COMPANY ROLE

Analytics, Computing, and Technology Manager

PROJECT ROLE / FOCUS AREAS

Machine Learning

Software Engineering

Digital Transformation

Geosciences

Geomorphology

EDUCATION

MA Earth Sciences, Boston University, 2009

BA Earth Sciences, Boston University, 2007

PROFESSIONAL MEMBERSHIP

American Geophysical Union

NICK HOWES

Analytics, Computing, and Technology Manager

Nick Howes, Analytics, Computing, and Technology (ACT) Manager, brings years of experience in applied science and machine learning to The Water Institute.

During his eight years as an applied scientist at Shell, he worked on a cross-disciplinary team focused prototyping novel methods for subsurface stratigraphic characterization and was appointed a subject-matter expert in the geology of shallow marine and fluvial reservoirs in 2016. He developed a proprietary platform to store geologic and remote sensing records, automate feature engineering, and apply machine learning to assess exploration prospects and reservoirs characterized by significant geologic uncertainty (e.g., below seismic resolution). This technology is validated and assessed at >100 x multiple of its development cost.

Prior to joining The Water Institute, Howes was a Senior Technical Consultant with MathWorks, where he helped organizations scope, develop, and deploy science and engineering solutions, leading projects in areas of artificial intelligence, experiment management, big data, software engineering, and supporting projects in enterprise integration and application development.

Howes specializes in applications of machine and deep learning to science and engineering problems. His project portfolio spans the energy, environmental, utilities, medical, semiconductor, and finance industries, and includes relevant expertise framing and developing predictive models and forecasts on large geophysical and geospatial data.

Howes' geoscience research expertise and interests consider how coastal landscapes respond to forcings on O(1)-O(100) year timescales, including individual events, changes in the frequency and magnitude of these events, relative sea level rise, and how these changes impact people.

PROFESSIONAL EXPERIENCE

2022-Present: ACT Manager, The Water Institute

2021-2022: Senior Research Scientist, The Water Institute

2017-2021: Senior Technical Consultant, MathWorks Inc

2006-2013: Geographer, U.S. Geological Survey, National Wetlands Research Center

2009-2006: GIS Specialist - IAP World Services, National Wetlands Research Center

2001-2005: Research Assistant - Coastal Marine Institute, Louisiana State University

SELECTED PROJECTS

Lower Mississippi River Management Program. *Coastal Protection and Restoration Authority. (Ongoing). Task Lead - Physics-based and machine learning environmental models.* Developing a decision science framework to examine long-term (multi-decadal) management strategies for sediment and water in the Lower Mississippi River. The program considers coastal protection, navigation, and ecosystem restoration objectives, including associated costs and benefits. Technical implementation integrates physics-based models and machine learning within the decision science framework.

SmartPort *Louisiana Economic Development. (Ongoing). Task Lead - Forecast models.* Developing a platform that harvests crowd-sourced vessel data and repeat high-resolution multibeam bathymetry data to produce machine learning forecasts of shoaling at the Port of New Orleans and other locations along the Mississippi River. This application will enable decision makers to anticipate dredging needs and proactively plan operations, among other use cases.

SELECTED PUBLICATIONS

1. Jobe, Z.R., **Howes, N.C.**, Martin J., Meyer R., Coutts D., Hou P., Stright L., and Laugier F. 2021. Sedimentary Graphic Logs: A Template for Description and a Toolkit for Digitalization. The Sedimentary Record. https://doi.org/10.2110/sedred.2021.3.3
2. van der Vegt, H., Storms, J.E.A, Walstra, D.J.R., Nordahl, K., **Howes, N.C.**, Martinius, A.W. 2020. Grain size fractionation by process-driven sorting in sandy to muddy deltas. The Depositional Record. https://doi.org/10.1002/dep2.85
3. Jobe, Z.R., **Howes, N.C.**, Straub, K.M., Cai, D., Deng H., Laugier, F.J., Pettinga, L.A., Shumaker, L.E. 2020. Comparing aggradation, superelevation, and avulsion frequency of submarine and fluvial channels. Frontiers in Earth Science. https://doi.org/10.3389/feart.2020.00053
4. Kirschner, D., **Howes, N.C.**, Daly, C., Mukherjee, J Li, J. 2019. Detecting P-and S-wave arrivals with a recurrent neural network. Society of Exploration Geophysicists Conference Proceedings. https://doi.org/10.1190/segam2019-3215081.1
5. Martin, J., Fernandes, A. M., Pickering, J., **Howes, N.C.**, Mann, S., Neil, K. M. C. 2018. The stratigraphically preserved signature of persistent backwater dynamics in a large paleodelta system: the Mungaroo Formation, northwest shelf, Australia. J. Sedimentary Research. https://doi.org/10.2110/jsr.2018.38
6. Pettinga, L., Jobe, Z.R., Shumaker, L., **Howes, N.C.** 2018. Morphometric scaling relationships in submarine channel-lobe systems. Geology https://doi.org/10.1130/G45142.1
7. Jobe, Z.R., **Howes, N.C.**, Auchter, N. 2016. Comparing submarine and fluvial channel kinematics: Implications for stratigraphic architecture. Geology. https://doi.org/10.1130/G38158.1
8. van der Vegt, H., Storms, J.E.A, Walstra, D.J.R., **Howes, N.C.** 2016. Can bed load transport drive varying depositional behavior in river delta environments? Sedimentary Geology. https://doi.org/10.1016/j.sedgeo.2016.08.009
9. Jobe, Z.R., Sylvester Z., Parker A.O., **Howes N.C.**, H. Slowey, N., Pirmez C. 2015. Rapid adjustment of submarine channel architecture to changes in sediment supply. J. Sedimentary Research. https://doi.org/10.2110/jsr.2015.30
10. **Howes N.C.**, FitzGerald D.M., Hughes, Z.J., Georgiou I.Y., Kulp M.A., Miner M.D., Smith J.M., Barras J.A. 2010. Hurricane-induced failure of low salinity wetlands. Proceedings of the National Academy of Sciences. https://doi.org/10.1073/pnas.0914582107