

# Memo



**Date:** July 2, 2010  
**To:** Kevin Stewart  
**From:** Markus Ritsch  
**Subject:** June 2010 ALERT Data Analysis

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## I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's Nova Star 4.0 base station (ALERT 2) were analyzed for the period June 1 through June 30, 2010.

## II. General System Analysis Summary

A total of 353,819 ALERT data reports were analyzed from the ALERT 2 base station. Meteorological sensors account for 71 percent, water level sensors 12 percent, and rain sensors 6 percent of the total monthly records.

The system-wide radio traffic loading was 11,794 reports per day with an average hourly loading of 491 reports. The peak hourly traffic loading was 1,609 reports, which occurred on June 12, between 1:00 AM and 2:00 AM. A plot of monthly average and peak hourly traffic loading is provided.

### A. Specific Issues Identified this Month

Performance of the following sensors (Table 1) was unacceptable this month.

**Table 1. Rain Sensors with Unacceptable Performance Characteristics**

Rain ID	Description	Timer	Event	Comments
1710	Shop Creek	0.45	1.0	Poor timer performance
2190	Squaw Mountain	0.95	0.25	Poor event performance
2240	Cold Spring Gulch Conf	0.70	0.88	Poor performance
2270	Cub Cr below Blue	0.62	0.73	Poor performance
2280	Kinney Peak	0.85	0.69	Poor performance
2320	Choke Cherry Reservoir	1.0	0.91	Large number of invalid reports
2900	Russellville Gulch	0.85	0.21	Poor event performance
2930	Spring Valley Road	0.92	0.52	Poor event performance
2970	Rampart Range Road	0.33	0.67	Antenna system was modified on June 20, 2010
2980	Dakan Road	0.78	0.58	Poor performance
4330	Indian Ruins	0.55	0.54	Poor performance
4470	Little Narrows	0.70	0.79	Poor performance
4490	Apple Valley	0.75	0.70	Poor performance

### III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. The worst performing rain sensors for the month are summarized (Table 2).

**Table 2. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)**

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
--	--	--	2970	2970	2970				--	--	--
--	--	--	3010	700	1710				--	--	--
--	--	--	700	2240	4330				--	--	--
--	--	--	4860	4330	2270				--	--	--
--	--	--	4330	4490	2240				--	--	--
--	--	--	4170	4270	4470				--	--	--

\*- Due to system start-up/shut-down, timer statistics are evaluated only when the entire network is operational between April 1 and October 15.

Sensors identified as having poor timer performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

### IV. Rain Sensor Event Reporting Summary

#### A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors were analyzed to quantify the District-wide statistical total monthly tip summary (Table 3).

**Table 3. District-Wide Total Tip/Count Statistical Summary**

Statistical Parameter	Value	Comments
Mean	56.04	Only the 1-mm rain sensors were included in the analysis
Median	53	Only the 1-mm rain sensors were included in the analysis
Standard deviation	23.27	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	125.85	Only the 1-mm rain sensors were included in the analysis
Minimum total count	4	ID 2190 (Squaw Mountain Weather)
Maximum total count	217	ID 420 (Expo Park) – influenced by irrigatin

#### B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 4).

**Table 4. Monthly Summary of District-Wide Mean Total 1-mm Tip/Count**

Year	Jan	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec	Ave
2006	4.62	5.92	18.39	20.47	19.44	13.75	74.03	46.89	24.17	41.13	5.04	16.45	24.19
2007	11.56	5.40	29.75	65.03	68.30	15.87	36.20	46.38	22.13	29.50	6.54	11.29	29.00
2008	4.05	7.38	12.26	20.57	54.82	26.06	16.43	90.20	37.54	19.59	2.82	9.24	25.08
2009	6.33	3.11	11.37	59.26	63.45	68.00	65.00	20.00	27.29	30.24	11.00	5.60	30.89
2010	5.97	11.90	32.54	70.57	39.63	56.04							

\*-Event statistics are skewed in these months because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

### C. Sensors with a Jump of Six or More in the Sequential Count

Several sensors experienced a large jump in the sequential tip count (Table 5).

**Table 5. Sensors with a Jump of 6 or More in Sequential Count**

Sensor Description	Sensor ID	Comment
Indian Ruins	4330	June 10 and June 12
Russellville Gulch	2900	June 12
Guy Hill Ranch	310	June 13 and June 14
Flying J	850	June 14
Kinney Peak	2280	June 13
Spring Valley Road	2930	June 30
Sugarloaf	4730	June 23
SBC at San Souci	4830	June 22

### D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 92 percent. A total of 6,116 incrementing reports were received and a total of 6,618 were expected. The total loss of incrementing reports for the month was approximately 8 percent. Those sensors with the worst event transmission performance are summarized (Table 6).

**Table 6. Monthly Summary of Sensors with the Most Missed Tips**

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
--	--	--	2970	700	2900				--	--	--
--	--	--	700	2280	2190				--	--	--
--	--	--	940	2970	2930				--	--	--
--	--	--	430	2980	4330				--	--	--
--	--	--	2900	2190	2980				--	--	--
--	--	--	4330	2240	2970				--	--	--

\*-Event statistics are skewed in these months and therefore not computed because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15.

Sensors identified as having poor event performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

## V. Heavy Radio Traffic Analysis

Periods exceeding 600 messages per hour were analyzed independently in an attempt to quantify data loss rates from rain sensors using the sequential tip count series.

### A. The Heaviest Hourly Traffic Periods This Month

The hours of highest radio traffic this month are shown (Table 7).

**Table 7. Heavy Radio Traffic Periods**

Peak Traffic Periods	Reports/hour	Hour Beginning
Peak Hourly Traffic	1,609	6/12/2010 1:00 AM
2nd Max	1,568	6/12/2010 12:00 AM
3rd Max	1,197	6/11/2010 11:00 PM
4th Max	1,007	6/12/2010 10:00 AM
5th Max	1,005	6/13/2010 10:00 AM

Each hour exceeding 600 reports was analyzed to quantify the number of missing rain reports for that hour (Figure 1). The following plot shows the loss of data as a function of data loading.

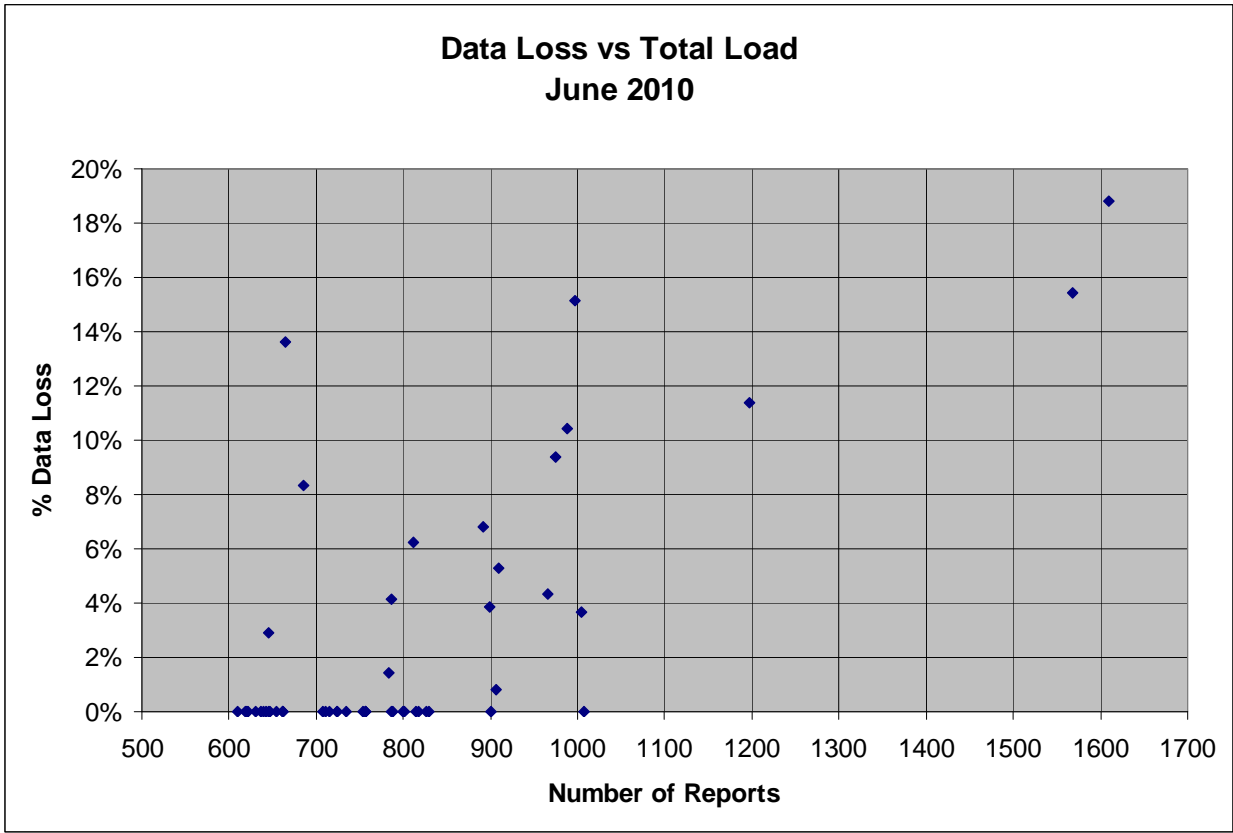


Figure 1. Data Loss vs. Data Loading

## VI. Unknown Device Analysis – Received Data Log

The ALERT IDs present in the audio signal received by the decoder are compared against a list of “active” device IDs that are defined within NovaStar. Those IDs received by the decoder that are not defined within NovaStar are considered to be “unknown” and may be the result of radio noise or problems with the telemetry system. The reception of “unknown” device reports for the month is summarized (Table 8).

Table 8. Summary of Unknown IDs

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	235
Total reports from unknown IDs	5,707
Unknown IDs with only a single received report (potential noise)	177
Total reports from all IDs – RecData Log entire month	353,819
Unknown reports as a fraction of total reports	1.61%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 9) are the total reports received from unknown sensor IDs for each month of the year.

Table 9. Monthly Summary of Total Reports from Unknown IDs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2010	1,220	1,474	1,276	1,174	721	5,707							

A number of “unknown” sensors had multiple reports, which may indicate the existence of a transmitter that is sending information on an ID that is not currently defined within NovaStar. The unknown IDs with multiple reports including the number of reports received by each are shown (Table 10).

**Table 10. Reports Received by Unknown IDs**

Unknown ID	Reports
2851	1025
2852	1001
2856	872
2857	845
2858	813
2854	809
487	14
709	10
2239	9
4819	8
2828	5
2861	5
2839	4
2993	4
4029	4
4109	4
4309	4
4839	4
1622	3
1628	3
1631	3
2736	3
4093	3
4329	3
4399	3
4796	3
4809	3
245	2
389	2
438	2
688	2
739	2
741	2
748	2
759	2
780	2
1633	2
2221	2
2695	2
2985	2
3043	2
4087	2
4092	2
4139	2
4173	2

4176	2
4259	2
4278	2
4289	2
4299	2
4304	2
4379	2
4509	2
4569	2
4829	2
4851	2
4856	2
5712	2

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 11). The goal of this analysis is to determine a pattern of occurrence that may correspond to a source of noise in the system, such as the use of a wireless microphone nearby.

The following table includes all the reports received from the unknown IDs in the 320 range.

**Table 11. Temporal Distribution of Received Reports**

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	47	12:00-12:59	36
1:00-1:59	21	1:00-1:59	54
2:00-2:59	25	2:00-2:59	29
3:00-3:59	23	3:00-3:59	37
4:00-4:59	10	4:00-4:59	30
5:00-5:59	2	5:00-5:59	37
6:00-6:59	10	6:00-6:59	28
7:00-7:59	35	7:00-7:59	14
8:00-8:59	21	8:00-8:59	25
9:00-9:59	17	9:00-9:59	37
10:00-10:59	43	10:00-10:59	69
11:00-11:59	16	11:00-11:59	55

## VII. Sensors with Invalid Reports

The following precipitation sensors had a large number of invalid reports (bit flip/contention errors/random decode):

Sensor ID	Description	Feb	Mar	Apr	May	June	July	Aug	Sep
120	West Woods	47	1	3	0	0			
640	Goldsmith @ Eastman	0	0	0	0	3			
700	Toll Gate @ 6th	0	0	0	0	3			
1300	Hidden Lake	0	0	0	4	0			
1420	Diamond Hill	2	1	2	0	0			
1460	Urban Farm	1	3	2	1	0			
1530	Bear Creek at Lowell	12	13	10	6	0			
1800	Sand Creek Park	--	4	0	0	0			
2310	Genesee Village	--	5	0	0	0			
2320	Choke Cherry Resvr	1	7	3	4	5			
2750	Castle Rock WX	--	4	6	1	0			
2970	Rampart Range Road	--	3	0	1	0			
3010	East Plum Cr at Hwy 105	0	0	0	0	9			
4030	Red Garden	6	2	3	1	1			
4330	Indian Ruins	2	1	2	0	4			



# General System Analysis

**Database Name** P:\A207-UDFCD-Data-Analysis\2010\06-2010\Novastar\_extract\_2010June.mdb

<b>First Date in Database</b>	6/1/10 12:00 AM	<b>Total Days</b>	30.0
<b>Last Date in Database</b>	6/30/10 11:59 PM	<b>Total Hours</b>	720.0

**Total Records Analyzed** 353819

## Records by Group

Wind Gust	53520	15%
Temperature	52689	15%
Relative Humidity	52617	15%
Water Level PT-HSE	32229	9%
Barometric Pressure	23777	7%
Wind Direction	20342	6%
Wind Speed Average & Azimuth	19886	6%
Precipitation	19792	6%
Wind Speed Average	19751	6%
Solar Radiation	9315	3%
Battery Voltage HSE	7904	2%
Unknown IDs	5707	2%
Fuel Temperature	5501	2%
Fuel Moisture	5491	2%
Water Level Float	4782	1%
Water Level PT	3768	1%
Battery Voltage Analog	3583	1%
Battery Voltage Digital	3379	1%
Soil Moisture	2720	1%
Repeater Status Report	2400	1%
Battery	1946	1%
Wing Gust	689	0%
Repeater Pass List	560	0%
Hayman Battery	515	0%
12Hr Status Report	493	0%
Battery Voltage	223	0%
Water Level	149	0%
Handar 585 ALARM Status	57	0%
Hayman Stage	34	0%
<b>Total</b>	<b>353819</b>	

## Records by Major Group

Meteorologic Sensors	251897	71%
Water Level Sensors	40779	12%
Rain Sensors	19792	6%
Sensor Status Transmissions	18376	5%
Soil and Fuel Sensors	13712	4%
<b>Total</b>	<b>344556</b>	

## Traffic Loading Summary

Alert Reports	353819	
Average Daily Traffic	11794	
Average Hourly Traffic	491	
Median Hourly Traffic	486	hour beginning
Peak Hourly Traffic	1609	6/12/10 1:00 AM
2nd Max	1568	6/12/10 12:00 AM
3rd Max	1197	6/11/10 11:00 PM
4th Max	1007	6/12/10 10:00 AM
5th Max	1005	6/13/10 10:00 AM



# Rain Timer Performance

Analyze Rain Sensors

# h Timer Performance

Rain ID	Description	Rcv	Average Timer Interval	Ave Exp	90% Performance
5800	Goose Creek	11	4:00	60.00	18%
2970	Rampart Range Rd	20	11:58	60.00	33%
5760	Cheeseman	20	4:30	60.00	33%
5940	Log Jumper	22	4:00	60.00	37%
1710	Shop Creek	27	13:05	60.00	45%
5720	Four Mile Creek	30	19:12	60.00	50%
5930	Long Hollow	31	7:00	60.00	52%
4330	Indian Ruins	33	18:24	60.00	55%
2270	Cub Cr below Blue	37	17:22	60.00	62%
5830	Platte Springs	41	15:05	60.00	68%
2240	Cold Sprg Glch conf	42	16:53	60.00	70%
4470	Little Narrows	42	16:11	60.00	70%
5740	Trail Creek	43	17:27	60.00	72%
540	Parker/Mississippi	45	14:43	60.00	75%
4490	Apple Valley	45	14:34	60.00	75%
4850	Porphory Mtn	45	15:10	60.00	75%
3010	EPC at Hwy 105	46	15:09	60.00	77%
4860	Fairview Peak	46	12:41	60.00	77%
5790	Flying G	46	12:18	60.00	77%
310	Guy Hill Ranch	47	13:43	60.00	78%
2230	Bear Cr below Cub	47	14:29	60.00	78%
2250	Rosedale	47	14:43	60.00	78%
2980	Dakan Rd	47	14:50	60.00	78%
4510	Pinewood Springs	48	13:59	60.00	80%
4240	Sunset	50	12:45	60.00	83%
4830	SBC @ San Souci	50	12:34	60.00	83%
1920	Wx-Brighton	51	13:57	60.00	85%
2280	Kinney Peak	51	12:59	60.00	85%
2900	Russelville Gulch-Douglas	51	12:00	60.00	85%
4180	Gold Lake	51	12:30	60.00	85%
5860	Cedar Mountain	51	12:16	60.00	85%
700	Toll Gate @ 6th	52	12:55	60.00	87%
1010	Denver West	52	12:46	60.00	87%
1110	Gunbarrel	52	13:17	60.00	87%
4130	Swiss Peaks	52	13:24	60.00	87%
4190	Slaughterhouse	52	13:04	60.00	87%
4220	Fling's	52	13:04	60.00	87%
4570	St. Antons	52	12:46	60.00	87%
5770	Lazy Gulch	52	13:23	60.00	87%
330	Van Bibber @ Hwy 93	53	12:59	60.00	88%
1200	Broomfield 3207	53	12:44	60.00	88%
2850	Cherry Cr bl Bayou Glch	53	13:31	60.00	88%
4010	Crescent	53	12:28	60.00	88%
4060	Lakeshore	53	12:28	60.00	88%
4530	Winiger Ridge	53	12:47	60.00	88%
4550	Boulder Jail	53	12:59	60.00	88%
420	Expo Park	54	12:45	60.00	90%
1100	Louisville Rec Ctr	54	12:30	60.00	90%
1500	Powers Park	54	12:23	60.00	90%
2370	Red Rocks Park	54	11:57	60.00	90%
2810	Pine Cliff Road	54	13:20	60.00	90%
2820	Haskins Gulch Conf	54	12:15	60.00	90%
2910	East Cherry Cr-Douglas	54	12:15	60.00	90%
4040	Martin Gulch	54	12:45	60.00	90%

4070	Bear Peak	54	12:43	60.00	90%
4090	Magnolia	54	13:16	60.00	90%
4230	Golden Age	54	12:30	60.00	90%
4810	Shanahan Ridge	54	12:13	60.00	90%
110	Ralston Reservoir	55	12:42	60.00	92%
200	Leyden Reservoir	55	13:01	60.00	92%
300	Van Bibber Park	55	12:59	60.00	92%
870	Murphy Creek GC	55	12:48	60.00	92%
900	Wx-Aurora Reservoir	55	12:00	60.00	92%
1440	Wx-Elbert	55	12:14	60.00	92%
1530	Bear Creek @ Lowell	55	12:12	60.00	92%
2310	Genesee Village	55	12:43	60.00	92%
2860	CC at Stroh Rd	55	12:44	60.00	92%
2930	Wx-Spring Valley Rd-DougCnty	55	12:45	60.00	92%
2940	Willow Creek - DougCnty	55	12:16	60.00	92%
2960	Indian Creek	55	12:46	60.00	92%
3020	Wx-West Creek WX	55	12:30	60.00	92%
4100	Filter Plant	55	12:34	60.00	92%
4110	Betasso	55	12:50	60.00	92%
4150	Gold Hill	55	12:44	60.00	92%
4250	Geer Canyon	55	13:04	60.00	92%
4290	Red Hill	55	12:43	60.00	92%
4350	Conifer Hill	55	12:13	60.00	92%
4360	Justice Center	55	11:57	60.00	92%
100	Carr Street	56	12:43	60.00	93%
140	Wx-Blue Mountain	56	12:14	60.00	93%
600	Harvard Gulch Park	56	12:42	60.00	93%
620	Quincy/Highline	56	12:29	60.00	93%
650	Iliff Pond	56	12:12	60.00	93%
750	Wx-Quincy Reservoir	56	12:28	60.00	93%
820	ETG @ Buckley	56	12:29	60.00	93%
1050	Jeffco Fairgrounds	56	12:12	60.00	93%
1660	SPR at Henderson	56	12:42	60.00	93%
1700	Cherry Cr @ Champa	56	12:42	60.00	93%
1720	Cherry Cr @ Steele	56	12:12	60.00	93%
2260	Brook Forest	56	12:29	60.00	93%
2330	Morrison	56	12:27	60.00	93%
2340	El Rancho	56	12:27	60.00	93%
2350	Idledale	56	12:27	60.00	93%
2710	Wx-Highlands Ranch WTP	56	12:00	60.00	93%
2950	DC Public Works	56	12:15	60.00	93%
4020	Rio Grande	56	12:13	60.00	93%
4200	Lazy Acres	56	12:45	60.00	93%
4340	Riverside	56	12:44	60.00	93%
4750	Wx-Louisville Lake	56	12:30	60.00	93%
4770	Wx-Cal-Wood Ranch	56	11:30	60.00	93%
5880	Hackett Mountain	56	12:15	60.00	93%
120	West Woods	57	12:27	60.00	95%
210	Leyden Confluence	57	12:12	60.00	95%
220	Upper Leyden	57	12:00	60.00	95%
400	Montview Park	57	12:11	60.00	95%
410	Kelly Dam	57	12:26	60.00	95%
440	Fire Station #7	57	12:12	60.00	95%
500	Havana Park	57	11:58	60.00	95%
510	Virginia Court	57	12:30	60.00	95%
610	Harvard @ Jackson	57	12:25	60.00	95%
640	Goldsmith @ Eastman	57	12:30	60.00	95%
710	Horseshoe Park Drop	57	10:36	60.00	95%
720	Confluence Pond	57	12:27	60.00	95%

730	No Name @ Quincy	57	11:57	60.00	95%
800	Sable Ditch @ 18th	57	11:57	60.00	95%
810	Granby Ditch @ 6th	57	11:58	60.00	95%
940	Sampson Gulch	57	12:12	60.00	95%
1040	Lena @ U.S. Hwy 6	57	12:14	60.00	95%
1060	Heritage Square	57	12:12	60.00	95%
1300	Hidden Lake	57	12:27	60.00	95%
1310	LDC at 64th	57	12:27	60.00	95%
1320	SPR at 3rd Ave	57	12:12	60.00	95%
1350	Chatfield COE	57	12:14	60.00	95%
1400	Upper Sloan Det.	57	12:28	60.00	95%
1420	Wx-Diamond Hill	57	12:28	60.00	95%
1600	Englewood Dam	57	12:28	60.00	95%
1620	Slaughterhouse Glch	57	11:58	60.00	95%
1810	Sand Creek at mouth	57	12:21	60.00	95%
2190	Wx-Squaw Mountain	57	12:13	60.00	95%
2920	West Cherry Head-Douglas Cnty	57	12:00	60.00	95%
4170	Pine Brook	57	12:49	60.00	95%
4310	Johnny Park	57	12:12	60.00	95%
4710	Wx-Ward C-1	57	11:39	60.00	95%
5810	Stump Bump	57	12:00	60.00	95%
5820	Corral Creek	57	12:14	60.00	95%
150	Nott Creek	58	11:57	60.00	97%
320	Sports Complex	58	12:12	60.00	97%
430	Utah Park	58	12:35	60.00	97%
530	Fire Station #19	58	12:12	60.00	97%
630	Temple Pond at DTC	58	11:57	60.00	97%
830	Side Creek Park	58	11:57	60.00	97%
840	Fire Station 12	58	12:00	60.00	97%
850	Flying J	58	12:00	60.00	97%
970	Pump Sta 3	58	12:00	60.00	97%
1000	Maple Grove Resv.	58	12:12	60.00	97%
1030	NREL/S. Table Mtn.	58	12:12	60.00	97%
1330	Roslyn	58	12:00	60.00	97%
1340	Sanderson at Xavier	58	11:59	60.00	97%
1370	West Metro FS13	58	12:13	60.00	97%
1460	Wx-Urban Farm	58	12:00	60.00	97%
1480	Third Creek at DIA	58	12:12	60.00	97%
1520	Wx-Marston Lake North	58	12:14	60.00	97%
1550	Lakewood CC	58	12:12	60.00	97%
1640	SPR at Union Ave.	58	12:00	60.00	97%
2360	Indian Hills	58	11:57	60.00	97%
2750	Wx-Castle Rock	58	12:14	60.00	97%
2840	Sulphur Gulch	58	12:21	60.00	97%
2870	Cottonwood (Apache)	58	12:13	60.00	97%
4160	Sunshine	58	12:13	60.00	97%
4260	Taylor Mountain	58	11:48	60.00	97%
4270	Cannon Mountain	58	12:12	60.00	97%
4300	Big Elk Park	58	12:25	60.00	97%
4790	Wx-Button Rock	58	12:00	60.00	97%
520	Jewell Detention	59	11:57	60.00	98%
760	Mission Viejo Park	59	11:57	60.00	98%
920	Wx-Aurora Town Hall	59	12:00	60.00	98%
950	Piney at Liverpool	59	11:58	60.00	98%
1360	Denver Zoo	59	12:00	60.00	98%
1570	Wx-Brighton Ditch	59	12:04	60.00	98%
1800	Sand Creek Park	59	11:57	60.00	98%
1900	Niver Detention	59	11:57	60.00	98%
2730	Wx-Salisbury Park	59	11:46	60.00	98%

4030	Red Garden	59	11:58	60.00	98%
4050	Walker Ranch	59	11:58	60.00	98%
4080	Twin Sisters	59	12:12	60.00	98%
4520	Eagle Ridge	59	12:15	60.00	98%
5730	West Creek	59	12:00	60.00	98%
2210	Wx-Hiwan G.C.	60	12:00	60.00	100%
4140	Logan Mill	60	11:44	60.00	100%
4840	SBC@S Boulder Ditch	60	11:57	60.00	100%
2990	Wx-Tomah Rd-DougCnty	61	11:01	60.00	102%
4730	Wx-Sugarloaf	61	11:46	60.00	102%
4820	Doudy Draw	62	11:03	60.00	103%
2320	Choke Cherry Resvr	197		60.00	

Rain Event Performance														
		Reports Received	8,254	Analyze Rain Sensors										
	Systemwide Avg	Total Tips	9,414											
	87.68%	Data Loss	12.32%											
Rain ID	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket	
2900	21%	7	1	0	1	0	1	2	10	47	37	0	0.0393701	
2190	25%	0	0	0	1	0	0	0	1	4	3	0	0.0393701	
2930	52%	17	0	0	0	0	0	1	17	33	16	0	0.0393701	
4330	54%	35	8	5	1	0	0	3	49	91	42	0	0.0393701	
2980	58%	15	13	3	0	1	0	0	32	55	23	0	0.0393701	
2970	67%	13	3	1	0	1	0	0	18	27	9	0	0.0393701	
2280	69%	35	10	2	0	0	0	1	47	68	21	1	0.0393701	
1200	69%	20	5	1	0	0	1	0	27	39	12	0	0.0393701	
310	70%	32	4	1	0	0	0	1	37	53	16	0	0.0393701	
4490	70%	27	13	1	1	0	0	0	42	60	18	0	0.0393701	
4790	70%	37	11	2	1	1	0	0	52	74	22	0	0.0393701	
2270	73%	21	6	1	1	0	0	0	29	40	11	0	0.0393701	
4510	74%	37	13	3	0	0	0	0	53	72	19	0	0.0393701	
4730	75%	58	13	0	1	0	0	1	72	96	24	1	0.0393701	
4550	76%	29	8	2	0	0	0	0	39	51	12	0	0.0393701	
4810	77%	50	10	1	1	1	0	0	63	82	19	0	0.0393701	
4830	77%	43	2	2	0	0	0	1	47	61	14	0	0.0393701	
4570	77%	47	8	1	1	1	0	0	58	75	17	1	0.0393701	
3010	77%	52	8	4	1	0	0	0	65	84	19	0	0.0393701	
4290	79%	44	8	2	1	0	0	0	55	70	15	0	0.0393701	
4180	79%	47	7	2	0	1	0	0	57	72	15	0	0.0393701	
4520	79%	40	8	1	1	0	0	0	50	63	13	0	0.0393701	
540	79%	24	2	0	0	0	1	0	27	34	7	0	0.0393701	
4470	80%	50	10	3	0	0	0	0	63	79	16	0	0.0393701	
4240	81%	41	6	3	0	0	0	0	50	62	12	0	0.0393701	
1110	81%	43	11	1	0	0	0	0	55	68	13	0	0.0393701	
1100	81%	40	5	1	0	1	0	0	47	58	11	0	0.0393701	
4150	81%	60	11	3	0	0	0	0	74	91	17	0	0.0393701	
1810	82%	32	7	1	0	0	0	0	40	49	9	0	0.0393701	
4140	82%	55	5	3	1	0	0	0	64	78	14	0	0.0393701	
4060	82%	50	9	2	0	0	0	0	61	74	13	0	0.0393701	
620	83%	39	8	1	0	0	0	0	48	58	10	0	0.0393701	
2730	83%	23	6	0	0	0	0	0	29	35	6	0	0.0393701	
510	83%	35	2	3	0	0	0	0	40	48	8	0	0.0393701	
4750	83%	43	4	3	0	0	0	0	50	60	10	0	0.0393701	
4300	84%	47	8	0	1	0	0	0	56	67	11	0	0.0393701	
2810	84%	23	2	0	1	0	0	0	26	31	5	0	0.0393701	
4220	84%	49	9	1	0	0	0	0	59	70	11	0	0.0393701	
4820	84%	51	5	3	0	0	0	0	59	70	11	0	0.0393701	
1660	84%	45	8	1	0	0	0	0	54	64	10	0	0.0393701	
150	85%	32	7	0	0	0	0	0	39	46	7	0	0.0393701	
4010	86%	49	10	0	0	0	0	0	59	69	10	0	0.0393701	
4130	86%	73	9	1	1	0	0	0	84	98	14	0	0.0393701	
4190	86%	53	6	2	0	0	0	0	61	71	10	0	0.0393701	
1720	86%	32	4	1	0	0	0	0	37	43	6	0	0.0393701	
650	86%	27	3	1	0	0	0	0	31	36	5	0	0.0393701	
4710	86%	49	6	0	1	0	0	0	56	65	9	0	0.0393701	
410	86%	33	4	1	0	0	0	0	38	44	6	0	0.0393701	
1550	86%	28	3	1	0	0	0	0	32	37	5	0	0.0393701	
120	87%	39	5	1	0	0	0	0	45	52	7	0	0.0393701	
1620	87%	23	2	1	0	0	0	0	26	30	4	0	0.0393701	
4090	87%	63	8	0	1	0	0	0	72	83	11	0	0.0393701	
1420	87%	35	4	1	0	0	0	0	40	46	6	0	0.0393701	
4530	87%	52	7	1	0	0	0	0	60	69	9	0	0.0393701	
1000	87%	41	5	1	0	0	0	0	47	54	7	0	0.0393701	
820	87%	39	1	0	0	0	1	0	41	47	6	0	0.0393701	
900	88%	44	3	2	0	0	0	0	49	56	7	0	0.0393699	
1330	88%	38	3	0	1	0	0	0	42	48	6	0	0.0393701	
2860	88%	24	4	0	0	0	0	0	28	32	4	0	0.0393701	
2920	88%	18	3	0	0	0	0	0	21	24	3	0	0.0393701	
4160	88%	61	8	1	0	0	0	0	70	80	10	0	0.0393701	
1010	88%	43	7	0	0	0	0	0	50	57	7	0	0.0393701	
2240	88%	37	6	0	0	0	0	0	43	49	6	0	0.0393701	
500	88%	32	3	1	0	0	0	0	36	41	5	0	0.0393701	
4770	88%	59	5	2	0	0	0	0	66	75	9	0	0.0393701	
1350	88%	33	3	1	0	0	0	0	37	42	5	0	0.0393701	
710	88%	47	4	0	1	0	0	0	52	59	7	0	0.0393701	
4040	88%	61	4	1	1	0	0	0	67	76	9	0	0.0393701	
610	88%	33	5	0	0	0	0	0	38	43	5	0	0.0393701	
4270	89%	55	6	1	0	0	0	0	62	70	8	0	0.0393701	
220	89%	35	5	0	0	0	0	0	40	45	5	0	0.0393701	

1920	89%	50	5	1	0	0	0	0	56	63	7	0	0.0393701
4340	89%	50	5	1	0	0	0	0	56	63	7	0	0.0393701
100	89%	51	5	1	0	0	0	0	57	64	7	0	0.0393701
4260	89%	50	7	0	0	0	0	0	57	64	7	0	0.0393701
330	89%	43	6	0	0	0	0	0	49	55	6	0	0.0393701
1460	89%	36	5	0	0	0	0	0	41	46	5	0	0.0393701
4200	89%	53	4	0	1	0	0	0	58	65	7	0	0.0393701
4070	89%	74	10	0	0	0	0	0	84	94	10	0	0.0393701
2250	89%	45	6	0	0	0	0	0	51	57	6	0	0.0393701
4080	90%	69	7	1	0	0	0	0	77	86	9	0	0.0393701
2870	90%	54	5	1	0	0	0	0	60	67	7	0	0.0393701
1900	90%	40	1	2	0	0	0	0	43	48	5	0	0.0393701
2960	90%	46	6	0	0	0	0	0	52	58	6	0	0.0393701
1530	90%	31	4	0	0	0	0	0	35	39	4	0	0.0393701
2360	90%	32	2	1	0	0	0	0	35	39	4	0	0.0393701
2840	90%	31	4	0	0	0	0	0	35	39	4	0	0.0393701
1060	90%	47	6	0	0	0	0	0	53	59	6	0	0.0393701
1520	90%	32	4	0	0	0	0	0	36	40	4	0	0.0393701
1480	90%	41	5	0	0	0	0	0	46	51	5	0	0.0393701
2330	90%	41	5	0	0	0	0	0	46	51	5	0	0.0393701
4360	90%	60	5	1	0	0	0	0	66	73	7	0	0.0393701
520	90%	34	4	0	0	0	0	0	38	42	4	0	0.0393701
600	91%	37	2	1	0	0	0	0	40	44	4	0	0.0393701
2320	91%	48	2	0	1	0	0	0	51	56	5	0	0.0393701
530	91%	38	4	0	0	0	0	0	42	46	4	0	0.0393701
1360	91%	38	4	0	0	0	0	0	42	46	4	0	0.0393701
4100	92%	59	6	0	0	0	0	0	65	71	6	0	0.0393701
4030	92%	70	7	0	0	0	0	0	77	84	7	0	0.0393701
<b>4350</b>	92%	72	5	1	0	0	0	0	78	85	7	0	0.0393701
700	92%	43	1	0	1	0	0	0	45	49	4	0	0.0393701
2370	92%	41	4	0	0	0	0	0	45	49	4	0	0.0393701
4170	92%	53	5	0	0	0	0	0	58	63	5	0	0.0393701
2230	92%	32	3	0	0	0	0	0	35	38	3	0	0.0393701
4110	92%	67	2	2	0	0	0	0	71	77	6	0	0.0393701
1050	92%	46	2	1	0	0	0	0	49	53	4	0	0.0393701
4050	92%	45	4	0	0	0	0	0	49	53	4	0	0.0393701
1320	93%	34	3	0	0	0	0	0	37	40	3	0	0.0393701
1340	93%	34	3	0	0	0	0	0	37	40	3	0	0.0393701
2310	93%	23	2	0	0	0	0	0	25	27	2	0	0.0393701
4230	93%	59	3	1	0	0	0	0	63	68	5	0	0.0393701
320	93%	48	2	1	0	0	0	0	51	55	4	0	0.0393701
440	93%	48	4	0	0	0	0	0	52	56	4	0	0.0393701
1400	93%	37	1	1	0	0	0	0	39	42	3	0	0.0393701
1440	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701
1030	93%	50	4	0	0	0	0	0	54	58	4	0	0.0393701
4020	93%	64	5	0	0	0	0	0	69	74	5	0	0.0393701
200	93%	40	3	0	0	0	0	0	43	46	3	0	0.0393701
430	94%	82	6	0	0	0	0	0	88	94	6	0	0.0393701
630	94%	114	2	0	2	0	0	0	118	126	8	0	0.0393701
810	94%	42	3	0	0	0	0	0	45	48	3	0	0.0393701
1640	94%	42	3	0	0	0	0	0	45	48	3	0	0.0393701
4840	94%	57	2	1	0	0	0	0	60	64	4	0	0.0393701
2340	94%	43	3	0	0	0	0	0	46	49	3	0	0.0393701
2950	94%	29	2	0	0	0	0	0	31	33	2	0	0.0393701
1600	94%	45	3	0	0	0	0	0	48	51	3	0	0.0393701
1570	94%	92	4	1	0	0	0	0	97	103	6	0	0.0393701
800	94%	31	2	0	0	0	0	0	33	35	2	0	0.0393701
840	94%	31	2	0	0	0	0	0	33	35	2	0	0.0393701
750	94%	47	3	0	0	0	0	0	50	53	3	0	0.0393701
2210	95%	51	1	1	0	0	0	0	53	56	3	0	0.0393701
640	95%	34	2	0	0	0	0	0	36	38	2	0	0.0393701
2710	95%	51	3	0	0	0	0	0	54	57	3	0	0.0393701
1310	95%	36	2	0	0	0	0	0	38	40	2	0	0.0393701
2350	95%	36	2	0	0	0	0	0	38	40	2	0	0.0393701
2850	95%	37	2	0	0	0	0	0	39	41	2	0	0.0393701
850	95%	39	1	0	0	0	0	1	40	42	2	0	0.0393701
830	95%	38	2	0	0	0	0	0	40	42	2	0	0.0393701
1500	95%	116	6	0	0	0	0	0	122	128	6	0	0.0393701
760	95%	60	3	0	0	0	0	0	63	66	3	0	0.0393701
970	95%	40	2	0	0	0	0	0	42	44	2	0	0.0393701
2990	95%	40	2	0	0	0	0	0	42	44	2	0	0.0393701
1040	96%	41	2	0	0	0	0	0	43	45	2	0	0.0393701
720	96%	43	0	1	0	0	0	0	44	46	2	0	0.0393701
110	96%	44	0	1	0	0	0	0	45	47	2	0	0.0393701
300	96%	43	2	0	0	0	0	0	45	47	2	0	0.0393701

4250	96%	65	3	0	0	0	0	0	68	71	3	0	0.0393701
4310	96%	66	3	0	0	0	0	0	69	72	3	1	0.0393701
420	96%	199	9	0	0	0	0	0	208	217	9	0	0.0393701
950	96%	71	3	0	0	0	0	0	74	77	3	0	0.0393701
920	96%	50	0	1	0	0	0	0	51	53	2	0	0.0393701
1300	96%	51	2	0	0	0	0	0	53	55	2	0	0.0393701
400	97%	28	1	0	0	0	0	0	29	30	1	0	0.0393701
1800	97%	34	1	0	0	0	0	0	35	36	1	0	0.0393701
140	98%	39	1	0	0	0	0	0	40	41	1	0	0.0393701
2820	98%	40	1	0	0	0	0	0	41	42	1	0	0.0393701
2260	98%	42	1	0	0	0	0	0	43	44	1	0	0.0393701
1370	98%	45	1	0	0	0	0	0	46	47	1	0	0.0393701
210	98%	52	1	0	0	0	0	0	53	54	1	0	0.0393701
870	98%	55	1	0	0	0	0	0	56	57	1	0	0.0393701
940	99%	75	1	0	0	0	0	0	76	77	1	0	0.0393699
730	100%	44	0	0	0	0	0	0	44	44	0	0	0.0393701
1700	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
1710	100%	15	0	0	0	0	0	0	15	15	0	0	0.0393701
2750	100%	20	0	0	0	0	0	0	20	20	0	0	0.0393701
2910	100%	25	0	0	0	0	0	0	25	25	0	0	0.0393701
2940	100%	41	0	0	0	0	0	0	41	41	0	0	0.0393701
3020	100%	29	0	0	0	0	0	0	29	29	0	0	0.0393701
	<b>Total Tips</b>	<b>7,390</b>	<b>719</b>	<b>108</b>	<b>26</b>	<b>7</b>	<b>4</b>	<b>11</b>	<b>8,254</b>	<b>9,414</b>	<b>1,160</b>	<b>4</b>	

# Monthly Traffic Loading

## 2010 Monthly ALERT Radio Traffic Summary

