

A. Khalifa Curriculum Vitae

Ahmed M. Khalifa

Research Scientist, River-Coastal Science & Engineering Department,
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Research Interest/Experience

Numerical Modeling, Physical Modeling, Machine Learning, Hydrodynamic, Storm Surge, Wave Dynamics, Compound Flooding, Morphodynamic, Land Scape Evolution (decadal time scale), Vegetation Dynamics, Saltwater Intrusion, Shoreline Change, Integrated Coastal Zone Management.

Education

B.S. Civil Engineering, Alexandria University, Egypt (2014)

Thesis: Flash Floods Risks in Watier Valley, South Sinai, Egypt

M.S. Coastal Engineering and Hydraulics, Alexandria University, Egypt (2017)

CGPA (3.5)

Thesis: Khalifa, A.M., 2017. Controlling Sedimentation problems at Damietta Harbor

Navigation Channel Using Numerical Modelling (DOI: 10.13140/RG.2.2.12434.12487)

Ph.D. Earth and Environmental Sciences, School of Science and Engineering, Tulane University (2023)

GPA (3.834)

Thesis: Khalifa, A.M., 2023. Development and applications of morphodynamic model to study deltaic and coastal ecosystems. Dissertation. Tulane University.

Peer-Reviewed Publications

Khalifa, A. M., Soliman, M. R., Yassin, A. A.; 2017. Assessment of a combination between hard structures and sand nourishment eastern of Damietta harbor using numerical modeling. Alexandria Engineering Journal, 56(4), 545–555. <https://doi.org/10.1016/j.aej.2017.04.009>

Meselhe, E., **Khalifa, A. M.,** Hu, K., Lewis, J., Tavakoly, A. A.; 2022. Influence of key environmental drivers on the performance of sediment diversions. Water (Switzerland), 14(1). <https://doi.org/10.3390/w14010024>

Khalifa, A.M., Meselhe, E.A., Hu, K., Reed, D.J., Beg, M.N.A.; 2024a. Development and Application of A Simplified Biophysical Model to Study Deltaic and Coastal Ecosystems. Estuar. Coast. Shelf Sci. 306. <https://doi.org/10.1016/j.ecss.2024.108899>

Khalifa, A.M., Meselhe, E.A., Hu, K., Reed, D., Rhode, R., Snider, N.L.; 2024b. Toward understanding the hydrologic, ecologic and community flooding implications of coastal restoration strategies: Sediment diversions. Estuar. Coast. Shelf Sci. 309. <https://doi.org/10.1016/j.ecss.2024.108984>

Khalifa, A. M., Meselhe, E. A., Hu, K., Day, J. W., Allison, M.; 2025. The Great Mississippi River Flood of 1927: Morphodynamic Analysis of The Caernarvon Crevasse Event. Estuar. Coast. Shelf Sci. 318. <https://doi.org/10.1016/j.ecss.2025.109234>

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Khalifa, A., Meselhe, E., Kemick, C., Hu, K., Allison, M.; 2026. Exploring salt wedge dynamics and nature-inspired mitigation measures in the lower Mississippi River. *Estuar. Coast. Shelf Sci.* 334. <https://doi.org/10.1016/j.ecss.2026.109814>

Articles Submitted and in Preparation

Allison, M., **Khalifa, A.M.**, Meselhe, E., Dangendorf, S., and Hu, K.; Interannual sea-level modulates timing of coastal land loss. (in review by Nature Geoscience).

Muste, M., **Khalifa, A.M.**, Meselhe, E.; Designing Self-Cleaning Culverts Using Integrated Physical and Numerical Modeling. (in preparation for publication)

Kemick, C., Meselhe, E., **Khalifa, A.**, Allison, M., Hu, K.; Toward Understanding of Drought Events in The Lower Mississippi River Using Statistical Analysis and Numerical Modeling. (in preparation for publication).

Hu, K., Meselhe, E., **Khalifa, A.**; Innovative Use of River Crevasse to Impede Upriver Progression of Salt Wedge and as a Land Building Sand Engine. (in preparation for publication).

Ahmed, S., Meselhe, E., Hu, K., **Khalifa, A.**, Allison, M.; Investigating Ecogeomorphic Feedback in the Mississippi River Delta Using Coupled Hydrodynamic and Vegetation Models: Implications for Restoration and Landscape Stability. (in preparation for publication).

Abdelrahim, A., Meselhe, E., **Khalifa, A.**, Hu, K., Allison, M., Jafari, N.; Investigating the Feasibility of Using Recycled Glass Sand in Coastal Protection Against Erosion in Terrebonne Bay. (in preparation for publication).

Abdelrahim, A., Meselhe, E., **Khalifa, A.**, Hu, K., Allison, M., Tarabih, O.; Integrating Physics-Based Modeling and Machine Learning to Predict Hypoxia and Dissolved Oxygen Dynamics in the Atchafalaya Basin. (in preparation for publication).

Conference Proceedings and Presentations

Peer-reviewed proceedings with presentations:

El-Tahan, M. K., **Khalifa, A. M.**, Moghazy, H. M., Kher El Din, K.; 2019. Environmental Impact of Egyptian Anthropogenic Coastal Mega Structures in Eastern Nile Delta-Case Study (El- Mansoura New City). In 38th IAHR World Congress - “Water: Connecting the World” (Vol. 38, pp. 2251–2260). Panama City, Panama.
<https://doi.org/10.3850/38wc092019-0790>

Khalifa, A. M., El-Tahan, M. K., Moghazy, H. M., Kher El-Din, K.; 2020. Assessment Of Morphodynamics And Water Quality Of Al Mansoura New Mediterranean Sea Island, In The 9th International Maritime and Logistics Conference, (Marlog 9). (pp.1–19). Alexandria, Egypt.

El Sayed, W. R., **Khalifa, A. M.**; 2017. NILE Delta shoreline protection between past and future. In Twentieth International Water Technology Conference, (IWTC20). (pp. 18–20). Hurghada, Egypt.

Conference presentations and posters:

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- Khalifa, A. M.**, Soliman, M. R., Yassin, A. A.; 2017. Investigation of Using Coastal Sediment Trap to Reduce Navigation Channel Siltation. In RETBE 17. Alexandria, Egypt.
- Khalifa, A. M.**, Meselhe, E. A., Hu, K.; 2021. Morphodynamic Analysis of Proposed Mississippi River Sediment Diversions (Poster). In Young Coastal Scientists and Engineers Conference – Americas, (YCSECA). Myrtle Beach, SC, USA.
- Khalifa, A. M.**, Meselhe, E. A., Hu, K., Day, J. W., Allison, M.; 2022. Morphodynamic Analysis of the 1927 Caernarvon Crevasse Event. In Environmental & Water Resources Institute | ASCE (EWRI). Atlanta, GA, USA.
- Khalifa, A. M.**, Meselhe, E. A., Hu, K., Day, J. W., Allison, M.; 2022. Morphodynamic Analysis of the 1927 Caernarvon Crevasse Event (Poster). In Young Coastal Scientists and Engineers Conference – Americas, (YCSECA). Pensacola, FL, USA.
- Meselhe, E. A., **Khalifa, A. M.**, Hu, K., Day, J. W., Allison, M.; 2023. The Great Flood of 1927: Comparative Analysis of Historical and Current Sediment Trends. In The State of The Coast. New Orleans, LA, USA.
- Khalifa, A. M.**, Meselhe, E. A., Hu, K., Reed, D. J., Beg, M. N. A., Rhode, R., Snider, N. P.; 2023. Development and Application of a Simplified Biophysical Model to Evaluate the Effects of Sediment Diversion Operations. In The State of The Coast. New Orleans, LA, USA.
- Meselhe, E. A., **Khalifa, A. M.**, Hu, K., Day, J. W., Allison, M.; 2023. The Great Flood of 1927: Comparative Analysis of Historical and Current Sediment Trends (Poster). In Third Lower MS River Science Symposium. New Orleans, LA, USA.

Academic Honors and Awards

- Prime Minister Award for Excellence: Trophy of excellence awarded by the Prime Minister for the best Irrigation and hydraulics engineering project in Egypt. (2014)
- Undergraduate Excellence: Annual certificate of appreciation from the Faculty of Engineering, Alexandria University. (2011/2012 – 2012/2013 – 2013/2014)
- Undergraduate Appreciation: Certificate of appreciation awarded by the Department of Civil Engineering, School of Engineering, Alexandria University for the best graduation project of the 2014 batch. (2014)

Experience

Professional teaching experience:

August 2014 to August 2015 – 2 years:

Teaching assistant in the Irrigation Engineering and Hydraulics Department, Faculty of Engineering, Alexandria University:

- Hydraulics II (Open Channels Hydraulics, Dimensional Analysis – Modeling). (2014)
- Hydraulics Laboratory Instructor. (2014)
- Design of Irrigation Structures I (Crossing structures – Weirs – Spillways). (2014)

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- Water Resources Engineering (Descriptive & Quantitative Hydrology – Ground Water – Reservoirs – Flood Damage Mitigation). (2015)
- Design of Irrigation Structures II (Dams – Regulators – Navigable Locks). (2015)

August 2023 to Present:

Teacher in the River-Coastal Science and Engineering Department, School of Science and Engineering, Tulane University:

- Intro to H&H Modeling (Graduate level course, 2 modules, 4 weeks). (2023)
- The Gulf Coast in 2100 (Undergraduate level course, 2 modules, 4 weeks). (2024)

Outreaching experience:

Host and EM River table modeler for Rivers and Deltas workshop for Boys in STEM at Tulane (BATS). (2023, 2024)

Host and EM River table modeler for Rivers and Deltas workshop for Girls in STEM at Tulane (GiST). (2023, 2024)

Host and EM River table modeler for Rivers and Deltas workshop for Girls in STEM at Tulane (GiST). (2024, 2025)

Professional research experience:

January 2015 to January 2018 – 3 years:

Research Assistant, Coastal Research Institute (CoRI), National Water Research Center (NWRC), Alexandria, Egypt

January 2018 to January 2020 – 2 years:

Assistant Researcher, Coastal Research Institute (CoRI), National Water Research Center (NWRC), Alexandria, Egypt

January 2020 to August 2023 – 3.5 years:

Research Assistant (PhD Student), Earth and Environmental Sciences Department, School of Science and Engineering, Tulane University.

September 2023 to Present:

Postdoctoral Fellow, River-Coastal Science and Engineering Department, School of Science and Engineering, Tulane University.

Professional consultancy experience:

January 2019 to January 2020 – 1 year:

Intern (Coastal Engineer – part time), Civil, Marine, and Coastal (CMC) Engineering Office, Alexandria, Egypt

Technical skills

Hydrodynamic and morphodynamic modeling packages for river and coast: Delft 3D, Delft-FM, SFINCS, XBEACH, HEC-RAS 1D&2D, DHI-Mike SHE, DHI-Mike+Rivers, DHI-LITPACK, SWAN, Flow-3D, SMS

Programming language: MATLAB, R, Python

Operating systems: Windows, Linux (Ubuntu)

GIS and remote sensing: ARC Map 10.1, ARC Pro, Global Mapper

Drawing tools: Surfer, AutoCAD

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Languages

Arabic – Native language

International English Language Testing System (IELTS) with score (6.5).

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Research Profiles

Google Scholar: <https://scholar.google.com/citations?hl=en&user=QgXUNFcAAAAJ>

Research Gate: <https://www.researchgate.net/profile/Ahmed-Khalifa-41>

LinkedIn: <https://www.linkedin.com/in/ahmed-khalifa-387910b4/>

ORCID: <https://orcid.org/0000-0002-0502-8980>