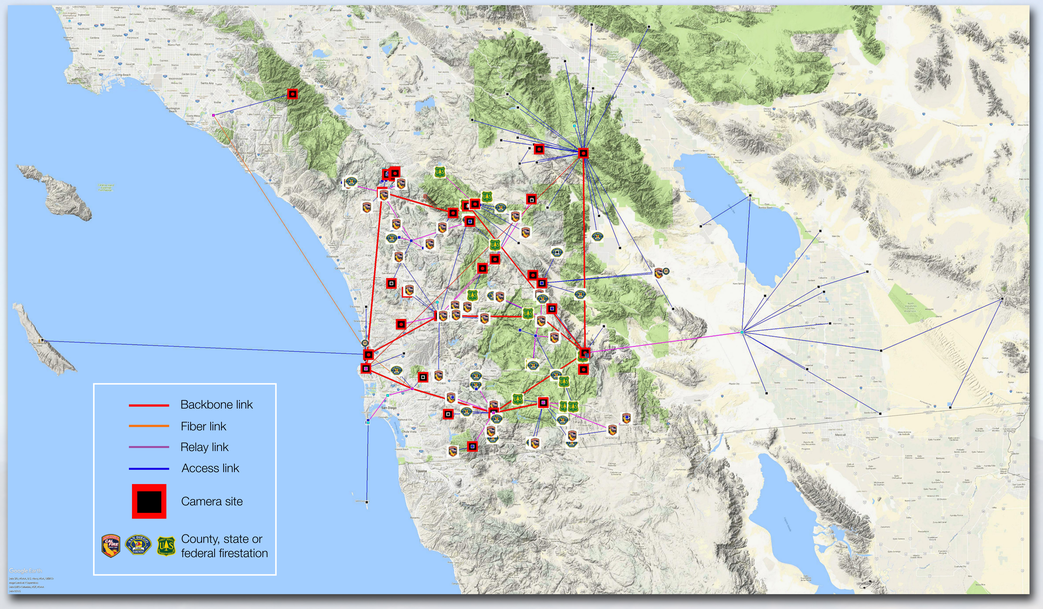
High Performance Wireless
Research & Education Network

HPWREN

The High Performance Wireless Research and Education Network (HPWREN) is a University of California San Diego interdisciplinary and multi-institutional partnership project managed by Frank Vernon at the Scripps Institution of Oceanography's Institute of Geophysics and Planetary Physics, in conjunction with the San Diego Supercomputer Center. HPWREN supports Internet-data applications in the research, education, and public safety realms.



HPWREN Backbone node installation work

Network camera view at a high-elevation site

Sensors with network connectivity at the Santa Margarita Ecological Reserve

Web camera capture of an osprey with a fish

Actual fire image captured by an HPWREN camera

Pan/tilt/zoom camera

The network spans from San Clemente Island in the Pacific Ocean, via the southern California coast to the inland valleys, east toward the mountain elevations of almost 9,000 feet, and the remote desert, reaching almost to the Arizona border. The network's longest link is 72 miles in distance: from the San Diego Supercomputer Center to San Clemente Island.

HPWREN supports a wide range of network application requirements, ranging from the high-volume and bursty astronomical data generated by the Palomar Observatory, to a steady output of continuous, low-volume real-time traffic from many devices such as earthquake and other environment-observing sensors. With its numerous points of presence, HPWREN creates opportunities to deploy new and diverse types of sensors distributed throughout southernmost California.

The Area Situational Awareness for Public Safety Network (ASAPnet) is a public/private partnership-based extension of the HPWREN infrastructure focusing on public safety communities, specifically San Diego County, California State, and federal firefighters in their mission as first responders. It persistently connects firefighter assets such as firestations, fire camps and air bases, and also allows for ad-hoc connections to Incident Command Posts and Base Camps. Of additional critical use to the firefighters is the HPWREN camera and meteorological sensor data.

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Palomar Observatory with geodetic/seismic sensor

HPWREN-connected California Wolf Center

Field-deployed seismic sensors

Fire station connected via the ASAPnet extension

Web cameras ready to be installed