



Great Smoky Mountains National Park Uses YSI 556 in Species Identification Program

Discover Life in America, Inc. (DLIA), an organization which collects and disseminates information to understand, manage, conserve, enjoy, and benefit from the diversity of life on our planet, has started an All Taxa Biodiversity Inventory (ATBI) of Great Smoky Mountains National Park. This project is a comprehensive study of all the species within the Park. The need for the inventory is simple - it's difficult to preserve something if you don't know it exists. DLIA believes that a worldwide network of schools, community groups, and citizen scientists, facilitated by scientists and technology, can assemble enough knowledge and wherewithal over the next 50 years to save many species from extinction.

The Great Smoky Mountains National Park ATBI will collect information on the distribution, abundance, and natural history of an estimated 100,000 species that inhabit the Park. As part of the study, the YSI 556 MPS (Multiparameter System) is used to measure all field water quality parameters including temperature, dissolved oxygen, pH, oxidation reduction potential (ORP), and conductivity. These parameters are used to identify conditions that may affect the density and diversity of Oligochaeta (true segmented worms in the phylum Annelida). Some oligochaetes are restricted to unique as well as disjunct habitats such as caves, springs, other groundwater habitats, and even thermal vents in the oceans.

The class Oligochaeta represents the most diverse and widely distributed group of annelids in freshwater habitats in North America. While oligochaetes commonly are an important and often dominant component of the benthic community, specimens are rarely identified beyond class or family level. According to Mark Wetzel, Aquatic Oligochaetologist / Macroinvertebrate Zoologist with the Illinois Natural History Survey, "To date, over 200 species of freshwater oligochaetes representing 13 families and over 74 genera are known to occur in North America; of these, at least 10 families, 58 genera, and nominal 120 species...are known or thought likely to occur in the southeastern U.S." (Wetzel, 2005).

Status of the Research

Initial surveys for aquatic oligochaetes and other annelids in the Park began in September 1999 and have continued through 2003. Funding and small continuance grants will enable the research to continue. Ninety-eight aquatic sites have been sampled in the Park, including streams, springs, seeps, rimstone pools, and ponds. The YSI 556 MPS was used to sample water quality parameters at all sites to gather baseline data and to enable determinations to be made based on water quality values.

As of December 2002, over 24 species of aquatic oligochaetes, representing four families and 14 genera, have been identified from the studies. All 24 species are new records for the Great Smoky Mountains National Park; four represent new state records for Tennessee and one represents a new state record for North Carolina. Several as-yet unidentified species also have been collected from aquatic habitats from within the Park. The identification of numerous oligochaete specimens currently being processed will certainly add to the list of species known to occur in the Park. Understanding their water quality needs will also add to the information needed to potentially protect these species.

Future surveys for aquatic oligochaetes will be conducted in streams and springs draining to the north, several caves within the Park that contain standing or flowing water, small seeps and springs that occur at high altitudes within the Park, and several minor drainages flowing south, particularly those that flow into the impoundments of the Little Tennessee River system.

For additional information regarding **Discover Life in America** and the **All Taxa Biodiversity Inventory**, please visit <http://www.dlia.org/atbi/index.shtml>

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Citations

Wetzel, M. J. (2005). *The Aquatic Oligochaeta (Annelida, Clitellata) of the Great Smoky Mountains National Park, North Carolina and Tennessee, USA*. Retrieved December 1, 2005, from Illinois Natural History Survey website: <http://www.inhs.uiuc.edu/~mjwetzel/AOGSMNP.home.html>



The YSI 556 MPS handheld display instrument measures several water quality parameters, logs data, connects to a PC, is waterproof, and has a 3-year warranty.