Texas Water Development Board
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October, 2013

The summer of 2013 brought timely rains for crops and playas alike. We continue to collect data on these flood events and to survey new playas to help understand their role in groundwater recharge.

Moving into our third year of field work for the Playa Lakes Ogallala Aquifer Recharge Project, we are planning for Phase 2 field-tests of playa modifications to increase recharge.

As part of the Phase 2 planning, the TWDB is working with the Texas Congressional delegation to ensure that language protecting Farm Program benefits for project participants is included in the Farm Bill reauthorization. Because the current Farm Bill has lapsed, any playa recharge modifications conducted at this time would not be protected under the exemption in the 2008 bill. Phase 2 work will not begin until we can ensure that benefits for project participants are protected.

As always, I welcome your continued participation in and input to this project. Feel free to contact me at 512-463-3210 or by e-mail at Andrew.weinberg@twdb.texas.gov with any comments or questions

Playa Monitoring

We have collected data on 39 flood events since the first monitoring station was installed back in April 2011. These data give us a clearer picture of how much water collects in the playas, how much evaporates, how much infiltrates the soil, and how fast the water moves down into the aquifer. Information on each of the flood events is shown in the table below.

2011 - 2013 Playa Monitoring Summary

Playa	Flood Date	Infiltration		Flood Depth, cm	Flood Length days
		mm/d	Percent		
Dawson 1	8/11	40.7	82.1	87.1	18
	5/12	37	78.2	56.5	13
	10/13	20.4	74.2	35.5	11
Dawson 2	5/12	8.6	45.5	19	10
	9/12	7.1	52.1	12	9
Floyd 1	8/13	2.99	33.4	20.6	22
	9/13	2.06	27.5	22.5	24+
Hale 1	7/12	2.07	17.5	70.6	70
	6/13	5.44	38.7	64.3	60
Hale 2	7/12	8.49	49.6	27.3	20
	6/13	6.43	41.0	21.2	12
Hale 3	6/12	1.96	16.6	46.2	50
	6/13	16.4	61.4	12.0	5
Hale 4	6/12	25.3	68.5	68.0	23
Hale 5	10/12	9.73	67	24.7	57
	7/13	2.49	25.3	64.9	75
Hale 6	8/11	15.2	67.1	61.4	23
	8/12	8.02	53.4	48.8	37
Hale 7	7/13	35.7	82.2	13.4	5
Hockley 1	5/12	6.05	38.8	65	39
	6/12	6.04	39.9	49	54
	6/13	11.1	56.9	33	17
Carson 1	2/12	0.16	3.3	16.4	37
	6/13	11.3	56.2	8	6
Carson 2	10/13	21.2	78.7	9.8	3
Carson 3	3/13	8.55	59.4	19.5	10
Arm-strong 1	4/12	13.3	61.9	10.1	5
	6/12	1.78	17.3	14.2	17
	6/13	2.83	21.1	23.0	17
	7/13	0.1	0.07	85.0	78+
Arm-strong 2	6/13	1.27	11.1	34.3	31
	8/13	0.75	9.1	51.5	35+
Randall 1	6/12	5.33	33.2	19.8	15
	10/12	0.74	12.5	26.7	42
	6/13	4.14	29.2	21.4	16
	8/13	2.57	22.9	27.9	26
Randall 2	6/12	-0.04	-0.04	18	22
	10/12	0.004	0.08	10.3	24
Randall 3	6/12	1.29	11.6	6.4	10

Note: 1 inch = 25.4 mm or 2.54 cm

Flood events lasted from as little as three days to over 80 days, and ranged from 6 cm to 87 cm in depth. Infiltration rates ranged from zero to over 40 millimeters per day.

Several patterns can be seen in the results:

- Dawson County playas have consistently high infiltration rates as a result of the sandier, more permeable soil there. Deeper floods increase infiltration rates in these lakes.
- Small flood events tend to have high apparent infiltration rates, especially following long dry spells, but probably do not contribute much groundwater recharge.

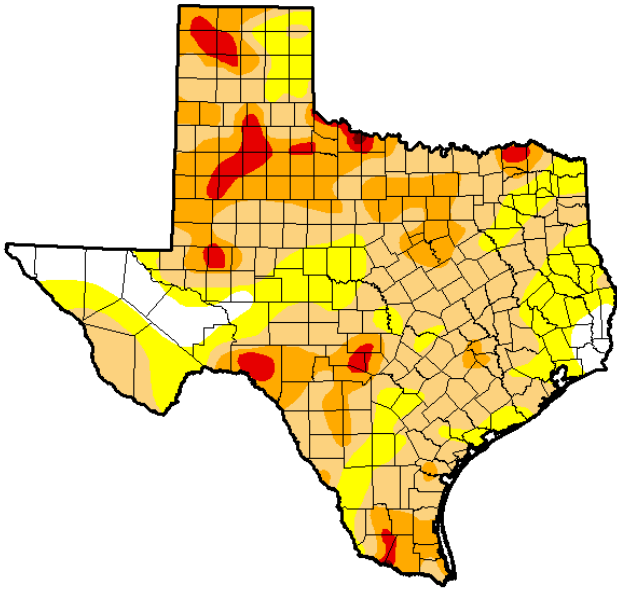
Infiltration from small floods is held in the clay soil in the playa bottoms, and little, if any, leads to actual recharge.

- Deep flood events and floods occurring on already wet soil have lower infiltration rates. Once the clays are hydrated and expand to swell soil cracks shut water movement is limited. For example, only 0.07 percent of the water from the large July 2013 flood at the Armstrong 1 playa contributed to infiltration, with over 99 percent of the water lost to evaporation.

More detailed modeling is planned to assess the relative importance of soil texture, soil moisture, flood depth, and flood duration to groundwater recharge. Please contact the TWDB if you are interested in more detailed data for playas on your property.

Drought

While drought conditions have eased across much of Texas, parts of the Panhandle continue to experience severe to extreme drought, as shown in the US Drought Monitor map of the most recent conditions for Texas below.



Regional climate analyses suggest that recent drought conditions are related to long-term trends in the tropical Pacific and Atlantic oceans. Both the Pacific Decadal Oscillation (PDO) and Atlantic Multi-decadal Oscillation (AMO) are in phases associated with drier than normal conditions in the southern U.S. These conditions may persist for years to come. Details are available from the Noble Foundation at http://www.noble.org/ global/ag/pasture/new-normal/new-normal.pdf. There is more information on climate and drought available from the Office of the Texas State Climatologist at http://climatexas.tamu.edu/.

October 8, 2013

(Released Thursday, Oct. 10, 2013)

Valid 7 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.60	93.40	70.47	25.41	4.41	0.12
Last Week 10/1/2013	6.62	93.38	70.95	25.08	4.01	0.12
3 Months Ago 7/9/2013	0.58	99.42	91.80	75.22	34.70	12.20
Start of Calendar Year 1/1/2013	3.04	96.96	87.00	65.39	35.03	11.96
Start of Water Year 10/1/2013	6.62	93.38	70.95	25.08	4.01	0.12
One Year Ago 10/9/2012	16.50	83.50	65.38	31.79	15.88	3.23

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

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http://droughtmonitor.unl.edu/