

# Fire Sensor Demonstration Project at Santa Margarita Ecological Reserve

A coalition of community groups, businesses, universities and fire response agencies in the Fallbrook area are collaborating to install a network of early-warning fire sensors at the Santa Margarita Ecological Reserve (SMER). The \$1.2 million project is funded by a grant from the National Telecommunications and Information Administration of the Department of Commerce and generous matching funds from the project partners.

## Purpose

The goal of the project is to demonstrate the potential of new technologies to enhance fire safety in backcountry areas by alerting emergency response personnel about fire occurrence. The project will determine if fire sensor networks can be used to (1) detect ignition in surrounding areas, and (2) raise awareness of fire hazards and enhance fire preparedness in the Fallbrook community.



The project team is currently installing a network of 13 state-of-the-art wireless wildfire sensors, four weather stations, and four remote cameras in and around SMER. Critical broadband Internet connectivity, which is provided by the National Science Foundation-funded High Performance Wireless Research and Education Network (HPWREN), is coupled with a collection of ecological sensors and data to make SMER a dynamic and engaging testbed for showcasing a real-time fire detection system. The data from the sensors and instruments will be delivered via pagers, email, and a website to emergency personnel and the general public. Teaming various public, academic, community and business organizations, the collaboration promises to have wide impact in the region.

## Fire Sensors

FireAlert DCS by Ambient Control Systems is a stand-alone, self-powered sensor designed to detect and monitor wildfires. A patented infrared optic system scans 360 degrees horizontally and distinguishes wildfires from other thermal phenomena. When a fire is detected the system transmits a message by radio to a receiver unit, which relays the message to a central computer server.

## Notification System

A computer server deployed at SMER receives messages from the network fire sensors and automatically transmits notifications by email and telephone to computers, phones,

and pagers. The notifications, which indicate location, time, and direction of fire, as well as contacts for additional information, are then parsed and depicted on a website hosted by the SDSU Visualization Center. The website includes a regional map showing the estimated location of the fire along with additional pertinent information.

## Education Website

An education website for the general public is also being constructed at SDSU in consultation with the project partners. The website will indicate the current fire danger as calculated using data from SMER weather station and web cameras, current sensor network status, historical fire information, a community calendar, discussion forums, and wildfire preparedness instructions tailored for specific segments of the local population. A team from the SDSU School of Communication has designed a study to evaluate the effect of the education website on the Fallbrook community.

## Funding Agency

Department of Commerce Technology Opportunity Programs  
[www.ntia.doc.gov/otiahome/top](http://www.ntia.doc.gov/otiahome/top)

## Contact

Dr. John Kim  
619-594-2896  
[jkim@sciences.sdsu.edu](mailto:jkim@sciences.sdsu.edu)

## Project Partners

SDSU Field Station Programs  
Fallbrook Fire Safe Council – Tracy Ragsdale  
California Department of Forestry and Fire Protection – Battalion Chief Rich Bolton  
North County Fire Protection District – Fire Marshall Steve Abbott  
SDSU Visualization Center – Dr. Eric Frost  
Mission Resource Conservation District  
Scripps Institution of Oceanography – Dr. Dan Cayan  
Ambient Control Systems – Jonathan Luck



FIELD STATION PROGRAMS



high performance wireless [research and education network](http://www.hpwrn.org)