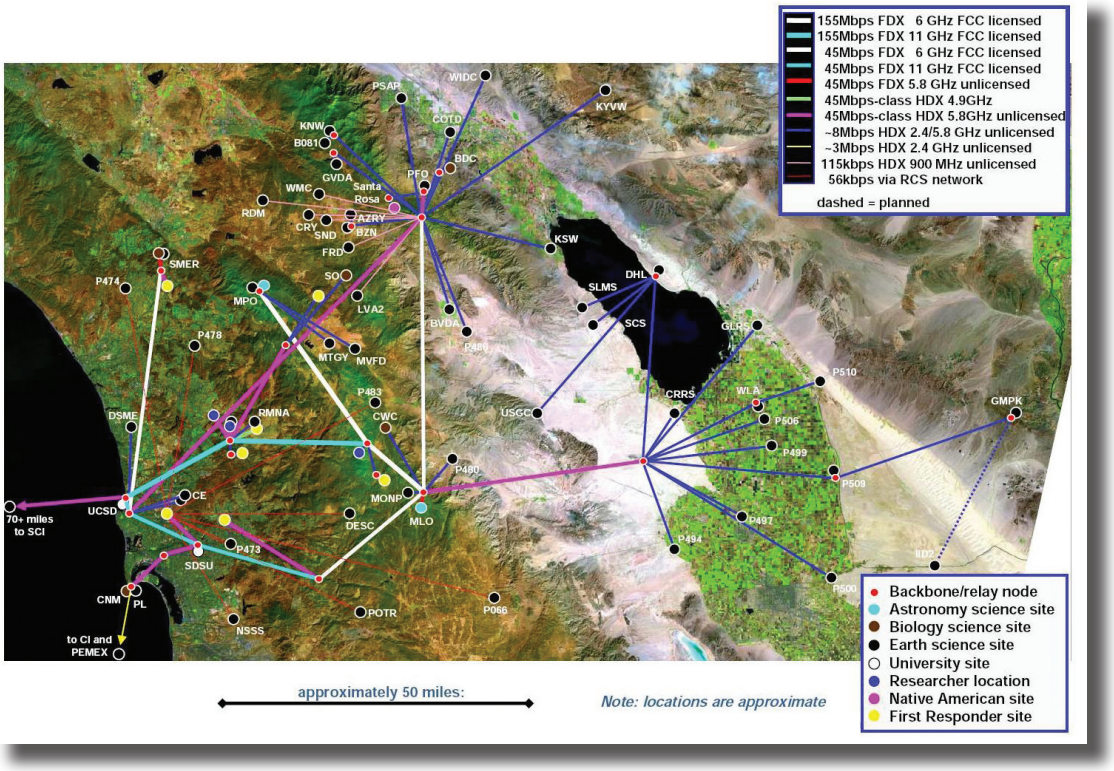
# HPWREN and First Responder Collaborations 2001 - present

## About HPWREN

The University of California San Diego High Performance Wireless Reseach and Education Network (HPWREN) is a National Science Foundation-funded high speed wireless network research project, supporting research, education, and first responder activities throughout San Diego and parts of Imperial and Riverside counties for the last several years.

Over the last decade, the HPWREN network has evolved to encompass a vast area as shown in the graphic below. It spans from San Clemente Island via the southern California coast to the inland valleys, on to the high mountains, reaching more than 8700 feet, and out to the remote desert. Backbone nodes are mostly located in rural and remote areas, often focusing on connecting real-time sensors.




## First Responder Collaborations

Since 2001, the HPWREN team has been working with San Diego regional first responder communities to better understand how high-speed wireless ad-hoc networking can assist with public safety in hard-to-reach areas of San Diego County.

Originally, environmental sensors, such as web cameras and weather stations, were deployed on mountain tops at HPWREN tower sites to aid in determining potential causes of possible network outages. It quickly became clear that first responders can benefit from the availability of this sensor data as well.

*Solar-powered sensor station at the Santa Margarita Ecological Reserve near Fallbrook*

## Environmental Sensors

HPWREN has installed environmental sensors on several area mountain tops, including:

- web cameras (providing visibility and weather data)
- meteorological sensors (recording wind, humidity, air temperature, fuel moisture/temperature, and rain accumulation)

Data sets from the sensors are in frequent use by public safety officials.

## Real-Time Alert System

Included with the suite of meteorology sensors is a real-time alert system that automatically pages public safety officials when concerning environmental conditions are present. These are currently focused on Santa Ana conditions and trigger sensor-automated email and pager alarms during alarm conditions, based on HPWREN data parameterization by a Cal Fire Division Chief.

*HPWREN setup during the Coyote Fire at Puerta La Cruz*

## Permanently Connected Cal Fire Sites and ICP Sites

Cal Fire sites which are currently connected to HPWREN permanently include:

Red Mountain Fire Station
La Cima Fire Camp
Ramona Air Attack Base
Gillespie Helitack Base
Puerta La Cruz Conservation Camp

Additionally three Cal Fire pre-designated Incident Command Posts (ICPs) have HPWREN connectivity as a pre-deployed resource:

Dos Picos
Puerta La Cruz
Potrero

## Wild Fire Support

Several ICP sites were supported by HPWREN-deployed high-speed network communication capabilities:

Coyote Fire (July 2003)
Eagle Fire (May 2004)
Mataguay Fire (July 2004)
Volcan Fire (Sept 2005)
Border 50 Fire (October 2005)
Horse Fire (July 2006)

## The Future

Over the last decade, public safety agencies and the HPWREN project benefited greatly by this collaborative effort and there is significant potential to expand on this in the future.

For more information, please go to http://hpwren.ucsd.edu