

Water Quality

Vital Signs Monitoring- Southwest Alaska Network



Importance / Issues

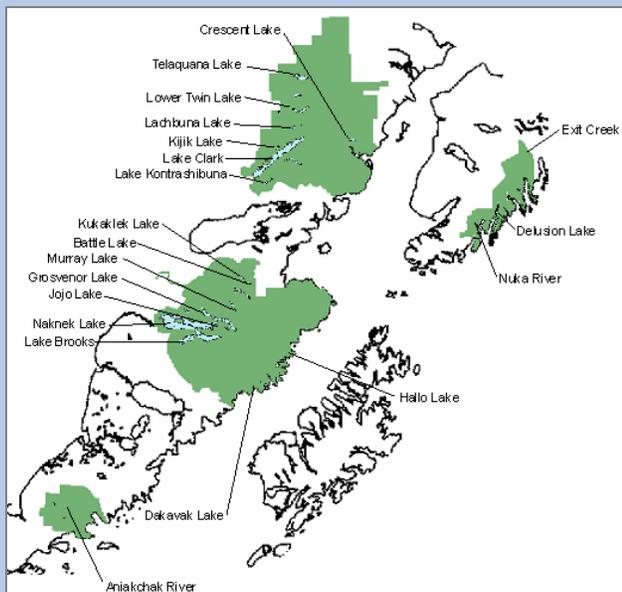
SWAN parks contain some of the largest and most pristine freshwater resources in the national park system. These include two large lakes, Naknek Lake and Lake Clark, numerous multi-lake systems, and thousands of miles of rivers, including five designated "Wild Rivers." Lakes and streams comprise interconnected *flow systems* within the broader landscape. They are interactive with their adjacent environments, integrative of the biophysical processes occurring there, and thereby sensitive to local climate (changes in precipitation, glacial retreat or advance), natural disturbance events (fire, landslides, volcanic eruptions) and land-use changes in and adjacent to parks. Despite their remoteness, freshwater resources of SWAN parks are subject to several types of influence affecting their function through time. Humans affect SWAN freshwater environments by altering the climate, introducing contaminants, and through land use. Water quality, especially dissolved oxygen, pH, and temperature, is not only important for maintenance of biological life, but can control or alter biogeochemical cycling as well as the toxicity of some elements.



SWAN and USGS staff collecting water quality core parameters on the Aniakchak River

Monitoring Approach and Progress

Little historic water quality data exists on SWAN park units, and no long term monitoring has occurred. SWAN park waters are relatively pristine, with no lakes or rivers listed as impaired pursuant to section 303(d) of the Clean Water Act. Most lakes and streams are oligotrophic, with low biological activity, low nutrient loads and low to moderate acid buffering capacity. Because water quality in SWAN parks is relatively pristine, monitoring will focus on documenting natural variability within park systems and changes due to affects such as climate change. Highest priority, or Tier 1 lakes (Naknek and Brooks Lakes in KATM, Exit Creek in KEFJ, and Lake Clark and Kontrashibuna Lakes in LACL) are not only of high management concern, but are readily accessible, and will be sampled on an annual basis. Tier 2 and Tier 3 flow systems (medium and low priority) lakes are less accessible than their Tier 1 counterparts; these lakes are important for expanding spatial inference to ensure trends observed at Tier 1 sites represent other flow systems in the parks. Lakes in this latter sample will be stratified by lake size, water type (clear, glacial) and accessibility.



SWAN lake systems selected for long-term monitoring based on access and greatest management concern.

Contacts:

Laurel Bennett, SWAN laurel_bennett@nps.gov

Ron Rickman, USGS rrickman@usgs.gov