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SUNY-ESF is in the vanguard of anti-terrorism research

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By Cornelius B. Murphy Jr.

Consider this: a barrier of moored buoys equipped with optical biochip sensor technology designed to detect a wide array of water-based toxins, chemicals and microbes. Some of these substances are known to naturally occur in water, but some also are known to have been developed in the former Soviet chemical and biological warfare program and are suspected to be a terrorism weapon.

Silently, on a reeled cable, sensors are moving automatically up and down to various depths, sampling the water column, the surface layer and all throughout reservoir supply intake systems. Around the clock, these floating sentinels conduct millions of sensing evaluations, looking for trace evidence of threats as small as one part per quadrillion.

An analysis is computed and digitally encrypted and results are linked skyward to a satellite orbiting overhead and then relayed down to a New York City Department of Environmental Protection center computer more than 100 miles away. In every reservoir of the New York City supply system, other patterns of buoys stand guard, collecting, analyzing and linking like data.

In all weather, these robotic sentinels stand vigilant watch over New York City's fresh water supply, ready to alert the system of a terrorist biological or chemical attack or intrusion by other man-made or natural pollutants.

At the State University of New York College of Environmental Science and Forestry, this is not a vision of the distant future. At SUNY-ESF, this is a developing technology ready for test and evaluation.

The first deployment will test a standard sensor suite, a beta chemical detection array and the communications system. Later this winter in the laboratory, prototype biochips will be perfected to detect key monitored microbes, water-based toxins and chemicals. Full-scale operational readiness deployment is slated for July 2003, with a commercial model to follow closely.

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Today, if there is a single societal element most able to encourage the mind-expanding technological advancement necessary to counter threats like biological and chemical terrorism, that institution is the American higher education community and specialized research colleges like SUNY-ESF. Granting degrees from bachelors to doctorates, SUNY-ESF scientists and engineers are hard at work solving the complex modern environmental and science problems of a post-Sept. 11 world.

At Edwin C. Jahn Laboratory, established in 1997, SUNY-ESF resident expertise encompasses 24 special-purpose research laboratories and 34 instrument laboratories and support services facilities.

Since the 1970s, SUNY-ESF has been a national leader in the detection of toxins in the environment and is the host site for one of only two waterborne toxin detection laboratories in the nation.

Year round, SUNY-ESF's labs routinely receive samples from water authorities from around the nation and the world. Today, SUNY-ESF is a recognized national leader for the establishment of protocols and standards for toxins in water and recently was awarded \$3.3 million from the U.S. Department of Commerce's National Oceanographic and Atmospheric Administration to conduct the first-ever large-scale detection of toxins study in the fresh water of the Great Lakes.

For SUNY-ESF's part, ongoing basic and applied research and development over more than a half-dozen disciplines make it clear ESF is designed to put technology to work improving the environment. Whether working on the protection of New York City's water supply or Syracuse's Skaneateles Lake or Utica's Hinckley Reservoir, we at SUNY-ESF - together with our industrial and collaborating medical partner, Upstate Medical University - are developing, testing and preparing to deploy leading edge-detection and alert systems able to help protect our potable water supplies now and far into the distant future.

Clearly, higher education partnered with private industry offers a significant resource to assist our nation in fighting chemical and biological terrorism and protecting the environment. Cornelius B. Murphy Jr. is president of the State University of New York College of Environmental Science and Forestry in Syracuse.

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