



Brigham Young University
BYU ScholarsArchive

International Congress on Environmental
Modelling and Software

10th International Congress on Environmental
Modelling and Software - Brussels, Belgium -
June 2020

Sep 17th, 11:20 AM - 11:40 AM

Coupling Models and Narrative in Support of Decision Making

Kristy Bryden
Iowa State University, United States

Follow this and additional works at: <https://scholarsarchive.byu.edu/iemssconference>

Bryden, Kristy, "Coupling Models and Narrative in Support of Decision Making" (2020). *International Congress on Environmental Modelling and Software*. 2.
<https://scholarsarchive.byu.edu/iemssconference/2020/A0/2>

This Event is brought to you for free and open access by the Civil and Environmental Engineering at BYU ScholarsArchive. It has been accepted for inclusion in International Congress on Environmental Modelling and Software by an authorized administrator of BYU ScholarsArchive. For more information, please contact ellen_amatangelo@byu.edu.

Coupling Models and Narrative in Support of Decision Making

K. A. Bryden^a, N. A. MacCarty^b, and K. M. Bryden^c

^aVirtual Reality Applications Center, Iowa State University, Ames, Iowa, USA (kabryden@iastate.edu)

^bSchool of Mechanical, Industrial and Manufacturing Engineering, Oregon State University, Corvallis, Oregon, USA (Nordica.MacCarty@oregonstate.edu)

^cDepartment of Mechanical Engineering, Iowa State University, Ames, Iowa, USA
(kmbryden@iastate.edu)

Abstract: In many cases the goal of modeling is to predict the future and enable informed intervention to change or optimize the future. That is, modeling seeks to be a decision support tool. However, modeling alone is insufficient to support decision making. As expressed by Lee Roy Beach, people do not make decisions as rational humans using available data and facts but rather construct narratives to understand the outcomes of a particular decision. Within community-based decision making, this narrative construction often proceeds in an ad hoc fashion which may or may not incorporate modeling outcomes and data. This occurs in part because the community lacks the ability to directly explore, challenge, and learn from the model while simultaneously updating the shared narrative. To overcome this, we are exploring a decision making model in which narrative and modeling are explicitly linked, the need for quantitative and qualitative in support of the narrative drives the system modeling effort, and the model evolves as the narrative is explored. There are three elements to this approach: (1) a shared definition of the narrative, (2) an open and transparent modeling process, and (3) explicit links between the narrative and the systems model. This paper focuses on the development of explicit links between the narrative and the model in support of a shared narrative and how the model and narrative can grow together. This approach is demonstrated using the interactions and outcomes of a village energy system model describing the interactions between energy, people, and the environment within the developing world. In this scenario there are multiple stakeholders with differing goals. We will show how exit points from this network of models representing this complex system can provide data into a developing narrative that supports the concerns of a community.

Keywords: systems modeling; decision making; narrative