

# Comparing Recharge to the Edwards Aquifer before, during, and after the 2011 Texas Drought

Peter Carlson

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In 2011, Texas went through what may have been its worst drought in recorded history. The Edwards Aquifer, a subterranean source for much of the drinking water and irrigation water for central Texas, was severely depleted by this drought. Two years later, the aquifer has yet to return to pre-drought water levels. Over this time, land use changes in central Texas as well as competition between drought-resistant versus drought-tolerant plants may have changed how flow from the contributing zone of the Edwards aquifer can recharge the aquifer. I propose to investigate how aquifer recharge has changed over the course of the drought and its continuing recovery.

In order to estimate recharge to the aquifer, I need to estimate potential sources and sinks for water in the contributing zone, recharge zone, and artesian zone of the aquifer. It will be especially challenging to estimate human contributions to change in water levels. I will need, for each year, to determine stream flows and precipitation amounts. I will also need to calculate or estimate local evapotranspiration. I can check my work by comparing these three components for the contributing zone versus the recharge zone. For the contributing zone, evapotranspiration and stream flow should more closely equal precipitation than in the recharge zone.

For this project, I will need:

Streamflow information 2010-2012

Elevation information (Edwards Aquifer)

Precipitation (2010-2012)

Evapotranspiration (2010-2012) This could be leaf area index, insolation, temperature, etc.

Well level data in the Edwards Aquifer (2010-2012)

Land use information 2010-2012

Water use information for Central Texas (2010-2012)