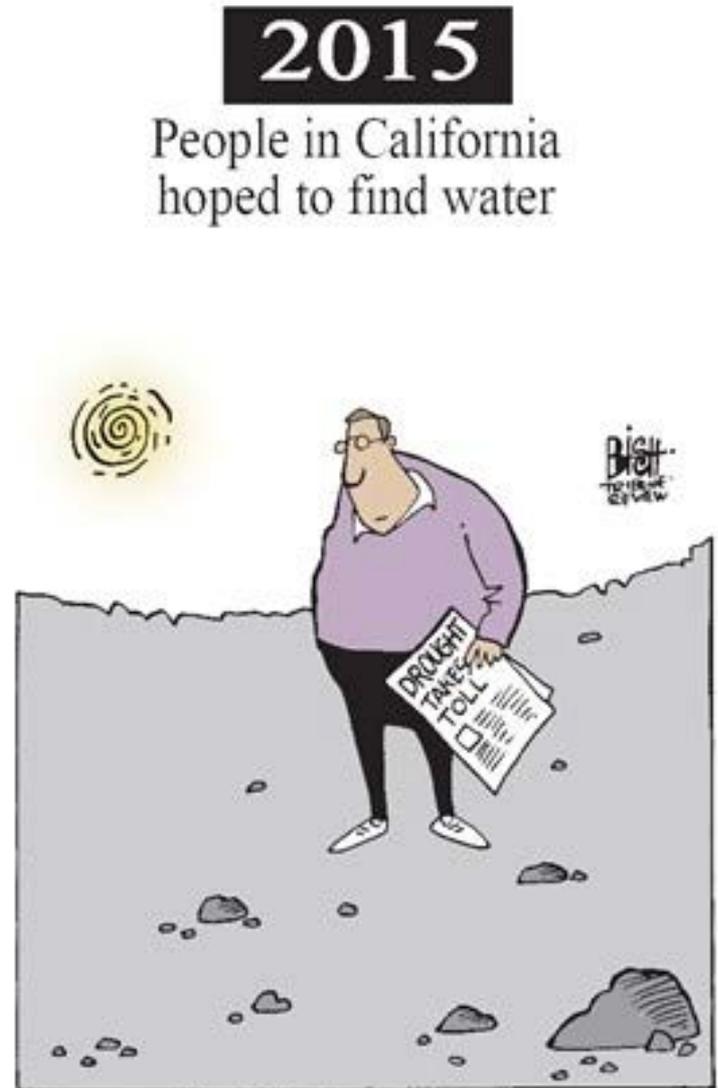
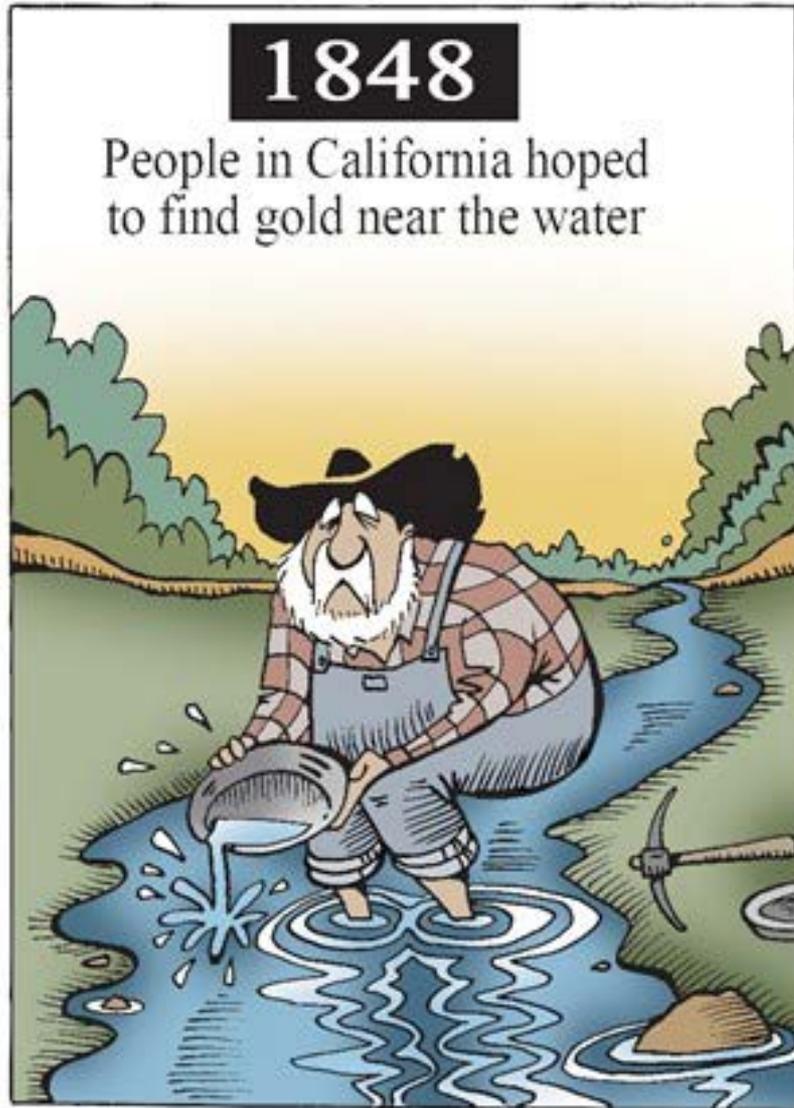


September 23, 2015 USC Meeting
Methodology 8/Weather Normalization
Subcommittee Update



Weather Normalization Subcommittee Update

September 23, 2015 USC Meeting

USC Subcommittee Members

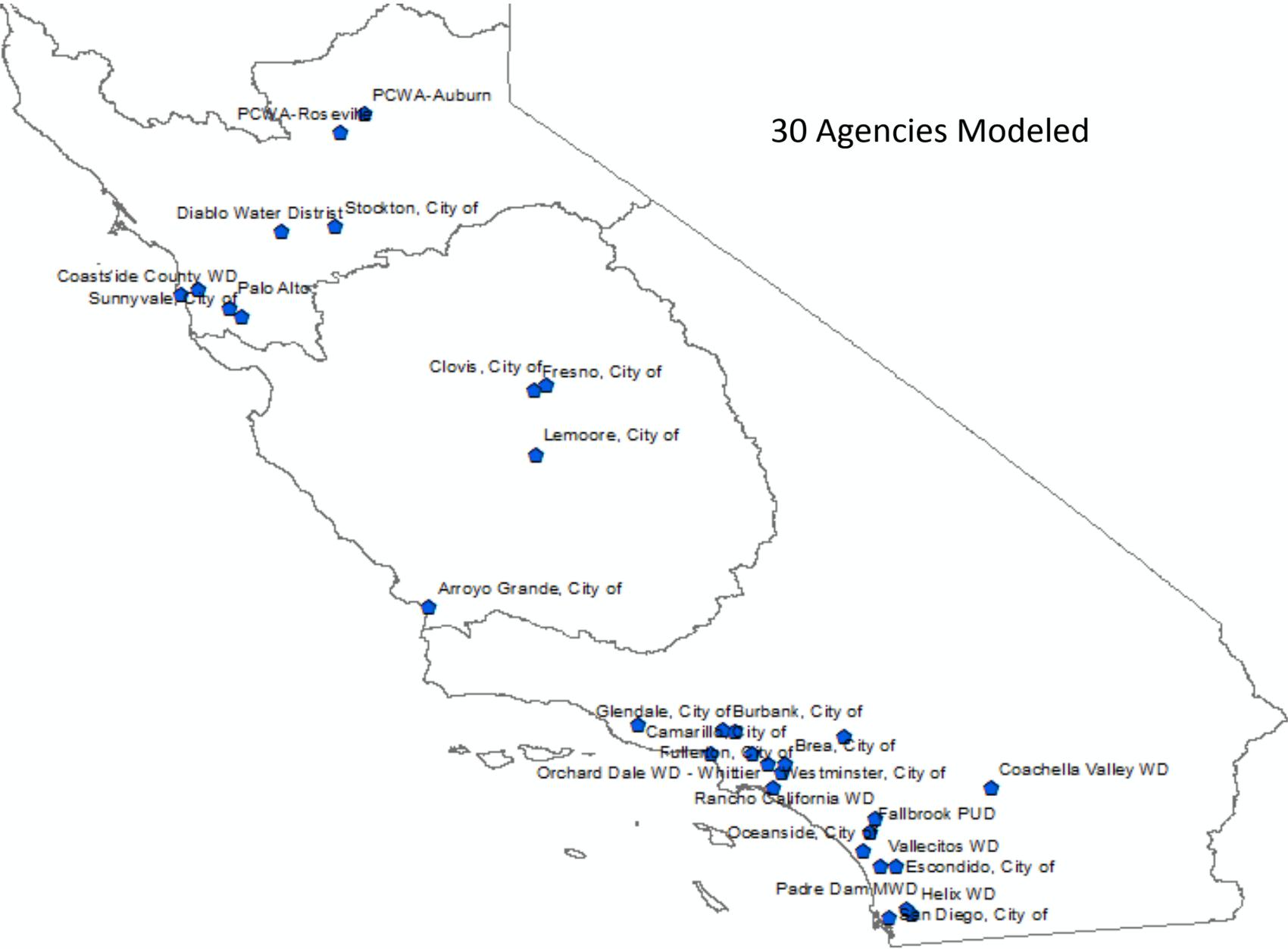
Nirmala Benin, DWR
Peter Brostrom, DWR
Anil Bamezai, Western Policy Research
Ray Hoagland, DWR

Simon Hsu, Los Angeles DWP
Lisa Koehn, City of Clovis
Patti Reyes, Coachella Valley Water District
Tim Bombardier, San Diego County WA
Matt Lyons, Long Beach Water Department
Warren Greco, MWDOC
Bob Kelly, Suburban Water Systems
Tony Firenzi, Placer County Water Agency
Tim Blair, MWD
Karly Gaynor, Western Municipal WD
Kris Olof, Consultant- PCWA
Greg Young, Consultant- PCWA
Richard Harris, East Bay MUD

September 23, 2015 USC Meeting
Methodology 8/Weather Normalization Subcommittee Update

- Model results
- DWR Guidance for 2015 Weather Adjustments
- Final Draft Methodology 8
- Vote

30 Agencies Modeled

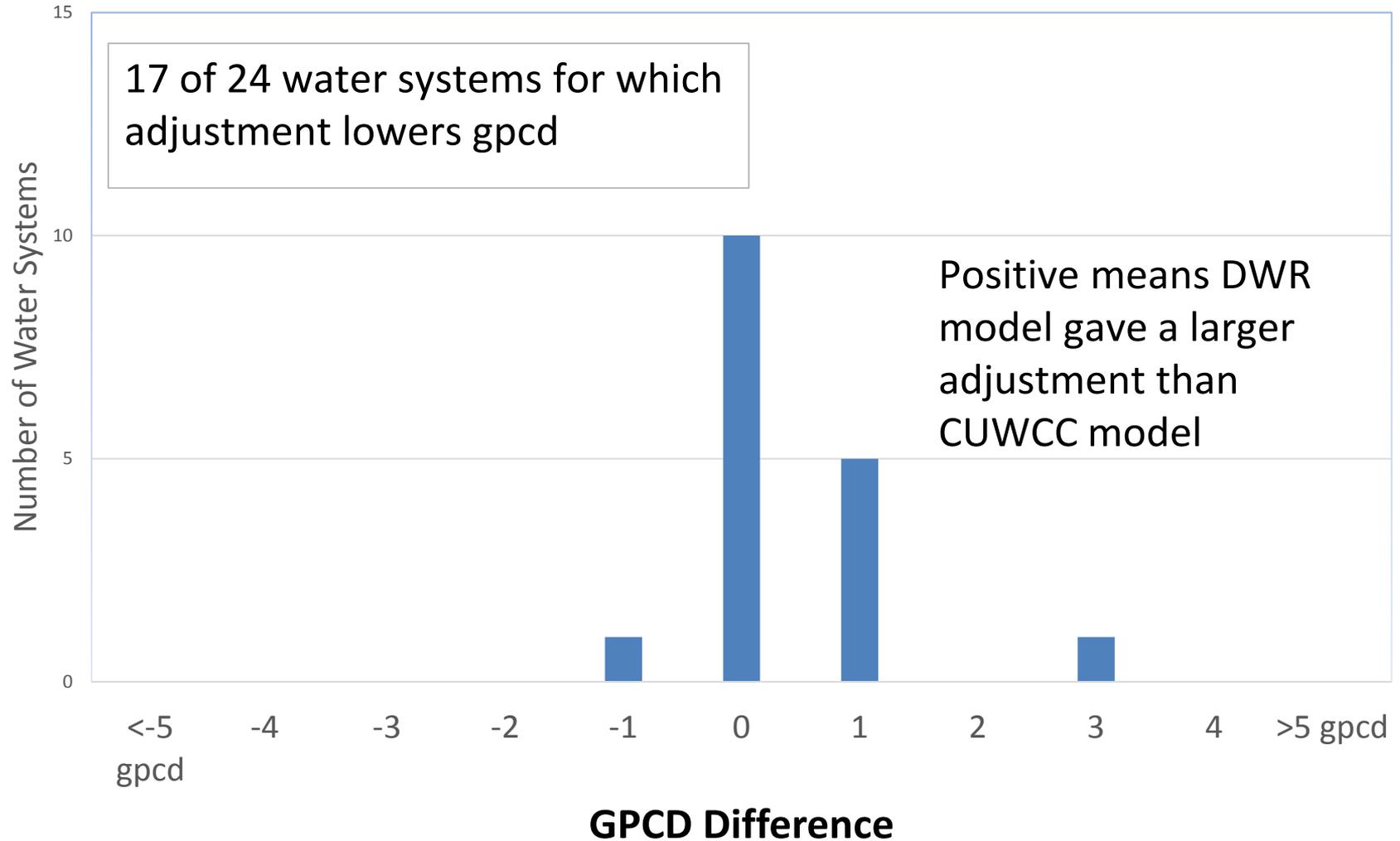


Model results

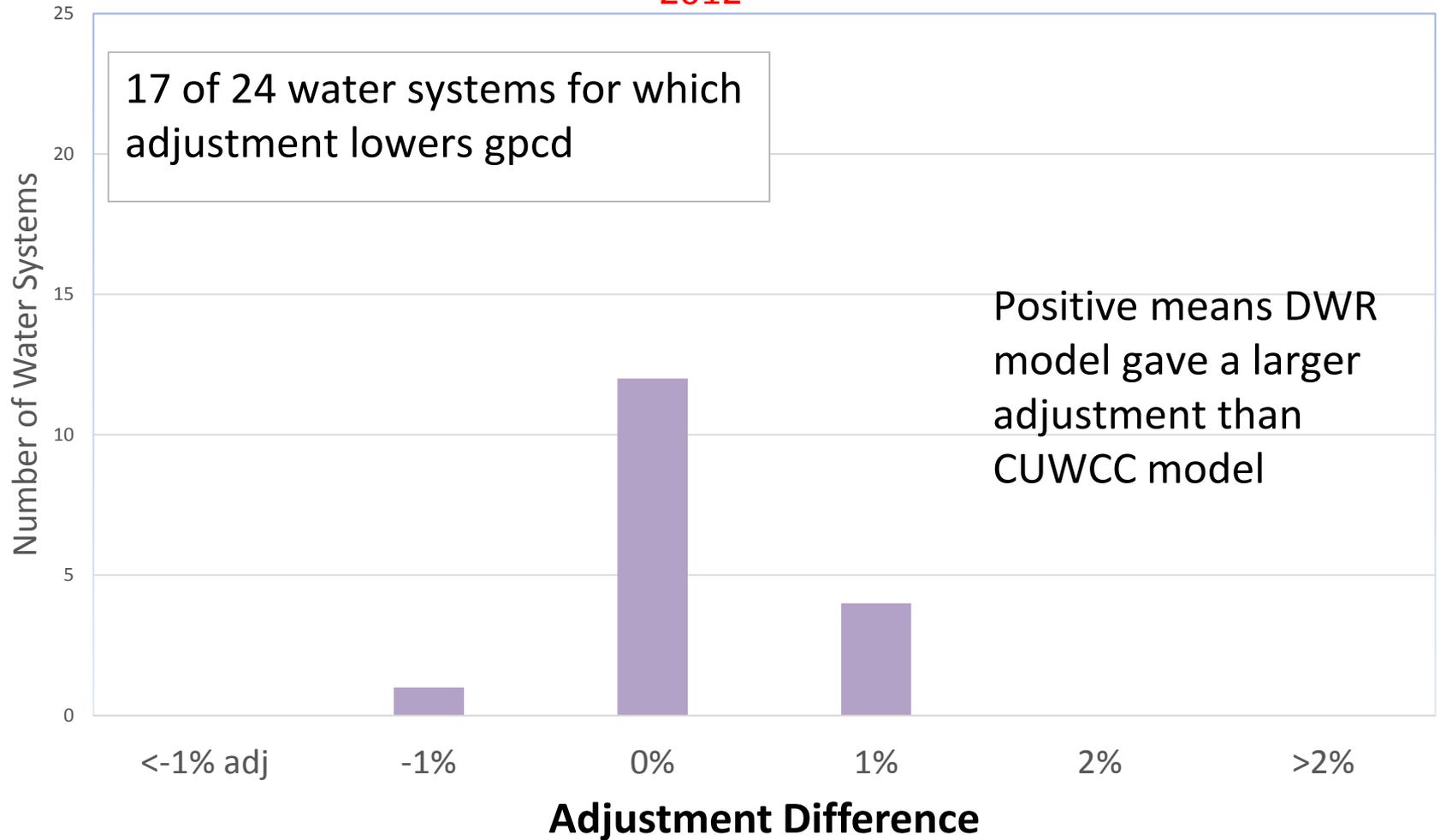
- 1. DWR and CUWCC model comparison**
2. Use of ETapplied water
3. Using unemployment as an indicator for economic adjustment

Difference between DWR and CUWCC adjustments (GPCD)

2012

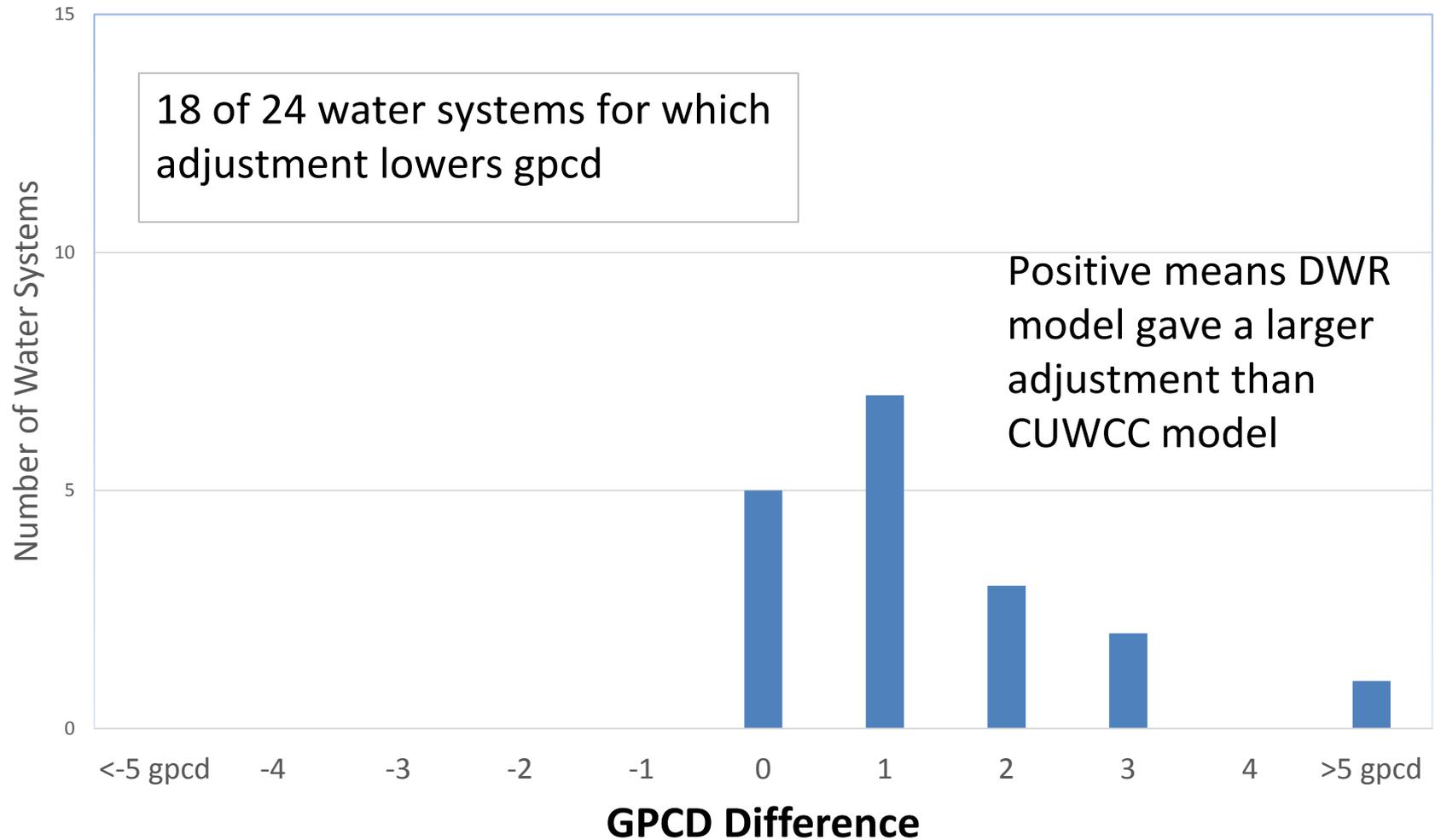


Difference between DWR and CUWCC adjustments
(adjustment as a percent)
2012

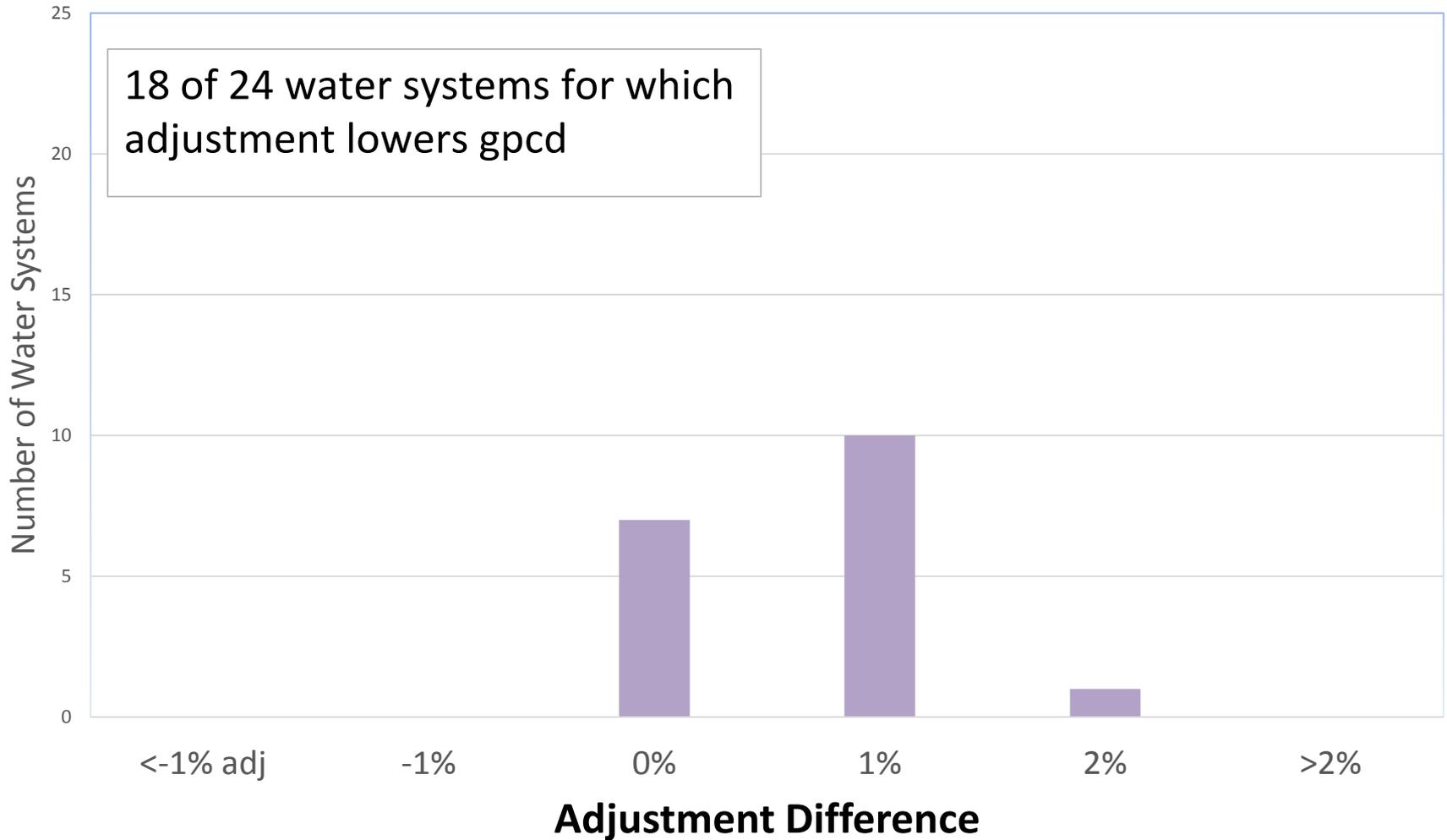


Difference between DWR and CUWCC adjustments (GPCD)

2013



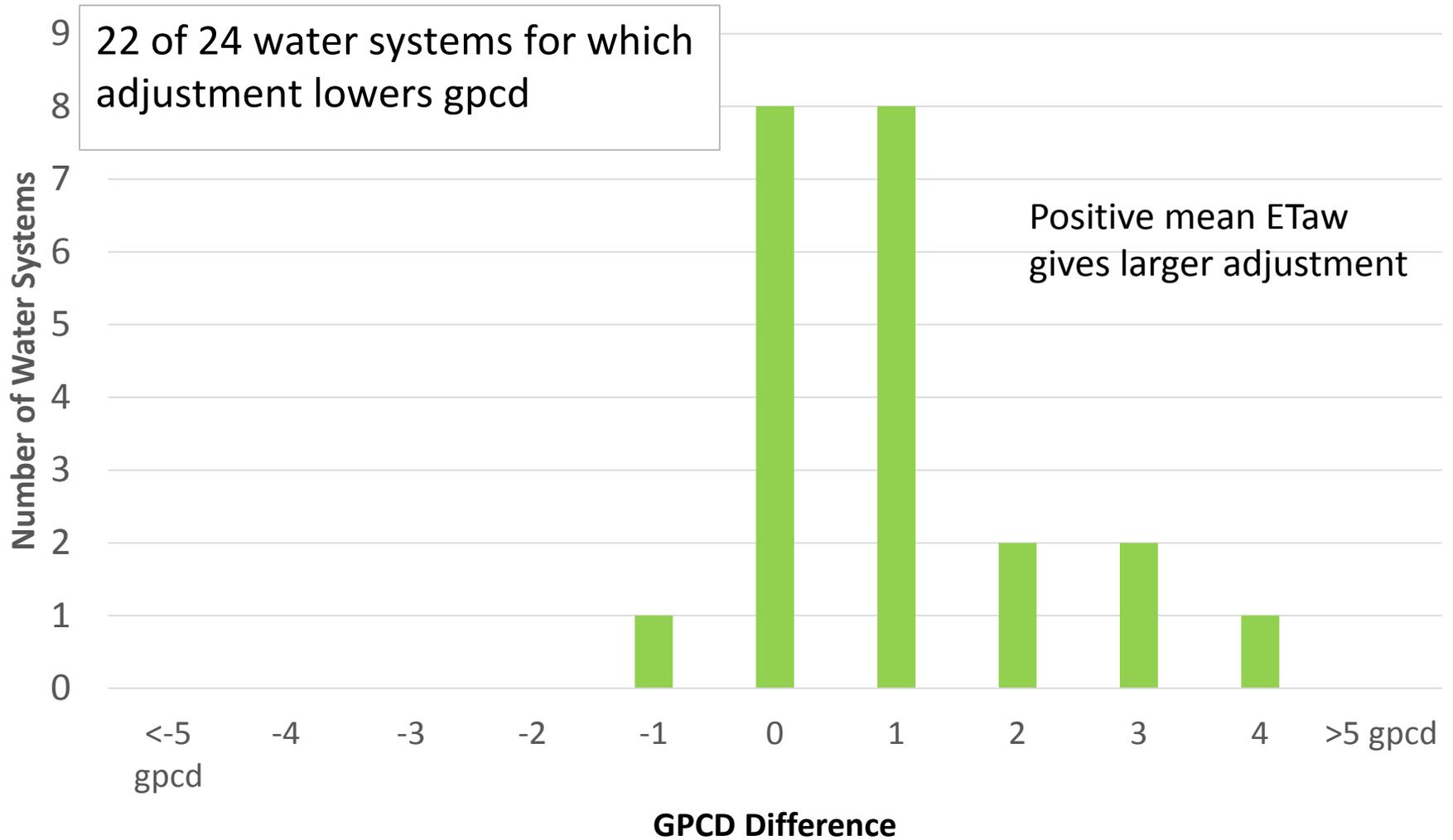
Difference between DWR and CUWCC adjustments
(adjustment as a percent)
2013



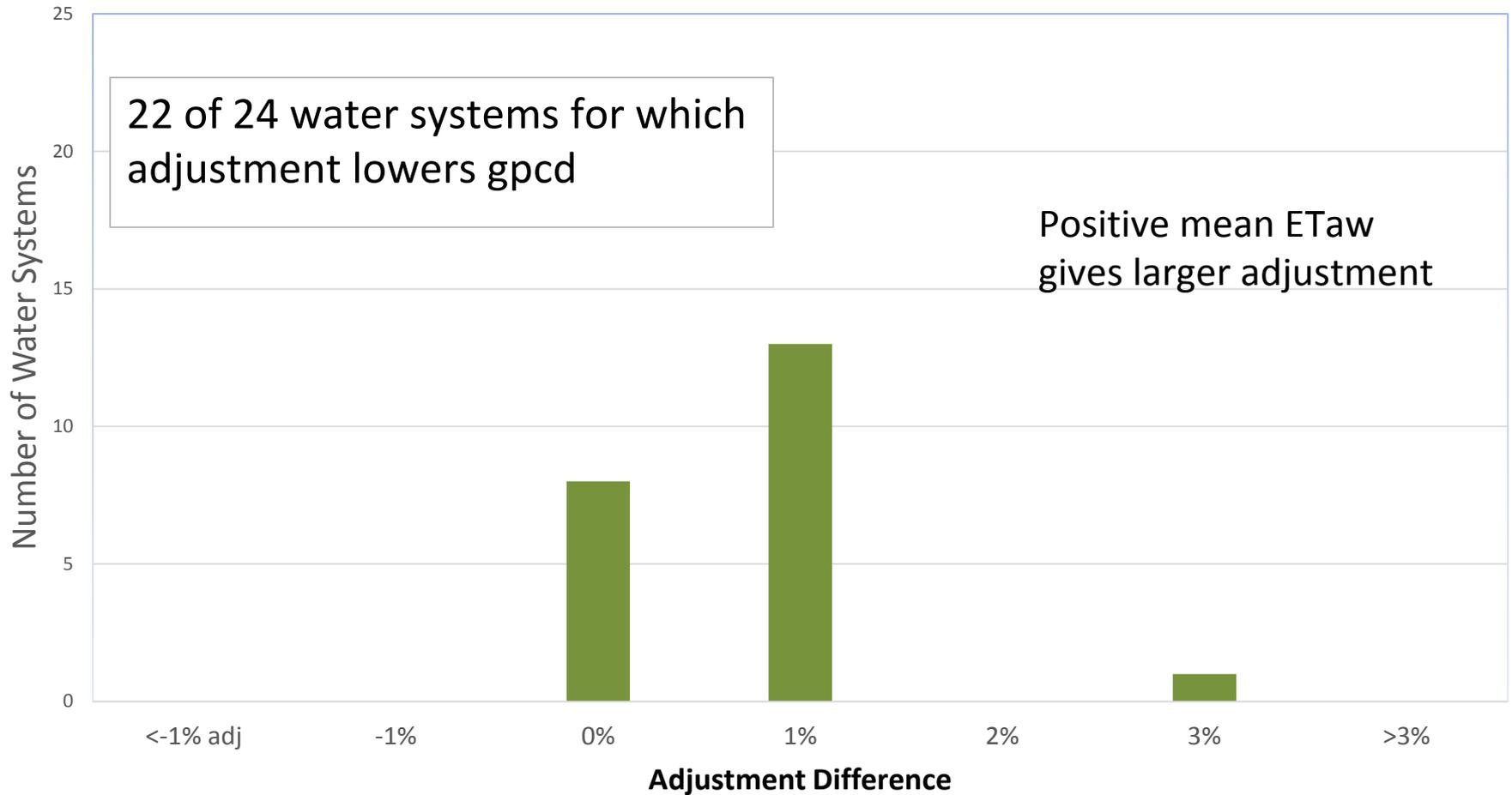
Model results

1. DWR and CUWCC model results
- 2. Use of ET_{applied} water : comparison with CUWCC weather variable (ET_o adjusted by 30% Precipitation)**
3. Using unemployment as an indicator for economic adjustment

Difference between adjusted ETo and ETaw DWR Model adjustments
(GPCD)
2013



Difference between adjusted ETo and ETaw DWR Model adjustments
(adjustment as a percent)
2013



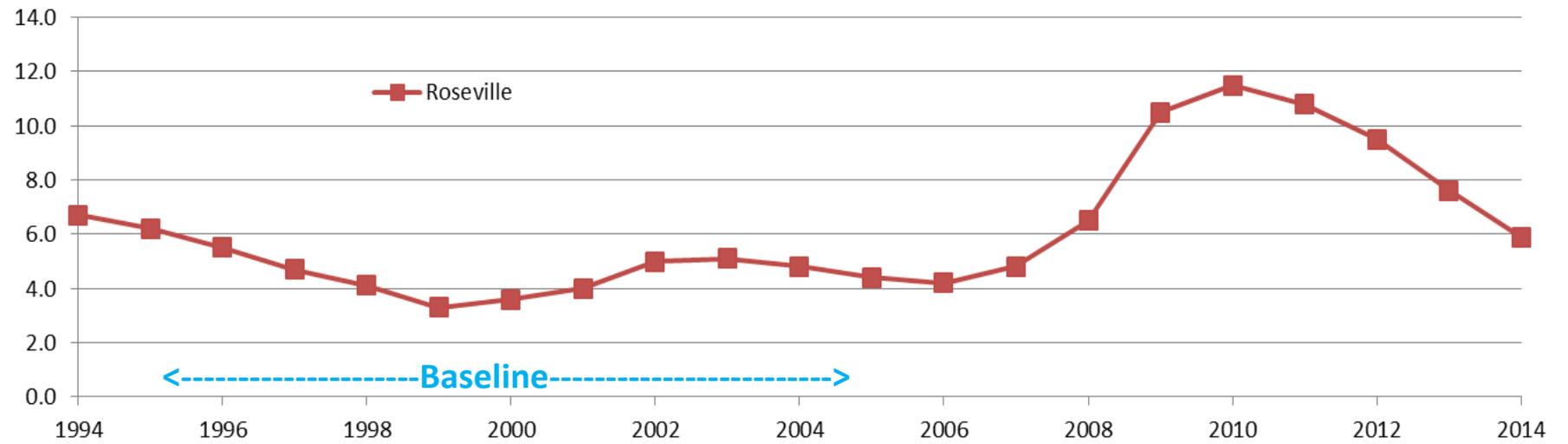
Model results

1. DWR and CUWCC model results
2. Use of ETapplied water
- 3. Using unemployment as an indicator for economic adjustment**

- For 2/3 of the agencies, the model either could not find a significant relationship to weather or the coefficient was counterintuitive.
- **Only 2** have unemployment data post-baseline for which unemployment was within the range of the baseline.
- Result: Use of the unemployment as an indicator is not viable for majority of cases

	DWR GPCD Log Model Weather + Unemployment Adj
	m5, DWR v13/v16 (numbers)
Water Supplier	
Hillsborough, Town of	ok
Lemoore, City of	n
Stockton, City of	n
Orchard Dale WD - Whittier	ok
Westminster, City of	ok
Fullerton, City of	n
Glendale, City of	ok
Diablo Water District	n
Brea, City of	n
Helix WD	n
Coastside County WD	n
Arroyo Grande, City of	n
Santa Monica, City of	n
Clovis, City of	n
PCWA-Roseville	ok
PCWA-Auburn	?
Fresno, City of	n
Sunnyvale, City of	ok
Burbank, City of	ok
Padre Dam MWD	n
Oceanside, City of	n
San Gabriel Valley WC - Fontana	n
Coachella Valley WD	n
Palo Alto	ok
Vallecitos WD	ok
San Diego, City of	ok
Camarillo, City of	n
Escondido, City of	n
Rancho California WD	n
Fallbrook PUD	-
Cal. Water Service Co. - East LA	ok

Roseville-unemployment data



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Weather Normalization Adjustment Options for 2015 UWMPs

1. No adjustment (adjustments are not required)
2. Use a model of your choice that meets Methodology 8 criteria and documentation requirements.
3. Use the CUWCC methodology modified to meet SBX7-7 requirements (spreadsheet can be made available on DWR ftp site) and meet documentation requirements. Methodology 8 model criteria requirements waived.
4. Upon request, DWR can run the DWR weather normalization for you if you are not meeting your 2015 target and provide documentation for submittal with your UWMP.

Final Draft of Methodology 8

Changes made since August USC meeting

Final Draft of Methodology 8
Changes made since August USC meeting

1st change. Acceptance of the CUWCC model for weather adjustments and partial waiver of documentation and criteria requirements

Adjustment 3 introduction (Page 12, 2nd paragraph)

... **However, DWR's exploratory modeling included a thorough evaluation of the California Urban Water Conservation Council's (Council's) weather normalization model and criteria and DWR has decided to waive the documentation and criteria requirements below (except for input data documentation submission) for 2015 if water suppliers use the Council's model as specified by the Council.**

Final Draft of Methodology 8
Changes made since August USC meeting

2nd change. Elimination of the following criterion that was initially designed to trigger additional review:

If the percentage correction being applied to compliance GPCD to account for abnormal weather exceeds half of the abnormality in weather itself, suppliers must provide a narrative that justifies this adjustment. (For example, if the weather measure used in the model indicates that the compliance year was 10% abnormal relative to the baseline, taking a GPCD credit greater than 5% may trigger a review.)

3rd change. Additional text added

Page 13, A.3.

Changes in service area characteristics, including conservation, rate increases, rate structure changes, etc. may cause GPCD to change over time. The model specification should, at a minimum, include a trend term to capture these effects. **Service areas that have experienced rapid changes (rate structure changes, large price increases, drought restrictions, metering of formerly unmetered accounts, etc.) coinciding with the model calibration period should include additional variables in their model to capture the impact of these changes instead of simply relying on a trend variable. The inclusion of these additional variables becomes paramount if suppliers choose to develop a fully-specified water demand model for estimating the impact of weather and economic factors on demand, especially if suppliers discover that estimation of statistically significant relationships between demand and economic factors requires extending the model calibration period beyond the 10-year baseline period.**

Final Draft of Methodology 8
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4th change. Text added for normality test

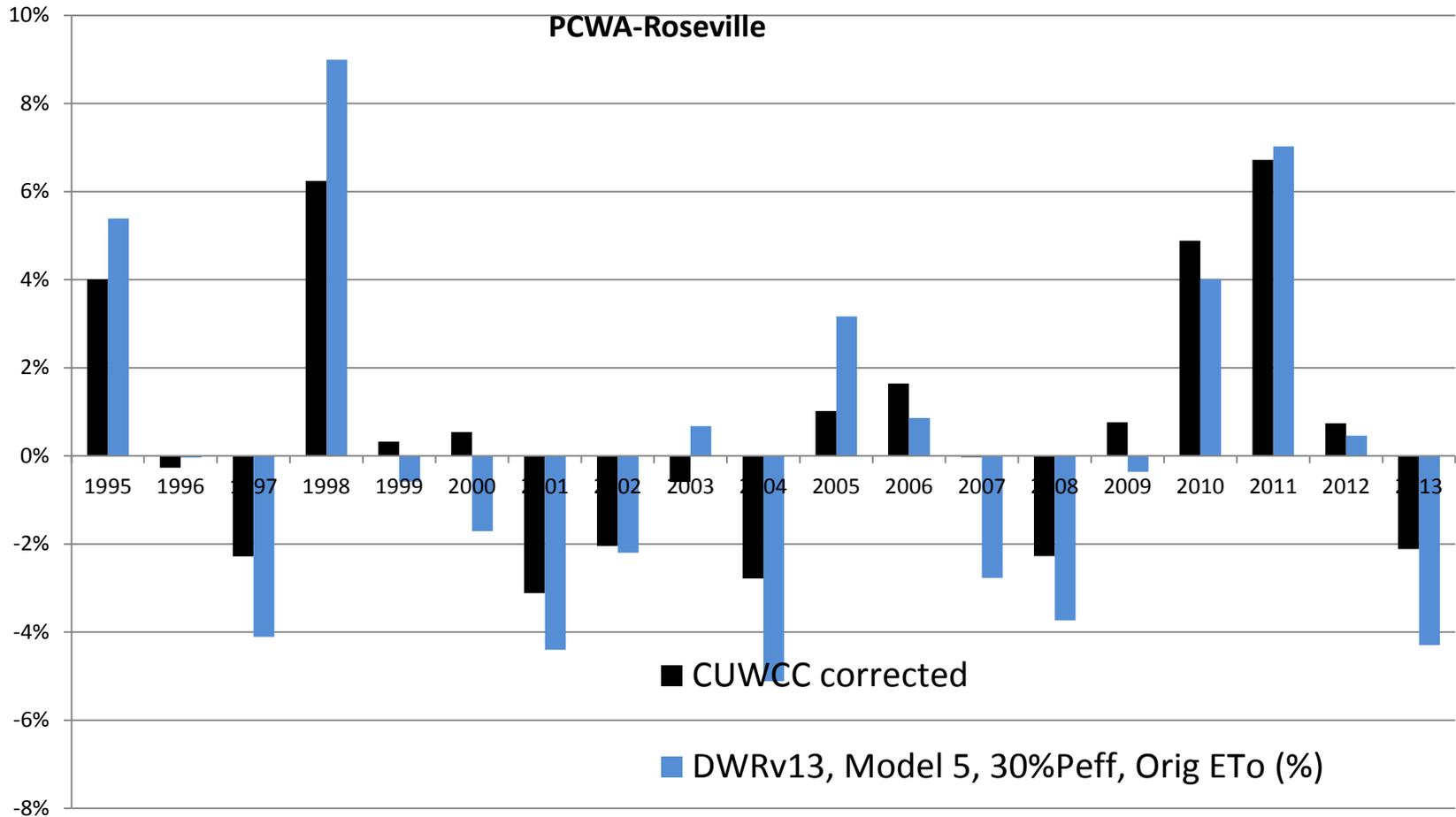
Page 14, B.2

Normality assumption for linear regression should not be unacceptably violated. Any appropriate statistical test for residual normality may be deployed. Up to four outliers may be excluded before performing the test. The test should demonstrate at a significance level of 10% that model residuals are distributed normally. **If the normality test is still not met, suppliers should use Robust Regression or other appropriate techniques instead of Ordinary Least Squares Regression techniques to estimate their statistical model. See DWR's Weather Normalization Guidelines document for guidance.**

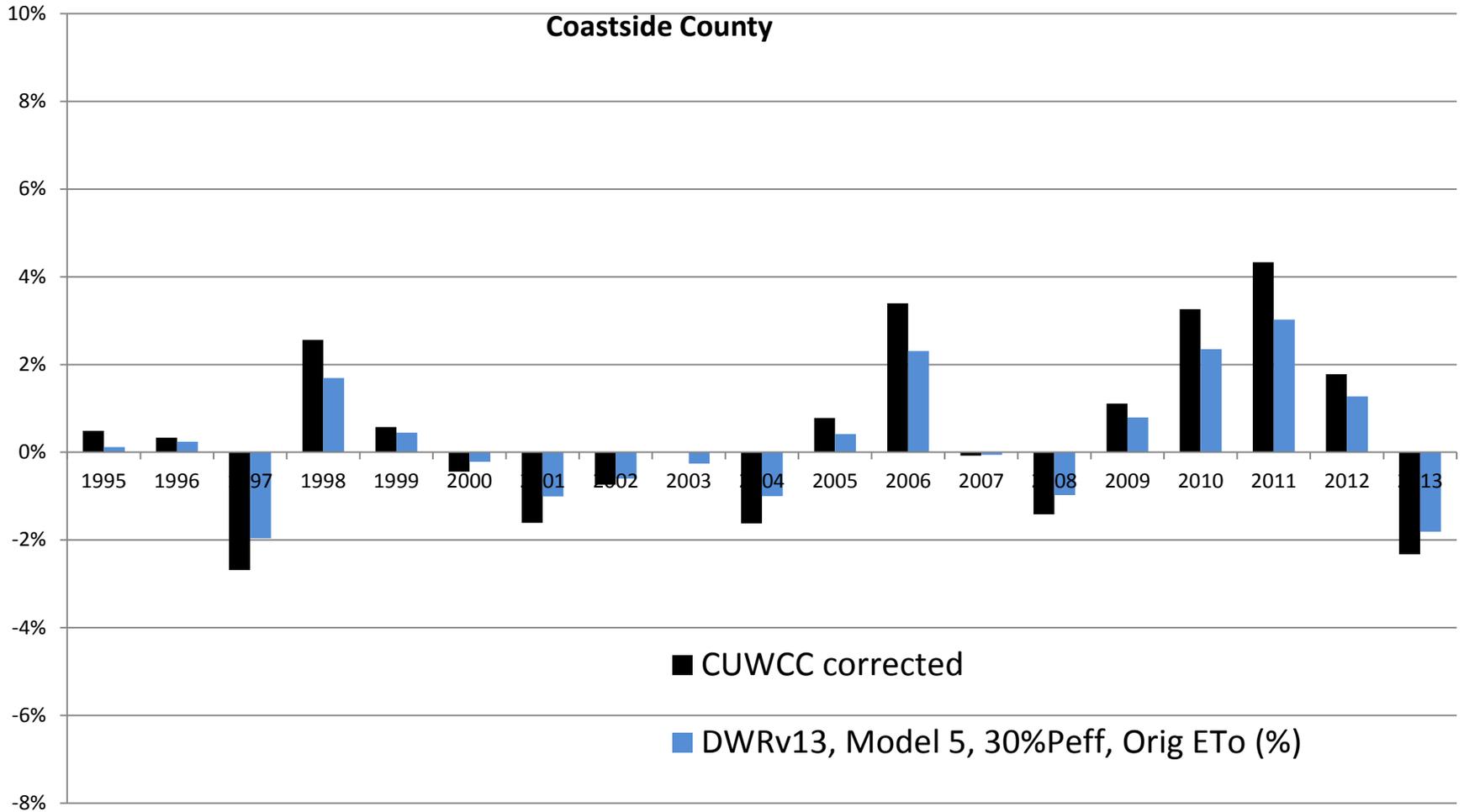
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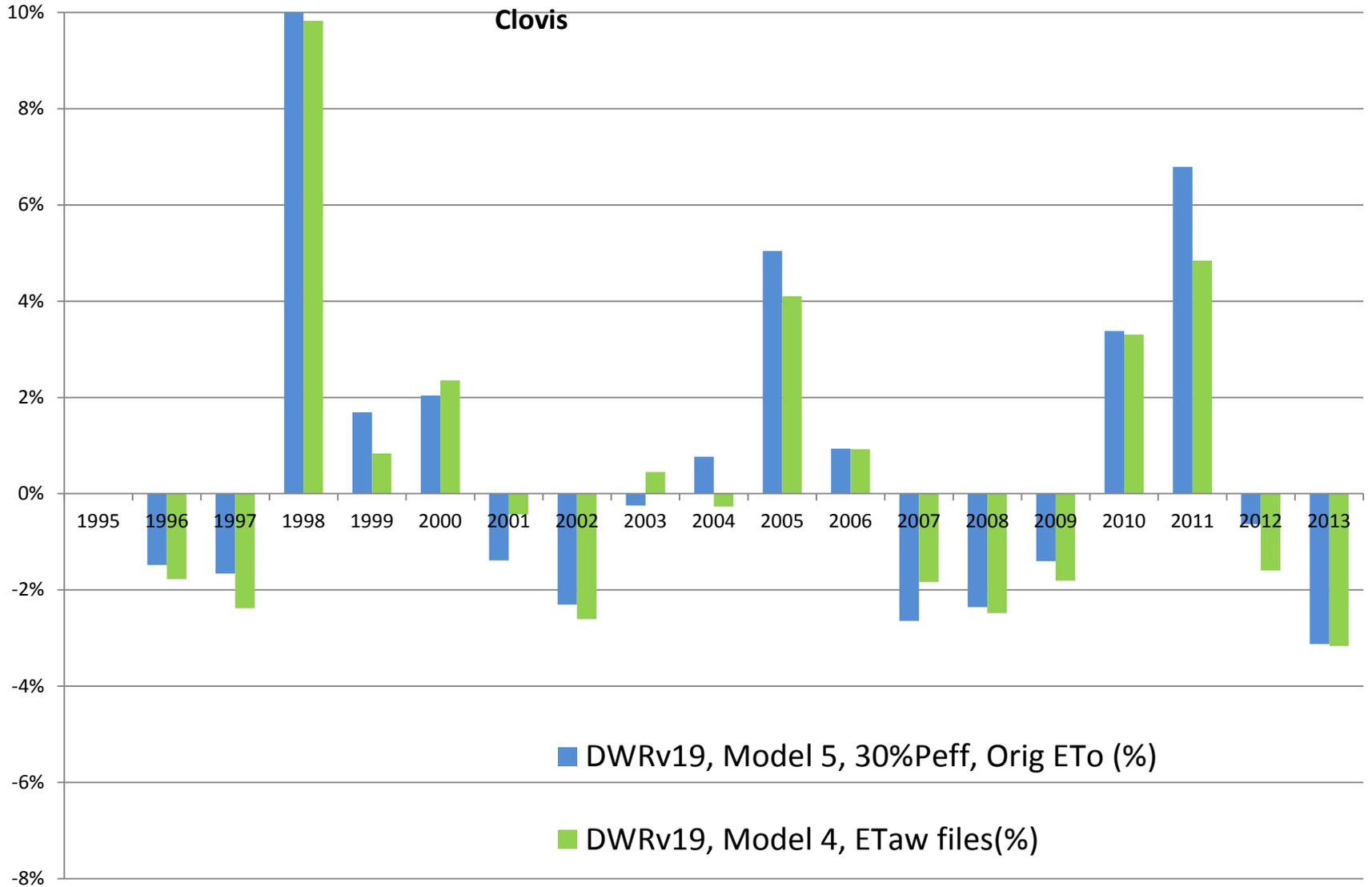
Model adjustments for PCWA- Roseville



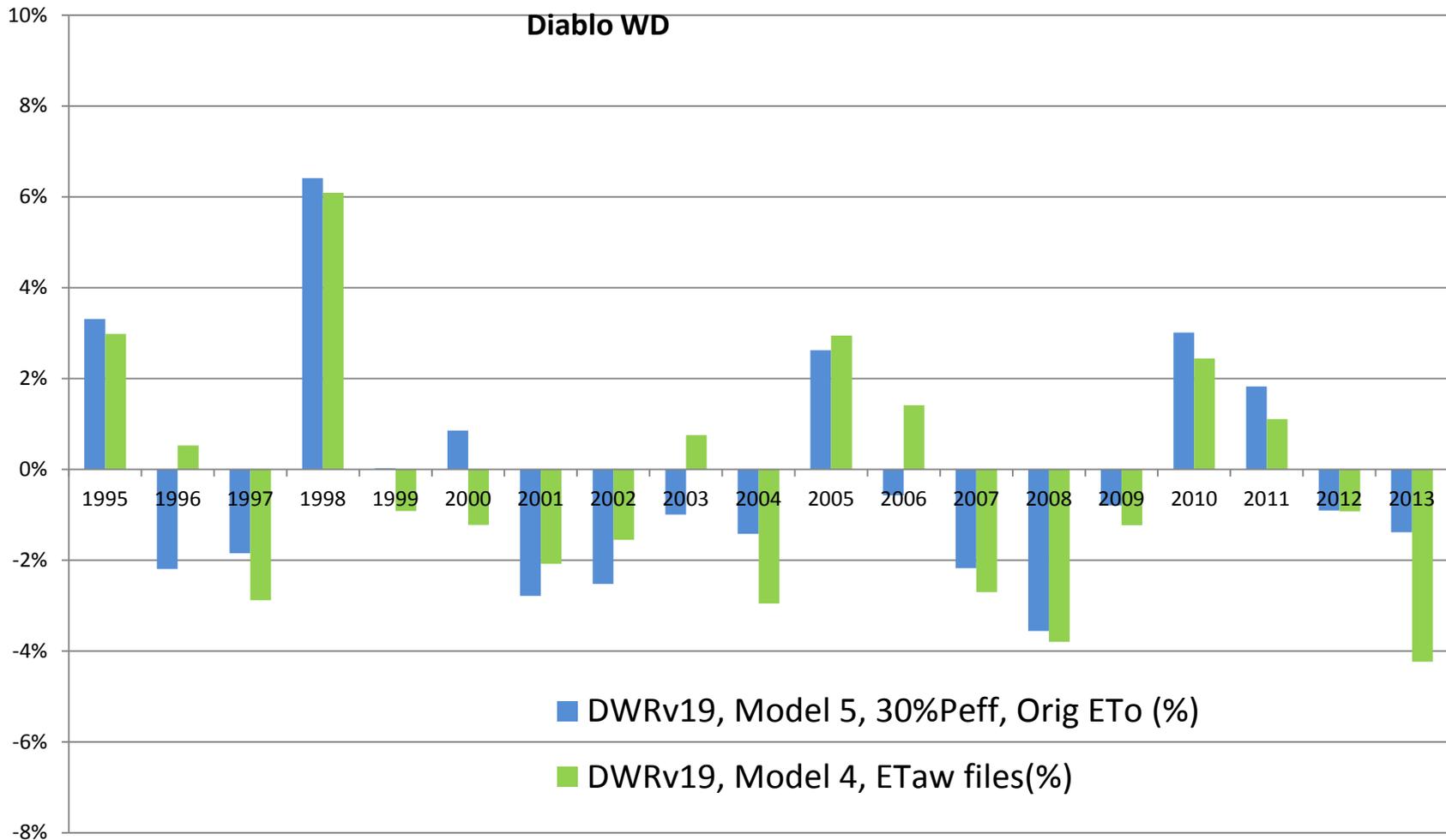
Model adjustments for Coastside County Water District



Model adjustments for City of Clovis



Model adjustments for Diablo WD



Model adjustments for City of Clovis

