US Army Corps of Engineers
Engineer Research and Development Center

U.S. Army Engineer Research and Development Center

Waterborne Pathogen Detection

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There is a need for remote, near-real time detection and location in austere environments of waterborne biological pathogens in potential drinking water sources. Since surface water is the primary water source for our deployed Soldiers, there is a critical requirement to determine the extent of potability, especially in undeveloped countries, and to provide continuous monitoring of water quality.

To address this need, Sporian Microsystems, Inc. designed and built a small portable biosensor device that is transportable to field locations to monitor streams and effluents for the detection of biological pathogens. This detection system will function remotely and can be integrated with wireless communications and global positioning to provide timely, critical information.

Sporian's technology consists of a patented optical biosensor that is sensitive, selective, and can operate for long periods on very little power. It can be easily tailored in the field to detect a variety of pathogens by replacing swappable modular cartridges. The sensor is connected to a buoy with wireless networking capability, tamper detection sensors, and additional sensor scalability. Buoys communicate wirelessly with rugged gateways that aggregate data and provide a first tier of data analysis. This facilitates rapid detection and notification of natural or human tainting of the water supply. Sporian's system will provide our Soldiers with significantly increased ability to monitor the quality of in-theater water supplies.

The US Army Research, Development and Engineering Command (RDECOM) and the US Army Tank Automotive Research, Development and Engineering Center (TARDEC) have also shown an interest in the system and have been involved in field testing. Sporian has received interest in its technology from companies in both the water quality and health care industries. Sporian has been awarded two patents for its sensing architecture.

Phase III Impacts

To date, Sporian has received $123K in Phase III funding awarded by the US Army Engineer Research and Development Center (ERDC), and anticipates another $305K in the second quarter of 2010. Sporian is integrating its system with commercial off the shelf (COTS) water sensors from other vendors, adding global positioning system (GPS) capabilities, integrating photovoltaic energy harvesting, providing additional tools to permit ERDC systems to query Sporian's database, and performing field testing.

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