Summary of AG Water Use and Acreage In Willcox, Douglas and San Simon Areas

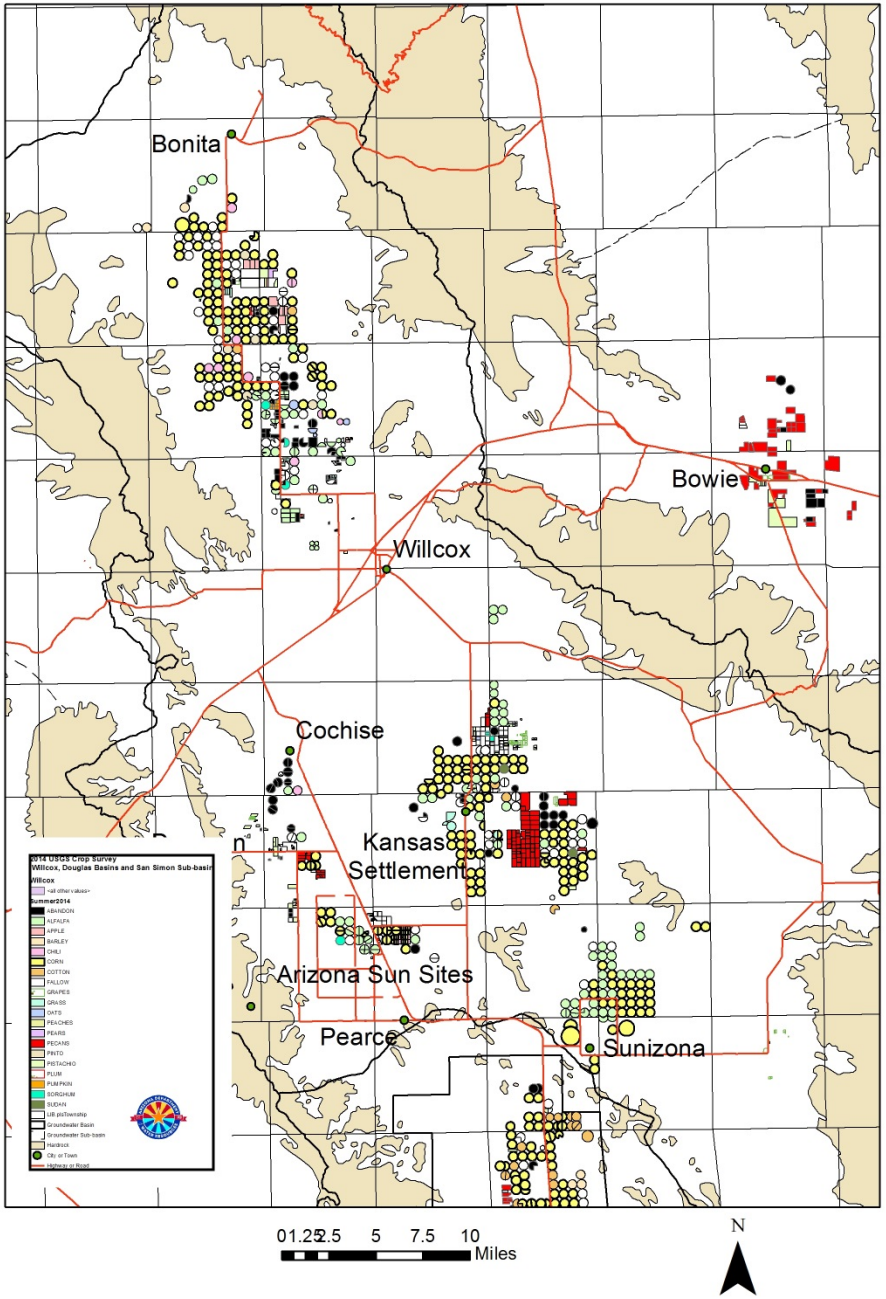
and

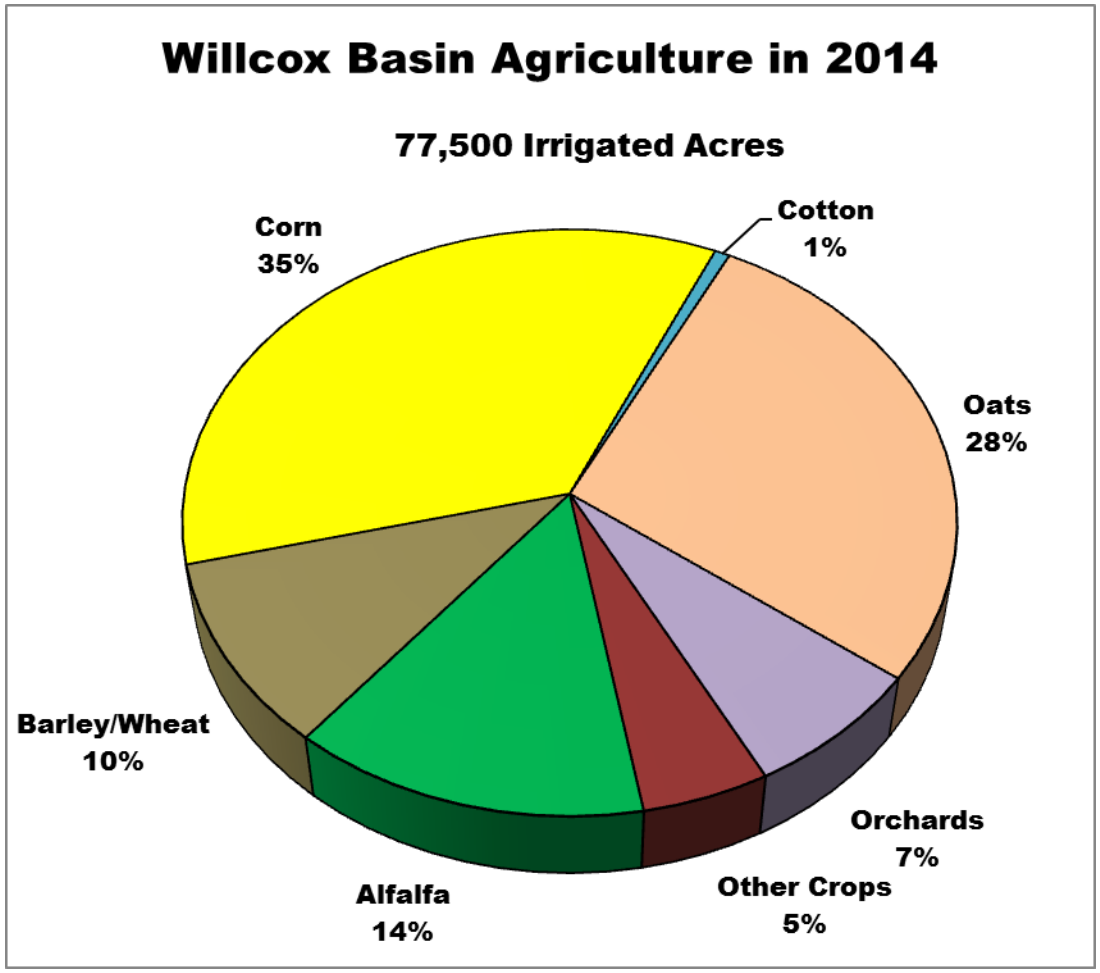
ADWR Water Level Sweep of the Willcox Basin 2014/15

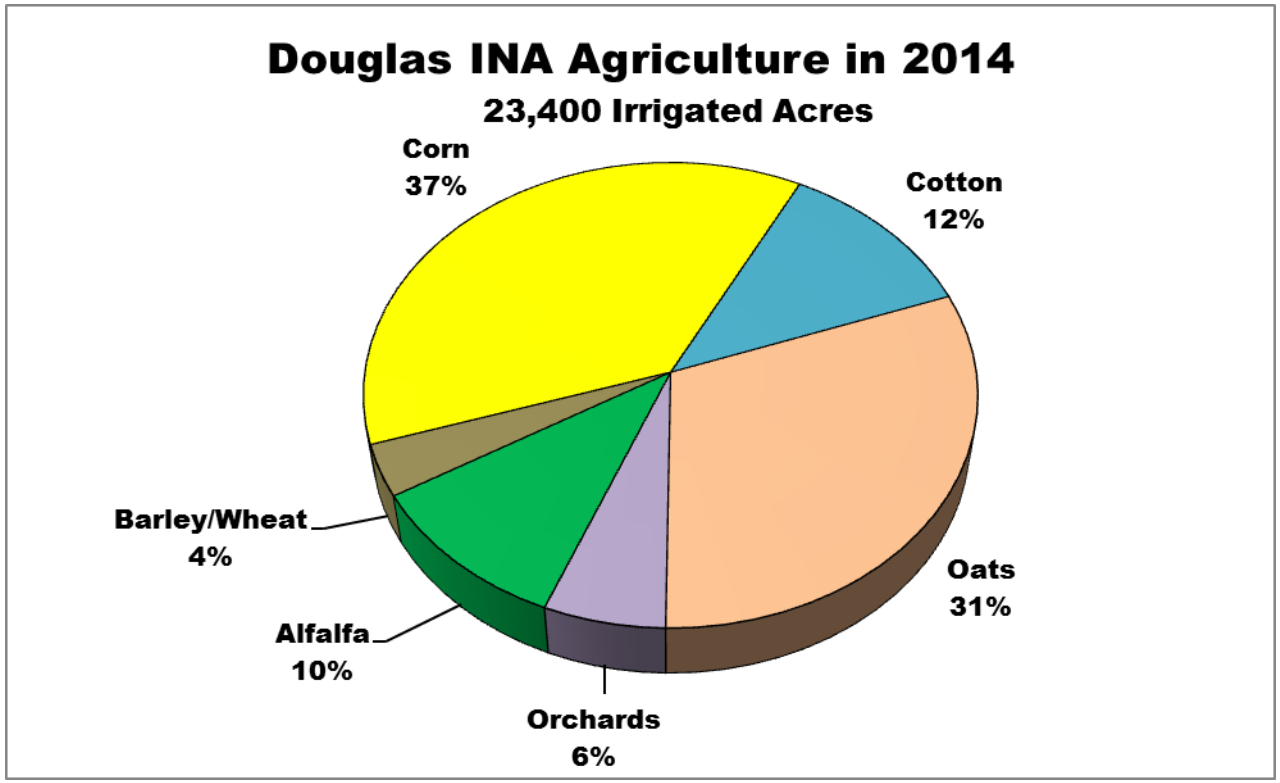
ADWR Hydrology Division

3/20/2015

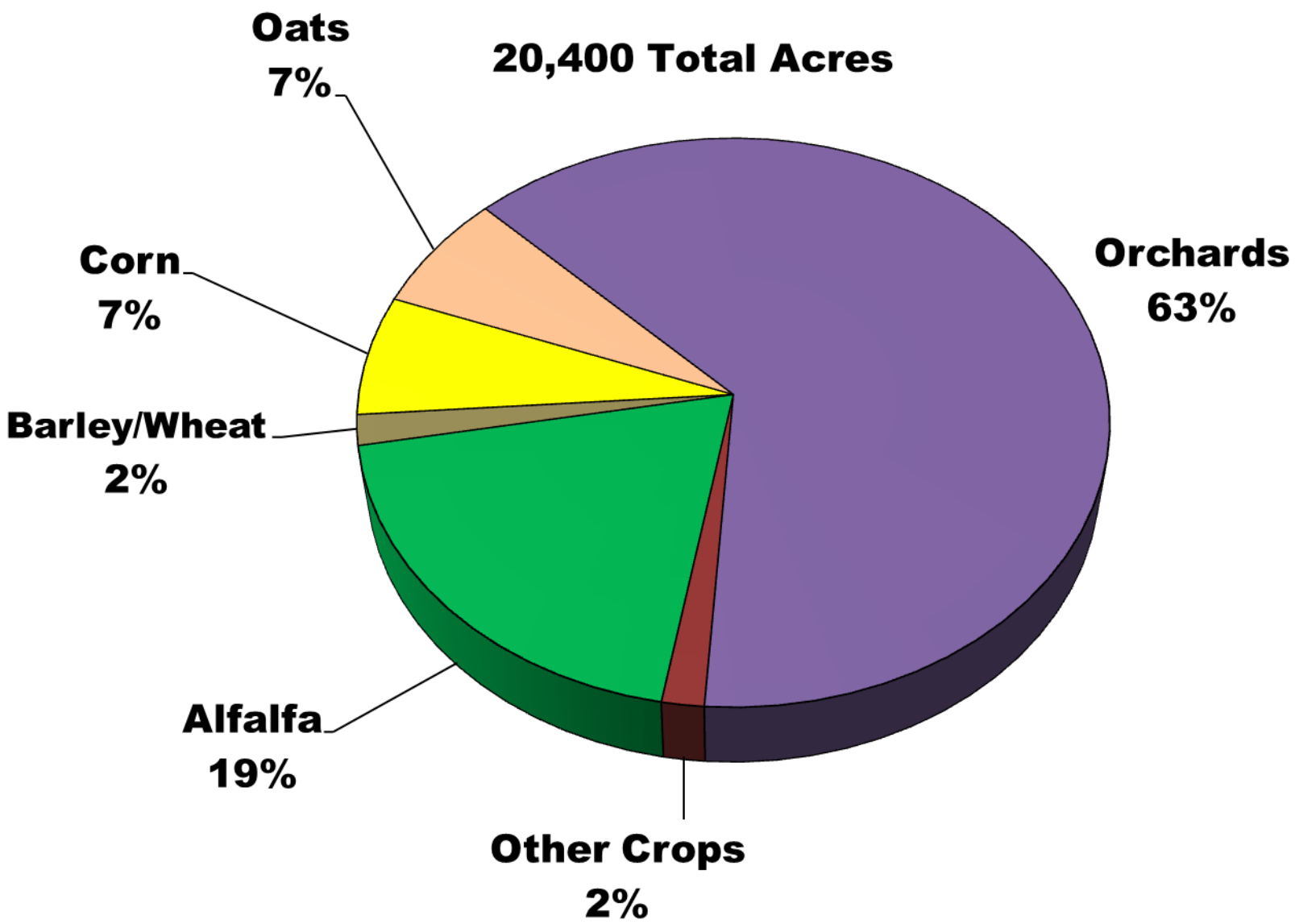
USGS 2014 Crop Survey of Willcox Basin

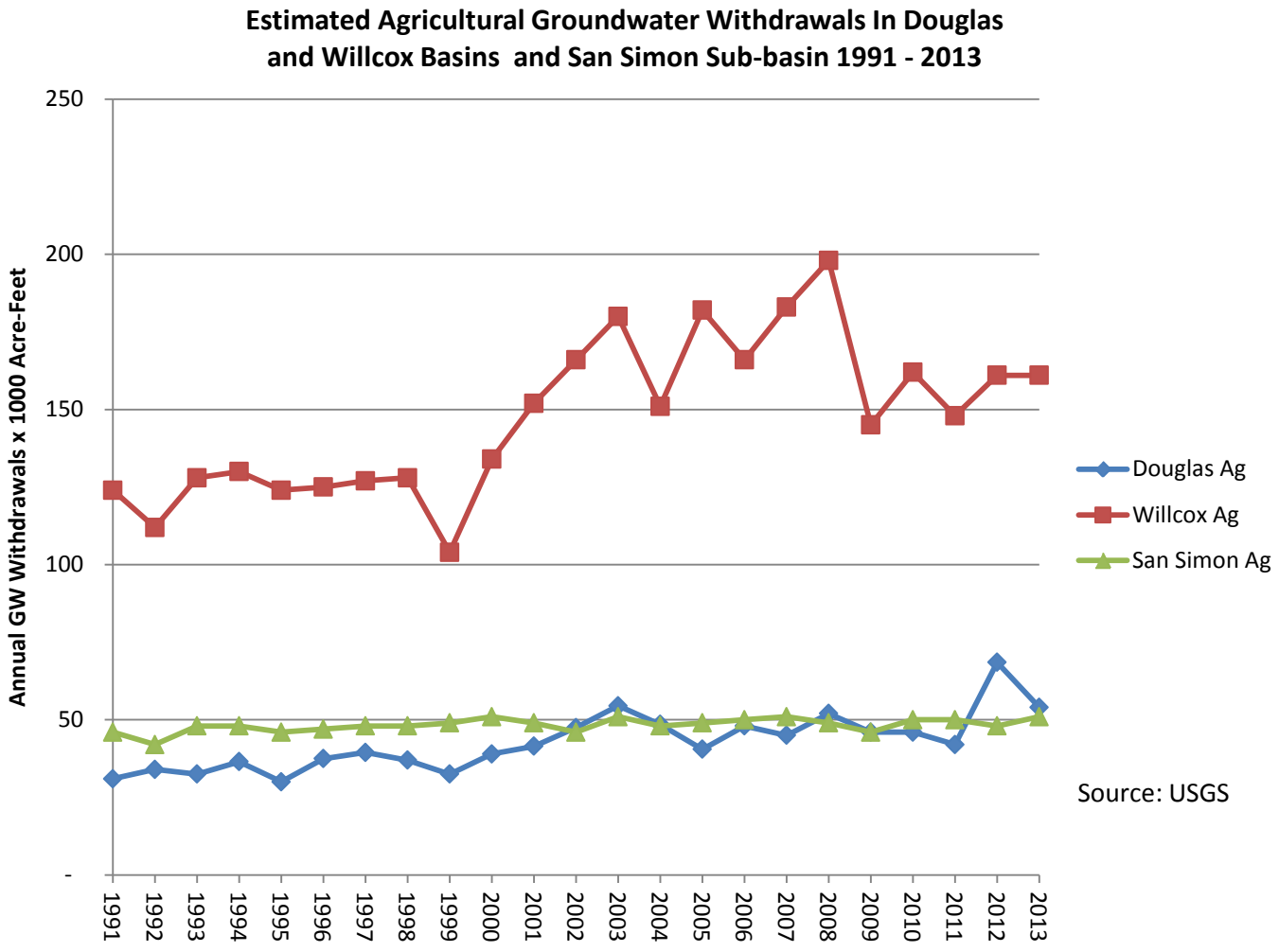


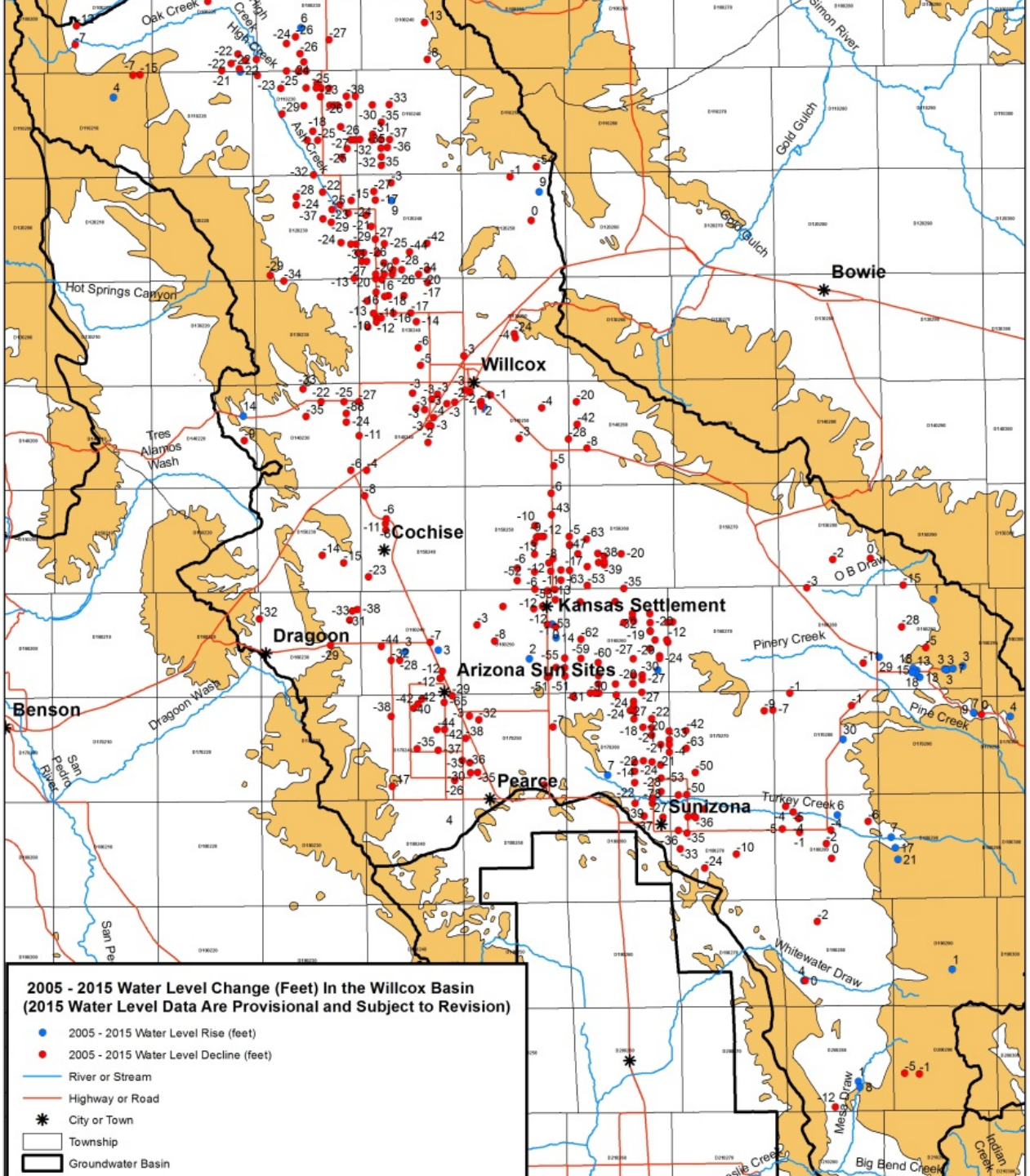

Willcox Basin Agriculture in 2014
77,500 Irrigated Acres
Corn
35%
Cotton
1%
Oats
28%
Barley/Wheat
10%
Orchards
7%
Other Crops
5%
Alfalfa
14%

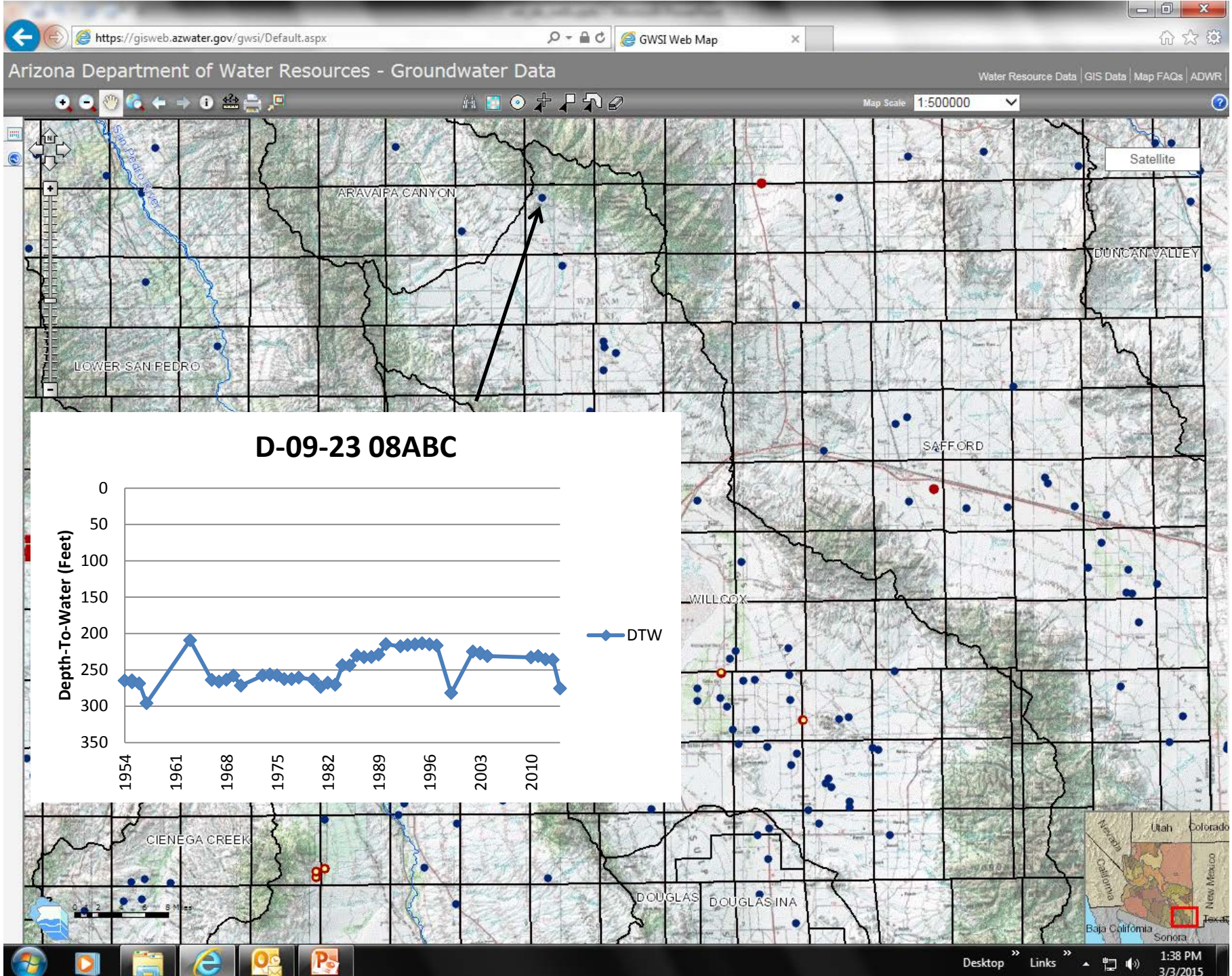

Douglas INA Agriculture in 2014
23,400 Irrigated Acres
Corn
37%
Cotton
12%
Oats
31%
Orchards
6%
Alfalfa
10%
Barley/Wheat
4%

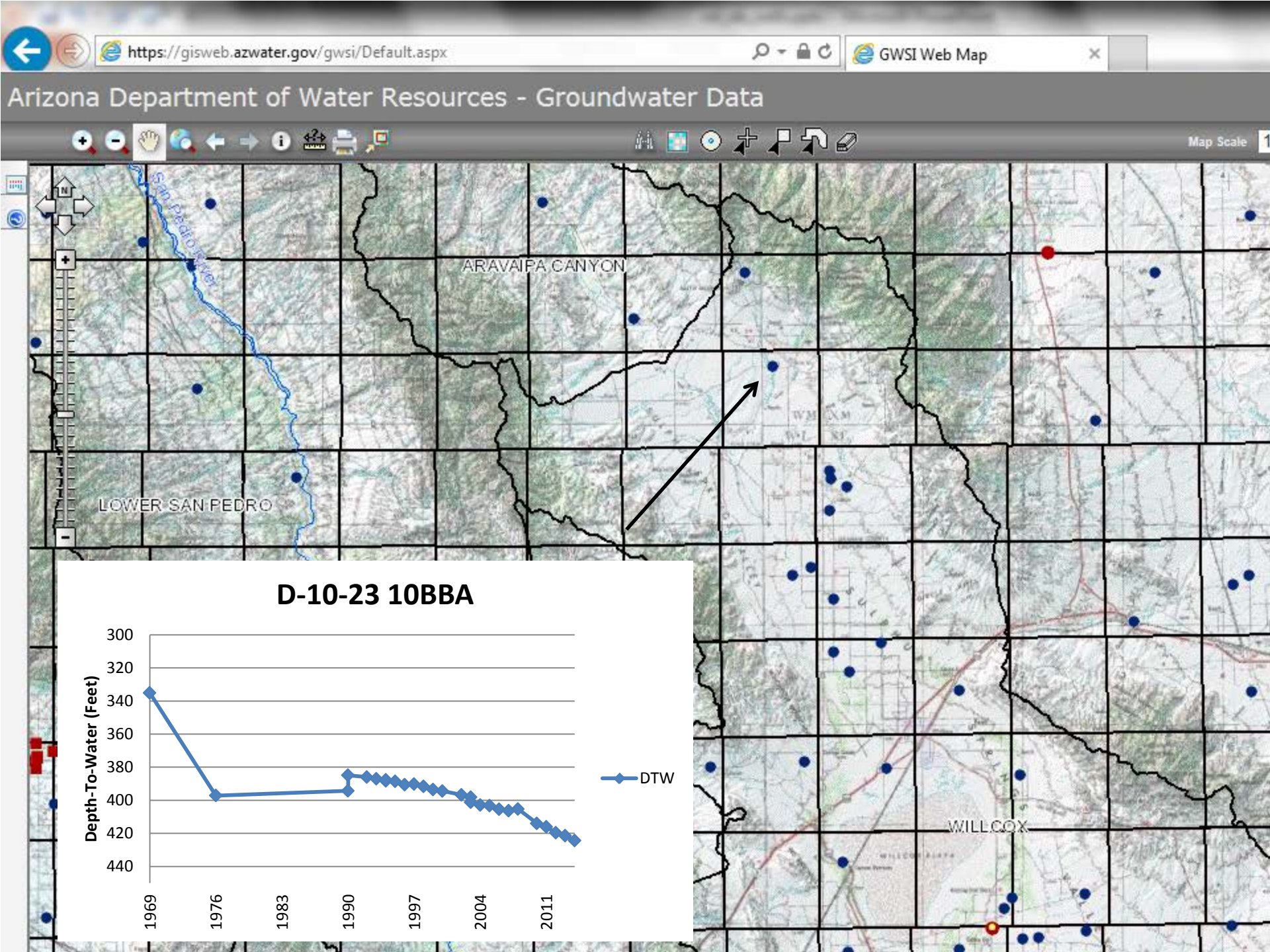
San Simon Irrigated Acres in 2014

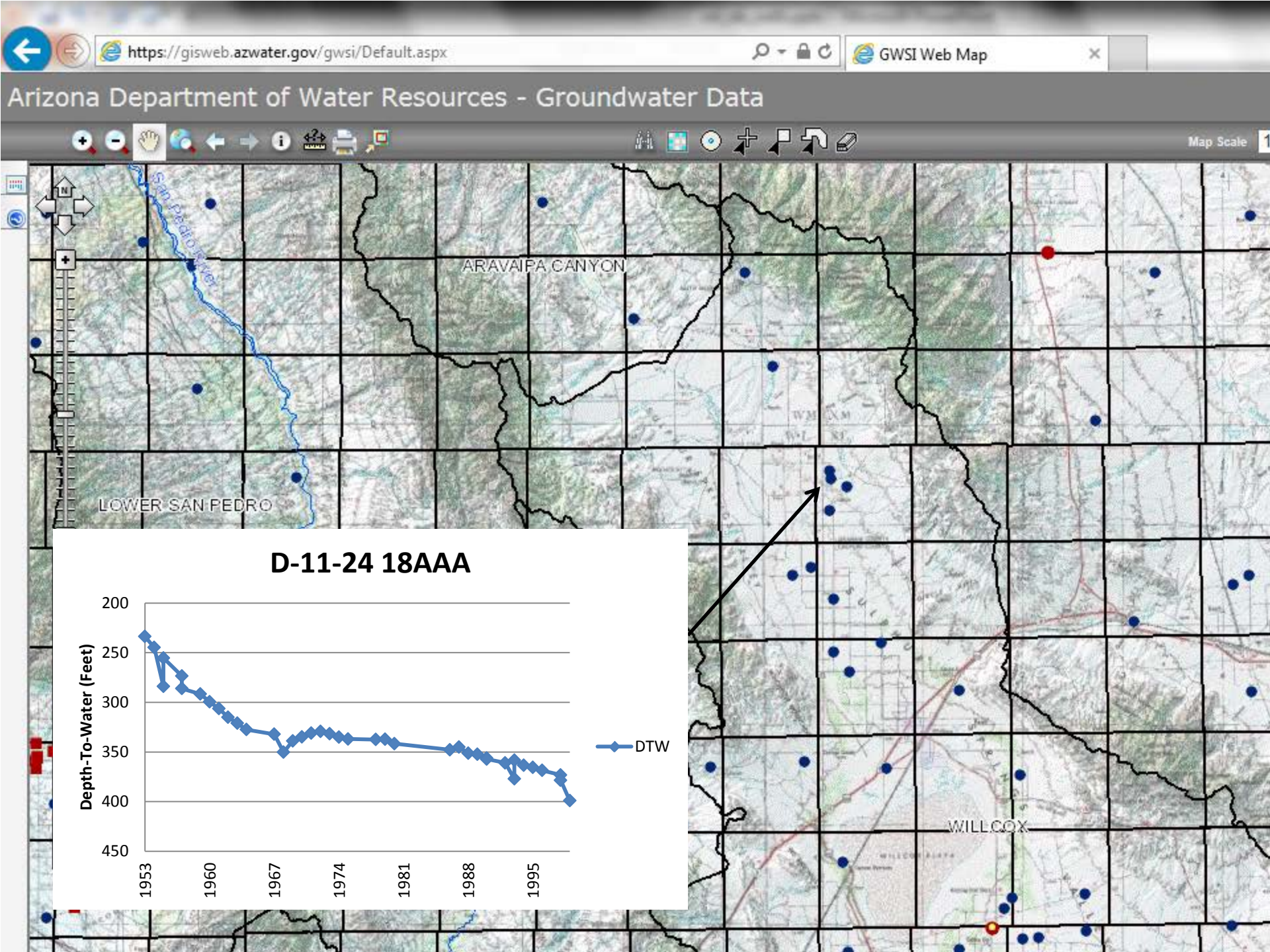


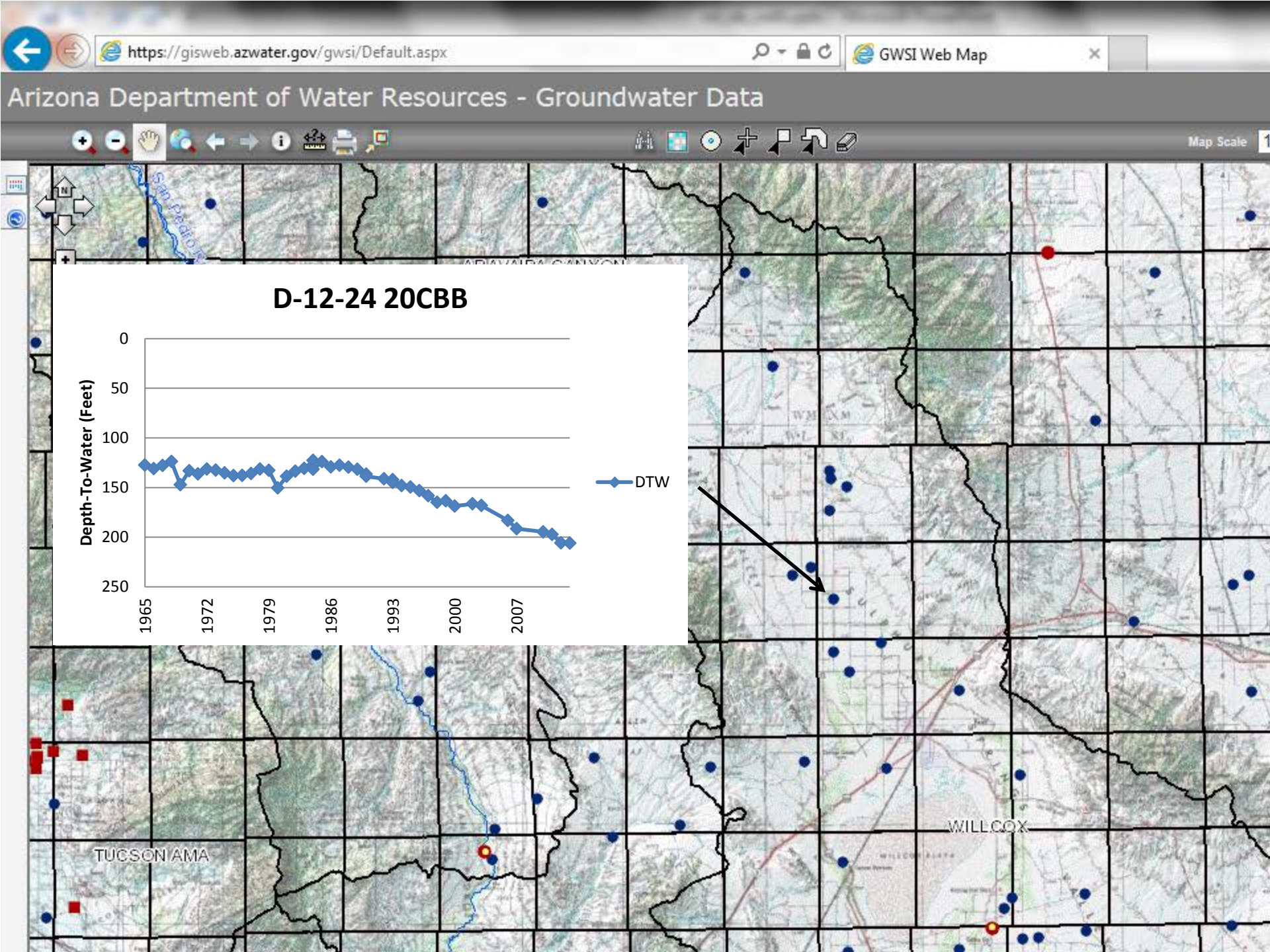

Estimated Agricultural Groundwater Withdrawals In Douglas and Willcox Basins and San Simon Sub-basin 1991 - 2013
Annual GW Withdrawals x 1000 Acre-Feet
250
200
150
100
50
-
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Douglas Ag
Willcox Ag
San Simon Ag
Source: USGS

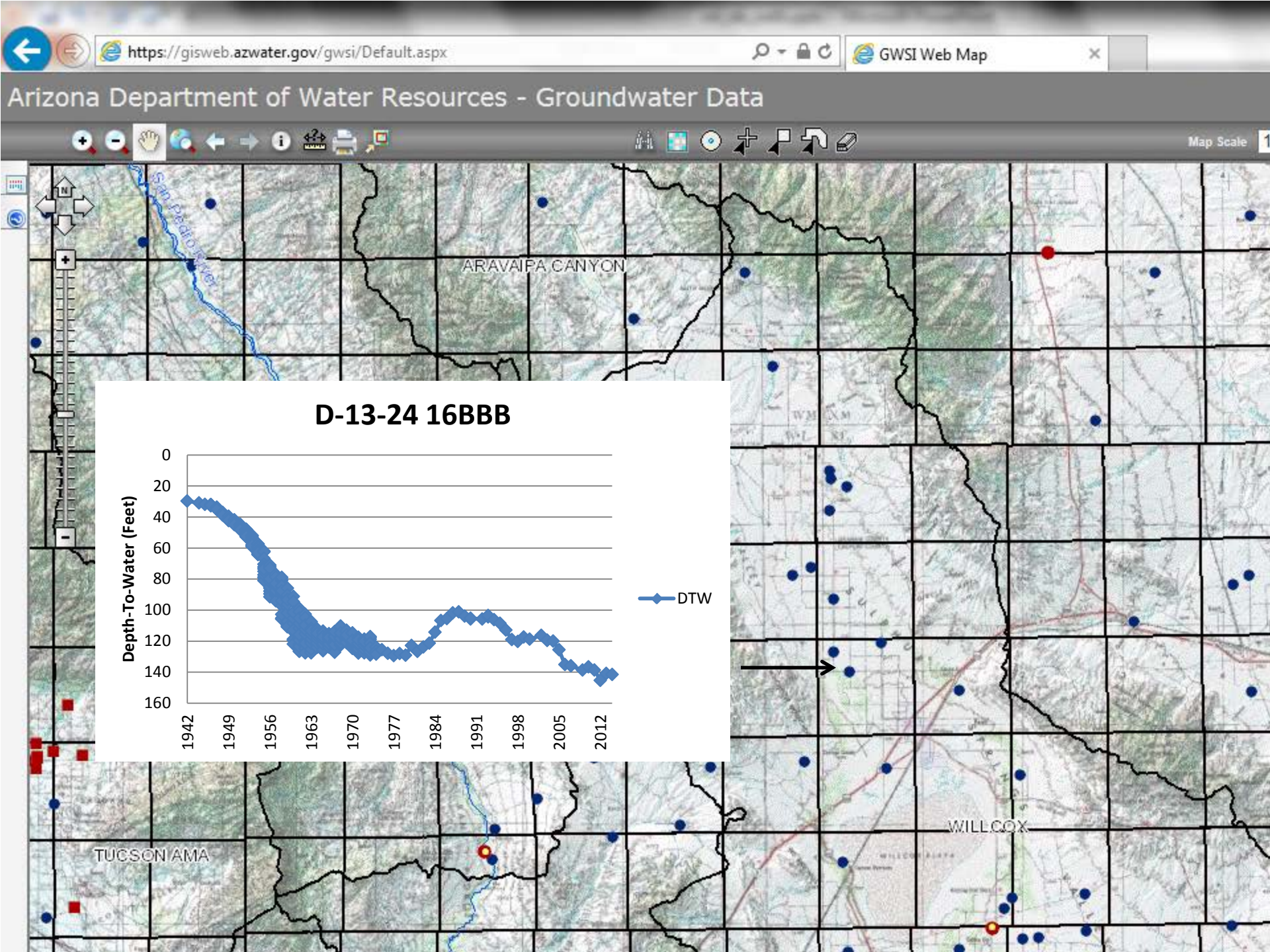

2005 - 2015 Water Level Change (Feet) In the Willcox Basin
(2015 Water Level Data Are Provisional and Subject to Revision)
2005 - 2015 Water Level Rise (feet)
2005 - 2015 Water Level Decline (feet)
River or Stream
Highway or Road
City or Town
Township
Groundwater Basin
Bowie
Willcox
Cochise
Kansas Settlement
Dragoon
Arizona Sun Sites
Benson
Pearce
Sunizona
Oak Creek
High Creek
Ash Creek
Hot Springs Canyon
Tres Alamos Wash
Gold Gulch
Simon River
O B Draw
Pinery Creek
Pine Creek
Dragoon Wash
San Pedro River
Turkey Creek
Whitewater Draw
Mesa Draw
Big Bend Creek
Indian Creek

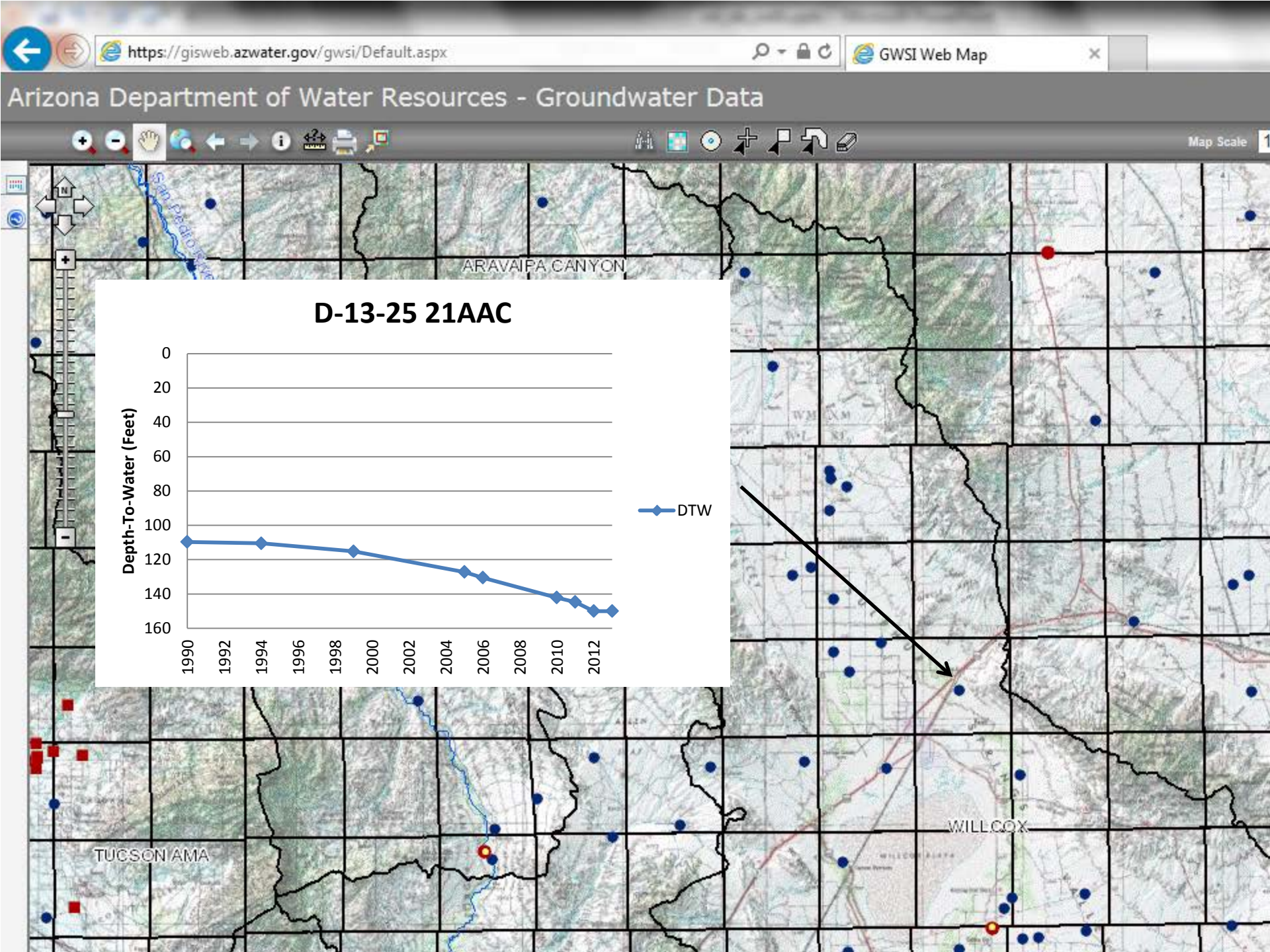

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Water Resource Data
GIS Data
Map FAQs
ADWR
Map Scale
1:500000
Satellite
ARAVAIPA CANYON
DUNCAN VALLEY
LOWER SAN PEDRO
SAFFORD
WILLCOX
CIENEGA CREEK
DOUGLAS
DOUGLAS INA
D-09-23 08ABC
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
1954
1961
1968
1975
1982
1989
1996
2003
2010
DTW
Utah
Colorado
Nevada
California
New Mexico
Baja California
Sonora
Desktop
Links
1:38 PM
3/3/2015

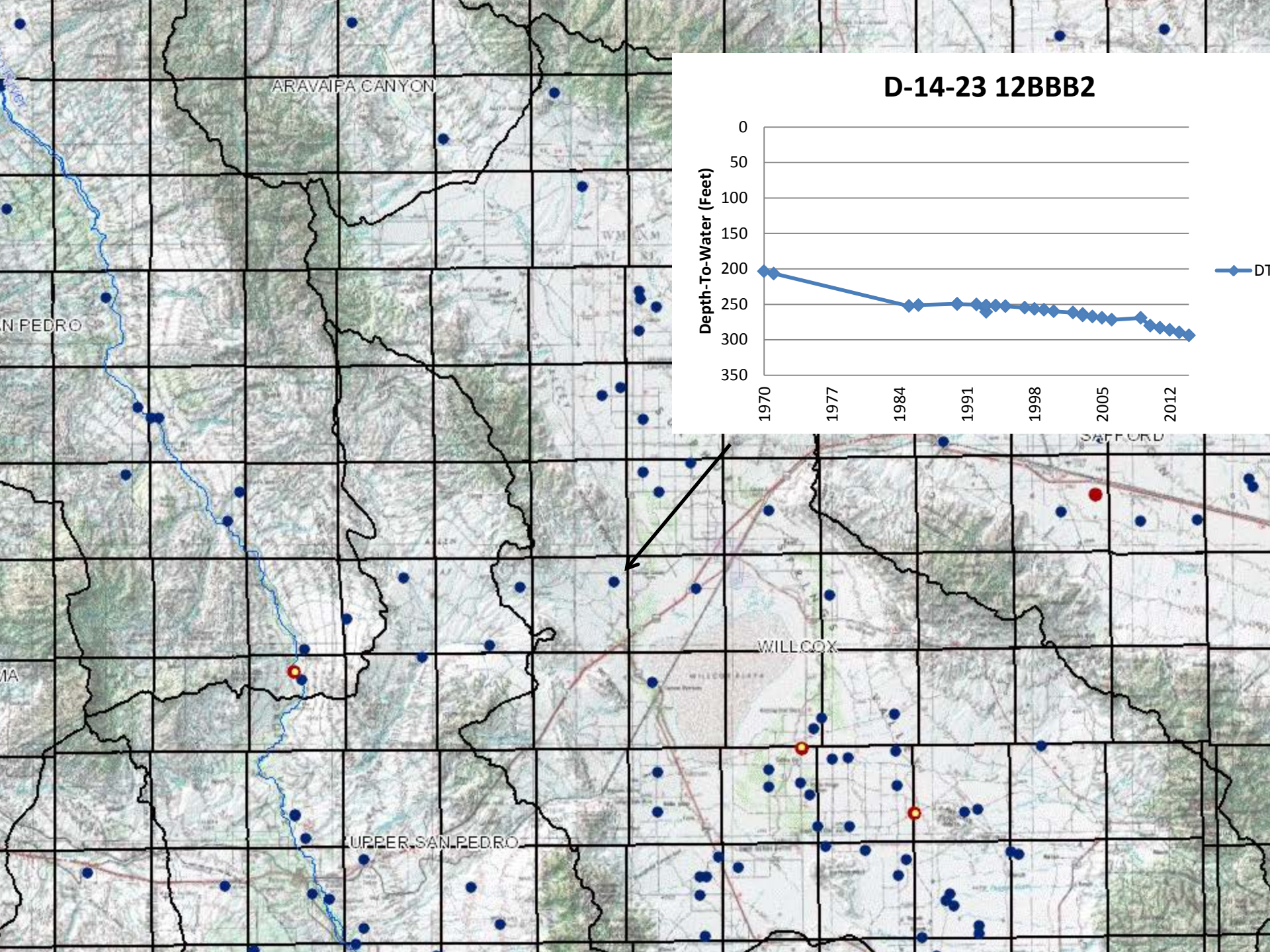

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Map Scale
ARAVAIPA CANYON
LOWER SAN PEDRO
WILLCOX
D-10-23 10BBA
Depth-To-Water (Feet)
300
320
340
360
380
400
420
440
1969
1976
1983
1990
1997
2004
2011
DTW

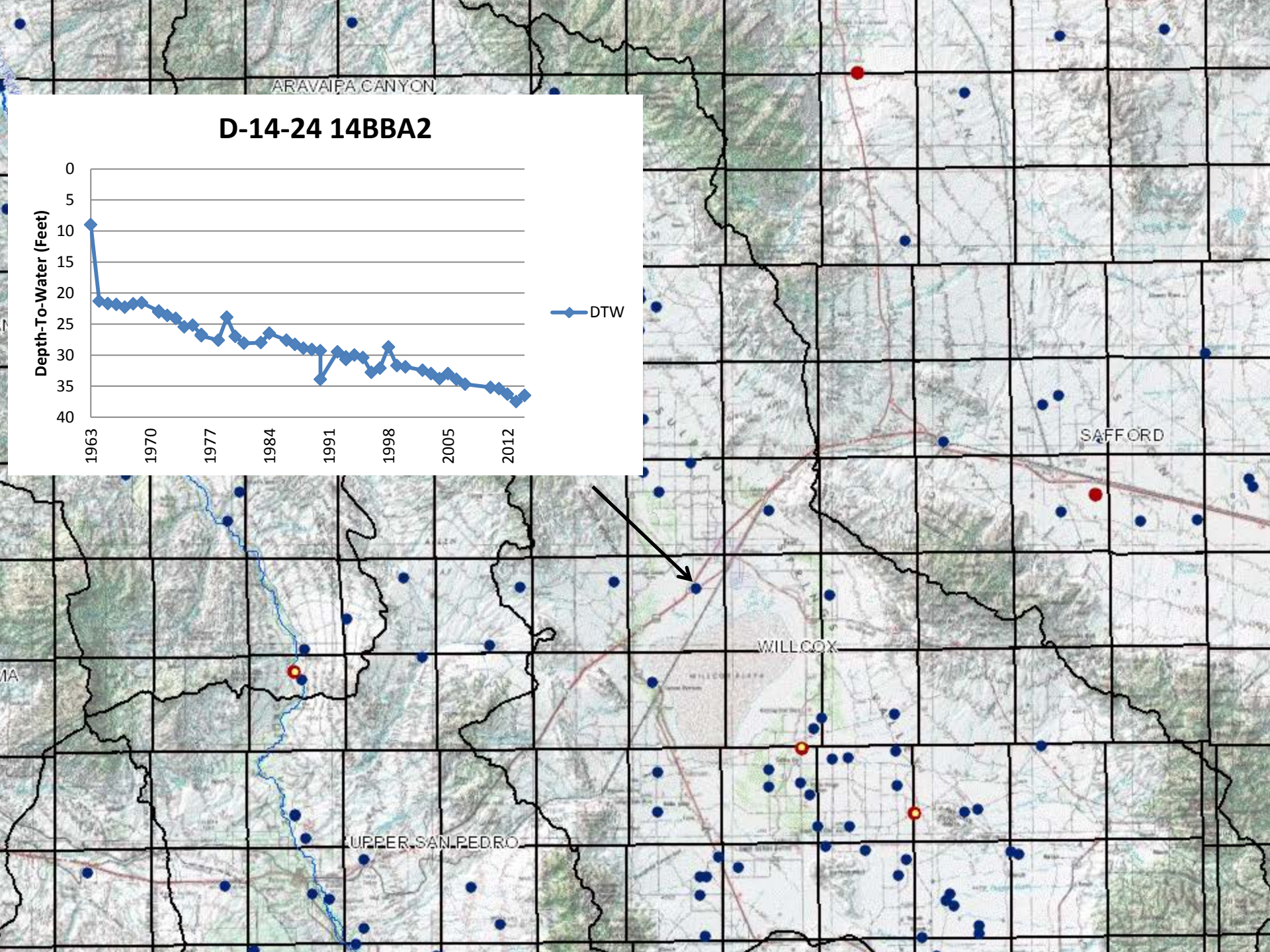

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Map Scale
ARAVAIPA CANYON
LOWER SAN PEDRO
WILLCOX
D-11-24 18AAA
Depth-To-Water (Feet)
200
250
300
350
400
450
1953
1960
1967
1974
1981
1988
1995
DTW

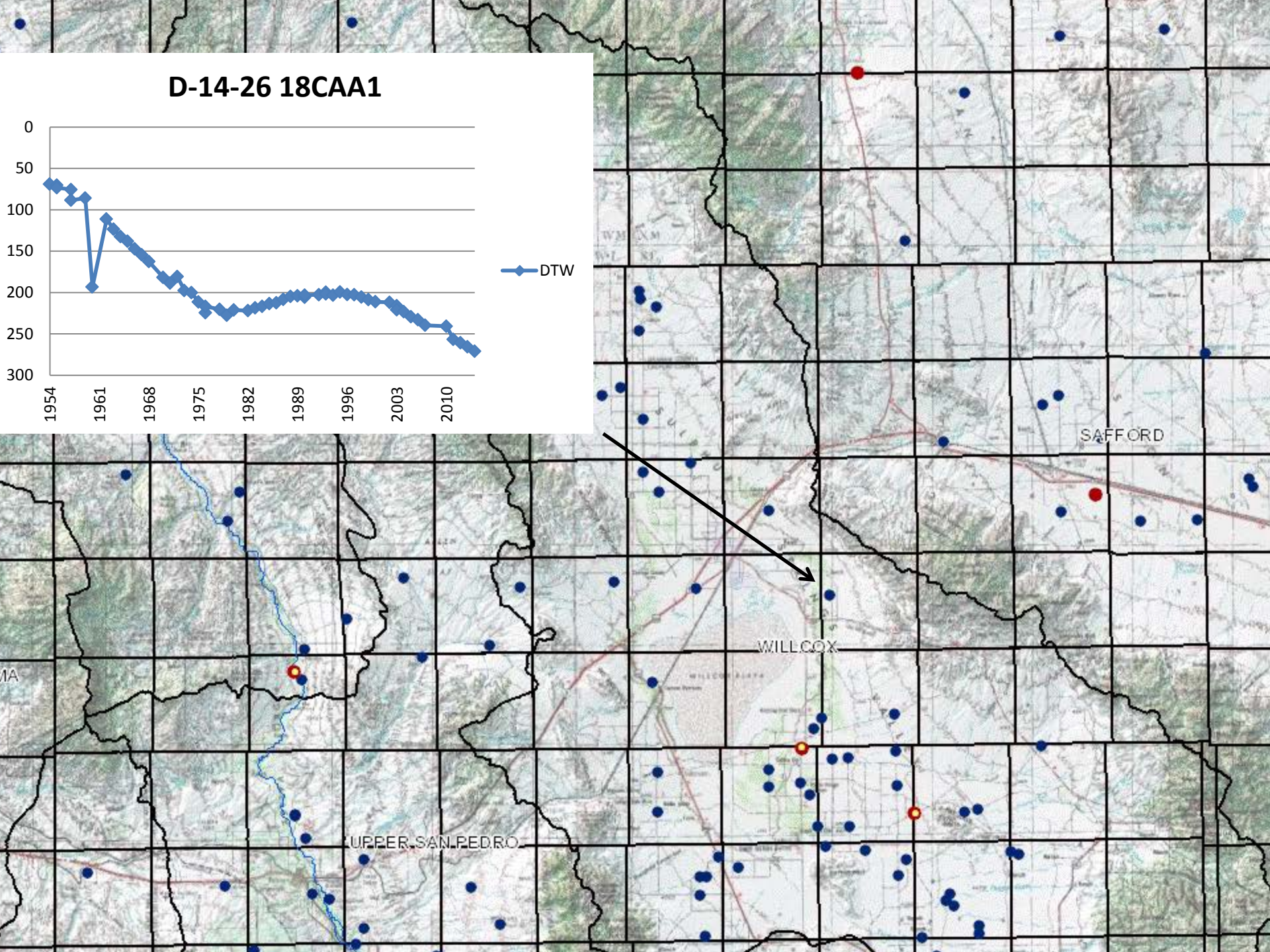

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Map Scale
D-12-24 20CBB
Depth-To-Water (Feet)
0
50
100
150
200
250
1965
1972
1979
1986
1993
2000
2007
DTW
TUCSON AMA
WILLCOX

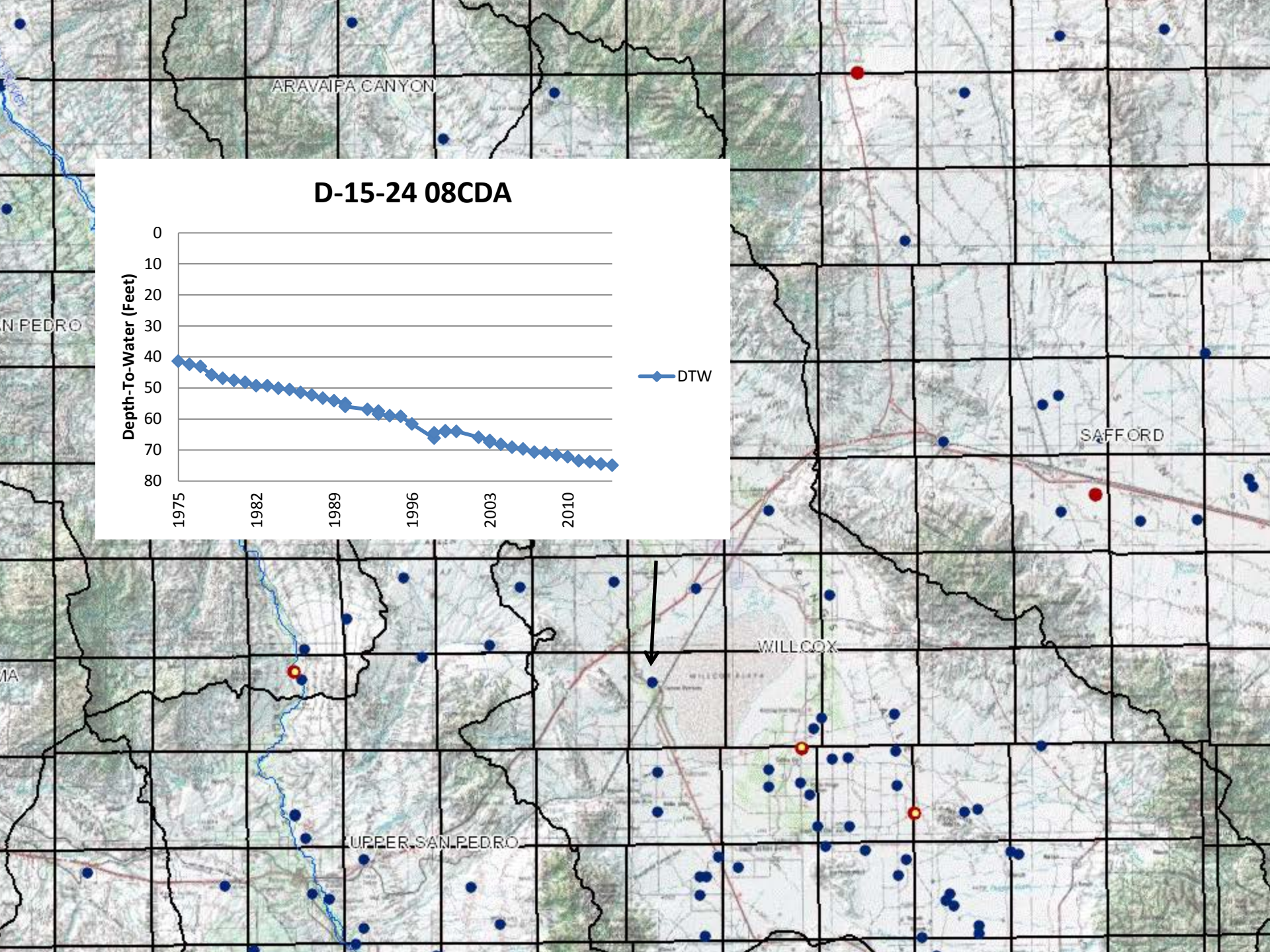

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Map Scale
ARAVAIPA CANYON
WILLCOX
TUCSON AMA
D-13-24 16BBB
Depth-To-Water (Feet)
0
20
40
60
80
100
120
140
160
1942
1949
1956
1963
1970
1977
1984
1991
1998
2005
2012
DTW

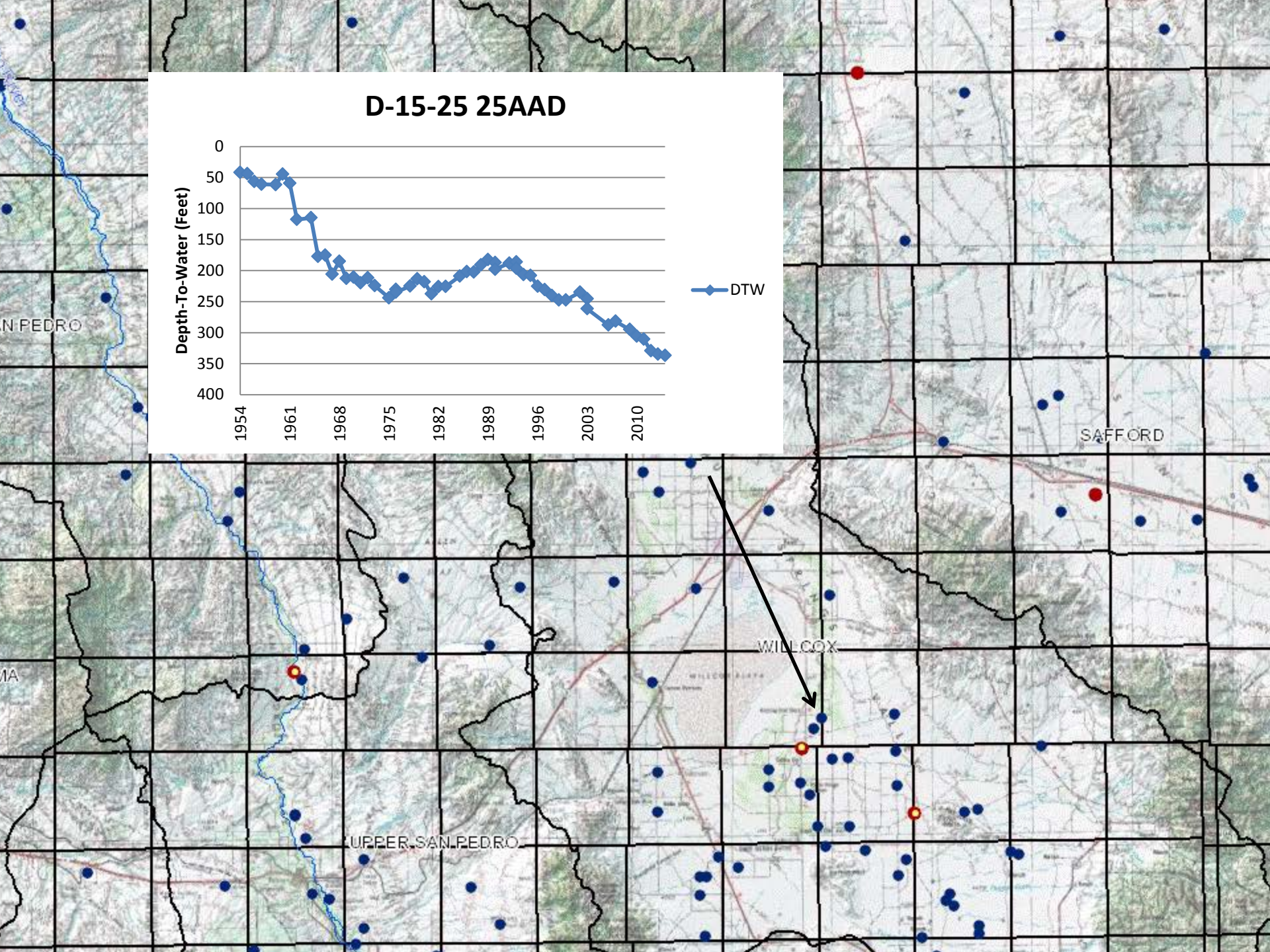

https://gisweb.azwater.gov/gwsi/Default.aspx
GWSI Web Map
Arizona Department of Water Resources - Groundwater Data
Map Scale
ARAVAIPA CANYON
D-13-25 21AAC
Depth-To-Water (Feet)
0
20
40
60
80
100
120
140
160
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
DTW
WILLCOX
TUCSON AMA

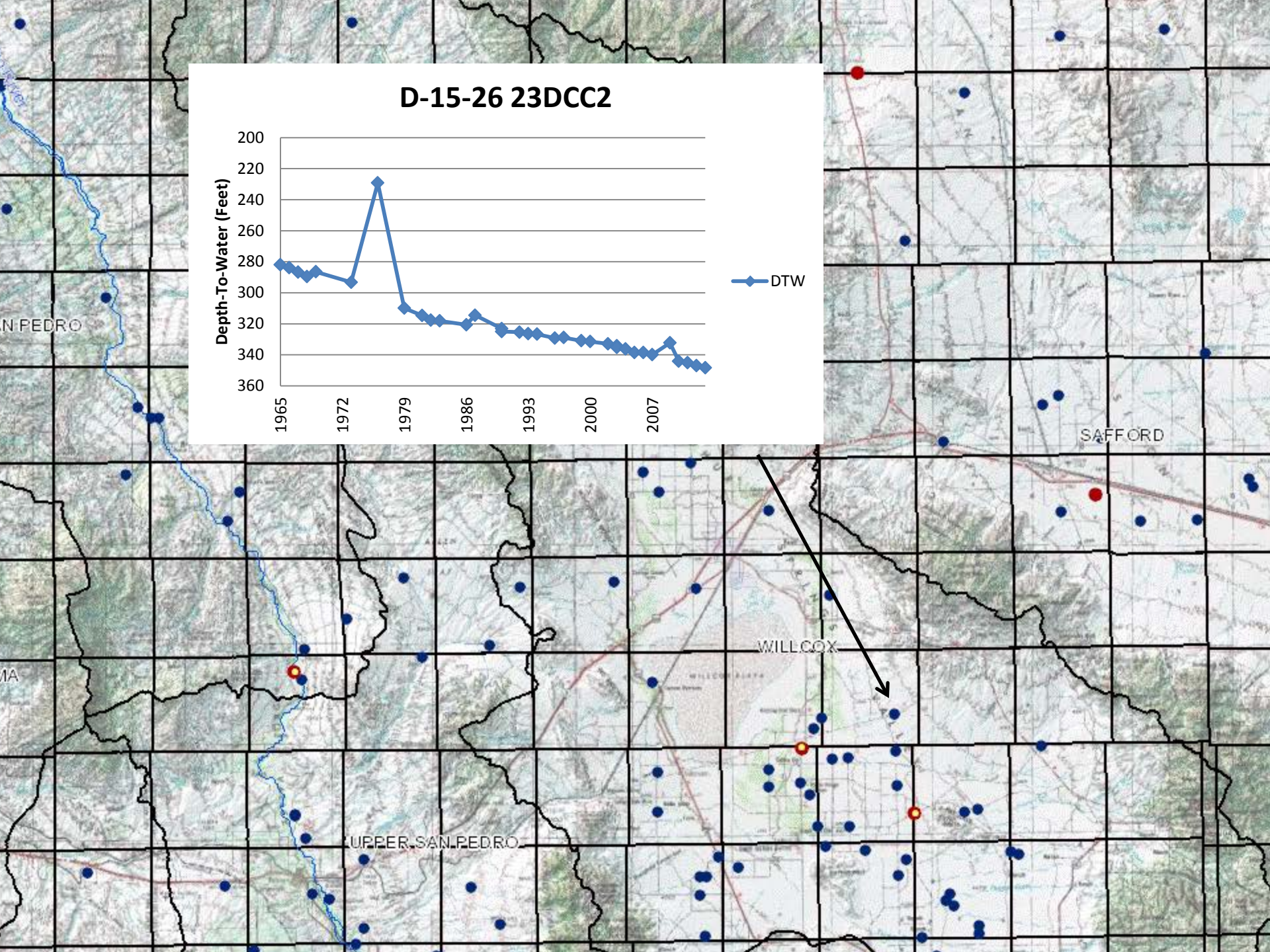

ARAVAIPA CANYON
N PEDRO
WILLCOX
UPPER SAN PEDRO
D-14-23 12BBB2
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
1970
1977
1984
1991
1998
2005
2012
DT

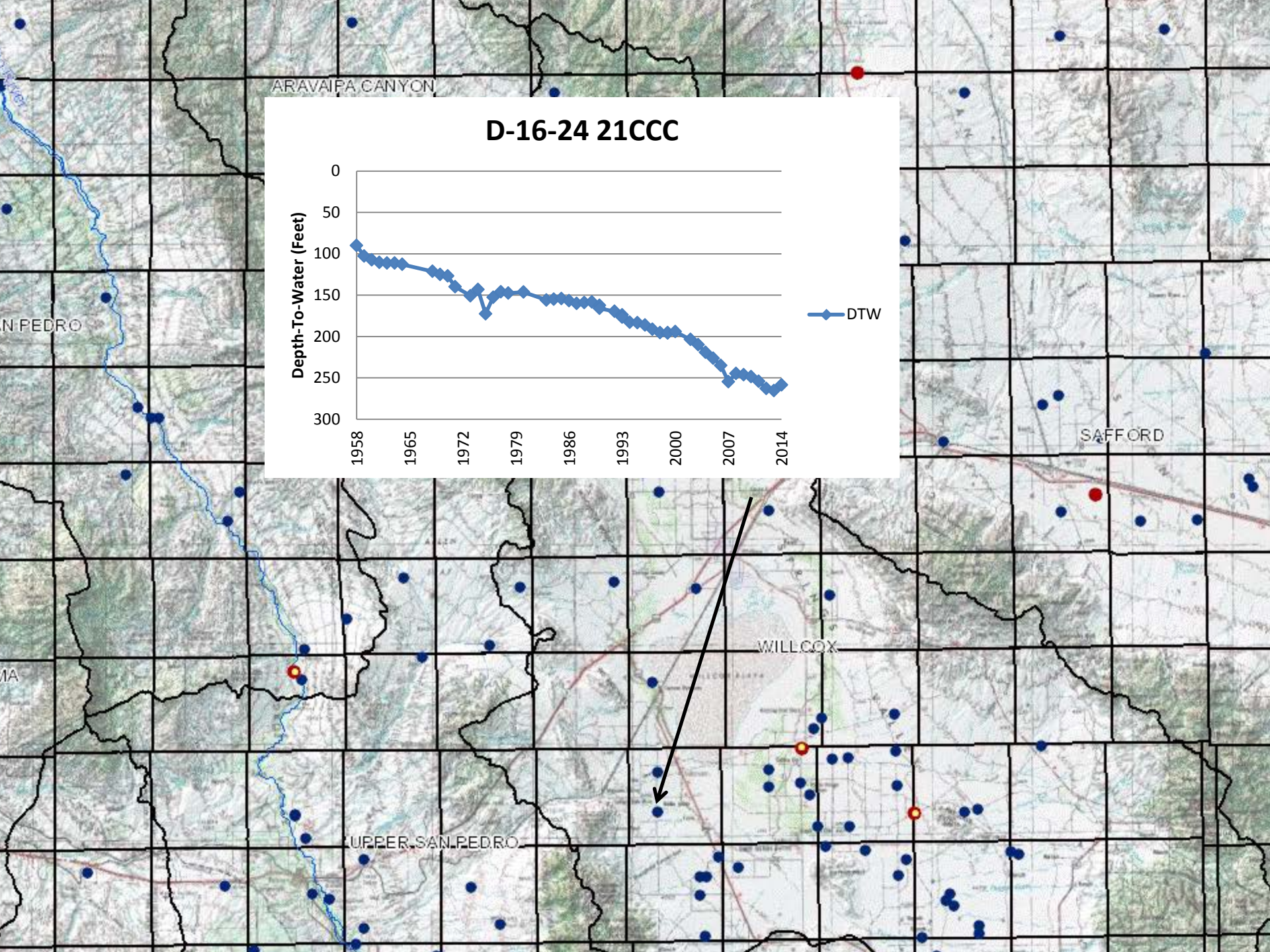

ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-14-24 14BBA2
Depth-To-Water (Feet)
0
5
10
15
20
25
30
35
40
1963
1970
1977
1984
1991
1998
2005
2012
DTW

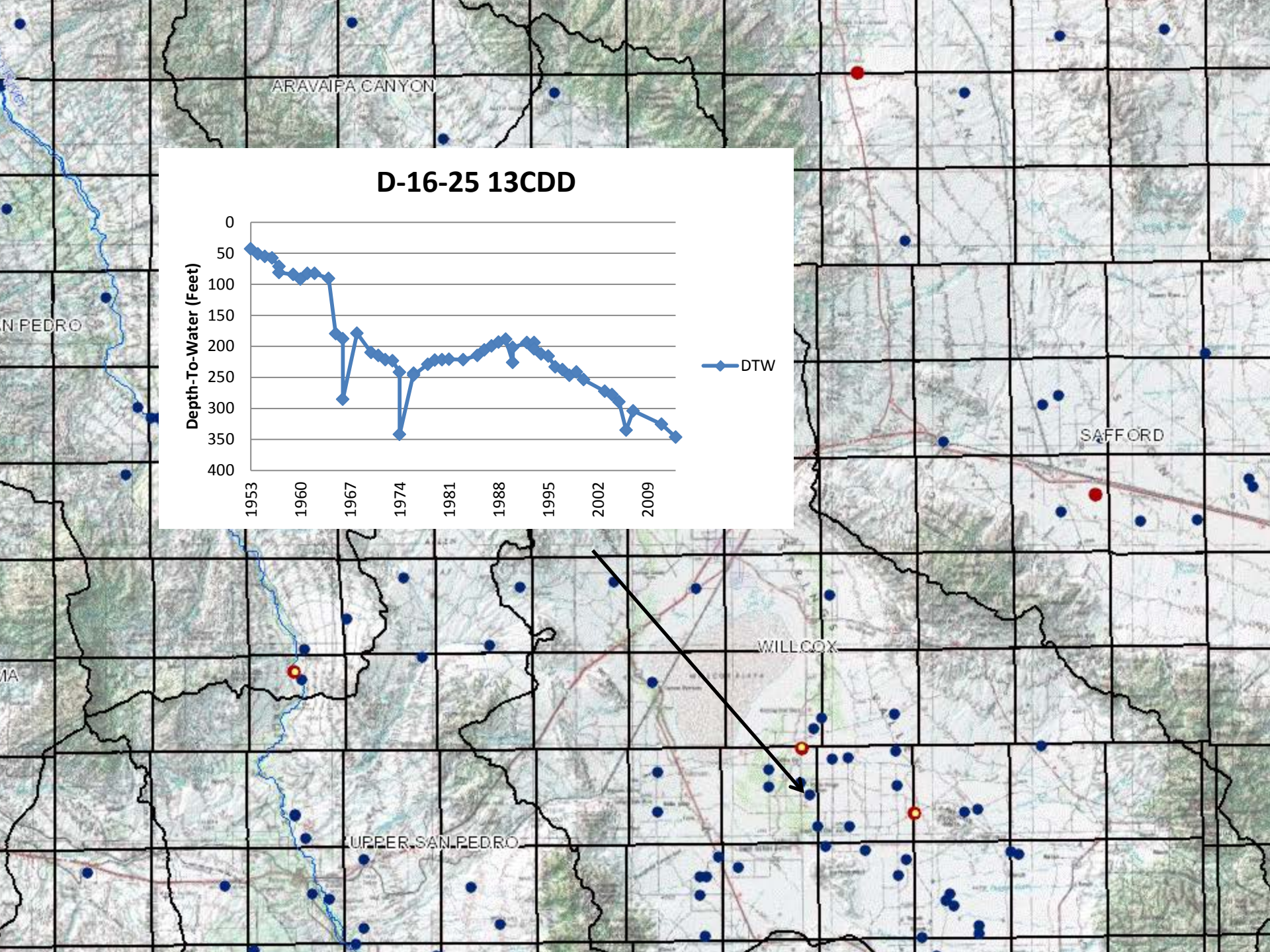

D-14-26 18CAA1
0
50
100
150
200
250
300
1954
1961
1968
1975
1982
1989
1996
2003
2010
DTW
SAFFORD
WILLCOX
UPPER SAN PEDRO

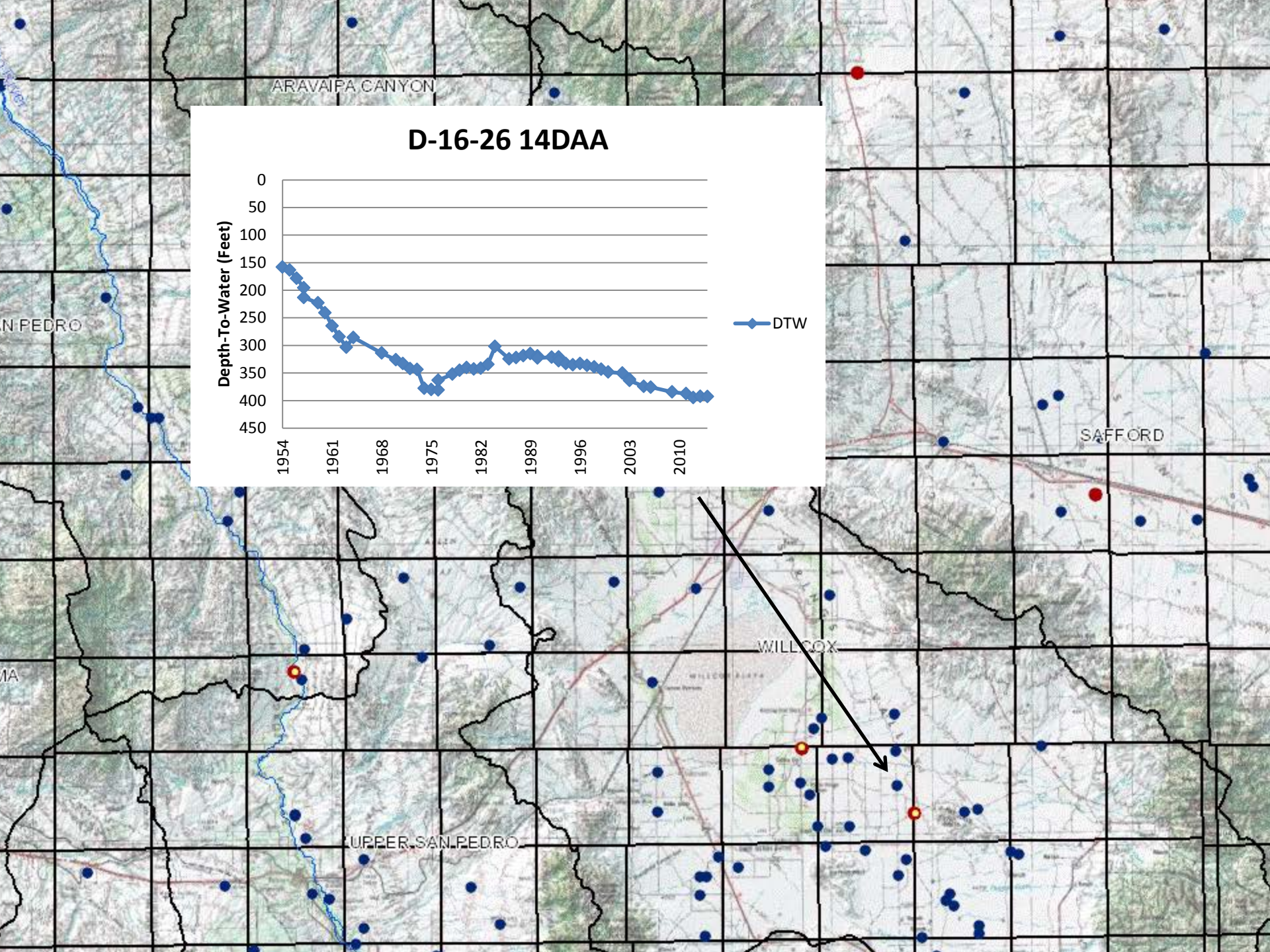

ARAVAIPA CANYON
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-15-24 08CDA
Depth-To-Water (Feet)
0
10
20
30
40
50
60
70
80
1975
1982
1989
1996
2003
2010
DTW

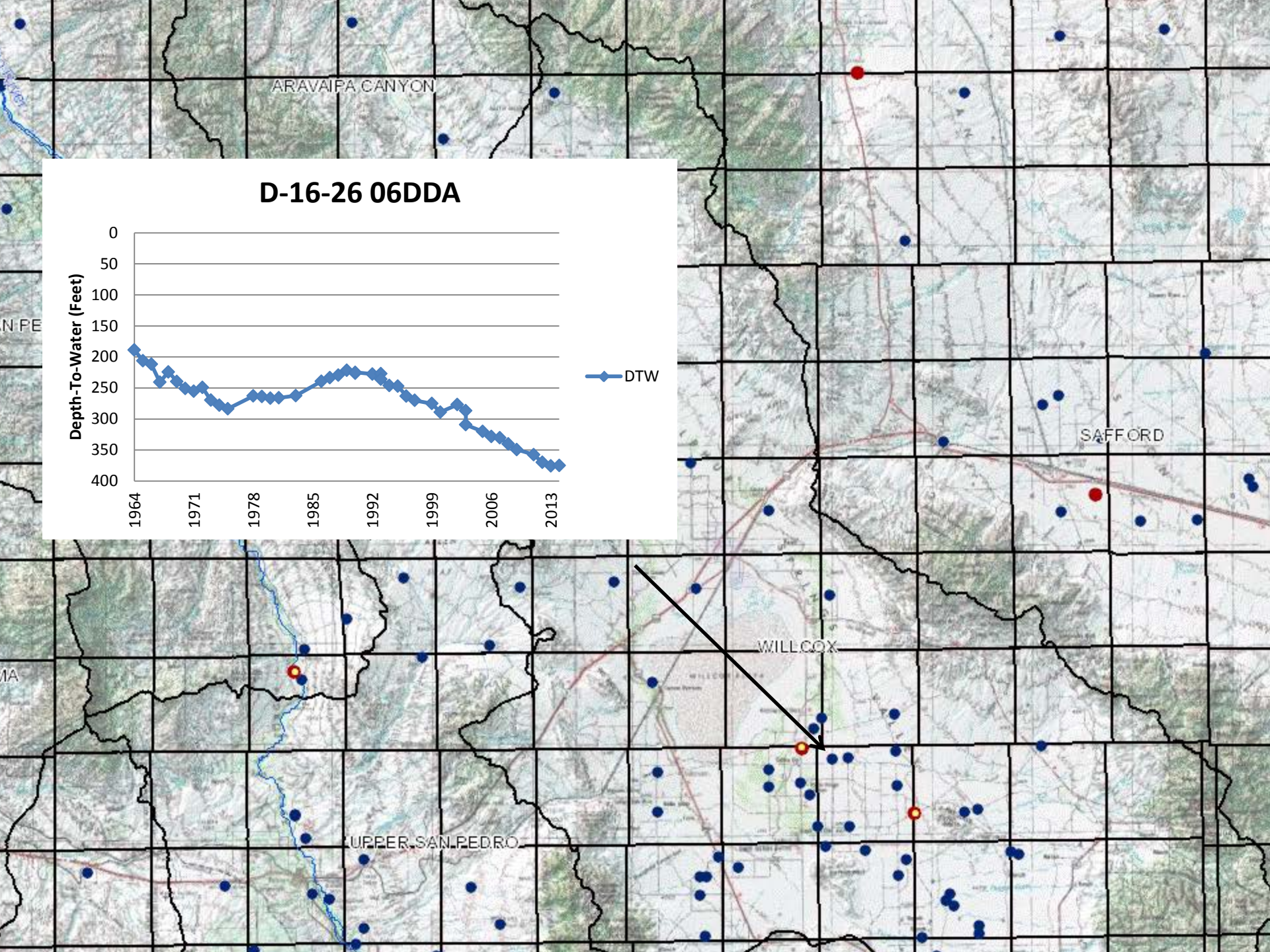

D-15-25 25AAD
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
400
1954
1961
1968
1975
1982
1989
1996
2003
2010
DTW
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO

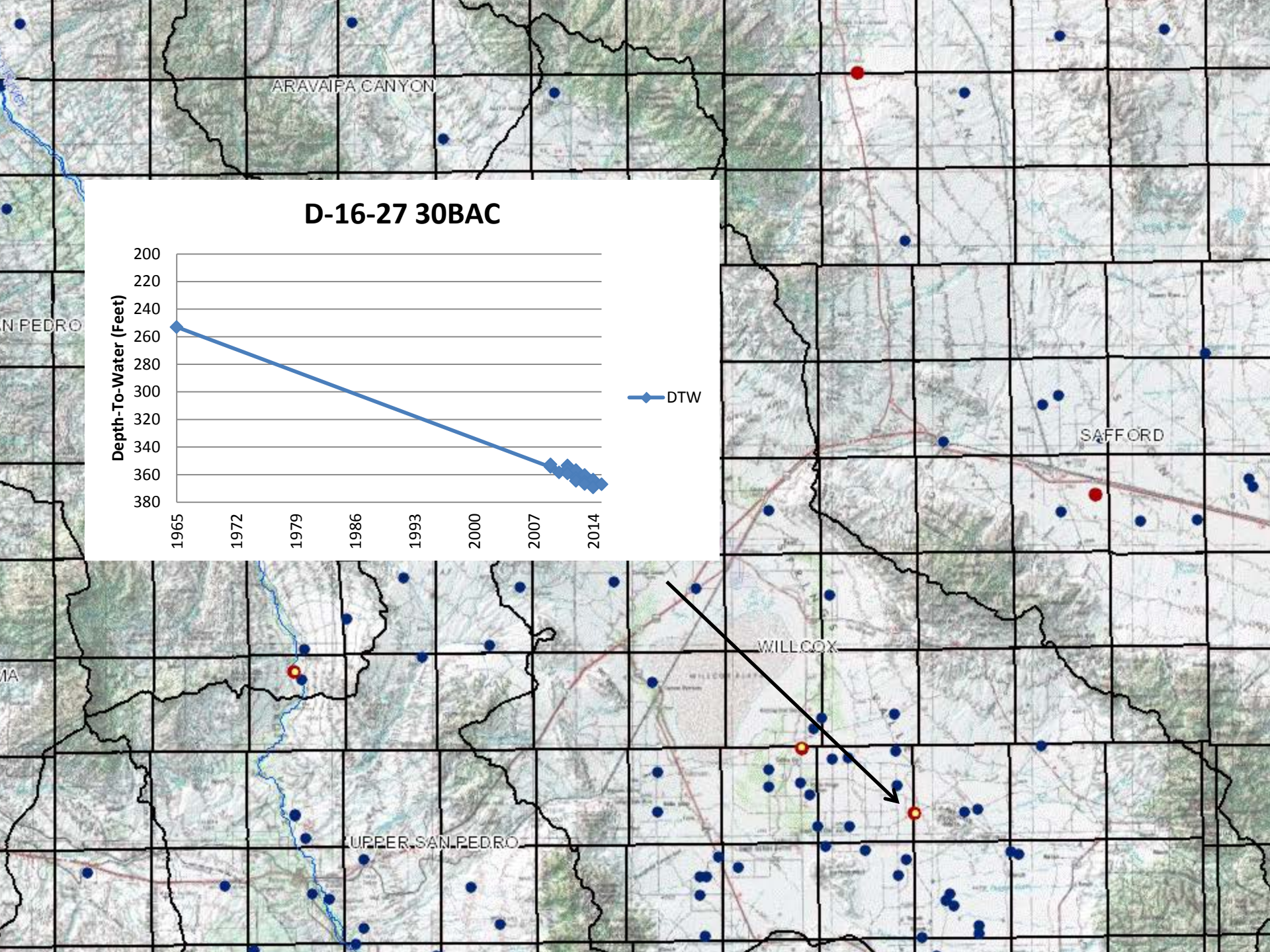

D-15-26 23DCC2
Depth-To-Water (Feet)
200
220
240
260
280
300
320
340
360
1965
1972
1979
1986
1993
2000
2007
DTW
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO

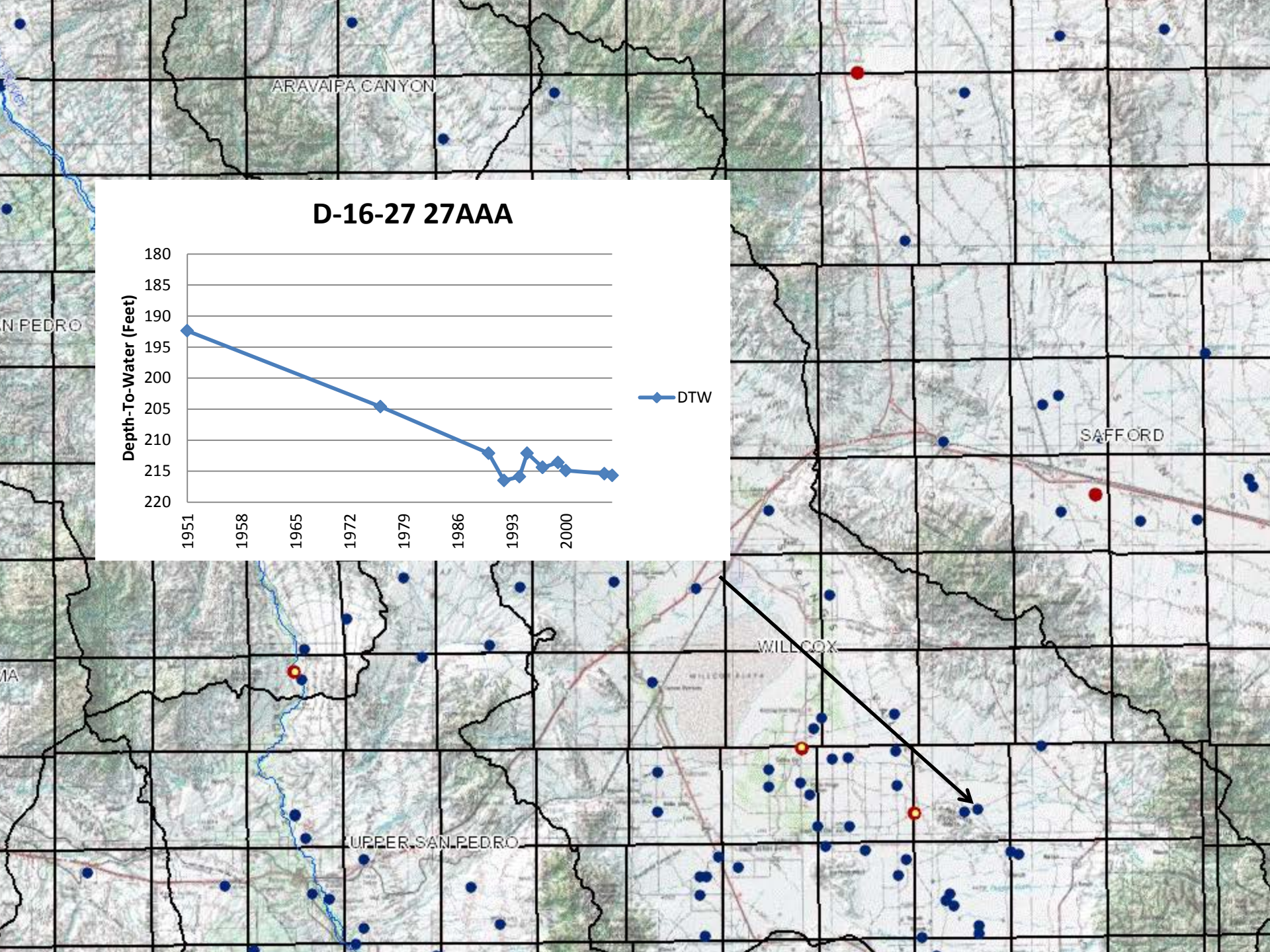

ARAVAIPA CANYON
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-16-24 21CCC
Depth-To-Water (Feet)
0
50
100
150
200
250
300
1958
1965
1972
1979
1986
1993
2000
2007
2014
DTW

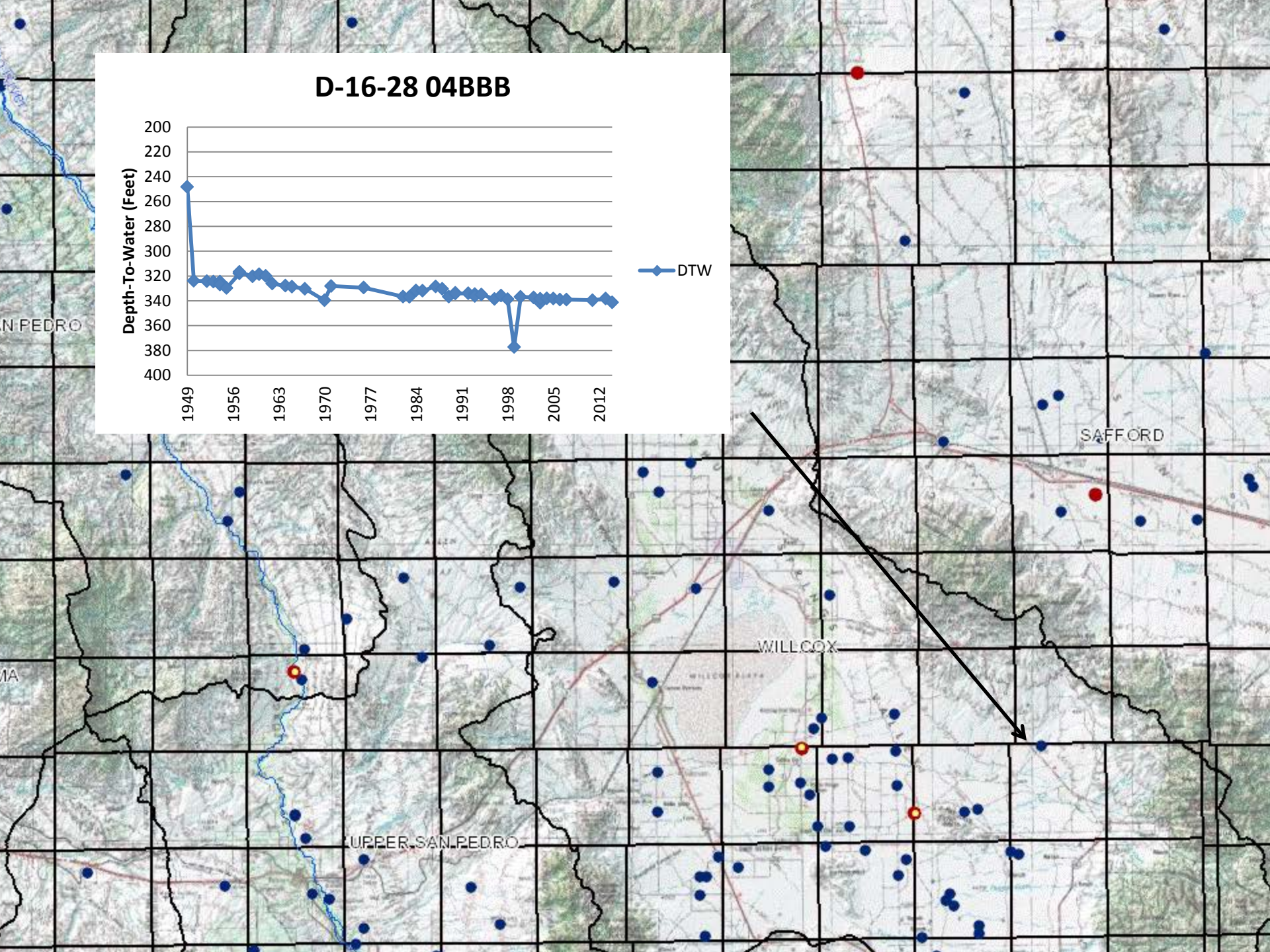

ARAVAIPA CANYON
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-16-25 13CDD
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
400
1953
1960
1967
1974
1981
1988
1995
2002
2009
DTW

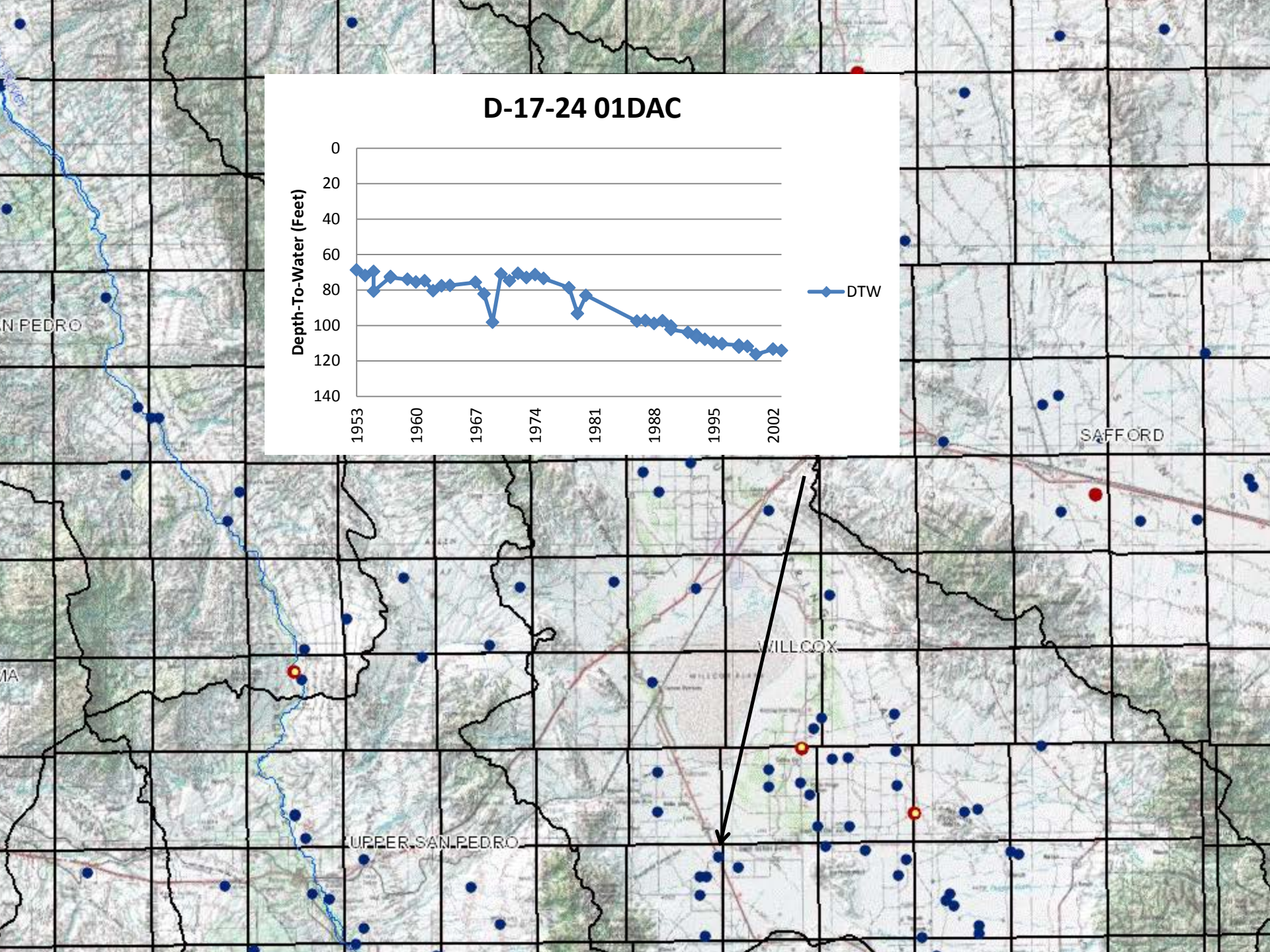

ARAVAIPA CANYON
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-16-26 14DAA
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
400
450
1954
1961
1968
1975
1982
1989
1996
2003
2010
DTW

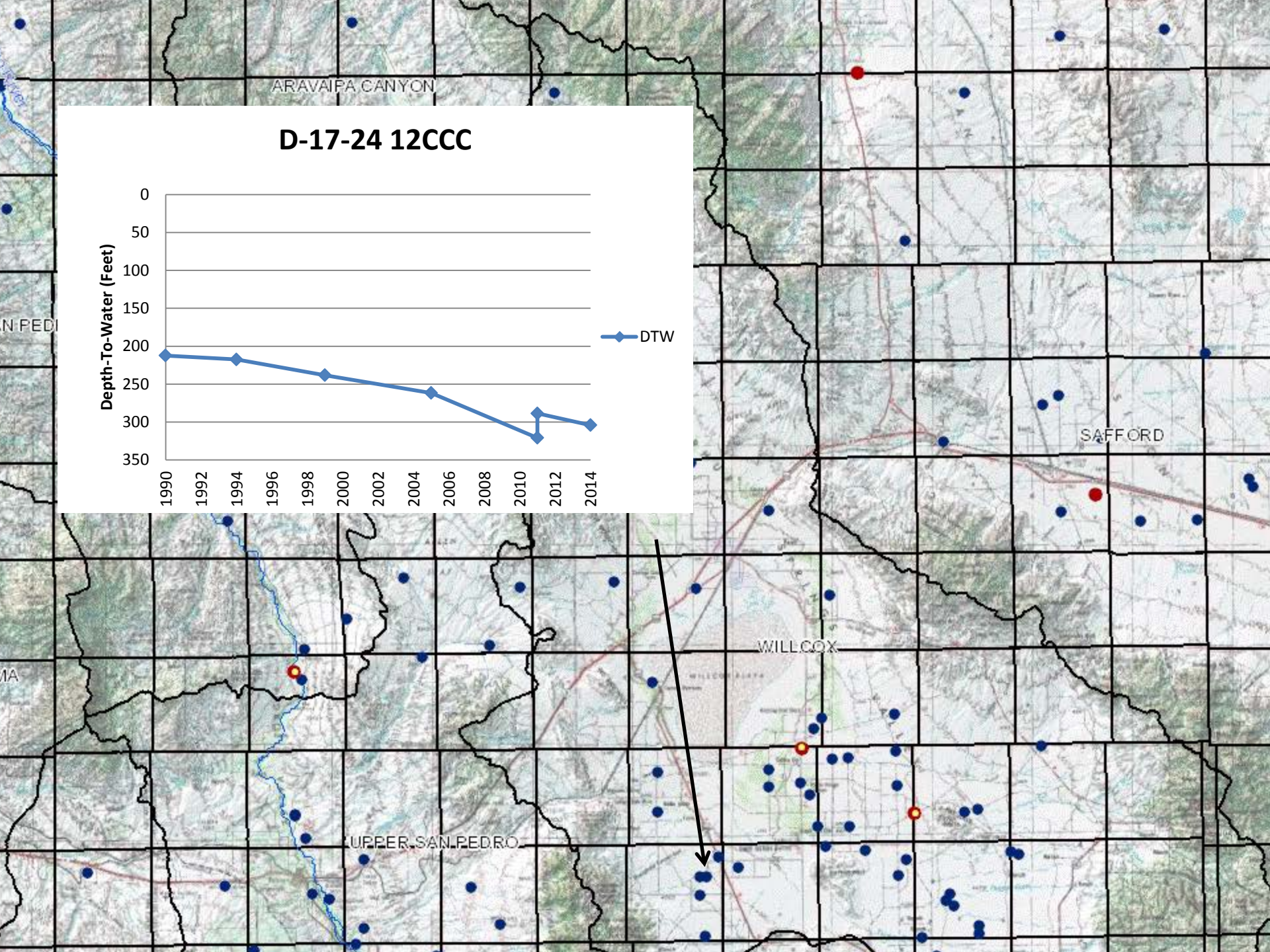

ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-16-26 06DDA
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
400
1964
1971
1978
1985
1992
1999
2006
2013
DTW

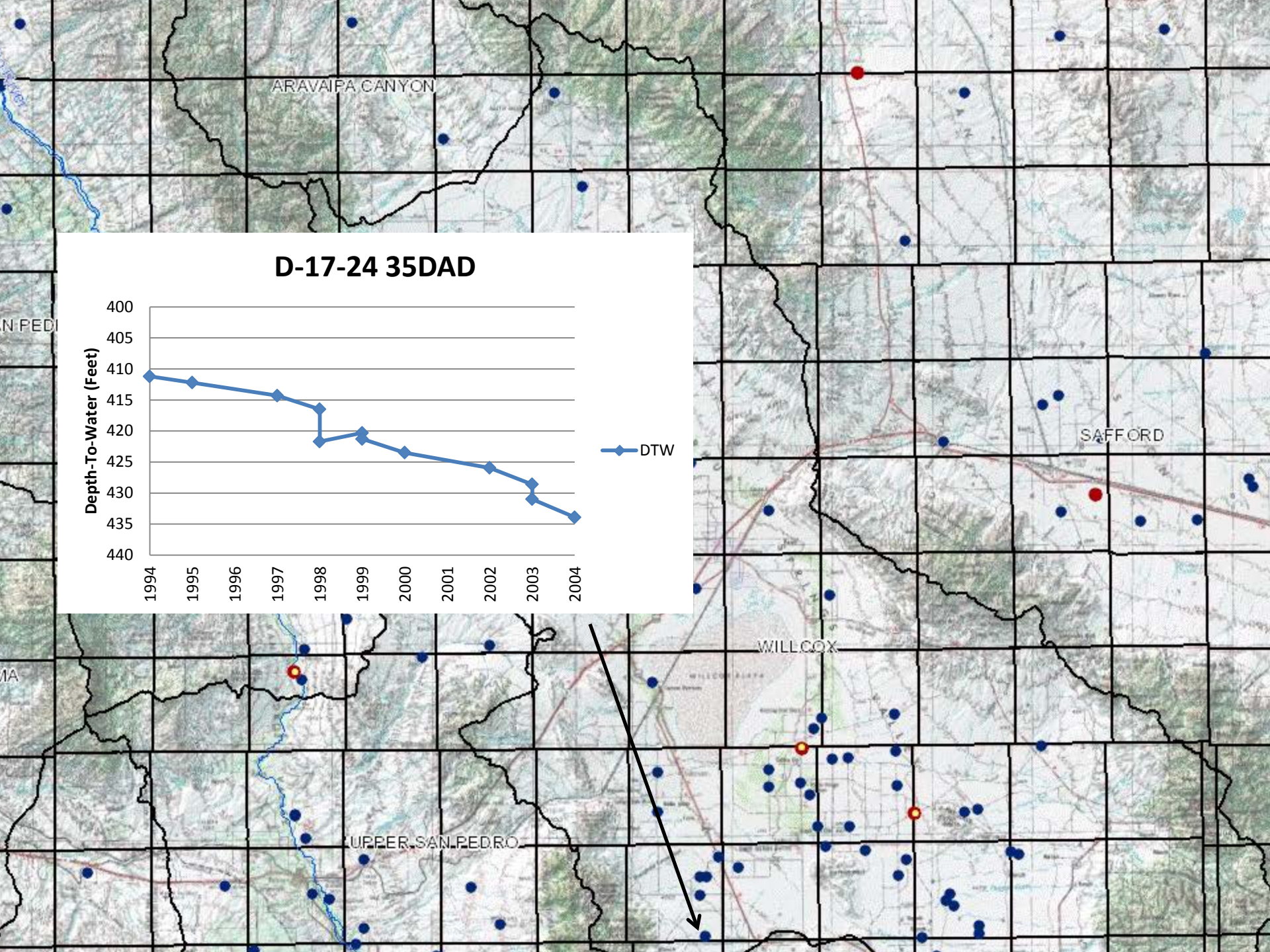

D-16-27 30BAC
Depth-To-Water (Feet)
200
220
240
260
280
300
320
340
360
380
1965
1972
1979
1986
1993
2000
2007
2014
DTW
ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO

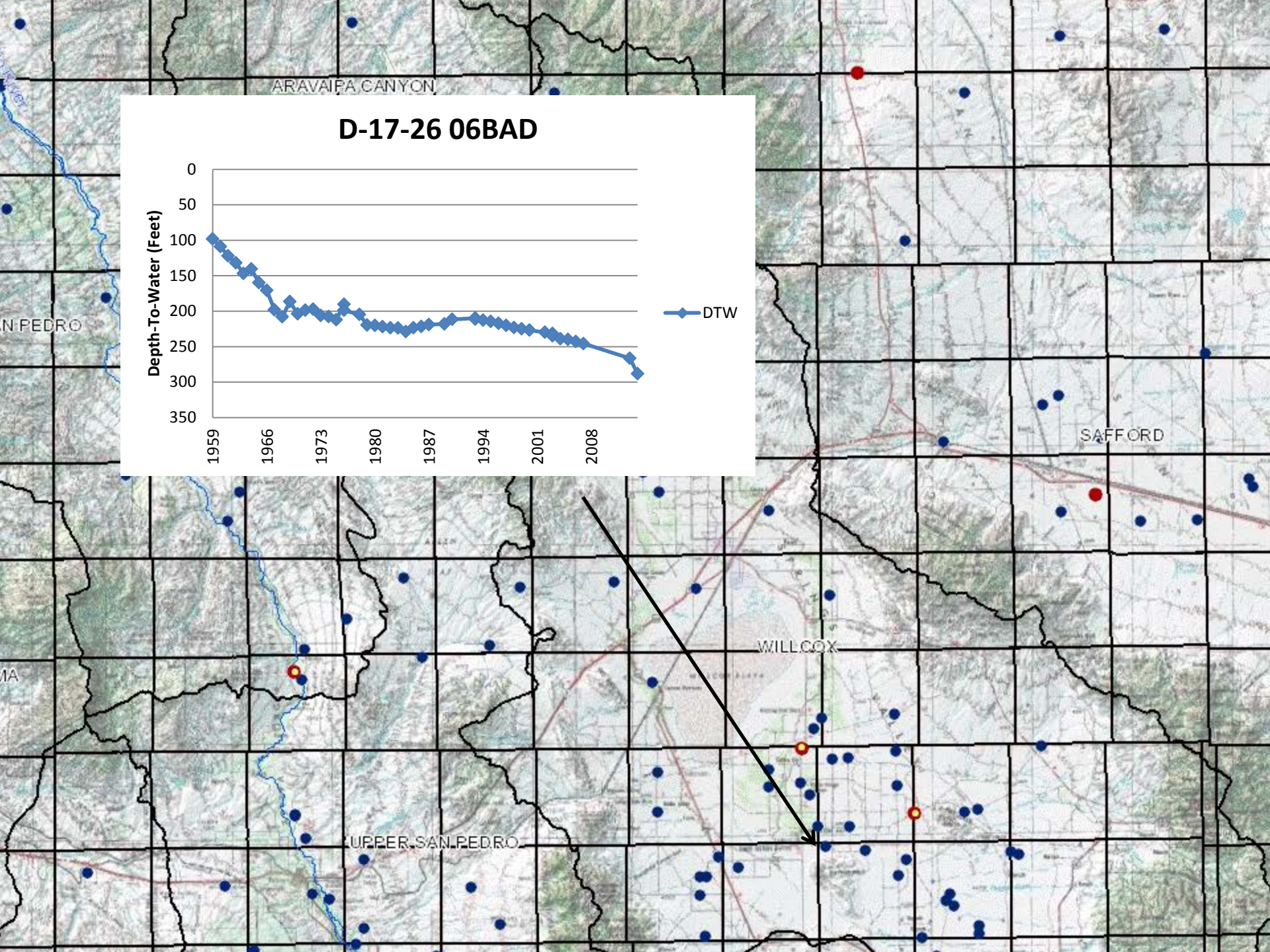

ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-16-27 27AAA
Depth-To-Water (Feet)
180
185
190
195
200
205
210
215
220
1951
1958
1965
1972
1979
1986
1993
2000
DTW

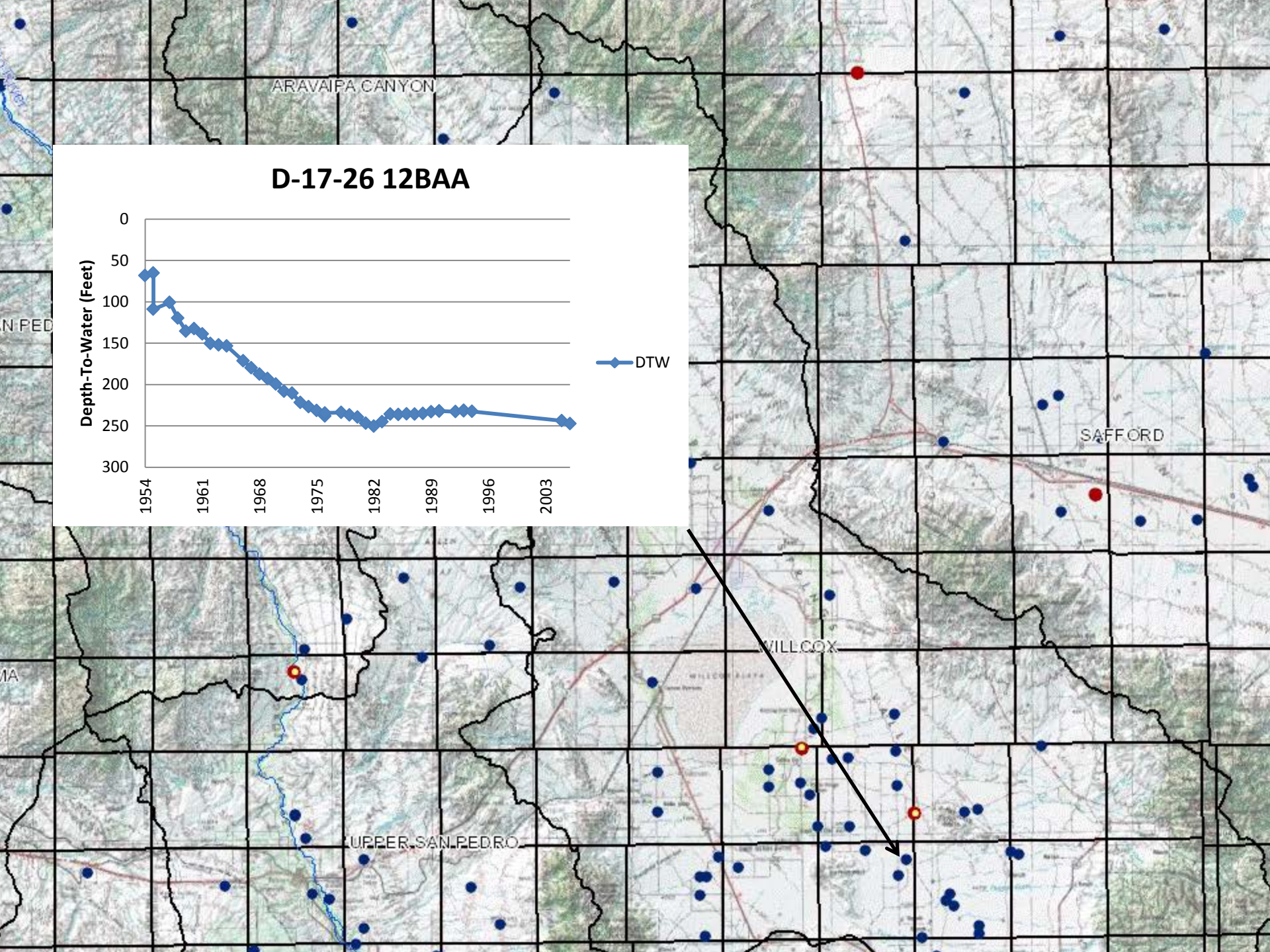

D-16-28 04BBB
Depth-To-Water (Feet)
200
220
240
260
280
300
320
340
360
380
400
1949
1956
1963
1970
1977
1984
1991
1998
2005
2012
DTW
SAFFORD
WILLCOX
UPPER SAN PEDRO

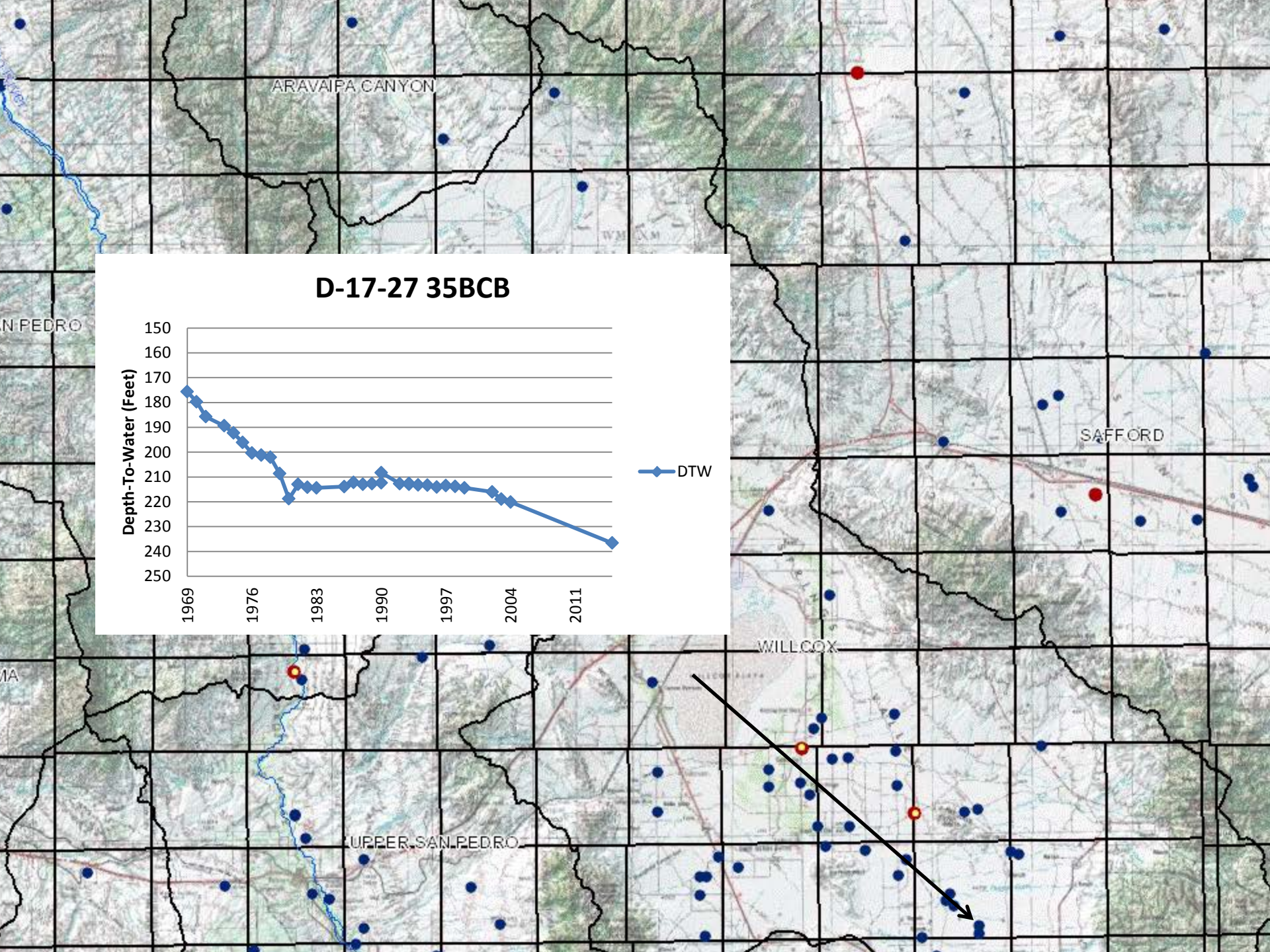

D-17-24 01DAC
Depth-To-Water (Feet)
0
20
40
60
80
100
120
140
1953
1960
1967
1974
1981
1988
1995
2002
DTW
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO

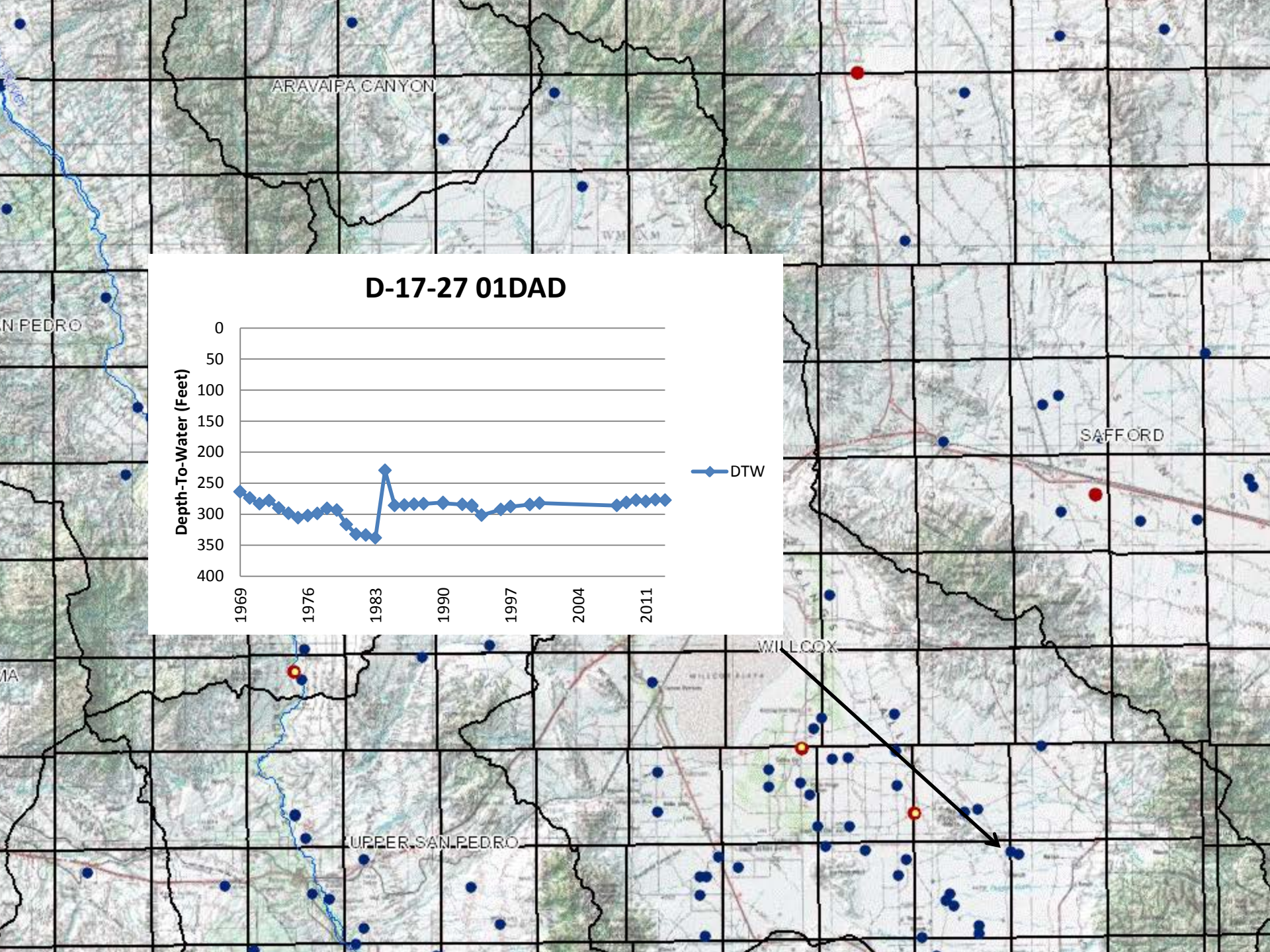

ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-17-24 12CCC
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
DTW

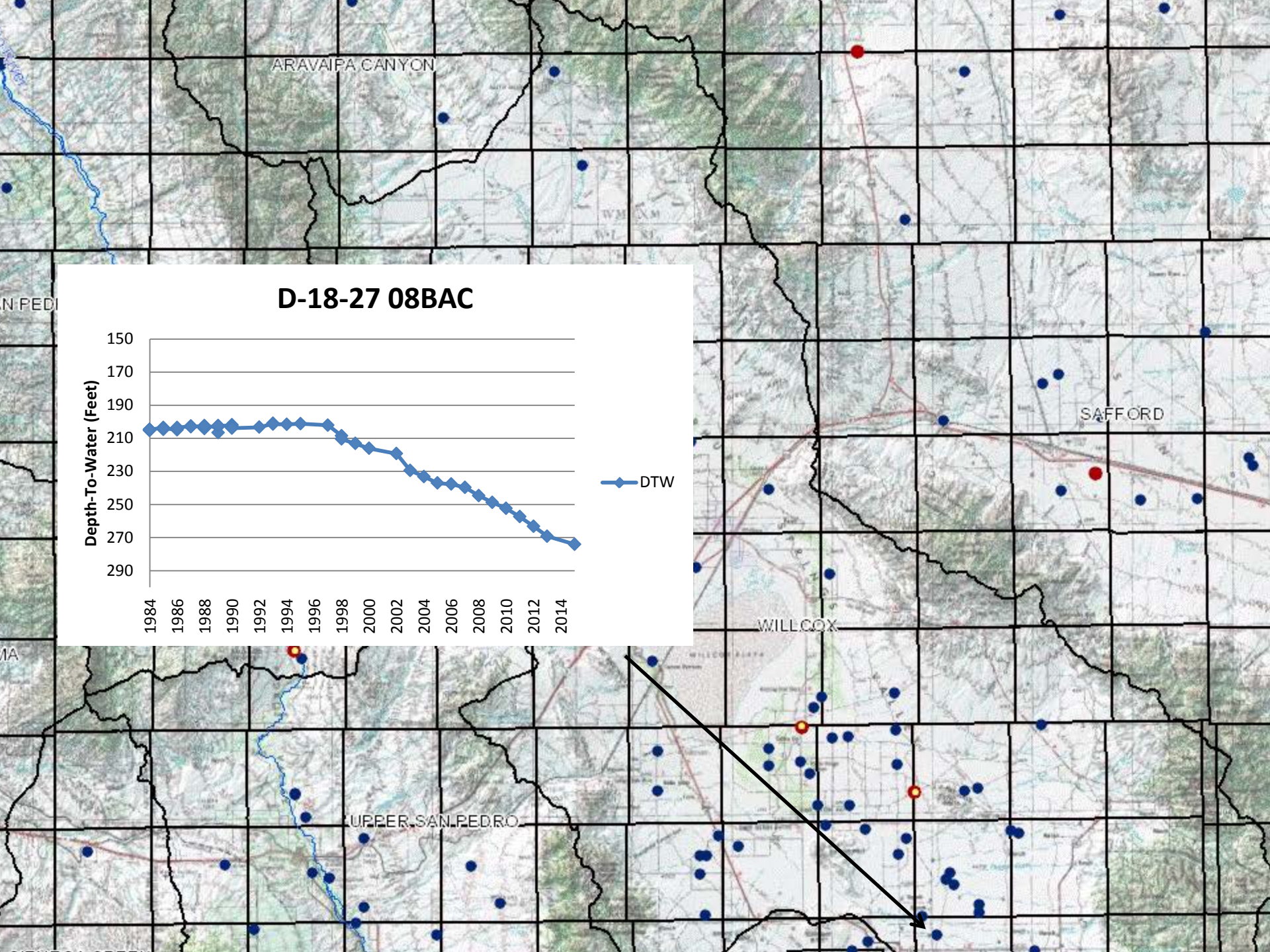

ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-17-24 35DAD
Depth-To-Water (Feet)
400
405
410
415
420
425
430
435
440
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
DTW


ARAVAIPA CANYON
N PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-17-26 06BAD
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
1959
1966
1973
1980
1987
1994
2001
2008
DTW


D-17-26 12BAA
Depth-To-Water (Feet)
0
50
100
150
200
250
300
1954
1961
1968
1975
1982
1989
1996
2003
DTW
ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO


ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-17-27 35BCB
Depth-To-Water (Feet)
150
160
170
180
190
200
210
220
230
240
250
1969
1976
1983
1990
1997
2004
2011
DTW


ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-17-27 01DAD
Depth-To-Water (Feet)
0
50
100
150
200
250
300
350
400
1969
1976
1983
1990
1997
2004
2011
DTW


ARAVAIPA CANYON
SAFFORD
WILLCOX
UPPER SAN PEDRO
D-18-27 08BAC
Depth-To-Water (Feet)
150
170
190
210
230
250
270
290
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
DTW

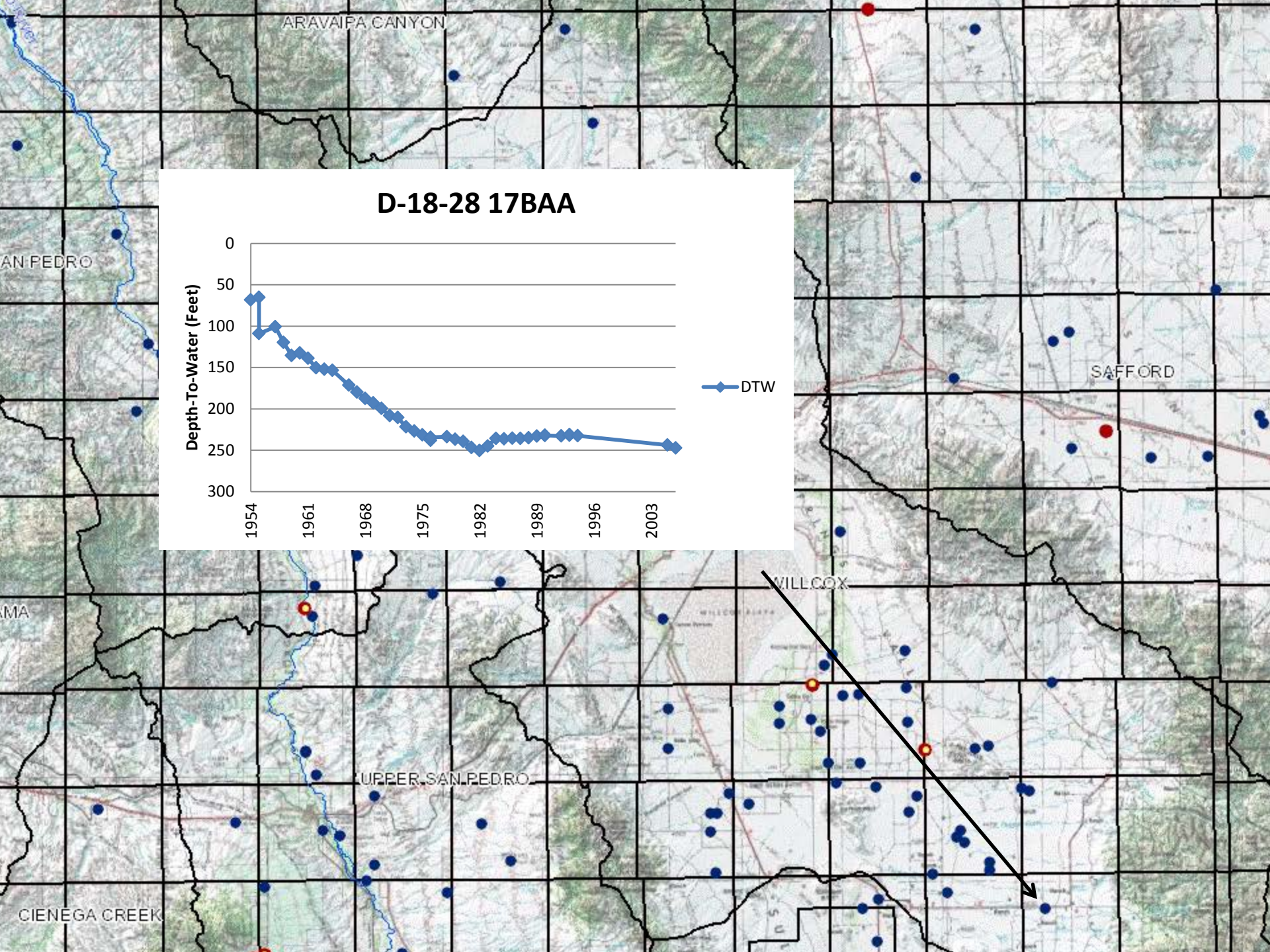

ARAVAIPA CANYON
AN PEDRO
SAFFORD
WILLCOX
UPPER SAN PEDRO
CIENEGA CREEK
D-18-28 17BAA
Depth-To-Water (Feet)
0
50
100
150
200
250
300
1954
1961
1968
1975
1982
1989
1996
2003
DTW

Table 1. Statistics From The 2005 and 2014/15 Water Level Sweeps of the Willcox Basin
***2014/15 Water Level Measurements Are Preliminary and Subject to Revision**

	2005 DTW (Feet)	2014/15 DTW (Feet)	2005 -2014/15 All WL Changes (Feet) (+ = WL Rise in Well) (- = WL Decline in Well)	2005 - 2014/15 Positive WL Change (Feet) (+ =WL Rise in Well)	2005 -2014/15 Negative WL Change (Feet) (- = WL Decline in Well)
Number of Measurements	836	513	390	39	351
Minimum	3	2	- 105	< +1	> -1
Maximum	730	741	+30	30	-105
Average	207	241	-22	9	-25
Median	221	263	-24	7	-25

Summary of Water Level Changes For 61 GWSI Index Wells In The Willcox Basin 1942 to 2015

SiteID	Recent Water Level Changes (Feet) (≈2005 to 2014/15)	Recent Water Level Change Rate (Feet/Year) (≈2005 to 2014/15)	Long-Term Water Level Changes (Feet) (≈1940s-60s to 2014/15)	Long-Term Water Level Change Rate (Feet/Year) (≈1940s-60s to 2014/15)	Years Monitored
Average	-27	-3.2	-104	-2.2	44
Median	-24	-2.8	-90	-2.1	48
Minimum	-105	-11.7	-304	-5.1	6
Maximum	5	0.5	29	0.6	72

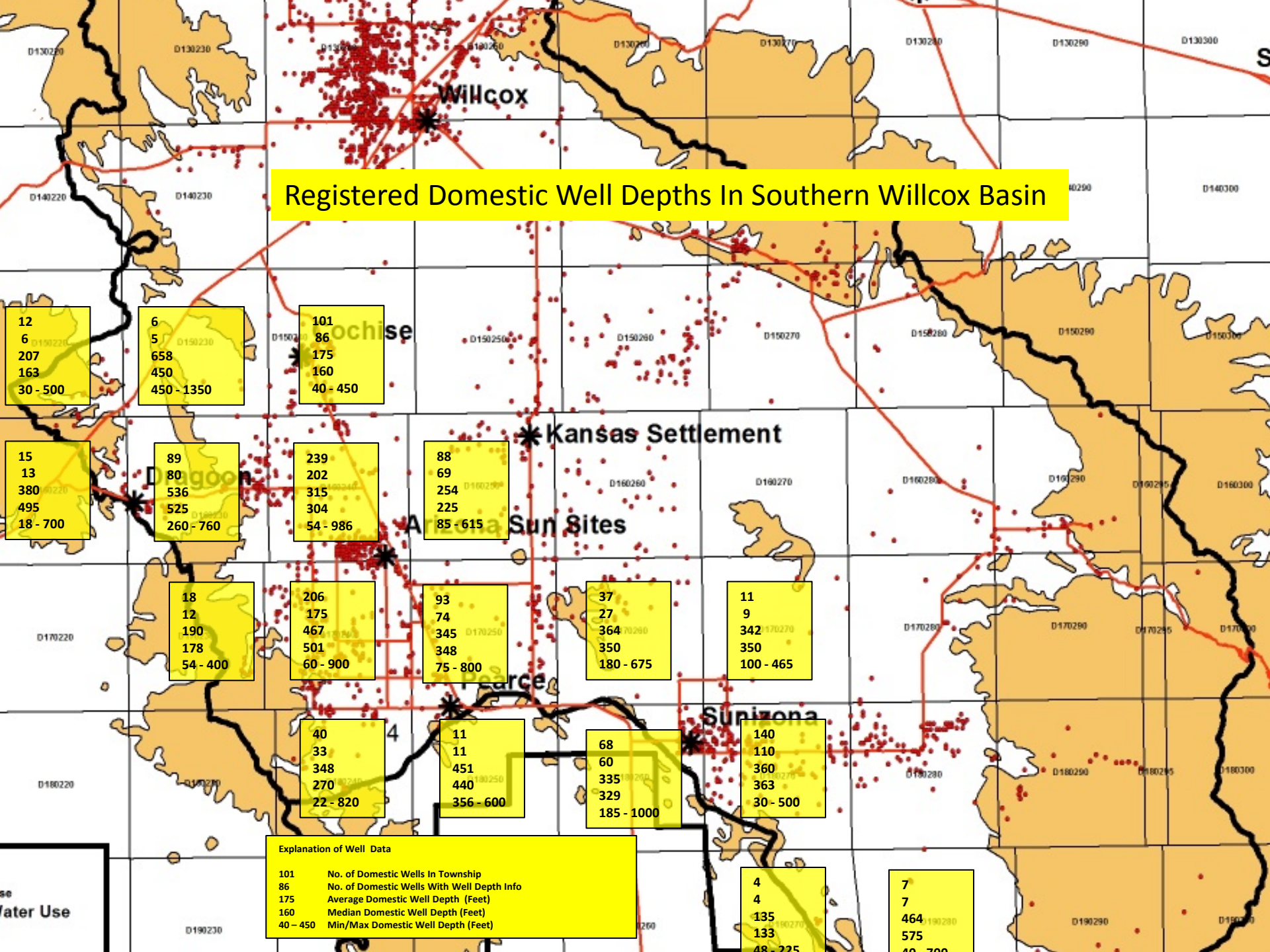
Summary of Typical Local Water Level Changes From 2005 – 2015 In the Willcox Basin

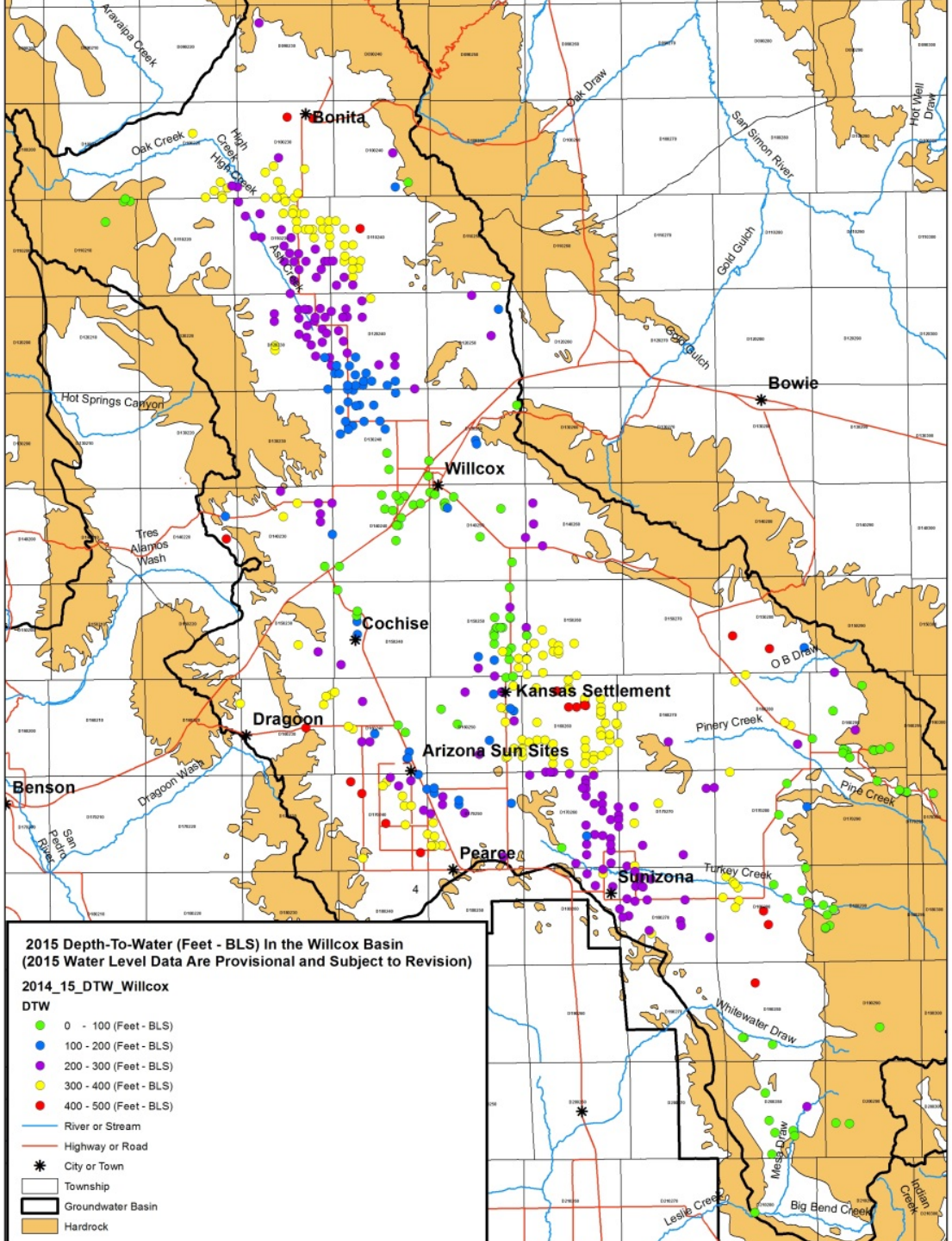
	(Feet of WL Change)
• Willcox to Bonita	≈ -10 to -30
• Town of Willcox area	< -5
• Cochise	< -10
• Dragoon	≈ -30
• Sunsites and Pearce	≈ -30 to -40
• Sunizona to Kansas Settlement	≈ -20 to -50
• Kansas Settlement	≈ -10 to -60
• Pine & Turkey Creek areas near Chiricahua's	≈ 0 to +20

Five Critical Factors That Impact Future Well Conditions

- How deep are the wells in the area?
- What is the current depth to water in the area?
- What is the current and potential future water level change rate in the area? This complicated factor is mainly related to the amount of historic, current and future pumping that may occur in the general area that will impact groundwater levels.
- How thick is the aquifer in the area?
- How productive is the aquifer in the area?

Registered Domestic Well Depths In Southern Willcox Basin




2015 Depth-To-Water (Feet - BLS) In the Willcox Basin
(2015 Water Level Data Are Provisional and Subject to Revision)
2014_15_DTW_Willcox
DTW
0 - 100 (Feet - BLS)
100 - 200 (Feet - BLS)
200 - 300 (Feet - BLS)
300 - 400 (Feet - BLS)
400 - 500 (Feet - BLS)
River or Stream
Highway or Road
City or Town
Township
Groundwater Basin
Hardrock
Bonita
Bowie
Willcox
Cochise
Kansas Settlement
Dragoon
Arizona Sun Sites
Benson
Pearce
Sunizona
Aravaipa Creek
Oak Creek
High Creek
Ash Creek
Oak Draw
San Simon River
Hot Well Draw
Gold Gulch
Hot Springs Canyon
Tres Alamos Wash
O B Draw
Pinery Creek
Pine Creek
Dragoon Wash
San Pedro River
Turkey Creek
Whitewater Draw
Mesa Draw
Leslie Creek
Big Bend Creek
Indian Creek
4

Summary of Water Level Changes For 61 GWSI Index Wells In The Willcox Basin 1942 to 2015

SiteID	Recent Water Level Changes (Feet) (≈2005 to 2014/15)	Recent Water Level Change Rate (Feet/Year) (≈2005 to 2014/15)	Long-Term Water Level Changes (Feet) (≈1940s-60s to 2014/15)	Long-Term Water Level Change Rate (Feet/Year) (≈1940s-60s to 2014/15)	Years Monitored
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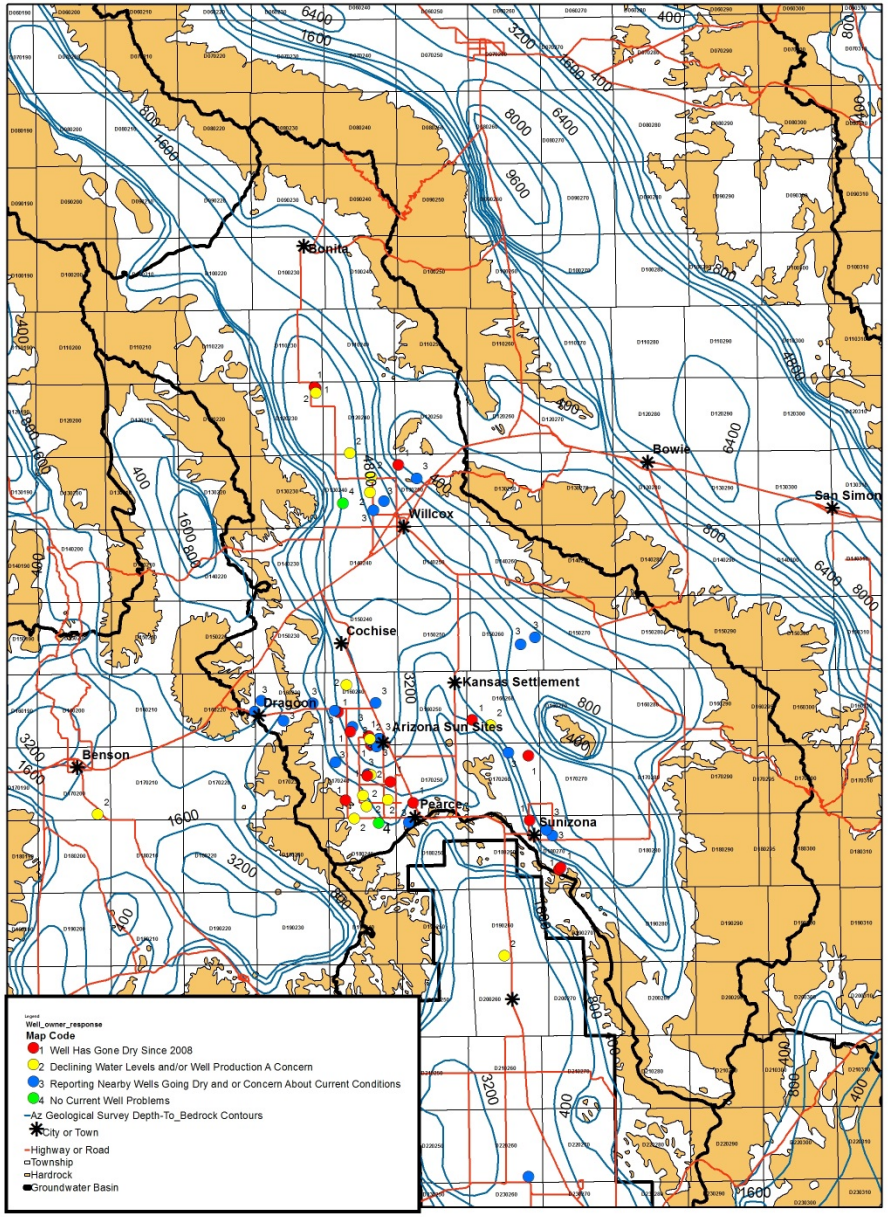
Arizona Geological Survey Depth-to-Bedrock With Well Survey Responses In Willcox Basin (1/2/2015)



0 3 6 12 18 24 Miles

N