National Park Service
U.S. Department of the Interior

Air Resources Division

Calling All Citizen Scientists and Dragonfly Enthusiasts!

Study Description:

Welcome to the 3rd year of the citizen scientist dragonfly study in national parks! This project encourages students and visitors in national parks to collect dragonfly larvae for mercury analysis as part of interpretive programs. The study connects people to parks, directly implementing the *Call to Action*, and provides baseline data to better understand the spatial distribution of mercury contamination in national parks.

Mercury is a globally distributed contaminant that can harm human and wildlife health. The main source of human-caused mercury in most remote national park environments is atmospheric deposition from coal-burning power plants. Mercury threatens natural resources the NPS is charged with protecting.

Dragonfly larvae (*Odonata: anisoptera*) can serve as indicators of mercury risk by characterizing the availability of mercury to food webs. These aquatic insects build up high levels of mercury because they are predatory and are long-lived underwater. Additionally, dragonfly larvae are widespread across the U.S., important food for fish and birds, and relatively easy to collect. We think they are ideal biosentinels!

The U.S. Geological Survey joined the project team in 2013, expanding the scope of previous research. We are thrilled to have their expertise and an anchor for parks in the West. In addition to a more robust scientific study, this opportunity will enlighten even more citizen scientists about biodiversity and the influence we have upon natural systems.

The Youth Conservation Corps collects dragonfly larvae at Yellowstone NP in 2013 (above). Example larva (right): Odonata, Corduliidae

Parks Involved:

Twenty-two parks collected samples during the 2013 season. New funds expand the study to at least 40 parks over the next two years, so we are inviting additional parks to participate and fill in spatial gaps. Join us!

Sampling Procedure:

Dragonfly larvae (above) are collected using dip nets and by wading near shore in streams, ponds, or wetlands. Upon collection, individual larvae are placed in zipper-seal bags, and later shipped on ice to UMaine or USGS for analysis. Individuals are identified to family and length is measured in the field. Water and sediment (new in 2014) samples are also collected for mercury and mercury-relevant environmental chemistry. Participating parks will receive a sampling kit that includes all supplies except larger items like a dip net. Two to three water bodies (three if they are available) are selected per park, and at least 15 individual larvae are requested from each sampling site. There is no cost to parks.

Study Timeline:

Dragonfly larvae samples can be collected anytime during the 2014 field season. Sampling kits will be sent out on an as-needed basis. Data will be available in 2015.

Project Webpage:
http://www.nature.nps.gov/air/Studies/air_toxics/dragonfly/index.cfm

Participating Agencies and Partners:

University of Maine | U.S. Geological Survey | Schoodic Institute | University of Wisconsin – La Crosse | Dartmouth College | NPS Air Resources Division | participating national park units and citizen scientists

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