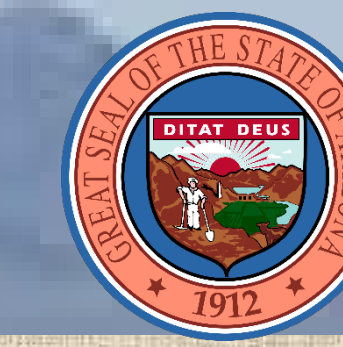


# All Recovery, No Recharge: The Geographic Mismatch of the Aquifer Storage and Recovery Program



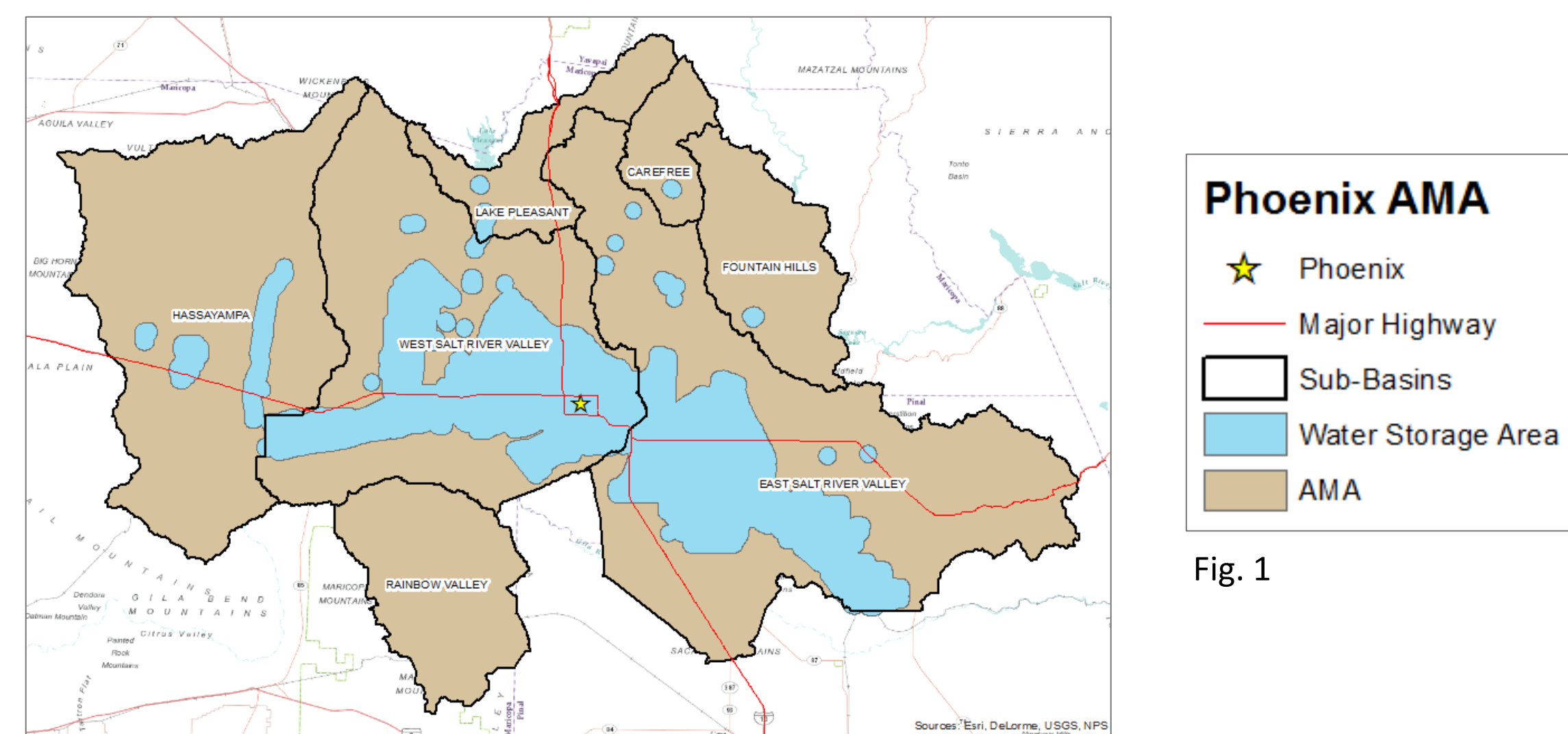
## Introduction

Arizona's Recharge and Recovery program is a key component of the Groundwater Management Act and allows a water provider to effectively store water in the ground of a sub-basin that can be withdrawn later for use.

A statute in the recharge program allows the withdrawal of stored water to occur away from the area where the water is stored. Over time, this could be detrimental to the individual aquifers. The program relies heavily on a mass-balance approach to compensate for any mismatch, but is this approach enough to manage the program?

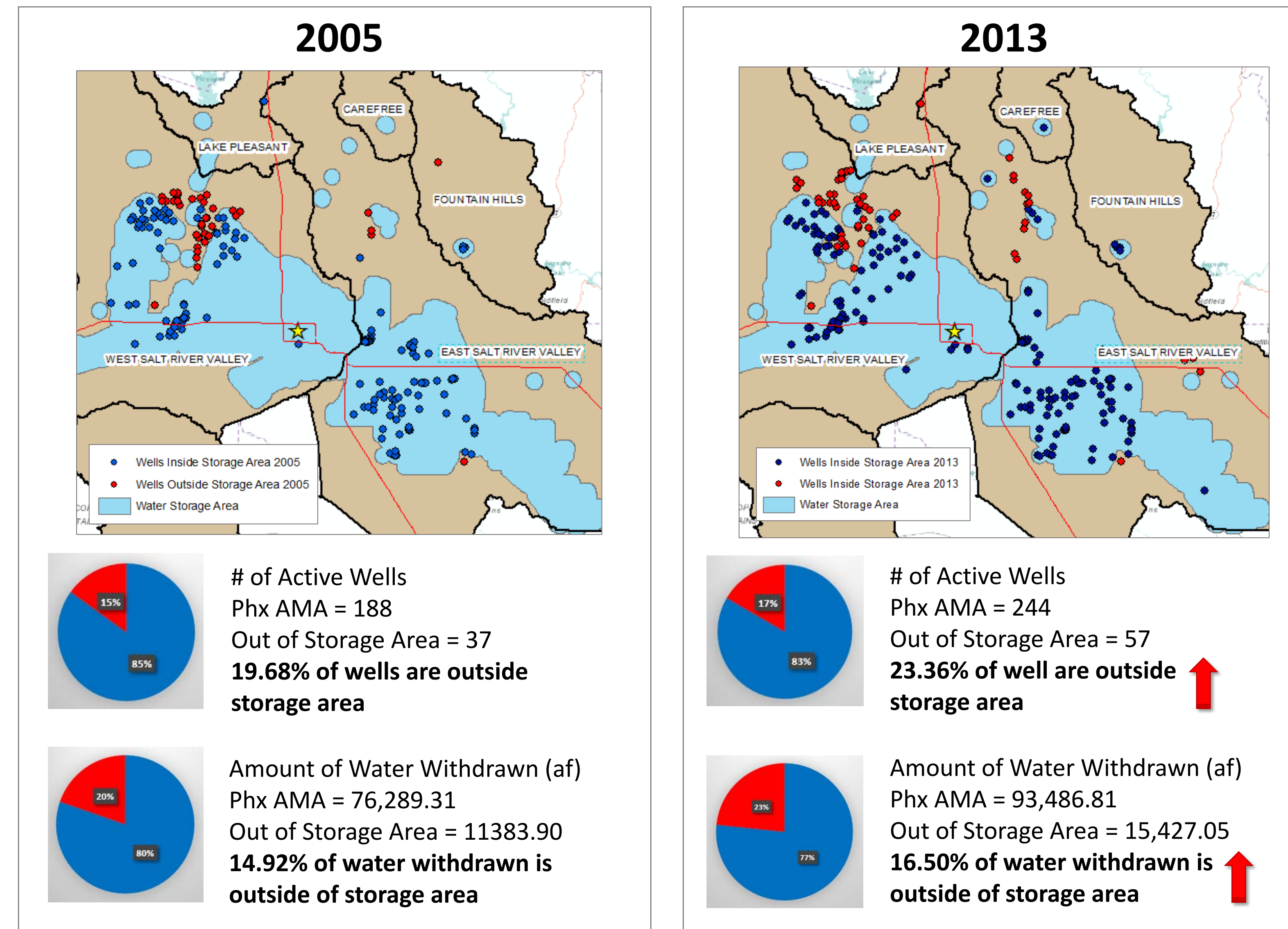
This study seeks to 1) Identify how many wells are withdrawing water from storage areas and 2) How much water is being withdrawn? The goal is to determine if there is an increase in the number of wells and the amount of water withdrawn from areas where no water is being stored.

My study area will focus on the Phoenix Active Management Area (AMA) (Fig. 1) during the time period of 2005 to 2013, and the results will be separated by sub-basins to determine if there is a greater risk to the individual sub-basins.



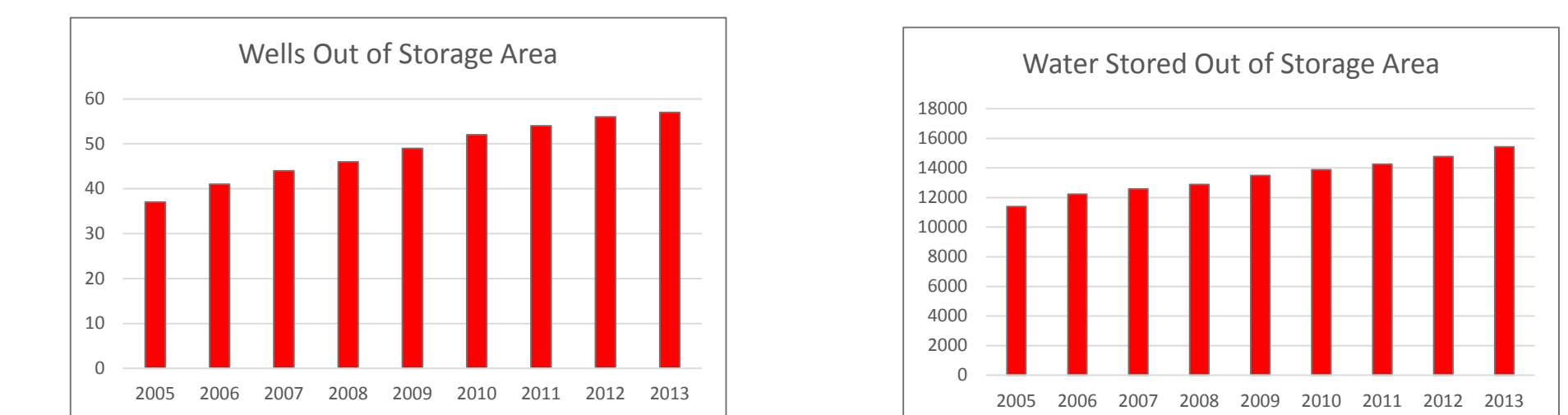
## Results

### Withdraw Wells Inside & Outside of Storage Area: Phoenix AMA

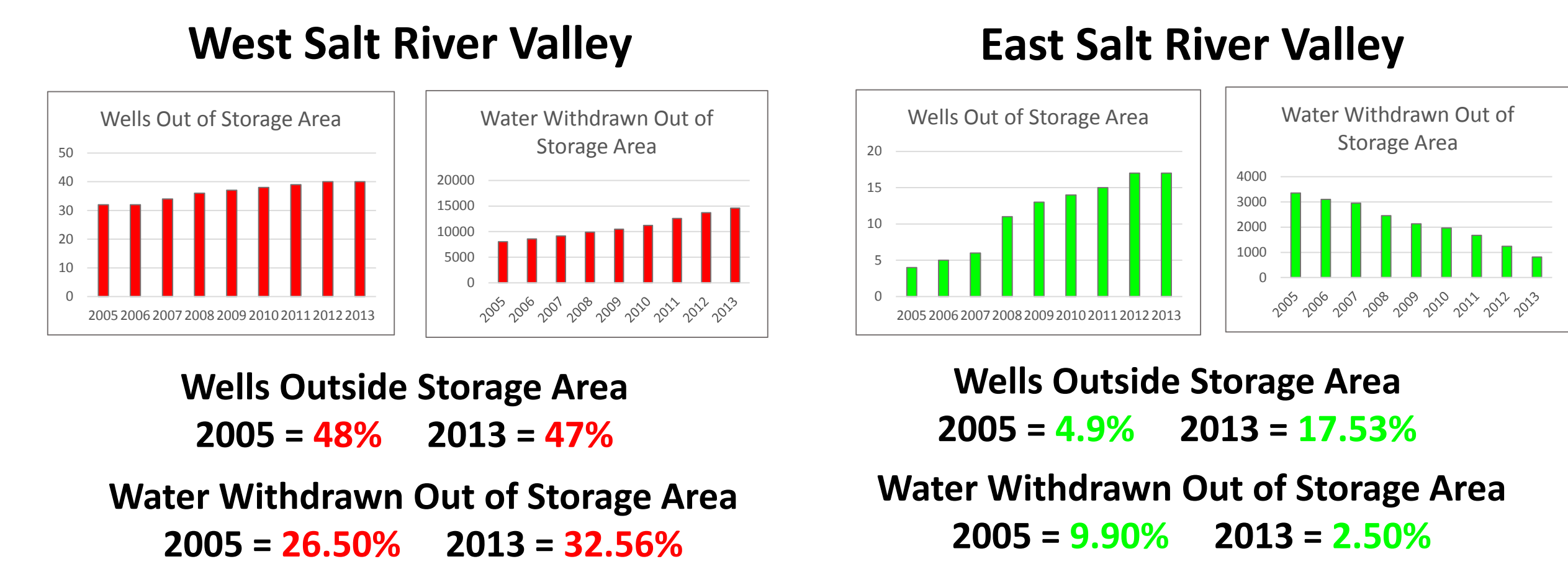


## Conclusion

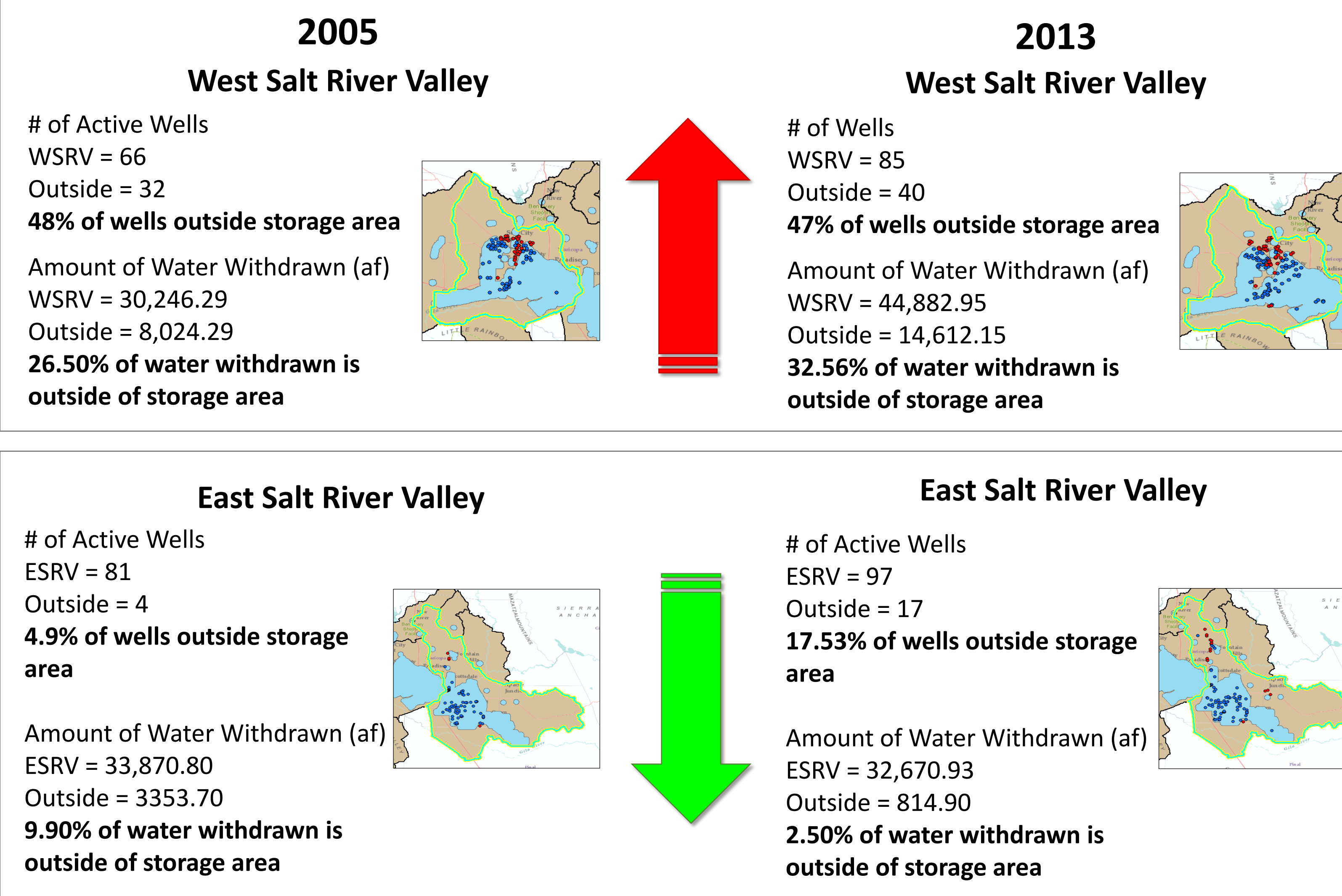
The results indicate that over the last 8 years the number of wells, and the quantity withdrawn, has increased outside of the storage areas in the Phoenix AMA by 1.58%.



However, when we examine the two largest basins impacted – West Salt River Valley and East Salt River Valley – there is a much larger discrepancy that may indicate that the mass-balance approach may not be effectively managing the program.



### Withdraw Wells Inside & Outside of Storage Area: Two Sub-basins That Account for Over 90% of Total Wells



## Methods

- Compiled point locations for withdraw wells and polygon shapefiles for storage areas from 2005 thru 2013 and displayed on a map utilizing ArcMap.
- Utilized Microsoft Excel to organize the data and create charts displaying the number of wells and the amount of water withdrawn inside and outside of the storage area
- To determine the amount water recovered by sub-basin, the results were separated and defined by the sub-basin boundaries.



### “Cut to the Aquifer” Provision and ADWR’s Proposal:

The Recharge program requires that a percentage of the stored water be made non-recoverable as a general benefit to the aquifer. These required volumes are called “cuts” to the aquifer.

The ADWR has been analyzing how the cut to the aquifer provision can be used to support aquifer management. One possible approach to address the imbalance is to modify the cut to the aquifer percentages.

**\*Currently, the cut to the aquifer is 5%\***

### ADWR’s Proposal:

- 0% - well is within 1 mile of storage area(s).
- 10% - well is greater than 1 mile from storage area, but within same sub-basin
- 20% - well is greater than 1 mile from storage area, but in a different sub-basin.
- 100% for wells in areas that will uniquely benefit the sub-basin.

## Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. SES-1462086, DMUU: DCDC III: Transformational Solutions for Urban Water Sustainability Transitions in the Colorado River Basin. Any opinions, findings and conclusions or recommendation expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).