Standard Operating Procedure (SOP) 2: Compliance, Permitting, and Updating Site Maps (WC_B), Version 2.03

Weather and Climate Monitoring Protocol

Arctic (ARCN), Central Alaska (CAKN), and Southeast Alaska (SEAN) Inventory and Monitoring Networks

Change History

Original Version #	Date of Revision	Revised By	Changes	Justification	New Version #
1.00	12/19/2006	P. Sousanes	Removed example and added links	Incorporated peer reviewed comments	1.01
1.01	March 2017	P. Sousanes K. Hill, M. Bower	Added updated links and annual compliance instructions. Included up-to-date site map as deliverable product.	New URLs and updated processes.	2.0
2.0	April 2018	P. Sousanes, M. Bower	Added location information for new sites in SEAN.	Two new sites were added as part of the SEAN weather and climate program.	2.01
2.01	February 2019	P. Sousanes W. Johnson	Added new location for SEAN	Lituya Bay weather Station was added to SEAN in 2018	2.02
2.02	February 2021	P. Sousanes	Updated compliance links for CAKN	Permits were renewed.	2.03

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Overview

This SOP describes the current compliance and permitting requirements associated with the ARCN, CAKN, and SEAN climate monitoring vital sign, which is subject to the legal justifications of the National Environmental Protection Act (NEPA) of 1969. Site maps must be updated every time a new weather station is added to a park under the climate monitoring protocol.

Each park has different requirements for permitting and compliance regarding the installation and maintenance of long-term weather stations. It is wise to check whether any of the policies have changed before the field season begins.

The weather stations are permanent installations on park lands and are therefore subject to evaluation through the NEPA. The NEPA documentation for each park (or station in some cases) is listed below, along with the required annual permitting or compliance that may be necessary. Compliance and permitting are constantly evolving; always inquire about current requirements.

Maps showing the locations of the weather stations must be kept up-to-date. The maps are stored as image files (JPEG) and ArcMap (MXD) files, as well as in the KMZ format for use on Google Earth (See SOP 10 for details). Updating the NPS Alaska Region Installation GIS layer will satisfy both the regional reporting requirement and the annual climate monitoring protocol deliverable WC_B: Site Map.

Arctic Network (ARCN) Weather Station Installations

NEPA Documentation

An Environmental Assessment (EA) for the Arctic Network Weather stations (covering the five Arctic parks) was completed in 2010. The Planning, Environment and Public Comment (PEPC) reference number is 34336 and the link to the final EA is below:

https://parkplanning.nps.gov/document.cfm?parkID=1&projectID=31471&documentID=34336Permits

Permits

There are no research permits associated with the climate vital sign in the Arctic parks.

Annual Compliance

A call will come out each spring for research proposals and NPS operational activity for the upcoming field season. It will include a **Compliance Questionnaire** form and a deadline for submittal, which is usually around the first of April. Complete the questionnaire for the upcoming season. The plan requires information regarding field dates, staff involved, type of transportation being used, fuel caches, use of park housing, description of work, etc. The questionnaire will be reviewed by the park's compliance team. Approval is necessary before proceeding. The compliance team is a good resource for changes in policy related to access, safety, subsistence, or any other regulations that may have changed. As a common courtesy, contact appropriate park staff prior to showing up to do fieldwork.

Central Alaska Network (CAKN) Weather Station Installations

NEPA Documentation

Yukon-Charley Rivers National Preserve (YUCH)

An Environmental Assessment (EA) for the Coal Creek and Upper Charley weather stations was completed in 2005 for Yukon-Charley National Preserve. The Planning, Environment and Public Comment (PEPC) reference number is 11467 and the link to the final EA is below:

https://parkplanning.nps.gov/documentsList.cfm?parkID=22&projectID=11467

Wrangell-St. Elias National Park and Preserve (WRST)

An Environmental Assessment (EA) for the five CAKN RAWS (Tebay, Tana Knob, Chititu, Gates Glacier, and Chicken Creek) was completed in 2005. The Planning, Environment and Public Comment (PEPC) reference number is 10930 and includes the final EA and the Finding of No Significant Impact (FONSI) is below. In 2019 a Categorical Exclusion (CE) to continue the long-term climate monitoring was implemented for 2019-2023 (PEPC 87032).

Denali National Park and Preserve (DENA)

Four of the CAKN RAWS sites were installed in non-wilderness areas of Denali under a categorical exclusion approved at the park level in 2002. These include: Toklat, Eielson Visitor Center, Dunkle Hills, and Stampede. The Ruth Glacier site was originally installed as a fire weather station in 1998 and was later transferred to the climate program. There was no compliance or permitting completed when these sites were installed in the mid-1990s.

An Environmental Assessment (EA) was completed in 2013 for the Wigand Creek RAWS and two high elevation research weather stations on Denali. The Planning, Environment and Public Comment (PEPC) reference number is 39422 and the link to the final EA and the Finding of No Significant Impact (FONSI) is below:

https://parkplanning.nps.gov/document.cfm?parkID=9&projectID=39422&documentID=53348

An EA for a National Oceanic and Atmospheric Administration (NOAA) Climate Reference Network (CRN) weather station at Wonder Lake was completed in 2014. The climate program staff will help arrange logistics for the annual site visit and act as liaison for the site, but the station will operate under the CRN program specifications. The Planning, Environment and Public Comment (PEPC) reference number is 11880 and the link to the final EA and the Finding of No Significant Impact (FONSI) is below:

https://parkplanning.nps.gov/documentsList.cfm?parkID=9&projectID=11880Permits

Permits

There are no research permits associated with the climate vital sign in YUCH or WRST.

There are two research permits associated with the climate monitoring vital sign at Denali. These are administered through the NPS Research Permit and Reporting System (RPRS). The annual requirements include updating any information pertinent to the administration of the permit (name of principal investigator, contact info, scope of work, etc.) and the submission of an Investigator's Annual Report (IAR). The annual call for the IAR is usually in December with a due date of March 31. The two permits are listed below:

> Meteorological Monitoring – Permit # DENA 1992-SCI-0002 (No. 370). This research permit was initiated in 1992 when five stations were installed in the Rock Creek Watershed as part of the Long Term Ecological Monitoring Program. The permit was updated in 2002 to include the new CAKN weather stations. The expiration date of the permit is 2020.

Annual Compliance

For YUCH, a call will come out each spring for research proposals and NPS operational activity for the upcoming field season. It will include a **Compliance Questionnaire** form and a deadline for submittal, which is usually around the first of April. Complete the questionnaire for the upcoming season. The plan requires information regarding field dates, staff involved, type of transportation being used, fuel caches, use of park housing, description of work, etc. The questionnaire will be reviewed by the park's compliance team. Approval is necessary before proceeding. The compliance team is a good resource for changes in policy related to access, safety, subsistence, or any other regulations that may have changed. As a common courtesy, contact appropriate park staff prior to showing up to do fieldwork.

For WRST, provide a field plan to the compliance officer and the Chief of Resources. Information that is useful includes field dates, staff involved, aircraft information, housing needs, and a general description of the field work. The compliance team will provide guidance on any new policies related to access, safety, subsistence, or any other regulations that may have changed. As a common courtesy, contact appropriate park staff prior to showing up to do fieldwork.

For DENA, contact the research coordinator or the Chief of Resources annually to see if there have been any changes, and send a courtesy e-mail that includes field dates, staff involved, aircraft information, housing needs, and a general description of the field work. Reference the NEPA documents above for specific information related to site access, timing, and other limitations or mitigations. As a common courtesy, contact appropriate park staff prior to showing up to do fieldwork.

Southeast Alaska Network (SEAN) Weather Station Installations

NEPA Documentation

Klondike Gold Rush National Historical Park (KLGO)

An EA for the installation of four KLGO RAWS (Chilkoot Pass, Sheep Camp, Taiya River Bridge [Dyea], and Goat Lake) as well as a new radio repeater station at Goat Lake was completed in 2010. The EA and FONSI can be accessed through the PEPC website under reference number 25249:

https://parkplanning.nps.gov/projectHome.cfm?projectID=25249

Glacier Bay National Park and Preserve (GLBA)

An EA for installation and operation of eight GLBA RAWS (Nunatak Upper, Nunatak Lower, Queen Inlet, Dry Bay, Lituya Bay, Deception Hills, Lone Island, and Brady Icefield) and two additional high elevation thermistors (Beartrack and Idaho Ridge radio repeater towers) was completed in 2015. The EA and FONSI can be accessed through the PEPC website under reference number 44972:

https://parkplanning.nps.gov/projectHome.cfm?projectID=44972

Permits

There are no research permits associated with the climate vital sign in KLGO.

There is a research permit associated with the climate monitoring vital sign at GLBA. Permit conditions include coordination of program activities, completion of an annual summary brief for public consumption, a formal annual progress report including analysis and synthesis of resulting data, and completion of an IAR. The annual call for the IAR is usually in December, with a due date of March 31. The annual progress report is due concurrently with the IAR. The following permit authorizes the installation and operation of a series of eight weather stations and two additional high elevation thermistors in GLBA:

> Long-term Monitoring of Weather and Climate in Glacier Bay National Park and Preserve – Permit #GLBA-2013-SCI-0025. This permit was issued during 2015 and expires on August 20, 2019.

Annual Compliance

Review EA/FONSI mitigation measures or stipulations and research permit conditions prior to planning the year's field operations. Contact the research coordinator at GLBA and Natural Resource Manager at KLGO to see if there have been any changes in compliance processes or research permit requirements. Also send an e-mail that notifies primary park contacts of planned operations for the year including proposed field dates, staff involved, aircraft information, vessel support needs, and housing needs. As a common courtesy, contact appropriate park staff prior to showing up to do fieldwork.

Updating Site Maps

Weather station location maps need to be kept up-to-date. This describes the process for updating the map in ArcMap. The Alaska Regional GIS team maintains a GIS layer of NPS Alaska Region Installations on ArcMap that includes the weather stations. Each year before the field season, review the weather station location map to be sure that it reflects the current array of sites in the parks. The layer is currently listed in Theme Manager under Alaska Region Theme List>Alaska-wide/Multi

Park Themes>Administrative/Infrastructure>NPS Alaska Region Installations (SDE) – PUBLIC VIEW (see Figure SOP 2-1). If permanent installations are added to the parks they must be included in this database. Contact your park or region GIS specialist for details on how to add a site to this database.

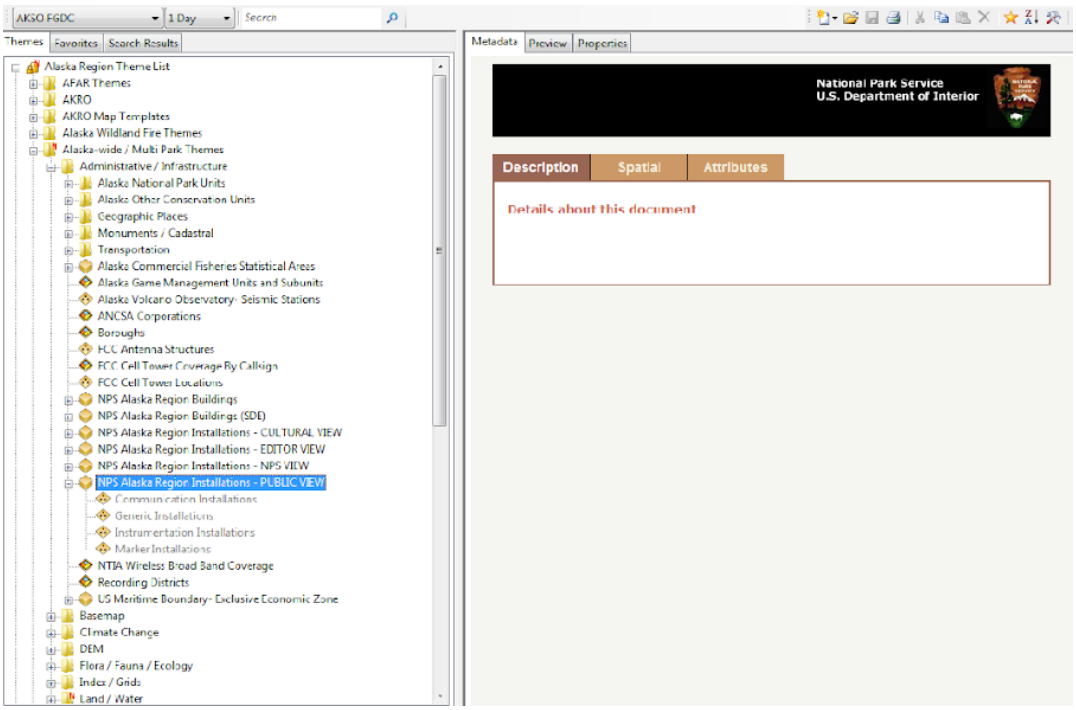

Figure SOP 2-1. Locating weather station layer in Alaska Theme Manager application.

Using ArcMap you can display all of the listed weather and weather stations within and around the Alaska parks (Figure SOP 2-2).

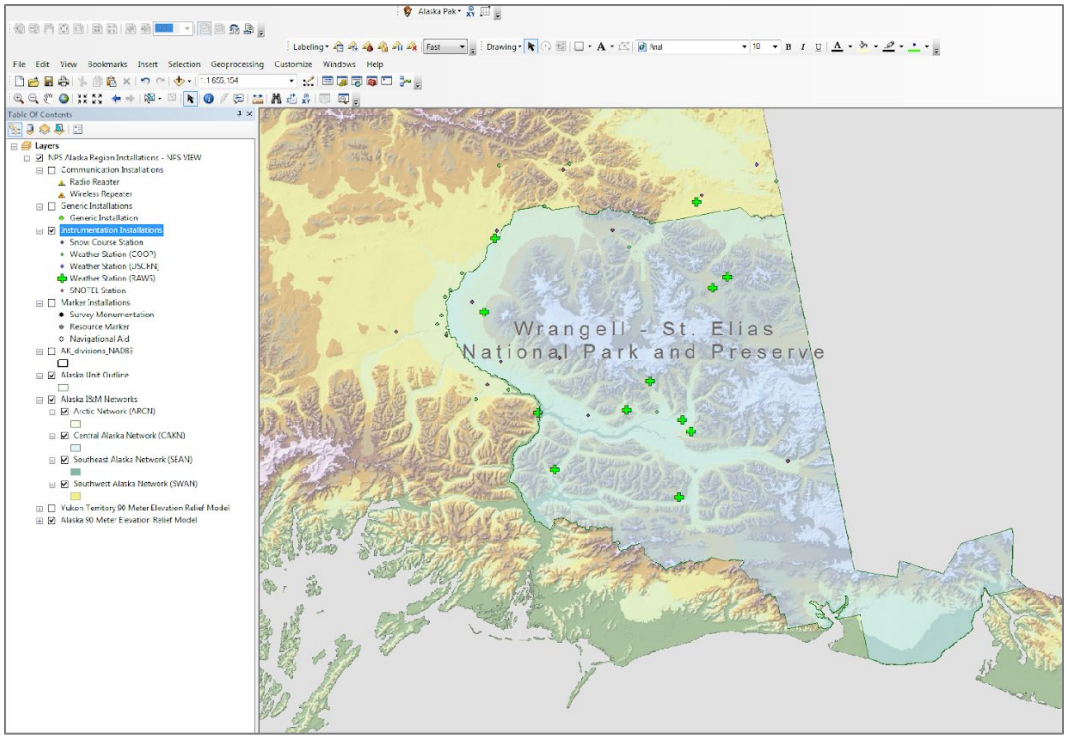

Figure SOP 2-2. Viewing park stations using ArcMap.

Contact the Alaska Region GIS team or your local GIS specialist if you need to add a site. This will require the submission of a list of site attributes as well as the station location. Check with the GIS specialists as requirements for the attributes often change. Keeping this layer updated will satisfy two reporting requirements: 1) the annual update to the NPS installation database, and 2) an updated map of the network's weather station locations that is an annual deliverable.

An updated site map should be published as a deliverable product each year in three formats: an image file (JPEG) with station locations and names, a GIS layer package with the locations (ArcMap MXD), and as a KMZ file typically used with Google products (see SOP 10; deliverable WC_B Site Map). A list of the current NPS weather stations in the network are listed in Appendix SOP 2-A.

Appendix SOP 2-A: Weather Station Locations in ARCN, CAKN, and SEAN

Table SOP 2-A.1. Arctic Network weather station locations

Name	NWS Identifier	Latitude	Longitude	Elev. (ft)	Start	End	Park
Chimney Lake	CHMA2	67 42.853	-150 35.100	3,700	8/7/2012	Present	GAAR
Pamichtuk Lake	PAMA2	67 45.977	-152 09.854	3,135	8/6/2012	Present	GAAR
Ram Creek	RAMA2	67 37.458	-154 20.678	4,100	8/7/2012	Present	GAAR
Killik Pass	KLIA2	67 59.007	-155 0.782	4,360	8/8/2012	Present	GAAR
Howard Pass	HOWA2	68 09.361	-156 53.749	2,062	7/7/2011	Present	NOAT
Imelyak	IMYA2	67 32.689	-157 04.646	3,620	7/6/2011	Present	NOAT
Kaluich	KAUA2	67 34.403	-158 25.903	2,411	7/20/2012	Present	NOAT
Salmon River	SRWA2	67 27.594	-159 50.475	1,262	7/8/2011	Present	NOAT
Sisiak	SSIA2	67 59.702	-160 23.739	1,823	7/13/2011	Present	NOAT
Asik	ASIA2	67 28.493	-162 15.986	1,329	7/13/2012	Present	NOAT
Kugururok	KUGA2	68 19.003	-161 29.518	1,020	7/18/2014	Present	NOAT
Tahinichok	TAHA2	67 33.009	-163 34.031	966	7/10/2011	Present	CAKR
Mt. Noak	MNOA2	67 08.486	-162 59.672	809	7/11/2011	Present	CAKR
Devil Mountain	DVLA2	66 17.756	-164 31.225	285	8/18/2011	Present	BELA
Ella Creek	ELLA2	65 16.511	-163 49.208	2,318	9/18/2012	Present	BELA
Midnight Mountain	MITA2	65 49.220	-164 32.565	2,267	8/17/2011	Present	BELA
Serpentine HS	SRTA2	65 51.138	-164 42.469	518	8/18/2011	Present	BELA

Table SOP 2-A.2. Central Alaska Network weather station locations

Name	NWS Identifier	Latitude	Longitude	Elev. (ft)	Start	End	Park
Dunkle Hills	DKLA2	63.2670	-149.5415	2,651	8/5/2004	Present	DENA
Eielson VC	EVCA2	63.4307	-150.3102	3,730	6/4/2005	Present	DENA
Ruth Glacier	RUGA2	62.7099	-150.5398	3,301	9/6/2008	Present	DENA
Stampede	SMPA2	63.7478	-150.3281	1,800	6/24/2003	Present	DENA
Toklat	TKLA2	63.5255	-150.0465	2,920	6/16/2005	Present	DENA
Wigand	WIGA2	63.8142	-150.1094	1,717	8/13/2013	Present	DENA
Coal Creek	CLCA2	65.3041	-143.1570	820	9/16/2004	Present	YUCH
Upper Charley	UPRA2	64.5169	-143.2023	3,654	8/3/2005	Present	YUCH
Chicken Creek	CREA2	62.1240	-141.8473	5,260	8/21/2004	Present	WRST
Chititu	CTUA2	61.2735	-142.6209	4,554	8/20/2004	Present	WRST
Gates Glacier	GGLA2	61.6029	-143.0132	4,060	7/6/2005	Present	WRST
Tebay	TEBA2	61.1810	-144.3392	1,880	7/8/2005	Present	WRST
Tana Knob	TANA2	60.9080	-142.9013	3,739	7/5/2005	Present	WRST

Table SOP 2-A.3. Southeast Alaska Network weather station locations

Name	NWS Identifier	Latitude	Longitude	Elev. (ft)	Start	End	Park
Chilkoot Pass	CKPA2	59.6953	-135.2592	4,200	5/22/2009	Present	KLGO
Sheep Camp	SPCA2	59.656832	-135.267867	920	8/13/2010	Present	KLGO
Goat Lake	GOTA2	59.526280	-135.187270	2,952	8/6/2011	9/13/2017	KLGO
Dyea	DWSA2	59.511910	-135.346851	50	5/6/2010	Present	KLGO
Nunatak Lower	GNLA2	58.977761	-136.100986	15	8/25/2015	Present	GLBA
Nunatak Upper	GNUA2	58.983758	-136.100385	941	7/24/2016	Present	GLBA
Queen Inlet	GQIA2	58.917260	-136.584659	1,045	8/26/2015	Present	GLBA
Dry Bay	DBWA2	59.167941	-138.484093	29	5/26/2016	Present	GLBA
Glacier Bay Fuel Dock	BLTA2	58.455151	-135.888519	30	9/10/2015	Present	GLBA
Deception Hills	DHWA2	59.090630	-138.214629	2,190	9/20/2017	Present	GLBA
Lone Island	GLIA2	58.721868	-136.295032	85	4/18/2018	Present	GLBA
Lituya Bay	LBWA2	58.626560	-137.657944	4	5/31/2018	Present	GLBA
Brady Icefield	-	-	-	-	-	-	GLBA

Grey shading = planned stations