Daniel (Dan) H. Loughlin, Physical Scientist in EPA's National Risk Management Research Laboratory

Air and Energy Management Division
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Area of expertise: Dr. Loughlin investigates the interplay among society's environmental and energy objectives. This is achieved through the application of energy system (e.g., MARKAL) and integrated assessment (e.g., GCAM-USA) models to:

- evaluate the environmental and energy implications of new and emerging technologies,
- characterize future U.S. pollutant emissions for wide-ranging scenarios of the future (involving different assumptions about population growth and migration, economic growth and transformation, technology development and adoption, climate change, consumer behavior, and policy),
- identify emerging challenges to meeting environmental and energy goals (e.g., National Ambient Air Quality Standards), and
- develop cost-effective and robust strategies for meeting those goals.

Select publications

Brown, K., Hottle, T., Bandyopadhyay, R., Babaee, S., Dodder, R., Kaplan, O., Lenox, C., and **D. Loughlin** (2018). Plausible scenarios for the evolution of the US energy system and related emissions under varying social and technical development paradigms for use in robust decision making. Environmental Science & Technology, 52(14) pp. 8027-8038.

Ou, Y., Shi, W., Smith, S.J., Ledna, C.M., West, J.J., Nolte, C.G., and **D.H. Loughlin** (2018). Estimating environmental co-benefits of U.S. GHG reduction pathways using the GCAM-USA Integrated Assessment Model. Applied Energy, 216C(2018) pp. 482-493.

Babaee, S., and **D.H. Loughlin** (2018). Factors affecting the market penetration potential of electricity production via natural gas combined-cycle with carbon capture and storage. Clean Technologies and Environmental Policy, 20(2): 379-391.

Shi, W., Ou, Y., Smith, S.J., Ledna, C., Nolte, C.G., and **D.H. Loughlin** (2017). Projecting state-level air pollutant emissions using an integrated assessment model: GCAM-USA. Applied Energy, 208(2017), pp 511-521.

Loughlin, D.H., Macpherson, A.J., Kaufman, K.R., and B.N. Keaveny (2017). Marginal abatement cost curves for NOx that incorporate control measures, renewable energy, energy efficiency and fuel switching. Journal of the Air and Waste Management Assoc., 67(10), 1115-1125.

Ran, L., **Loughlin, D.H.**, Yang, D., Adelman, Z., Baek, B.H., and C. Nolte (2015). ESP2.0: enhanced method for exploring emission impacts of future scenarios in the United States –

addressing spatial allocation. Geoscientific Model Development, 8, 1775-1787. DOI: 10.5194/gmd-8-1775-2015

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Education

- B.S.E., Duke University, Durham, NC; Civil and Environmental Engineering, 1993
- M.S., North Carolina State University, Raleigh, NC; Civil Engineering, 1995
- Ph.D., North Carolina State University, Raleigh, NC; Civil Engineering, 1998

Professional Experience

- Scientist, U.S. Environmental Protection Agency, Durham, NC 2005-present
- Postdoctoral Fellow, U.S. Environmental Protection Agency, Durham, NC 2003-2005
- Research Associate, University of North Carolina at Chapel Hill, 2002-2003
- Research Scientist, MCNC-Environmental Modeling Center, Durham, NC 2001-2002
- Research Assistant Professor, North Carolina State University, Raleigh, NC 1998-2003

Awards and Honors

- U.S. EPA Gold Medal (2010)
- U.S. EPA Bronze Medal (2012, 2013)
- ORD Exceptional/Outstanding Technical Assistance to the Regions or Program Offices (2017)
- Administrator's Award for Excellence, 2006
- Phi Kappa Phi Honor Society, 1995
- Kimley-Horn Scholarship, 1995
- William Brewster Snow Award, Duke Univ., 1993

Science Matters: Breaking Through? Evaluating Technologies for Greenhouse Gas Mitigation
Science Matters: New MARKAL Tool Designed to Help Cities Meet Environmental Protection Goals