

OSU, Oxford, others launch citizen scientist climate modeling initiative

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An international group of scientists from the United Kingdom, South Africa and the United States is collaborating on a fascinating new climate modeling initiative – using the idle computers of thousands of citizens to create a network of digital power that surpasses that of the best supercomputers.

Oxford University launched the initial effort in 2003 and its "climateprediction.net" project has used hundreds of volunteers to test climate simulation models. Now that effort is expanding to look at regional, as well as global climate modeling, specifically in southern Africa, Europe and the western United States, and broadening the scope of its volunteers.

Oregon State University is leading the effort on the western U.S. portion of the study, building on initial work done at the University of Washington. Pennsylvania State University has joined with the University of Cape Town to look at South African climate.

The rationale, scientists say, is simple.

"In less than two months, we can run 40,000 different year-long climate simulation models with our network of volunteers," said Philip Mote, director of the Oregon Climate Change Research Institute at OSU and one of the principal investigators on the project. "A dedicated supercomputer, during that time, could simulate a couple hundred years worth of data.

"It's exciting that both climate modeling and computer technology have advanced to the point that people at home can contribute to the effort to study climate change," he added.

Microsoft Research provided initial funding for the West Coast portion of the project; additional support for the research has come from the Bureau of Land Management in Oregon and Washington, the California Energy Commission, and the U.S. Geological Survey.

"By bringing together citizen volunteers, public institutions, and private corporations across three continents, the Climateprediction.net 'Weather at Home' project is a great example of the types of public-private partnerships necessary to address today's important issues," said Tony Hey, vice president for External Research, a division of Microsoft Research.

Volunteers can sign up for the project at:

<http://www.weatherathome.net/> and learn more about the initiative. Mote said participants can download units onto their computer and run the simulations when their computer is on, but idle. "It's like a screensaver," he pointed out.

It takes about a week to run a year-long unit of climate data and the program will automatically send finished results back to the scientists each month.

Project leaders hope creating a large network of volunteers will give them the computing power to run regional climate models that can test the efficacy of different models and determine what impacts that subtle changes may have on climate. In these regional studies, the models will be on a much finer scale than on the global climate models, and explore even more variables – such as winds, cloud cover and humidity.

"This is not about simulating the weather and trying to predict storms more accurately," Mote said. "This is about looking at the complexity of climate and trying to determine which things could change and where, and how confident we are in the changes."

One major experiment involves testing different formulations of the regional climate model to simulate conditions from 1960 to 2010 and using real sea surface temperatures and measurements of sea ice, atmospheric greenhouse gases and aerosols (cloud formation) to compare those models with recorded observations – a process that will help fine-tune future climate models.

Other experiments include:

- Producing a forecast of changes in regional weather events in the 2020s and 2030s, including the likelihood of drought, flood and extreme heat or cold;
- Analyzing changes in climate over the past 50 years in an effort to determine what changes can be attributed to human interference in the climate system;
- Forecasting potential implications of two-, three- and four-degree increases in global temperatures toward the end of the century;

Mote and colleagues at the University of Washington helped design the regional experiments for the western United States that will get down to a scale as small as 15 miles.

"The results will help better inform government, business leaders and resource managers about the specifics of climate so they can take

appropriate steps in dealing with potential changes," Mote said. "Our citizenry will be affected by changes in [climate](#); here is their chance to help describe and plan for the future."

Provided by Oregon State University

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