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## Drought Impact on Urban Forests

Austin's public urban forest provides an estimated \$8.85 million annually in social, economic, and environmental benefits.<sup>1</sup> Ensuring those benefits continue well into the future means maintaining healthy trees.

Providing an adequate amount of water in a tree's root zone is critical for tree health and growth as insufficient soil moisture for prolonged periods leads to tree decline.<sup>2</sup> If sustained over a long period of time, water inadequacy can result in tree mortality. It is often difficult to directly relate drought conditions to tree mortality because tree decline is often a slow process, however it is estimated that Texas lost roughly 5.6 million trees, or 10% of its urban forests, between 2010 and 2011 due to drought-related tree mortality.<sup>3</sup>

## Precipitation

Austin experiences variable precipitation defined by periodic droughts and occasional flooding with an average rainfall near 32 inches per year. The graph below shows the variation in annual rainfall at Austin-Bergstrom Airport with most years experiencing below average annual precipitation.

## Trees Removed Due to Poor Condition

In Austin, a tree removal permit is required for trees with trunks 19 inches in diameter or greater. This includes all tree species regardless of condition. The City of Austin tracks regulated tree removals through this permitting process thus allowing inferences into impacts to the urban forest due to drought conditions. The graph below shows the amount of trees removed in Austin due solely to health conditions. Since 2005, over 10,000 protected size trees were reportedly removed with the average size protected tree at 24 inches in diameter. The years

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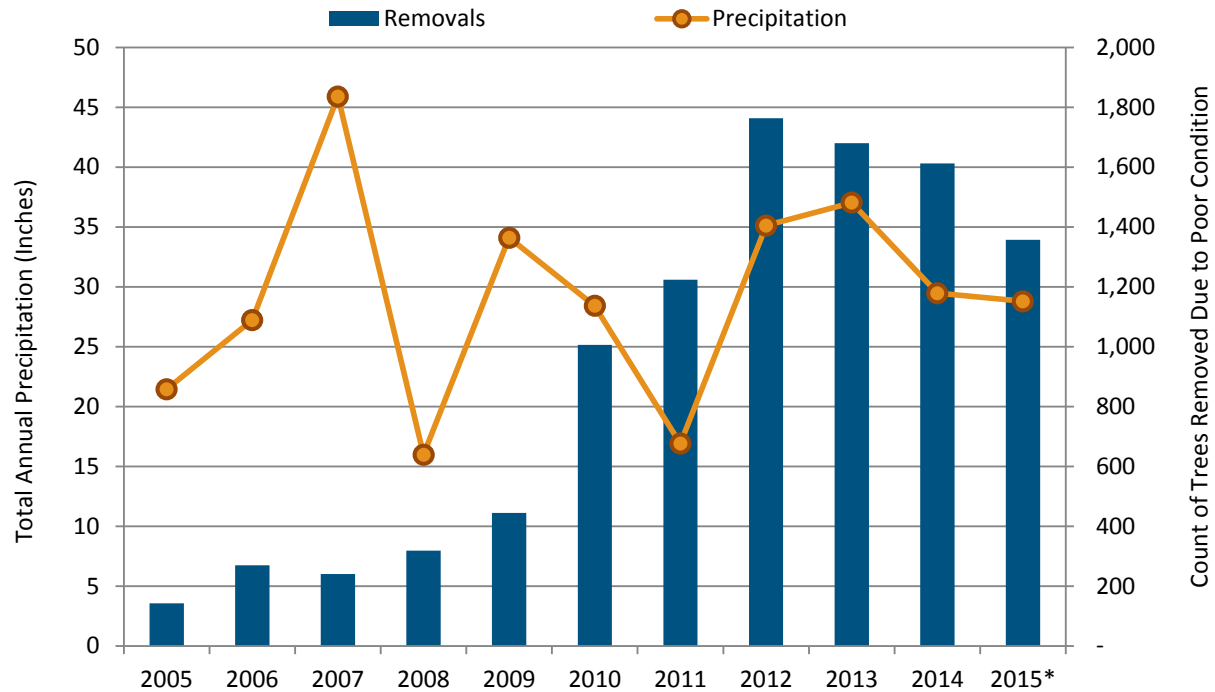
<sup>1</sup> City of Austin iTree Eco Study, 2014

<sup>2</sup> For more on watering trees during drought visit the City of Austin's [Grow Green Tree Care Guide](#).

<sup>3</sup> Texas A&M Forest Service <http://texasforestservice.tamu.edu/main/popup.aspx?id=15126>

following 2009 saw a spike in the amount of tree removals, due to poor condition, with an average increase of 122 tree removals over the last ten years. This increase may be attributed to multiple factors such as drought conditions, greater public knowledge of the permitting process, and/or more effective database procedures.

### Annual Precipitation and Trees Removed Due to Poor Condition



*\*2015 tree removal count is projected; 2015 precipitation data reflects available data through July 2015*

Source: Precipitation data from NOAA Online Weather Data, National Weather Service Forecast Office for Austin/San Antonio, TX, <http://w2.weather.gov/climate/xmacis.php?wfo=ewx>  
 Source: Tree removal data from City of Austin's AMANDA database.