



INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

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Reporting Year: 2009	Park: Sitka NHP	Select the type of permit this report addresses: Scientific Study
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Study Title (maximum 300 characters): Scale and distribution of global pollutants (mercury and POPs) in Southeast Alaska Network park watersheds			
Park-assigned Study or Activity #: SITK-00207	Park-assigned Permit #: SITK-2007-SCI-0002	Permit Start Date: Jun 01, 2007	Permit Expiration Date: Sep 30, 2007
Scientific Study Starting Date: Jun 01, 2007		Estimated Scientific Study Ending Date: Sep 30, 2007	
For either a Scientific Study or a Science Education Activity, the status is: Completed		For a Scientific Study that is completed, please check each of the following that applies: <input checked="" type="checkbox"/> A final report has been provided to the park or will be provided to the park within the next two years <input type="checkbox"/> Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park <input type="checkbox"/> All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed	
Activity Type: Research			
Subject/Discipline: Contaminants / Hazardous Materials			

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters): The main goal of this project is to conduct a contaminants survey in freshwater fish, benthic macroinvertebrates (BMI), streambed sediments, and stream water in the Indian River in SITK. The harmful effects of mercury (Hg) and persistent organic pollutants (POPs) in the environment is well established. However, there is scarce information on these pollutants in southeast Alaska, although the limited data indicate they may be present at high concentrations (Day et al., 2004; Fitzgerald et al., 2006; Vander Pol et al., 2004). While local emission sources are insignificant, global sources of Hg and some forms of POPs are projected to continue rising. In particular, the rapid economic expansion of China, whose energy needs are being met by extensive Hg-laced coal burning, is suspected to be leading to large increases in Hg export to Alaska via atmospheric transport pathways (Streets et al., 2005). Both Hg and POPs are highly volatile and tend to become concentrated at high latitudes due to atmospheric circulation patterns and polar temperature controls (AMAP, 2002; Pacyna and Pacyna, 2002). In addition, salmon and birds may act as powerful biovectors of these contaminants; accumulating them in oceans and distant source areas and depositing them in riparian areas as they pass through to spawn or migrate (Blais et al., 2007). This project would provide original data that would evaluate the current scale of these contaminants in the Indian River (and other SEAN streams), examine the landscape patterns that explain their distribution, and also pertain to the Vital Signs program by serving as a baseline data set to which future contaminants monitoring can be compared.
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Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

The Indian River contained some of the lowest values of filtered total mercury (HgT) (0.3 ng/L) in our survey of contaminants in SEAN watersheds, which also included 2 rivers in KLGO and 16 streams in and immediately adjacent to GLBA. Filtered methylmercury (MeHg) concentrations in the Indian River (0.03 ng/L) was close to the quantification limit (0.01 ng/L) Total mercury in streambed sediments (unsieved grab samples) was relatively low in the Indian River (9 ng/g dry weight), although MeHg in streambed sediments was relatively high for the SEAN streams. In both KLGO and SITK, MeHg and HgT concentrations in both types of mayflies collected (baetidae and heptageneiidae) were within the ranges seen at GLBA, generally occurring at concentrations similar to those in the medium-aged and older streams. Total mercury in Indian River juvenile coho tissues measured at 6.0 ng/g HgT, which is close to the average value for all the samples in the study. Juvenile coho collected for POPs analysis showed that the Indian River had the highest PCBs—nearly double that of the Skagway River and 3-8 times levels found in GLBA streams. A study on murre eggs throughout Alaska also found the Sitka area (on St. Lazaria Island) had the highest PCBs of all sites in that study (Kucklick et al., 2002; Vander Pol et al., 2004). Additionally, a concurrent survey of POPs in intertidal mussels in the SEAN showed that the Sitka area had the highest PCBs of all sites measured (D.Tallmon, personal communication), providing two other lines evidence that the area may be at a disproportionately high (compared with other SEAN streams) receiving end of atmospheric deposition of this pollutant. Although mercury and persistent organic pollutants were found in Indian River streamwater, sediments, and juvenile coho, none exceeded criteria for the protection of human health or wildlife.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):

\$0.00

Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):

\$0.00

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information form is estimated to average 1.38 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3130 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.

Privacy Act Notice: Scientific research, education and collecting activities within units of the National Park System that may impact parks invoke a permitting and reporting requirement per regulations at 36 CFR 1.6 (Permits), 36 CFR 2.1 (Preservation of Natural, Cultural and Archeological Resources), and 36 CFR 2.5 (Research Specimens). The National Park Service collects information about permit applicants and permittees to administer and document research, collecting, and reporting activities within parks. The information disclosed on this form is required and may result in denial of permit applications if not provided.