Standard Operating Procedure (SOP) 1: Annual Deliverable Schedule, Version 1.02

Weather and Climate Monitoring Protocol

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

Change History

Previous Version #	Revision Date	Revised By	Changes	Justification	New Version #
-	August 2017	P. Sousanes K. Hill, M. Bower, W. Johnson	New SOP	Clarify scheduling	1.0
	February 2021	P. Sousanes	Changes regarding reporting schedule	Prioritize analysis over annual data summaries	1.01
	February 2024	P. Sousanes	Changes in file type for WC_B	More sustainable file type for deliverable	1.02

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Overview

The purpose of this SOP is to outline the work flow that is required to produce the annual deliverables for the ARCN/CAKN/SEAN climate monitoring protocol. It describes month-by-month, the logistical planning necessary for completing the NPS I&M Remote Automated Weather Station (RAWS) annual maintenance, metadata documentation, data management, and reporting.

The annual product deliverable matrix is included. Details of each deliverable are described in additional SOPs and the mechanics of each deliverable are clearly outlined in SOP 10.

Annual Work Flow

January - February: Submit compliance or permitting documents for upcoming field season. Renew any relevant interagency/cooperative agreements (SOP 2). Assess training needs, schedule training sessions, especially aviation needs that are required for field season (SOP 3). Begin logistic planning/collaborate with other staff on sharing field resources. If time and staffing levels permit, complete an annual resource brief that summarizes the synoptic climate for the network for previous calendar or water year (SOP 12)

March: Inventory equipment and determine what sensors will be required for upcoming field season by referencing calibration schedule (SOP 4) and annual maintenance logs (SOP 9). Return sensors to Campbell Scientific, Inc. for calibration/repair. Determine additional sensor needs and place order. Complete annual compliance updates for each park unit; if formal compliance is not necessary ensure that park management are aware of timing and nature of the fieldwork. Complete Investigator Annual Reports (IAR) if the climate vital sign is under a park permit. If time and staffing levels permit, compile a fall/winter weather summary. Continue logistic planning.

April: Continue logistic planning. If necessary, prepare aviation/float/backcountry safety plans with guidance from each park (see SOP 3). Schedule aircraft and boats (if needed) for the field season.

May: Complete logistic planning. Complete all necessary field training including bear safety, firearm safety, aviation, boating, wilderness first aid/responder, etc. Compile site visit worksheets (SOP 9). Reserve NPS housing in remote locations if necessary.

June – August: Complete annual maintenance on NPS I&M RAWS stations (SOP 9). Coordinate with any cooperators if necessary (NRCS, NWS, DOT, CRN, Fire, etc.). Place final end-of-season equipment order by the appropriate budget deadline.

September: Complete any unscheduled maintenance on NPS I&M RAWS as needed. Inventory equipment and order any additional sensors/equipment /gear as end-of-year funds allow. If time and staffing levels permit, complete spring/summer seasonal weather summary. Update the metadata and annual site visit narrative for each weather station in the network into the Wildland Fire Management Information System (WFMI) (SOP 9).

October: Begin data quality management for NPS I&M RAWS data (SOP 11). Complete annual maintenance report (SOP 12). Provide annual updates to network work plan and compile information to present at annual network meetings.

November: Upload all specified program deliverables (SOP 10) to the NPS Data Store (SOP 10.

December- February: Networks jointly review protocol narrative, PIPs, DQSs, QAPs and SOPs for possible revisions. Compile all SOPs that will be used for the upcoming field season and publish as SOP Set 20xx (xx = upcoming field season year).

Month	Tasks	Reporting
January	Compliance; Agreements Assess training needs for upcoming season	Complete annual resource brief (if staff and time permits)
February	Begin logistic planning; Training as available; Collaborate with other staff	
March	Inventory Equipment; Continue logistic planning; Return sensors for calibration; Complete annual compliance/permitting if necessary	
April	Continue logistic planning; Order additional equipment; If necessary, schedule aircraft/boats for season and prepare aviation/float/backcountry safety plans	Publish any necessary revision to protocol narrative, PIPs, QAPs, DQSs, or the SOP set in advance of the field season.
May	Complete logistic planning; Complete annual training; Prepare maintenance checklists; Reserve NPS/other housing if necessary	
June	Field work: Weather station maintenance	
July	Field work: Weather station maintenance	
August	Field work: Weather station maintenance	
September	Complete any unscheduled maintenance; Inventory Equipment; Update station status in WFMI program.	
October	Perform data quality control; Send certified data to Data Store and WRCC.	Contribute to network annual work plan Complete annual maintenance/operations report
November		
December	Networks jointly review protocol narrative, PIPs, DQSs, QAPs and SOP set for possible revisions.	

Annual Deliverables for the Climate Monitoring Vital Sign

					Responsibilities		
Deliverable Title	**Description**	**SOP**	**Provided to Customers as**	**Frequency Produced**	**Builder**	**Validator**	**Acceptor**
WC_A: Protocol-PIP-QAP-DQS-SOP set	The detailed document set defining this weather and climate monitoring program throughout its history and published as NRR reports or other acceptable form in the NPS Data Store.	1, 10, 13	PDF files.	New documents as needed, but always prior to the field season they operate on.	Project Leader	Peer Review Panel	Regional I&M Coordinator
WC_B: Site map	GPS Coordinates and map documenting location of stations participating in network's climate monitoring.	2, 10	CSV and PNG files	As needed to accommodate new sites.	Project Staff	Project Leader	Project Leader
WC_C: Site visit worksheets	One worksheet per site visit documenting in a standard form the condition of the site, actions taken, and final configuration. Packaged as a cumulative set of all worksheets for all stations in a particular field season zipped into one file.	9, 10	Windows files in XLSX format, wrapped into a single ZIP file.	One zip file per year created after completion of all field work.	Project Staff	Project Leader	Project Leader
WC_D: Datalogger program	The program source code installed into dataloggers for all stations over a field season. They authoritatively document the exact nature of parameters collected.	6, 10	A ZIP of text files containing all versions of programs used by stations in a field season.	One zip file per year created after completion of all field work.	Project Staff	Project Leader	Project Leader
WC_E: Site photo sets	One set of photos per site per field season used to document physical conditions.	9, 10	Windows JPEG data files wrapped into a single ZIP file for each site/year.	One ZIP file per site per year created after completion of all field work.	Project Staff	Project Leader	Project Leader

WC_F: Station Download	The cumulative collection of RAWS station observations in Campbell Scientific .DAT format. It is extracted from the station datalogger during each visit to each site. Multiple years are stored in a ring buffer in the station and the entire buffer is captured on each visit. No data corrections are directly applied to this Processing Level 0 product.	9, 10	Windows data files of datalogger output in .DAT format wrapped into a single ZIP file for each field season.	One ZIP file per field season containing typically one downloaded file from each station visited that year.	Project Staff	Project Leader	Project Leader
WC_G: RAWS corrected data	The collection of RAWS output for all stations in ASCII CSV format at Processing Level 1B having duplicate readings removed, standard formatting applied, measurement units made consistent, and quality flags plus selected metadata added. This contains all network station data for all years and all stations.	11, 10	A single Windows ASCII CSV data file.	Annually, after the WC_F station downloads and WC_C site visit worksheets are accepted.	Project Staff	Project Leader	Project Leader
WC_H: Annual report	Annual report summarizing operations and data collection in the form of a PDF. Deliverable WC_C is a prerequisite.	12, 10	One PDF file.	One PDF file per year created after completion of all field work	Project Leader	Peer Review Panel	Project Leader
WC_I: Calibration certificate images	Scanned images of sensor calibration records provided by instrument vendor/servicer having printed dates that are in one calendar year.	4, 10	One PDF file covering all instruments in the year.	One PDF file per calendar year following receipt of the year's last calibrated instrument.	Project Staff	Project Leader	Project Leader
WC_J: Periodic report	Multi-year climate analysis based in the parameters collected by stations, written in the form of an NPS NRR publication.	12, 10	One PDF file.	Once every ten years.	Project Leader	Peer Review Panel	Regional I&M Coordinator