

Brigham Young University BYU Scholars Archive

International Congress on Environmental Modelling and Software

9th International Congress on Environmental Modelling and Software - Ft. Collins, Colorado, USA - June 2018

Jun 28th, 9:00 AM - 10:20 AM

Culture influences on human decision-making processes toward environmental policy: an integrative model of human-environment interaction

Gabriel Granco
Stroud Water Research Center, ggranco@stroudcenter.org

Jessica Heier Stamm

Kansas State University, jlhs@ksu.edu

Jason Bergtold

Kansas State University, bergtold@ksu.edu

Melinda Daniels
Stroud Water Research Center, mdaniels@stroudcenter.org

Matthew Sanderson
Kansas State University, mattrs@ksu.edu

See next page for additional authors

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

Granco, Gabriel; Heier Stamm, Jessica; Bergtold, Jason; Daniels, Melinda; Sanderson, Matthew; Sheshukov, Aleksey; Mather, Martha; Haukos, David; and Caldas, Marcellus, "Culture influences on human decision-making processes toward environmental policy: an integrative model of human-environment interaction" (2018). *International Congress on Environmental Modelling and Software*. 1. https://scholarsarchive.byu.edu/iemssconference/2018/Stream-C/1

This Oral Presentation (in session) 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 scholarsarchive@byu.edu, ellen amatangelo@byu.edu.

Presenter/Author Information Gabriel Granco, Jessica Heier Stamm, Jason Bergtold, Melinda Daniels, Matthew Sanderson, Aleksey Sheshukov, Martha Mather, David Haukos, and Marcellus Caldas



9th International Congress on Environmental Modelling and Software
Fort Collins, Colorado, USA, Mazdak Arabi, Olaf David, Jack Carlson, Daniel P. Ames (Eds.)
https://scholarsarchive.byu.edu/iemssconference/2018/

Culture Influences on Human Decision-Making Processes toward Environmental Policy: An Integrative Model of Human-Environment Interaction

<u>Gabriel Granco</u>^a, Jessica Heier Stamm^b, Jason Bergtold^c, Melinda Daniels^d, Martha Mather^e, Matthew Sanderson^f, Aleksey Sheshukov^g, David Haukos^h, Marcellus Caldasⁱ

^aStroud Water Research Center, ggranco@stroudcenter.org ^bDepartment of Biological and Agricultural Engineering, Kansas State University, jlhs@ksu.edu ^c Department of Agricultural Economics, Kansas State University,bergtold@ksu.edu ^dStroud Water Research Center, mdaniels@stroudcenter.org

^e US Geological Survey, Kansas Cooperative Fish and Wildlife Research Unit, Division of Biology, Kansas State University, mmather@ksu.edu

^fDepartment of Sociology, Anthropology, and Social Work, Kansas State University, mattrs@ksu.edu

^g Department of Biological and Agricultural Engineering, Kansas State University, ashesh@ksu.edu

^h US Geological Survey, Kansas Cooperative Fish and Wildlife Research Unit, Division of Biology,

Kansas State University, dhaukos@ksu.edu

Department of Geography, Kansas State University, caldasma@ksu.edu

Abstract: The Anthropocene era marks the role of humans as agents of planetary modification. In this era, the search for sustainability in human-environment interactions has pushed the development of modeling techniques able to incorporate dynamic natural and human feedbacks across temporal and spatial scales. While researchers have refined models for both natural and human systems separately, the coupling of these systems via model integration continues to be a challenge. In response, researchers have concentrated their attention on how human decision-making processes respond to and affect the environment. New pathways to sustainability may be developed by examining how human culture informs the decision-making process related to environmental issues. The Values, Beliefs, and Norms (VBN) theory is a culture-dependent conceptual framework that relates human actions to their beliefs and values about the environment. The goal of this paper is to quantify cultural influences on human decisions regarding environmental policy. We focus on freshwater sustainability within the Smoky Hill River watershed, an intensive agricultural region of the Central Great Plains, Kansas, U.S.A. An agent-based model integrates natural and human system processes and the feedback loops and interactions among the systems. The feedback from the natural system to the human system is mediated by a VBN-based decision rule, while the feedback from the human to the natural system is mediated by economic decisions on land use, with land use/land use change impacting biodiversity and water availability. By linking policy support to biodiversity and social structures, this research explores socio-cultural levers to improve freshwater sustainability.

Keywords: Socio-ecological system; Coupled natural and human systems; Kansas; Agent-Based Model; freshwater sustainability.