GEOSCIENTISTS-IN-THE-PARKS
2018 – PROJECT DESCRIPTION

NPS UNIT: SOUTHWEST ALASKA NETWORK – INVENTORY & MONITORING PROGRAM	PD #: 2018442

Position Title: Water Quality Analyst
Position Type: Guest Scientist
Primary natural resource discipline: Water resources
Location: Anchorage, Alaska

Applicants should submit a short technical writing sample to Krista Bartz (krista_bartz@nps.gov) by the application deadline

PROJECT DESCRIPTION AND WORK PRODUCTS

Position Description: Lakes integrate water, energy, nutrients, sediments, and pollutants from the surrounding land and air. Therefore, lake water quality can be a useful indicator of broad scale stressors, such as climate change. High-latitude lakes are projected to become not only warmer as a result of climate change, but also more turbid, more enriched in nutrients and organic matter, and more productive. These changes have the potential to impact the growth, survival, and reproduction of aquatic organisms such as salmon, and also the terrestrial organisms that rely on them.

The Southwest Alaska Network (SWAN) is one of 32 regional networks established as part of the National Park Service Inventory and Monitoring (I&M) Program. SWAN staff monitor several lake water quality parameters, including temperature, pH, conductivity, and dissolved oxygen. Because these four parameters are monitored by all I&M networks nationwide, they are called “core parameters.”

The SWAN has recorded hourly measurements of the four core parameters during the open-water season (May – September) at the outlets of Lake Clark and Naknek Lake since 2010 and 2012, respectively. In 2015, we began recording turbidity data as well. Our goal is to use these data to assess inter- and intra-annual patterns and drivers in seasonal water quality for two of the largest lakes in the National Park system.

SWAN is seeking an intern to help finalize, summarize, and analyze these data, and then convey the results in a formal technical report. Specific tasks of this position will be to: (1) finalize the data and associated metadata via uploading, correcting, and grading them in a database called AQUARIUS; (2) produce summary statistics for the data using AQUARIUS and R; (3) assess status of the core parameters and turbidity, in terms of their central tendency and variability; (4) assess trends of the core parameters and turbidity, via seasonal Kendall analyses in R; and (5) document findings on status and trend in a publishable report. Time permitting, the intern will explore relationships between these parameters and other SWAN datasets pertaining to water quality, water quantity, and weather.

Freshwater resources in the SWAN are abundant, featuring thousands of kilometers of rivers and two of the largest lakes in the National Park system: Naknek Lake (58,824 ha) and Lake Clark (31,117 ha). The Naknek Lake and Lake Clark watersheds are so extensive that they cover 48.6% and 31.6% of the land area within their

respective parks. In establishing these parks, Congress recognized the cultural, ecological, recreational, and economic importance of freshwater resources, with reference to protecting and maintaining lakes in their natural state in the enabling legislation (ANILCA 1980). SWAN's monitoring of lake water quality addresses the NPS mission of maintaining lakes in their natural state by quantifying the "natural state" baseline and assessing changes over time. The GIP internship described above would contribute directly to that effort. It would also make a previously internal dataset public, as mandated under a 2013 Executive Order for open, machine-readable data.

This position is offered through the National Park Service's Geoscientists-in-the-Parks (GIP) Internship Program in partnership with Stewards Individual Placement Program (Stewards) and The Geological Society of America (GSA).

Work Products:

- Uploaded, corrected, and graded data for two lake outlet sites, with the data made publically available through the NPS database, AQUARIUS
- Tabular and graphical summaries of water quality parameters recorded at the two lake outlet sites
- Technical report documenting status and trend of water quality parameters, intended for publication in the NPS Natural Resource Report series
- R code created during the course of the project, fully commented for transparency and reproducibility
- Intermediate data sets generated during the course of the project

QUALIFICATIONS

Applicants must have strong backgrounds in data analysis, as demonstrated through coursework in statistics, applied mathematics, ecological modelling, etc. Applicants must also be proficient at programming in R. Experience communicating scientific information verbally and in writing and the ability to work independently and meet agreed upon deadlines are also required. A detail-oriented mindset is key. Previous experience working with water quality data is helpful.

The applicant must be a U.S. citizen or U.S. permanent legal resident (“green-card-holder”) between the ages of 18 and 35 years old. Prior to starting this position a government security background clearance will be required.

VEHICLE/DRIVER'S LICENSE REQUIREMENTS

Applicant must have a valid driver’s license and a good driving record. A valid driver's license is required for the project. That said, we anticipate the intern will have little if any need to drive a park vehicle, so this is mainly to preserve options should the need arise.

A personal vehicle is not required for the commute. As stated below, Anchorage is a small city, with many housing options available within walking, cycling, or busing distance of downtown, where the NPS office is located. A bicycle (complete with lock, lights, helmet, and studded tires) is available for loan.

If the GIP is required to drive a park vehicle for their position, a driving records search will be performed and the GIP’s ability to drive a park vehicle will be contingent upon the results. Examples that will preclude a GIP from driving a park vehicle include DUIs, multiple moving vehicle violations, suspended or revoked license, or three or more accidents (regardless of fault) in the last 3 years. The program’s liability insurance coverage for driving a NPS vehicle is limited to GIPs that are 21 years or older and have a good driving record. If the NPS unit cannot provide alternate liability insurance coverage for these persons, the GIP will not be permitted to drive an NPS vehicle their workday.

HOUSING

Park housing is not available. Anchorage is a compact city, with many housing options available within walking, cycling, or busing distance of downtown, where the NPS office is located. Options range from shared housing (at the low cost end) to multi-room apartments (at the high cost end). See Craigslist for short-term rental prices

(https://anchorage.craigslist.org/search/hhh). Note that prices during summer tend to exceed those during the rest of the year, when this internship will occur. The NPS will offer the intern a housing allowance of $2,899 ($145/week for 20 weeks).

INTERNSHIP START/END DATES

Start Date: 10/22/2018
End Date: 3/8/2019
Number of weeks: 20
Flexibility of dates: Yes

STIPEND PAYMENT

$7,000 for 20 weeks ($350/week)

HOUSING PAYMENT

$2,899 for 20 weeks ($145/week)

TRAVEL ALLOWANCE

$1,000 (For non-local candidates)

AMERICORPS PROGRAM

AmeriCorps is a program that engages individuals in intensive community service work with the goal of "helping others and meeting critical needs in the community". The GIP Program is supported through AmeriCorps by providing a Segal Education Award in addition to the GIP's living stipend and travel/housing allowance.

Upon successful completion of the GIP position, the GIPs (AmeriCorps members) are eligible for a $1,230 - $5,815 pre-tax education that can be used for paying back student loans or for continuing their education.

AmeriCorps limits the number of terms an individual can serve to 4 terms. If an applicant has previously completed 4 GIP or other AmeriCorps positions, he/she will not be eligible to apply for an additional GIP position.

PHYSICAL/NATURAL & WORK ENVIRONMENT

Physical/Natural Environment: Anchorage is Alaska's most populous city, with a diverse population of ~300,000 residents and a landscape bordered by mountains and ocean. It has a subarctic climate with strong maritime influences that lead to relatively moderate winter weather, compared to Alaska's interior. Average daytime winter temperatures range from ~5 to 30 °F (−15.0 to −1.1 °C). High latitude causes winter days to be short (as little as ~6 hours of daylight), however the ability of snow cover to reflect ambient light and brighten surroundings is substantial.

All standard amenities are available in Anchorage, including hospitals, schools, universities, restaurants, museums, theaters, and airports. Indoor and outdoor activities abound. In winter, outdoor activities include skiing (classic, skate, downhill, backcountry), snowboarding, snowshoeing, ice skating, and fat tire cycling, among others. Trails and lakes throughout the city are groomed and hot-mopped (respectively) during winter, and are available for recreation free of charge.

Work Environment: Work will be indoors at the Alaska Regional Office, located in downtown Anchorage. Office space and a laptop will be provided.

MENTORING AND LEARNING GOALS

Mentoring: The intern will be mentored by the SWAN Aquatic Ecologist, first through training and then regular progress meetings. If issues arise outside the expertise of the Aquatic Ecologist, a cadre of experts is available for guidance, including the SWAN Assistant Data Manager, and Natural Resource Specialists in Anchorage and Fort Collins. While working with these scientists, the intern will develop applied skills vital to a career in geosciences that will ultimately contribute to informed decision making.

Learning Goals: This project will allow the intern to gain practical experience in the latter phases of the scientific research process, from data quality control and summary to analysis and reporting. Additionally, the intern will gain competence with a database used by multiple federal agencies (USGS, NPS), as well as state, regional and local water authorities, private businesses, and academic institutions. Finally, the intern will gain experience communicating long-term monitoring results to a diverse audience.	
SUPERVISORS	
Primary Supervisor: Krista Bartz	**Secondary Supervisor:** Russ Frith
Title: Aquatic Ecologist	**Title:** Assistant Data Manager
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