

Memo



Date: June 3, 2011
To: Kevin Stewart
From: Markus Ritsch
Subject: May 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 May 1 through May 31, 2011.

II. General System Analysis Summary

A total of 356,246 ALERT (legacy) data reports were analyzed. Meteorological sensors account for 71 percent, water level sensors 10 percent, and rain sensors 7 percent of the total monthly records.

The system-wide radio traffic loading was 11,492 reports per day with an average hourly loading of 479 reports. The peak hourly traffic loading was 1,134 reports, which occurred on May 19, between 3:00 PM and 4:00 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 Poor Performance Characteristics

| Rain ID | Description | Timer Reporting | Event Reporting |
|---------|---------------------|-----------------|-----------------|
| 1620 | Slaughterhouse Glch | 53.23% | 14.63% |
| 1660 | SPR at Henderson | 61.29% | 28.42% |
| 650 | Iliff Pond | 54.84% | 34.07% |
| 810 | Granby Ditch @ 6th | 58.06% | 33.90% |
| 500 | Havana Park | 53.23% | 37.11% |
| 1710 | Shop Creek | 51.61% | 38.89% |
| 540 | Parker/Mississippi | 51.61% | 39.77% |
| 1900 | Niver Detention | 58.06% | 35.58% |
| 940 | Sampson Gulch | 59.68% | 35.40% |
| 710 | Horseshoe Park Drop | 53.23% | 40.20% |
| 1700 | Cherry Cr @ Champa | 43.55% | 49.35% |
| 520 | Jewell Detention | 59.68% | 38.24% |
| 630 | Temple Pond at DTC | 54.84% | 41.91% |
| 730 | No Name @ Quincy | 56.45% | 40.91% |
| 830 | Side Creek Park | 59.68% | 38.89% |
| 410 | Kelly Dam | 56.45% | 41.41% |
| 1800 | Sand Creek Park | 58.06% | 40.40% |
| 920 | Wx-Aurora Town Hall | 53.23% | 44.19% |
| 750 | Wx-Quincy Reservoir | 58.06% | 44.68% |
| 430 | Utah Park | 59.68% | 44.00% |
| 760 | Mission Viejo Park | 62.90% | 45.54% |
| 850 | Flying J | 64.52% | 46.30% |
| 870 | Murphy Creek GC | 59.68% | 51.43% |
| 2190 | Wx-Squaw Mountain | 61.29% | 61.36% |

The data decoders at the District for legacy ALERT reporting were accidentally unplugged during the remodeling of the building in early May. The battery backup power to the decoders died on May 9th at 4:00 AM and was restored on May 10th at 10:00 AM. Legacy ALERT reports were not received during this period on ALERT and ALERT2. A second period of data loss was identified extending from May 12 through May 18.

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 | 1700 | 1700 | | | | | | | |
| 1440 | 1440 | 4270 | 3060 | 700 | | | | | | | |
| 4470 | 4470 | 4330 | 3030 | 540 | | | | | | | |
| 1460 | 1460 | 4510 | 700 | 1710 | | | | | | | |
| 140 | 140 | 1440 | 3090 | 500 | | | | | | | |
| 1570 | 4490 | 4810 | 2970 | 710 | | | | | | | |

*- 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 | 92.68 | Only the 1-mm rain sensors were included in the analysis |
| Median | 95.00 | Only the 1-mm rain sensors were included in the analysis |
| Standard deviation | 19.71 | Only the 1-mm rain sensors were included in the analysis |
| Mean plus three standard deviations | 151.80 | Only the 1-mm rain sensors were included in the analysis |
| Minimum total count | 30 | ID 2930 (Spring Valley Road – Douglas County) |
| Maximum total count | 150 | ID 430 (Utah Park – Influenced by irrigation) |

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 | 33.94 | 92.68 | | | | | | | | |

*- 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 |
|--------------------|-----------|--|
| Temple Pond | 630 | Large data gap between May 12 and May 18 |
| Utah Park | 430 | Large data gap between May 12 and May 18 |
| Jewell Detention | 520 | Large data gap between May 12 and May 18 |
| Horseshoe Park | 710 | Large data gap between May 12 and May 18 |
| Mission Viejo Park | 760 | Large data gap between May 12 and May 18 |
| Slaughterhouse | 1620 | Large data gap between May 12 and May 18 |
| Quincy Reservoir | 750 | Large data gap between May 12 and May 18 |
| SPR at Henderson | 1660 | Large data gap between May 12 and May 18 |
| Havana Park | 500 | Large data gap between May 12 and May 18 |
| Sand Creek Park | 1800 | Large data gap between May 12 and May 18 |
| Kelly Dam | 410 | Large data gap between May 12 and May 18 |
| Niver Detention | 1900 | Large data gap between May 12 and May 18 |
| Murphy Creek | 870 | Large data gap between May 12 and May 18 |
| Shop Creek | 1710 | Large data gap between May 12 and May 18 |
| Aurora Regional | 940 | Large data gap between May 12 and May 18 |
| No Name | 730 | Large data gap between May 12 and May 18 |

Legacy ALERT reports were not received on ALERT, ALERT2, ALERT3 and NS5 for a general period extending from May 12 through May 18. The A2 protocol reports however were received at the District for this period. The outage in data only occurred in the legacy ALERT reporting.

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 81.88 percent. A total of 12,977 incrementing reports were received and a total of 15,848 reports were expected. The total loss of incrementing reports for the month was approximately 18.12 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 | 1700 | 1620 | | | | | | | |
| 1460 | 950 | 2970 | 1620 | 1660 | | | | | | | |
| 4470 | 1320 | 710 | 2930 | 810 | | | | | | | |
| 4330 | 1330 | 4330 | 2990 | 650 | | | | | | | |
| 2710 | 840 | 870 | 4330 | 940 | | | | | | | |
| 1640 | 1720 | 1200 | 2950 | 1900 | | | | | | | |

*-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 700 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 700 reports was analyzed to quantify the number of missing rain reports for that hour.

Table 7. Heavy Radio Traffic Periods

| Day | Hour | Expected Reports | Received Reports | Total Load | Loss |
|-----|------|------------------|------------------|------------|--------|
| 19 | 15 | 231 | 219 | 1133 | 5.19% |
| 19 | 16 | 150 | 147 | 983 | 2.00% |
| 19 | 23 | 177 | 169 | 951 | 4.52% |
| 24 | 10 | 161 | 155 | 939 | 3.73% |
| 18 | 13 | 233 | 209 | 906 | 10.30% |
| 11 | 5 | 235 | 198 | 882 | 15.74% |
| 18 | 14 | 172 | 155 | 864 | 9.88% |
| 12 | 4 | 51 | 54 | 863 | 0% |
| 19 | 22 | 110 | 109 | 852 | 0.91% |
| 19 | 17 | 83 | 81 | 840 | 2.41% |
| 11 | 19 | 49 | 52 | 839 | 0% |
| 20 | 0 | 15 | 16 | 818 | 0% |
| 12 | 6 | 40 | 45 | 813 | 0% |
| 18 | 20 | 112 | 112 | 811 | 0% |
| 18 | 17 | 134 | 133 | 808 | 0.75% |
| 11 | 18 | 113 | 113 | 807 | 0% |
| 24 | 11 | 97 | 95 | 806 | 2.06% |
| 12 | 5 | 41 | 43 | 799 | 0% |
| 12 | 0 | 11 | 12 | 791 | 0% |
| 18 | 15 | 149 | 126 | 790 | 15.44% |
| 12 | 2 | 43 | 45 | 785 | 0% |
| 20 | 1 | 2 | 2 | 782 | 0% |
| 19 | 18 | 16 | 20 | 774 | 0% |
| 11 | 22 | 9 | 13 | 772 | 0% |
| 18 | 19 | 95 | 94 | 769 | 1.05% |
| 11 | 17 | 110 | 105 | 768 | 4.55% |
| 11 | 23 | 4 | 6 | 740 | 0% |
| 11 | 2 | 57 | 56 | 738 | 1.75% |
| 11 | 21 | 9 | 15 | 737 | 0% |
| 20 | 2 | 1 | 1 | 729 | 0% |
| 19 | 14 | 77 | 74 | 725 | 3.90% |
| 11 | 16 | 120 | 119 | 722 | 0.83% |
| 11 | 4 | 125 | 125 | 712 | 0% |
| 18 | 21 | 94 | 93 | 708 | 1.06% |
| 20 | 10 | 82 | 83 | 702 | 0% |

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) | 976 |
| Total reports from unknown IDs | 2,051 |
| Unknown IDs with only a single received report (potential noise) | 613 |
| Total reports from all IDs – RecData Log entire month | 356,246 |
| Unknown reports as a fraction of total reports | 0.58% |

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 | 1,254 | 2,051 | | | | | | | |

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% | 0.37% | 0.58% | | | | | | | |

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 | Total Reports |
|-------------------|---------------|
| 1855 | 22 |
| 1407 | 21 |
| 1934 | 16 |
| 1470 | 15 |
| 1919 | 15 |
| 2748 | 14 |
| 1423 | 13 |
| 1487 | 13 |
| 441 | 12 |
| 741 | 12 |
| 949 | 12 |
| 1486 | 12 |
| 1446 | 11 |
| 1926 | 11 |
| 1933 | 11 |
| 1950 | 11 |
| 2224 | 11 |
| 1443 | 10 |
| 1651 | 10 |
| 2768 | 10 |
| 2808 | 10 |
| 511 | 9 |
| 1011 | 9 |
| 1457 | 9 |
| 1458 | 9 |
| 1534 | 9 |
| 1657 | 9 |
| 767 | 8 |
| 1167 | 8 |
| 1454 | 8 |
| 1719 | 8 |
| 1951 | 8 |
| 1953 | 8 |
| 2754 | 8 |
| 154 | 7 |
| 206 | 7 |
| 766 | 7 |
| 1001 | 7 |
| 1008 | 7 |
| 1653 | 7 |
| 1773 | 7 |
| 1775 | 7 |
| 1915 | 7 |
| 1949 | 7 |
| 2447 | 7 |
| 4093 | 7 |
| 207 | 6 |
| 497 | 6 |
| 758 | 6 |
| 761 | 6 |
| 764 | 6 |
| 1415 | 6 |
| 1453 | 6 |
| 1478 | 6 |
| 1531 | 6 |
| 1592 | 6 |
| 1637 | 6 |
| 1781 | 6 |
| 1787 | 6 |
| 1918 | 6 |
| 1954 | 6 |
| 2205 | 6 |
| 2215 | 6 |
| 2239 | 6 |

| | |
|------|---|
| 2746 | 6 |
| 2760 | 6 |
| 4091 | 6 |
| 237 | 5 |
| 240 | 5 |
| 432 | 5 |
| 762 | 5 |
| 869 | 5 |
| 957 | 5 |
| 1007 | 5 |
| 1231 | 5 |
| 1409 | 5 |
| 1631 | 5 |
| 1663 | 5 |
| 1741 | 5 |
| 1776 | 5 |
| 1814 | 5 |
| 1830 | 5 |
| 1842 | 5 |
| 1854 | 5 |
| 1923 | 5 |
| 1930 | 5 |
| 1959 | 5 |
| 2200 | 5 |
| 2203 | 5 |
| 2204 | 5 |
| 2448 | 5 |
| 2771 | 5 |
| 2799 | 5 |
| 2847 | 5 |
| 3019 | 5 |
| 4735 | 5 |
| 101 | 4 |
| 145 | 4 |
| 153 | 4 |
| 202 | 4 |
| 301 | 4 |
| 626 | 4 |
| 629 | 4 |
| 637 | 4 |
| 642 | 4 |
| 719 | 4 |
| 738 | 4 |
| 909 | 4 |
| 1016 | 4 |
| 1021 | 4 |
| 1119 | 4 |
| 1166 | 4 |
| 1449 | 4 |
| 1451 | 4 |
| 1481 | 4 |
| 1501 | 4 |
| 1502 | 4 |
| 1506 | 4 |
| 1564 | 4 |
| 1607 | 4 |
| 1639 | 4 |
| 1711 | 4 |
| 1743 | 4 |
| 1777 | 4 |
| 1821 | 4 |
| 1832 | 4 |
| 1850 | 4 |
| 2185 | 4 |
| 2221 | 4 |
| 2443 | 4 |

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 | 139 | 12:00-12:59 | 30 |
| 1:00-1:59 | 151 | 1:00-1:59 | 28 |
| 2:00-2:59 | 151 | 2:00-2:59 | 21 |
| 3:00-3:59 | 118 | 3:00-3:59 | 22 |
| 4:00-4:59 | 119 | 4:00-4:59 | 34 |
| 5:00-5:59 | 100 | 5:00-5:59 | 36 |
| 6:00-6:59 | 134 | 6:00-6:59 | 54 |
| 7:00-7:59 | 102 | 7:00-7:59 | 63 |
| 8:00-8:59 | 89 | 8:00-8:59 | 94 |
| 9:00-9:59 | 57 | 9:00-9:59 | 100 |
| 10:00-10:59 | 54 | 10:00-10:59 | 146 |
| 11:00-11:59 | 46 | 11:00-11:59 | 163 |

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 | Apr 2011 | May 2011 | | | | | |
|-----------|---------------------------|----------|----------|--|--|--|--|--|
| 140 | Wx-Blue Mountain | 0 | 4 | | | | | |
| 430 | Utah Park | 0 | 4 | | | | | |
| 500 | Havana Park | 0 | 6 | | | | | |
| 630 | Temple Pond at DTC | 0 | 7 | | | | | |
| 650 | Iliff Pond | 0 | 4 | | | | | |
| 760 | Mission Viejo Park | 0 | 5 | | | | | |
| 810 | Granby Ditch @ 6th | 0 | 4 | | | | | |
| 920 | Wx-Aurora Town Hall | 0 | 7 | | | | | |
| 940 | Sampson Gulch | 0 | 8 | | | | | |
| 1010 | Denver West | 0 | 5 | | | | | |
| 1460 | Wx-Urban Farm | 0 | 5 | | | | | |
| 1520 | Wx-Marston Lake North | 2 | 4 | | | | | |
| 1530 | Bear Creek at Lowell | 2 | 10 | | | | | |
| 1570 | Wx-Brighton Ditch | 1 | 3 | | | | | |
| 1580 | Roslyn | 0 | 3 | | | | | |
| 1710 | Shop Creek | 0 | 5 | | | | | |
| 1660 | Spring Creek at Henderson | 0 | 4 | | | | | |
| 1900 | Niver Detention | 0 | 5 | | | | | |
| 1920 | Wx-Brighton | 3 | 3 | | | | | |
| 2190 | Wx-Squaw Mountain | 0 | 8 | | | | | |
| 2750 | Wx-Castle Rock | 3 | 2 | | | | | |
| 2970 | Rampart Range Road | 0 | 5 | | | | | |
| 4330 | Hansen Rain | 0 | 5 | | | | | |
| 4730 | Wx-Sugarloaf | 0 | 5 | | | | | |

General System Analysis

Database Name

P:\A207-UDFCD-Data-Analysis\2011\05-2011\Novastar_extract_2011May.mdb

First Date in Database

5/1/11 12:00 AM

Total Days

31.0

Last Date in Database

5/31/11 11:59 PM

Total Hours

744.0

Total Records Analyzed

356,246

Records by Group

| | | |
|------------------------------|----------------|-------------|
| Wind Gust | 54,439 | 15% |
| Temperature | 52,702 | 15% |
| Relative Humidity | 51,856 | 15% |
| Water Level PT-HSE | 27,995 | 8% |
| Barometric Pressure | 25,147 | 7% |
| Precipitation | 25,111 | 7% |
| Wind Speed Average & Azimuth | 21,925 | 6% |
| Wind Direction | 19,571 | 5% |
| Battery Voltage | 19,210 | 5% |
| Wind Speed Average | 19,017 | 5% |
| Solar Radiation | 8,642 | 2% |
| Fuel Moisture | 5,667 | 2% |
| Fuel Temperature | 5,646 | 2% |
| Water Level PT | 4,669 | 1% |
| Water Level Float | 3,771 | 1% |
| Soil Moisture | 2,835 | 1% |
| Repeater Status Report | 2,507 | 1% |
| Unknown | 2,051 | 1% |
| Wind ALERT | 1,524 | 0% |
| Repeater Pass List | 694 | 0% |
| 12Hr Status Report | 494 | 0% |
| Hayman Battery | 344 | 0% |
| Water Level | 325 | 0% |
| Handar 585 ALARM Status | 75 | 0% |
| Solar Power | 18 | 0% |
| ALERT/A2 Testing | 10 | 0% |
| Longmont Flow Gage | 1 | 0% |
| Total | 356,246 | 100% |

Records by Major Group

| | | |
|-----------------------------|----------------|-----|
| Meteorologic Sensors | 252,935 | 71% |
| Water Level Sensors | 36,436 | 10% |
| Rain Sensors | 25,111 | 7% |
| Soil and Fuel Sensors | 14,148 | 4% |
| Sensor Status Transmissions | 3,788 | 1% |
| Total | 332,418 | |

Traffic Loading Summary

| | | |
|------------------------|---------|-----------------|
| Alert Reports | 356,246 | |
| Average Daily Traffic | 11,492 | |
| Average Hourly Traffic | 479 | |
| Median Hourly Traffic | 477 | hour beginning |
| Peak Hourly Traffic | 1,134 | 19-May 03:00 PM |
| 2nd Max | 984 | 19-May 04:00 PM |
| 3rd Max | 951 | 19-May 11:00 PM |
| 4th Max | 939 | 24-May 10:00 AM |
| 5th Max | 907 | 18-May 01:00 PM |

Rain Timer Performance

Analyze Rain Sensors

13:10

82%

| Rain ID | Description | Rcv | Timer | Exp | Performance |
|---------|------------------------|-----|-------|-------|-------------|
| 5940 | Log Jumper | 13 | 19:30 | 62.00 | 21% |
| 1700 | Cherry Cr @ Champa | 27 | 18:56 | 62.00 | 44% |
| 700 | Toll Gate @ 6th | 28 | 1:15 | 62.00 | 45% |
| 540 | Parker/Mississippi | 32 | 13:14 | 62.00 | 52% |
| 1710 | Shop Creek | 32 | 15:21 | 62.00 | 52% |
| 500 | Havana Park | 33 | 12:51 | 62.00 | 53% |
| 710 | Horseshoe Park Drop | 33 | 12:49 | 62.00 | 53% |
| 920 | Wx-Aurora Town Hall | 33 | 14:10 | 62.00 | 53% |
| 1620 | Slaughterhouse Glch | 33 | 12:23 | 62.00 | 53% |
| 5720 | Four Mile Creek | 33 | 15:21 | 62.00 | 53% |
| 630 | Temple Pond at DTC | 34 | 12:27 | 62.00 | 55% |
| 650 | Iliff Pond | 34 | 13:09 | 62.00 | 55% |
| 410 | Kelly Dam | 35 | 12:21 | 62.00 | 56% |
| 730 | No Name @ Quincy | 35 | 13:12 | 62.00 | 56% |
| 750 | Wx-Quincy Reservoir | 36 | 12:21 | 62.00 | 58% |
| 810 | Granby Ditch @ 6th | 36 | 12:21 | 62.00 | 58% |
| 1800 | Sand Creek Park | 36 | 12:22 | 62.00 | 58% |
| 1900 | Niver Detention | 36 | 13:05 | 62.00 | 58% |
| 2970 | Rampart Range Rd | 36 | 15:25 | 62.00 | 58% |
| 430 | Utah Park | 37 | 11:57 | 62.00 | 60% |
| 520 | Jewell Detention | 37 | 15:09 | 62.00 | 60% |
| 830 | Side Creek Park | 37 | 12:44 | 62.00 | 60% |
| 870 | Murphy Creek GC | 37 | 12:46 | 62.00 | 60% |
| 940 | Sampson Gulch | 37 | 11:57 | 62.00 | 60% |
| 1660 | SPR at Henderson | 38 | 12:41 | 62.00 | 61% |
| 2190 | Wx-Squaw Mountain | 38 | 15:43 | 62.00 | 61% |
| 4330 | Hansen Rain | 38 | 17:17 | 62.00 | 61% |
| 760 | Mission Viejo Park | 39 | 12:42 | 62.00 | 63% |
| 4490 | Apple Valley | 39 | 15:38 | 62.00 | 63% |
| 850 | Flying J | 40 | 13:46 | 62.00 | 65% |
| 2230 | Bear Cr below Cub | 43 | 15:03 | 62.00 | 69% |
| 2320 | Choke Cherry Resvr | 45 | 15:51 | 62.00 | 73% |
| 4470 | Little Narrows | 45 | 14:37 | 62.00 | 73% |
| 4860 | Fairview Peak | 45 | 14:04 | 62.00 | 73% |
| 110 | Ralston Reservoir | 46 | 14:42 | 62.00 | 74% |
| 310 | Guy Hill Ranch | 46 | 15:17 | 62.00 | 74% |
| 4790 | Wx-Button Rock | 46 | 13:17 | 62.00 | 74% |
| 4510 | Pinewood Springs | 47 | 14:01 | 62.00 | 76% |
| 2240 | Cold Sprg Glch conf | 49 | 14:37 | 62.00 | 79% |
| 2270 | Cub Cr below Blue | 49 | 13:40 | 62.00 | 79% |
| 2710 | Wx-Highlands Ranch WTP | 49 | 15:13 | 62.00 | 79% |
| 4550 | Boulder Jail | 49 | 13:30 | 62.00 | 79% |
| 2280 | Kinney Peak | 50 | 13:13 | 62.00 | 81% |
| 2980 | Dakan Rd | 50 | 13:47 | 62.00 | 81% |
| 4070 | Bear Peak | 50 | 14:37 | 62.00 | 81% |
| 4170 | Pine Brook | 50 | 14:32 | 62.00 | 81% |
| 4530 | Winiger Ridge | 50 | 14:36 | 62.00 | 81% |
| 1100 | Louisville Rec Ctr | 51 | 14:41 | 62.00 | 82% |
| 1720 | Cherry Cr @ Steele | 51 | 13:17 | 62.00 | 82% |
| 2250 | Rosedale | 51 | 13:34 | 62.00 | 82% |
| 2810 | Pine Cliff Road | 51 | 12:52 | 62.00 | 82% |
| 2840 | Sulphur Gulch | 51 | 13:27 | 62.00 | 82% |
| 4060 | Lakeshore | 51 | 13:20 | 62.00 | 82% |
| 4090 | Magnolia | 51 | 13:40 | 62.00 | 82% |

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|------|-------------------------------|----|-------|-------|-----|
| 4200 | Lazy Acres | 51 | 13:39 | 62.00 | 82% |
| 4290 | Red Hill | 51 | 13:51 | 62.00 | 82% |
| 4570 | St. Antons | 51 | 13:53 | 62.00 | 82% |
| 610 | Harvard @ Jackson | 52 | 13:05 | 62.00 | 84% |
| 1310 | LDC at 64th | 52 | 14:00 | 62.00 | 84% |
| 1370 | West Metro FS13 | 52 | 12:51 | 62.00 | 84% |
| 1400 | Upper Sloan Det. | 52 | 13:15 | 62.00 | 84% |
| 1460 | Wx-Urban Farm | 52 | 12:52 | 62.00 | 84% |
| 1480 | Third Creek at DIA | 52 | 13:30 | 62.00 | 84% |
| 2340 | El Rancho | 52 | 13:29 | 62.00 | 84% |
| 2900 | Russelville Gulch-Douglas | 52 | 14:50 | 62.00 | 84% |
| 2950 | DC Public Works | 52 | 13:23 | 62.00 | 84% |
| 3080 | Tallman Gulch | 52 | 11:24 | 62.00 | 84% |
| 4050 | Walker Ranch | 52 | 13:45 | 62.00 | 84% |
| 4830 | SBC @ San Souci | 52 | 13:51 | 62.00 | 84% |
| 100 | Carr Street | 53 | 13:06 | 62.00 | 85% |
| 120 | West Woods | 53 | 13:09 | 62.00 | 85% |
| 210 | Leyden Confluence | 53 | 13:45 | 62.00 | 85% |
| 330 | Van Bibber @ Hwy 93 | 53 | 13:09 | 62.00 | 85% |
| 720 | Confluence Pond | 53 | 14:00 | 62.00 | 85% |
| 800 | Sable Ditch @ 18th | 53 | 13:04 | 62.00 | 85% |
| 900 | Wx-Aurora Reservoir | 53 | 13:42 | 62.00 | 85% |
| 1420 | Wx-Diamond Hill | 53 | 13:45 | 62.00 | 85% |
| 1500 | Powers Park | 53 | 12:35 | 62.00 | 85% |
| 1520 | Wx-Marston Lake North | 53 | 11:46 | 62.00 | 85% |
| 1530 | Bear Creek @ Lowell | 53 | 13:20 | 62.00 | 85% |
| 1550 | Lakewood CC | 53 | 12:17 | 62.00 | 85% |
| 2850 | Cherry Cr bl Bayou Glch | 53 | 14:08 | 62.00 | 85% |
| 3030 | Bingham Lake Park | 53 | 14:06 | 62.00 | 85% |
| 4080 | Twin Sisters | 53 | 13:32 | 62.00 | 85% |
| 4100 | Filter Plant | 53 | 13:53 | 62.00 | 85% |
| 4140 | Logan Mill | 53 | 14:06 | 62.00 | 85% |
| 4220 | Fling's | 53 | 14:01 | 62.00 | 85% |
| 4240 | Sunset | 53 | 13:08 | 62.00 | 85% |
| 4250 | Geer Canyon | 53 | 12:16 | 62.00 | 85% |
| 4810 | Shanahan Ridge | 53 | 13:15 | 62.00 | 85% |
| 4850 | Porphyry Mtn | 53 | 13:40 | 62.00 | 85% |
| 400 | Montview Park | 54 | 12:48 | 62.00 | 87% |
| 420 | Expo Park | 54 | 12:19 | 62.00 | 87% |
| 600 | Harvard Gulch Park | 54 | 13:06 | 62.00 | 87% |
| 1030 | NREL/S. Table Mtn. | 54 | 13:40 | 62.00 | 87% |
| 1060 | Heritage Square | 54 | 13:27 | 62.00 | 87% |
| 1110 | Gunbarrel | 54 | 12:16 | 62.00 | 87% |
| 1300 | Hidden Lake | 54 | 12:33 | 62.00 | 87% |
| 1340 | Sanderson at Xavier | 54 | 13:40 | 62.00 | 87% |
| 1440 | Wx-Elbert | 54 | 13:05 | 62.00 | 87% |
| 2310 | Genesee Village | 54 | 13:13 | 62.00 | 87% |
| 2350 | Idledale | 54 | 13:23 | 62.00 | 87% |
| 2360 | Indian Hills | 54 | 13:13 | 62.00 | 87% |
| 2370 | Red Rocks Park | 54 | 13:32 | 62.00 | 87% |
| 2910 | East Cherry Cr-Douglas | 54 | 13:05 | 62.00 | 87% |
| 2920 | West Cherry Head-Douglas Cnty | 54 | 12:54 | 62.00 | 87% |
| 2930 | Wx-Spring Valley Rd-DougCnty | 54 | 13:57 | 62.00 | 87% |
| 2940 | Willow Creek - DougCnty | 54 | 13:23 | 62.00 | 87% |
| 2960 | Indian Creek | 54 | 13:12 | 62.00 | 87% |
| 3050 | East/West Trailhead | 54 | 13:08 | 62.00 | 87% |
| 3060 | Fire Sta 47 | 54 | 13:42 | 62.00 | 87% |
| 4020 | Rio Grande | 54 | 13:30 | 62.00 | 87% |
| 4130 | Swiss Peaks | 54 | 13:13 | 62.00 | 87% |

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|------|------------------------|----|-------|-------|-----|
| 4150 | Gold Hill | 54 | 13:13 | 62.00 | 87% |
| 4190 | Slaughterhouse | 54 | 13:09 | 62.00 | 87% |
| 4310 | Johnny Park | 54 | 13:17 | 62.00 | 87% |
| 4360 | Justice Center | 54 | 13:47 | 62.00 | 87% |
| 4820 | Doudy Draw | 54 | 12:32 | 62.00 | 87% |
| 5860 | Cedar Mountain | 54 | 13:05 | 62.00 | 87% |
| 150 | Nott Creek | 55 | 13:32 | 62.00 | 89% |
| 300 | Van Bibber Park | 55 | 13:04 | 62.00 | 89% |
| 320 | Sports Complex | 55 | 12:49 | 62.00 | 89% |
| 820 | ETG @ Buckley | 55 | 13:42 | 62.00 | 89% |
| 1010 | Denver West | 55 | 13:21 | 62.00 | 89% |
| 1040 | Lena @ U.S. Hwy 6 | 55 | 13:21 | 62.00 | 89% |
| 1050 | Jeffco Fairgrounds | 55 | 13:06 | 62.00 | 89% |
| 1200 | Broomfield 3207 | 55 | 13:57 | 62.00 | 89% |
| 1350 | Chatfield COE | 55 | 13:08 | 62.00 | 89% |
| 1570 | Wx-Brighton Ditch | 55 | 12:52 | 62.00 | 89% |
| 2260 | Brook Forest | 55 | 13:25 | 62.00 | 89% |
| 2330 | Morrison | 55 | 13:11 | 62.00 | 89% |
| 2730 | Wx-Salisbury Park | 55 | 13:41 | 62.00 | 89% |
| 2820 | Haskins Gulch Conf | 55 | 12:15 | 62.00 | 89% |
| 2860 | CC at Stroh Rd | 55 | 13:23 | 62.00 | 89% |
| 3090 | Highland Heritage Park | 55 | 13:06 | 62.00 | 89% |
| 4010 | Crescent | 55 | 13:08 | 62.00 | 89% |
| 4110 | Betasso | 55 | 13:08 | 62.00 | 89% |
| 4730 | Wx-Sugarloaf | 55 | 12:54 | 62.00 | 89% |
| 4770 | Wx-Cal-Wood Ranch | 55 | 13:50 | 62.00 | 89% |
| 5740 | Trail Creek | 55 | 13:25 | 62.00 | 89% |
| 5810 | Stump Bump | 55 | 13:05 | 62.00 | 89% |
| 140 | Wx-Blue Mountain | 56 | 12:47 | 62.00 | 90% |
| 510 | Virginia Court | 56 | 13:08 | 62.00 | 90% |
| 620 | Quincy/Highline | 56 | 12:46 | 62.00 | 90% |
| 840 | Fire Station 12 | 56 | 12:48 | 62.00 | 90% |
| 970 | Pump Sta 3 | 56 | 12:00 | 62.00 | 90% |
| 1600 | Englewood Dam | 56 | 12:44 | 62.00 | 90% |
| 1640 | SPR at Union Ave. | 56 | 13:01 | 62.00 | 90% |
| 1810 | Sand Creek at mouth | 56 | 13:23 | 62.00 | 90% |
| 1920 | Wx-Brighton | 56 | 13:21 | 62.00 | 90% |
| 2870 | Cottonwood (Apache) | 56 | 12:43 | 62.00 | 90% |
| 3010 | EPC at Hwy 105 | 56 | 12:32 | 62.00 | 90% |
| 3020 | Wx-West Creek WX | 56 | 13:18 | 62.00 | 90% |
| 4030 | Red Garden | 56 | 12:31 | 62.00 | 90% |
| 4160 | Sunshine | 56 | 12:33 | 62.00 | 90% |
| 4260 | Taylor Mountain | 56 | 13:09 | 62.00 | 90% |
| 4270 | Cannon Mountain | 56 | 12:38 | 62.00 | 90% |
| 4300 | Big Elk Park | 56 | 12:32 | 62.00 | 90% |
| 4350 | Conifer Hill | 56 | 13:06 | 62.00 | 90% |
| 200 | Leyden Reservoir | 57 | 12:29 | 62.00 | 92% |
| 220 | Upper Leyden | 57 | 12:51 | 62.00 | 92% |
| 440 | Fire Station #7 | 57 | 12:46 | 62.00 | 92% |
| 530 | Fire Station #19 | 57 | 13:04 | 62.00 | 92% |
| 1330 | Roslyn | 57 | 12:48 | 62.00 | 92% |
| 1360 | Denver Zoo | 57 | 12:50 | 62.00 | 92% |
| 2210 | Wx-Hiwan G.C. | 57 | 12:54 | 62.00 | 92% |
| 2750 | Wx-Castle Rock | 57 | 12:46 | 62.00 | 92% |
| 2990 | Wx-Tomah Rd-DougCnty | 57 | 13:05 | 62.00 | 92% |
| 4040 | Martin Gulch | 57 | 12:49 | 62.00 | 92% |
| 4230 | Golden Age | 57 | 13:06 | 62.00 | 92% |
| 4840 | SBC@S Boulder Ditch | 57 | 12:48 | 62.00 | 92% |
| 5730 | West Creek | 57 | 13:01 | 62.00 | 92% |

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|------|---------------------|----|-------|-------|------|
| 860 | Sand Cr at Colfax | 58 | 12:47 | 62.00 | 94% |
| 1000 | Maple Grove Resv. | 58 | 12:43 | 62.00 | 94% |
| 1320 | SPR at 3rd Ave | 58 | 12:45 | 62.00 | 94% |
| 5880 | Hackett Mountain | 58 | 12:49 | 62.00 | 94% |
| 4180 | Gold Lake | 59 | 12:48 | 62.00 | 95% |
| 4520 | Eagle Ridge | 59 | 12:31 | 62.00 | 95% |
| 4750 | Wx-Louisville Lake | 59 | 12:34 | 62.00 | 95% |
| 640 | Goldsmith @ Eastman | 60 | 11:14 | 62.00 | 97% |
| 4340 | Riverside | 60 | 12:33 | 62.00 | 97% |
| 950 | Piney at Liverpool | 67 | 10:02 | 62.00 | 100% |

| Rain Event Performance | | | | Analyze Rain Sensors | | | | | | | | | | |
|------------------------|----------------|------------------|--------|----------------------|--------|--------|--------|---------|-----|-----|------|------|-----------|--|
| | | Reports Received | 12,977 | | | | | | | | | | | |
| | Systemwide Avg | Total Tips | 15,848 | | | | | | | | | | | |
| | 81.88% | Data Loss | 18.12% | | | | | | | | | | | |
| Rain ID | Performance | 1-tips | 2-tips | 3-tips | 4-tips | 5-tips | 6-tips | >6-tips | Rcv | Exp | miss | hold | bucket | |
| 1620 | 15% | 7 | 2 | 1 | 1 | 1 | 0 | 3 | 12 | 82 | 70 | 0 | 0.0393701 | |
| 1660 | 28% | 22 | 3 | 1 | 1 | 0 | 0 | 3 | 27 | 95 | 68 | 0 | 0.0393701 | |
| 810 | 34% | 32 | 6 | 1 | 0 | 0 | 1 | 2 | 40 | 118 | 78 | 0 | 0.0393701 | |
| 650 | 34% | 23 | 5 | 1 | 0 | 1 | 1 | 2 | 31 | 91 | 60 | 0 | 0.0393701 | |
| 940 | 35% | 36 | 3 | 0 | 0 | 1 | 0 | 3 | 40 | 113 | 73 | 0 | 0.0393699 | |
| 1900 | 36% | 30 | 2 | 2 | 2 | 0 | 1 | 3 | 37 | 104 | 67 | 0 | 0.0393701 | |
| 500 | 37% | 29 | 2 | 1 | 1 | 2 | 1 | 3 | 36 | 97 | 61 | 0 | 0.0393701 | |
| 520 | 38% | 32 | 4 | 2 | 1 | 0 | 0 | 4 | 39 | 102 | 63 | 0 | 0.0393701 | |
| 1710 | 39% | 32 | 8 | 2 | 0 | 0 | 0 | 3 | 42 | 108 | 66 | 0 | 0.0393701 | |
| 830 | 39% | 29 | 4 | 6 | 0 | 2 | 1 | 2 | 42 | 108 | 66 | 0 | 0.0393701 | |
| 540 | 40% | 32 | 3 | 0 | 0 | 0 | 0 | 2 | 35 | 88 | 53 | 0 | 0.0393701 | |
| 710 | 40% | 37 | 3 | 0 | 1 | 0 | 0 | 4 | 41 | 102 | 61 | 0 | 0.0393701 | |
| 1800 | 40% | 34 | 4 | 1 | 0 | 1 | 0 | 3 | 40 | 99 | 59 | 0 | 0.0393701 | |
| 730 | 41% | 19 | 5 | 1 | 1 | 1 | 0 | 2 | 27 | 66 | 39 | 0 | 0.0393701 | |
| 410 | 41% | 39 | 0 | 1 | 0 | 1 | 0 | 3 | 41 | 99 | 58 | 0 | 0.0393701 | |
| 630 | 42% | 49 | 4 | 3 | 0 | 0 | 1 | 5 | 57 | 136 | 79 | 0 | 0.0393701 | |
| 430 | 44% | 53 | 7 | 3 | 2 | 1 | 0 | 5 | 66 | 150 | 84 | 0 | 0.0393701 | |
| 920 | 44% | 46 | 8 | 3 | 0 | 0 | 0 | 2 | 57 | 129 | 72 | 0 | 0.0393701 | |
| 750 | 45% | 32 | 6 | 2 | 2 | 0 | 0 | 3 | 42 | 94 | 52 | 0 | 0.0393701 | |
| 760 | 46% | 44 | 3 | 4 | 0 | 0 | 0 | 4 | 51 | 112 | 61 | 0 | 0.0393701 | |
| 850 | 46% | 35 | 10 | 3 | 1 | 1 | 0 | 2 | 50 | 108 | 58 | 0 | 0.0393701 | |
| 1700 | 49% | 28 | 9 | 1 | 0 | 0 | 0 | 1 | 38 | 77 | 39 | 0 | 0.0393701 | |
| 870 | 51% | 46 | 3 | 4 | 0 | 1 | 0 | 3 | 54 | 105 | 51 | 0 | 0.0393701 | |
| 2190 | 61% | 27 | 0 | 0 | 0 | 0 | 0 | 1 | 27 | 44 | 17 | 0 | 0.0393701 | |
| 4470 | 69% | 43 | 16 | 1 | 2 | 1 | 0 | 0 | 63 | 91 | 28 | 0 | 0.0393701 | |
| 2980 | 70% | 34 | 20 | 2 | 0 | 0 | 0 | 0 | 56 | 80 | 24 | 0 | 0.0393701 | |
| 2250 | 71% | 43 | 9 | 1 | 4 | 0 | 0 | 0 | 57 | 80 | 23 | 0 | 0.0393701 | |
| 4330 | 72% | 60 | 12 | 4 | 2 | 0 | 1 | 0 | 79 | 110 | 31 | 0 | 0.0393701 | |
| 2270 | 72% | 44 | 9 | 4 | 2 | 0 | 0 | 0 | 59 | 82 | 23 | 0 | 0.0393701 | |
| 2730 | 78% | 45 | 13 | 2 | 0 | 0 | 0 | 0 | 60 | 77 | 17 | 0 | 0.0393701 | |
| 4520 | 79% | 60 | 10 | 3 | 0 | 1 | 0 | 0 | 74 | 94 | 20 | 0 | 0.0393701 | |
| 4490 | 80% | 60 | 9 | 5 | 0 | 0 | 0 | 0 | 74 | 93 | 19 | 0 | 0.0393701 | |
| 110 | 80% | 63 | 7 | 4 | 0 | 1 | 0 | 0 | 75 | 94 | 19 | 0 | 0.0393701 | |
| 4820 | 81% | 73 | 7 | 3 | 0 | 0 | 0 | 1 | 83 | 103 | 20 | 0 | 0.0393701 | |
| 4790 | 81% | 64 | 10 | 4 | 0 | 0 | 0 | 0 | 78 | 96 | 18 | 0 | 0.0393701 | |
| 4550 | 82% | 80 | 13 | 4 | 0 | 0 | 0 | 0 | 97 | 118 | 21 | 0 | 0.0393701 | |
| 1530 | 82% | 64 | 13 | 2 | 0 | 0 | 0 | 0 | 79 | 96 | 17 | 0 | 0.0393701 | |
| 2280 | 83% | 47 | 8 | 2 | 0 | 0 | 0 | 0 | 57 | 69 | 12 | 0 | 0.0393701 | |
| 2330 | 83% | 63 | 13 | 0 | 1 | 0 | 0 | 0 | 77 | 93 | 16 | 1 | 0.0393701 | |
| 4240 | 84% | 42 | 8 | 1 | 0 | 0 | 0 | 0 | 51 | 61 | 10 | 0 | 0.0393701 | |
| 4510 | 84% | 79 | 10 | 2 | 0 | 1 | 0 | 0 | 92 | 110 | 18 | 0 | 0.0393701 | |
| 4530 | 84% | 61 | 8 | 3 | 0 | 0 | 0 | 0 | 72 | 86 | 14 | 0 | 0.0393701 | |
| 1320 | 84% | 66 | 10 | 1 | 1 | 0 | 0 | 0 | 78 | 93 | 15 | 0 | 0.0393701 | |
| 1720 | 85% | 65 | 10 | 2 | 0 | 0 | 0 | 0 | 77 | 91 | 14 | 0 | 0.0393701 | |
| 310 | 85% | 44 | 4 | 1 | 1 | 0 | 0 | 0 | 50 | 59 | 9 | 0 | 0.0393701 | |
| 4830 | 85% | 86 | 7 | 3 | 0 | 1 | 0 | 0 | 97 | 114 | 17 | 0 | 0.0393701 | |
| 420 | 86% | 84 | 11 | 1 | 1 | 0 | 0 | 0 | 97 | 113 | 16 | 0 | 0.0393701 | |
| 2950 | 86% | 55 | 5 | 1 | 1 | 0 | 0 | 0 | 62 | 72 | 10 | 0 | 0.0393701 | |
| 800 | 86% | 86 | 12 | 2 | 0 | 0 | 0 | 0 | 100 | 116 | 16 | 0 | 0.0393701 | |
| 1010 | 86% | 72 | 7 | 3 | 0 | 0 | 0 | 0 | 82 | 95 | 13 | 0 | 0.0393701 | |
| 4010 | 86% | 71 | 10 | 0 | 1 | 0 | 0 | 0 | 82 | 95 | 13 | 0 | 0.0393701 | |
| 530 | 86% | 71 | 11 | 1 | 0 | 0 | 0 | 0 | 83 | 96 | 13 | 0 | 0.0393701 | |
| 1360 | 86% | 85 | 9 | 1 | 0 | 1 | 0 | 0 | 96 | 111 | 15 | 0 | 0.0393701 | |
| 4110 | 87% | 73 | 13 | 0 | 0 | 0 | 0 | 0 | 86 | 99 | 13 | 0 | 0.0393701 | |
| 4750 | 87% | 74 | 11 | 1 | 0 | 0 | 0 | 0 | 86 | 99 | 13 | 0 | 0.0393701 | |
| 620 | 87% | 69 | 10 | 1 | 0 | 0 | 0 | 0 | 80 | 92 | 12 | 0 | 0.0393701 | |
| 2870 | 87% | 71 | 7 | 1 | 1 | 0 | 0 | 0 | 80 | 92 | 12 | 0 | 0.0393701 | |
| 4250 | 87% | 89 | 10 | 1 | 1 | 0 | 0 | 0 | 101 | 116 | 15 | 0 | 0.0393701 | |
| 2350 | 87% | 64 | 11 | 0 | 0 | 0 | 0 | 0 | 75 | 86 | 11 | 0 | 0.0393701 | |
| 1420 | 88% | 80 | 9 | 2 | 0 | 0 | 0 | 0 | 91 | 104 | 13 | 0 | 0.0393701 | |
| 4060 | 88% | 68 | 9 | 1 | 0 | 0 | 0 | 0 | 78 | 89 | 11 | 0 | 0.0393701 | |
| 2340 | 88% | 56 | 7 | 1 | 0 | 0 | 0 | 0 | 64 | 73 | 9 | 0 | 0.0393701 | |
| 2990 | 88% | 45 | 3 | 2 | 0 | 0 | 0 | 0 | 50 | 57 | 7 | 0 | 0.0393701 | |
| 600 | 88% | 71 | 8 | 0 | 1 | 0 | 0 | 0 | 80 | 91 | 11 | 0 | 0.0393701 | |
| 1520 | 88% | 70 | 9 | 1 | 0 | 0 | 0 | 0 | 80 | 91 | 11 | 1 | 0.0393701 | |
| 3080 | 88% | 70 | 9 | 1 | 0 | 0 | 0 | 0 | 80 | 91 | 11 | 0 | 0.0393701 | |

| | | | | | | | | | | | | | |
|------|-----|-----|----|---|---|---|---|---|-----|-----|----|---|-----------|
| 4020 | 88% | 78 | 8 | 2 | 0 | 0 | 0 | 0 | 88 | 100 | 12 | 0 | 0.0393701 |
| 320 | 88% | 101 | 7 | 2 | 0 | 1 | 0 | 0 | 111 | 126 | 15 | 0 | 0.0393701 |
| 4070 | 88% | 79 | 8 | 2 | 0 | 0 | 0 | 0 | 89 | 101 | 12 | 0 | 0.0393701 |
| 720 | 88% | 79 | 10 | 1 | 0 | 0 | 0 | 0 | 90 | 102 | 12 | 0 | 0.0393701 |
| 4810 | 88% | 93 | 12 | 1 | 0 | 0 | 0 | 0 | 106 | 120 | 14 | 0 | 0.0393701 |
| 1920 | 88% | 81 | 8 | 2 | 0 | 0 | 0 | 0 | 91 | 103 | 12 | 0 | 0.0393701 |
| 4290 | 88% | 88 | 9 | 2 | 0 | 0 | 0 | 0 | 99 | 112 | 13 | 0 | 0.0393701 |
| 1440 | 89% | 41 | 6 | 0 | 0 | 0 | 0 | 0 | 47 | 53 | 6 | 0 | 0.0393701 |
| 860 | 89% | 91 | 9 | 2 | 0 | 0 | 0 | 0 | 102 | 115 | 13 | 0 | 0.0393701 |
| 2820 | 89% | 55 | 8 | 0 | 0 | 0 | 0 | 0 | 63 | 71 | 8 | 0 | 0.0393701 |
| 840 | 89% | 92 | 9 | 2 | 0 | 0 | 0 | 0 | 103 | 116 | 13 | 0 | 0.0393701 |
| 3090 | 89% | 78 | 11 | 0 | 0 | 0 | 0 | 0 | 89 | 100 | 11 | 0 | 0.0393701 |
| 4310 | 89% | 80 | 8 | 0 | 1 | 0 | 0 | 0 | 89 | 100 | 11 | 0 | 0.0393701 |
| 2850 | 89% | 74 | 6 | 2 | 0 | 0 | 0 | 0 | 82 | 92 | 10 | 0 | 0.0393701 |
| 1370 | 89% | 58 | 8 | 0 | 0 | 0 | 0 | 0 | 66 | 74 | 8 | 0 | 0.0393701 |
| 2840 | 89% | 73 | 10 | 0 | 0 | 0 | 0 | 0 | 83 | 93 | 10 | 0 | 0.0393701 |
| 4730 | 89% | 66 | 9 | 0 | 0 | 0 | 0 | 0 | 75 | 84 | 9 | 0 | 0.0393701 |
| 2810 | 90% | 54 | 5 | 1 | 0 | 0 | 0 | 0 | 60 | 67 | 7 | 0 | 0.0393701 |
| 1300 | 90% | 86 | 7 | 2 | 0 | 0 | 0 | 0 | 95 | 106 | 11 | 0 | 0.0393701 |
| 1480 | 90% | 85 | 9 | 1 | 0 | 0 | 0 | 0 | 95 | 106 | 11 | 0 | 0.0393701 |
| 1570 | 90% | 100 | 13 | 0 | 0 | 0 | 0 | 0 | 113 | 126 | 13 | 0 | 0.0393701 |
| 3030 | 90% | 79 | 10 | 0 | 0 | 0 | 0 | 0 | 89 | 99 | 10 | 0 | 0.0393701 |
| 4170 | 90% | 80 | 8 | 1 | 0 | 0 | 0 | 0 | 89 | 99 | 10 | 0 | 0.0393701 |
| 440 | 90% | 82 | 7 | 0 | 1 | 0 | 0 | 0 | 90 | 100 | 10 | 0 | 0.0393701 |
| 950 | 90% | 90 | 8 | 0 | 1 | 0 | 0 | 0 | 99 | 110 | 11 | 0 | 0.0393701 |
| 2320 | 90% | 77 | 2 | 2 | 1 | 0 | 0 | 0 | 82 | 91 | 9 | 0 | 0.0393701 |
| 1050 | 90% | 68 | 6 | 1 | 0 | 0 | 0 | 0 | 75 | 83 | 8 | 0 | 0.0393701 |
| 820 | 90% | 85 | 8 | 1 | 0 | 0 | 0 | 0 | 94 | 104 | 10 | 0 | 0.0393701 |
| 200 | 90% | 68 | 8 | 0 | 0 | 0 | 0 | 0 | 76 | 84 | 8 | 0 | 0.0393701 |
| 700 | 90% | 85 | 10 | 0 | 0 | 0 | 0 | 0 | 95 | 105 | 10 | 0 | 0.0393701 |
| 3050 | 91% | 70 | 8 | 0 | 0 | 0 | 0 | 0 | 78 | 86 | 8 | 0 | 0.0393701 |
| 640 | 91% | 106 | 10 | 1 | 0 | 0 | 0 | 0 | 117 | 129 | 12 | 0 | 0.0393701 |
| 400 | 91% | 79 | 9 | 0 | 0 | 0 | 0 | 0 | 88 | 97 | 9 | 0 | 0.0393701 |
| 970 | 91% | 73 | 6 | 1 | 0 | 0 | 0 | 0 | 80 | 88 | 8 | 0 | 0.0393701 |
| 4360 | 91% | 92 | 8 | 1 | 0 | 0 | 0 | 0 | 101 | 111 | 10 | 0 | 0.0393701 |
| 4570 | 91% | 65 | 5 | 1 | 0 | 0 | 0 | 0 | 71 | 78 | 7 | 0 | 0.0393701 |
| 4140 | 91% | 74 | 8 | 0 | 0 | 0 | 0 | 0 | 82 | 90 | 8 | 0 | 0.0393701 |
| 2920 | 91% | 29 | 1 | 1 | 0 | 0 | 0 | 0 | 31 | 34 | 3 | 0 | 0.0393701 |
| 210 | 91% | 105 | 8 | 0 | 1 | 0 | 0 | 0 | 114 | 125 | 11 | 0 | 0.0393701 |
| 330 | 91% | 76 | 6 | 1 | 0 | 0 | 0 | 0 | 83 | 91 | 8 | 0 | 0.0393701 |
| 2900 | 91% | 77 | 6 | 1 | 0 | 0 | 0 | 0 | 84 | 92 | 8 | 0 | 0.0393701 |
| 1810 | 91% | 96 | 8 | 1 | 0 | 0 | 0 | 0 | 105 | 115 | 10 | 0 | 0.0393701 |
| 4090 | 91% | 87 | 7 | 1 | 0 | 0 | 0 | 0 | 95 | 104 | 9 | 0 | 0.0393701 |
| 4190 | 91% | 87 | 9 | 0 | 0 | 0 | 0 | 0 | 96 | 105 | 9 | 0 | 0.0393701 |
| 4130 | 91% | 69 | 5 | 1 | 0 | 0 | 0 | 0 | 75 | 82 | 7 | 0 | 0.0393701 |
| 1600 | 91% | 79 | 6 | 1 | 0 | 0 | 0 | 0 | 86 | 94 | 8 | 0 | 0.0393701 |
| 4350 | 91% | 79 | 6 | 1 | 0 | 0 | 0 | 0 | 86 | 94 | 8 | 0 | 0.0393701 |
| 610 | 92% | 80 | 6 | 1 | 0 | 0 | 0 | 0 | 87 | 95 | 8 | 0 | 0.0393701 |
| 2370 | 92% | 71 | 5 | 1 | 0 | 0 | 0 | 0 | 77 | 84 | 7 | 0 | 0.0393701 |
| 4150 | 92% | 81 | 6 | 1 | 0 | 0 | 0 | 0 | 88 | 96 | 8 | 0 | 0.0393701 |
| 510 | 92% | 81 | 8 | 0 | 0 | 0 | 0 | 0 | 89 | 97 | 8 | 0 | 0.0393701 |
| 3060 | 92% | 72 | 5 | 1 | 0 | 0 | 0 | 0 | 78 | 85 | 7 | 0 | 0.0393701 |
| 1200 | 92% | 85 | 4 | 2 | 0 | 0 | 0 | 0 | 91 | 99 | 8 | 0 | 0.0393701 |
| 4340 | 92% | 73 | 7 | 0 | 0 | 0 | 0 | 0 | 80 | 87 | 7 | 0 | 0.0393701 |
| 1400 | 92% | 55 | 3 | 1 | 0 | 0 | 0 | 0 | 59 | 64 | 5 | 0 | 0.0393701 |
| 2860 | 92% | 78 | 3 | 2 | 0 | 0 | 0 | 0 | 83 | 90 | 7 | 0 | 0.0393701 |
| 4200 | 92% | 89 | 6 | 1 | 0 | 0 | 0 | 0 | 96 | 104 | 8 | 0 | 0.0393701 |
| 1500 | 92% | 90 | 6 | 1 | 0 | 0 | 0 | 0 | 97 | 105 | 8 | 0 | 0.0393701 |
| 4270 | 92% | 80 | 3 | 2 | 0 | 0 | 0 | 0 | 85 | 92 | 7 | 0 | 0.0393701 |
| 2260 | 92% | 68 | 4 | 1 | 0 | 0 | 0 | 0 | 73 | 79 | 6 | 0 | 0.0393701 |
| 4080 | 92% | 69 | 3 | 0 | 1 | 0 | 0 | 0 | 73 | 79 | 6 | 0 | 0.0393701 |
| 100 | 92% | 91 | 6 | 1 | 0 | 0 | 0 | 0 | 98 | 106 | 8 | 0 | 0.0393701 |
| 1640 | 93% | 68 | 6 | 0 | 0 | 0 | 0 | 0 | 74 | 80 | 6 | 0 | 0.0393701 |
| 1460 | 93% | 93 | 6 | 1 | 0 | 0 | 0 | 0 | 100 | 108 | 8 | 0 | 0.0393701 |
| 2240 | 93% | 71 | 4 | 1 | 0 | 0 | 0 | 0 | 76 | 82 | 6 | 0 | 0.0393701 |
| 1340 | 93% | 86 | 1 | 1 | 0 | 1 | 0 | 0 | 89 | 96 | 7 | 0 | 0.0393701 |
| 4100 | 93% | 82 | 7 | 0 | 0 | 0 | 0 | 0 | 89 | 96 | 7 | 0 | 0.0393701 |
| 1040 | 93% | 72 | 6 | 0 | 0 | 0 | 0 | 0 | 78 | 84 | 6 | 0 | 0.0393701 |
| 2230 | 93% | 74 | 2 | 2 | 0 | 0 | 0 | 0 | 78 | 84 | 6 | 0 | 0.0393701 |
| 300 | 93% | 88 | 3 | 2 | 0 | 0 | 0 | 0 | 93 | 100 | 7 | 0 | 0.0393701 |
| 4260 | 93% | 74 | 6 | 0 | 0 | 0 | 0 | 0 | 80 | 86 | 6 | 0 | 0.0393701 |

| | | | | | | | | | | | | | |
|--------------|------|---------------|--------------|------------|-----------|-----------|----------|-----------|---------------|---------------|--------------|----------|-----------|
| 2960 | 93% | 75 | 6 | 0 | 0 | 0 | 0 | 0 | 81 | 87 | 6 | 0 | 0.0393701 |
| 4770 | 93% | 75 | 6 | 0 | 0 | 0 | 0 | 0 | 81 | 87 | 6 | 0 | 0.0393701 |
| 4840 | 93% | 101 | 6 | 1 | 0 | 0 | 0 | 0 | 108 | 116 | 8 | 0 | 0.0393701 |
| 2750 | 93% | 51 | 4 | 0 | 0 | 0 | 0 | 0 | 55 | 59 | 4 | 0 | 0.0393701 |
| 4030 | 93% | 105 | 8 | 0 | 0 | 0 | 0 | 0 | 113 | 121 | 8 | 0 | 0.0393701 |
| 4300 | 93% | 66 | 5 | 0 | 0 | 0 | 0 | 0 | 71 | 76 | 5 | 0 | 0.0393701 |
| 4180 | 93% | 80 | 6 | 0 | 0 | 0 | 0 | 0 | 86 | 92 | 6 | 0 | 0.0393701 |
| 4050 | 94% | 72 | 3 | 1 | 0 | 0 | 0 | 0 | 76 | 81 | 5 | 0 | 0.0393701 |
| 120 | 94% | 86 | 6 | 0 | 0 | 0 | 0 | 0 | 92 | 98 | 6 | 0 | 0.0393701 |
| 1330 | 94% | 87 | 6 | 0 | 0 | 0 | 0 | 0 | 93 | 99 | 6 | 0 | 0.0393701 |
| 220 | 94% | 88 | 6 | 0 | 0 | 0 | 0 | 0 | 94 | 100 | 6 | 0 | 0.0393701 |
| 1110 | 94% | 89 | 4 | 1 | 0 | 0 | 0 | 0 | 94 | 100 | 6 | 0 | 0.0393701 |
| 1550 | 94% | 89 | 6 | 0 | 0 | 0 | 0 | 0 | 95 | 101 | 6 | 0 | 0.0393701 |
| 4220 | 94% | 90 | 4 | 1 | 0 | 0 | 0 | 0 | 95 | 101 | 6 | 0 | 0.0393701 |
| 1310 | 94% | 95 | 6 | 0 | 0 | 0 | 0 | 0 | 101 | 107 | 6 | 0 | 0.0393701 |
| 1100 | 94% | 64 | 4 | 0 | 0 | 0 | 0 | 0 | 68 | 72 | 4 | 0 | 0.0393701 |
| 2210 | 94% | 64 | 4 | 0 | 0 | 0 | 0 | 0 | 68 | 72 | 4 | 0 | 0.0393701 |
| 900 | 95% | 87 | 5 | 0 | 0 | 0 | 0 | 0 | 92 | 97 | 5 | 0 | 0.0393699 |
| 1030 | 95% | 88 | 5 | 0 | 0 | 0 | 0 | 0 | 93 | 98 | 5 | 0 | 0.0393701 |
| 1000 | 96% | 95 | 4 | 0 | 0 | 0 | 0 | 0 | 99 | 103 | 4 | 0 | 0.0393701 |
| 1060 | 96% | 77 | 3 | 0 | 0 | 0 | 0 | 0 | 80 | 83 | 3 | 0 | 0.0393701 |
| 2310 | 96% | 103 | 4 | 0 | 0 | 0 | 0 | 0 | 107 | 111 | 4 | 0 | 0.0393701 |
| 4040 | 96% | 103 | 4 | 0 | 0 | 0 | 0 | 0 | 107 | 111 | 4 | 0 | 0.0393701 |
| 2360 | 97% | 81 | 3 | 0 | 0 | 0 | 0 | 0 | 84 | 87 | 3 | 0 | 0.0393701 |
| 4230 | 97% | 55 | 2 | 0 | 0 | 0 | 0 | 0 | 57 | 59 | 2 | 0 | 0.0393701 |
| 2930 | 97% | 28 | 1 | 0 | 0 | 0 | 0 | 0 | 29 | 30 | 1 | 0 | 0.0393701 |
| 150 | 97% | 84 | 3 | 0 | 0 | 0 | 0 | 0 | 87 | 90 | 3 | 0 | 0.0393701 |
| 4160 | 97% | 94 | 3 | 0 | 0 | 0 | 0 | 0 | 97 | 100 | 3 | 0 | 0.0393701 |
| 1350 | 97% | 32 | 1 | 0 | 0 | 0 | 0 | 0 | 33 | 34 | 1 | 0 | 0.0393701 |
| 2710 | 97% | 34 | 1 | 0 | 0 | 0 | 0 | 0 | 35 | 36 | 1 | 0 | 0.0393701 |
| 3020 | 98% | 38 | 1 | 0 | 0 | 0 | 0 | 0 | 39 | 40 | 1 | 0 | 0.0393701 |
| 2910 | 98% | 40 | 1 | 0 | 0 | 0 | 0 | 0 | 41 | 42 | 1 | 0 | 0.0393701 |
| 2940 | 100% | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 46 | 0 | 0 | 0.0393701 |
| 140 | 100% | 82 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 82 | 0 | 0 | 0.0393701 |
| TOTAL | | 11,607 | 1,121 | 183 | 38 | 21 | 7 | 69 | 12,977 | 15,848 | 2,871 | 2 | |
| 2970 | 82% | 118 | 13 | 2 | 1 | 1 | 1 | 0 | 136 | 165 | 29 | 0 | 0.0393701 |
| 3010 | 84% | 111 | 14 | 2 | 1 | 1 | 0 | 0 | 129 | 154 | 25 | 0 | 0.01 |
| 4850 | 82% | 261 | 41 | 12 | 1 | 0 | 0 | 0 | 315 | 383 | 68 | 0 | 0.01 |
| 4860 | 89% | 243 | 24 | 4 | 1 | 0 | 0 | 0 | 272 | 307 | 35 | 0 | 0.01 |
| 5720 | 83% | 21 | 2 | 0 | 1 | 0 | 0 | 0 | 24 | 29 | 5 | 0 | 0.0393701 |
| 5730 | 97% | 29 | 1 | 0 | 0 | 0 | 0 | 0 | 30 | 31 | 1 | 0 | 0.0393701 |
| 5740 | 95% | 36 | 2 | 0 | 0 | 0 | 0 | 0 | 38 | 40 | 2 | 0 | 0.0393701 |
| 5810 | 98% | 46 | 1 | 0 | 0 | 0 | 0 | 0 | 47 | 48 | 1 | 0 | 0.0393701 |
| 5860 | 89% | 29 | 2 | 1 | 0 | 0 | 0 | 0 | 32 | 36 | 4 | 0 | 0.0393701 |
| 5880 | 96% | 23 | 1 | 0 | 0 | 0 | 0 | 0 | 24 | 25 | 1 | 0 | 0.0393701 |
| 5940 | 67% | 5 | 0 | 0 | 1 | 0 | 0 | 2 | 6 | 9 | 3 | 0 | 0.0393701 |

2011 Monthly ALERT Radio Traffic Summary

