



Montana Department of
Natural Resources and
Conservation

Remote Automated Weather Station Operating Plan

Introduction

The Montana Department of Natural Resources and Conservation Fire Program has been taking weather observations almost since its inception. Fire weather data is a critical component of fire management decisions and firefighter safety. Automated Remote Automated Weather Stations (RAWS) provide weather data including temperature, humidity, precipitation, wind, fuel moisture and solar radiation on an hourly basis to a variety of users. This plan was developed to outline procedures related to the operations, procurement and maintenance of RAWS stations owned by the Montana DNRC.

Data from Montana DNRC weather stations is used for a wide variety of applications including National Fire Danger Rating System (NFDRS) indices, fire behavior, prescribed fire, climatology and other general forecasting applications. Because of this, Montana DNRC has adopted the following documents as common standards in supplement of this Operating Plan:

- Interagency Wildland Fire Weather Station Standards & Guidelines, January 2014 (PMS 426-3)
- Gaining an Understanding of the National Fire Danger Rating System, July 2002 (PMS 932)

Objectives

The objectives of the Montana DNRC RAWS program are to:

- Develop and maintain a fire weather station network to collect the meteorological data necessary to support fire danger rating and fire management decisions for the Montana Department of Natural Resources and Conservation.
- Ensure that all DNRC owned RAWS stations are operated within compliance of national standards and procedures.
- Define the roles and responsibilities within Montana DNRC RAWS program
- Encourage the development of and participation in NFDRS plans at the Land Office or Zone Levels.
- Provide a framework for identifying program needs and implementing upgrades to the existing network.

Current Operations Overview

Montana DNRC is currently operating 7 RAWS stations across the state.

Station Name	Station Type	WIMS ID	Land Office & Unit	Lat. x Long	Elev.	Installed	10 yrs
Fisher River	RAWS	240118	NWLO-Libby	48.3833 x 115.5667	2160	2004	2014
Boorman	RAWS	240226	NWLO-Kalispell	48.1439 x 114.1718	3963	2002	2012
Stillwater	RAWS	240221	NWLO-Stillwater	48.5394 x114.5594	3116	2002	2012
Clearwater	RAWS	241520	SWLO-Clearwater	47.0136 x113.3331	3839	2009	2019
Harvey Grouse	RAWS	243003	SWLO-Missoula	46.6642 x113.4239	5386	2011	2021
Yankee Flats	RAWS	244403	SWLO-Anaconda	43.1627 x113.1410	6000	2013	2023
Dearborn	RAWS	241910	CLO-Helena	47.1328 x111.9008	3527	2008	2018

Roles and Responsibilities

Fire Bureau RAWS Program Administrator

The DNRC Direct Protection Coordinator will function as the program administrator for the Montana DNRC RAWS program. The RAWS Program Administrator will deal primarily with four key facets of the Montana DNRC RAWS program.

1. RAWS Site Determination and Interagency Coordination

The Montana DNRC RAWS program is a contributing member of the national RAWS system, and interagency cooperation is integral to continued program success. The Montana DNRC RAWS Program Administrator is responsible for maintaining and enhancing this partnership. In addition to serving as the single point of contact for interagency RAWS concerns, the program administrator will work with RAWS program partners to ensure that Montana DNRC RAWS data and stations meet NFDRS standards and that new stations are located in sites that will provide benefit to both the DNRC and the RAWS system as a whole.

2. Financing and procurement

Funding for new RAWS is typically provided by the FAMB. The RAWS program administrator will assist in obtaining authorization for new RAWS purchases as well as facilitate procurement of RAWS.

3. Maintenance Contract

Currently, Montana DNRC maintains a contract with the BLM RAWS depot for standard maintenance and sensor replacement. The RAWS program administrator will coordinate this contract or other maintenance scenario on a statewide basis. Coordinating maintenance on a statewide basis will eliminate redundancy, increase efficiency and streamline the maintenance process. The DNRC RAWS coordinator will also be responsible for maintenance of the GOES satellite license renewal every 5 years.

4. Quality Assurances

Provide oversight to ensure annual maintenance is preformed and that stations meet NFDRS standards.

Recommended Training:

- Advanced National Fire Danger Rating Systems,
 - S-491 Intermediate National Fire Danger Rating Systems
 - Basic WIMS
 - N3095 RAWS Station Maintenance

Land Office RAWS Coordinator

Each Land Office will identify a single Land Office RAWS Coordinator to act as the single point of contact on their land office and facilitate communications between the individual Units and the RAWS program administrator. Land Office RAWS Coordinators will coordinate and facilitate RAWS usage across their respective areas. Primarily, this will consist of:

1. RAWS Site Determination, Procurement, and Installation

Each land office administrator will be responsible for assisting their Units in establishing RAWS sites based on NFDRS Plans, procuring RAWS, providing cost estimate and providing technical support during station installation. The land office administrator will work directly with the RAWS Program Administrator to fund and procure Unit RAWS and ensure that site selection is coordinated to best meet the needs of the Unit and the national RAWS system.

2. Station Catalog and Data Management

Land office administrators are responsible for obtaining station IDs, establishing station catalogs in WFMI, and ensuring that data is flowing upstream in compliance with NFDRS and national RAWS standards. The land office administrator is also responsible for each station in WIMS and shall be listed as the station owner. In some occasions, actual WIMS data management may be accomplished at the respective Unit or interagency dispatch center.

3. Station Maintenance

Each land office administrator will be responsible for assisting their Units in obtaining and replacing sensors via the statewide contract. The land office administrator, with coordination of the RAWS Program Administrator will be the primary point of contact with the BLM RAWS depot and station vendor for all RAWS located on their land office.

Recommended Training:

- Advanced National Fire Danger Rating Systems,
- S-491 Intermediate National Fire Danger Rating Systems
- Basic WIMS
- N3095 RAWS Station Maintenance

Unit Level Manager/Technician

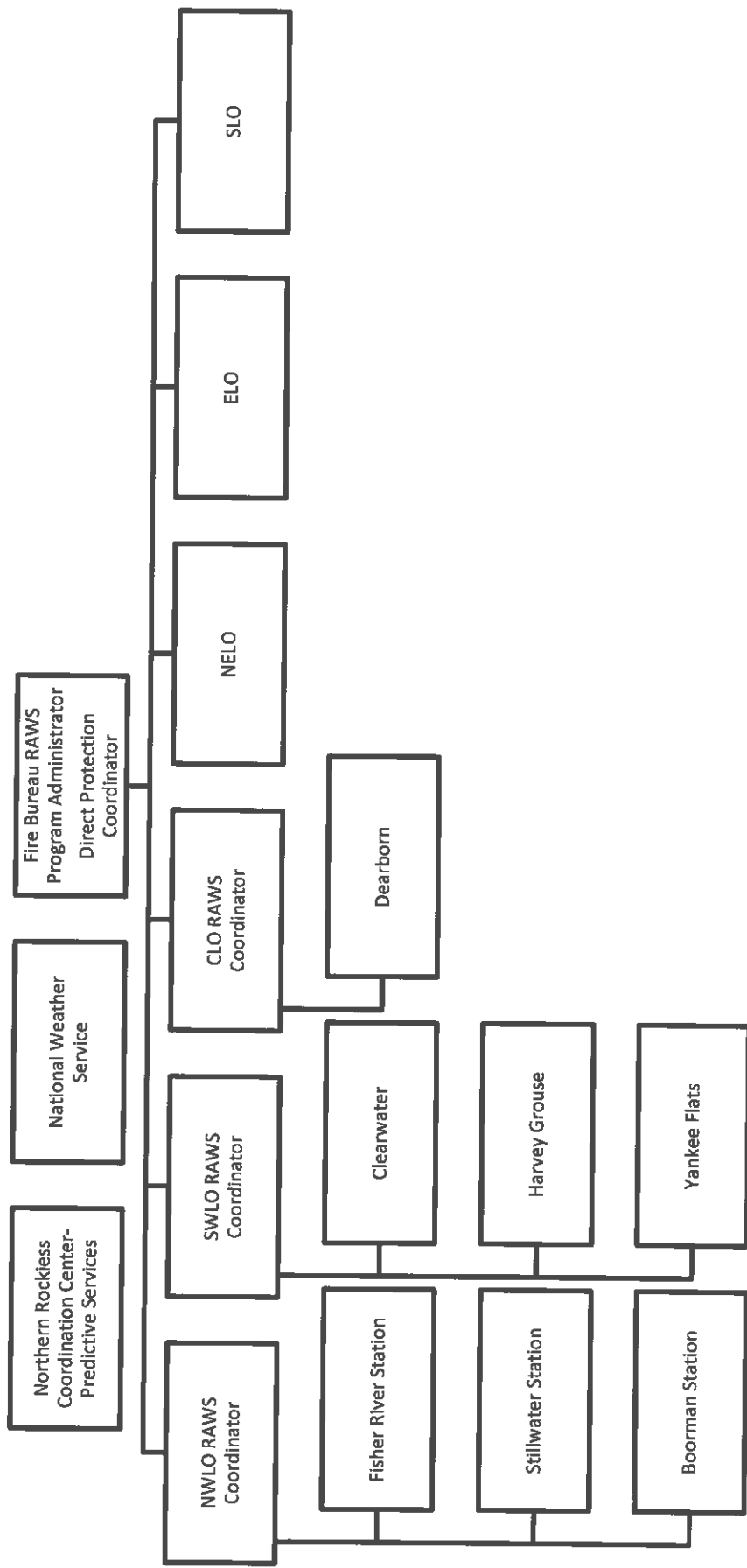
For each Unit where a RAWS is located, a single point of contact will be identified to communicate concerns relating to their RAWS. For RAWS stations on their Unit, this individual:

1. Will be listed in WFMI as the Alternate Point of Contact.
2. Performs minor weather station maintenance/repairs as requested or needed
3. Responsible for performing yearly site maintenance including replacing sensors, fuel sticks ect.
4. Ensures site visits are accurately reported to the Land Office Coordinator in a timely fashion.

Recommended Training:

- S-491 Intermediate National Fire Danger Rating Systems
- Basic WIMS
- N3095 RAWS Station Maintenance

Montana DNRC RAWs Organization



Operational Procedures

Funding

As funding allows the DNRC Fire and Aviation Management Bureau will purchase RAWS stations in support of a DNRC weather station network in accordance with the proposal process listed below. FAMB will provide for the funding and upkeep of all DNRC owned RAWS stations to ensure they meet NWCG and NFDRS standards through annual maintenance contracts. All site specific needs (fencing, improvements) will be the responsibility of the Land Office/Unit.

Land Offices may purchase additional RAWS stations and/or upgrades through their respective budgets but should follow the statewide process outlined below when determining locations

Proposals for new Weather Stations

When determining a location for a new RAWS station; Land Offices/Units shall consult with the local NFDRS plan and the Northern Rockies Coordinating Group Predictive Services Meteorologists to determine optimal sites and elevations. All Units/Land Offices should identify primary and secondary sites for any new proposals.

New proposals should also include the following information:

- Type of Station
- Desired sensor compliment (all stations will be required to have the minimum NFDRS sensors for compliance)
- Power source (Solar or Hardwire)
- Permanent or Portable
- Type of base (Lunar module or post)
- Estimated cost

These proposals will be developed in conjunction with the Land Office RAWS Administrator who will then forward them to the FAMB RAWS Coordinator for consideration. The FAMB RAWS Coordinator will prioritize requests and provide a recommendation to the FAMB for funding.

Procurement and installation of new DNRC owned RAWS stations will be prioritized as follows:

1. Greatest need, holes in coverage or lack of data as determined by local NFDRS Plans for DNRC operations
2. Greatest need, holes in coverage or lack of data as determined by local NFDRS Plans for cooperators and other agencies
3. Replacing critical manual stations.

Weather Station Maintenance

Annual service of NFDRS RAWS stations provides an opportunity to ensure general station integrity and to perform necessary preventative maintenance. All Montana DNRC owned RAWS stations will be maintained in accordance to processes and procedures outlined in the 2014 version of the "Interagency

Wildland Fire Weather Station Standards & Guidelines (PMS 426-3)". The FAMB will maintain an annual maintenance contract with the Boise RAWS Depot for all DNRC owned RAWS stations.

To maintain NFDRS compliance requirements, each DNRC owned RAWS station will receive at a minimum, one site visit per year. A site visit is usually accomplished when the Unit/Land Office is completing sensor change out early each summer prior to the sensors calibration expiration. The Land Office RAWS Administrator will coordinate these visits and ensure that the site visit is logged in WFMI.

For all DNRC owned RAWS stations; F6 data loggers will be programmed to reset the annual precipitation on January 1st of each year.

Efforts shall be made to train Unit/Land Office staff in the proper maintenance of RAWS stations through local and regional training opportunities. The N3095 RAWS Station Maintenance course is usually held each winter in Boise, ID.

Operation

The optimal operating period for all weather stations used for NFDRS calculations is year round. However the minimum operational period for all DNRC owned RAWS stations shall be as follows:

A minimum 30 day start up period prior to the need for NFDRS indices and the regular spring green-up period through a season ending event in the fall, usually determined by snowfall or significant rainfall.

Units/Land Offices should work with their local interagency intelligence dispatcher to provide data publishing year round.

NFDRS and FDOP Plans

Land Offices and Units shall prepare or participate in local NFDRS and Fire Danger Operating Plans. These plans are used to identify the decision-making process for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters by establishing planning and response levels using the best available scientific methods and historical weather/fire data. In addition, these plans outline procedures for developing seasonal risk analysis and define fire severity trigger points.

At a minimum, the NFDRS/FDOP should contain the following information:

- Area Roles and Responsibilities
- Historical Fire & Weather information
- Fire Danger Rating Inventory
- Operational Procedures
- Climatic Breakpoints and Fire Business Thresholds
- Staffing Levels

- NFDRS Indices to be used (Burning Index, Energy Release Component, Spread Component, or Ignition Component)
- Adjective Fire Danger Rating thresholds

Future Planning/Program Needs

Looking into the future DNRC will use a collaborative effort between other local, geographic and agency members when choosing locations for new RAWS stations and the need to move or remove stations from service. In all cases new RAWS stations should be situated to provide a benefit to DNRC operations first and then as will benefit to interagency partners.

The DNRC RAWS workgroup should meet annually to review this operating plan and identify project priorities for the next 5 years.

Current Program Priorities Include:

- Upgrading current “mast” configured stations to the tripod or lunar style setup.
 - Libby (scheduled for 2018)
 - Dearborn (scheduled for 2018)
 - Harvey Grouse
 - Clearwater
- Upgrading stations to have Radio Voice Transmitters (RVT) for better user interface.
- Continuing to send Unit Level Technicians to N3095 RAWS Station Maintenance