



Homeland Security

By Coleen L. Geraghty



The new national imperative becomes a regional mission, with San Diego State at the forefront. And Washington is watching.

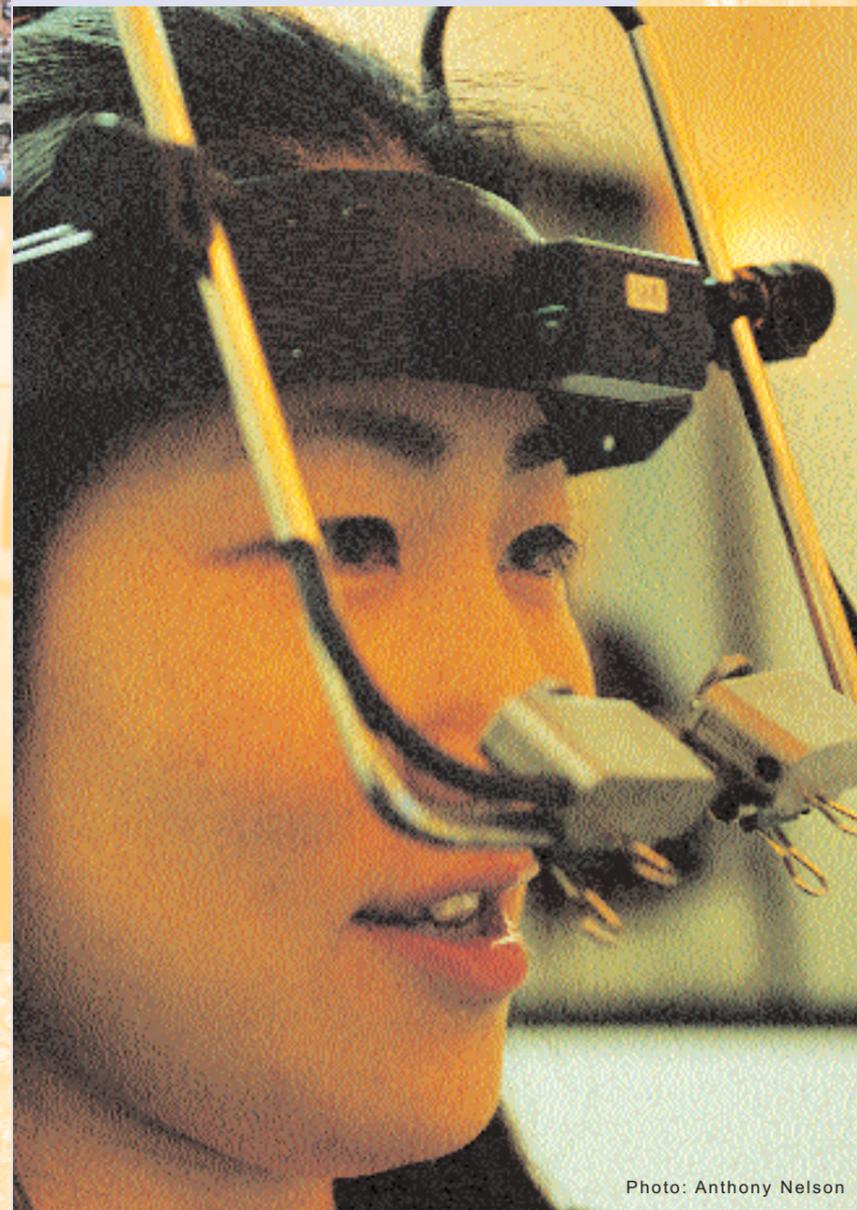


Photo: Anthony Nelson

Inside jam-packed QUALCOMM Stadium on Super Bowl Sunday 2003, Buccaneers and Raiders battled for a championship.

Outside, space cowboy look-alikes in Hazmat suits paced the perimeter, checking air and water sensors for warning spikes. Part of a San Diego State University-led team, they were staging a sophisticated response to a simulated public health emergency, such as an act of terrorism. Local and federal security experts assigned to the Super Bowl took note. By the time the Buccaneers had felled the Raiders, San Diego State had proven its commitment to implementing a new national imperative.

The work began after the fall of the Twin Towers, and long before the Department of Homeland Security existed, when communities across the country began to assess their own vulnerabilities to terrorist activity at the local level.

San Diego officials saw security hot spots everywhere – at the bustling port, on the border with Mexico, at the international airport downtown and at smaller airfields in the suburbs, across the arching span of the San Diego-Coronado Bridge and even at the San Onofre nuclear power plant 50 miles away.

But local leaders realized these potential problems also presented an opportunity: San Diego could well become a template for homeland security solutions. It would take organization, communication, and the best minds available. So California congressional representatives Duncan Hunter and Susan Davis turned to two pre-eminent local universities – UC San Diego and San Diego State.

In the tradition of community collaboration that has always distinguished San Diego State University, the campus immediately offered its resources and personnel to enhance San Diego's homeland security efforts. Today, SDSU faculty sit side by side with regional officials in public health meetings and on advisory groups that plan responses to potential emergencies. Researchers and students at San Diego State are turning technological wizardry into practical applications for port and border security. In short, SDSU faculty, students and alumni are involved in homeland security ventures all over the region.

Dolores Wozniak, dean of the College of Health and Human Services, co-chairs the Regional Network for Homeland Security, a dynamic consortium of public and private institutions charged with evaluating San Diego's first-response needs and capabilities, and developing strategies to bridge the gaps between them. The Regional Network's mission

is two-fold: to pursue state and federal funding opportunities, and to strengthen homeland security programs by dispersing information and leveraging local resources.

Peter Andersen, a professor in the School of Communications who is also a leader in the Regional Network, believes the university's involvement makes good sense. "SDSU contributes significant brainpower to the Regional Network," he said. "We are a linchpin in helping

the Department of Homeland Security. But in the absence thus far of any substantial federal funding, the university has partnered with community groups, elected officials, private companies and county agencies to fashion viable strategies for responding to potential threats.

The most comprehensive expression of their response to date unfolded Jan. 26 behind the scenes of Super Bowl XXXVII as some 70,000 football fans gathered in San Diego's



to inform the public and in collaborating with emergency services. In addition, this is an opportunity for us as an institution to conduct some very excellent funded research that has an impact on homeland security."

Like other major universities, San Diego State is competing for a share of the federal funds President Bush committed when he signed legislation authorizing

QUALCOMM Stadium. While athletes from Oakland and Tampa Bay fought for the National Football League Championship, about 200 volunteers stationed in and around the stadium staged a drill based on the premise of a natural or man-made disaster. Truly a demonstration of community activism, the SDSU-led exercise called ShadowBowl came together because committed people from

academia, technology, medicine, business and county agencies pooled their talents in an effort to "pre-pond" to a potential mass casualty situation.

ShadowBowl was the brainchild of San Diego State alumnus and adjunct professor David Warner, a medical neuroscientist with kinetic enthusiasm for marrying communications technology and health care applications. Without government funding, using off-the-shelf or borrowed equipment, networking with

Department of Homeland Security, the technology demonstrated at ShadowBowl is "highly relevant to our homeland security mission."

SDSU's cavernous Immersive Visualization Laboratory became command central as Warner adapted Internet-based technology to connect first-responders with medical experts in distant locations. Working with them to establish the real-time, two-way audio and video system was Bob Younger, business area manager for advanced technology transition at the Navy's SPAWAR Systems Center.

The resulting breakthrough communications system enabled participating doctors across the nation to view the "disaster scene" through video cameras attached to the emergency workers' headgear. In an impressive, futuristic twist, first-responders could speak with physicians many miles away, and see, on a PDA screen, a doctor's guiding hand superimposed over the image of the "disaster victim."

As Warner directed the emergency response simulation, Eric Frost, professor of geological sciences, and Bob Welty, director of homeland security projects for the SDSU Foundation, supervised operations from the "Vis Lab." The team monitored vital data on air and water quality collected by strategically placed environmental sensors, and crowd movement detected by the stadium's security cameras.

This last task was one that ShadowBowl organizers had not anticipated. But in the final days before the big game, Super Bowl security managers asked Warner to stand by, ready to convert the Vis Lab into a fallback communications hub for law enforcement officers.

local law enforcement and medical experts, Warner created an emergency readiness and response system that dazzled federal homeland security officials, including FBI and CIA agents assigned to the Super Bowl.

In the words of Steve Cooper, special assistant to the president and senior director for information integration at the U.S.

Emergency Training

"In an emergency, what's needed are trained people. We are taking public health students who already understand disease control, and sharpening their skills in surveillance, field investigation and community education."

Louise Gresham

"They said they didn't even know this kind of capability existed," Warner said. "The agencies were overwhelmed; we were filling the holes they couldn't fill to support public safety."

As ShadowBowl demonstrated, San Diego State's unique contributions to homeland security flow from high levels of communication and trust established between university and community. So naturally, when members of the Regional Network divided the tasks set before them, SDSU assumed responsibility for public health and safety/education, training and communications – an ambitious undertaking and one requiring the highest level of community interaction.

"There is such a dynamic collaboration between SDSU and the community," observed Louise Gresham, an epidemiologist and Graduate School of Public Health professor who also works with the Regional Network.

Gresham directs two grants for SDSU's Graduate School of Public Health; both hold homeland security implications. One finances the training of public health students and staff for emergency response, particularly to a bioterrorism

Beyond Shadow Bowl

As Dave Warner began writing the story of ShadowBowl in his head, he realized its enormous potential. It would be a multi-party effort led by San Diego State University. It would establish professional relationships and personal rapport across a broad spectrum of the San Diego region. And it would showcase technology customized to protect community well-being.

threat. The second funds a program to educate clinicians working with Native American communities about how to monitor and deal with the effects of biological, nuclear and chemical attacks.

Public health students are also creating a terrorism awareness Web site for the San Diego County Office of Emergency Services. When completed, five slide shows on the site will relay information and advice in both English and Spanish. The project builds on an earlier student effort – a bilingual curriculum manual for public health workers that outlines various chemical and biological threats and treatments.

Projects like these extend San Diego State directly into the community and simultaneously connect students with experienced professionals in mentoring situations. In the College of Engineering, for example, professor Ron Kline's students have conducted a technology assessment of San Diego's port and border security. After visiting security posts and interviewing key border agency personnel, the students identified assets and vulnerabilities, along with new technologies, such as transborder tunnel detectors and remote vehicle-disabling devices, that could enhance security efforts.

San Diego State has long been a champion of such emergent technology for homeland security applications. As a partner in the Center for Commercialization of Advanced Technology (CCAT), SDSU works with other public and private institutions to identify and help finance start-up companies that develop anti-terrorism technologies.

One such venture is EyeTracking Inc., founded by Sandra Marshall, an SDSU psychology professor. Marshall discovered a way to use pupil dilation as a gauge of cognitive effort and fatigue.

Marshall is now collaborating with other researchers and companies to take augmented cognition technology to the next level for possible military application. Jeffrey Morrison, a decision support project manager for SPAWAR Systems Center, likes the idea. "[This project] could dramatically improve decisions of military operators by helping them manage the information they receive," he said. Funded by the Defense Advanced Research Projects Agency (DARPA), the sensory technology will be tested by defense contractors over the next two years.



Photo: David Friend

San Diego State is home to numerous leading-edge research efforts such as Marshall's, and much of it is relevant to anti-terrorism. Engineering professor Joseph Katz and his students, for instance, contributed invaluable technical assistance to Northrop Grumman during development of the Global Hawk, an unmanned, high-altitude surveillance aircraft. Equipped with radar, infrared and high-resolution photo imaging capability, the Global Hawk gives ground commanders an unprecedented ability to pinpoint hostile activity almost instantaneously, at great distances and over vast geographical areas.

In the environmental engineering department, Mirat Gurol and her colleagues are completing a study of ozone's effectiveness in fighting anthrax. The work was financed by a \$100,000 research grant from the National Science Foundation. Biology professor John Love is also tackling anthrax. His research team uses computer

technology to design antibody-like proteins that could bind to and inactivate harmful proteins released by disease-causing organisms.

Efforts like Love's and Gurol's will proliferate with completion of a planned BioScience Center at SDSU. Envisioned as a campus home for innovative programs like the San Diego State University Heart Institute, the Center for Microbial Sciences and the Molecular Biology Institute, the facility also will lease facilities to private companies working to develop or test biodefense technology. The result: an interactive research environment for many fields of biology and engineering, including those with homeland security applications.

"We will be directly involved in strengthening preparedness for bioterrorism by supporting research with organisms considered most likely to be agents of biological warfare," said Stanley Maloy, professor of microbial sciences.

Each of these endeavors attests to San Diego State's extraordinary outreach efforts in homeland security. Already, the university's contributions have extended far into the community, improving health services, law enforcement, border security and communications. As a result, the San Diego region is better equipped to face our unique homeland security challenges and develop exportable solutions for other major metropolitan areas.



ROTC roll call

The U.S. Army, Air Force, and Navy all operate Reserve Officers' Training Corps (ROTC) programs at San Diego State. The university's Air Force cadet wing is the largest in California, and its Army battalion recently ranked 12th among 270 units in advanced training at Fort Lewis, Wash. The Navy (and Marine) battalion is part of a regional consortium. Several cadets who graduated this spring have already been stationed in Afghanistan and throughout the Middle East.

Cadets enrolled at SDSU:

- Air Force: 167
- Army: 88
- Navy: 60

First year on campus:

- Air Force: 1952
- Army: 1986
- Navy: 1982

Cadets commissioned since:

- Air Force: 905
- Army: 374
- Navy: 91

Program strengths:

- Leadership
- Discipline
- Time management
- Physical fitness