



San
Antonio
Water
System

2011 Drought: SAWS Aquifer Storage & Recovery Activities

November 2, 2011

Capital Improvements
Advisory Committee

Darren Thompson

Manager / Water Resources – Edwards Activities

Outline

- Drought Conditions
 - How does this drought compare?
 - Rainfall: historic perspective
 - Future Outlook
- What is an Aquifer Storage & Recovery?
- Why an ASR in San Antonio?
 - SAWS Implementation of ASR
- Twin Oaks ASR Activities
 - Storage over Time
 - 2011

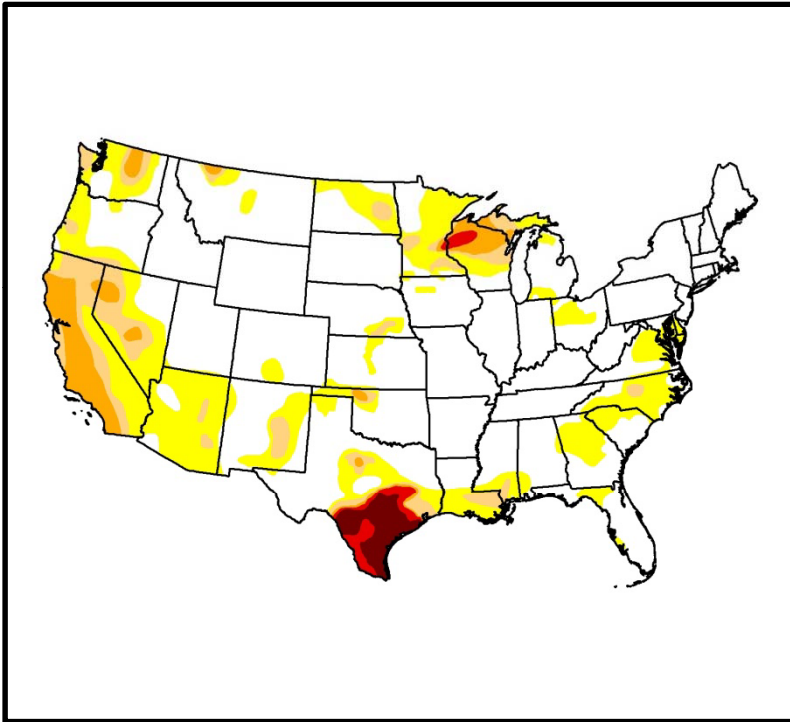
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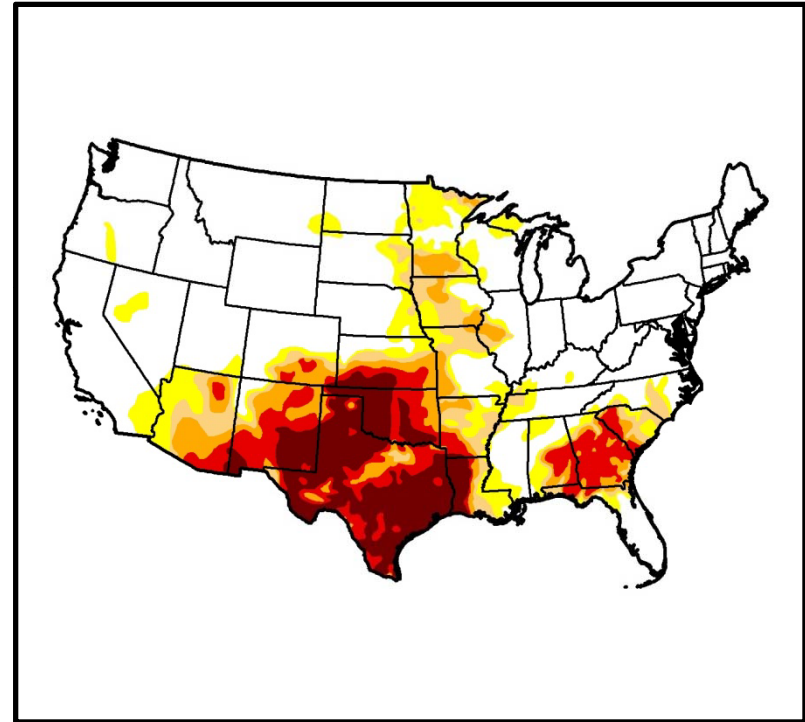


2011 Drought

Widespread, Intense, Record-Breaking



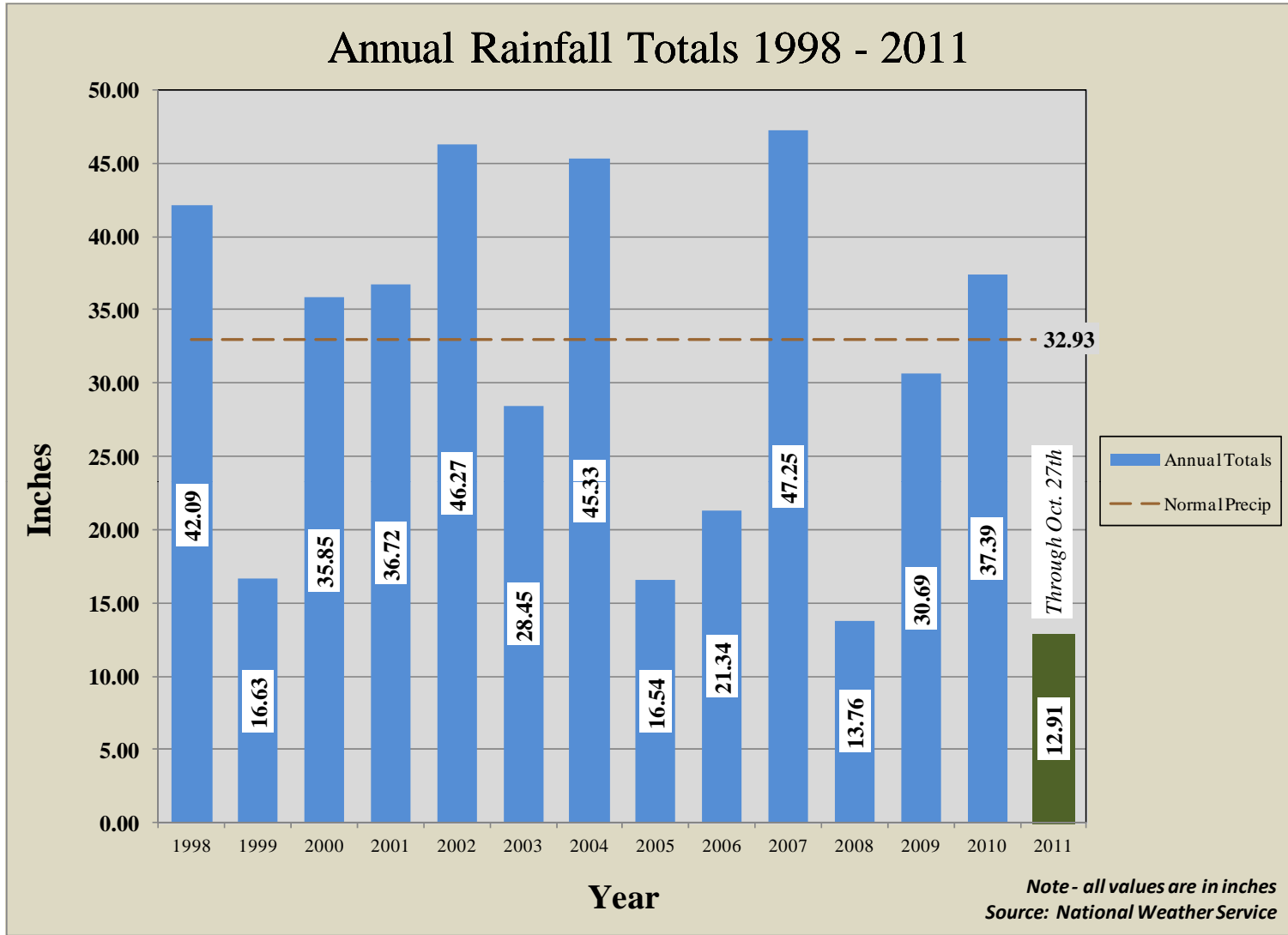
August 18, 2009



October 25, 2011

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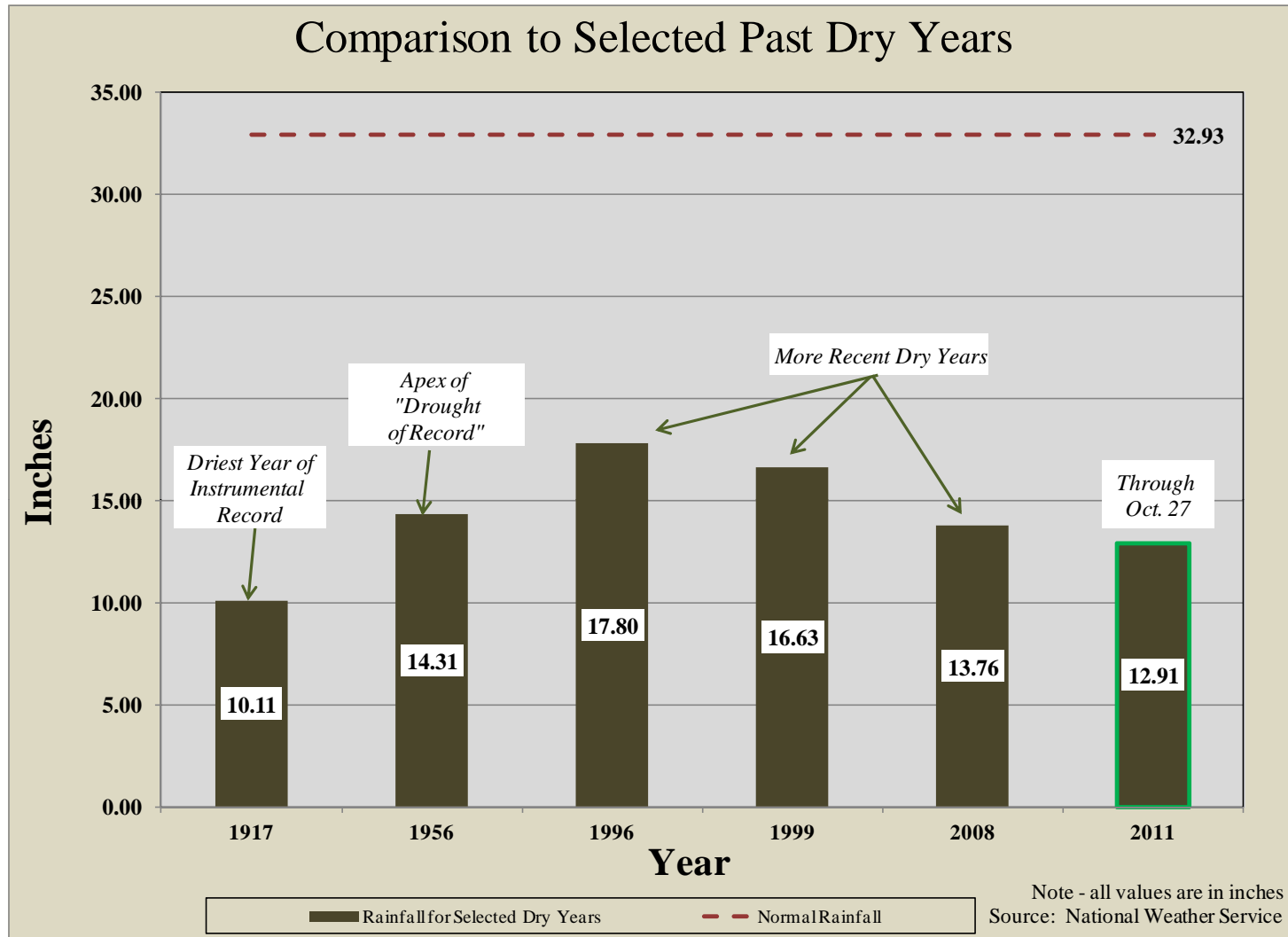


Driest in Recent History (so far...)

November 2, 2011

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... & Drier Than Most Droughts

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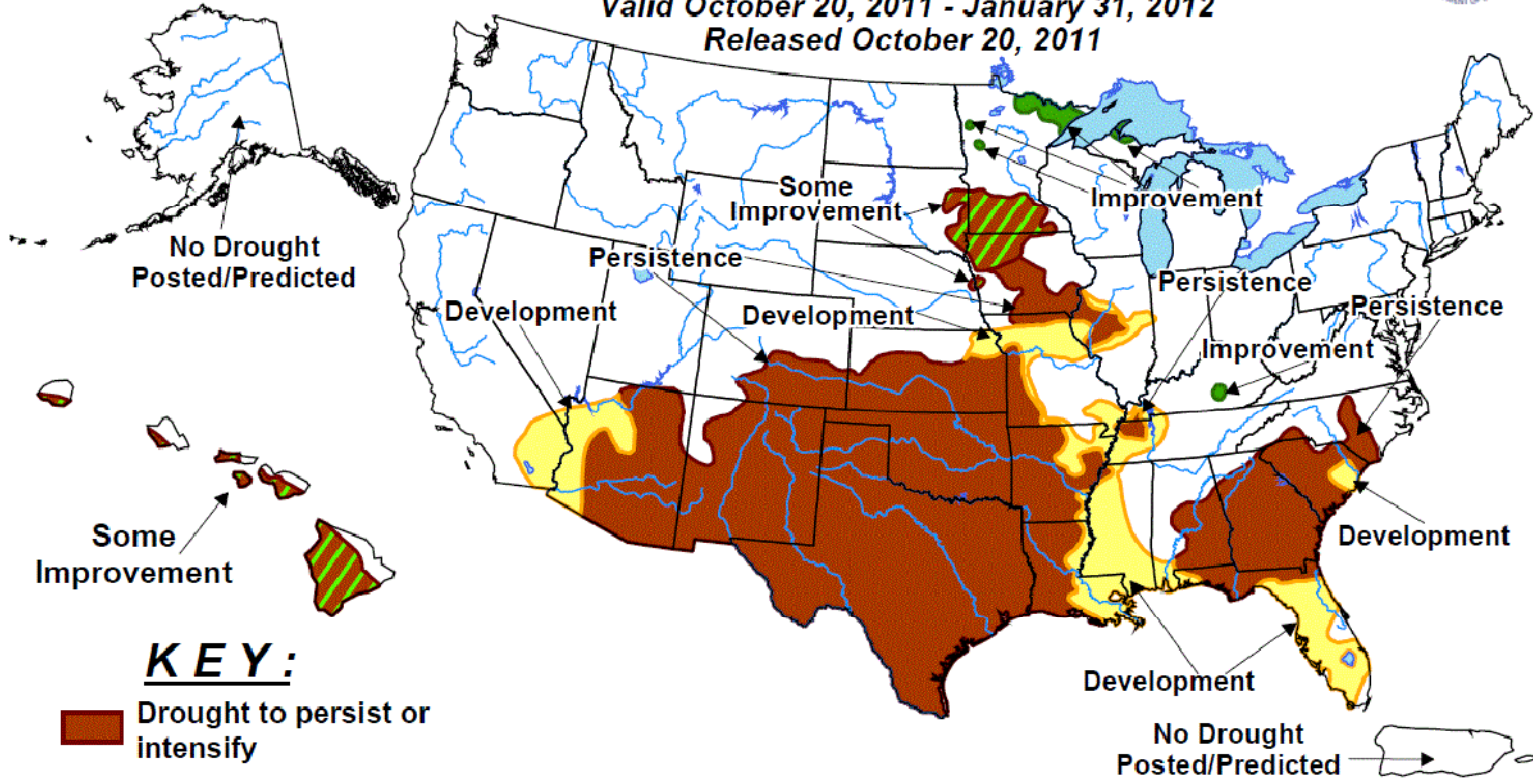


U.S. Seasonal Drought Outlook





Drought Tendency During the Valid Period

Valid October 20, 2011 - January 31, 2012

Released October 20, 2011



KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

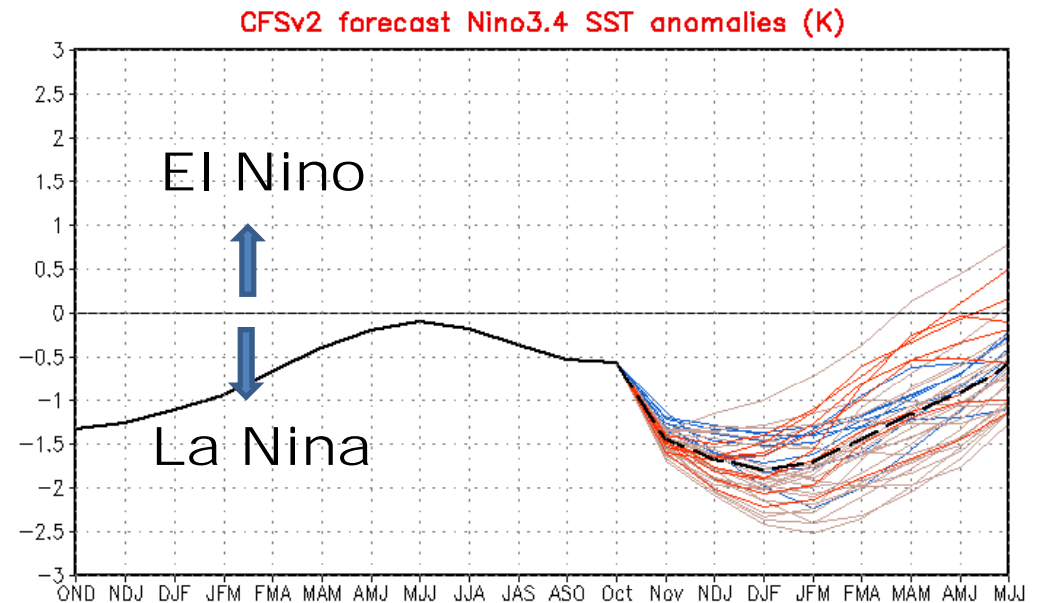
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Outlook: Not Promising

- *“This past year we had an unusual drought ... And we have a strong possibility of it continuing.”*
 - Texas A&M professor of meteorology and state climatologist Dr. John Nielsen-Gammon.



“The majority of ENSO models predict the continuation of La Niña through the Northern Hemisphere winter... La Niña conditions to continue and strengthen through the Northern Hemisphere spring of 2012”

- National Oceanic and Atmospheric Administration

November 2, 2011

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SAWS Aquifer Storage and Recovery



What is Aquifer Storage and Recovery?

Pumping or injection of water supplies into aquifer formations that store water long term until such time that it is needed to meet peak needs, long-term growth or emergency conditions.

November 2, 2011

2011 Drought & SAWS ASR



Why an ASR in San Antonio?

- Usage of Edwards Aquifer limited in 1990s:
 - Alternative water supplies were needed to meet demands.
- Feasibility Studies:
 - Completed in 1998, found that ASR was a viable strategy in our water resource management.
- No “*Roll-Over Water!*”
 - Most water resources are permitted and managed on an annual basis and during wet periods there is no method to store allocations that we do not use
- The nearby Carrizo/Wilcox aquifer is suitable for long term storage.

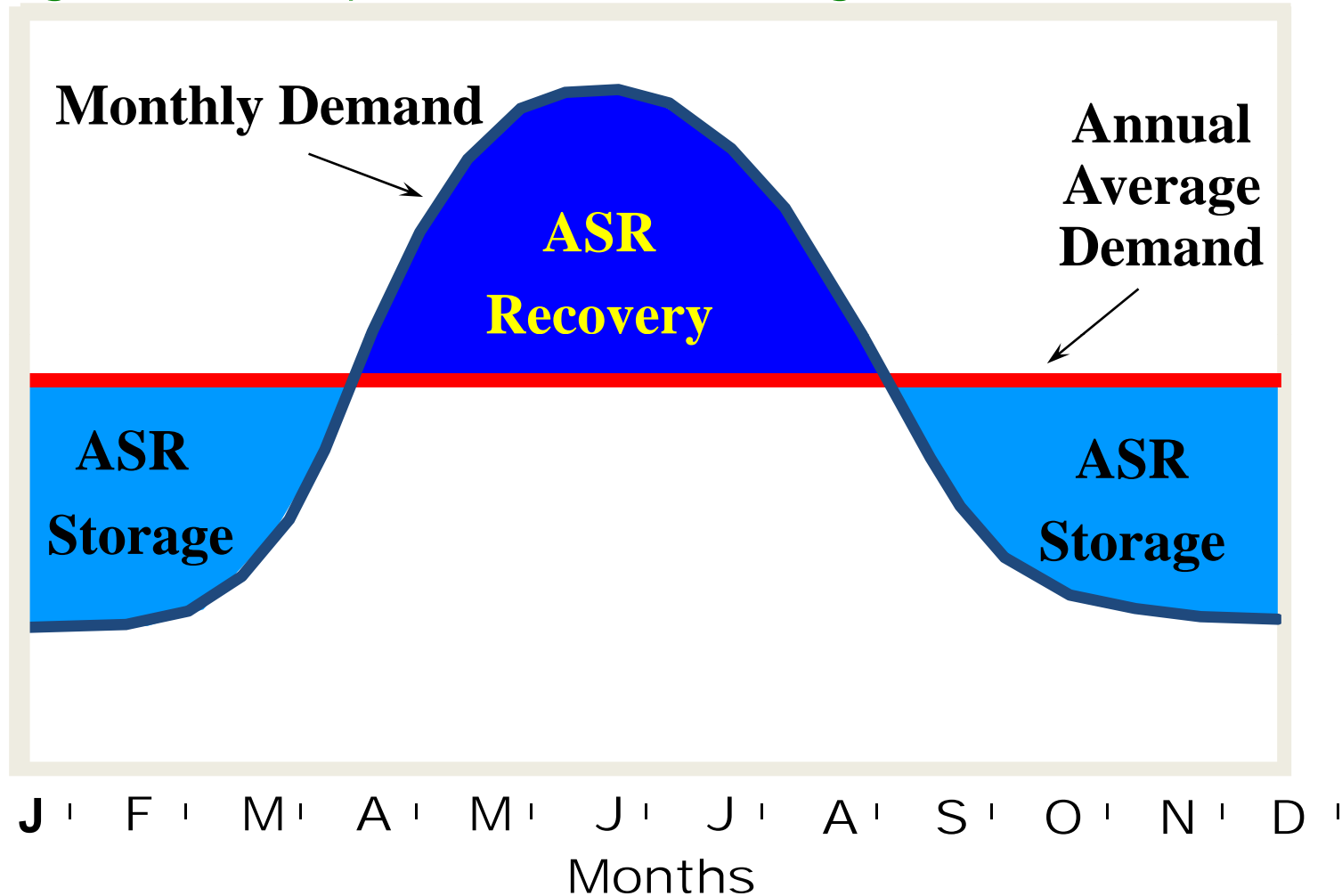
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SAWS Implementation of ASR

Original Concept: Seasonal Storage

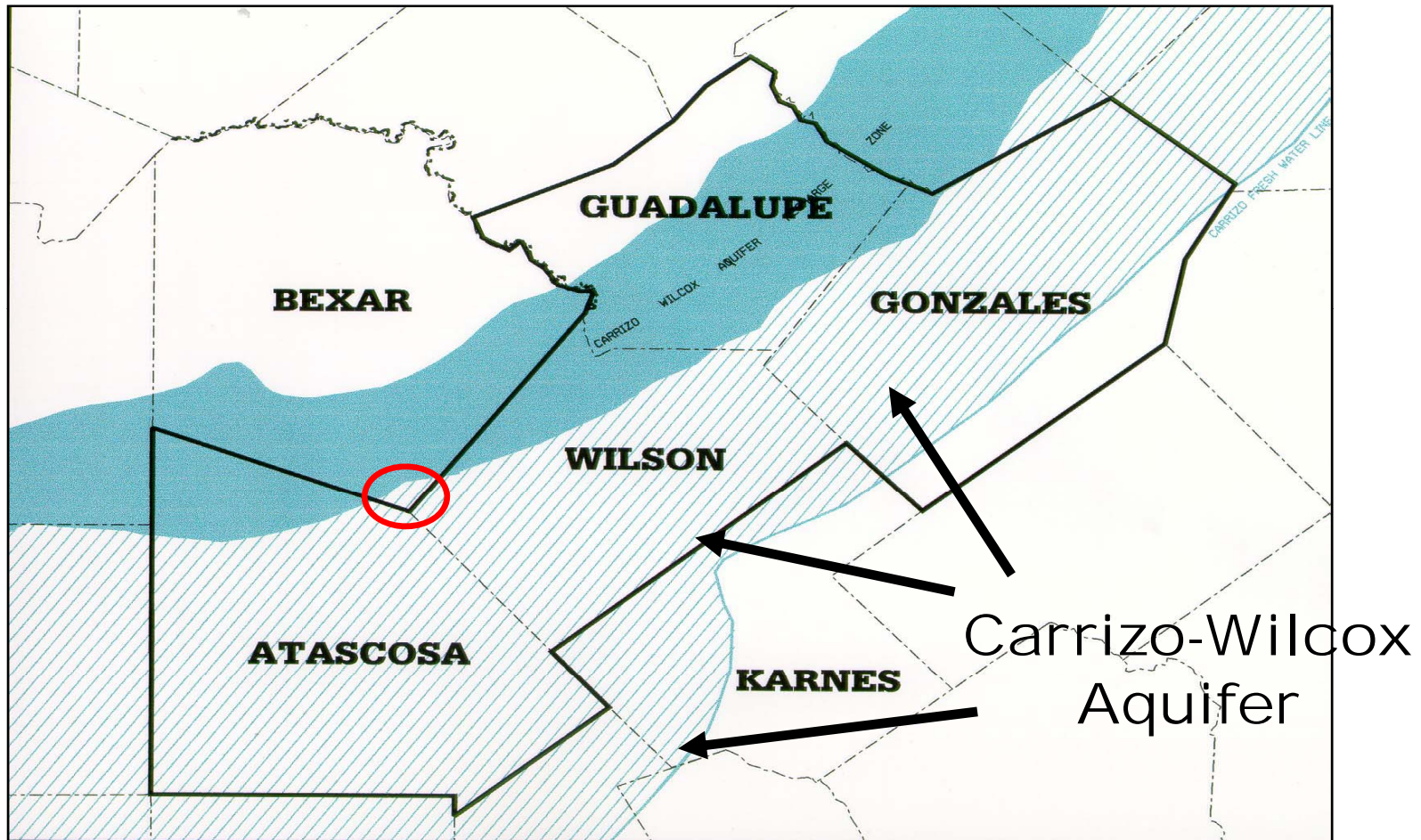


November 2, 2011

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SAWS Implementation of ASR

The Storage Zone



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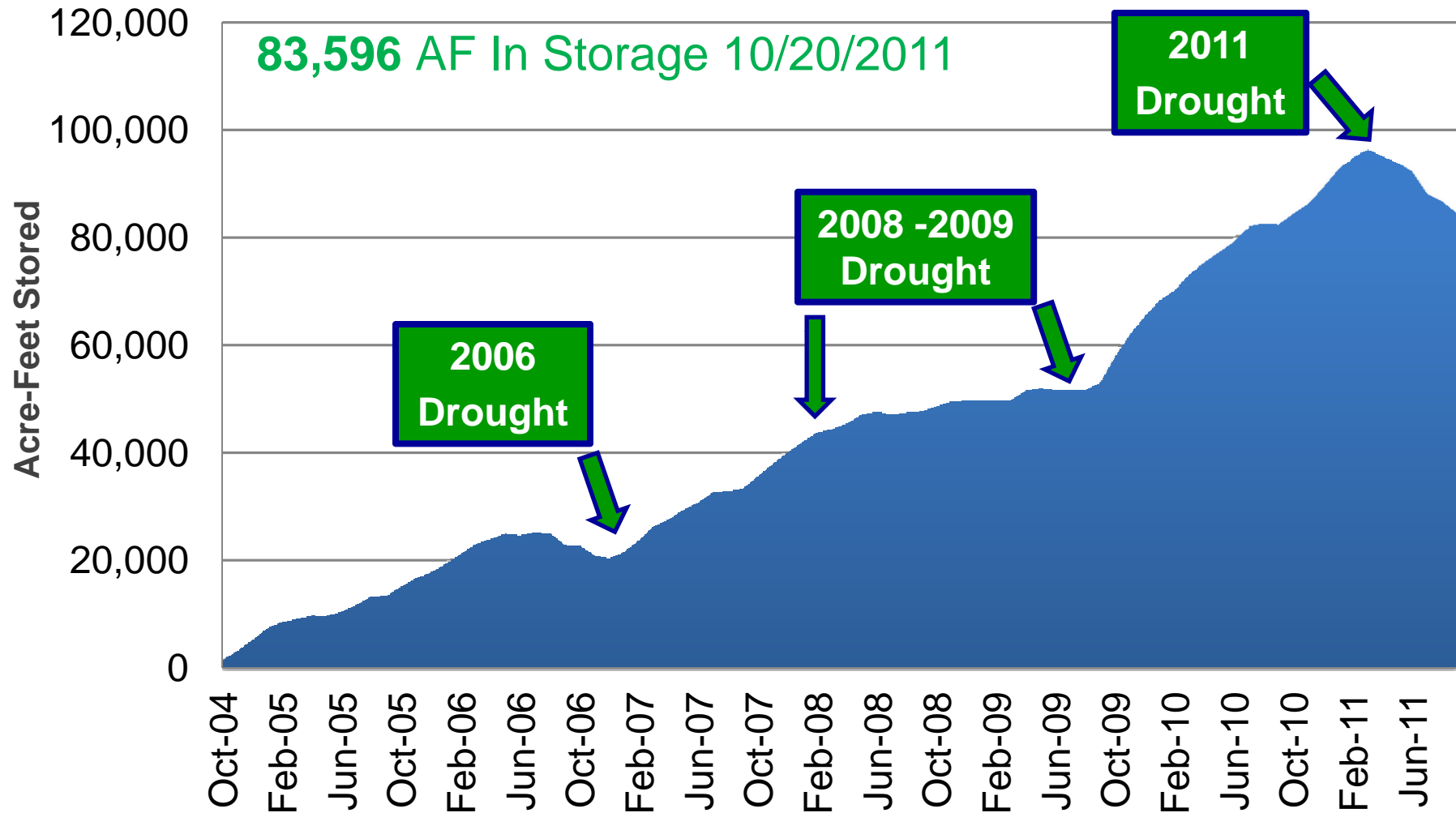


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Historic Twin Oaks Aquifer Storage

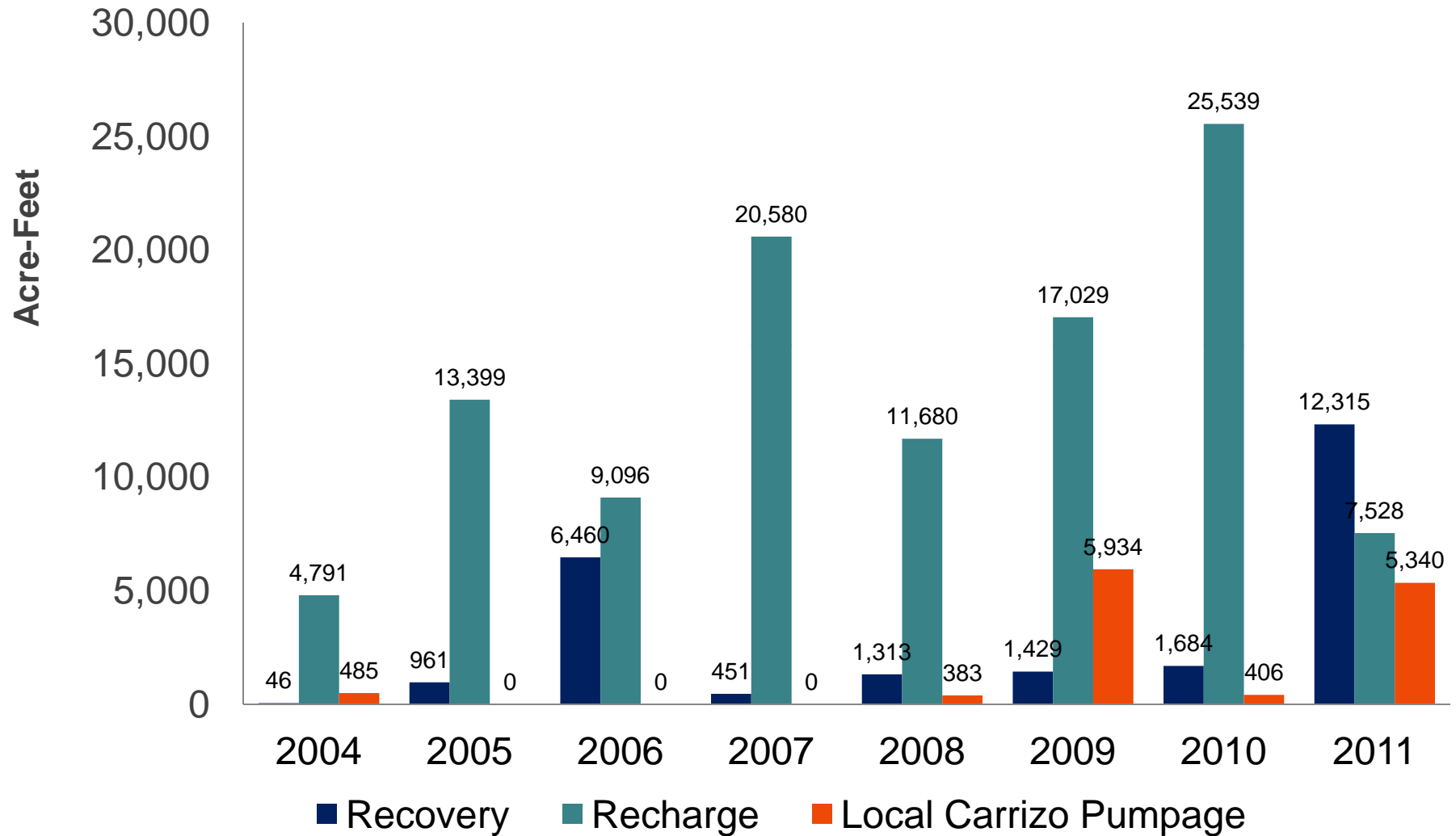


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Productive Activity: Annual Volumes By Type

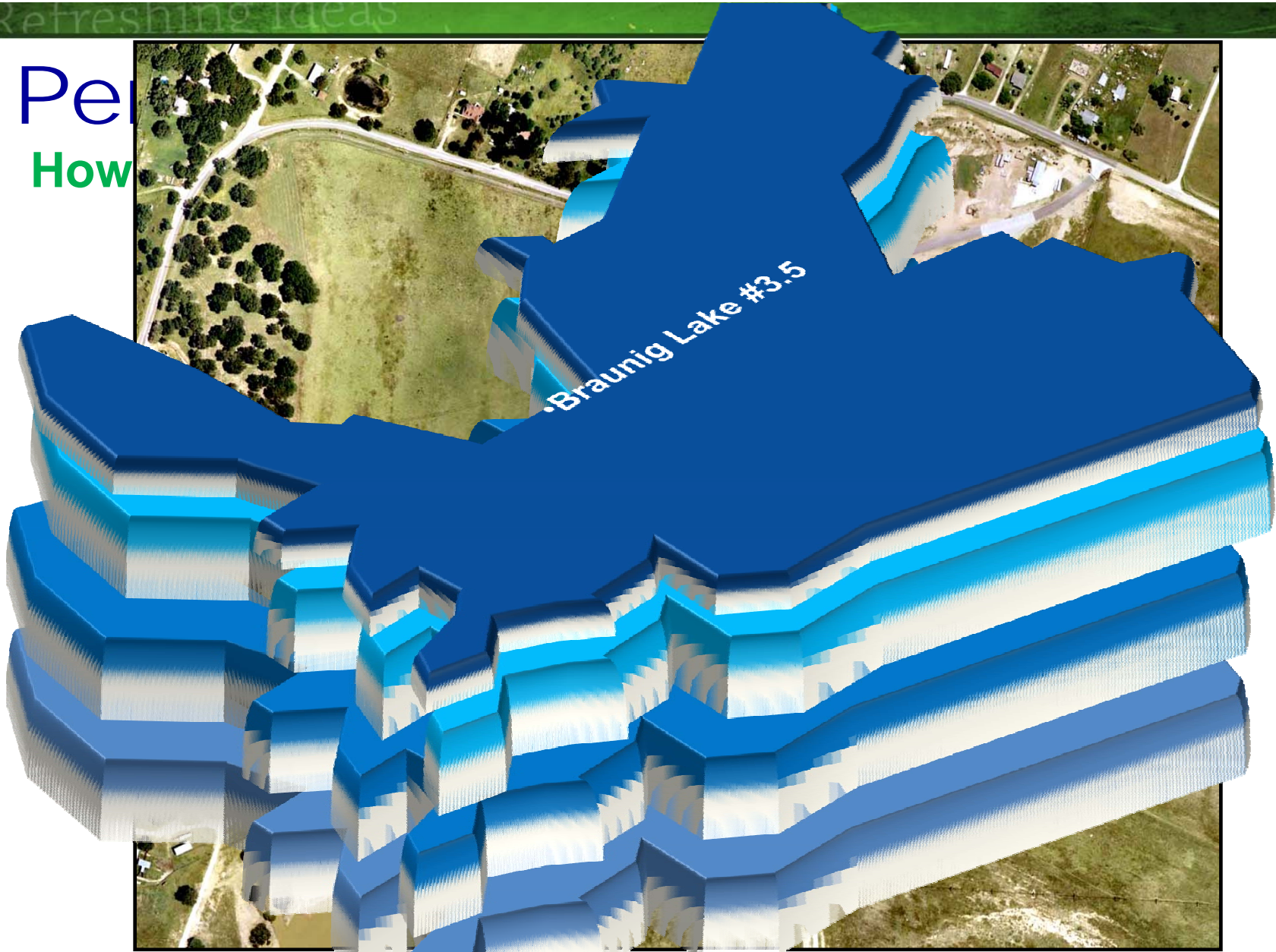


November 2, 2011

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Per
How

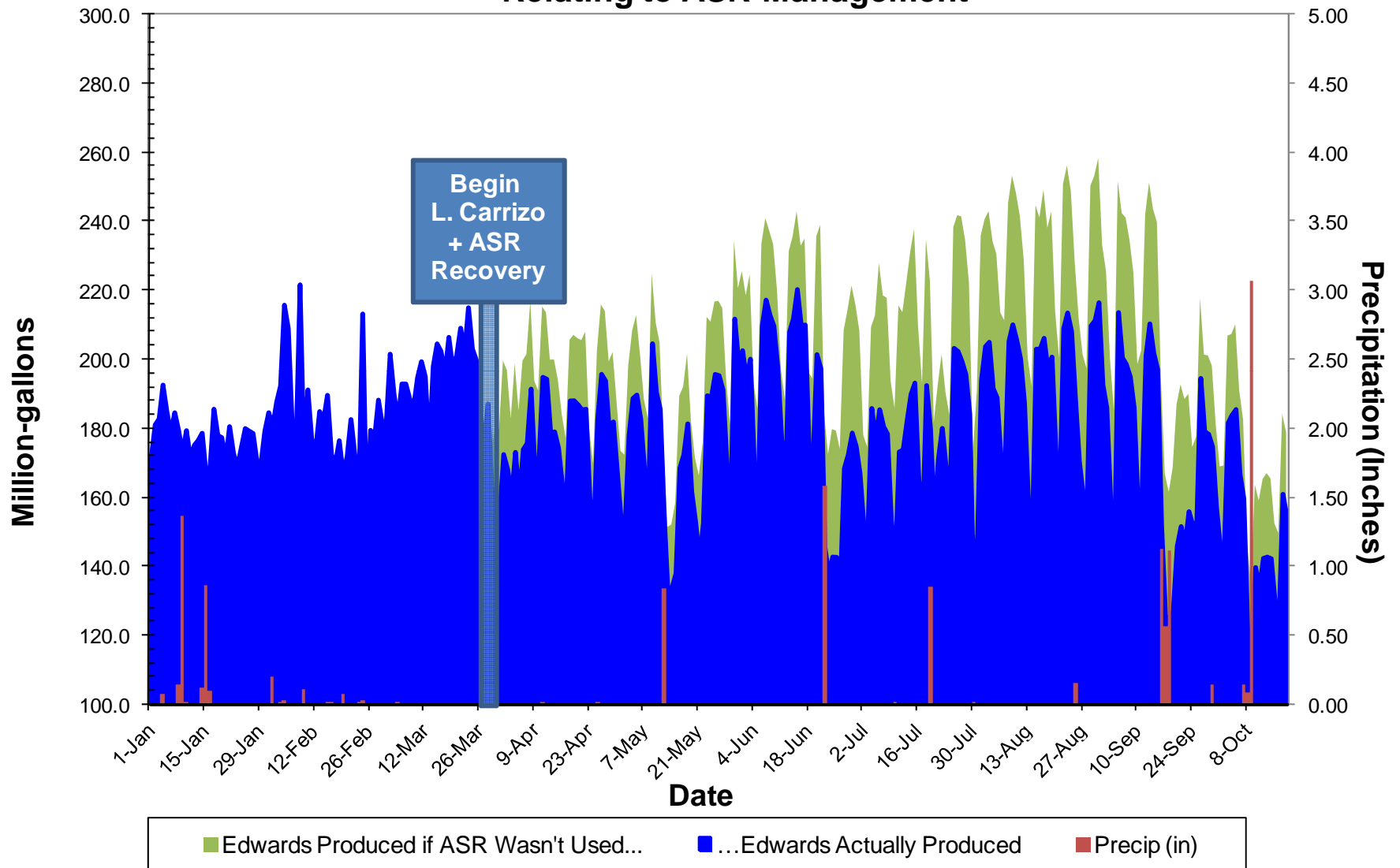


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Edwards Demand Reduction Relating to ASR Management



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