

Assistant Professor of Coastal Engineering
Physics & Physical Oceanography Department
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PROFESIONAL PREPARATION

- 2017 - 2019 **Postdoctoral Research Associate**, National Research Council (NRC)
U.S. Naval Research Laboratory, Stennis Space Center, MS, USA
- 2017 **Ph.D.**, University of Delaware (UD), Newark, DE, USA
Civil & Environmental Engineering (Coastal Focus)
- 2014 **M.C.E.**, University of Delaware (UD), Newark, DE, USA
Civil & Environmental Engineering (Coastal Focus)
- 2011 **B.S.**, Texas A&M University, College Station, TX, USA
Ocean Engineering

PUBLICATIONS

**Featured in JGR's Journal Highlights*

Refereed Journal Papers

- 2019 Kim, Y., **Mieras, R. S.**, Cheng, Z., Anderson, D., Hsu, T., Puleo, J. A. and Cox, D. T. A numerical study of sheet flow driven by velocity and acceleration skewed near-breaking waves on a sandbar using SedWaveFoam. *Coastal Engineering*, 152, 103526. <https://doi.org/10.1016/j.coastaleng.2019.103526>
- 2019 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., Hsu, T. and Calantoni, J. Relative contributions of bed load and suspended load to sediment transport under skewed-asymmetric waves on a sandbar crest. *J. Geophys. Res.: Oceans.*, 124(2), 1294-1321. <https://doi.org/10.1029/2018JC014564>
- 2018 Fromant, G., **Mieras, R. S.**, Revil-Baudard, T., Puleo, J. A., Hurther, D., and Chauchat, J. On bedload and suspended load measurement performances in sheet flows using acoustic and conductivity profilers. *J. Geophys. Res.: Earth Surface*, 123, 1-17. <https://doi.org/10.1029/2017JF004560>
- 2017 ***Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Large-scale experimental observations of sheet flow on a sandbar under skewed-asymmetric waves. *J. Geophys. Res.: Oceans*, 122(6), 5022-5045. <https://doi.org/10.1002/2016JC012438>
- 2017 Anderson, D., Cox, D. T., **Mieras, R. S.**, Puleo, J. A., Hsu, T. Observations of wave-induced pore pressure gradients and bed level response on a surf zone sandbar. *J. Geophys. Res.: Oceans*, 122(6), 5169-5193. <https://doi.org/10.1002/2016JC012557>
- 2017 Wu, G., Huajun, L., Liang, B., Shi, F. Kirby, J. T., and **Mieras, R. S.** Subgrid modeling of the effects of vegetation on the hydrodynamics in a salt marsh. *Earth Surf. Processes and Landforms*, 42(12), 1755-1768. <https://doi.org/10.1002/esp.4121>
- 2016 Wu, G., Shi, F., Kirby, J. T., **Mieras, R. S.**, Liang, B., Li, H. and Shi, J. A pre-storage, subgrid model for simulating flooding and draining processes in salt marshes. *Coastal Engineering*, 108, 65-78. <https://doi.org/10.1016/j.coastaleng.2015.11.008>

Conference Proceedings

- 2018 Fromant, G., Revil-Baudard, T., **Mieras, R. S.**, Hurther, D., Chauchat, J., and Puleo, J. A. On bedload measurement performances of high-resolution acoustic (ACVP) and conductivity (CCP) profilers. Proc. of *River Flow 2018* Conference, Sept. 5-8, Lyon, France.
- 2017 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Large-scale experimental observations of wave-induced sediment transport over a surf zone sandbar. Proc. of the *8th Coastal Dynamics*, June 12-16, Helsingør, Denmark, pp. 618-629. http://coastaldynamics2017.dk/onewebmedia/179_mieras.pdf
- 2017 Kim, Y., Cheng, Z., Hsu, T., **Mieras, R. S.**, and Puleo, J. A. A numerical investigation of sheet flow under non-breaking and breaking waves. Proc. of the *8th International Conference on Coastal Dynamics*, June 12-16, Helsingør, Denmark, pp. 1779-1788. http://coastaldynamics2017.dk/onewebmedia/165_Kim_Yeulwoo.pdf
- 2011 Bloxom, A. L., von Ellenrieder, K. D., Anderson, M., **Mieras, R. S.**, and Weidle, W. S. Wave Height Measurements Behind Submerged Lens-Shaped Structures. Proc. *30th Int. Conf. on Ocean, Offshore and Arctic Engineering (ASME)*, Rotterdam, June 19-24: *Ocean Engineering*, Vol. 6, pp. 69-81. <https://doi.org/10.1115/OMAE2011-49102>

Technical Reports

- 2014 **Mieras, R. S.**, Kirby, J. T. and Shi, F. “A high-resolution numerical model investigation into the response of a channelized salt marsh to a storm surge event.” Research Report No. CACR-14-07, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
- 2014 **Mieras, R. S.** and Kirby, J. T. “Discharge, Pressure and Bathymetry Measurements in Brockonbridge Gut, Kent County, Delaware: Data Report.” Research Report No. CACR-14-05, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
- 2013 Shi, F., Kirby, J. T., Hsu, T., Chen, J. and **Mieras, R. S.** “NearCoM-TVD: A Hybrid TVD Solver for the Nearshore Community Model, Documentation and User’s Manual.” Research Report No. CACR-13-06, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.

Data Sets

- 2018 Fromant, G., **Mieras, R. S.**, Revil-Baudard, T., Puleo, J. A., Hurther, D., and Chauchat, J. “Parrot Experiments.” Zenodo (publisher). <https://doi.org/10.5281/zenodo.1443459>
- 2018 **Mieras, R. S.**, Puleo, J. A., Cox, D. T. and Hsu, T. “Sandbar Sediment Transport.” PRJ-1740, DesignSafe-CI (publisher). <https://doi.org/10.17603/DS2BW9W>

Theses

- 2017 **Mieras, R. S.**, Sheet flow and suspended sediment transport processes on a surf zone sandbar. Doctoral Dissertation, University of Delaware, Newark, DE, USA, 181 pp. <http://udspace.udel.edu/handle/19716/23210>
- 2014 **Mieras, R. S.**, A high-resolution numerical model investigation into the response of a channelized salt marsh to a storm surge event. Master’s Thesis, University of Delaware, Newark, DE, USA, 108 pp. <http://udspace.udel.edu/handle/19716/16412>

INVITED TALKS

- 2019 Applied Physics Laboratory (APL), University of Washington, “Cross-shore sediment transport processes over a laboratory sandbar.” Seattle, WA, USA, May 30.
- 2018 Virginia Tech, “Observations of sediment transport over a large-scale laboratory sandbar.” Blacksburg, VA, USA, Oct. 17.
- 2018 Louisiana State University, “Sediment transport processes on a large-scale laboratory sandbar.” Baton Rouge, LA, USA, Sept. 26.
- 2016 U.S. Naval Research Laboratory, “From the sand bed to the free surface: an experimental study of wave-induced sediment transport over a sandbar.” Stennis Space Center, MS, USA, Nov. 3.
- 2016 USACE Engineering Research and Development Center, Coastal and Hydraulics Laboratory, “Wave-induced sheet flow on a sandbar: roles of the pressure gradient and bed shear stress.” Vicksburg, MS, USA, Sept. 20.

AWARDS & HONORS

- 2017 - 2019 National Academy of Sciences, NRC Research Associateship Award
- 2017 Best Student Presentation, Young Coastal Scientists and Engineers Conference
- 2011 Academic Excellence Award, Ocean Engineering Department, Texas A&M
- 2009 – 2011 Omega Epsilon Ocean Engineering Honor Society
- 2010 – 2011 Society of Naval Architects and Marine Engineers Scholarship
- 2010 – 2011 American Bureau of Shipping Scholarship
- 2009 – 2010 Association of Former Students Scholarship
- 2009 – 2010 Michael W. Ranger Scholarship
- 2009 Marine Technology Society (MTS) Wayne Ingram Scholarship
- 2009 Louis Stokes Alliance for Minority Participation (LSAMP) Scholarship
- 2009 International Education Fee (IEF) Scholarship

RESEARCH EXPERIENCE

Projects with Active Role

- 2019 **Sand-mud Multi-phase Turbulence Experiment**, Ocean City, Maryland (Field)
- 2018 **Field Particle Image Velocimetry (PIV)**, Waimanalo, Hawai'i (Field)
- 2018 **Oscillatory flow tunnel bed form dynamics**, Naval Research Laboratory (Laboratory)
- 2017 **Inner shelf near-bed processes and internal waves**, Point Sal, California (Field)
- 2017 **Steady sheet flow dynamics in open channel flow**, Grenoble, France (Laboratory)
- 2015 **Sediment transport processes over a sandbar**, Corvallis, Oregon (Laboratory)
- 2014 **Large-scale salt marsh channel hydrodynamics**, South Bowers, Delaware (Field)
- 2010 **Wave focusing via submerged lens**, Annapolis, Maryland (Laboratory)

Projects with Supporting Role

- 2018-2019 **Nature-based breakwaters for mitigating boat-wake intracoastal waterway erosion**, Vilano Beach, Florida (Field)
- 2017 **Mobility of surrogate unexploded ordnance (smart munitions) in the swash zone II**, Wallops Island, Virginia (Field)
- 2016 **Mobility of surrogate unexploded ordnance (smart munitions) in the swash zone I**, Aberdeen, Maryland (Laboratory)
- 2016 **Drifter study of spatio-temporal current patterns downdrift of a stabilized coastal inlet**, Dewey Beach, Delaware (Field)
- 2014 **Quantifying inundation and hydrodynamics in an anthropogenically-altered tidal wetland**, Lewes, Delaware (Field)
- 2014 **Delaware surf-zone injury study: hydrodynamics**, Atlantic Coast of Delaware (Field)
- 2014 **Field study of inner-surf and swash-zone processes**, South Bethany, Delaware (Field)
- 2013 **Quantifying spatio-temporal variability of hydrodynamics inundation on a tidal salt marsh**, Brockonbridge Marsh, Kent County, Delaware (Field)

TEACHING EXPERIENCE

Graduate Level

- 2016 **Matlab for Engineering Analysis**, Instructor, University of Delaware (Spring)

Undergraduate Level

- 2018 **Introduction to Coastal Engineering**, Invited Lecture, Virginia Tech, October 18
- 2015 **Fluid Mechanics**, Invited Lecture, University of Delaware, November 20
- 2014 – 2015 **Fluid Mechanics Laboratory**, Teaching Assistant, University of Delaware (Fall & Spring)

CONFERENCES

Oral Presentations

- 2019 **Mieras, R. S.**, Suzuki, T., and Cox, D. T. Large-scale laboratory observations of sheet flow under breaking transient waves. *Two-phase modeling for Sediment dynamics (THESES) Symposium*, Sept. 17-19, Newark, DE, USA.
- 2019 Puleo, J. A., **Mieras, R. S.**, and Lanckriet, T. Sheet Flow in the Swash and Surf Zones. *Two-phase modeling for Sediment dynamics (THESES) Symposium*, Sept. 17-19, Newark, DE, USA.
- 2019 Landry, B., Zúñiga Zamalloa, C., Calantoni, J., Gray, C., **Mieras, R. S.**, Braithwaite III, E. F., Key, C., and Griffin, S. In situ Particle Image Velocimetry Measurements over a Rippled Sand Bed. *Two-phase modeling for Sediment dynamics (THESES) Symposium*, Sept. 17-19, Newark, DE, USA.
- 2019 Kim, Y., **Mieras, R. S.**, Cheng, Z., Anderson, D., Hsu, T., Chauchat, J., Puleo, J. A., and Cox, D. T. A free-surface resolving Eulerian two-phase model and its application to sheet flow driven by surface waves. *Two-phase modeling for Sediment dynamics (THESES) Symposium*, Sept. 17-19, Newark, DE, USA.

- 2018 **Mieras, R. S.**, Swann, C., Braithwaite III, E. F., Hode, A., and Calantoni, J. Observations of near bed turbulent production and dissipation on the inner shelf at Pt. Sal. *AGU Fall Meeting*, Dec. 10-14, Washington, DC, USA.
- 2018 Landry, B., Zúñiga Zamalloa, C., **Mieras, R. S.**, Key, C., Braithwaite III, E. F., Gray, C., Griffin, S., and Calantoni, J. Adapting Laboratory Instrumentation to Observe Sand Ripple Dynamics in the Nearshore. *AGU Fall Meeting*, Dec. 10-14, Washington, DC, USA.
- 2018 **Mieras, R. S.**, Swann, C., Braithwaite III, E. F., Hode, A., and Calantoni, J. Observations of near bed turbulent production and dissipation on the inner shelf at Pt. Sal. *5th Young Coastal Scientists and Engineers Conference - Americas*, Nov. 9-11, Merida, Yucatan, Mexico.
- 2018 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., Hsu, T., and Calantoni, J. Observations of horizontal and vertical sediment fluxes on a sandbar in the suspended and sheet flow layers. *Int. Conf. on Coastal Engineering*, July 30 – Aug. 3, Baltimore, MD, USA.
- 2018 Kim, Y., **Mieras, R. S.**, Cheng, Z., Hsu, T., and Puleo, J. A. Modeling sheet flow under breaking waves on a surf zone sandbar. *Int. Conf. on Coastal Engineering*, July 30 – Aug. 3, Baltimore, MD, USA.
- 2018 Kim, Y., **Mieras, R. S.**, Cheng, Z., Hsu, T., and Puleo, J. A. An Eulerian two-phase simulation of wave-induced sediment transport on a surf zone sandbar. *Ocean Sciences Meeting*, Feb. 11-16, Portland, OR, USA.
- 2017 Swann, C., Frank, D., **Mieras, R. S.**, Penko, A., Braithwaite III, E. F., Hagg, R., and Calantoni, J. Observations of munitions mobility during a nor'easter at Wallops Island. *AGU Fall Meeting*, Dec. 10-14, New Orleans, LA, USA.
- 2017 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Large-scale experimental observations of wave-induced sediment transport over a surf zone sandbar. *4th Young Coastal Scientists and Engineers Conference - Americas*, Aug. 21-23, Dauphin Island, AL, USA.
- 2017 Kim, Y., **Mieras, R. S.**, Cheng, Z., Hsu, T., and Puleo, J. A. An eulerian three-phase model for sheet flow under breaking waves. *4th Young Coastal Scientists and Engineers Conference - Americas*, Aug. 21-23, Dauphin Island, AL, USA.
- 2017 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Large-scale experimental observations of wave-induced sediment transport over a surf zone sandbar. *8th International Conference on Coastal Dynamics*, June 11-16, Helsingør, Denmark.
- 2017 Kim, Y., Cheng, Z., Hsu, T., **Mieras, R. S.**, and Puleo, J. A. A numerical investigation of sheet flow under non-breaking and breaking waves. *8th International Conference on Coastal Dynamics*, June 11-16, Helsingør, Denmark.
- 2016 Anderson, D., Cox, D. T., **Mieras, R. S.**, Puleo, J. A., and Hsu, T. Instantaneous Sediment Bed Level Response to Wave-induced Pore-pressure Gradients on a Surf zone Sandbar. *AGU Fall Meeting*, Dec. 11-16, San Francisco, CA, USA.
- 2016 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Wave-induced sheet flow on a sandbar: roles of the pressure gradient and bed shear stress. *53rd Society of Engineering Science Technical Meeting*, Oct. 2-5, College Park, MD, USA.

- 2016 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. Large-scale experimental observations of wave-induced sheet flow on a sandbar: roles of bed shear stress and pressure gradient. *3rd Young Coastal Scientists and Engineers Conference - Americas*, June 13-15, Kingston, Ontario, Canada.
- 2015 **Mieras, R. S.** and Puleo, J. A. Near-bed sediment transport over a sandbar under breaking waves. *2nd Young Coastal Scientists and Engineers Conference - North America*, July 27-29, Newark, DE, USA.
- 2014 **Mieras, R. S.**, Kirby, J. T. and Shi, F. The frictional nature of tidal propagation in channelized estuaries, with application to a tidal marsh in Delaware. *1st Young Coastal Scientists and Engineers Conference - North America*, July 9-11, Newark, DE, USA.
- 2014 **Mieras, R. S.**, Kirby, J. T. and Shi, F. Modeling the response of a tidally-driven salt marsh with a complex channel network. *Delaware Wetlands Conference*, Jan. 30, Dover, DE, USA.

Poster Presentations

- 2019 Calantoni, J., Kelley, M. M., Simeonov, J., Braithwaite III, E. F., Key, C., Griffith, S., Hode, A., **Mieras, R. S.**, Phillip, R., Landry, B., Ye, L., Hsu, T., and Manning, A. Variability of sediment observations across the sand-mud inner shelf near Ocean City Inlet. *AGU Fall Meeting*, Dec. 9-13, San Francisco, CA, USA.
- 2019 Kelley, M. M., Simeonov, J., Calantoni, J., Braithwaite III, E. F., Key, C., **Mieras, R. S.**, Griffith, S., Hode, A., Gough, M., and Phillip, R. Hydrodynamic and sediment observations across the sand-mud inner shelf near Ocean City Inlet. *AGU Fall Meeting*, Dec. 9-13, San Francisco, CA, USA.
- 2019 Kelley, M. M., Simeonov, J., Calantoni, J., Braithwaite III, E. F., Key, C., **Mieras, R. S.**, Griffith, S., Hode, A., and Gough, M. Observations across the sand-mud inner shelf during the Multi-Phase Turbulence EXperiment (MPTEX). *GSA Annual Meeting*, Sept. 22-25, Phoenix, AZ, USA.
- 2019 Bateman, S., Palmsten, M., Penko, A., and **Mieras, R. S.** Probabilistic prediction of sediment resuspension using a Bayesian network. *Two-phase modeling for Sediment dynamics (THEISIS) Symposium*, Sept. 17-19, Newark, DE, USA.
- 2018 Swann, C., **Mieras, R. S.**, Simeonov, J., Braithwaite III, E. F., Colosi, J., and Calantoni, J. Field observations of internal waves and bottom boundary layer processes along the California inner shelf. Poster OS23G-1716, *AGU Fall Meeting*, Dec. 10-14, Washington, DC, USA.
- 2018 Swann, C., **Mieras, R. S.**, Calantoni, J., Simeonov, J., Allen, R., Braithwaite III, E. F., et. al. Field observations of turbulent bottom boundary layer processes along the inner shelf. Poster CD14C-0077, *Ocean Sciences Meeting*, Feb. 11-16, Portland, OR, USA.
- 2016 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., and Hsu, T. From the sand bed to the free surface: an experimental study of wave-induced sediment transport over a sandbar. Poster OS23B-2039, *AGU Fall Meeting*, Dec. 11-16, San Francisco, CA, USA.
- 2016 Kim, Y., Cheng, Z., Hsu, T., **Mieras, R. S.**, and Puleo, J. A. A numerical study of wave-induced sediment transport - coupling sedFoam and waves2Foam. *AGU Fall Meeting*, Dec. 11-16, San Francisco, CA, USA.

- 2016 **Mieras, R. S.**, Puleo, J. A., Anderson, D., Cox, D. T., Hsu, T., and Kim, Y. Sheet flow measurements on a surf zone sandbar under shoaling and breaking waves. Poster EC14C-0991, *Ocean Sciences Meeting*, Feb. 21-26, New Orleans, LA, USA.

MENTORSHIP & ADVISING

- 2017 – 2018 **Helena Garcia**, University of Delaware (Undergraduate)

PROFESSIONAL SERVICE

- 2019 **Steering Committee Member**, Young Coastal Scientists & Engineers Conference – Americas (YCSEC-A)
- 2018 - present **Reviewer**, Marine Geology
- 2018 - present **Reviewer**, Journal of Geophysical Research: Oceans
- 2018 **Session Chair**, Nearshore Physical Processes, AGU Fall Meeting

EDUCATION & OUTREACH

- 2017 - present **Webmaster**, Young Coastal Scientists & Engineers Conference – Americas (YCSEC-A) (<https://ycseca.wordpress.com/>)
- 2017 **Organizer & Presenter**, Informal student workshop series, UD
“*The best way to write a manuscript: Everything I wish somebody told me 6 years ago*”
- 2017 **Panel Member**, Center for Integration of Research, Teaching and Learning, UD
Future Faculty Conversations: “*Work-Life (Im)Balance*”
- 2015 **Judge**, Thurgood Marshall Elementary School science fair, Newark, DE
- 2015 **Outreach Communicator**, Wave flume demonstrations to local middle school students describing beach erosion, Newark, DE
- 2014 – 2015 **Outreach Communicator**, Coast Day demonstrations about beach erosion using a small-scale wave flume, Lewes, DE

PROFESSIONAL MEMBERSHIP & REGISTRATION

- 2018 - present **Member** – American Shore and Beach Preservation Association (ASBPA)
- 2016 - present **Member** – American Geophysical Union (AGU)
- 2011 **Engineer in Training** (EIT) – Texas Board of Professional Engineers

PROFESSIONAL EXPERIENCE

- 2010 **Student Intern**, Naval Research Enterprise Internship Program (NREIP), United States Naval Academy, U.S. Navy (Summer)
- 2008 **Calculus I Help Session Leader**, Texas A&M University, Dept. of Mathematics (Fall)

TECHNICAL SKILLS & EXPERIENCE

Coastal / Civil Field & Laboratory

Programming, deploying, and/or troubleshooting

Conductivity Concentration Profiler (CCP), Acoustic Doppler Current Profilers and Velocimeters (e.g., Nortek – Signature 500/1000, Aquadopp HR Profiler, AWAC, Vector, Vectrino, Vectrino Profiler), Teledyne Q-Boat Survey System, CTDs, Temperature & Pressure Gauges, (Fiber) Optical Backscatter Sensors, Real Time Kinematic (RTK) GPS systems, Multi-frequency Profiling Sonar, Single Beam Sonar, Digital Echo Sounder, Ultrasonic/Acoustic Distance Meters

Computer / Numerical

Proficient in

MATLAB

GUI Development, Data Visualization & Management, Image Processing, Data Acquisition Toolbox
High Performance Computing (HPC), NearCoM-TVD, Unix Shell

Experienced in

Python, Micro-controllers (Raspberry Pi, Particle, Arduino), ArcGIS, FUNWAVE-TVD, Fortran, OpenMPI, C/C++, Adobe Photoshop & Illustrator, Web Development (HTML, CSS, Javascript)