

## Christopher Read Esposito

The Water Institute of The Gulf  
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### Education

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Ph.D.	<b>Tulane University</b> , Earth and Environmental Sciences <i>Advisor: Kyle M. Straub</i>	2017
M.S.	<b>University of New Orleans</b> , Earth and Environmental Sciences <i>Advisor: Ioannis Y. Georgiou</i>	2011
B.S.	<b>Rutgers The State University of New Jersey</b> <i>Majors: Mathematics, Physical Oceanography</i>	2004

### Employment and Professional Appointments

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The Water Institute of The Gulf	Research Scientist 2: Applied Geosciences Research Scientist 1: Applied Geosciences Post Doctoral Research Scientist: Water Resources	2021 – 2019 – 2021 2016 – 2019
Tulane University	Adjunct Professor of Earth and Environmental Sciences	2017 –
Tulane University	Teaching and Research Assistant	2011 – 2016
Conoco Phillips	Geomodeling Intern	2012, 2013
University of New Orleans	Research Assistant	2009 – 2011
Public High Schools	Math/Environmental Education Teacher	2004 – 2009

### Instructional Experience

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Classroom/lecture	High School Math/Science Teaching Assistant (Sedimentology and Stratigraphy) Teaching Assistant (Intro to Earth and Env. Sciences)	2004 – 2009 2012, 2013 2011, 2012
Short Course	Delft3D Modeling Short Course (Joint Water Institute/Deltares)	2017
Field Course	Leader/designer or instructor for field lessons throughout the Mississippi River Delta, Wyoming, Florida Keys. Trips pitched to middle schoolers through senior academics.	2008 –

## Research Grants and Funding

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### Active funding:

NSF-GLD: Collaborative Research: Freshwater flocculation and its impact on sustaining floodplains and deltaic wetlands (with California Institute of Technology and The University of New Orleans). \$50,000 to the Water Institute, 2021 – 2024.

NSF-IRES: Water Resources Training Course for Advanced Graduate Students (with The University of New Orleans, Deltares, and Utrecht University). \$397,000 (\$75,000 to Water Institute), 2021-2024.

### Completed funding:

Charles Lamar Family Foundation: The Bay Denesse Living Lab. \$119,000 2021 – 2021.

Shell: Erosion and Deposition Thresholds and Rates within Mangrove Forests (with Massachusetts Institute of Technology). \$80,000 to the Water Institute, 2021 – 2022.

SECASC (contracted via Mississippi State University): Facilitating Accurate and Effective Application of Marsh Modeling Outputs. \$37,000 to the Water Institute, 2020 – 2021.

The Joe W. and Dorothy Dorsett Brown Foundation: The Ecological and Geomorphic Basis for Carbon Sequestration and Land Building. \$85,000, 2018 – 2021

National Academy of Sciences: Gulf Research Program: Thresholds for Fine Sediment Transport in Vegetation (with Massachusetts Institute of Technology and Tulane University). \$592,179 (\$392,000 to the Water Institute), 2018 – 2021.

## Peer Reviewed Publications

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† Student Publication

10. Beltrán-Burgos, M. †, **Esposito, C. R.**, Nepf, H. M., Baustian, M. M., & Di Leonardo, D. R. (2023). Vegetation-Driven Seasonal Sediment Dynamics in a Freshwater Marsh of the Mississippi River Delta. *Journal of Geophysical Research: Biogeosciences*, 128(4), e2022JG007143. <https://doi.org/10.1029/2022JG007143>
9. Xu, Y., **Esposito, C. R.**, Beltrán-Burgos, M., & Nepf, H. M. (2022). Competing effects of vegetation density on sedimentation in deltaic marshes. *Nature Communications*, 13(1), 4641. <https://doi.org/10.1038/s41467-022-32270-8>
8. Cox, J. R., Paauw, M., Nienhuis, J. H., Dunn, F. E., van der Deijl, E., **Esposito, C.**, et al. (2022). A global synthesis of the effectiveness of sedimentation-enhancing strategies for river deltas and estuaries. *Global and Planetary Change*, 214, 103796. <https://doi.org/10.1016/j.gloplacha.2022.103796>
7. Yuill, B., Wang, Y., Allison, M., Meselhe, E., & **Esposito, C.** (2020). Sand settling through bedform-generated turbulence in rivers. *Earth Surface Processes and Landforms*, 45(13), 3231–3249. <https://doi.org/10.1002/esp.4962>
6. **Esposito, C. R.**, Georgiou, I. Y., & Straub, K. M. (2020). Flow Loss in Deltaic Distributaries: Impacts on Channel Hydraulics, Morphology and Stability. *Water Resources Research*, 56, e2019WR026463. <https://doi.org/10.1029/2019WR026463>
5. **Esposito, C. R.**, Di Leonardo, D., Harlan, M., & Straub, K. M. (2018). Sediment Storage Partitioning in Alluvial Stratigraphy: The Influence of Discharge Variability. *Journal of Sedimentary Research*, 88(6), 717–726. <https://doi.org/10.2110/jsr.2018.36>

4. Nienhuis, J. H., Törnqvist, T. E., & **Esposito, C. R.** (2018). Crevasse Splays Versus Avulsions: A Recipe for Land Building With Levee Breaches. *Geophysical Research Letters*, 45(9), 4058–4067. <https://doi.org/10.1029/2018GL077933>
3. **Esposito, C. R.**, Shen, Z., Törnqvist, T. E., Marshak, J., & White, C. (2017). Efficient retention of mud drives land building on the Mississippi Delta plain. *Earth Surface Dynamics*, 5(3), 387–397. <https://doi.org/10.5194/esurf-5-387-2017>
2. **Esposito, C. R.**, Georgiou, I. Y., & Kolker, A. S. (2013). Hydrodynamic and geomorphic controls on mouth bar evolution. *Geophysical Research Letters*, 40(8), 1540–1545. <https://doi.org/10.1002/grl.50333>
1. Straub, K. M., & **Esposito, C. R.** (2013). Influence of water and sediment supply on the stratigraphic record of alluvial fans and deltas: Process controls on stratigraphic completeness. *Journal of Geophysical Research: Earth Surface*, 1–14. <https://doi.org/10.1002/jgrf.20061>

## Invited Talks

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- Esposito, C.R.** (2022) “Human Mediated Landscapes: Anthro-Geomorphology”, Department of Civil, Construction, and Environmental Engineering; North Carolina State University, Raleigh, NC
- Esposito, C.R.** (2021) “Quantifying Dredging as a Geomorphic Agent in the Lowermost Mississippi River”, Coasts, Oceans, Ports, and Rivers Institute (COPRI); Louisiana State University, Baton Rouge, LA
- Esposito, C.R.** (2020) “Basin-Side Sediment Diversion Considerations in the Lowermost Mississippi River”, Sedimentation Strategies in Deltas Workshop; Utrecht, Netherlands / Virtual
- Esposito, C.R.** (2020) “Rapidly Changing Transport Conditions in a Vegetated Marsh”, U.S. Fish and Wildlife Service Hydrology and Aquatic Resources Conservation Seminar
- Esposito, C.R.** (2019) “Putting Ecogeomorphology Into Practice: The Future of Coastal Management”, AGU Fall Meeting, Young Scientists View of The Future
- Esposito, C.R.** (2019) “Rapidly Changing Transport Conditions in Deltaic Marshes”, Louisiana State University School of the Coast and Environment, Baton Rouge, LA.
- Esposito, C.R.** (2019) “Restoration and Monitoring Activity in the Bay Denesse Wetland Restoration Planting”, Plaquemines Parish Coastal Zone Advisory Commission, Port Sulfur, LA.
- Esposito, C.R.** (2019) “Dynamic Interactions Between Channels and the Overbank Environment”, Dauphin Island Sea Lab, Dauphin Island, AL.
- Esposito, C.R.** (2019) “Exchange Processes Between Channels and Wetlands: Understanding and Application”, Woods Hole Oceanographic Institution, Woods Hole, MA.
- Esposito, C.R.** (2018) “Coastal Marsh Storage Dynamics: the Clastics and The Carbon”, Plant Genetics and Carbon in Coastal Louisiana, Cocodrie, LA.
- Esposito, C.R.**, Törnqvist, T.E., Shen, Z., Marshak, J., White, C. (2015) “Building The Mississippi River Delta With Silt and Clay: Texture and Sediment Retention Efficiency of Crevasse Splays”, Mississippi River Delta Coalition’s Diversion Workshop, New Orleans, LA.

**Esposito, C.R.,** Straub, K.M. (2014) "Observing Morphology Becoming Stratigraphy: The Statistical Imprint of Coastal Processes In Deltaic Stratigraphy", International Deltas Meeting, Istomino, Russia.

**Esposito, C.R.,** Boyd, R. (2012) "Representing Stratigraphic Time With Delft3D", Deltares Energy Symposium, Delft, The Netherlands.

## Synergistic Activities

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- Coastal Studies Advisory Board, Nunez Community College
- North Carolina Natural and Working Lands (NWL) Coastal Habitats Subcommittee
- Gulf Coastal Solutions Workshop, Steering Committee.
- Resource Manager Outreach: Maintain a twice-yearly meeting of restoration practitioners, agency scientists, academic scientists, and stakeholders to discuss scientific topics related to the best use of vegetation in coastal restoration.
- CoPe (Coastlines and People) Workshop. NSF effort to define coastal research needs. 2018
- Session Chair: CERF 2019, AGU 2017 EP43, GSA South Central 2016 T7 (co-chair)
- Journal Reviewer: *J. Geophys. Res. Earth Surf.*, *Nature Geosciences*, *Geophys. Res. Lett.*, *Geomorphology*, *Mar. Geol.*, *Estuar. Coast. Shelf Sci.*, *Earth Surf. Process. Landf.*, *Earth Surf. Dyn.*, *Catena*
- Proposal Reviewer: *NSF-FRES*, *Deleware Sea Grant*, *Louisiana Sea Grant*, *California Sea Grant*
- Advisory service to the Plaquemines Parish Coastal Zone Advisory Commission
- Coastal Advisory Commission, Southeast Levee Flood Protection Authority. 2015 – 2016
- Artist collaborations through *A Studio In The Woods*. 2013 - 2015
- Frequent panelist and interviewee on coastal resilience.

## Honors and Awards

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- Vokes Fellowship for Outstanding PhD Candidate in Earth and Env. Sciences (2015)
- Department of Earth and Environmental Sciences, Tulane University (2014), Outstanding Graduate Student Research Award
- Department of Earth and Environmental Sciences, Tulane University (2013), Outstanding Graduate Student Teaching Award
- Department of Earth and Environmental Sciences, Tulane University (2011), McWilliams Scholarship
- New Orleans Geological Society (2010), University Earth Science Award
- Institute for Marine and Coastal Sciences (2002), Undergraduate Research Fellow
- Rutgers, The State University of New Jersey, Dean's List
- National Merit Scholar Program Finalist (my father makes me keep this on here)

## In the Media

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- Delta Dispatches. Exploring a Living Lab on Louisiana's Coast (July 7 2022)  
<https://deltadispatches.fireside.fm/192?t=0>
- The Times Picayune (July 14, 2017)  
[https://www.nola.com/news/environment/a-bayou-crevasse-centuries-ago-holds-lessons-for-todays-coastal-restoration/article\\_71e82cf2-9c1d-5787-a2bc-e5a49e3d7699.html](https://www.nola.com/news/environment/a-bayou-crevasse-centuries-ago-holds-lessons-for-todays-coastal-restoration/article_71e82cf2-9c1d-5787-a2bc-e5a49e3d7699.html)

## Conference Presentations

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† Student Presentation

- Burgos, M.B.<sup>†</sup>, **Esposito, C.R.**, Baustian, M.M., Di Leonardo, D, Nepf, H.M., 2020: Accounting for Vegetation Turbulence in a Morphodynamics Model of a Delta, AGU Fall Meeting, online.
- Yuill, B.T., **Esposito, C.R.**, Nienhuis, J., 2020: Accounting for Vegetation Turbulence in a Morphodynamics Model of a Delta, AGU Fall Meeting, online.
- Esposito, C.R.**, Courtois, A.J., Miner, M.D., 2020: Dredging as a Geomorphic Process, AGU Fall Meeting, online.
- Esposito, C.R.**, Nepf, H.M., Burgos, M.B., Baustian, M.M., 2019: Rapidly Changing Transport Conditions In a Mississippi River Marsh, AGU Fall Meeting, San Francisco, CA.
- Tevis, L., Mahon, R., **Esposito, C.R.**, 2019: Flow and Sediment Dynamics Through Complex Emergent Marsh Vegetation, AGU Fall Meeting, San Francisco, CA.
- Esposito, C.R.**, Nepf, H.M., Burgos, M.B., Baustian, M.M., 2019: Sediment Retention Processes in Coastal Marshes, CERF, Mobile, AL.
- Esposito, C.R.**, Meselhe, E.M., Allison, M.A., Ramatchandirane, C., Di Leonardo, D., Weathers, H., Yuill, B., 2018: A Sediment Budget for the Calcasieu Lake in Southwest Louisiana, AGU Fall Meeting, Washington, DC.
- Esposito, C.R.**, Meselhe, E.M., Liang, M., 2018: "River Bar Dynamics and Sand Discharge Through Diversions", State of The Coast, New Orleans, LA.
- Meselhe, E.M., Sadid, K.M., Jung, H., Messina, F., **Esposito, C.**, Liang, M., 2017: "Ecologic and Morphodynamic Analysis of a Proposed Network of Sediment Diversions", AGU Fall meeting.
- Esposito, C.R.**, Liang, M., Yuill, B., Meselhe., 2017: "Maintaining the Link to the Floodplain: Scour Dynamics in Crevasses", AGU Fall meeting.
- Meselhe, E.M., Sadid, K.M., Jung, H., Messina, F., **Esposito, C.**, Liang, M., 2017: "Ecologic and Morphodynamic Analysis of a Proposed Network of Sediment Diversions", AGU Fall meeting.
- Esposito, C.R.**, Meselhe, E.M., Liang, M. 2017: "Sustainability and Operational Design of Sediment Delivering River Diversions", CSDMS, Boulder, CO

- Fernandes, A.M., **Esposito, C.R.**, Kolker, K., Ameen, A., Wang, K., Chamberlain, E., 2016: "Time-Scales of Land Construction in Systems Dominated by Suspended Load", State of the Coast, New Orleans, LA
- Esposito, C.R.**, Straub, K.M., Georgiou, I.Y., 2016: "Gradually Varied Flow in Delta Distributary Networks", State of the Coast, New Orleans, LA
- Esposito, C.R.**, Shen, Z., Törnqvist, T., Marshak, J., White, C., 2016: "Efficient Retention of Mud for Land Building on the Mississippi Delta Plain", State of the Coast, New Orleans, LA
- Esposito, C.R.** and Straub, K.M., 2014: "Observing morphology becoming stratigraphy: The statistical imprint of coastal processes in deltaic stratigraphy", SEPM Meeting on Autogenic Dynamics of Sedimentary Systems, Grand Junction, Colorado. (talk)
- Esposito, C.R.** and Straub, K.M., 2013: "The statistical signal of morphological process in stratigraphy", Fall Meeting of the American Geophysical Union, San Francisco, California. (talk)
- Straub, K.M. and **Esposito, C.R.**, 2013: "Influence of water and sediment supply on the completeness of the stratigraphic record and the construction of stratigraphic surfaces in alluvial fans and deltas", Annual Meeting of the American Association of Petroleum Geologist, Pittsburgh, Pennsylvania.
- Esposito, C.R.**, R. Boyd, K.M. Straub, 2013: "Forward stratigraphic modeling of deltaic deposits using Delft3D", Annual Meeting of the American Association of Petroleum Geologist, Pittsburgh, Pennsylvania. (poster)
- Straub, K.M., Y. Wang, **C.R. Esposito**, 2012: "Relating the creation and preservation of stratigraphic surfaces to geomorphic surfaces in continental margin environments", Fall Meeting of the American Geophysical Union, San Francisco, California.
- Esposito, C.R.**, Georgio, I.Y., Kolker, A. 2010: "Patterns of Sediment Transport and Deposition During a Single Flood Event in a River Dominated Wetland", AGU Fall Meeting, San Francisco, CA.
- Esposito, C.R.**, Georgio, I.Y. 2010: "Delta Evolution During a Single Flood Event in a River Dominated Wetland", GSA Denver Annual Meeting, Denver CO.