### WeatherShare Phase 4

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### Disclaimer

The opinions, findings and conclusions expressed in this presentation are those of the authors and not necessarily those of the Western States Rural Transportation Consortium, the California Department of Transportation, or Montana State University.



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- Dan Richter



### Abstract

Now in its fourth phase, this multi-phase research project is **aimed at** combining functionality of WeatherShare, SCAN Web<sup>™</sup> and SCAN <u>Sentry<sup>TM</sup> into a single, open system</u>. In this phase, the project team has continued work on the retrieval, storage and presentation mechanisms, developed alerting and user profile mechanisms for the system, and is working with Caltrans to test and evaluate the system during the bad weather season. Caltrans currently uses the SCAN Web<sup>TM</sup> application to aggregate and present weather information from RWIS sites to maintenance and operations personnel. Other applications such as SCAN Sentry<sup>TM</sup> are used by individual districts to provide additional capabilities such as weather-based alerting. There has been a desire to combine these functionalities into a single, open system. The purpose of this project is to further develop the capabilities of WeatherShare to include those of SCAN Web<sup>TM</sup>, SCAN Sentry<sup>TM</sup>, and other desirable but currently unavailable functionality into WeatherShare through further development of WeatherShare – Phase 4. In this presentation, the project team will discuss the design and development of the system.



### WeatherShare Phases



### WeatherShare Phases

- The Phase 1 proof-of-concept WeatherShare system provided coverage of Northern California via a custom map. This approach was sufficient for proof-of-concept purposes, but a more robust approach was necessary for subsequent prototype development.
- The Phase 2 prototype system covered the entire state of California and was implemented in a more robust manner, including use of Google Maps.
- The Phase 1 and Phase 2 prototypes targeted Caltrans personnel as users, as well as other public safety entities and the general public.
- During these early phases, WeatherShare was not intended to be the official or sole repository for any of the data presented including RWIS data.



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### WeatherShare Phases

- With the anticipated "end of life" of SCAN Web<sup>™</sup> and related services (SCAN Sentry<sup>™</sup>), it was envisioned that WeatherShare would become the official repository for Caltrans RWIS data.
- The Phase 3 prototype system initiated development focused exclusively on the needs of Caltrans Maintenance and ITS personnel. Coupled with the Caltrans "Information Relay" appliance, the system was envisioned as a complete, open replacement for prior proprietary products.
- Further work needed to be done to implement user profiles and alerts. Testing needed to be done during a bad weather season.
   Phase 4 carries that work forward.



### Phase 4 Tasks

The project tasks for the fourth phase of this research include the following:

- Task 1: Project Management, to keep the Caltrans project manager and technical panel apprised of project progress;
- Task 2: On-Going System Development, continues development of the prototype system including implementation of <u>alerts</u> and <u>user profiles</u>;
- Task 3: System Testing and Evaluation, which will include measures of prototype system use, utility and performance.



# Concept, Requirements, Design and Implementation



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WeatherShare Phase 3 Prototype System Operational Concept (OpsCon)

by

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and

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A report prepared for the

State of California, Department of Transportation Division of Research, Innovation and System Information

> May 10, 2013 (revised October 11th, 2013)

## Prototype System Operational Concept (OpsCon)

The purpose of the System Operational Concept was to document, from the perspective of the system user and at a high level, what the system would do. The purpose was not to document how the system would accomplish this functionality.

### Finalized on October 11<sup>th</sup>, 2013.



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## Prototype System Operational Concept (OpsCon)

- Documented the current situation.
- Defined user classes.
- Provided nature of and justification for changes.
- Defined concepts for the proposed system.
- Defined 45 Use Case operational scenarios.
- Summarized impacts and analyzed the proposed system.



## Example Use Case

### **Use Case 5: (System) Evaluates and Actuates Alerts**

Primary Actor: The WeatherShare System

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**Goal:** Evaluate currently defined alerts to determine if conditions are met. If so, actuate active alerts. Log results.

**Trigger:** Immediately following storage of new RWIS data (See Use Case 2: (System) Stores RWIS Data) and Quality Checks (See Use Case 3: (System) Performs RWIS Data Quality Checks).

### **Preconditions:**

- Successful storage of new RWIS data (See Use Case 2: (System) Stores RWIS Data), and
- Successful RWIS data quality checks (See Use Case 3: (System) Performs RWIS Data Quality Checks).

**Main Success Scenario:** The WeatherShare System evaluates currently defined alerts to determine if conditions met. If so, active alerts are actuated. Historical data is logged for alerts which are actuated. Note: It remains to be determined if a log entry will be generated to correspond to alert conditions met but QC failure on a contributing condition. Note: It is currently assumed that alerts will only be generated based on RWIS data - not on National Weather Service data or data from other weather stations.



### **Example Use Case**

### Use Case 26: (User) Receives an Alert

**Primary Actor:** A Caltrans WeatherShare User

**Goal:** Receive an alert, actuated via an alert definition where associated conditions are satisfied.

**Trigger:** An alert is actuated – conditions associated with the alert are satisfied by current RWIS sensor readings.

### **Preconditions:**

- User must have access to email or text messaging.
- User must be assigned responsibility for the affected RWIS.

Main Success Scenario: The user successfully receives the alert via email or text message.



## Prototype System Software Requirements Specification

The purpose of the Software Requirements Specification (SRS) was to document what the system will do. The purpose was not to document how the system would accomplish this functionality.

Finalized on March 12<sup>th</sup>, 2014.

WeatherShare Phase 3 Prototype System Software Requirements Specification (SRS)

by

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and

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A report prepared for the

State of California, Department of Transportation Division of Research, Innovation and System Information

> November 19, 2013 (Revised March 12, 2014)



### Prototype System Software Requirements Specification

- Provided an overall description of the system.
- Defined specific requirements, performance requirements, application requirements and enabling requirements.



## **Example Requirements**

### 3.5.2. Alert Evaluation and Actuation

- 3.5.2.1. Alert conditions shall be evaluated when new RWIS sensor readings are read by The System.
- 3.5.2.2. Alerts shall be actuated when their defining conditions are satisfied.
- 3.5.2.3. Alerts shall be considered expired if the valid duration has passed since the alert was last actuated.
- 3.5.2.4. Alerts shall be considered extended if the alert is already actuated and new RWIS sensor readings satisfy their defining conditions.
- 3.5.2.5. A cleared alert shall immediately be de-actuated, regardless of valid duration.
- 3.5.2.6. The System shall evaluate user-defined alerts when applicable sensor readings are updated.
- 3.5.2.7. The System shall actuate alerts for which alert conditions are satisfied.
- 3.5.2.8. The System shall log results of alert evaluation, including QC status of inputs.



## **Example Requirements**

### 3.5.4. Alert Notification

- 3.5.4.1. Users shall receive (actuated) alert notifications via email and/or text message.
- 3.5.4.2. Users shall be able to view alerts via a map interface

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- 3.5.4.3. Users shall view currently actuated alerts via a tabular interface.
- 3.5.4.4. Users shall view historical actuated alerts via a tabular interface.
- 3.5.4.5. Alert notification via email shall include the alert name, the time at which the alert was actuated, the valid duration and expiration, and the RWIS sensor readings and conditions for the last actuation of the alert.
- 3.5.4.6. Alert notification via text message shall include the alert name, the time at which the alert was actuated, and the valid duration and expiration.
- 3.5.4.7. Alert notification emails shall include a link to a web page allowing the individual user to unsubscribe or otherwise change their subscription options for the given alert.
- 3.5.4.8. Alerts shall be either sent immediately upon actuation or on scheduled intervals (example: every 5 min, 10 min, 15 min, 30 min, 60 min) depending on user preferences specified in the subscription, in user preference defaults, or by way of system default values.



WeatherShare Phase 3 Prototype System Design

by

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and

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A report prepared for the

State of California, Department of Transportation Division of Research, Innovation and System Information

October 3, 2014

(revised December 23rd, 2015)

## Prototype System Design

The purpose of the Prototype System Design was to document how the system would accomplish the functionality described in the Software Requirements Specification (SRS).

Finalized on December 23<sup>rd</sup>, 2015.



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## Prototype System Design

- Defined data structures.
- Defined processes.
- (Partially) Defined interfaces.



### Information-Relay-RWIS

-index recordDate -recordTime -district -locationName -nearByPlace -longitude -latitude -elevation -direction -county -route -routeSuffix -postmilePrefix -alignment -milepost -inService essReferenceHeight -essPressureHeight -essWindSensorHeight -essAtmosphericPressure -essAvgWindDirection -essAvgWindSpeed -essSpotWindDirection -essSpotWindSpeed -essWindSituation -essMaxWindGustSpeed -essMaxWindGustDir -essNumTemperatureSensors -essTemperatureSensorIndex -essAirTemperature1 -essWetbulbTemp -essDewpointTemp -essMaxTemp -essMinTemp essRelativeHumidity -essWaterDepth -essPrecipYesNo -essPrecipRate -essPrecipSituation essPrecipitationStartTime essPrecipitationEndTime essPrecipitationOneHour essPrecipitationThreeHours -essPrecipitationSixHours essPrecipitationTwelveHours -essPrecipitation24Hours -essVisibility -essVisibilitySituation -numEssPavementSensors -essPavementSensorIndex1-8 -essPavementType1-8 -essPavementSensorType1-8 -essSurfaceStatus1-8 -essSurfaceTemperature1-8 -essPavementTemperature1-8 -essSurfaceWaterDepth1-8 -essSurfaceSalinity1-8 -essSurfaceFreezePoint1-8 -essSurfaceBlackIceSignal1-8 -numEssSubSurfaceSensors -essSubSurfaceSensorIndex1-8 -essSubSurfaceType1-8 -essSubSurfaceDepth1-8 -essSubSurfaceTemperature1-8

### Example Data Structures (RWIS Data)

RWIS-Metadata	RWIS-Atmospheric-Observations-and-QC	RWIS-Pavement-Observations-With-QC
-index	-index	-index
-lastRecordDate	-recordDate	-recordDate
-lastRecordTime	-recordTime	-recordTime
-district	-district	-district
-locationName	-essAtmosphericPressure	-numEssPavementSensors
-nearByPlace	-essAvgWindDirection	-essPavementSensorIndex1-8
longitude	-essAvgWindSpeed	-essPavementType1-8
-latitude	-essSpotWindDirection	-essPavementSensorType1-8
-elevation	-essSpotWindSpeed	-essSurfaceStatus1-8
-direction	-essWindSituation	-essSurfaceTemperature1-8
-county	-essMaxWindGustSpeed	-essPavementTemperature1-8
-route	-essMaxWindGustDir	-essSurfaceWaterDepth1-8
-routeSuffix	-essNumTemperatureSensors	-essSurfaceSalinity1-8
-postmilePrefix	-essTemperatureSensorIndex	-essSurfaceFreezePoint1-8
-alignment	-essAirTemperature1	-essSurfaceBlackIceSignal1-8
-milepost	-essWetbulbTemp	-QC VARIABLES
-inService	-essDewpointTemp	
-essReferenceHeight	-essMaxTemp	
-essPressureHeight	-essMinTemp	
-essWindSensorHeight	-essRelativeHumidity	RWIS-Subsurface-Observations-With-Q
-essNumTemperatureSensors	-essWaterDepth	-index
-numEssPavementSensors	-essPrecipYesNo	-recordDate
-numEssSubSurfaceSensors	-essPrecipRate	-recordTime
	-essPrecipSituation	-district
	-essPrecipitationStartTime	-numEssSubSurfaceSensors
	-essPrecipitationEndTime	-essSubSurfaceSensorIndex1-8
	-essPrecipitationOneHour	-essSubSurfaceType1-8
	-essPrecipitationThreeHours	-essSubSurfaceDepth1-8
	-essPrecipitationSixHours	-essSubSurfaceTemperature1-8
	-essPrecipitationTwelveHours	-QC VARIABLES
	-essPrecipitation24Hours	
	-essVisibility	
	-essVisibilitySituation	
	-QC VARIABLES	



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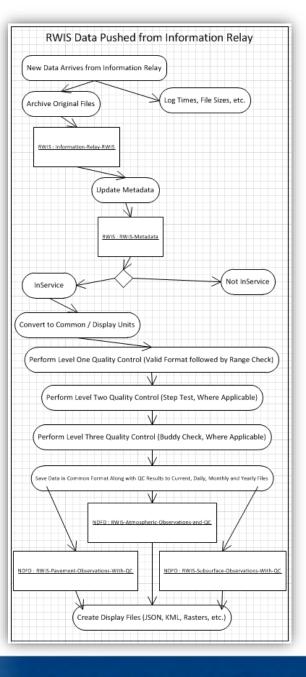
20

## Example Data Structures (Alerts and Notification)

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SensorValue +	SensorIDs()		Duration		Subscription		UserPreference	
-Timestamp -QCindicator	Value() : boolean(idl)	-Reco -Distr	litionID mmendedNotific ictAlert idualAlert	ationTiming -subscribed to	-SubscriptionID -AlertID -UserID -NotificationTiming -NotificationGrouping	-subscribes	-UserID -NotificationTimin -NotificationGroup	
SimpleCondition	ComplexCondit	tion	-fine	Is subscribers and checks timing				
ConditionID SensorID	-ConditionID -Conditions			necks for actuated alerts			-has	
ComparisonOperator Threshold	-CombinationOper	rators	1 -evaluat	es	* -fin	ds subscribers and	d checks timing	
		1	lertEvaluator					
«enumeration» NotificationTiming +0 = immediate +5 = 5 min +10 = 10 min +15 = 15 min +30 = 30 min +60 = 60 min	* -creates ImmediateNotifica -NotificationID -AlertID -UserID -SubscriptionID		s	ion() -logs -logs -AlertHistory -AlertID -EvaluationTime -ActuatedFlag		-UserID -EmailAddre -SMSAddres		
-logs *			1					
NotificationHistory		1	NotificationHand	ler 1				
-AlertID -UserID -TimeCreated -EmailSendTime -SMSSendTime	-logs * -create * PendingNotification -NotificationID -AlertID	s +Proce +Creat	essPendingNotific: essImmediateNoti ePendingNotifica * -crea	fication() (ionList()				
	-UserID		Email	TextMessage				
*	-SubscriptionID	-processes	-EmailAddress -Subject -Body	-SMSAddress -Message				



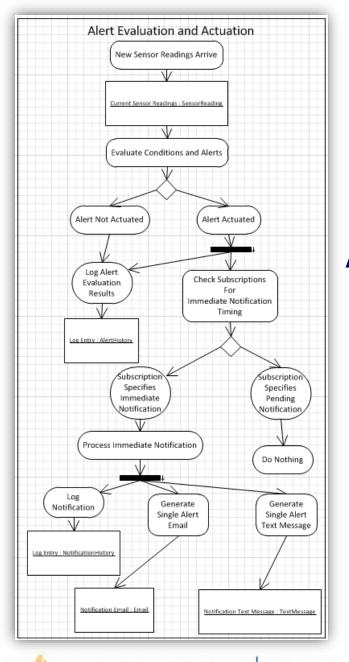
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Example Process (RWIS Data Pushed from Information Relay and Received by WeatherShare)



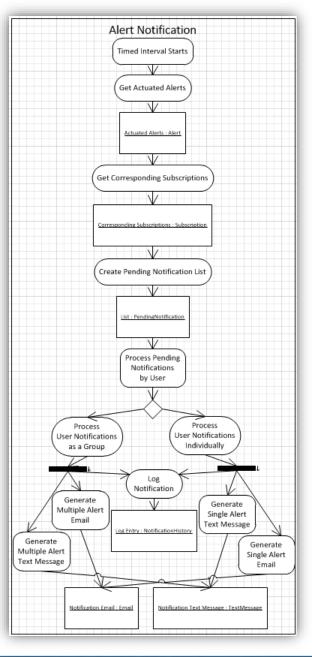
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Example Processes (Alert Evaluation and Actuation, Alert Notification)



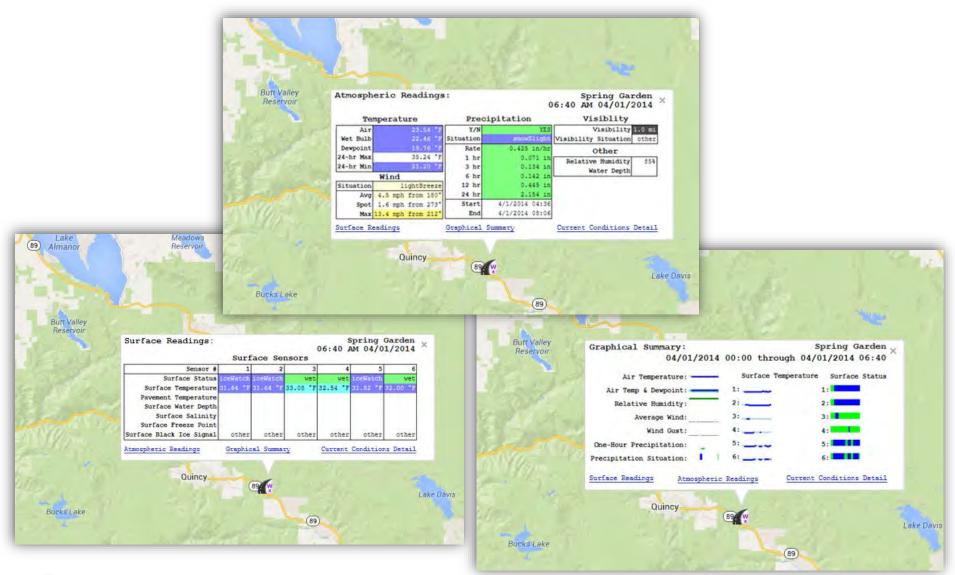
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23

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### Example Interface / Screens (Map InfoWindows)

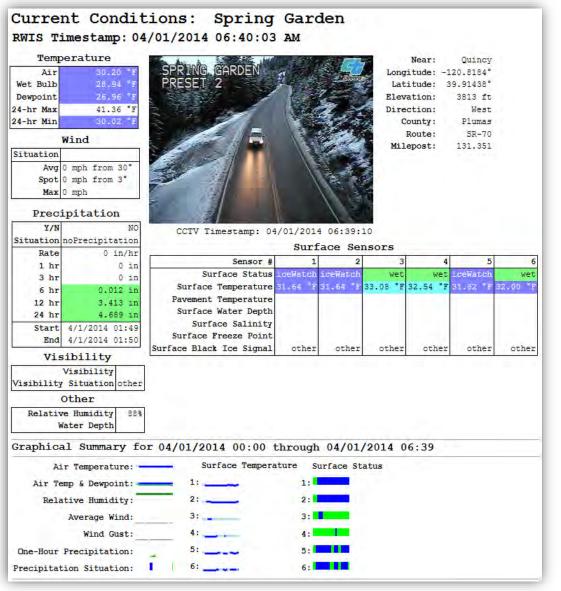


24



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### Example Interface / Screens (Station Summary)



25



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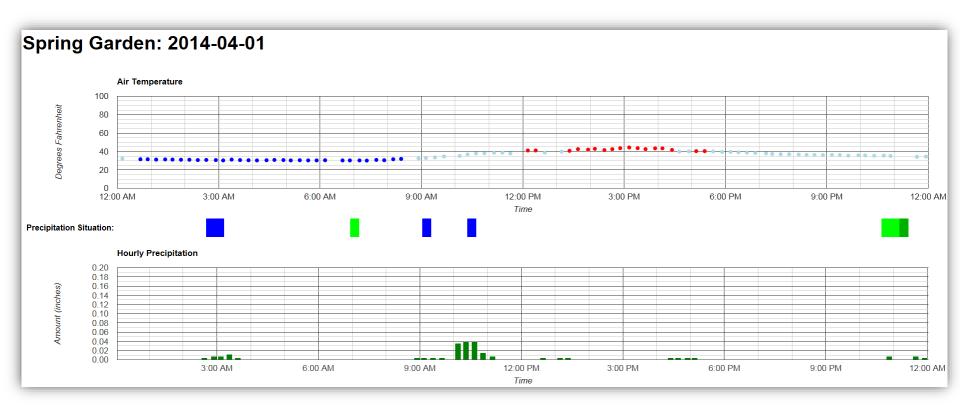
### Example Interface / Screens (Historical Data)

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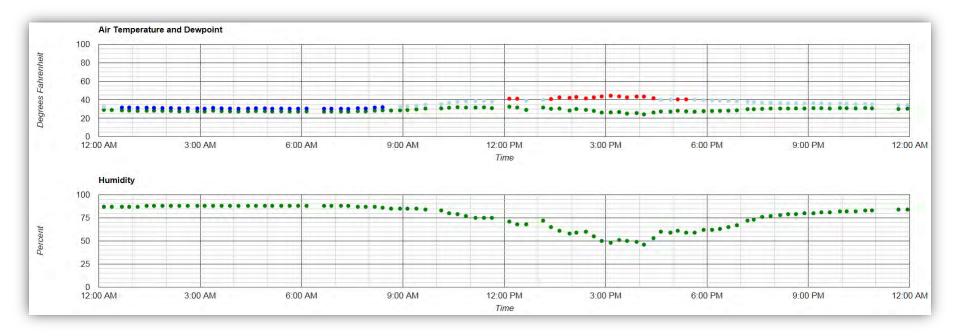


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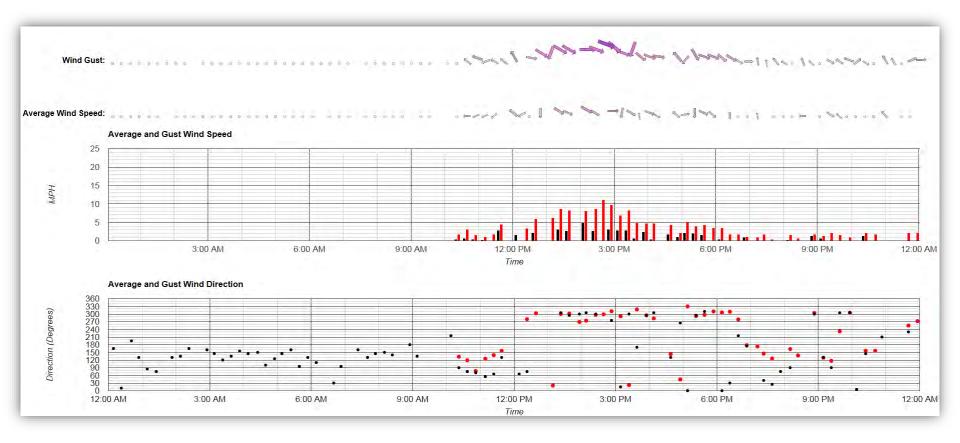
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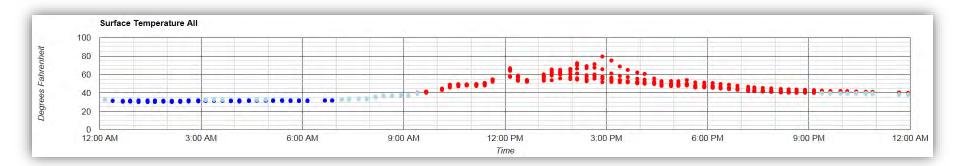


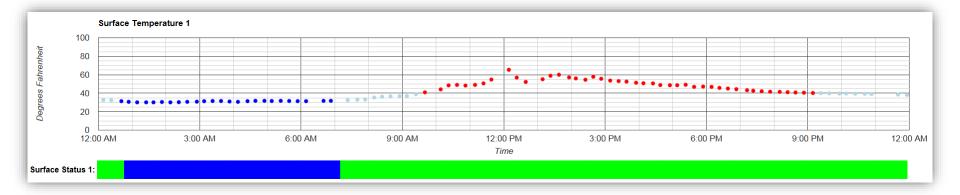
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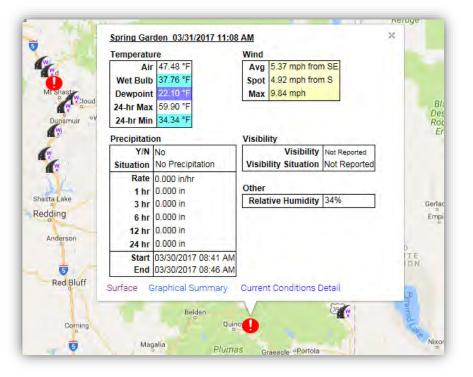
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## Design vs. Implementation (Map InfoWindows)







31

## Design vs. Implementation (Station Summary)

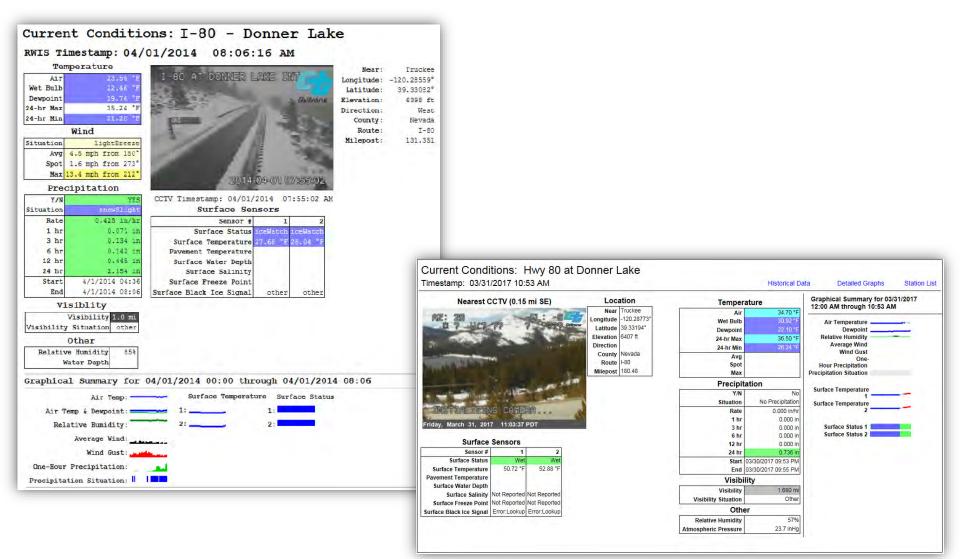


32



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## Design vs. Implementation (Station Summary)



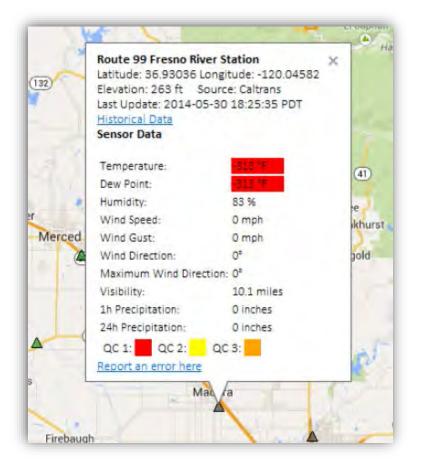
33



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## **QC** Not Implemented

(Range checks were implemented but are not displayed.)

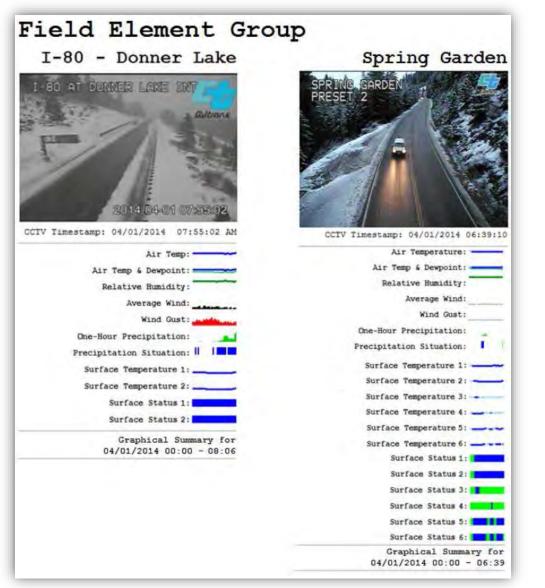


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Weather Station Problem Report Form	1	×
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Description of the problem:		
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Submit Feedback		
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34

### **Field Element Groups Not Implemented**





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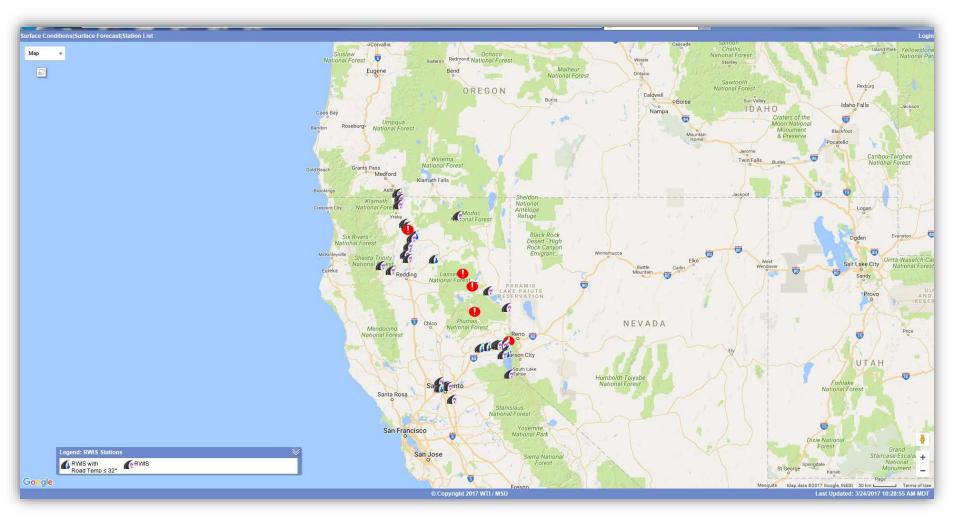
35

## A Look at the System



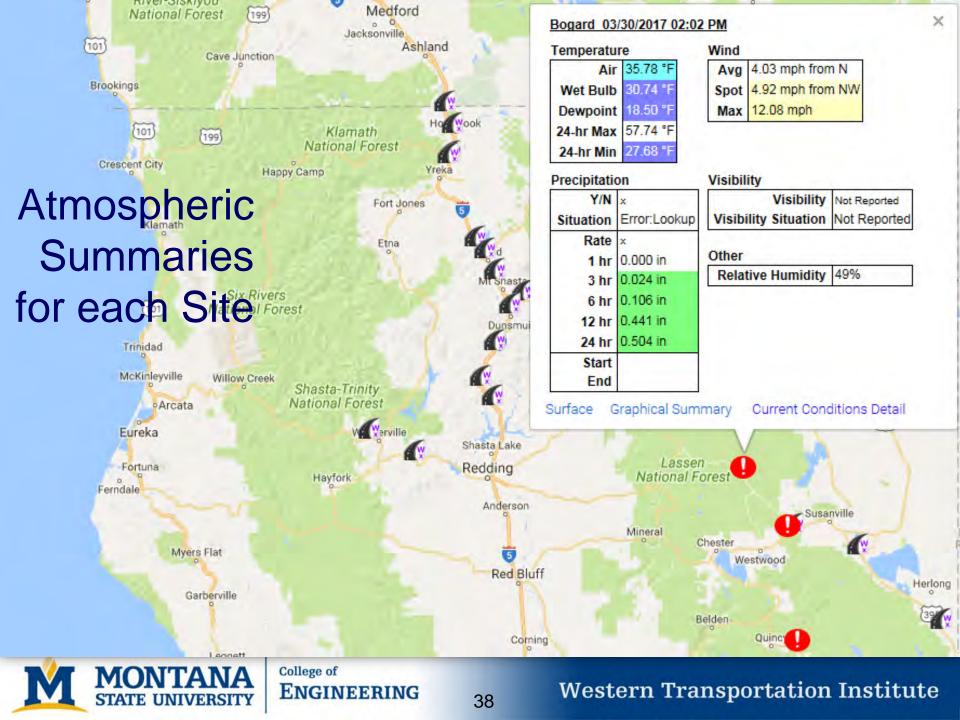
36

# The Map

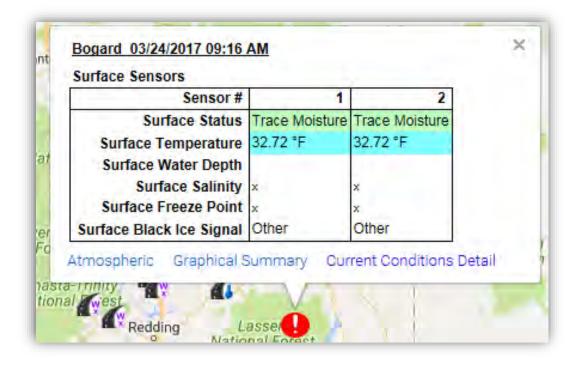




37

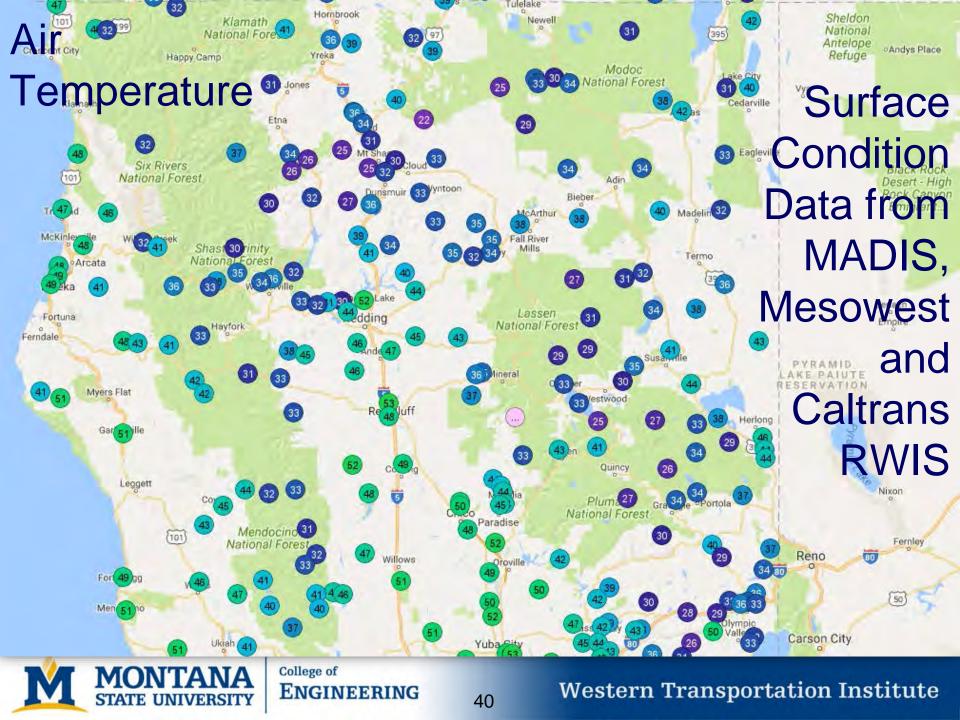


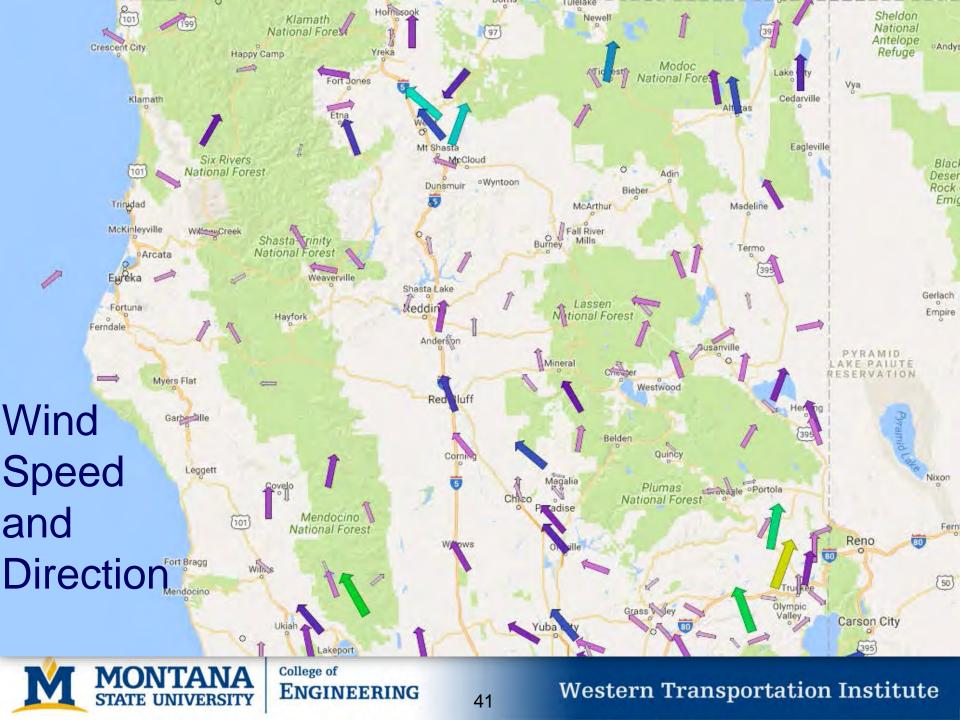
# Surface Summaries for Each Site

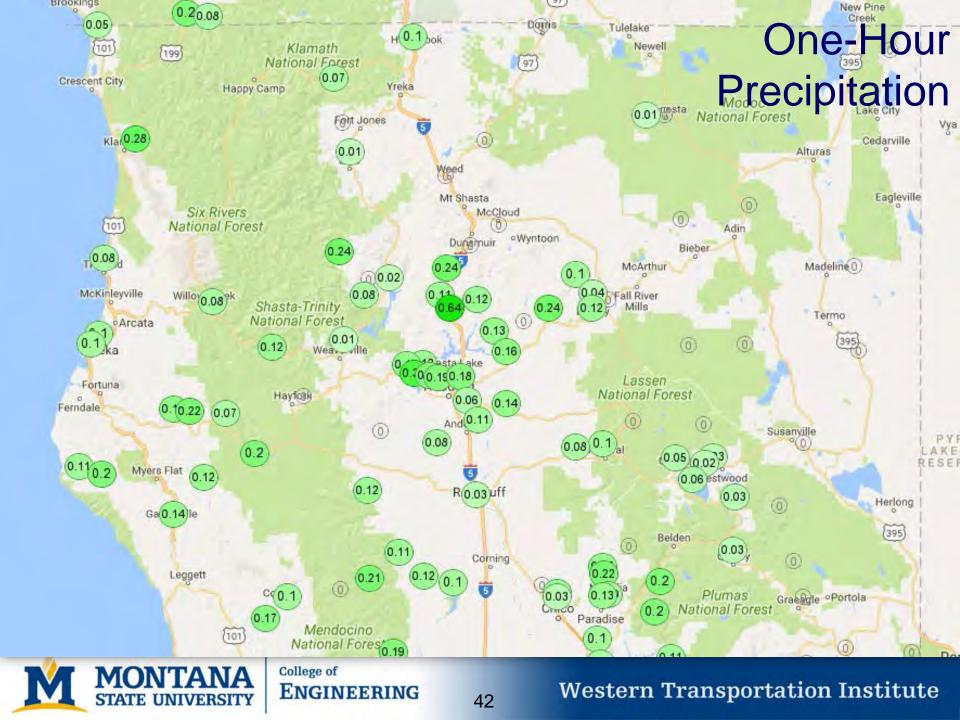


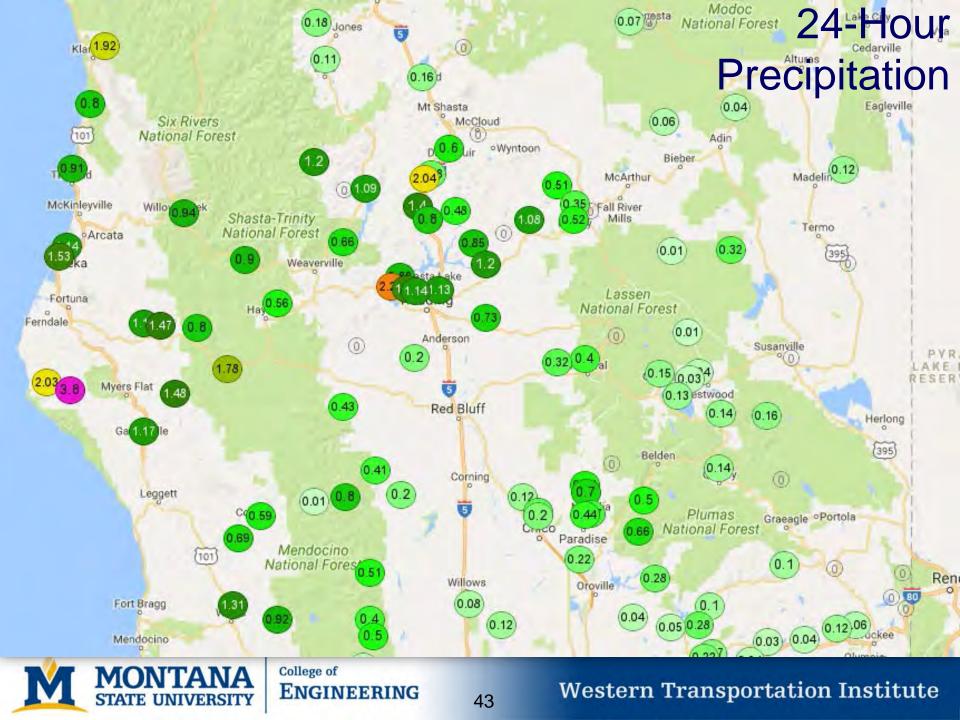


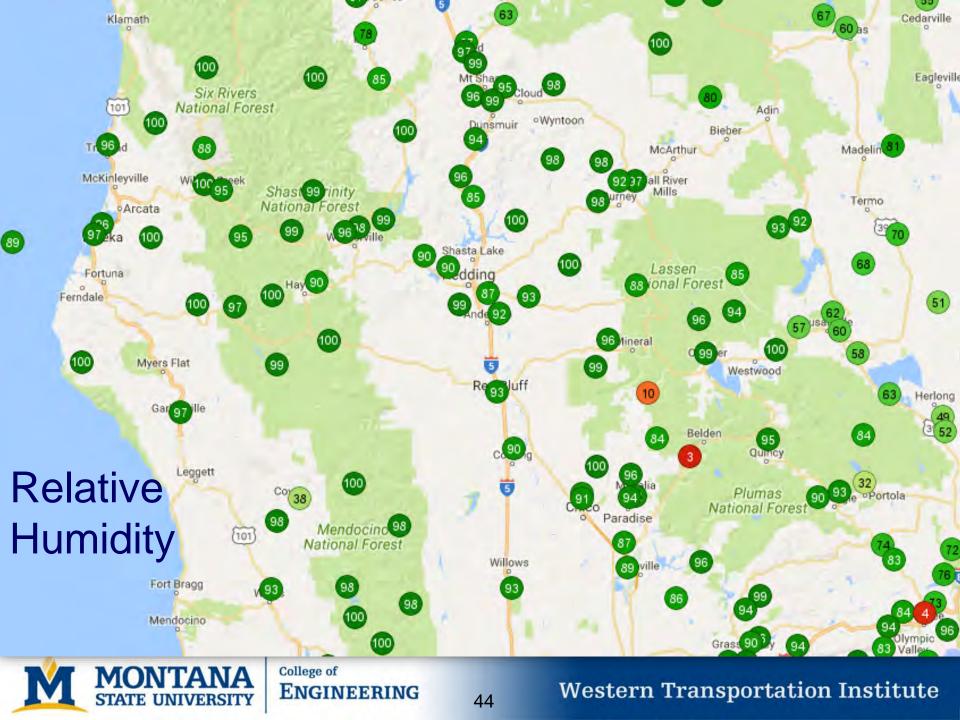
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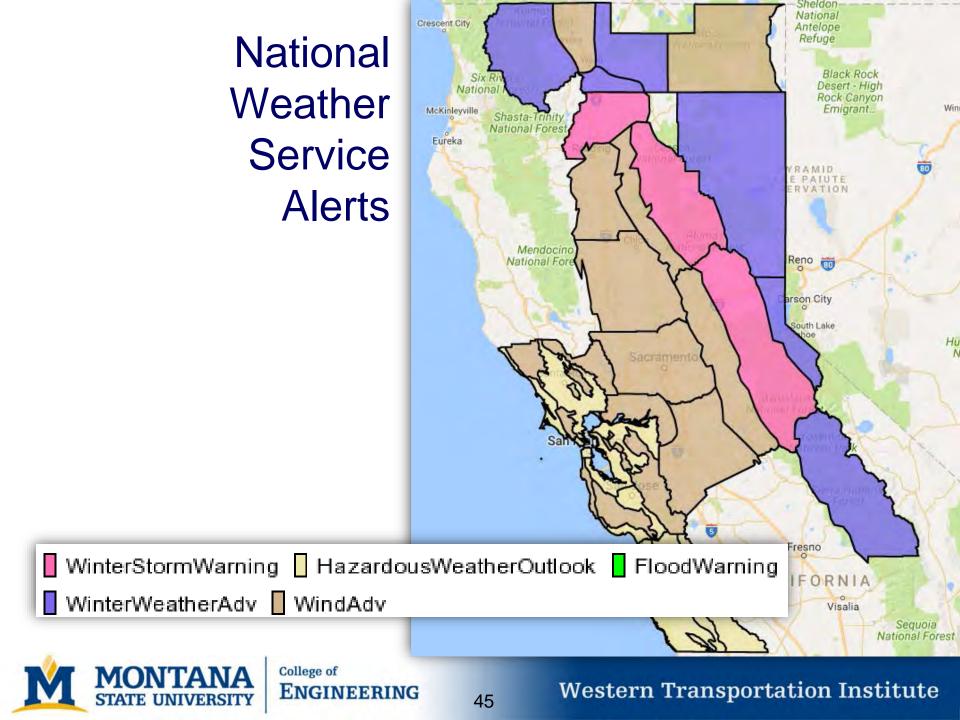












### CAZ071 Active Alerts:

Winter Weather Advisory

### Winter Weather Advisory:

Sent: 03:03 Mar 24, 2017 PDT Expires: 04:00 Mar 25, 2017 PDT Effective: 03:03 Mar 24, 2017 PDT

Severity: Minor Urgency: Expected Certainty: Likely

Type: Alert Category: Met Status: Actual Scope: Public Sender: NWS Reno (Western Nevada) Source: w-nws.webmaster@noaa.gov

Note: Alert for Lassen-Eastern Plumas-Eastern Sierra Counties (California) Issued by the National Weather Service

Area Description: Lassen-Eastern Plumas-Eastern Sierra Counties

Headline: Winter Weather Advisory issued March 24 at 3:03AM PDT until March 25 at 4:00AM PDT by NWS Reno

Description: ...WINTER WEATHER ADVISORY REMAINS IN EFFECT FROM 4 PM THISAFTERNOON TO 4 AM PDT SATURDAY ABOVE 5500 FEET...\* Timing: Rain and higher elevation snow will begin this morningand continue tonight as snow levels fall.\* Snow Accumulations: 6 to 12 inches above 6500 feet with up to4 inches down to 5000 feet. Heaviest snow south and west of Susanville.\* Snow Levels: 5500 feet today lowering to valley floors by latetonight.\* Impacts: Snow will cause hazardous driving conditions forroads near and above 5500 feet including Yuba Pass andFredonyer Summit.

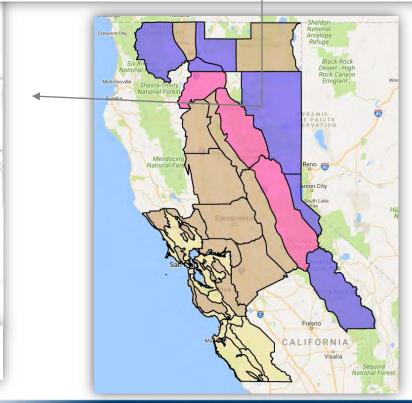
Instruction: Even light snowfall causes major travel delays, especially duringperiods of high traffic volume. Be sure to allow extra time toreach your destination. Leave extra space between vehicles sinceit takes longer to stop on slick roadways.

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46

### Description: ...WINTER WEATHER ADVISORY REMAINS IN EFFECT FROM 4 PM THISAFTERNOON TO 4 AM PDT SATURDAY ABOVE 5500 FEET...\* Timing: Rain and higher elevation snow will begin this morningand continue tonight as snow levels fall.\* Snow Accumulations: 6 to 12 inches above 6500 feet with up to4 inches down to 5000 feet. Heaviest snow south and west of Susanville.\* Snow Levels: 5500 feet today lowering to valley floors by latetonight.\* Impacts: Snow will cause hazardous driving conditions forroads near and above 5500 feet including Yuba Pass andFredonyer Summit.



Winter Weather Advisory



### CAZ013 Active Alerts:

Winter Storm Warning

### Winter Storm Warning:

Sent: 04:10 Mar 24, 2017 PDT Expires: 05:00 Mar 25, 2017 PDT Effective: 04:10 Mar 24, 2017 PDT

Severity: Moderate Urgency: Expected Certainty: Likely

Type: Alert Category: Met Status: Actual Scope: Public Sender: NWS Sacramento (North Central California) Source: w-nws.webmaster@noaa.gov Description: ...Another round of snow for northern California mountains....A Pacific frontal system will move through northern Californiatoday bringing heavy snow over the mountains with snow levels downto many passes. In addition to the snowfall, gusty winds arelikely at times especially during the day today. If planningtravel through the Sierra Cascade range or northern mountains todaythrough early Saturday, expect delays and chain controls. Beprepared and check the latest weather and road reports beforedeparture....WINTER STORM WARNING REMAINS IN EFFECT UNTIL 5 AM PDTSATURDAY...\* TIMING...Snowfall continuing through Saturday morning.\* SNOW AMOUNTS...8 to 12 inches above 3500 feet with up to 18 inches highest elevations.\* MAIN IMPACT...Heavy high elevation snow.\* OTHER IMPACTS...Gusty winds up to 40 mph highest elevationscausing white-out conditions at times.Interact with us via social

mediawww.facebook.com/nws.sacramentowww.twitter.com/nwssacramento

Note: Alert for Shasta Lake Area, Northern Shasta County (California) Issued by the National Weather Service

Area Description: Shasta Lake Area, Northern Shasta County

Headline: Winter Storm Warning issued March 24 at 4:10AM PDT until March 25 at 5:00AM PDT by NWS Sacramento

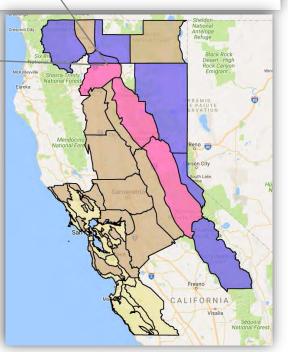
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mediawww.facebook.com/nws.sacramentowww.twitter.com/nwssacramento

Instruction: A Winter Storm Warning for heavy snow means severe winter weatherconditions are expected or occurring. Significant amounts ofsnow are forecast that will make travel dangerous. If you musttravel, keep an extra flashlight, food, and water in your vehiclein case of an emergency.

Winter Storm Warning

47





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### CAZ017 Active Alerts:

Wind Advisory

### Wind Advisory:

Sent: 04:19 Mar 24, 2017 PDT Expires: 19:00 Mar 24, 2017 PDT Effective: 04:19 Mar 24, 2017 PDT

Severity: Minor Urgency: Expected Certainty: Likely

Type: Alert Category: Met Status: Actual Scope: Public Sender: NWS Sacramento (North Central California) Source: w-nws.webmaster@noaa.gov

Note: Alert for Carquinez Strait and Delta; Central Sacramento Valley; Motherlode; Northeast Foothills, Sacramento Valley; Northern Sacramento Valley; Northern San Joaquin Valley; Southern Sacramento Valley; Western Plumas County, Lassen Park (California) Issued by the National Weather Service

Area Description: Carquinez Strait and Delta; Central Sacramento Valley; Motherlode; Northeast Foothills, Sacramento Valley; Northern Sacramento Valley; Northern San Joaquin Valley; Southern Sacramento Valley; Western Plumas County, Lassen Park

Headline: Wind Advisory issued March 24 at 4:19AM PDT until March 24 at 7:00PM PDT by NWS Sacramento

Description: ...WIND ADVISORY REMAINS IN EFFECT FROM 9 AM THIS MORNING TO 7 PMPDT THIS EVENING...\* TIMING...Winds will increase this morning and continue through this afternoon before declining this evening and overnight.\* WINDS...South winds 20 to 30 mph with gusts up to 40 mph.\* IMPACTS...Local downed trees and limbs, blowing debris, and local power outages possible.Interact with us via social

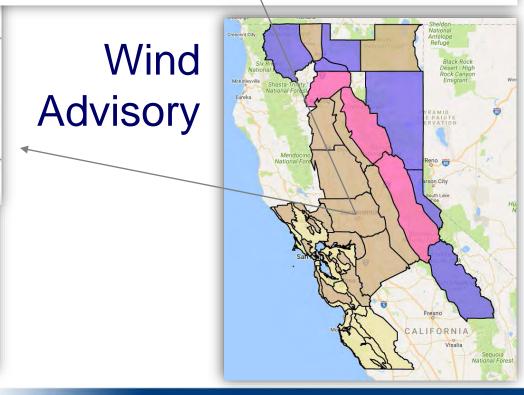
mediawww.facebook.com/nws.sacramentowww.twitter.com/nwssacramento

Instruction: A Wind Advisory means that winds of 35 mph or higher areexpected. Winds this strong can make driving difficult, especiallyfor high profile vehicles. Use extra caution.

Description: ...WIND ADVISORY REMAINS IN EFFECT FROM 9 AM THIS MORNING TO 7 PMPDT THIS EVENING...\* TIMING...Winds will increase this morning and continue through this afternoon before declining this evening and overnight.\* WINDS...South winds 20 to 30 mph with gusts up to 40 mph.\* IMPACTS...Local downed trees and limbs, blowing debris, and local power outages possible.Interact with us via social

mediawww.facebook.com/nws.sacramentowww.twitter.com/nwssacramento

Instruction: A Wind Advisory means that winds of 35 mph or higher areexpected. Winds this strong can make driving difficult, especiallyfor high profile vehicles. Use extra caution.





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48

### CAZ517 Active Alerts:

· Hazardous Weather Outlook

HazardousWeatherOutlook:

Sent: Not Available Expires: Not Available Effective: Not Available

Severity: Urgency: Certainty:

Type: Outlook Category: Outlook Status: Scope: Sender: National Weather Service San Francisco CA Source:

Note:

#### Area Description:

San Francisco-

Coastal North Bay Including Point Reyes National Seashore-North Bay Interior Valleys-North Bay Mountains-San Francisco Bay Shoreline-San Francisco Peninsula Coast-East Bay Interior Valleys-East Bay Hills and the Diablo Range-Santa Cruz Mountains-Santa Clara Valley Including San Jose-Southern Salinas Valley/Arroyo Seco and Lake San Antonio-Santa Lucia Mountains and Los Padres National Forest-Mountains Of San Benito County And Interior Monterey County Including Pinnacles National Park-Northern Salinas Valley/Hollister Valley and Carmel Valley-

Northern Monterey Bay-Southern Monterey Bay and Big Sur Coast-547 AM PDT Fri Mar 24 2017

Headline: Outlook

Description: This Hazardous Weather Outlook is for portions of western California. .DAY ONE...Today and Tonight

A storm system will bring widespread rainfall and gusty southerly winds to our area today. Rain could be heavy at times which might lead to hydro issues. Gusty southerly winds could also topple some trees and power lines. A Wind Advisory is in effect for today for the San Francisco Peninsula...the North and East Bay Hills and the Diablo Range...and the Santa Cruz mountains.

DAYS TWO THROUGH SEVEN...Saturday through Thursday



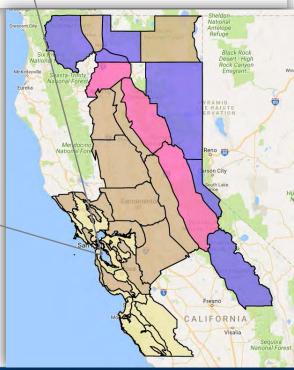
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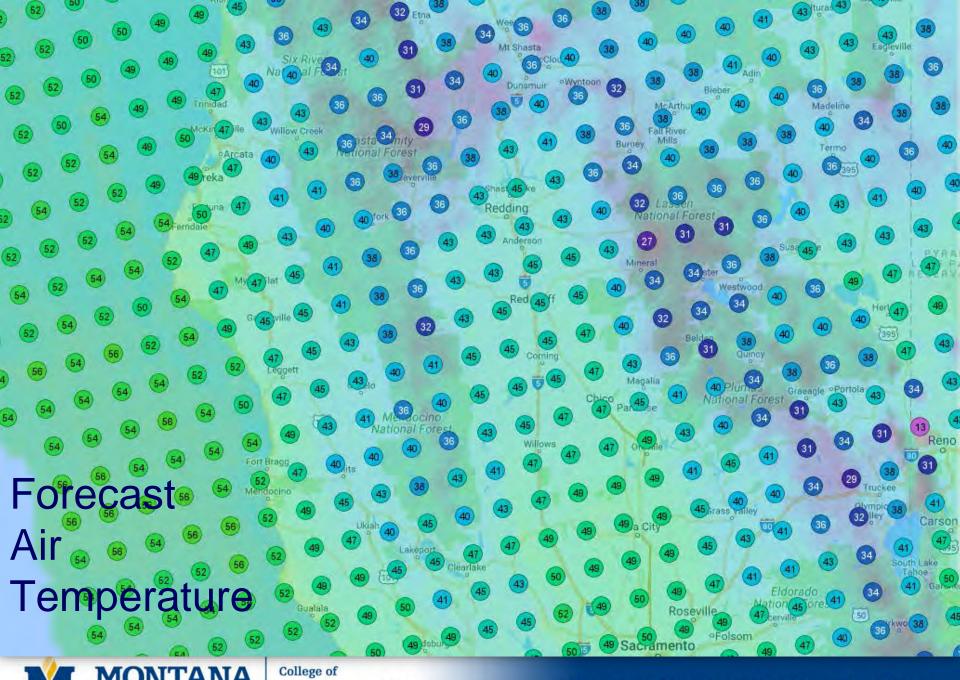
A storm system will bring widespread rainfall and gusty southerly winds to our area today. Rain could be heavy at times which might lead to hydro issues. Gusty southerly winds could also topple some trees and power lines. A Wind Advisory is in effect for today for the San Francisco Peninsula...the North and East Bay Hills and the Diablo Range...and the Santa Cruz mountains.

.DAYS TWO THROUGH SEVEN...Saturday through Thursday Saturday should be mostly dry...then another frontal system will sweep through the area on Sunday bringing another round of rain chances and gusty winds. After this storm departs...dry weather should follow for the rest of the week. .SPOTTER INFORMATION STATEMENT...

> Hazardous Weather Outlook

49





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50

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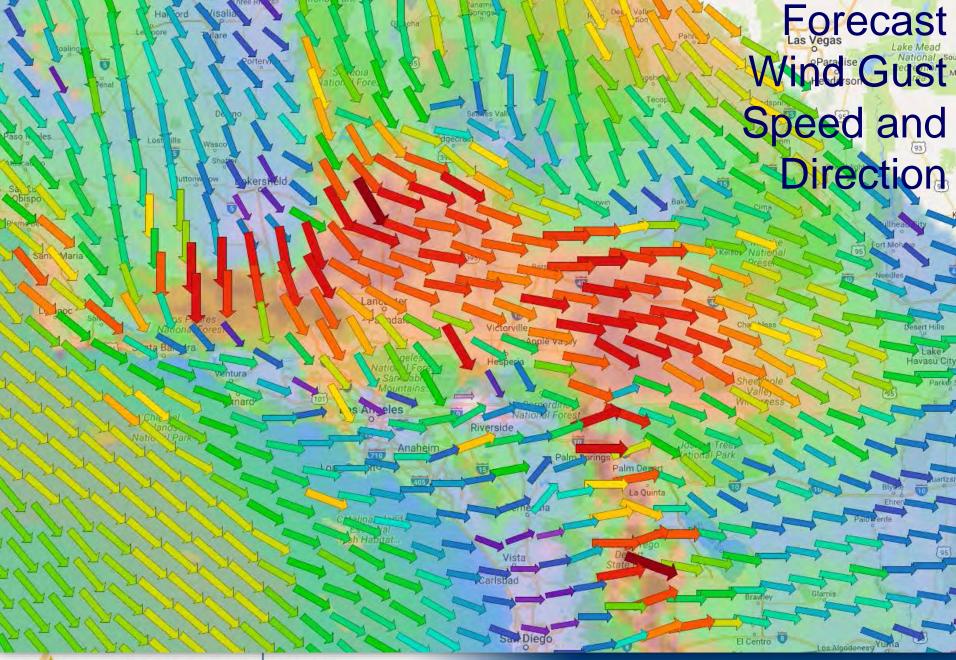
VERSITY

199 Klamath Vewell 101 Nation V Fores **Grescent** City Happy Camp nesta Nation Lake City Fort Jones Ced Itville Alturas Mt Shasta National Fold Adin OWW Dunsmy Bieber McKinle ville Willow Creek Fall asta-Trinity National Forest Veaverville Aureka Shast Futuna Reddin S vior N Tional prest Ferndale Andel Myen Flat Wes wood Red B Forecast Garl Erville Wind egalia Pluma agle offertola National P rest Paradise Speed/ Methocino Nation Fore Orovine liows and Direction ympic alley u a City Lakep

51



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52

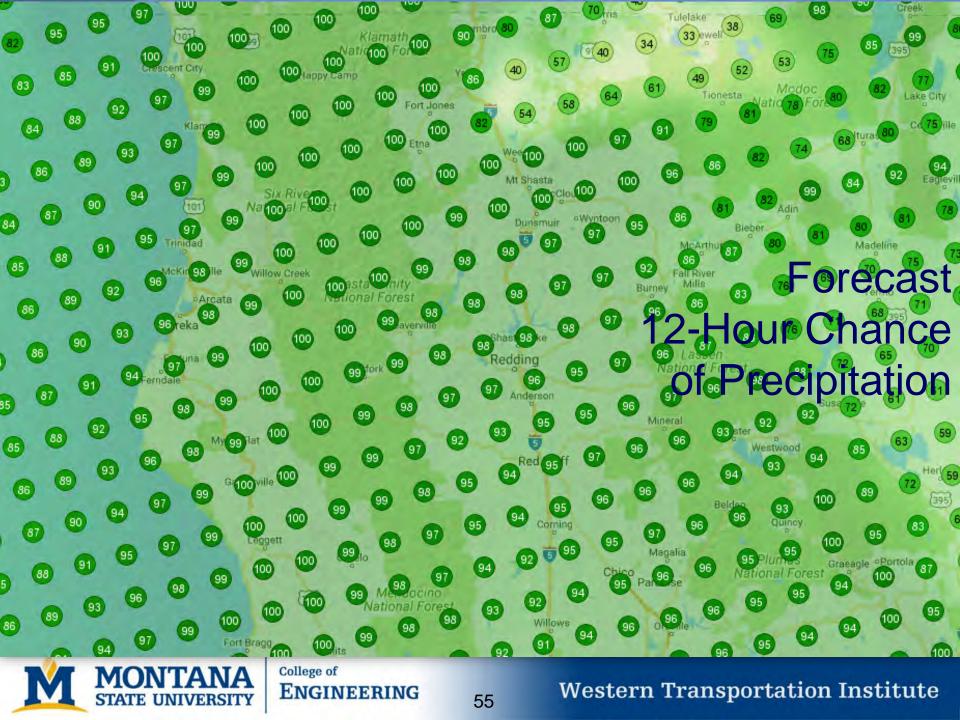


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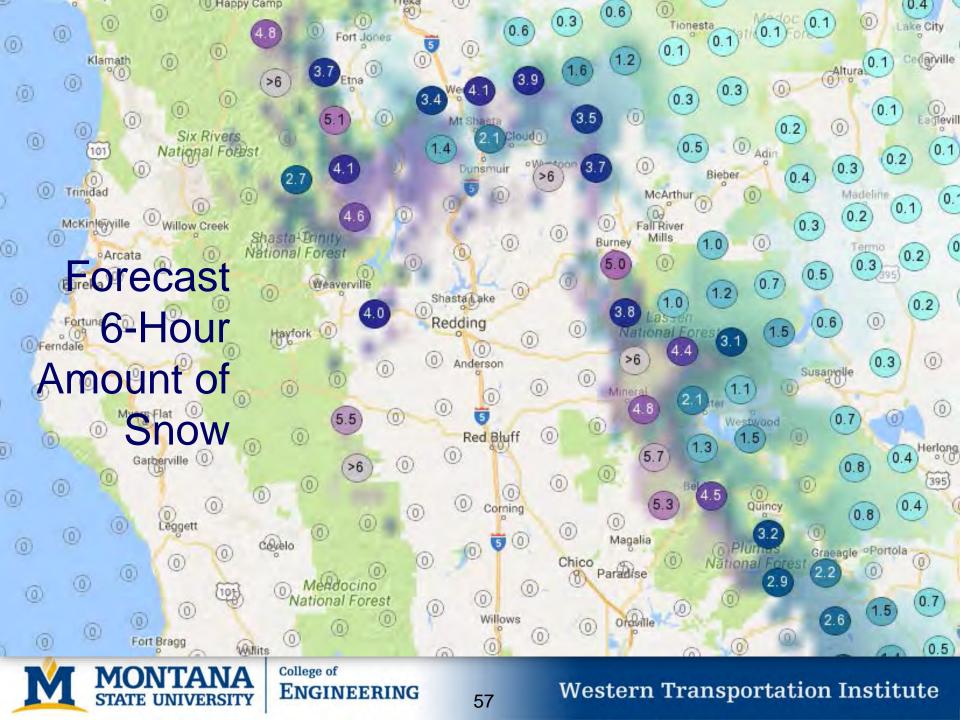


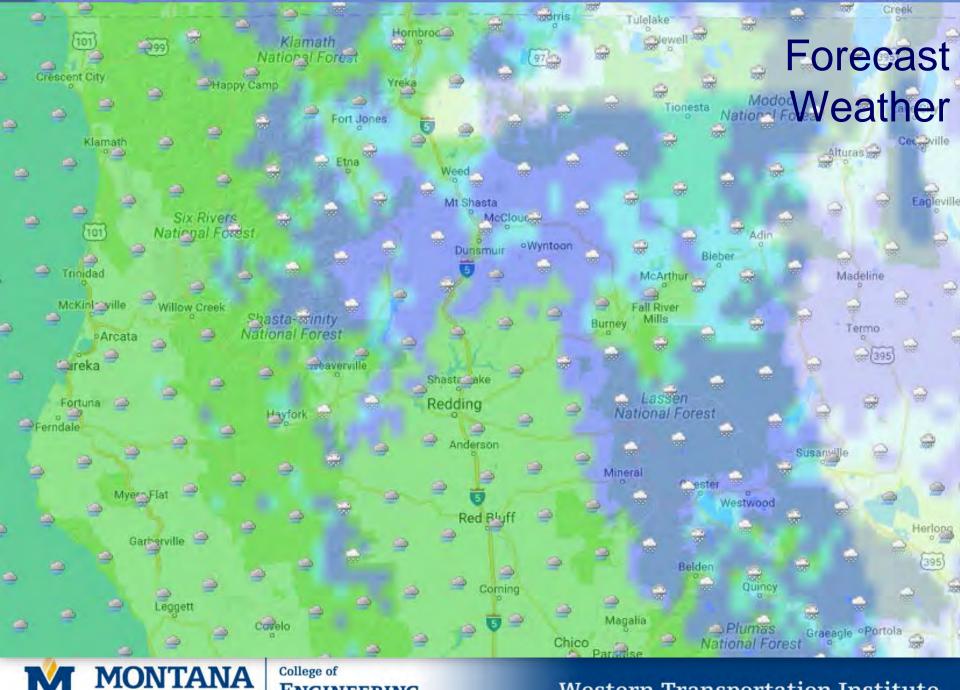


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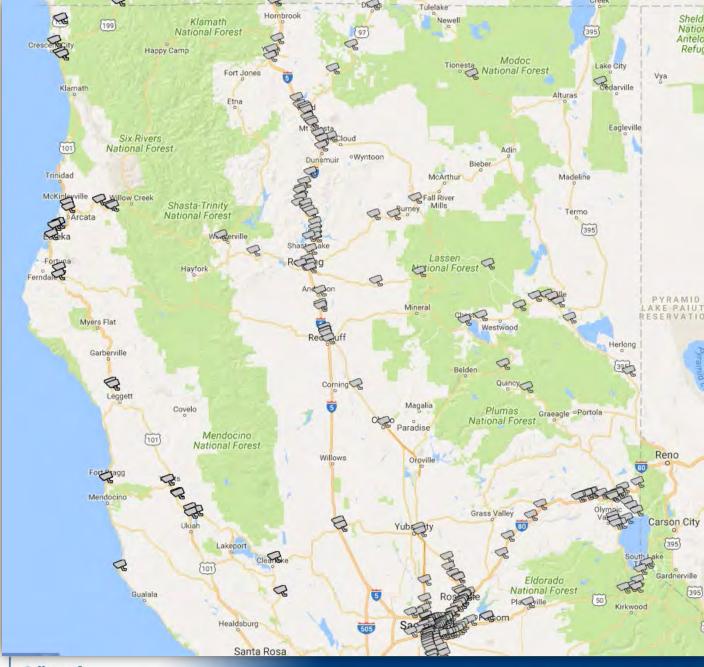
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58

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5



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59



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60

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61

# The D2 Station List (unauthenticated)

### Atmospheric Overview Graphical Overview

District-2 District-3

Links	Station Name	ID	Last Updated	Active	Location		Elevation	Nearby Location	County	Route	Milepost
graphs historical summary	Anderson Grade	D02-02	03/24/2017 09:46 AM	yes	-122.58937°	41.79255°	3002 ft	Yreka	Siskiyou	I-5	780.283
graphs historical summary	Anderson Grade Summit	D02-81	03/24/2017 09:46 AM	yes	-122.58186°	41.80012°	3078 ft	Yreka	Siskiyou	1-5	780.993
graphs historical summary	Antlers SmtRWIS	D02-04	03/24/2017 09:46 AM	yes	-122.36559°	40.86709°	1512 ft	Lakehead	Shasta	I-5	700.038
graphs historical summary	Black Butte	D02-06	03/24/2017 09:37 AM	yes	-122.35590°	41.35411°	3912 ft	Mount Shasta	Siskiyou	1-5	741.746
graphs historical summary	Bogard	D02-07	03/24/2017 09:46 AM	yes	-121.08870°	40.58548°	5629 ft	Susanville	Lassen	SR-44	84.312
graphs historical summary	Buckhorn	D02-08	03/24/2017 09:40 AM	yes	-122.76080°	40.65457°	2646 ft	Lewiston	Trinity	SR-299	111.662
graphs historical summary	Doyle	D02-13	03/24/2017 09:44 AM	yes	-120.08530°	40.00069°	4300 ft	Doyle	Lassen	US-395	379.026
graphs historical summary	Dunsmuir	D02-14	03/24/2017 09:46 AM	yes	-122.27521°	41.21896°	2420 ft	Dunsmuir	Siskiyou	1-5	730.226
graphs historical summary	Fredonyer Smt	D02-19	03/24/2017 09:47 AM	yes	-120.86760°	40.36054°	5741 ft	Susanville	Lassen	SR-36	231.218
graphs historical summary	FredonyerEastRWIS	D02-20	03/24/2017 09:39 AM	yes	-120.83679°	40.36964°	5167 ft	Westwood	Lassen	SR-36	232.653
graphs historical summary	Hatchet Mtn	D02-22	03/24/2017 09:45 AM	yes	-121.76202°	40.85216°	4366 ft	Burney	Shasta	SR-299	182.338
graphs historical summary	HiltRWIS	D02-24	03/24/2017 09:41 AM	yes	-122.60745°	41.98883°	3097 ft	Hornbrook	Siskiyou	I-5	795.274
graphs historical summary	HornbrookRWIS	D02-25	03/24/2017 09:43 AM	yes	-122.56764°	41.90631°	2303 ft	Hornbrook	Siskiyou	1-5	789.158
graphs historical summary	Janesville	D02-28	03/24/2017 09:44 AM	yes	-120.50847°	40.29413°	4165 ft	Janesville	Lassen	US-395	410.23
graphs historical summary	NorthWeedRWIS	D02-37	03/24/2017 09:48 AM	yes	-122.40218°	41.42958°	3465 ft	Weed	Siskiyou	1-5	747.987
graphs historical summary	Oregon Mtn	D02-39	03/24/2017 09:48 AM	yes	-122.99080°	40.73877°	2775 ft	Weaverville	Trinity	SR-299	90.16
graphs historical summary	Perez	D02-78	03/24/2017 09:45 AM	yes	-121.20725°	41.60412°	4478 ft	Perez	Modoc	SR-139	88.66
graphs historical summary	Sims Road	D02-49	03/24/2017 09:35 AM	yes	-122.35592°	41.07786°	1804 ft	Castella	Shasta	1-5	718.468
graphs historical summary	SnowmanRWIS	D02-51	03/24/2017 09:48 AM	yes	-122.21339°	41.26848°	4485 ft	Dunsmuir	Siskiyou	SR-89	237.775
graphs historical summary	Spring Garden	D02-53	03/24/2017 09:38 AM	yes	-120.81840°	39.91438°	3813 ft	Quincy	Plumas	SR-70	131.351
graphs historical summary	Vollmers	D02-61	03/24/2017 09:43 AM	yes	-122.42692°	40.94086°	1322 ft	Lakehead	Shasta	1-5	706.888
graphs historical summary	Weed Airport	D02-64	03/24/2017 09:45 AM	yes	-122.45290°	41.47430°	2936 ft	Weed	Siskiyou	1-5	752.728

62



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# The D2 Station List (authenticated)

#### Atmospheric Overview Graphical Overview

Admin | Profile | Logout(dgalarusITS)

District-2 District-3

Links	Station Name	ID	Last Updated	Active	Location		Elevation	Nearby Location	County	Route	Milepost	Alerts
graphs historical summary	Anderson Grade	D02-02	03/24/2017 09:46 AM	yes	-122.58937°	41.79255°	3002 ft	Yreka	Siskiyou	I-5	780.283	Alerts
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graphs historical summary	Weed Airport	D02-64	03/24/2017 09:45 AM	yes	-122.45290°	41.47430°	2936 ft	Weed	Siskiyou	1-5	752.728	Alerts



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## Alerts

## Alerts for D02-07 - Bogard

		Alert Name	Alert Created	Author	Last Evaluation	Last Status Change	Status	
	Definition History Subscribe	Bogard Freezing	02/01/2017 13:18:58 PM	dgalarusITS	03/24/2017 09:55:26 AM	03/24/2017 09:35:21 AM	Activated	Edit Delete
	Definition History Subscribe	BogartPrecip	02/15/2017 08:15:25 AM	dgalarusITS	03/24/2017 09:55:26 AM	03/24/2017 09:55:26 AM	Activated	Edit Delete
	Definition History Subscribe	Bogard near Freezing	03/21/2017 12:36:52 PM	dgalarusITS	03/24/2017 09:55:26 AM	03/24/2017 09:55:26 AM	Activated	Edit Delete
	Definition History Subscribe	Bogard Wet Pavement	03/22/2017 13:03:35 PM	dgalarusITS	03/24/2017 09:55:26 AM	03/24/2017 09:55:26 AM	Activated	Edit Delete
	Definition History Subscribe	Bogard Icy Road	03/23/2017 10:21:52 AM	dgalarusITS	03/24/2017 09:55:26 AM		Deactivated	Edit Delete
1	New Alert							

64



# The D3 Station List (authenticated)

#### Atmospheric Overview Graphical Overview

Admin | Profile | Logout(dgalar

District-2 District-3

Links	Station Name	ID	Last Updated	Active	Location		Elevation	Nearby Location	County	Route	Milepost	Alerts
graphs historical summary	Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM	yes	-120.07189°	39.26081°	7194 ft	Tahoe Vista	Placer	SR-267	8.50	Alerts
graphs historical summary	Hwy 267 at Truckee Bypass	D03-07	02/25/2016 06:45 AM	yes	-120.16325°	39.33431°	5866 ft	Truckee	Nevada	SR-267	0.36	Alerts
graphs historical summary	Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM	yes	-120.10387°	39.19358°	6522 ft	Tahoe City	Placer	SR-28	3.00	Alerts
graphs historical summary	Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM	yes	-121.64166°	38.67335°	19 ft	West Sacramento	Yolo	I-5	530.57	Alerts
graphs historical summary	Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM	yes	-121.50445°	38.59846°	36 ft	Sacramento	Sacramento	I-5	519.85	Alerts
graphs historical summary	Hwy 50 at Echo Summit	D03-05	10/12/2016 01:02 PM	yes	-120.02994°	38.81322°	7401 ft	South Lake Tahoe	El Dorado	US-50	94.97	Alerts
graphs historical summary	Hwy 51 at Exposition	D03-13	02/25/2016 06:44 AM	yes	-121.44536°	38.59155°	32 ft	Sacramento	Sacramento	SR-51	2.97	Alerts
graphs historical summary	Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM	yes	-120.70311°	39.28340°	5314 ft	Emigrant Gap	Placer	I-80	154.89	Alerts
graphs historical summary	Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM	yes	-120.54444°	39.30916°	5675 ft	Soda Springs	Placer	I-80	164.88	Alerts
graphs historical summary	Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM	yes	-120.28773°	39.33194°	6407 ft	Truckee	Nevada	I-80	180.48	Alerts
graphs historical summary	Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM	yes	-120.34782°	39.33906°	7221 ft	Soda Springs	Nevada	I-80	176.31	Alerts
graphs historical summary	Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM	yes	-120.02388°	39.39557°	5291 ft	Floriston	Nevada	I-80	198.01	Alerts
graphs historical summary	Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM	yes	-120.13009°	39.36223°	5826 ft	Truckee	Nevada	I-80	189.86	Alerts
graphs historical summary	Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM	yes	-120.17757°	39.16532°	6250 ft	Olympic Valley	Placer	SR-89	69.40	Alerts
graphs historical summary	Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM	yes	-121.34690°	38.36228°	49 ft	Elk Grove	Sacramento	SR-99	283.27	Alerts
graphs historical summary	Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM	no	-121.54475°	38.60300°	<b>19 ft</b>	Sacramento	Sacramento	I-80	84.29	Alerts
graphs historical summary	Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM	no	-121.63891°	38.56359°	29 ft	Woodland	Yolo	I-80	78.00	Alerts



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65

# D2 Atmospheric Overview

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#### Station List Graphical Overview

District-2 District-3

#### Temperature Wind Precipitation Visibility Last Wet Dew- 24-hr 24-hr Relative Atmospheric Spot Spot Max Max Avg Avg Links ID Station Name Updated Air Bulb point Max Min Humidity Pressure Speed Dir Speed Dir Speed Dir Rate Situation Start End 1 hr 3 hr 6 hr 12 hr 24 hr Situation Alerts ٩F ٩F °F °F °F in Hg ۰ • Y/N in/hr text Date Time Date Time mph mph mph in in in in in mi text Rair 03/24/2017 03/24/201 36.50 35.78 34.88 57.92 34.88 93.0 .043 0.091 0.094 0.094 0.098 graphs historical summary Anderson Grade D02-02 09:46 AM .79 SE 1.57 SE 3.58 S Yes 0.003 Slight 09:29 AN Alerts 03/24/201 Not Reported graphs historical summary Anderson Grade Summit D02-81 09:46 AN хΧ x Error:Lookup Alerts 03/24/201 03/23/2017 D02-04 41.90 40.10 37.76 59.72 40.64 85.0 4 47 SE 3.80 SE 12.08 SE Yes 0.021 0.358 0.862 1.366 1.984 2.465 Unknown Alerts graphs historical summarv AntiersSmtRWIS Hea 09:46 AM 06:35 PM 03/24/201 .00 32.00 32.00 49.82 99.0 SE Black Butte D02-06 15.2 SE 14.09 S 24.16 0.008 0.016 0.024 0.055 0.087 Alerts graphs historical summary 09:52 AN × Other 03/24/201 graphs historical summary Bogard D02-07 32.18 30.74 28.22 44.60 85.0 3.36 SE 2.46 SE 8.50 SE x Error:Lookup 0.031 0.055 0.079 0.079 0.079 Alerts 09:46 AM 03/24/201 03/24/2017 D02-08 33.80 32.90 31.64 40.82 33.08 graphs historical summary Buckhorn 09:40 AN NW 1.34 NW 2.24 NE Yes Unknown 09:37 AM Alerts 03/24/20 No 03/21/2017 03/21/201 09:49 AM 46.94 40.10 03:27 PM 0.000 0.000 0.000 0.000 0.000 55.22 53.0 10.07 13.42 SE No 0.000 x Unknown graphs historical summary Doyle D02-13 S 6.04 SE Precipitation Alerts 03:01 PM Rai 03/24/20 03/24/2017 54.86 32.18 99.0 5.37 SE 5.82 SE 0.006 0.055 0.126 0.362 0.799 0.945 graphs historical summary D02-14 2 00 32 00 32 00 5.82 F Moderat Dunsmuir 09:51 AM Yes 09:28 AM Alerts 03/24/201 D02-19 1.82 29.12 23.54 43.52 29.66 710 6.26 w 13.20 W 12.97 N 0.004 0.008 0.008 0.008 0.008 × Alerts graphs historical summary Fredonyer Smt 09:52 AM x Error:Lookun 03/24/201 03/24/2017 FredonverEastRWIS D02-20 34.88 30.74 22.28 48.20 32.90 59.0 4.03 S 0.00 SW 12.97 S Yes Unknown 04:15 AM graphs historical summary 09:39 AM x × х x x Alerts Rai 03/24/2017 03/24/201 D02-22 2.00 32.00 31.82 46.94 29.66 98.0 0.00 Ν 0.00 SW 0.00 NW Yes 0.009 Moderate 0.110 0.256 0.484 0.634 0.634 graphs historical summary Hatchet Mtn 09:50 AN 07:44 AM Alerts Rain 03/24/201 03/24/2017 35.24 34.34 33.08 55.04 30.38 D02-24 91.0 5.14 SE 9.17 Е 9.62 SE Yes 0.003 Sligh 0.059 0.236 0.272 0.287 0.319 graphs historical summary HiltRWIS 09:41 AM 09:39 AM Alerts Rair 03/24/201 03/24/2017 HornbrookRWIS D02-25 38.48 36.68 34.34 59.72 37.76 85.0 4.47 Е 4.03 Е 7.38 E Yes 0.001 Sligh 05:56 AM 0.031 0.169 0.193 0.197 0.205 graphs historical summary 09:43 AN Alerts 03/24/201 03/22/2017 03/22/201 No 09:15 AM 0.000 0.000 0.000 0.000 0.000 09:44 AM 44.60 39.56 32.90 52.70 62.0 graphs historical summary Janesville D02-28 16.11 S 8.28 SW 24.38 SW No 0.000 Precipitation 09:10 AM Alerts Rai 03/24/201 03/24/2017 09:48 AM 34.52 33.08 31.10 50.72 86.0 25.05 SE 25.05 SE 33.33 SE 0.006 Moderat 0.106 0.232 0.382 0.476 0.516 graphs historical summary NorthWeedRWIS D02-37 Yes 08:07 AM Alerts Ra 03/24/201 03/23/2017 graphs historical summary Oregon Mtr D02-39 34.52 33.98 33.26 55.58 33.98 94.0 8.72 Е 5.59 Е 11.18 E Yes 0.009 Moderat 122 0.390 0.748 1.303 1.425 Alerts 09:48 AM 10:40 PM ~ 03/24/201 03/24/2017 03/24/201 0.000 graphs historical summary D02-78 34.70 34.34 33.98 51.44 96.0 671 S 8.28 S 9.62 S No Precipitation 09:40 AM 0.024 0.043 0.055 0.055 0.055 Alerts Perez 09:50 AM 09:35 AM Rai 03/24/201 03/23/2017 graphs historical summary Sims Road D02-49 35.60 35.06 34.34 57.74 36.32 95.0 0.00 SE 1.34 SE 2.68 SW Yes 0.016 Modera 11:56 PM 0.189 0.563 1.035 1.665 1.878 x Alerts 09:50 AM 03/24/201 03/23/2017 D02-51 1.46 30.92 30.20 36.32 29.84 95.0 0.00 SE 0.00 0.00 Ν 0.006 0.189 0.650 1.134 1.795 1.890 graphs historical summary SnowmanRWIS 09:53 AM S Yes 07:16 PM × Alerts Rai 03/24/201 03/24/2017 graphs historical summary Spring Garden D02-53 09:53 AN 37.40 36.86 36.50 54.68 96.0 1.79 SE 1.57 Е 5.59 S Yes 0.006 Moderat 09:27 AM 0.055 0.091 0.130 0.130 0.130 Alerts Rai 03/24/20 03/23/2017 38 84 38 30 37 94 59 00 36 32 1 34 2.46 0.013 0.217 0.610 0.945 1.539 1.878 graphs historical summary Vollmers D02-61 09:43 AM 96.0 NW 0.00 NW NW Yes Moderate 11:32 PM Alerts 03/24/201 03/24/2017 03/24/201 09:45 AM 36.86 32.00 21.74 55.40 35.96 09:43 AM 0.012 0.031 0.043 0.047 0.047 D02-64 54.0 26.84 SE 26.62 SE 36.91 SE No 0.000 Alerts graphs historical summary Weed Airport 09:42 AM Precipitation



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# D2 Atmospheric Overview

### Station List Graphical Overview

### District-2 District-3

					Te	empera	ture			
Links	Station Name	ID	Last Updated	Air		Dew- point		24-hr Min	Relative Humidity	Atmospheric Pressure
				۴F	٩F	۴F	٩F	۴F	%	in Hg
graphs historical summary	Anderson Grade	D02-02	03/24/2017 09:46 AM	36.50	35.78	34.88	57.92	34.88	93.0	x
graphs historical summary	Anderson Grade Summit	D02-81	03/24/2017 09:46 AM	×	x	x	x	x	x	x
graphs historical summary	AntlersSmtRWIS	D02-04	03/24/2017 09:46 AM		40.10	37.76	59.72	40.64	85.0	x
graphs historical summary	Black Butte	D02-06	03/24/2017 09:52 AM	32.00	32.00	32.00	49.82	31.64	99.0	x
graphs historical summary	Bogard	D02-07	03/24/2017 09:46 AM	32.18	30.74	28.22	44.60	30.92	85.0	x

			Wir							Precip	itation						V	isibility	
Sp	Avg eed nph	Avg Dir °	Spot Speed mph	Spot Dir °	Max Speed mph	Max Dir °	Y/N	Rate in/hr	Situation text	Start Date Time	End Date Time	1 hr in	3 hr in	6 hr in	12 hr in	24 hr in	mi	Situation text	Alerts
1.7	9	SE	1.57	SE	3.58	s	Yes	0.003	Rain Slight	03/24/2017 09:29 AM		0.043	0.091	0.094	0.094	0.098	x	x	Alerts
x		x	x	x	x	x	Not Reported	x	Error:Lookup			x	x	x	x	x	x	x	Alerts
4.4	7	SE	3.80	SE	12.08	SE	Yes	0.021	Rain Heavy	03/23/2017 06:35 PM		0.358	0.862	1.366	1.984	2.465	x	Unknown	Alerts
15.	21	SE	14.09	s	24.16	SE		×	Other			0.008	0.016	0.024	0.055	0.087	×	x	Alerts
3.3	6	SE	2.46	SE	8.50	SE	,	×	Error:Lookup			0.031	0.055	0.079	0.079	0.079	x	x	Alerts

67



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# D3 Atmospheric Overview

tation List Graphical Ove istrict-2 District-3	erview											Admi	n   Pro	ofile Lo	gout(d	IgalarusiT	S)									
						erature							lind					Pr	ecipitation					Vis	ibility	
Links	Station Name	ID	Last Updated	Air B		ew-24-h bint Max		Relative Humidity	Atmospheric Pressure	Avg Speed	Avg Dir	Spo Speed			Max Dir	Rat	e Situation	Start	End	1 hr 3	hr 6hr	12 hr	24 hr		Situation	Alert
				°F	°F	°F °I	°F	%	in Hg	mph	•	mpl	1	° mph	•	Y/N in/t		Date Time	Date Time	in	in in	in	in	mi	text	
graphs historical summary	Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM	32.54 32	.18 31	.82 41.36	21.74	96.0	×	6.49	NW	0.67	w	8.95	NW	×	Frozen Precipitation x Slight			×	x	c x	×	0.04	Other	Alert
graphs historical summary	Hwy 267 at Truckee Bypass	D03-07	02/25/2016 06:45 AM	43.88	15	.98 58.10	42.80	32.0	x	0.89	SE	0.67	SE	1.34	SE	No 0.00	No Precipitation	02/24/2016 01:21 PM	02/24/2016 01:22 PM	0.000 0.0	000.000	0.000	0.000	×	x	Alert
graphs historical summary	Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM	32.00 31	.64 31	.10 32.00	31.82	97.0	x	0.00	W		x	× 0.45	w	×	x Unknown			×	x	( x	×	×	Unknown	Alert
graphs historical summary	Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM	52.70 50	.90 49	.46 54.68	51.08	88.0	30.07	22.37	SE		×	x 29.75	s	Yes 0.00	Rain )1 Slight			0.008 0.0	051 0.083	×	×	1.24	Unknown	Alert
graphs historical summary	Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM	53.42 51	.44 49	.82 64.40	48.38	87.0	x	11.18	SE		x	x 20.13	sw	No 0.00	No Precipitation			0.000 0.0	000.000	0.000	0.000	1.24	Unknown	Alert
graphs historical summary	Hwy 50 at Echo Summit	D03-05	10/12/2016 01:02 PM	57.38 15	1.16 29	.48 57.38	36.14	29.0	x	3.36	s	3.58	SW	8.28	s	No 0.00	No Precipitation	10/06/2016 08:24 AM	10/06/2016 08:32 AM	0.000 0.0	000.000	0.000	0.000	1.24	Clear	Alert
graphs historical summary	Hwy 51 at Exposition	D03-13	02/25/2016 06:44 AM	48.56	45	.14 66.92	48.38	88.0	30.09	4.47	N		x	<sub>x</sub> 6.71	Е	No 0.00	No Precipitation			0.000 0.0	000.000	0.000	×	×	x	Alert
graphs historical summary	Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM	32.00 29	.84 25	.34 37.22	32.00	76.0	x	3.36	SE	5.82	SE	14.99	SE	x	x Other	06/25/2016 08:59 PM	06/25/2016 09:00 PM	0.000 0.0	000.000	0.000	0.000	40.72	Unknown	Alert
graphs historical summary	Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM	23.90 22	.82 20	.66 26.60	23.72	87.0	×	9.17	sw		×	× 20.36	NE	Yes 0.00	Snow 2 Slight			0.012 0.0	028 0.059	×	×	0.40	Unknown	Alert
graphs historical summary	Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM	33.26 32		.66 42.62	29.84	86.0	23.73	:	x x	c	×	×	x x	Yes 0.02	Rain 8 Heavy	03/24/2017 03:53 AM		0.476 1.4	421 2.248	2.390	×	0.43	Other	Alerts
graphs historical summary	Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM	43.88	15	.08 58.10	42.80	31.0	x	0.89	Е	0.89	SE	1.12	Е	No 0.00	No Precipitation	02/24/2016 01:21 PM	02/24/2016 01:22 PM	0.000 0.0	000.000	0.000	0.000	x	х	Alert
graphs historical summary	Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM	44.24 38	.84 31	.46 51.62	36.68	60.0	x	10.29	s		x	x 22.37	w	×	× Unknown			×	x :	( x	×	×	Unknown	Alert
graphs historical summary	Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM	37.40	x 30	.92 45.50	32.00	77.0	x	15.43	s		x	x 26.62	w	×	× Unknown			×	x	( x	×	x	x	Alerts
graphs historical summary	Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM	34.70 34	.16 33	.62 41.00	19.76	96.0	x	3.58	N	0.00	Е	9.17	NW	×	Snow × Moderate			×	×	c x	×	0.34 Blo	owing Snow	Alert
graphs historical summary	Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM	52.52 50	.36 48	.38 64.04	46.94	86.0	30.08	10.07	SE		×	x 21.47	sw	Yes 0.00	No Precipitation			0.012 0.0	035 0.043	0.043	0.043	1.24	Unknown	Alert
graphs historical summary	Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM	х	x	х	x x	x x	x		x x	c	x	x	x x	×	x x	x	x	х	x :	c x	x	x	х	Alerts
graphs historical summary	Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM	x	x	x	x x	x x	x	-	x x	c	x	x :	x x	x	x x	x	x	x	x :	с х	x	x	x	Alerts

68



ENGINEERING

# D3 Atmospheric Overview

### Station List Graphical Overview

District-2 District-3

					Te	mperat	ture			
Links	Station Name	ID	Last Updated	Air		Dew- point		24-hr Min	Relative Humidity	Atmospheric Pressure
			opullin	٩F	°F	۴	۴F	۴F	%	in Hg
			03/24/2017							
graphs historical summary	Hwy 267 at Brockway Summit	D03-06		32.54	32.18	31.82	41.36	21.74	96.0	×
graphs historical summary	Hwy 267 at Truckee Bypass	D03-07	02/25/2018 06:45 AM			15.98	58.10	42.80	32.0	x
graphs historical summary	Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM		31.64	31.10	32.00	31.82	97.0	x
graphs historical summary	Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM	52.70	50.90	49.46	54.68	51.08	88.0	30.07
graphs historical summary	Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM	53.42	51.44	49.82	64.40	48.38	87.0	x

		Win	d						P	recipitation						١	Visibility	
Avg Speed mph		Spot Speed mph	Spot Dir °		Max Dir °	Y/N	Rate in/hr	Situation text	Start Date Time	End Date Time	1 hr in	3 hr in	6 hr in	12 hr in	24 hr in	mi	Situation text	Alerts
6.49	NW	0.67	w	8.95	NW	,	c x	Frozen Precipitation Slight			x	x	x	×	x	0.04	Other	Alerts
0.89	SE	0.67	SE	1.34	SE	No	0.000	No Precipitation	02/24/2016 01:21 PM	02/24/2016 01:22 PM	0.000	0.000	0.000	0.000	0.000	x	x	Alerts
0.00	W	x	x	0.45	w	>	x x	Unknown			×	×	x	x	×	×	Unknown	Alerts
22.37	SE	x	x	29.75	s	Yes	0.001	Rain Slight			0.008	0.051	0.083	x	×	1.24	Unknown	Alerts

69



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# D2 Graphical Overview

Links	Station Name	ID	Last Updated	Air Temperature	Dewpoint	Relative Humidity	Average Wind	Wind Gust	One-Hour Precipitation	Precipitation Situation	Alerts
graphs historical summary	Anderson Grade	D02-02	03/24/2017 09:46 AM			-				1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1	Alerts
graphs historical summary	Anderson Grade Summit	D02-81	03/24/2017 09:46 AM					- 1 P			Alerts
graphs historical summary	AntlersSmtRWIS	D02-04	03/24/2017 09:46 AM				-				Alerts
graphs historical summary	Black Butte	D02-06	03/24/2017 09:52 AM		*						Alerts
graphs historical summary	Bogard	D02-07	03/24/2017 09:46 AM	-	-	-					Alerts
graphs historical summary	Buckhorn	D02-08	03/24/2017 09:40 AM		•					111983	Alerts
graphs historical summary	Doyle	D02-13	03/24/2017 09:49 AM	-	-			Section and Station			Alerts
graphs historical summary	Dunsmuir	D02-14	03/24/2017 09:51 AM								Alerts
graphs historical summary	Fredonyer Smt	D02-19	03/24/2017 09:52 AM	-	-						Alerts
graphs historical summary	FredonyerEastRWIS	D02-20	03/24/2017 09:39 AM		-			And the second day		1000	Alerts
graphs historical summary	Hatchet Mtn	D02-22	03/24/2017 09:50 AM	-							Alerts
graphs historical summary	HiltRWIS	D02-24	03/24/2017 09:41 AM	-						1 1000	Alerts
graphs historical summary	HornbrookRWIS	D02-25	03/24/2017 09:43 AM		÷						Alerts
graphs historical summary	Janesville	D02-28	03/24/2017 09:44 AM		-		القصل سناري والمؤتد				Alerts
graphs historical summary	NorthWeedRWIS	D02-37	03/24/2017 09:48 AM		-		and an and a state	an and a second			Alerts
graphs historical summary	Oregon Mtn	D02-39	03/24/2017 09:48 AM	-	-	-			And a state of the		Alerts
graphs historical summary	Perez	D02-78	03/24/2017 09:50 AM	-	-					1.1	Alerts
graphs historical summary	Sims Road	D02-49	03/24/2017 09:50 AM		-						Alerts
graphs historical summary	SnowmanRWIS	D02-51	03/24/2017 09:53 AM	-			-	1			Alerts
graphs historical summary	Spring Garden	D02-53	03/24/2017 09:53 AM	-						0.0 B	Alerts
graphs historical summary	Vollmers	D02-61	03/24/2017 09:43 AM		<b>*</b> -1-		Links				Alerts
graphs historical summary	Weed Airport	D02-64	03/24/2017 09:45 AM		-		and the second second			I I CO. FREE DIN	Alerts



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		• •				1	1
Station Name	ID	Last Updated	Air Temperature	Dewpoint	Relative Humidity	Average Wind	Wind Gust
Anderson Grade	D02-02	03/24/2017 09:46 AM	-			adamatikiin taa ta ta	
Anderson Grade Summit	D02-81	03/24/2017 09:46 AM					
AntlersSmtRWIS	D02-04	03/24/2017 09:46 AM				hilles a des ades Hollowilli a	
Black Butte	D02-06	03/24/2017 09:52 AM	ļ				
Bogard	D02-07	03/24/2017 09:46 AM				a antonomodonomiliatanilata.	Lie Laterandonium.
Buckhorn	D02-08	03/24/2017 09:40 AM	-				
Doyle	D02-13	03/24/2017 09:49 AM	}			an Andrew of Manadala Andrew	Laite et an Million Million
Dunsmuir	D02-14	03/24/2017 09:51 AM	-	•			
Fredonyer Smt	D02-19	03/24/2017 09:52 AM	_				an an a still statistics
FredonyerEastRWIS	D02-20	03/24/2017 09:39 AM		-		s inne a muundulliilee	der och handlikklikke
Hatchet Mtn	D02-22	03/24/2017 09:50 AM					analamat analla
HiltRWIS	D02-24	03/24/2017 09:41 AM					
HornbrookRWIS	D02-25	03/24/2017 09:43 AM	-				
Janesville	D02-28	03/24/2017 09:44 AM		-			a
NorthWeedRWIS	D02-37	03/24/2017 09:48 AM	·			n in an an infin	
Oregon Mtn	D02-39	03/24/2017 09:48 AM		~			
Perez	D02-78	03/24/2017 09:50 AM					
Sims Road	D02-49	03/24/2017 09:50 AM		•			
SnowmanRWIS	D02-51	03/24/2017 09:53 AM				-	
Spring Garden	D02-53	03/24/2017 09:53 AM					
Volimers	D02-61	03/24/2017 09:43 AM		-			
Weed Airport	D02-64	03/24/2017 09:45 AM	<b></b>	~			



College of ENGINEERING

71

		Last		
Station Name	ID	Updated 03/24/2017	One-Hour Precipitation	Precipitation Situation
Anderson Grade	D02-02	09:46 AM		
Anderson Grade Summit	D02-81	03/24/2017 09:46 AM		
AntlersSmtRWIS	D02-04	03/24/2017 09:46 AM		
Black Butte	D02-06	03/24/2017 09:52 AM		
Bogard	D02-07	03/24/2017 09:46 AM		
Buckhorn	D02-08	03/24/2017 09:40 AM		
Doyle	D02-13	03/24/2017 09:49 AM		
Dunsmuir	D02-14	03/24/2017 09:51 AM		
Fredonyer Smt	D02-19	03/24/2017 09:52 AM		
FredonyerEastRWIS	D02-20	03/24/2017 09:39 AM		
Hatchet Mtn	D02-22	03/24/2017 09:50 AM		
HiltRWIS	D02-24	03/24/2017 09:41 AM		
HornbrookRWIS	D02-25	03/24/2017 09:43 AM	_ 📥	
Janesville	D02-28	03/24/2017 09:44 AM		
NorthWeedRWIS	D02-37	03/24/2017 09:48 AM		
Oregon Mtn	D02-39	03/24/2017 09:48 AM		
Perez	D02-78	03/24/2017 09:50 AM		
Sims Road	D02-49	03/24/2017 09:50 AM		
SnowmanRWIS	D02-51	03/24/2017 09:53 AM		
Spring Garden	D02-53	03/24/2017 09:53 AM		
Vollmers	D02-61	03/24/2017 09:43 AM		
Weed Airport	D02-64	03/24/2017 09:45 AM		



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## D3 Graphical Overview

strict-2 District-3											
inks	Station Name	ID	Last Updated	Air Temperature	Dewpoint	Relative Humidity	Average Wind	Wind Gust	One-Hour Precipitation	Precipitation Situation	Alert
raphs historical summary	Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM					·			Aler
raphs historical summary	Hwy 267 at Truckee Bypass	D03-07	02/25/2016 06:45 AM								Aler
raphs historical summary	Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM								Aler
raphs historical summary	Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM								Aler
raphs historical summary	Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM								Aler
raphs historical summary	Hwy 50 at Echo Summit	D03-05	10/12/2016 01:02 PM								Aler
raphs historical summary	Hwy 51 at Exposition	D03-13	02/25/2016 06:44 AM								Aler
raphs historical summary	Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM								Aler
raphs historical summary	Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM								Aler
raphs historical summary	Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM								Aler
raphs historical summary	Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM								Alert
raphs historical summary	Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM								Alert
raphs historical summary	Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM			-					Alert
raphs historical summary	Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM			-		matching			Alert
raphs historical summary	Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM								Alert
graphs historical summary	Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM								Alert
raphs historical summary	Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM								Alert



73

Links	Station Name	ID	Last Updated	Air Temperature	Dewpoint	Relative Humidity
LIIIKS	Station Name	IU III		All Temperature	Dewpoint	Relative nutility
graphs historical summary	Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM			
graphs historical summary	Hwy 267 at Truckee Bypass	D03-07	02/25/2018 06:45 AM			
graphs historical summary	Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM			
graphs historical summary	Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM			
graphs historical summary	Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM	—		
graphs historical summary	Hwy 50 at Echo Summit	D03-05	10/12/2016 01:02 PM			
graphs historical summary	Hwy 51 at Exposition	D03-13	02/25/2016 06:44 AM			
graphs historical summary	Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM			
graphs historical summary	Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM			
graphs historical summary	Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM			
graphs historical summary	Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM			
graphs historical summary	Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM			
graphs historical summary	Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM			
graphs historical summary	Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM			
graphs historical summary	Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM			
graphs historical summary	Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM			
graphs historical summary	Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM			

74



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		Last		
Station Name	ID	Updated	Average Wind	Wind Gust
Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM		.a
Hwy 267 at Truckee Bypass	D03-07	02/25/2016 06:45 AM		
Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM		
Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM		
Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM		
Hwy 50 at Echo Summit	D03-05	10/12/2018 01:02 PM		
Hwy 51 at Exposition	D03-13	02/25/2018 06:44 AM		
Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM		
Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM		
Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM		
Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM		
Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM	a se anna an Malanta ann An	and a difference in
Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM	and a standard line	
Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM		
Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM		
Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM		
Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM		

75



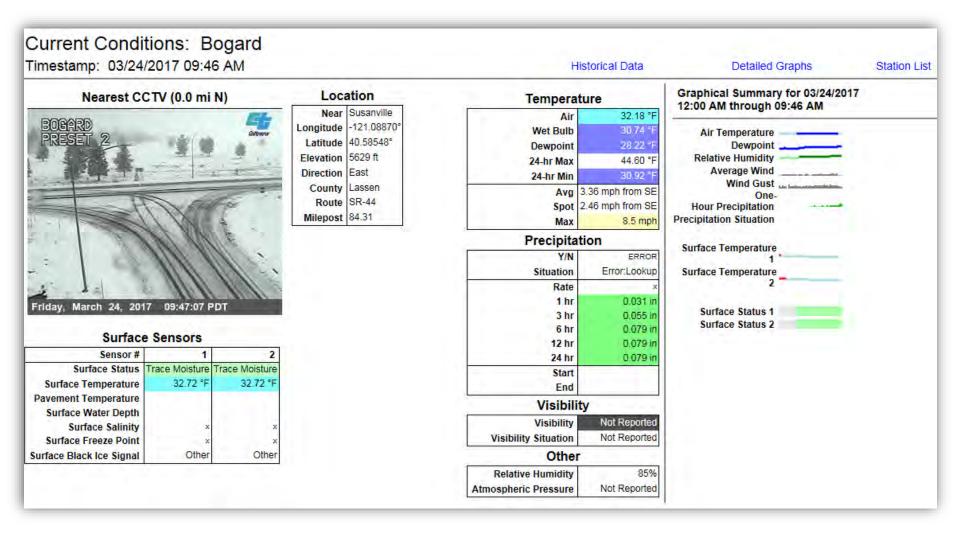
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		Last		
Station Name	ID	Updated	One-Hour Precipitation	Precipitation Situation
Hwy 267 at Brockway Summit	D03-06	03/24/2017 09:46 AM		
Hwy 267 at Truckee Bypass	D03-07	02/25/2016 06:45 AM		
Hwy 28 at Dollar	D03-18	02/10/2017 07:13 AM		
Hwy 5 at Elkhorn	D03-14	03/24/2017 09:45 AM		
Hwy 5 at Richards	D03-15	03/24/2017 09:46 AM		
Hwy 50 at Echo Summit	D03-05	10/12/2016 01:02 PM		
Hwy 51 at Exposition	D03-13	02/25/2016 06:44 AM		
Hwy 80 at Blue Canyon	D03-01	03/24/2017 09:47 AM		
Hwy 80 at Cisco Grove	D03-02	01/01/2017 11:35 PM		
Hwy 80 at Donner Lake	D03-04	03/24/2017 09:51 AM		
Hwy 80 at Donner Summit	D03-03	02/25/2016 06:40 AM		
Hwy 80 at Floriston	D03-10	03/24/2017 09:53 AM		
Hwy 80 at Truckee Scales	D03-09	03/24/2017 09:39 AM		
Hwy 89 at Rampart	D03-17	03/24/2017 09:45 AM		
Hwy 99 at McConnell	D03-16	03/24/2017 09:46 AM		
Hwy 80 at Bryte Bend	D03-11	02/25/2016 06:37 AM		
Hwy 80 at Chiles	D03-08	02/24/2016 06:10 PM		



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# Site Summary



77



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#### Bogard Atmospheric Data: 03/24/2017

Data Atmospheric Date < 03/24/2017 > St

Summary Detailed Graphs Station List

														phe											
		Ter	mperat							Win	d						P	recipitatio	ı					Visib	ility
Timestamp Date Time	Air °F	Wet Bulb °F	Dew- point °F	24- hr Max °F	24- hr Min °F	Relative Humidity %	Atmospheric Pressure in Hg	Avg Speed mph	Avg Dir °	Spot Speed mph	Spot Dir	Max Speed mph	Max Dir	Y/N		Situation	Start Date Time	En Date Tim		3 hr in	6 hi in		r24hr nin	mi	Situation text
03/24/2017 12:02 AM	33.44	29.30	19.58	44.60	20.30	56.0	Not Reported	4.25	SE	6.71	E	14.54	E		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 12:16		29.12			20.30	56.0	Not Reported		SE	1.57	E	7.16	SE			x Error:Lookup							0.000	Not Reported	Not Reported
03/24/2017 12:32	33.44	29.12		44.60	20.30	55.0	Not Reported		SE	2.46	Е	15.21	sw			x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 12:47	33.08	29.12:			20.30	58.0	Not Reported		SE	4.92	s	10.29	s			x Error:Lookup							0.000	Not Reported	Not Reported
03/24/2017 01:02	32.90	28.94	19.76	44.60	20.30	57.0	Not Reported		s	4.70	SE	10.51	SE			x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 01:17 AM	32.54	28.76	19.40	44.60	20.30	57.0	Not Reported		s	8.05	s	×	s			x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 01:33 AM	32.72	28.76		44.60	20.30	56.0	Not Reported		SE	8.95	SE	18.12	s		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 01:47 AM	32.54	28.40	18.50	44.60	20.30	55.0	Not Reported		s	2.68	SE	10.96	SE		x	x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 02:03 AM	32.54	28.40	17.96	44.60	20.30	54.0	Not Reported	7.16	s	4.92	SE	11.63	SE		x :	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 02:17 AM	32.54	28.22	17.60	44.60	20.30	53.0	Not Reported	5.37	SE	3.58	s	12.53	SE		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 02:32 AM	32.36	28.22	18.32	44.60	20.30	56.0	Not Reported	5.14	SE	3.36	SE	14.09	s		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 02:47 AM	31.82	28.22	19.94	44.60	20.30	61.0	Not Reported	4.92	SE	5.37	SE	10.07	SE		×	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 03:05 AM		28.40		44.60	20.30	66.0	Not Reported	5.82	SE	7.61	s	10.96	s		x	x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 03:17 AM	31.28 :	28.40		44.60	20.30	70.0	Not Reported	5.37	SE	6.04	SE	10.29	sw		x	x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 03:32 AM	31.46 :	28.76	23.36	44.60	20.30	71.0	Not Reported	5.37	SE	6.49	SE	8.28	s		x :	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 03:48 AM	31.46	28.94	23.90	44.60	20.30	73.0	Not Reported	4.47	Е	10.07	SE	12.75	SE		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 04:04 AM			24.08	44.60	20.30	74.0	Not Reported	5.59	SE	6.04	SE	12.53	s		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 04:17 AM			24.44	44.60	20.30	75.0	Not Reported	9.17	s	10.51	s	14.09	s		x	x Error:Lookup			0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
03/24/2017 04:32 AM				44.60	20.30	75.0	Not Reported	6.71	s	15.43	s	12.53	s		x	x Error:Lookup			0.000	0.000	0.00	0 0.000	0.000	Not Reported	Not Reported
03/24/2017 04:47 AM	31.28	29.12	25.16	44.60	20.30	78.0	Not Reported	4.47	SE	2.68	SE	13.87	SE		x	x Error:Lookup			0.004	0.004	0.00	4 0.004	4 0.004	Not Reported	Not Reported
03/24/2017 05:02 AM			25.70	44.60	20.30	79.0	Not Reported	4.03	SE	9.84	SE	11.18	s		x	x Error:Lookup			0.004	0.004	0.00	4 0.004	4 0.004	Not Reported	Not Reported
03/24/2017 05:17 AM				44.60	20.30	81.0	Not Reported	6.49	SE	4.25	SE	10.96	SE		x	x Error:Lookup			0.008	8 0.008	0.00	B 0.008	8 0.008	Not Reported	Not Reported
03/24/2017 05:32 AM	31.28		26.24	44.60	20.30	81.0	Not Reported	7.61	s	2.68	s	14.76	SE		x	x Error:Lookup			0.012	2 0.012	0.01	2 0.012	2 0.012	Not Reported	Not Reported
03/24/2017 05:47 AM	31.46	29.48	26.06	44.60	20.30	81.0	Not Reported	6.26	SE	5.82	SE	14.54	SE		x	x Error:Lookup			0.008	8 0.012	0.01	2 0.012	2 0.012	Not Reported	Not Reported
03/24/2017 06:02 AM			26.42	44.60	20.30	81.0	Not Reported	7.16	SE	5.59	SE	14.09	SE		x	x Error:Lookup			0.008	8 0.016	0.01	6 0.016	5 0.016	Not Reported	Not Reported
03/24/2017 06:17 AM	31.46 :		26.42	44.60	20.30	81.0	Not Reported	8.28	SE	7.83	SE	14.09	SE		x	x Error:Lookup			0.008	8 0.016	0.01	6 0.016	6 0.016	Not Reported	Not Reported
03/24/2017 06:33 AM 03/24/2017 06:47	31.46 :		26.42	44.60	20.30	81.0	Not Reported	9.62	SE	7.61	SE	13.87	E		x	x Error:Lookup			0.004	0.016	0.01	6 0.016	6 0.016	Not Reported Not	Not Reported Not
03/24/2017 05:47 AM	31.46 :	29.66	26.42	44.60	20.30	81.0	Not Reported	6.93	SE	3.36	SE	14.09	S		x	x Error:Lookup			0.012	2 0.024	0.02	4 0.024	4 0.024	Reported	Reported
03/24/2017 07:01 AM			25.88	44.60		78.0	Not Reported	7.83	SE	8.28	s	17.00	SE		x	x Error:Lookup			0.008	8 0.024	0.02	4 0.024	4 0.024	Not Reported	Not Reported
03/24/2017 07:17 AM		29.48	25.88	44.60		79.0	Not Reported	8.05	s	11.41	s	14.32	SE		×	x Error:Lookup			0.008	8 0.024	0.02	4 0.024	4 0.024	Not Reported	Not Reported
03/24/2017 07:32 AM		29.48		44.60		80.0	Not Reported	6.71	SE	7.38	SE	15.88	SE		x	x Error:Lookup			0.012	2 0.031	0.03	1 0.031	1 0.031	Not Reported	Not Reported
03/24/2017 07:46 AM	31.46 :	29.66	26.42	44.60	23.54	81.0	Not Reported	7.16	SE	7.83	SE	12.53	SE		x :	x Error:Lookup			0.008	8 0.028	0.03	1 0.031	1 0.031	Not Reported	Not Reported
03/24/2017 08:03 AM	31.28 :	29.48	26.60	44.60		82.0	Not Reported	7.38	E	12.08	SE	17.00	SE	Yes		x Error:Lookup			0.016	6 0.031	0.03	9 0.039	9 0.039	Not Reported	Not Reported
03/24/2017 08:18 AM				44.60		83.0	Not Reported	11.41	Е	9.40	Е	14.09	E		×	x Error:Lookup			0.016	0.035	0.04	3 0.043	3 0.043	Not Reported	Not Reported
03/24/2017 08:32 AM				44.60		84.0	Not Reported	12.97	Е	9.62	SE	15.43	SE		×	x Error:Lookup			0.012	2 0.031	0.04	3 0.043	3 0.043	Not Reported	Not Reported
03/24/2017 08:47 AM	31.46	29.84	27.32	44.60	27.68	84.0	Not Reported	7.16	Е	8.28	E	14.54	E		x	x Error:Lookup			0.012	2 0.035	0.04	7 0.047	7 0.047	Not Reported	Not Reported
03/24/2017 09:02 AM			27.68	44.60		85.0	Not Reported	10.29	Е	10.07	Е	15.88	E		x	x Error:Lookup			0.016	6 0.039	0.05	5 0.055	5 0.055	Not Reported	Not Reported
03/24/2017 09:16 AM		30.38		44.60		85.0	Not Reported	4.92	SE	4.03	SE	12.75	SE	:	x	x Error:Lookup			0.016	6 0.043	0.05	9 0.059	9 0.059	Not Reported	Not Reported
03/24/2017 09:32 AM	32.00			44.60		85.0	Not Reported	4.92	SE	7.61	SE	9.17	SE		x	x Error:Lookup			0.028	8 0.051	0.07	1 0.071	1 0.071	Not Reported	Not Reported
03/24/2017 09:46 AM	32.18	30.74	28.22	44.60	30.92	85.0	Not Reported	3.36	SE	2.46	SE	8.50	SE		x	x Error:Lookup			0.031	0.055	0.07	9 0.079	9 0.079	Not Reported	Not Reported

# Historical Atmospheric Data



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78

Г			Te	emperat	ture						Win	d					P	recipitation					
	Timestamp Date Time	Air °F	Wet Bulb °F	point	24- hr Max °F	24- hr Min °F	Relative Humidity %	Atmospheric Pressure in Hg	Avg Speed mph	Avg Dir °	Spot Speed mph	Spot Dir °	Max Speed mph	Max Dir ∘	Y/N	Rate Situation in/hr text	Start Date Time	End Date Time	1 hr in	3 hr in	6 hr 1 in	l <mark>2</mark> hr in	
1	03/24/2017 04:04 AM	31.46	28.94	24.08	44.60	20.30	74.0	Not Reported	5.59	SE	6.04	SE	12.53	s	×	x Error:Lookup			0.000	0.000	0.000 0	.000	0.000
	03/24/2017 04:17 AM	31.46	29.12	24.44	44.60	20.30	75.0	Not Reported	9.17	s	10.51	s	14.09	s	x	x Error:Lookup			0.000	0.000	0.000 0	.000	0.000
	03/24/2017 04:32 AM	31.46	29.12	24.62	44.60	20.30	75.0	Not Reported	6.71	s	15.43	s	12.53	s	x	x Error:Lookup			0.000	0.000	0.000 0	.000	0.000
	03/24/2017 04:47 AM	31.28	29.12	25.16	44.60	20.30	78.0	Not Reported	4.47	SE	2.68	SE	13.87	SE	×	x Error:Lookup			0.004	0.004	0.004 0	.004	0.004
	03/24/2017 05:02 AM	31.10	29.12	25.70	44.60	20.30	79.0	Not Reported	4.03	SE	9.84	SE	11.18	s	×	x Error:Lookup			0.004	0.004	0.004 0	.004	0.004
	03/24/2017 05:17 AM	31.10	29.12	26.06	44.60	20.30	81.0	Not Reported	6.49	SE	4.25	SE	10.96	SE	×	x Error:Lookup			0.008	0.008	0.008 0	.008	0.008
	03/24/2017 05:32 AM	31.28	29.66	26.24	44.60	20.30	81.0	Not Reported	7.61	s	2.68	s	14.76	SE	×	x Error:Lookup			0.012	0.012	0.012 0	.012	0.012
	03/24/2017 05:47 AM	31.46	29.48	26.06	44.60	20.30	81.0	Not Reported	6.26	SE	5.82	SE	14.54	SE	x	x Error:Lookup			0.008	0.012	0.012 0	.012	0.012

### Historical Atmospheric Data

	Te	mperat	ture	
1	Bulb	Dew- point °F	hr Max	Min
31.46	28.94	24.08	44.60	20.30
31.46	29.12	24.44	44.60	20.30
31.46	29.12	24.62	44.60	20.30
31.28	29.12	25.16	44.60	20.30
31.10	29.12	25.70	44.60	20.30
31.10	29.12	26.06	44.60	20.30
31.28	29.66	26.24	44.60	20.30
31.46	29.48	26.06	44.60	20.30

MONTANA STATE UNIVERSITY Wind

Avg Speed mph	_	Spot Speed mph	-	Max Speed mph	Max Dir ₀
5.59	SE	6.04	SE	12.53	S
9.17	s	10.51	s	14.09	s
6.71	s	15.43	s	12.53	s
4.47	SE	2.68	SE	13.87	SE
4.03	SE	9.84	SE	11.18	s
6.49	SE	4.25	SE	10.96	SE
7.61	s	2.68	s	14.76	SE
6.26	SE	5.82	SE	14.54	SE

1	hr :	3 hr	6 hr	12 hr	24 hr
	in	in	in	in	in
	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000
	0.004	0.004	0.004	0.004	0.004
	0.004	0.004	0.004	0.004	0.004
	0.008	0.008	0.008	0.008	0.008
	0.012	0.012	0.012	0.012	0.012
	0.008	0.012	0.012	0.012	0.012

### Western Transportation Institute

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ENGINEERING

#### Bogard Surface Data: 03/24/2017

Data Surface V Date < 03/24/2017 >

-	Surface Status	Temp	rface erature	Surfa Wat Dep	er th	Surface Salinity	Surf Free Poi	eze int	Blac Sig	iace k Ice nal	Subsurface Temperature
Timestamp Date Time	1 2 text text		2 ⁰F	1 in	2 in	1 2	1 .⁰F	2 °F	1 text	2 text	1 °F
03/24/2017 12:02 AM		40.82	41.90			pp100K pp100K	<u> </u>				48.20
03/24/2017 12:02 AM		39.92	41.90	×	×	xx		x			48.38
03/24/2017 12:16 AM		39.92 39.74	41.18	×	x	x x		x			48.38
03/24/2017 12:32 AM		39.74	40.64	×	x	x x		x			48.38
03/24/2017 12:47 AM		38.84	39.92	×	x	xx		x			48.38
03/24/2017 01:02 AM		38.48	39.92	×	x	x x		x			48.56
03/24/2017 01:17 AM		36.46	39.20	×	×	xx		x			48.56
03/24/2017 01:33 AM		37.94	38.48	×	×	xx		x			48.56
			38.30	×	x	xx	-	x			48.56
03/24/2017 02:03 AM		37.40 37.22	38.30	×	×	xx		x			
03/24/2017 02:17 AM				×	×	x x		x			48.74
03/24/2017 02:32 AM	Dry Dry	36.86	37.58	×	×	x x		x			48.74
	Trace Moisture Trace Moisture		37.58	x	x	xx		x			
	Trace Moisture Trace Moisture		36.86	×	×	xx		x			48.74
03/24/2017 03:17 AM			36.50	×	×	x x		x			48.74
	Trace Moisture Trace Moisture		36.14	×	×	x x	x	x			48.74
03/24/2017 03:48 AM			35.60	×	x	x x	x	x			48.74
03/24/2017 04:04 AM	Trace Moisture Trace Moisture		35.06	×	×	x x	x	x	Other		
	Trace Moisture Trace Moisture		34.88	×	×	x x	×	x			48.74
03/24/2017 04:32 AM			34.70	×	×	x x	×	x			48.74
	Trace Moisture Trace Moisture		33.98	×	x	xx	×	x			48.74
03/24/2017 05:02 AM	Trace Moisture Trace Moisture		33.26	×	×	xx	×	x	Other	Other	48.92
	Trace Moisture Trace Moisture		32.90	×	×	x x	x	x			48.74
03/24/2017 05:32 AM	Trace Moisture Trace Moisture	32.90	33.26	×	×	xx	x	x			48.74
03/24/2017 05:47 AM	Trace Moisture Trace Moisture	32.72	32.90	×	×	x x	x	x	Other	Other	48.74
03/24/2017 06:02 AM	Trace Moisture Trace Moisture	32.90	33.08	x	x	x x	x	x	Other	Other	48.74
03/24/2017 06:17 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	хх	×	x	Other	Other	48.74
03/24/2017 06:33 AM	Trace Moisture Trace Moisture	32.72	32.90	×	x	x x	x	x	Other	Other	48.74
03/24/2017 06:47 AM	Trace Moisture Trace Moisture	32.72	32.90	×	x	x x	x	x	Other	Other	48.74
03/24/2017 07:01 AM	Trace Moisture Trace Moisture	32.72	32.72	x	x	x	x	x	Other	Other	48.74
03/24/2017 07:17 AM	Trace Moisture Trace Moisture	32.72	32.90	×	×	xx	x	x	Other	Other	48.74
03/24/2017 07:32 AM	Trace Moisture Trace Moisture	32.72	32.72	x	×	x x	x	x	Other	Other	48.74
03/24/2017 07:46 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	x	x	x	Other	Other	48.74
03/24/2017 08:03 AM	Trace Moisture Trace Moisture	32.72	32.72	×	x	x x	x	x	Other	Other	48.74
03/24/2017 08:18 AM	Trace Moisture Trace Moisture	32.54	32.72	×	x	x x	x	x	Other	Other	48.56
03/24/2017 08:32 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	x x	×	x	Other	Other	48.56
03/24/2017 08:47 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	x x	x	x	Other	Other	48.56
03/24/2017 09:02 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	x x	x	x	Other	Other	48.56
03/24/2017 09:16 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	xx	x	x	Other	Other	48.56
03/24/2017 09:32 AM	Trace Moisture Trace Moisture	32.72	32.72	×	×	x		x	Other	Other	48.38
03/24/2017 09:46 AM	Trace Moisture Trace Moisture		32.72	×	x	x		x	Other	Other	48.38

# Historical Surface Data



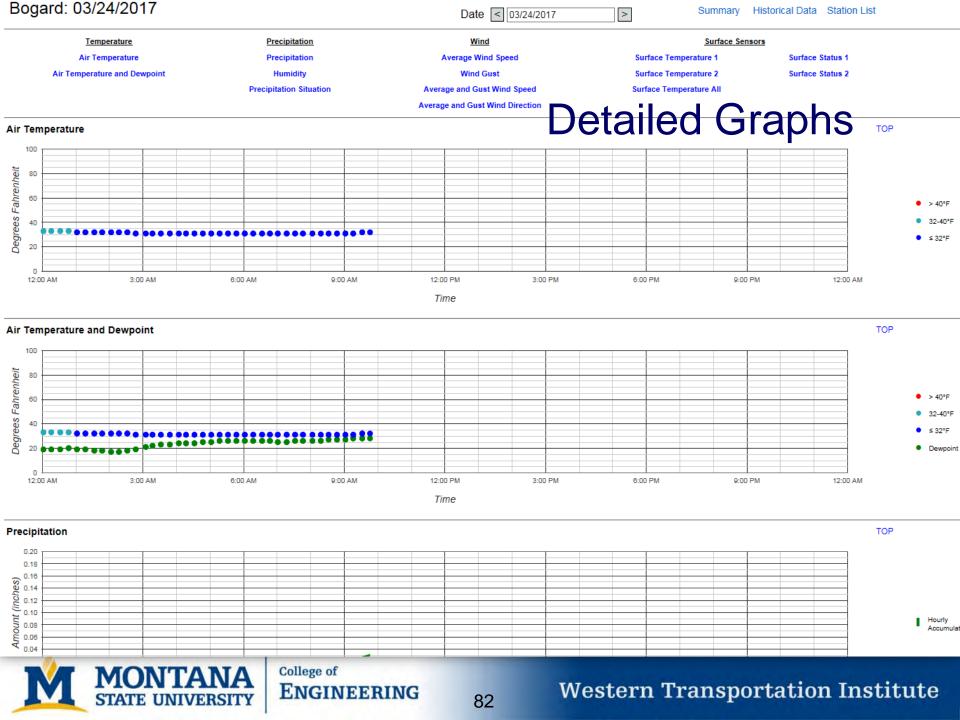
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## **Historical Surface Data**

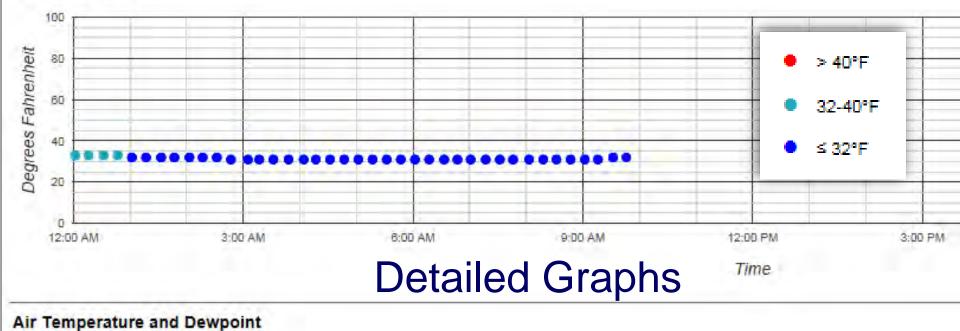
	Suri Sta	face tus		face erature	Surfa Wat Dep	er		face nity	Surfa Free Poi	ze	Blac	face k Ice nal	Subsurface Temperature
Timestamp	1	2	1	2	1	2	1	2	1	2	1	2	1
Date Time	text	text	٩F	°F	in	in	pp100K	pp100K	°F	°F	text	text	°F
03/24/2017 12:02 AM	Dry	Dry	40.82	41.90	×	x	x	×	x	x	Other	Other	48.20
03/24/2017 12:16 AM	Dry	Dry	39.92	41.18	×	x	x	×	x	x	Other	Other	48.38
03/24/2017 12:32 AM	Dry	Dry	39.74	40.64	×	x	×	×	x	x	Other	Other	48.38
03/24/2017 12:47 AM	Dry	Dry	39.38	40.10	×	x	x	×	×	x	Other	Other	48.38
03/24/2017 01:02 AM	Dry	Dry	38.84	39.92	×	x	x	x	x	x	Other	Other	48.38
03/24/2017 01:17 AM	Dry	Dry	38.48	39.20	×	x	x	×	×	x	Other	Other	48.56
03/24/2017 01:33 AM	Dry	Dry	37.94	38.66	×	x	×	×	x	x	Other	Other	48.56
03/24/2017 01:47 AM	Dry	Dry	37.40	38.48	x	x	×	×	×	x	Other	Other	48.56
03/24/2017 02:03 AM	Dry	Dry	37.40	38.30	x	x	x	x	x	x	Other	Other	48.56
03/24/2017 02:17 AM	Dry	Dry	37.22	37.94	×	x	×	×	x	x	Other	Other	48.74
03/24/2017 02:32 AM	Dry	Dry	36.86	37.58	×	x	x	×	×	x	Other	Other	48.74
03/24/2017 02:47 AM	Trace Moisture	Trace Moisture	36.86	37.58	x	x	×	×	x	x	Other	Other	48.74
03/24/2017 03:05 AM	Trace Moisture	Trace Moisture	35.60	36.86	x	x	x	x	x	x	Other	Other	48.74
03/24/2017 03:17 AM	Trace Moisture	Trace Moisture	35.60	36.50	×	x	×	x	×	x	Other	Other	48.74
03/24/2017 03:32 AM	Trace Moisture	Trace Moisture	35.42	36.14	×	x	×	x	×	x	Other	Other	48.74
03/24/2017 03:48 AM	Trace Moisture	Trace Moisture	34.88	35.60	×	x	x	x	×	x	Other	Other	48.74

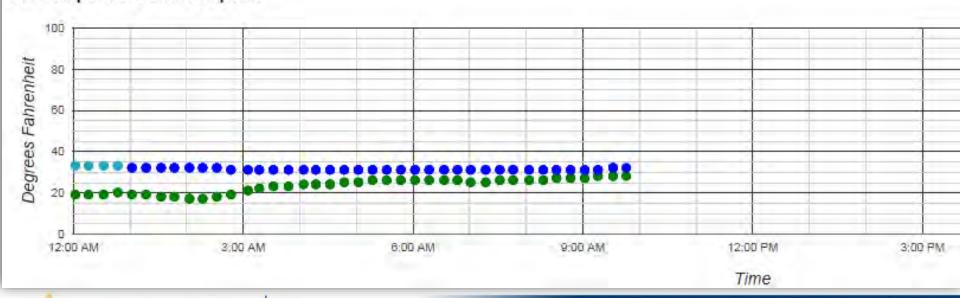


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### Air Temperature

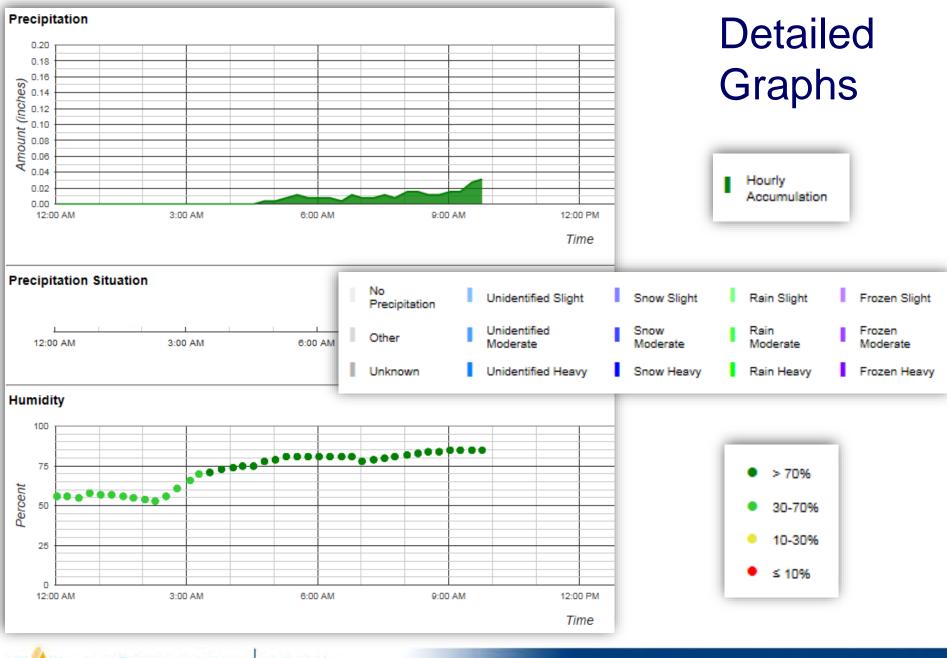




83



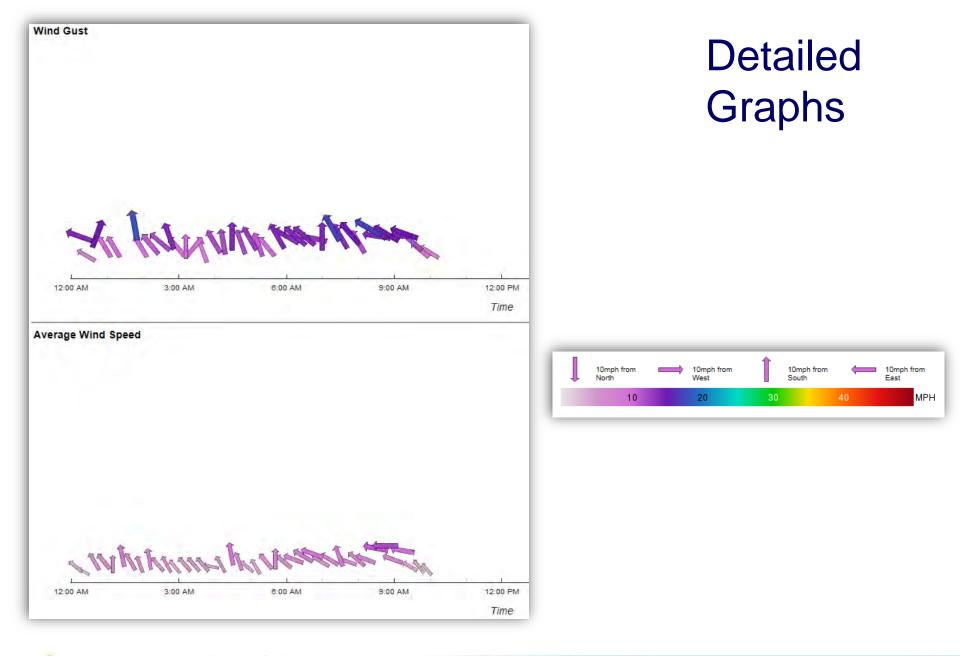
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84

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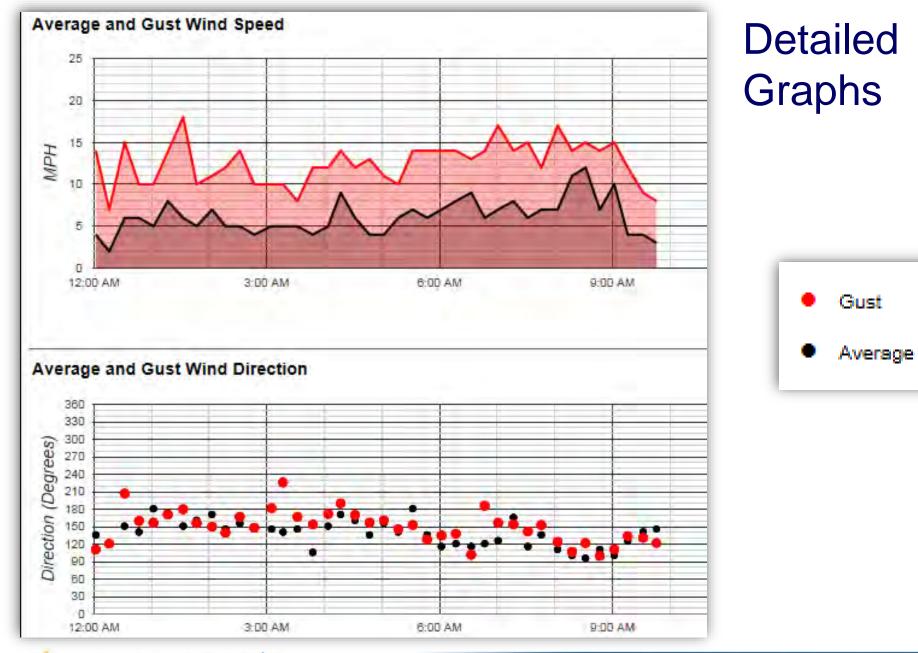




85

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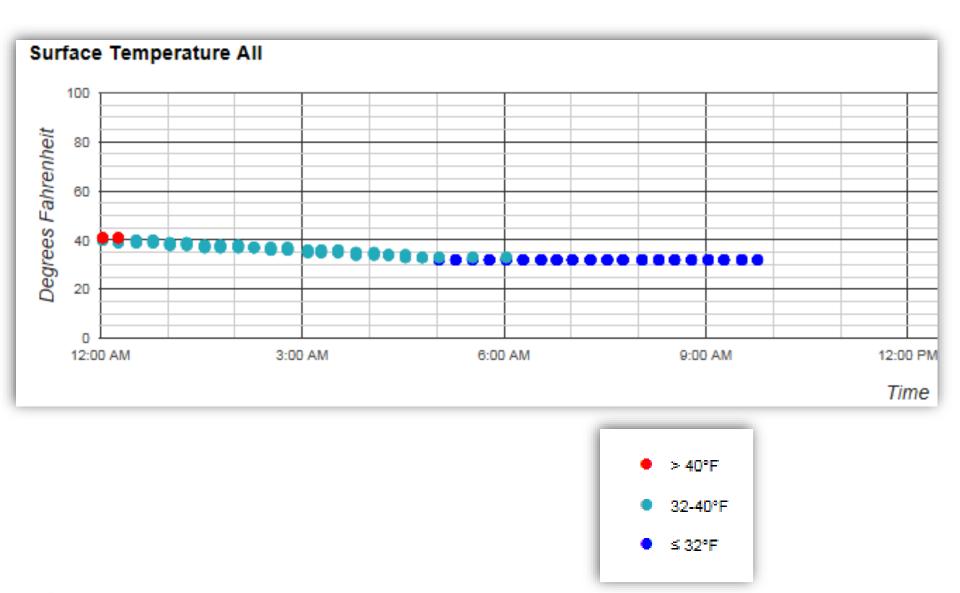
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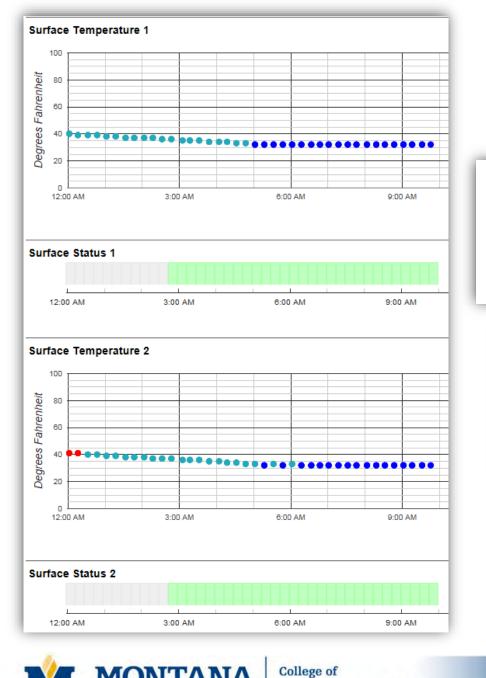
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86



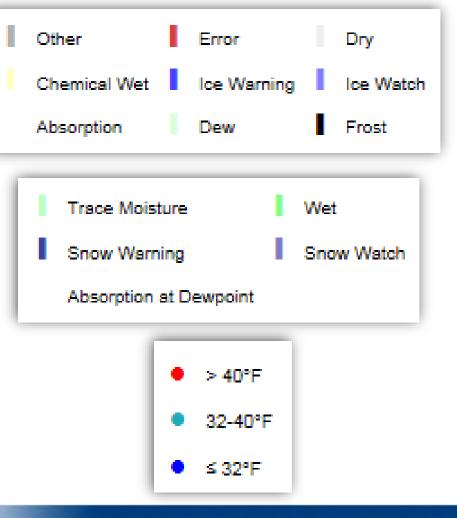


87



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### **Detailed Graphs**

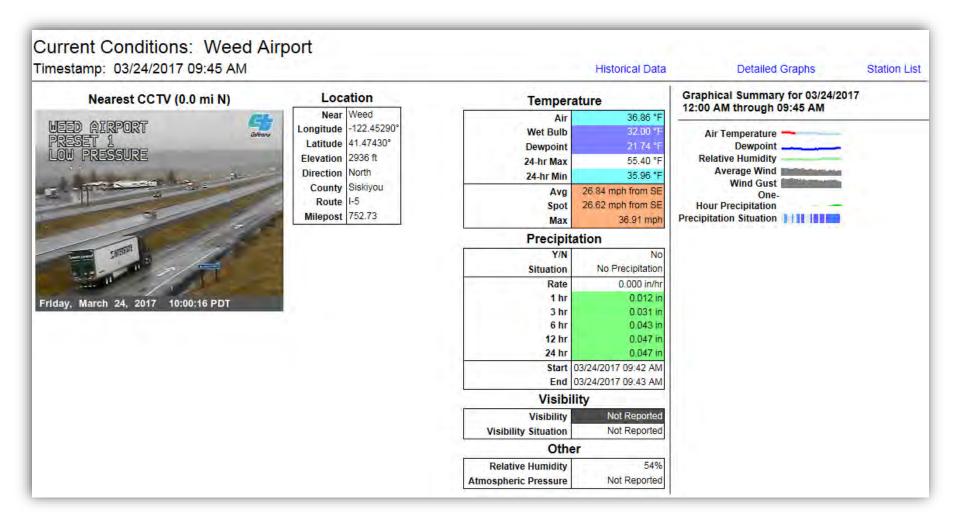


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88

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# Another Site Summary





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#### Weed Airport Atmospheric Data: 03/24/2017

Data Atmospheric V Date < 03/24/2017 > Summ

4/2017 Summary Detailed Graphs Station List

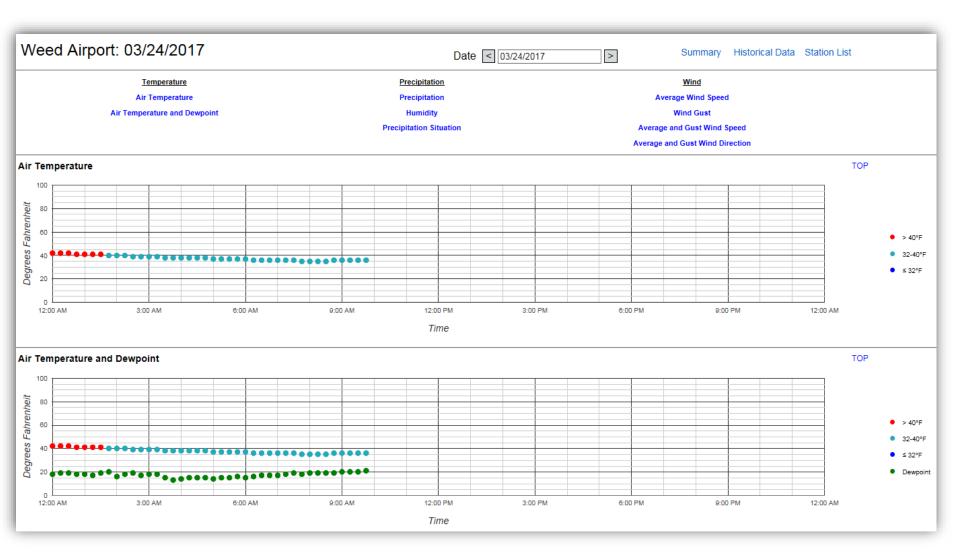
ı		Te	nperat	ure						Win	d						Pred	ipitation						Viei	bility
			÷	24-	24-												1100	aprodución						13	billty
Timestamp Date Time	Air °F		Dew- point °F	hr Max °F	hr Min °F	Relative Humidity %	Atmospheric Pressure in Hg	Avg Speed mph	Avg Dir °	Spot Speed mph	Spot Dir °	Max Speed mph	Max Dir °	Y/N	Rate in/hr	Situation text	Start Date Time	End Date Time	1 hr in	3 hr in	6 hr in	12 hr in	24 hr in	mi	Situation text
03/24/2017 12:00 AM	42.62	35.60	18.68	55.40	32.00	38.0	Not Reported	39.15	SE	39.15	SE	47.87	SE	No	0.000	No Precipitation	03/23/2017 10:53 PM	03/23/2017 10:54 PM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 12:15 AM	42.26	35.42		55.40	32.00	39.0	Not Reported	39.15	SE	40.04	SE	52.79	SE	No	0.000	No Precipitation	03/24/2017 12:06 AM	03/24/2017 12:10 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 12:30 AM	42.08	35.24	19.40	55.40	32.00	40.0	Not Reported	39.59	SE	33.33	s	54.58	SE	No	0.000	No Precipitation	03/24/2017 12:28 AM	03/24/2017 12:29 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 12:45 AM	41.90	35.06	18.14	55.40	32.00	38.0	Not Reported	38.92	SE	45.19	SE	50.55	SE	Yes	0.000	Unidentified Slight	03/24/2017 12:44 AM		0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 01:00 AM	41.90	34.88	18.68	55.40	32.00	39.0	Not Reported	39.15	SE	42.95	SE	52.12	SE	Yes	0.000	Unidentified Slight	03/24/2017 12:59 AM		0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 01:15 AM	41.36	34.52		55.40	32.00	38.0	Not Reported	38.25	SE	35.34	SE	53.24	SE	No	0.000	No Precipitation	03/24/2017 01:06 AM	03/24/2017 01:13 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 01:30 AM	41.18	34.52	19.22	55.40	32.00	41.0	Not Reported	36.01	SE	41.16	SE	52.34	SE	No	0.000	No Precipitation	03/24/2017 01:23 AM	03/24/2017 01:24 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 01:45 AM	40.82	34.52	20.66	55.40	32.00	44.0	Not Reported	36.69	SE	41.38	SE	54.36	SE	No	0.000	No Precipitation	03/24/2017 01:36 AM	03/24/2017 01:41 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 02:00 AM	40.82	34.16		55.40	32.00	37.0	Not Reported	37.13	SE	39.82	SE	54.58	SE	Yes	0.000	Unidentified Slight	03/24/2017 01:58 AM		0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
03/24/2017 02:15 AM	40.28	33.80	18.32	55.40	32.00	41.0	Not Reported	38.03	SE	35.57	SE	53.46	SE	No	0.000	No Precipitation	03/24/2017 02:10 AM	03/24/2017 02:14 AM	0.000	0.000	0.00	0.000	0.000	Not Reported	Not Reported
	39.74	33.62		55.40	32.00	43.0	Not Reported	40.49	SE	38.03	SE	53.24	SE	No	0.000	No Precipitation	03/24/2017 02:26 AM	03/24/2017 02:29 AM	0.000	0.000	0.000	0.000	0.000	Not Reported	Not Reported
	39.56	33.26	17.78	55.40	32.00	41.0	Not Reported	41.38	SE	44.74	SE	52.79	SE	Yes	0.000	Slight	03/24/2017 02:44 AM		0.000	0.000	0.00	0.000	0.000	Not Reported	No Reported
03/24/2017 03:00 AM 03/24/2017	39.38	33.08		55.40	32.00	42.0	Not Reported	37.13	SE	34.67	SE	48.54	SE	Yes	0.000	Snow Slight	03/24/2017 02:56 AM 03/24/2017	03/24/2017	0.000	0.000	0.000	0.000	0.000	Not Reported	No Reported
03/24/2017 03:15 AM 03/24/2017	39.02	33.08		55.40	32.00	44.0	Not Reported	34.23	SE	40.94	SE	52.34	SE	No	0.000	No Precipitation	03/24/2017 03:13 AM 03/24/2017	03/24/2017 03:14 AM	0.000	0.000	0.000	0.000	0.000	Not Reported Not	No Reported No
03/24/2017 03/24/2017	38.84	32.54		55.40	32.00	39.0	Not Reported	39.15	SE	43.40	SE	48.77	SE	Yes	0.000	Snow Slight	03:26 AM 03/24/2017		0.000	0.000	0.000	0.000	0.000	Reported	Reported
03:45 AM	38.48	32.18	13.82	55.40	32.00	36.0	Not Reported	41.38	SE	41.38	SE	52.34	SE	Yes	0.000	Snow Slight	03:42 AM	03/24/2017				4 0.004		Reported	Reporte
03/24/2017		32.18		55.40		38.0	Not Reported	32.21	SE	31.32	SE	47.87	SE		0.000	No Precipitation	03:42 AM 03/24/2017	03:52 AM 03/24/2017						Reported Not	Reporter
03/24/2017		32.00 32.00		55.40		39.0	Not Reported		SE	30.65	SE	44.29	SE		0.000	No Precipitation	04:13 AM 03/24/2017	04:14 AM 03/24/2017						Reported Not	Reporter No
04:30 AM 03/24/2017 04:45 AM		32.00		55.40	02.00	39.0 39.0	Not Reported	33.33 34.00	SE SE	34.23 32.44	SE SE	49.44	SE SE		0.000	No Precipitation	04:28 AM 03/24/2017 04:35 AM	04:29 AM 03/24/2017 04:38 AM						Reported Not Reported	Reporter No Reporter
03/24/2017 05:00 AM		32.00		55.40		38.0		35.12	SE	29.75	SE	48.77			0.000	Snow Slight	03/24/2017 04:56 AM					4 0.004	0.004	Not Reported	Reported Reported
03/24/2017		31.64		55.40		40.0	Not Reported		SE	27.07	SE	46.08	SE		0.000	No Precipitation	03/24/2017 04:56 AM	03/24/2017 05:14 AM						Not	No
03/24/2017 05:30 AM	37.40	31.64		55.40	32.00	41.0	Not Reported	33.11	SE	41.83	SE	48.99	SE		0.000	Snow Slight	03/24/2017 05:29 AM		0.004	0.008	0.008	3 0.008	0.008	Not Reported	No Reported
03/24/2017 05:45 AM	37.22	31.64	16.16	55.40	32.00	42.0	Not Reported	30.65	SE	27.07	SE	47.87	SE	Yes	0.000	Snow Slight	03/24/2017 05:44 AM		0.004	0.008	0.008	3 0.008	0.008	Not Reported	No Reporte
03/24/2017 06:00 AM	37.04	31.28	15.44	55.40	32.00	41.0	Not Reported	28.86	SE	25.05	SE	47.20	SE	Yes	0.000	Snow Slight	03/24/2017 05:55 AM		0.000	0.008	0.00	3 0.008	0.008	Not Reported	No Reported
03/24/2017 06:15 AM	36.86	31.28	16.34	55.40	32.00	43.0	Not Reported	30.87	SE	29.30	SE	42.50	SE	No	0.000	No Precipitation	03/24/2017 06:08 AM	03/24/2017 06:09 AM	0.000	0.008	0.012	2 0.012	0.012	Not Reported	No Reporte
	36.68	31.46		55.40	32.00	46.0	Not Reported	31.09	SE	33.78	SE	41.16	SE	Yes	0.000	Snow Slight	03/24/2017 06:28 AM		0.000	0.008	0.012	2 0.012	0.012	Not Reported	Reporte
03/24/2017 08:45 AM 03/24/2017		31 10 31.10	17 - 111	55.40 55.40	32.00	47.0	Not Reported	21.54	SE SE	31 32	SE	42.05	SE	Yes Yes	0.000 0.000	Snow Slight Snow Slight	03/24/2017 08:43 AM 03/24/2017					2 0.012		Not Reported Not	Reporter No Reporter
07:00 AM 03/24/2017 07:15 AM		31.10		55.40 55.40		47.0	Not Reported	32.44 31.99	SE	38.25	SE	40.49			0.000	No Precipitation	08:57 AM 03/24/2017 07:10 AM	03/24/2017 07:11 AM						Reported Not Reported	Reported No Reported
03/24/2017		31.28		55.40		49.0	Not Reported		SE	21.70	SE	41.16			0.000	Snow Slight	03/24/2017 07:29 AM					2 0.012		Not Reported	No Reported
03/24/2017 07:45 AM		31.10		55.40			Not Reported		SE	32.88	SE	44.07			0.002	Snow Slight	03/24/2017 07:33 AM					0.016		Not Reported	No Reporter
03/24/2017 08:00 AM	35.96	31.10		55.40				33.78	SE	30.65	SE	48.77	SE	Yes	0.000	Snow Slight	03/24/2017 07:33 AM					0.020		Not Reported	No Reported
03/24/2017 08:15 AM	35.96	31.28		55.40	35.96	51.0	Not Reported	29.53	SE	27.74	SE	46.08	SE	Yes	0.000	Unidentified Moderate	03/24/2017 07:33 AM		0.008	0.012	0.024	10.024	0.024	Not Reported	Not Reported
03/24/2017 08:30 AM		31.28		55.40	35.96	51.0	Not Reported		SE	34.90	SE	44.74	SF	Yes		Unidentified Moderate	03/24/2017 07:33 AM					3 0.028		Not	Not
03/24/2017		31.28		55.40			Not Reported		SE	24.38	SE	46.75			0.000	Snow Slight	03/24/2017 07:33 AM					0.020		Not Reported	Not Reported
03/24/2017		31.46		55 40	35.06	53.0	Not Reported		SE	27.29	SE	45.86		Yes		Unidentified Moderate	03/24/2017 07:33 AM					5 0 035		Not	Not
03/24/2017 09:15 AM		31.46		55.40		53.0		24.01	SE	22.82	SE	43.84	SE		0.001	Snow Slight	03/24/2017 07:33 AM					9 0.043		Not Reported	Reported Reported
03/24/2017		31.64		55.40		53.0	Not Reported		SE	27.96	SE	39.15			0.000	Snow Slight	03/24/2017 07:33 AM					3 0.043		Not Reported	Not Reported
03/24/2017		32.00			35.96		Not Reported		SE	26.62	SE	36.91	SE			No Precipitation	03/24/2017 09:42 AM	03/24/2017				3 0.047		Not	Not

# Historical Atmospheric Data



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90



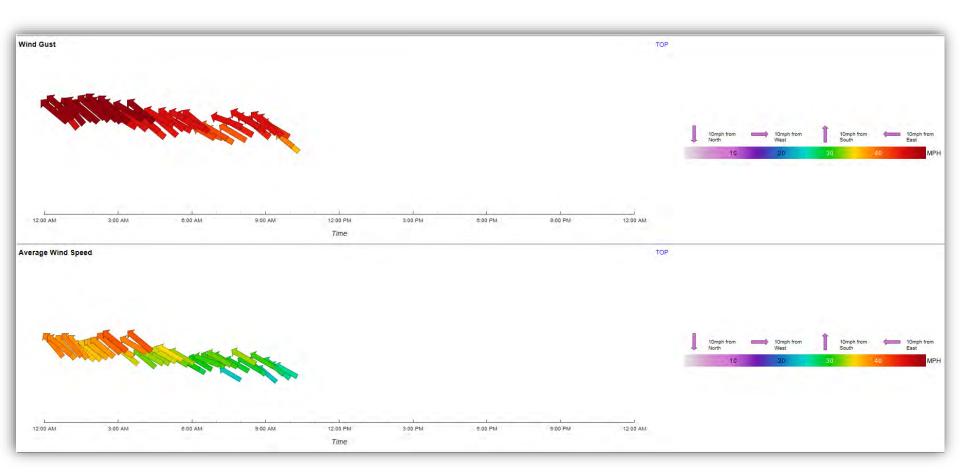


91



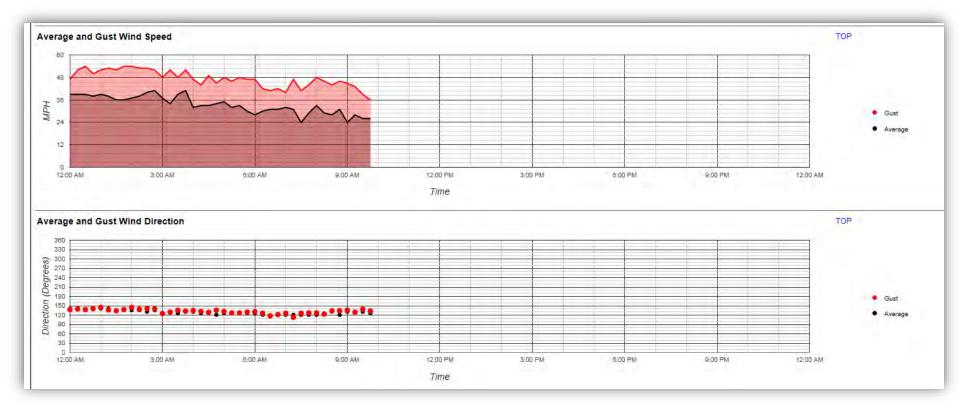


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94



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### **Alerts and Subscriptions**



95

# Alerts are Organized by Site

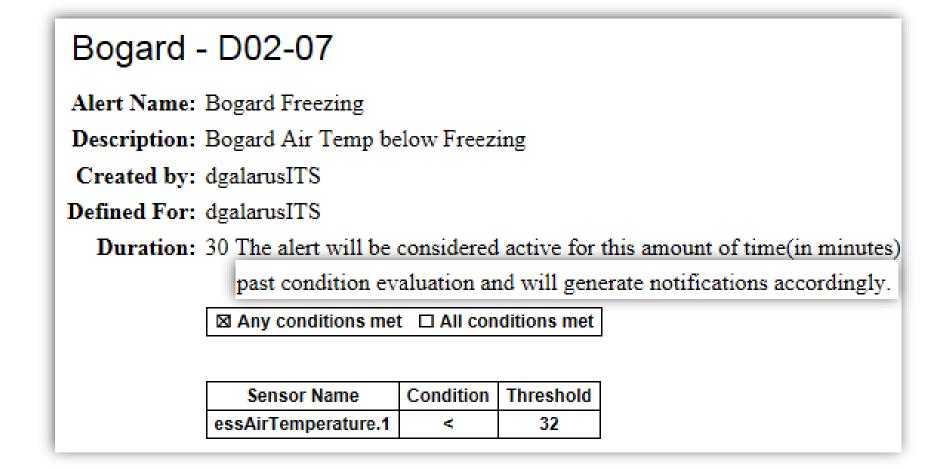
### Alerts for D02-07 - Bogard

	Alert Name	Alert Created	Author	Last Evaluation	Last Status Change	Status	
Definition History Subscribe	Bogard Freezing	02/01/2017 13:18:58 PM	dgalarusITS	03/24/2017 10:10:26 AM		Deactivated	Edit Delete
Definition History Subscribe	BogartPrecip	02/15/2017 08:15:25 AM	dgalarusITS	03/24/2017 10:10:26 AM	03/24/2017 10:10:26 AM	Activated	Edit Delete
Definition History Subscribe	Bogard near Freezing	03/21/2017 12:36:52 PM	dgalarusITS	03/24/2017 10:10:26 AM	03/24/2017 10:05:21 AM	Activated	Edit Delete
Definition History Subscribe	Bogard Wet Pavement	03/22/2017 13:03:35 PM	dgalarusITS	03/24/2017 10:10:26 AM	03/24/2017 10:10:26 AM	Activated	Edit Delete
Definition History Subscribe	Bogard Icy Road	03/23/2017 10:21:52 AM	dgalarusITS	03/24/2017 10:10:26 AM		Deactivated	Edit Delete
New Alert							



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# A Simple, Example Alert





## **Alert History**

### Alert History D02-07 - Bogard

Alert Name: Bogard Freezing Description: Bogard Air Temp below Freezing

Date < 03/24/2017

Date/Time	Alert	Status	Condition(s)
03/24/2017 02:50:25 AM	Bogard Freezing	Activated	essAirTemperature.1(31.82) < 32
03/24/2017 02:55:21 AM	Bogard Freezing	Activated	essAirTemperature.1(31.82) < 32
03/24/2017 03:00:20 AM	Bogard Freezing	Activated	essAirTemperature.1(31.82) < 32
03/24/2017 03:05:26 AM	Bogard Freezing	Activated	essAirTemperature.1(31.82) < 32
03/24/2017 03:10:21 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
03/24/2017 03:15:20 AM			essAirTemperature.1(31.46) < 32
03/24/2017 03:20:25 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
03/24/2017 03:20:26 AM	Bogard Freezing	Activated	essAirTemperature.1(31.28) < 32
03/24/2017 03:25:20 AM	Bogard Freezing	Activated	essAirTemperature.1(31.28) < 32
03/24/2017 03:30:21 AM	Bogard Freezing	Activated	essAirTemperature.1(31.28) < 32
03/24/2017 03:35:25 AM	Bogard Freezing	Activated	essAirTemperature.1(31.28) < 32
03/24/2017 03:35:25 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
03/24/2017 03:40:21 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
03/24/2017 03:45:20 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
03/24/2017 03:50:26 AM	Bogard Freezing	Activated	essAirTemperature.1(31.46) < 32
00/04/00/7 00 50 00 444	a	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 T 1 1/04 100 00

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Alert History D02-07 - Bogard Alert Name: Bogard Freezing

Description: Bogard Air Temp below Freezing Date C 0324/2017

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8:55:21 AV Bogard Freezing Activated essArTemperature 8:00:20 AV Bogard Freezing Activated essArTemperature

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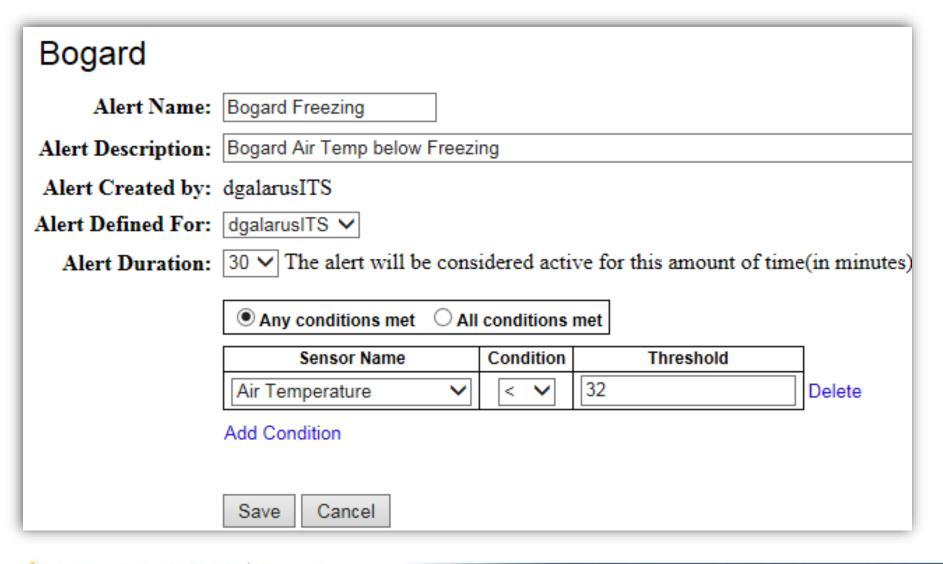
20 AN Bogard Freezing Activated essanTemperature

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# **Alert Creation/Editing**



99



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### Bogard - D02-07

Alert Name: BogartPrecip

Description: Bogart Precipitation

Created by: dgalarusITS

Defined For: dgalarusITS

Duration: 30 The alert will be considered active for this amount of

Any conditions met All conditions met

# Example Precipitation Alert

Sensor Name	Condition	Threshold	
essPrecipYesNo	is	Precipitation	
essPrecipSituation	is	Unidentified Slight	
essPrecipSituation	is	Unidentified Moderat	
essPrecipSituation	is	Unidentified Heavy	
essPrecipSituation	is	Snow Slight	gartPrecipActivatedessPrecipitationOneHour(0.00787402) > 0
essPrecipSituation	is	Snow Moderate	gartPrecipActivatedessPrecipitationOneHour(0.00787402) > 0
essPrecipSituation	is	Snow Heavy	partPrecip Activated essPrecipYesNo(Precipitation) is Precipitation
essPrecipSituation	is	Rain Slight	
essPrecipSituation	is	Rain Moderate	gartPrecip Activated essPrecipYesNo(Precipitation) is Precipitation essPrecipitationOneHour(0.01574804) > 0
essPrecipSituation	is	Rain Heavy	partPrecip Activated essPrecipYesNo(Precipitation) is Precipitation
essPrecipSituation	is	Frozen Precipitation	
essPrecipSituation	is	Frozen Precipitation	gartPrecip Activated essPrecipYesNo(Precipitation) is Precipitation essPrecipitationOneHour(0.01574804) > 0
essPrecipSituation	is	Frozen Precipitation	gartPrecip Activated essPrecipitationOneHour(0.01574804) > 0
essPrecipitationOneHour	>	0	gartPrecip Activated essPrecipitationOneHour(0.01574804) > 0



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100

### Bogard - D02-07

Alert Name: Bogard Wet Pavement

Description: Board Wet Pavement - not dry and not ERRO

Created by: dgalarusITS

Defined For: dgalarusITS

Duration: 30 The alert will be considered active for this a

## Example Wet Pavement Alert

Sensor Name	Condition	Threshold
essSurfaceStatus.1	isnt	Dry
essSurfaceStatus.1	isnt	ERROR

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Date < 03/24/2017

Date/Time	Alert	Status	Condition(s)
03/24/2017 02:50:26 AM	Bogard Wet Pavement	Activated	essSurfaceStatus.1(Trace Moisture) isnt Dry essSurfaceStatus.1(Trace Moisture) isnt ERROR
03/24/2017 02:55:21 AM	Bogard Wet Pavement	Activated	essSurfaceStatus.1(Trace Moisture) isnt Dry essSurfaceStatus.1(Trace Moisture) isnt ERROR
03/24/2017 03:00:20 AM	Bogard Wet Pavement		essSurfaceStatus.1(Trace Moisture) isnt Dry essSurfaceStatus.1(Trace Moisture) isnt ERROR

Bogard

not dry and not ERRO

nt

>



101

### Bogard - D02-07

Alert Name: Bogard Icy Road

Description: Bogard Icy Road as detected by surface sense

Created by: dgalarusITS

Defined For: dgalarusITS

Duration: 30 The alert will be considered active for this

#### Any conditions met All conditions met

## Example Icy **Road Alert**

### ry D02-07 - Bogard

gard Icy Road gard Icy Road as detected by surface sensors

			7	>		
Sensor Name	Condition	Threshold	-			
essSurfaceStatus.1	is	Ice Watch		Alert	Status	Condition(s)
essSurfaceStatus.1	is	Snow Warning		Bogard Icy Road Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.1	is	Snow Watch		Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.1	is	Frost		Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.2	is	Ice Watch		Bogard Icy Road Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.2	is	Ice Warning		Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.2	is	Snow Watch		Bogard Icy Road Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.2	is	Snow Warning	M	Bogard Icy Road	Activated	essSurfaceStatus.1(Ice Watch) is Ice Watch
essSurfaceStatus.2	is	Frost		Bogard Icy Road Bogard Icy Road		essSurfaceStatus.1(Ice Watch) is Ice Watch essSurfaceStatus.1(Ice Watch) is Ice Watch
	1	03/20/2017 03:03:21				essSurfaceStatus.1(Ice Watch) is Ice Watch essSurfaceStatus.2(Ice Watch) is Ice Watch
03/28/2017 05:10:21			AM	Bogard Icy Road	Activated	essSurfaceStatus.1(Ice Watch) is Ice Watch

03/28/2017 05:10:21 AM Bogard Icy Road Activated



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102

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essSurfaceStatus.2(Ice Watch) is Ice Watch

# **Alert Subscriptions**

### Alert Subscriptions D02-07 - Bogard

Alert Name: Bogard Freezing

Description: Bogard Air Temp below Freezing

### User Subscriptions

Subscriptions for those having WeatherShare user accounts.

User Name	Contact Address	Notification Timing	]
dgalarusITS	Email 1 🗸	15 🗸	Delete

Add Subscription

### **Non-User Subscriptions**

Subscriptions for those not having WeatherShare user accounts.

Name	Email Address	Notification Timing	
		•	Delete
Add Non-Subscription			
Save Cancel			

103



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## **Alert Notification**

Fri 3/24/2017 8:54 AM

WxShare@weathershare.org

Grouped WeatherShare Alerts

To Galarus, Doug

Bogard : 2017-03-24 07:50 : Bogard Wet Pavement, essSurfaceStatus.1(Trace Moisture) isnt Dry; essSurfaceStatus.1(Trace Moisture) isnt ERROR Bogard : 2017-03-24 07:50 : BogartPrecip, essPrecipitationOneHour(0.00787402) > 0 Bogard : 2017-03-24 07:50 : Bogard Freezing, essAirTemperature.1(31.46) < 32

Fri 3/24/2017 10:54 AM

WxShare@weathershare.org

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Grouped WeatherShare Alerts

To Galarus, Doug

Bogard : 2017-03-24 09:50 : Bogard Wet Pavement,essSurfaceStatus.1(Trace Moisture) isnt Dry;essSurfaceStatus.1(Trace Moisture) isnt ERROR Bogard : 2017-03-24 09:50 : Bogard near Freezing,essAirTemperature.1(32.18) <= 40;essAirTemperature.1(32.18) > 32 Bogard : 2017-03-24 09:50 : BogartPrecip,essPrecipitationOneHour(0.03149608) > 0 Bogard : 2017-03-24 09:35 : Bogard Freezing,essAirTemperature.1(31.82) < 32

104



## Administrative Functionality



105

## **User Profile Options**

Profile Options Station List Map

**Edit Preferences** 

Change Password

Admin Logout(dgalarusITS)



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106

# Edit User (Profile)

	Edit User	
Username:	dgalarusITS	
Email 1:	dgalarus@montana.edu	Emails must have a valid email format.
Email 2:		(optional) Second Email Address
SMS:		(optional) SMS Gateway Email Address
Group Notifications:	$\checkmark$	If checked, multiple notifications may be grouped in single emails.
Notification Timing:	60 🗸	Timing interval (in minutes) for grouped notifications.
	Save Cancel	



107

## **Administrative Options**

Administrative Options Station List Map

Manage Users

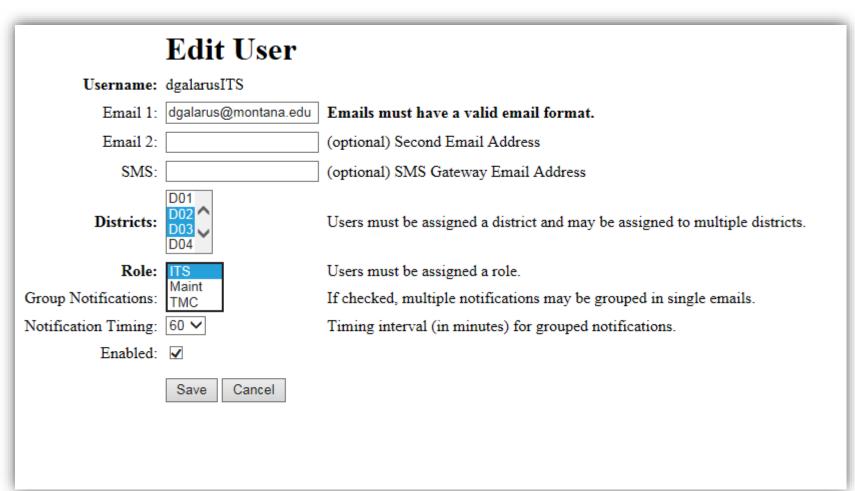


108

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Profile Logout(dgalarusITS)

# Edit User (Administrative)





109

## **Some Implementation Details**



110

## **Client-Side Technologies**

Google Maps JavaScript API: https://developers.google.com/maps/ https://developers.google.com/maps/documentation/javascript/

jQuery Sparklines: http://omnipotent.net/jquery.sparkline/#s-about

Google Charts and Visualization API: <u>https://developers.google.com/chart/</u> <u>https://developers.google.com/chart/interactive/docs/gallery</u> <u>https://developers.google.com/chart/interactive/docs/reference</u>

Hand-coded HTML, CSS and JavaScript ...



111

## Some Client-Side Issues

The chart APIs use their own custom data structures and functionality. I.e., these things are non-standard.

- Custom-coding was necessary.
- Duplication of data was necessary.
- We had to kludge the appearance of some items to get the output we wanted.

We considered using jQuery for tables but opted to hand-code the HTML.

- jQuery tables did not give the flexibility in display that we wanted.
- jQuery did offer other features (sorting) that would have been nice.

The Google Maps API InfoWindows continue to give us challenges.

- Issues with sizing of the InfoWindows.
- Issues with formatting within the InfoWindows.



## Server-Side (LAMP)

	Production
CentOS	release 6.8 (Final)
Apache	2.2.23
Mysql	14.14 Distrib 5.1.73
Python	2.6.6
PhP	5.3.21
ImageMagick	6.8.2-10



113

# Some Server-Side Comments

We tried to implement using flat-files for storage.

- We largely did this. See below.
- In WeatherShare Phase 1, we got burned trying to handle the many data elements associated with RWIS in a database.
- Generally, we don't need advanced query capability.

We used Python and Shell scripts for all processing.

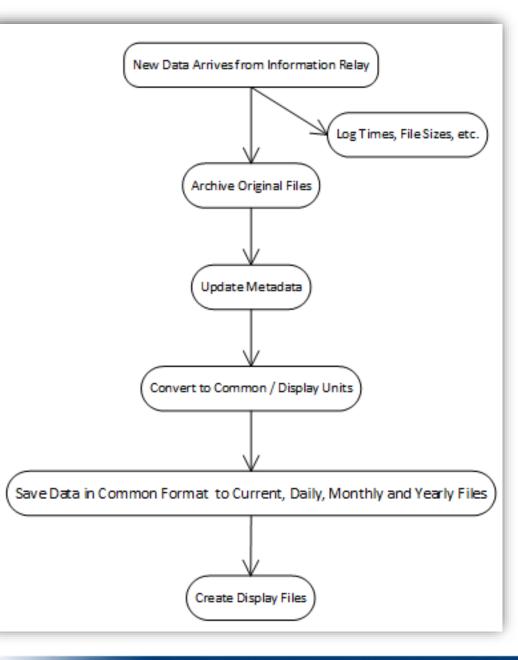
- This gets messy in places.
- In other places, it works well example: the use of inotify to indicate when new files have been received.

We ultimately used a database (MySql) for profile and alert functionality.

There are many "moving parts" ...

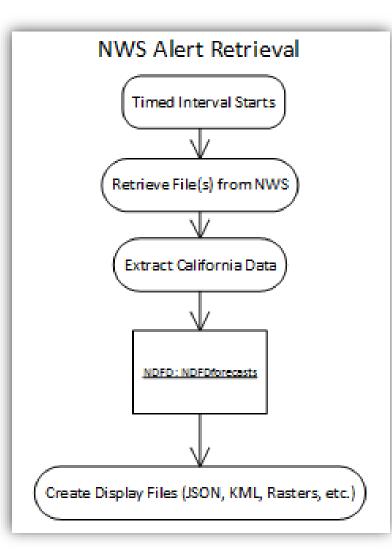


**RWIS Data is Pushed** by the Caltrans Information Relay to WeatherShare and then Processed





115

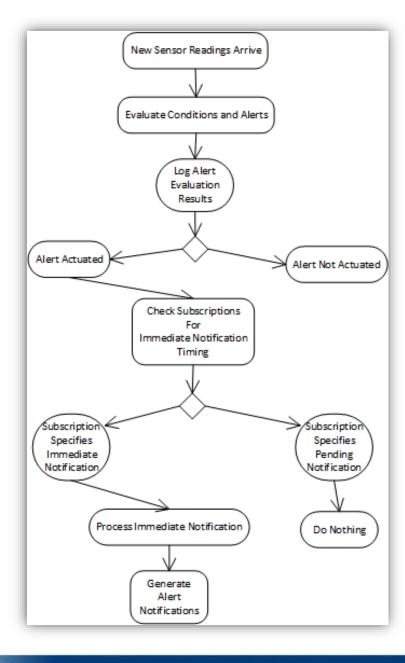


Other Data is Retrieved Periodically by WeatherShare and then Processed



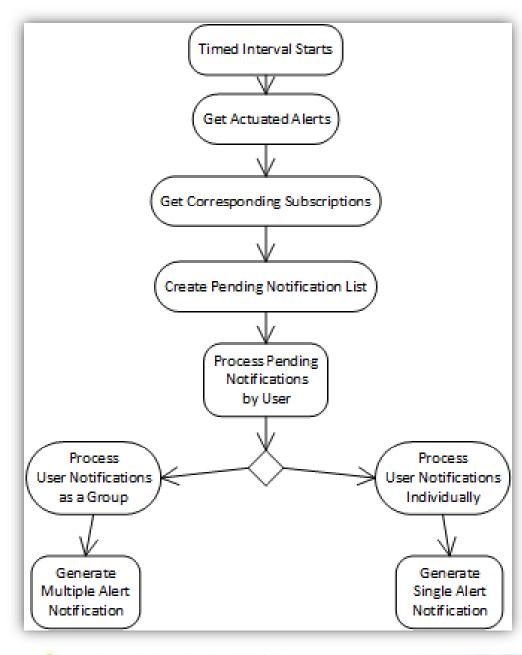
116

### Alert Conditions are Evaluated Upon Arrival of New Sensor Readings





117



Pending Alert Notifications are Processed after Timed Intervals and Depending on Grouped or Individual Preference

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118

# Summary

- Major functionality has been implemented.
- Alerts, notification and profiles greatly increased the complexity of the system.
- Alerts and notification were finished after the bad weather season.
- The alert and notification interface is still rough.
- In general, the system is ready for use.



# WeatherShare and Western States OSS

### Try them out:

http://oss.weathershare.org/ http://www.weathershare.org/

## For further information:

http://www.westernstates.org/Projects/OSS/

http://www.westernstates.org/Projects/WeatherShare/





120

# **Questions?**



121