

WATER QUALITY PROTOCOLS FOR VITAL SIGNS MONITORING IN NATIONAL PARKS

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ABSTRACT

In 2001, the National Park Service initiated the Vital Signs Monitoring Program and embarked on a new era of science-based monitoring to provide park managers with the information they need to understand and better protect resources. Water resources and particularly water quality is a critical component of this strategy for park monitoring, and a national effort is underway to characterize the current status and determine trends in the condition of park aquatic resources. Water quality monitoring has been focused primarily on identified impaired and pristine waters.

The overall approach to network water quality monitoring is underpinned by solid scientific monitoring through a protocol and standard operating procedures development process described in Oakley et al. (Wildlife Society Bulletin 2003, 31(4)). The operating procedures address key quality assurance questions related to monitoring objectives, sampling design, laboratory and field methods, data handling, management and archiving, reporting, personnel requirements, training, and operational requirements. A multi-agency and academic peer review of the protocol further guarantees that the program will be implemented in a sound scientific manner.

Specific monitoring protocols are being developed for wadeable streams, large rivers, lakes and ponds, seeps and springs, wetlands and wetland habitats, groundwater, estuaries and marine areas, amphibians, macroinvertebrates, fish, stream flow quantity, nutrients, and toxic contaminants. Different networks are focusing on different protocols depending on the aquatic vital signs they intend to monitor. The San Francisco Bay Area Network and Northern Colorado Plateau Network freshwater quality protocols are good examples of narratives that are well organized, address quality assurance and control issues, and incorporate state guidance. The Greater Yellowstone Network regulatory water quality protocol is a good example that focuses on monitoring of impaired or 303(d) listed waterbodies. The Great Lakes Network rivers protocol is an example that addresses large rivers, and the Northeast Coastal and Barrier Network estuary protocol is an example that targets indicators of estuarine eutrophication.

A series of national meetings are being held to facilitate information exchange among network aquatic professionals, central office experts, and network cooperators. This interaction is helping networks capture existing protocols and promote standardized monitoring procedures. Also, listserv sites and databases are being developed to help facilitate information/data exchange.

KEYWORDS

Vital signs, networks, monitoring, protocols, standard operating procedures, national parks