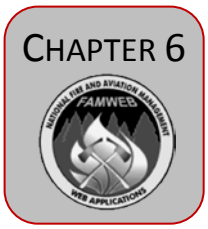


WORKING WITH STATION INFORMATION -- STA

This chapter gives users the information needed to enter and manipulate station information, Special Interest Group (SIGs), and Access Control Lists (ACLs).

User menu options and functions depend on account type and access level. Tasks described in this chapter are not available to everyone.

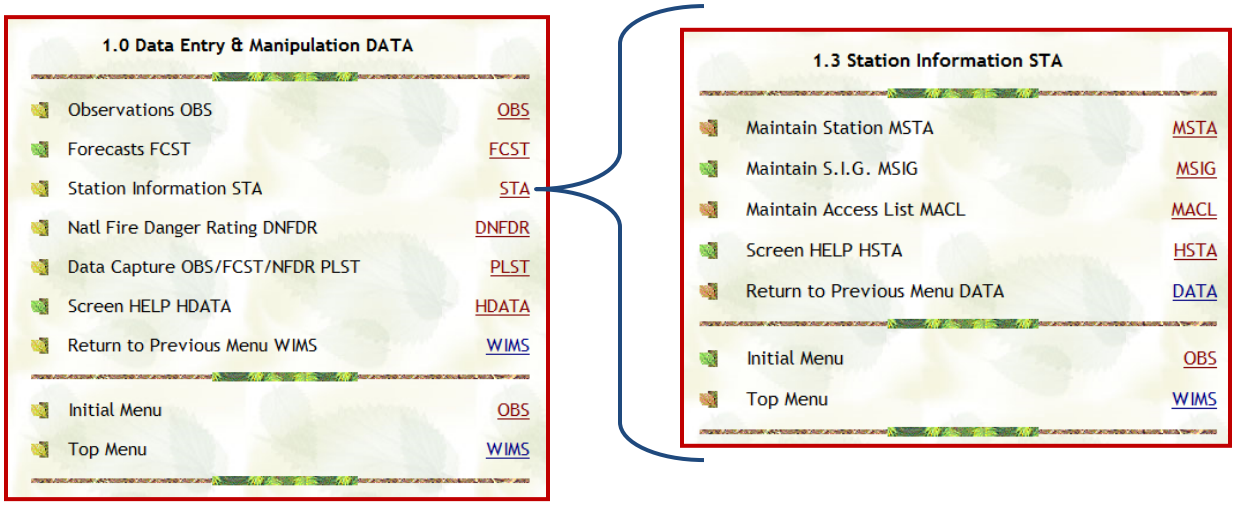
For more information about access levels, see Appendix A, "Menus, FastPaths, and access levels."

TABLE OF CONTENTS

STATION INFORMATION

- Weather observations are transmitted to WIMS from remote automated weather stations (RAWS), or entered directly in WIMS for manual stations. Before weather observations can be stored, the station number and other station information must be stored in WIMS as a station catalog.

Station information is located under Data Entry and Manipulation (DATA) Menu. From the WIMS main menu select DATA followed by STA.



You may bypass the menus by using the FastPath STA.

The Station Information STA menu provides access to:

Maintain Station Information

Maintain a SIG

Maintain Access List

Go directly to any of the Station Information menus by typing its FastPath command:

MSTA -Maintain Station

MSIG - Maintain SIG

MACL - Maintain Access List

Maintain Station Information

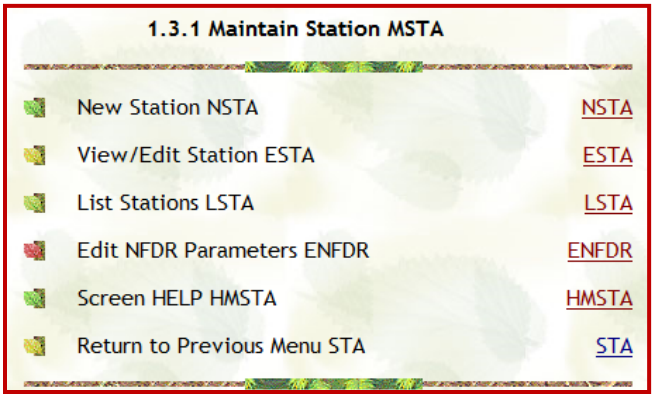
The Maintain Station Information menu provides access to the following menus:

Create a new station catalog NSTA

View/Edit an existing station catalog ESTA

List existing stations LSTA

Edit NFDR parameter ENFDR



Creating a new station

To create a new station (NSTA) the following General Station Information will be needed:

Station Name and Station Type.

NESDIS number for RAWS station.

A Station ID that has been assigned by the local Geographic Area Coordination Center GACC. Contact the Predictive Services at the GACC. **Don't just make up a number!**

Site description including, aspect, elevation, and slope location.

FIPS information, including county and state codes.

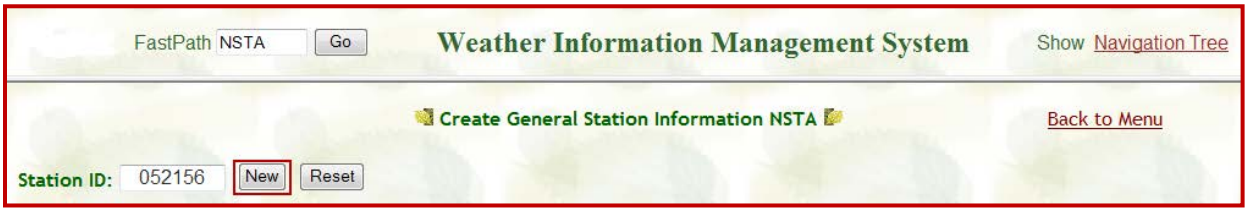
GPS acquired latitude and longitude of the station location using the NAD 83 datum.

Access Control List to be assigned to the station.

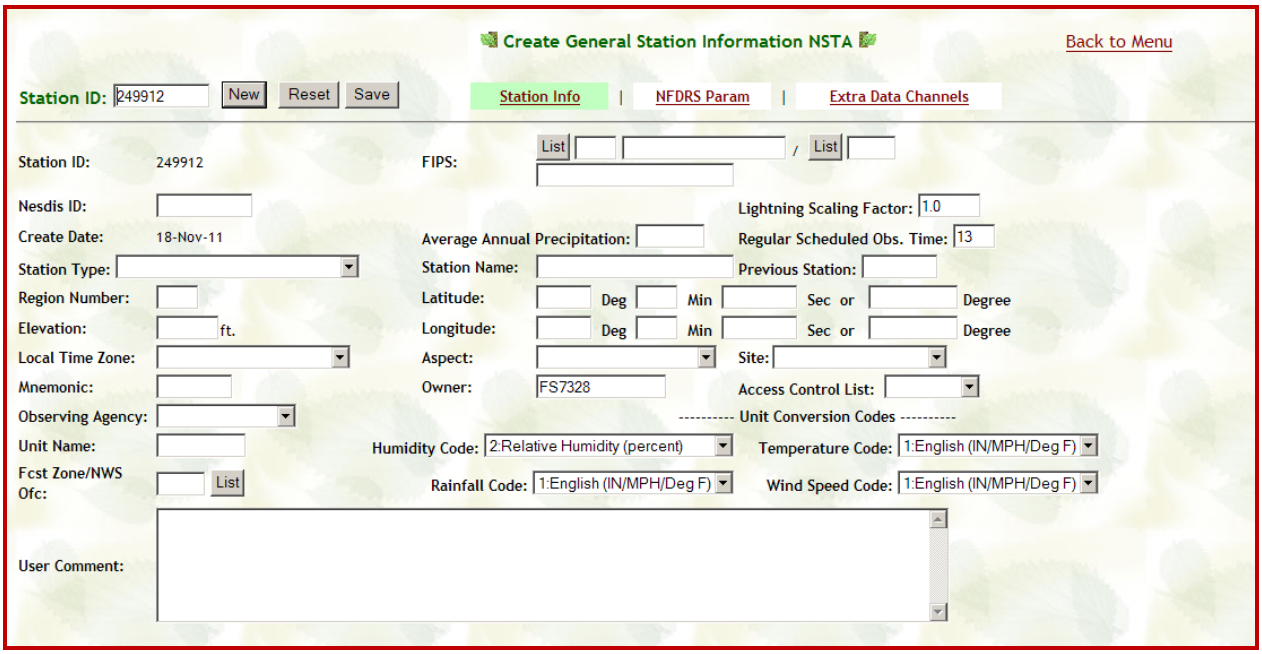
- The WIMS user ID of the user creating a station becomes the Station owner. WIMS automatically fills this field when the Station ID is created.
- Other information required for the station depends on the type of station created.

  - If an NFDRS station, the NFDRS Parameters section needs to be completed. This includes fuel model, slope, climate class, grass type, staffing index, number of decision classes, breakpoint values and initial fuel moisture values.
  - Create Automated Sensor Station Information. This section is completed by WIMS with information from WFMI once the station information is saved.

In the FastPath field type NSTA. The Create General Station Information screen will open. Enter the new Station ID and click New.



The NSTA form will open to the first of three screens.



To move between the screens, click on the links to the right of the save button.

General Station Information Field Definitions

Station ID

This is a six digit number that is assigned to a specific station by the local Geographical Area Coordination Center (GACC) Predictive Services Unit. When feasible, the following numbering convention is used:

Digits one and two are the state identifier, digits three and four are the county identifier, and digits five and six are the sequential number of the station in the county.

Station numbers from xxxx90 thru xxxx99 are utilized for temporary or "dummy stations". The observed weather data entered into WIMS for a temporary station is NOT archived in the National Interagency Fire Management Integrated Data Base (NIFMID). An example of a temporary station would be a portable RAWS that is being used to collect weather data for a prescribed fire.

XX99XX Portable/Temporary Station numbering. Eliminates any county designator, insert state and station number.

FIPS

This is the acronym for the Federal Information Processing Standard. This is an American National Standard Institute (ANSI) system for uniformly designating standard codes for the unique identification of states and counties. This field is for informational purposes only. Click the **List** buttons to select the correct state and county.

NESDIS ID

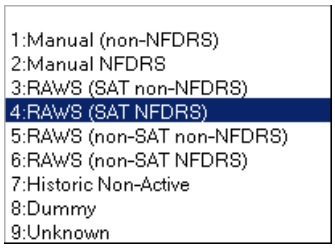
This entry is for RAWS only. This is an eight-character identifier assigned by the National Environmental Satellite, Data, and Information Service (NESDIS) to a specific channel and transmit time-slot (transmit window) in their satellite based data collection system. Once assigned to a specific site, the identifier is commonly referred to as the "platform id".

A NESDIS ID may be associated with only one station ID.

Transmit times (i.e. platform id's or NESDIS id's) are assigned to only one platform id, and are obtained thru the Agency Data Collection Platform (DCP) Coordinator. The time-slot assignment is shown in Greenwich Mean Time (GMT).

Station Type

A one-character code designates the type of weather station as follows:



Selecting a non-NFDRS station eliminates the NFDRS forms and field restrictions. Non-NFDRS stations will not generate fire danger rating outputs.

SAT refers to stations that transmit observations via GOES satellites. Non-SAT stations deliver data to WIMS through an alternate data portal, using Web-Dav protocols.

Average Annual Precipitation

The KBDI computation requires the average annual precipitation amount at the weather station. This includes both rainfall and the water equivalent of snowfall. If site specific year-round precipitation data is not available, a reliable estimate can be obtained from the nearest National Weather Service Office. THIS FIELD IS ESSENTIAL WHEN USING 1988 FUEL MODELS as KDBI is used to add drought fuel to the fuel model during drought conditions.

This field can be entered for stations using only 1978 fuel models to compute a valid KBDI. In these cases KBDI serves as a stand-alone index to provide fire managers with another tool for assessing fire danger. This is a required field.

Station Name

The full geographic or descriptive name given to the weather station, up to 20-characters.

Region Number

The USDA Forest Service Region number. Enter the number even if the station is owned by an agency other than the Forest Service. (e.g. a station in the state of Arizona is in USFS Region 3, so enter 3 here, etc.)

Elevation

The station elevation, in feet, above sea level.

Local Time Zone

The Time Zone is the three letter designation for STANDARD TIME ZONE in which the station is located.

Mnemonic

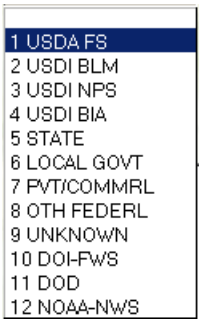
This field is often used for the local agency Incident Command System (ICS) three letter identifier, or other appropriate agency identifier. (e.g. CLP=Crater Lake NP, LIF=Lincoln NF, GJD=Grand Junction District), although any meaningful or useful value may be entered.

Unit Name

The name of the unit (District, Forest) that owns the station.

Observing Agency

Select the agency which operates the station from the following:



REGULAR SCHEDULED OBSERVATION TIME (RS)

This two-digit number indicates the hour at which the station normally takes fire weather observations (usually 12 or 13).

After improvements with Version 2.0 (Nov. 2010) WIMS, the RAWS ingest gateway program uses the RS time to estimate certain parameters that previously required user assessment and entry. For automated NFDRS stations (Types 4 and 6) it is ***critical*** to set the RS time correctly. There are several things to remember:

- The observation time is in LOCAL STANDARD TIME (LST).
- The NFDR Time of an observation in WIMS is the hour portion only of the transmission time (hhmm). For example, 1255 become 12 while 1305 becomes 13.
- Data transmitted from the weather station site prior to 1300 LST (1230 to 1259) should set RS to 12.
- Data transmitted after 1300 LST (1300 to 1330) LST transmission, should set RS to 13.

FCST ZONE/NWS OFC (FIRE WEATHER FORECAST ZONE OR NWS OFFICE)

A three or four digit number assigned by the NWS or GACC Predictive Service Unit (PSU) to designate the fire weather forecast zone the station is located in. The first digit usually corresponds to the Forest Service Region the fire weather forecast zone is located in.

Note: Fire Weather Forecast Zones are used for Trend Zone Forecasts. Point Forecasts are generated using NWS Office Identifier. You should verify with the NWS and Predictive Services which method is currently being used in your area.

WIMS administrators maintain the list of fire weather forecast zones, which are actually public Special Interest Groups (SIG). See page 23 of this chapter for more on SIGs.

LIGHTNING SCALING FACTOR

This variable empirically accounts for factors not directly addressed by the lightning-fire occurrence model such as the susceptibility of local fuels to ignition by lightning, fuel continuity, topography and the characteristics of local thunderstorms. It is derived empirically from lightning-fire occurrence and lightning activity level data for an area within a 28 mile radius of the weather station.

Enter the locally determined value, ranging from 0.01 to 5.0. The default value is 1.0.

See Appendix D in "USDA Forest Service General Technical Report INT-39" for further information.

LATITUDE/LONGITUDE

The station location is used to calculate changing day length, computer graphics, and for fire behavior interpolation of the standard observation to other locations and times of day.

- The correct format is Degrees/Minutes/Decimal Seconds. (e.g. 46 55 27.9836)
- WIMS will convert and display decimal degrees . (e.g. 46.924440)
- Locations should be entered using NAD 83.

ASPECT

A one digit code indicates the exposure of the slope on which the station is located with the eight-point number system. WIMS will convert and print the English translation.

0	Flat/None		5	Southwest	225
1	Northeast	45	6	West	270
2	East	90	7	Northwest	315
3	Southeast	135	8	North	360
4	South	180			

SITE

A one digit code indicates the general location of the site.

1 Valley bottom or flat
2 Mid-slope
3 Ridge or peak

PREVIOUS STATION

This information is displayed as appropriate to provide continuity for historical purposes. If a station has operated under different station identifiers (a manual station verses an automatic station), or if a number changed for other reasons, you can cross reference the stations in NIFMID and track the archived weather data.

- Station data security and sharing is maintained through Access Control Lists (FastPath MACL - See Chapter 1.3.3). These are very important inputs as they control the ability of others to assist in the managing of station information and in the entry and editing of daily fire weather observations.

OWNER

This field will default to the user identification (Logon ID) of the user that is actually entering the new station data. This field may be changed by any user with edit access to this station through the Access Control List. The owner has full access to all station data functions.

- ***If an Owner ID is changed, and not specified on the Access Control List (ACL) for the station, the former owner will not have edit access to the station data or the observations.***

ACCESS CONTROL LIST

This is a list of users who can edit, manipulate, and delete data from catalogs, observations, etc. The access control list must exist in WIMS before it can be assigned.

UNIT CONVERSION CODES

Unit Conversion Codes identify the type of moisture variable which WIMS is to expect, as well as the temperature, wind speed and precipitation units.

Humidity Code

The humidity code identifies the type of moisture variable which is expected in New Observations for that specific station. The system default value is a "2" for relative humidity.

This is a one-digit number indicating the moisture variable to be entered in the observation.

1	Wet-bulb Temperature (deg. F)	4	Wet-bulb Temperature (deg. C)
2	Relative Humidity (percent)	5	Unused
3	Dew point Temperature (deg. F)	6	Dew point Temperature (deg. C)

- Manual stations are usually entered using relative humidity or wet bulb. NWS stations often use dew point temperature.
- RAWS are always entered as relative humidity.

Rainfall Code

A one-digit code indicating how rainfall is entered for new observations (FastPath NOBS - See Chapter 1.1.1). The default value is a "1" for inches of precipitation.

1 English (Inches/MPH/Deg. F)
2 Metric (MM/KPH/Deg. C)

Temperature Code

A one-digit code indicating the temperature units used for new observations (FastPath NOBS - See Chapter 1.1.1). The default value is a "1" for degrees Fahrenheit.

1 English (Inches/MPH/Deg. F)
2 Metric (MM/KPH/Deg. C)

Wind Speed Code

A one-digit code indicating the wind speed units used in the observation. The default value is a "1" for miles per hour.

1 English (Inches/MPH/Deg. F)
2 Metric (MM/KPH/Deg. C)

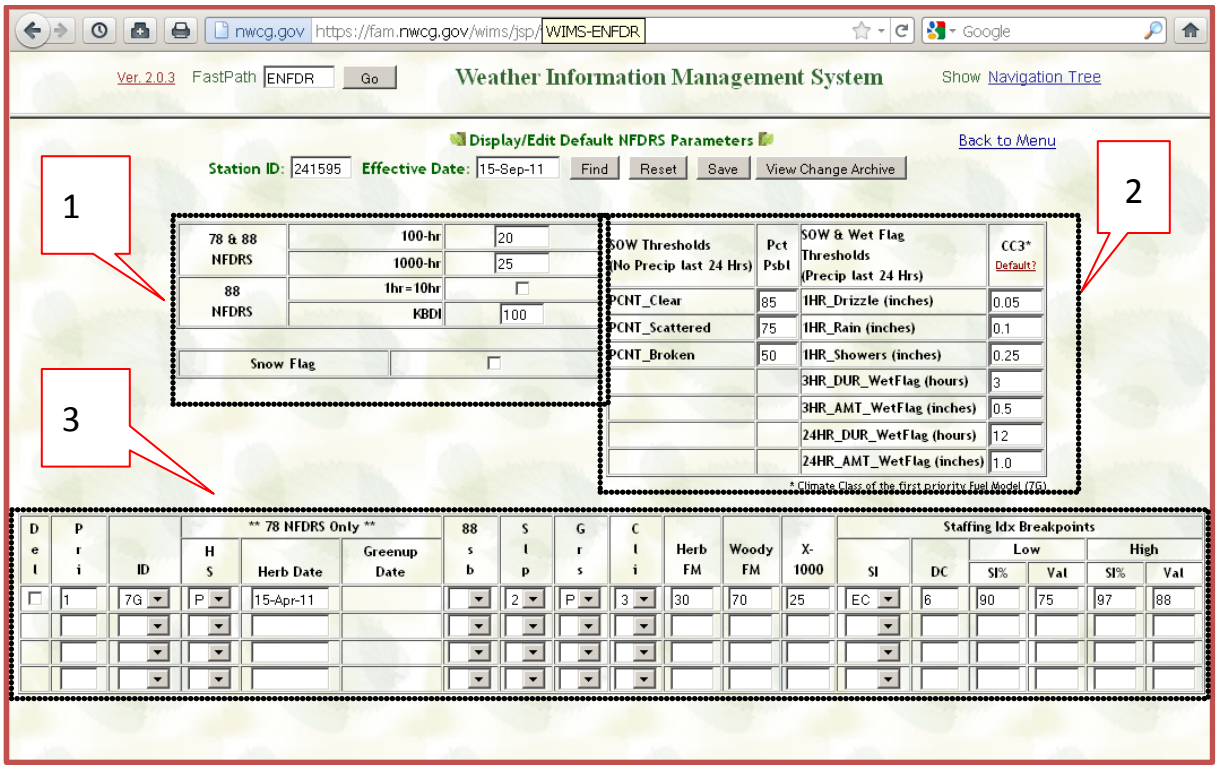
USER COMMENT

Use this field to record any comments pertaining to the station.

NFDRS PARAMETERS

"Default NFDRS Parameters", the second screen displays NFDRS station's (station types 2, 4, or 6) key variables, such as fuel model, slope class, staffing variables, and moisture values, that the NFDRS processor utilizes in the calculation of NFDRS outputs. Default values will appear in many of the fields when the station catalog is first created. The default values may be accepted or replaced with user provided inputs.

The NFDRS Parameters screen has 3 basic sections. Sections 1 and 2 are generally applied at the station level and are not fuel model dependent. Section 3 contains the information that depends on the selected fuel models parameters.



NFDRS PARAMETERS, SECTION 1

100-HR

This value represents the modeled moisture content of dead fuels in the 1 to 3 inch diameter class. It can also be used as a very rough estimate of the average moisture content of the forest floor from three-fourths inch to 4 inches below the surface. The 100-hour Timelag Fuel Moisture (TLFM) is a function of length of day (latitude and date), maximum and minimum temperature and relative humidity, and precipitation duration in the previous 24 hours.

Values generally range from 5 to 60 percent. A default value, based on the climate class of the priority #1 fuel model module, will automatically be entered in this field if there is a break of 30 days or more in the observations.

1000-HR

This value represents the modeled moisture content in the dead fuels in the 3 to 8 inch diameter class and the layer of the forest floor about 4 inches below the surface. The value is based on a running 7-day average. The 1000-HR TLFM is a function of length of day (latitude and date), daily temperature and relative humidity extremes (maximum and minimum values) and the 24-hour precipitation duration values for a 7-day period.

Values generally range from around 7 to 60 percent. A default fuel moisture value, based on the climate class of the priority #1 fuel model module, will automatically be entered in this field if there is a break of 30 days or more in the observations.

1 HR = 10 HR

When using 1988 fuel models, the processor will always set the 1 Hr = 10 Hr on the day of and day following a precipitation event of more than 0.1 inches. This is done to reduce the problem of overrating fire danger after precipitation in the Southeast. Users may opt to set 1 Hr = 10 Hr ***everyday*** by checking this box. Remember, this applies to '88 fuel models only.

KBDI

The Keetch-Byram Drought Index is based on annual precipitation, daily precipitation and maximum daily temperatures. It is used to estimate the deep drying of duff and litter and the subsequent availability of additional fuels that could be consumed in the flaming front of a fire. This field may be calculated for EITHER the 1978 or 1988 fuel models.

The 1978 fuel models lack the ability to simulate increased fuel availability as drought conditions worsen. The 1988 models include a "potential dead fuel load" that can be added to the fuel model as a function of the KBDI. The added fuel is distributed in proportion to the pre-drought dead fuel loads, with depth increased to preserve the packing ratio.

The total dead load increases above the threshold KBDI value of 100 and the total potential dead load is realized once the KBDI reaches 800.

See Appendix D, USDA-Forest Service Research Paper SE-38 or USDA-Forest Service Research Paper SE-273 for further information.

SNOW FLAG

Version 2 of WIMS added a Station Level Snow Flag to indicate that fuels represented by the weather are covered with snow. When fuels are covered with snow, the NFDRS processor essentially sets fuels as wet and may add some precipitation duration if the temperature is warm enough. This has the effect of keeping the large fuels from drying out over winter at stations that run through the winter but have long periods of snowpack.

NFDRS PARAMETERS, SECTION 2

STATE OF WEATHER AND WET FLAG THRESHOLDS

New gateway routines in WIMS Version 2.0 estimate the State of Weather (SOW) and Wet Flag (WF) for the "R" observations at regular_scheduled_obs_time (RS) from solar radiation (percent of possible for the latitude and date, and time) and precipitation amount and duration for the current hour, the previous 3 hours, and the past 24 hours. Default thresholds are by climate class.

The following cases define logic and thresholds that set SOW and Wet Flag for the RS observation. Station owners may modify and restore default thresholds in the ENFDR module.

Case 1: No Precipitation in past 24 hours: Set SOW based solely on Solar Radiation

PCNT_SOLAR is the 1-hour averaged Solar Radiation (watts/m^2) converted to percent possible for that station/date/hour. In this example if PCNT_SOLAR >= 80, SOW would be 0 (clear).

```
Condition:   (24HR_PRECIP ==0)

Actions:  If (PCNT_SOLAR >= Pcnt_Clear)  SOW = 0                                          (Clear, < 1/10 cloud cover)
          If (PCNT_SOLAR >= Pcnt_Scattered  AND PCNT_SOLAR < Pcnt_Clear)  SOW = 1         (Scattered, 1/10 to 5/10 cloud cover)
          If (PCNT_SOLAR >= Pcnt_Broken  AND PCNT_SOLAR < Pcnt_Scattered) SOW = 2         (Scattered, 6/10 to 9/10 cloud cover)
          If (PCNT_SOLAR <  Pcnt_Broken)  SOW = 3                                         (Overcast, > 9/10 cloud cover)
          If (PCNT_SOLAR <  Pcnt_Broken AND RELATIVE_HUMIDITY > 95)  SOW = 4              (Fog)
          If (OBS_SOLAR < 25) SOW = 3  Catch observations during the nighttime.
          Wetflag = 'N'
```

Case 2: Precipitation in last 24 hours, but none last 3 hours

```
Condition:   (24HR_PRECIP<>0  AND 3HR_PRECIP == 0)

Actions:  SOW set as in Case 1.

          WetFlag = 'N'
          IF (24HR_DURATION > 24HR_DUR_WetFlag  OR  24HR_AMT >  24HR_AMT_WetFlag)    WetFlag = "Y"
```

Case 3: Precipitation during previous 3 hours but none last hour

```
Condtion:  (3HR_PRECIP> 0  AND 1HR_PRECIP== 0)

Actions:  SOW set as in Case 1.

          WetFlag = 'N'
          IF (3HR_PRECIP_DUR > 3HR_DUR_WetFlag OR 3HR_PRECIP_AMT > 3HR_AMT_WetFlag)        WetFlag = "Y"
```

Case 4: Precipitation during previous hour

```
Condition:   (1HR_ PRECIP > 0)
Actions:
        if (oneHrPrecipAmt <= one_hr_drizzle)  SOW and WetFlag set as in Case 1.
        Otherwise
        if (oneHrPrecipAmt > one_hr_drizzle and oneHrPrecipAmt <= one_hr_rain)   sow = 6; // rain
        if (oneHrPrecipAmt > one_hr_rain    and oneHrPrecipAmt <= one_hr_shower) sow = 8; //t-showers
        if (oneHrPrecipAmt > one_hr_shower) sow = 9;                                       //thunderstorm
        if (dbtemp<=32.0f) sow = 7;                                                        //snow/sleet
        Then set WetFlag for SOW or 3-hr or 24-hour WF Thresholds
        wetflag = "N" ;
        if (sow==6 or sow==7 or twentyfourHrPrecipDur> twentyfour_hr_dur_wetflag or twentyfourHrPrecipAmt >
twentyfour_hr_amt_wetflag
          or threeHrPrecipDur>three_hr_dur_wetflag or threeHrPrecipAmt>three_hr_amt_wetflag) wetflag = "Y";
```

NFDRS PARAMETERS, SECTION 3

Following are descriptions of NFDRS Fuel Model parameters. Certain inputs are only required for the 1978 fuel models, while others are only required for the 1988 fuel models. Parameters may be defined for up to four "rows" of fuel models. Fuel model "rows" may be unique (based on fuel model, slope class, grass type, climate class combinations) or they may be the same structurally, but with different NFDRS outputs and/or thresholds used for setting staffing and adjective classes.

PRIORITY (PRI)

This field identifies the order (1 – 4) that NFDRS values are displayed throughout WIMS. The initial entry default 100-HR and 1000-HR fuel moisture values in the fire danger-rating processor are set according to the climate class of the Priority 1 fuel model module.

IDENTIFICATION (ID)

This field identifies the fuel model used for danger rating calculations. The NFDRS processor will accommodate both the 1978 and 1988 fuel models. A 7 or 8 is added to the alphabetic fuel model to differentiate the set of fuel models being utilized; for example 7C would indicated the 1978 version of fuel model C and 8G would indicate the 1988 version of fuel model G.

HERBACEOUS VEGETATION STAGE CODE (HS) – '78 FUEL MODELS ONLY

This field is utilized to describe the general condition of the herbaceous vegetation in the area represented by the danger rating station.

P PREGREEN

A "P" describes the vegetative state that exists in late winter/early spring before new growth appears. Pregreen is the default herbaceous vegetation stage code when a new station is created. It also becomes the default value if there has been a break in the data of at least 30 days. The herbaceous fuel moisture is set equal to the 1-hour fuel moisture in the Pregreen stage.

G GREEN

A "G" signifies that the herbaceous plants are reacting to improved growing conditions. This is usually once a year in the spring. Several **Green** conditions per year are possible in drier climates. The herbaceous fuel moisture in the green stage ranges from 120 to 250 percent and the total loading of the herbaceous fuels is in the live fuel class.

The length of the greenup period (the initial period after model is activated with the "G" code) in the fire danger rating processor is set by the Climate Class, which is discussed later in this chapter.

Two important actions occur in the fuels models during the "greenup period"; (1) the herbaceous fuel load is transferred from the 1-hour timelag [dead] category to the live

herbaceous category at a rate established by the climate class, and (2) the herbaceous fuel moisture is also increased from its Pregreen, Cured or Frozen value to a value dependent on environmental conditions both before and during the growing season.

Typically, herbaceous moisture will be somewhere near or at 250 percent at the completion of greenup. If the conditions prior to and during the growing season are dry or if a late "greenup" is experienced, the herbaceous moisture may peak at a lower value.

If it has been exceptionally dry during the greenup period, the modeled herbaceous fuel moisture may not reach 120 percent by the end of the "greenup period", and as a result, the Green stage is bypassed and the model goes directly into the Transition stage.

NOTE: It is important to calculate NFDRS outputs daily for 30 days prior to and throughout the "greenup period" to ensure that the herbaceous and woody fuel moisture models function properly.

See Appendix H of "USDA-Forest Service General Technical Report INT-39" for further information on climate classes.

T TRANSITION

A "T" indicates that the fuels are in a state of transition; the range of herbaceous fuel moisture is between 30 and 120 percent. During Transition, the live perennial herbaceous fuel load is being passed back and forth between the 1-hour timelag fuels as live fuel moisture fluctuates with environmental conditions which affect the live fuel moisture content of the plants.

- For annual herbaceous plants, the transition process differs. In Transition, herbaceous fuel moisture of annual plants is not allowed to increase; fuel load only transfers from the live category to the dead category.

C CURED

A "C" indicates herbaceous fuels have reached a "cured state". It is normally entered when the herbaceous fuel moisture model in the danger rating processor does not "cure" the herbaceous plants (herbaceous fuel moisture equal to 30%) on a timetable matching the actual phenological curing in the area represented by the station. It is also used to signal the death of herbaceous plants due to cold temperatures when the temperature is not low enough to affect woody plants.

Perennial plants are allowed to recover from the "cured state" and "re-green" on their own if moisture conditions improve. Annual herbaceous plants, however, stay "Cured" until the user declares "Green".

While in the Cured stage, as in Pregreen, herbaceous fuel moisture is equal to the fine dead fuel (1-hour timelag) moisture.

F FROZEN

The "F" code signifies when cold temperatures have killed herbaceous plants and forced woody fuels into dormancy. While in the Frozen stage, the herbaceous fuel moisture is equal to the fine dead fuel (1-hour timelag) moisture and the dormant woody moisture stays at the climate class default value.

See USDA-Forest Service Research Paper INT-226 for more detailed information on the live fuel moisture model utilized with the 1978 fuel model set.

HERB DATE

This is the date associated with the ***current*** "Herbaceous Vegetation Stage Code". The fire danger-rating processor automatically updates this date when the herbaceous fuel moisture computations move the herbaceous vegetation state between stages, i.e. from Green (G) to Transition (T) to Cured (C). The user must enter a date to correspond to any changes made manually to the "Herbaceous Vegetation Stage Code."

NOTE: Whenever a Green (G) is entered for the Herbaceous Vegetation State Code to signal the start of the greenup process, the date entered in the herb date field will be known as the "greenup date" for the live fuels associated with the fuel model and be displayed in the "Greenup Date" field.

When "greenup" is started, the herbaceous fuel moisture increases from its cured, frozen or pre-green value of 30 percent or less (herbaceous fuel moisture equal to the 1-hour timelag fuel moisture), to a green value which is determined by the moisture conditions during the greenup period.

GREENUP DATE

Displays the date that the user declared "greenup" for the specific fuel model module. The value defaults to the date that a "G" is entered but may be changed.

SLOPE CLASS CODE (SLP)

Enter the one-digit number representing the average slope percent in the area represented by the station. This field can be used by the fire manager to represent the average slope class in the vicinity of the weather station, an area of special concern, or a protection area.

1 0% - 25%

2 26% - 40%

3 41% - 55%

4 56% - 75%

5 greater than 75%

The classes were selected so that the effects double with the next higher slope class. Slope class 5 has 16 times the effect as slope class 1.

SHRUB TYPE CODE (SB) – '88 FUEL MODELS ONLY

The Shrub Type Code defines whether woody shrubs are deciduous or evergreen. If the evergreen option is selected, the live woody load remains static at all live woody fuel moistures. If the deciduous option is selected, the live woody load is transferred between the live woody and the fine dead fuel classes as the live woody greenness factor changes (dynamic).

When the shrub greenness factor is 0, all live woody load is transferred to the fine dead fuel class. When it is 20, live woody load is at the fully assigned value for the fuel model.

The Shrub Type Code also combines with the Season Code to control the wind adjustment factor in the 1988 fuel models, which varies seasonally when the Shrub Type Code is designated as deciduous. The adjustment factor is set to its maximum value during the winter season which provides the minimum wind speed reduction (maximum mid-flame wind speed). It is set to its minimum value during the summer season which provides the maximum wind speed reduction (minimum mid-flame wind speed). During the spring the adjustment factor decreases, and during the fall it increases, as a function of the woody greenness factor. It is held constant all year if the Shrub Type Code is designated as evergreen.

If using the 1988 fuel models, the user must select the prevalent type of shrub cover (woody plants) for the area represented by the weather station. The evergreen mode should be selected if the live shrubs are not deciduous or if for some reason you desire to not have the live fuel load transferred between the live and dead classes.

The Shrub Type Code are:

D Deciduous (dynamic)

E Evergreen (static)

GRASS TYPE CODE (GRS)

Correctly designating the lesser vegetation in the fuel model as "annual" or "perennial" is extremely important. The live fuel moisture model will predict faster drying and curing rates for annuals than for perennials. If more than half of the herbaceous plants in the represented area are annuals, designate them as "annuals," otherwise they are "perennials." The "annual" grass type code (A) is seldom appropriate in mountainous areas or east of the 100th Meridian.

The Grass Type Codes are:

A Annual

P Perennial

NOTE: Fuel Model A must be given an annual designation and Fuel Model L must be given a perennial designation.

CLIMATE CLASS CODE (CLI)

The climate class provides *broad scale* plant moisture responses needed for rating fire danger across the country. Climate class is used to define different linear drying rates for annuals, perennials, and woody plants. Within a particular climate class, a single drying rate is assumed for woody plants. In the live herbaceous plants, the drying rate varies in two stages: the Green stage (1978 models) or Summer season (1988 models) where the herbaceous fuel moisture exceeds 120 percent, and the Transition stage (1978 models) or the Fall season (1988 models) where the herbaceous moisture ranges from 30 to 120 percent. In the Green stage/Summer season annuals and perennials dry at the same rate, but in the Transition stage/Fall season annuals exhibit faster drying rates than perennials.

The length of the greenup was scaled to the climate class (seven times the climate class value) because plants growing in drier climates typically respond quicker to favorable growing conditions than do plants in wetter climates.

While the United States can be divided into many climatic zones, four general zones have been selected to meet danger-rating needs. The climate class should be selected for the location of the station.

The Climate Class Codes are:

1 Arid / Semiarid

2 Sub-humid (rainfall deficient in summer)

3 Sub-humid (rainfall adequate in all seasons) / Humid

4 Wet

Climate class also serves to establish start up values for Woody FM, 100-HR, 1000-HR and X-1000 (see below) as follows:

Cli	Woody FM	100-HR	1000-HR	X-1000	Length (days)
1	50	10	15	15	7
2	60	15	20	20	14
3	70	20	25	25	21
4	80	25	30	30	28

See USDA-Forest Service General Technical Report INT-39, pages 51-54 for further information.

HERBACEOUS FUEL MOISTURE (HERB FM)

This calculated value represents the moisture content expressed as a percent of oven-dry weight of the herbaceous fuels (plants that grow from the base or from seed each year, such as grasses, forbs and ferns). These fuels are in the 0 to ¼ inch size class. The herbaceous fuel

moisture is a function of the X-1000 value, the herbaceous plant type and the NFDRS climate class.

During spring greenup, the live herbaceous fuel moisture increases gradually from the 1-hour timelag fuel moisture. If a second greenup occurs during the growing season, the X-1000 value is set equal to the 1000-HR and the herbaceous fuel moisture increases from its current value rather than from the 1-hour timelag fuel moisture value.

See Appendix H of USDA-Forest Service General Technical Report INT-39 and USDA-Forest Service Research Paper INT-226 for additional information.

WOODY FUEL MOISTURE (WOODY FM)

This calculated value represents the moisture content expressed as a percent of oven dry weight of the foliage and small twigs of woody perennial plants (reproduction of either conifer or broadleaf tree species, and shrub or brush species, evergreen or deciduous). The woody fuel moisture is a function of the 1000-HR TLFM and the climate class. The basic moisture computation is the same in the 1978 and 1988 fuel models; however in the 1988 models, the value is further refined through the use of the shrub greenness factor as described above (Shrub Type Code).

The woody fuel moisture in the 1978 fuel models does not respond to the Cured stage declaration, if and when entered by the user, as do the herbaceous fuels. The woody fuel moisture may recover from its dormant value unless it is Frozen (1978) or the Season Code is set to Winter (1988) which maintains the woody fuel moisture at its dormant value.

X-1000

The X-1000 is the live fuel moisture recovery value. It is a function of the daily change in the 1000-HR TLFM, and the average temperature. Its purpose is to better relate the response of the live herbaceous fuel moisture model to the 1000-HR TLFM. The X-1000 decreases at the same rate as the 1000-HR TLFM, but increases more slowly during periods of precipitation to limit excessive herbaceous fuel moisture recovery.

With the 1978 fuel models, when a second "greenup" is declared, the X1000 is reset to equal to the current 1000-HR TLFM.

The X-1000 value can vary between fuel models at the same station if they have different climate classes or Greenup dates.

NOTE: Weather observations must be started 3 to 4 weeks prior to the onset of greenup to assure that the 1000-hour TLFM, and therefore the X-1000 have stabilized at a reasonable value for the current weather conditions.

The "Staffing Index Breakpoints" fields provide the fire manager the flexibility to generate a variety of NFDRS outputs which can be used as guides in daily decisions based on the various fire danger rating outputs.

Fire managers normally utilize fire danger information to "regulate" three categories of people. These categories are agency personnel, industry, and the general public. Each category requires different types of fire-danger rating information to deal with needs specific to that category. The specific characteristics of each of the NFDRS output allows them to be matched with the fire-danger rating information needs of each of the categories of people and fire problems being "regulated" or managed.

Processes exist to correlate fire activity and NFDRS outputs to assist in making better fire management decisions.

STAFFING INDEX (SI)

Enter the Staffing Index code for the fuel model upon which the user agency bases fire danger-rating decisions. More than one index may be selected for use at a station, but each requires a complete line entry on the "Create Default NFDRS Parameters" form.

Valid entries are as follows:

BI BURNING INDEX

Very high sensitivity to the fuel model. Low to moderate memory. Moderate variability. Low predictability. Fair to good characterization of the fire season.

EC ENERGY RELEASE COMPONENT

Very high sensitivity to the fuel model. Moderate to good memory. Low variability as it is not affected by the wind. Good predictability. Fair to good characterization of the fire season.

IC IGNITION COMPONENT

Moderate sensitivity to fuel models. Very short memory as it is dominated by the 1-hour timelag fuel moisture. Highly variable due to effects of relative humidity and wind speed. Very low predictability. Very poor characterization of the fire season.

SC SPREAD COMPONENT

Very high sensitivity to fuel models. Very short memory dominated by surface area weighting and the 1-hour TLFM. High variability due to relative humidity, wind, and live fuel moisture. Low predictability. Very poor characterization of the fire season.

KB KEETCH-BYRAM DROUGHT INDEX

No sensitivity to fuel models. Good memory, moderate variability, good predictability and characterization of the fire season.

See USDA, Forest Service General Technical Report INT-39, pages 7-10, for additional information.

DISPLAY CLASSES (DC)

The number of display classes, when coupled with the "Staffing Index Percentile Values" forms the basis for the "staffing levels" (SL) and "adjective fire danger" (R) fields displayed in the various NFDRS outputs. The number of classes can range from 3 to 9 and is based on local needs. Most units use 5 or 6. DC can vary for each fuel model/staffing index.

STAFFING INDEX PERCENTILE LEVELS AND VALUES (SI% AND VAL-- LOW/HIGH)

These values describe the climatological break points used by fire management agencies to guide fire danger-rating related decisions. The values normally represent the top of the "High" and "Very High" classes for the for fire danger as determined by the 90^{th} and 97^{th} percentiles.

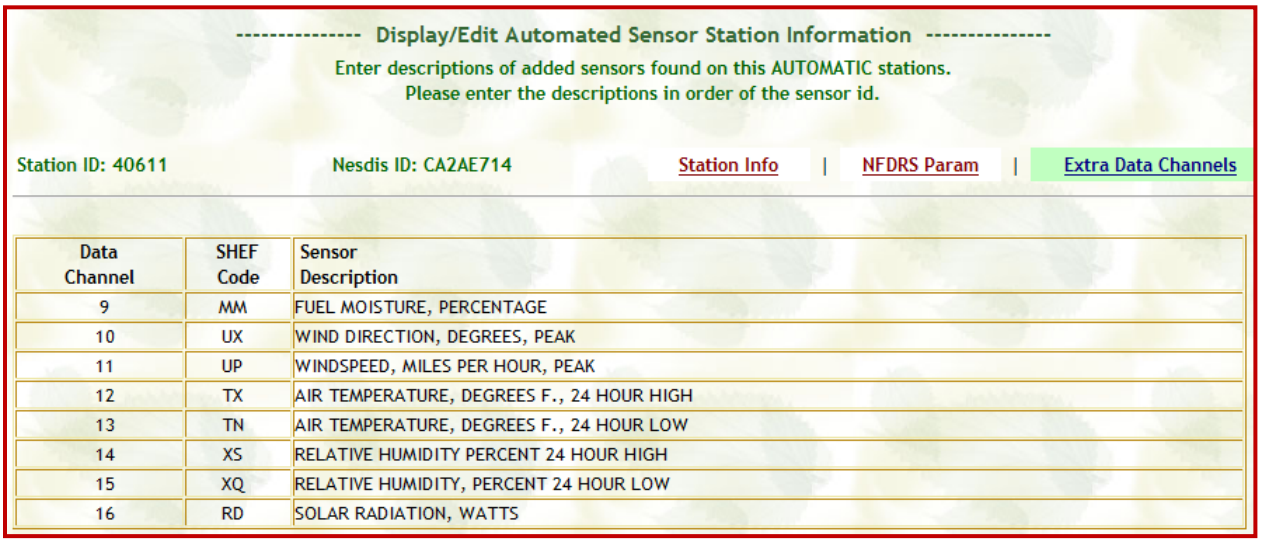
- **SI%** documents the percentile *level* used for establishing break points in the fire danger distribution
- **Val** is the value of the index at that percentile level.

The staffing index percentile values guide in the determination of the staffing levels (SL) and the adjective fire danger-rating (R) displayed as part of the NFDRS outputs (See Chapter 1.1.4).

The appropriate low and high percentile values for a staffing index are established by using FireFamilyPlus to analyze historic fire weather data.

AUTOMATED SENSOR STATION INFORMATION

The third screen of a RAWS weather station displays the inputs that identify the data channels and Standard Hydrological Exchange Format (SHEF) code and description for any additional RAWS data that is displayed in the DRAWS module (See Chapter 1.1.3).



---------- Display/Edit Automated Sensor Station Information ----------

Enter descriptions of added sensors found on this AUTOMATIC stations.
Please enter the descriptions in order of the sensor id.

Station ID: 40611 Nesdis ID: CA2AE714 Station Info | NFDRS Param | Extra Data Channels

Data Channel	SHEF Code	Sensor Description
9	MM	FUEL MOISTURE, PERCENTAGE
10	UX	WIND DIRECTION, DEGREES, PEAK
11	UP	WINDSPEED, MILES PER HOUR, PEAK
12	TX	AIR TEMPERATURE, DEGREES F., 24 HOUR HIGH
13	TN	AIR TEMPERATURE, DEGREES F., 24 HOUR LOW
14	XS	RELATIVE HUMIDITY PERCENT 24 HOUR HIGH
15	XQ	RELATIVE HUMIDITY, PERCENT 24 HOUR LOW
16	RD	SOLAR RADIATION, WATTS

SHEF CODE

Standard Hydrometeorological Exchange Format (SHEF) codes describes the data elements of the RAWS data transmission. These codes enable other users of the station data to identify the data elements measured at the RAWS site.

The information contained in data channels 1 through 8 have been pre-identified in WIMS and no further input is required by the WIMS user for these channels.

The SHEF codes used to identify the data in channels 9 through 99 are input directly from WFMI.

Automated station data channel information is very important as it identifies the types of data being transmitted by the data collection platform (the RAWS) and moved through the NESDIS satellite network to the Bureau of Land Management down-linking facility at Boise, ID and then to the WIMS mainframe computer in Kansas City, MO.

The first eight channels are pre-identified in WIMS and no entry on the part of the user is required. The eight pre-identified data channels and their designated SHEF codes are as follows:

1 PC Precipitation
2 US Wind Speed
3 UD Wind Direction
4 TA Atmospheric Temperature

5	MT	Fuel Temperature
6	XR	Relative Humidity
7	VB	Battery Voltage
8	PA	Atmospheric Pressure

In WIMS, the SHEF code functions as a data identifier for the additional data displayed in the DRAWS display. See Chapter 1.1.3 for data channels 9 through 99.

Sensor data channels 9 through 18 have no established order. The types of data being collected on channels 9-99 should be coordinated with the NIFC/RAWS down-linking facility to ensure accurate transmittal of the data to WIMS. Examples of typical data include:

MM	Fuel Moisture, Wood
UX	Wind Gust Direction
UG	Wind Gust Speed
TX	Atmospheric Temperature Maximum
TN	Atmospheric Temperature Minimum
XS	Relative Humidity Maximum
XQ	Relative Humidity Minimum
MS	Moisture, Soil
TG	Temperature, Underground
RD	Solar Radiation

SPECIAL INTEREST GROUPS (SIG)

A SIG allows you to manage stations as a group which can facilitate easier daily operations such as editing observations and displaying outputs. Stations are usually grouped together to represent Fire Danger Rating Areas, Forest Management Areas, regions, or administrative boundaries. Each station in a SIG is displayed for a all WIMS queries on separate rows except for DAVG.

In DAVG a single row is returned with averaged values for all stations in the SIG. Averages are computed based on assigned station weights. If a station or stations in a SIG are missing for a DAVG query WIMS will display the message:

Info: Not all station(s) reporting; Weight has been re-distributed. Details.

SIGs are ***required*** for Units using special outputs for USFS Regions 5 (Project Activity Levels – PAL) and Region 6 (Industrial Fire Precautions Level—IFPL). You can read more about these in chapter 9, "Working with NFDRS under the DAVG." Setting station weights are addressed in EAVG later in this chapter.

WIMS has both Public and Private SIGs. Public SIGs are lists of stations in designated NWS Fire Weather Forecast Zones. Public SIGs are available to all, but are maintained by WIMS administrators. Public SIGs are named using numbers only.

SIGS created by users are Private and can only be maintained and used by that user. You may copy other users' SIGs to create an identical SIG that you can edit and/or use. SIG weights are also copied when copying SIGs. Private SIGs are named using characters and numbers but may not *begin* with a number.

The Maintain SIG (MSIG) menu allows you to:

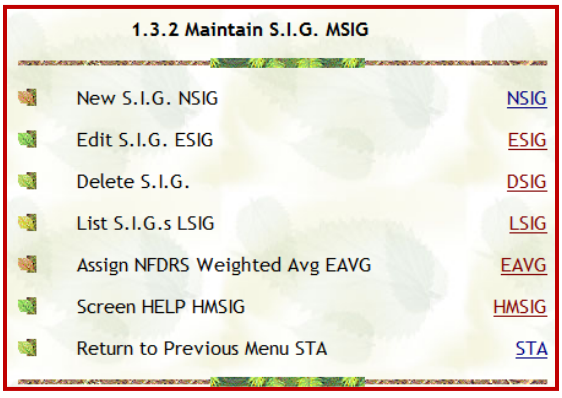
Create a new SIG

Edit a SIG

Delete a SIG

List SIGs

Assign NFDRS weighted averages to a SIG.



NEW SIG

Determine the need for a new SIG before you create one. As a guideline, define a SIG whenever you need to repeatedly gather or display information for the same stations. Users will also need to develop SIGs if determining outputs for industrial precautions PAL or IFPL.

A SIG name can be up to four characters, the first character must be alphabetic. Once created the SIG becomes part of the users SIG list that is available by selecting the SIG button in many forms.

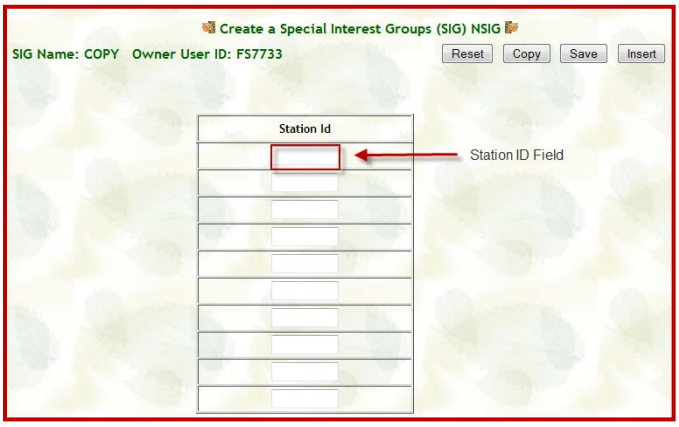
If creating SIGs for editing daily observation data, make the editing process more convenient by grouping similar station types together into one SIG. For example, create one SIG that identifies RAWS (satellite) stations and another SIG that identifies manual (non-satellite) stations. Another common practice is to group stations by standard observation time; however with Version 2.0 allowing RS in the time field, it is relatively easy to manage stations with different observation times in a single SIG.

To access the Create a Special Interest Group form, type NSIG in the FastPath field, and click **Go**.

Enter the chosen SIG name in the SIG Name field then select the **Setup** button.

The form will update with fields in which to enter station numbers. It also has four buttons: Reset, Copy, Save and Insert. You have two options for filling out the **Station Id** values.

Option 1—Enter each station number in the **Station Id** fields. If you need more than 10 rows, Click **Insert** to add rows. Click **Save** when done.



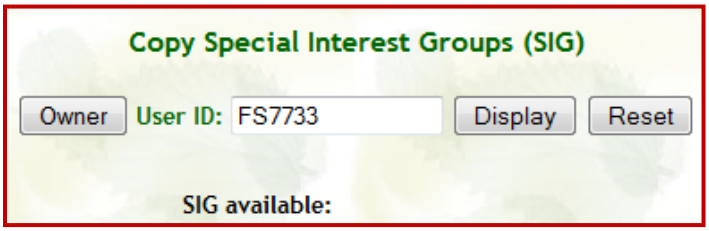
Once saved the form will provide a message and display values in green.

Option 2—Copy an existing SIG.

SIGs created by another user can be copied. Copied SIGs will contain assigned weights of the source SIG.

Assign a SIG name and click the **Setup** button as shown above. The form will again create fields in which to enter station numbers. Click the **Copy** button.

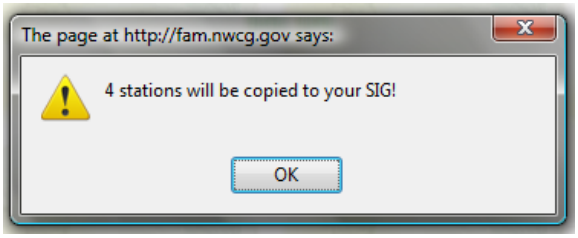
A separate window will open. Enter the User ID of the user who owns the SIG. If the user ID is unknown click the **Owner** button at the left of the User ID field. A new window will open and list every WIMS User's ID. Select the user from the list. Then click **Display.**



The window will expand to show all the SIGS owned by the user.

Select the SIG to copy from the users SIG list. A window will show the Copy SIG Details, including the User ID, the SIG being copied, and the station numbers and names. If this is correct, click **Copy;** if not **Cancel**.

Confirm your copy operation by clicking **OK** in the confirmation window. The stations will be entered into the fields.



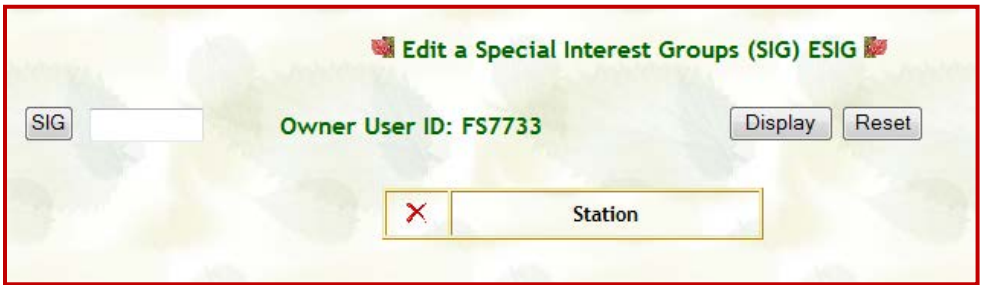
Click **Save** to complete the Copy. The Stations added to the SIG will be shaded green and there will be a confirmation message.

SIGs can be easily copied from List SIG. With LSIG you cannot select the name of the new SIG; it retains the name of the source SIG. See the List SIG section later in this unit.

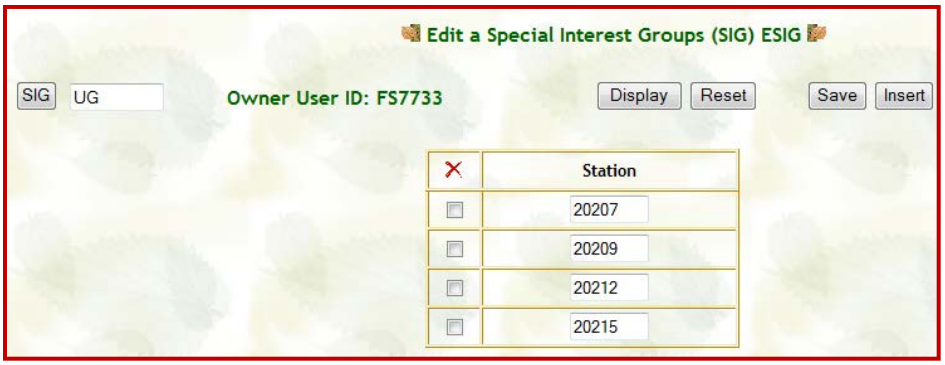
- With Copy, a SIG is created without typing station numbers and setting weights in EAVG.

EDIT SIG

A user may edit any SIG they have created. To access the Edit a Special Interest Groups form type the FastPath ESIG and select Go. The form has a field in which to enter the SIG name. If unsure of the name click the **SIG** button and a window will list your SIGS.



Select the SIG to be edited from the list. The form field will be populated with the SIG name; then click **Display**. The stations of the SIG will be displayed.



To change a station number, type the new number in the Station field.

To delete a station(s), check the box to the left of the station number.

To add a station(s) click **Insert**. Additional rows will be added.

Click **Save** to save any changes.

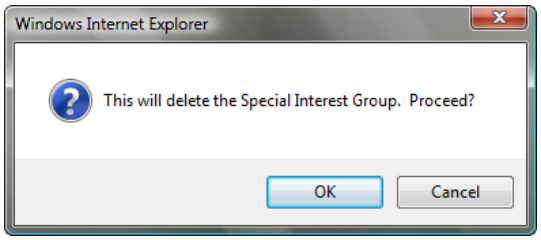
Following the Save, the fields of the modified stations will be shaded and there will be a message: Info: SIG 'SIG Name' has been successfully updated.

DELETE SIG

A SIG may be deleted by entering the FastPath DSIG. SIGs can only be deleted by the owner. Enter the SIG name or select the SIG to be deleted from the drop down list.

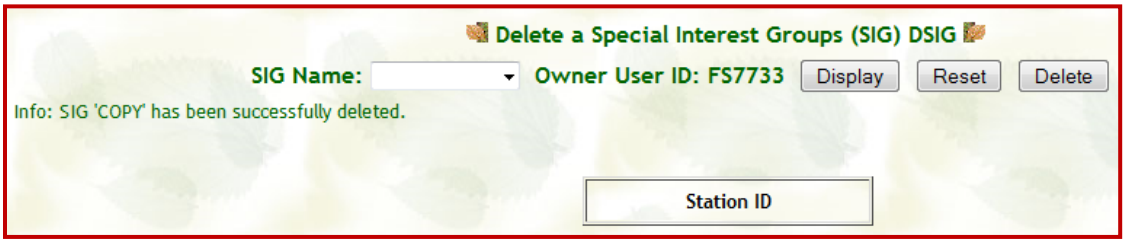
Click **Display** to view the SIG before deletion or just click the **Delete** button

Click **Delete** and click **OK** in the confirmation window to delete.



.

The DSIG form will show the message: Info: SIG 'SIG Name' has been successfully deleted



LIST SIG

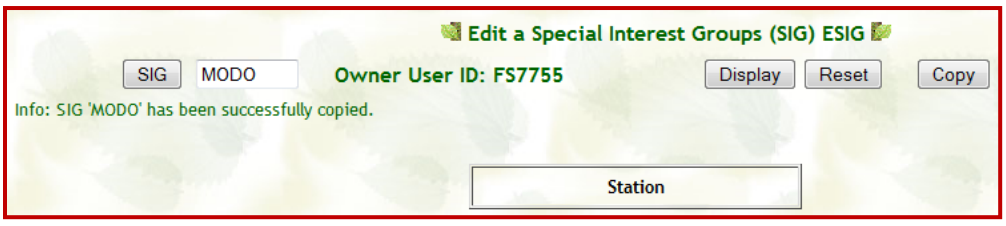
LSIG allows you to locate and view the contents of any SIG in WIMS and make a copy for yourself. Type the FastPath LSIG and select Go.

Enter the desired User ID and click **Display** or click **List** to select from a list of all WIMS users.

The SIGs of the user will be listed. For this example, "MODO" is selected.

The stations are displayed in ESIG. The SIG can be copied by clicking **Copy**.

The ESIG form will display the message: Info: SIG 'MODO' has been successfully copied. You now have a SIG with the name, stations and weights of the source SIG.



ASSIGN NFDRS WEIGHTED AVERAGE (EAVG)

The EAVG form assigns weights to each station in a SIG in order to calculate a single set of NFDRS indices that represent the SIG. Units that wish to generate a single NFDRS output for an area made up of numerous weather stations would use this function. Some examples:

- Project Activity Level USFS Region 5 (CA) to regulate timber operations
- Grouping stations to produce a PocketCard index
- Grouping stations to determine a dispatch level

These weights determine the percentage of influence of a station relative to other stations within the SIG. Total weighting for the SIG must be 100 percent. Initially WIMS will distribute the weighting as equal as possible based on the stations of the SIG. The total may not be 100 percent so redistribution may be necessary. Ultimately the weight distribution should be based on the following:

- The total area that each station represents
- Resource values
- Historic fire occurrences
- Public use patterns
- Degree of importance to local managers.
- Fire occurrence

not just an even split of the 100 percent.

➢ *SIGs created for facilitating observation editing do not require weights (via EAVG) although the same SIG could be used for EOBS and DAVG.*

Enter EAVG in the FastPath field and select Go.

In this example a SIG was been created (NSIG) with three stations. In EAVG, the SIG name was selected from the drop-down SIG list, then displayed.

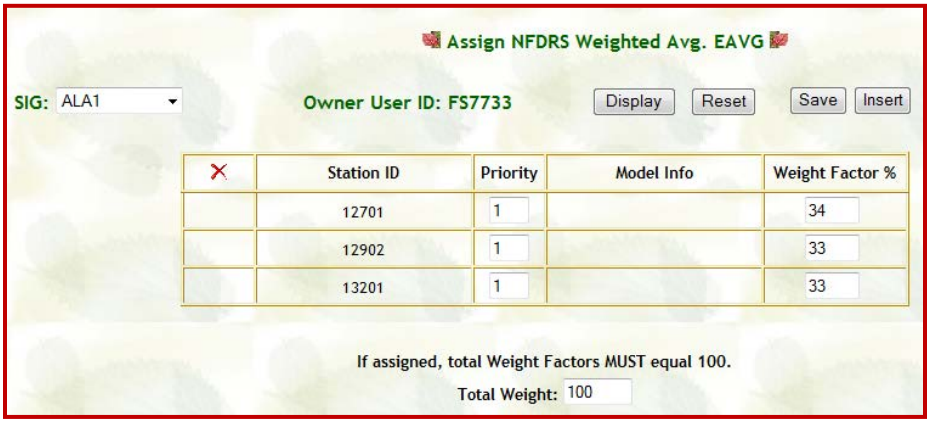
- If a SIG was copied from another user it will come with the weights in the source SIG.
- The first time a newly created (NSIG) is displayed in EAVG it will have no Model Information.

WIMS has distributed the weights among the three stations but has assigned the first station a 34% and the other two 33% so the total is 100.

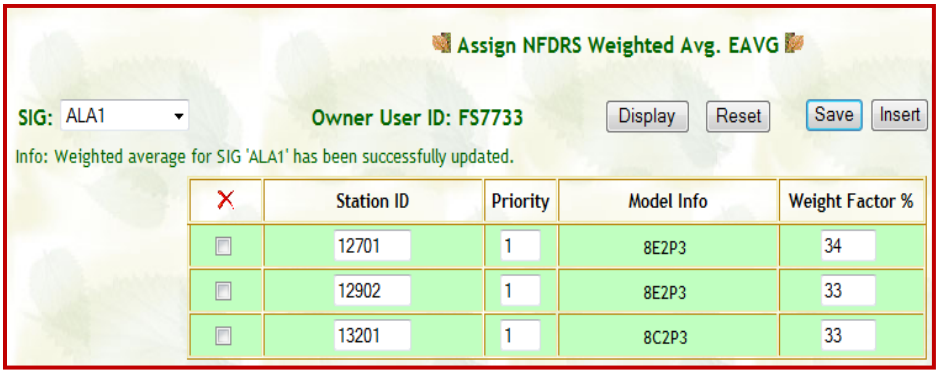
The EAVG table includes:

- station number
- fuel model priority from the station NFDRS Parameters page
- fuel model information
- weight factor percentage assigned.

Click the **Save** button.



The Model Info fields of the table will populate with the model information based on the Priority column entry.

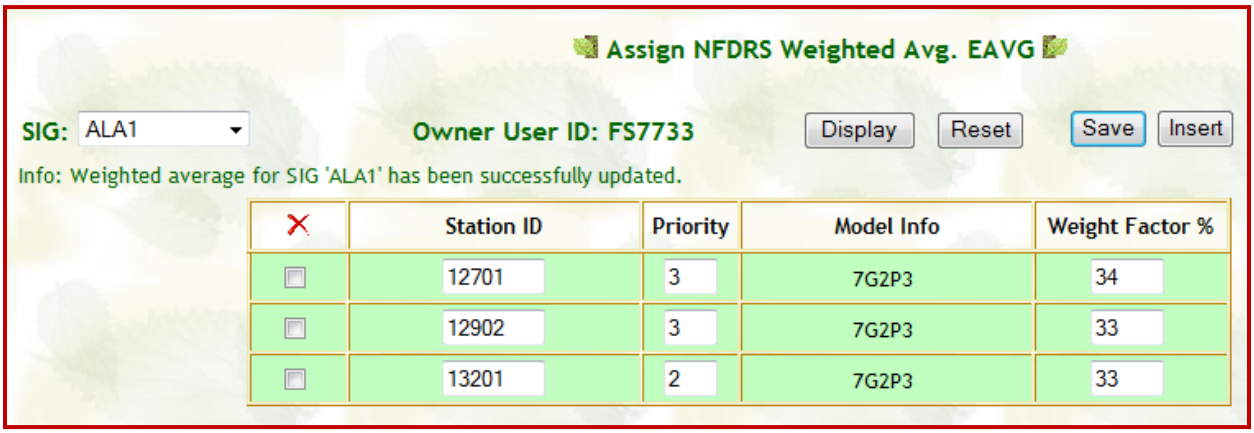


In this example all stations are based on the Priority 1 line Model Info. The Model Info format utilized is the same format used in output displays. In this example the model info for station 12701 is 8E2P3. That represents the station with:

8E	2	P	3
88 fuel model E	Slope Class 2	Grass type: Perennial	Climate Class 3

It is the intention to use this SIG based on a fuel model G. In order to do this, each stations fuel model priority line (PRI) must be found to select the desired fuel model. This can be done by:

- Inspecting fuel model parameters of each station via ESTA (Edit Station) or ENFDR (Edit NFDR), or
- Change and Save Priority values for each station in EAVG until the desired fuel models are displayed.



For stations 12701 and 12902 the G fuel model was defined in Priority 3 line while station 13201 the G was defined in line 2.

- It is an important step in EAVG to check each stations fuel model if you want outputs for all NFDRS indices and components.

- If all stations of a SIG do not have like fuel models the DAVG will still display outputs in DAVG but Burning Index (BI) and Energy Release Component (ERC) are not shown.

- If a SIG is used to generate IFPL or PAL values, it must be based on the proper fuel models or IFPL and PAL values will not display. See Chapter 9, Working with NFDRS under DAVG.

- A Station may be deleted from a SIG in EAVG by checking the box in the column to the left of the Station ID. The Weight Factor percentages must be adjusted to total 100% before you click **Save** or the SIG will not be saved and an Error Message will be generated.

ACCESS CONTROL LISTS (ACLS)

An ACL is a list of User IDs created by a station owner to grant other users specific authority to:

- Station Edit. Allow user to edit all station information including station ownership, ACL assignments, and NFDRS parameters. Use discretion when allowing others to edit station information.
- Observations Enter. Allow user to create new observations, usually for manual stations.
- Observations Edit. Allows the user to edit observations, usually for RAWS stations.

- You must have the WIMS Data Manager Access level to perform any Access Control List functions. If you do not have this access level, WIMS will not accept FastPath commands to these functions. The ACL must exist in WIMS before it can be assigned in ESTA (Edit Station Information).

- If a station has no ACL assigned, only the owner has authority to manage the station.

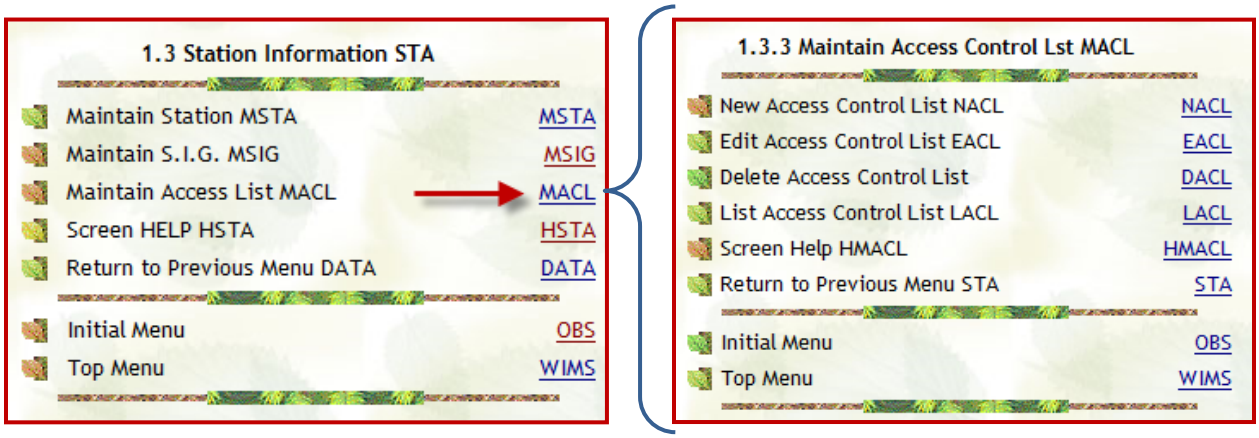
- Station owners do not need to be specified in the ACL; however, it is good practice to do so in case another user with Station Edit rights changes the Station Owner.

- You cannot edit or delete another owner's ACL.

- **Recommendation:** Use the ACL to allow regional, area, state, or agency NFDRS technical specialists to access your stations. This can be invaluable when problems arise and you need help. Be very selective when granting Edit access.

MAINTAIN ACL

Maintain Access Control Lists Menu is accessed through the Station Information STA menu.



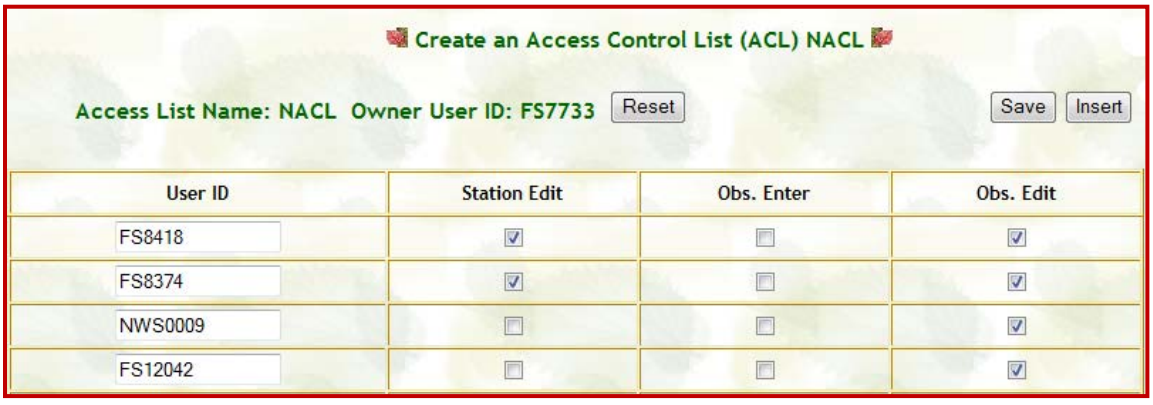
Type MACL in the FastPath field and select Go. Remember, you can skip this menu by typing the FastPath commands.

NEW ACL

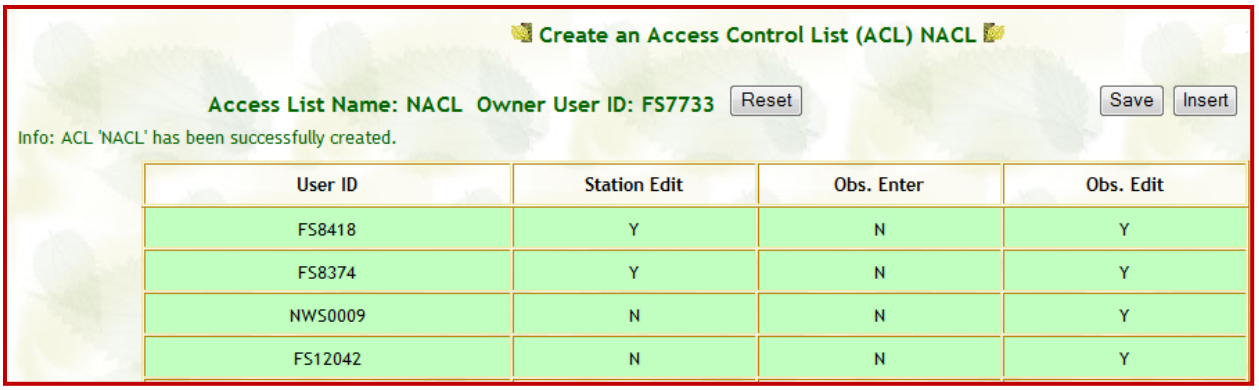
In the FastPath field, type NACL and click **Go**.

Enter a name for the new ACL in the Access List Name field and click **Setup.**

The form will display the ACL name and Owner's ID at the top. Enter the User ID and level of access for each user in the ACL.



Click **Insert** to add more rows if needed and then **Save**.



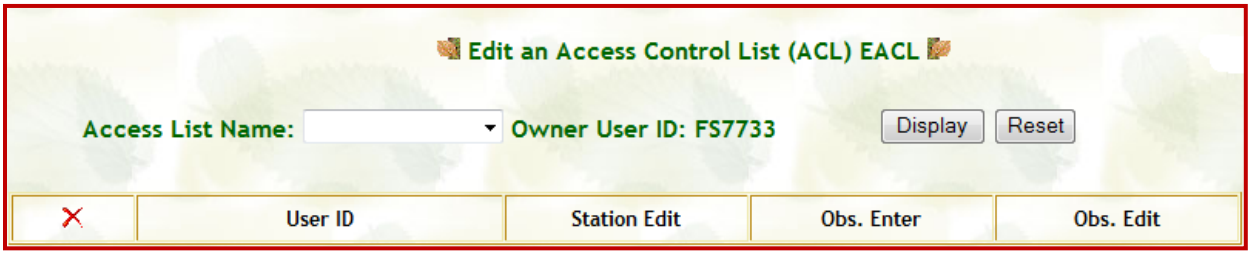
The table will be shaded and identify access privileges, with a Y or N, for the user in each column. The new ACL can now be referenced in a station catalog.

- If a station's ownership changes, the new owner must create a new ACL for that station.

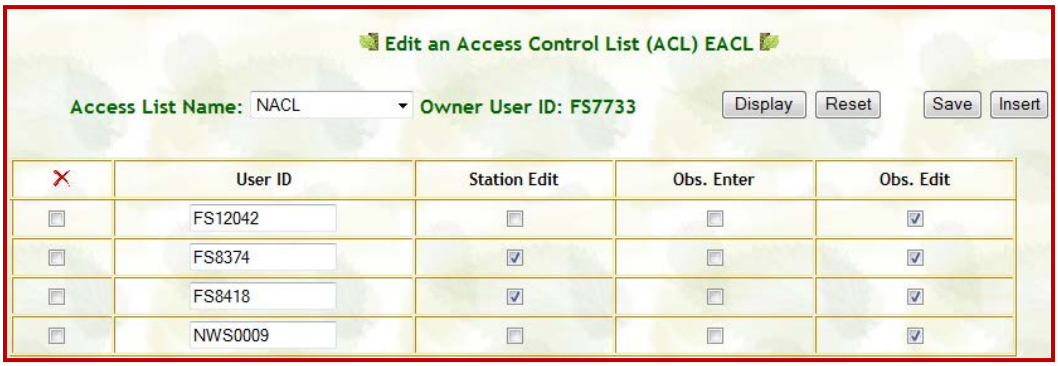
EDIT ACL

An ACL can be edited to add or remove users or change their permissions. ACLs can only be edited by the user that created the ACL.

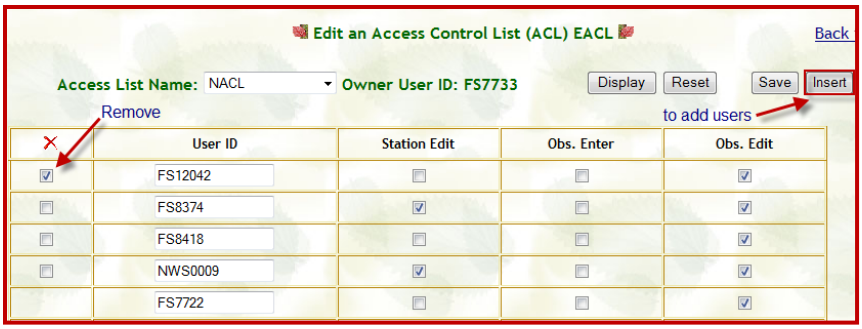
To access the Edit Access Control List form type the FastPath EACL and select Go.



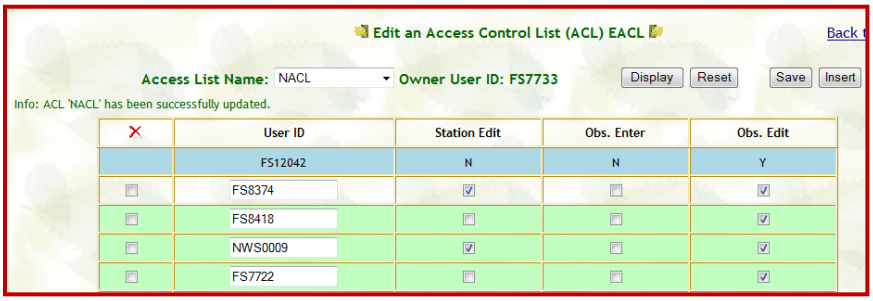
From the Access List Name drop-down menu, select the Access Control List name and select display. The Edit an Access Control List form redisplays, listing all WIMS logon IDs for that ACL.



To add users click **Insert** and additional rows will be added. To delete a user check the box to the left of the user ID (X column). To change access designations, check or uncheck as needed. You can also replace an existing User ID by typing in the User ID.



To save the changes made to the ACL, select Save.

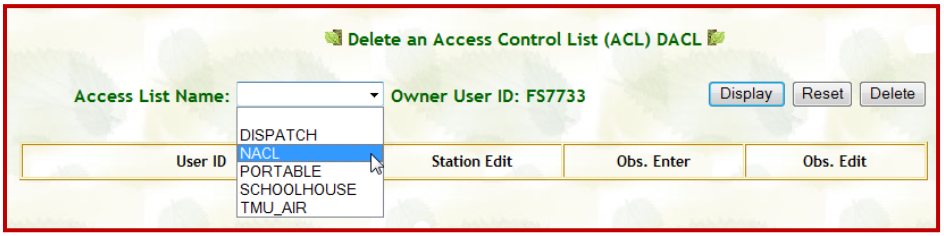


DELETE ACL

- Use caution when deleting an ACL as it might result in an unintended loss of access.

Type the FastPath DACL and select Go.

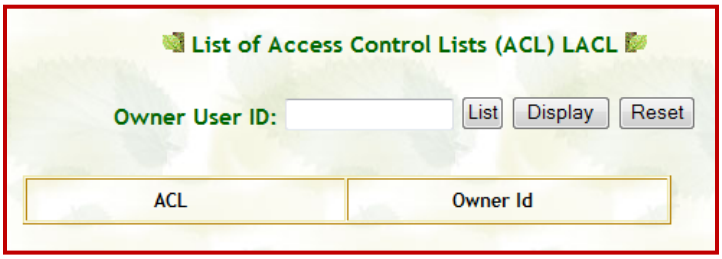
In the Access List Name drop-down, select the Access Control List name. The ACL can be viewed before deletion by clicking **Display** or just delete by clicking **Delete**.



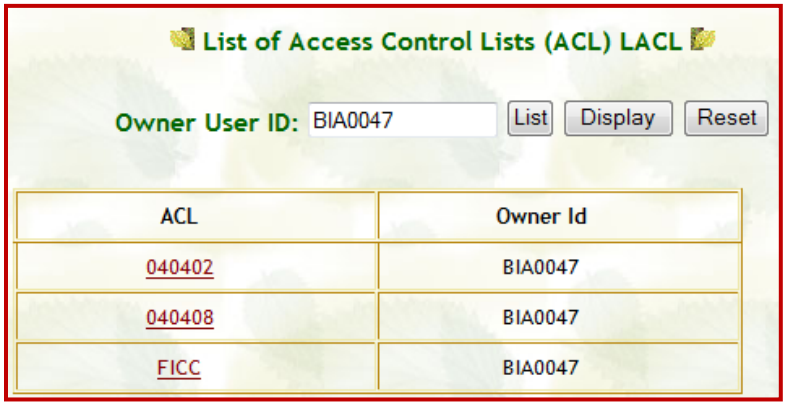
Delete will open a window asking for confirmation of the delete. Click **OK** or **Cancel**.

LIST ACL

The LACL form allows users to quickly identify ACLs of any WIMS user. Type LACL in the FastPath field and select Go.



If the User ID is unknown click **List;** a second window will open listing all WIMS user ID's. Select the ID from the list and click **Display**. If the User ID is known enter it into the Owner User ID field and click **Display**.



In the example to the left, WIMS User BIA0047 has created 3 ACLs.

To view the users with permissions in a ACL select the ACL name.

The names will be displayed in the EACL form.

ACL 040408 contains 4 User IDs. Each user's permissions can be viewed in the EACL screen below. Notice that the Access List Name field is a drop-down so each of the other ACLs owned by BIA0047 can be selected for display.

If the user listing the ACL is not the owner, they may only view/display the ACL.

If the user listing the ACL is the owner, they may edit the ACL

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