

# Jon Derek Loftis

Assistant Research Scientist, Center for Coastal Resources Management

Virginia Institute of Marine Science, College of William & Mary

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<b>Education:</b>	Post-Doc	Virginia Institute of Marine Science, Research under Dr. Harry V. Wang related to development of a street-level sub-grid inundation model and applications, 2014-2016
	Ph.D.	Marine Science, <b>College of William &amp; Mary</b> , Virginia Institute of Marine Science, 2014, Dissertation Title: <i>Development of a Large-Scale Storm Surge and High-Resolution Sub-Grid Inundation Model for Coastal Flooding Applications: A Case Study during Hurricane Sandy</i>
	M.S.	Environmental Sci., <b>Christopher Newport University</b> , Biology, Chemistry, and Env. Sci., 2009
	B.S.	Biology, <b>Christopher Newport University</b> , Biology, Chemistry, and Env. Sci., 2007, Minors: Chemistry and Leadership Studies

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**Primary Research Interests:** Develop numerical simulations and forecasts for regions prone to flood damage, validate model accuracy with remote sensing observations, and engineer solutions to enhance adaptability to future flood events to protect human life and valuable infrastructural assets.

## **Positions Held:**

**Virginia Institute of Marine Science, Center for Coastal Resources Mgmt. Gloucester Pt., VA**  
**Assistant Research Scientist 06/2016 - Present**

- Develops high-resolution street-level hydrodynamic model grids from Lidar-derived measurements to forecast flooding from storm surge, rain, and tidal inundation in Coastal Virginia in association with the Commonwealth Center for Recurrent Flooding Resiliency's research initiatives.
- Teaches advanced Geographic Information Systems lecture and laboratory courses including Remote Sensing and Environmental Applications of GIS at the William & Mary Williamsburg Campus.
- Applies for local, state, and federal sources of funding aligned with the functional hydrodynamic modeling operations of the VIMS Center for Coastal Resources Management.

**Virginia Institute of Marine Science, Department of Physical Sciences Gloucester Pt., VA**  
**Post-Doctoral Research Associate 05/2014 - 06/2016**

- Prepares chapters from dissertation and deliverables from ongoing research projects for publication in peer-reviewed journals.
- Conducts and oversees storm surge and inundation forecast and hindcast modeling operations.
- Performs multivariate statistical analysis for estuarine water quality projects in the Chesapeake Bay and its tributaries, and assists in execution of water quality and ecosystem modeling simulations using high-performance computing resources and technology.

**Virginia Institute of Marine Science, College of William and Mary Gloucester Pt., VA**  
**Ph.D. Graduate Student Researcher 08/2009 - 05/2014**

- Conducted storm surge and inundation forecast and hindcast modeling operations for 2012 Hurricane Sandy using both a large-scale storm tide model of the U.S. East Coast and a street-level inundation model in New York City.

- Authored a 207-page dissertation entitled: "Development of a Large-Scale Storm Surge and High-Resolution Sub-Grid Inundation Model for Coastal Flooding Applications: A Case Study during Hurricane Sandy," and presented a defense seminar at the College of William and Mary in 2014.
- Co-authored titular portions of dissertation research in two peer-reviewed publications with his Ph.D. advisor, Harry V. Wang prior to graduation.

**National Aeronautics and Space Administration, Langley Research Center Hampton, VA  
Graduate Research Personnel with 'Develop National Program' 06/2007 - 08/2009**

- Operated as a graduate researcher, project presenter, and project manager for numerous projects, including: CA Ecological Forecasting, VA Climate Change, and AK Ecosystem Management.
- Presented NASA sea level trend data to Southern Growth Policy Board, Hampton Roads Planning District Commission, VA General Assembly, and to VA Congressman Rob Whitman in 2009.

**Recent Peer-Reviewed Publications (Past 3 Years):**

**Loftis, J.D.**, Forrest, D., Katragadda, K., Spencer, K., Organski, T., Nguyen, C., and Rhee, S. (2018). StormSense: A New Integrated Network of IoT Water Level Sensors in the Smart Cities of Hampton Roads, VA. *Marine Technology Society Journal*, 52(2). [PDF](#)

Boon, J.D., Mitchell, M., **Loftis, J.D.**, & Malmquist, D.M. (2018). Anthropocene Sea Level Change: A History of Recent Trends Observed in the U.S. East, Gulf, and West Coast Regions. *Special Report in Applied Marine Science and Ocean Engineering (SRAMSOE)*. No. 467. Virginia Institute of Marine Science, College of William and Mary. [PDF](#)

**Loftis, J.D.**, Mitchell, M., Atkinson, L., Hamlington, B., Allen, T.R., Forrest, D., Updyke, T., Tahvildari, N., Bekaert, D., & Bushnell, M. (2018). Integrated Ocean, Earth and Atmospheric Observations in Hampton Roads, Virginia. *Marine Technology Society Journal*, 52(2). [PDF](#)

**Loftis, J.D.**, Katragadda, K., Rhee, S., & Nguyen, C. (2018). StormSense: A Blueprint for Coastal Flood Forecast Information & Automated Alert Messaging Systems. *SCOPE '18 Proceedings of the 3rd International Workshop on Science of Smart City Operations and Platforms Engineering*, 3(1). [PDF](#)

**Loftis, J.D.**, Wang, H.V., Hamilton, S.E., and Forrest, D.R. (2018). Combination of Lidar Elevations, Bathymetric Data, and Urban Infrastructure in a Sub-Grid Model for Predicting Inundation in New York City during Hurricane Sandy. *Computers, Env., and Urban Systems. (In Re-Review)*. Preprint [PDF](#)

**Loftis, J.D.**, Wang, H., Forrest, D., Rhee, S., Nguyen, C. (2017). Emerging Flood Model Validation Frameworks for Street-Level Inundation Modeling with StormSense. *SCOPE '17 Proceedings of the 2nd International Workshop on Science of Smart City Operations and Platforms Engineering*, 2(1), 13-18. [PDF](#)

**Loftis, J.D.**, Wang, H.V., DeYoung, R.J., and Ball, W.B. (2016). Using Lidar Elevation Data to Develop a Topobathymetric Digital Elevation Model for Sub-Grid Inundation Modeling at Langley Research Center, In: Brock, J.C.; Gesch, D.B.; Parrish, C.E.; Rogers, J.N., and Wright, C.W. (eds.), *Advances in Topobathymetric Mapping, Models, and Applications. Journal of Coastal Research*, Special Issue 76, 134-148. Coconut Creek (Florida), ISSN 0749-0208. [PDF](#)

Wang, H., **Loftis, J.D.**, Forrest, D., Smith, W., and Stamey, B. (2015). Modeling Storm Surge and inundation in Washington, D.C., during Hurricane Isabel and the 1936 Potomac River Great Flood. *Journal of Marine Science and Engineering*, 3(3), 607-629. [PDF](#)

**Recent Presentations (Past 3 Years):**

**Invited Presentations and Panels:**

**March 21, 2018 - Virginia Science Museum, Climate Connections Seminar Richmond, VA**  
D. Loftis. Storm Surge, Subsidence, & Sea Level Rise: How Coastal VA is Preparing for the Future.

**February 8, 2018 - GCTC Smart and Secure Communities Challenge Washington, DC**  
D. Loftis. IES City Framework - Framing the Opportunity Panel.

**December, 13, 2017 - CCRFR King Tide Volunteer Thank You and Review Norfolk, VA**  
D. Loftis. King Tide Thank You and Review.

**August 30, 2017 - NIST/IEEE IoT Sensors Workshop Gaithersburg, MD**  
D. Loftis. Lessons Learned Building StormSense: Evaluating Sensor Performance Standards & Model.

<b>June 18, 2017 - Capitol Hill Ocean Week</b>	<b>Washington, DC</b>
D. Loftis. Emerging Leaders Panel.	
<b>November 8, 2016 - Hampton University Physics Dept. Seminar</b>	<b>Hampton, VA</b>
D. Loftis and H. V. Wang. Storm Surge and Street-Level Inundation Modeling in New York City during Hurricane Sandy and Flooding during 2016 Hurricanes Hermine and Matthew.	
<b>July 6, 2016 - Hampton Roads Flood Adaptation Forum</b>	<b>Virginia Beach, VA</b>
D. Loftis. Validating Street-Level Inundation Modeling with Emerging Verification Methods.	
<b>March 12, 2015 - Salisbury University Geography Dept. Seminar</b>	<b>Salisbury, MD</b>
D. Loftis. Development of a Large-Scale Storm Surge and High-Resolution Sub-Grid Inundation Model for Coastal Flooding Applications in an Urban Env.: A Case Study during Hurricane Sandy.	
<b>January 18, 2015 - Sea Level Rise/Flooding Adaptation Forum</b>	<b>Chesapeake, VA</b>
D. Loftis, H.V. Wang, Z. Liu, D. Forrest, and J. Zhang. Storm Surge and Street-Level Inundation Modeling in New York City during Hurricane Sandy.	
<b>February 19, 2014 - VIMS Physical Oceanography Dept. Seminar</b>	<b>Gloucester Point, VA</b>
D. Loftis, H.V. Wang, and Z. Liu. Hurricane Sandy Storm Surge and Inundation using Sub-Grid Modeling in New York City.	
<b>January 26, 2014 - ODU Coastal Oceanography Dept. Seminar</b>	<b>Norfolk, VA</b>
D. Loftis and H.V. Wang. Storm Surge and Inundation Sub-Grid Modeling in New York City during Hurricane Sandy.	

**Conference Presentations:**

<b>January 8, 2018 - American Meteorological Society Meeting</b>	<b>Austin, TX</b>
A. Molthan, D. Loftis... 2018 NASA Coastal Hazards Demo: Communities at Intensive Risk.	
<b>August 28, 2017 - Global City Teams Challenge Expo</b>	<b>Washington, DC</b>
D. Loftis and S. Katragadda. StormSense: Forecasting Flooding from Storm Surge, Rain, and Tides.	
<b>July 11, 2017 - ESRI GIS User Conference</b>	<b>San Diego, CA</b>
D. Loftis, S. Katragadda and K. Spencer. Urban Street-Scale Flood Model of Micro-Burst Rainfall.	
<b>July 10, 2017 - ESRI GIS User Conference</b>	<b>San Diego, CA</b>
D. Loftis and S. Katragadda. Cities Becoming Smarter: Preparing for Regional Resilience.	
<b>June 2, 2017 - MARACOOS Meeting</b>	<b>Annapolis, MD</b>
D. Loftis, H.V. Wang and D.R. Forrest. Emerging Street-Level Flood Model Validation Methods using the Citizen Science App, Sea Level Rise.	
<b>September 20, 2016 - Hampton Roads Water Symposium</b>	<b>Chesapeake, VA</b>
D. Loftis, H.V. Wang and D.R. Forrest. Lessons Learned Forecast Modeling 2011 Hurricane Irene, and the Path to Predicting Street-Level Inundation.	
<b>June 2, 2016 - Chesapeake Bay Modeling Symposium</b>	<b>Chesapeake, VA</b>
D. Loftis, H.V. Wang and D.R. Forrest. Hydrodynamic Modeling Strategies for Forecasting Street-Level Inundation in the Chesapeake Bay: Past Success, Current Approaches, and Plans for the Future.	
<b>February 10, 2016 - Ocean Sciences Meeting</b>	<b>New Orleans, LA</b>
D. Loftis, H.V. Wang, D.R. Forrest and S. Stiles. Towards Predicting Street-Level Inundation: using Operational Forecast Modeling Techniques during 2011 Hurricane Irene in Hampton Roads, VA	
<b>February 9, 2016 - Ocean Sciences Meeting</b>	<b>New Orleans, LA</b>
D. Loftis H.V. Wang, D.R. Forrest. Modeling Street-Level Inundation in Galveston, Texas City, and Houston during 2008 Hurricane Ike: Now and Implications for the Future	
<b>April 8, 2015 - Atlantic Estuarine Research Society Meeting</b>	<b>Virginia Beach, VA</b>
D. Loftis. Forecast Modeling 2011 Hurricane Irene, and the Path to Predicting Street-Level Inundation	
<b>March 22, 2015 - York River Research Symposium</b>	<b>Gloucester Point, VA</b>
D. Loftis. High-Res. Sub-Grid Inundation Modeling and Forecasting along the York River Estuary.	
<b>May 16, 2014 - Chesapeake Bay Modeling Symposium</b>	<b>Annapolis, MD</b>
D. Loftis. Representation and Analysis of DataFlow Meas. for the James River Chlorophyll-a Study.	
<b>February 26, 2014 - Ocean Sciences Meeting</b>	<b>Honolulu, HI</b>
D. Loftis and H.V. Wang. High-Resolution Sub-Grid Modeling of Local Inundation in the New York Harbor during 2012 Hurricane Sandy	

## **Professional Projects & Advisory Service (as Primary PI):**

### **Ongoing Projects:**

<b>FEMA</b>	07/18 – 07/20	Development of High-Resolution Flood Depth Grids for Guidance in Building-Level Damage Assess. in Newport News, VA for IFLOWS
<b>NRDC</b>	01/18 – 10/18	Proposal to NRDC in Support of Six New Water Level Sensors near Military Installations At-Risk of Inundation from Combined Effects of Storm Surge and Sea Level Rise in the Next Decade
<b>NASA</b>	07/17 - 06/18	Development of a Street-Scale Hydrodynamic Model, Calibration, and Future Flooding Scenarios for the City of Portsmouth

### **Completed Projects:**

<b>Portsmouth</b>	07/17 – 11/17	Development of a Street-Scale Hydrodynamic Model, Calibration, and Future Flooding Scenarios for the City of Portsmouth
<b>NIST</b>	09/16 - 12/17	Replicable Smart Cities Technology: GCTC StormSense Project

### **Teaching Experience:**

**College of William & Mary**

**Williamsburg, VA**

**Adjunct Professor (INTR 495 and Lab)**

**01/2015 - 05/2017**

- Provided instruction for 3 GIS Remote Sensing courses and labs every spring semester for 3 years.
- Presented engaging lectures, developed homework/laboratory GIS exercises designed to hone skills in the Geographic Information Sciences, directed students where to find and how to analyze satellite and aerial passive remote sensing data tailored to their individual interests.
- Introduced sonar, radar, and lidar active remote sensors to students, and allows them to inspect and observe the relevant data formats and types that may be obtained from active remote sensing networks.
- Arranged for applicable guest lectures from a broad range of disciplines to encourage development of creative mapping projects through project-based learning.
- Students reported favorable approval ratings based upon online instructor evaluation forms.

**Christopher Newport University**

**Newport News, VA**

**Adjunct Professor (BIOL 109L, BIOL 391WI)**

**01/2008 - 05/2016**

- Provided instruction for 4 Writing Intensive Capstone Seminars for Biology Majors in 2015 and 2016.
- Instructed 2-5 General Biology Laboratories (24-28 students each) per semester for 17 semesters.
- Presented brief lecture instruction and simplistic direction while providing additional assistance in creative experimental design and implementation. Responsible for grading and reporting scores.
- Provided students with understanding regarding the importance of documentation in the scientific method, while helping individual students to enhance public speaking capacities and writing skills.
- Received top-percentile student approval ratings based on IDEA instructor evaluation forms.

### **Professional Organization Affiliations:**

American Geophysical Union

American Society for Photogrammetry and Remote Sensing

Association for Computing Machinery

Atlantic Estuarine Research Society

IEEE Computer Society

IEEE Ocean Engineering Society, Region 3

Marine Technology Society

Sigma Xi - Tidewater Chapter, VA

**Collaborators & Affiliations:**

Allen, Thomas - Old Dominion University  
Andrews, Elizabeth - VA Coastal Policy Center  
Atkinson, Larry - ODU  
Ball, William - NASA Langley GIS Team  
Bekaert, David - NASA Jet Propulsion Laboratory  
Boon, John - VIMS Professor Emeritus  
Bushnell, Mark - CoastalObsTechServices, L.L.C.  
Covi, Michelle - ODU  
DeYoung, Russell - NASA Langley  
Durhing, Karen - VIMS CCRM  
Forrest, David - VIMS  
Hamilton, Stuart - Salisbury University  
Hamlington, Benjamin - ODU  
Herman, Julie - VIMS CCRM  
Hershner, Carl - VIMS CCRM  
Katragadda, Sridhar - City of Virginia Beach  
Luckenbach, Mark - VIMS  
Malmquist, David - VIMS

Molthan, Andrew - NASA Marshall  
Mitchell, Molly - VIMS CCRM  
Murray, John - NASA Disasters Division  
Nguyen, Cuong - NIST  
Organski, Tamara - City of Newport News  
Rhee, Sokwoo - NIST  
Rogers, Laura - NASA Langley Research Center  
Rose, Robert - College of William and Mary  
Shen, Jian - VIMS  
Singh-Miller, Natasha - City of Virginia Beach  
Spencer, Kyle - City of Norfolk, Resilience Office  
Stiles, Skip - Wetlands Watch  
Tahvildari, Navid - ODU  
Updyke, Teresa - ODU  
Wang, Harry - VIMS  
Wright, Dawn - ESRI  
Zhang, Joseph - VIMS