

Project Title: Transfer of Mercury and Methylmercury Across Ecosystem Boundaries in Arid River Landscapes

Investigator: Weston Nowlin

Department: Biology

Project Summary:

Environmental mercury (Hg) contamination represents a serious threat to humans and wildlife. Humans have greatly altered the Hg cycle by releasing Hg via coal-fired power plants, mining, and industrial activities; approximately half of global Hg emissions are from humans. In the present study, I examined Hg contamination and fluxes at three sites in the Lower Rio Grande. I examined one relatively “low Hg” to two “high Hg” sites. Independence Creek (the low Hg site) is a tributary of the Pecos River and the high Hg sites (Tornillo Creek at Hot Springs and Terlingua Creek at Santa Elena) are near abandoned Hg mines. At all sites, we examined Hg contamination and trophic structure of aquatic food webs, and the cross–ecosystem Hg fluxes between stream and riparian habitats. We collected fish, aquatic and terrestrial insects, algae and sediments in July and October/November 2008. We also collected breast feathers from 17 and 26 birds from the Big Bend and Independence Creek sites, respectively. Ventral hair was collected from 28 and 10 bats from the Big Bend and Independence Creek, respectively. Due to limited samples of birds and bats, we have contacted several researchers that have collections from these areas. Currently, we have processed all invertebrate, algal and fish samples for stable isotope analyses and will receive the data within the next two weeks. In addition, data on the Hg content of fish, invertebrates, birds, and bats will be processed this summer. We expect to submit a manuscript within six months.

External Grants Applied:

1) Ecological Values and Ecosystem Services of Watersheds in the Lower Rio Grande River. Timothy Bonner, Weston Nowlin, and Thomas Hardy. USDA - SAWC Program. \$85,000

2) Effects of Invasive Species on the Biogeochemistry of Hyporheic Water from Sandbars: A Comparison Restored and Unrestored Areas in, Big Bend National Park. Kevin Urbanczyk (SRSU), Weston Nowlin (TSU-SM), Jeff Bennett (NPS. USDA - SAWC Program. \$47,000

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