

Standard Operating Procedure (SOP) 12: Annual Reporting and Deliverable Publishing, Version 2.0

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 #
1.0	12/20/2006	P. Sousanes	Changed SOP from 22 to 23	Placeholder for SOP 22 on data analysis	1.01
1.01	March 2017	P. Sousanes K. Hill S. Miller, M. Bower, B. Johnson	Update on reporting requirements with description of the process for archiving the annual deliverables.	Reporting process is simplified and corresponds to annual deliverable archive.	2.0

Please cite this Standard Operating Procedure as:

Sousanes, P., K. Hill, M. Bower, W. Johnson, and S. Miller. 2017. Standard Operating Procedure (SOP) 12: Annual Reporting and Deliverable Publishing, Version 2.0. Weather and Climate Monitoring Protocol, Arctic (ARCN), Central Alaska (CAKN), and Southeast Alaska (SEAN) Inventory and Monitoring Networks. National Park Service, Fairbanks, Alaska. Available online at <https://irma.nps.gov/DataStore/Reference/Profile/2243701>.

Overview

This SOP describes the method for reporting on the climate monitoring protocol and the process for archiving all of the annual deliverables. The reports are published under the Natural Resource Publication Management guidelines and archived in the Integrated Resource Management Applications (IRMA) Data Store. Each network has a project container where all of the scheduled deliverables, including reports and the current version of the protocol and SOPs, are archived annually. This ensures that the metadata for each annual data download resides in one place for easy discovery and easy tractability from data collection to reporting.

The Data Store project reference codes are as follows:

Arctic Network Climate Monitoring: IRMA Project #: [2210690](#).

Central Alaska Network Climate Monitoring: IRMA Project #: [2218183](#).

Southeast Alaska Network Climate Monitoring: IRMA Project #: [2172595](#).

Reporting

Annual Weather Station Operations Report

A network-wide maintenance (or operations) report is published annually in the Natural Resources Data Series (NRDS). The operations report is deliverable WC_H (SOP 1). Additional reporting may occur if staffing levels and time permit, but are not required as annual deliverables. The purpose of the annual maintenance (or operations) report is to summarize the work that was accomplished during the field season. It includes a brief summary of the field season, site maintenance work, and a compilation of information taken from the site visit worksheets. The appendices include a summary of the logistics involved in getting to each site, a summary of the current weather station specifications, and a metadata table for each site that lists the type of equipment and date of installation. The compiled site visit worksheets (WC_C) can also satisfy this reporting requirement.

These reports are published under the Natural Resources Data Series (NRDS) and must follow the peer review process described under the Natural Resources Publication Management ([NRPM](#)) procedures. The network program manager must review the report before it is published in IRMA Data Store. There are three years of weather station maintenance (operations) reports in the Data Store that can be referenced and used as a template. (See [Climate Station Maintenance in the Central Alaska Inventory and Monitoring Network: 2015 summary](#) [<https://irma.nps.gov/DataStore/Reference/Profile/2225218>])

Annual Climate Summary Report

If time and staffing levels allow, an annual report may be produced providing a synopsis of weather events for a calendar year. Weather stations around the parks operated by various state and federal agencies are used as index sites to compare current climate conditions in the region to the climatological normal - the average weather conditions over a 30-year period. The current normal period is 1981-2010. The annual reports summarize the annual and monthly temperature and precipitation deviations for the index sites and compile monthly and annual statistics for the NPS weather stations in the network. A brief synopsis of regional, national, and global climate conditions is included for climatic context. There are ten years of annual reports from the CAKN climate monitoring program in the IRMA system that can be referenced. [Annual Climate Summary 2013: Central Alaska Network](#).

Seasonal Weather Summaries

If time and staffing levels allow, the seasonal weather summaries are short quarterly briefs highlighting climate statistics for each season for the three parks in the network. They provide a concise summary of temperature and precipitation anomalies and extremes. The seasonal temperature and precipitation trends are also analyzed in the brief. Data for the trend reporting is acquired from the [xmACIS2](#) website; a video tutorial is available at [xmACIS2 instructional video](#) and the process is described in Appendix SOP 12-B. These briefs are a good resource for park management,

interpreters, and education specialists as well as the general public. [Wrangell - St. Elias Fall 2015 Weather Summary](#).

Trend Report

Every ten years a data analysis and trends report will be written (SOP 1, 10; Deliverable WC_J). This deliverable is a multi-year analysis of network climate status and trends. It is processed according to the formal Inventory and Monitoring Division methods currently in effect for Natural Resource Report publications. The latest climate analysis for the Central Alaska Network was published in 2013 and includes data through 2010 ([Keen 2013](#)).

Reporting and data visualization for climate monitoring will evolve over the next few years with the publication of national level climate protocols.

Publishing and Managing the Annual Deliverables

Closeout is the part of the climate monitoring data management life cycle through which annual data collection files (deliverables, SOP 1 - Table 1) are archived in the IRMA Data Store. Specific closeout procedures to accomplish this are found in SOP 10. Closeout happens each year after the field season when data files have been collected, processed and integrated. The annual cycle is considered complete when the IRMA Data Store holdings match the deliverable schedule (Figure 1). The references are linked to the ARCN, CAKN, and SEAN climate monitoring IRMA project references so that it becomes discoverable to the public.

The annual cycle described above will ensure that all data objects collected each year are accounted for, documented and available for perpetuity should the need arise to re-use or revisit the data.

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Project - (Code: 2210690)

Title

Climate Monitoring in the Arctic Network of National Parklands

Description

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.

Full Citation

Climate Monitoring in the Arctic Network of National Parklands. 2010

Visibility

Public

click here for more info

Products Created by This Project (25)

File Count: 25

1

2016

Tabular Dataset

Hill K and Sousanes P. 2016. WC_F_2016_ARCN_Raw data

WC_F_2016_ARCN_Raw data

2016

1

2016

Photograph

Hill K and Sousanes P. 2016. WC_E_2016_ARCN_Site photo sets

WC_E_2016_ARCN_Site photo sets

2016

1

2016

Notes

Hill K and Sousanes P. 2016. WC_D_2016_ARCN_Datalogger programs

WC_D_2016_ARCN_Datalogger programs

2016

1

2016

Notes

Hill K and Sousanes P. 2016. WC_C_2016_ARCN_Site Visit Worksheets

WC_C_2016_ARCN_Site Visit Worksheets

2016

1

2015

Published Report

Hill K and Sousanes P. 2015. Climate station maintenance in the Arctic Network: 2014 Summary

Climate station maintenance in the Arctic Network: 2014 Summary

2015

1

2015

Published Report

Hill K and Sousanes P. 2015. Climate Station Maintenance in the Arctic Network: 2014 Summary

Climate Station Maintenance in the Arctic Network: 2014 Summary

2015

1

2014

Climate station maintenance 2013 summary: Arctic Network

Climate station maintenance 2013 summary: Arctic Network

2014

1

2014

Climate change scenario planning for interior arctic Alaska parklands

Climate change scenario planning for interior arctic Alaska parklands

2014

1

2014

Climate exposure of US National Parks in a new era of change

Climate exposure of US National Parks in a new era of change

2014

1

2013

Bering Land Bridge Winter 2013-2014 Weather Summary

Bering Land Bridge Winter 2013-2014 Weather Summary

2014

1

2013

Western Arctic Parklands Fall 2013 Weather Summary

Western Arctic Parklands Fall 2013 Weather Summary

2013

1

2013

Gates of the Arctic Fall 2013 Weather Summary

Gates of the Arctic Fall 2013 Weather Summary

2013

1

2013

Bering Land Bridge Fall 2013 Weather Summary

Bering Land Bridge Fall 2013 Weather Summary

2013

1

2013

Western Arctic Parklands Summer 2013 Weather Summary

Western Arctic Parklands Summer 2013 Weather Summary

2013

1

2013

Gates of the Arctic Summer 2013 Weather Summary

Gates of the Arctic Summer 2013 Weather Summary

2013

1

2013

Bering Land Bridge Summer 2013 Weather Summary

Bering Land Bridge Summer 2013 Weather Summary

2013

1

2013

Gates of the Arctic Spring 2013 Weather Summary

Gates of the Arctic Spring 2013 Weather Summary

2013

Annual Deliverables for the Climate Monitoring Vital Sign

Deliverable Title	Description	Provided to Customers as	Frequency Produced
WC_A: Protocol-PIP-SOPs	The detailed document set defining the weather and climate monitoring program throughout its history and published as NRR reports in the NPS Data Store.	1, 10 PDF files.	New documents as needed, but always prior to the field season they operate on.
WC_B: Site map	Map documenting location of stations participating in network's climate monitoring.	2, 10 ESRI layer, JPEG, and KMZ files	As needed to accommodate new sites
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.
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.
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.
WC_F:	The cumulative collection of	9, 10 Windows data	One ZIP file per field

The data cycle is complete when the annual deliverables are available in the IRMA Data Store

Figure SOP12-1. Data deliverables are defined in the monitoring protocol and archived in IRMA Dataset references annually.

Appendix SOP 12-A provides an example for uploading annual products into IRMA. It also describes how to drop reports and resource briefs, or the deliverables that are better suited for public consumption, into ‘collections’ that can then be accessed via web services by the Network web sites.

IRMA components and capabilities are evolving at a rapid pace; it is wise to contact the network data manager for updates and details before doing the final archive each year.

Appendix SOP 12-A. Uploading Deliverables to IRMA Data Store

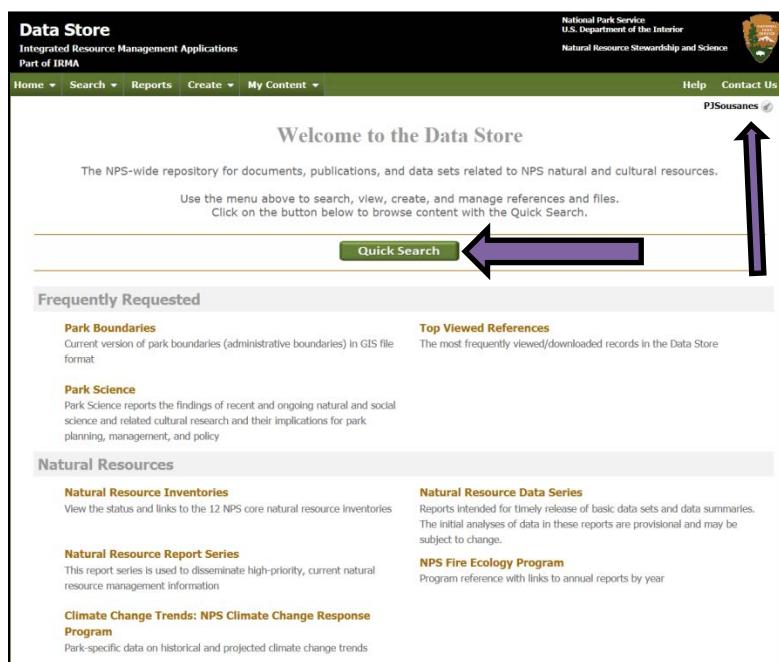
The following describes the process for uploading reports and resource briefs into the IRMA Data Store.

Overview

- Create an IRMA reference for an annual climate report, an annual maintenance report, or a weather summary
- Upload the document to the IRMA reference.
- Add the reference to the Climate Vital Sign Documents collection and, if it is a seasonal weather summary, the Network Weather Summaries documents collection.

Create an IRMA reference for the annual report, the maintenance (operations) report, or the seasonal weather summary

1. Navigate to <https://irma.nps.gov/DataStore/> and ensure you are logged in; your username should appear in the upper right of the browser.
2. Ensure the weather summary (or other deliverable) does not already exist by doing a Quick Search.
3. If the record exists, acquire permission to edit if needed and ensure it follows the requirements of this SOP.



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Integrated Resource Management Applications
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U.S. Department of the Interior
Natural Resource Stewardship and Science

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Quick Search

Search Using the Options Below

Search Text

Unit

Clear Search Search

4. If the record does not exist click Create → Reference. Continue by selecting **Create a new reference on the next page.**

Data Store
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Quick Search

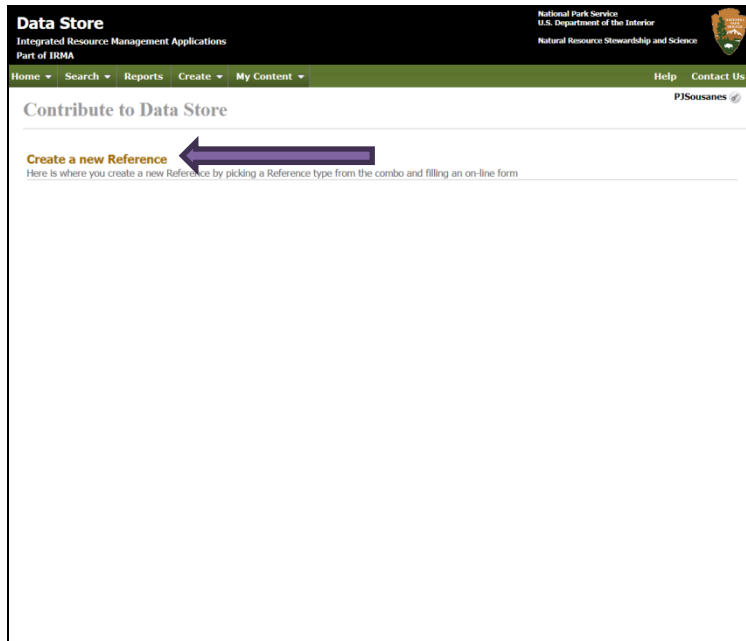
Search Using the Options Below

Search Text

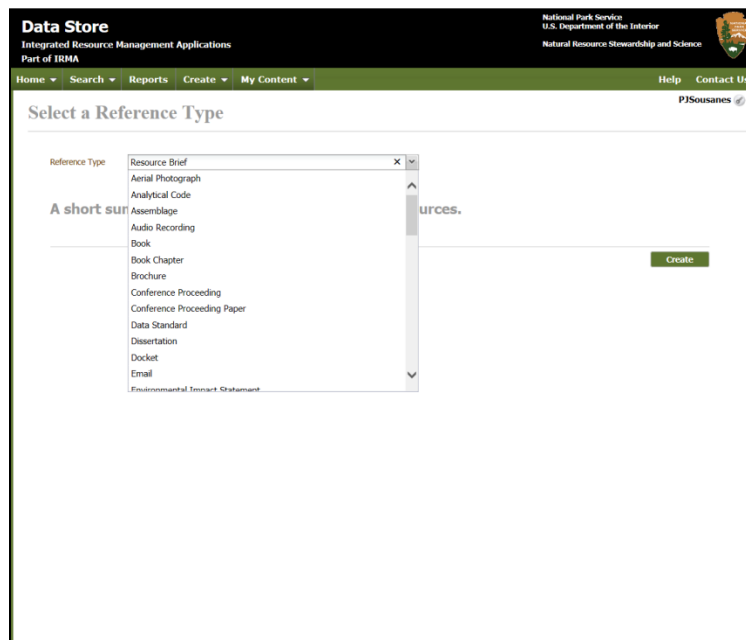
Unit

Clear Search Search

Reference



5. Select **Published Report** or **Resources Brief** in the dropdown menu under **Reference Type**.



6. Enter a Title for the reference. For seasonal summaries, make sure that the park name and the season of issue are both in the title.
7. Populate the information required under each tab. Make sure to check the box next to Created by/and for the NPS.

Required to Submit: Display Citation: Untitled Resource Brief
Current Lifecycle: Draft (In Edit Mode)

Core Permissions Files and Links Units and Geography Subjects and Keywords Taxonomy Cross-References Version History Change Type

Resource Brief

Title: Yukon-Charley Fall 2015 Weather Summary

Date Published: Fall Year: 2015

Author(s): Add +
Physical Scientist Pamela Souanes (National Park Service)
Physical Scientist Ken Hill (National Park Service)

Editor(s): Add +
No Editor(s) found

☒ Created by and/or for the NPS

Publisher: National Park Service

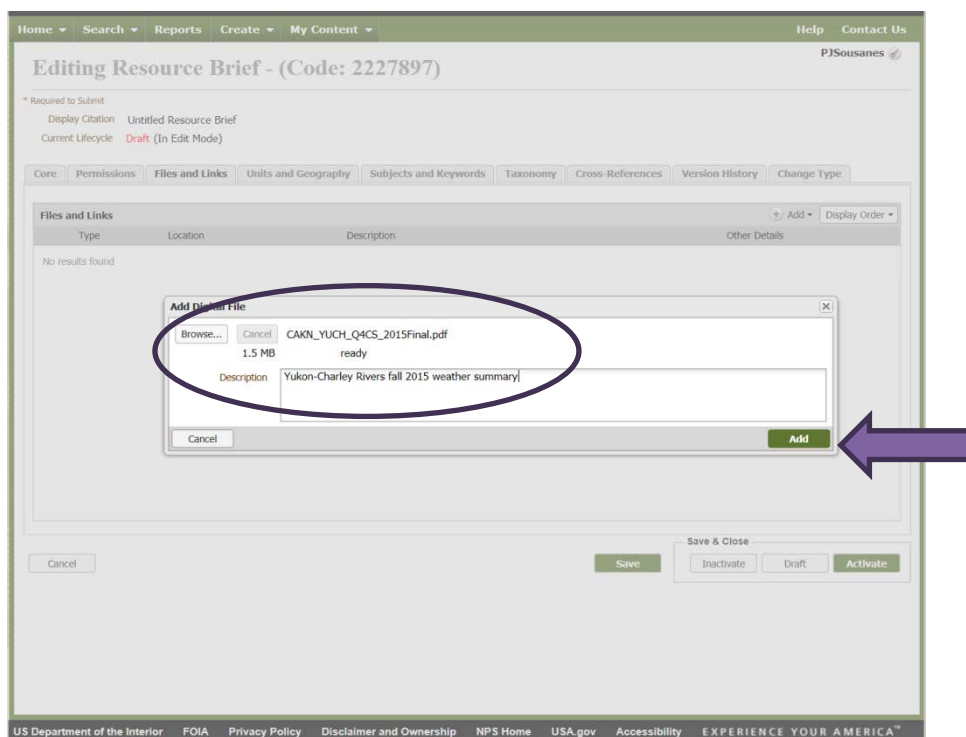
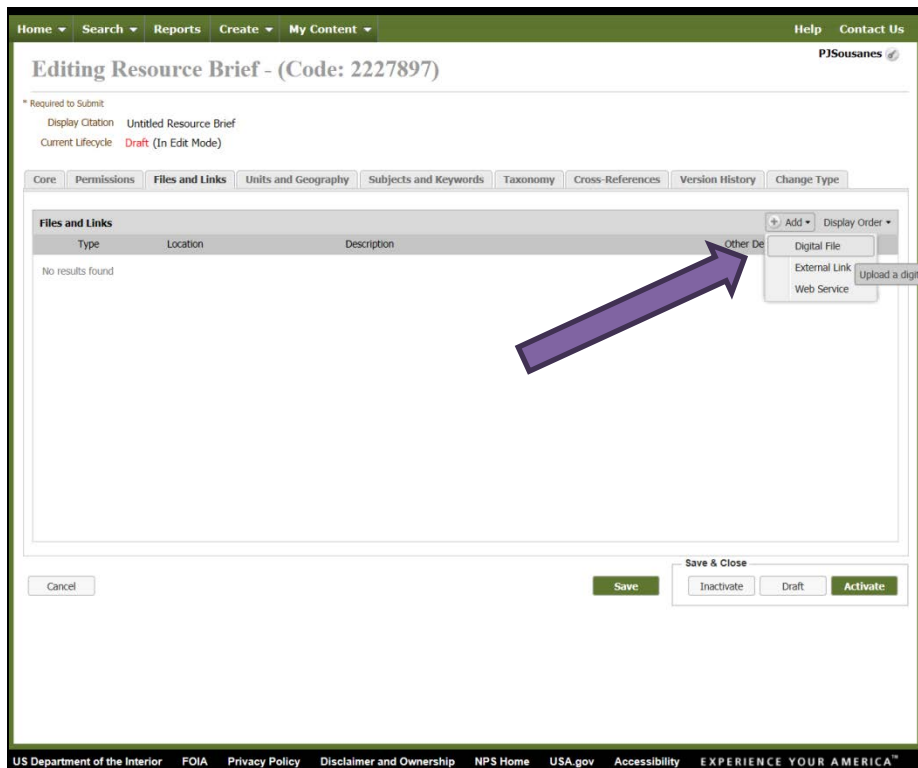
Number of Pages: 3

Description: Summary of weather conditions in fall 2015 for Yukon-Charley Rivers National Preserve.

Notes:

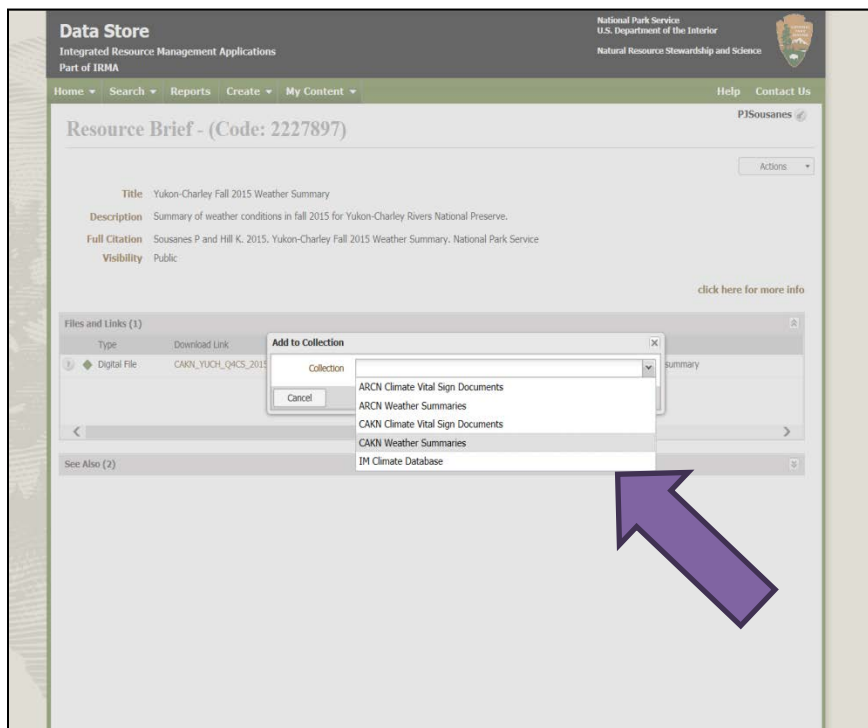
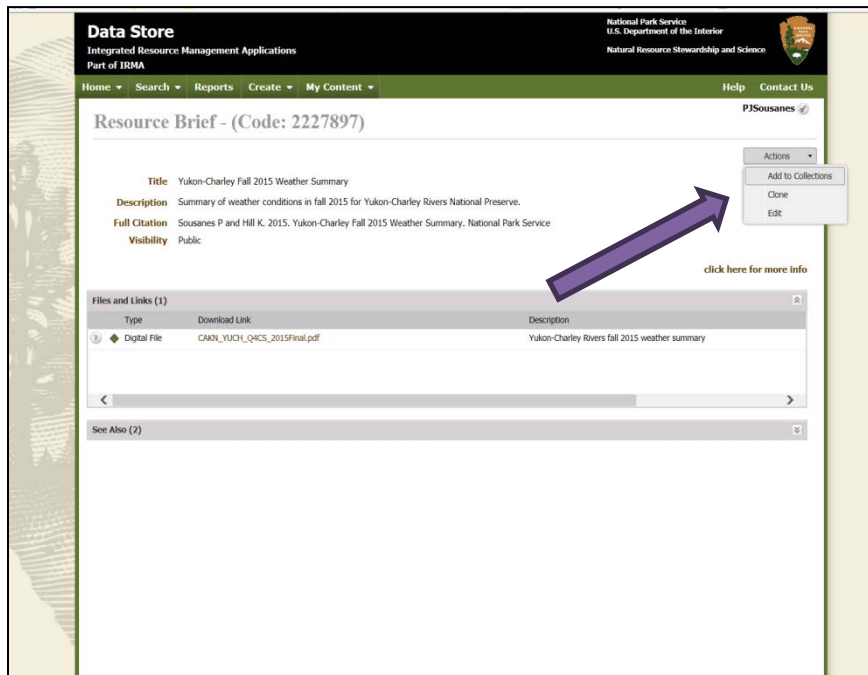
Cancel Save Inactivate Draft Activate

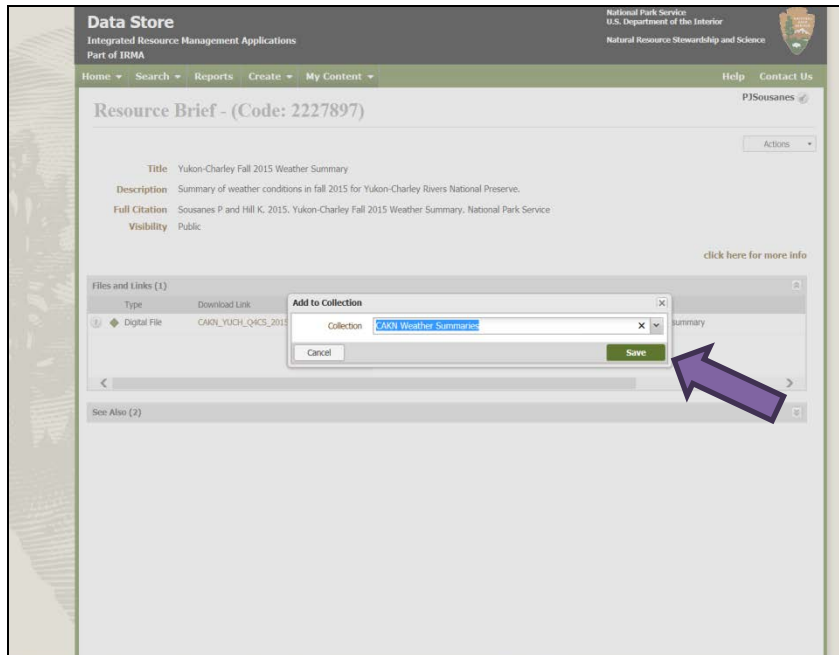
8. Fill in any remaining pertinent information for the IRMA reference under the other tabs. Important aspects include:
 - Ensuring that the park and Network are added under the **Units and Geography** tab.
 - **Permissions** are given to the Network program manager, data manager, collaborating scientists and any others who may need to edit the record.
 - Selecting 'Weather and Climate' as a subject category.
 - Under the **Cross-References** tab add the Climate Monitoring Project (ARCN: 2210690; CAKN: 2218183; SEAN: 2172595) and the Network Program code (ARCN: 2208369; CAKN: 2210836; SEAN 2170061).
9. Under the **Files and Links** tab, select Add>Digital File. Browse for the file, add a description, and click **add**.



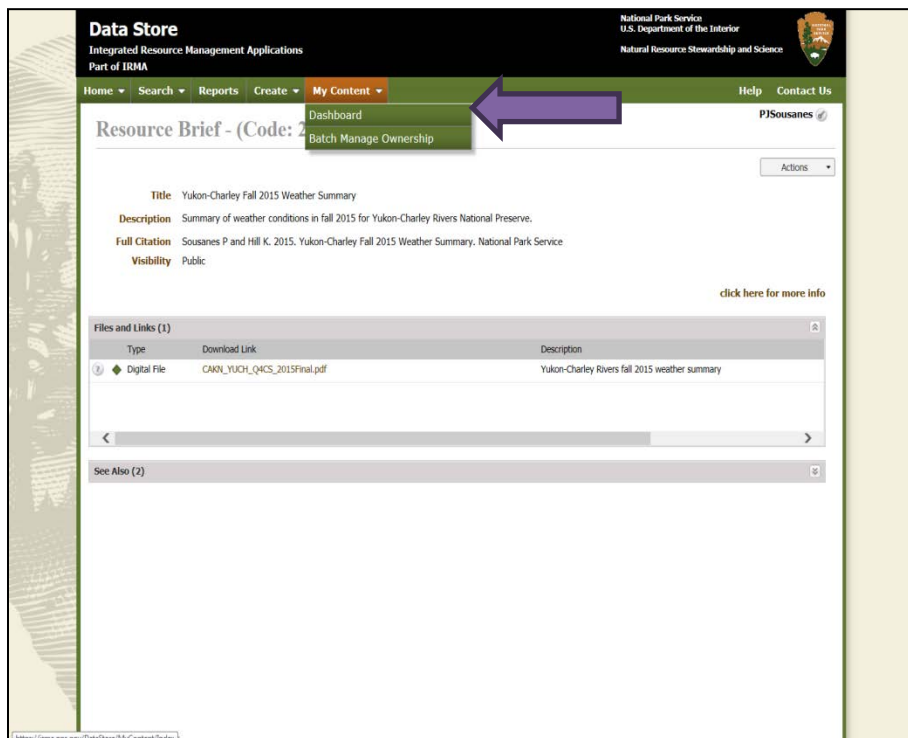
10. Review information under each tab and then click **Activate** at bottom right.

11. If adding to a specific collection: Add the reference to the appropriate collection by using the dropdown menu under **Actions** to select **Add to Collections** and click **Save**.





12. Verify that the reference is in the collection under My Content>Dashboard



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Dashboard » PJSousanes

My References: Draft (6), Active (106), Inactive (1)

Code	Lifecycle	Visibility	File Count	Type	Title	Year of Issue
2227897	Draft	Restricted	1	Resource Brief	Yukon-Charley Rivers Fall 2015 Weather Summary	2015
2227895	Draft	Restricted	1	Resource Brief	Denali Fall 2015 Weather Summary	2015
2224757	Draft	Restricted	1	Resource Brief	Wrangell - St. Elias Spring 2014 Weather Summary	2014
2224749	Draft	Restricted	1	Resource Brief	Denali 2014-2015 Winter Weather Summary	2015
2223906	Draft	Restricted	1	Resource Brief	Western Arctic Parklands Spring 2015 Weather Summary	2015
2223905	Draft	Restricted	1	Resource Brief	Gates of the Arctic Spring 2015 Weather Summary	2015
2227896	Active	Public	1	Resource Brief	Wrangell-St. Elias Fall 2015 Weather Summary	2015
2227894	Active	Public	1	Resource Brief	Gates of the Arctic Fall Weather Summary 2015	2015
2227891	Active	Public	1	Resource Brief	Western Arctic Parklands Fall Weather Summary 2015	2015
2227875	Active	Public	1	Resource Brief	Bering Land Bridge Fall Weather Summary 2015	2015
2224764	Active	Public	1	Resource Brief	Gates of the Arctic Summer 2015 Weather Summary	2015
2224763	Active	Public	1	Resource Brief	Yukon-Charley Rivers Summer 2015 Weather Summary	2015
2224762	Active	Public	1	Resource Brief	Wrangell - St. Elias Summer 2015 Weather Summary	2015

Page 1 of 5 Records per Page 25 Displaying 1 - 25 of 113

My Collections (5)

Title	Description	# Owners
ARCN Climate Vital Sign Documents	Documents related to the Arctic Network Climate Vital Sign	4
ARCN Weather Summaries	Weather Summaries for the Arctic Network Inventory and Monitoring Program	4
CANM Climate Vital Sign Documents	Documents related to the Central Alaska Network's Climate Vital Sign	4
CANM Weather Summaries	Central Alaska Network Weather Summaries	4
IM Climate Database	IM Climate Database	7

13. Check the Climate Vital Sign profile on the Network web site to ensure the new weather summary is displayed.

National Park Service
Inventory & Monitoring (I&M)

CENTRAL ALASKA NETWORK

Climate

Overview

Climate patterns are key to understanding ecosystem processes, yet the available analyses, trends, and models for Alaska are based on relatively few observations. One of the fundamental ways the Central Alaska Network is helping to assess climate change is by deploying climate stations that record temperature, precipitation, wind speed and direction, soil temperature, relative humidity, snow depth, and solar radiation throughout the parks. These new climate stations are providing critical quantitative data for current and future research and management decisions. There are several large-scale climate patterns and indices that are of particular interest to Alaska, including the Pacific Decadal Oscillation (PDO) which is an index of sea surface temperatures in the North Pacific Ocean. Typical winter sea surface temperatures during the warm phase of the PDO are warmer off of the Gulf Coast of Alaska moderating air temperatures over Alaska (Heathman and Wenzler, 2005; Keen, 2006). The PDO seems to cycle through a warm and cool phase every 20-30 years. Temperature trends that have shown climatic warming tend to be strongly biased by a sudden shift in 1976 from the cooler regime to a warmer regime. Since 2005 the index has been predominantly negative and annual air temperatures have been near or below normal around CANM – a possible indication of a phase shift from positive to negative. Unfortunately large scale changes such as this take at least a decade to confirm. 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 "tailored 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. 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 proposed in the Arctic parks. The objective of the climate monitoring program is to monitor and record weather conditions at representative locations in order to provide reliable climate data to other researchers, and to guide management decisions for Arctic climate monitoring and park planning beyond park boundaries.

Project Leader: Pamela Sousanes

Park Units

- Denali
- Wrangell - St. Elias
- Yukon-Charley Rivers

Resource Briefs

Please select one

Weather Summaries

2015

DENAI

Summer [Denali Summer 2015 Weather Summary](#)

Winter [Denali Winter 2014-2015 Weather Summary](#)

WRST

Summer [Wrangell - St. Elias Spring 2015 Weather Summary](#)

Summer [Wrangell - St. Elias Summer 2015 Weather Summary](#)

Winter [Wrangell - St. Elias Winter 2014-2015 Weather Summary](#)

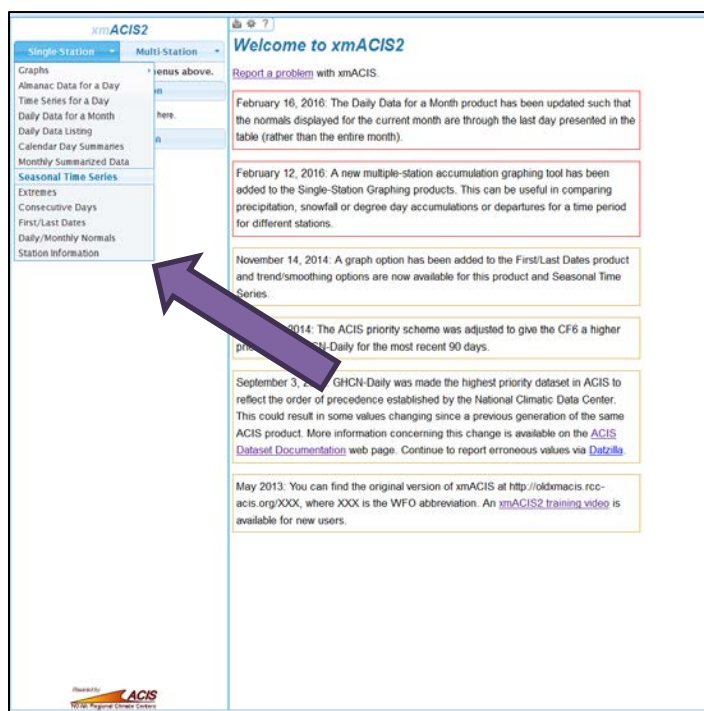
Viewing and Editing Climate Vital Sign collections

IRMA allows you to view reference collections, and if given permission, to edit collection contents. It would be redundant to include detailed instructions here when there is excellent help available in the IRMA Data Store help (<https://irma.nps.gov/content/help/datastore/index.aspx>) document.

Appendix SOP 12-B. Accessing Climate Data in xmACIS2

There are a number of websites that have tools for accessing climate data. The xmACIS2 site is currently the preferred choice for accessing the data records for the long-term index sites that are used for network wide analyses. The process is described below.

1. Navigate to the website at <http://xmaccis.rcc-acis.org/>; [xmACIS2](http://xmaccis.rcc-acis.org/)
2. Under the Single Station tab, select the data you are interested in. In this example a seasonal time series is selected.



3. The options selection pops up after you select the type of data you want to display. Here you can choose the type of output (graph, table, or .csv file), the variable, the summary (sum, maximum, number of days, etc.), the period of record, and in the seasonal summary selection, the period of interest.
4. Click **More options** and select **Set maximum missing values**. There are also graphing options available under this tab. For the seasonal summaries, the default is 5 missing days. After the options have been selected, click **Go** at the bottom.

Welcome to xmACIS2

[Report a problem with xmACIS.](#)

February 16, 2016: The Daily Data for a Month product has been updated such that the normals displayed for the current month are through the last day presented in the table (rather than the entire month).

February 12, 2016: A new multiple-station accumulation graphing tool has been added to the Single-Station Graphing products. This can be useful in comparing precipitation, snowfall or degree day accumulations or departures for a time period for different stations.

November 14, 2014: A graph option has been added to the First/Last Dates product and trend/smoothing options are now available for this product and Seasonal Time Series.

March 14, 2014: The ACIS priority scheme was adjusted to give the CF6 a higher priority than GHCN-Daily for the most recent 90 days.

September 3, 2013: GHCN-Daily was made the highest priority dataset in ACIS to reflect the order of precedence established by the National Climatic Data Center. This could result in some values changing since a previous generation of the same ACIS product. More information concerning this change is available on the [ACIS Dataset Documentation](#) web page. Continue to report erroneous values via [Datazilla](#).

May 2013: You can find the original version of xmACIS at <http://oldxmaccis.rcc-acis.org/XXX>, where XXX is the WFO abbreviation. An [xmACIS2 training video](#) is available for new users.

- Next select the site (or station). Use the ID or Search tab. Enter either an ID or a station name to select the station. If the **Search** option is used a map will pop up; use the name in the table to navigate to the correct site.

Station selection

Click column heading to sort ascending. click again to sort descending.

Year	Mean Avg Temperature	Missing Count
1902	21.7	1
1903	M	8
1904	M	92
1905	M	62
1906	37.0	1
1907	28.4	0
1908	M	92
1909	23.4	0
1910	M	92
1911	M	92
1912	M	92
1913	M	92
1914	M	92
1915	M	92
1916	M	62

- Select **Go** and the graph, table, or csv file will be generated.



7. Use the menu in the upper right corner to save the graph.

