



## Weather and Climate

Resource Brief 2011



**Gates of the Arctic      Noatak      Kobuk Valley      Cape Krusenstern      Bering Land Bridge**

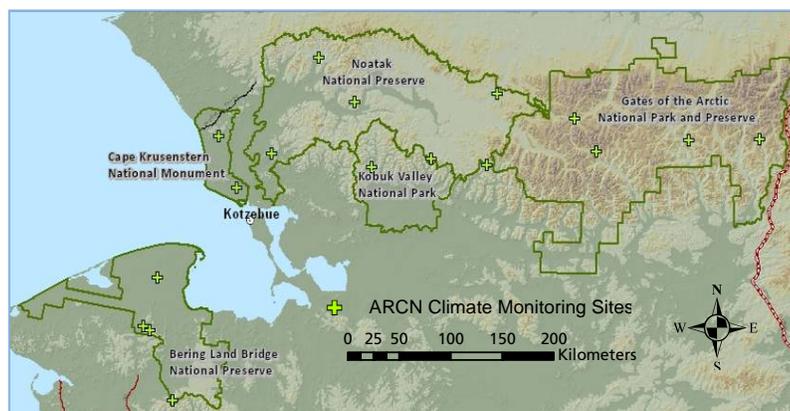
### Importance

Climate is considered to be the most important broad-scale factor influencing ecosystems. Because global climate models indicate that climate change and variability will be greatest at high latitudes, climate monitoring will be critical to understanding the changing conditions of park ecosystems.

Potential effects in the Arctic parks include a reduced snowpack, earlier ice break-up on lakes, warmer winters, and wetter summers. These changes may affect the distribution, abundance, growth, and productivity of plants and animals.

### Climate Monitoring

The mission of the Arctic Network Inventory and Monitoring Program (ARCN) is to collect, compile and synthesize scientific information about the arctic network of parks in order to manage park resources "unimpaired for the enjoyment of future generations". The Inventory and Monitoring Program is a major component of the National Park Service's strategy to improve park management through greater reliance on scientific information.



Map of ARCN climate station sites

In an attempt to better understand climate variation as well as long-term changes in park ecosystems, several new long-term climate monitoring stations are being installed in the Arctic parks. The objective of the climate monitoring program is to monitor and record weather conditions at representative locations in order to identify long and short-term trends, provide reliable climate data to other researchers, and to participate in larger scale climate monitoring and modeling efforts beyond park boundaries.

### Program Development and Site Evaluation

Numerous weather and climate professionals participated in a 2006 workshop in an effort to identify potential climate sites in the Arctic parks, including: park personnel, the National Weather Service, the Natural Resource Conservation Service, the Western Regional Climate Center, and the University of Alaska. All agreed that the current coverage was inadequate. After numerous discussions, refinements, and iterations that included guidance from park management, the site list was trimmed from 58 potential sites to 17. A comprehensive site evaluation was conducted between 2007-2009, which included an analysis of potential sites based on weather station siting criteria, wilderness mitigation efforts, and management concerns.

The number of new climate stations that were proposed represents a balance of science and wilderness concerns in an area with a sparse network of climate stations. The proposed inter-station spacing of about 40 miles (65 km), or one station per 1.1 million acres, was determined to be a reasonable density to help understand regional climate patterns. The number is not a result of statistical analysis, but instead represents a consensus among an expert panel of climatologists and resource managers who agreed on the proposed spatial density and distribution.



Imelyak in Noatak



Salmon River in Kobuk Valley



Serpentine in Bering Land Bridge

### Program Status 2011

After initial scoping was completed in 2009, an Environmental Assessment (EA) for the Arctic Network Climate Monitoring Program was initiated. The EA was completed in May 2010. The EA was issued for public review and comment from June 11, 2010 to July 12, 2010 and was routed by mail to 176 agencies, communities, organizations, and individuals as well as being posted on the NPS Planning, Environment, and Public Comment website. Forty-four comment letters were received during the 30-day public comment period. Thirty-five substantive comments required NPS responses which were included within the final record of decision, which was a Finding of No Significant Impact (FONSI). The NPS decision selected the preferred alternative that would provide for 17 climate monitoring stations to be installed in Gates of the Arctic National Park and Preserve (4 sites), Noatak National Preserve (6 sites), Kobuk Valley National Park (1 site), Cape Krusenstern National Monument (2 sites), and Bering Land Bridge National Preserve (4 sites).

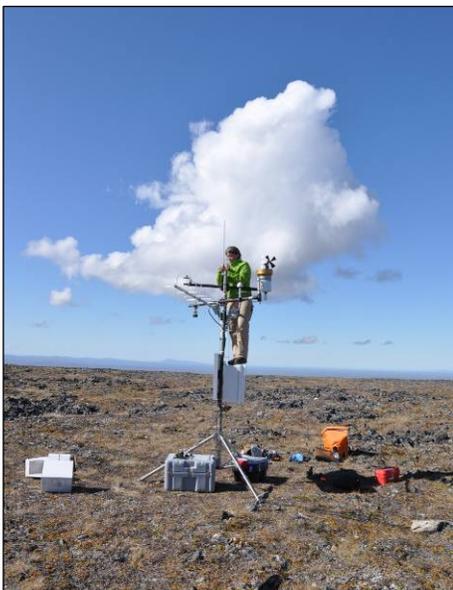
A number of mitigating measures were included in the decision, including the caveat that the climate monitoring protocols would be reviewed every 5 years to evaluate whether the methods and sampling design continue to meet the objectives of the monitoring program. In situations where the data from any station is duplicative of data available from outside the park units, and does not contribute to further understanding of climate trends, the station will be removed from the park.

### Summer 2011 Installations

Nine of the seventeen sites were installed in the summer of 2011, including 3 in Bering Land Bridge, 2 in Cape Krusenstern, 3 in Noatak, and 1 in Kobuk Valley. An additional eight stations will be installed in the summer 2012, including 4 in Gates of the Arctic, 3 in Noatak, and 1 in Bering Land Bridge.

### Stations

The climate stations consist of research grade equipment that is fully automated and powered through a battery and solar panel system. They record temperature, wind speed and direction, precipitation, snow depth, relative humidity, soil temperature, and solar radiation on an hourly basis. The data are transmitted by satellite, and disseminated and archived through the Western Regional Climate Center.



Setting up a climate station in Bering Land Bridge

### **For more information contact:**

Pam Sousanes  
Physical Scientist  
Arctic Inventory and Monitoring Network  
[pam\\_sousanes@nps.gov](mailto:pam_sousanes@nps.gov)  
(907) 683-9573

or

Jim Lawler  
Program Coordinator  
Arctic Inventory and Monitoring Network  
[jim\\_lawler@nps.gov](mailto:jim_lawler@nps.gov)  
(907) 455-0624