



Computer modeling helps manage wildfires

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When predicting how a wildfire might develop, scientists must take into consideration conditions such as temperature, humidity, wind speed, wind direction, weather patterns, available fuel, fuel conditions, and terrain.

That's a lot of rapidly changing data to consider at any given time, but the Laboratory's supercomputers make the data analysis a little more manageable.

For decades Los Alamos has built computer models of complex systems that move and change through time. That work includes hot gasses (fire) and the atmosphere, so when a team of scientists in the Laboratory's Earth and Environmental Sciences division started collaborating with the U.S. Forest Service Rocky Mountain Research Station and Southern Research Station, they were able to simulate the interacting processes that make up a wildfire as a basis for predicting its behavior.

The result is Firetec, the first wildfire model to simulate the interaction among many of the physical processes that determine the continuous changes between fire and its surroundings. Now developed in collaboration with U.S. Forest Service, Firetec simulates three-dimensional interactions among fire, fuel, and the environment (terrain, vegetation, etc.) at landscape scales.

Firetec presents a new way of studying fire that provides additional scientific input for decisions by policymakers working in land management, water resources, and energy. Firetec scientists hope the technology will eventually assist fire and fuel management operations in the field during a fire. Lab scientists are contributing to the development of less-detailed but faster-running tools that could be run on laptops (rather than giant supercomputers) in the field.

Smoke over the National Security Sciences Building at Los Alamos National Laboratory in July 2011.

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