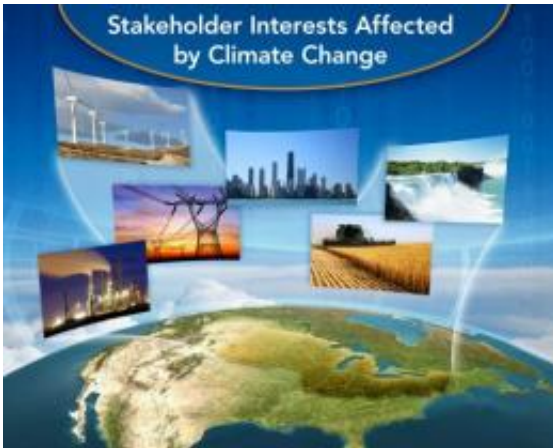


# Building a framework, brick by brick

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In the Midwest pilot region, researchers collected stakeholder input from industry sectors, regional planners and policy makers to construct a flexible framework for decision support on climate mitigation and adaptation strategies.

If you want to build a better house, first ask what your buyer needs. Researchers at Pacific Northwest National Laboratory built a modeling structure for policy-making decisions addressing climate change. Their research identified specific regional stakeholder needs, including real-world decisions faced by industry, regional planners, and policy makers. This unique modeling framework will provide decision support for regional climate mitigation and adaptation planning. The research was published in *Mitigation and Adaptation Strategies for Global Change*.

Home construction requires knowledge of building materials and construction techniques, local conditions, and the needs of the future

owner. Building a structure to tackle complex energy, water, economic, and land-use decisions to address regional climate change will take even more challenging coordination. Science typically focuses on individual systems processes and [climate change impacts](#). Industry, regional planners, and policy makers, on the other hand, must focus on investment decisions, regional resource impacts, and risk management, to name a few. The impacts of climate change and policy decisions for regional resource planning, such as water and land-use, loom large. This new tool will assist researchers to better characterize uncertainty and manage the risks in those decisions.

"Our research was directed at getting clarity on the most important mitigation and adaptation alternatives facing regional stakeholders," said Ms. Jennie Rice, a scientist at PNNL and lead author of the paper.

"What are their decision criteria—the issues that will drive their decisions? This work is being used for tool development and demonstration to help ensure the modeling will provide useful support for those regional decisions, by revealing key land-energy-water interactions and conflicts, and engaging stakeholders."

The U.S. Midwest was chosen as a pilot region for this study. Through a combination of stakeholder interviews and literature review of regional studies, the researchers identified the decision support needs of stakeholders from the energy, water, land use and agricultural sectors for climate mitigation and adaptation.

Unlike other regional [climate change](#) studies that have centered on impact assessment, this research focused on the key decisions and criteria for making decisions at the regional level. The research targeted both reducing greenhouse gas emissions and finding alternatives to effectively adapt to climate changes; for example, changes in averages and extremes of precipitation and temperature. The research results provide guidance not only for the capabilities included in the integrated

Regional Earth System Model (iRESM) initiative, a PNNL Laboratory Directed Research and Development investment, but also for the demonstration of the iRESM modeling framework.

"This research provides a much-needed structured approach for engaging with stakeholders from different sectors," said Dr. Ian Kraucunas, atmospheric scientist and leader of the PNNL iRESM initiative. "The flexibility of the framework will support the identification of key variables at the regional level, an important component in characterizing uncertainties for mitigation and adaptation strategies."

While the current research focused on the Midwest region of the U.S., the framework is designed to be adapted to other parts of the country and to other nations. Future research will focus on a range of numerical experiments to explore key science questions and the need to identify sources of model uncertainty in the framework.

**More information:** Rice JS, et al. 2012. "Incorporating Stakeholder Decision Support Needs into an Integrated Regional Earth System Model," *Mitigation and Adaptation Strategies for Global Change*. [DOI:10.1007/s11027-011-9345-3](https://doi.org/10.1007/s11027-011-9345-3).

Provided by Pacific Northwest National Laboratory

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