1%/yr

(Co-I) NASA Applied Sciences: Water Resources $451,995 (UNC: $157,542)
Real-time satellite and sensor fusion for predicting and understanding water quality threats to water supply networks of Northern Colorado (PI: M. Ross, Colorado St; Co-Is Pavelsky, X. Yang, UNC) This grant aims to develop a new operational tool for identifying algal blooms in Colorado reservoirs using NASA satellite imagery.
Dates Active: 7/1/2022-6/30/2025
Pavelsky Effort: 2.1%/yr

(Co-I) NASA Science of Terra, Aqua, and Suomi NPP $682,714 (UNC: $185,443)
CoReSSD: A Cold Regions Snowpack and Snowfall Dataset constrained by Earth Observations for Continental Scale Snow Hydrology Science (PI: M. Durand, Ohio State; Co-Is Pavelsky, M. Wrzesien and S. Kumar, NASA GSFC) This grant aims to develop and validate a new snowpack dataset for North America that fuses MODIS satellite imagery and numerical model output.
Dates Active: 2/4/2022-2/3/2025
Pavelsky Effort: 2.1%/yr

(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: 11.1% effort in 2022-2025

(Co-I) NSF Coupled Natural and Human Systems $1,499,708 (Pavelsky: $262,217)
CNH2-L: The coupled, co-evolving roles of drought and electricity systems in humans' exposure to air pollution (PI: J. West, UNC; Pavelsky one of several Co-Is) this project aims to improve both simulation of drought and of electricity systems, and then to combine these simulations in order to improve understanding of how drought impacts electricity generation and resulting air pollution. Dates active: 8/1/2020-1/31/2025
Pavelsky Effort: 4.2%/yr in 2021-2024

(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: $183,427)
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: 5/21/2019-5/20/2023.
Pavelsky Effort: 8.3%/yr 2020, 2021; 4.2% 2022

(Co-I) NSF Navigating the New Arctic $2,999,698 (UNC: $199,111)
Converging Pressures on Arctic Development (CPAD)
(PI: A. Lynch, Brown U., Pavelsky one of many Co-Is) This project aims to combine natural and social science to understand how changing geophysical, economic, and social conditions are likely to impact economic development in the Arctic in the next 30 years. The UNC focus is on how changing river ice impacts transportation. Dates Active: 9/1/2020-8/30/2025
Pavelsky Effort: 2.1%/yr 2021-2024

(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: 3/15/2019-3/14/2023
Pavelsky Effort: 4.2%/yr

(PI) NASA/Jet Propulsion Laboratory $523,686
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: 10/1/2018-9/30/2022
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: 6/25/2018-6/24/2022
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.*

Editorial Work: Associate Editor, *Geophysical Research Letters*, 2024-present
Editor, *ARC Geophysical Research*, 2024-present
Proposal reviewer: NSF, NASA, NSERC (Canada), U.S. Army Research Office, FNR (Luxembourg).
Member: AGU Hydrology Section Remote Sensing Technical Committee (2005-2008)
Conference Session Chair/Co-Chair:

- "The Surface Water and Ocean Topography (SWOT) Mission: New Frontiers in Hydrology," AGU Fall Meeting, 2024
- "The Surface Water and Ocean Topography (SWOT) Mission: A New Satellite for Earth's Water Cycle," AGU Fall Meeting, 2023
- "The Surface Water and Ocean Topography (SWOT) Mission: A New Satellite for Earth's Water Cycle," AGU Fall Meeting, 2022
- "The Potential of the SWOT Satellite Mission for Hydrologic Science", AGU Frontiers in Hydrology Meeting, 2022.
- "Surface Water Hydrology from SWOT, NISAR, and ICESat-2." AGU Fall Meeting, 2021
- "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:

- 14 meetings of the NASA/CNES SWOT Science Team or Science Definition Team between January 2014 and June 2024; Each meeting included 80-270 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

Oct 2021—July 2024	Member, EMES Promotion and Tenure Committee
Oct 2021—July 2024	Member, EMES Diversity, Equity, and Inclusion Committee
Sept 2023—Mar 2023	Chair, EMES faculty hiring committee
July 2021—June 2022	Member, EMES Graduate Degrees Taskforce
May 2020—May 2021	Co-Chair, Geological Sciences/Marine Sciences/IMS Merger Committee
Jan. 2019—June 2021	Associate Chair, UNC Department of Geological Sciences
Jan. 2019—June 2021	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

Aug 2024	Invited Speaker, Highlands Biological Station, Highlands, NC
Apr 2024	Speaker, UNC Sustainability Day Seminar
Feb 2024	Lunchtime seminar series, UpstreamTech
Dec 2023	Invites Speaker, Sigma Xi Science Cafe
Oct 2023	Colloquium Speaker, Cornell Civil and Environmental Engineering
Aug 2023	Invited Seminar, NASA Jet Propulsion Lab
Feb 2023	Colloquium Speaker, Virginia Tech Remote Sensing Interdisciplinary Graduate Education Program
Feb 2023	Keynote Speaker, Environmental Defense Fund Science Day Series
Dec 2022	Special Seminar, Morehead Planetarium and Science Center, UNC
Aug 2022	Plenary Speaker, International Society for Limnology Meeting, Berlin
May 2022	Keynote Speaker, AWRA Geospatial Science & Technology Conference
Jan. 2022	U. Michigan Osher Lifelong Learning Institute
Nov. 2021	USGS Water Management Area Seminar Series
Oct. 2021	Appalachian St Department of Earth and Environmental Science
Sept. 2021	NASA/Caltech Jet Propulsion Lab Invited Seminar
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