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Andrew J. R. Gillespie

US Environmental Protection Agency, National Exposure Research Laboratory, gillespie.andrew@epa.gov

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Environmental Model Management within the US Environmental Protection Agency

Andrew J. R. Gillespie, Ph. D.

*US Environmental Protection Agency, National Exposure Research Laboratory, Durham NC USA.
Gillespie.andrew@epa.gov*

Abstract: The United States Environmental Protection Agency (USEPA) is responsible for formulating and implementing environmental rules and regulations under several major US laws aimed at protecting human health and the environment. USEPA's work strives to be grounded on a strong and rigorous scientific foundation which increasingly relies on models to improve understanding of complex human-environmental systems. USEPA decisions are frequently challenged in courts, so the underlying science needs to meet a high bar in terms of transparency and scientific rigor established through peer review. USEPA currently has no universal framework for managing models over a lifecycle. There is a grassroots effort underway to develop a system for Designing and Deploying Environmental Software (DDES), but at present different parts of USEPA follow different processes to build, validate, and maintain the models they need to do their work. Models in USEPA can be thought of as falling along a continuum, one region of which consists of research models (models developed by researchers to study some system of interest and to answer research questions) and another region defined by regulatory models (models used by regulatory offices of USEPA to evaluate alternatives and support decisions about environmental regulations). This presentation will summarize some of the different approaches and lessons learned from developing and supporting models across several key EPA programs, e.g. acceptable approaches to peer review and transparency for Agency models. It will also summarize some current thinking regarding a more sustainable future state of modeling at USEPA including movement towards more open source development of models and a need for culture shift from individual model ownership to corporate portfolio management.

Keywords: Public; Validation; Lifecycle; Decision making