### Providing Water for Wildlife and Resiliency Before the Next Drought



Joe Saenz
Aransas National Wildlife Refuge
Elizabeth H Smith
International Crane Foundation
James Dodson
San Antonio Bay Partnership

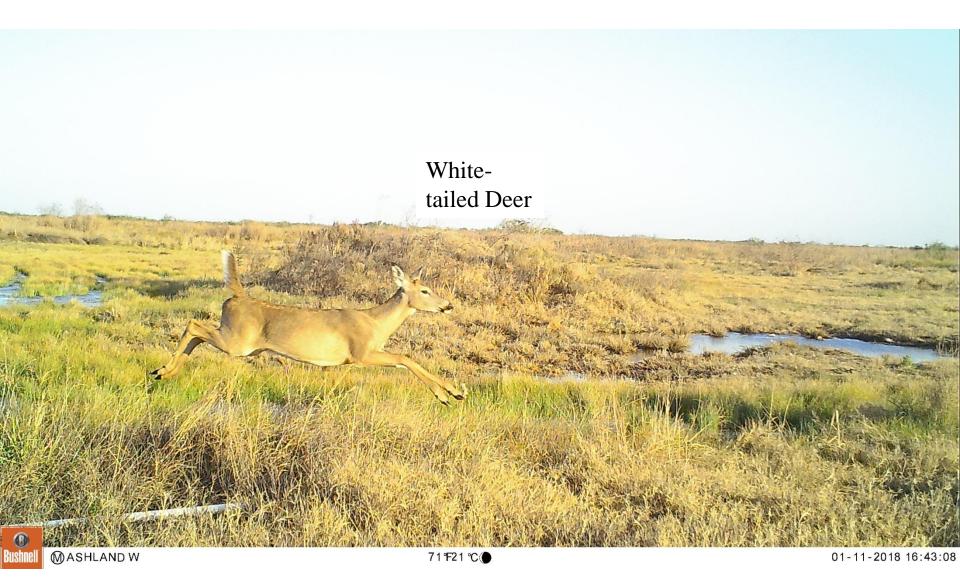
## Whooping Crane Use of Freshwater Ponds During Drought Conditions





Bushnell

01-02-2013 11:25:14





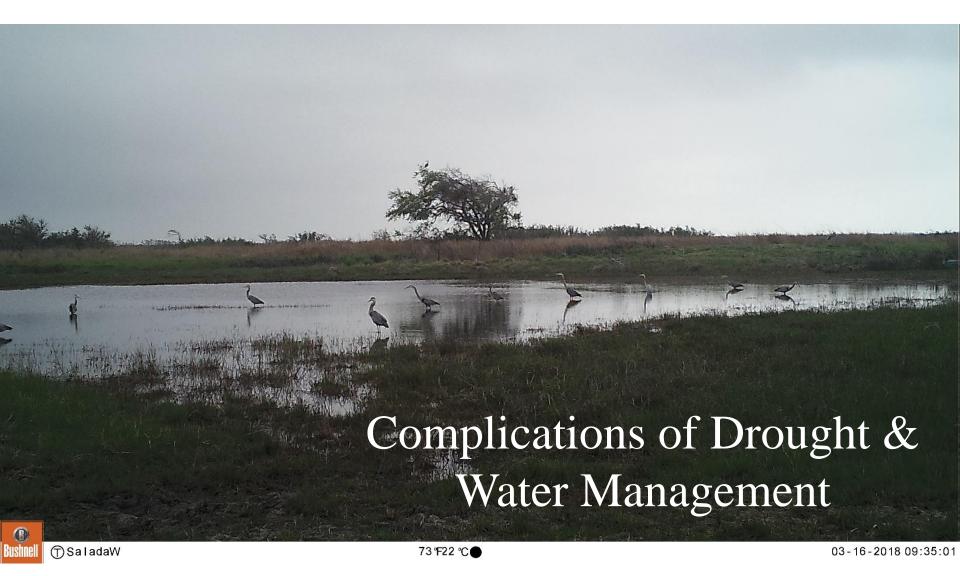




# Windmills Provide Water for Whooping Cranes & Wildlife



# Windmills Provide Water for Whooping Cranes & Wildlife



## Complications of Drought

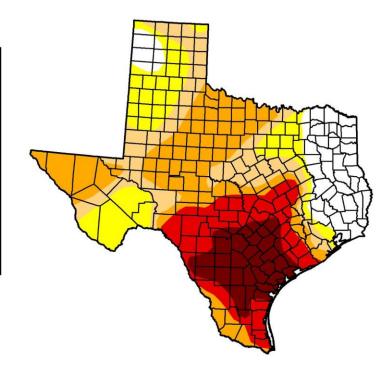
### U.S. Drought Monitor

**April 14, 2009** Valid 7 a.m. EST

**Texas** 

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.9	85.1	68.2	50.6	25.1	11.5
Last Week (04/07/2009 map)	6.7	93.3	79.1	53.5	24.6	7.1
3 Months Ago (01/20/2009 map)	26.9	73.1	45.8	22.2	16.0	4.2
Start of Calendar Year (01/06/2009 map)	41.7	58.3	24.5	15.0	9.1	4.2
Start of Water Year (10/07/2008 map)	67.2	32.8	20.5	11.0	3.6	0.0
One Year Ago (04/15/2008 map)	36.2	63.8	45.0	18.4	10.5	3.3





D0 Abnormally Dry D1 Drought - Moderate

D2 Drought - Severe

D3 Drought - Extreme D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.









Released Thursday, April 16, 2009 Author: Richard Heim, NOAA/NESDIS/NCDC

## Complications of Drought

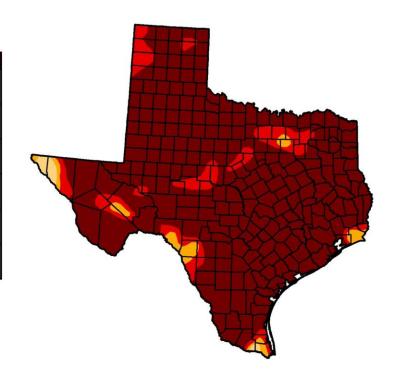
### U.S. Drought Monitor

September 13, 2011

#### **Texas**

<b>Drought Conditions</b>	(Percent Area)
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i i	g co (r ordener nod)						
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	
Current	0.00	100.00	100.00	99.17	96.75	87.83	
Last Week (09/06/2011 map)	0.00	100.00	99.93	99.01	95.68	81.06	
3 Months Ago (06/14/2011 map)	1.97	98.03	96.53	94.77	88.57	64.78	
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00	
Start of Water Year (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00	
One Year Ago (09/07/2010 map)	69.60	30.40	5.25	1.51	0.00	0.00	



#### Intensity:

D0 Abnormally Dry D1 Drought - Moderate D2 Drought - Severe

D3 Drought - Extreme D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.









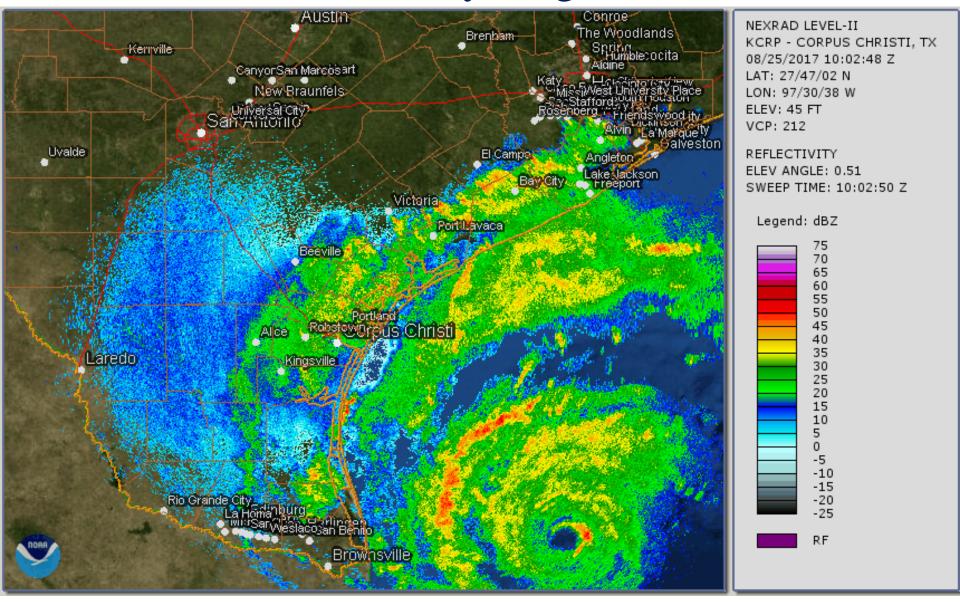
Released Thursday, September 15, 2011 Mark Svoboda, NDMC

# Waters for Wildlife Funding Provided By

- Friends of ANWR, San Antonio Bay Foundation
- Texas State Aquarium Research Grant Program
- Coastal Bend Bays & Estuaries Program
- National Fish and Wildlife Foundation
  - Aransas National Wildlife Refuge
  - San Antonio Bay Partnership
  - International Crane Foundation
- US Fish and Wildlife Service, Private Lands Program
  - International Crane Foundation

# Complications of Hurricanes & Water Management

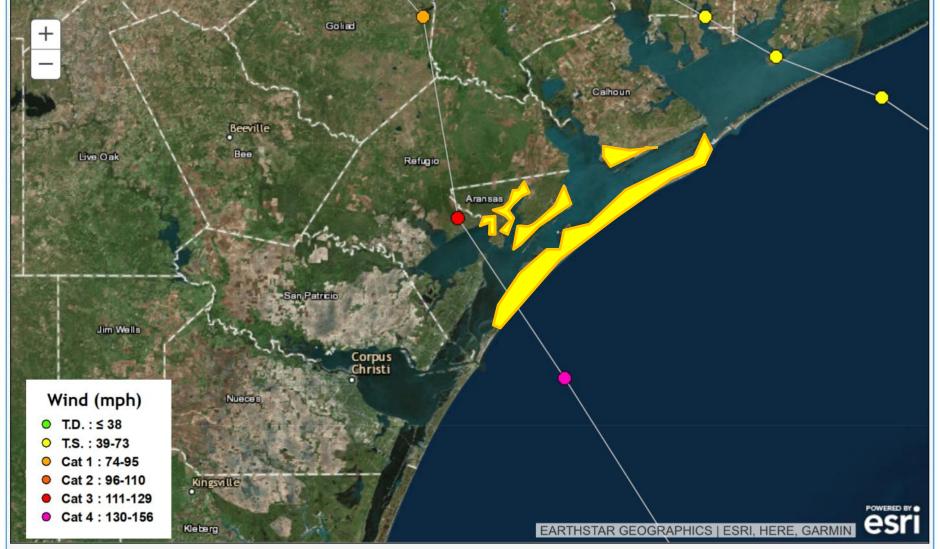
### Hurricane Harvey August 25, 2017

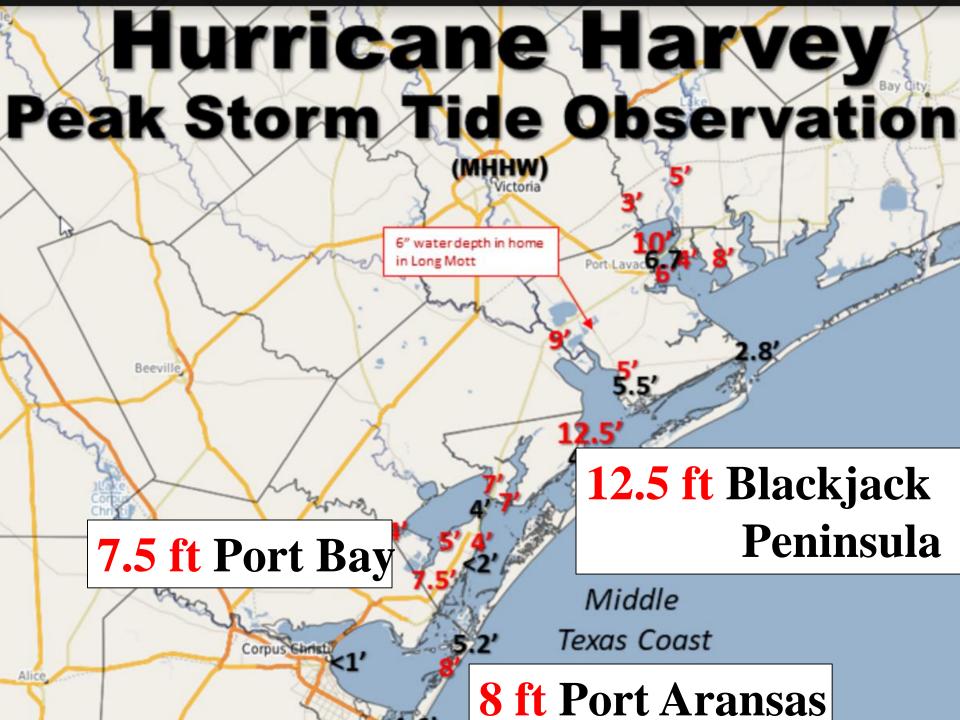


#### Category 4 Hurricane Harvey: South Texas Landfall & Impacts from August 25<sup>th</sup> to 29<sup>th</sup>, 2017

Overview Harvey Stats Radar Satellite Winds Storm Surge Rainfall Rivers Seadrift Tornado Storm Reports Photos

...Hurricane Harvey is the first Major Hurricane to strike South Texas since Celia in 1970...
...Hurricane Harvey is the first Hurricane to strike the Texas Coast since Ike in 2008...





### Coastal Marshes Post-Harvey: Good Condition





# Potential Impacts to Whooping Cranes & Wildlife: Fresh Water



### Day Before the Hurricane









