Climate Wizard makes large databases of climate information visual, accessible

December 15 2009

A Web tool that generates color maps of projected temperature and precipitation changes using 16 of the world's most prominent climate-change models is being used to consider such things as habitat shifts that will affect endangered species, places around the world where crops could be at risk because of drought and temperatures that could cripple fruit and nut production in California's Great Central Valley.

Climate Wizard, a tool meant for scientists and non-scientists alike, is being demonstrated by The Nature Conservancy in Copenhagen, Denmark, in conjunction with the climate summit underway there. It also is the subject of a presentation Tuesday, Dec. 15, at the American Geophysical Union meeting in San Francisco and a paper just released online by the Public Library of Science's PLoS ONE with Evan Girvetz as lead presenter and lead author. Girvetz worked on Climate Wizard during postdoctoral work at the University of Washington's School of Forest Resources and just accepted a job with The Nature Conservancy.

"Climate Wizard is meant to make it easier to explore climate data in an interactive way," Girvetz says. "It makes the data accessible in ways that are more intuitive, even for people who are not climate scientists."

For example, data used by the U.N. Intergovernmental Panel on Climate Change, the science organization evaluating the risks of climate change, is made visual and more readily understandable through Climate Wizard. Politicians, resource managers and citizens are all potential users, Girvetz says. Find Climate Wizard at http://www.climatewizard.org/.

Climate Wizard, a joint effort among the UW, University of Southern Mississippi and The Nature Conservancy, lets users focus on states, countries or regions around the world and apply different scenarios to generate color-coded maps of changes in temperature and precipitation that can, in turn, be used to consider such things as moisture stress in vegetation and freshwater supplies.

Users can choose from a number of parameters. For example, one can look at the climate of the past 50 years or projections for mid-century, the 2050s, or toward the end of the century, the 2080s. Among other variables, one can generate maps based on the Intergovernmental Panel on Climate Changes' estimates of greenhouse gas emissions being high, medium or low in the future.

One can consider the projections from each of 16 individual climate models. Girvetz recommends using one of the newest features added to the program, the ability to create an ensemble of some or all of the 16 models. Want to average the temperatures of, say, the 12 climate models that forecast the largest temperature increases? Climate Wizard can do so almost instantaneously.

"Ensembles can give a better range of future possible climate changes compared to using a single model," he says.

Girvetz was the project's analytical lead, taking the 16 climate models and organizing the data from them so they could be queried. Chris Zganjar of The Nature Conservancy brought expertise about user experiences and George Raber of the University of Southern Mississippi developed a Web site to connect to the data sets organized by Girvetz. Other authors on the PLoS ONE paper are Edwin Maurer, Santa Clara University; Peter Kareiva, The Nature Conservancy, Seattle; and Joshua Lawler, UW assistant professor of forest resources.

"Because of the size and format of the datasets, climate data are notoriously unwieldy," Lawler says. "Climate Wizard makes those data readily available to a much wider audience."

More information: Girvetz EH, Zganjar C, Raber GT, Maurer EP, Kareiva P, et al. (2009) Applied Climate-Change Analysis: The Climate Wizard Tool. PLoS ONE 4(12): e8320. doi:10.1371/journal.pone.0008320

Provided by University of Washington