Memo

Water & Earth Technologies, Inc.
Water Resources and Environmental Consulting

Date: April 5, 2011
To: Kevin Stewart
From: Markus Ritsch
Subject: **March 2011 ALERT Data Analysis**

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's NovaStar base station were analyzed for the period March 1 through March 31, 2011.

II. General System Analysis Summary

A total of 339,485 ALERT (legacy) data reports were analyzed. Meteorological sensors account for 78 percent, water level sensors 5 percent, and rain sensors 3 percent of the total monthly records.

The system-wide radio traffic loading was 10,951 reports per day with an average hourly loading of 456 reports. The peak hourly traffic loading was 769 reports, which occurred on March 31, between 5:00 PM and 6:00 PM. 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 questionable this month.

Table 1. Rain Sensors with Unacceptable Performance Characteristics

Rain ID	Description	Timer	Event	Comments
4270	Cannon Mountain	69%	90%	Poor timer performance
4330	Hansen Rain	79%	63%	Poor overall performance
4470	Little Narrows	94%	75%	Poor event performance
4490	Apple Valley	67%	94%	Poor timer performance
4710	Wx-Ward C-1	0%	0%	Poor timer 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*
1520	4710	4490									
1440	1440	4270									
4470	4470	4330									
1460	1460	4510									
140	140	1440									
1570	4490	4810									

***- Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.**

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	7.54	Only the 1-mm rain sensors were included in the analysis
Median	7	Only the 1-mm rain sensors were included in the analysis
Standard deviation	4.07	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	19.74	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Numerous stations
Maximum total count	21	ID 2260 (Brook Forest)

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	50.23	31.01	4.18	18.31	8.30	3.31	27.67
2011	6.78	7.45	7.54										

***- Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.**

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
Murphy Creek GC	870	Large jumps occurred on March 9 – looks like spring start-up
Sanderson at Xavier	1340	Large jumps occurred on March 9 – looks like spring start-up
Red Rocks Park	2370	Large jumps occurred on March 16 – looks like spring start-up

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 94.56 percent. A total of 487 incrementing reports were received and a total of 515 reports were expected. The total loss of incrementing reports for the month was approximately 5.44 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*
1420	1350	2820									
1460	950	2970									
4470	1320	710									
4330	1330	4330									
2710	840	870									
1640	1720	1200									

***-Only sensors that are operational year-round (weather stations and stations in Boulder County) are included for the analysis in these months. **-Due to Spring start-up Fall shut-down the performance values in these months are not accurate.**

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 500 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 hourly periods of highest radio traffic this month are shown (Table 7). Each hour exceeding 500 reports was analyzed to quantify the number of missing rain reports for that hour.

Table 7. Heavy Radio Traffic Periods

Peak Traffic Periods	Reports/hour	Missing Rain Reports (% loss)	Hour Beginning
Peak Hourly Traffic	769	0 %	3/31/2011 5:00 PM
2nd Max	762	0 %	3/31/2011 4:00 PM
3rd Max	707	0 %	3/31/2011 3:00 PM
4th Max	693	0 %	3/31/2011 12:00 PM
5th Max	685	0 %	3/22/2011 8:00 PM

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)	474
Total reports from unknown IDs	3,065
Unknown IDs with only a single received report (potential noise)	274
Total reports from all IDs – RecData Log entire month	339,485
Unknown reports as a fraction of total reports	0.90%

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
2010	1,220	1,474	1,276	1,174	721	5,707	610	1,738	442	533	2,857	6,396
2011	1,231	2,165	3,065									

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 10).

Table 10. Monthly Percent of Unknown Sensor Reports

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	0.42%	0.56%	0.38%	0.32%	0.20%	1.61%	0.17%	0.49%	0.13%	0.16%	0.93%	1.88%
2011	0.39%	0.73%	0.90%									

Any month shaded in yellow has an excessive number of reports from unknown sensors.

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 11).

Table 11. Reports Received by Unknown IDs

Unknown Sensor ID	Number of Reports
2872 (CC @ Cottonwood)	304
2871(CC @ Cottonwood)	300
2877(CC @ Cottonwood)	271
2876(CC @ Cottonwood)	270
2878(CC @ Cottonwood)	267
2874(CC @ Cottonwood)	262
4391 (Boulder Falls)	42
4394(Boulder Falls)	42
4397(Boulder Falls)	42
4392(Boulder Falls)	41
4396(Boulder Falls)	41
4398(Boulder Falls)	41
1423	29
1470	29
2811	21
1454	15
1534	15
1933	15
799	13
1446	12
154	11
1926	11
1934	11
1954	11
2748	11
2768	11
2808	11
1529	10
1607	10
1443	9
1486	9
1502	9
1915	9
1949	9
1951	9
2754	9
1918	8
1919	8
2239	8
2746	8
709	7
939	7
1459	7
1511	7
1582	7
1929	7
1953	7
2706	7
2713	7
2760	7
2784	7
4469	7
206	6
809	6
1458	6
1506	6
1531	6
1631	6
1923	6
1938	6
1950	6
2708	6
2756	6
2776	6
1478	5
1622	5
1653	5
2705	5
2714	5
2715	5
2716	5
121	4
153	4
201	4
208	4
429	4
719	4
1342	4
1382	4
1419	4
1445	4
1587	4
1591	4
1602	4
1611	4
1628	4
1639	4
1937	4
2179	4
2745	4
2775	4
2849	4
4109	4
202	3
207	3
318	3
1367	3
1387	3
1399	3
1415	3
1430	3
1433	3
1435	3
1453	3
1455	3
1479	3
1528	3
1583	3
1599	3
1614	3
1621	3
1624	3
1804	3
1812	3
1925	3
1930	3
1941	3
2371	3
2771	3
4031	3
4039	3
4049	3
4063	3
4083	3
4091	3
4149	3
4389	3
4760	3

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 12). 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.

Table 12. Temporal Distribution of Received Reports

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	82	12:00-12:59	155
1:00-1:59	54	1:00-1:59	122
2:00-2:59	48	2:00-2:59	153
3:00-3:59	43	3:00-3:59	249
4:00-4:59	43	4:00-4:59	353
5:00-5:59	42	5:00-5:59	433
6:00-6:59	54	6:00-6:59	321
7:00-7:59	143	7:00-7:59	100
8:00-8:59	186	8:00-8:59	81
9:00-9:59	19	9:00-9:59	64
10:00-10:59	38	10:00-10:59	111
11:00-11:59	59	11:00-11:59	112

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	Nov 2010	Dec 2010	Jan 2011	Feb 2011	Mar 2011
140	Wx-Blue Mountain	3	5	4	2	2
860	Sand Cr at Colfax	0	0	0	0	4
870	Murphy Creek GC	0	0	0	0	4
1420	Wx-Diamond Hill	2	0	3	2	3
1460	Wx-Urban Farm	2	2	1	1	0
1500	Powers Park	0	0	0	0	3
1520	Wx-Marston Lake North	0	0	0	3	2
1530	Bear Creek at Lowell	0	0	0	5	2
1570	Wx-Brighton Ditch	0	0	0	0	4
1580	Roslyn	0	0	0	0	4
1920	Wx-Brighton	0	0	4	1	0
2190	Wx-Squaw Mountain	2	1	1	1	0
2750	Wx-Castle Rock	0	0	4	0	1
4060	Lakeshore	13	7	1	0	1
4090	Magnolia	65	27	0	1	0
4840	SBC-S. Boulder Ditch	3	1	1	0	1

VIII. Rainfall Alarms and Intensity Analysis

The following rainfall rate alarms from the Urban Drainage and Flood Control District ALERT Web Server were identified this month.

Urban Drainage and Flood Control District
ALERT Web Server

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<<<<<<<<<<<<<<<<<<<<<<<<<<<< RAINFALL RATE ALARMS >>>>>>>>>>>>>>>>>>>>>>>>>
No alarms logged for this month
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General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2011\03-2011\Novastar_extract_2011Mar.mdb

First Date in Database	3/1/11 12:00 AM	**Total Days**	31.0
Last Date in Database	3/31/11 11:59 PM	**Total Hours**	744.0

Total Records Analyzed 339485

Records by Group

Wind Gust	57973	17%
Temperature	52079	15%
Relative Humidity	50493	15%
Wind Speed Average & Azimuth	30078	9%
Barometric Pressure	22599	7%
Wind Direction	20773	6%
Wind Speed Average	20538	6%
Battery Voltage	18570	5%
Precipitation	10545	3%
Water Level PT-HSE	10522	3%
Solar Radiation	9407	3%
ALERT/A2 Testing	7433	2%
Fuel Temperature	5676	2%
Fuel Moisture	5641	2%
Water Level Float	3303	1%
Unknown	3065	1%
Soil Moisture	2801	1%
Water Level PT	2722	1%
Repeater Status Report	2582	1%
Water Level	1455	0%
Repeater Pass List	569	0%
12Hr Status Report	484	0%
Hayman Battery	87	0%
Handar 585 ALARM Status	67	0%
Solar Power	23	0%
Total	339485	

Records by Major Group

Meteorologic Sensors	263940	78%
Water Level Sensors	16547	5%
Soil and Fuel Sensors	14118	4%
Rain Sensors	10545	3%
Sensor Status Transmissions	3725	1%
Total	308875	

Traffic Loading Summary

Alert Reports	339485	
Average Daily Traffic	10951	
Average Hourly Traffic	456	
Median Hourly Traffic	456	hour beginning
Peak Hourly Traffic	769	3/31/11 5:00 PM
2nd Max	762	3/31/11 4:00 PM
3rd Max	707	3/31/11 3:00 PM
4th Max	693	3/31/11 12:00 PM
5th Max	685	3/22/11 8:00 PM

Rain Timer Performance

Weather Stations and Boulder County Gages

Analyze Rain Sensors

			12:49		75%
Sensor ID	**Description**	**Rcv**	**Timer**	**Exp**	**Performance**
4490	Apple Valley	42	14:46	62.00	68%
4270	Cannon Mountain	43	16:49	62.00	69%
4330	Hansen Rain	49	13:52	62.00	79%
4510	Pinewood Springs	50	14:34	62.00	81%
1440	Wx-Elbert	51	14:21	62.00	82%
4810	Shanahan Ridge	51	13:01	62.00	82%
2710	Wx-Highlands Ranch WTP	52	13:45	62.00	84%
1420	Wx-Diamond Hill	52	13:36	62.00	84%
4570	St. Antons	52	13:09	62.00	84%
4530	Winiger Ridge	52	13:17	62.00	84%
4220	Fling's	52	13:43	62.00	84%
2750	Wx-Castle Rock	53	13:27	62.00	85%
4520	Eagle Ridge	53	12:30	62.00	85%
4190	Slaughterhouse	53	13:41	62.00	85%
1460	Wx-Urban Farm	54	12:50	62.00	87%
4730	Wx-Sugarloaf	54	12:51	62.00	87%
4860	Fairview Peak	54	12:58	62.00	87%
4850	Porphory Mtn	54	12:46	62.00	87%
4350	Conifer Hill	54	13:12	62.00	87%
4310	Johnny Park	54	13:26	62.00	87%
4180	Gold Lake	54	12:45	62.00	87%
4170	Pine Brook	54	12:58	62.00	87%
4770	Wx-Cal-Wood Ranch	55	12:55	62.00	89%
1920	Wx-Brighton	55	13:24	62.00	89%
140	Wx-Blue Mountain	55	13:11	62.00	89%
4840	SBC@S Boulder Ditch	55	13:08	62.00	89%
4200	Lazy Acres	55	13:30	62.00	89%
4160	Sunshine	55	12:41	62.00	89%
4110	Betasso	55	12:59	62.00	89%
4080	Twin Sisters	55	13:09	62.00	89%
2930	Wx-Spring Valley Rd-DougCnty	56	12:57	62.00	90%
4830	SBC @ San Souci	56	12:40	62.00	90%
4820	Doudy Draw	56	13:07	62.00	90%
4550	Boulder Jail	56	13:05	62.00	90%
4090	Magnolia	56	13:08	62.00	90%
1570	Wx-Brighton Ditch	57	12:54	62.00	92%
4290	Red Hill	57	12:55	62.00	92%
4250	Geer Canyon	57	12:12	62.00	92%
4240	Sunset	57	12:13	62.00	92%
4150	Gold Hill	57	12:42	62.00	92%
4100	Filter Plant	57	12:55	62.00	92%
2990	Wx-Tomah Rd-DougCnty	58	12:15	62.00	94%
2190	Wx-Squaw Mountain	58	12:27	62.00	94%
4750	Wx-Louisville Lake	58	12:39	62.00	94%
4470	Little Narrows	58	11:58	62.00	94%
4360	Justice Center	58	12:37	62.00	94%
4300	Big Elk Park	58	12:40	62.00	94%
4230	Golden Age	58	12:38	62.00	94%
4130	Swiss Peaks	58	12:35	62.00	94%
4070	Bear Peak	58	12:53	62.00	94%
4790	Wx-Button Rock	59	12:26	62.00	95%
4050	Walker Ranch	59	12:24	62.00	95%
4030	Red Garden	59	12:27	62.00	95%
3020	Wx-West Creek WX	60	12:01	62.00	97%
2730	Wx-Salisbury Park	60	12:13	62.00	97%
1520	Wx-Marston Lake North	60	12:12	62.00	97%
2210	Wx-Hiwan G.C.	60	11:41	62.00	97%
920	Wx-Aurora Town Hall	60	12:01	62.00	97%
900	Wx-Aurora Reservoir	60	12:26	62.00	97%
4340	Riverside	60	12:11	62.00	97%
4260	Taylor Mountain	60	12:12	62.00	97%
4140	Logan Mill	60	12:11	62.00	97%
4060	Lakeshore	60	12:12	62.00	97%
4040	Martin Gulch	60	12:25	62.00	97%
4010	Cresent	61	12:11	62.00	98%
750	Wx-Quincy Reservoir	62	11:31	62.00	100%
4020	Rio Grande	62	11:45	62.00	100%

Rain Event Performance

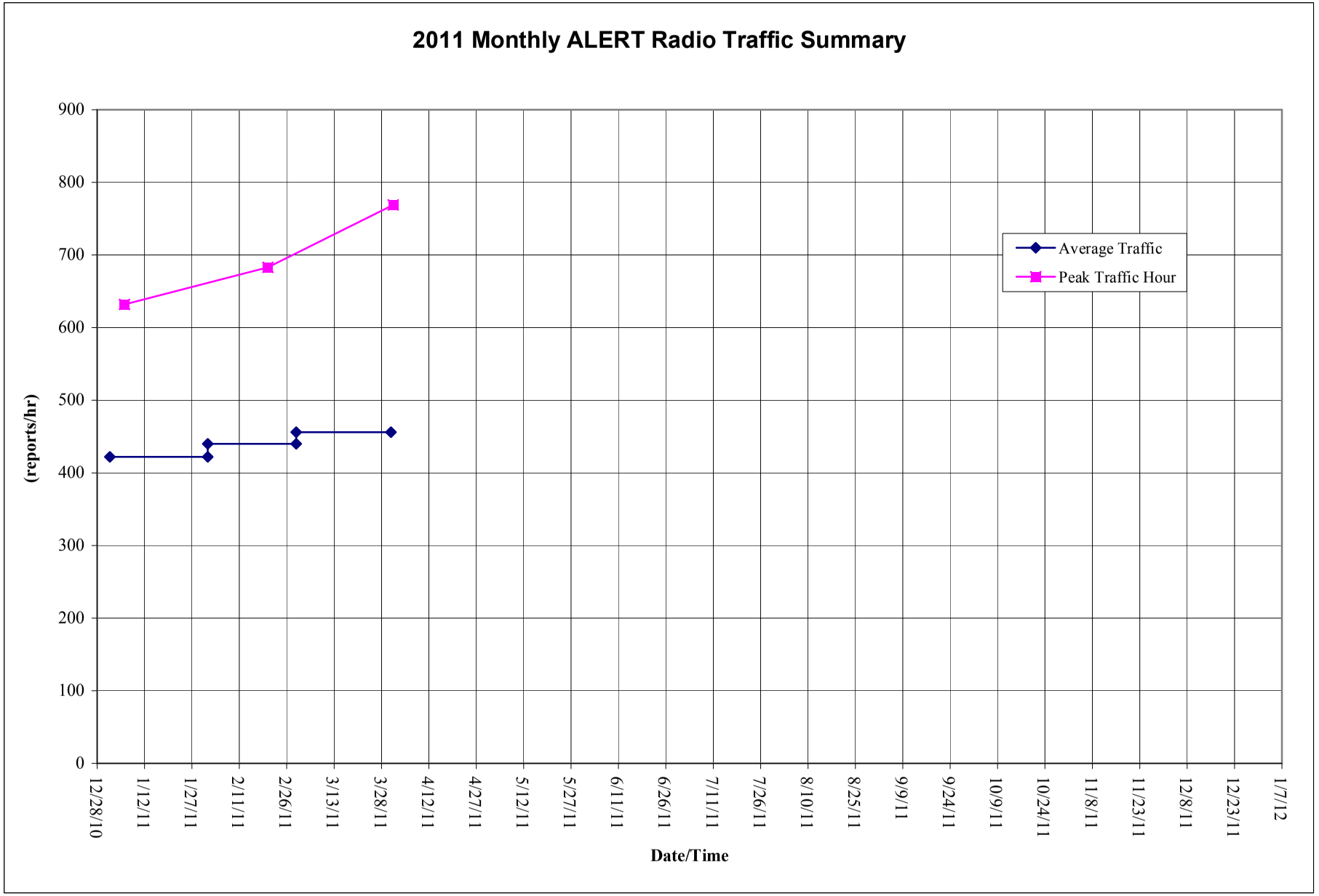
Analyze Rain Sensors

		Reports Received	1,179
	Systemwide Avg	Total Tips	1,251
	94.24%	Data Loss	5.76%

Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	miss	hold	bucket
2820	50%	0	1	0	0	0	0	0	1	2	1	0	0.0393701
2970	50%	1	0	1	0	0	0	0	2	4	2	0	0.0393701
710	57%	3	0	0	1	0	0	0	4	7	3	0	0.0393701
4330	63%	3	1	1	0	0	0	0	5	8	3	0	0.0393701
870	64%	6	0	0	0	1	0	3	7	11	4	1	0.0393701
1200	67%	3	0	1	0	0	0	0	4	6	2	1	0.0393701
2340	71%	4	0	1	0	0	0	0	5	7	2	0	0.0393701
1340	73%	5	3	0	0	0	0	1	8	11	3	0	0.0393701
4470	75%	6	3	0	0	0	0	0	9	12	3	0	0.0393701
940	80%	3	1	0	0	0	0	0	4	5	1	0	0.0393699
4010	82%	7	2	0	0	0	0	0	9	11	2	0	0.0393701
2230	82%	13	0	0	1	0	0	0	14	17	3	0	0.0393701
440	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
1100	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
2240	83%	8	2	0	0	0	0	0	10	12	2	0	0.0393701
4810	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
120	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
310	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
620	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
1700	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
4080	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
4180	86%	10	2	0	0	0	0	0	12	14	2	0	0.0393701
4190	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
1620	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701
1030	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
1330	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
1530	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
1640	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
4040	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
4510	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701
4570	89%	14	2	0	0	0	0	0	16	18	2	1	0.0393701
4220	89%	15	2	0	0	0	0	0	17	19	2	0	0.0393701
1370	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701
1420	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701
4270	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701
1010	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701
1520	91%	9	1	0	0	0	0	0	10	11	1	1	0.0393701
1550	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701
2330	91%	9	1	0	0	0	0	0	10	11	1	1	0.0393701
4310	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701
4250	92%	10	1	0	0	0	0	0	11	12	1	0	0.0393701
4530	92%	10	1	0	0	0	0	0	11	12	1	0	0.0393701
2210	92%	11	1	0	0	0	0	0	12	13	1	1	0.0393701
2280	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
2320	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
4150	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
4350	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
2250	93%	13	1	0	0	0	0	0	14	15	1	1	0.0393701
4240	93%	13	1	0	0	0	0	0	14	15	1	0	0.0393701
4490	94%	15	1	0	0	0	0	0	16	17	1	0	0.0393701
2260	95%	19	1	0	0	0	0	0	20	21	1	1	0.0393701
2370	100%	11	0	0	0	0	0	1	11	11	0	0	0.0393701
100	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
110	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
140	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
150	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701
200	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
210	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
220	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
300	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
320	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
330	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
400	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
410	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
420	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
430	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701

500	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
510	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
520	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
530	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
540	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
600	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
610	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
630	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
640	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
650	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
700	100%	7	0	0	0	0	0	0	7	7	0	1	0.0393701
720	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
730	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
750	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
760	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
800	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
810	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
820	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
830	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
840	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
850	100%	9	0	0	0	0	0	0	9	9	0	1	0.0393701
860	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
900	100%	4	0	0	0	0	0	0	4	4	0	1	0.0393699
920	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
950	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
970	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1000	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701
1040	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
1050	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
1060	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1110	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
1300	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1320	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1350	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1360	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
1400	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
1440	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1460	100%	9	0	0	0	0	0	0	9	9	0	1	0.0393701
1480	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1500	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1570	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1600	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1660	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1710	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1720	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1800	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
1810	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1900	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
1920	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
2190	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
2270	100%	16	0	0	0	0	0	0	16	16	0	0	0.0393701
2310	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
2350	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
2360	100%	16	0	0	0	0	0	0	16	16	0	0	0.0393701
2710	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
2730	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2750	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2810	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2850	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
2860	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2870	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
2900	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2910	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2920	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
2930	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
2940	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2950	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2960	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2980	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
2990	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
3010	100%	3	0	0	0	0	0	0	3	3	0	0	0.01

3020	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4020	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
4030	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4050	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
4060	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
4070	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4090	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4100	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4110	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
4130	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701
4140	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701
4160	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4170	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4200	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4230	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4260	100%	19	0	0	0	0	0	0	19	19	0	0	0.0393701
4290	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
4300	100%	17	0	0	0	0	0	0	17	17	0	0	0.0393701
4340	100%	14	0	0	0	0	0	0	14	14	0	0	0.0393701
4360	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4520	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4550	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4730	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4750	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
4770	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4790	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4820	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4830	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4840	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
	Total Tips	1,118	54	4	2	1	0	5	1,179	1,251	72	12	


2011 Monthly ALERT Radio Traffic Summary
900
800
700
600
500
400
300
200
100
0
(reports/hr)
Average Traffic
Peak Traffic Hour
12/28/10
1/12/11
1/27/11
2/11/11
2/26/11
3/13/11
3/28/11
4/12/11
4/27/11
5/12/11
5/27/11
6/11/11
6/26/11
7/11/11
7/26/11
8/10/11
8/25/11
9/9/11
9/24/11
10/9/11
10/24/11
11/8/11
11/23/11
12/8/11
12/23/11
1/7/12
Date/Time