# AGENDA

## IDAHO WATER RESOURCE BOARD

**Board Meeting No. 10-21**
**WORK SESSION**
**Thursday, July 22, 2021**
Executive Session begins at 8:00 a.m. (MST) *closed to the public*
Work Session begins at 9:00 a.m. (MST)
Hilton Garden Inn
Snake River Ballroom / Zoom Online
1741 Harrison St. N
TWIN FALLS, ID
**Board Members & the Public may participate via Zoom**
Click here to join our Zoom Meeting
Dial in Option: 1(253) 215-8782
Meeting ID: 983 1609 4396 Passcode: 173045



1. Roll Call
2. Executive Session: Board will meet pursuant to Idaho Code § 74-206(1) subsection (f) to communicate with legal counsel regarding legal ramifications of and legal options for pending litigation, or controversies not yet being litigated but imminently likely to be litigated. Topics: Water rights applications 37-23110 and 37-23111 and Water right applications 01-10613, 21-13160, 21-7578, 21-7580, & 21-7577. Also, subsection (d) To consider records that are exempt from disclosure as provided in chapter 1, title 74, Idaho Code. Topic: H.B. 266 Cloud Seeding. There are no actions during executive session. Closed to the public.
3. Eastern Snake Plain Aquifer Update
    a. Aquifer Storage Update
    b. Thousand Springs & Swan Falls Flows Update
    c. Near Blackfoot to Minidoka Reach Gains Update
    d. Sentinel Wells Update
    e. IWRB Recharge Effects Analysis
4. Bennington Irrigation Loan
5. Adjourn

*The board will break for lunch at approximately noon.*

*1:00 p.m. – 4:00 p.m.: The board will depart for a field trip of the Twin Falls Canal Company facilities.*

*Transportation will be provided for board members, IDWR staff, and invited guests.*

*The Board will hold a ceremony for retiring board members at 6 p.m. for board members, IDWR staff, and invited guests.*

* Action Item: A vote regarding this item may be made this meeting. Identifying an item as an action item on the agenda does not require a vote to be taken on the item. **Americans with Disabilities**: If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email: jennifer.strange@idwr.idaho.gov or by phone at (208) 287-4800.


**322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098**
**Phone: (208) 287-4800 Fax: (208) 287-6700 Website: idwr.idaho.gov/IWRB/**

# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: July 14, 2021

Re: Aquifer Storage Update

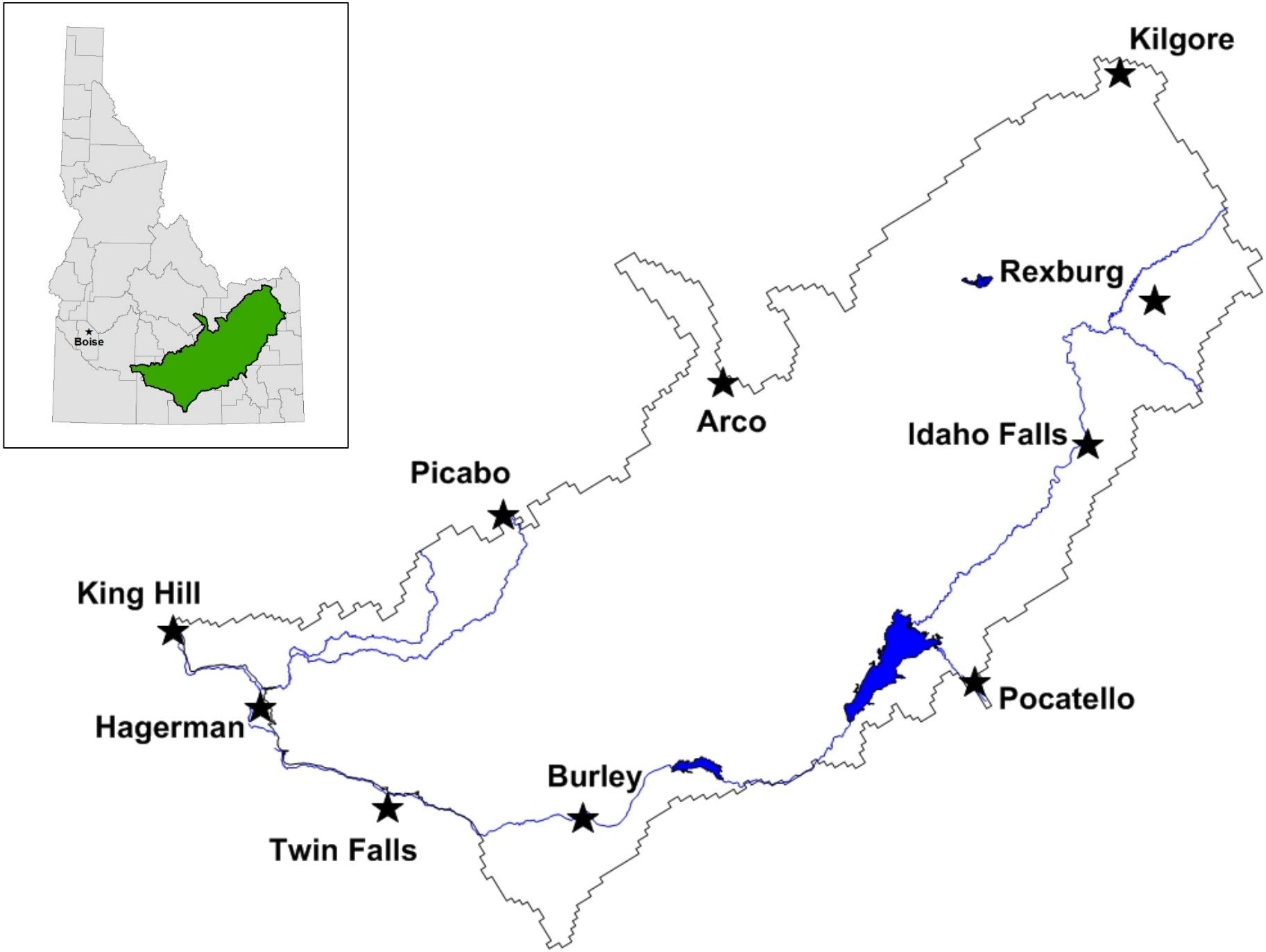
Mike McVay of IDWR will provide an update on the ESPA storage.


IDAHO
Water Resource Board

# ESPA Storage Changes

Presented by Mike McVay, P.E., P.G.

July 22, 2021


Boise
Kilgore
Rexburg
Arco
Idaho Falls
Picabo
King Hill
Pocatello
Hagerman
Burley
Twin Falls

# Aquifer Water Balance

**Inflow – Outflow = ΔStorage**

ESPA Inflows = Incidental recharge from SW irrigation, Canal Seepage, Perched River Seepage, Tributary Underflow, Precipitation.

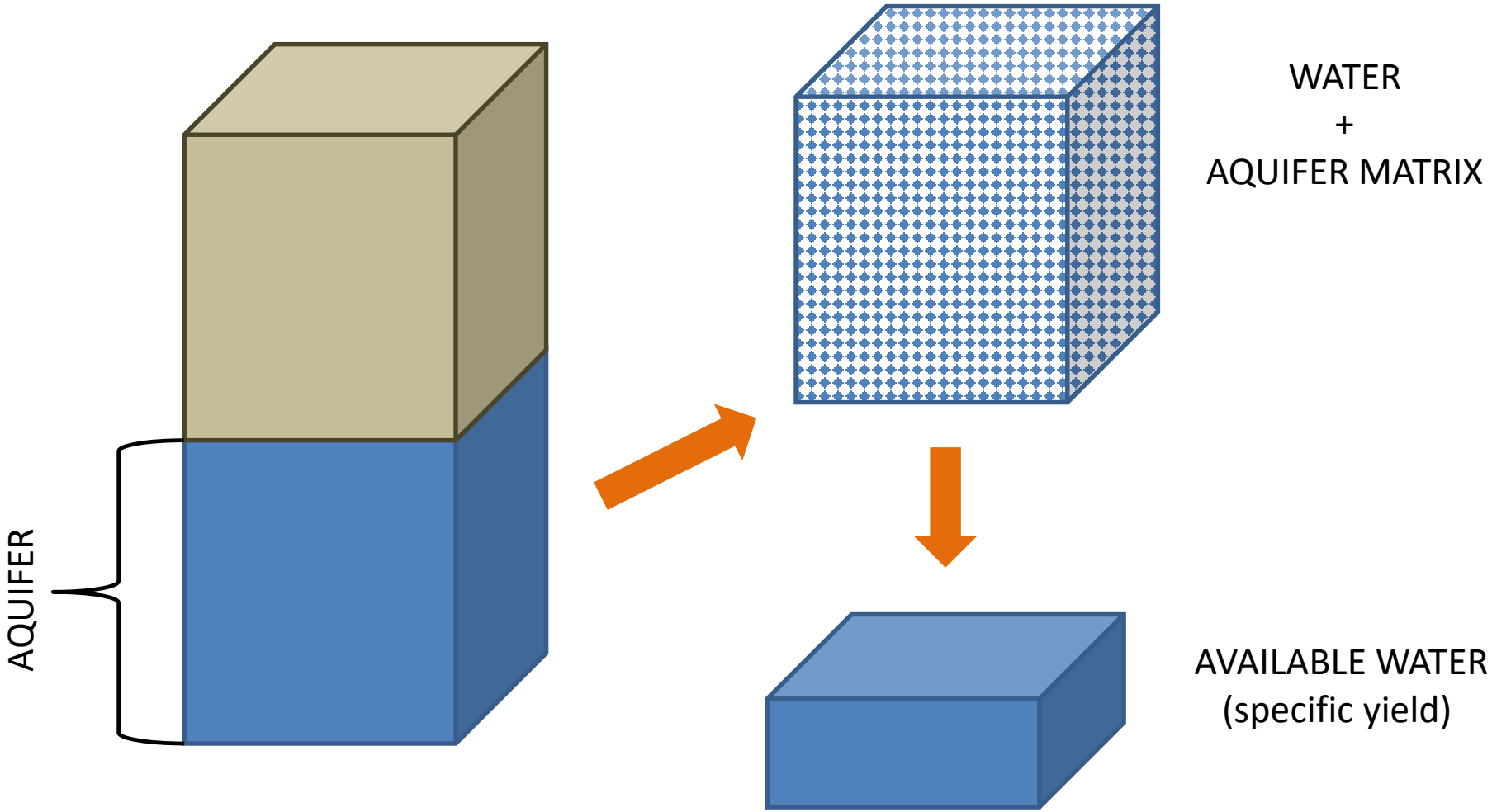
ESPA Outflows = Evapotranspiration, Spring Discharge, Well Pumping

- Requires large investment of time, money and effort.
- A more efficient method of calculating change-in-storage allows us to evaluate both aquifer conditions and aquifer management activities.
- Direct calculation of change-in-storage using water-level measurements.

# Using Water-Level Data to Estimate Changes in Aquifer Storage

- Water-level changes are calculated for each of the wells.
- Changes at the wells are interpolated across the **ESPAM version 2.2** (ESPAM2.2) model area to create water-level change maps.
  - The resulting volume represents water and aquifer matrix.
- Specific Yield (Sy) is the ratio of the volume of water that drains from a saturated rock due to gravity to the total volume of the rock.

# Specific Yield = Available Water



# Using Water-Level Data to Estimate Changes in Aquifer Storage

- Water-level data are differenced to produce water-level changes at discrete points (at the wells).
- Changes at the wells are interpolated across the ESPAM2.2 model area to create water-level change maps.
  - The resulting volume represents water and aquifer matrix.

✓ The volumes calculated above are multiplied by the average, calibrated Sy from EPAM2.2 to calculate the change in volume of water.

# Storage Coefficient Change with ESPAM2.2

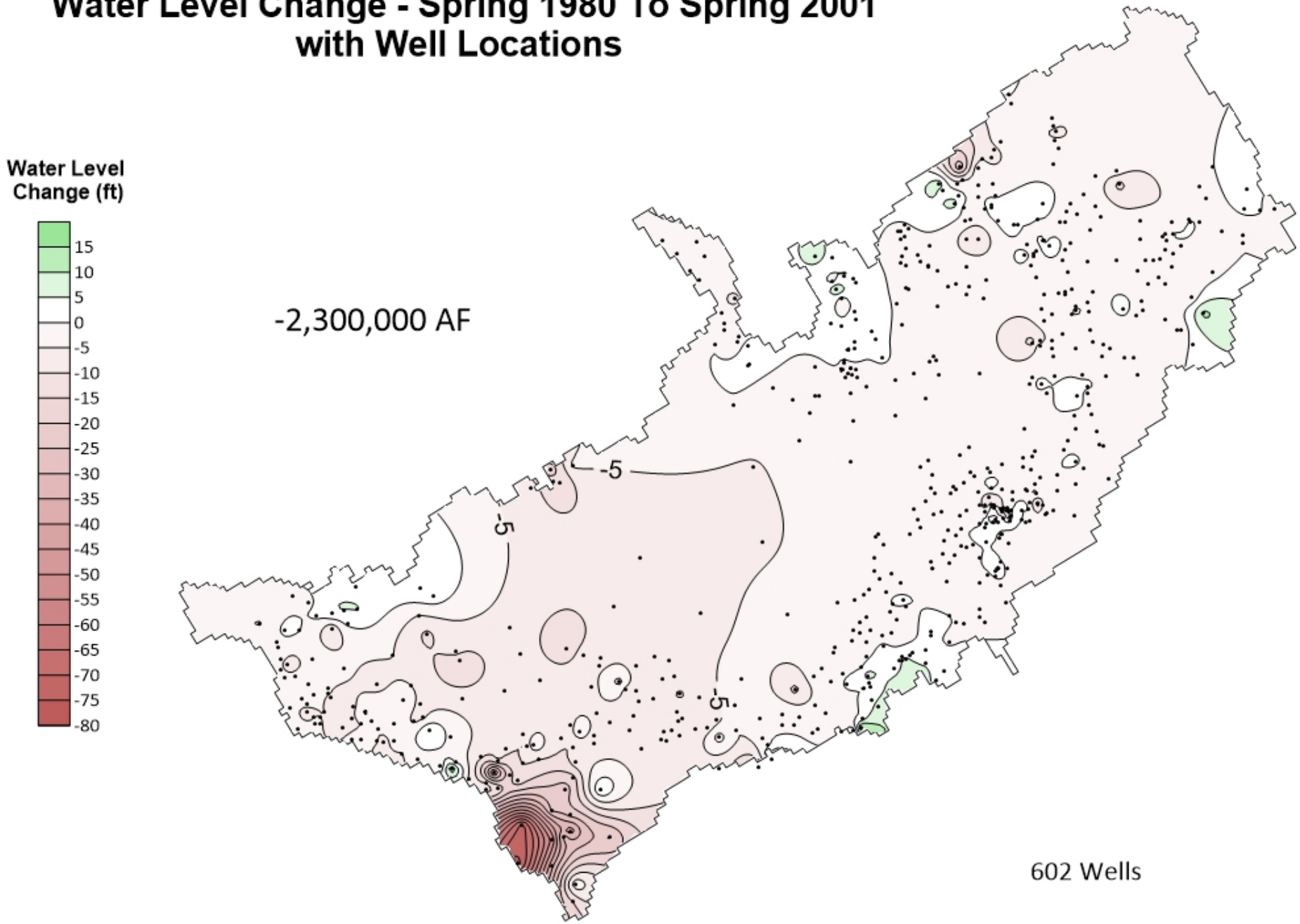
- The ESPAM has been updated to ESPAM2.2
- Increased monitoring provided additional data for calibration.
  - Much of the new data were in areas that did not have much (or any) data in ESPAM2.1.
- The calibrated Sy increased from **0.06** to **0.085**.
- A larger Sy increases the calculated aquifer-storage change value.
  - Both gains and losses are larger using the Sy from ESPAM2.2.

# Mass Measurements and Aquifer Storage Changes

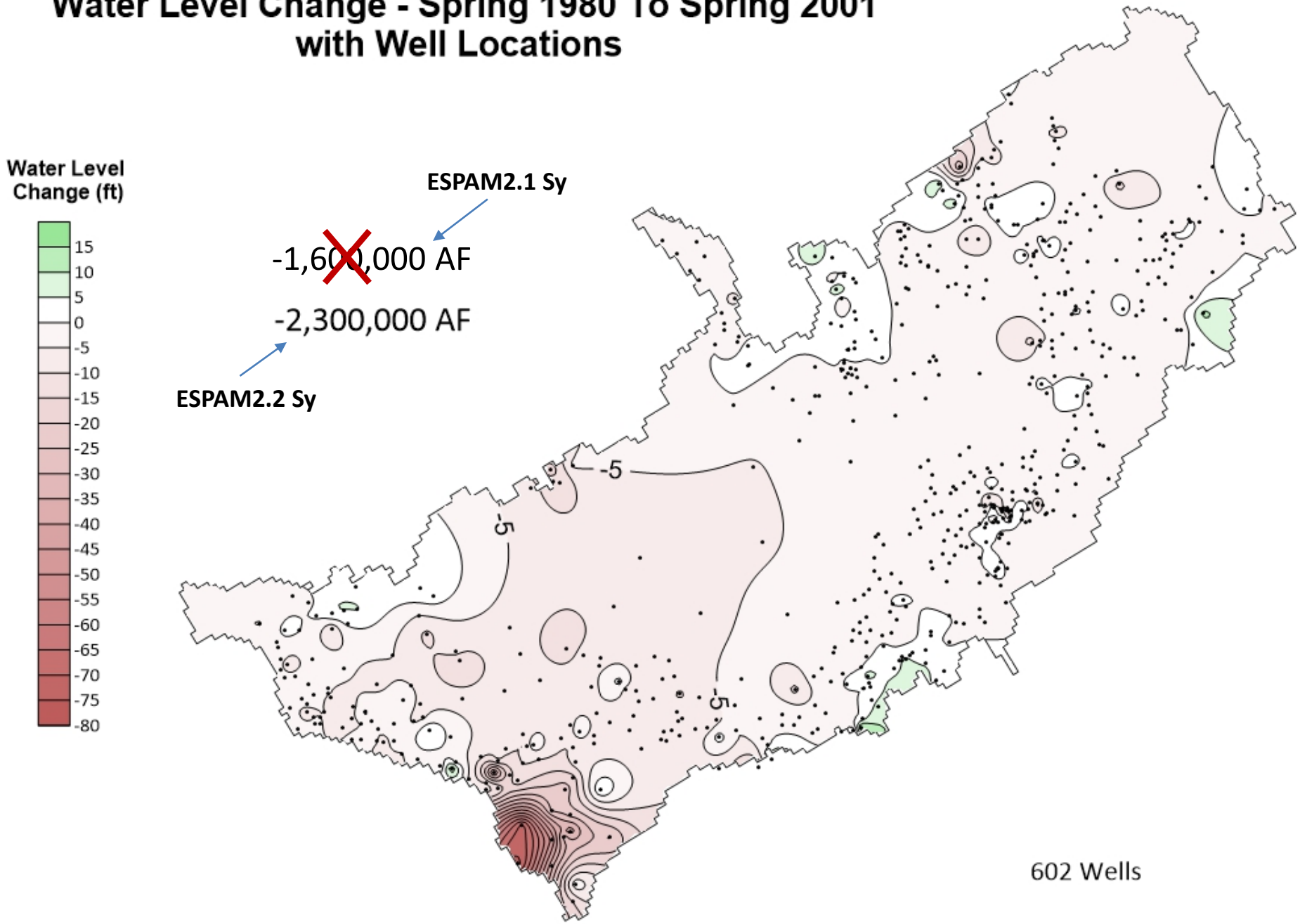
- Storage change calculations are based on data collected during mass measurement events.
- Mass measurement events are designed to collect as much data as possible during a brief window of time.
  - Provides a snapshot of the aquifer.
- Previous mass measurement events took place in the spring of 1980, 2001, 2002, 2008, 2013, 2018, and are now conducted every 5 years.

# Mass Measurement Change Maps

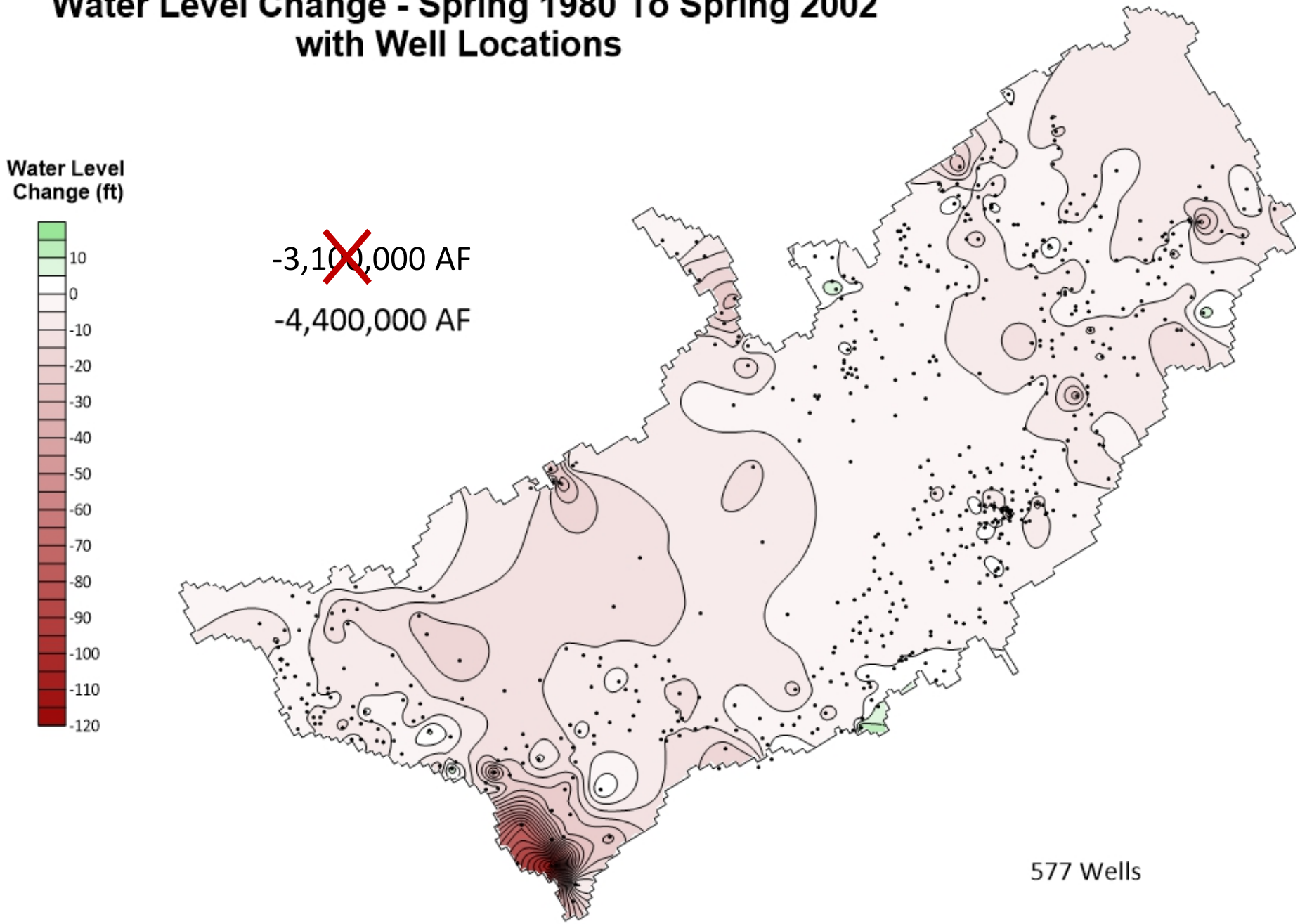
# Water Level Change - Spring 1980 To Spring 2001 with Well Locations



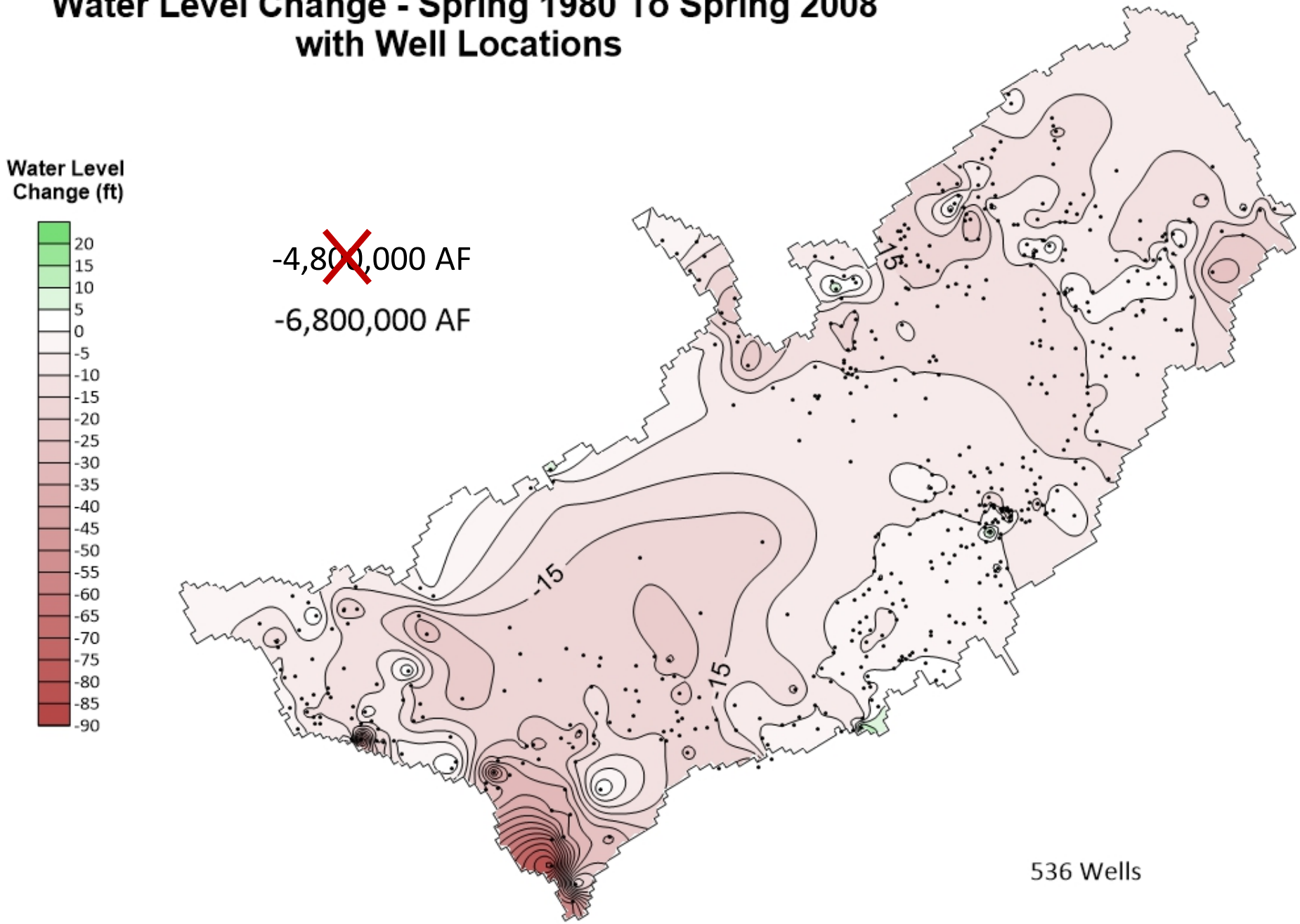
# Water Level Change - Spring 1980 To Spring 2001 with Well Locations



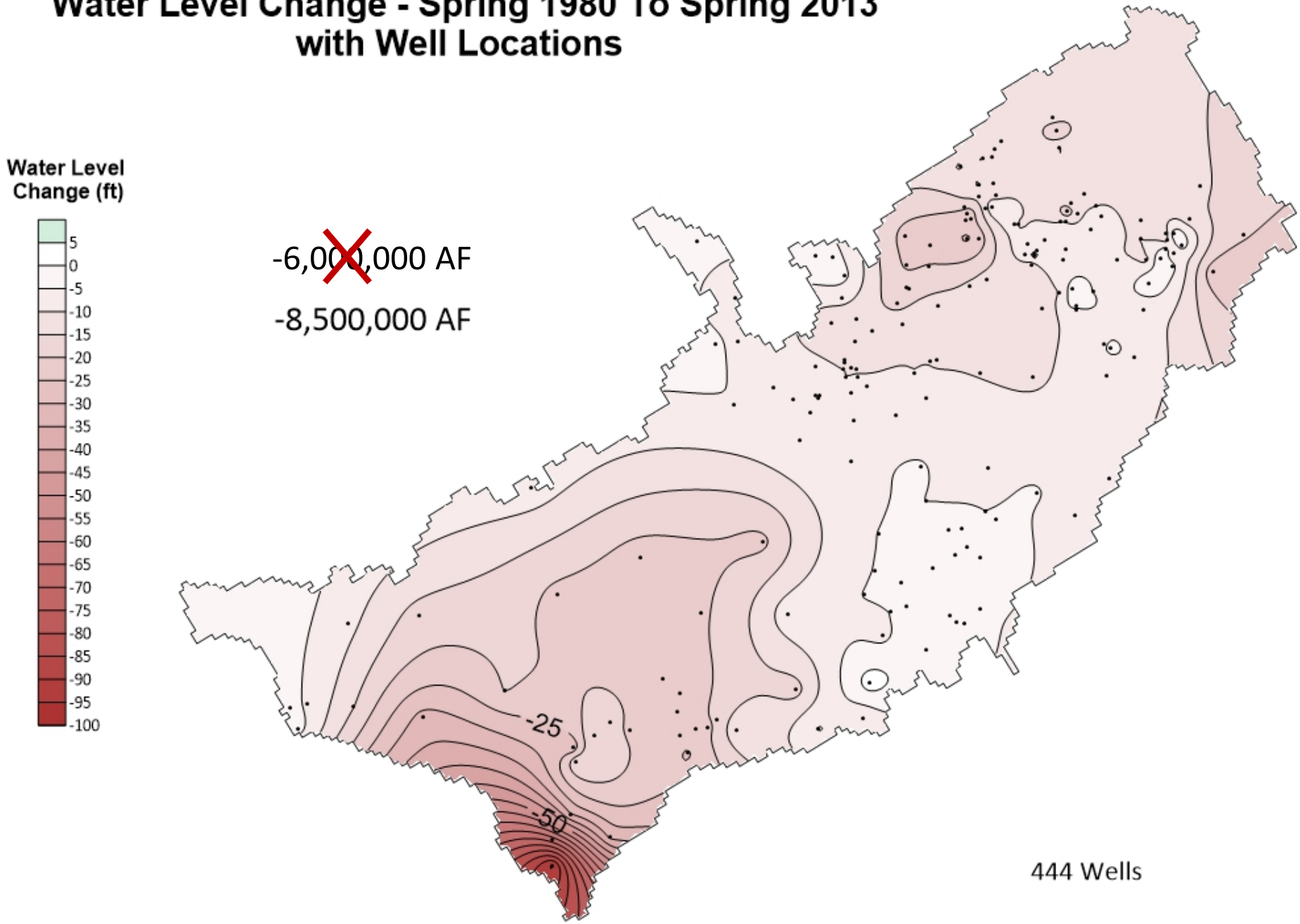
# Water Level Change - Spring 1980 To Spring 2002 with Well Locations



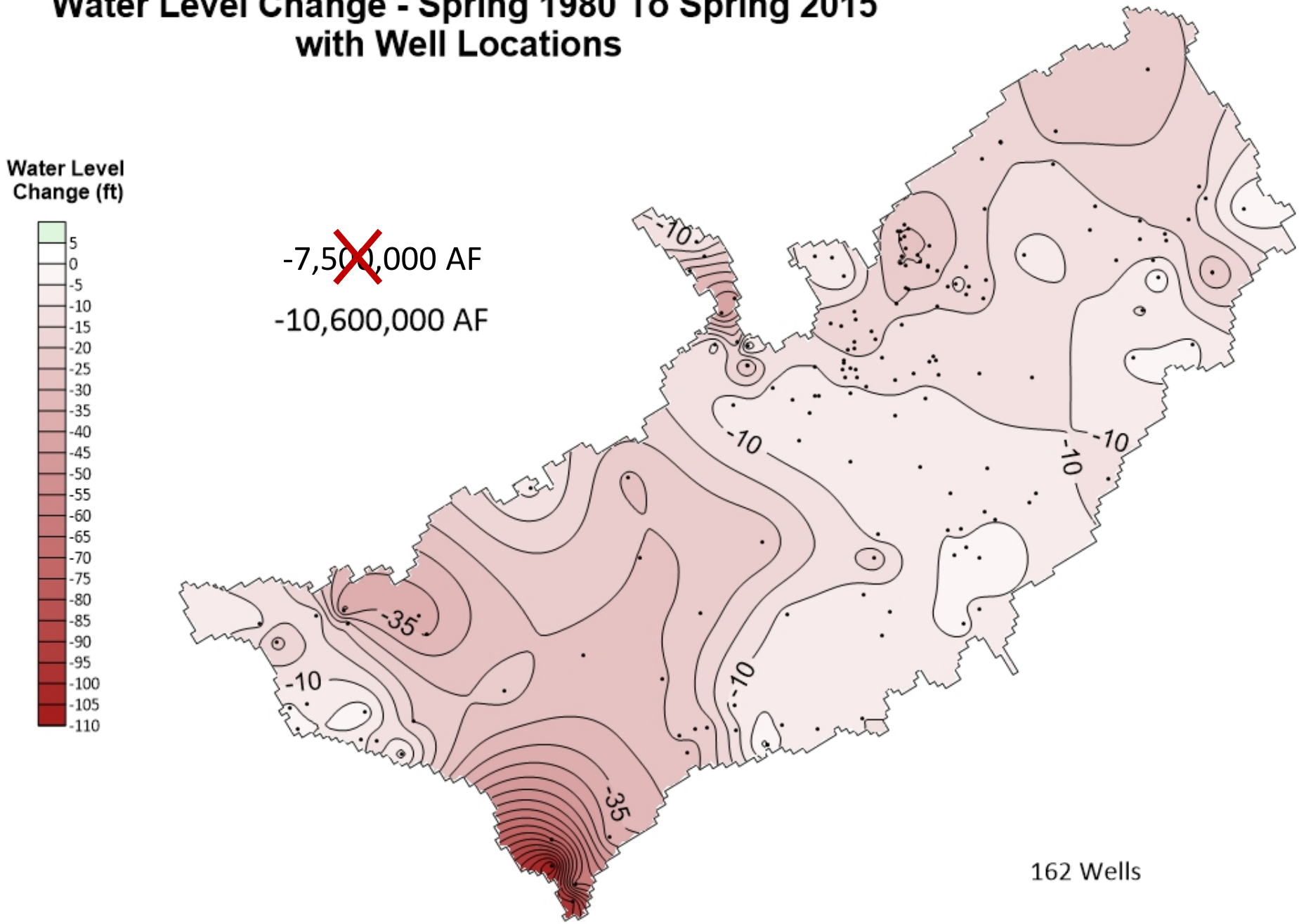
# Water Level Change - Spring 1980 To Spring 2008 with Well Locations



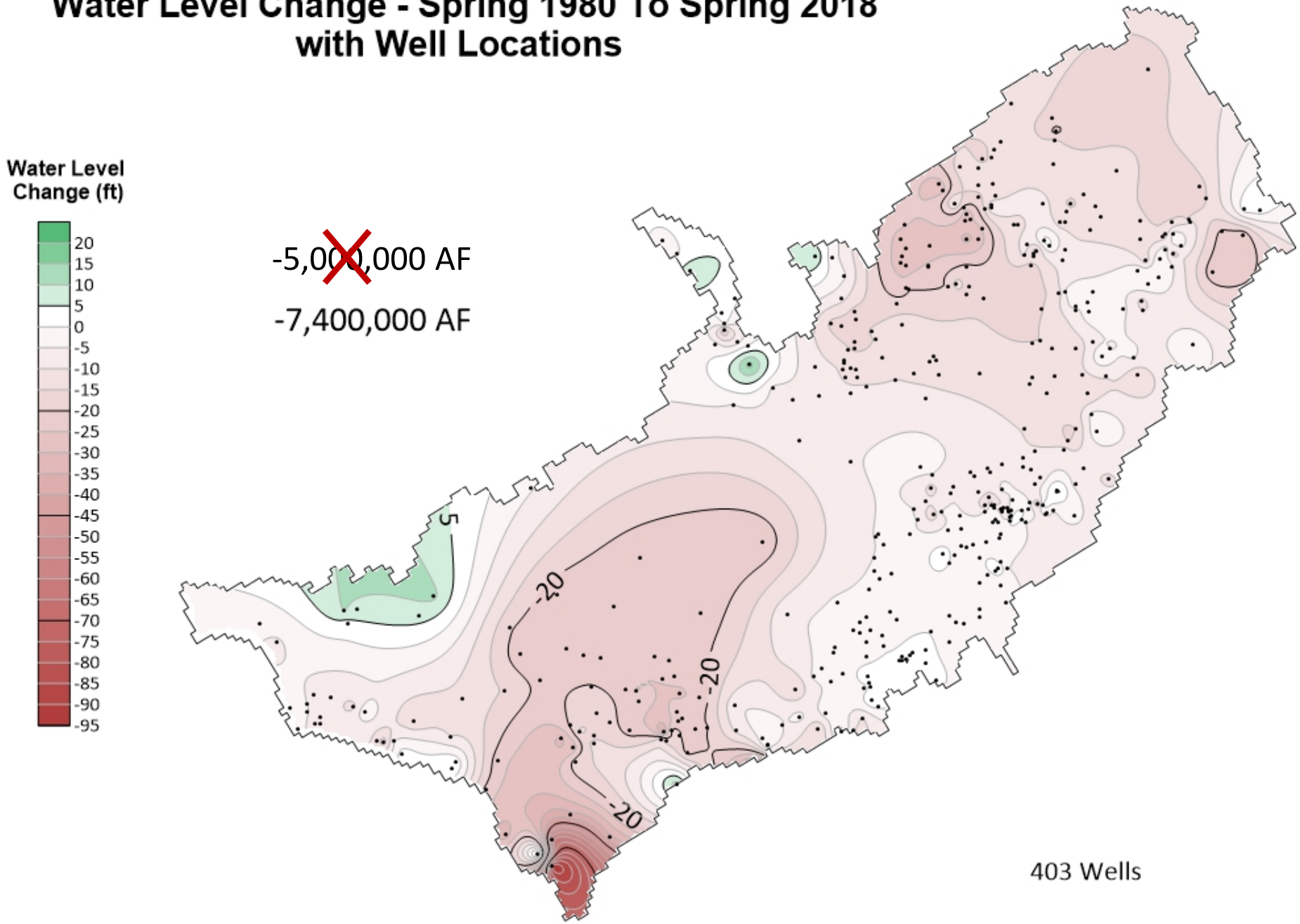
# Water Level Change - Spring 1980 To Spring 2013 with Well Locations

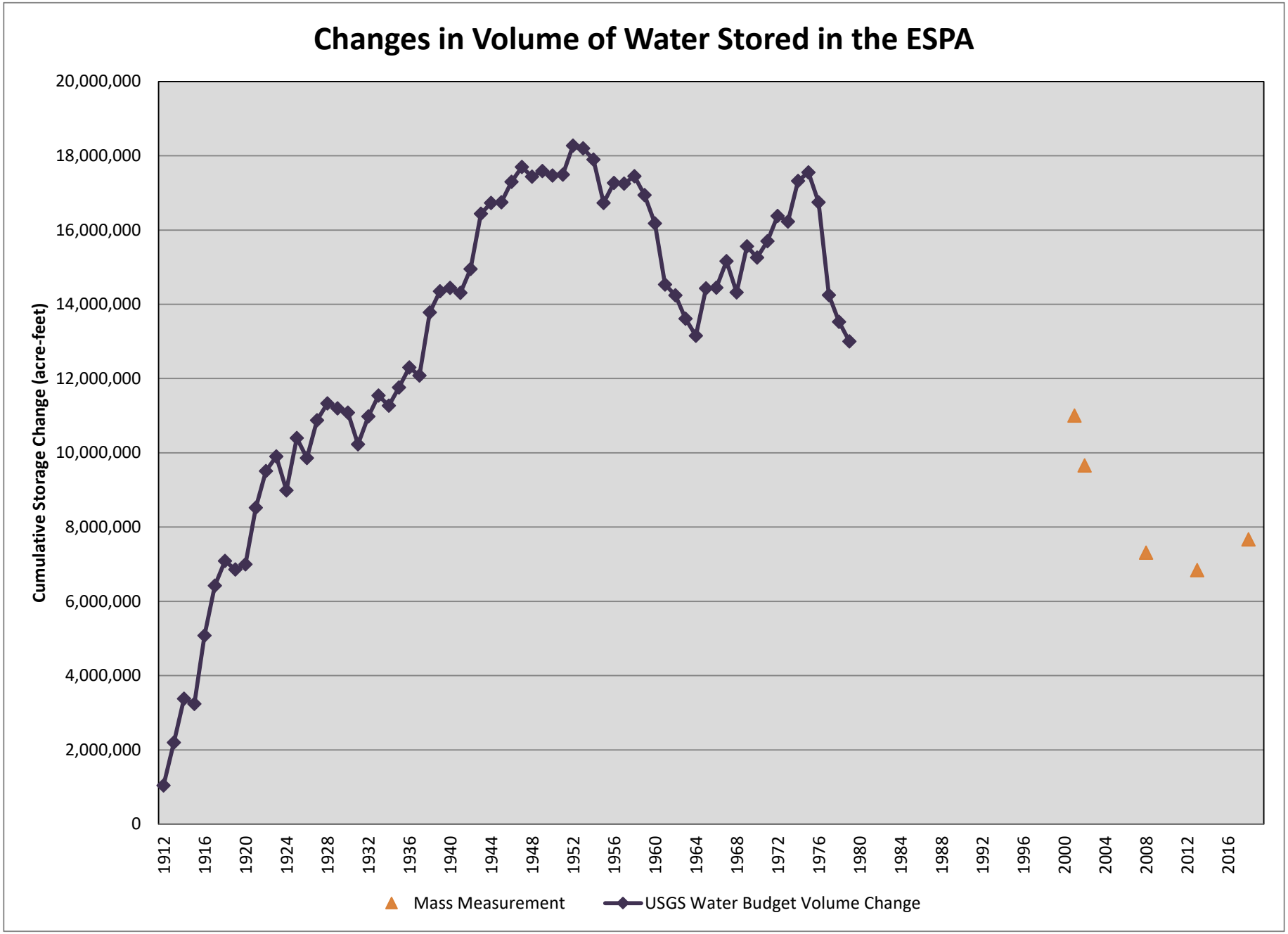


# Water Level Change - Spring 1980 To Spring 2015 with Well Locations



# Water Level Change - Spring 1980 To Spring 2018 with Well Locations




Changes in Volume of Water Stored in the ESPA
Cumulative Storage Change (acre-feet)
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
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1936
1940
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1952
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1968
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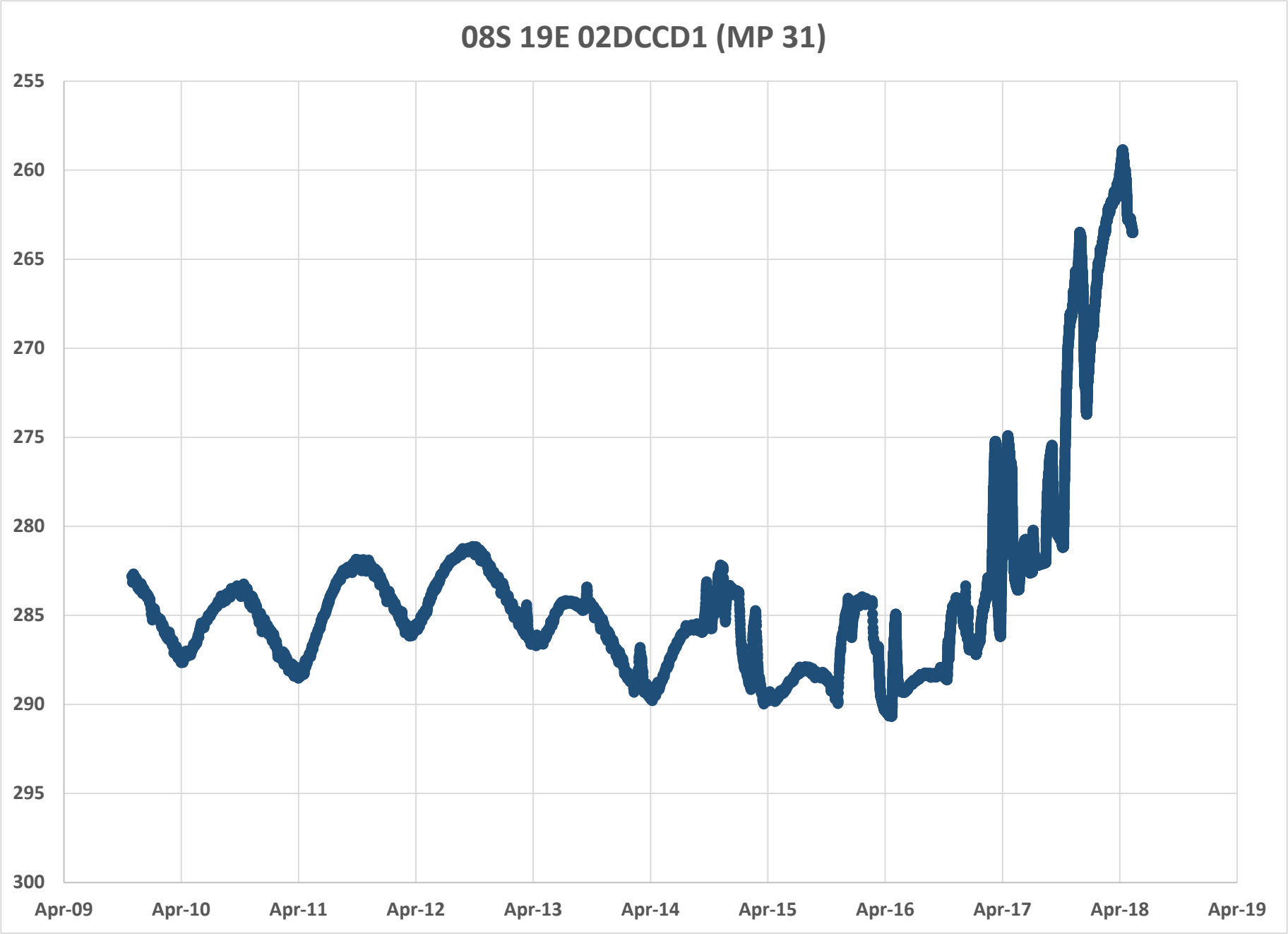
1984
1988
1992
1996
2000
2004
2008
2012
2016
Mass Measurement
USGS Water Budget Volume Change

# Storage Change between Mass Measurements

- Changes based on mass-measurement events give a general indication of the volume of water stored in the aquifer;
  - However, it is difficult to make management decisions with only this information.
- Hundreds of wells are measured in the spring each year.
  - Historically, these measurements were taken as time and conditions allowed.
- Since the spring of 2016, IDWR has been conducting coordinated measurement of the ESPA well network every spring to facilitate storage-change calculations.

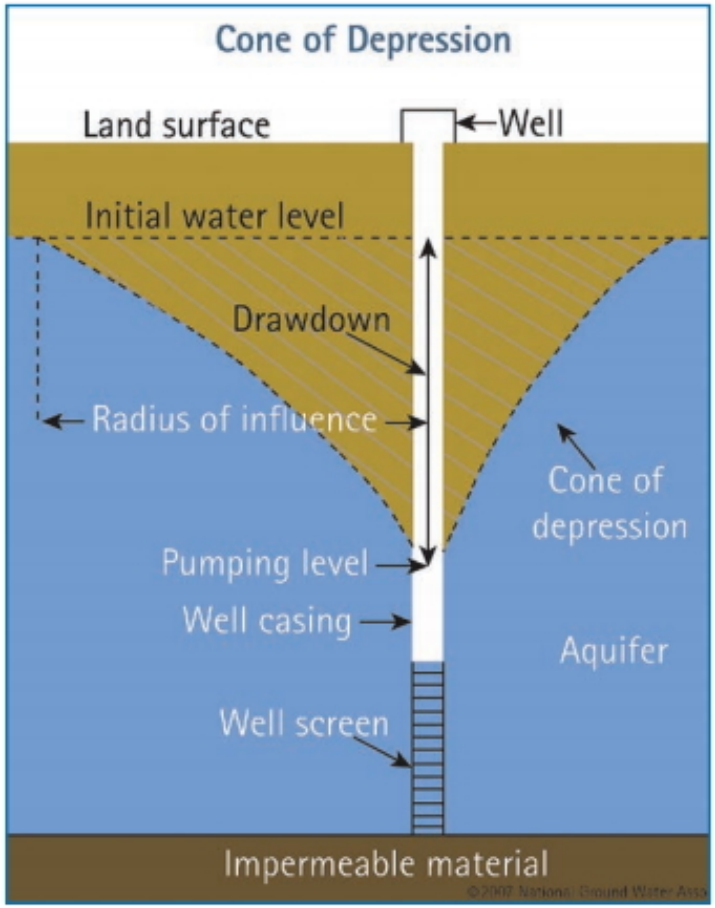
# Rationale for using Spring-Season Water Levels

- Conducting measurement events in the spring:
  - Maximizes the time between irrigation seasons.
  - Integrates the impacts due to irrigation-season activities into a resulting condition (annual aquifer storage change).
  - Pre-irrigation measurements reduce the impact of local water use on water levels (unperturbed water table).
- Managed recharge impacts water levels, and these impacts need to be addressed in the storage-change calculations.


08S 19E 02DCCD1 (MP 31)
255
260
265
270
275
280
285
290
295
300
Apr-09
Apr-10
Apr-11
Apr-12
Apr-13
Apr-14
Apr-15
Apr-16
Apr-17
Apr-18
Apr-19

# Water-Level Impacts due to Local Water Use

- Example: Short-term pumping in a well can produce water-level changes that do not represent the regional conditions. We don't want these water levels.
- What if a water level is impacted by increased areal recharge from a wet winter?
- Managed recharge also impacts water levels...



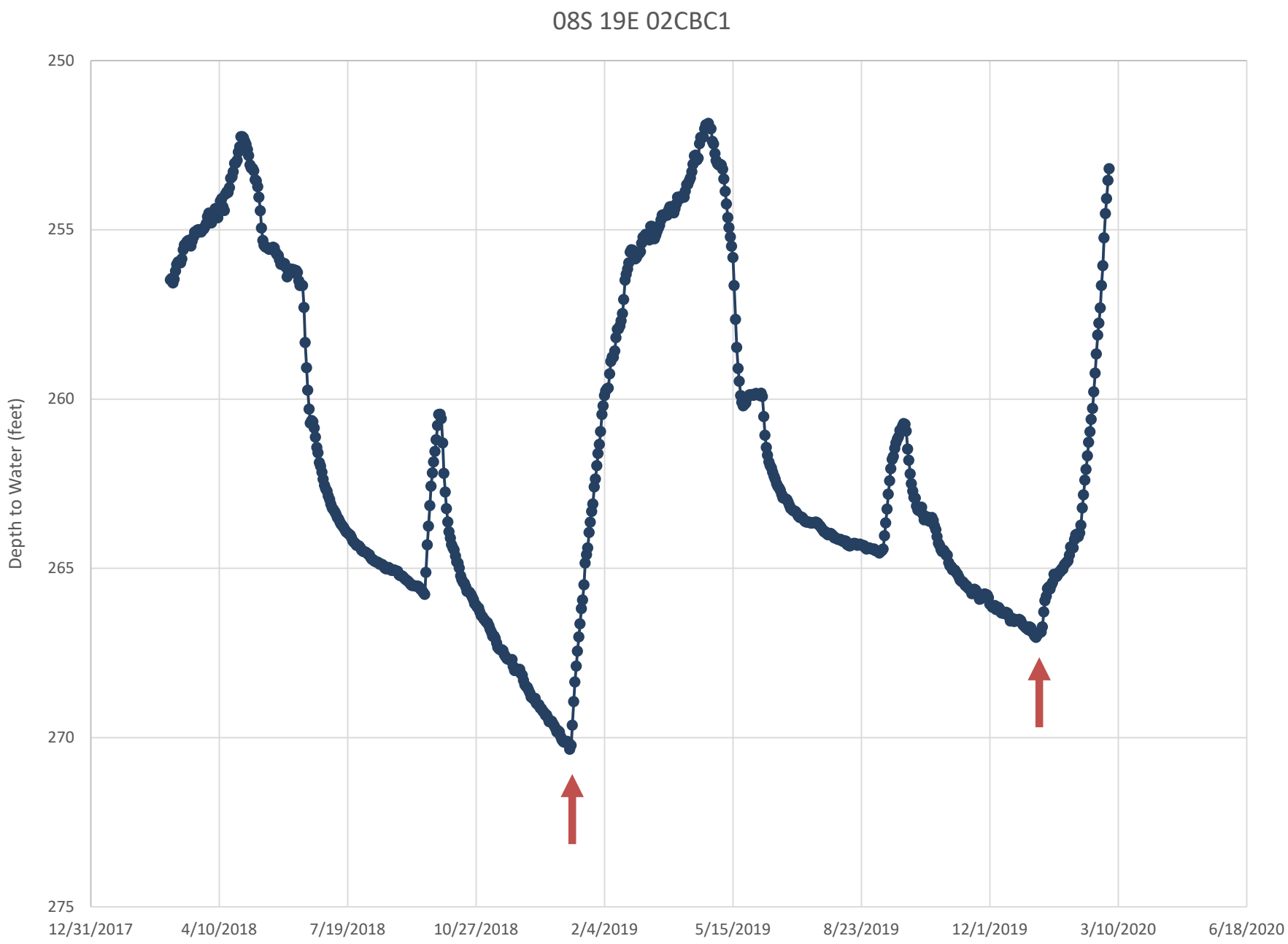

Source: National Groundwater Association,2007

# Water Levels Impacted by Managed Recharge

- Recharge is not an artifact of local use. It is a real, regional water-budget component.
- Water levels that are impacted by managed recharge **must be included**.
- We need to avoid over-estimating storage changes by excluding water levels that respond too strongly to recharge.
  - Any approach used to determine which data to include/exclude requires a subjective decision.
  - There is no direct answer as to whether water-level responses to recharge appropriately represent water-budget change

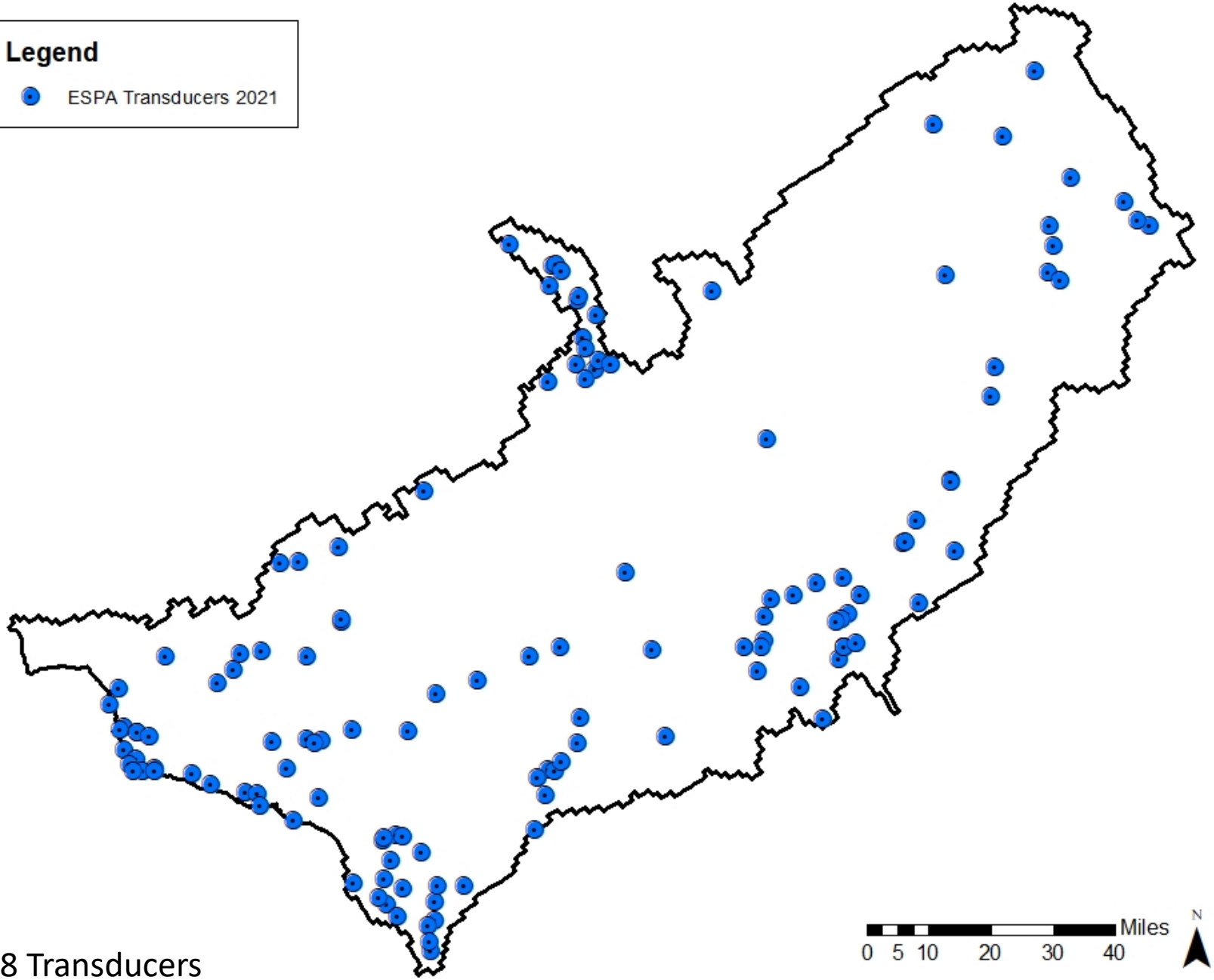
# Choosing Wells in Proximity to Managed Recharge

- ESPAM2.2 is a regional model.
  - The model area is broken into one-mile grid cells.
  - The model simulation period is divvied into one-month stress periods.
- Because we are calculating regional impacts, I have used the ESPAM2.2 discretization to include/exclude wells.
  - Exclude wells that are less than one mile from a recharge location.
  - For wells > one mile from recharge, exclude water levels that occur less than 30 days after an obvious recharge event –
  - Not all recharge locations are known, and not all water-level data are sufficient for these choices.


08S 19E 02CBC1
Depth to Water (feet)
250
255
260
265
270
275
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020

# The Value of Transducer-Data Loggers

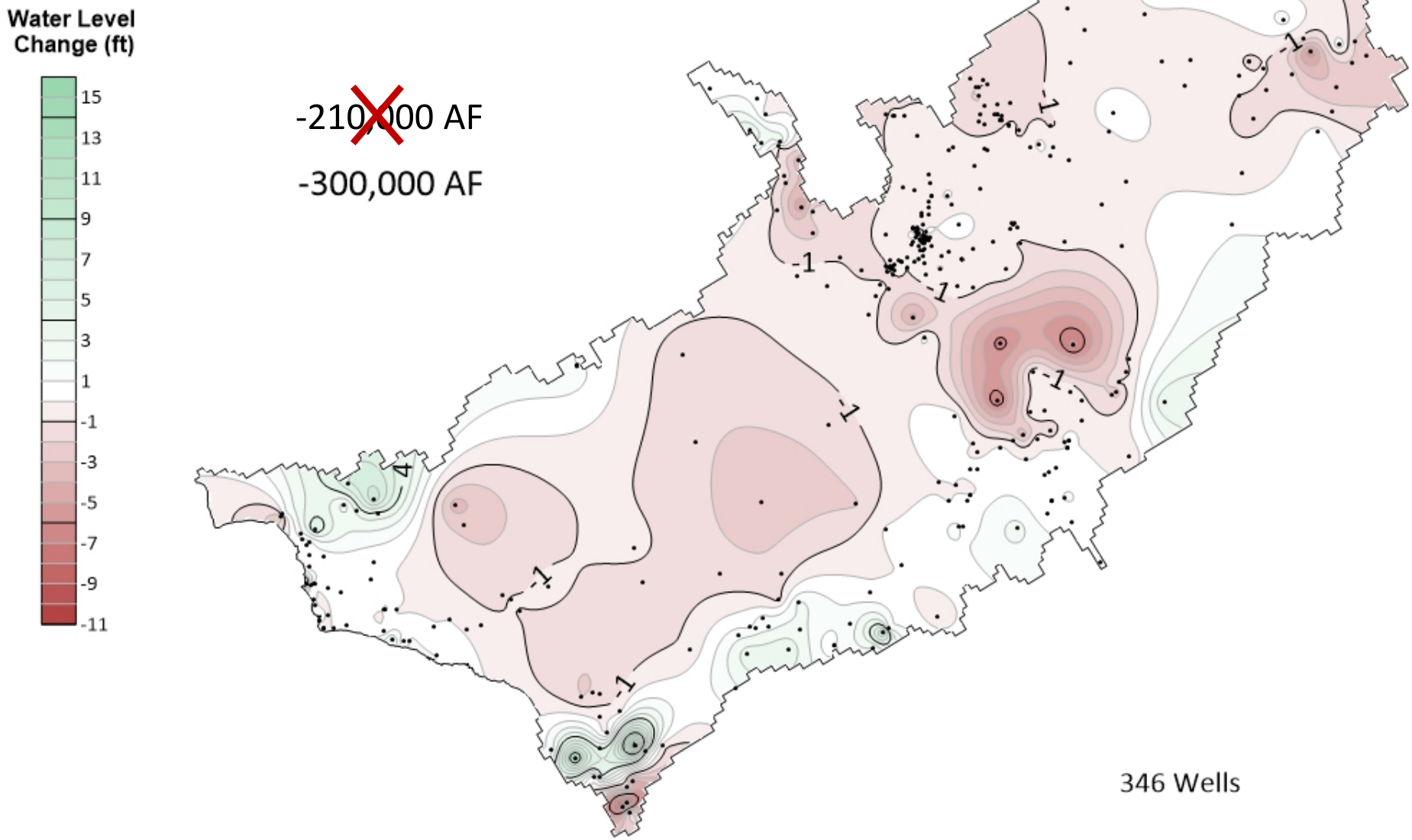
- Transducers measure the pressure of water above the probe.
  - Manual measurements are used to relate the pressure to depth-of-water.
- Data loggers record the pressure measurements.
- We collect much more data using transducers.
- Able to collect measurements even if the well is inaccessible during the synoptic measurement event.
- Allows for understanding of well behavior.
- Data collected via transducer allows for the selection of the most appropriate water level.
  - Even if the water levels aren't obviously influenced by recharge.



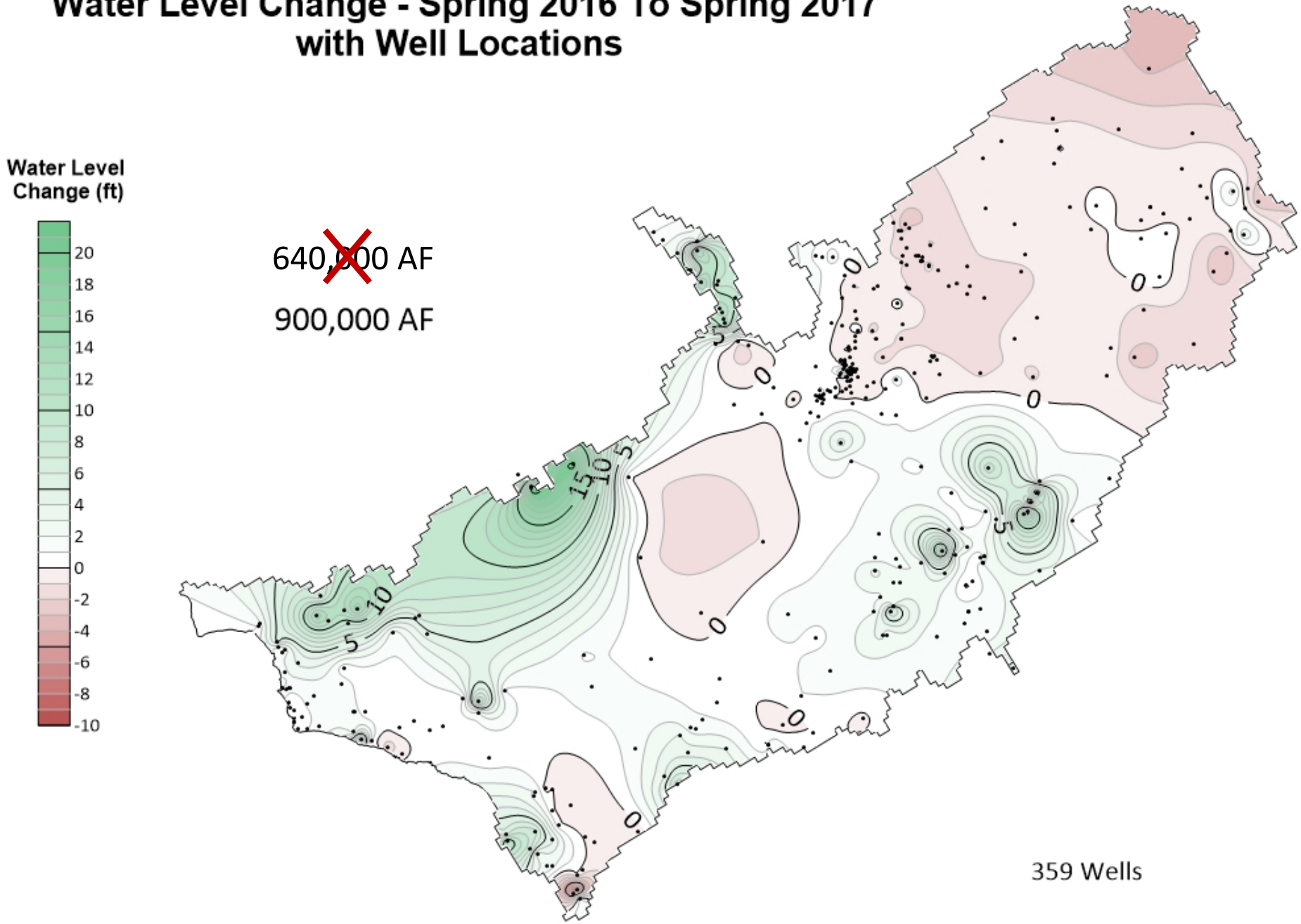

138 Transducers

# Annual Measurement Change Maps: 2015 – 2021

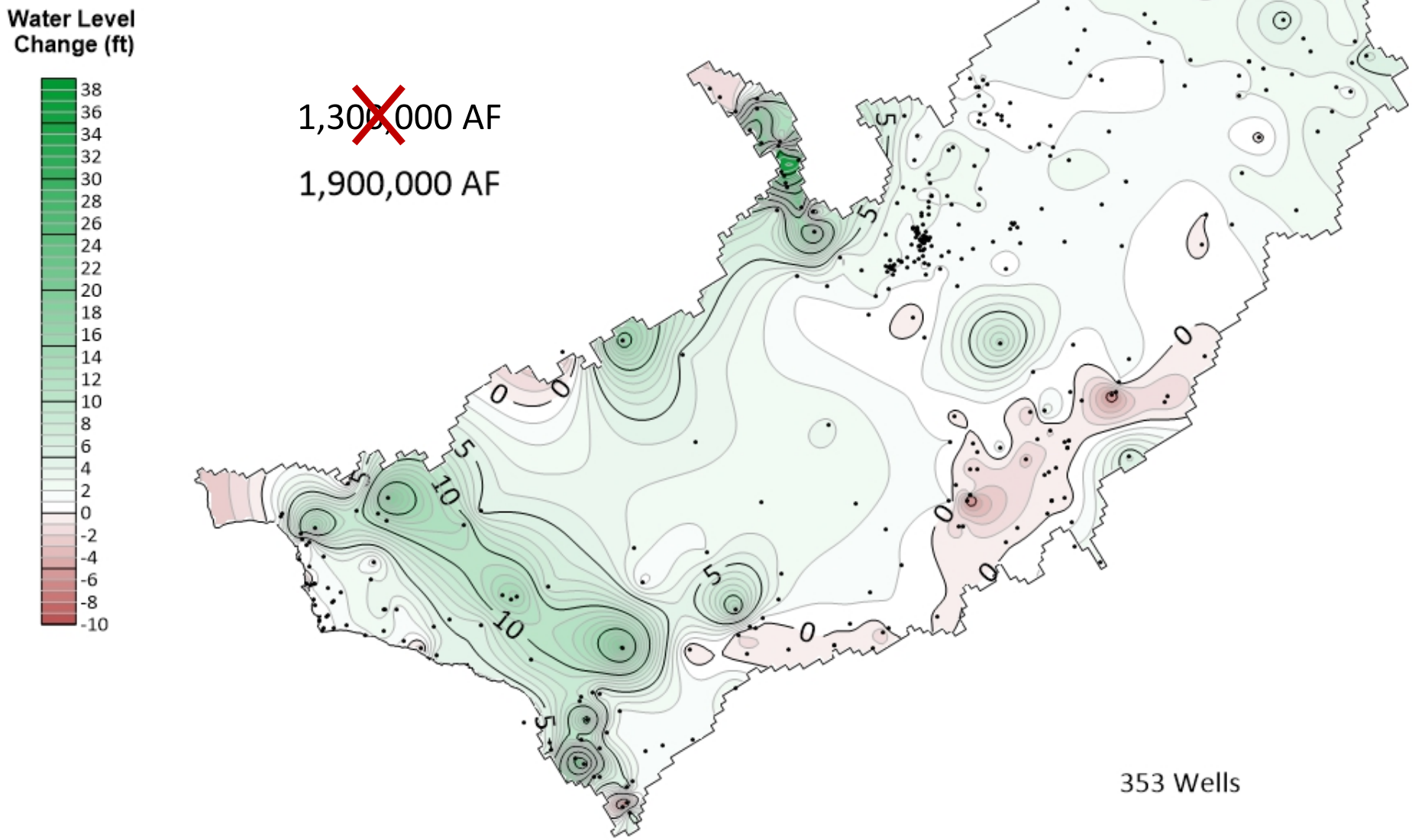
# Water Level Change - Spring 2015 To Spring 2016 with Well Locations



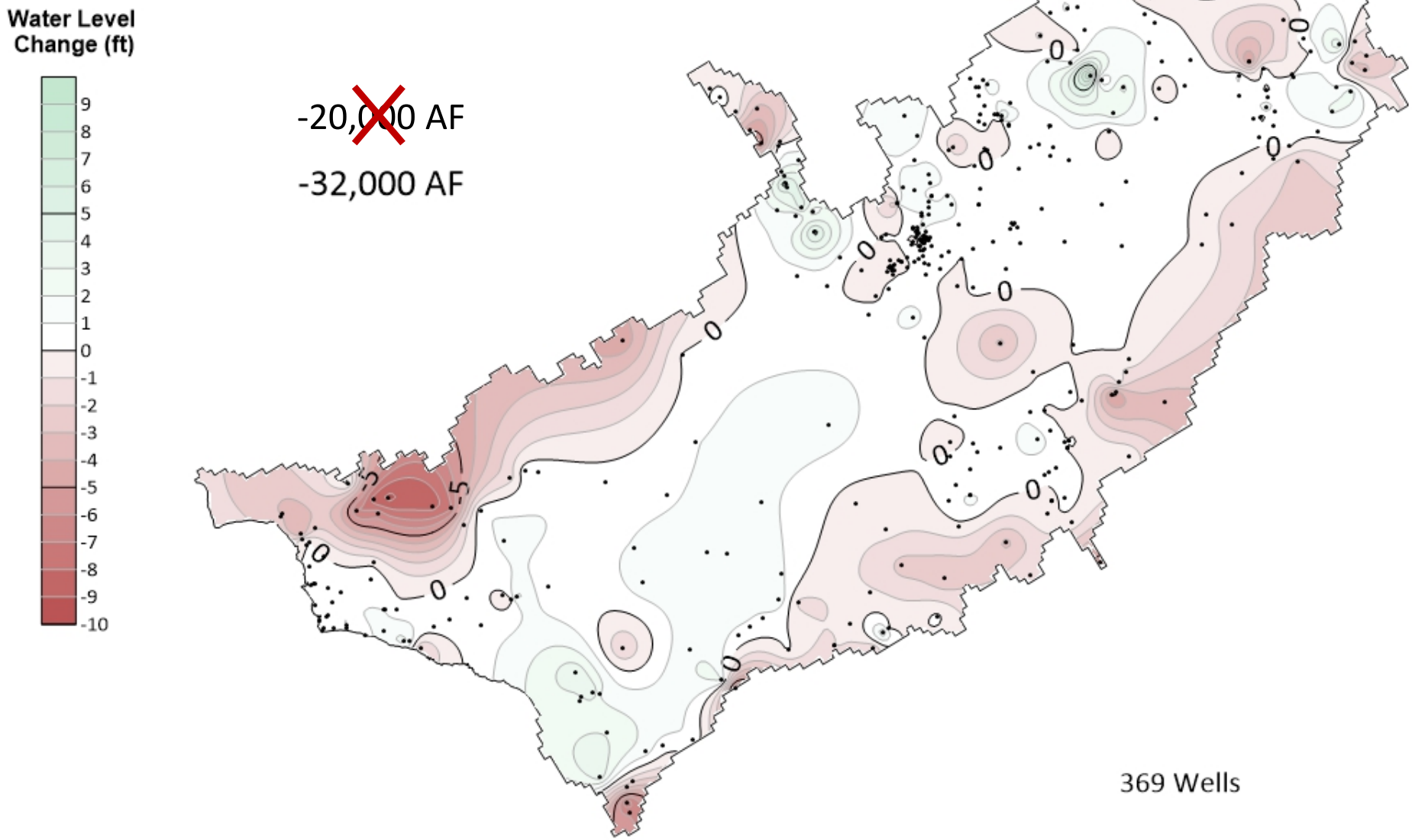
# Water Level Change - Spring 2016 To Spring 2017 with Well Locations



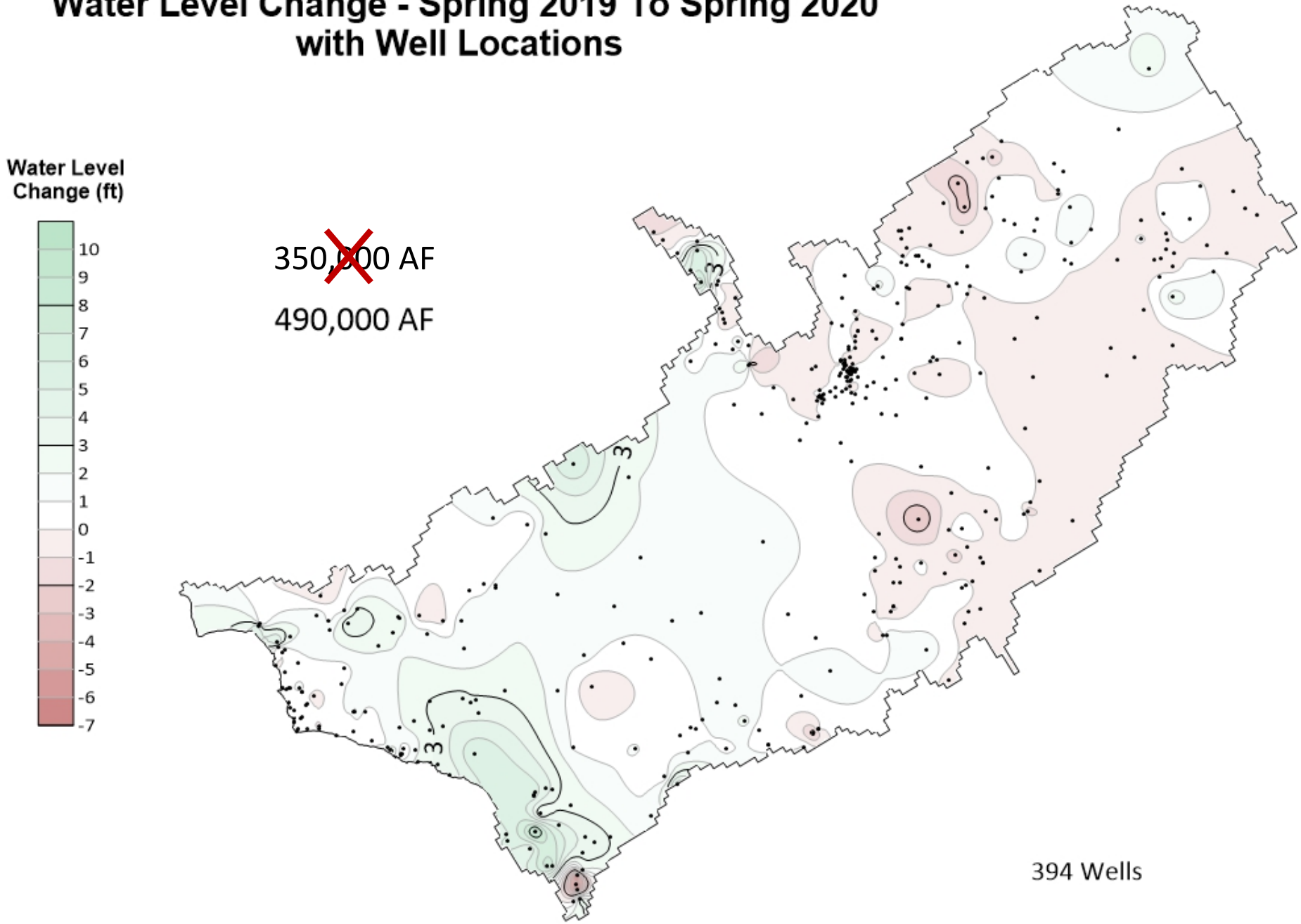
# Water Level Change - Spring 2017 To Spring 2018 with Well Locations



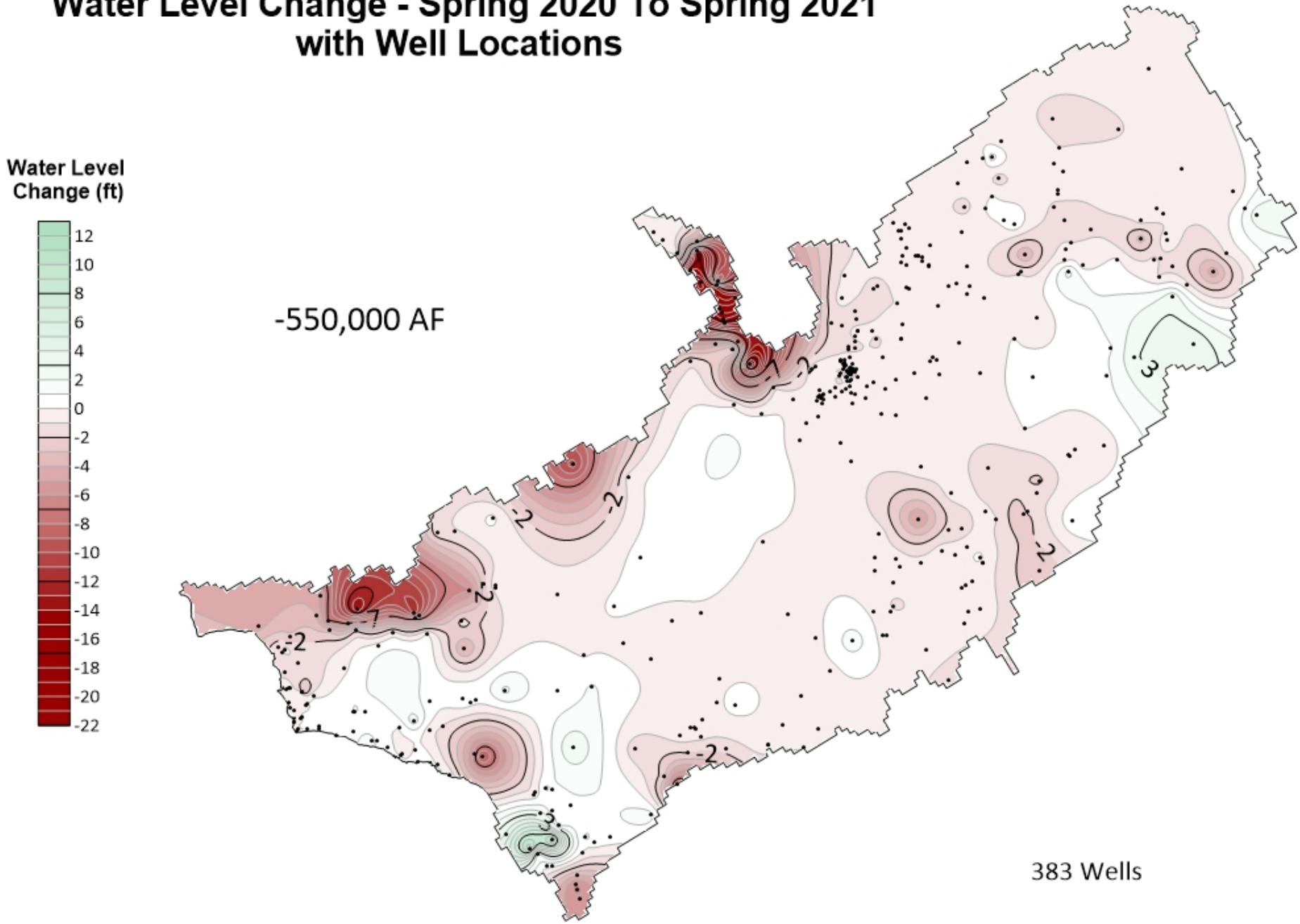
# Water Level Change - Spring 2018 To Spring 2019 with Well Locations



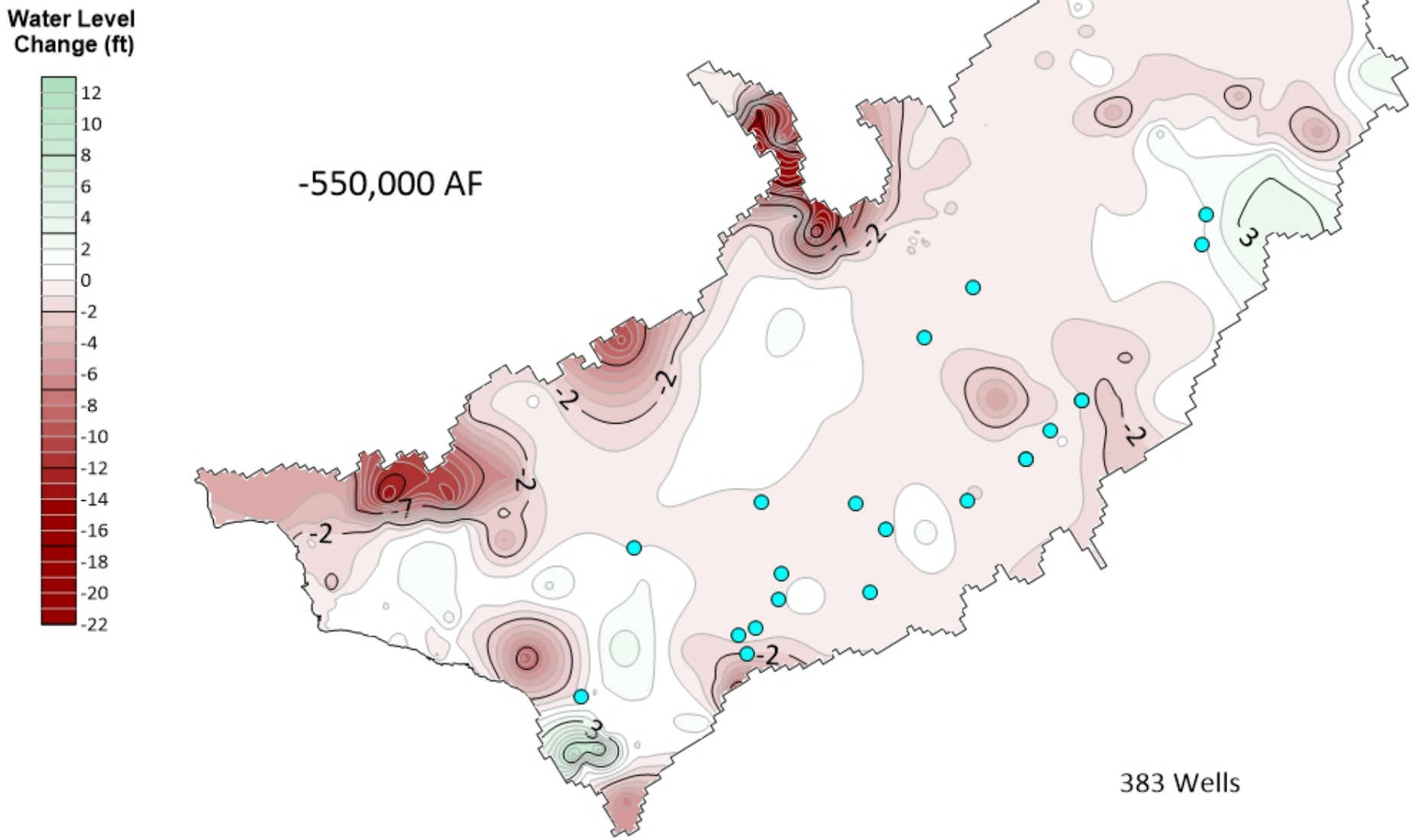
# Water Level Change - Spring 2019 To Spring 2020 with Well Locations



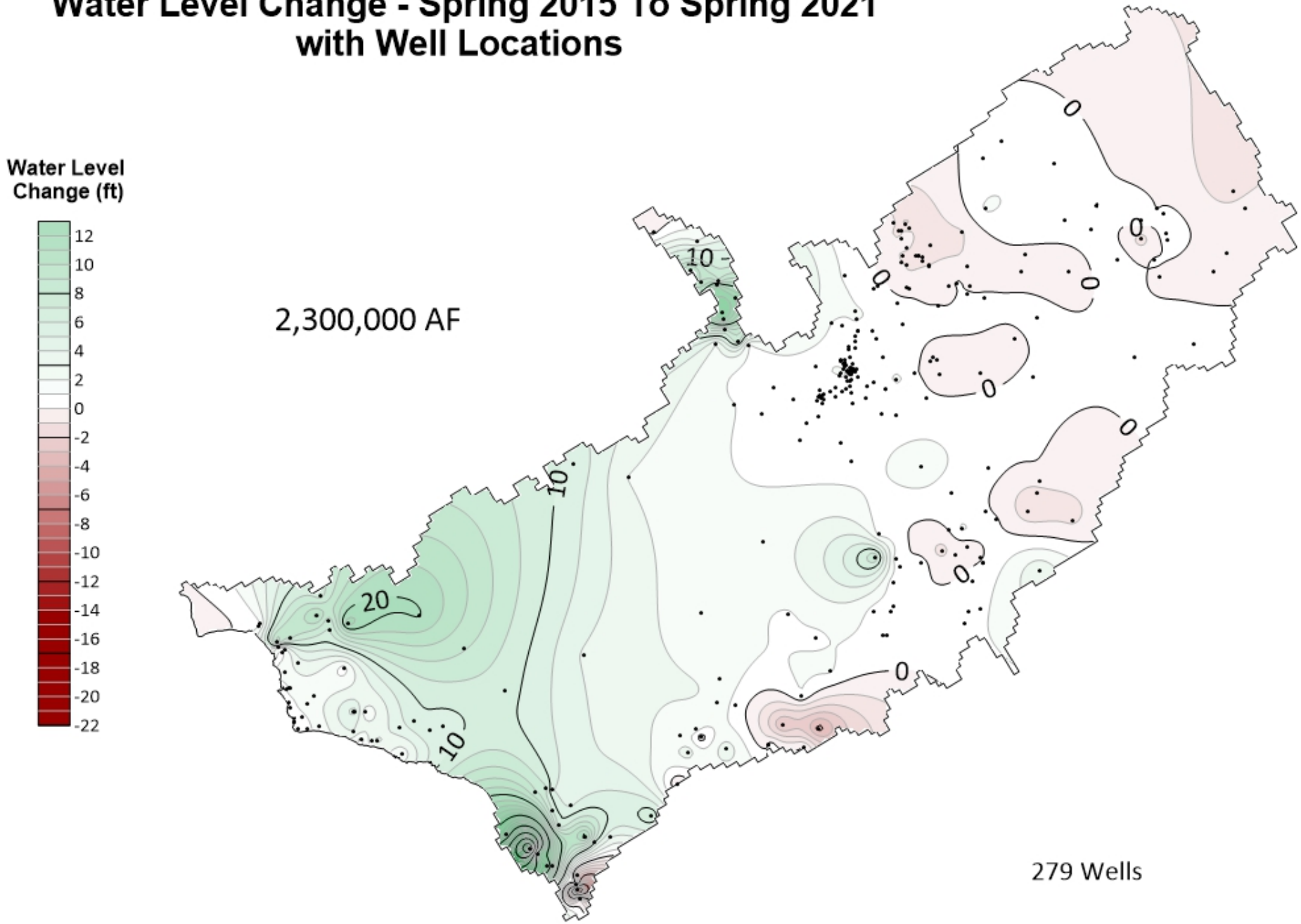
# Water Level Change - Spring 2020 To Spring 2021 with Well Locations



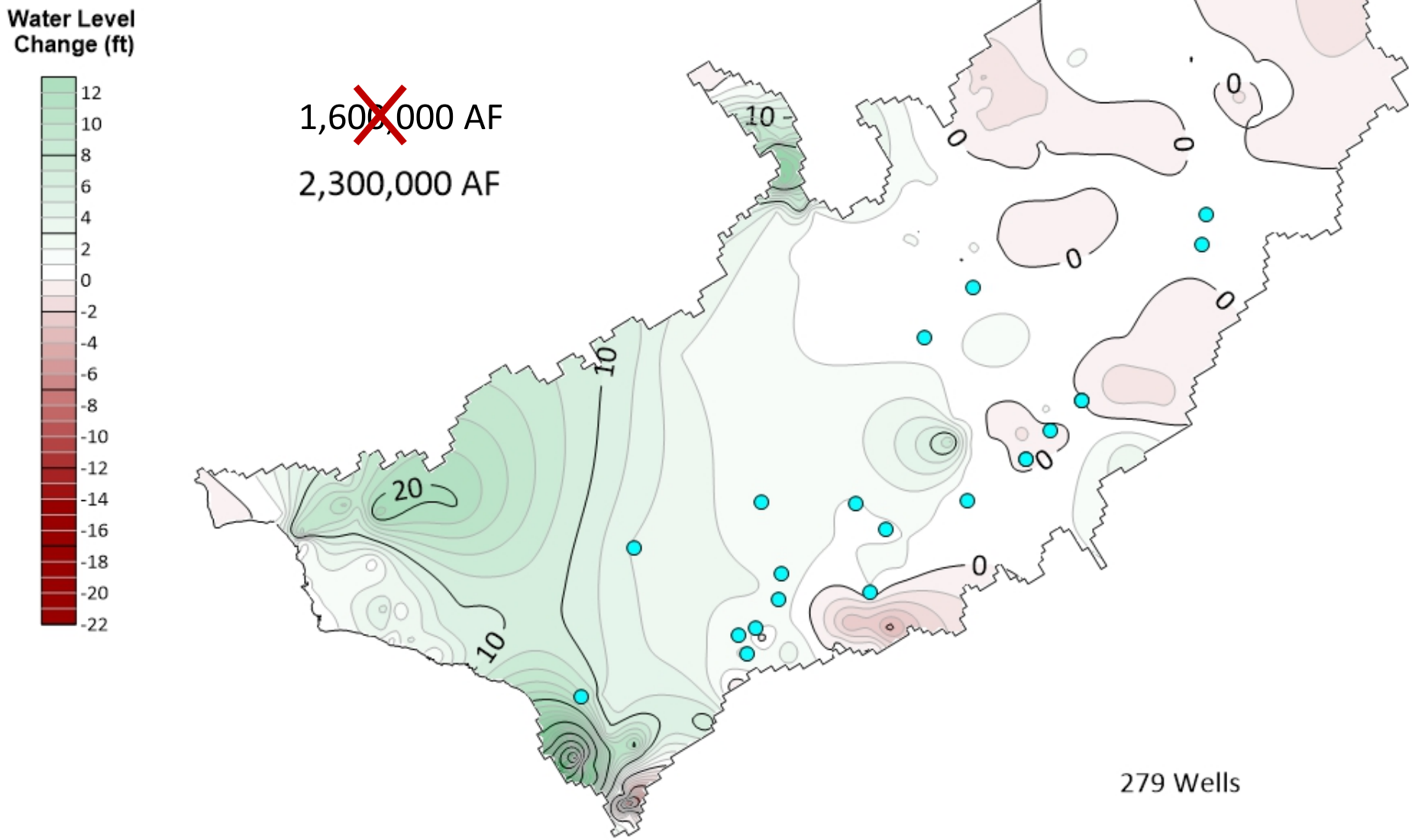
# Water Level Change - Spring 2020 To Spring 2021 with Sentinel Well Locations

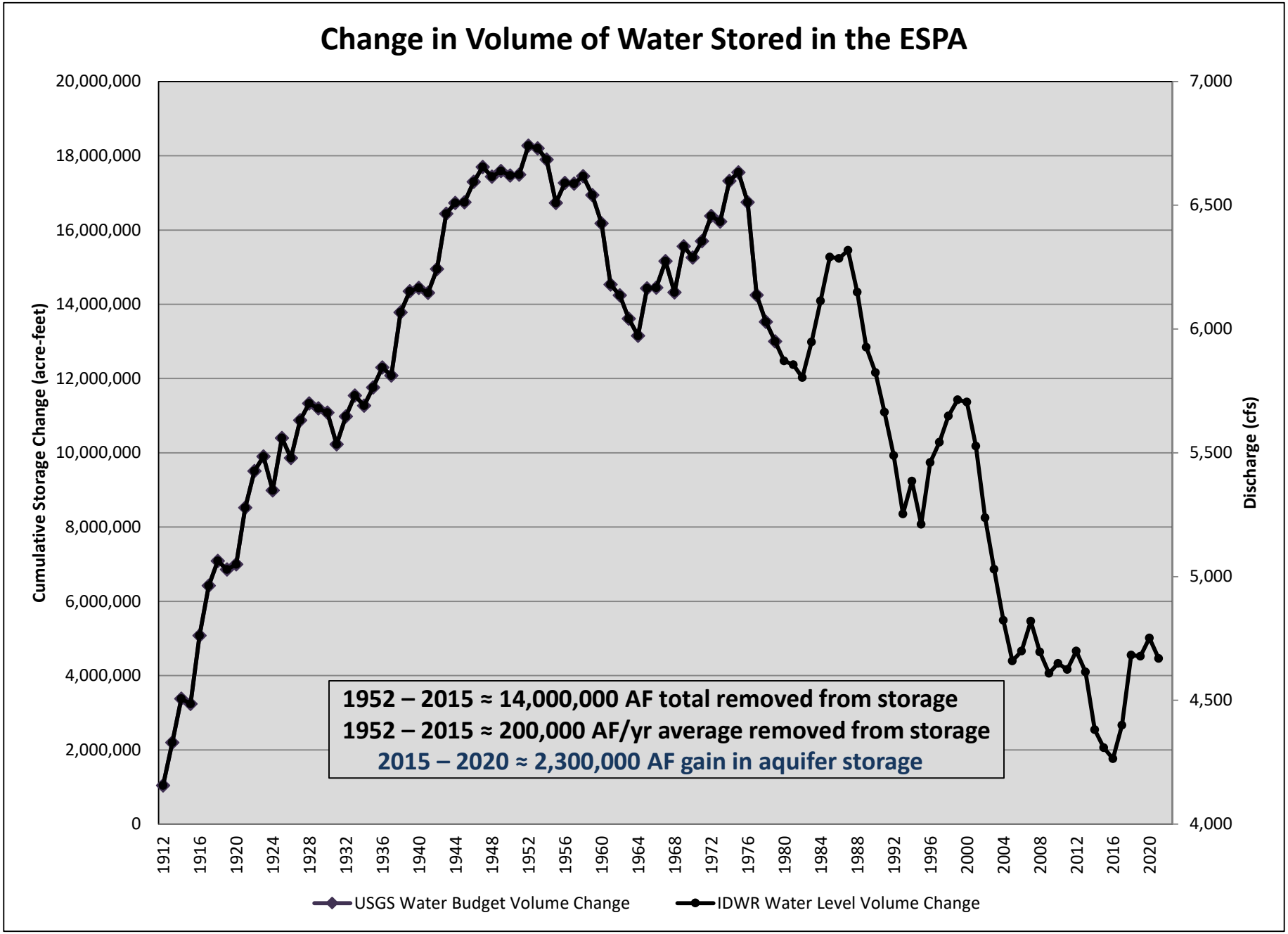


# Water Level Change - Spring 2015 To Spring 2021 with Well Locations



# Water Level Change - Spring 2015 To Spring 2021 with Sentinel Well Locations




Change in Volume of Water Stored in the ESPA
Cumulative Storage Change (acre-feet)
Discharge (cfs)
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
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8,000,000
6,000,000
4,000,000
2,000,000
0
7,000
6,500
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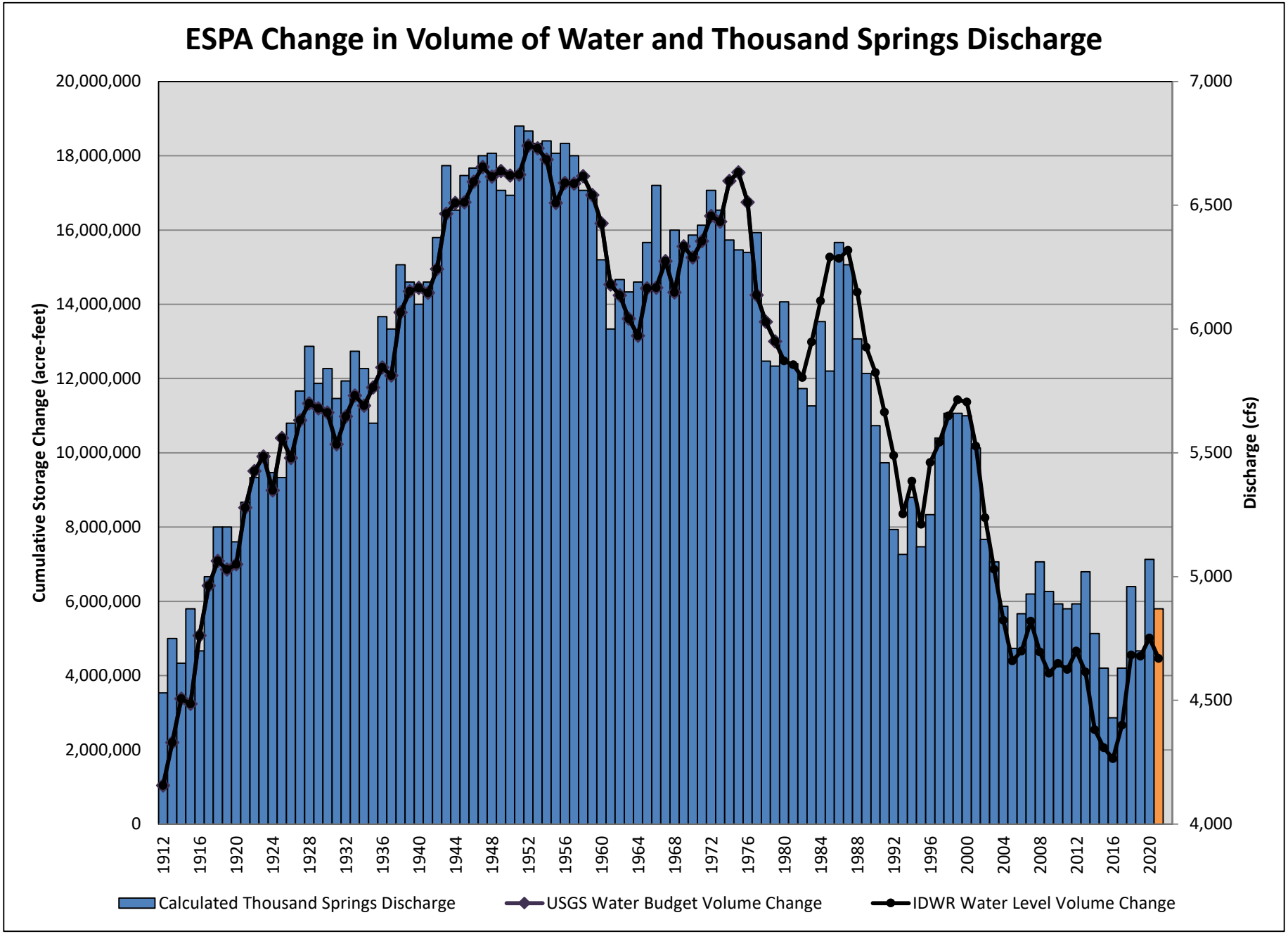
2016
2020
1952 – 2015 ≈ 14,000,000 AF total removed from storage
1952 – 2015 ≈ 200,000 AF/yr average removed from storage
2015 – 2020 ≈ 2,300,000 AF gain in aquifer storage
USGS Water Budget Volume Change
IDWR Water Level Volume Change


ESPA Change in Volume of Water and Thousand Springs Discharge
Cumulative Storage Change (acre-feet)
Discharge (cfs)
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
7,000
6,500
6,000
5,500
5,000
4,500
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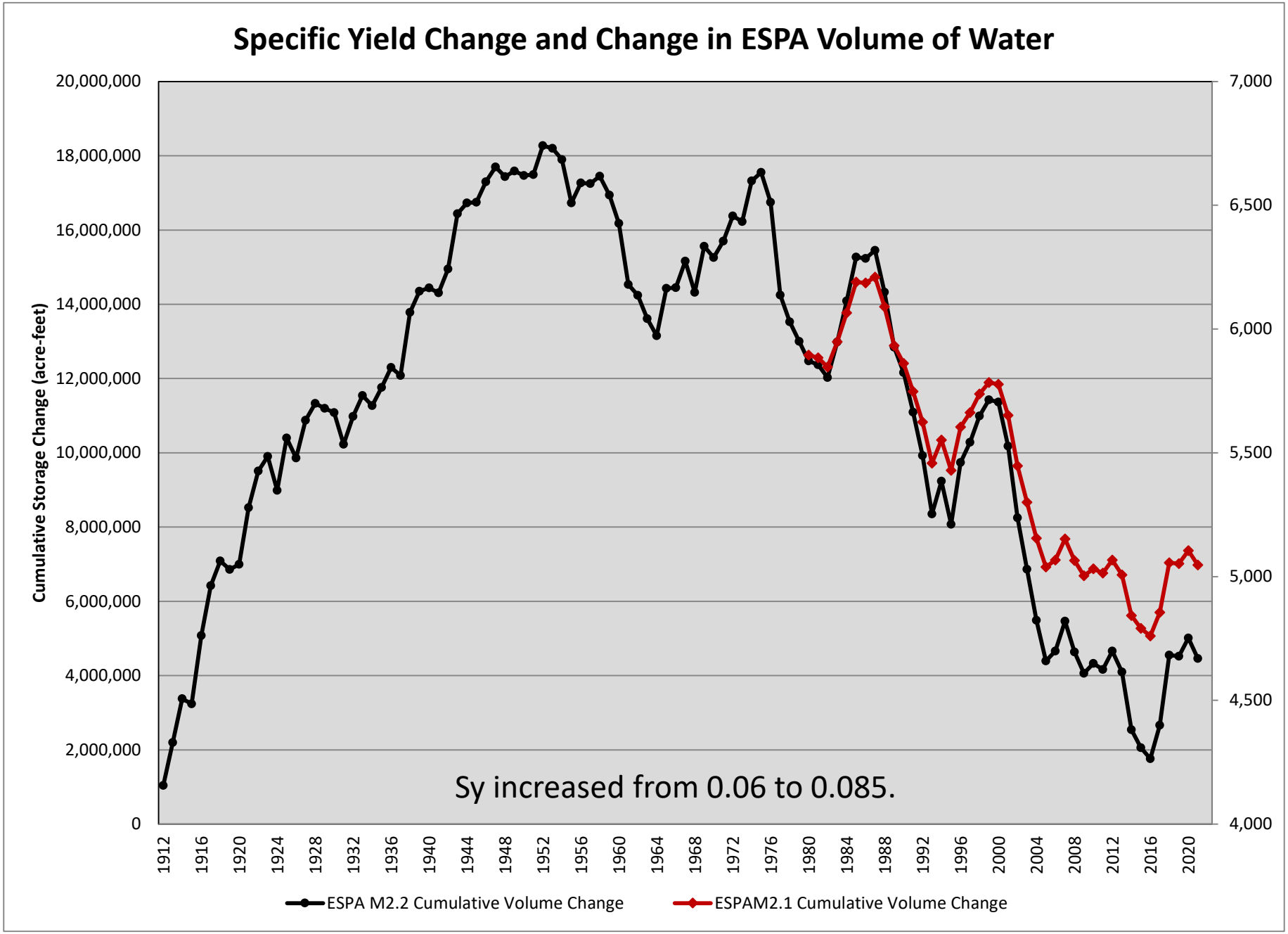
2016
2020
Calculated Thousand Springs Discharge
USGS Water Budget Volume Change
IDWR Water Level Volume Change


Specific Yield Change and Change in ESPA Volume of Water
Cumulative Storage Change (acre-feet)
20,000,000
18,000,000
16,000,000
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8,000,000
6,000,000
4,000,000
2,000,000
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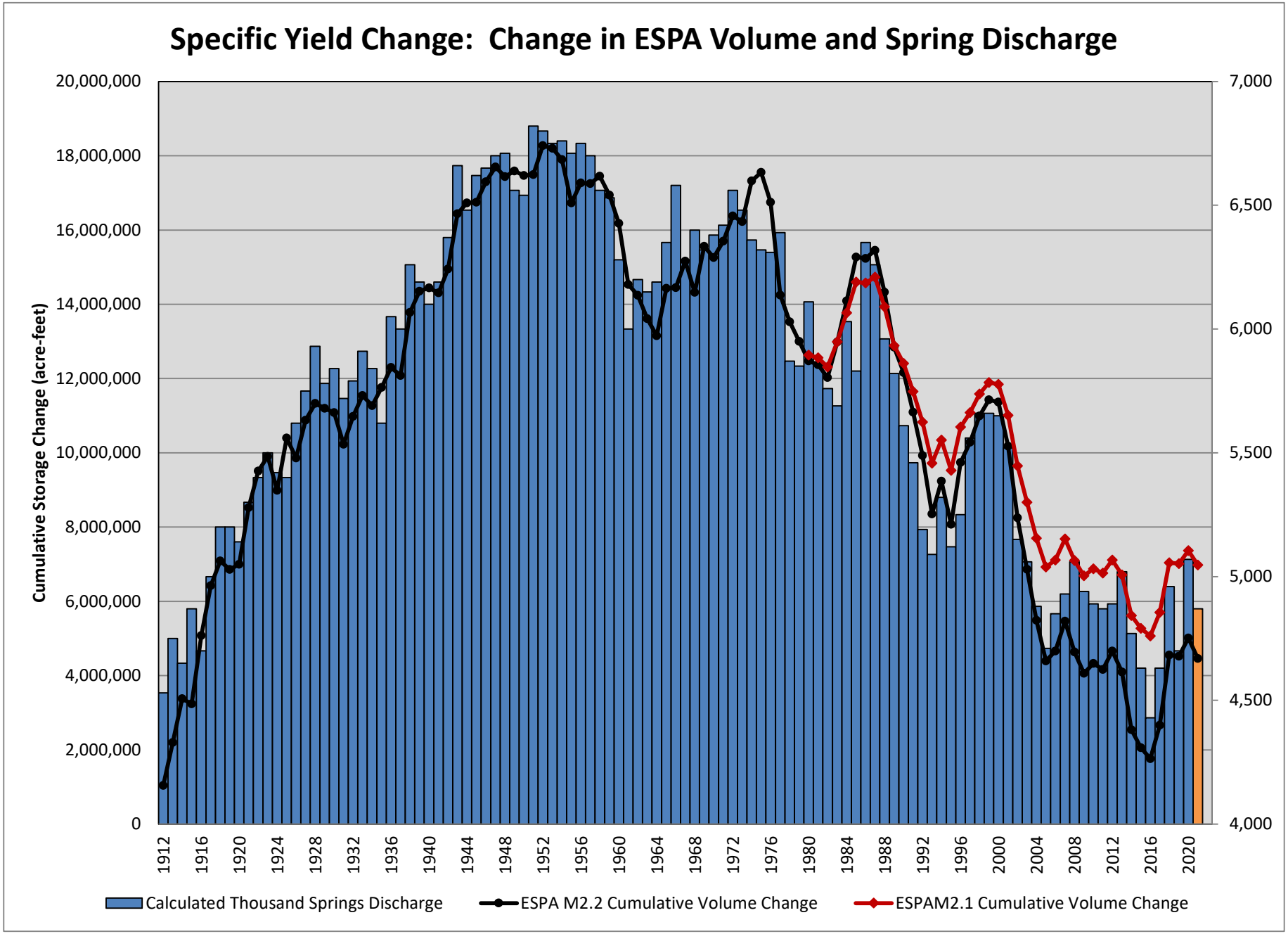
2016
2020
Sy increased from 0.06 to 0.085.
ESPA M2.2 Cumulative Volume Change
ESPAM2.1 Cumulative Volume Change


Specific Yield Change: Change in ESPA Volume and Spring Discharge
Cumulative Storage Change (acre-feet)
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
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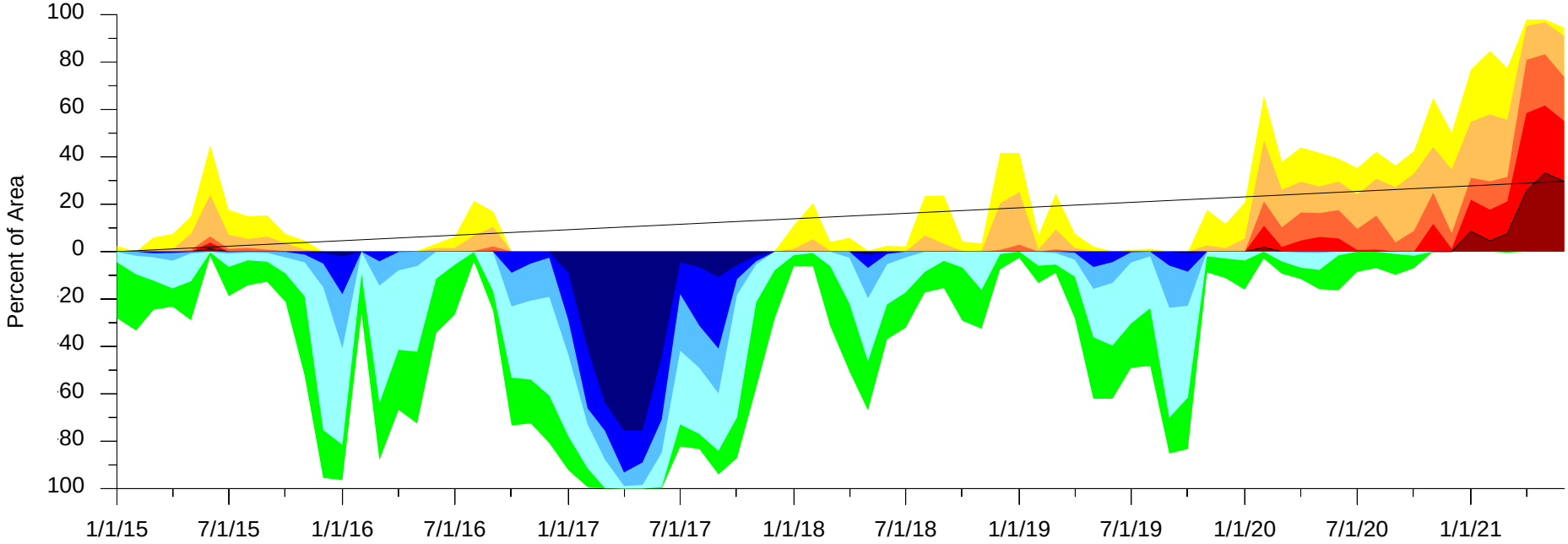
2016
2020
Calculated Thousand Springs Discharge
ESPA M2.2 Cumulative Volume Change
ESPAM2.1 Cumulative Volume Change

# Standardized Precipitation Index: ESPA Counties




- Abnormally Wet
- Moderate Wet
- Severe Wet
- Extreme Wet
- Exceptional Wet
- Abnormally Dry
- Moderate Drought
- Severe Drought
- Extreme Drought
- Exceptional Drought

The Standardized Precipitation Index (SPI) is used to characterize drought using only precipitation. It is useful in comparing precipitation conditions in areas with different climates (mountains vs desert).

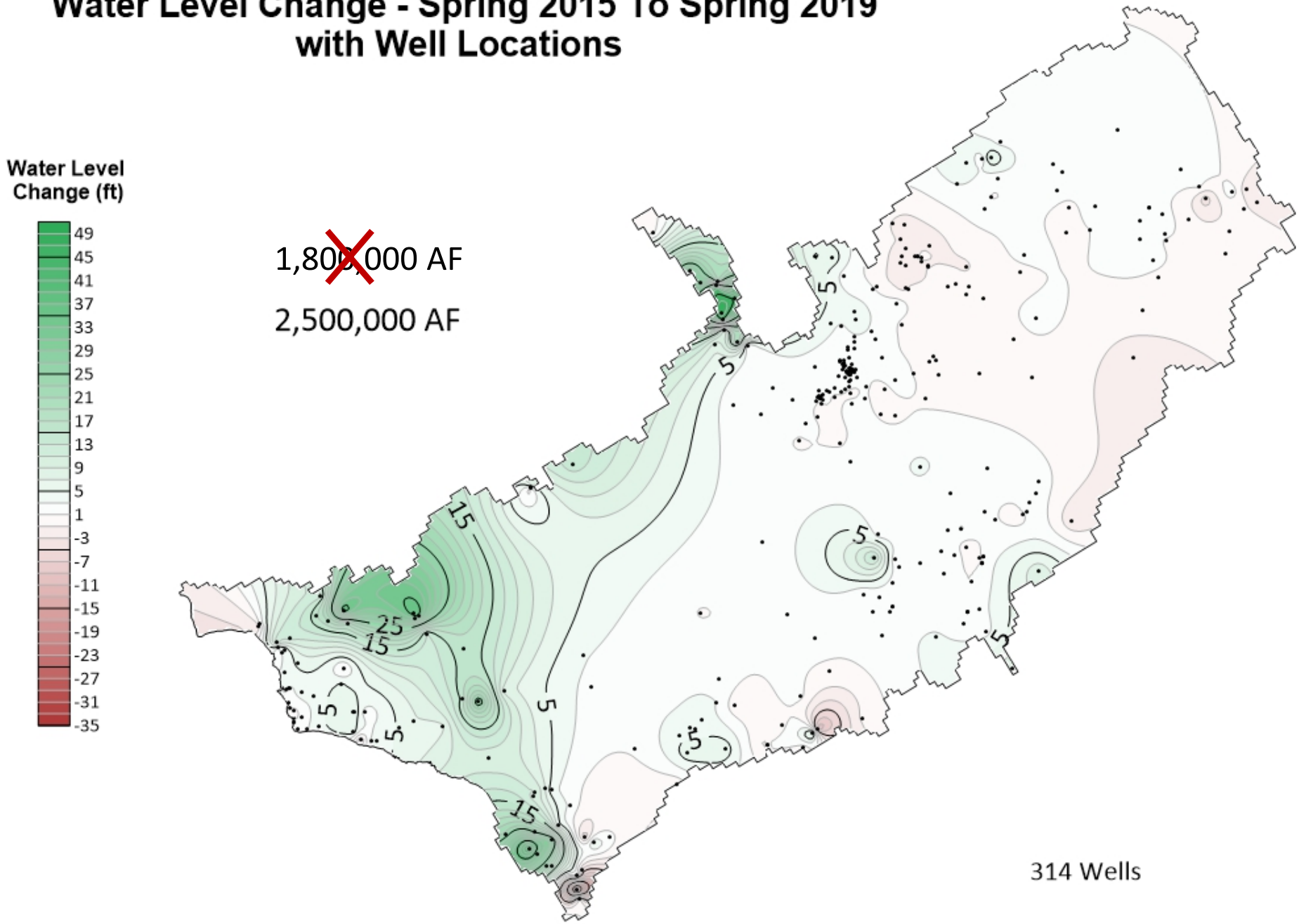
Data obtained from National Integrated Drought Information System; Drought.gov

# Storage Change Synopsis

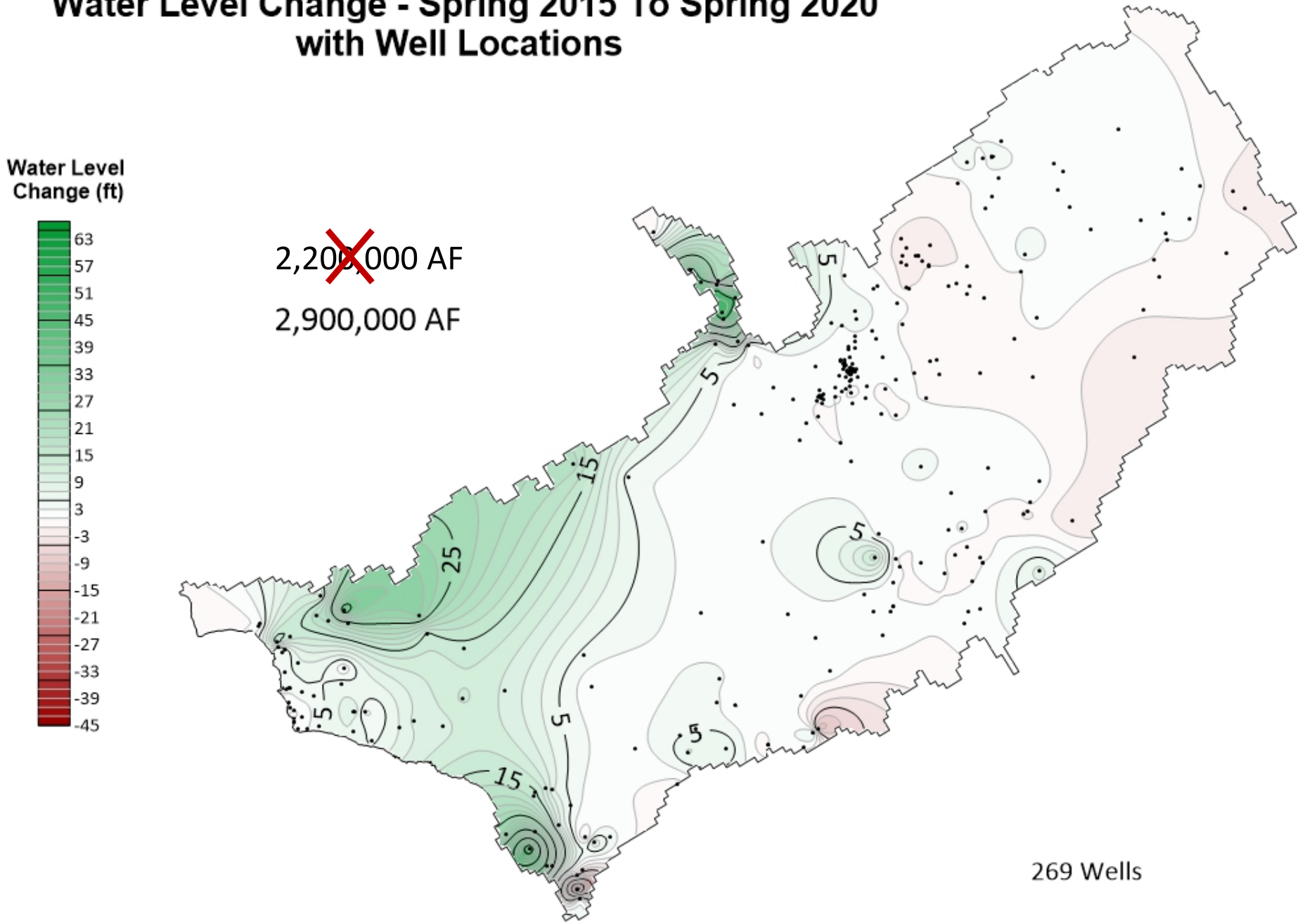
- The ESPAM Sy increased from 0.06 to 0.85.
  - Increases the volume change for the same water-level change.
- The aquifer lost 550,000 acre-feet from 2020 to 2021.
  - 2021 has been much drier than 2019 and 2020.
- The aquifer has gained 2,300,000 acre-feet of storage since 2015.
- The increase in precipitation for the last few years helped us get a good start to a long-term solution.
  - Undulations due to weather are to be expected.
  - The ESPA leaks, and aquifer-storage gains are fleeting.
  - Perseverance through the dry times is vital to success.

# Discussion

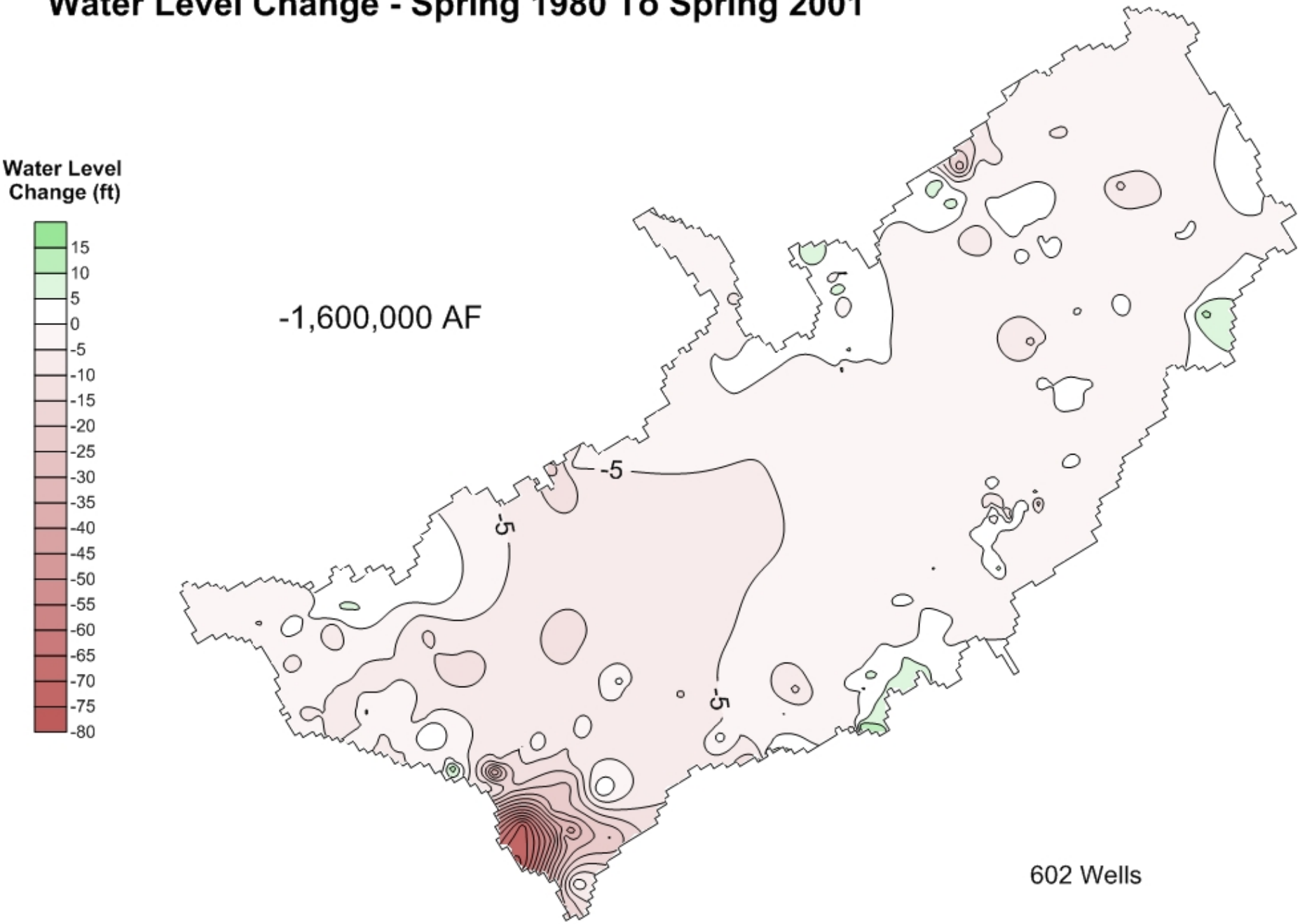
# Water Level Change - Spring 2015 To Spring 2019 with Well Locations



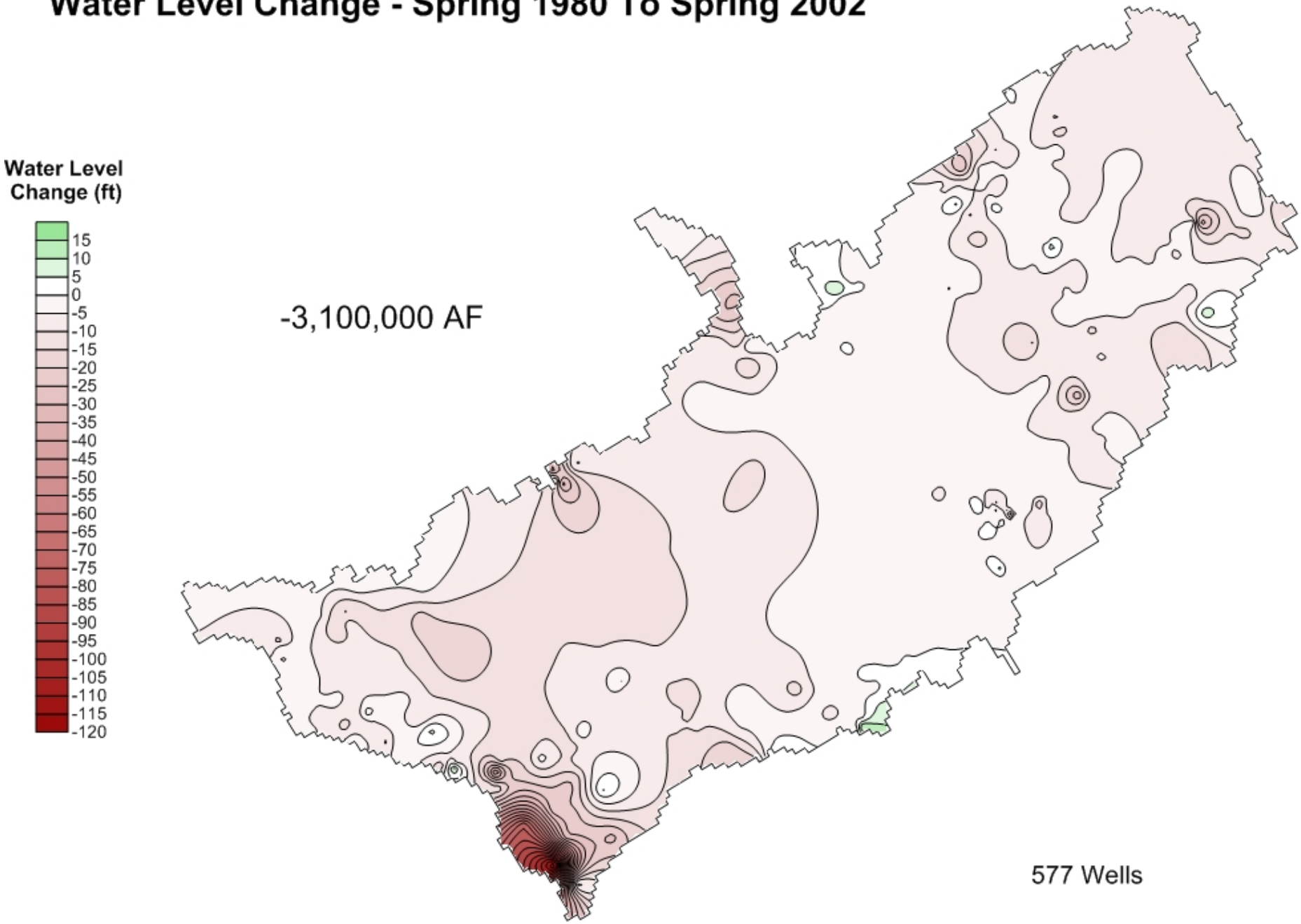
# Water Level Change - Spring 2015 To Spring 2020 with Well Locations



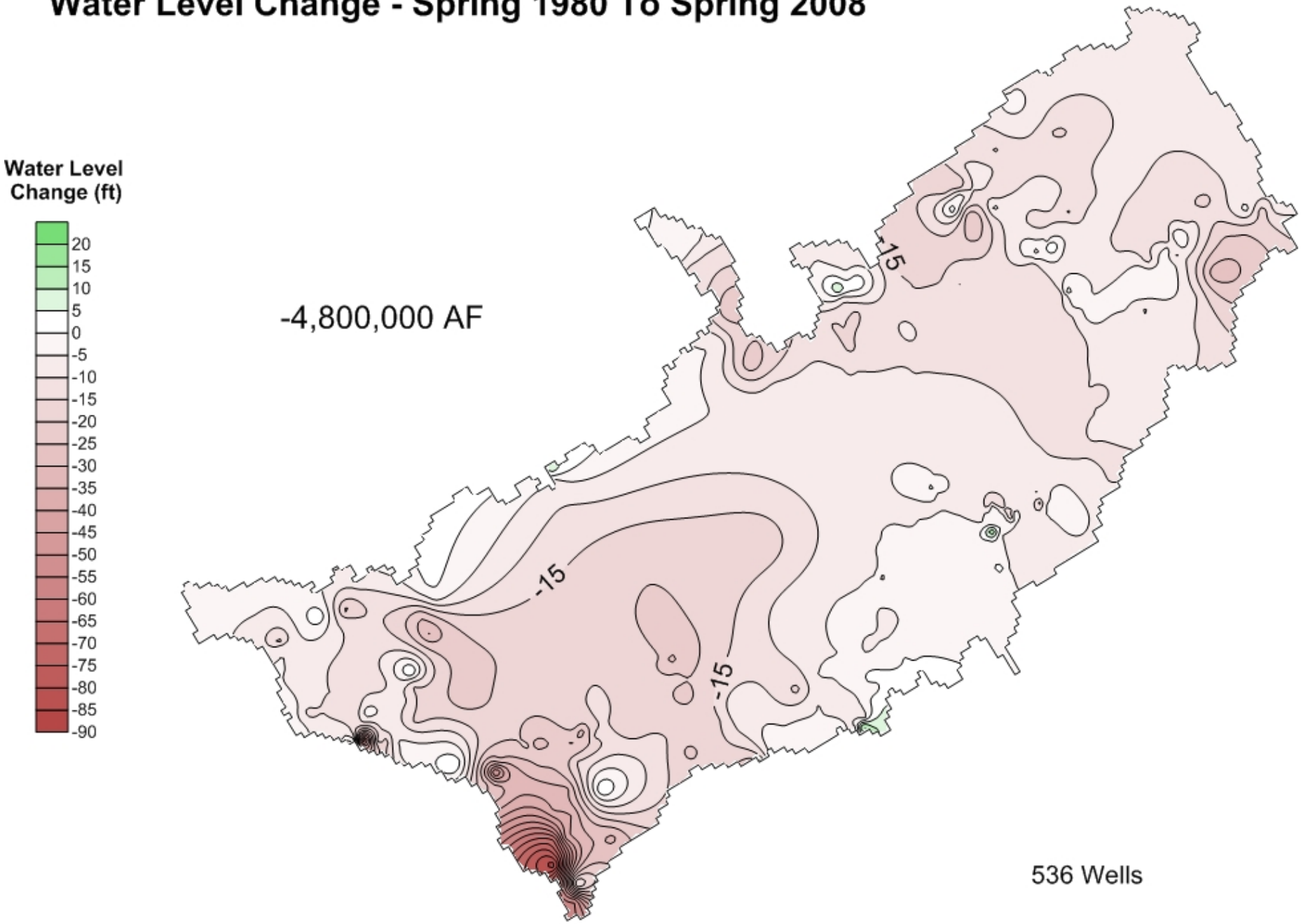
# Water Level Change - Spring 1980 To Spring 2001



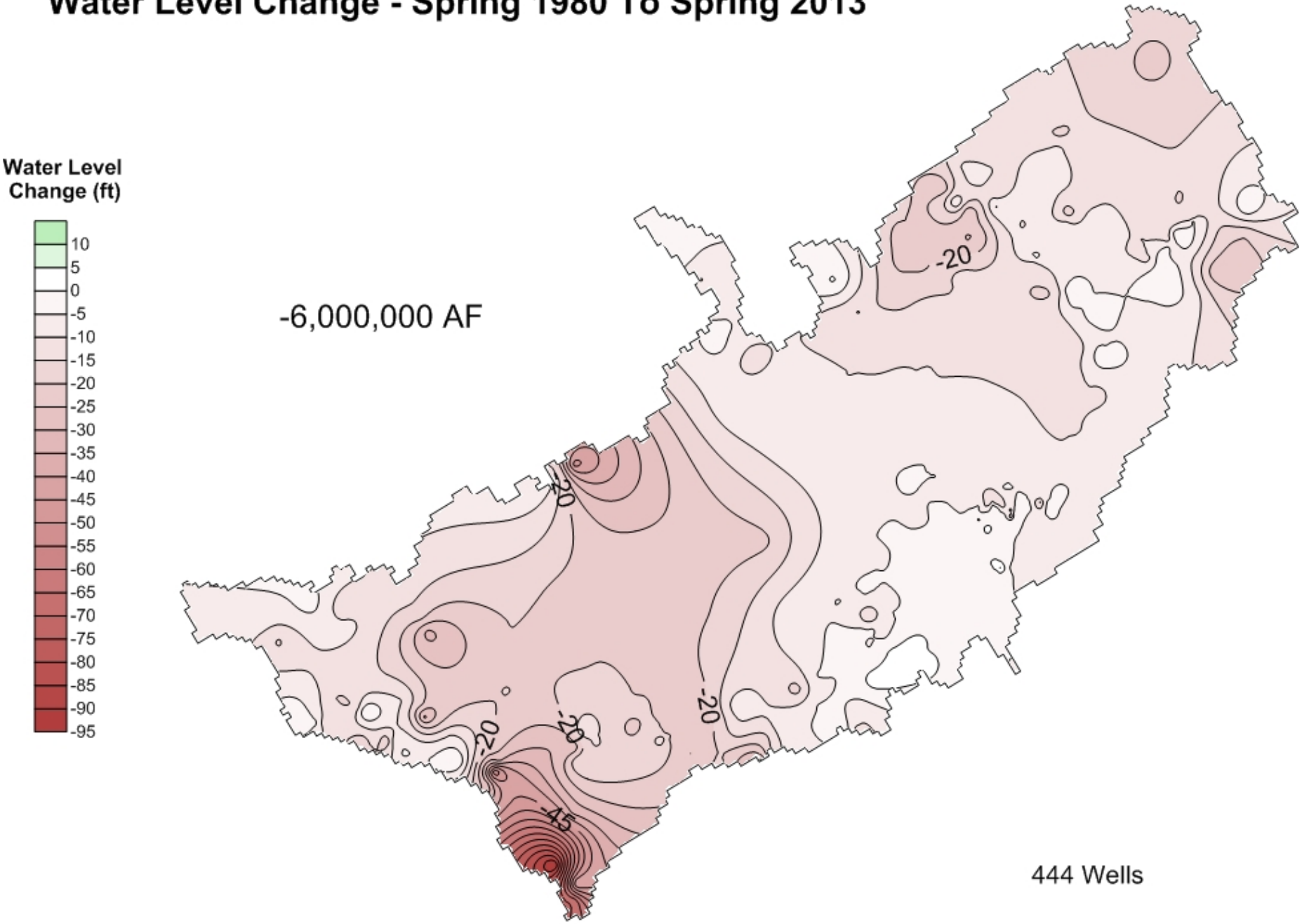
# Water Level Change - Spring 1980 To Spring 2002



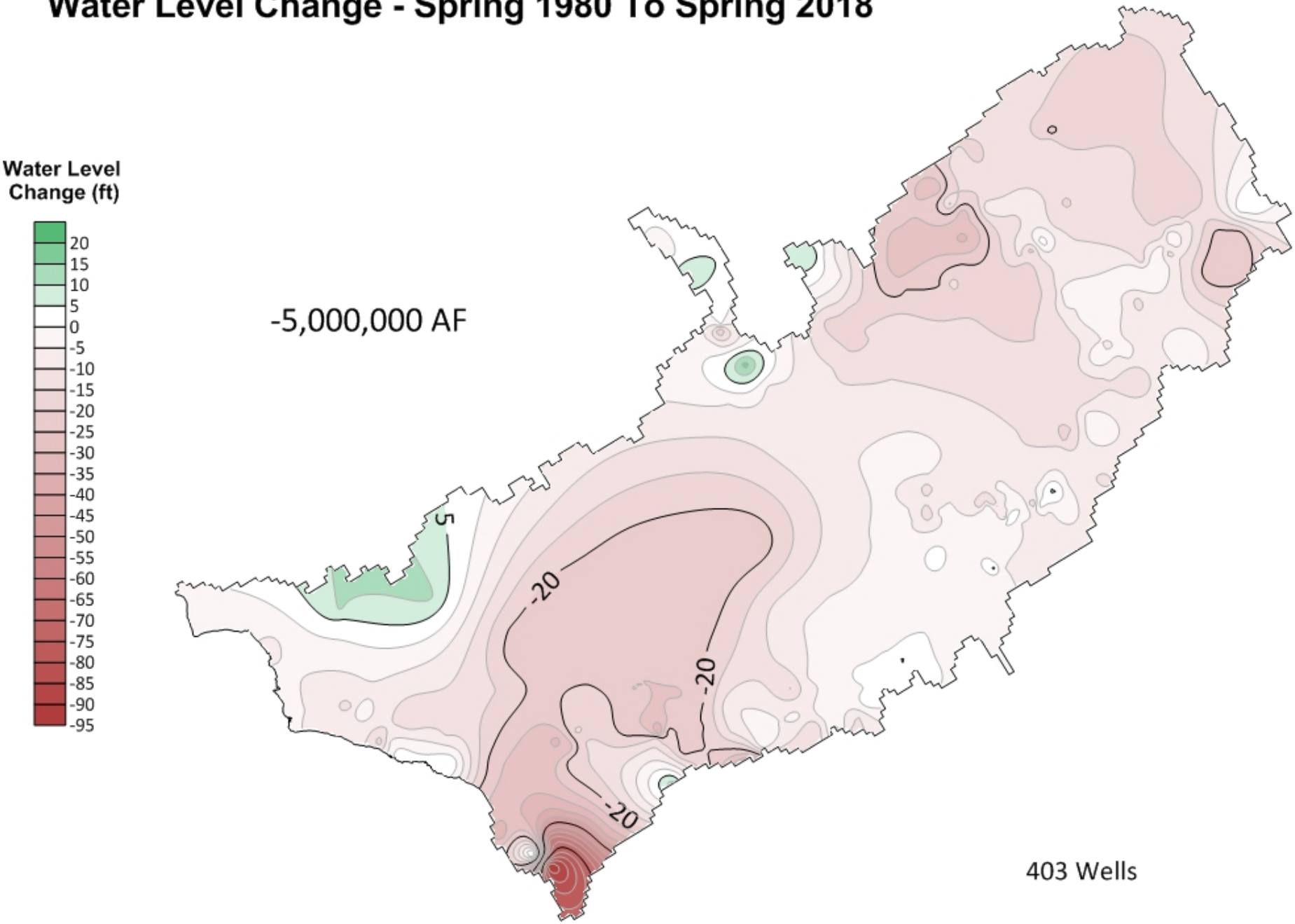
# Water Level Change - Spring 1980 To Spring 2008



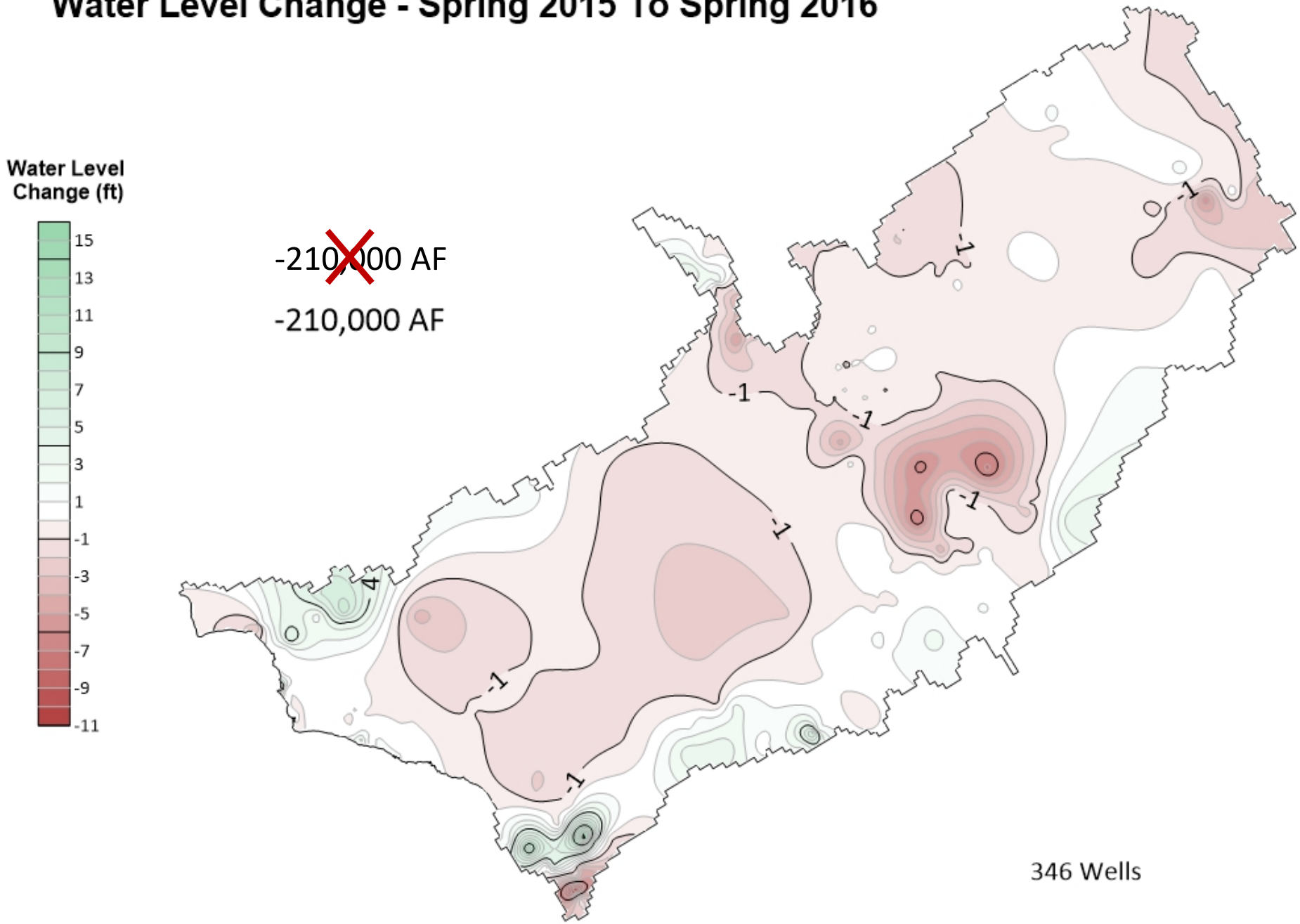
# Water Level Change - Spring 1980 To Spring 2013



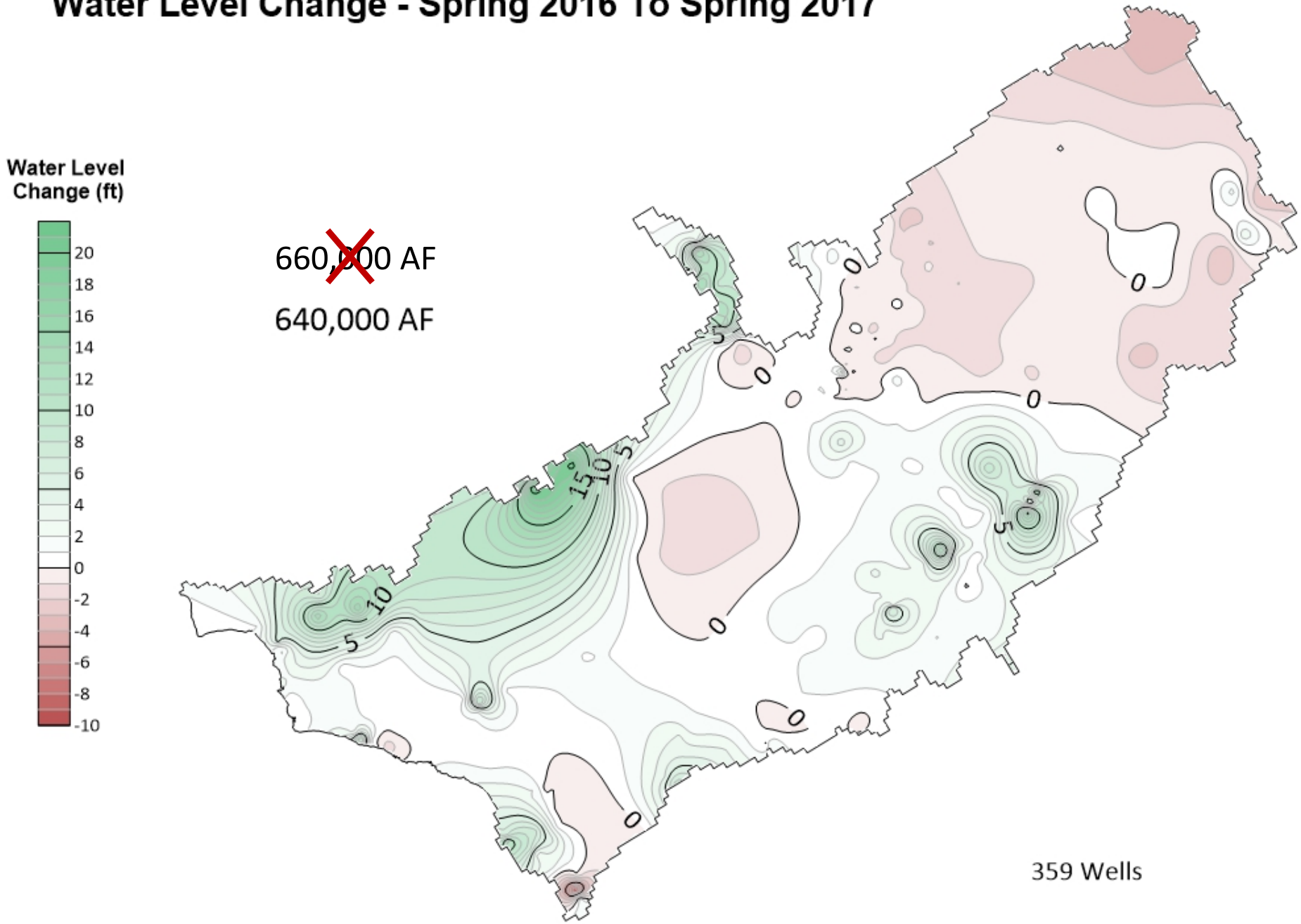
# Water Level Change - Spring 1980 To Spring 2018



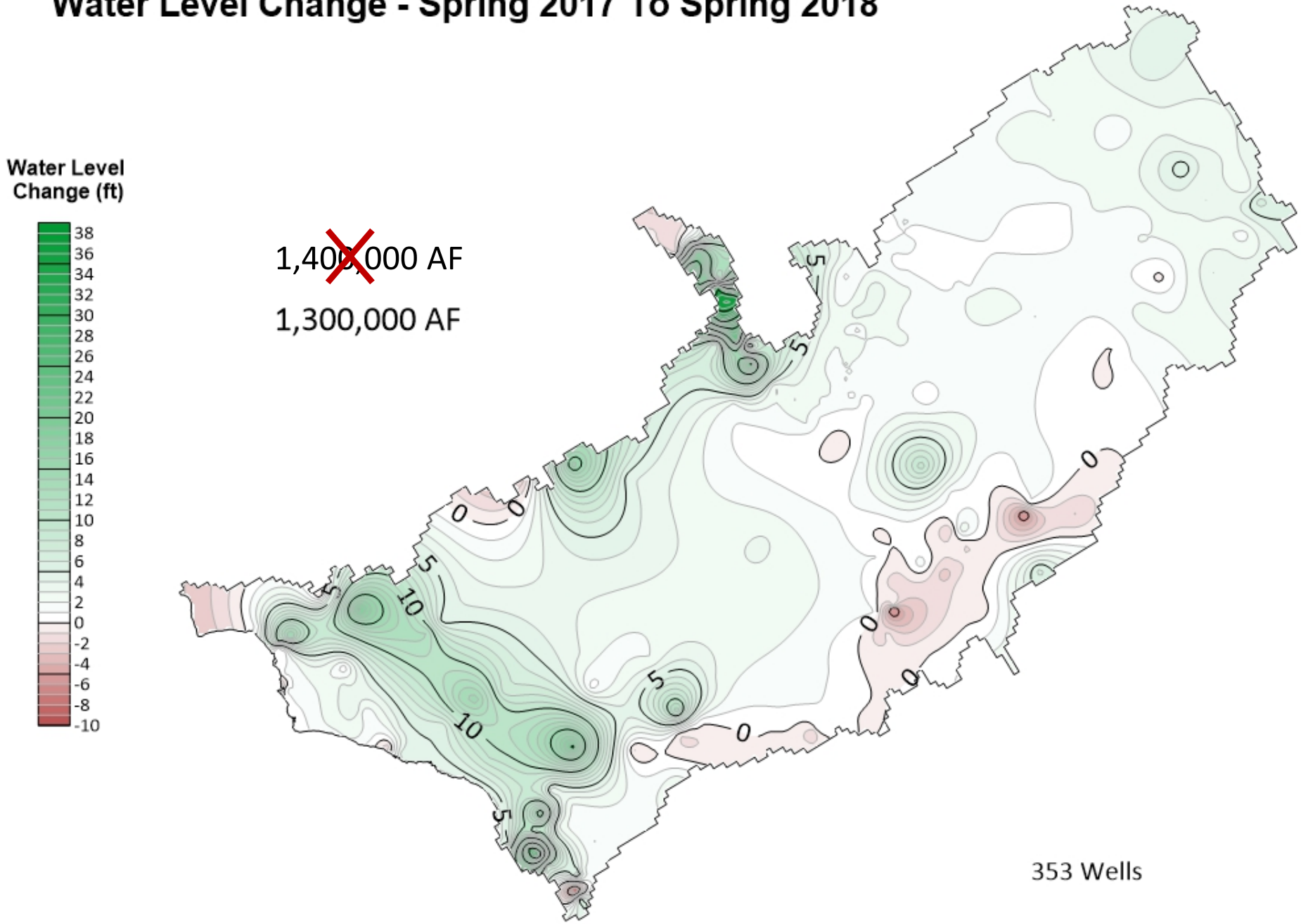
# Water Level Change - Spring 2015 To Spring 2016



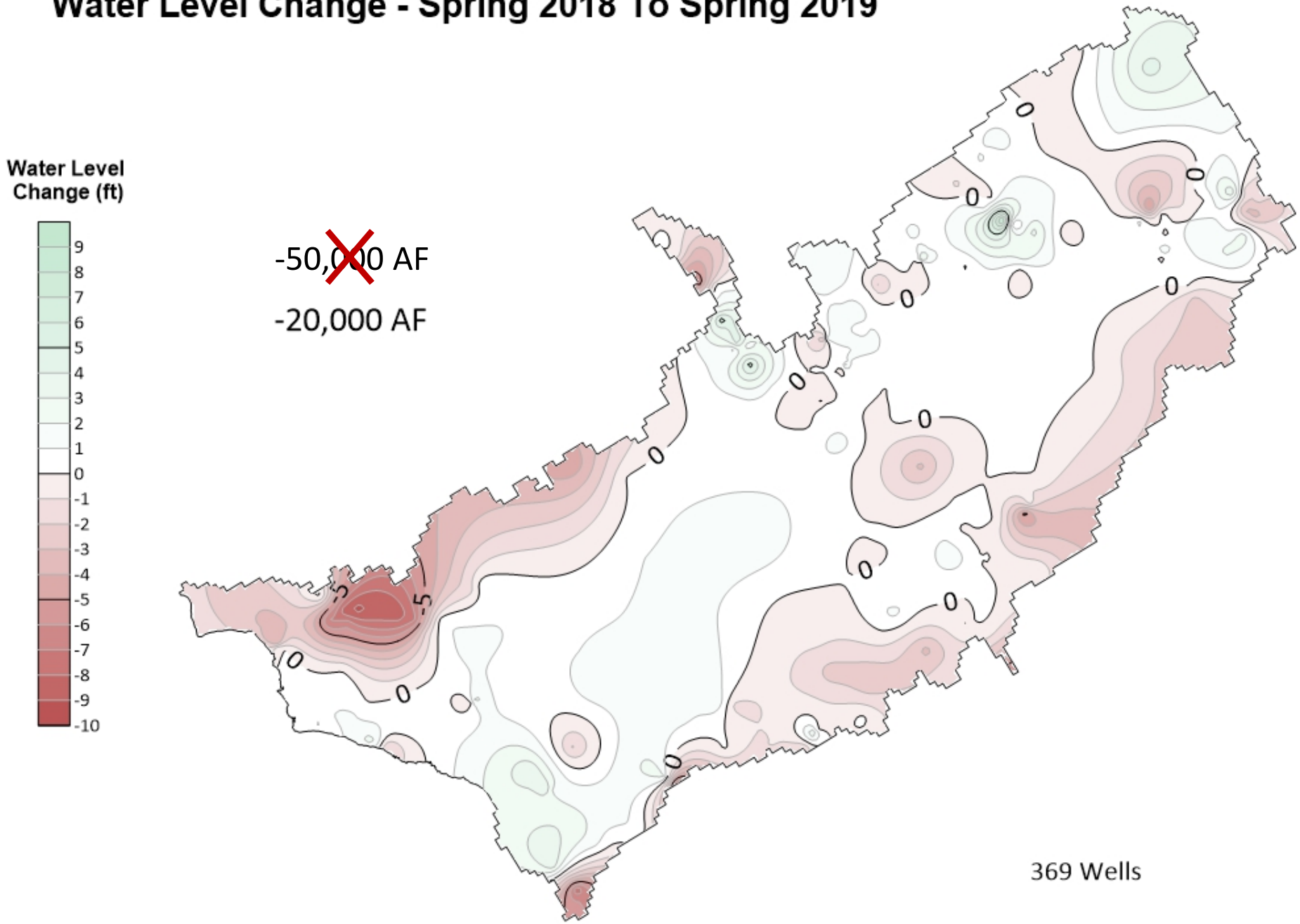
# Water Level Change - Spring 2016 To Spring 2017



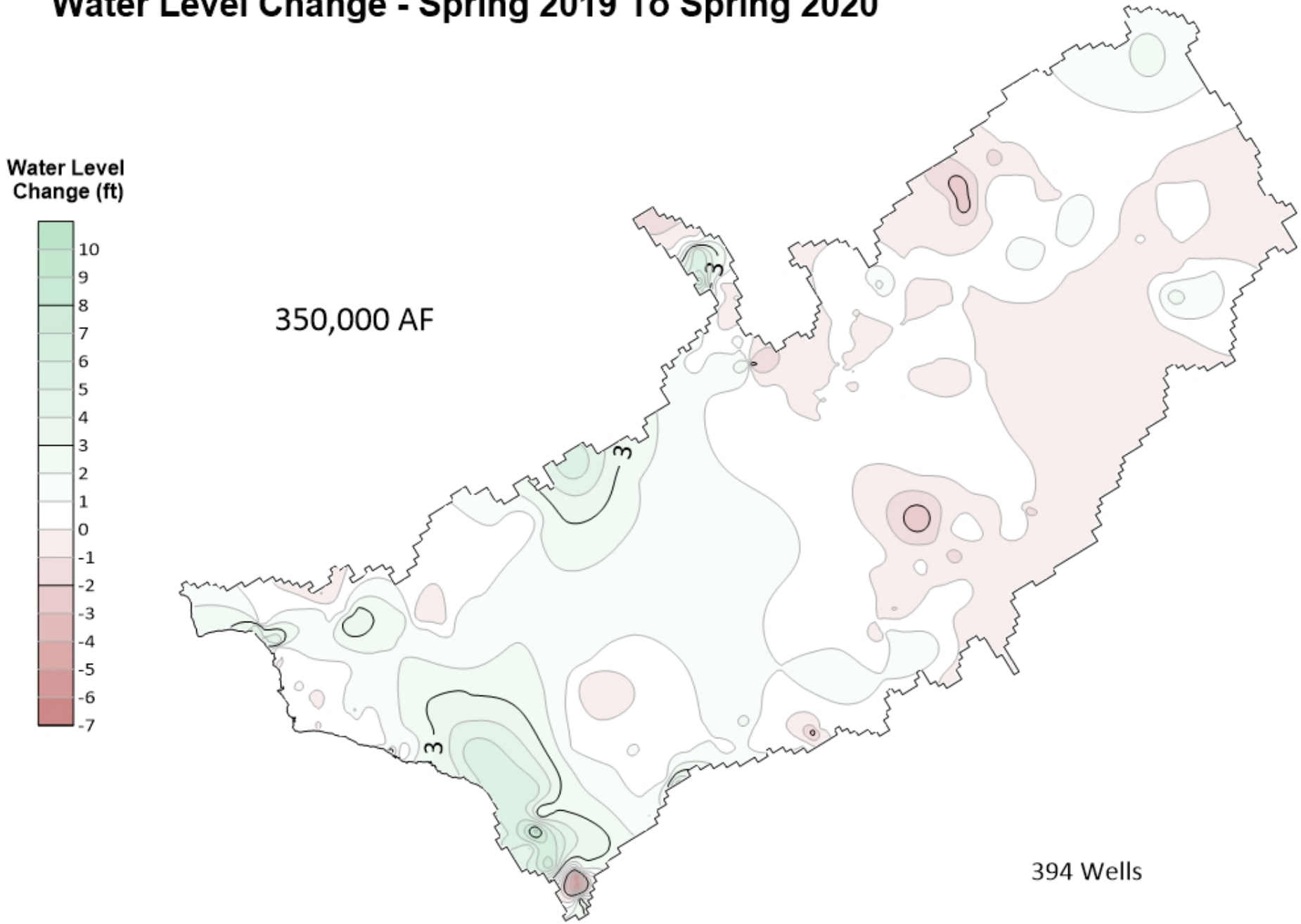
# Water Level Change - Spring 2017 To Spring 2018



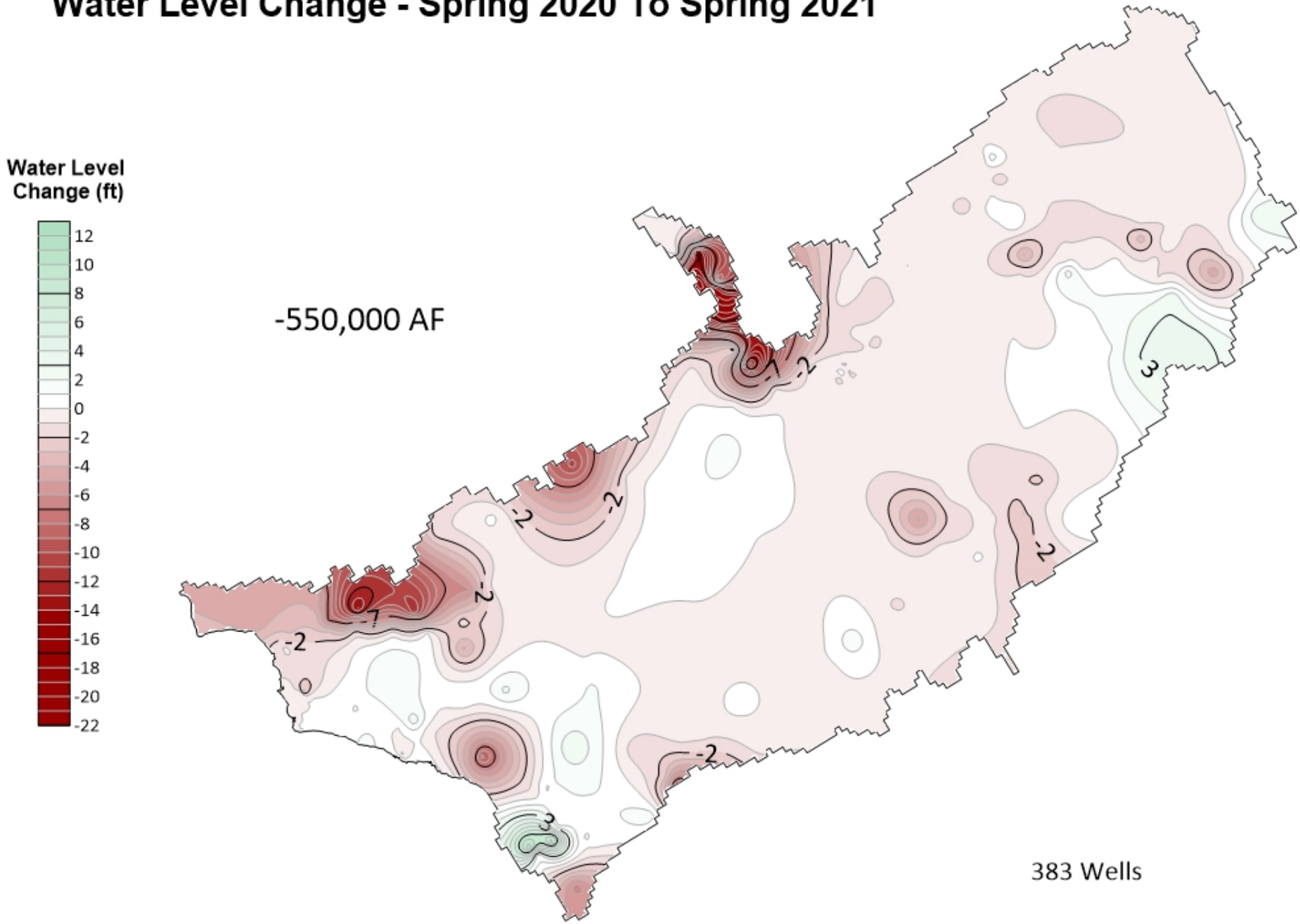
# Water Level Change - Spring 2018 To Spring 2019



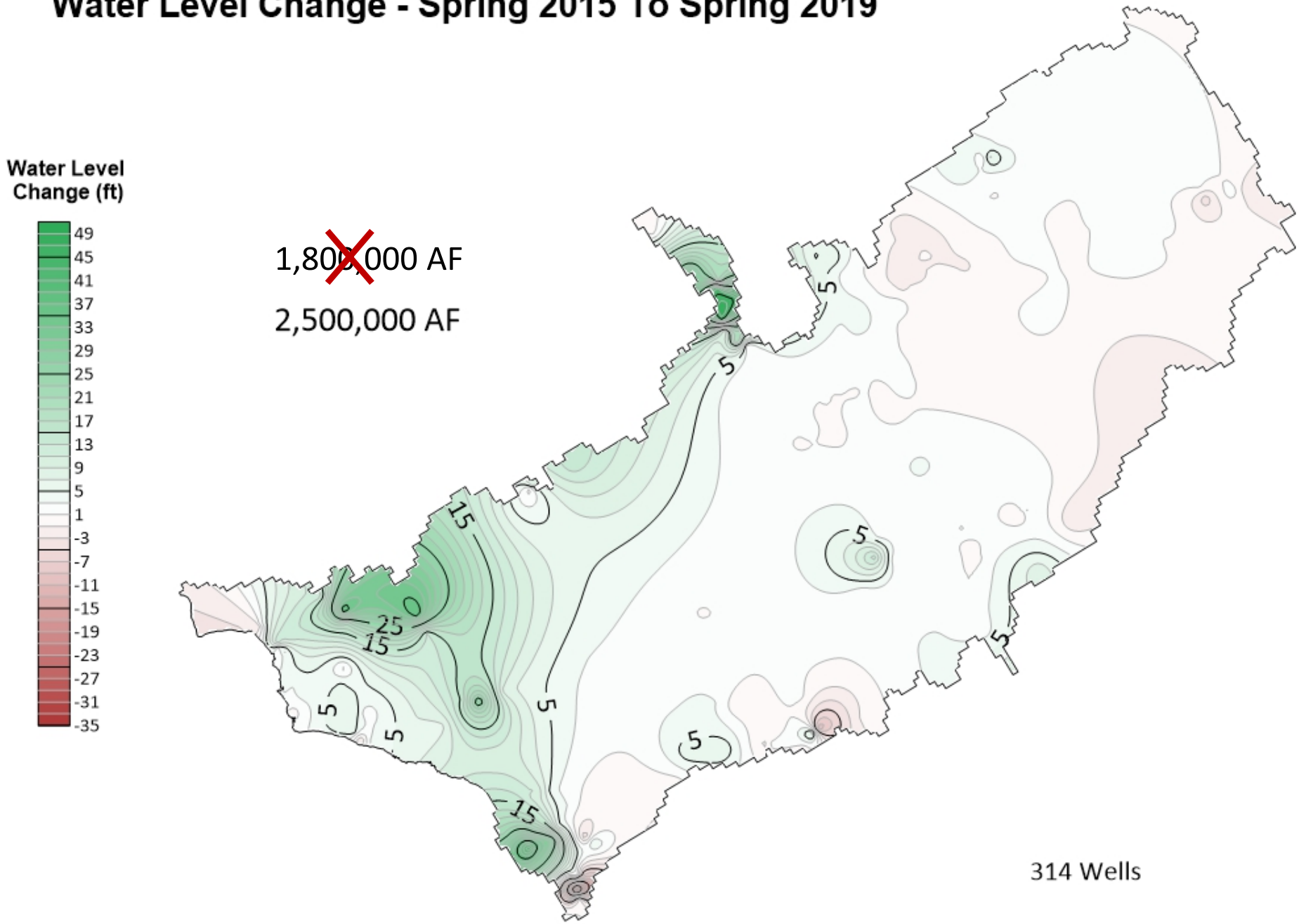
# Water Level Change - Spring 2019 To Spring 2020



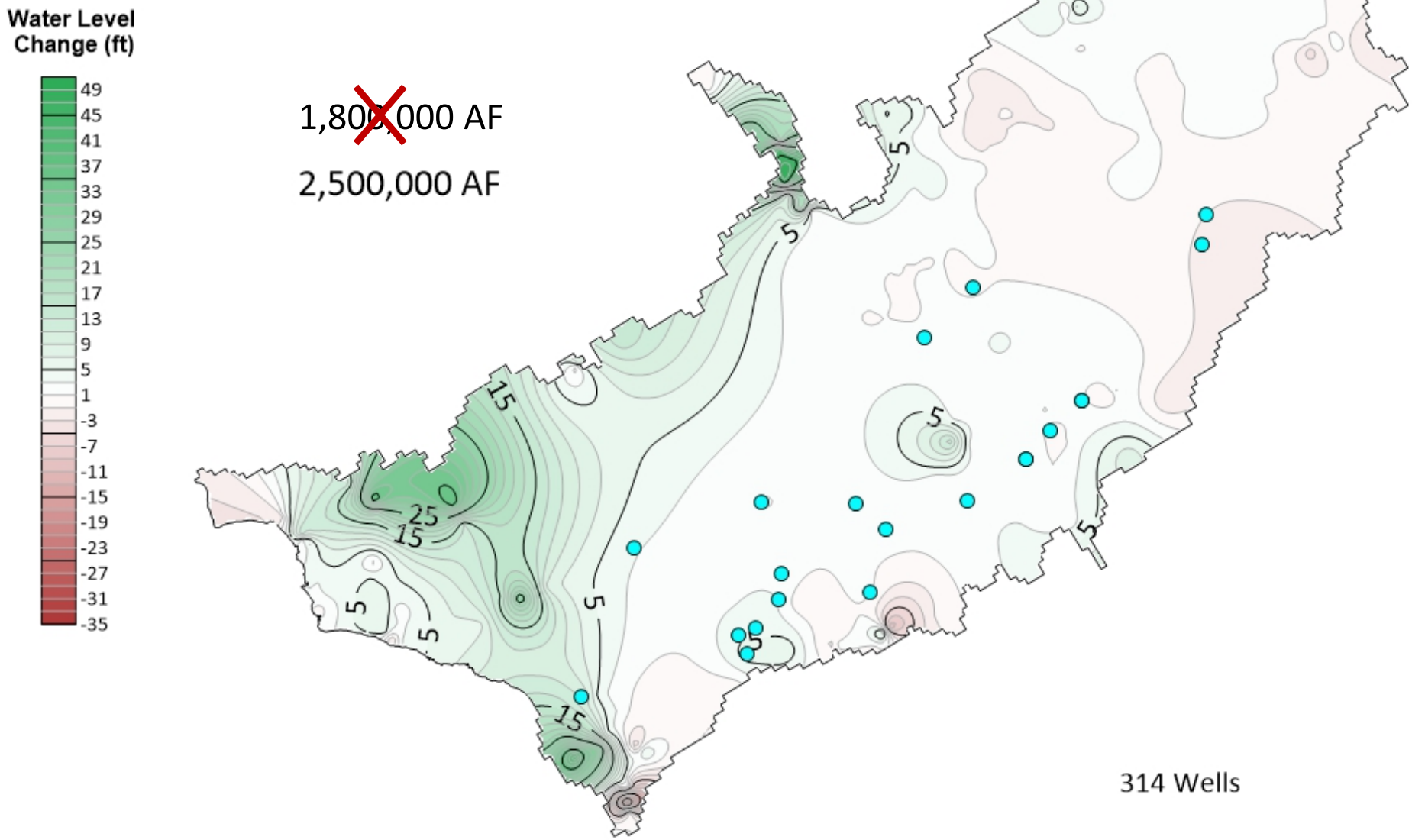
# Water Level Change - Spring 2020 To Spring 2021



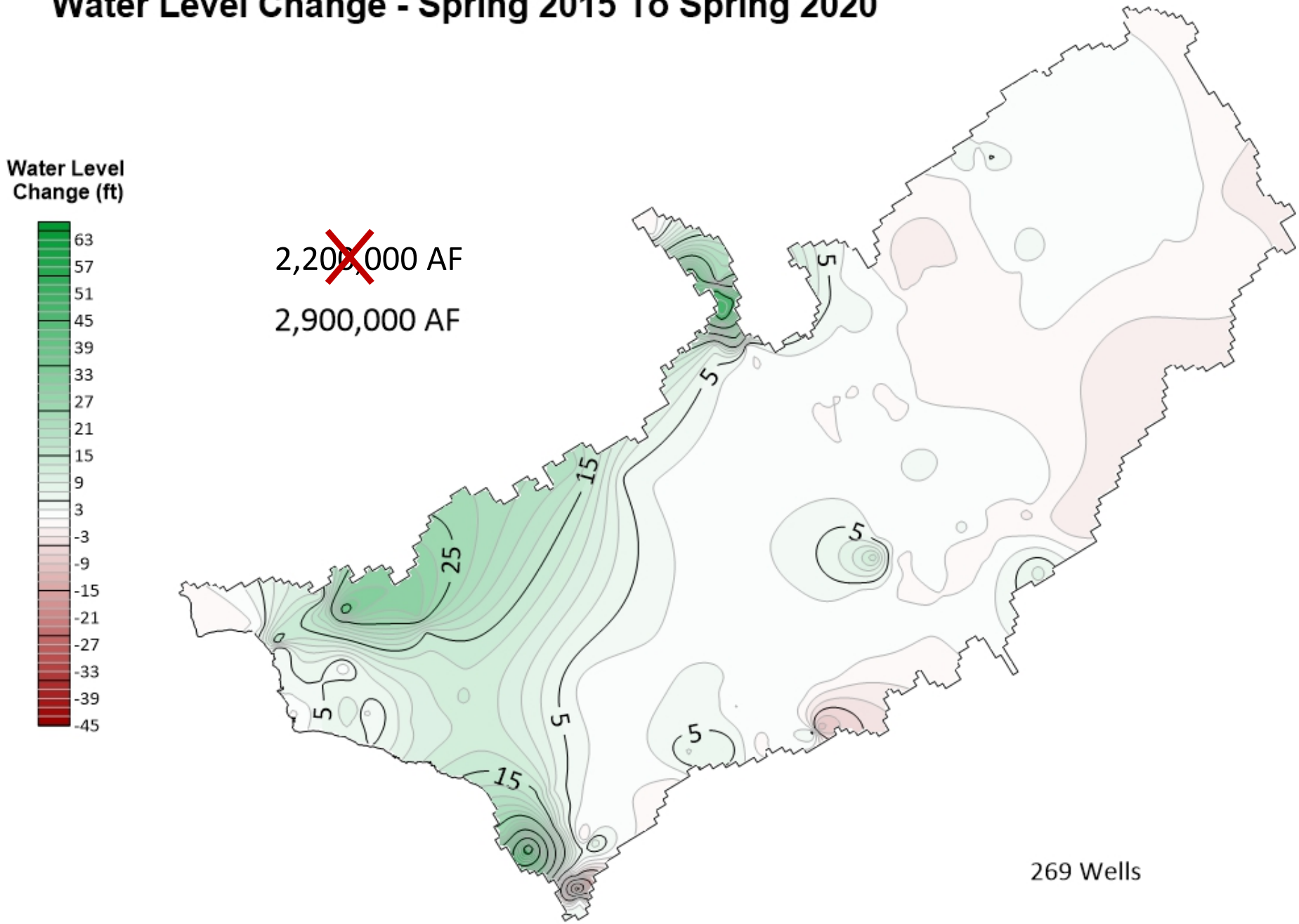
# Water Level Change - Spring 2015 To Spring 2019



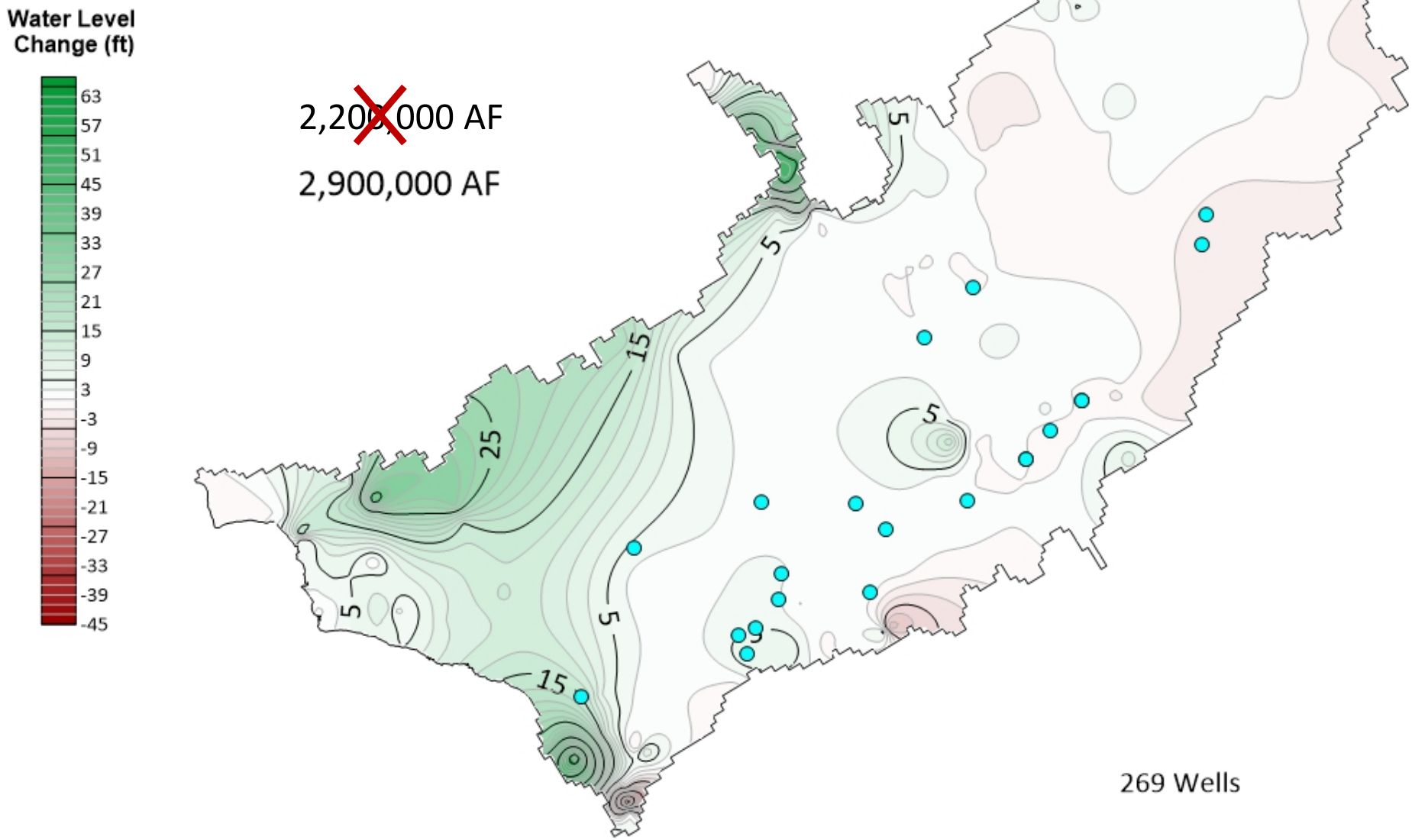
# Water Level Change - Spring 2015 To Spring 2019 with Sentinel Well Locations



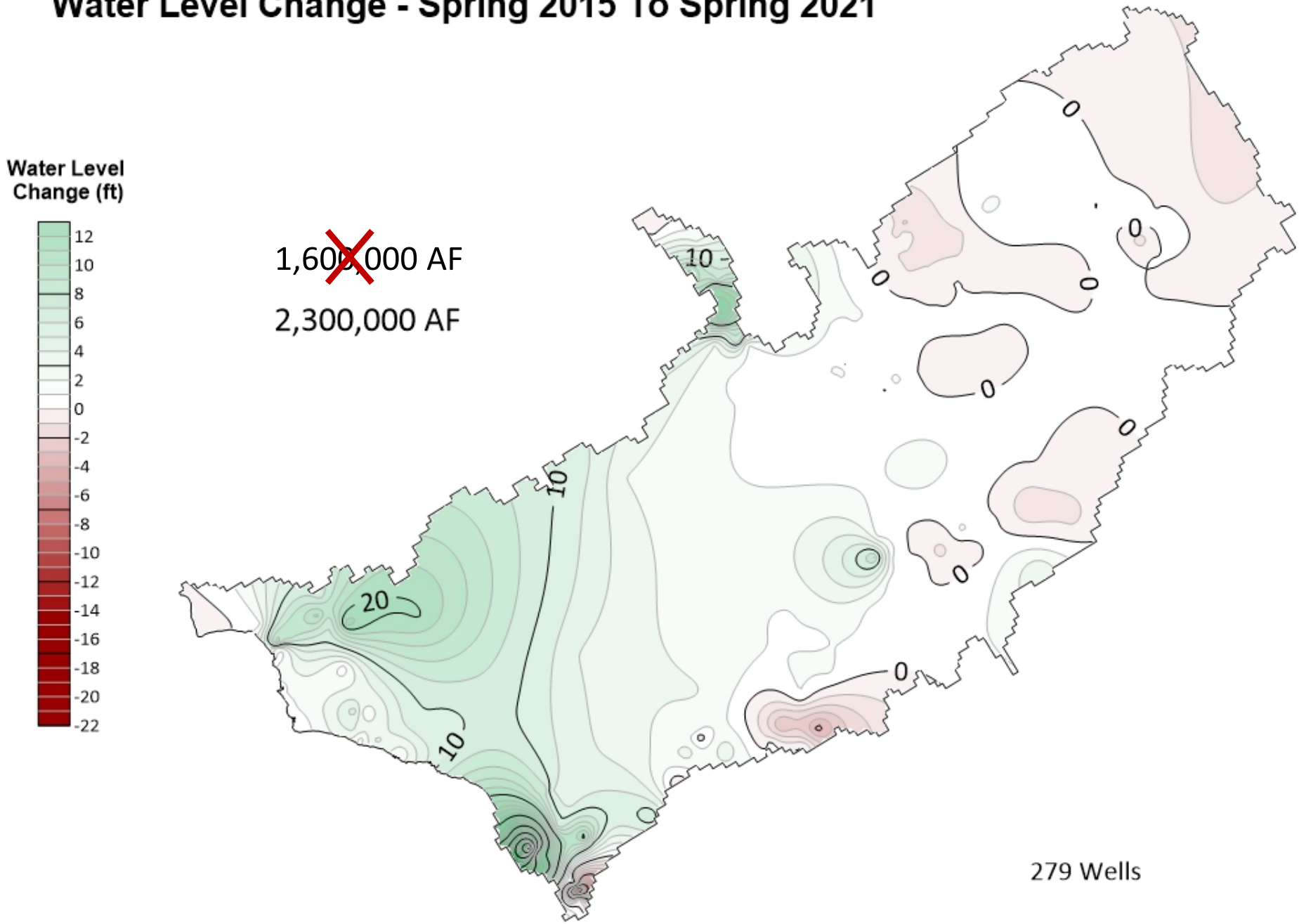
# Water Level Change - Spring 2015 To Spring 2020



# Water Level Change - Spring 2015 To Spring 2020 with Sentinel Well Locations



# Water Level Change - Spring 2015 To Spring 2021



# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: July 14, 2021

Re: Thousand Springs & Swan Falls Flows

Matt Anders of IDWR will provide an update on the Thousand Springs and Swan Falls flows.

# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: July 14, 2021

Re: Near Blackfoot to Minidoka Reach Gains

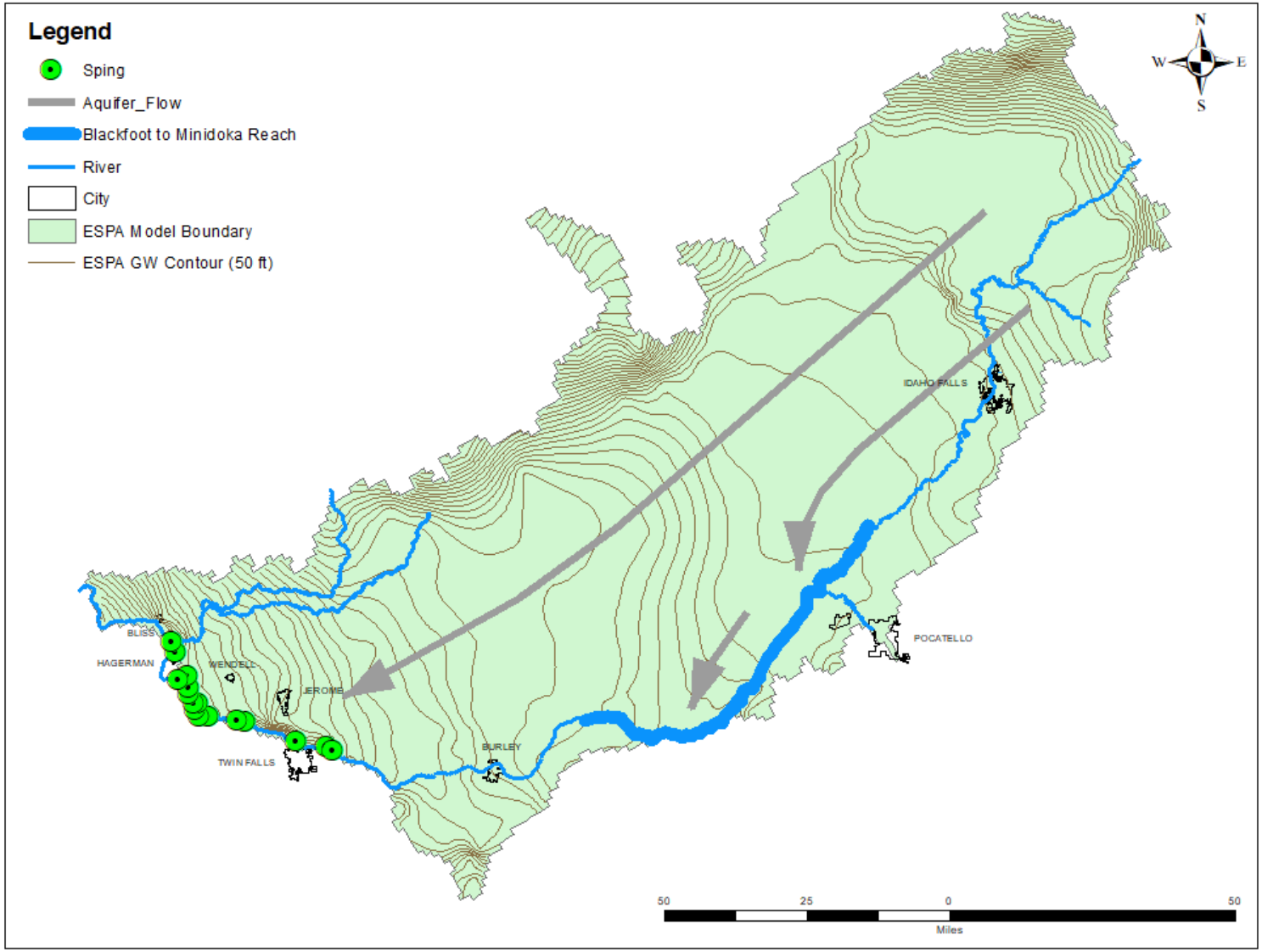
Matt Anders of IDWR will provide an update on the near Blackfoot to Minidoka reach gains.


# ESPA Discharge

Presented by: Matt Anders

Date: 7/22/2021

# Discharge from ESPA

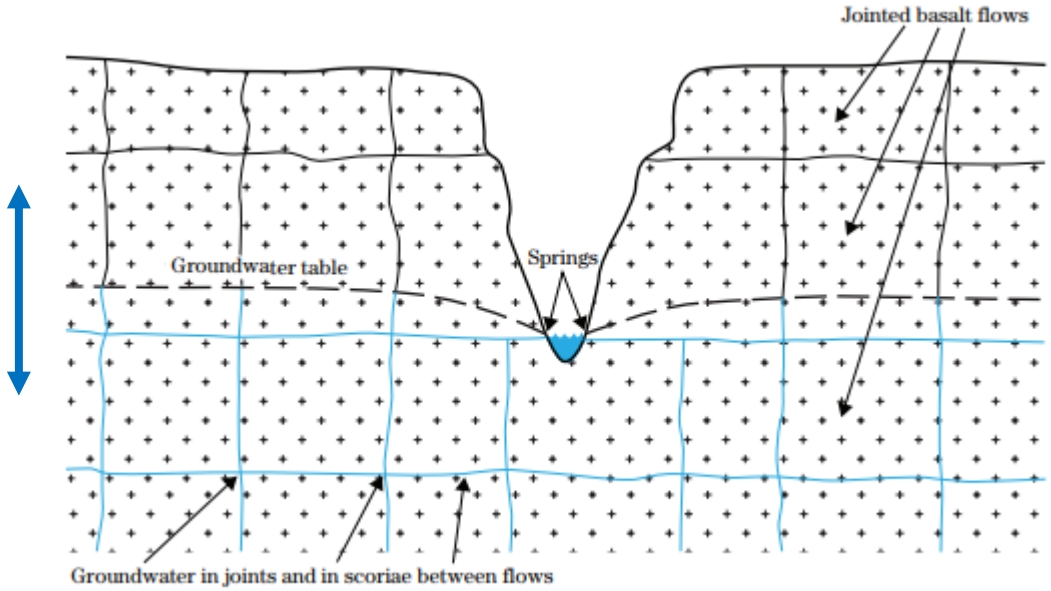


# Spring Discharge on ESPA

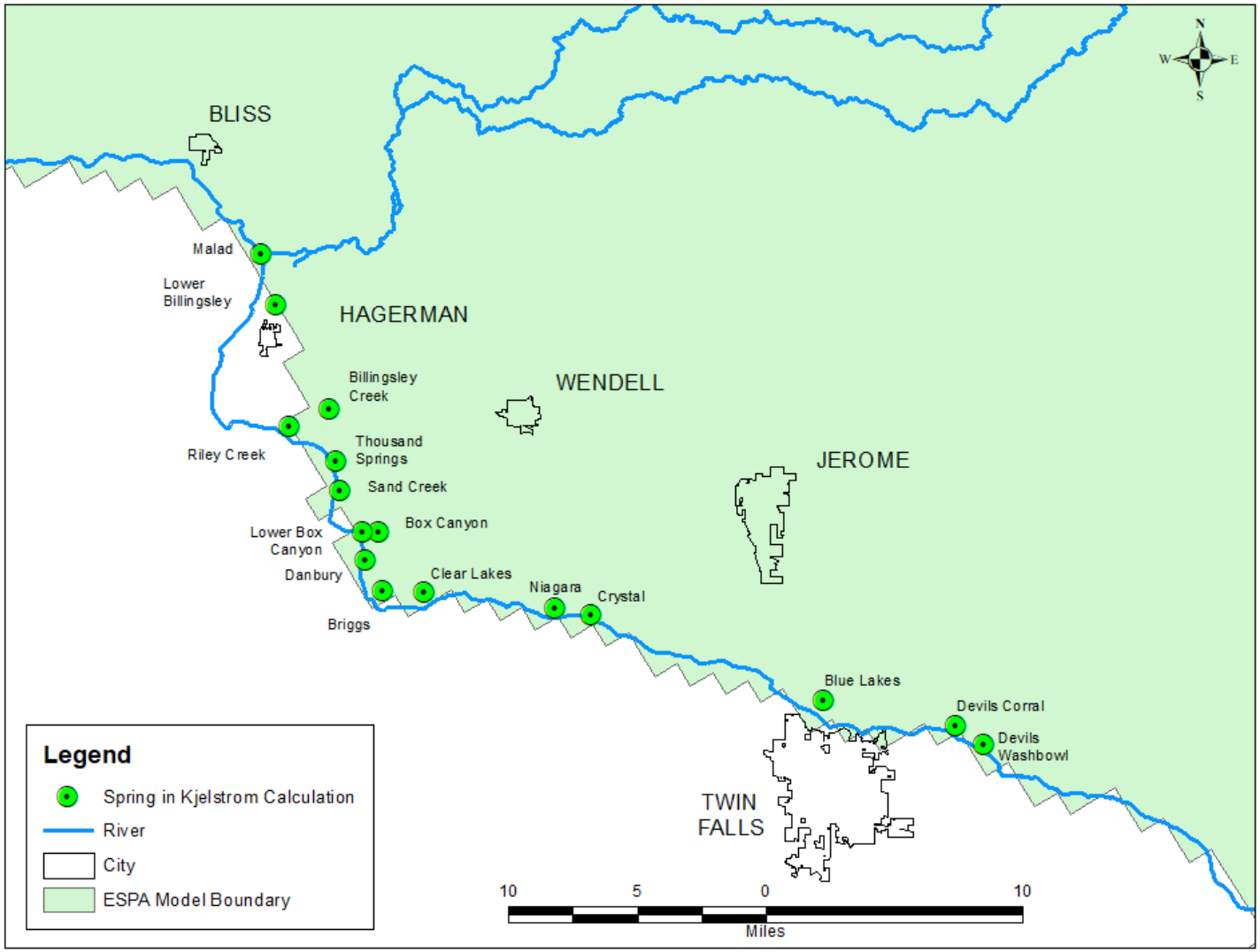
# Spring Discharge on ESPA

- Springs occur when the groundwater table intersects the land surface or canyon wall.

- Discharge from springs is controlled by the water level in the ESPA. Higher water levels in the aquifer increase discharge at springs, and vice versa.



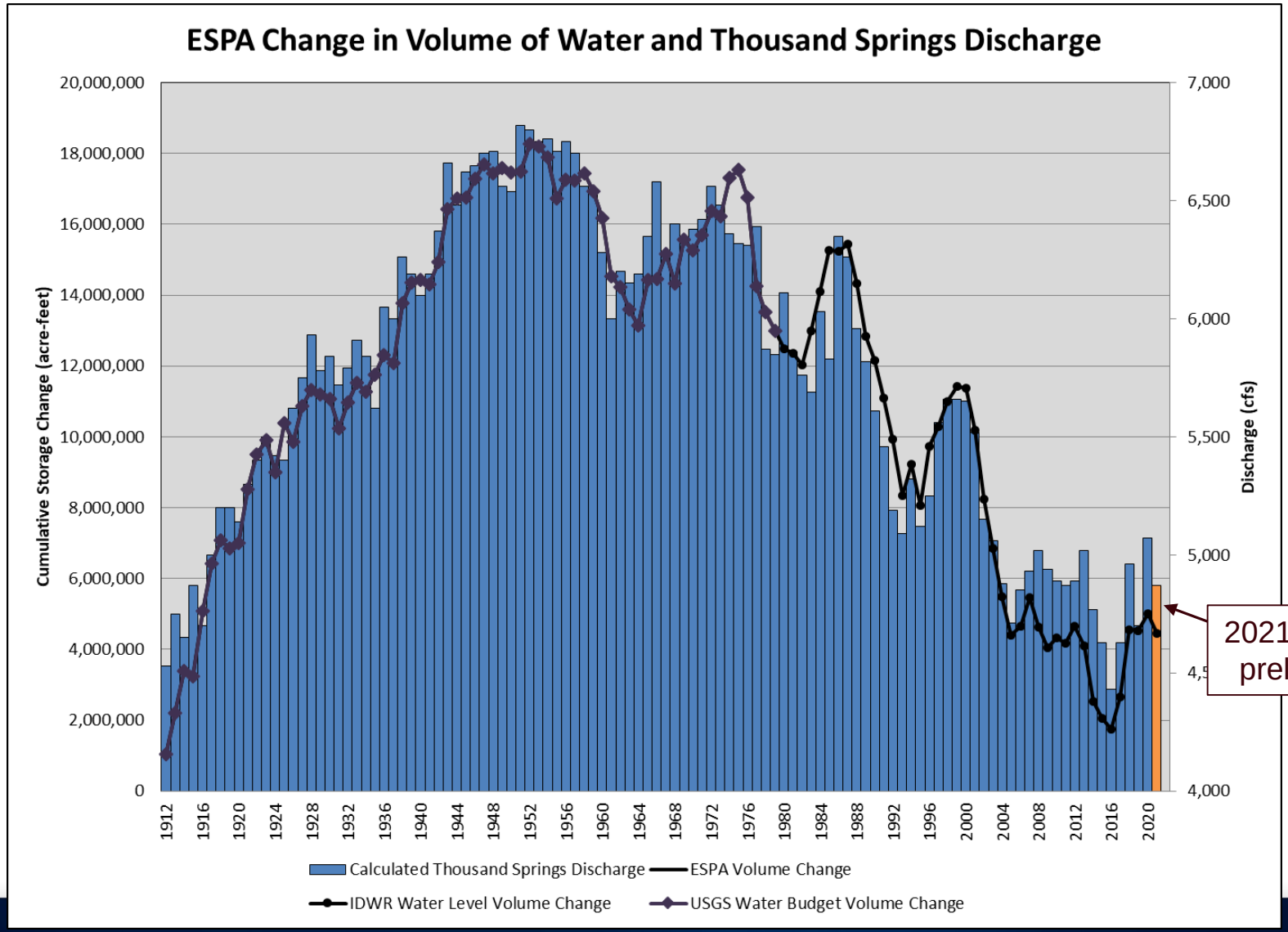
# Thousand Springs Reach



# Thousand Springs Reach Discharge Estimation

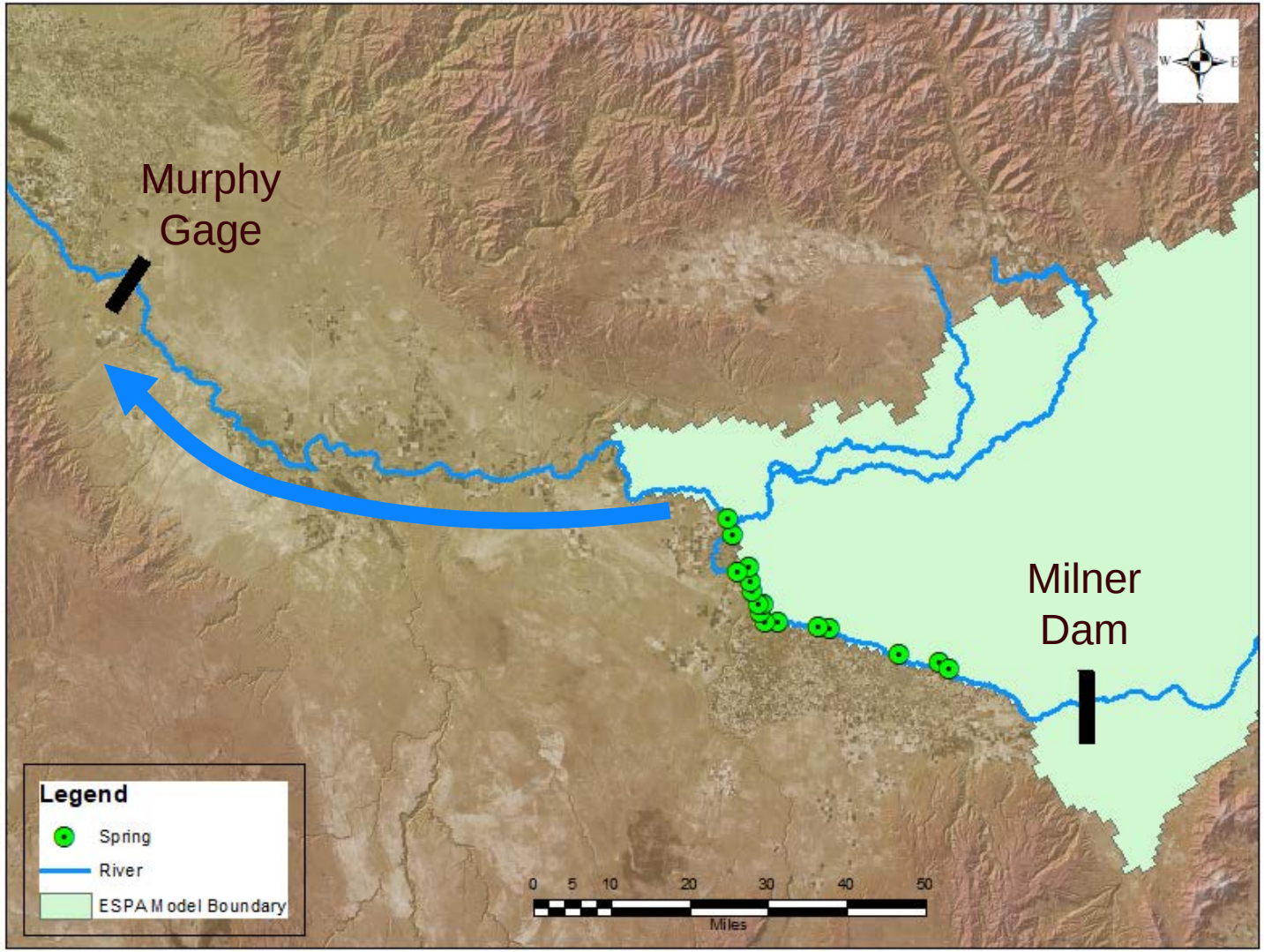
- Calculation method developed by Luther Kjelstrom (USGS) in 1995.
- 17 springs in the Milner to King Hill reach of Snake River.
- Discharge values used in calculation:
  - Measured springs: Measurements in March-April.
  - Unmeasured springs: Estimated using mathematical equations.

# Spring Discharge – 1912 to 2021

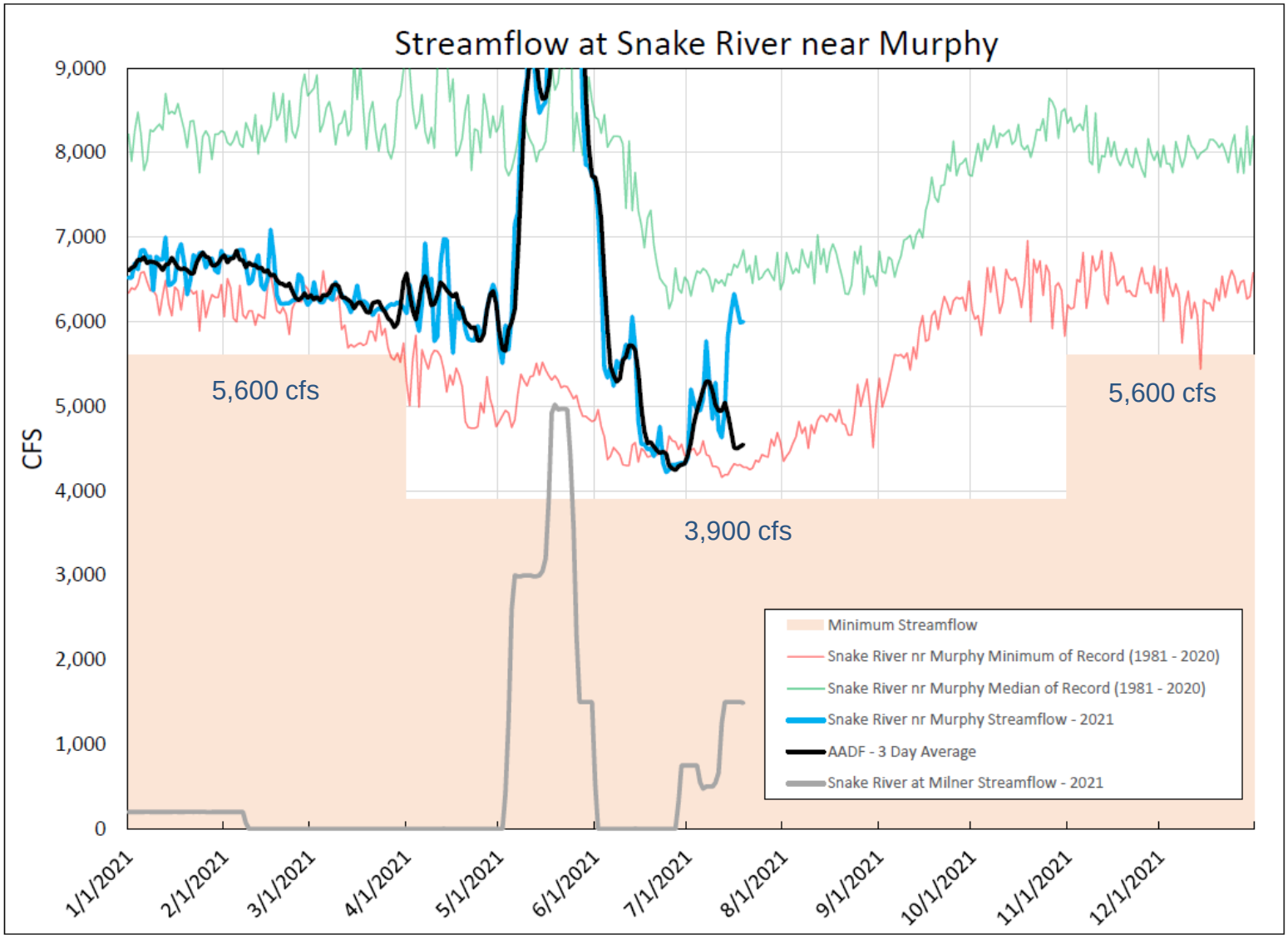



2021 value is preliminary

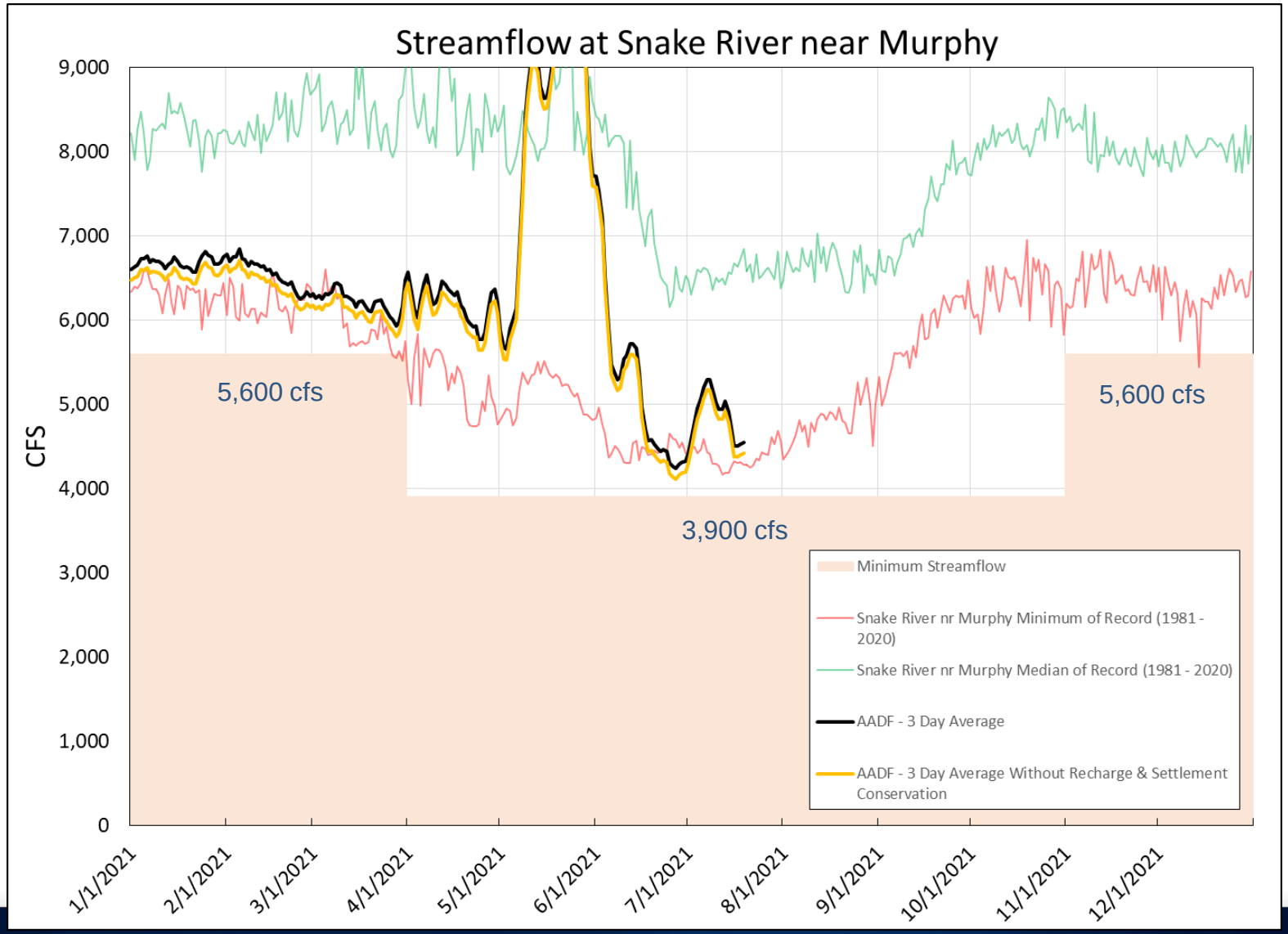
# Spring Discharge – Murphy Gage



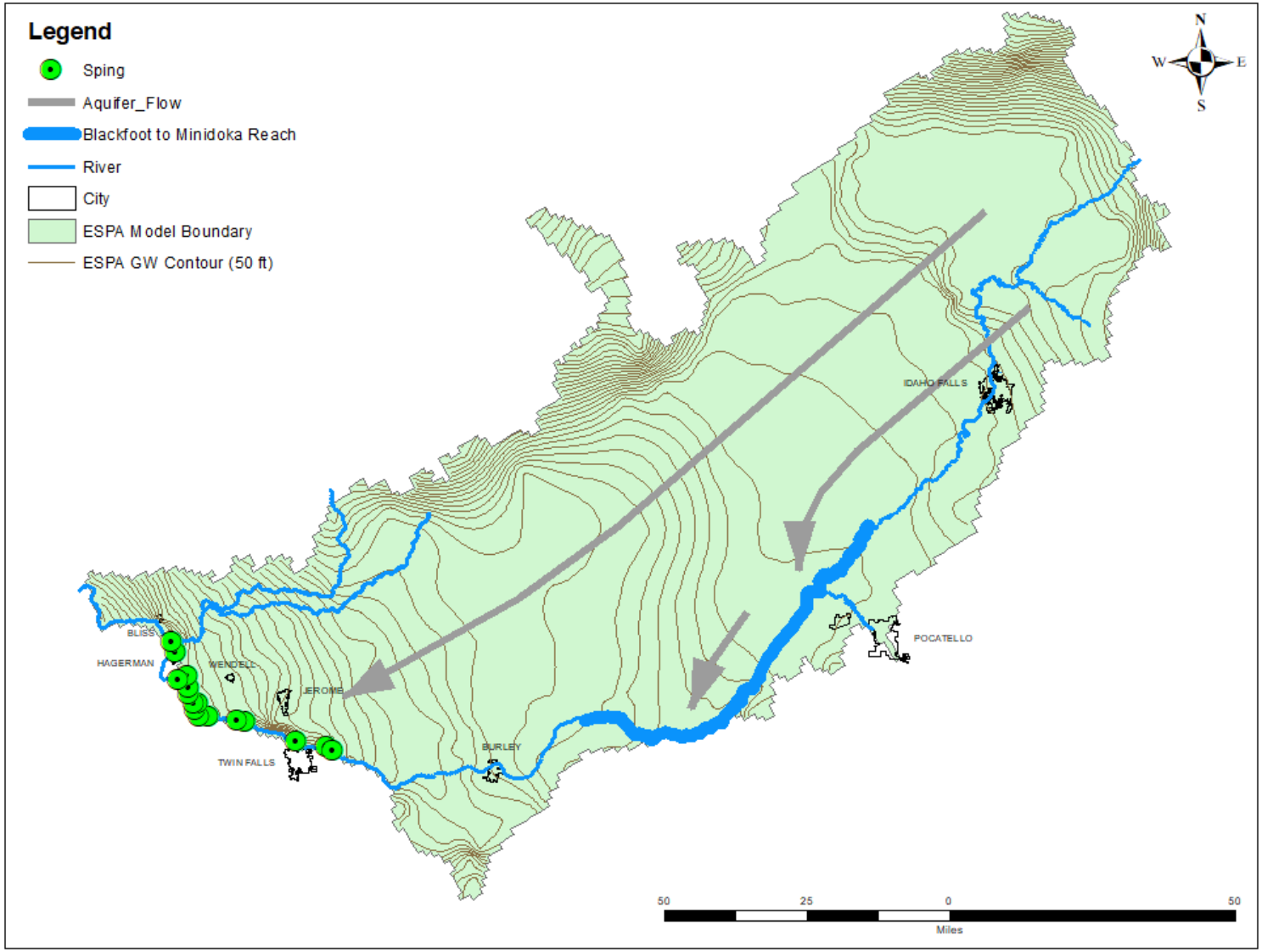
# Murphy Gage – Adjusted Average Daily Flow (AADF)



# Murphy Gage – Adjusted Average Daily Flow (AADF)



# Near Blackfoot-Minidoka Reach Gains



# Reach Gains

- The gain or loss of water between the beginning and end of a river reach.

- Reach Gain = Outflow - Inflow + Diversions + Reservoir Change in Content + Reservoir Evaporation - Return Flow

  Outflow is the river discharge at the end of the river reach.

  Inflow is the river discharge at the beginning of the river reach.

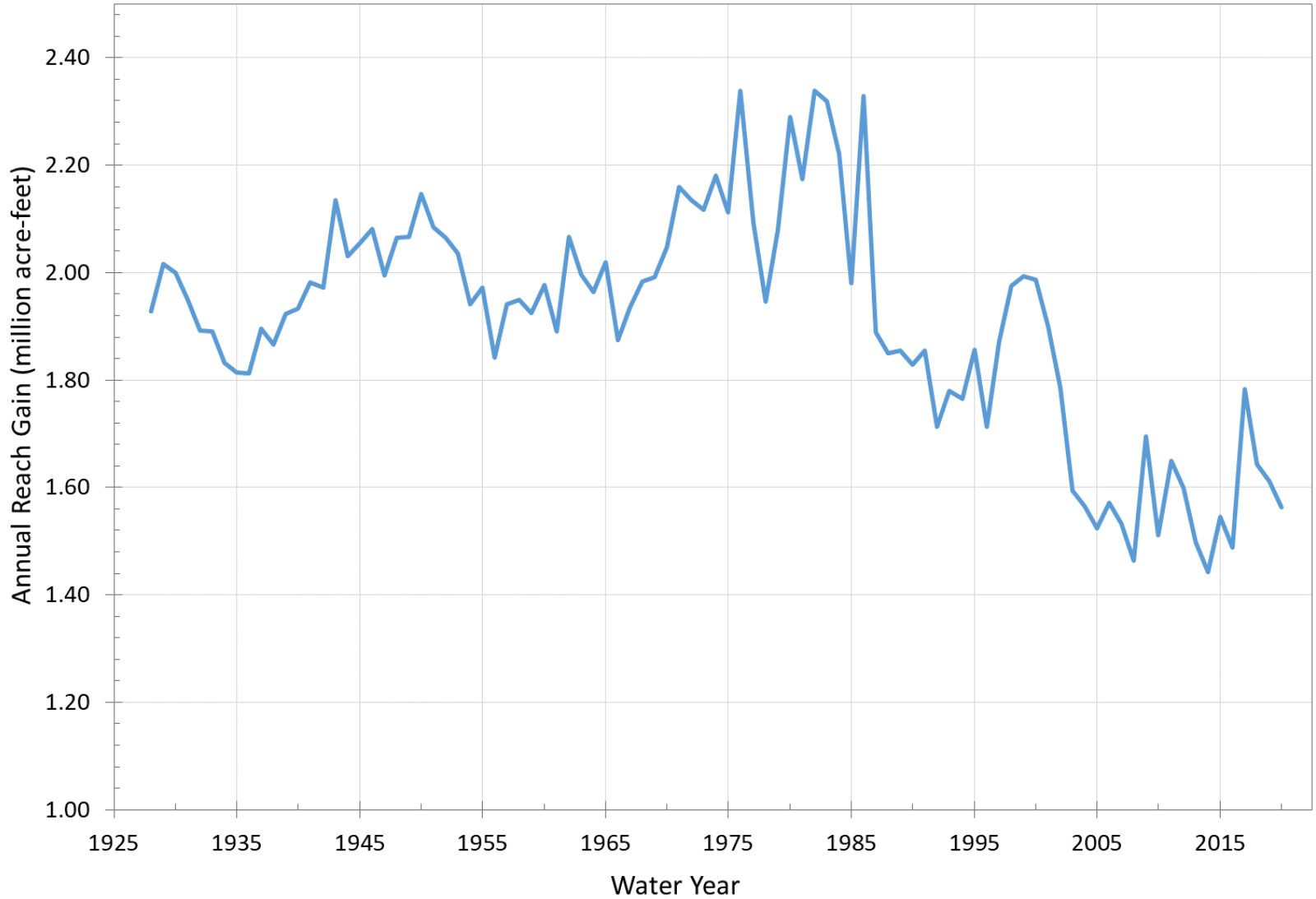
  Diversions is the sum of canal and pump diversions from the river reach.

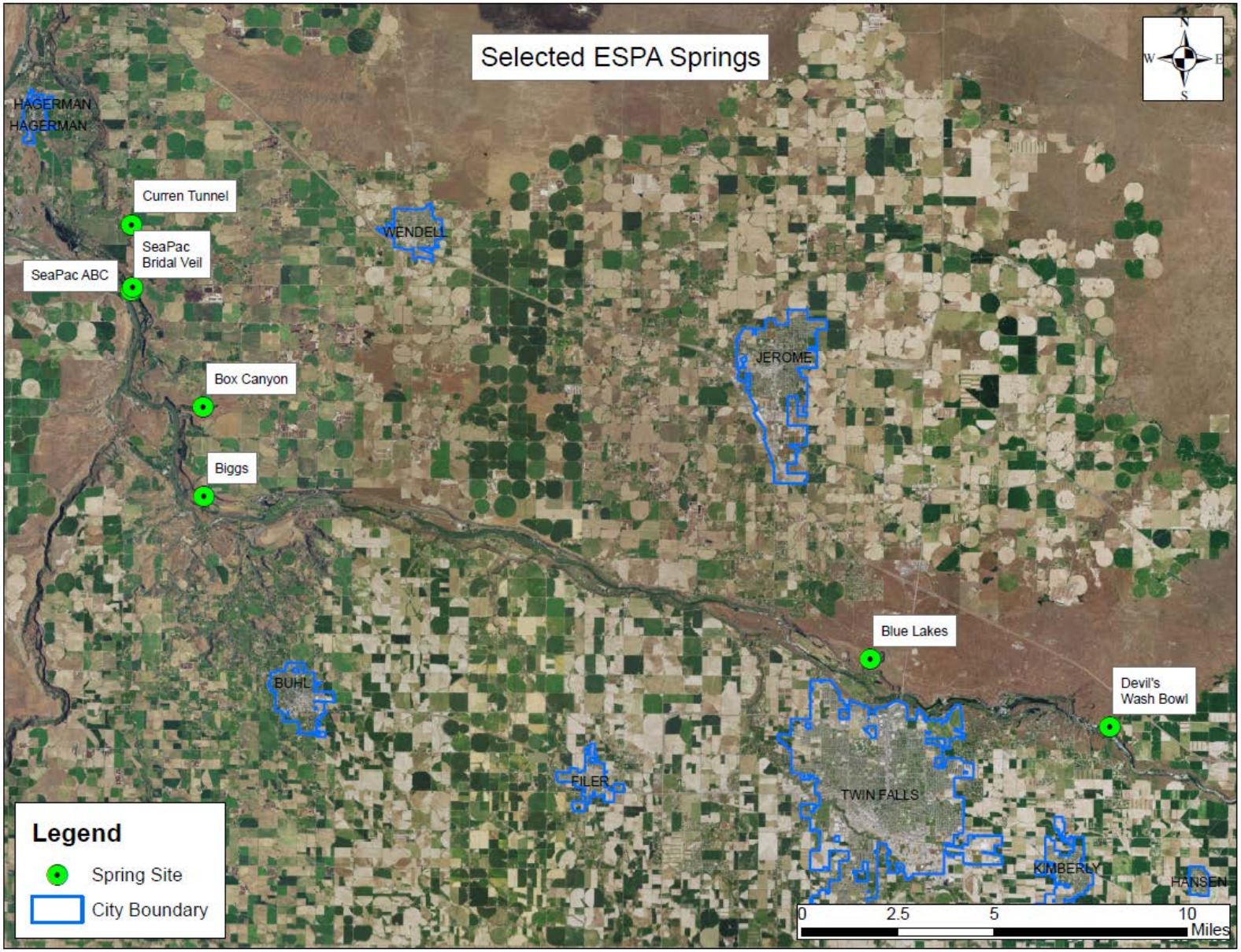
  Reservoir Change in Content is the daily increase or decrease in physical content of any reservoirs within the river reach.

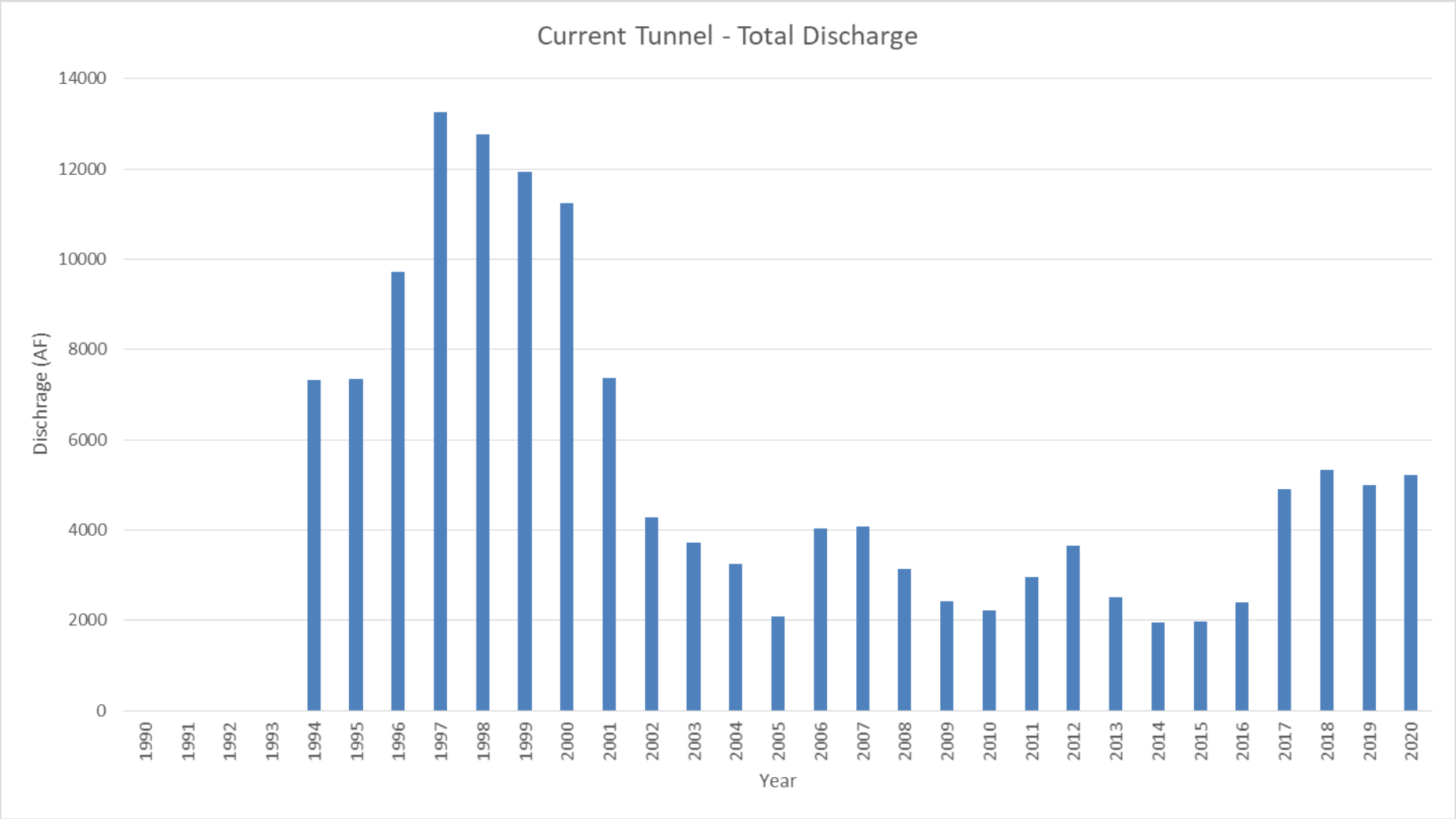
  Reservoir Evaporation is the calculated evaporative losses from the reservoir.

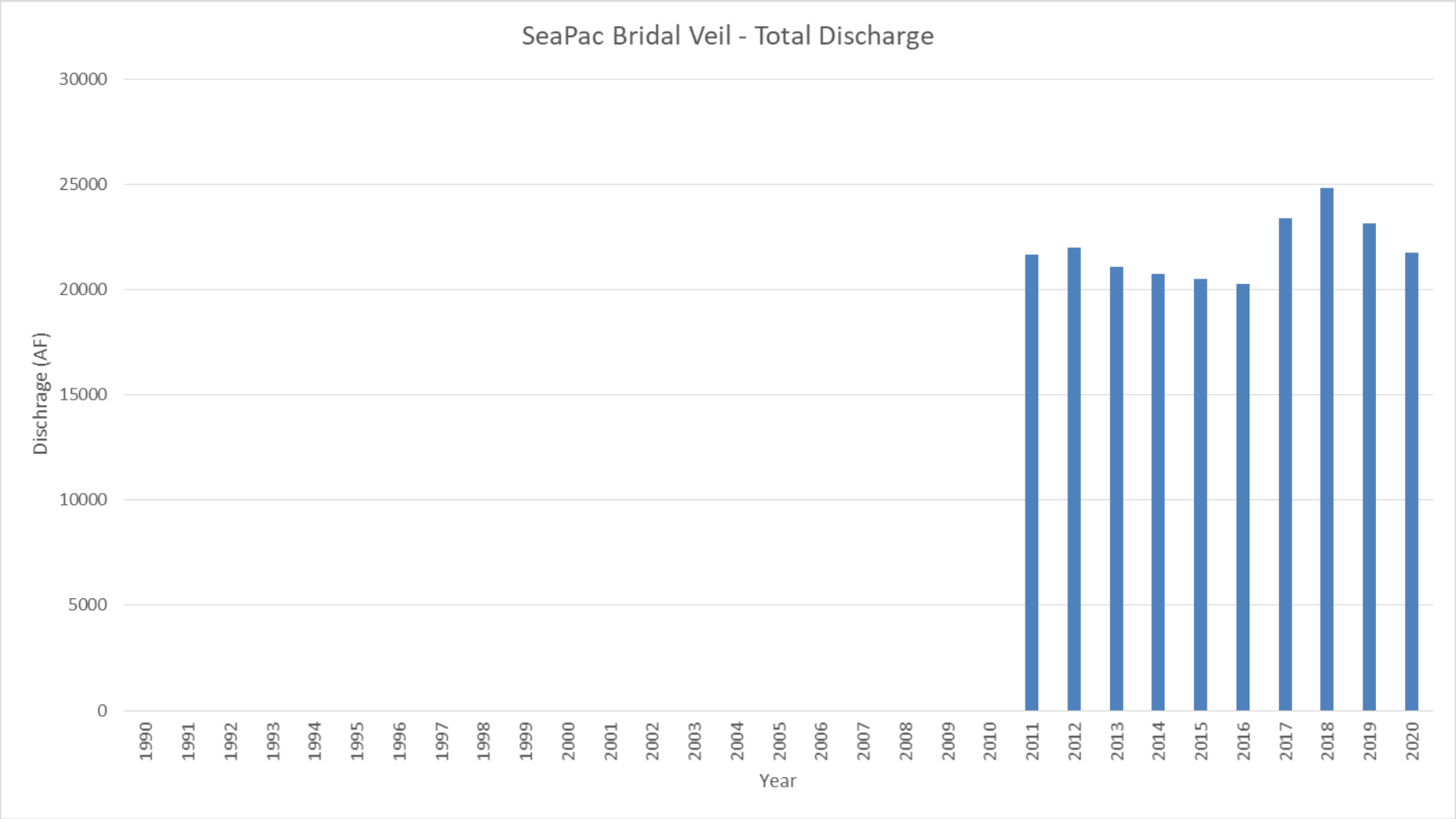
  Return Flow is the unused irrigation diversion returning to the river.

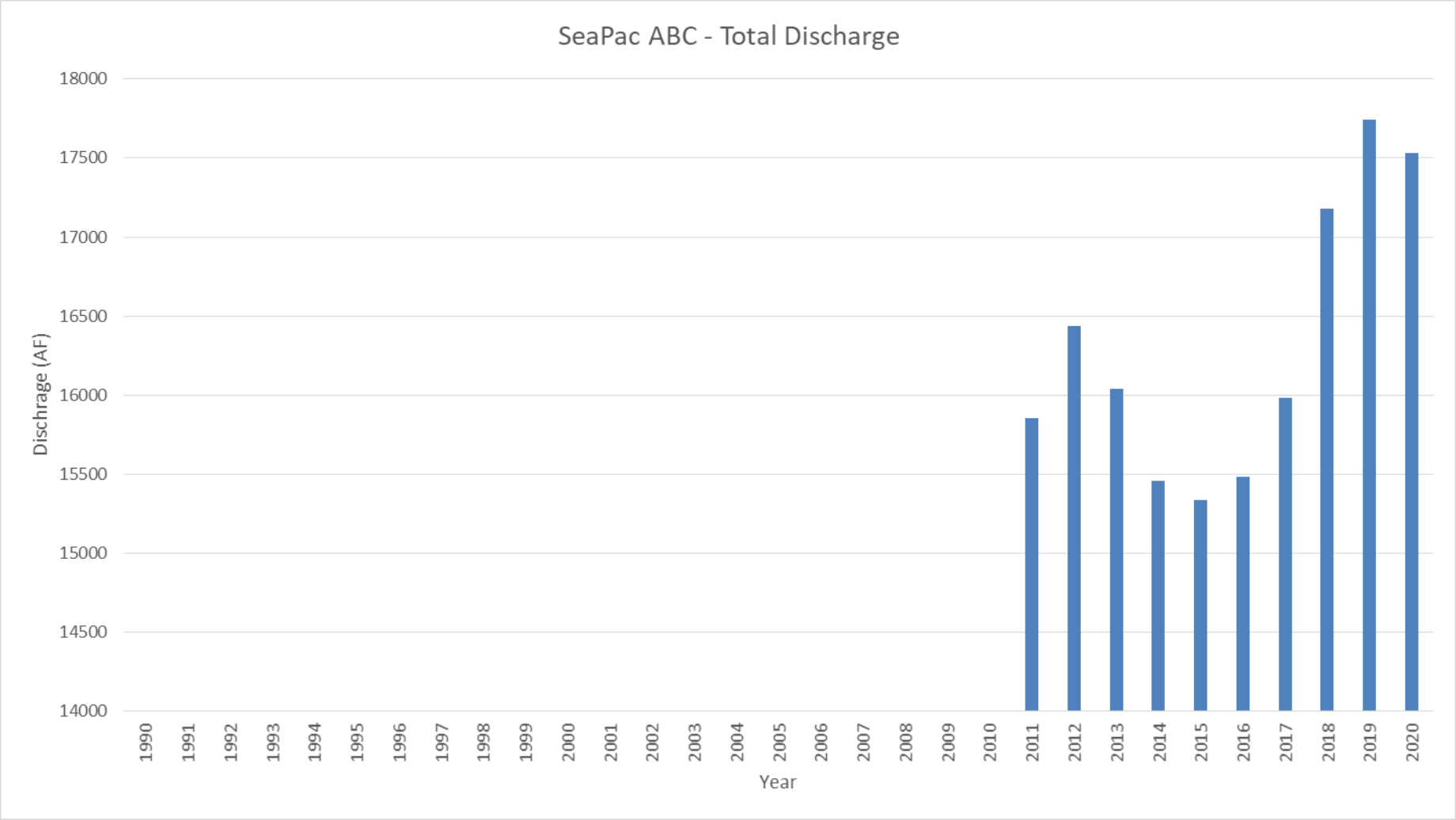
# Near Blackfoot to Minidoka Reach Gains – 1928 to 2020

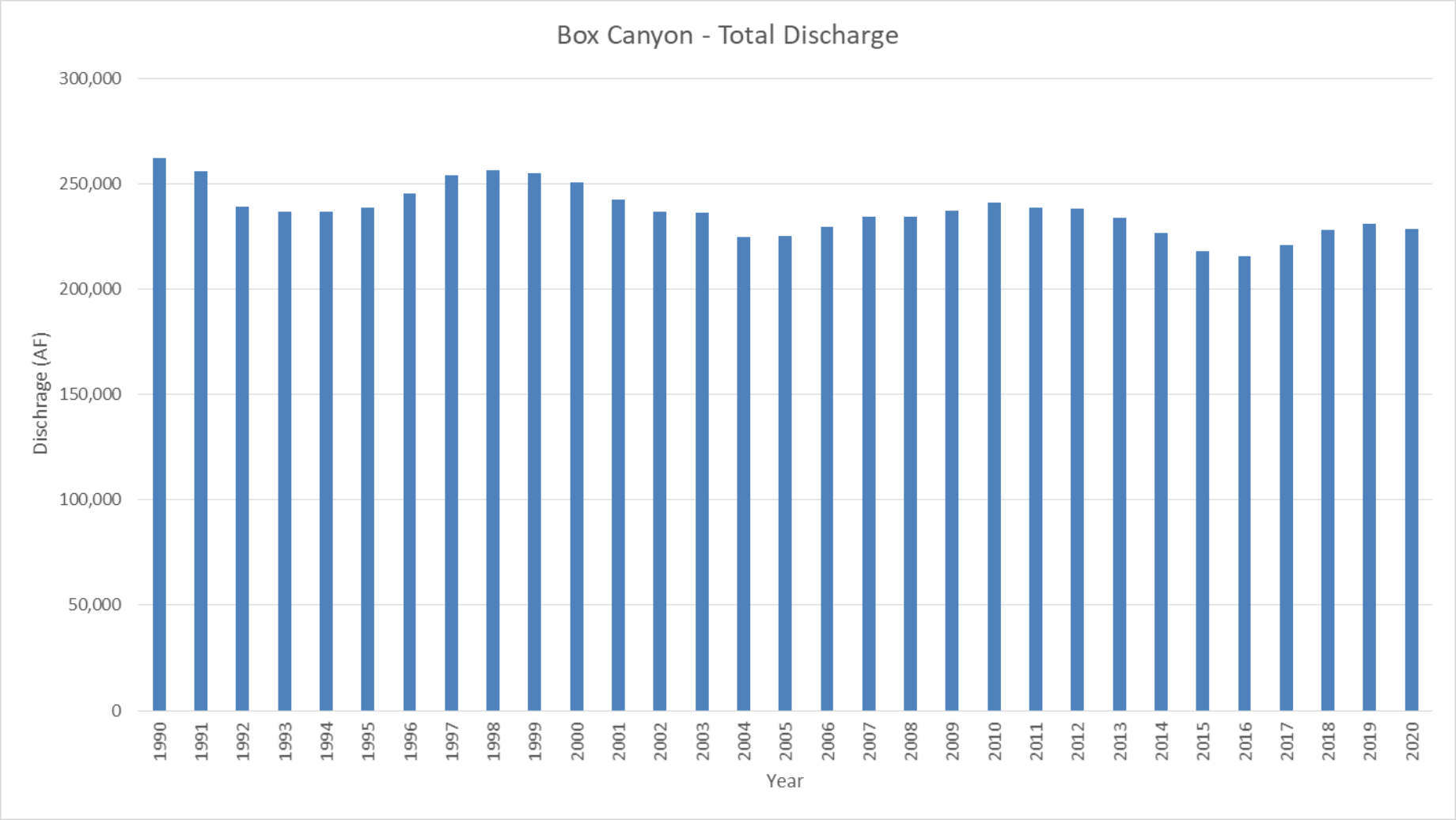


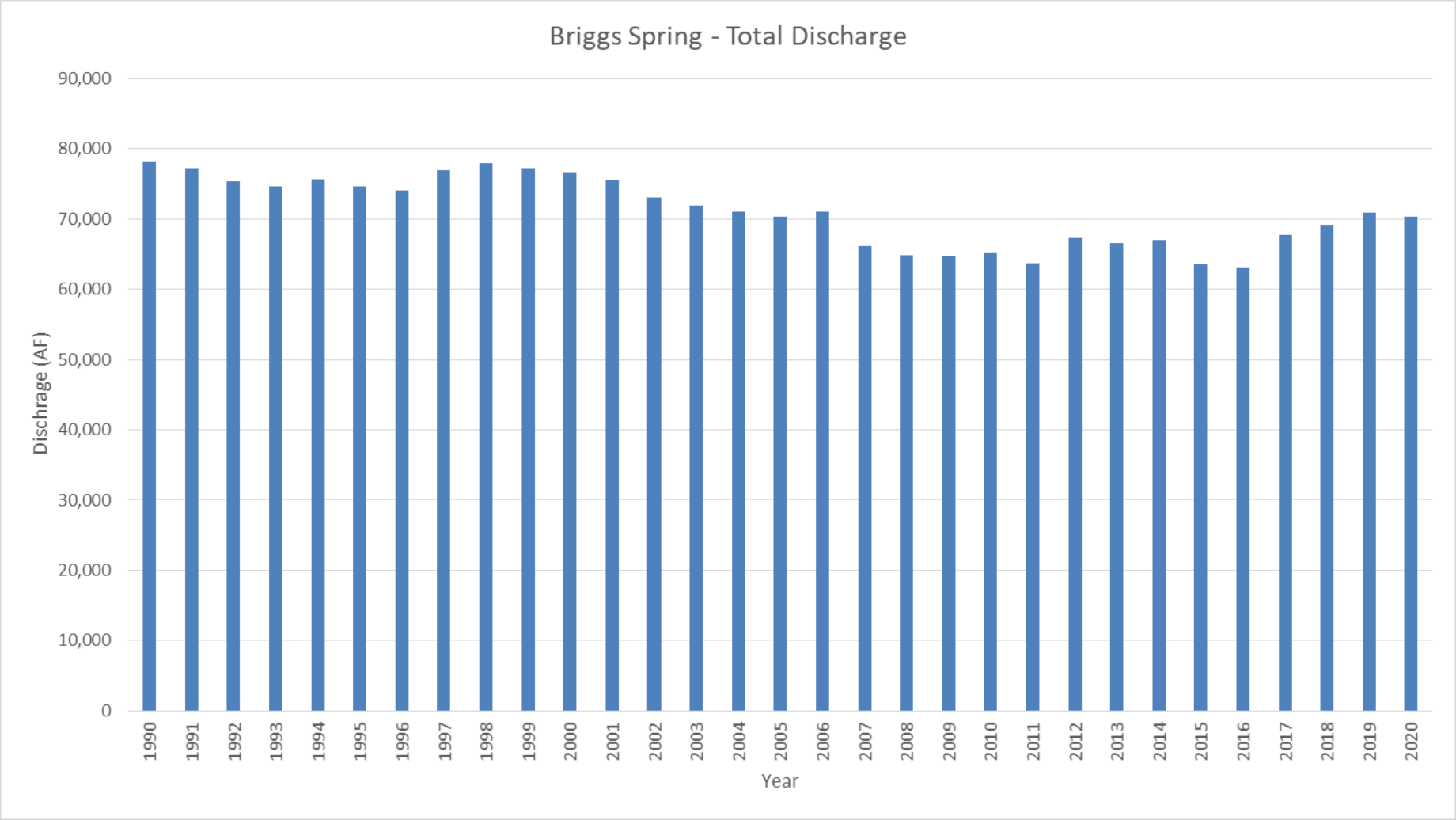

Selected ESPA Springs
N
W
E
S
HAGERMAN
HAGERMAN
Curren Tunnel
SeaPac Bridal Veil
SeaPac ABC
WENDELL
JEROME
Box Canyon
Biggs
Blue Lakes
Devil's Wash Bowl
BUHL
FILER
TWIN FALLS
KIMBERLY
HANSEN
Legend
Spring Site
City Boundary
0
2.5
5
10
Miles

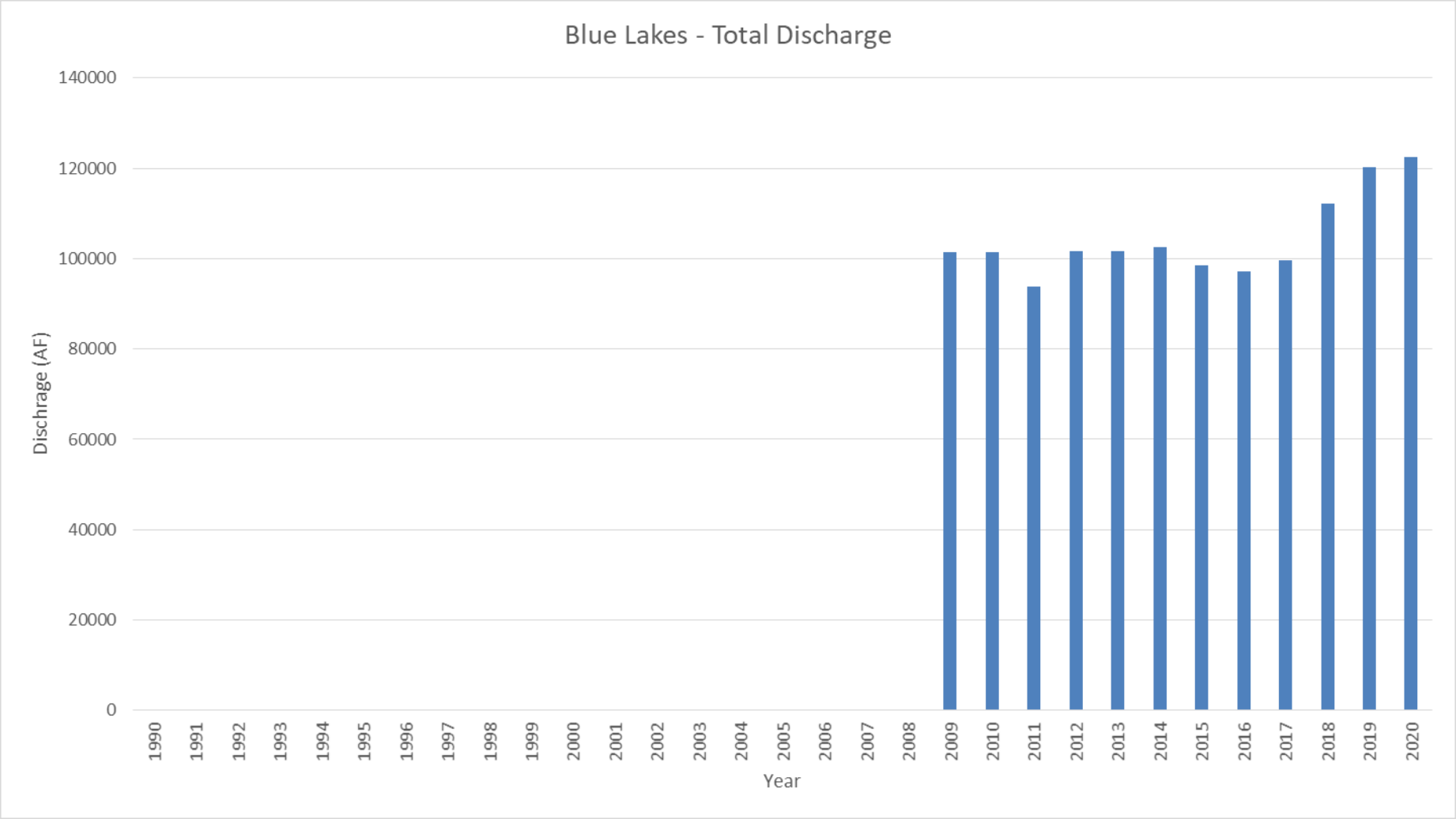

Current Tunnel - Total Discharge
Dischrage (AF)
14000
12000
10000
8000
6000
4000
2000
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

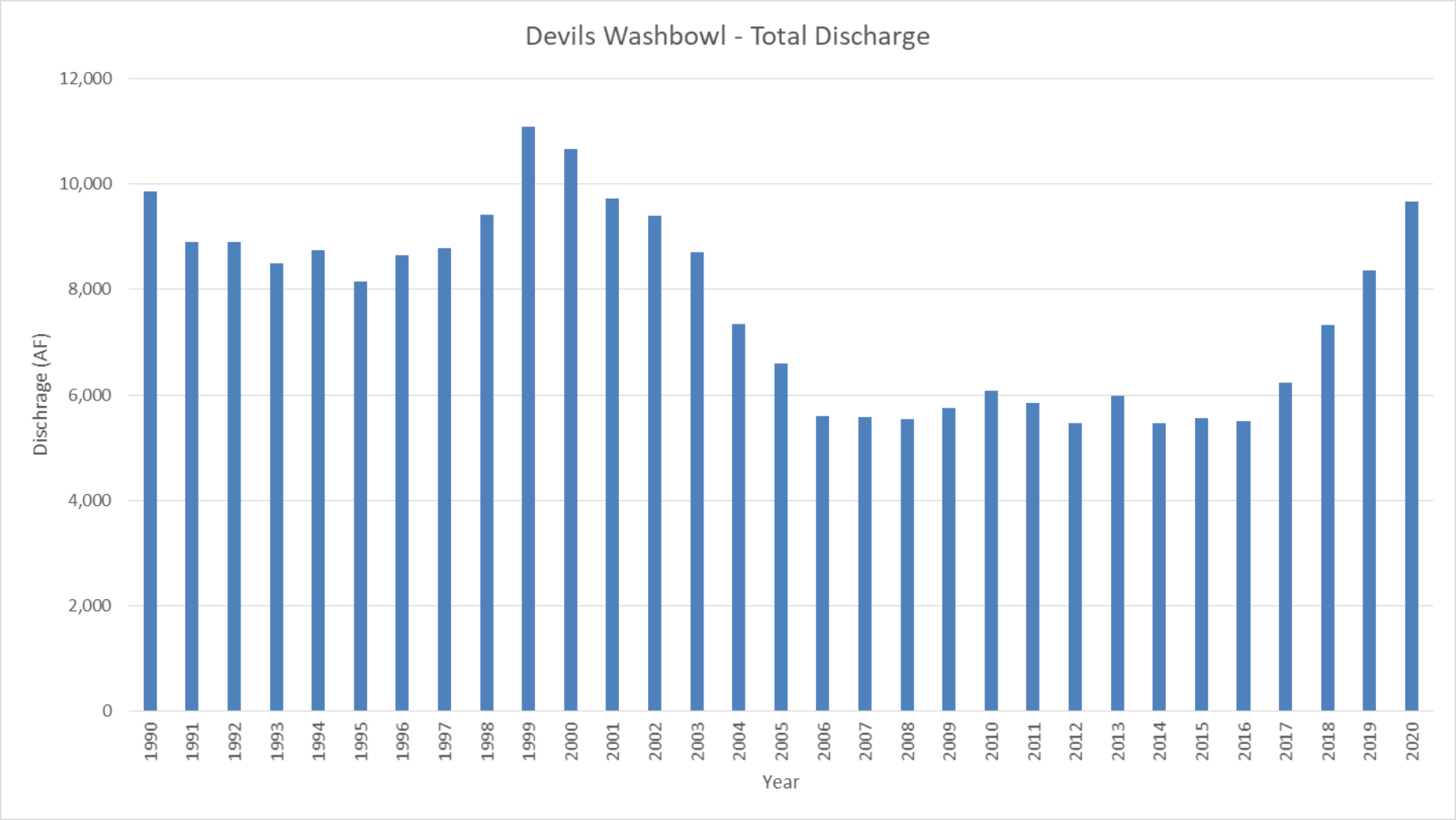

SeaPac Bridal Veil - Total Discharge
Dischrage (AF)
30000
25000
20000
15000
10000
5000
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


SeaPac ABC - Total Discharge
Discharge (AF)
18000
17500
17000
16500
16000
15500
15000
14500
14000
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


Box Canyon - Total Discharge
300,000
250,000
200,000
150,000
100,000
50,000
0
Discharge (AF)
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


Briggs Spring - Total Discharge
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Dischrage (AF)
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


Blue Lakes - Total Discharge
Dischrage (AF)
140000
120000
100000
80000
60000
40000
20000
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


Devils Washbowl - Total Discharge
12,000
10,000
8,000
6,000
4,000
2,000
0
Dischrage (AF)
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

# Questions?

Matt Anders
(208) 287-4932
matthew.anders@idwr.idaho.gov


# ESPA Settlement Agreements: 2020 Activities

Presented by: Brian Ragan

Date: July 22, 2021

# OUTLINE

1. City Settlement Agreement: 2020 Annual Progress Report
   - 2019-2023: work towards average annual mitigation of 7,650 acre-feet
   - 2024 and beyond: maintain 5-year rolling average of at least 7,650 acre-feet
2. ID Ground Water Appropriators 2020 Annual Progress Report
   - 240,000 acre-feet reduction in GW diversion
3. Sentinel Well 2021 GW Level Index

# City Settlement Agreement

**2020 Annual Recharge**

**7,813.8 af**

**Average Annual Mitigation**

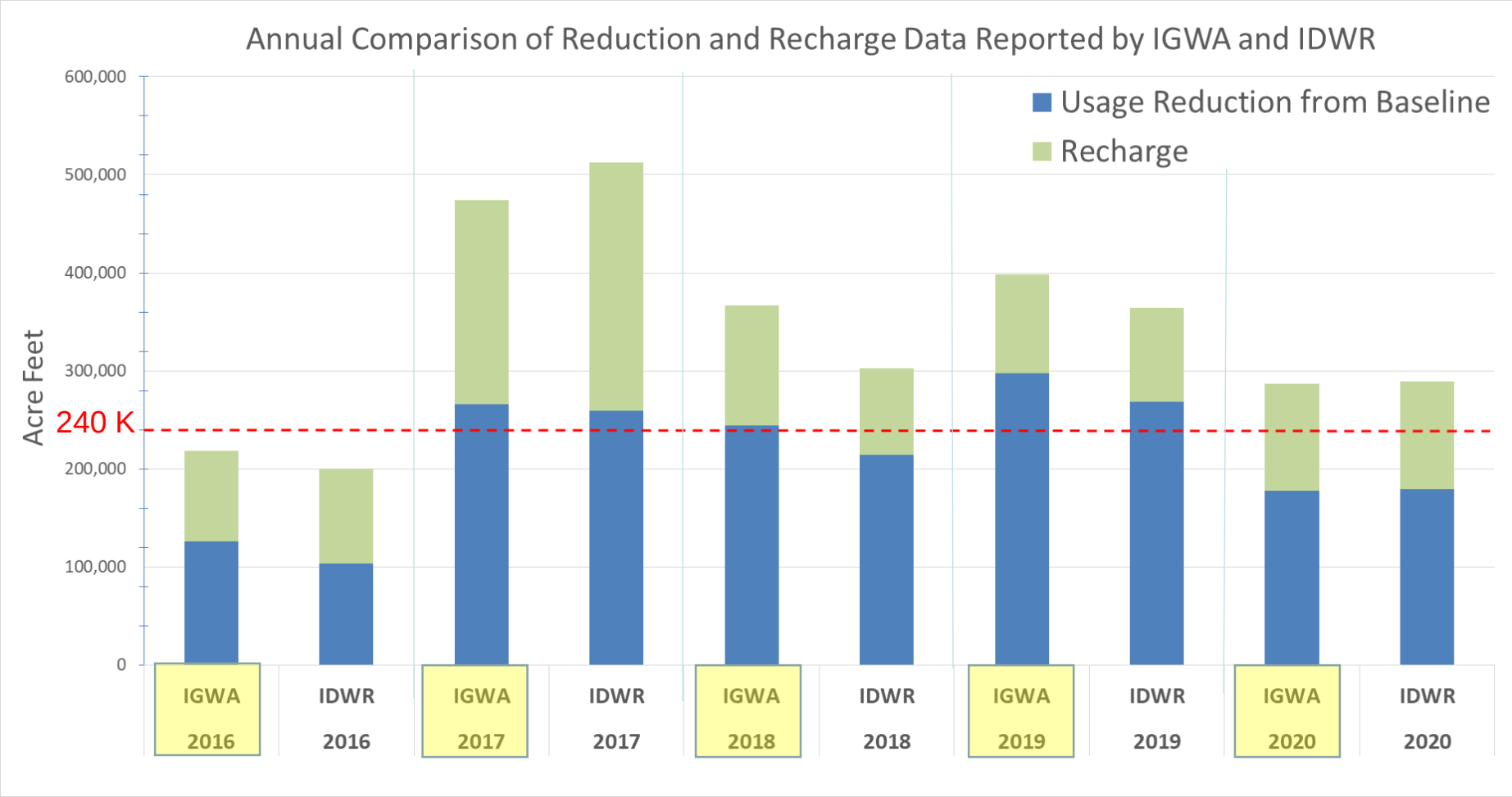
**7,991.6 af**

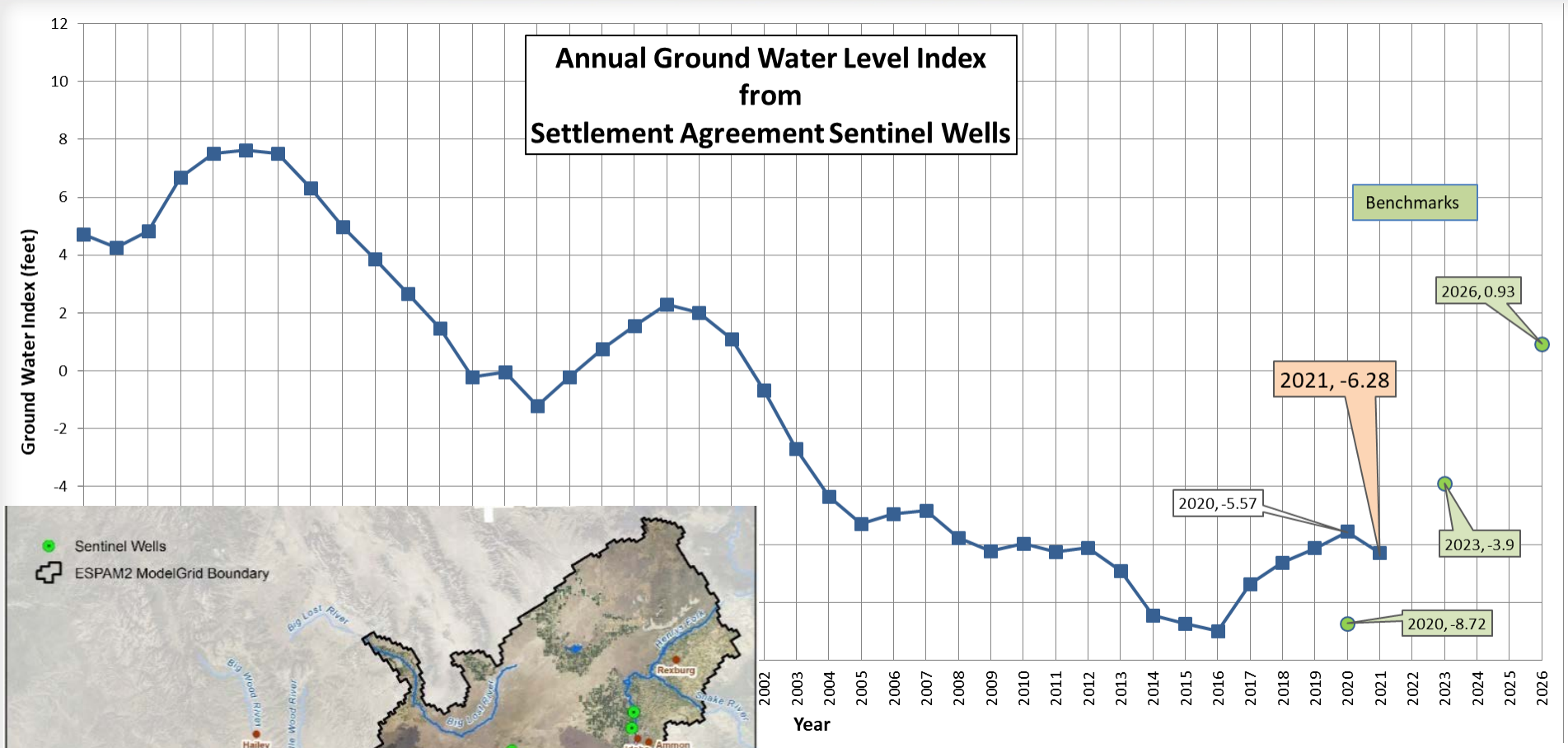
| City | Source of Recharge Water | Recharge Location | Recharge Date | Is location authorized? Does location meet Agreement criteria? | 2020 Recharge Amount (acre-feet) |
|---|---|---|---|---|---|
| All | City of Pocatello's Palisades Reservoir Storage | Idaho Water Resource Board: Numerous Locations | 11/16 - 11/23 | Yes. Approved method as per City Agreement II.A.2.a | 3,897.7 |
| Blackfoot | Rented water from Palisades Water Users', Inc. | Jensen's Grove | Not Provided | Yes. Location appears in table 12 of McVay Report[2] | 345.0 |
| Idaho Falls | Source 1. Temporary Permit # 27-115 (462.2 acre-feet)<br><br>Source 2. City of Idaho Falls shares in Palisades Water Users', Inc. (1152.8 acre-feet)<br><br>Source 3. Idaho Irrigation District rental (535 AF)<br><br>Source 4. Idaho Irrigation District rental assigned to IWRB (1,215 AF) | Sand Creek Site<br><br>St. Anthony Union Canal | 4/18 - 10/29<br><br>11/19 - 11/23 | Yes. ESPAM2.1 modeled 5-year retention of 17.8% (row 77, columns 160 and 161)<br><br>Yes. Approved method as per City Agreement II.A.2.a | 3,365.0 |
| Rexburg | Rexburg Teton River surface water rights 22-203 and 22-204C | Walters Pond | 6/4 - 8/31 | Yes. ESPAM2.1 modeled 5-year retention of 44.3% (row 77, column 183) | 206.1 |

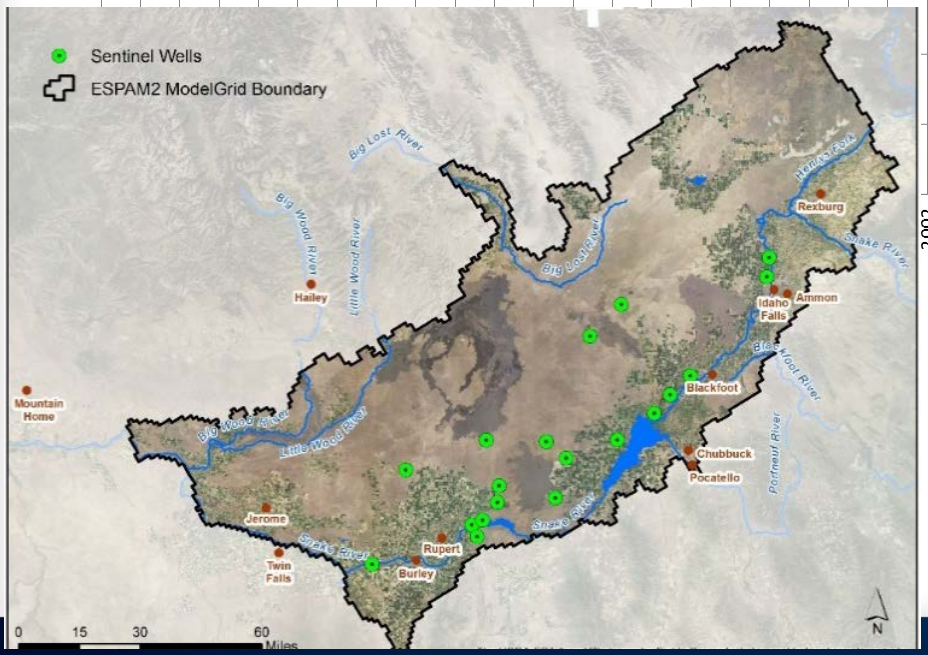
| | 2019 | 2020 | 2021 | 2022 | 2023 | Five Year Average |
|---|---|---|---|---|---|---|
| **Total City Recharge Amount** | 8,169.4 | 7,813.8 | | | | 7,991.6 |

IGWA 2020 Progress Report

| | IGWA | IDWR | IDWR relative to IGWA |
|---|---|---|---|
| 5-Year Baseline | 1,776,565 | 1,762,513 | -0.8% |
| | - | | |
| 2020 Usage (AF) | 1,598,942 | 1,582,684 | -1.0% |
| | = | | |
| 2020 Reduction (AF) | 177,623 | 179,829 | 1.2% |
| | + | | |
| 2020 Recharge (AF) | 109,272 | 109,267 | 0.0% |
| | = | | |
| Total Conservation (AF) | 286,894 | 289,096 | 0.8% |
| | | | |
| 240,000 AF Exceeded by: | 46,894 | 49,096 | 4.7% |


Annual Comparison of Reduction and Recharge Data Reported by IGWA and IDWR
Usage Reduction from Baseline
Recharge
Acre Feet
600,000
500,000
400,000
300,000
240 K
200,000
100,000
0
IGWA 2016
IDWR 2016
IGWA 2017
IDWR 2017
IGWA 2018
IDWR 2018
IGWA 2019
IDWR 2019
IGWA 2020
IDWR 2020


Annual Ground Water Level Index
from
Settlement Agreement Sentinel Wells
Ground Water Index (feet)
12
10
8
6
4
2
0
-2
-4
Year
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Benchmarks
2026, 0.93
2021, -6.28
2020, -5.57
2023, -3.9
2020, -8.72


Sentinel Wells
ESPAM2 ModelGrid Boundary
Big Lost River
Big Wood River
Little Wood River
Hailey
Mountain Home
Jerome
Twin Falls
Burley
Rupert
Snake River
Big Lost River
Idaho Falls
Ammon
Rexburg
Henrys Fork
Blackfoot
Black Foot River
Chubbuck
Pocatello
Portneuf River
0
15
30
60
Miles
N


Questions?

# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: July 14, 2021

Re: IWRB Recharge Effects Analysis

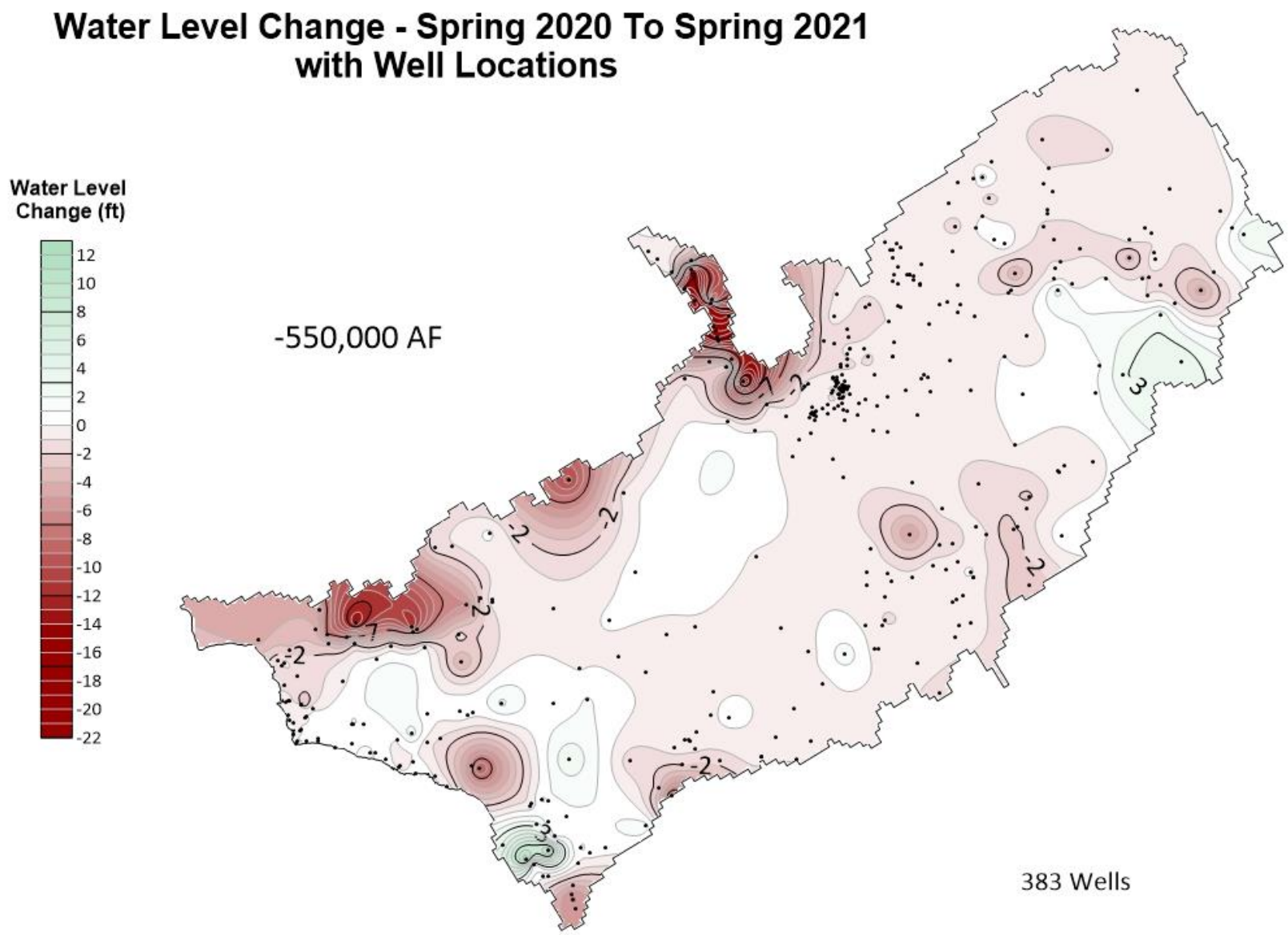
Noah Stewart-Maddox of IDWR will provide an analysis on the board's Recharge Effects.

Noah Stewart-Maddox, Staff Hydrogeologist

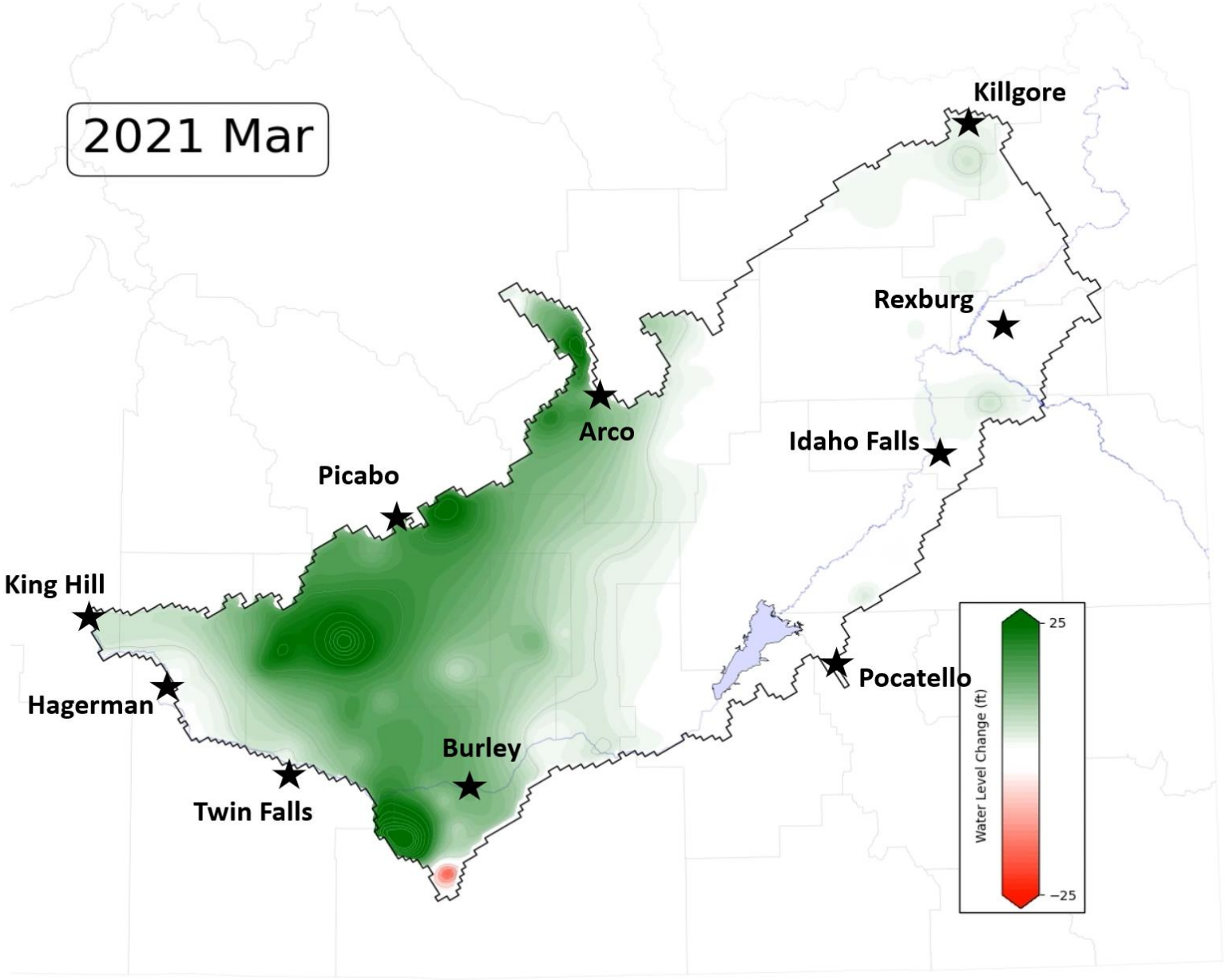
# The ESPA and the Role of Aquifer Management

# Water Level Change Animation

- What happens in between these snapshots?
- More than 100 transducers have been installed across the ESPA
  - Many hand measurements also collected
- This data can be used to create an approximation of water level changes throughout the year



# How do water levels vary throughout the year?



# What would have happened if no aquifer management had occurred?

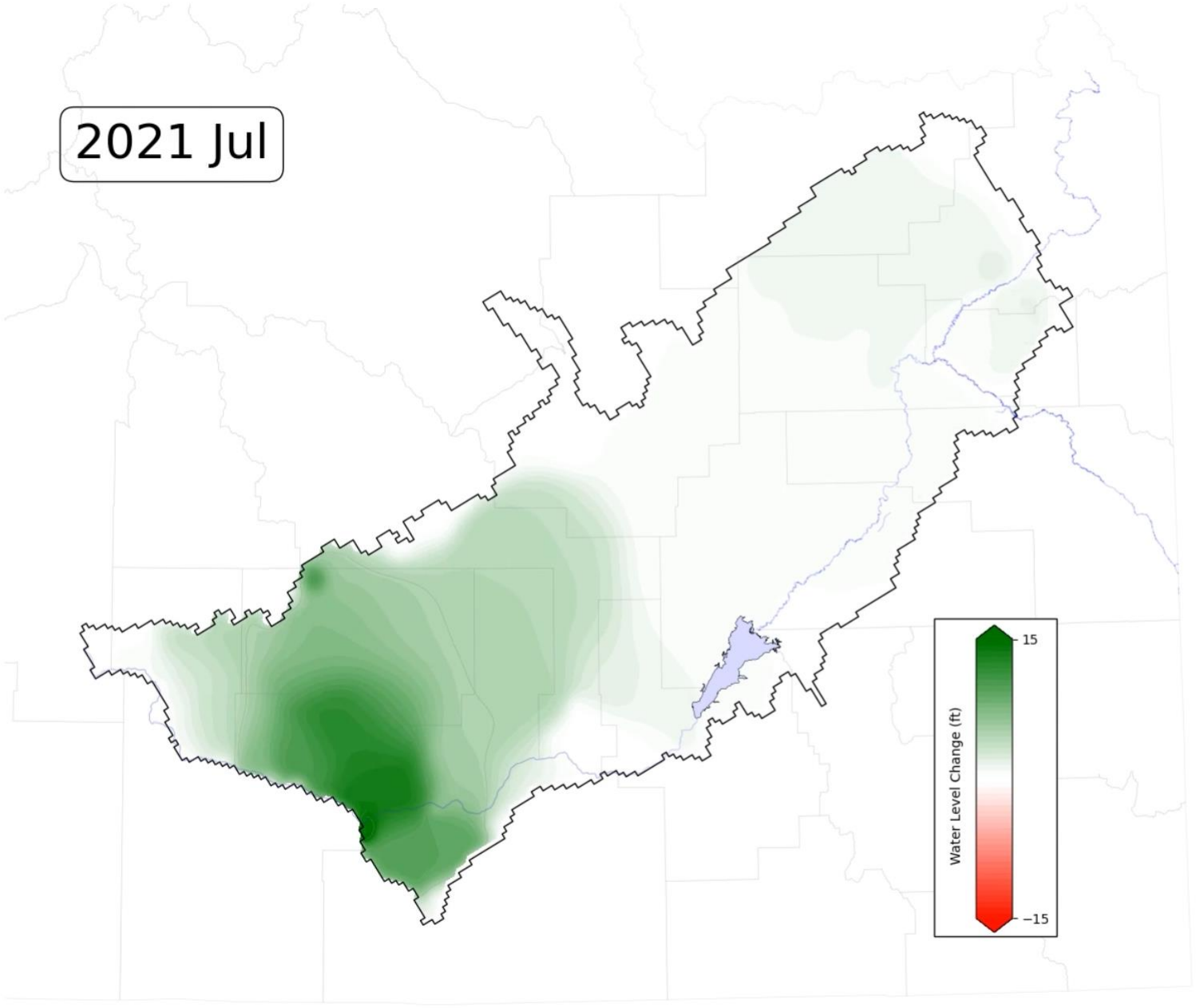
Aquifer management has significantly changed over the past several years

- Pumping reductions
- Private Recharge
- IWRB Recharge

To better understand the effects of aquifer management, a series of model runs were performed

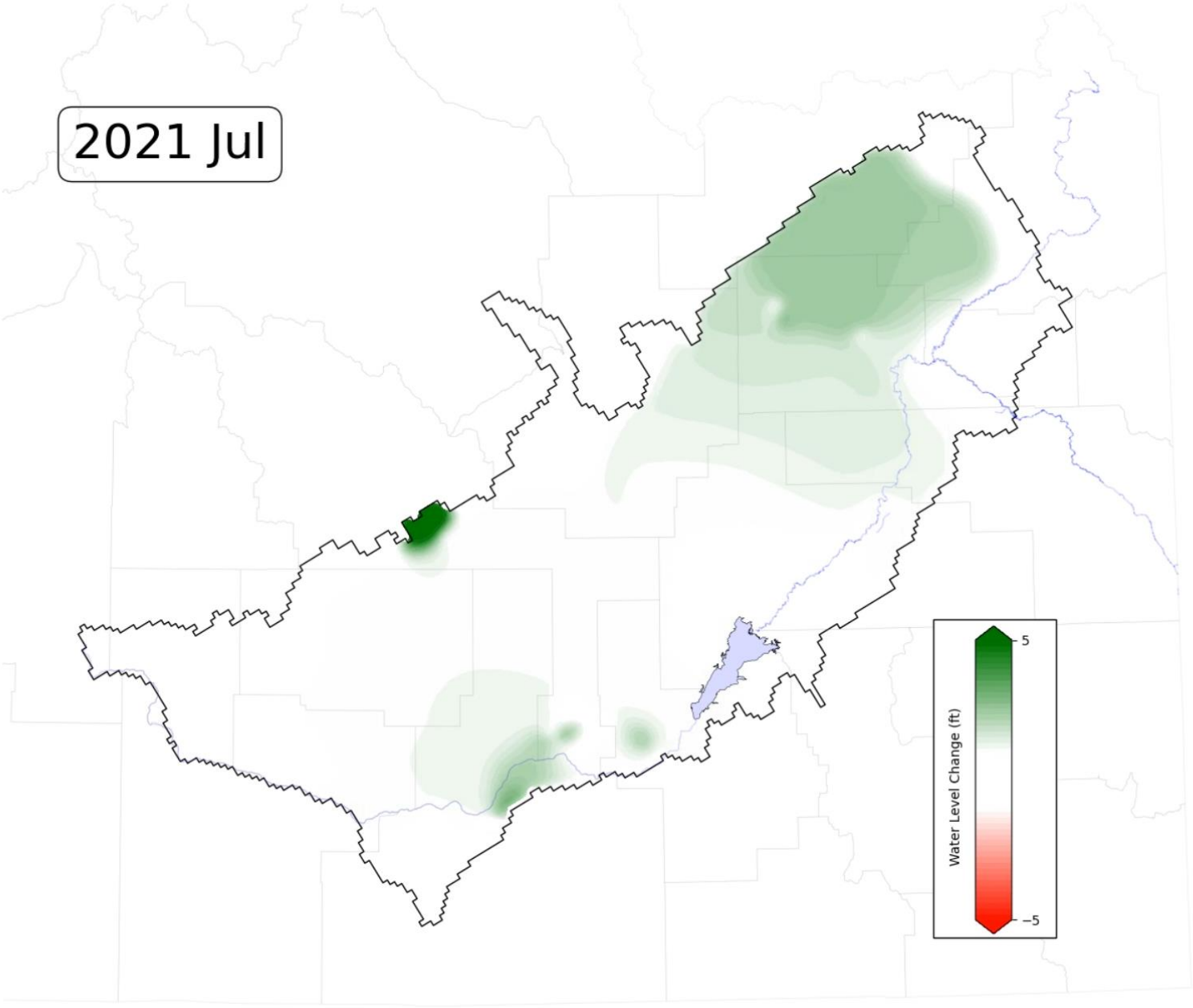
# IWRB Recharge

- IWRB Recharge full-scale program began in 2014
- Increased water supply and build out has dramatically increased recharge potential
- Primarily focused in the Lower Valley



# IGWA Total Conservation

- IGWA/SWC agreement went into effect in 2016
- A combination of groundwater pumping reduction and private recharge
- Widely dispersed across ESPA



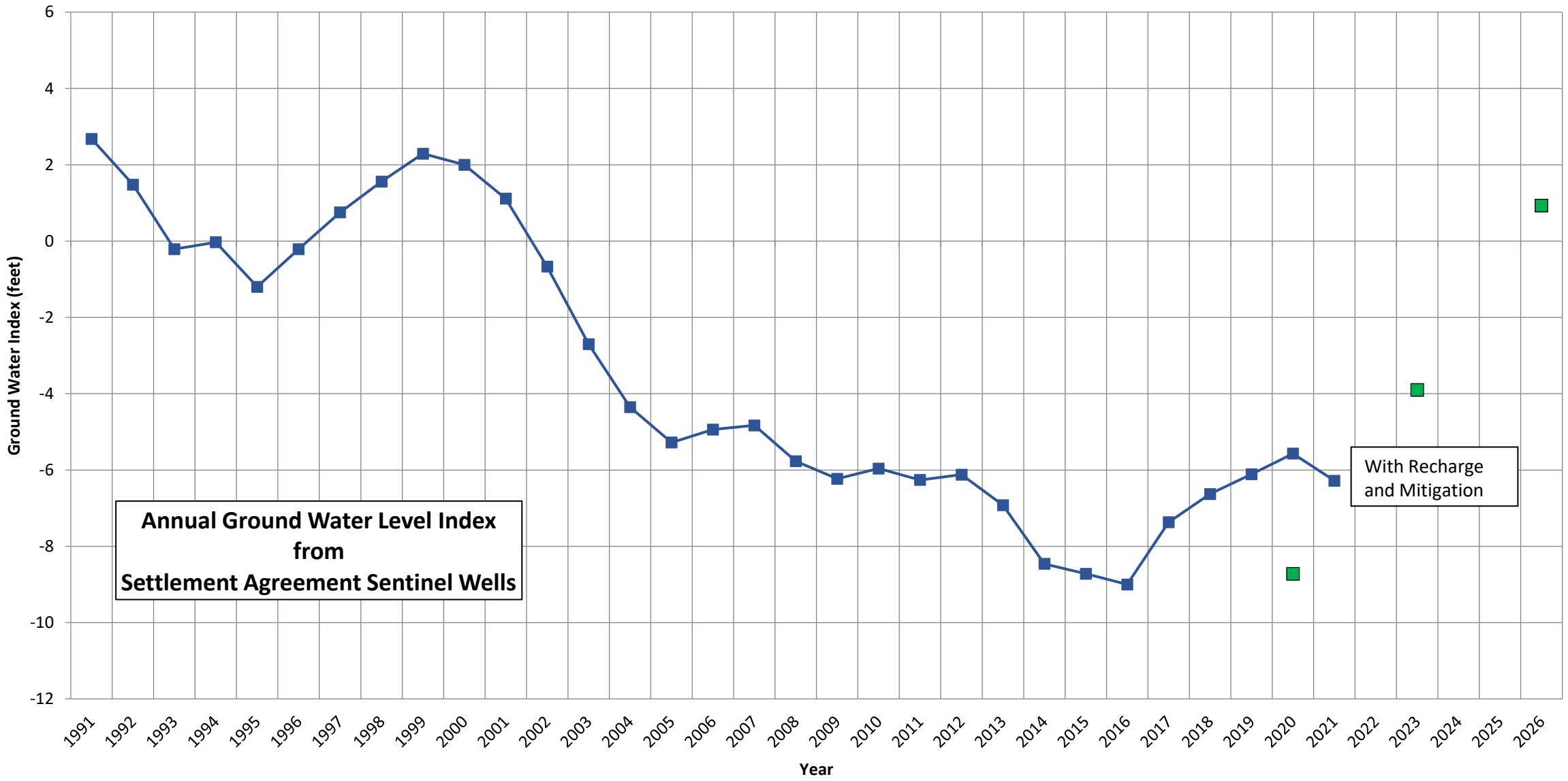
# Changes in aquifer management have significantly improved aquifer conditions

- Recharge and total conservation have added significant amounts of additional water into the ESPA

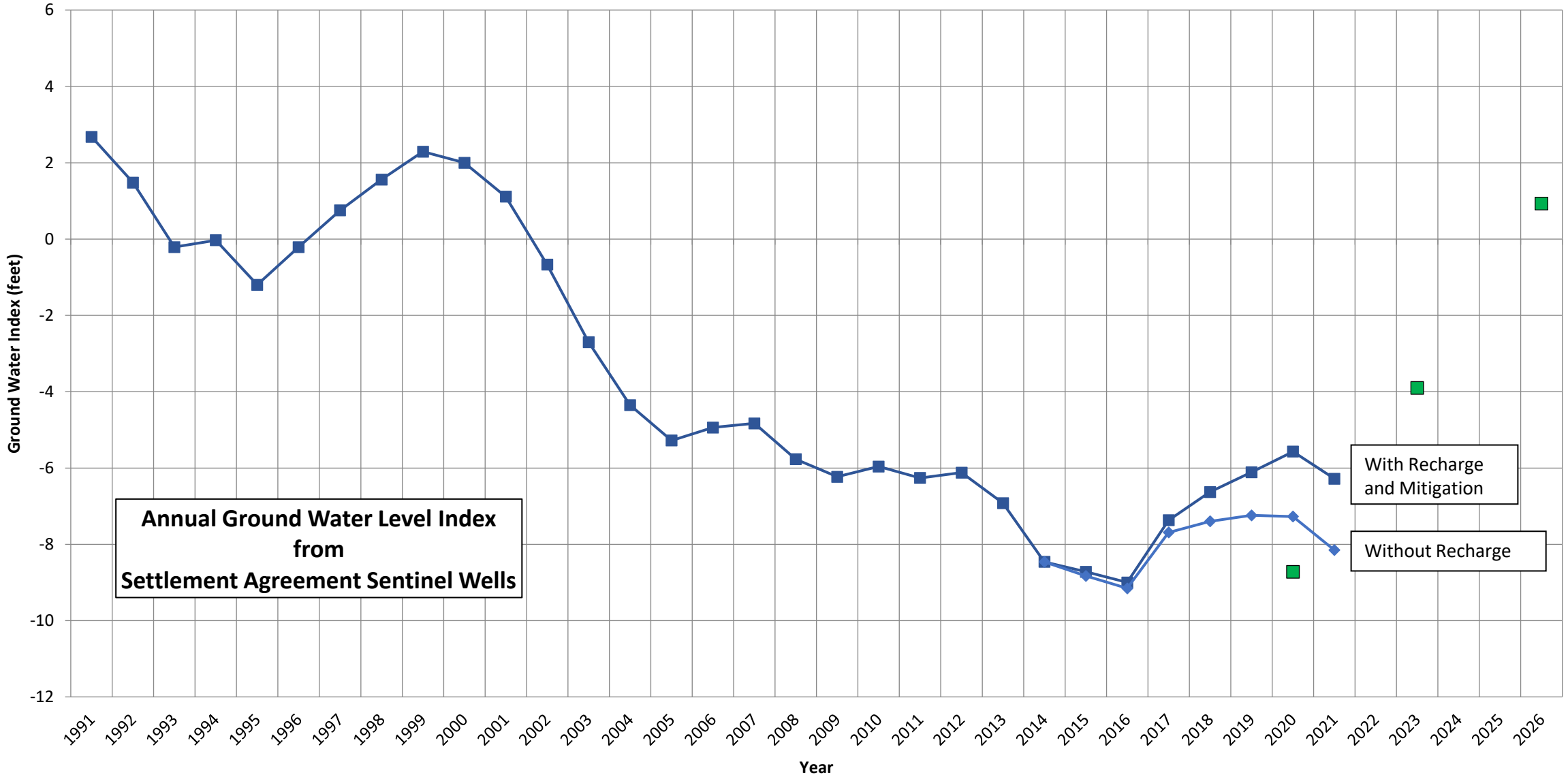
- The goal of these changes in aquifer management are attempting to reverse decades of decline

- What would conditions in the ESPA look like without changes in aquifer management?

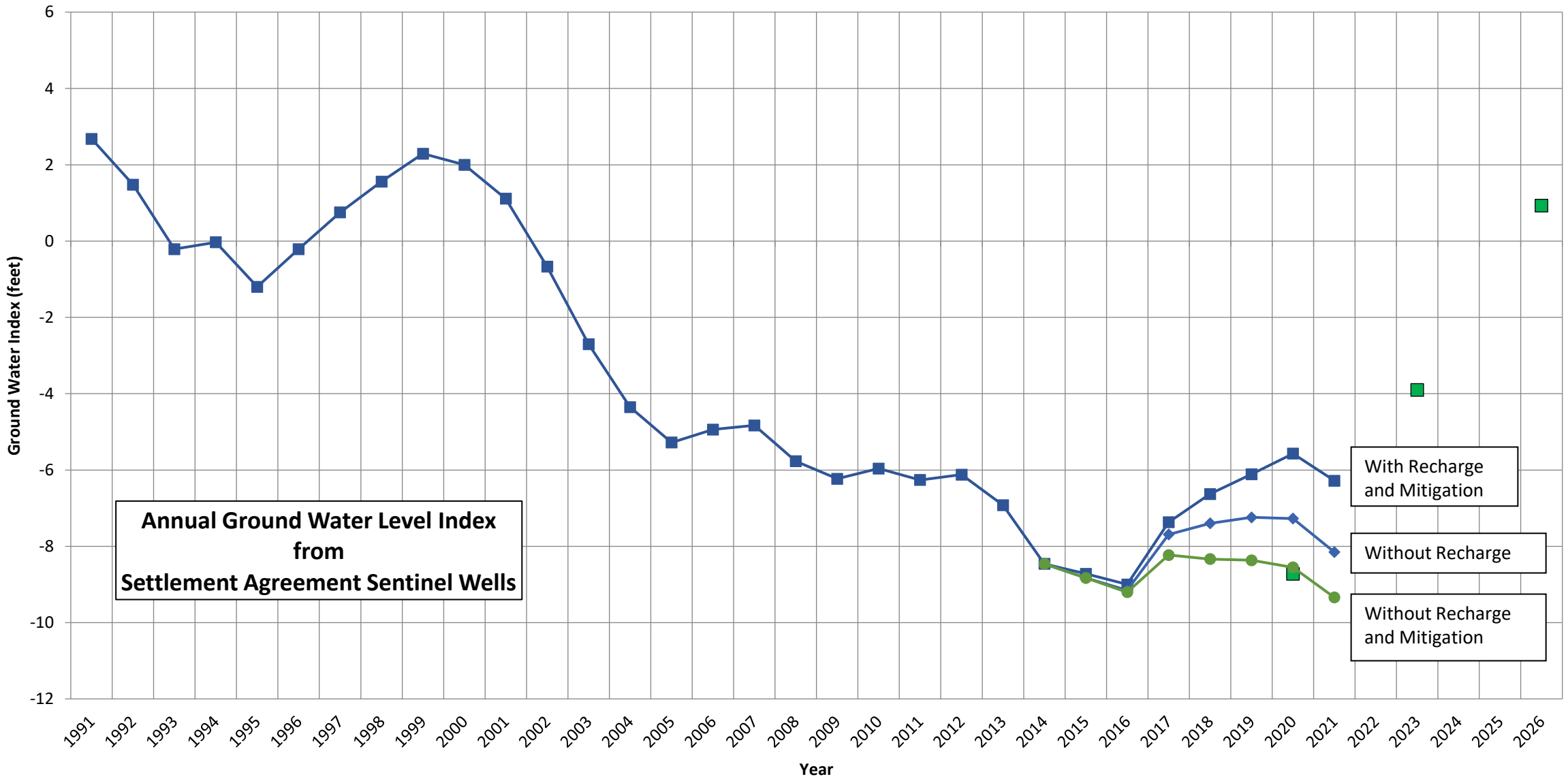
# A combination of wet years and changes in aquifer management have resulted in an increased sentinel index

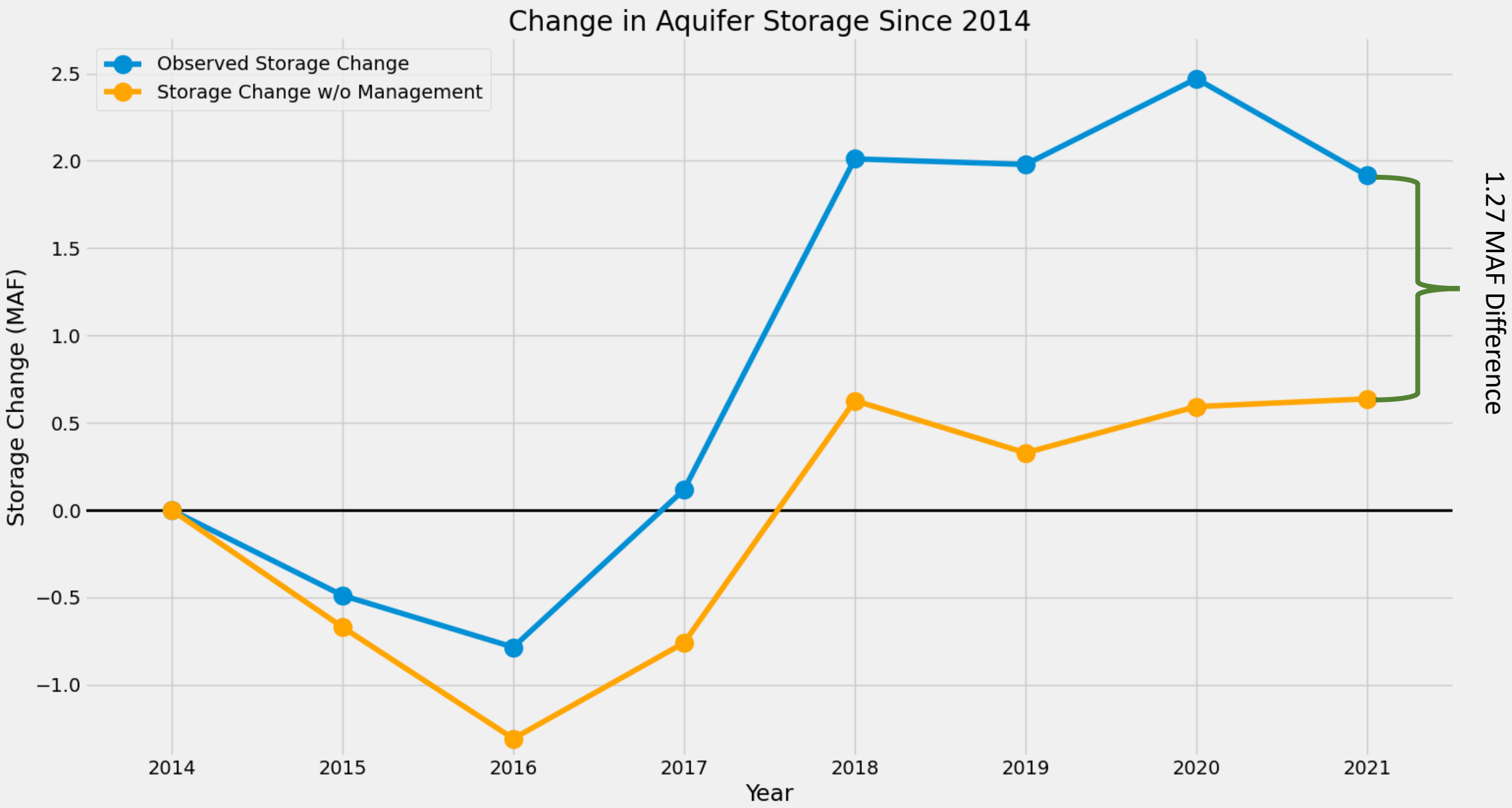


# A combination of wet years and changes in aquifer management have resulted in an increased sentinel index



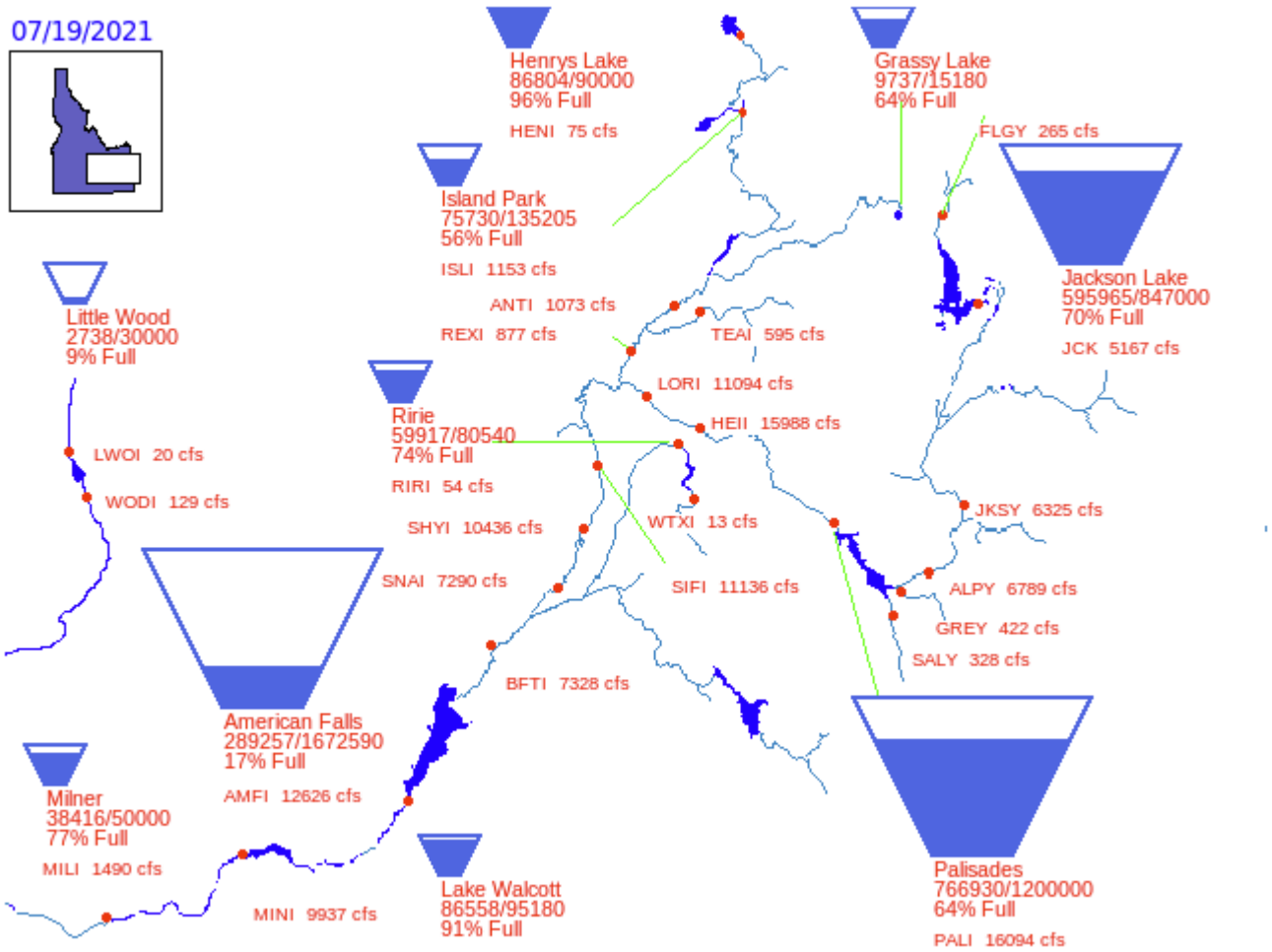
# A combination of wet years and changes in aquifer management have resulted in an increased sentinel index




Change in Aquifer Storage Since 2014
Observed Storage Change
Storage Change w/o Management
Storage Change (MAF)
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
2014
2015
2016
2017
2018
2019
2020
2021
Year
1.27 MAF Difference

IWRB recharge and groundwater conservation can provide significant benefits in dry years

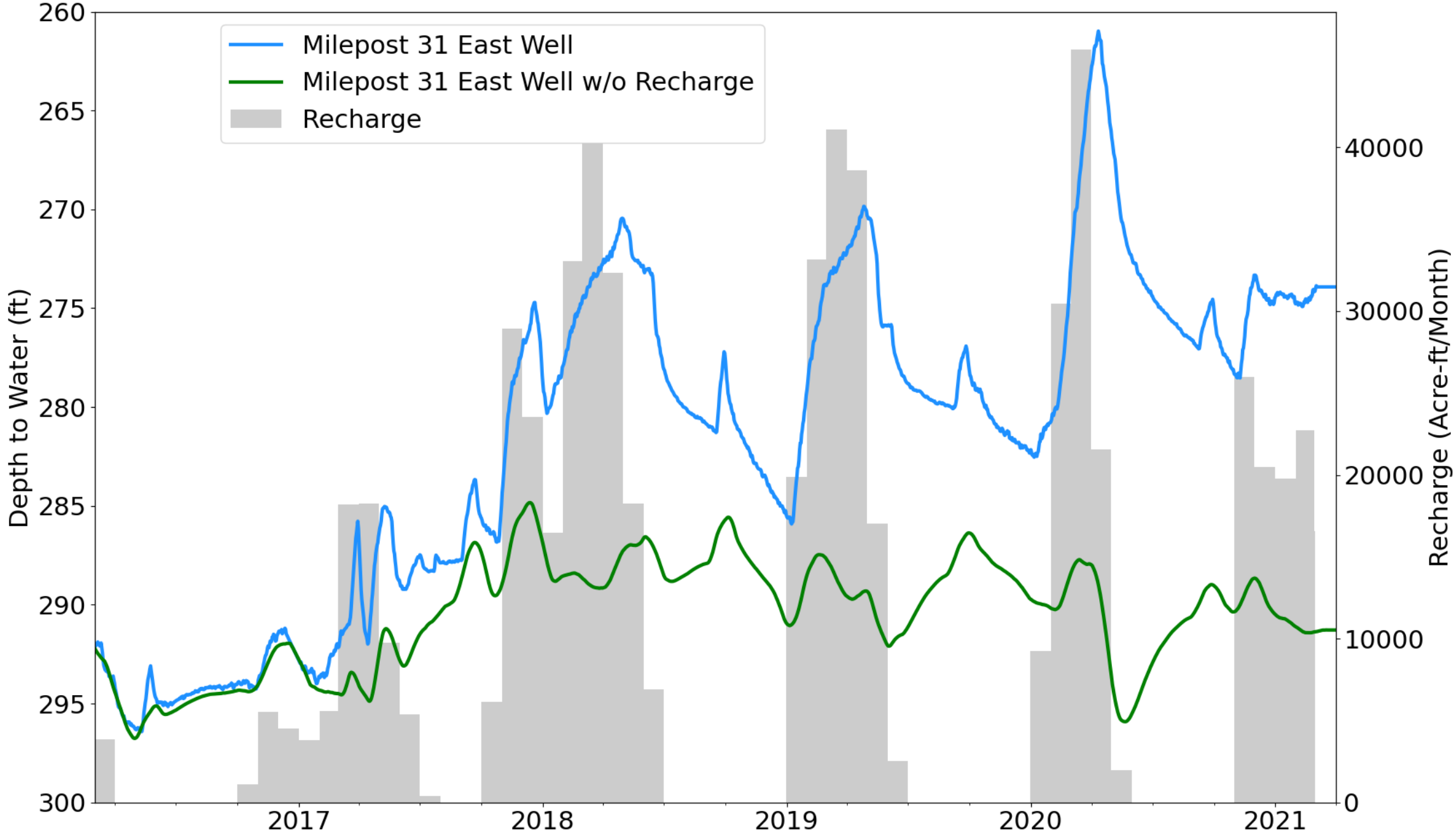
- A combination of IWRB Recharge and IGWA total conservation will add an 84,750 additional acre-ft to the Snake River system in 2021




**Upper Snake River system is at 47 % of capacity.**

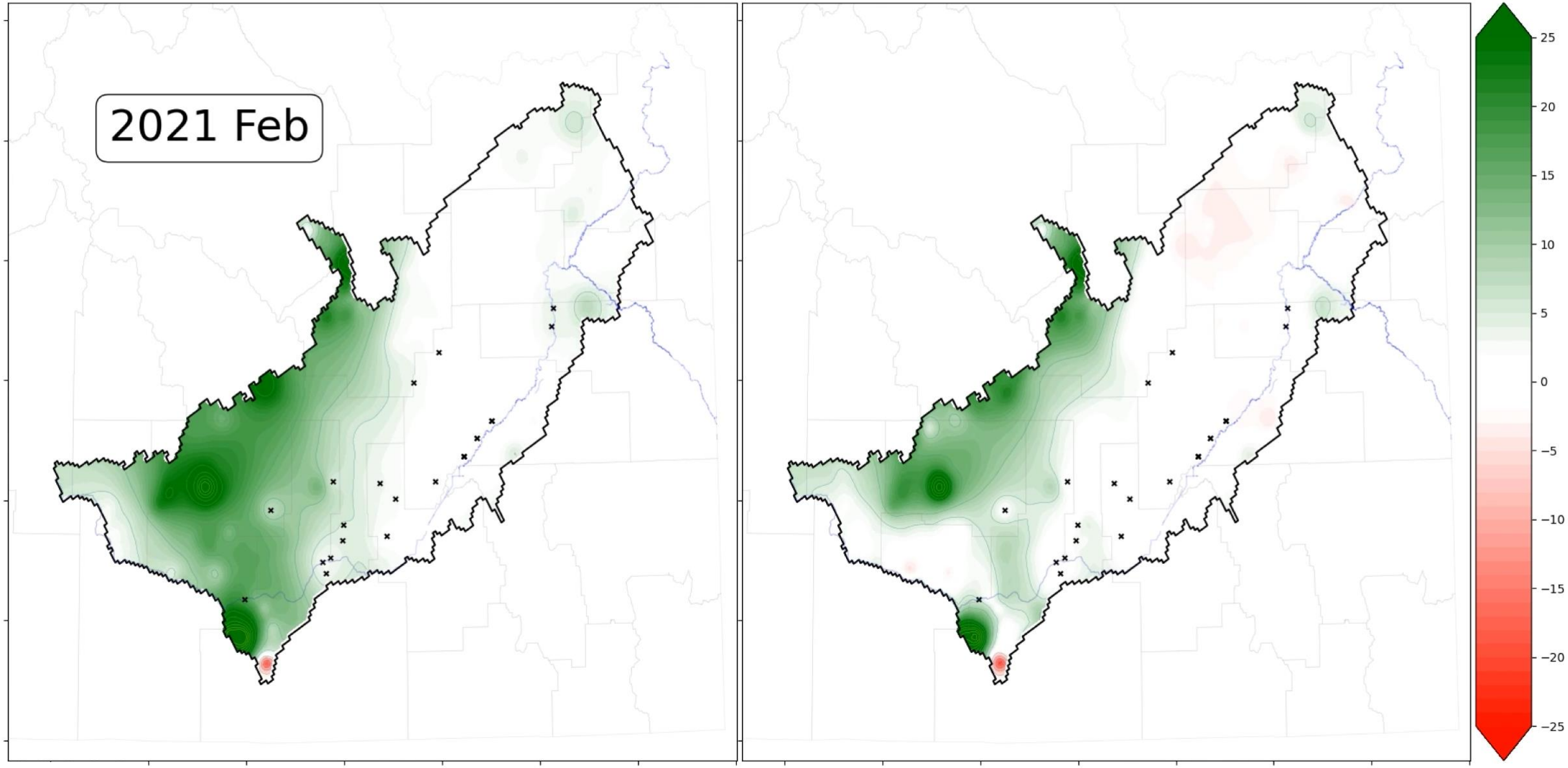
| | |
|---|---|
| Total space available: | 2,161,601 AF |
| Total storage capacity: | 4,045,695 AF |

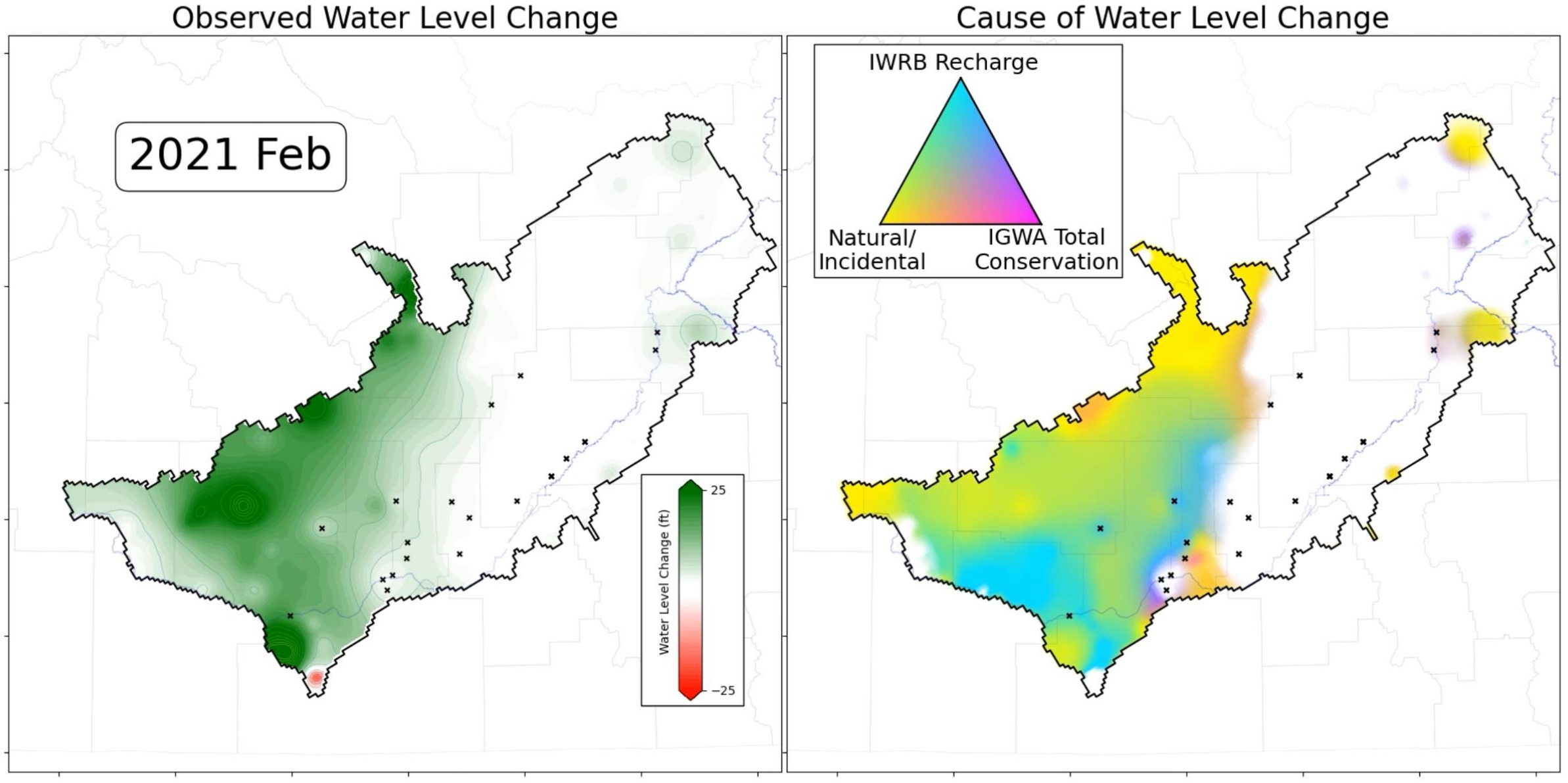
# How much of the water level rise is due to changes in management?



# Observed Water Level Change

# Water Level Change w/o Management




Observed Water Level Change
2021 Feb
Water Level Change (ft)
25
−25
Cause of Water Level Change
IWRB Recharge
Natural/
Incidental
IGWA Total
Conservation

# Conclusions

- It took decades for water levels to decline to their current levels
  - Likewise, it will take decades to resolve all the issues
- Changes in aquifer management are already starting to improve aquifer conditions
- There will be droughts, where options for aquifer management will be limited
- During wet periods, it is important to capture as much water into the aquifer for use later

# Questions?

# MEMO

**To:** Idaho Water Resource Board

**From:** Kala Golden

**Date:** July 12, 2021

**Subject:** Bennington Irrigating Company– New Water Project Loan Application

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**Action Item: $200,000 loan request**

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## 1.0 INTRODUCTION

Bennington Irrigating Company (Company) is requesting a new loan in the amount of $200,000 from the Idaho Water Resource Board (Board) to replace deteriorated pipeline and its main concrete flume (Project).

## 2.0 BACKGROUND

Based in Bear Lake County, the Company provides irrigation water to 79 shareholders within its service area. Located 4 miles north of Montpelier, Idaho, the Company's service area covers approximately 1,550 acres of irrigated lands, delivering water to its 20,000 shares held by the Company's users. Water is sourced from unnamed streams within Bennington Canyon. The main concrete flume and several thousand feet of pipe throughout the Company's delivery system have deteriorated beyond acceptable conditions for use, and need to be replaced. Like many water delivery systems throughout Southern Idaho, the Company's aging infrastructure is in need of imminent repairs to sustain future use of the system, and conserve valuable water supplies.

## 3.0 PRIOR LOANS

The Company has not previously held a water project loan with the Board.

## 4.0 PROPOSED PROJECT

The Project includes the installation of over 12,000 feet of pipeline, 2 new head boxes, and replacement of the Company's main flume. Engineering and technical support will be provided by the Idaho Soil & Water Conservation Commission. The project is anticipated to begin October 2021, and be completed by December of 2021.

## 5.0 BENEFITS

The necessary system improvements will provide a reliable, long-term water supply for the users within the Company's service area, helping to protect valuable agricultural lands within the State of Idaho.

## 6.0 FINANCIAL ANALYSIS

The total project costs are estimated to be approximately $257,000. The company has been approved for a grant from the Bear Lake Soil & Water Conservation District in the amount of $34,050, and requires a two-thirds match. The Company will fund the required match of $22,700, and is requesting a loan from the Board for the remaining project costs, estimated to be approximately $200,000.

The Company, by approval of its voters, last increased shareholder assessments in April of 2021, to account for costs related to the proposed Project. The Company's shareholders currently pay $100 per shareholder for the first 13 shares, and $1.00 per share for each additional share held; up from previous assessments of $0.20 per additional share. The Company does not hold any existing debts.

The Company is requesting a new loan of $200,000 for a 15-year term. The following analysis reflects the Board's current interest rate of 3.5%. The Company's previous annual revenues are based on an average of the most recent 3-year period.

**Payment Analysis**

| Term (Years) | Estimated Annual Payment- Revolving Account Loan | Previous Assessments Total Annual Revenues | New Assessments Total Annual Revenues* |
|---|---|---|---|
| 15 | $17,365.01 | $6,049.55 | $26,827.36 |

*Effective April 2021

## 6.0 WATER RIGHTS

| WATER RIGHT | SOURCE | Diversion Rate (CFS) | PRIORITY DATE |
|---|---|---|---|
| 11-4226 | Unnamed Streams | 47.000 | 08/06/1880 |

## 7.0 SECURITY

As collateral for the loan, the Board is authorized to hold the Company's water rights associated with the System, in addition to its facilities, equipment, and all materials associated with this project.

## 8.0 OTHER CONSIDERATIONS

In consideration of current market conditions and continued variability in the cost of goods, the Company has committed to securing necessary materials in a timely manner, to ensure project costs remain manageable. In the case the proposed loan is approved, the Company would like to request that the Board consider a future amendment to the interest rate approved. Should the Board modify its Loan Program rates within the next 3 months, the Company would like to request that the Board consider allowing an adjustment to the approved interest rate on its loan, based on the rate set for this type of project.

## 9.0 CONCLUSION AND RECOMMENDATION

This loan will be used to replace deteriorated infrastructure within the Company's service area. Bennington Irrigating Company is a qualified applicant, and the project for which the Company has proposed is consistent with the goals of the Board as identified within the Idaho State Water Plan. Staff recommend approval of the loan request by the Company, for the total amount of $200,000.

**IDAHO WATER RESOURCE BOARD**
322 East Front Street, Statehouse Mail
Boise, Idaho 83720
Tel: (208) 287-4800
FAX: (208) 287-6700

# APPLICATION FOR FINANCIAL ASSISTANCE FOR NON-POTABLE WATER SYSTEM CONSTRUCTION PROJECT

Answer the following questions and provide the requested material as directed. All pertinent information provided. Additional information may be requested by the Idaho Water Resource Board (IWRB) depending on the scope of the project and amount of funding requested. For larger funding amounts an L.I.D. may be required.

**Incomplete documents will be returned and no further action taken will be taken by IWRB staff. All paperwork must be in twenty eight (28) working days prior to the next bi-monthly Board meeting.**

Board meeting agendas can be found at: http://www.idwr.idaho.gov/waterboard/

## I. Prepare and attach a "Loan Application Document".

The Loan Application Document requirements are outlined in the Water Project Loan Program Guidelines. The guidelines can be found at:
http://www.idwr.idaho.gov/waterboard/Financial%20program/financial.htm.
You can also obtain a copy by contacting IWRB staff.

## II. General Information:

A. Type of organization: (Check box)

- ☐ Irrigation District
- ☒ Canal/Irrigation Company
- ☐ Lateral Association
- ☐ Flood Control District
- ☐ Homeowners Association
- ☐ Water User's Association
- ☐ Municipality
- ☐ Reservoir Company
- ☐ Other

Explain: _____

Bennington Irrigating Company
Organization name

Rhett Phelps / President
Name and title of Contact Person

423 N. 2nd E.
PO Box/Street Address

(208) 317-7243
Contact telephone number

Bennington, Idaho, 83254
City, County, State, Zip Code

rhettphelps@yahoo.com
e-mail address

Project location legal description: Waters running from Bennington Canyon - SE1/4 SE1/4 of Section 10, Township 12 South, Range 44 East of the Boise Meridian, in Idaho;

B. Is your organization registered with the Idaho Secretary of State's office? Yes ☒ No ☐

**C.** Purpose of this loan application.

- ☐ New Project
- ☒ Rehabilitation or replacement of existing facility
- ☐ DEQ requirement
- ☐ Other: _____

**D.** Briefly describe the project:

Replace an old deteriorated concrete flume with larger plastic pipe, estimated cost $250K, projected start date Oct 1, 2021 ending Dec 1, 2021

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## III. WATER SYSTEM:

**A.** Source of water:

- ☒ Stream
- ☐ Reservoir
- ☐ Groundwater
- ☐ Other

**B.** Water Right Numbers:

| Water Right | Stage | Priority Date | Source | Amount |
|---|---|---|---|---|
| 11-4226 | Active | 8/6/1880 | Unnamed streams | 47.000 |
| | | | | |
| | | | | |
| | | | | |

**Note:** Stage refers to how the water right was issued. (License, Decree, or Permit)

**C.** If irrigation/lateral system:

Number of acres served: _____

Number of shareholders served 79

Water provided annually (acre-feet) _____

**D.** If flood control system, drainage system, groundwater recharge, or other type of system:

Number of acres within District or service area: N/A

Number of people within District or service area: N/A

**E.** If an Association/Municipality the number of residences served by the system:

Number of residences served: N/A

Number of hookups possible: N/A

---

## IV. USER RATES:

**A.** How des your organization charge users rates?

- ☐ Per acre
- ☒ Per share
- ☐ Per hook up
- ☐ Tax assessment

Explain what a share is: 1/20000 of total seasonal stream flow

- ☒ Other, explain $100.00 for the first 13 shares and then an addditional $1.00 per share for each additional share

**B**. Current rate? $ see other above per Previous rate -$.20/share
(Share, hook-up, month, year, etc.)

**C**. When was the last rate change? April 2021 (month/year)

**D**. Does your organization measure water use? Yes ■ No ☐
If yes, explain how: System of diversion boxes and weirs

**E**. Does you organization have a regular assessment for a reserve fund? Yes ☐ No ■
If yes, explain how it is assessed:

**F**. Does your organization have an assessment for some future special need? Yes ■ No ☐
If yes, explain for what purpose and how it is assessed:
To assist with future project piping replacement and associated fees

## V. PROPOSED METHOD FOR REVENUE FOR REPAYMENT OF LOAN

**How will you plan to assess for the annual loan payments?**

Check revenue sources below:

☐ Tax Levies
☐ Capital Improvement Reserve Account or Sinking Fund
☐ User Fees and Tap/Hookup Fees
■ Other (explain) Annual adjusted assessments as needed

Will an increase in assessment be required? Yes ■ No ☐
When will new assessments start and how long will they last?
April 2021 for approximately 10 years

## VI. SECUREMENT OF LOAN

List all land, buildings, waterworks, reserve funds, and equipment with estimated value that will be used as collateral for the loan:

| Property | Estimated Value |
|---|---|
| Approximately 5000' of main line piping | $75000 |
| Two steel diversion structures | $10000 |

**For property Securement, attach a legal description of the property being offered along with a map referencing the property.**

## VII. FINANCIAL INFORMATION:

**A**. Attach a copy of each of the last 3 year's financial statement. **(Copies must be attached)**

**B.** Reserve fund (current) _____

**C.** Cash on hand $32218.78

**D**. Outstanding indebtedness:

| To Whom | Annual Payment | Amt. Outstanding | Years Left |
|---|---|---|---|
| None | | | |
| | | | |

**E.** What other sources of funding have been explored to fund the project? (example: NRCS, USDA Rural Development, Banks, Local Government, etc.)

Soil & Water Conservation (Bear Lake District) - matching fund $34,050 to our $22,700

---

## VIII. ORGANIZATION APPROVAL:

Is a vote of the shareholders, members, etc. required for loan acquisition? Yes ☐ No ■
If yes, a record of the vote must be attached.

**Amount of funds requested:** $200000

*By signing this document you verify that all information provided is correct and the document is filled out to the best of your ability.*

**Authorized signature& date:** Aaron R Jaubet 5/29/2021

**BEFORE THE IDAHO WATER RESOURCE BOARD**

| IN THE MATTER OF BENNINGTON IRRIGATING COMPANY FUNDING REQUEST | RESOLUTION TO AUTHORIZE FUNDING FOR THE REPLACEMENT OF DETERIORATED INFRASTRUCTURE |
|---|---|

WHEREAS, Bennington Irrigating Company (Company) submitted a loan application to the Idaho Water Resource Board (IWRB) in the amount of $200,000.00 to replace deteriorated piping and its main concrete flume (Project)

WHEREAS, the Company, located in Bear Lake County, provides water to approximately 1,550 acres of irrigated land within its service area; and

WHEREAS, the aging infrastructure of the Company's delivery system is in need of imminent repairs to remain sustainable for future use; and

WHEREAS, the necessary system improvements will provide a reliable, long term water supply for users within the Company's service area, helping to protect valuable agricultural lands within the State of Idaho; and

WHEREAS, the total estimated cost for the Project is approximately $257,000. The Company has secured grant funding in the amount $34,050 from the Bear Lake Soil & Water Conservation District. The grant requires a two-thirds match, and will be funded by the Company in the amount of $22,700; and

WHEREAS, the Company is a qualified applicant and the proposed Project qualifies for a loan from the Board's Revolving Development Account; and

WHEREAS, the proposed Project is in the public interest and is in compliance with the State Water Plan.

NOW THEREFORE BE IT RESOLVED that the IWRB approves a loan not to exceed $200,000 from the Revolving Development Account at 3.5% interest with a 15-year repayment term, and provides authority to the Chairman of the Idaho Water Resource Board, or his designee, to enter into contracts with the Company on behalf of the Board.

NOW THEREFORE BE IT FURTHER RESOLVED that this resolution and the approval of the loan are subject to the following conditions:

1) The Company shall comply with all applicable rules and regulations that apply to the proposed Project.
2) The Company will provide acceptable security for the loan to the IWRB including, but not limited to, the Company's water rights associated with the System and, all facilities and equipment associated with the Project.

DATED this 23rd day of July, 2021.

_____
JEFF RAYBOULD, Chairman
Idaho Water Resource Board

ATTEST _____
JO ANN COLE-HANSEN, Secretary