

Do Gilbert residents use less water on their landscapes during and after a storm event?

There is a potential for water savings in the landscape that can result from well-planned irrigation schedules and an understanding of how seasonal changes affect the water needs of plants. This study looks at how residents in the town of Gilbert use water during rainfall events and what can be done to capitalize on those potential water savings.

Outdoor water usage constitutes 70% of household water consumption.

5 years examined, from 2010-2014.

Rainfall event data were collected from 29 rain gauge locations:

- District of Maricopa County Flood Control
- Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) (<http://www.cocorahs.org/>)
- RainLog (<http://www.rainlog.org>)

Ground water well production data were collected from 28 sites in the Town of Gilbert.

- The town uses wells to supplement usual water production.
- If low well production correlates to rainfall, residents may be choosing to use less water on their landscapes during rainfall events.



Fig. 1 CoCoRaHS Rain Gauge

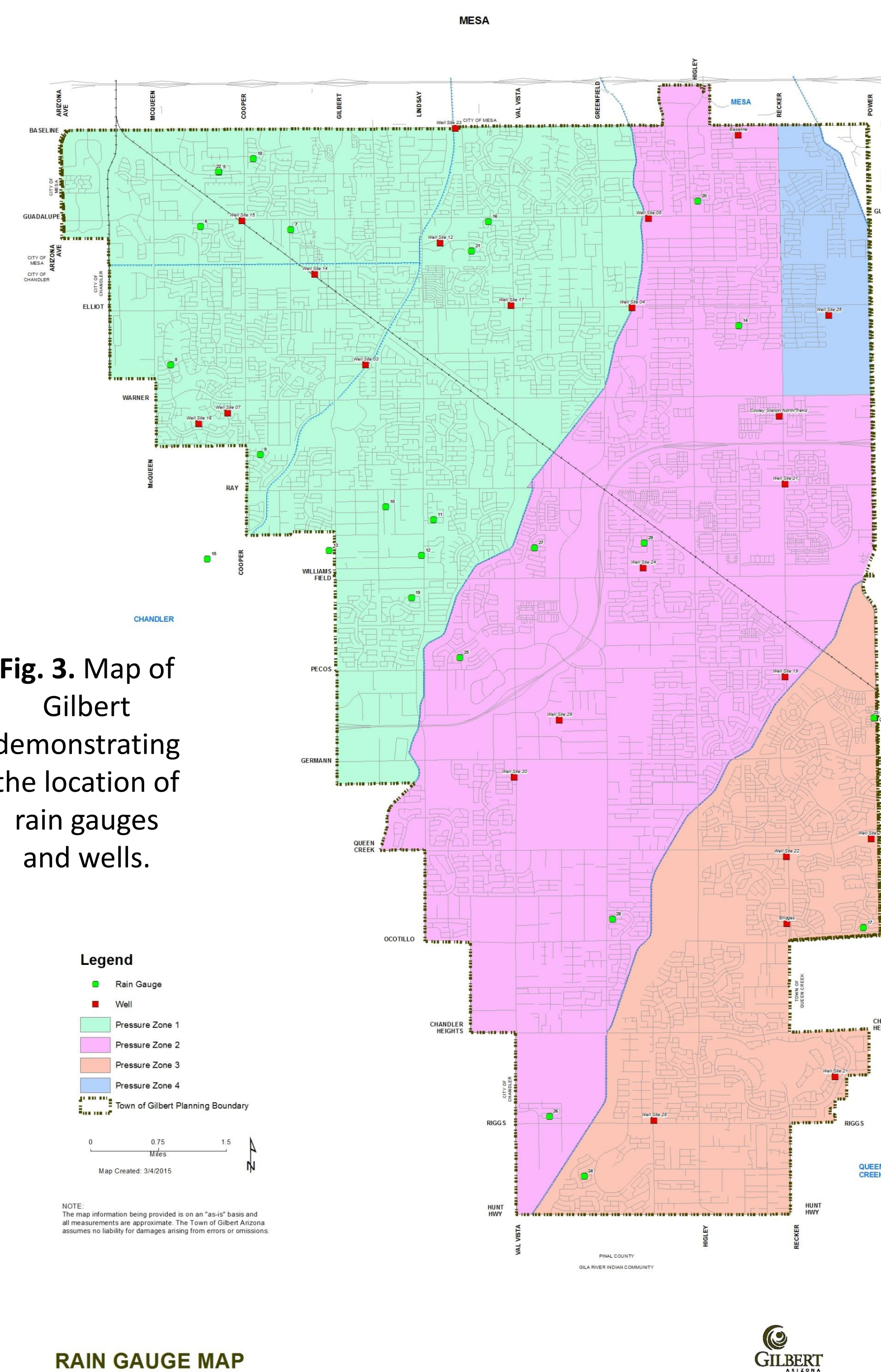


Fig. 2 Town of Gilbert ground water well

Gilbert is divided into four pressure zones for water delivery.

- Rain gauge and well data were compared by zone.
- Averages per zone were obtained for the daily rainfall.
- Sums per zone were derived for the daily groundwater extractions.
- N.B. Zone 4 was excluded because none of the 29 gauge sites were located within the zone.

There is a slight trend of water conservation during and after rainfall events.



Trend graphs for each zone for all five years show a small correlation between well production and rainfall events. The graph for Zone 2 is included below.

As rainfall amounts increase, it is clear that well production amounts decrease slightly.

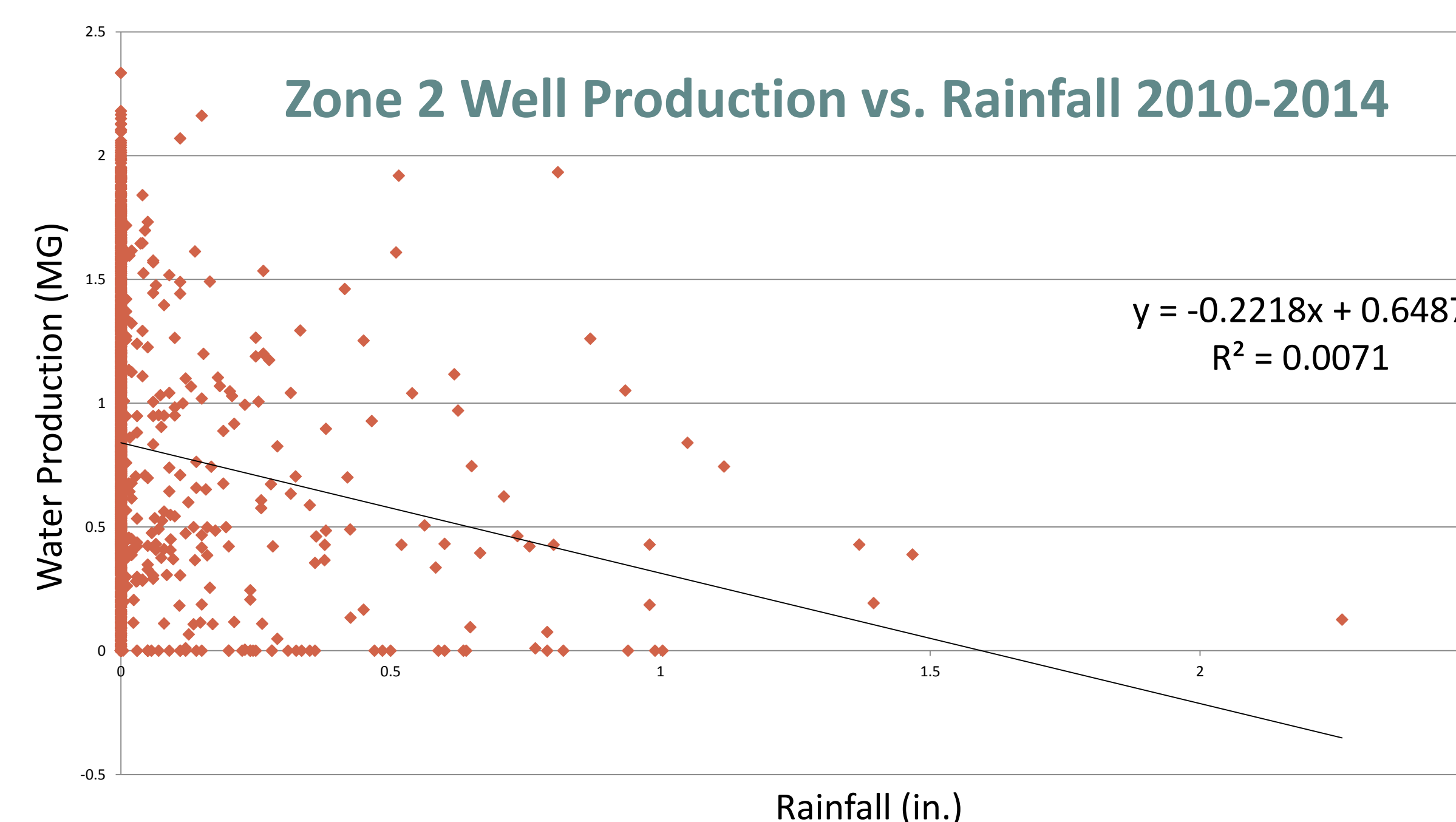
Slope and R² values for the zone trend graphs represent the amount of water conserved per inch of rain (slope) and the coefficient of determination (R²), or the measure of how close the data are to the fitted line.

While the graphs for all three zones had a similar shape, the slopes and R² values did vary greatly.

- Zones with a more negative slope value show greater water savings per inch of rain.
- Zones with a larger R² value show a greater correlation between increased rainfall and decreased well production.

	Slope	R ²
Zone 1	-2.76	0.0085
Zone 2	-0.22	0.0071
Zone 3	-0.0007	0.115

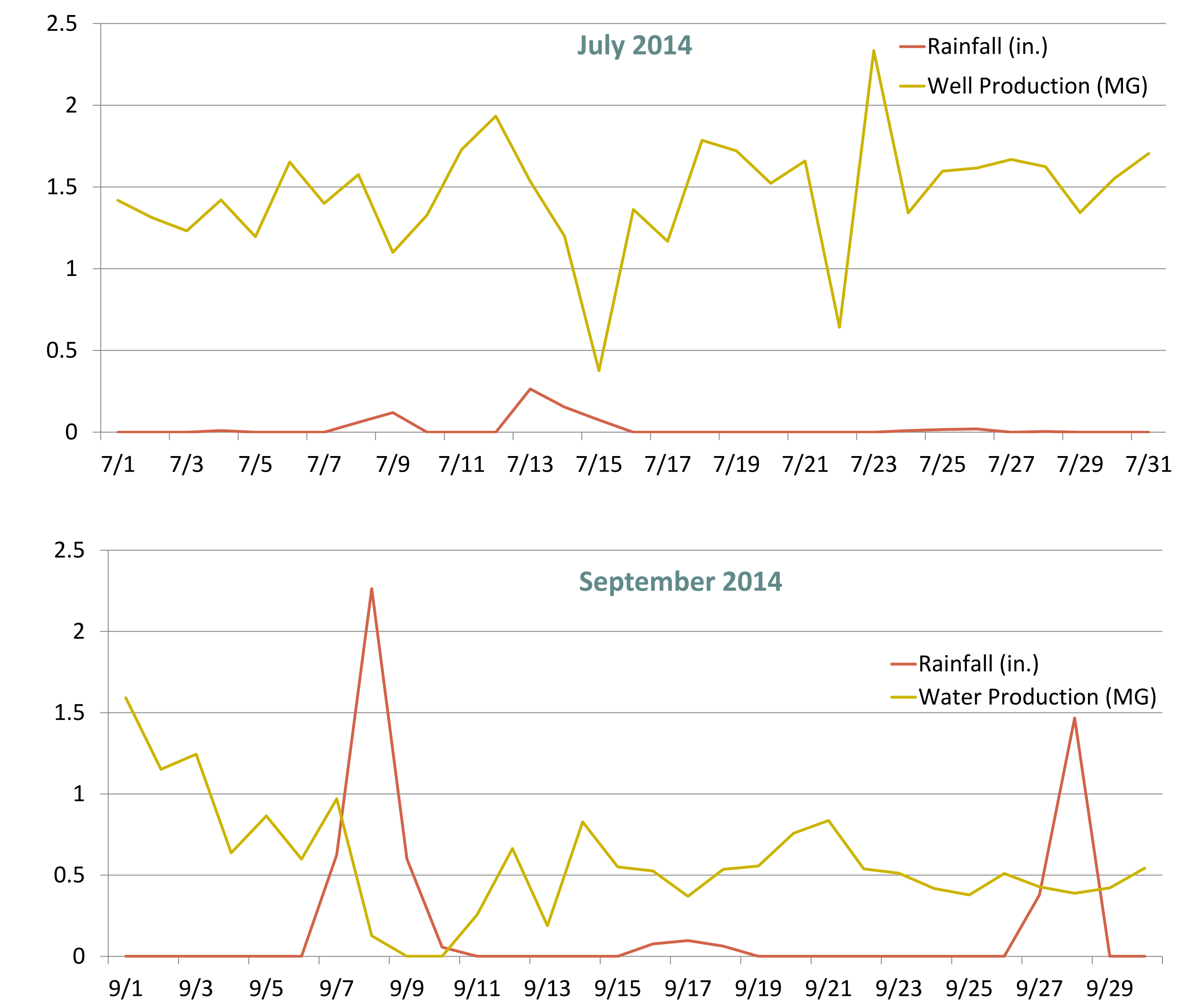
Fig. 4 Table showing the slopes and R² values for the three evaluated zones.



Further research could include:

- Seasonal analysis of rainfall and well production relationships
- Spatial averaging of rainfall from gauges to determine more accurately how much rain had fallen where

Line graphs of select months show that decreases in well production often follow even minor rainfall events.



What comes next?

While the data demonstrate slight conservation trends, Gilbert can increase water savings during and after storm events. Suggestions include:

Installing Town-operated rain gauges

- This will create an evenly spaced rain gauge network at the Town's disposal for the purpose of collecting accurate data with ease.

Developing guidelines for rainfall irrigation schedules.

Implementing an alert system to inform residents and others that irrigation systems can be turned off.

Working with HOAs or businesses in order to implement water-saving schedules during storms.

Acknowledgment

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