2015 Rainfall Analysis

Executive Summary

- In spite of the summer drought, the 2015 total rainfall volume was 41.04 inches, which is 13.4% above the historical average from 1981-2012.
- While above the historical average, 8 fewer inches of rain were recorded in 2015 than in 2014, with 20 fewer days of greater than 0.10 inches of rain recorded.
- Rainfall in December was the highest on record, while rainfall during the months of May and June both came within 0.2 inches from setting record lows.

Historical Rainfall Comparison

The average annual rainfall for the period of record (1981 to 2012) is 36.19 inches, while the 2015 total was 41.04 inches[1].

The following charts indicate that Bellevue rainfall during 2015 was somewhat unusual with respect to historical trends. A summary of these findings is outlined below.

- Nine months of the year had rainfall totals outside expected range. Rainfall in the month of December established a new historical record for high monthly rainfall, while totals for the months of May and June were each within two-tenths of an inch from setting historical low records. In contrast, September, October, and November rainfalls were slightly higher than average, but were within the expected ranges.
- Considerable variability in rainfall amounts were seen throughout the city. The lowest annual rainfall volume was recorded near Meydenbauer Bay (225 ft. above sea level), where the gauge recorded 40.6 inches of rain. The Lakemont gauge is located at a higher elevation (618 ft. above sea level) and recorded the highest annual volume of 50.2 inches. This variability can be seen spatially in **Appendix A.** A number of factors determine this variability, including elevation, as well as proximity to spatially small, but strong storm cells.
- Bellevue experienced few storms this year, all of which were typical of a traditional, wet season event. The largest of these storms occurred on March 15th, and within a six-hour period there were 1.09 inches of rain recorded at Coal Creek near I-405. This amount corresponds to a 4 year storm event, which contributed to urban flooding.

Over the last three years, the City's rainfall patterns have been outside historical patterns and the variation has not been consistent between years. It is uncertain whether the recent variability is an on-going trend, as our period of record is not sufficient to make assumptions about climate change.

[1] Rainfall totals refer to City of Bellevue gauge near I-405 & SR-520 interchange.

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Monthly Averages

The charts on the following two pages show historical rainfall amounts. The first chart (bar graph) shows the historical (1981-2012) average monthly rainfall (grey) and the 2013, 2014, and 2015 totals (orange, blue, and red, respectively). The second chart is a box plot[2] showing historical monthly rainfall statistics, as well as monthly totals for 2013, 2014, and 2015.

Number of Rain Days

In addition, a box plot is included in this report which shows statistics for the number of rain days experienced during the previous three years against the period of record (1990-2012). This plot is included to show just how often it rains each month. Note that the period of record shown begins in 1990, which was when the gauge was moved to its present location, since rainfall patterns vary by location within the city.

[2] A box plot is a graphical depiction of a statistical summary of a dataset. The upper-most and lower-most boundaries of the box represent the upper and lower quartiles (75th and 25th percentiles), respectively. The line in the center of the box represents the median data point (50th percentile). The upper and lower points, connected to the box by vertical lines, represent the highest and lowest observed data points.

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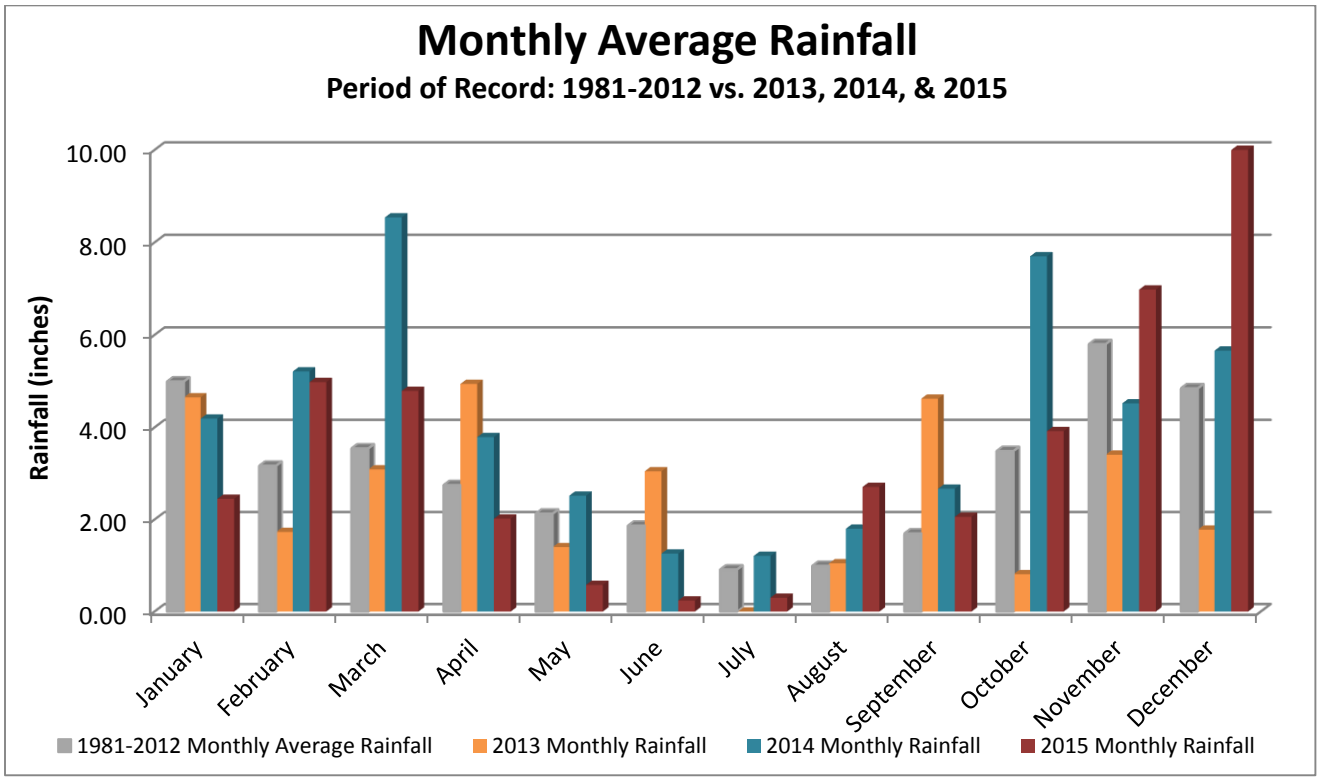
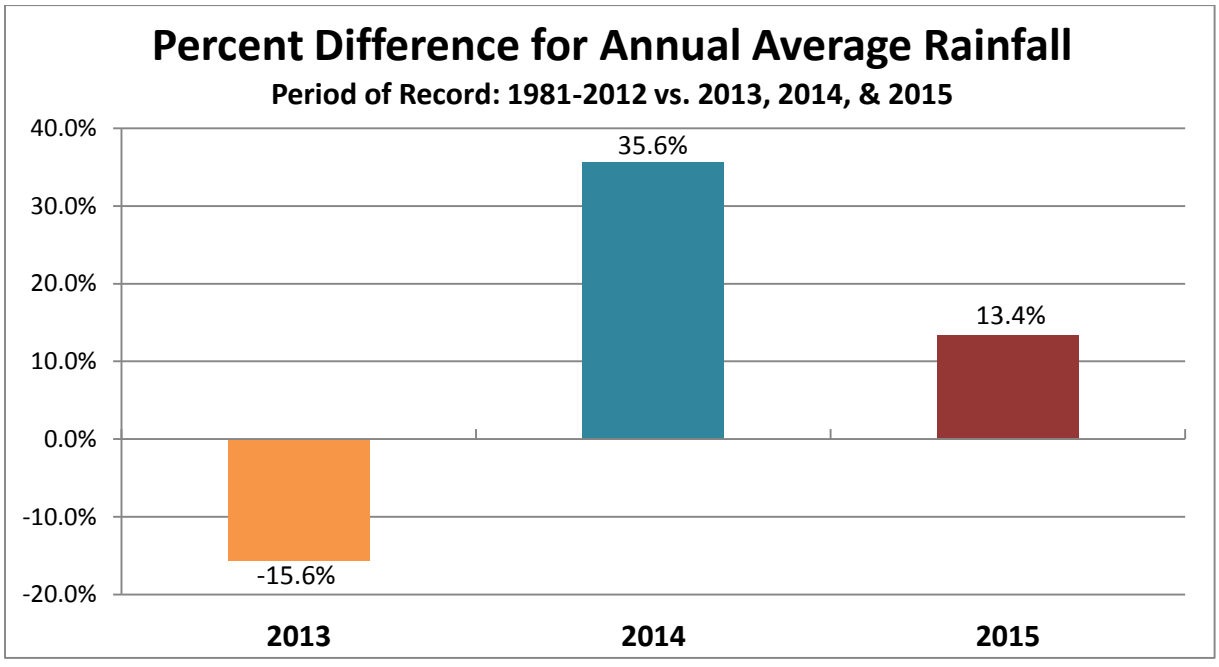
Monthly Averages: Chart 1

This chart shows the historical average monthly rainfall (grey) and the 2013, 2014, and 2015 totals (orange, blue, and red, respectively). The second chart displays the percent difference in annual average rainfall for 2013, 2014, and 2015, from the average for the period of record (1981-2012).



*Gauge location: near I-405 and SR 520 interchange, Bellevue, WA



*Gauge location: near I-405 and SR 520 interchange, Bellevue, WA

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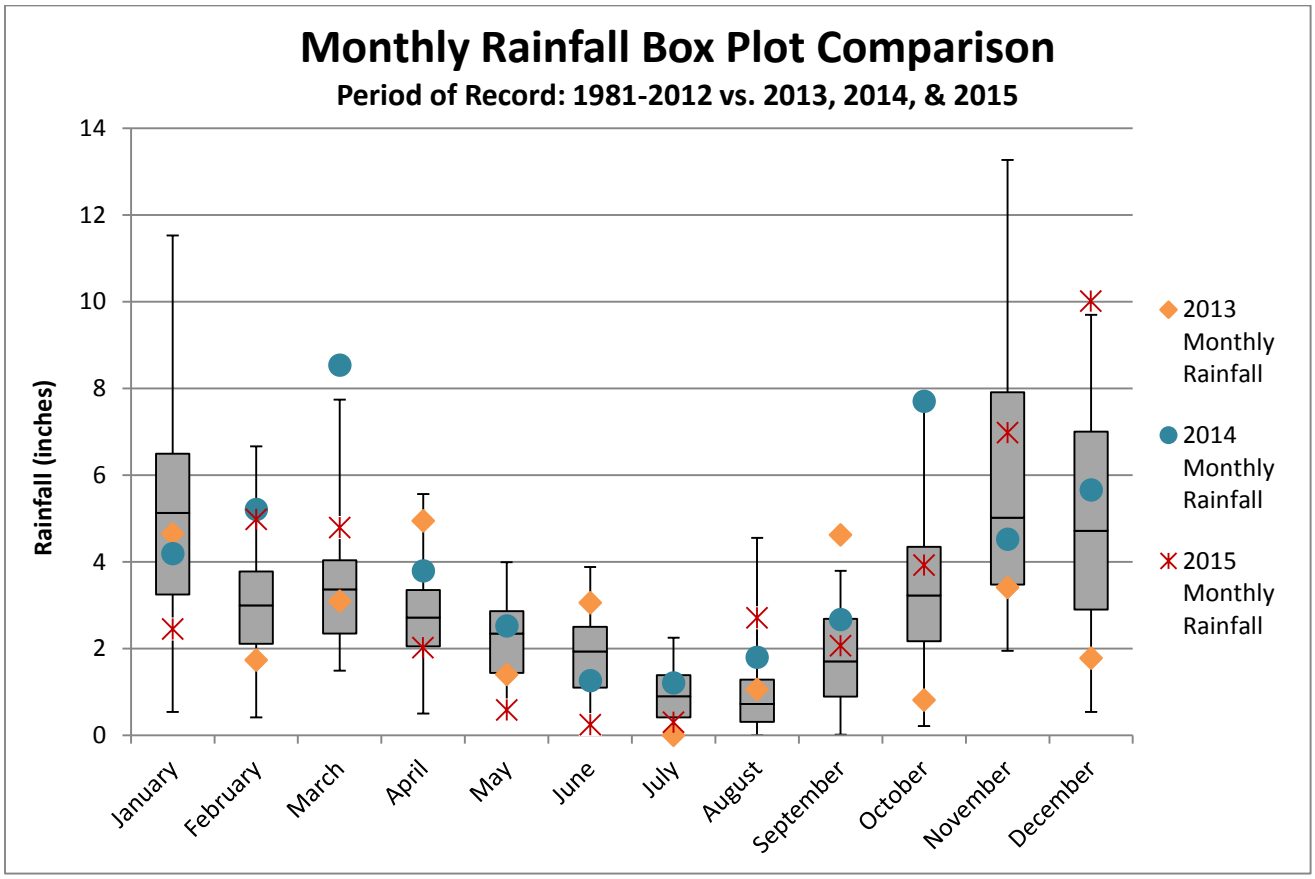
Monthly Averages: Chart 2

Below is a box plot[3] comparing monthly rainfall statistics for the period of record to monthly totals for 2013, 2014, and 2015. The historical monthly statistics are represented by the grey boxes, with 2013 represented by the orange diamond, 2014 represented by the blue circle, and 2015 represented by the red asterisk.



*Gauge location: near I-405 and SR 520 interchange, Bellevue, WA

[3] A box plot is a graphical depiction of a statistical summary of a dataset. The upper-most and lower-most boundaries of the box represent the upper and lower quartiles (75th and 25th percentiles), respectively. The line in the center of the box represents the median data point (50th percentile). The upper and lower points, connected to the box by vertical lines, represent the highest and lowest observed data points.

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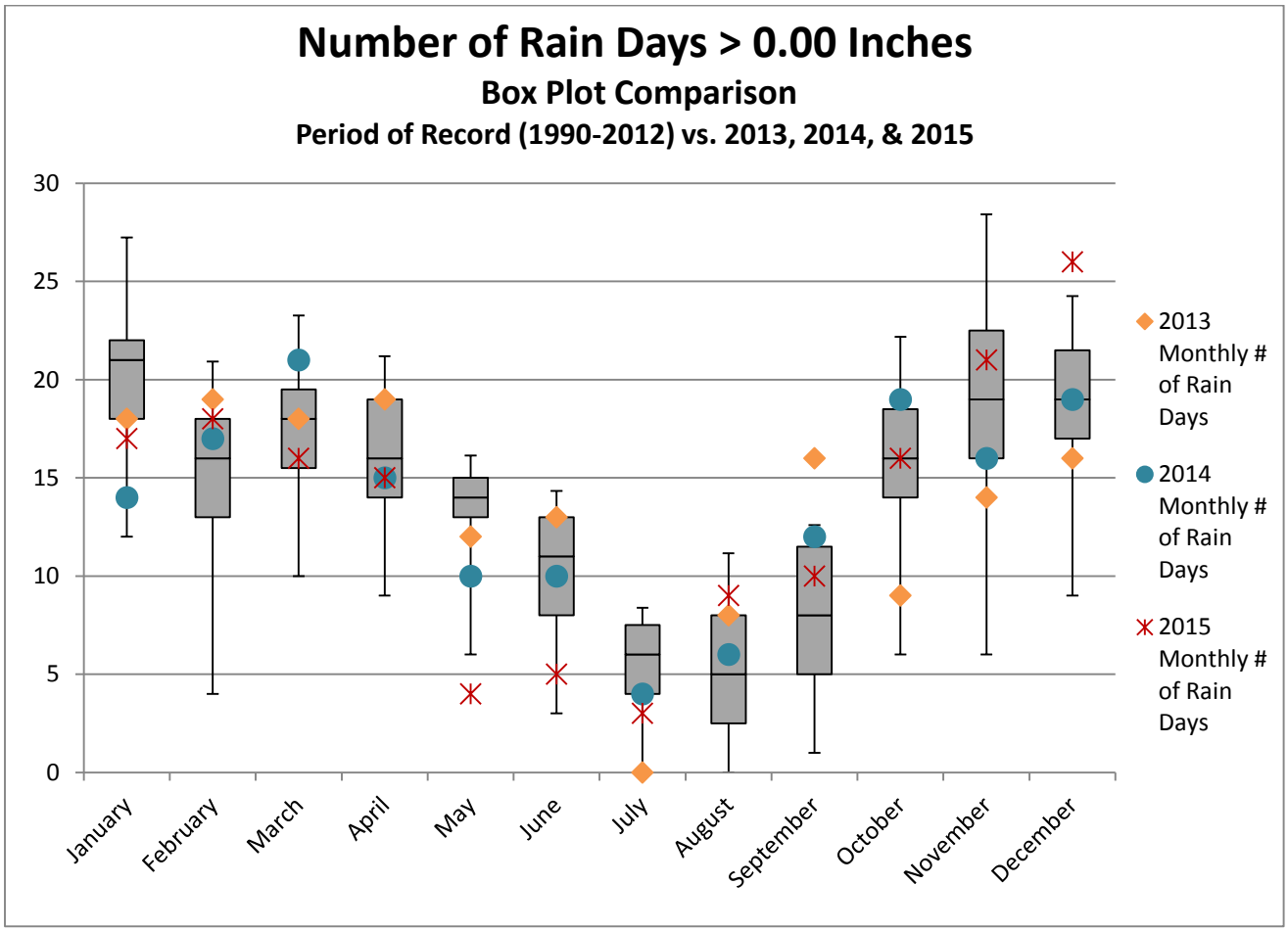
Number of Rain Days Chart

The chart shown below is a box plot[4] showing statistics for the number of rain days, comparing the period of record to monthly totals for 2013, 2014, and 2015. The historical monthly statistics are represented by the grey boxes, with 2013 represented by the orange diamond, 2014 represented by the blue circle, and 2015 represented by the red asterisk. For this graph, the period of record begins in 1990 when the gauge was moved to its present location.



[4] A box plot is a graphical depiction of a statistical summary of a dataset. The upper-most and lower-most boundaries of the box represent the upper and lower quartiles (75th and 25th percentiles), respectively. The line in the center of the box represents the median data point (50th percentile). The upper and lower points, connected to the box by vertical lines, represent the highest and lowest observed data points.

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Appendix A

- **Blue circles indicate relative amount (inches) of rainfall recorded in 2015.**