

# **DROUGHT PLANNING INITIATIVE**

**February 26, 2013**



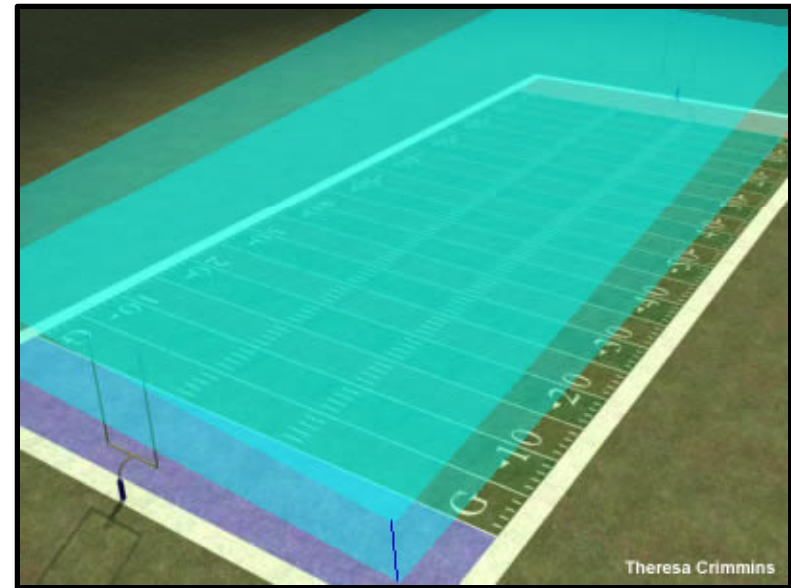
## TOPIC OVERVIEW

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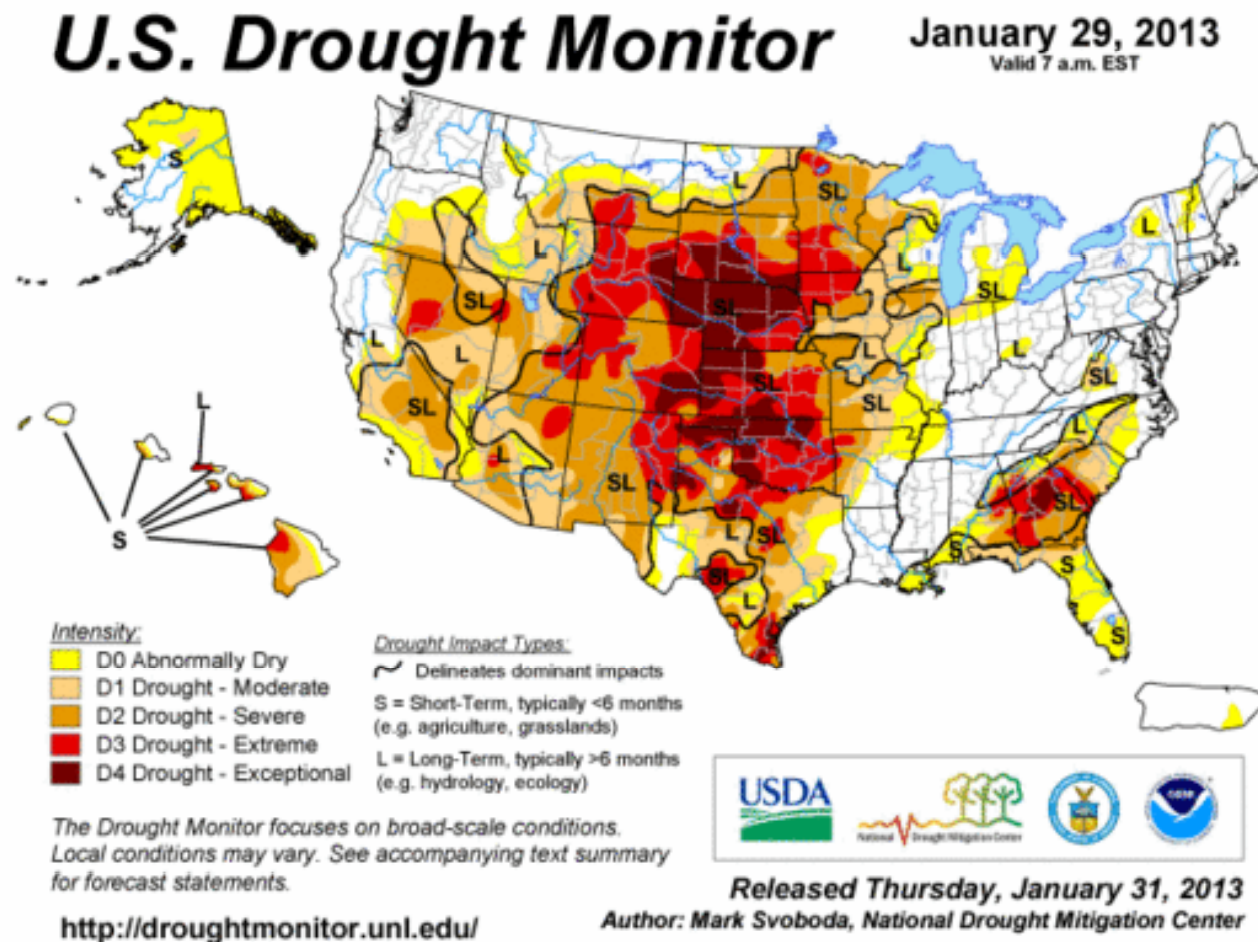
- Current conditions of Wichita's water sources
- History of previous and current droughts
- Strategies proposed to lengthen the available water supply for the community
- Water models to allow for decisions about demand reductions and supply increases

# ACRE FOOT EXPLANATION

- Large quantities of water are better measured in acre feet (1 Ac Ft = 325,851 gallons)
- Roughly equivalent to a football field with a foot of water on top of it
- Volumes are expressed in acre feet throughout the presentation



# CURRENT DROUGHT MONITOR



# KANSAS CONDITIONS

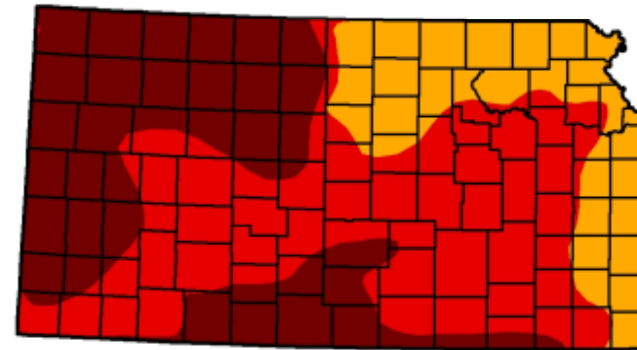
## U.S. Drought Monitor Kansas

January 29, 2013

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	79.53	36.14
Last Week (01/22/2013 map)	0.00	100.00	100.00	100.00	79.53	36.14
3 Months Ago (10/30/2012 map)	0.00	100.00	100.00	99.79	77.80	39.68
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	100.00	79.36	35.97
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	100.00	88.34	51.04
One Year Ago (01/24/2012 map)	38.25	61.75	47.15	23.20	13.50	0.22



Intensity:



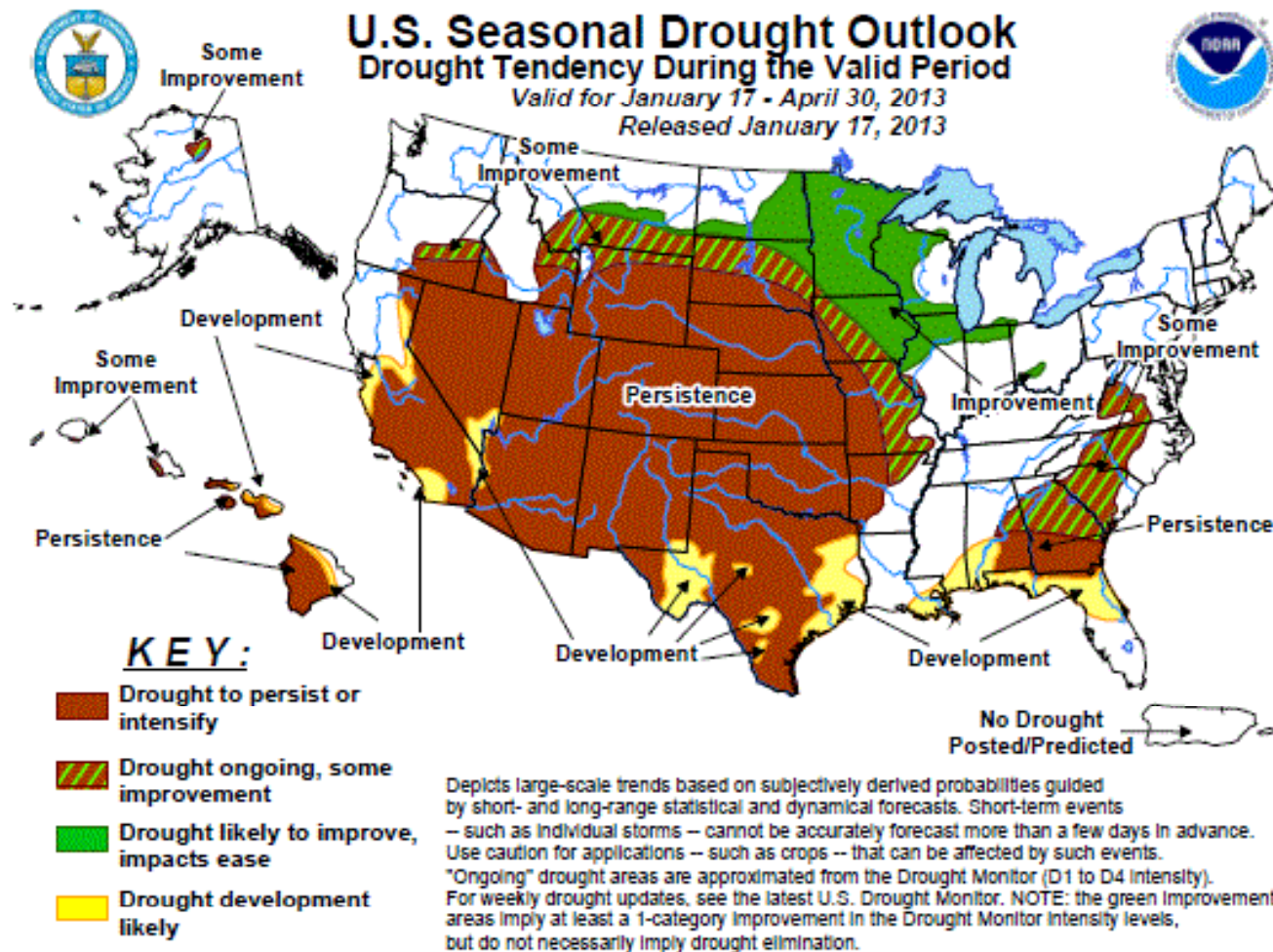
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



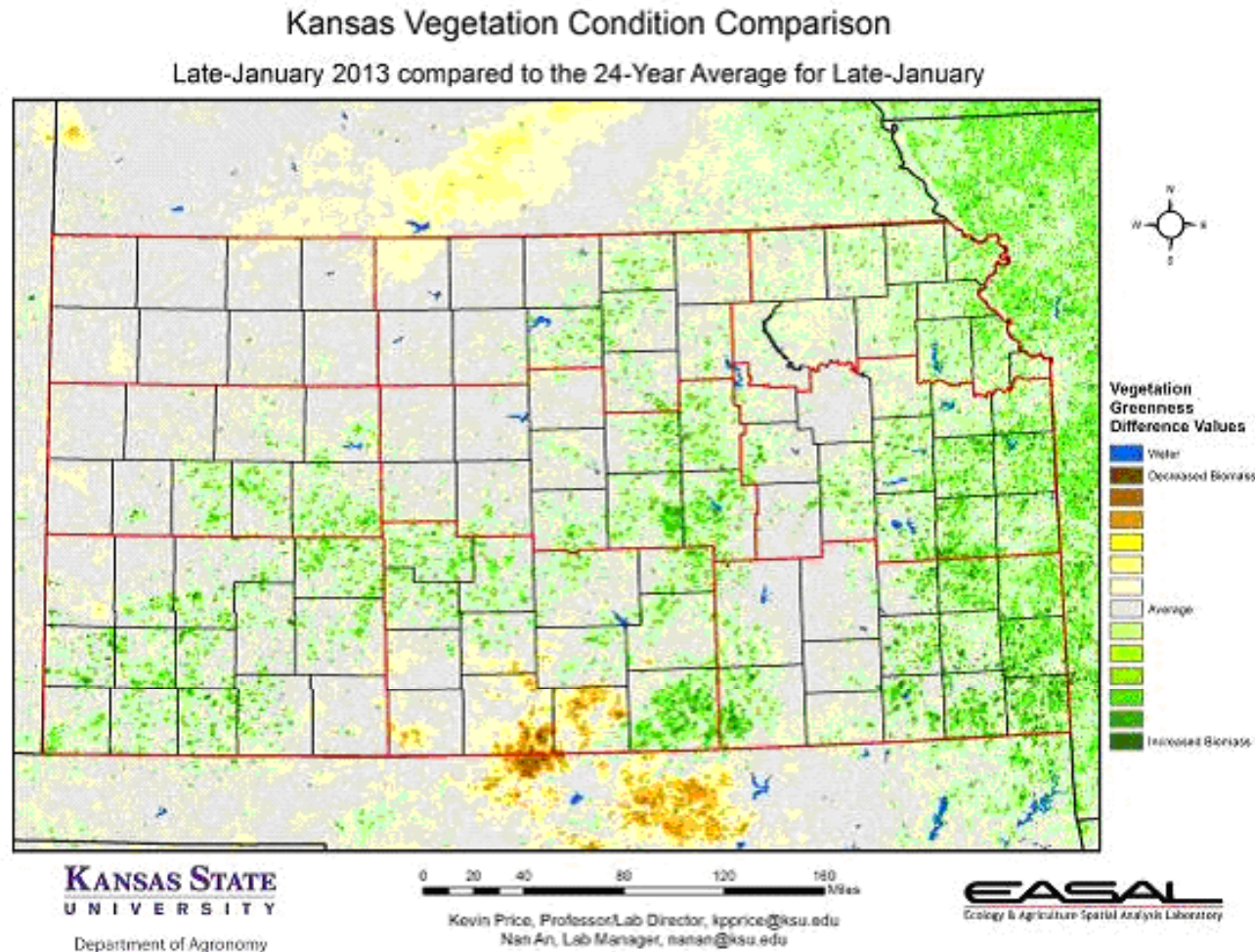
Released Thursday, January 31, 2013  
Mark Svoboda, National Drought Mitigation Center

# DROUGHT OUTLOOK





# VEGETATIVE CONDITIONS

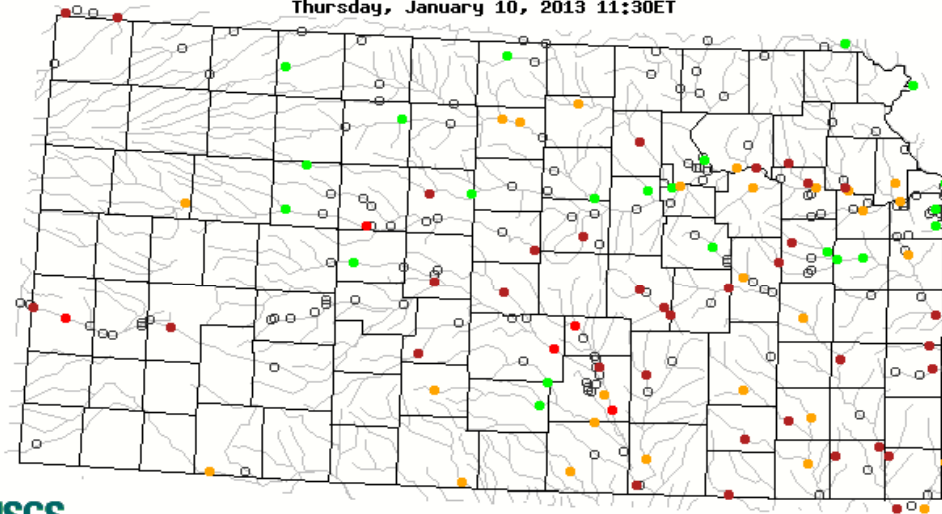


# CURRENT STREAM FLOW CONDITIONS

Map of real-time streamflow compared to historical streamflow for the day of the year (Kansas)

Kansas or Water-Resources Regions

Thursday, January 10, 2013 11:30ET



Choose a data retrieval option and select a location on the map

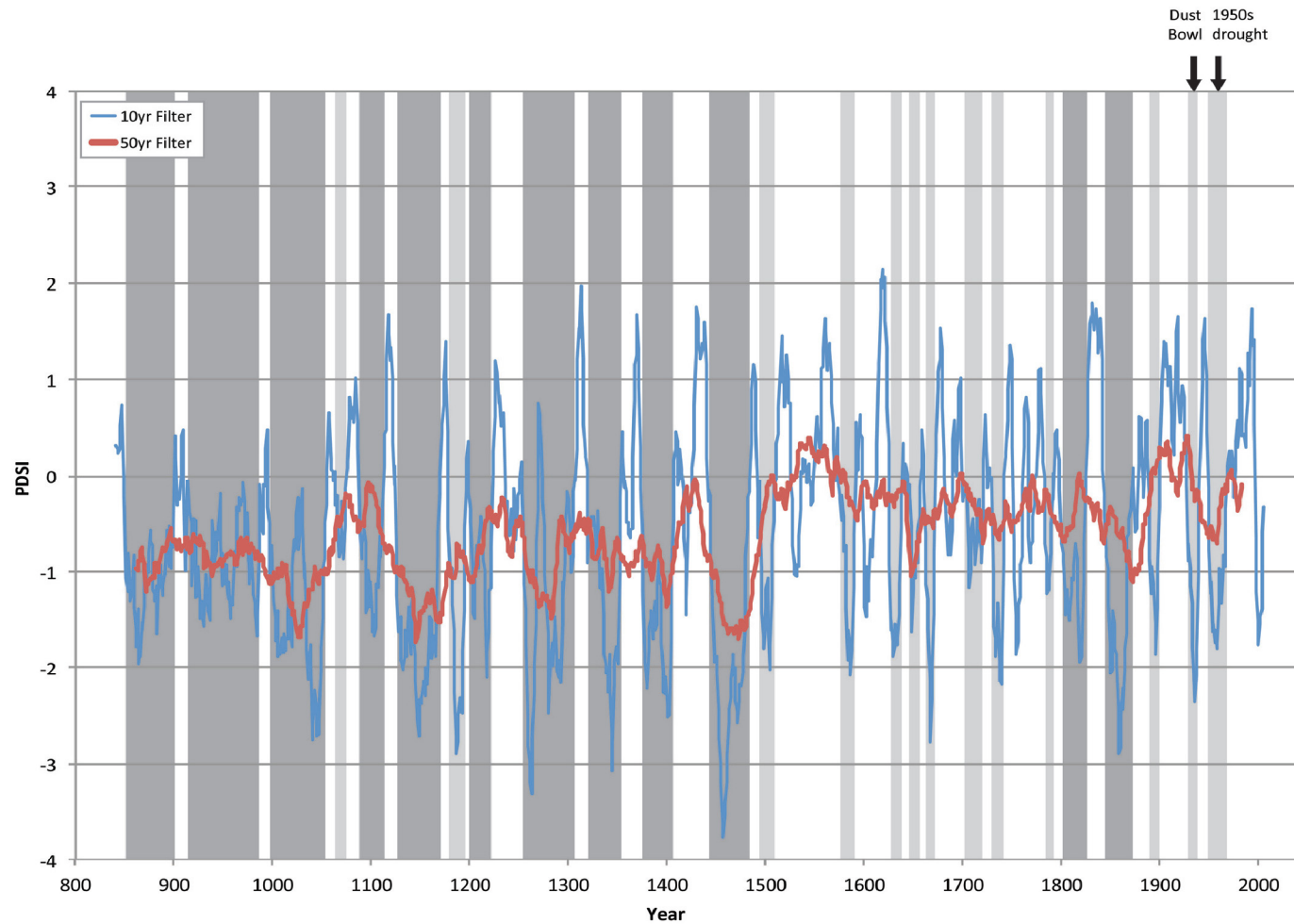
List of all stations Single station Nearest stations Peak flow

Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



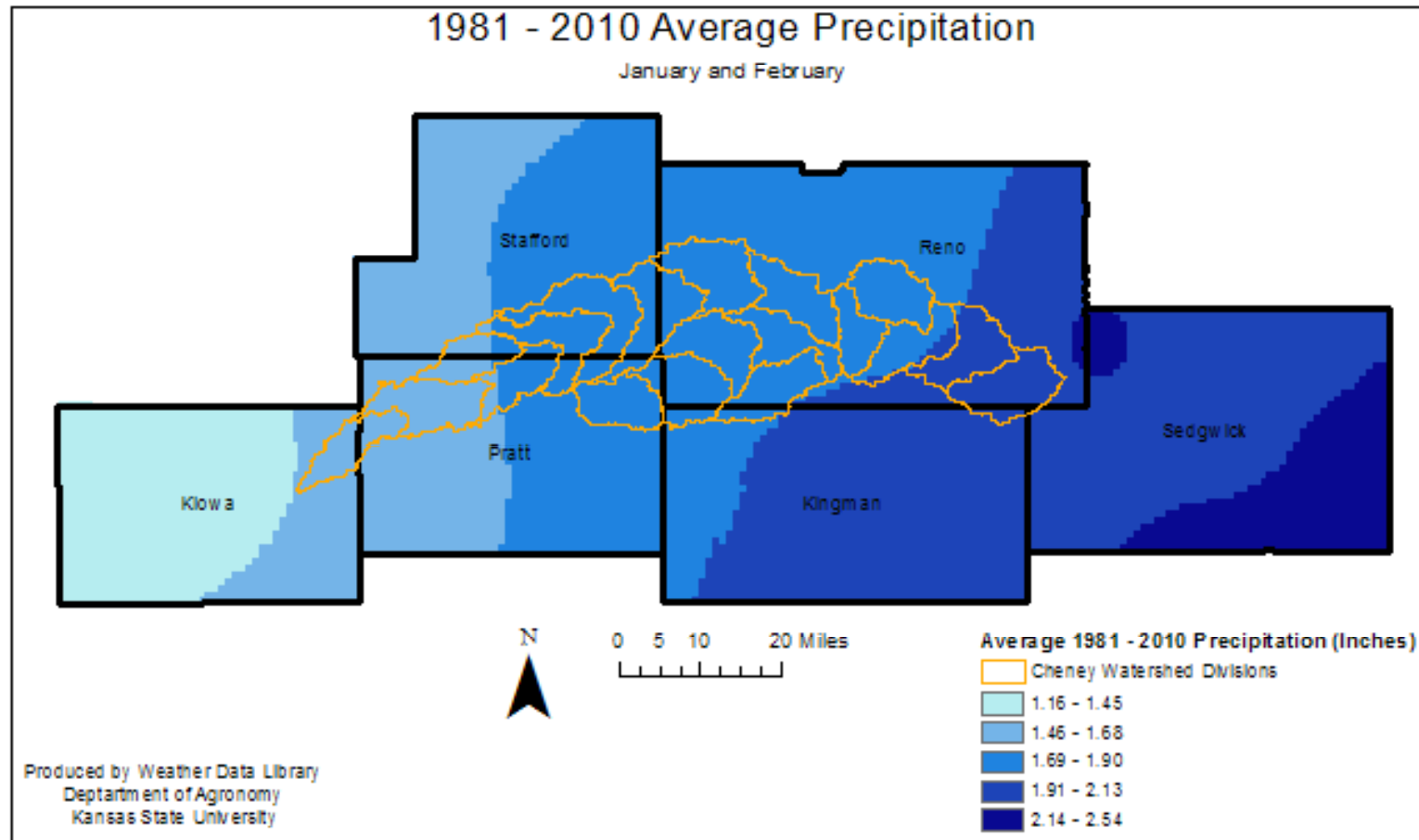
# PAST DROUGHTS



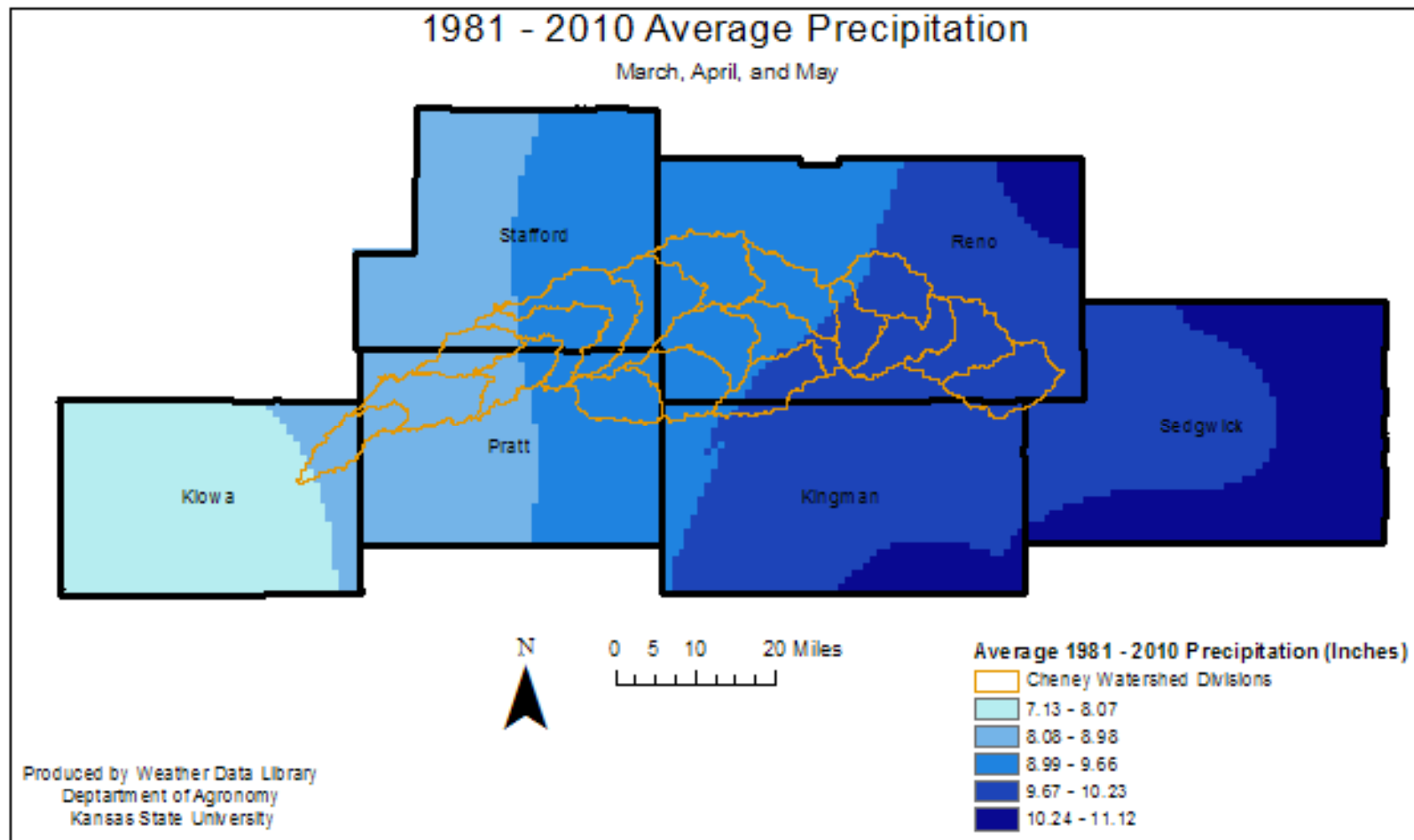
# SEDGWICK COUNTY COMPARISONS

Year	Annual	Dept from LTA
2005	35.85	5.35
2006	26.76	-3.74
2007	41.70	11.20
2008	47.77	17.27
2009	38.14	7.64
2010	30.52	0.02
2011	24.39	-6.11
2012	25.21	-5.30
Long-Term Average (LTA)	30.50	
1981-2010 Normal	32.64	
Median	31.08	
Max	47.77	
Min	24.39	

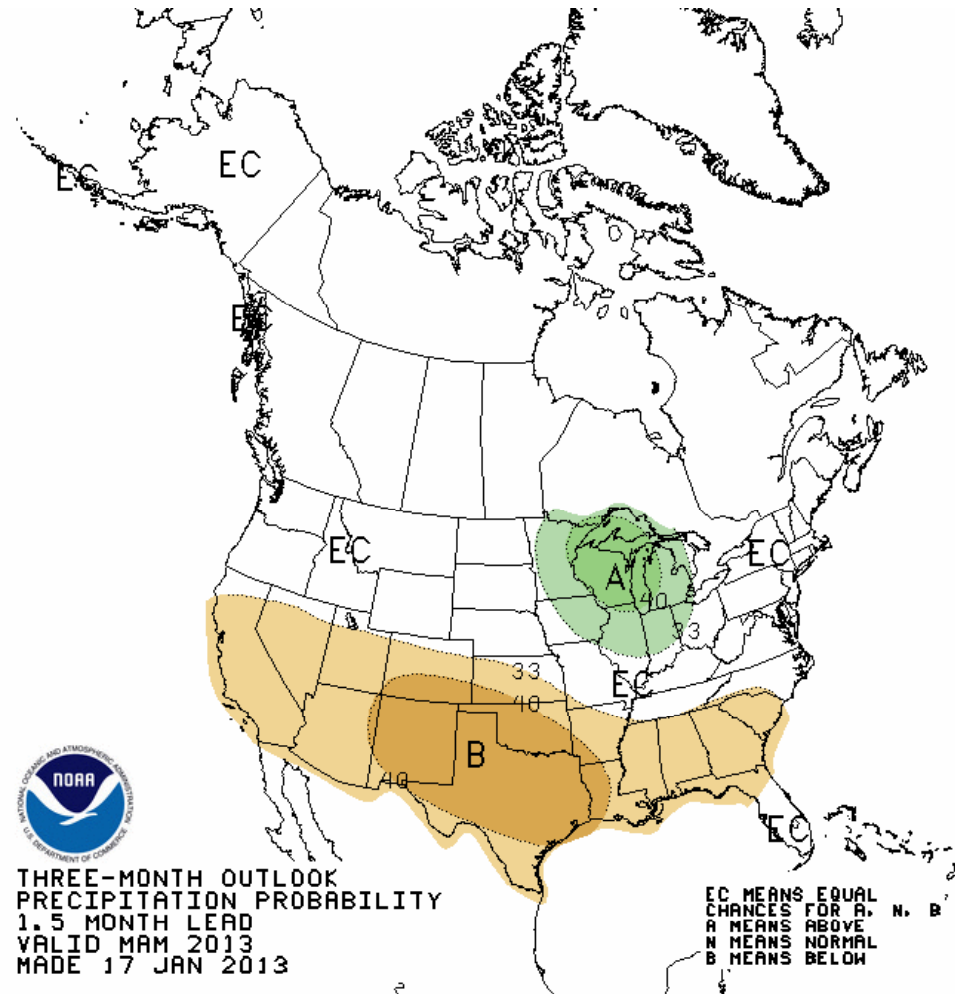
# NORMAL WINTER PRECIPITATION



# NORMAL SPRING RAINFALL



# SPRING OUTLOOK



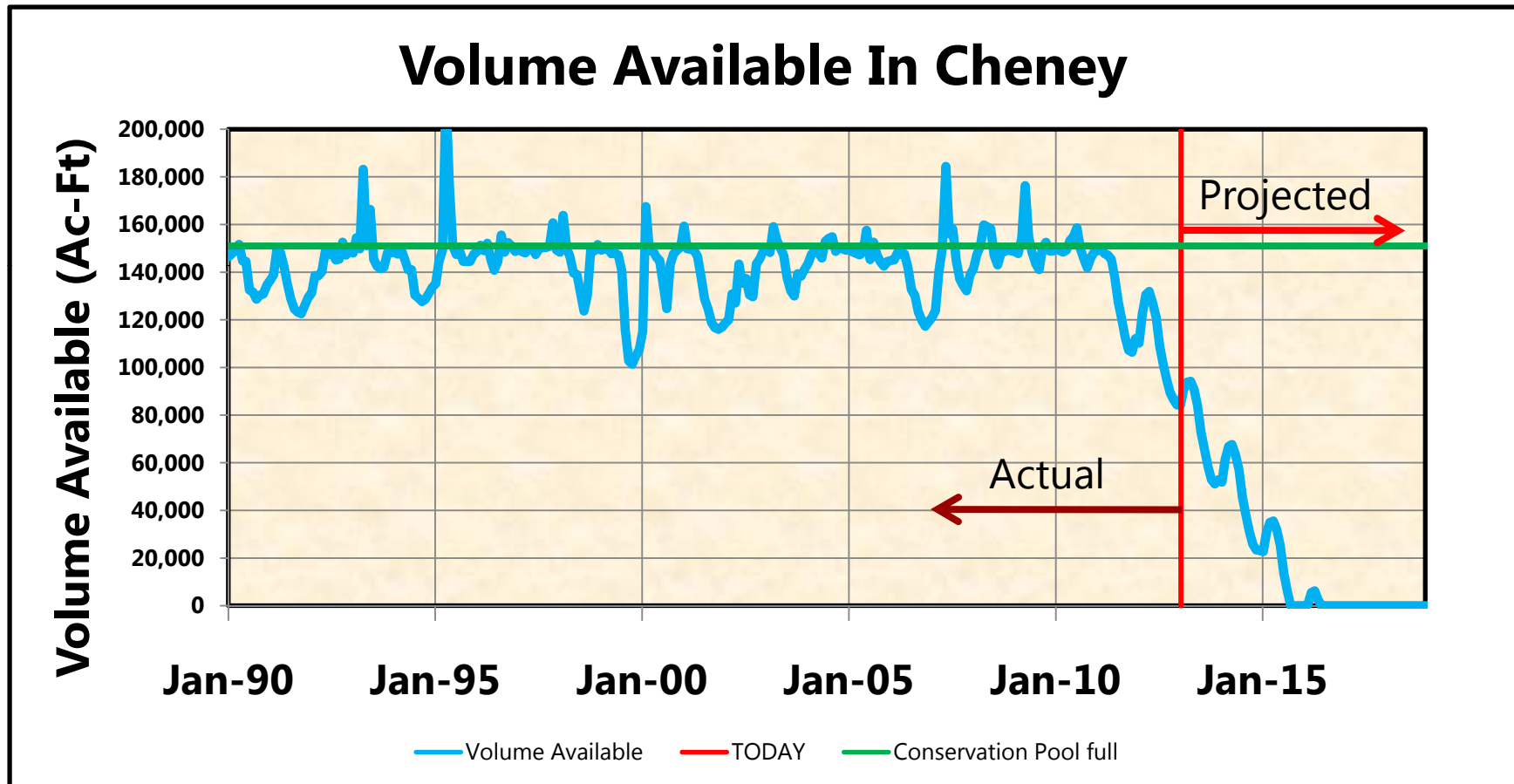


# CHENEY RESERVOIR

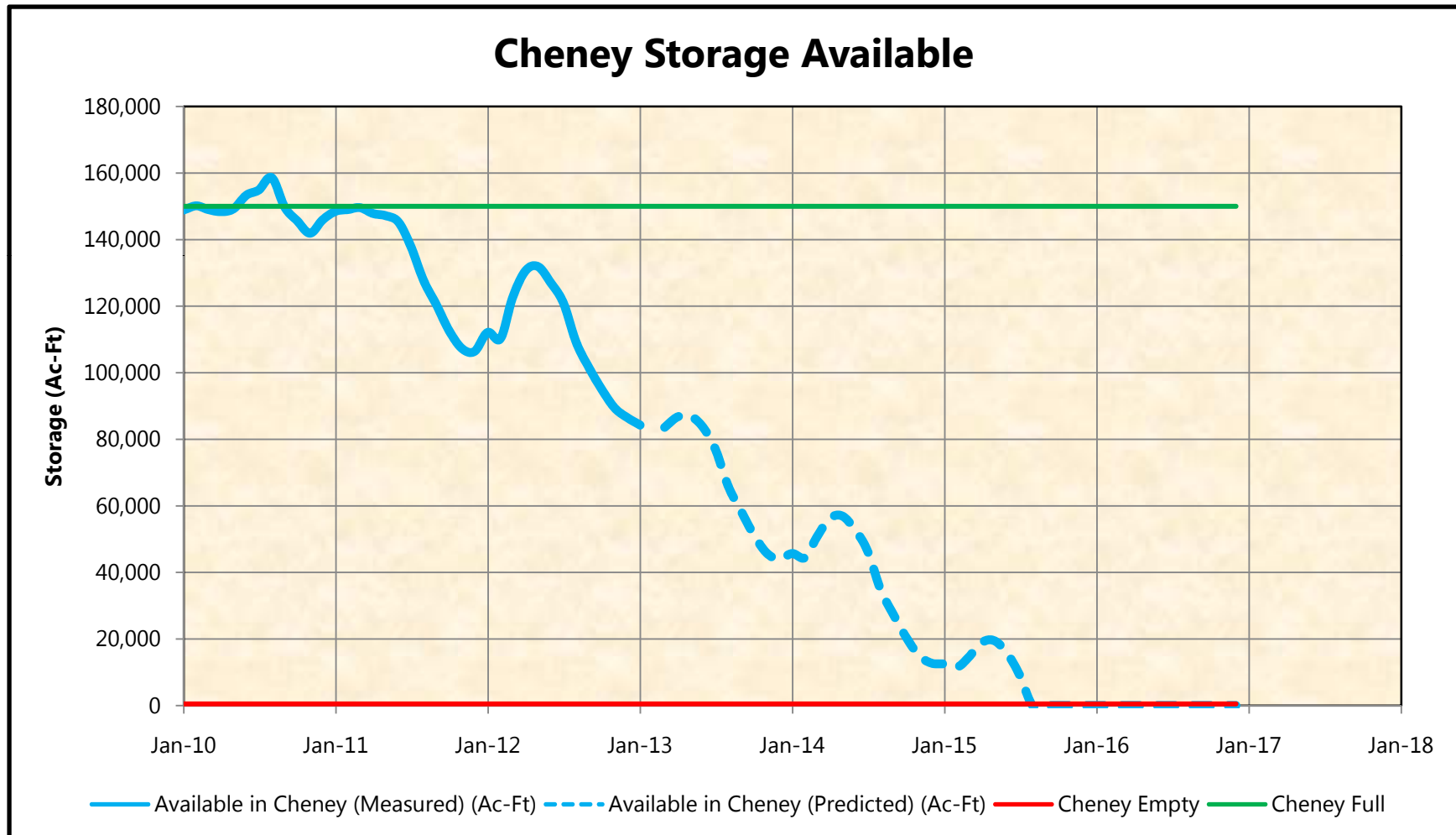
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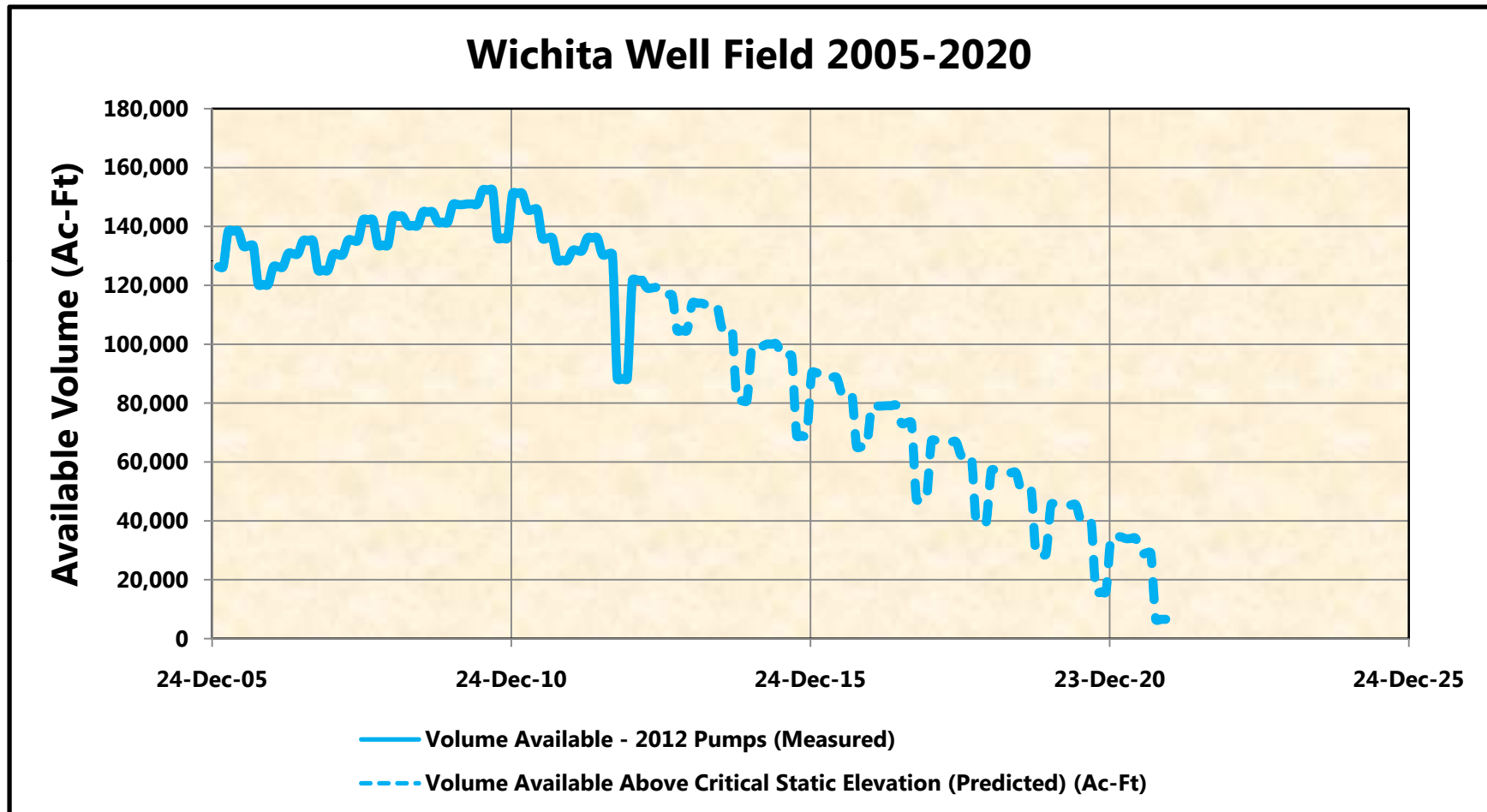
# CHENEY LAKE 1990 – 2015



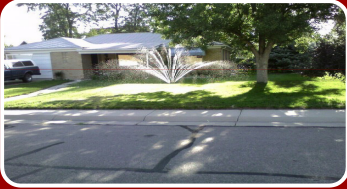
# CHENEY LAKE 2011 -2015



# CONTINUE EXISTING SUPPLY AND DEMAND

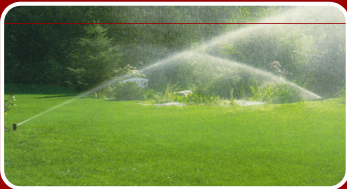


# DEMAND REDUCTION STRATEGIES



## Option 1

Voluntary Water Restrictions



## Option 2

50% Reduction in Outdoor Usage



## Option 3

100% reduction in Outdoor Usage



## Option 4

10% Reduction in Base Usage



# DEMAND REDUCTION STRATEGIES

## Option 1: Voluntary Water Restrictions

Description: Residents would be encouraged to reduce overall water consumption through voluntary restriction, with an emphasis on outdoor usage. A public information campaign and media advertisements would commence.

Shortfall: None      Water Saved: 334 Acre Feet

Supply Extension: 0.3 Months

### Monthly Customer Billing Impact

Low-Use Customers		High- Use Customers	
<u>Monthly Bill</u>	<u>Difference</u>	<u>Monthly Bill</u>	<u>Difference</u>
\$32.67	\$0.00 (0.0%)	\$151.00	\$0.00 (0.0%)

# DEMAND REDUCTION STRATEGIES

## Option 2: 50% Reduction in Outdoor Usage

Description: Would generally affect outdoor usage that does not generate economic activity, including lawn and garden watering and private pools. Golf courses, car washes, public pools, and other businesses reliant on outdoor water could operate but at higher costs.

Shortfall: \$5,016,366      Water Saved: 7,093 Acre Feet

Supply Extension: 7 Months

### Monthly Customer Billing Impact

Low-Use Customers		High- Use Customers	
<u>Monthly Bill</u>	<u>Difference</u>	<u>Monthly Bill</u>	<u>Difference</u>
\$32.67	\$0.00 (0.0%)	\$321.59	\$170.59 (113.0%)

# DEMAND REDUCTION STRATEGIES

## Option 3: 100% Reduction in Outdoor Usage

Description: Major effects on the community. Would severely impact 12 golf courses, the Stryker Sports Complex, Botanica, car washes, and companies doing construction work. About 4,000 private and public pools would be impacted.

Shortfall: \$17,245,330      Water Saved: 14,186 Acre Feet

Supply Extension: 21 Months

### Monthly Customer Billing Impact

Low-Use Customers		High- Use Customers	
<u>Monthly Bill</u>	<u>Difference</u>	<u>Monthly Bill</u>	<u>Difference</u>
\$41.64	\$8.97 (27.5%)	\$471.44	\$320.44 (212.2%)

# DEMAND REDUCTION STRATEGIES

## Option 4: 10% Reduction in Base Demand

Description: Deepest demand reduction strategy outlined. Would probably come after a reduction in outdoor usage. Strategy results in a 10% decrease in non-discretionary usage, mainly from indoor usage in homes and business operations.

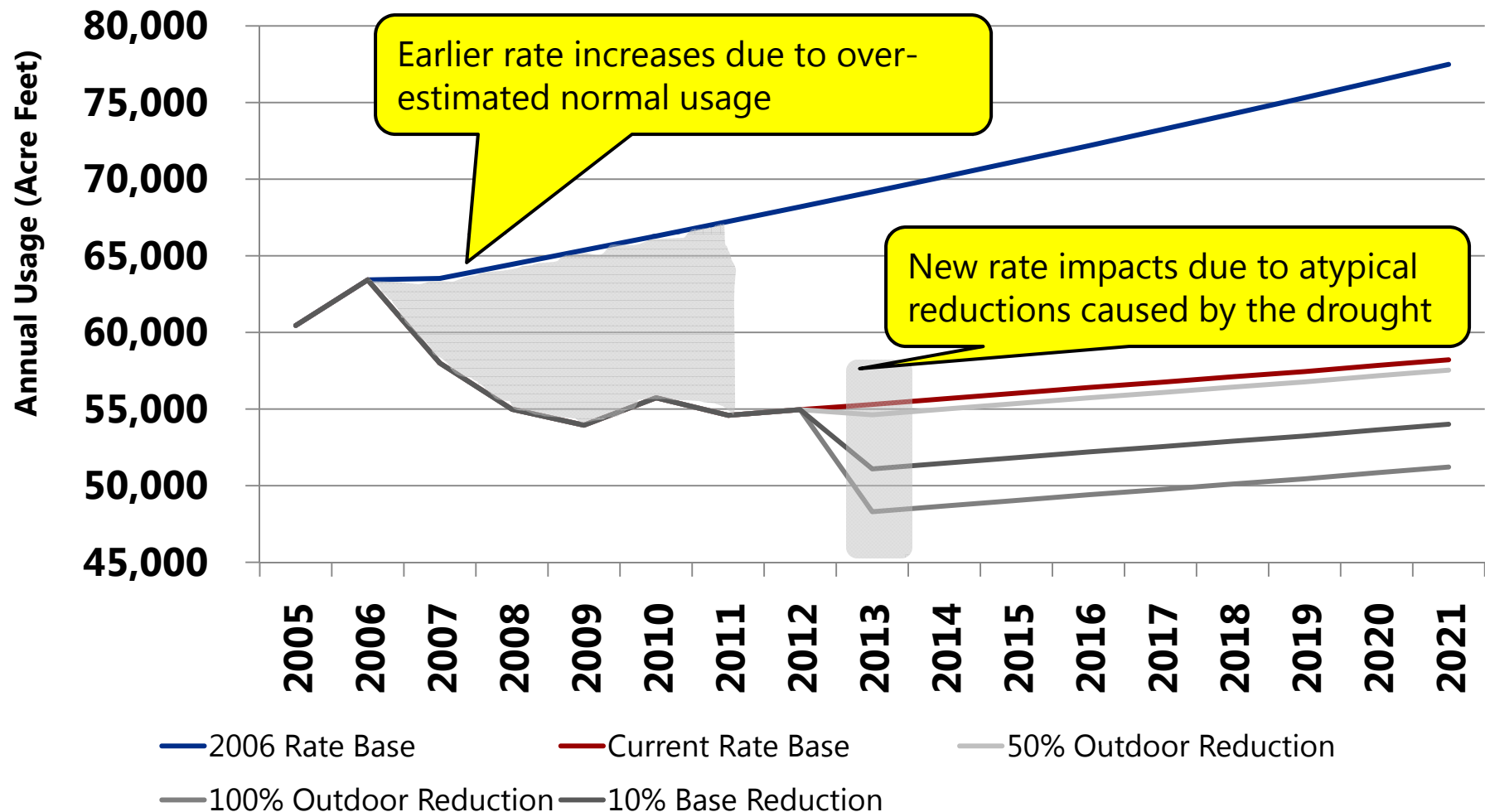
Shortfall: \$12,328,274      Water Saved: 5,177 Acre Feet

Supply Extension: 5 Months

### Monthly Customer Billing Impact

Low-Use Customers		High- Use Customers	
<u>Monthly Bill</u>	<u>Difference</u>	<u>Monthly Bill</u>	<u>Difference</u>
\$52.94	\$20.27 (62.0%)	\$488.61	\$337.61 (223.6%)

# REASON FOR RATE IMPACTS





## RATE DESIGN

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- Rates are effective instrument to reduce usage
- AWWA standards show that usage goes down 1%-3% for every 10% increase in rates

	Option 2	Option 3	Option 4
Fixed Charge	0%	77%	55%
Block 1 Increase	0%	0%	100%
Block 2 Increase	100%	300%	300%
Block 3 Increase	300%	300%	300%

# SUPPLY ENHANCEMENT STRATEGIES



## Option 1

Modify Well Field to Maximize Capacity



## Option 2

Buy Additional Water Rights



## Option 3

Develop New Groundwater Sources



## Option 4

Build a Desalinization Plant

# SUPPLY ENHANCEMENT STRATEGIES

## Option 1: Restore Well Field Capacity

Description: Restore well capacity. Extends the use of Cheney, but shortens the life of the aquifer. No rate impact because the cost can be covered by 2012 excess water sales.

Timeline: 4 Months

Cost: \$5,000,000

New Water: 15,000 Acre Feet

Supply Extension: 22 Months

### Monthly Customer Billing Impact

2013		2014	
<u>Residential</u>	<u>Commercial</u>	<u>Residential</u>	<u>Commercial</u>
\$0.00	\$0.00	\$0.00	\$0.00

# SUPPLY ENHANCEMENT STRATEGIES

## Option 2: Buy Additional Water Rights

Description: Different users in the region pull water from the same aquifer as Wichita – their water rights could be purchased to increase the supply for Wichita customers.

Timeline: 21 Months

Cost: \$80,000,000

New Water: 7,500 Acre Feet

Supply Extension: 2 Months

### Monthly Customer Billing Impact

2013		2014	
<u>Residential</u>	<u>Commercial</u>	<u>Residential</u>	<u>Commercial</u>
\$0.00	\$0.00	\$0.38	\$5.40

# SUPPLY ENHANCEMENT STRATEGIES

## Option 3: Develop New Groundwater Sources

Description: Additional wells would be installed in west Wichita to tap into shallow groundwater that is not currently being used in the system.

Timeline: 60 months

Cost: \$20,000,000      New Water: 5-10K Acre Feet

Supply Extension: Dependent on implementation of other options

### **Monthly Customer Billing Impact**

*This is a long-term strategy that would not have a rate impact until after 2014, if it is enacted. Specific customer billing impacts would be presented at a later date if this option is explored after further research.*



# SUPPLY ENHANCEMENT STRATEGIES

## Option 4: Build a Desalinization Plant

Description: Groundwater not presently available for use could be desalinated and pumped into the system. The viability of a desalinization plant is under review as part of the Water Master Plan. Source water has not yet been identified.

Timeline: 60 months

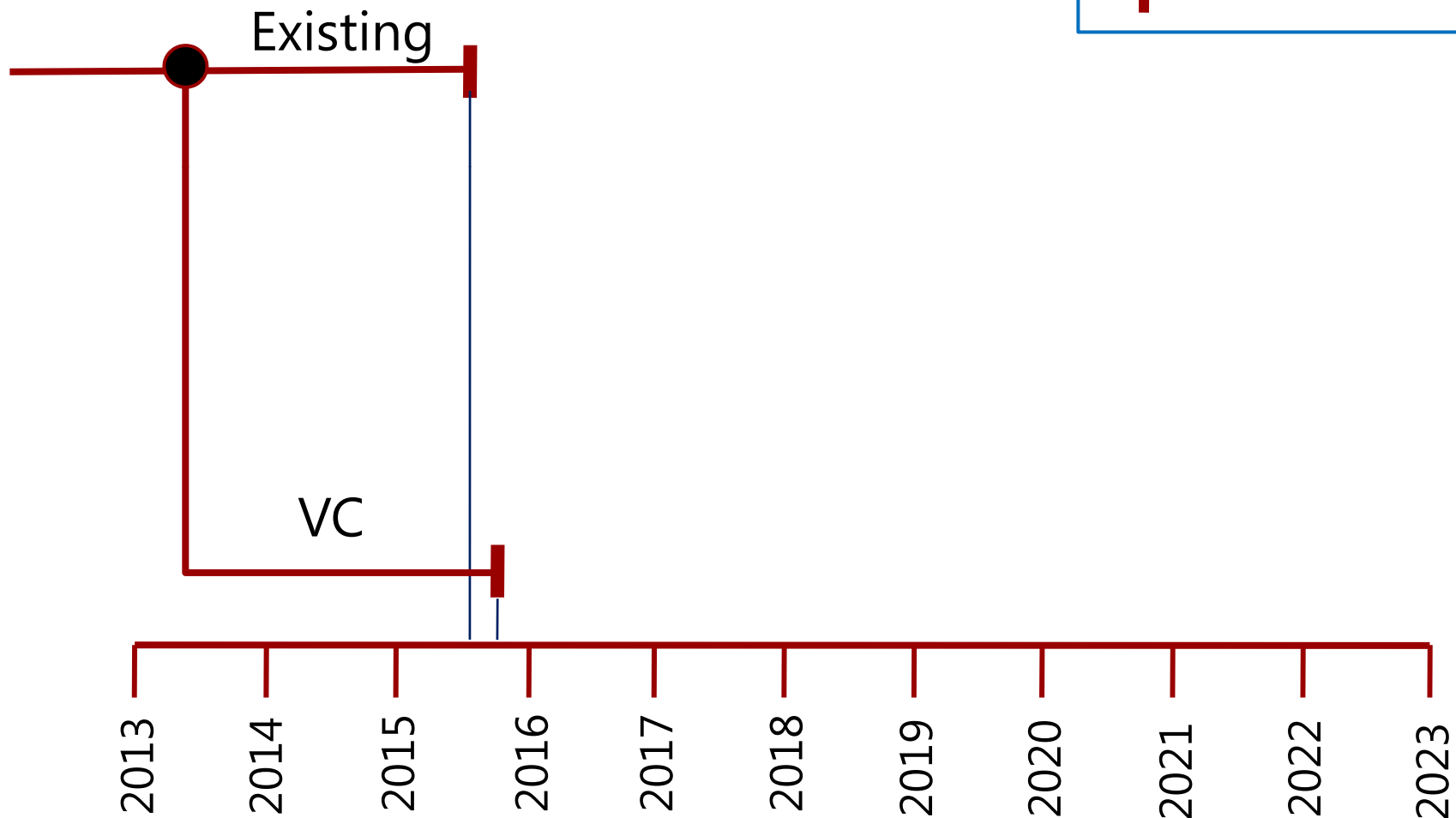
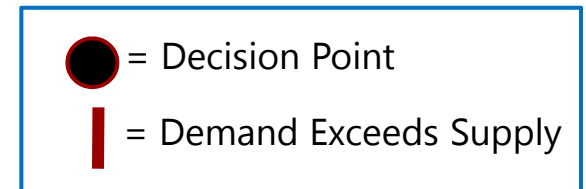
Cost: \$200,000,000      New Water: 50K Acre Feet

Supply Extension: Dependent on implementation of other options

### **Monthly Customer Billing Impact**

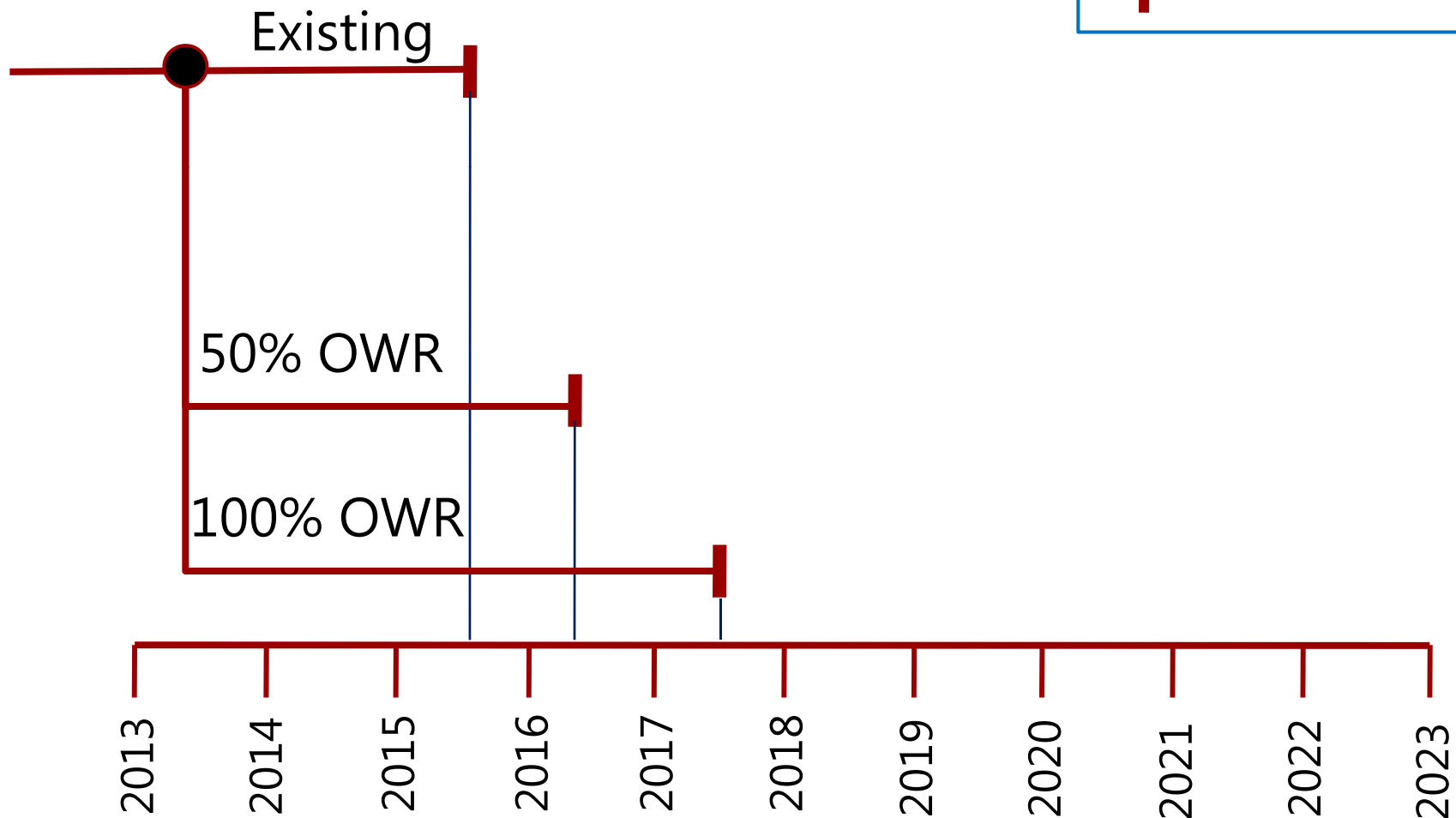
*This is a long-term strategy that would not have a rate impact until after 2014, if it is enacted. Specific customer billing impacts would be presented at a later date if this option is explored after further research.*

# 1) Voluntary Conservation ( VC )



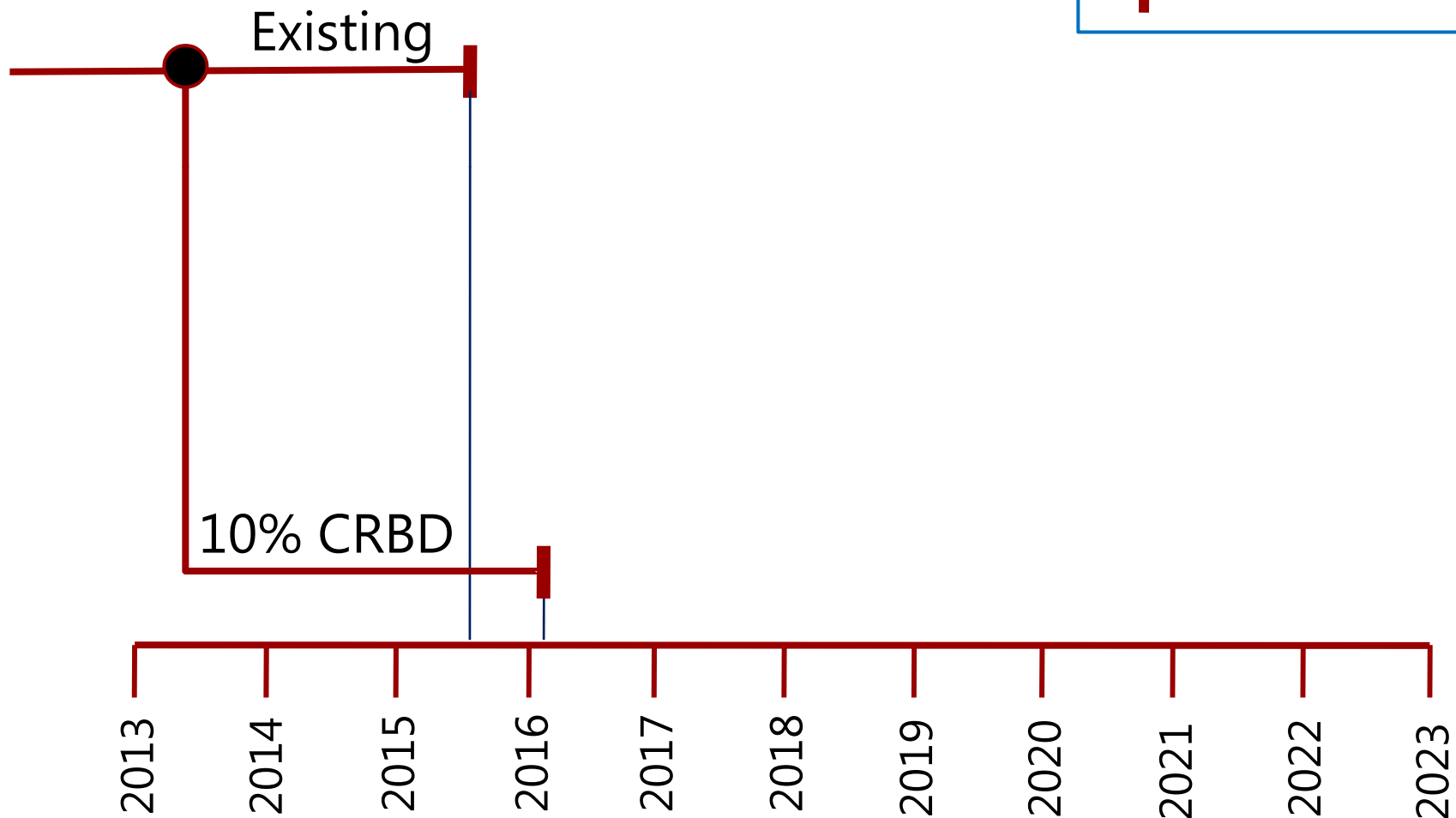
## 2) 50% vs. 100% Outside Water Reduction (OWR) in 2013

● = Decision Point  
| = Demand Exceeds Supply



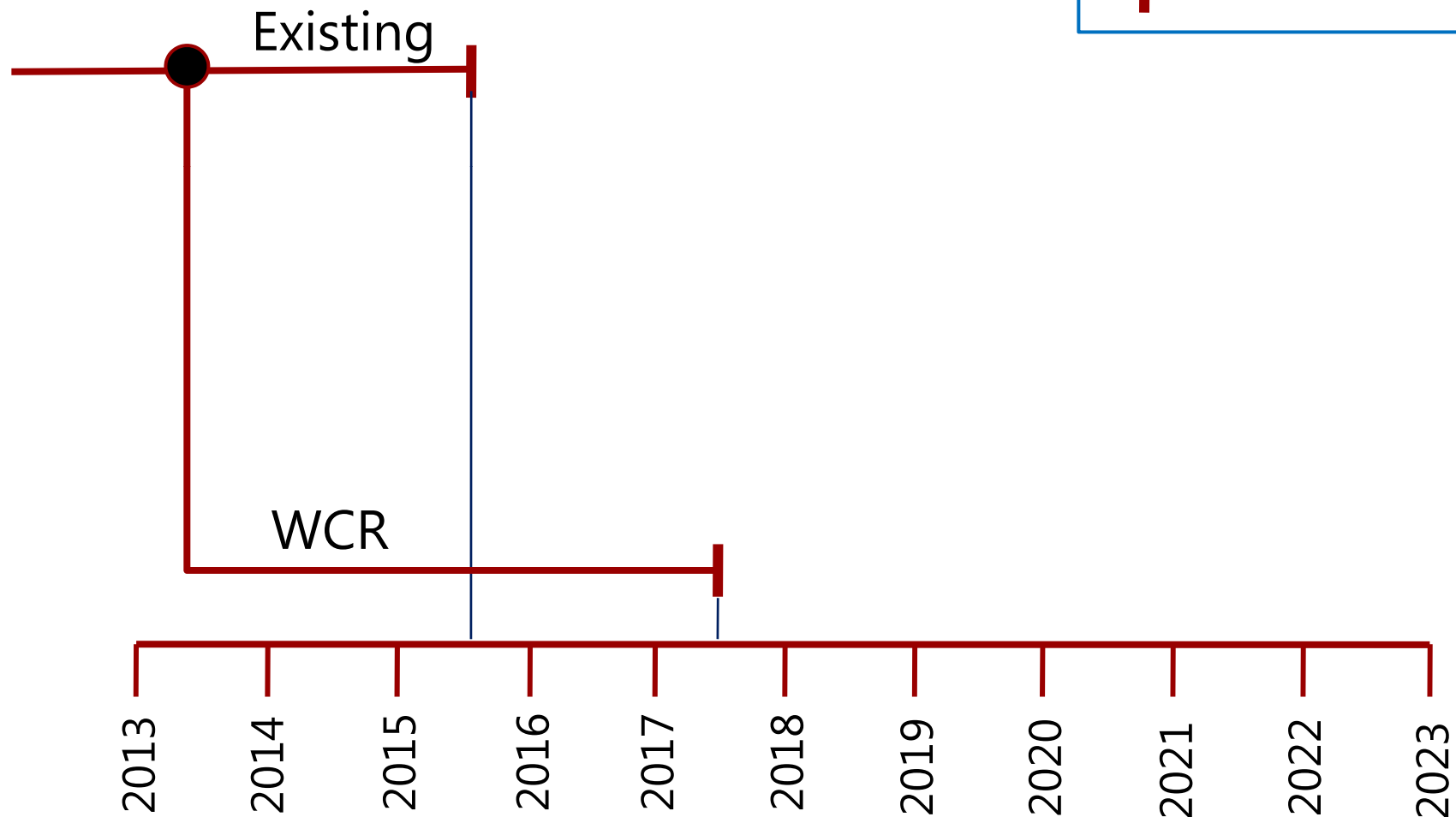
### 3) Conservation & Reduced Base Demand (CRBD)

● = Decision Point  
| = Demand Exceeds Supply

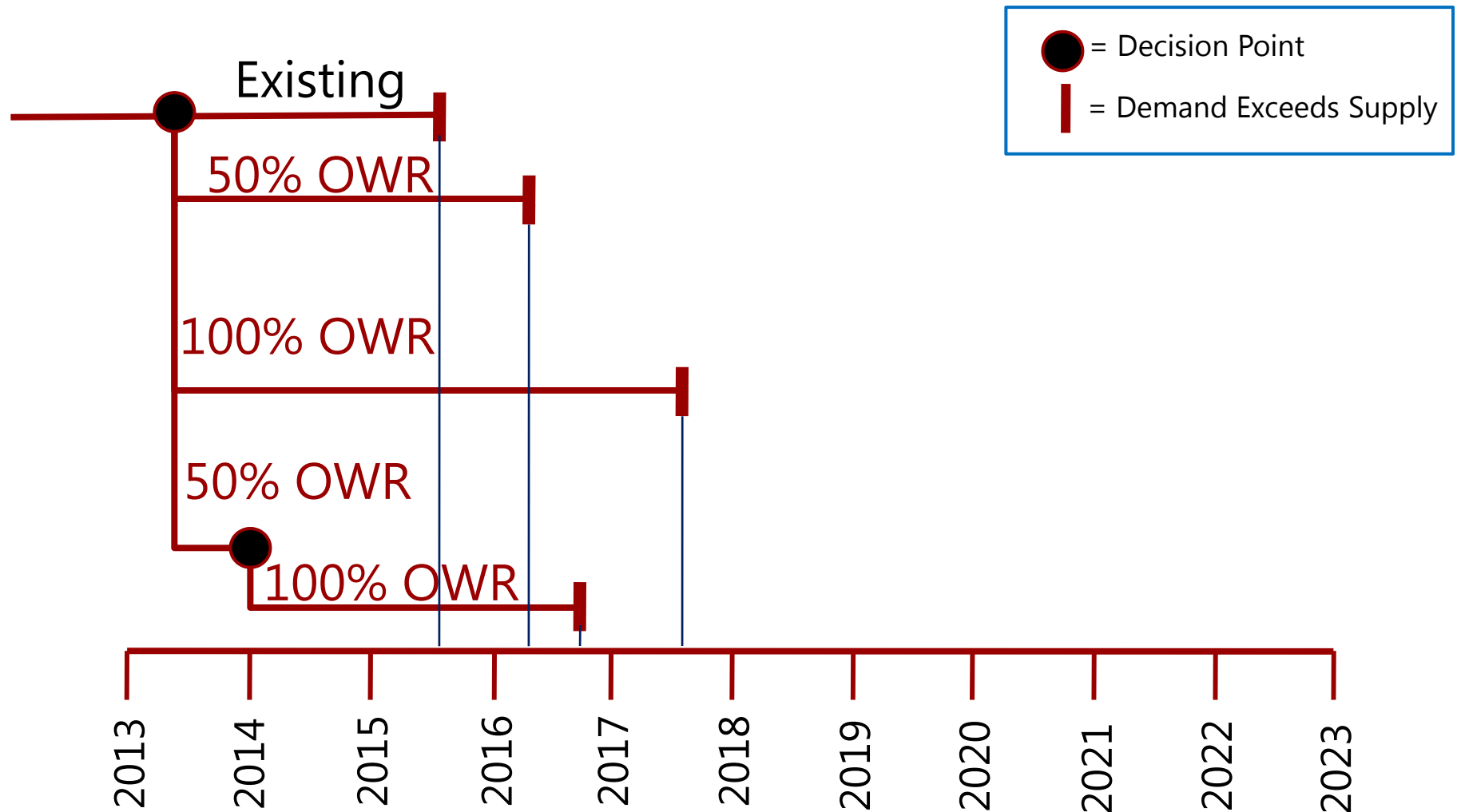


## 4) Well Field Capacity Restoration, Maximum Production (WCR)

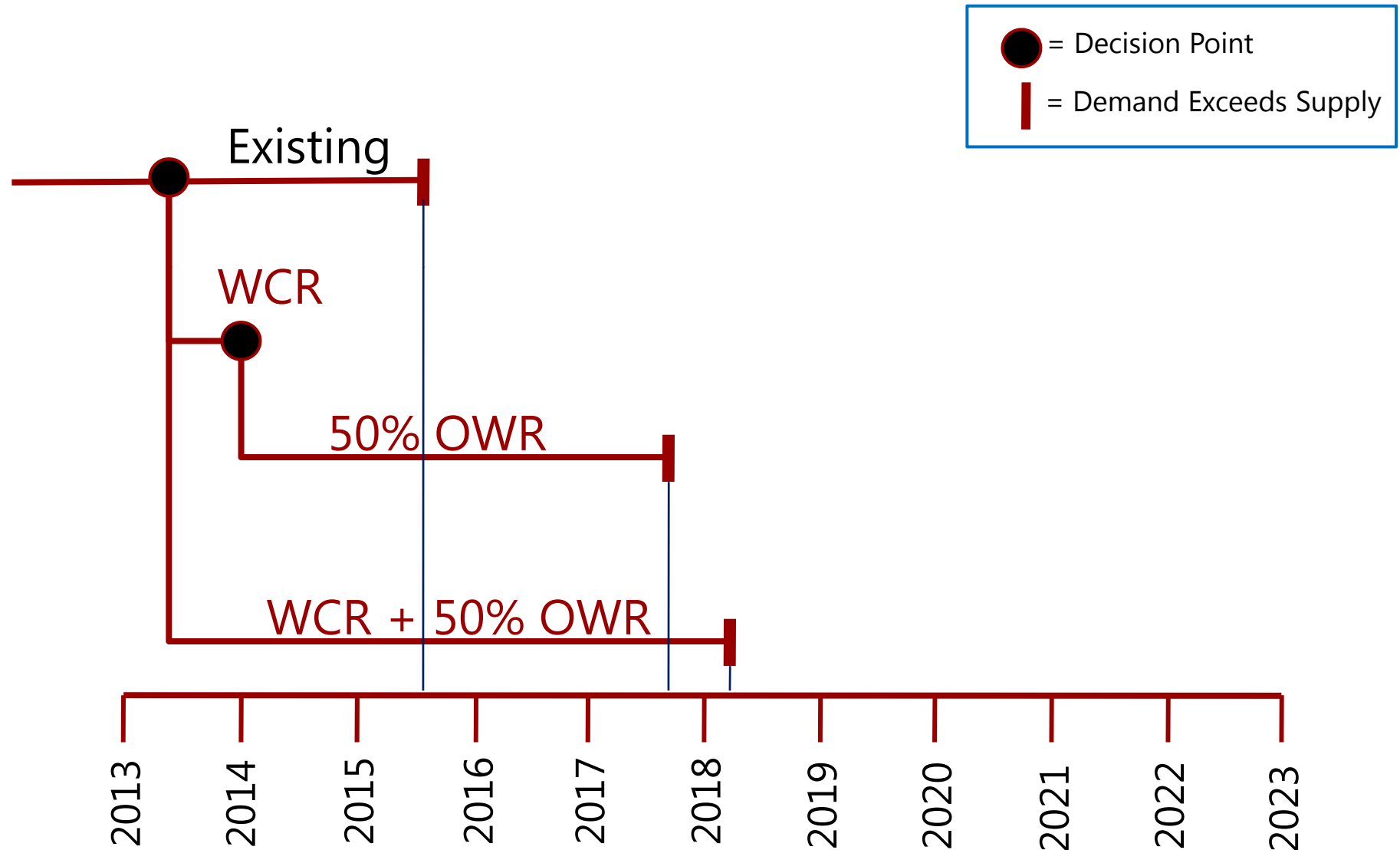
● = Decision Point  
| = Demand Exceeds Supply



## 5) Impact of 100% OWR in 2013 instead of 50% OWR in 2013 and 100% OWR in 2014

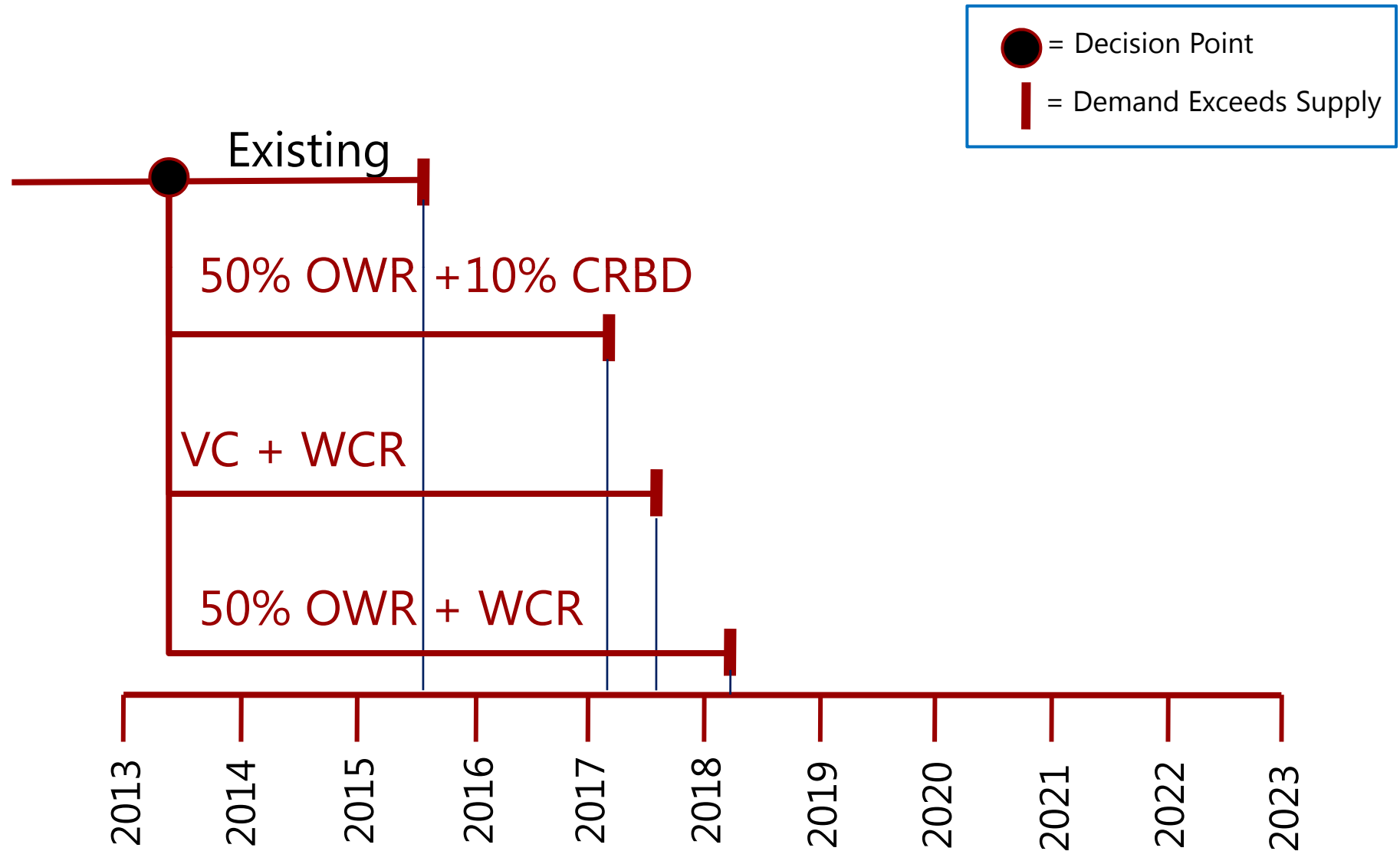


## 6) Impact of Delaying 50% OWR until 2014





## 7) Decision Made in March



# SUMMARY OF OPTIONS

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## Cheney Runs Out of Water

August 2015

### Demand Reduction Options

#1: Voluntary Conservation	1 Month
#2: 50% Reduction in Outdoor Usage	7 Months
#3: 100% Reduction in Outdoor Usage	21 Months
#4: 10% Reduction in Base Usage	5 Months

### Supply Enhancement Options

#1: Modify Well field to Maximize Capacity	22 Months
#2: Buy Additional Water Rights	2 Months

*Months of supply based on deciding in March 2013 to implement options*

## RECOMMENDATION

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- Initiate well field modifications for \$5 million to extend supply by 22 months
- Pursue a 50% reduction in outdoor usage by increasing the discretionary block rates
- Protect non-discretionary water users from rate increases caused by drought reductions
- Freeze or delay non-essential CIP projects (including water main replacements) to cover financial shortfalls

## RECOMMENDATION: RATE IMPACT

COMBINED MONTHLY WATER & SEWER BILLS FOR 2013			
	Current	Proposed	Difference
<b><u>Residential Customers</u></b>			
3,000 Gallons	\$32.67	\$32.67	<b>\$0.00</b>
15,000 Gallons	\$96.49	\$145.79	<b>\$49.31</b>
22,500 Gallons	\$151.00	\$321.59	<b>\$170.59</b>
<b><u>Commercial Customers</u></b>			
100,000 Gallons	\$483.84	\$483.84	<b>\$0.00</b>
<b><u>Industrial Customers</u></b>			
10 Million Gallons	\$45,327	\$45,327	<b>\$0</b>

## NEXT STEPS

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- Direction about which options to enact and which to research further
- Future City Council action needed to implement any of the options
- Continual monitoring of water supply and usage, with reports back during the summer