

NEAL EDWARD BLAIR

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Education and Professional Positions

Director of the Environmental Science Program, Northwestern University, 2015-2016.
Director of the Environmental Policy and Culture Program, Northwestern University, 2014-2016.
Director of the Environmental Science, Engineering and Policy Programs, Northwestern University, 2010-2016.
Professor, Department of Civil and Environmental Engineering, and
Department of Earth and Planetary Sciences, Northwestern University, 2007-
Adjunct Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, 2007-
Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, 1998- 2007
Associate Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, 1991-1998
Assistant Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, 1985-1991
Research Associate, NASA-Ames Research Center, 1982-1984
Lecturer, Department of Chemistry, Stanford University, 1980-1981
NRC Research Associate, NASA-Ames Research Center, 1980-1981
Ph.D. (Organic Chemistry) Stanford University, 1980
B.S. (Chemistry) University of Maryland, 1975

Professional and Honorary Affiliations

American Association for the Advancement of Sciences
American Chemical Society: Organic and Geochemical Divisions
American Geophysical Union
Geochemical Society
Sigma Xi

Research Interests

Research has focused on the biogeochemical transformations of carbon with an emphasis

on process-oriented studies of the fate of organic carbon in surface environments. Current projects involve the characterization and tracking of macromolecular organic matter with an emphasis on resolving the age distribution of the material. One application is the study of the evolution of organic carbon as particles move from exposed bedrock on land to ultimate burial at sea. Anthropogenic impacts on the global C-cycle via land use and hydrologic engineering, such as reservoir construction are being investigated. Novel applications of carbon isotopic measurements, pyrolysis and spectroscopic methods are key elements of this research. The role of soil fungi in the sequestration of organic matter is being investigated. In situ isotopic probes of methanogenic pathways are another focus of research.

Most Recent Publications

Carbon mass balance, isotopic tracers of biogenic methane, and the role of acetate in coal beds: Powder River Basin (USA). *Chemical Geology* (2019) doi.org/10.1016/j.chemgeo.2019.119329 (Vinson, D.S., Blair, N.E., Ritter, D.J., Martini, A.M., and McIntosh, J.C.).

The Intensively Managed Landscape Critical Zone Observatory: A Scientific Testbed for Understanding Critical Zone Processes in Agroecosystems. *Vadose Zone J.*, Accepted Paper, posted 10/29/2018. [doi:10.2136/vzj2018.04.0088](https://doi.org/10.2136/vzj2018.04.0088). (Wilson, C., Abban, B., Keefer, L., Wacha, K., Dermisis, D., Giannopoulos, C., Zhou, S., Goodwell, A.E., Woo, D.K., Yan, Q., Ghadiri, M., Stumpf, A., Pitcel, M., Lin, Y-F., Marini, L., Storsved, B., Goff, K., Vogelgsang, J., Dere, A., Schilling, K.E., Muste, M., Blair, N.E., Rhoads, B., Bettis, A., Pai, H., Kratt, C., Sladek, C., Wing, M., Selker, J., Tyler, S., Lin, H., Kumar, P., and Papanicolaou, A.N.T.)

Critical Transition in Critical Zone of Intensively Managed Landscapes. *Anthropocene* (2018) <https://doi.org/10.1016/j.ancene.2018.04.002> (Kumar, P., Le, P.V.V., Papanicolaou, T., Rhoads, B.L., Anders, A.M., Stumpf, A., Wilson, C.G., Bettis, E.A. III, Blair, N., Ward, A.S., Filley, T., Lin, H., Keefer, L., Keefer, D.A., Lin, Y-F., Muste, M., Royer, T.V., Foufoula-Georgiou, E., Belmont, P.).

The C-biogeochemistry of a Midwestern USA agricultural impoundment in context: Lake Decatur in the Intensively Managed Landscape Critical Zone Observatory. *Biogeochemistry* (2018) 138:171-195. <https://doi.org/10.1007/s10533-018-0439-9> (Blair, N.E., Leithold, E.L., Papanicolaou, A.N.T., Wilson, C.G., Keefer, L., Kirton, E., Vinson, D., Schnoebelen, D., Rhoads, B., Yu, M., Lewis, Q.).

Centers of Organic Carbon Burial and Oxidation at the Land-Ocean Interface. *Organic Geochemistry* (2017) doi.org/10.1016/j.orggeochem.2017.09.008 (Bianchi, T.S., Cui, X., Blair, N.E., Burdige, D.J., Eglinton, T.I., Galy, V.).

Microbial methane from in situ biodegradation of coal and shale: A review and reevaluation of hydrogen and carbon isotope signatures. *Chemical Geology* (2017) 453: 128-145.

doi:10.1016/j.chemgeo.2017.01.027 (Vinson, D.S., Blair, N.E., Martini, A., Larter, S., Orem, W.H., McIntosh, J.C.).

A Source to Sink Perspective of the Waipaoa River Margin. *Earth-Science Reviews* (2016) *doi: 10.1016/j.earscirev.2015.10.001*. (Kuehl, S.A., Alexander, C.R., Blair, N.E., Harris, C.K., Marsaglia, K.M., Ogston, A.S., Orpin, A.R., Roering, J.J., Bever, A.J., Bilderback, E.L., Carter, L., Cerovski-Darriau, C., Childress, L.B., Corbett, D.R., Hale, R.P., Leithold, E.L., Litchfield, N., Moriarty, J.M., Page, M.J., Pierce, L.E.R., Upton, P. and Walsh, J.P.).

Source to Sink Sedimentary Systems and Global Organic Carbon Burial: A River Runs Through It. *Earth-Science Reviews* (2016) *doi:10.1016/j.earscirev.2015.10.011* (Leithold, E.L., N. E. Blair, K.W. Wegmann).