Finding common ground fosters understanding of climate change

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Grasping the concept of climate change and its impact on the environment can be difficult. Establishing common ground and using models, however, can break down barriers and present the concept in an easily understood manner.

In a presentation at this year's meeting of the American Association for the Advancement of Science, Michigan State University systems ecologist and modeler Laura Schmitt-Olabisi shows how system dynamics models effectively communicate the challenges and implications of climate change.

"In order to face the ongoing challenges posed by climate adaptation, there is a need for tools that can foster dialogue across traditional boundaries, such as those between scientists, the general public and decision makers," Schmitt-Olabisi said. "Using boundary objects, such as maps, diagrams and models, all groups involved can use these objects to have a discussion to create possible solutions."

Schmitt-Olabisi has vast experience working directly with stakeholders using participatory model-building techniques. She uses a model of a hypothetical heat wave in Detroit to illustrate the implications of climate change.

Climate change is anticipated to increase the frequency and intensity of heat waves in the Midwest, which could potentially claim hundreds or thousands of lives. Hot weather kills more people in the United States

annually than any other type of natural disaster, and the impacts of heat on human health will be a major climate change adaptation challenge.

To better understand urban health systems and how they respond to heat waves, Schmitt-Olabisi's team interviewed urban planners, health officials and emergency managers. They translated those interviews into a computer model along with data from earlier Midwestern heat waves.

Participants are able to manipulate the model and watch how their changes affect the outcome of an emergency. The exercise revealed some important limitations of previous approaches to reducing deaths and hospitalizations caused by extreme heat.

"The model challenges some widely held assumptions, such as the belief that opening more cooling centers is the best solution," Schmitt-Olabisi said. "As it turns out, these centers are useless if people don't know they should go to them."

More importantly, the model provides a tool, a language that everyone can understand. It is a positive example of how system dynamics models may be used as boundary objects to adapt to climate change, she added.

Overall, Schmitt-Olabisi finds that this approach is a powerful tool for illuminating problem areas and for identifying the best ways to help vulnerable populations. Future research will focus on improving the models' accuracy as well as expanding it beyond the Midwest.

"In order for the models to be deployed to improve decision-making, more work will need be done to ensure the model results are realistic," Schmitt-Olabisi said.

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