

Using Remote Sensing to Estimate Irrigation Water Use in Texas



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Texas Water Development Board

August 26, 2014

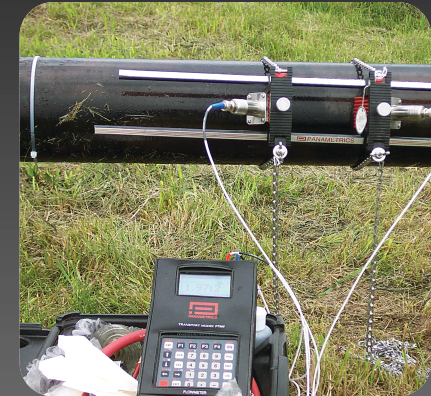
Texas Water Development Board

“to provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas”

The following presentation is based upon professional research and analysis within the scope of the Texas Water Development Board’s statutory responsibilities and priorities but, unless specifically noted, does not necessarily reflect official Board positions or decisions.

Agricultural Water Conservation

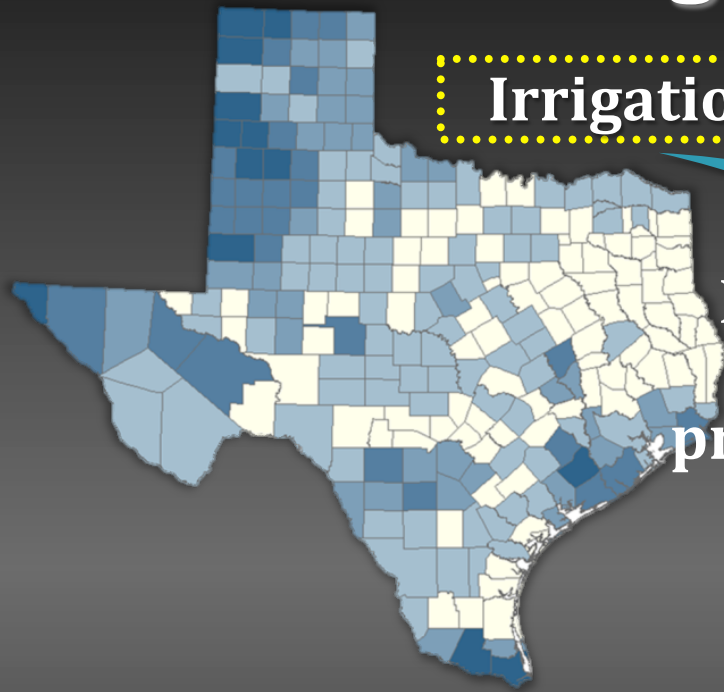
- Grants & Loans
- Demonstration Projects
- Education & Outreach
- Irrigation Estimates



www.twdb.texas.gov/conservation

Irrigation Estimates

Irrigation Estimates



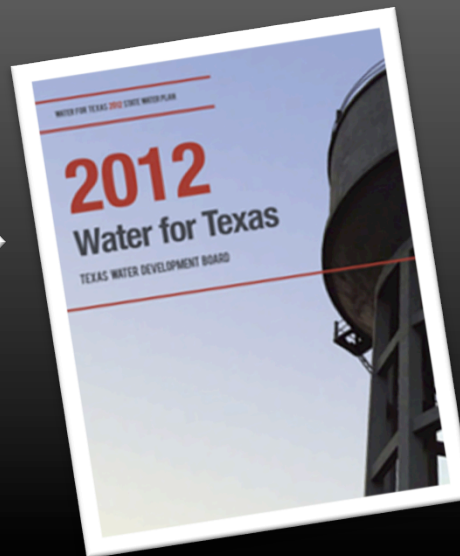
Irrigation
demand
projections

Statewide
irrigation
demands

Regional water
planning process

Regional
Water Plans

\$2 billion



State Water Plan

(every 5 years)

Irrigation Estimates

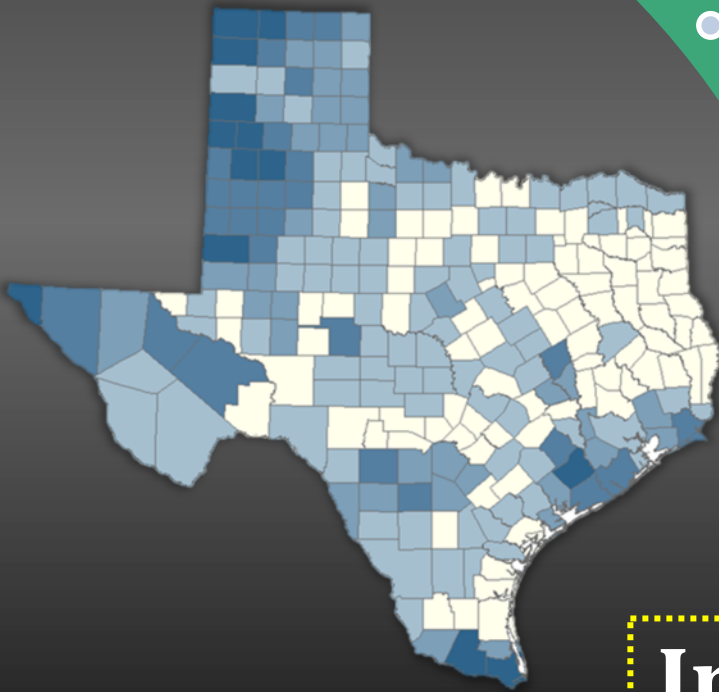
• Five-year average

• Farm Service Agency acres

• Weather data

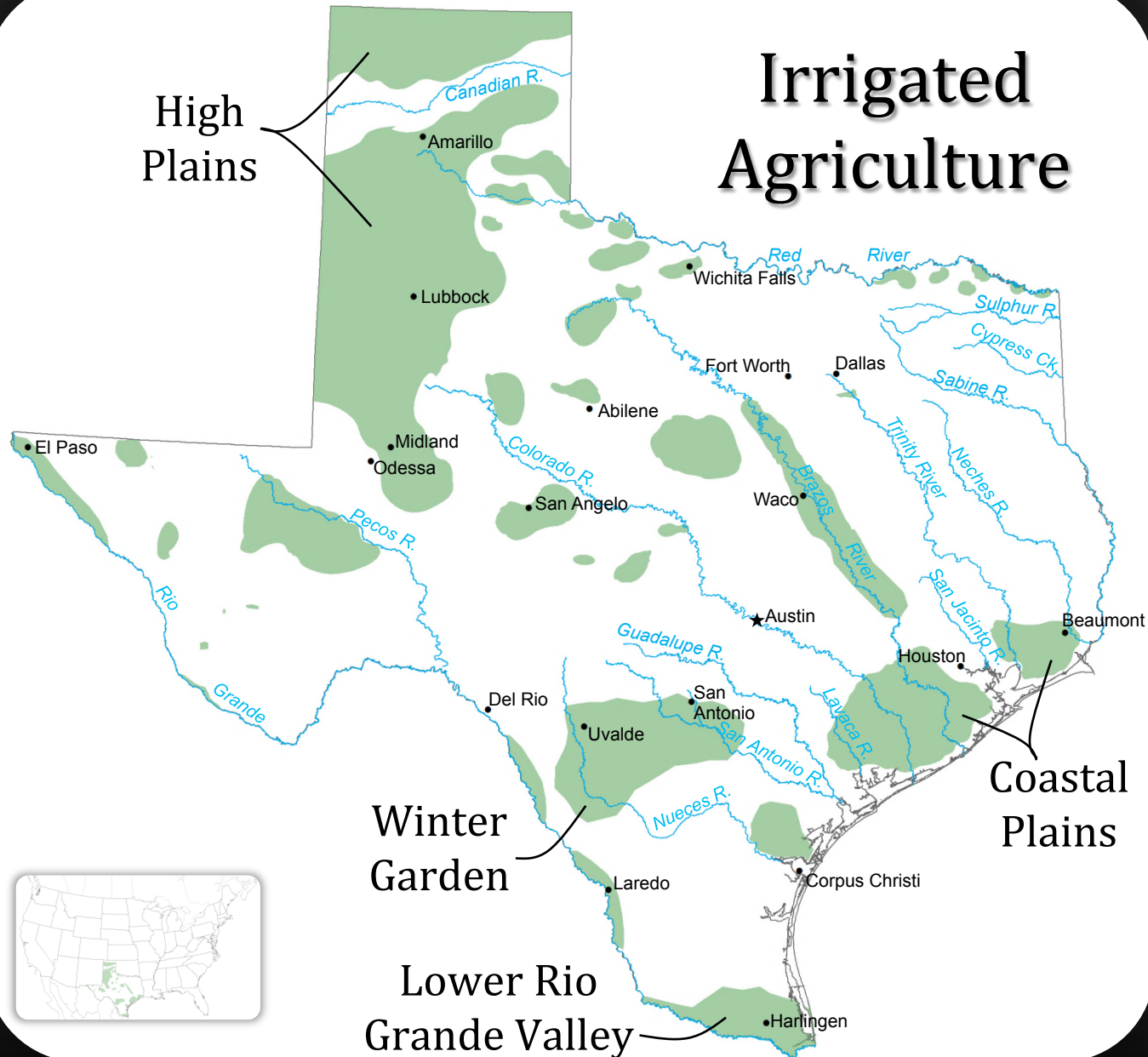
• Surface water diversions

• Mail-out & Comments



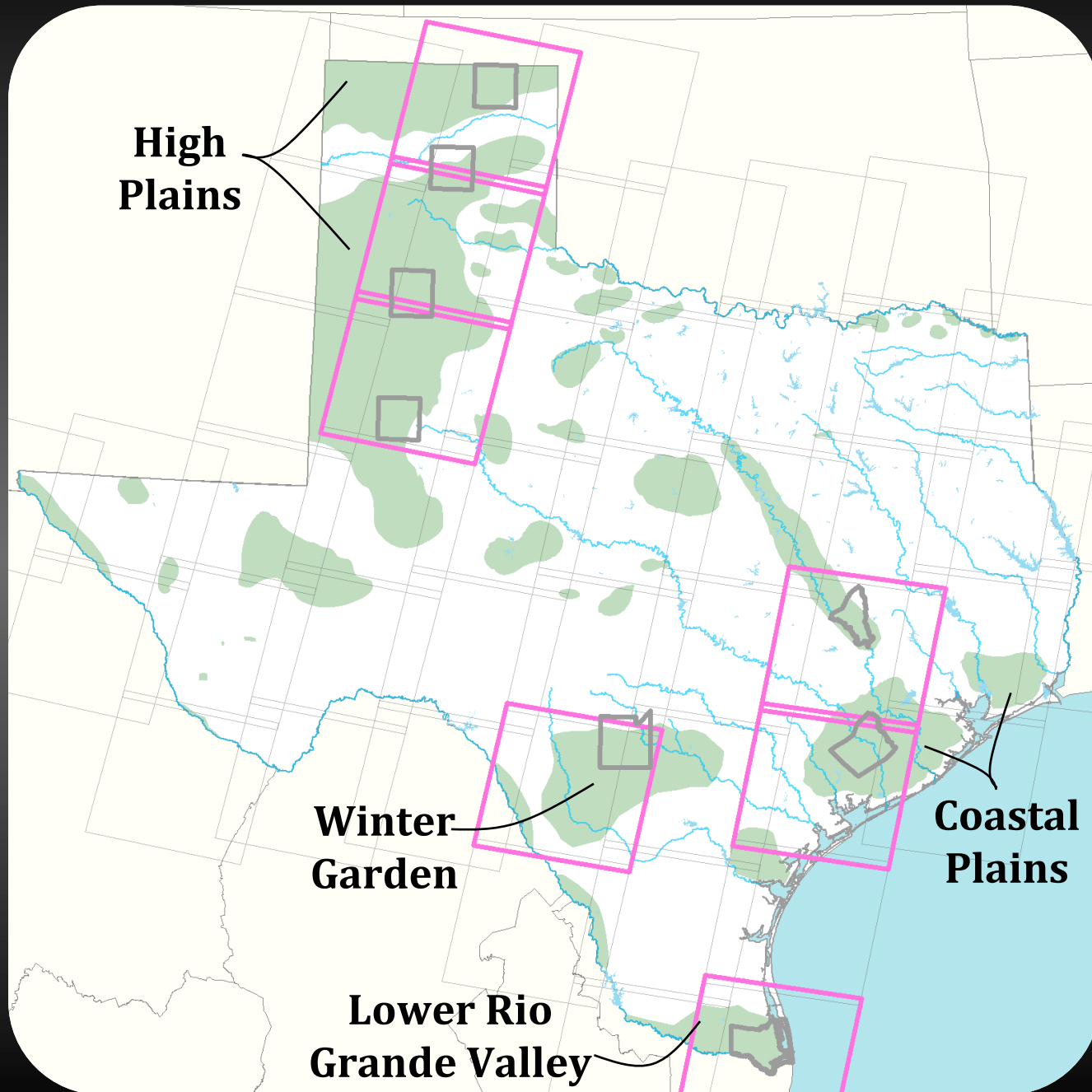
Irrigation Estimates

Irrigated Agriculture



#	Task Description	2013						2014												2015												2016					
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
1	Assessment of satellite ET algorithms																																				
2	Assessment of Precip & gridded data sets																																				
3	Assessment of time integration methods																																				
4	Development of validation data																																				
	<i>Initial Feasibility Report</i>																																				
	<i>Stakeholder workshop</i>																																				
5	Implementation study																																				
	<i>Final feasibility report</i>																																				

ET Algorithm		Accuracy	Feasibility	Justification	Complexity
Group A	SEBI	Tier 3	Low	Disadvantages: albedo and aerodynamic roughness; antiquated method	Low
	SEBS	Tier 4	Moderate	Similar limitations to SEBI; also requires daily met data; SEBAL more current	Moderate
	S-SEBI	Tier 2	High	Simplified version; easy time integration at the expense of accuracy	Low
Group B	TSM	Tier 3	Low	Advantages: separate soil/veg ET; disadvantages: no time integration; antiquated method	Moderate
	ALEXI	Tier 3	Low	Advantages: time differential Ts, robust time integration; disadvantages: course spatial resolution and complexity	High
Group C	SEBAL	Tier 3/4	Moderate	Advantages: no land cover required, high accuracy; disadvantages: no ET at hot cell, proprietary code, complex algorithms	High
	METRIC	Tier 3/4	High	Advantages: similar to SEBAL but ET constrained by soil water balance; disadvantages: proprietary code and complex algorithms	High
Group D	STARFM DisALEXI	Tier 4	Moderate	Advantages: no cloud issues; disadvantages: complicated, requires significant in-house algorithm development	High



Thank you



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