High Performance Wireless Research and Education Network

The High Performance Wireless Research and Education Network (HPWREN) is a National Science Foundation funded interdisciplinary and multi-institutional network research project at the University of California San Diego, which also functions as a collaborative cyberinfrastructure on research, education, and first responder activities. It includes creating, demonstrating, and evaluating a non-commercial, prototype, high-performance, wide-area, wireless network in San Diego, Riverside, and Imperial counties. The network includes backbone nodes at the UC San Diego and San Diego State University campuses as well as a number of hard-to-reach science, education, and public safety sites.

HPWREN is headed by Principal Investigator Hans-Werner Braun at the San Diego Supercomputer Center. Co-Principal Investigator Frank Vernon is a Research Geophysicist with the Scripps Institution of Oceanography.

Remote Research

Scientists utilizing HPWREN for data connectivity in remote areas include astronomers, biologists, ecologists, meteorologists, oceanographers and others. HPWREN has facilitated for researchers and educators to collect and monitor a vast array of sensor data remotely as well as connect people and agencies that typically may not collaborate.

Rural Education and Distance Learning

The HPWREN project is continuously involved with education and outreach, such as distance education. An example is connecting inner city and underserved students to oceans, rivers, wildlife, and the environment, as well as remote conference activities, as part of Live Interactive Virtual Explorations (LIVE). Ongoing education projects include both informal and formal classroom use of real- time HPWREN-connected web cameras, weather stations, and environmental sensors located at several remote science sites in southern California.

Public Safety

Since 2001, the HPWREN team has been working with San Diego County first responders to better understand how high-speed wireless ad-hoc networking can assist with public safety in hard-to-reach areas. HPWREN-connected cameras, meteorological sensors, and real-time computer-driven alert systems located on several mountaintop towers provide first responders and rural community members with real-time images, environmental conditions, and public safety alerts in San Diego County.

Network Analysis and Research

The network research includes activities surrounding systems integration, workload profiling, performance analysis, and the utilization of quality of service (QoS) and policy based routing (PBR) methodologies, to adapt the cyberinfrastructure to a very diverse traffic load.

HPWREN
High Performance Wireless Research & Education Network

http://hpwren.ucsd.edu