OTAY WATER DISTRICT

SPECIAL MEETING OF THE BOARD OF DIRECTORS
DISTRICT BOARDROOM

2554 SWEETWATER SPRINGS BOULEVARD
SPRING VALLEY, CALIFORNIA

MONDAY
March 19, 2012
3:00 P.M.

AGENDA

1. ROLL CALL

2. PLEDGE OF ALLEGIANCE

3. APPROVAL OF AGENDA

4. PUBLIC PARTICIPATION – OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO SPEAK TO THE BOARD ON ANY SUBJECT MATTER WITHIN THE BOARD'S JURISDICTION BUT NOT AN ITEM ON TODAY'S AGENDA

ACTION ITEMS

5. BOARD

   a) RECEIVE NOMINATIONS AND APPOINT A MEMBER AND ALTERNATE MEMBER TO THE CITY OF CHULA VISTA REDEVELOPMENT AGENCY'S OVERSIGHT BOARD

WORKSHOP

6. REVIEW AND DISCUSS WATER SALES FORECASTING (BEACHEM/BELL)

   a) PRESENTATION ON GROWTH AND THE ECONOMY (ALAN NEVIN, LONDON GROUP) [20 minutes]

   b) PRESENTATION ON PRICE ELASTICITY (DR. STEVE PIPER, BUREAU OF RECLAMATION) [20 minutes]

   c) PRESENTATION ON WEATHER FORECASTING (ALEXANDER TARDY, NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION) [20 minutes]

   d) PRESENTATION ON METER SALES FORECASTING (KENNEDY) [5 minutes]

e) PRESENTATION ON WATER CONSERVATION FORECASTING (GRANGER) [5 minutes]

RECESS TO CLOSED SESSION

7. CLOSED SESSION

a) CONFERENCE WITH LEGAL COUNSEL – ANTICIPATED LITIGATION [GOVERNMENT CODE §54956.9]

(I) SALT CREEK GOLF, LLC, UNITED STATES BANKRUPTCY COURT, CASE NO. 11-13898-LA11

b) CONFERENCE WITH LEGAL COUNSEL – ANTICIPATED LITIGATION [GOVERNMENT CODE §54956.9]

1 MATTERS

RETURN TO OPEN SESSION

8. REPORT ON ANY ACTIONS TAKEN IN CLOSED SESSION. THE BOARD MAY ALSO TAKE ACTION ON ANY ITEMS POSTED IN CLOSED SESSION

9. ADJOURNMENT

All items appearing on this agenda, whether or not expressly listed for action, may be deliberated and may be subject to action by the Board.

The Agenda, and any attachments containing written information, are available at the District's website at www.otaywater.gov. Written changes to any items to be considered at the open meeting, or to any attachments, will be posted on the District's website. Copies of the Agenda and all attachments are also available through the District Secretary by contacting her at (619) 670-2280.

If you have any disability which would require accommodation in order to enable you to participate in this meeting, please call the District Secretary at 670-2280 at least 24 hours prior to the meeting.

Certification of Posting

I certify that on March 16, 2012, I posted a copy of the foregoing agenda near the regular meeting place of the Board of Directors of Otay Water District, said time being at least 24 hours in advance of the special meeting of the Board of Directors (Government Code Section §54954.2).

Executed at Spring Valley, California on March 16, 2012.

/s/ Susan Cruz, District Secretary

AGENDA ITEM 6

STAFF REPORT

TYPE MEETING:	Special Board	MEETING DATE:	March 19, 2012
SUBMITTED BY:	Rita Bell, Finance Manager	PROJECT:	Various DIV. NO. ALL
APPROVED BY:	☒ Joseph R. Beachem, Chief Financial Officer ☒ German Alvarez, Assistant General Manager ☒ Mark Watton, General Manager		
SUBJECT:	Review and Discuss Water Sales Forecasting		

GENERAL MANAGER'S RECOMMENDATION:

This is an informational item only.

PURPOSE:

To review and discuss with the Board water sales forecasting.

ANALYSIS:

At the February 14, 2012 Finance, Administration and Communications Committee meeting, a request was made for staff to prepare a presentation discussing the factors used in budgeting water sales.

This staff report includes a presentation to explain how water sales are budgeted. Three guest speakers along with staff will talk about various subjects related to the presentations involved in this process.

Alan Nevin from The London Group will discuss meter growth and the economy. His presentation will include the national and San Diego County economic factors including unemployment, earnings, sales tax collections, and data on real estate. He will also discuss Otay specific real estate growth in the areas of single-family, multi-family and commercial properties.

Dr. Steve Piper from the Bureau of Reclamation will discuss the price elasticity of water. Dr. Piper is currently working on a large project that will produce a price elasticity formula for a number of

agencies in the Western United States. This is a work in progress and it is hoped that the study will produce a number of useful tools for the District. Variables in the study include the rate of unemployment, inflation, rate tiering structure, bill layout, rainfall, temperature, income levels, Otay's specific rate structure, and other local community profile data.

Alexander Tardy from the National Oceanic and Atmospheric Administration (NOAA) will discuss water supply, temperature and precipitation. This topic will include historical patterns of rainfall and weather patterns such as El Nino and La Nina, and how forecasts are developed.

In addition, staff will present how the budget for water sales is developed and will include presentations from the following staff:

Finance Staff will present the topics of water sales budgeting including the current methodology that looks at historical trends, average usage per customer type, and the amount of water sold in each tier. This topic will also discuss that staff "normalizes" the past 12 months of data to adjust for the prior weather if it was either hot and dry or wet and cool.

Engineering Staff will discuss how the economist data is included in the development of projected meter sales. This projection also includes historical data of development within the service area, communication with the developers, and master planning data. The data is then converted to EDUs and a six-year projection is developed for the purpose of budgeting capacity fees and meter growth.

The District's Water Conservation Manager will discuss factors that are influencing indoor and outdoor demand now and in the future. Some of these factors are driven by code changes that lower both indoor and outdoor demand, much of which are likely to be a permanent decrease in demand. Customers outdoor water usage is being increasingly influenced by the marketing of water smart landscapes promoted at outreach events and the Water Conservation Garden.

The presentation will conclude with a discussion of options to consider incorporating into the future water sales budgeting process to further enhance the process.

FISCAL IMPACT: ☒ Joe Beachem, Chief Financial Officer

None.

STRATEGIC GOAL:

Provide value by directing and managing the financial issues that are critical to the District.

LEGAL IMPACT:

None.

Attachments:

Attachment A - Factors Used In Budgeting for Water Sales
Attachment B - Economic Update 2012-2018
Attachment C - Reclamation - Managing Water in the West
Attachment D - Water Supply, Temperature and Precipitation

Attachment A

Factors Used in Budgeting for Water Sales

March 19, 2012

Factors

- Major Factors
  - Historic Sales (Rita Bell)
  - Weather (Alexander Tardy, NOAA)

- Other Factors
  - Price Elasticity (Dr. Steve Piper, Bureau of Reclamation)
  - Meter Sales (Alan Nevin, The London Group)
  - Economy (Alan Nevin, The London Group)
  - Conservation (William Granger)

Guest Speakers

- Alan Nevin, The London Group
  - Growth and Economy
- Steve Piper, Bureau of Reclamation
  - Price Elasticity
- Alexander Tardy, National Oceanic and Atmospheric Administration
  - Weather

Growth and Economy

Alan Nevin
The London Group
(20 Minutes)

Price Elasticity

Dr. Steve Piper
Bureau of Reclamation
(20 Minutes)

Weather

Alexander Tardy
National Oceanic and Atmospheric Administration
(20 Minutes)

Historical Sales

- Create baseline by starting with most recent 12 months (April 2011 through March 2012)
  - Customer Class and Meter Count
  - Sales by Month
  - Sales by Tier

This baseline includes the factors of weather, the economy, growth, conservation, and price elasticity as experienced by the District.

Track Sales by Customer Type and Meter Size

		FY09 Actual	FY10 Actual	FY11 Projections	FY11 Budget	FY12 Budget
SFR	Single-Family	8,844,440	7,679,494	7,504,151	7,776,400	7,684,300
MM	Master Meters	1,427,758	1,371,244	1,389,968	1,358,800	1,423,300
PC<10	Public and Commercial < 10" Meter	1,357,484	1,371,122	1,410,266	1,376,300	1,444,100
PC>10	Public and Commercial > 10" Meter	584,743	427,155	325,473	480,800	333,300
IRR 75&1	Agr, Lds and Comm .75" & 1" Meter	237,051	199,218	190,392	210,200	195,000
IRR 1.5&2	Agr, Lds and Comm 1.5" & 2" Meter	1,717,536	1,281,675	1,251,786	1,344,800	1,281,800
IRR >3	Agr, Lds and Comm > 3" Meter	229,167	163,237	70,655	184,700	72,400
REC75&1	Recycled .75" & 1.0" Meter	58,743	49,393	45,362	54,000	47,100
REC1.5&2	Recycled 1.5" & 2.0" Meter	1,435,274	1,295,264	1,207,536	1,384,300	1,253,900
REC3&4	Recycled 3.0" & 4.0" Meter	56,114	73,737	69,994	70,700	72,700
REC>6	Recycled > 6.0" Meter	441,258	355,567	339,637	362,200	352,700
TEMP75&1	Temporary .75" & 1.0" Meter	3,173	4,123	3,928	4,600	4,000
TEMP1.5&2	Temporary 1.5" & 2.0" Meter	7,012	2,436	2,290	3,200	2,300
TEMP>3	Temporary 1> 3.0" Meter	513,149	247,457	167,063	272,700	171,100
TOTAL	TOTAL	16,912,902	14,521,122	13,978,501	14,883,700	14,338,000
Volume Change		(663,904)	(2,391,780)	(542,621)	905,199	359,499
Potable		14,921,513	12,747,161	12,315,972	13,012,500	12,611,600
Rainfall (Inches)		9.15	10.55	12.01		

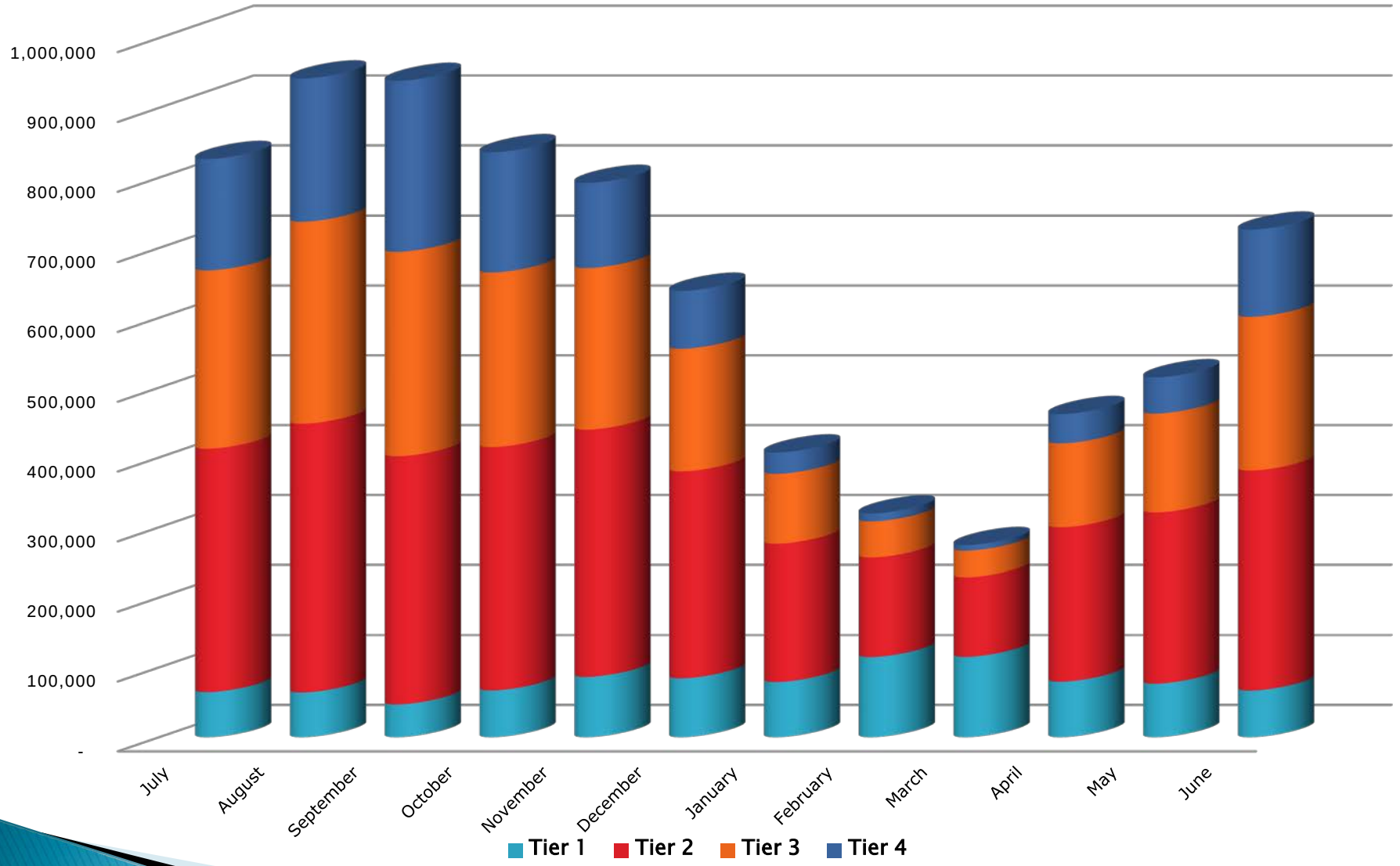
Trend Average Monthly Usage by Customer Type and Meter Size

		FY09 Actual	FY10 Actual	FY11 Projections	FY11 Budget	FY12 Budget
SFR	Single-Family	17.0	14.7	14.3	14.8	14.8
MM	Master Meters	155.1	143.4	145.0	140.7	140.7
PC<10	Public and Commercial < 10" Meter	76.8	80.2	82.4	76.0	76.0
PC>10	Public and Commercial > 10" Meter	8,121.4	5,932.7	5,424.6	8,013.3	8,013.3
IRR 75&1	Agr, Lds and Comm .75" & 1" Meter	55.8	62.2	43.8	49.2	49.2
IRR 1.5&2	Agr, Lds and Comm 1.5" & 2" Meter	166.6	126.3	123.0	133.1	133.1
IRR >3	Agr, Lds and Comm > 3" Meter	1,273.2	971.7	452.9	1,099.4	1,099.4
REC75&1	Recycled .75" & 1.0" Meter	51.5	42.9	41.1	45.0	45.0
REC1.5&2	Recycled 1.5" & 2.0" Meter	212.1	188.1	174.7	198.2	198.2
REC3&4	Recycled 3.0" & 4.0" Meter	519.6	614.5	583.3	589.2	589.2
REC>6	Recycled > 6.0" Meter	12,257.2	9,876.9	9,434.4	10,061.1	10,061.1
TEMP75&1	Temporary .75" & 1.0" Meter	16.5	21.5	20.5	24.0	24.0
TEMP1.5&2	Temporary 1.5" & 2.0" Meter	64.9	25.4	23.9	33.3	33.3
TEMP>3	Temporary 1> 3.0" Meter	411.2	229.1	143.5	249.7	249.7
TOTAL	TOTAL	17.0	14.7	14.3	14.8	14.8

Project Sales within Tiers

Single-Family Residential				
	Projected Units	**% Distribution**	**Rate**	**Amount**
1 - 5 hcf	944,400	12.30%	$1.49	$ 1,407,200
6 - 10 hcf	3,316,900	43.20%	$2.31	7,662,000
11 - 22 hcf	2,165,200	28.20%	$3.00	6,495,600
over 23 hcf	1,251,500	16.30%	$4.63	5,794,400
	7,678,100	100.00%		$ 21,359,200

Budget FY 2012 Residential Unit Sales by Tier



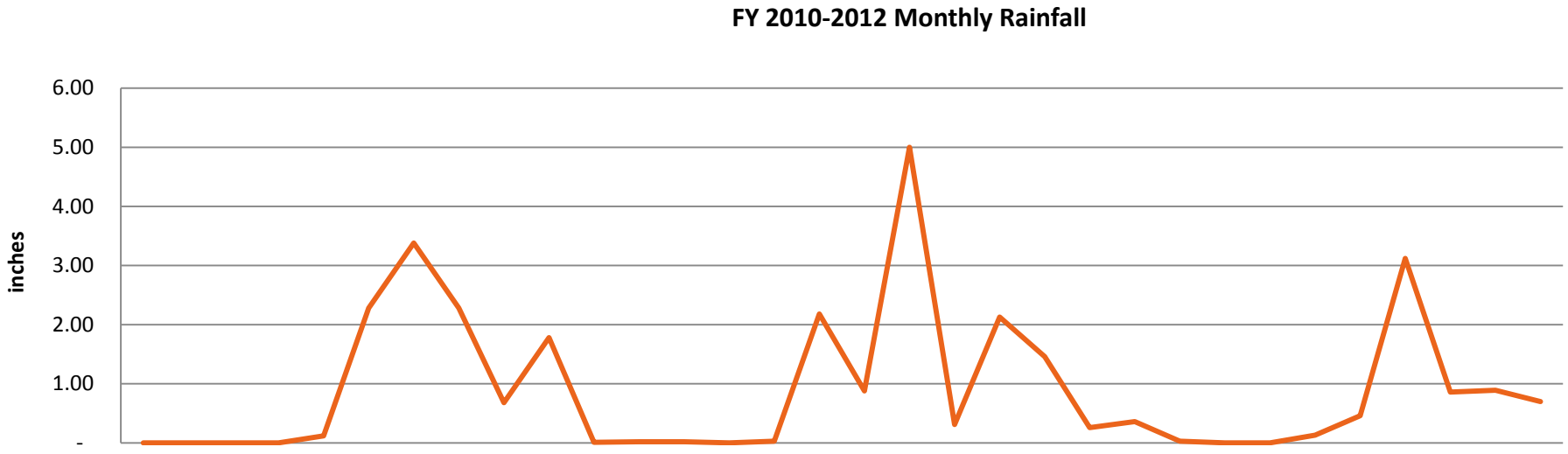
Establish Monthly Budget Allocation by Tier

	Tier 1	Tier 2	Tier 3	Tier 4	Total
	1 – 5 hcf	6 – 10 hcf	11 – 22 hcf	> 23 hcf	
July	7.80%	42.10%	30.90%	19.20%	100.00%
August	6.80%	40.80%	30.70%	21.70%	100.00%
September	5.00%	37.80%	31.20%	26.00%	100.00%
October	8.00%	41.60%	29.90%	20.50%	100.00%
November	10.90%	44.60%	29.20%	15.30%	100.00%
December	13.20%	46.30%	27.50%	13.00%	100.00%
January	19.40%	48.50%	24.60%	7.50%	100.00%
February	35.90%	44.40%	16.10%	3.60%	100.00%
March	41.90%	41.50%	13.70%	2.90%	100.00%
April	17.20%	47.70%	26.00%	9.10%	100.00%
May	14.90%	47.50%	27.50%	10.10%	100.00%
June	9.20%	43.30%	30.30%	17.20%	100.00%
Average	**15.85%**	**43.84%**	**26.47%**	**13.84%**	**100.00%**

Weather projected “Normal”

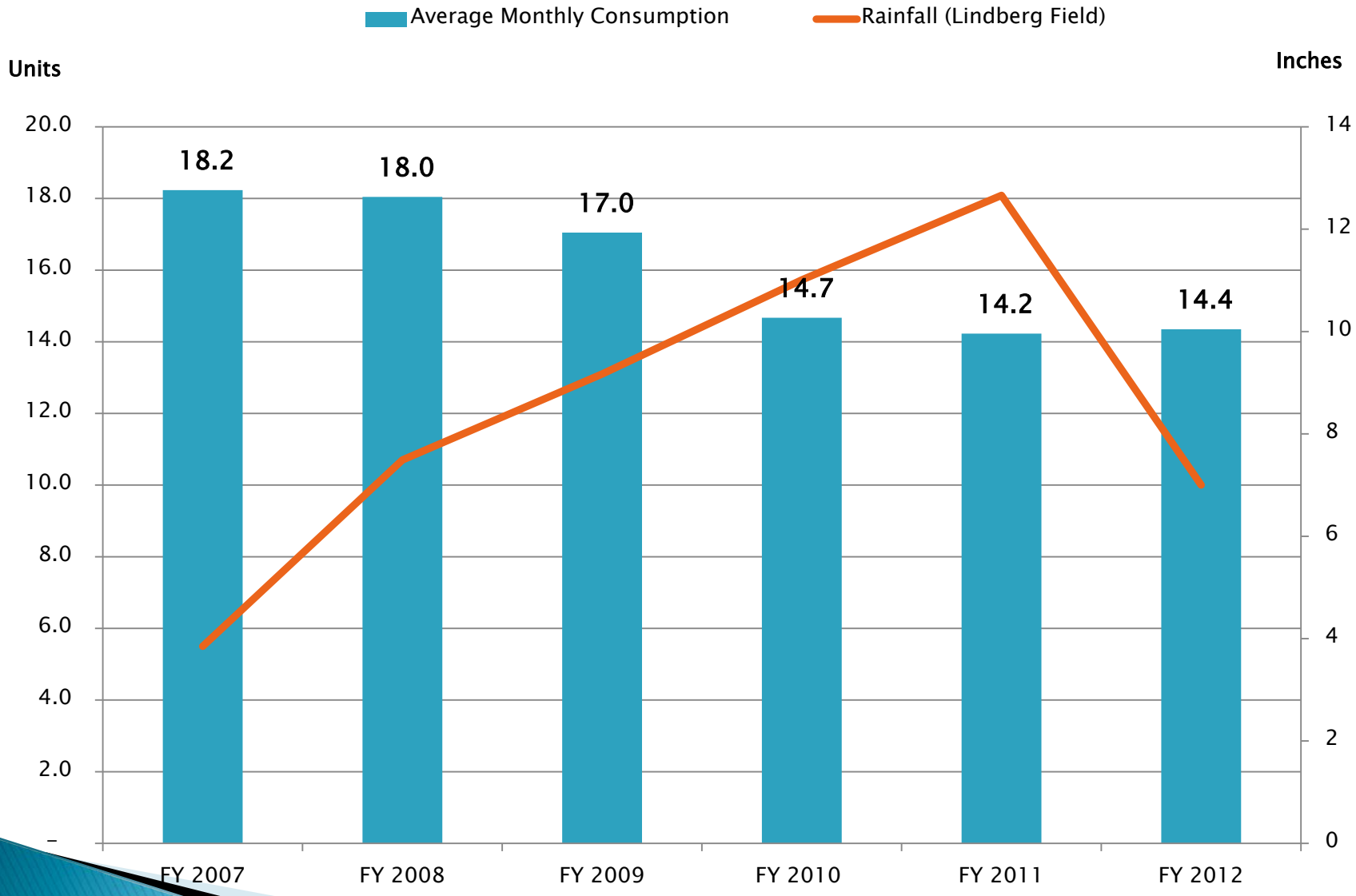
- Look at weather in past twelve months and 3 years prior rainfall and temperature
- Adjust back to “normal” rainfall year

Trending Rainfall

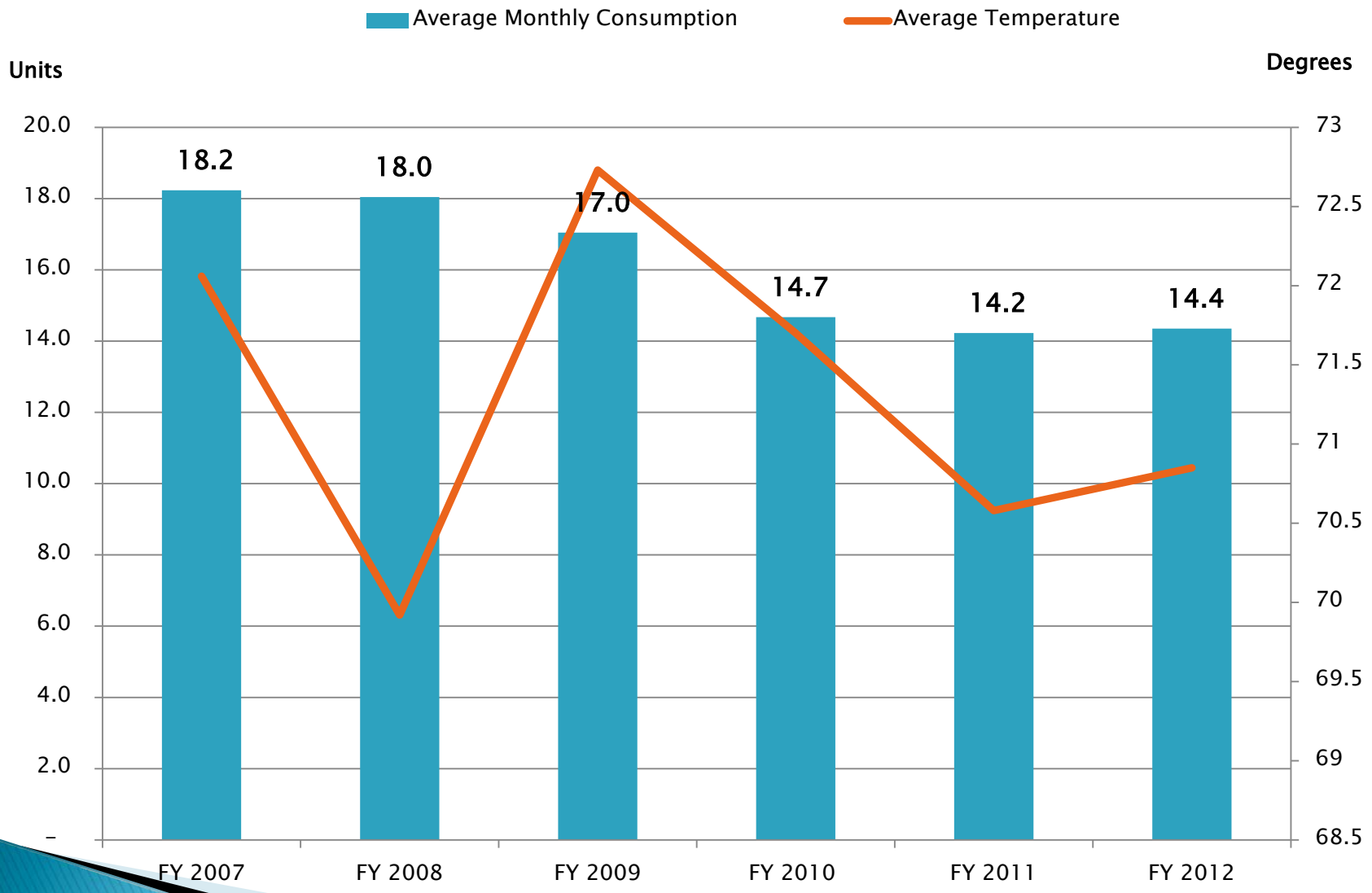


	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12
Rainfall Monthly (Inches)	-	-	-	-	0.12	2.28	3.38	2.28	0.68	1.78	0.01	0.02	0.02	-	0.03	2.18	0.88	5.00	0.31	2.13	1.46	0.26	0.36	0.03	-	-	0.13	0.46	3.12	0.86	0.89	0.70

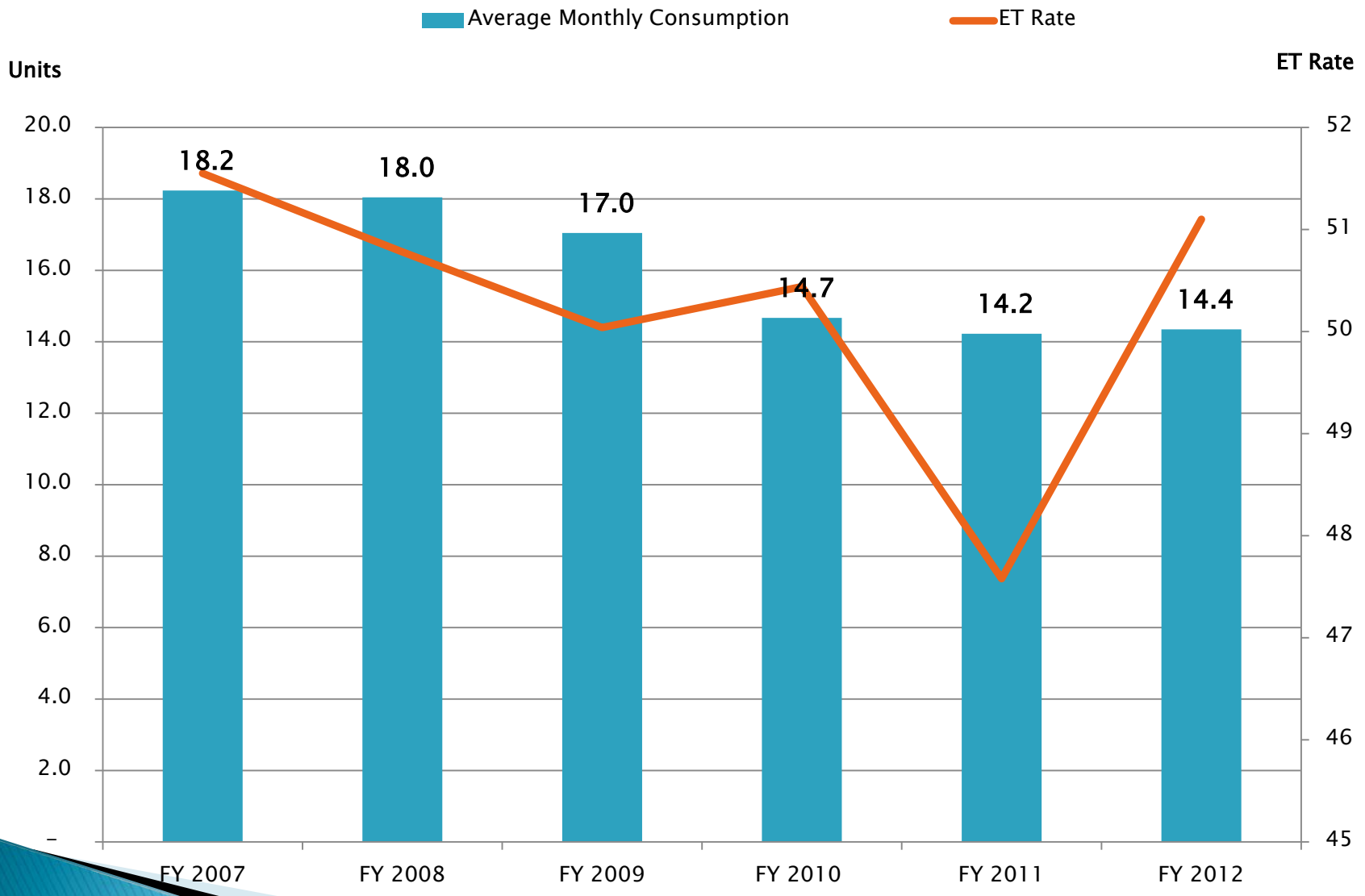
Average Sales per Meter for Single-Family Residential



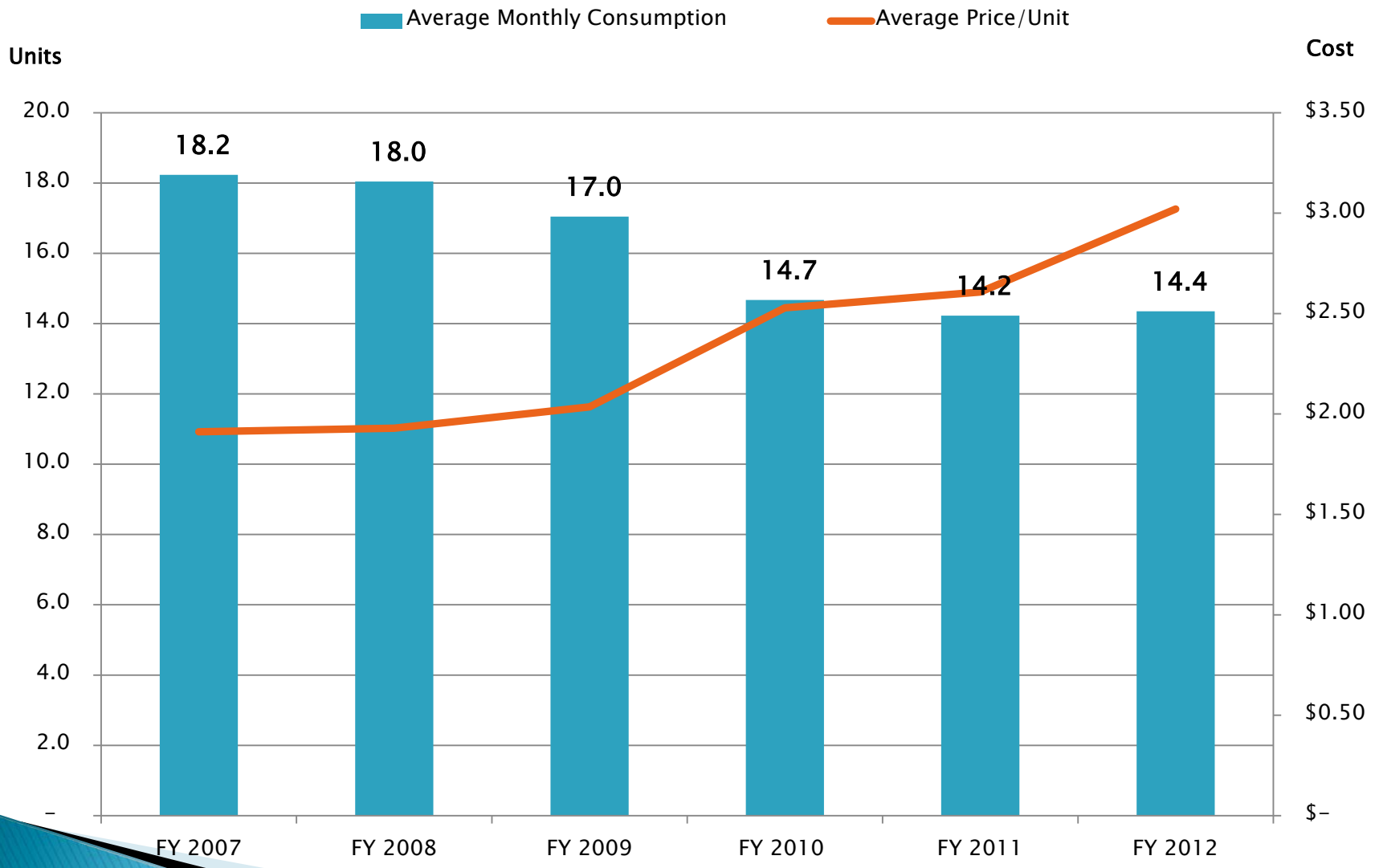
Average Sales per Meter for Single-Family Residential



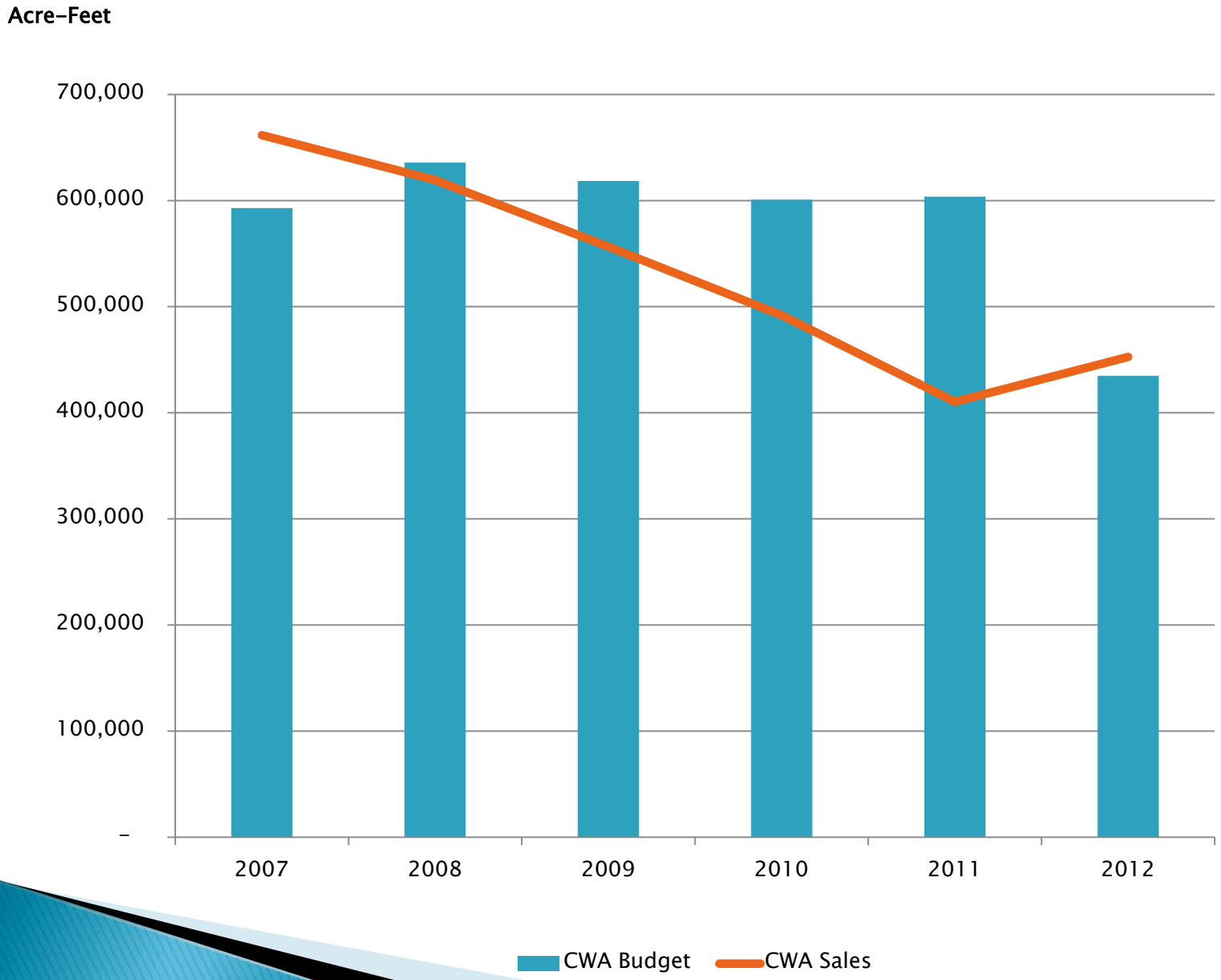
Average Sales per Meter for Single-Family Residential



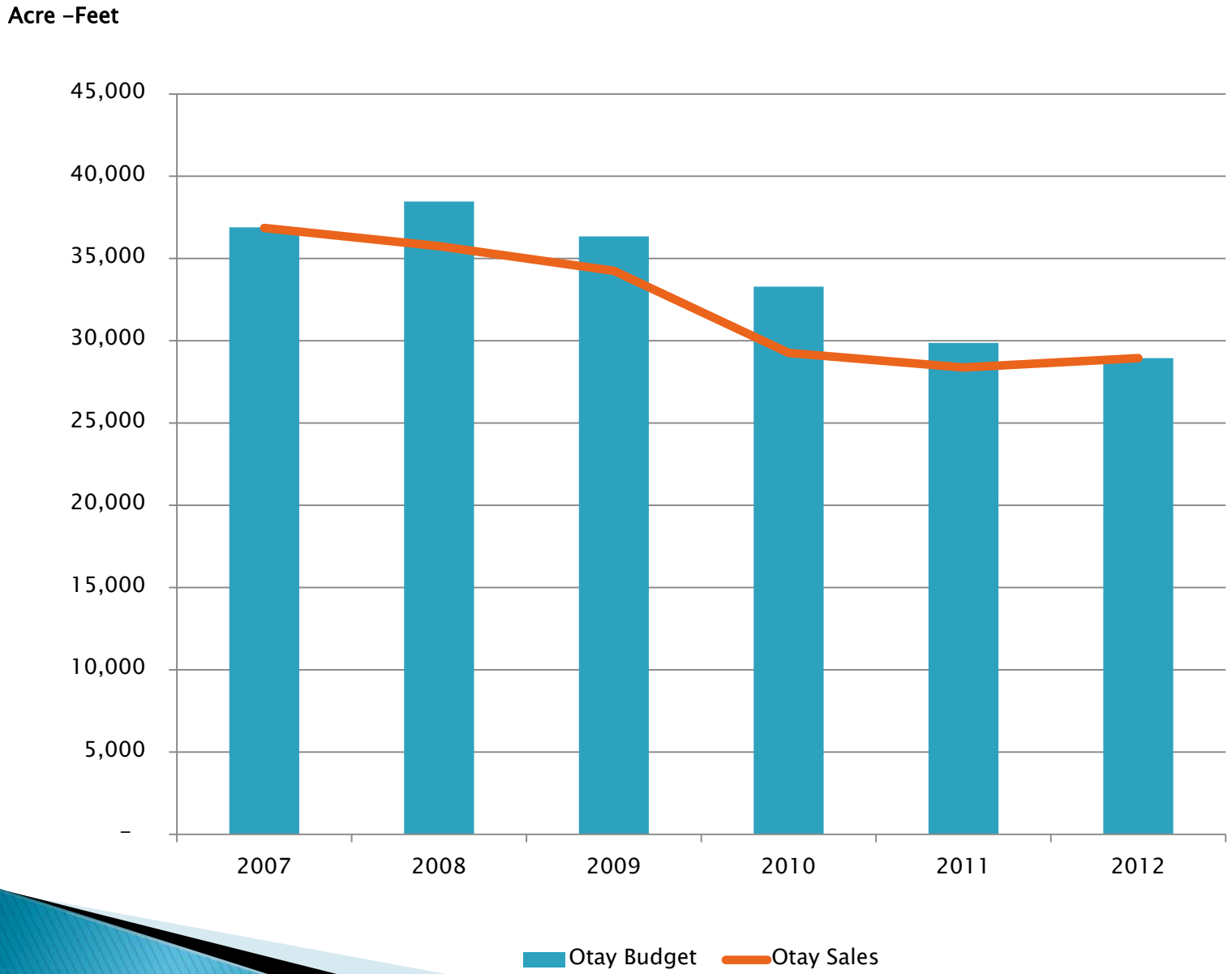
Average Sales per Meter for Single-Family Residential



CWA Budget vs. Actual Sales



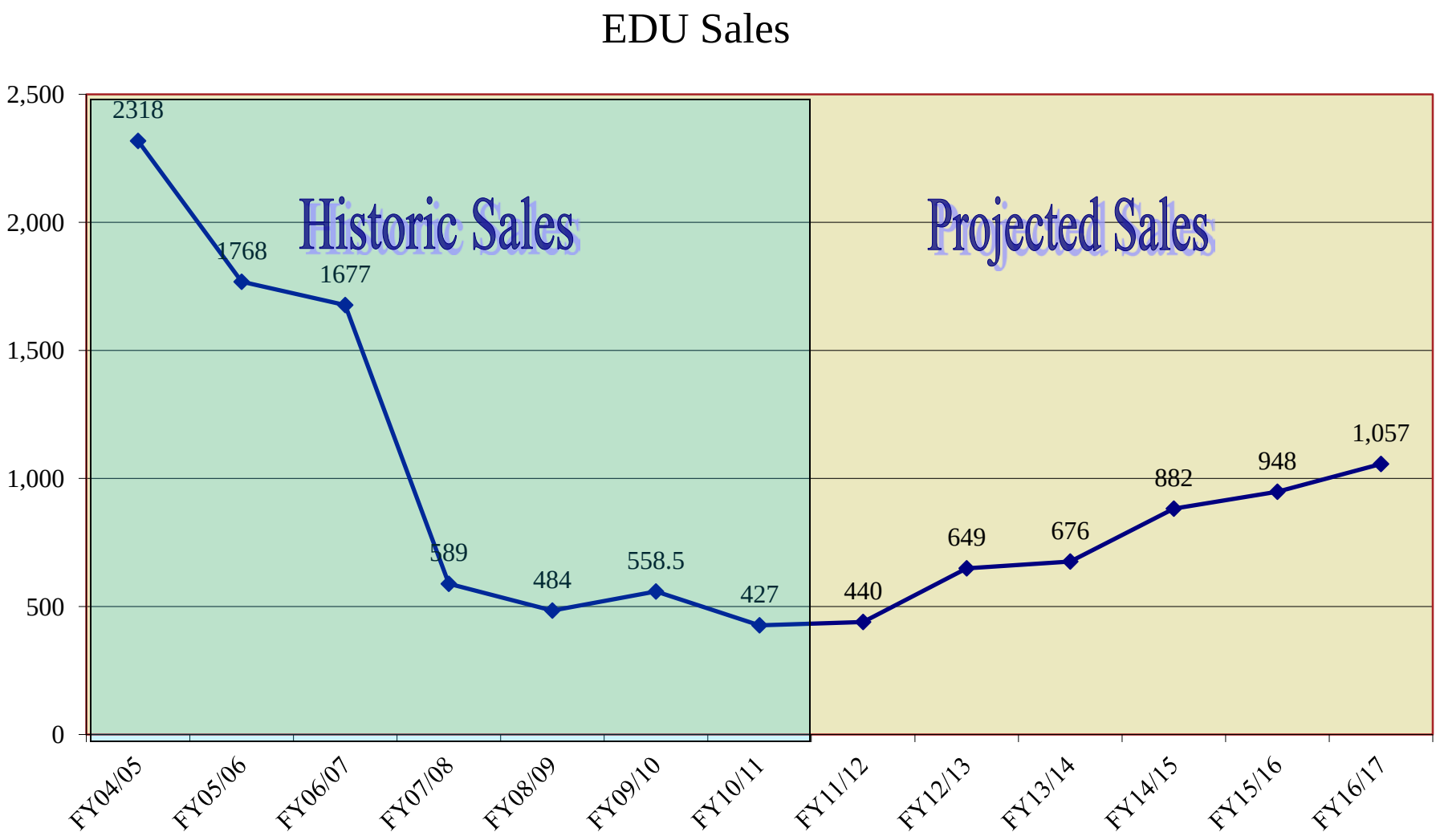
Otay Budget vs. Actual Sales



Methodology to Develop EDU's Projections FY 2013

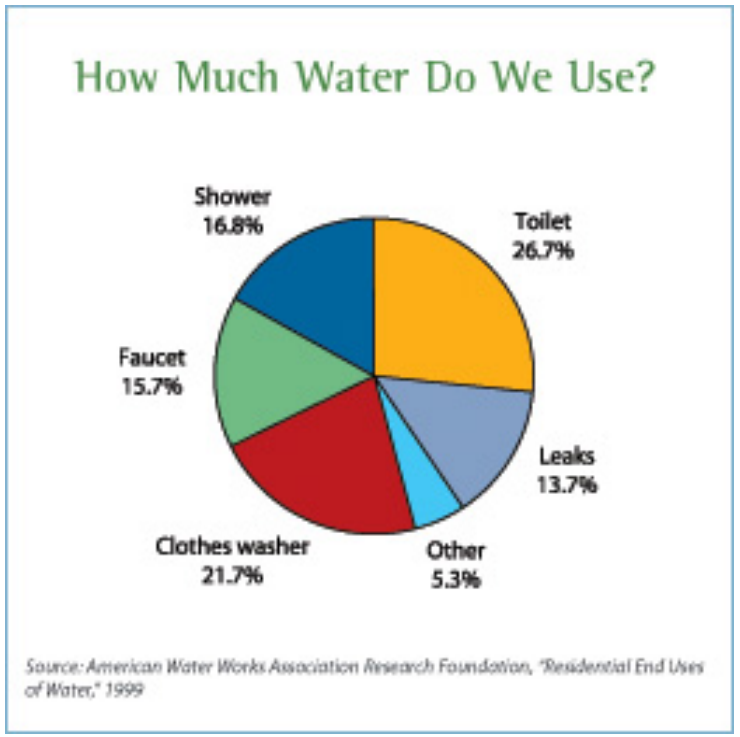
- Review historical data of development within service area, i.e., SAMPS, plans submitted, newspaper articles, etc.
- Communicate with Developers to confirm sales progress and anticipated new construction and timing of completion
- Compare information with Alan Nevin and supplement his research
- Develop a final "draft" of six-year projection for the entire District
- Numbers finalized for Budget workshop in May 2012

Meter Sales


EDU Sales
2,500
2,000
1,500
1,000
500
0
2318
1768
1677
589
484
558.5
427
440
649
676
882
948
1,057
Historic Sales
Projected Sales
FY04/05
FY05/06
FY06/07
FY07/08
FY08/09
FY09/10
FY10/11
FY11/12
FY12/13
FY13/14
FY14/15
FY15/16
FY16/17

Conservation's New Normal

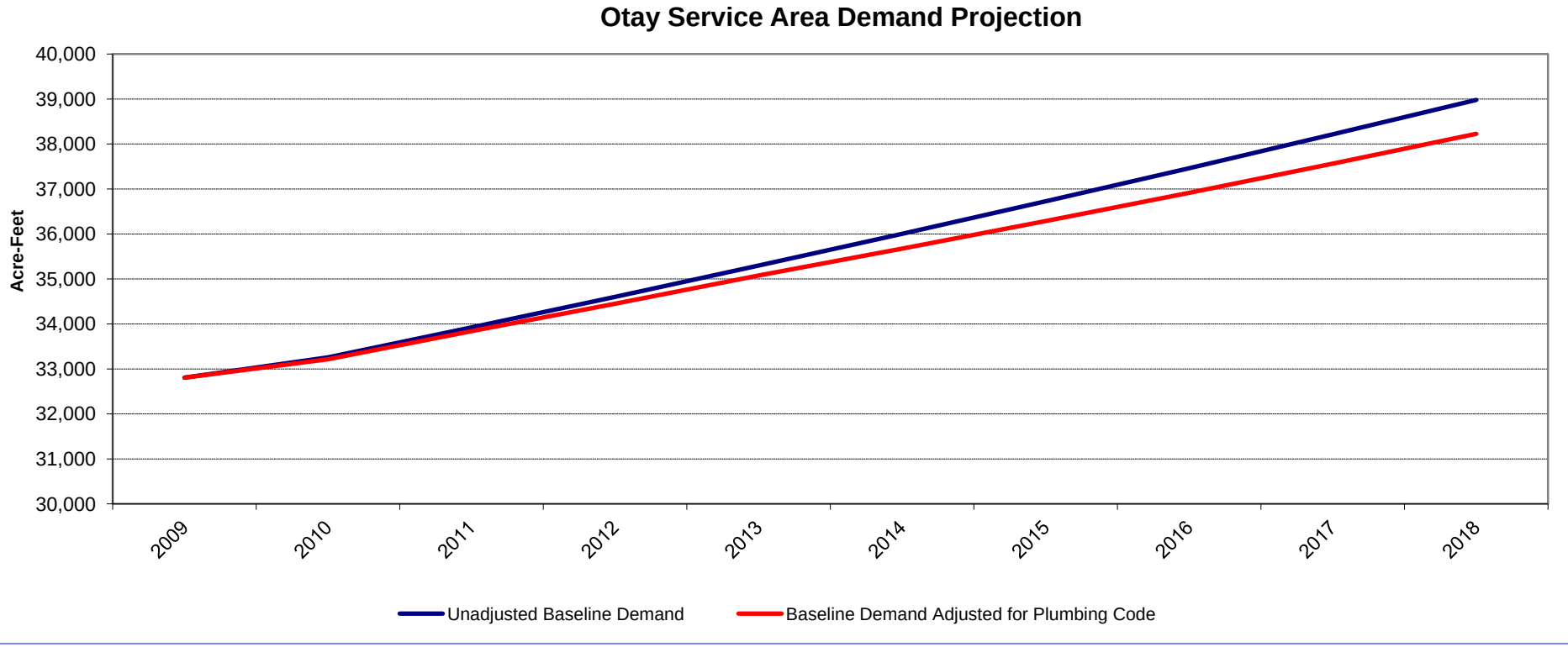
- Permanent Changes in Indoor Water Usage
  - Code changes influence indoor water use
    - Chula Vista's Green Building Code went into effect October 2009 for new construction (500+ homes)
    - 1/1/2014: only High Efficiency Toilets (HETs) will be sold in California; use 30% less water than standard 1.6 gallons/flush
    - 1/1/2014: only HE Urinals (.5 gallons/flush) can be sold in California



Outdoor Water Consumption Drivers

- Waterwise Landscapes
  - California Model Landscape Ordinance- new landscapes were required to be more efficient, effective 1/1/2010
    - 18" setbacks from sprinklers to hardscape eliminates runoff
    - No overhead sprinklers for areas narrower than 8 feet
    - Maximum allowed water allowance for new and refurbished sites decreased by 10%

Otay's Future Demand Trend 2009-2018



Customers are Purchasing Water Smart Products

- WaterSense Program – products use 20% less water and have specific performance criteria

- WaterSense Products currently include:
  - Toilets
  - Showerheads
  - Faucets
  - Urinals

- Programs such as the Water Authority's Water Smart and MET's California Friendly® brand are beginning to have an impact in the region.
  - Home Depot's Garden Friendly Plant Fairs

- Increased visitation to the Water Conservation Garden – over 40,000 visitors per year

Survey of the District's Customers

- City of Chula Vista: no planned changes
- Large HOAs: Eastlake I, III: continue to take out turfgrass
- County of SD: continue to under irrigate
- Golf Courses: shrinking the amount of irrigated area
- Otay Customers:
  - Customer's interest in saving water has grown steadily since 2005
  - 50% of the District's customers indicated that higher water rates motivated them to conserve water and took specific steps to conserve water during the past 6 months

Options to Consider

- Budget Growth by Customer Type
- Reexamine Percentages within Tiers
- Adjust Future Sales for Weather in Upcoming Year
- Adjust Future Sales for Price Elasticity
- Adjust Future Sales for Continued Conservation

Questions?

Attachment B

Economic Update (2012-2018)

Otay Water District

The London Group Realty Advisors

Consultants to Real Estate Investors and Portfolio Managers

Alan N. Nevin

Principal & Director

Litigation Support Practice

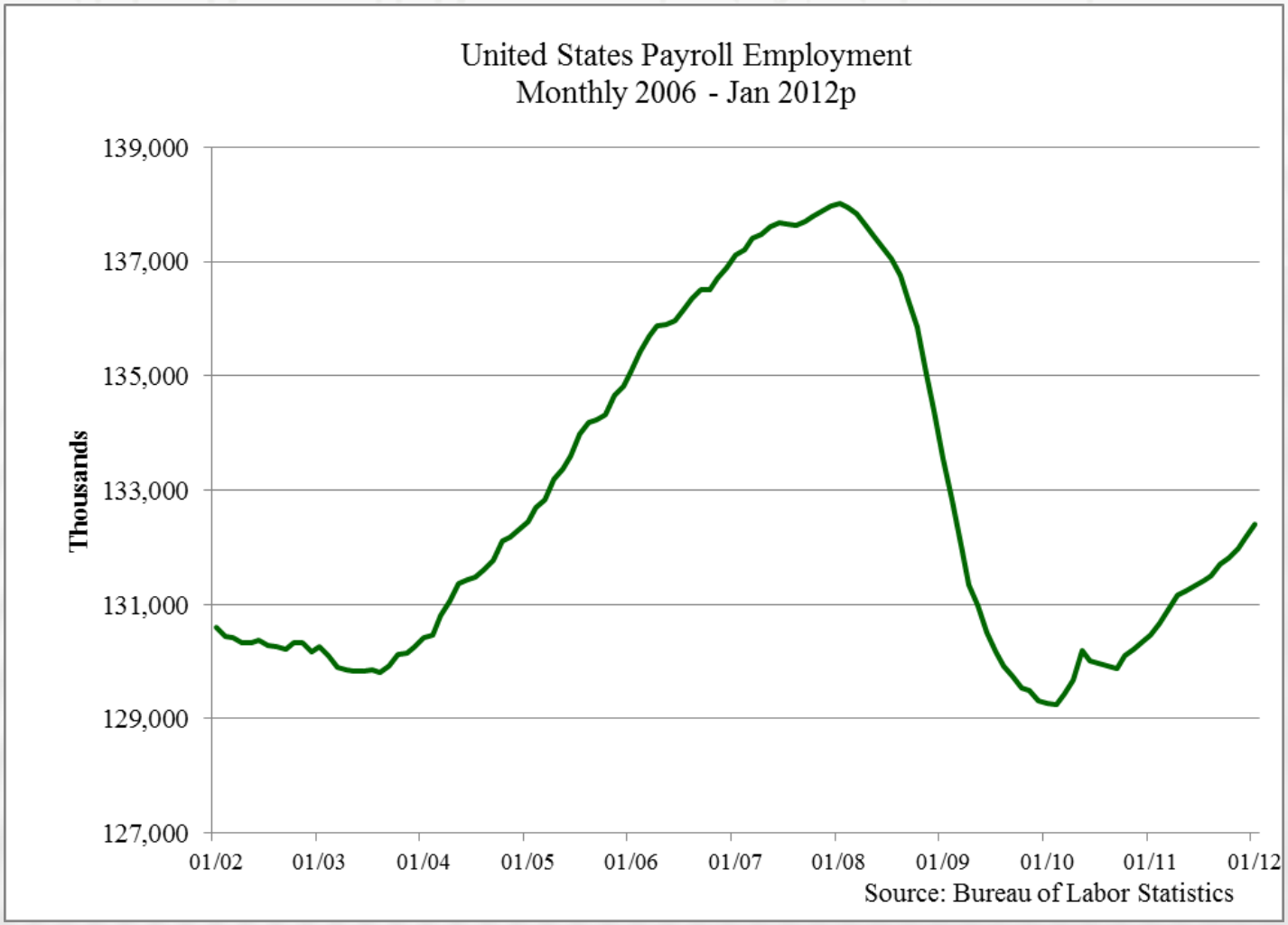
(619) 269-4010 x5

alan@londongroup.com

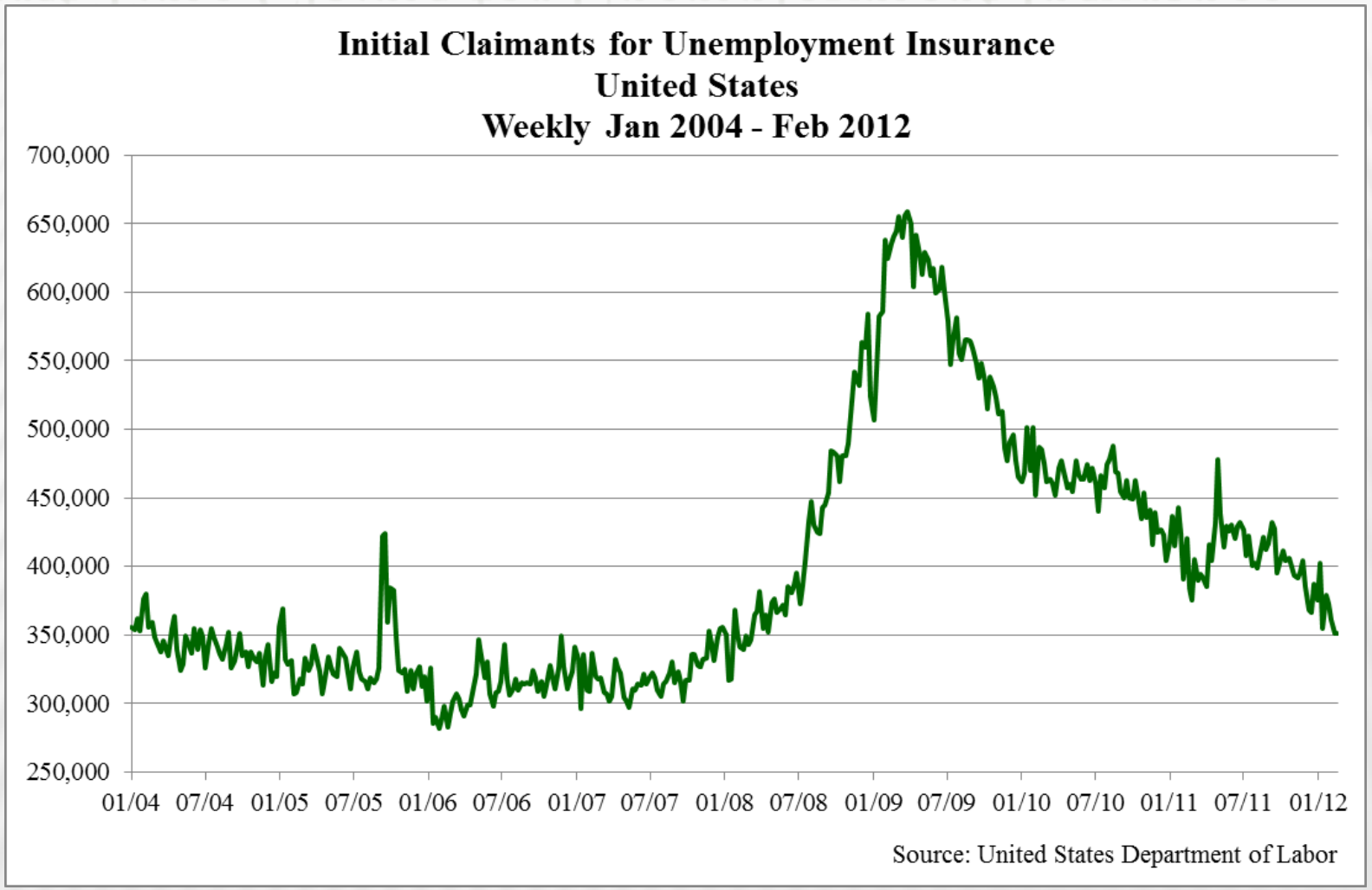
- The National Picture

U.S. Unemployment Rate Pushes Downward

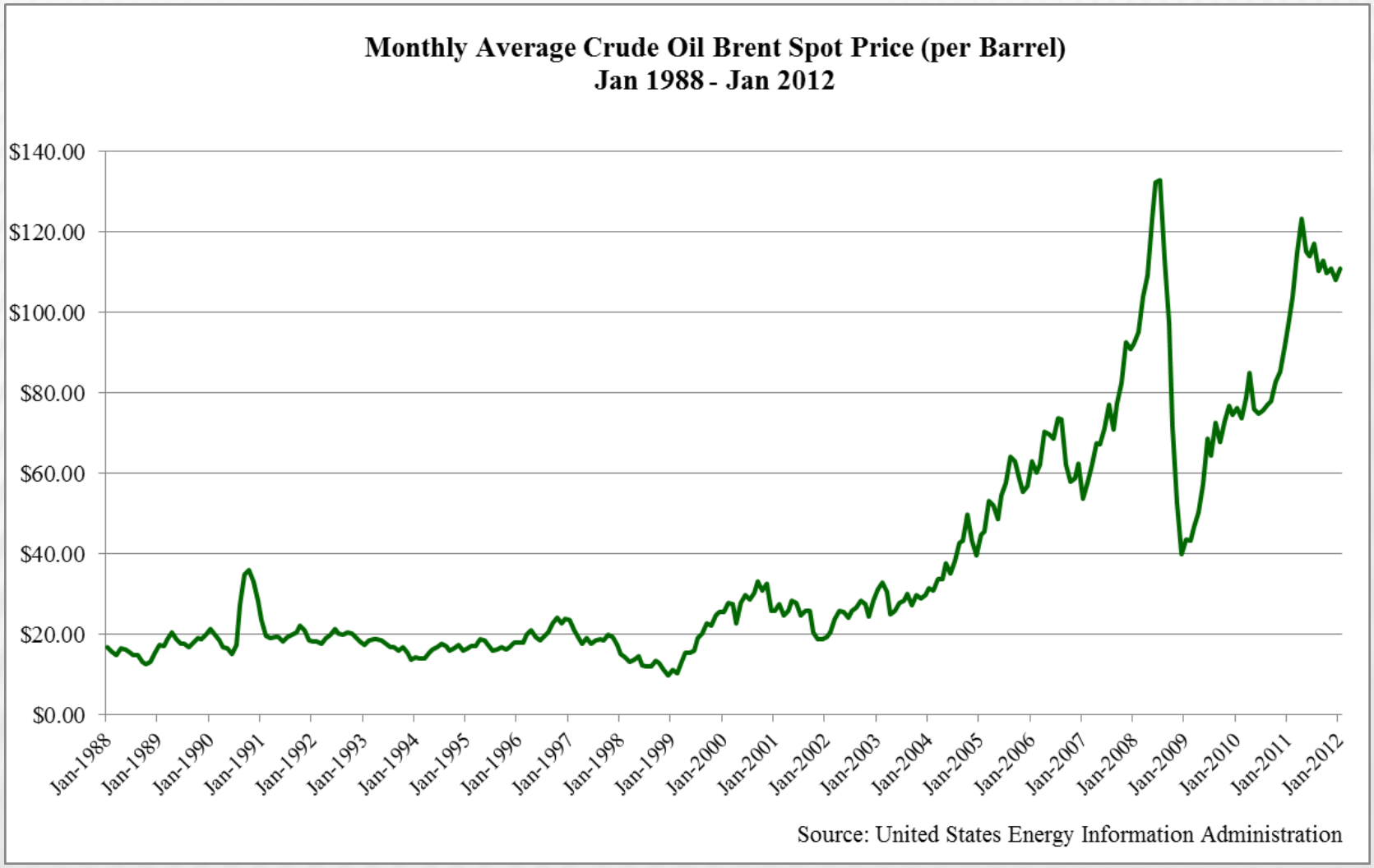
U.S. Monthly Payroll Rises – but Not Enough



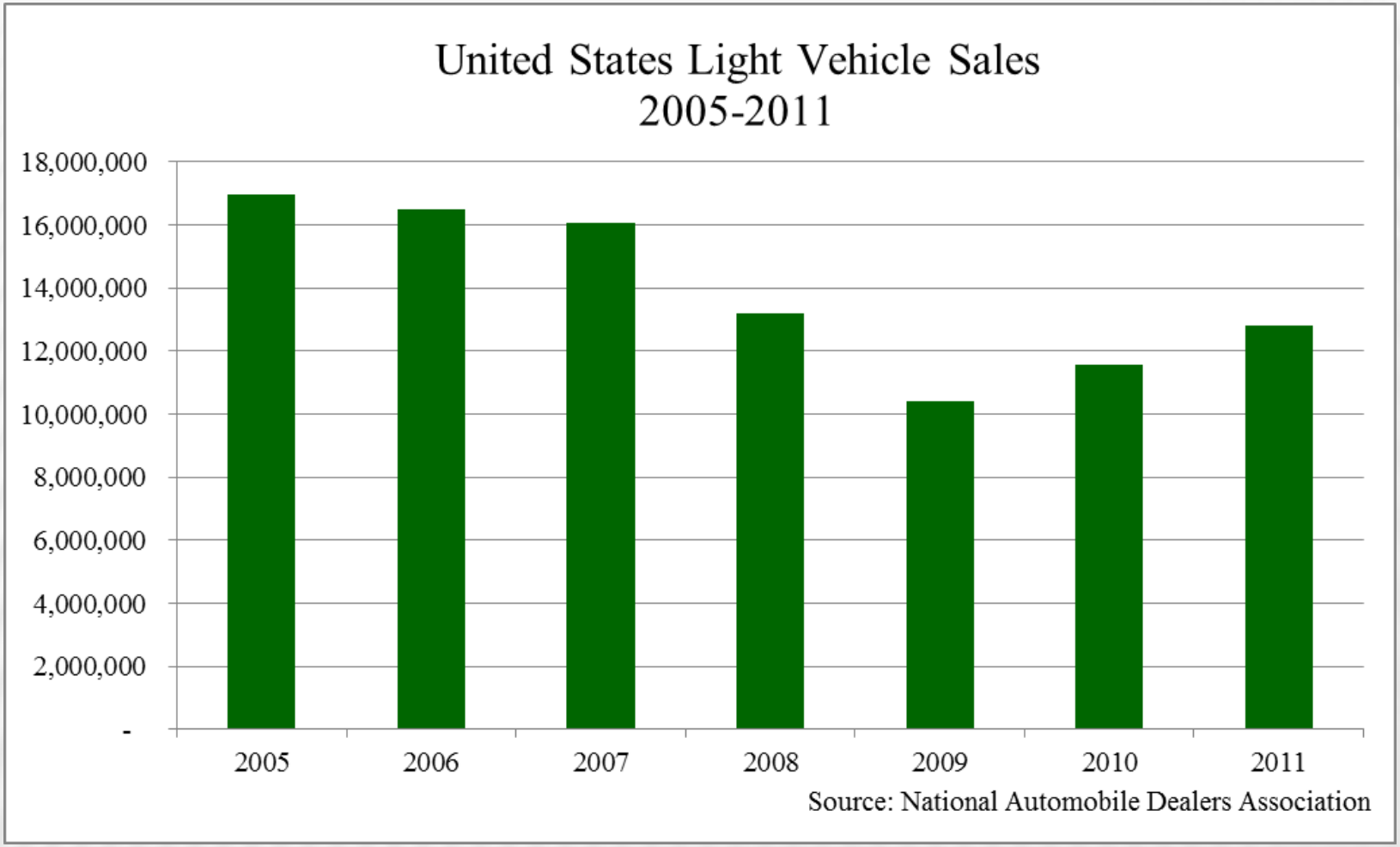
First Time Claims for Unemployment Insurance



Oil Prices move Erratically Upward



New Vehicle Sales Looking Up

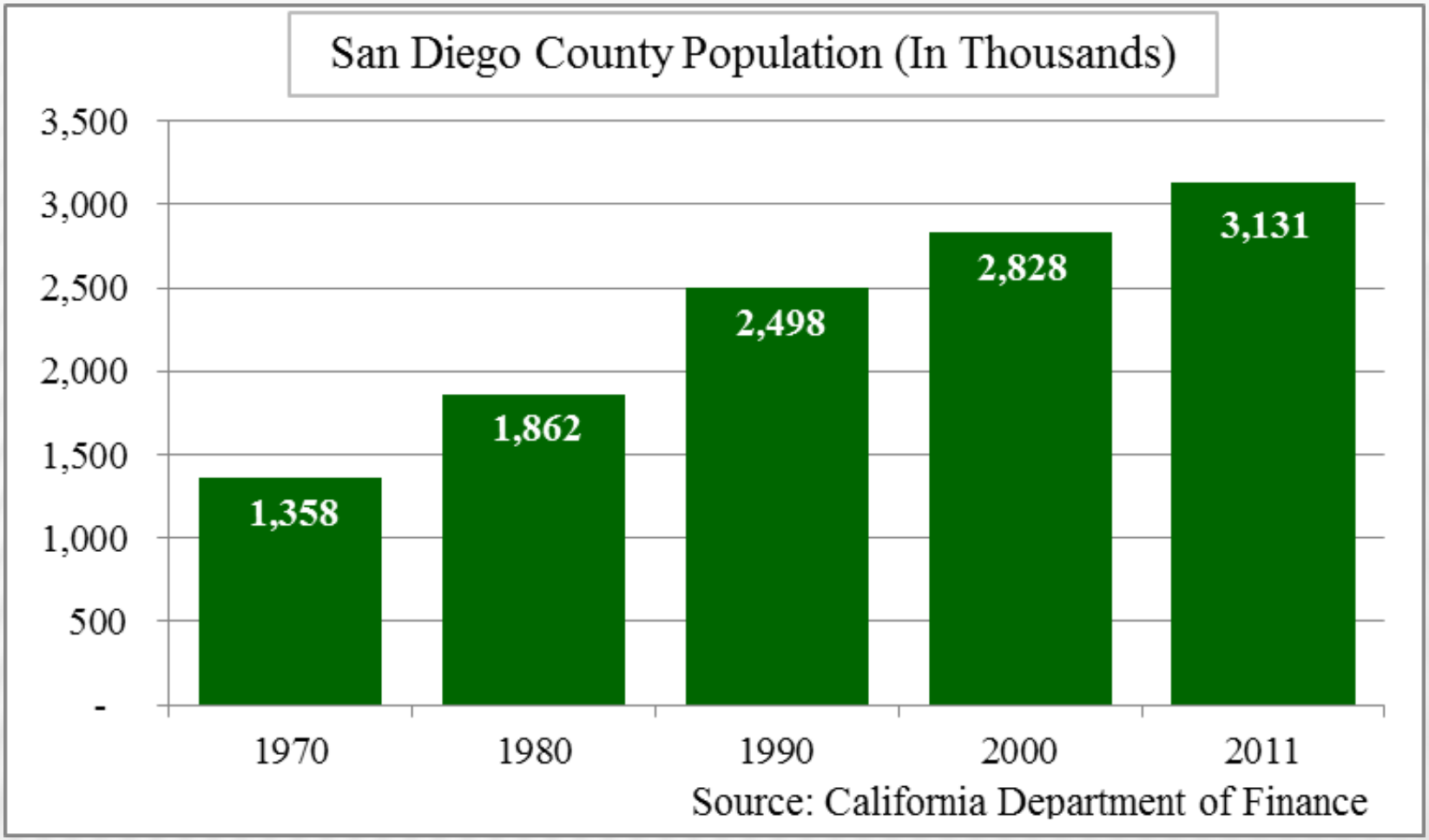


The San Diego Economy

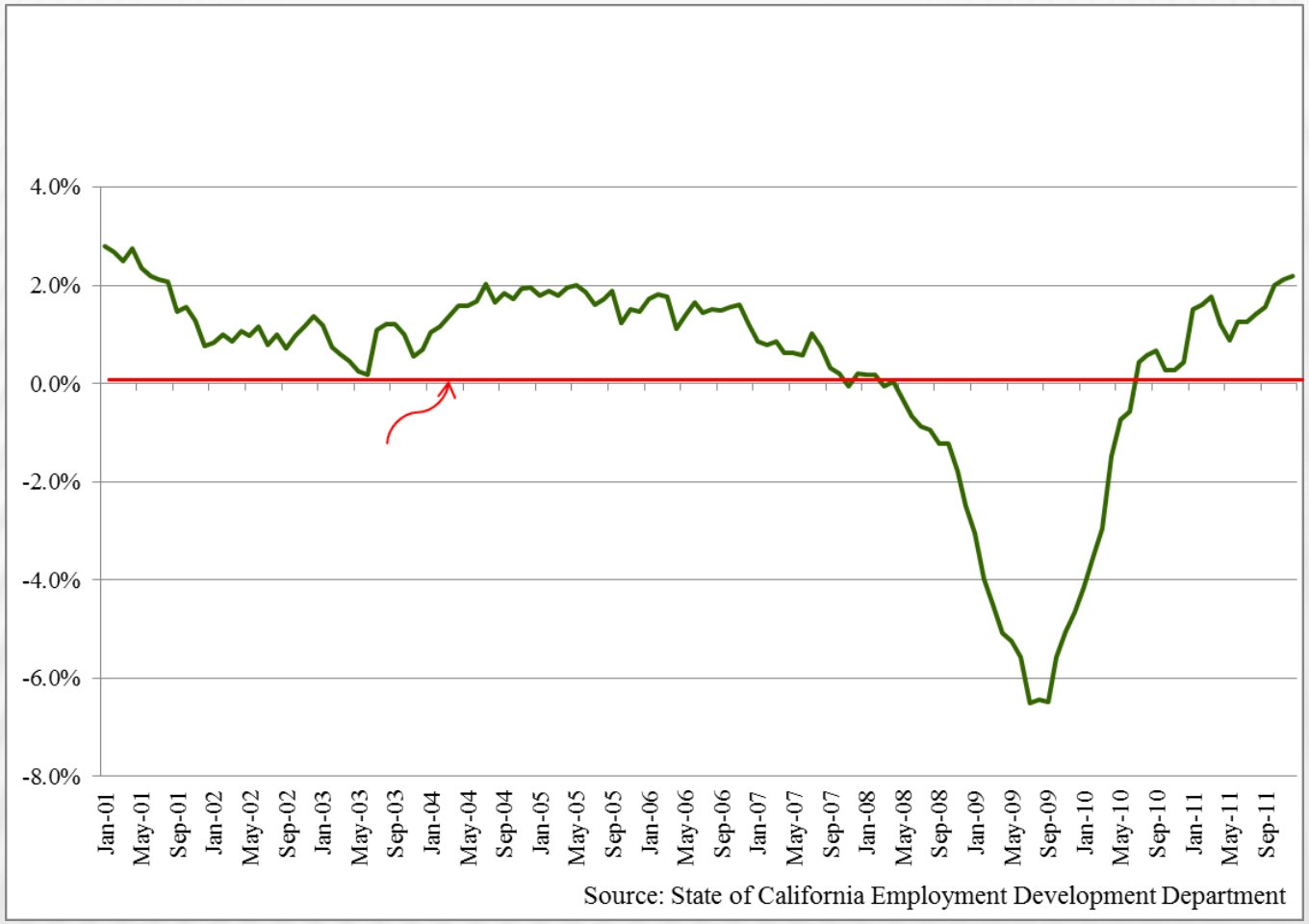
San Diego County Ranking in % Employment Change

Top Ten Metropolitan Areas % Employment Change 2010-2011					
		Employment		2010-2011	
Metropolitan Area	% Change Rank	2010	2011	Change	% Change
Salt Lake City	1	617	637	20	3.2%
Houston	2	2,567	2,643	76	3.0%
San Jose	3	864	889	25	2.9%
Tampa/St. Petersburg	4	1,122	1,150	28	2.5%
Seattle	5	1,650	1,688	38	2.3%
San Diego	**6**	**1,234**	**1,261**	**27**	**2.2%**
Austin	7	770	786	16	2.1%
Riverside/San Bernardino	8	1,119	1,142	23	2.1%
Jacksonville	9	587	597	10	1.7%
Raleigh	10	502	510	8	1.6%

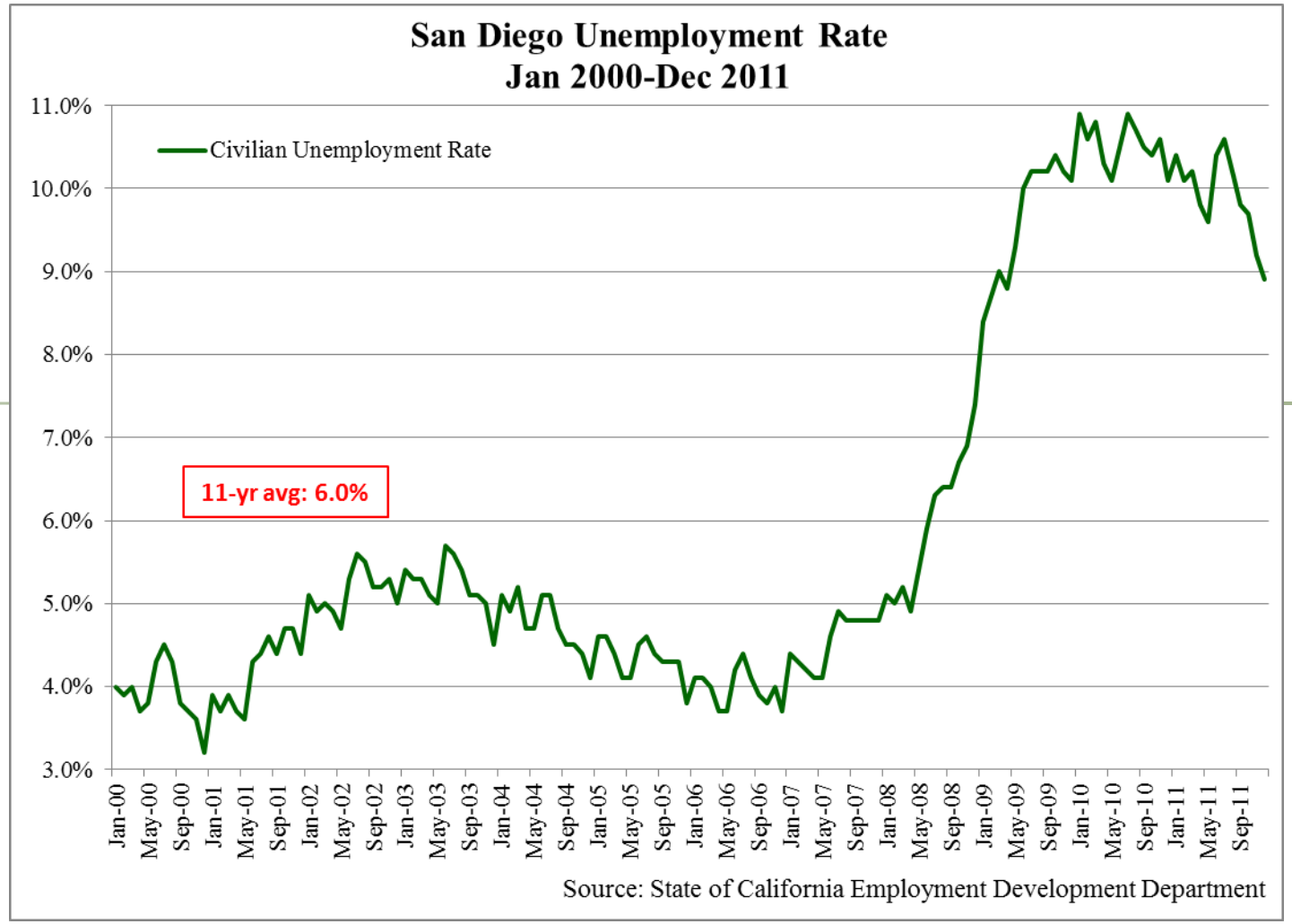
Source: Bureau of Labor Statistics
London Group Realty Advisors 2.2012


San Diego County Population (In Thousands)
3,500
3,000
2,500
2,000
1,500
1,000
500
-
1,358
1,862
2,498
2,828
3,131
1970
1980
1990
2000
2011
Source: California Department of Finance

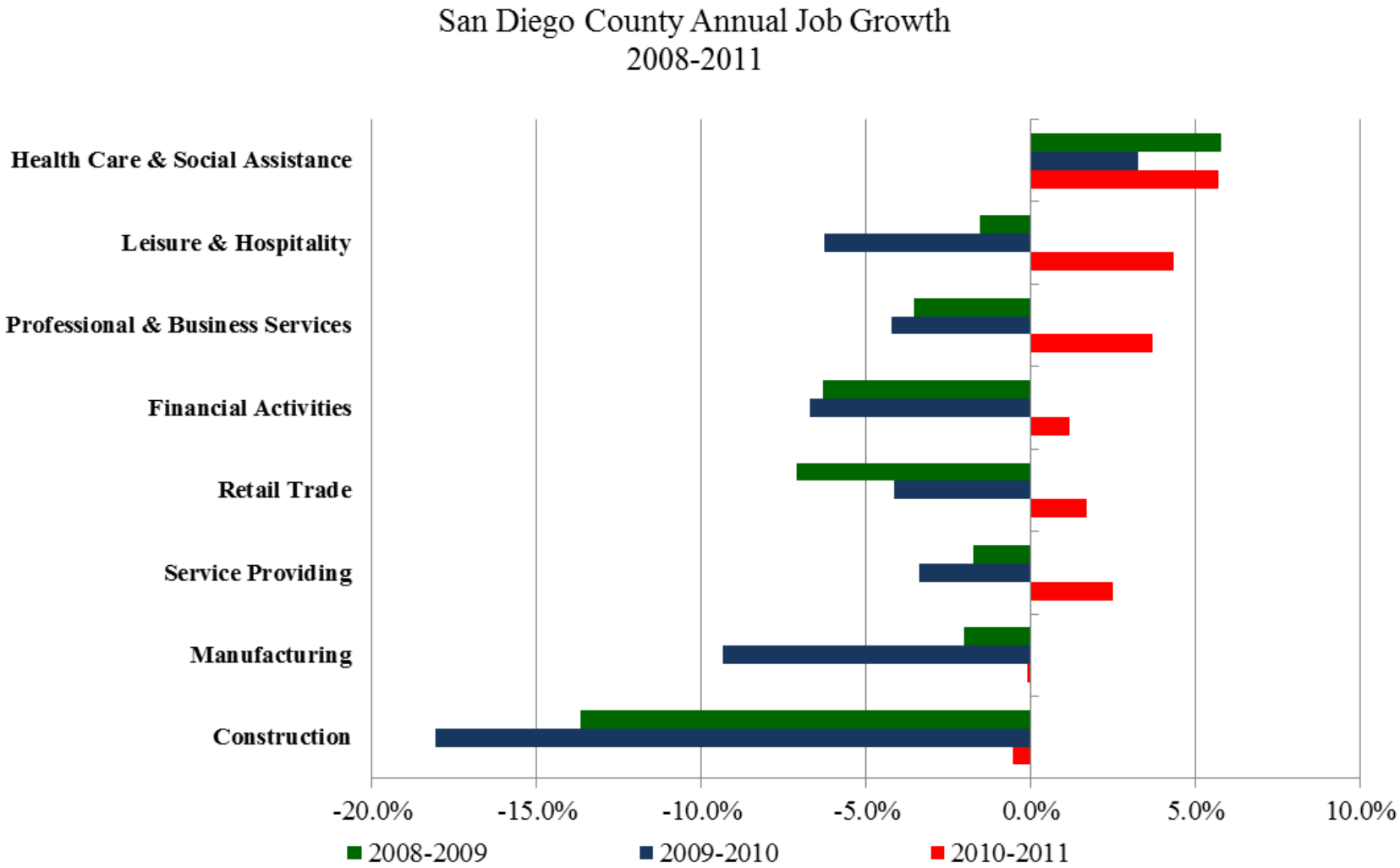
Payroll Employment – San Diego County



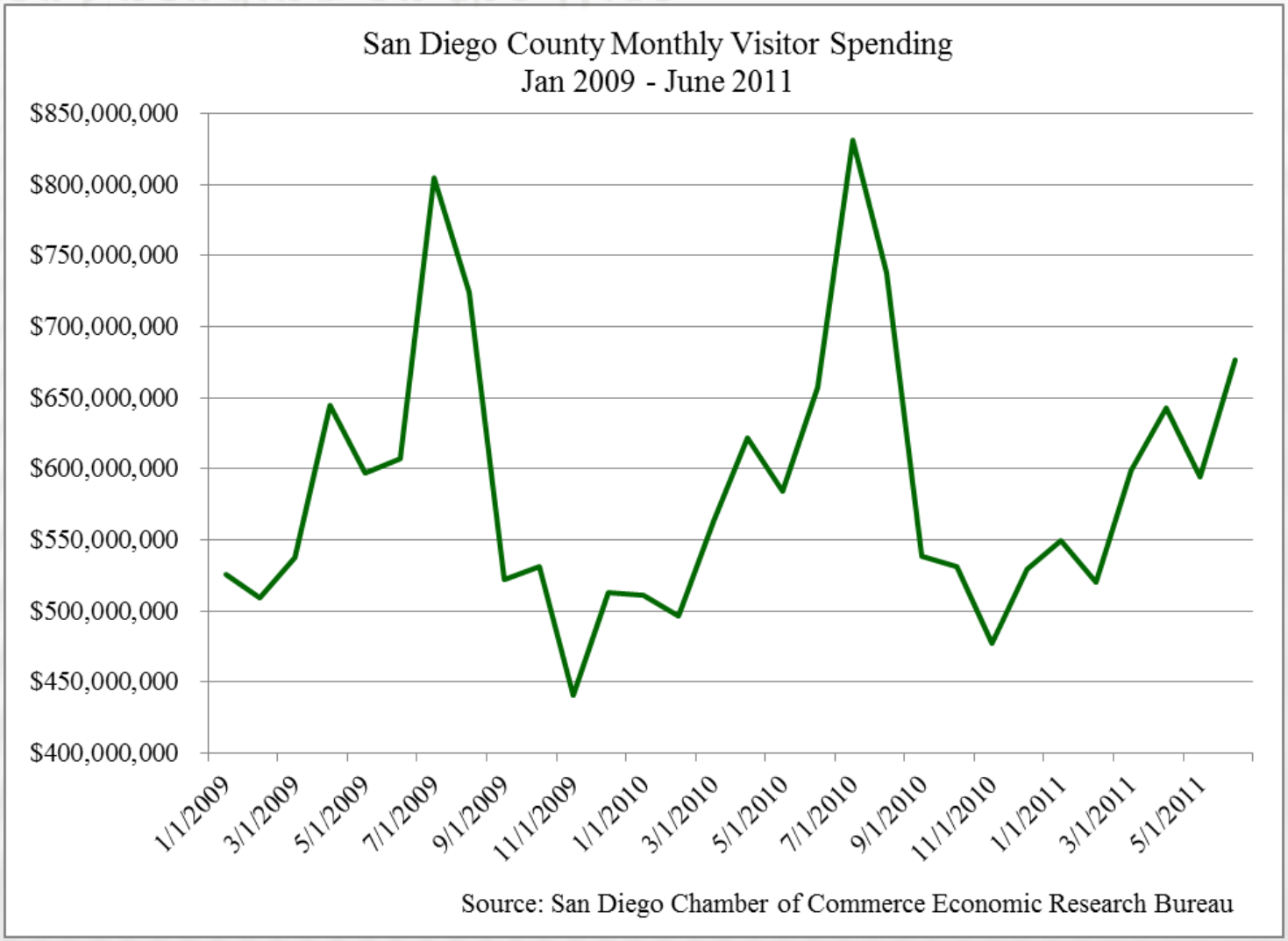
Civilian Unemployment Rate – San Diego County



Annual Payroll Employment by Job Category



Visitor Spending on the Rise

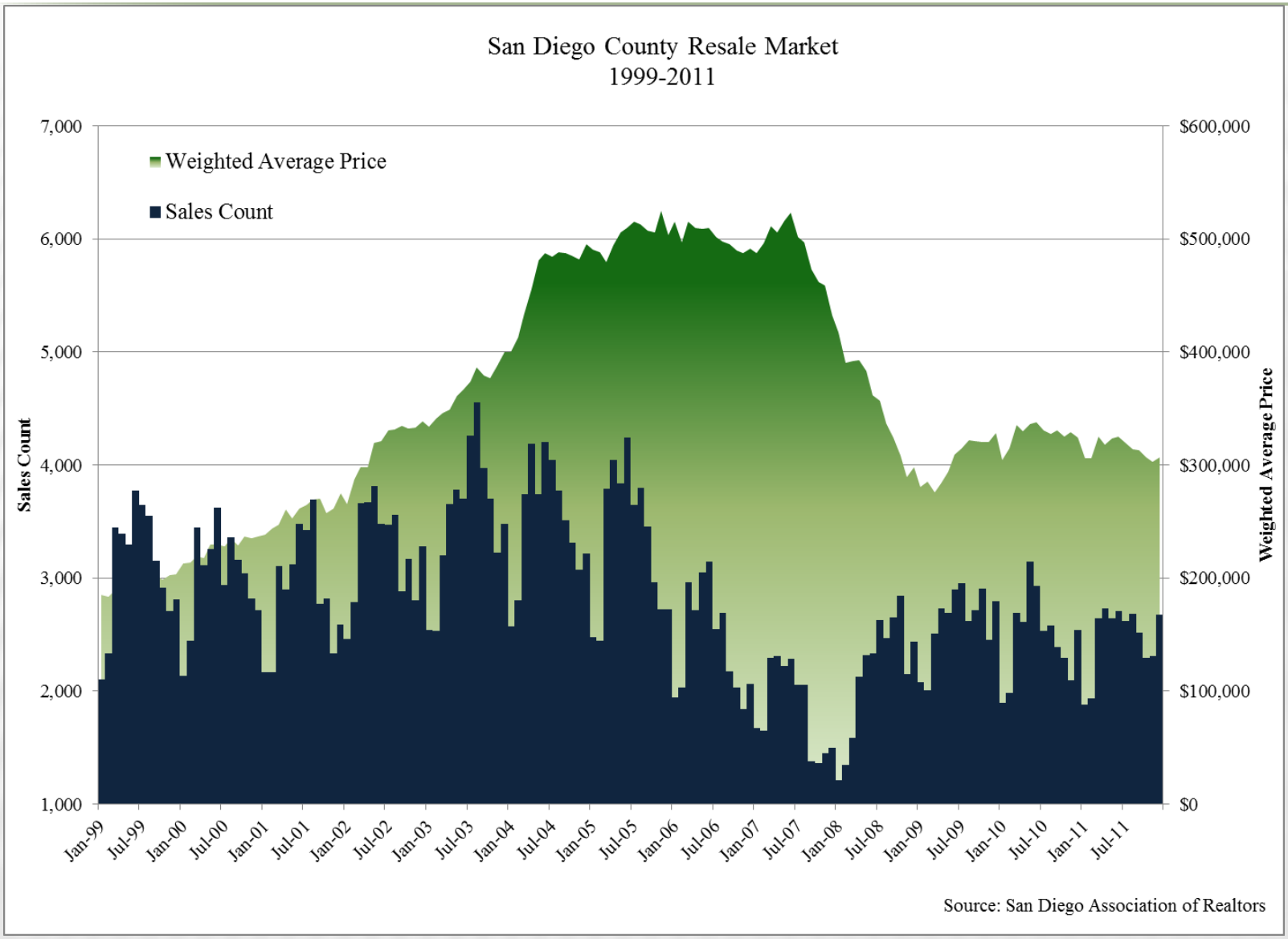


Sales Tax Point of Sale
San Diego County & State of California

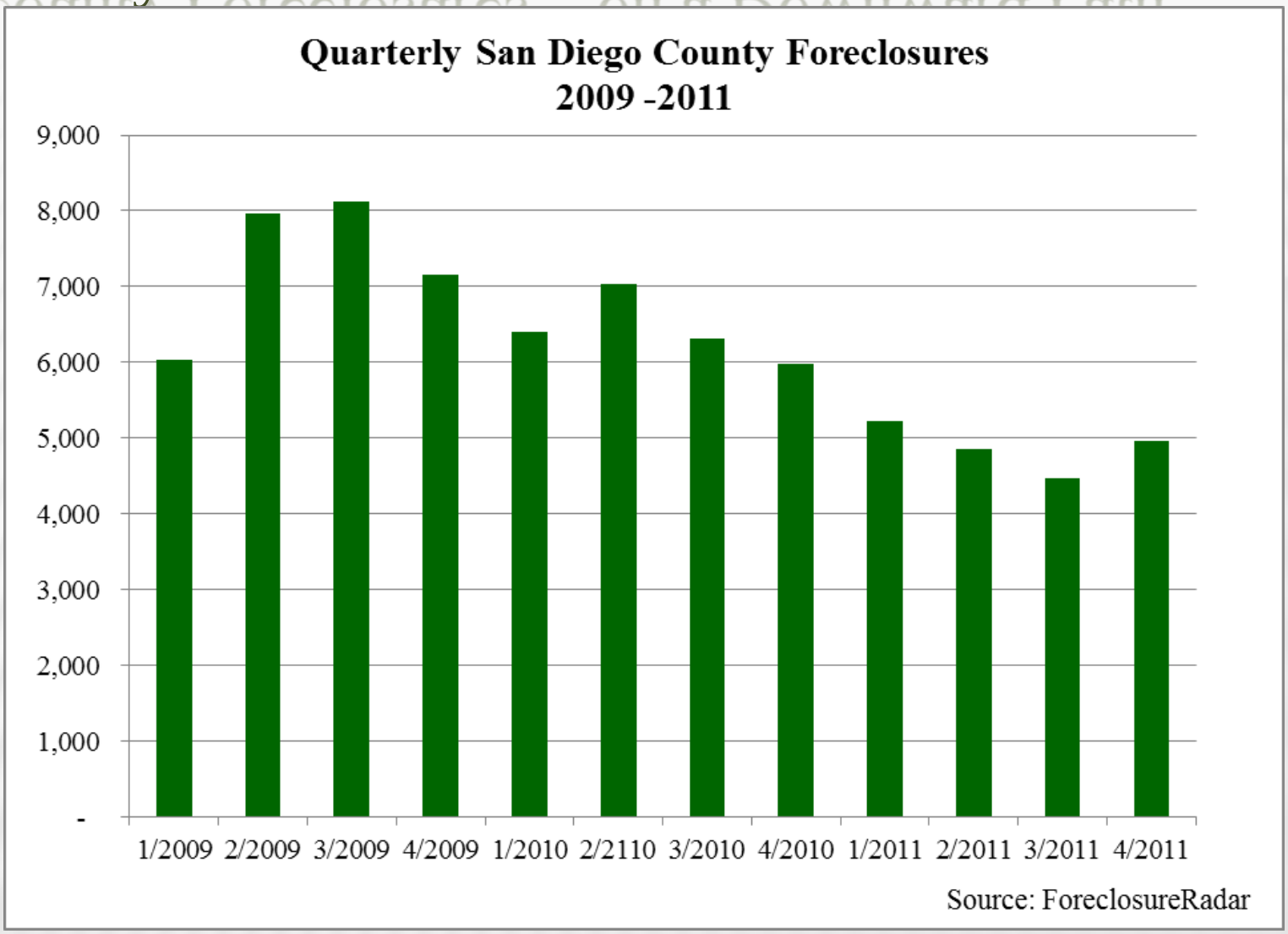
	California		San Diego Co.	
Quarter	**2010**	**2011**	**2010**	**2011**
1st	$ 1,098,527,221	$ 1,182,935,803	$ 97,070,512	$ 104,479,532
2nd	$ 1,201,338,068	$ 1,323,063,425	$ 105,750,900	$ 113,812,159
3rd	$ 1,224,547,750	$ 1,335,561,436	$ 106,952,810	$ 115,244,572
total	$ 3,524,413,039	$ 3,841,560,664	$ 309,774,222	$ 333,536,263
Change 1st-3rd Qtrs. 2010-2011		$ 317,147,625		$ 23,762,041
% Change		**9.0%**		**7.7%**

Source: HdL
The London Group Realty Advisors 2.2012

- San Diego Residential
- Real Estate


San Diego County Resale Market
1999-2011
Weighted Average Price
Sales Count
7,000
6,000
5,000
4,000
3,000
2,000
1,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
Sales Count
Weighted Average Price
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Source: San Diego Association of Realtors

S.D. County Foreclosures – on a Downward Path



Residential Resales – South San Diego County

South San Diego County Annual Residential Sales 2005-2011		
Year	**# Closings**	**Avg. Sales Price**
2005	7,527	$693,476
2006	5,501	$716,132
2007	4,283	$753,418
2008	6,206	$487,876
2009	7,668	$398,174
2010	6,761	$434,590
2011	6,392	$448,495
Source: SANDICOR		

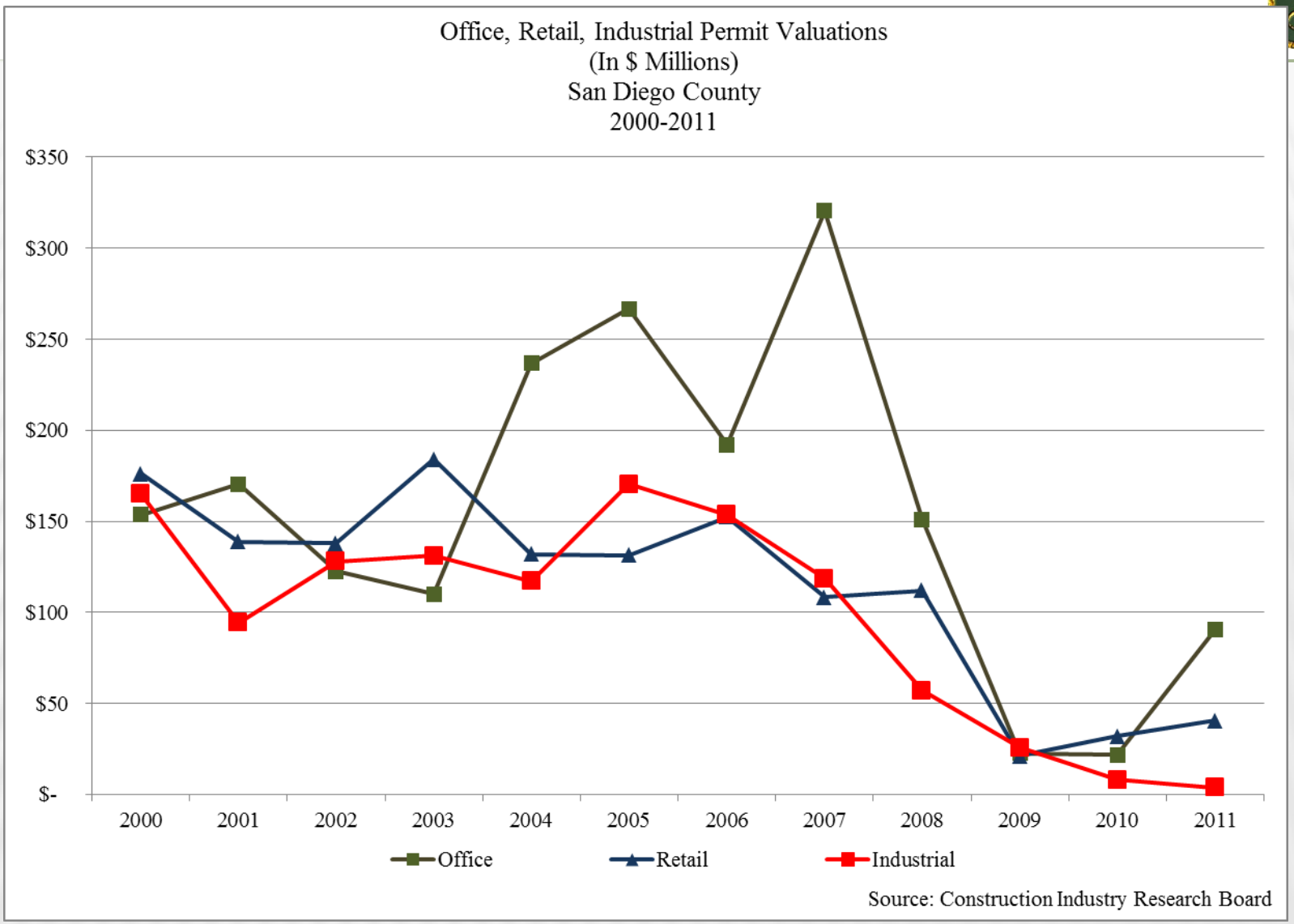
Foreclosures

San Diego County and Otay Water District Area

2009-2011

Quarter	SD Co.	Total owd	OWD as % of SD Co.
1/2009	6,039	783	**13%**
2/2009	7,971	808	10%
3/2009	8,131	862	11%
4/2009	7,161	662	9%
1/2010	6,400	617	10%
2/2110	7,029	712	10%
3/2010	6,313	630	10%
4/2010	5,987	544	9%
1/2011	5,220	444	9%
2/2011	4,858	416	9%
3/2011	4,474	383	9%
4/2011	4,966	443	**9%**
4/2011 as % of 1/2009		**57%**	

- Commercial Real Estate
- San Diego County


Office, Retail, Industrial Permit Valuations
(In $ Millions)
San Diego County
2000-2011
$350
$300
$250
$200
$150
$100
$50
$-
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Office
Retail
Industrial
Source: Construction Industry Research Board

South County Commercial Not Doing Well

Direct Vacancy Rates Commercial Real Estate San Diego County and South County 4th Quarter 2011				
	South S.D. County		S D County	
Property Type	Sq.Ft. Vacant	Vacancy Rate	Sq.Ft. Vacant	Vacancy Rate
Retail	901,384	5.0%	6,946,036	5.1%
Office	960,673	17.7%	15,430,672	13.7%
Industrial	3,627,671	13.8%	13,011,164	8.0%

Source: CoStar

London Group Realty Advisors 3.2012

- Real Estate Development
- Otay Water District Area
- 2012-2018

One-Year's Inventory Remains in OWD Area

Unsold New Home Inventory Summary Eastern Chula Vista As of 2/12/2012		
Style	**Remaining Units**	**%**
Detached	611	49.4%
Attached	627	50.6%
Total	1,238	100.0%
# Projects	28	
Weeks of Supply (1)	**44.2**	

(1) at 1 Sale per Week per Project

Source: Steve Aranoff Consultants
The London Group Realty Advisors 2.2012

Summary: Projected Residential Construction Permits
Otay Water District Area and San Diego County
2012-2018

Otay Water District Area	Total Units	Annual Avg.
Single Family Detached	**4,100**	**586**
Condominium (1)	3,450	493
Apartments	4,500	643
Total Multi-Family	**7,950**	**1,136**
Total Units	**12,050**	**1,721**

San Diego County		
Single Family Detached	**17,600**	**2,514**
Condominium (1)	8,300	1,186
Apartments	23,000	3,286
Total Multi-Family	**31,300**	**4,471**
Total Units	**48,900**	**6,986**

OWD as % of County	
Single Family Detached	23.3%
Condominium (1)	41.6%
Apartments	19.6%
Total Multi-Family	25.4%
Total Units	**24.6%**

Multi-Family as % of Total	
OWD Area	66.0%
San Diego County	64.0%

(1) Townhomes, Garden, Mid-Rise and High-Rise Condominiums (conversions omitted)

The London Group Realty Advisors 2.2012

Projected Residential Construction Permits
Otay Water District Area & San Diego County
2012-2018

YEAR	2012	2013	2014	2015	2016	2017	2018	AVERAGE 2012-2018
Otay Water District Area								
Single Family Detached	**450**	**300**	**450**	**600**	**700**	**800**	**800**	**586**
Condominium (1)	350	350	350	600	600	600	600	**493**
Apartments	400	300	600	800	800	800	800	**643**
Total Multi-Family	**750**	**650**	**950**	**1,400**	**1,400**	**1,400**	**1,400**	**1,136**
Total Units	**1,200**	**950**	**1,400**	**2,000**	**2,100**	**2,200**	**2,200**	**1,721**
San Diego County								
Single Family Detached	**1,900**	**2,100**	**2,100**	**2,500**	**3,000**	**3,000**	**3,000**	**2,514**
Condominium (1)	500	600	800	1,200	1,600	1,800	1,800	**1,186**
Apartments	3,000	4,000	4,000	3,000	3,000	3,000	3,000	**3,286**
Total Multi-Family	**3,500**	**4,600**	**4,800**	**4,200**	**4,600**	**4,800**	**4,800**	**4,471**
Total Units	**5,400**	**6,700**	**6,900**	**6,700**	**7,600**	**7,800**	**7,800**	**6,986**
OWD as % of County								
Single Family Detached	**24%**	**14%**	**21%**	**24%**	**23%**	**27%**	**27%**	**23%**
Condominium (1)	70%	58%	44%	50%	38%	33%	33%	42%
Apartments	13%	8%	15%	27%	27%	27%	27%	20%
Total Multi-Family	**21%**	**14%**	**20%**	**33%**	**30%**	**29%**	**29%**	**25%**
Total Units	**22%**	**14%**	**20%**	**30%**	**28%**	**28%**	**28%**	**25%**

(1) Townhomes, Garden, Mid-Rise and High-Rise Condominiums (conversions omitted)

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Comparison of Forecasts – 2011-2012

Comparison: Residential and Non-Residential Permits Projections Otay Water District 2011 and 2012 Forecast								
Residential (units)								
Single Family	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
2011 Forecast	250	375	375	450	450	450	450	
2012 Forecast		450	300	450	600	700	800	800
Multi-Family								
2011 Forecast	400	400	600	900	1,025	1,150	1,200	
2012 Forecast		750	650	950	1,400	1,400	1,400	1,400
Total								
2011 Forecast	650	775	975	1,350	1,475	1,600	1,650	
2012 Forecast	-	1,200	950	1,400	2,000	2,100	2,200	2,200
Non-Residential ($ millions)								

	2011		2012	
Total	2011-2014	2015-2017	2012-2015	2016-2018
	$ 22	$ 26	$ 52	$ 54

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Non-Residential Permits (Historic and Projected)
(in $Millions)
Otay Water District and San Diego County
2001-2018

	Annual Average ($ Millions)				
Year	**Office**	**Retail**	**Industrial**	**Hotel**	**Total**
San Diego County					
Average Annual					
2001-2005	$181	$145	$128	$60	$514
2006-2011	$141	$85	$72	$60	$359
2012-2014	$103	$70	$28	$27	$228
2015-2018	$143	$63	$67	$60	$333
Otay Water District					
Average Annual					
2012-2014	$10	$35	$5	$3	$53
+ 20% Miscellaneous	$2	$7	$1	$1	$11
TOTAL	**$12**	**$42**	**$6**	**$3**	**$64**
2015-2018	$14	$15	$10	$6	$45
+ 20% Miscellaneous	$3	$3	$2	$1	$9
TOTAL	**$17**	**$18**	**$12**	**$7**	**$54**
OWD as % of SD County					
2012-2014	12%	60%	21%	12%	28%
2015-2018	12%	28%	18%	12%	16%

Note: Publically funded projects and remodeling excluded
Source of Historic Data: Construction Industry Research Board
London Group Realty Advisors 2.2012

The London Group Realty Advisors

Alan Nevin

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We provide a full range of advisory services for:

- ✓ Developers
- ✓ Investors
- ✓ Lenders
- ✓ Attorneys
- ✓ Public Agencies

Attachment C

RECLAMATION

Managing Water in the West

Bureau of Reclamation Rate Study – The Effectiveness of Conservation Pricing in Reducing Water Demand

U.S. Department of the Interior
Bureau of Reclamation

Participating entities

- Contra Costa Water District
- Eastern Municipal Water District
- San Juan Capistrano
- Irvine Ranch Water District
- Western Municipal Water District
- Carlsbad
- Los Angeles Department of Water and Power
- City of Henderson
- Otay Water District
- East Bay Municipal Utility District
- Las Vegas Water District

Residential data provided by participants

- Over 600,000 total observations for single family residences in over 150 zip codes
- Time period is 2000 through 2010
- Monthly use per connection
- Customer water rates per unit of use by tier
- Other charges and fees applied to bill
- Days included in billing period
- Service location
- Lot size for some participants

Additional obtained by Reclamation by Zip Code or community

- Climate data – Precipitation, temperature, evapotranspiration
- Median household income and per capita income
- Unemployment rate
- Median age of population
- Median home value
- Percentage of occupied homes that are single family detached
- Percentage with a B.S. degree or higher.

Basic Question to be evaluated

- What impact does the price of water and various pricing structures have on the amount of water used?
- The impact of price on the quantity of water consumed can be evaluated by estimating the price elasticity of demand.
  - Price elasticity of demand measures the percentage change in water use resulting from a change in price, holding all other factors constant.
  - A typical demand curve has a negative slope (law of demand), therefore an increase in price results in a decrease in quantity demanded.

Basic Question to be evaluated

- **Price elasticity of demand example:**
  - **Suppose the price elasticity of demand for residential water is estimated to be -0.50**
  - **This says that a 10% increase in price would lead to a 5% decrease in the quantity demanded for residential water.**
- **Long run versus short run elasticity**
  - **Consumers are less price elastic in the short run because they need time to make adjustments related to the water price change. These adjustments could include investments in water saving devices and technology.**
  - **Short run elasticity < Long run elasticity**

Variables the Affect Residential Water Demand

- Price – Average, marginal, lagged, real, nominal.
- Income – Real or nominal.
- Climate – Precipitation, temperature, evapotranspiration.
- Macroeconomic factors – Affect of the recession. Change in income over time and change in unemployment over time.

Most Important Variables the Affect Residential Water Demand

- Price – Higher price leads to decreased quantity demanded.
- Income – Higher income leads to increased demand.
- Precipitation – Higher precipitation leads to decreased demand
- Appearance of water bill

What is the correct price to include in modeling water demand?

What do individuals react to?

- **Average price – Average for all water used**
- **Marginal price – Cost of last unit used**
- **Lagged price from previous water bill**
- **Preliminary regression results indicate that the lagged average price per unit of water was the best price variable**

Real versus nominal dollars

- A nominal dollar value is a price that would actually be observed at any given time.
- A real dollar value is a measure of purchasing power after removing price changes over time. Real dollars are measured in base years.
- Most economists would argue that the real value is more indicative of economic value (Most of us know that prices increase over time and adjust our expectations accordingly). Models have been run using both.

Unemployment as a macroeconomic variable

- Unemployment is an indicator of recession impacts
  - Unemployment was included to account for the effects of the recession beyond the income effect.
  - In some cases unemployment was collinear with income, creating potential estimation problems.

What are the climate variables to include in modeling water demand?

- Precipitation
- Temperature
- Evapotranspiration
- Some of the datasets provided ET
- Data was also collected from the California Irrigation Management Information System
- Precipitation was consistently the best explanatory variable.
- Will look at using peak temperature rather that average temperature.

Preliminary Otay Residential Results

Variable	Coefficient	t - statistic
Intercept	-2.4854	
ln lagged cost	-0.80355	-72.75
Per capita income	0.000019	17.84
Precipitation	-0.21102	-44.01
Median age	0.04211	26.34
Unemployment	-0.29906	-1.92
Adj. R-squared = .37		
N = 17,764		

RECLAMATION

Caveats and Perspective

- Results are preliminary, modifications will be made.
- The elasticity estimates should be interpreted as long run elasticities.
- Long run elasticity > short run elasticity
- Therefore, cannot interpret the previous elasticity estimates as “If we increase price by X% we should expect to see a Y% decrease in per capita water use next month (or next year).

Caveats and Perspective

- Results are based on historical data that corresponds with historical actions that may not be repeated in the future.
- Past programs may be one-time events, so future water use reductions may not be as pronounced
- Uncertainty in the estimates from unknown future conditions as well as unexplained variance in the model.

Caveats and Perspective

- **Results from a 1997 meta-analysis of residential price elasticities of demand (Espey, Espey, and Shaw; Water Resources Research, June 1997) indicated:**
  - **Studies between 1967 and 1993 had a range of price elasticities between -0.02 and -3.33**
  - **Average elasticity was -0.51**
  - **Short run median was -0.38**
  - **Long run median was -0.64**
- **More recent Land Economics study indicated a mean of -0.41 for 300 studies.**

Next Steps

- **Modify current model:**
  - **Include seasonality variable.**
  - **Separate data into pre-recession and recession time periods and evaluate potential change in elasticity with recession.**
  - **Estimate best individual demand model for use in a meta-analysis.**

Next Steps

- **Meta-analysis would use price elasticity results from individual models and estimate a second model where:**
  - **Estimated Elasticity = f(tier structure, region alcharacteristics, bill format, others)**
- **Individual entities will use individual elasticity estimates combined with the meta analysis results to evaluate effect of changing rate structures and other variables on elasticities.**

Questions and Discussion

THE END

spiper@usbr.gov

RECLAMATION

Attachment D

Otay Water District

Water Supply, Temperature and Precipitation

March 19, 2012

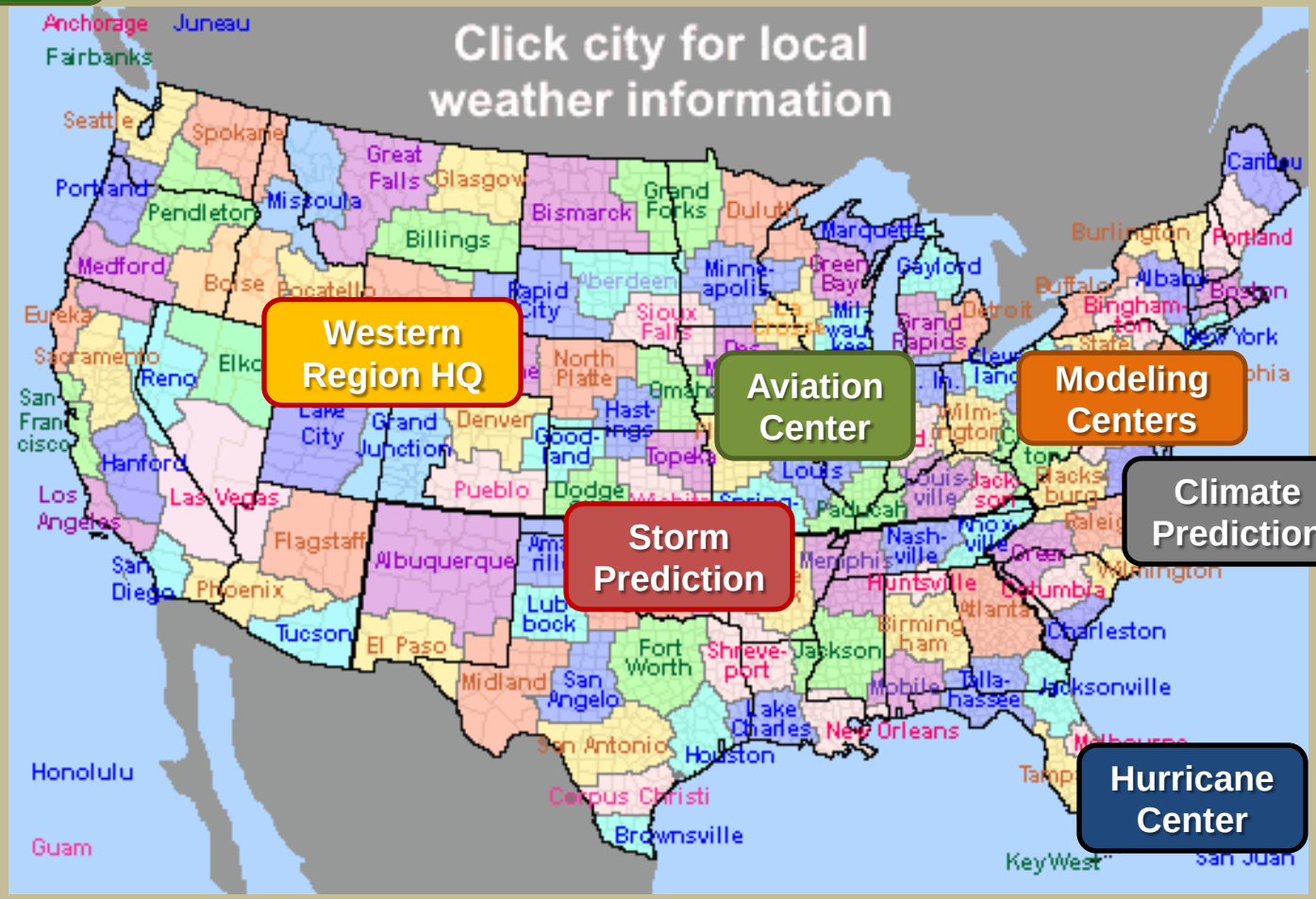
Alex Tardy

Warning Coordination Meteorologist

NOAA National Weather Service

123 Weather Forecast Offices
13 River Forecast Centers

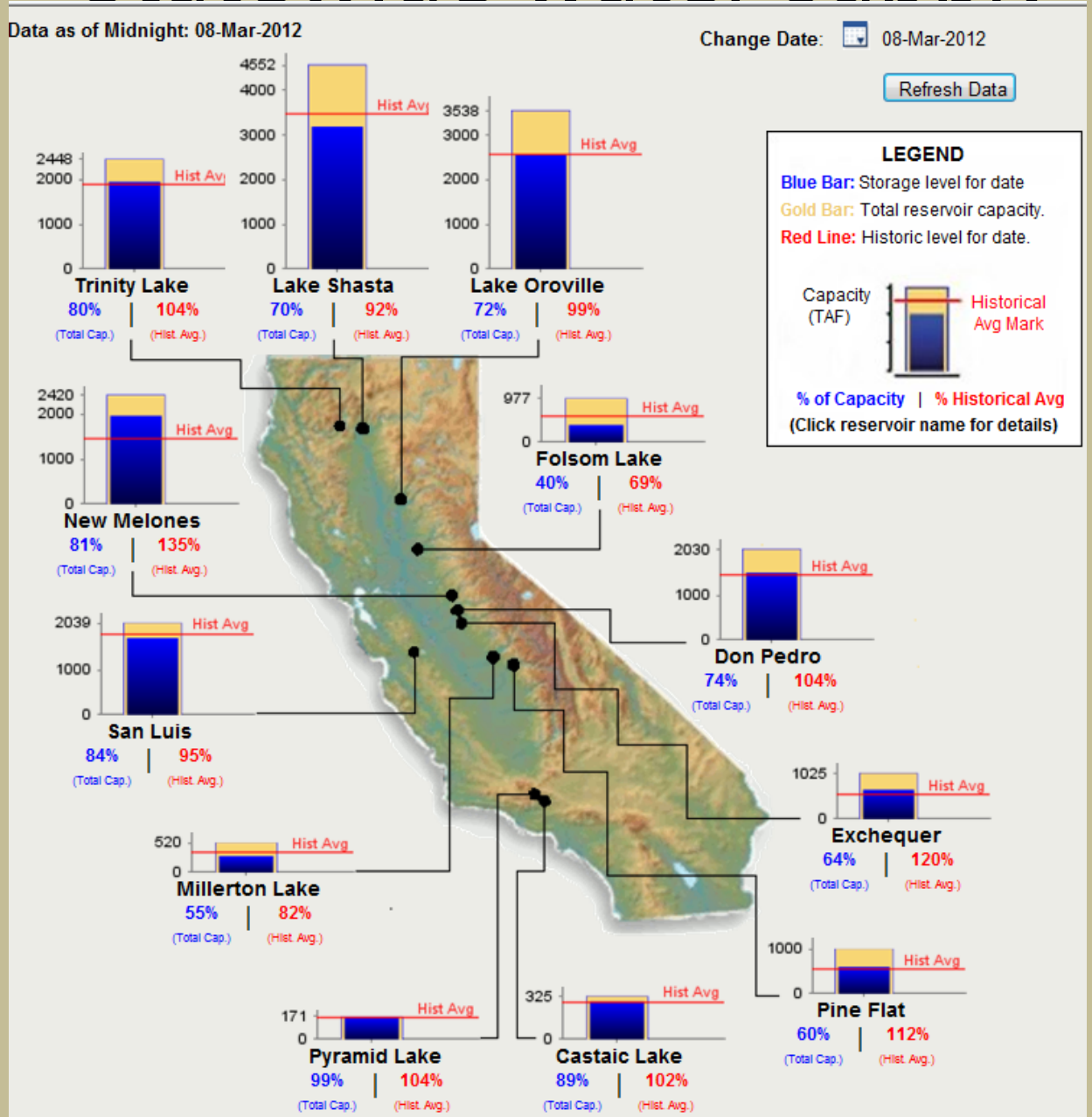
Tsunami Center



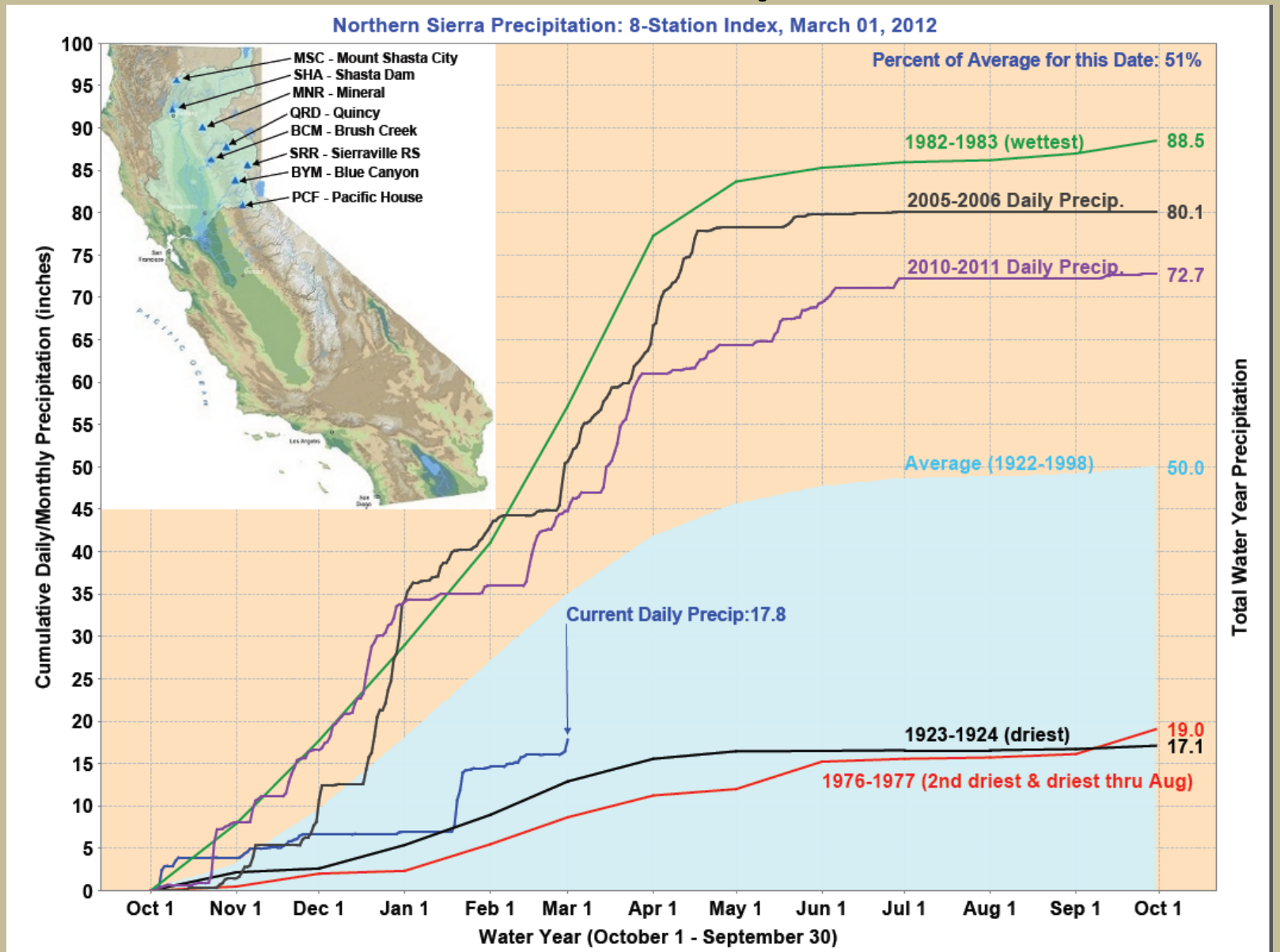
Our service area

10 million people served

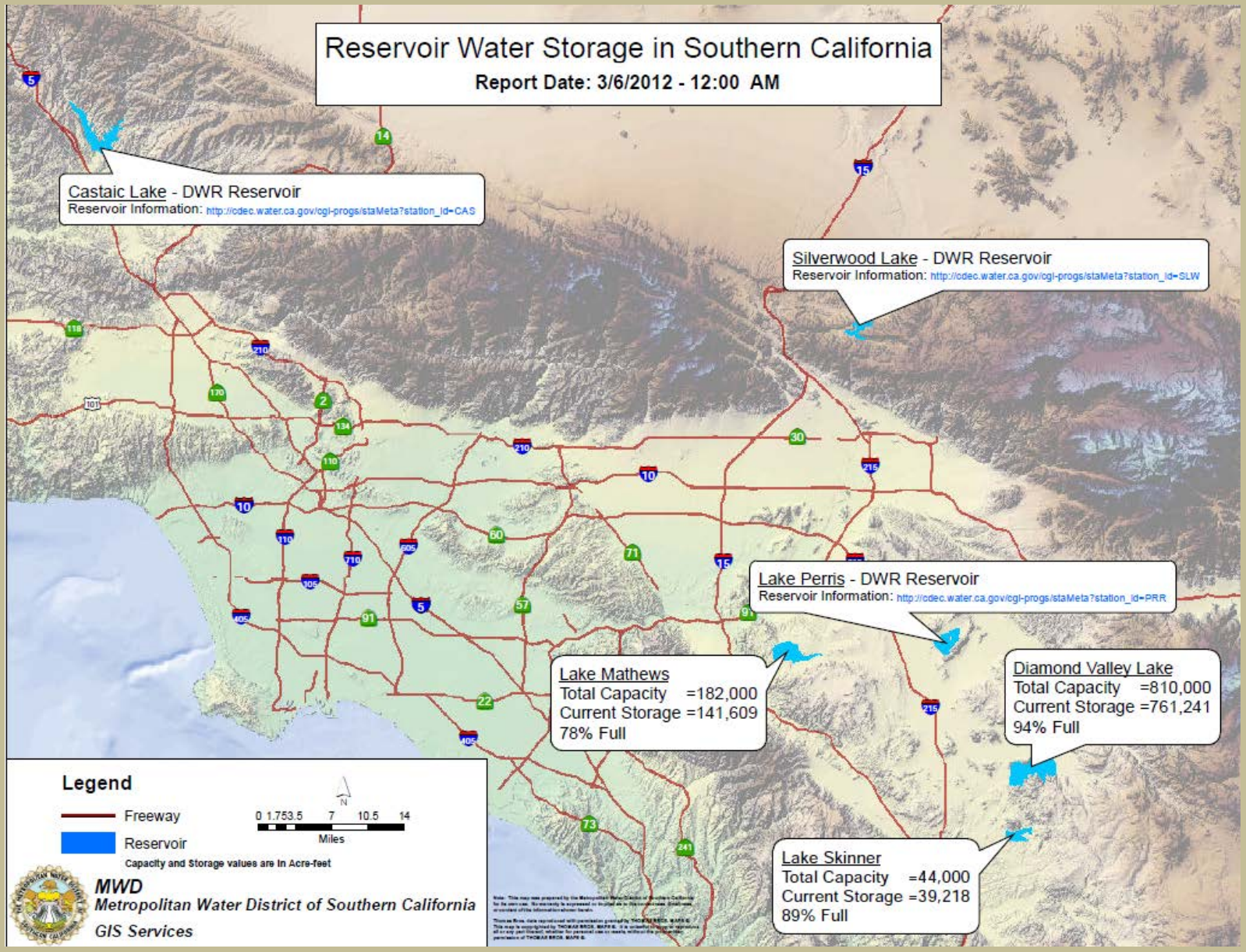
Statewide water supply



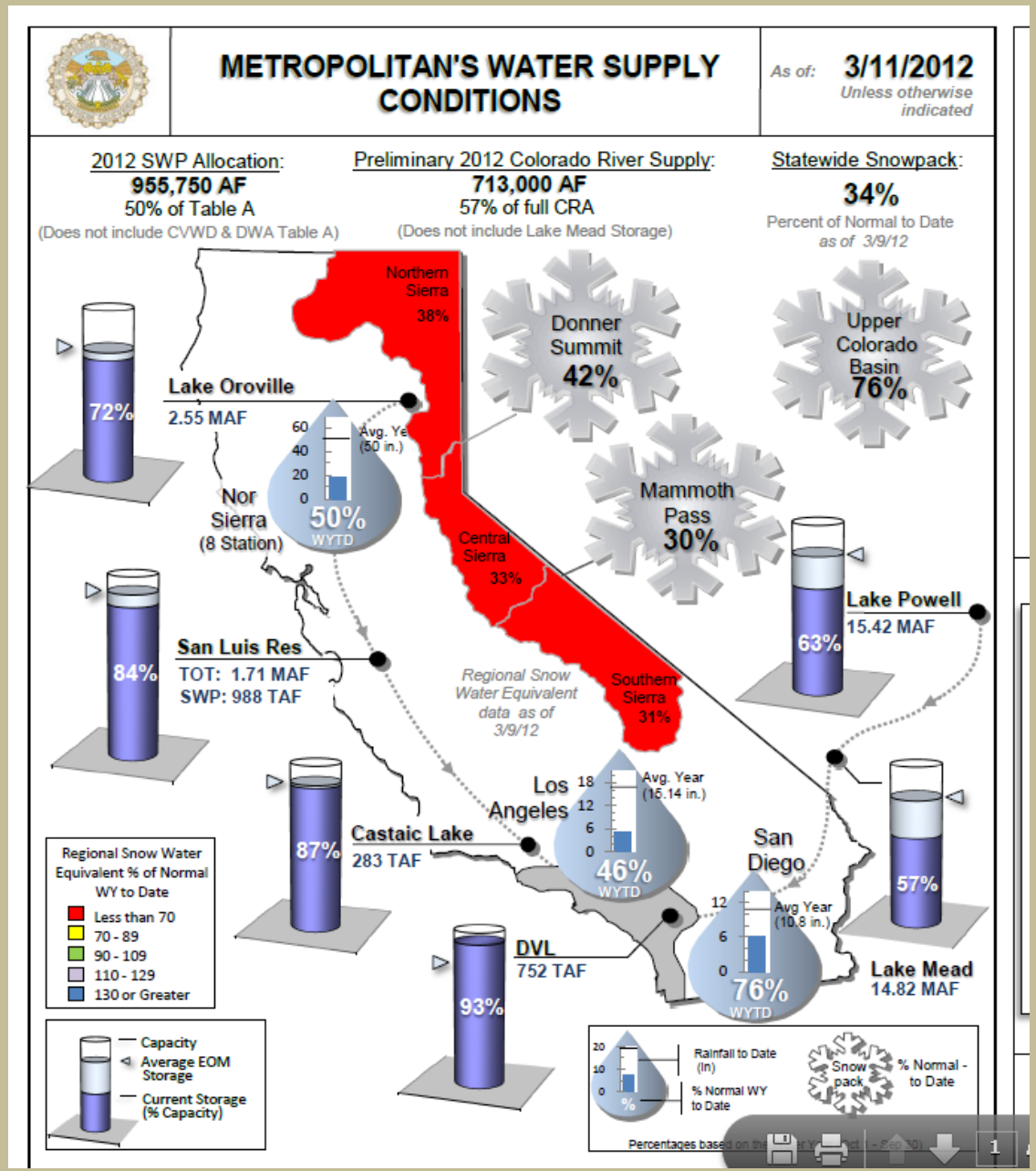
Snow Pack/Preciptiation



Local water supply



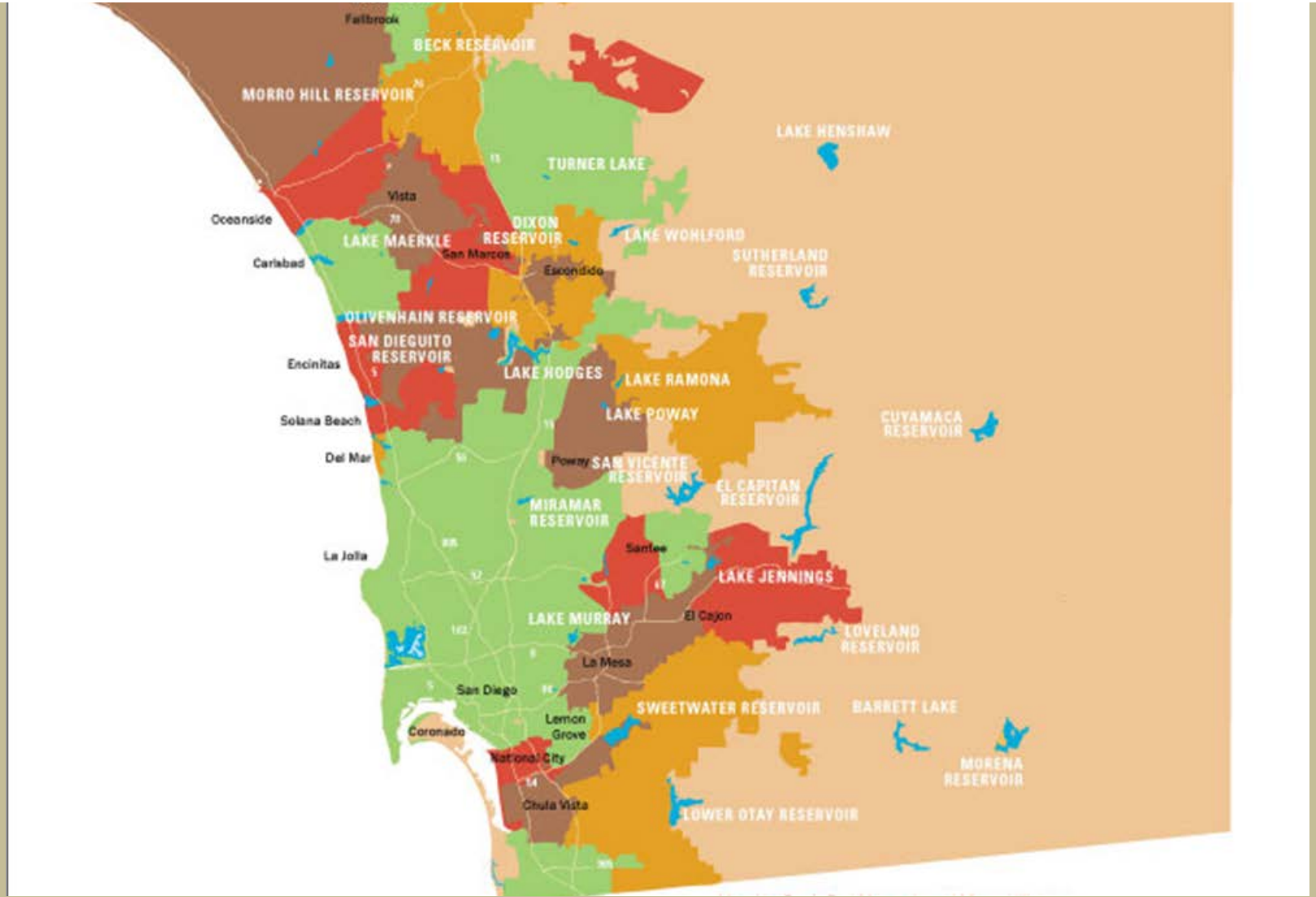
Local water supply



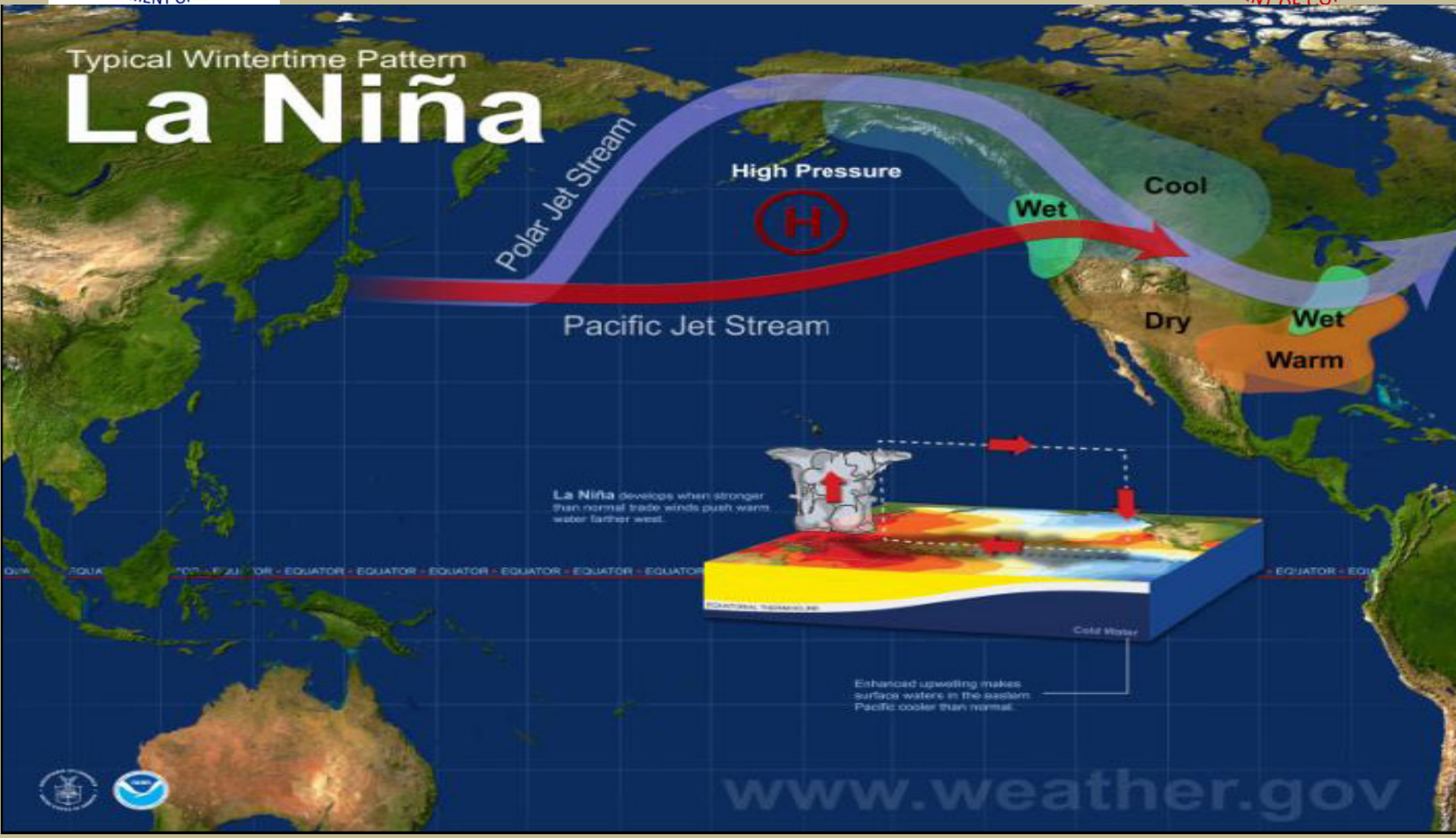
San Diego reservoirs

		Capacity	Storage		Capacity PCT	Change (AF
Totals		586,582	329,061		56.1%	507

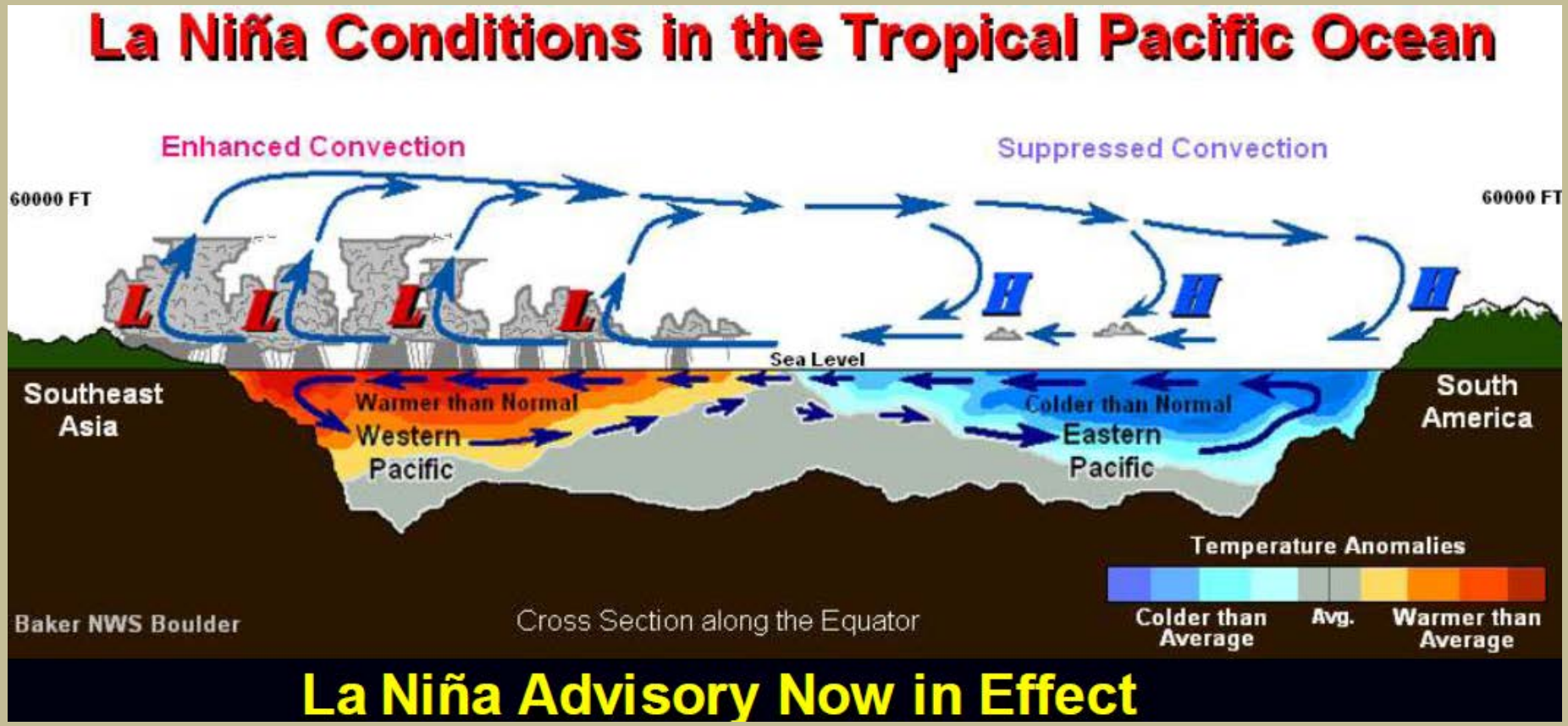
Date generated: 3/5/2012



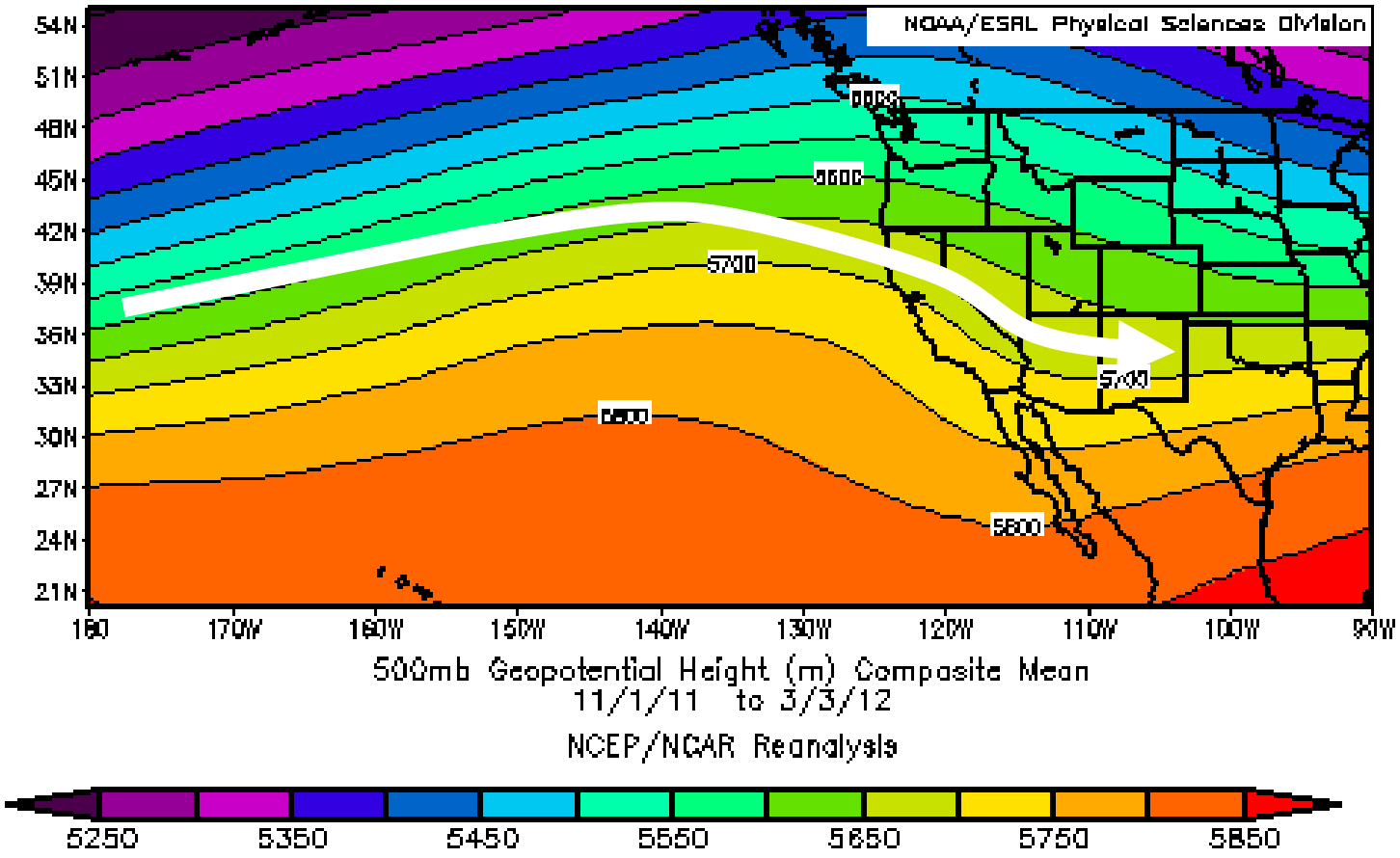
Seasonal Forecast Challenges In California



Current and past conditions deep reservoir of cooler water



Jet Stream 2011-12

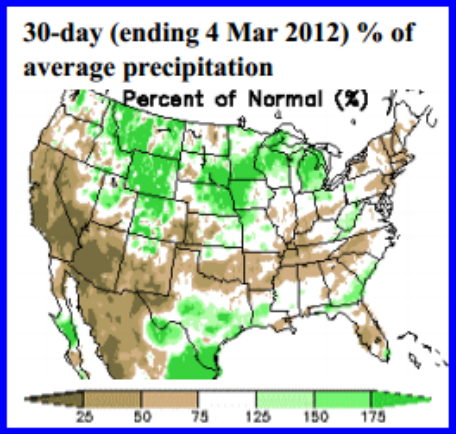


Current and past conditions

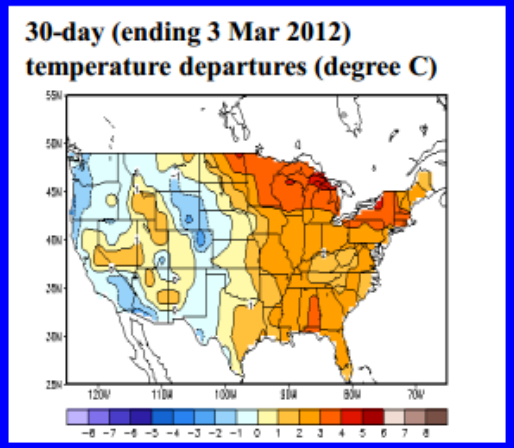
U.S. Temperature and Precipitation Departures During the Last 30 and 90 Days

Last 30 Days

30-day (ending 4 Mar 2012) % of average precipitation

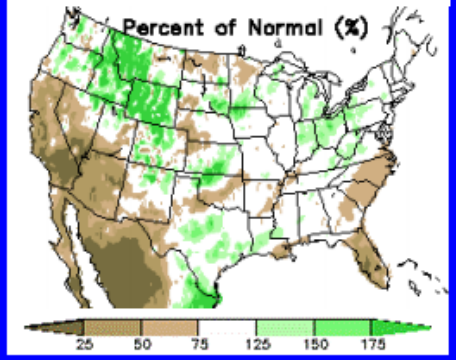


30-day (ending 3 Mar 2012) temperature departures (degree C)

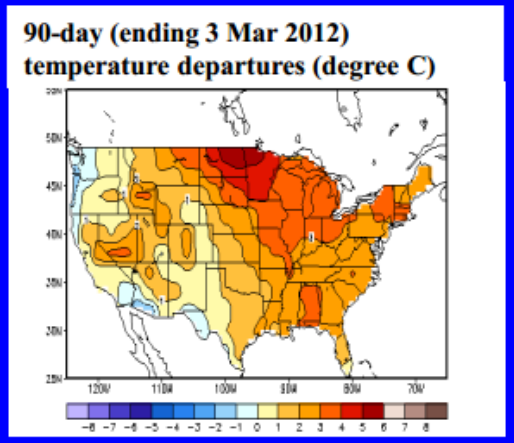


Last 90 Days

90-day (ending 4 Mar 2012) % of average precipitation

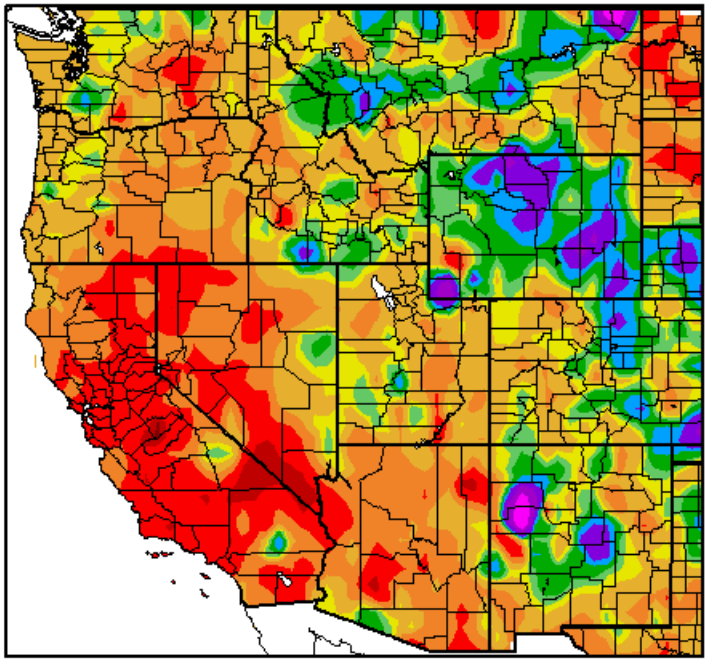


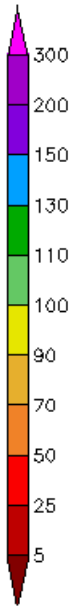
90-day (ending 3 Mar 2012) temperature departures (degree C)



October 1 to March 4

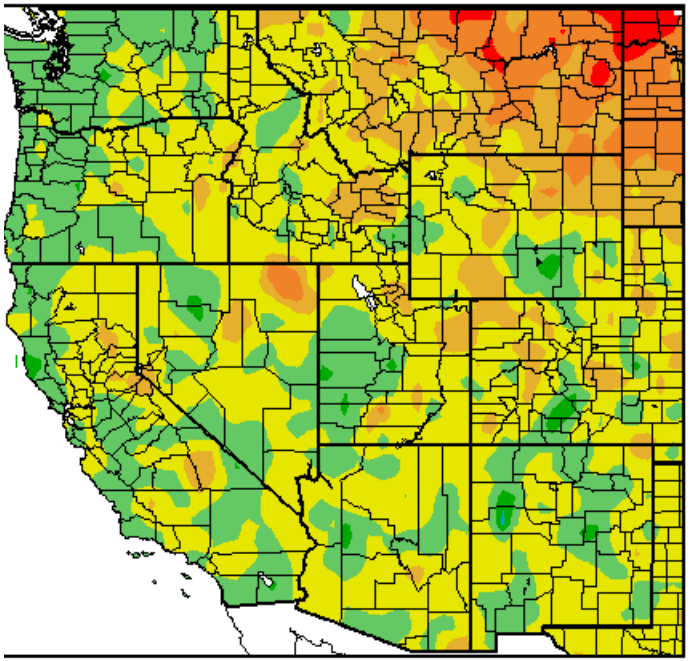
Percent of Normal Precipitation (%)
10/1/2011 – 3/4/2012





ated 3/5/2012 at HPRCC using provisional data.

eparture from Normal Temperature (F)
10/1/2011 – 3/4/2012

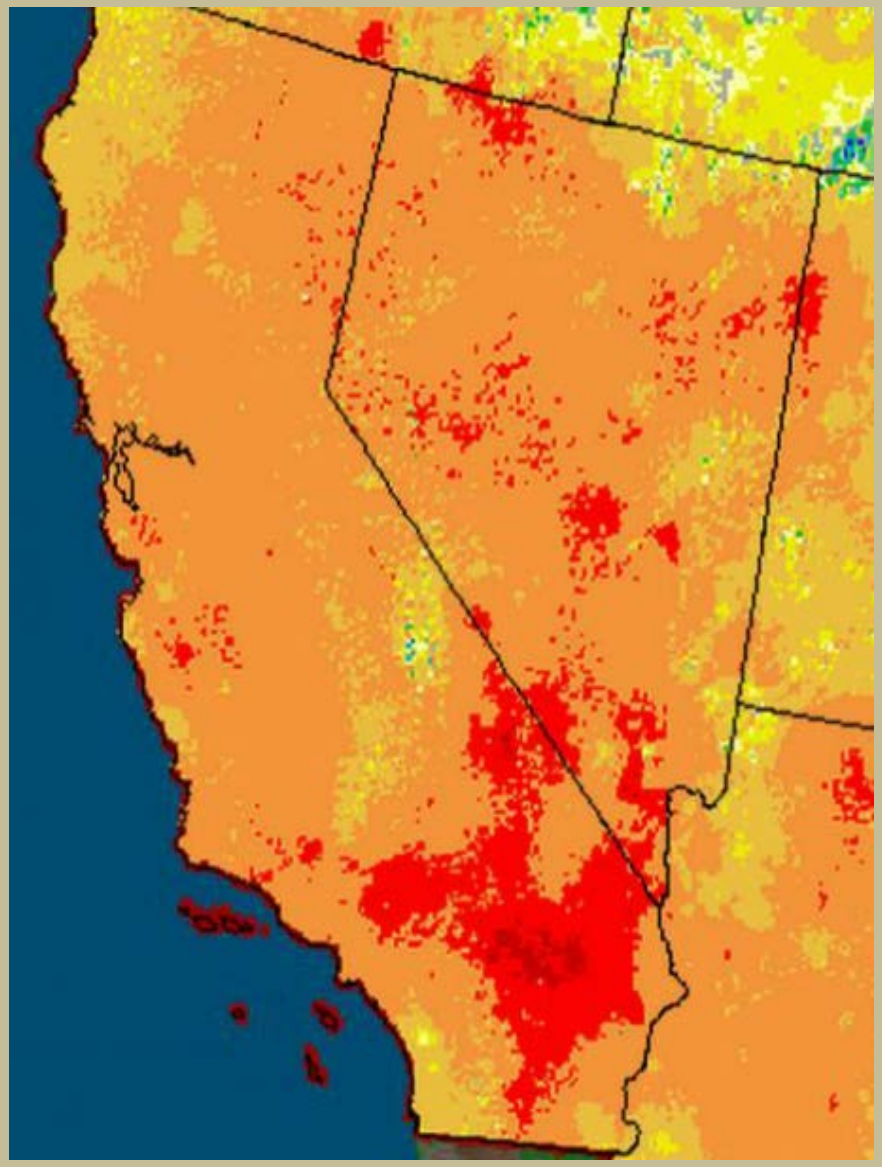


Regional Climate Centers at HPRCC using provisional data.

Regional Climate Centers

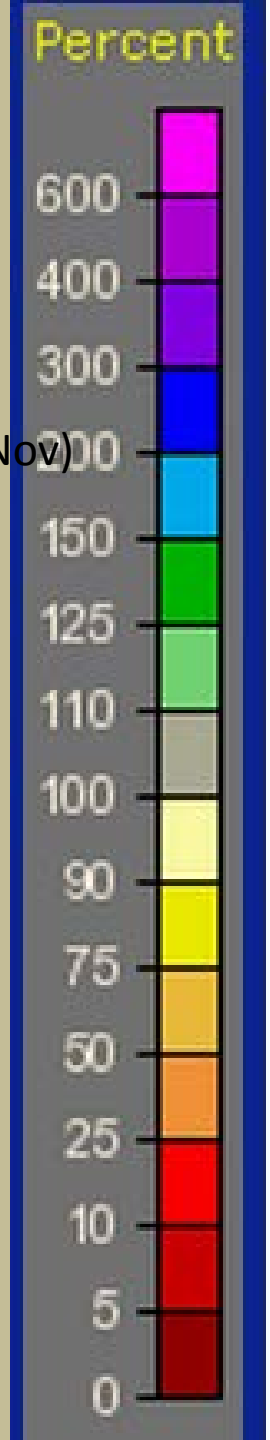
Departure from Normal Temperature and Percent of Normal Precipitation

Percent of normal precipitation since October 1, 2011



Precipitation Events

October 4-5
November 4-5
November 12
November 20 (300 percent Nov)
December 1
December 12 and 16
January 21-23
February 11-15
February 27



Monthly Normal

Month	San Diego	Santa Ana	Riverside
February	2.27	3.39	2.51
March	1.81	2.14	1.66
April	0.78	0.87	0.77
May	0.12	0.21	0.15
Actual since July 1	6.16	3.82	3.72
Departure	-2.25	-7.71	-6.86

Normals and so far

2011-12 climate

San Diego Big Monthly Rainfall

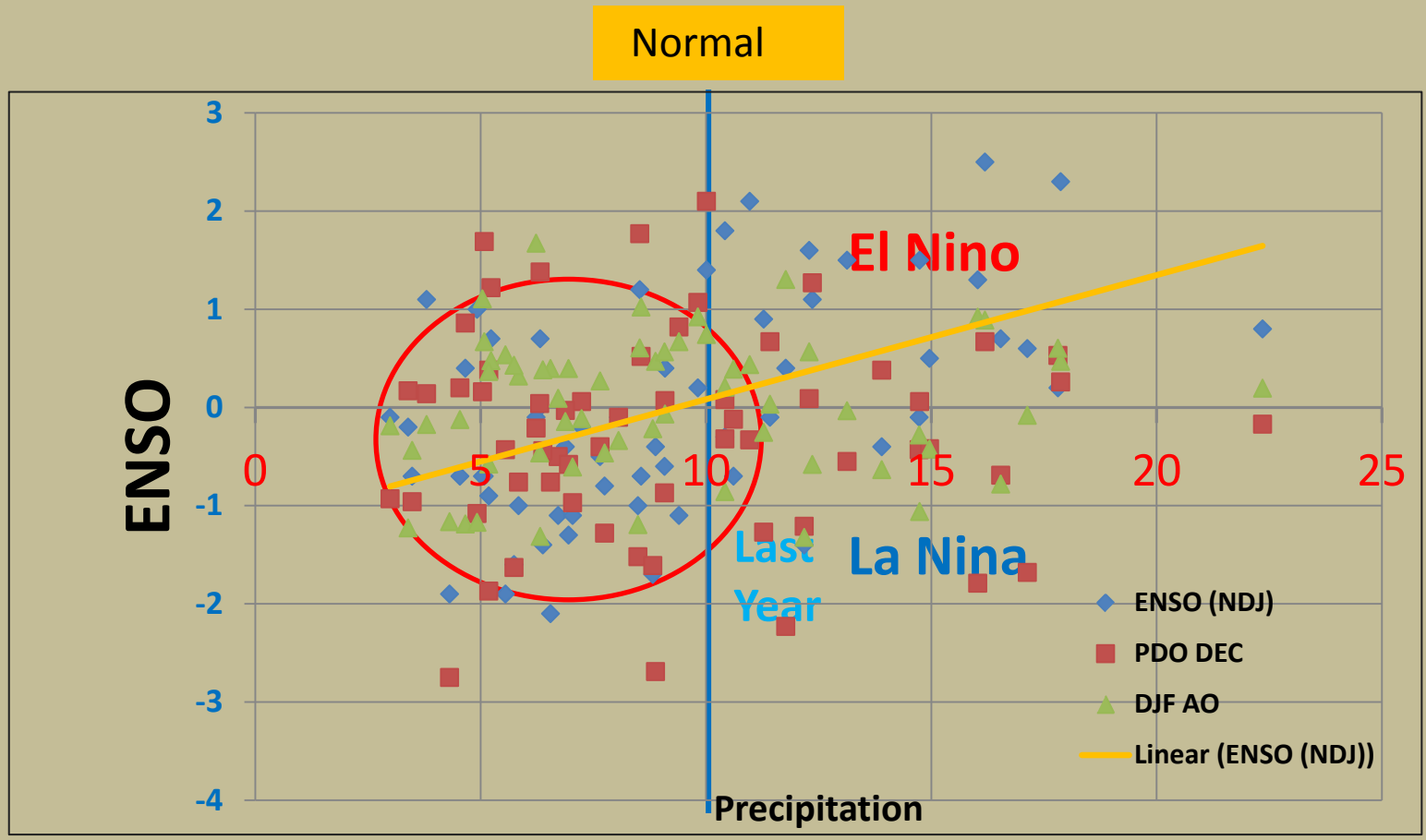
Winter October to April

Month Year	Total Precipitation	October-April	ENSO ONI
January 1993	**9.09**	**17.81**	**0.2 (neutral)**
January 1995	8.06	16.63	1.3
February 1998	7.65	16.19	2.5
March 1991	6.96	11.77	0.4 (neutral)
March 1983	6.57	17.87	2.3
December 1965	6.60	14.74	1.5
January 1978	5.95	16.54	0.7
February 2005	5.83	22.35	0.7
January 1979	5.82	14.03	-0.1 (neutral)
November 1965	5.82	14.74	1.5
January 1980	5.58	14.96	0.5
December 2010	5.00	12.18	-1.4 2010-11

2011-12 climate

What does that mean?

All years (October to April) for San Diego
October to April normal is 9.94 inches



Normal for San Diego (10.33), Oceanside (9.82), Riverside (9.82), Santa Ana (13.05), and Lake Arrowhead (37.37)

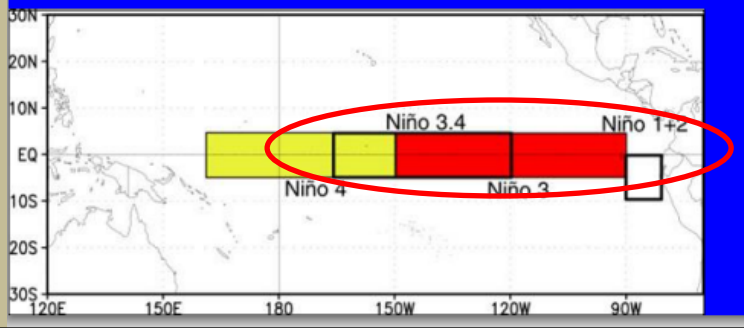
La Nina status

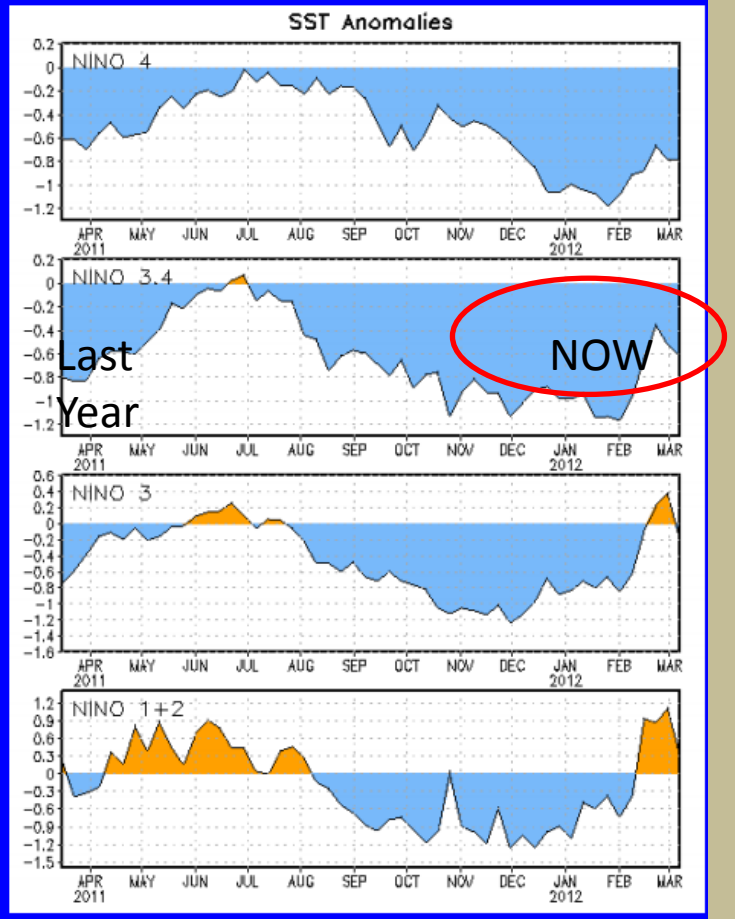
Circled is current Moderate La Nina ends and rapid weakening expected through May

Niño Region SST Departures (°C)
Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.8°C
Niño 3.4	-0.6°C
Niño 3	-0.2°C
Niño 1+2	0.4°C

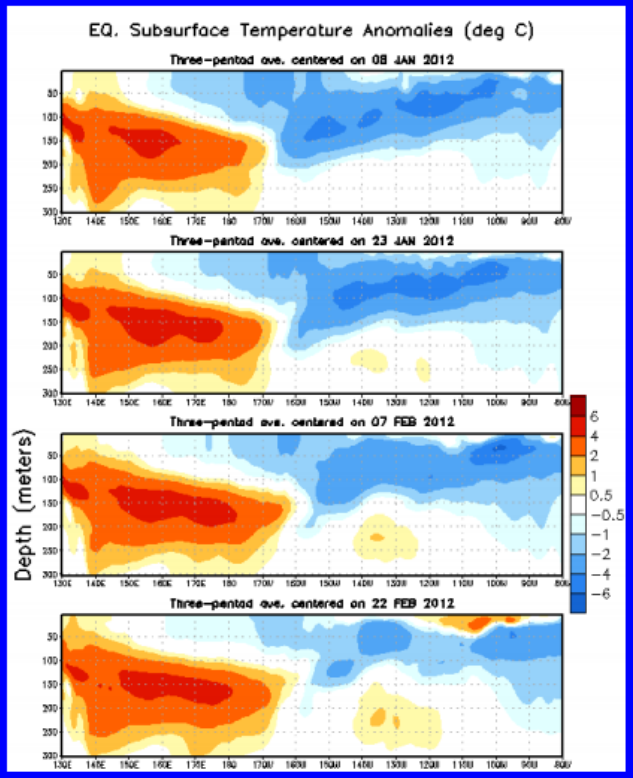




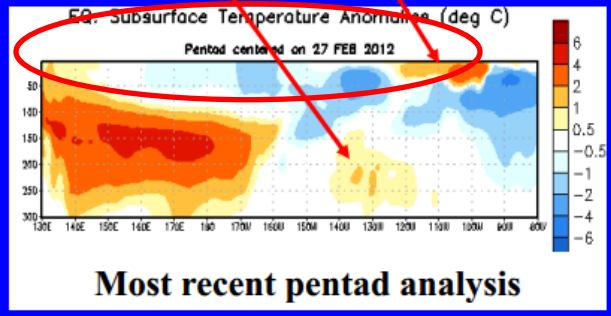
La Nina (ENSO) status

La Nina Warming

Sub-Surface Temperature Departures (°C) in the Equatorial Pacific



- During the last two months, negative subsurface temperature anomalies weakened across the Pacific.
- During the recent period, strong near-surface warming is evident in the eastern equatorial Pacific. Also, anomalous warmth is evident between 150-300m depth in the east-central Pacific.



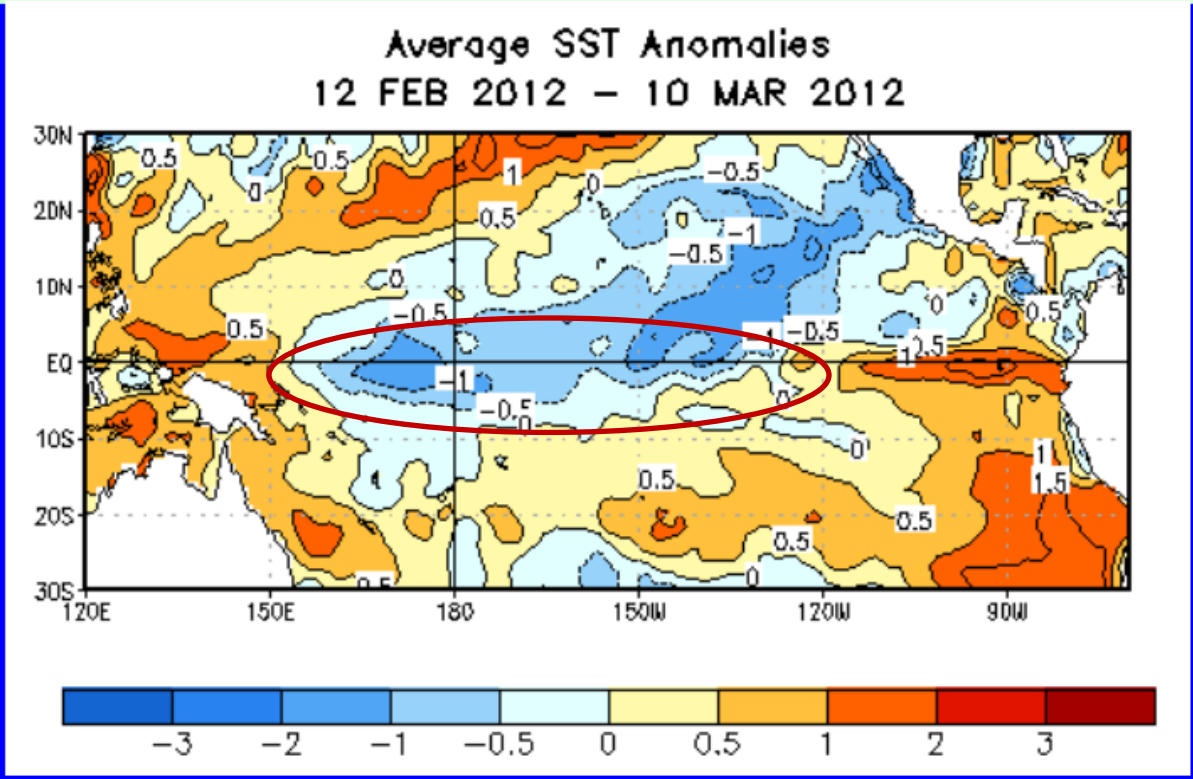
Most recent pentad analysis

Circled is current Subsurface ocean is warming

Sea surface tempeatures

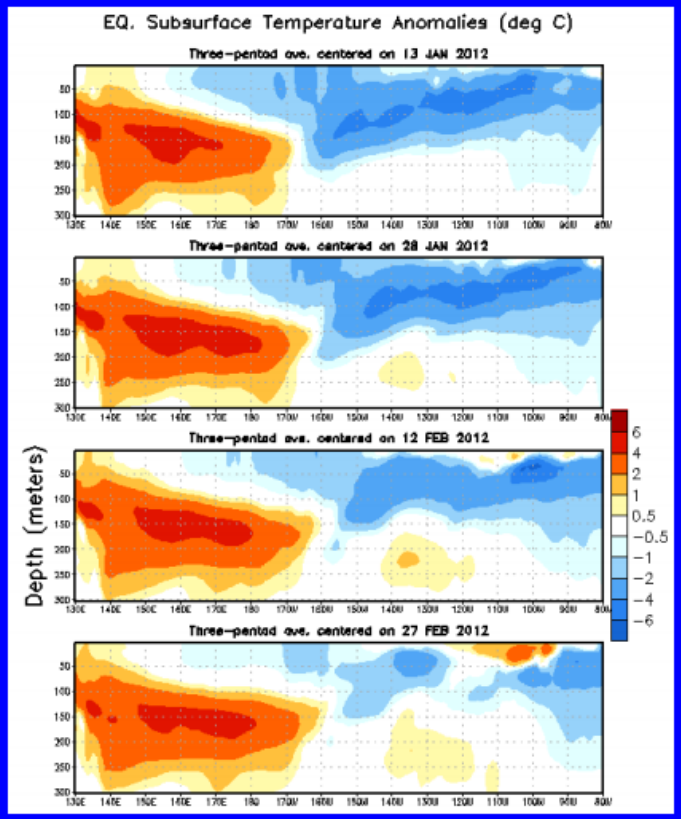
SST Departures (°C) in the Tropical Pacific During the Last 4 Weeks

During the last 4-weeks, equatorial SSTs were more than 0.5°C below average between 160°E and 130°W, and more than 1°C below average in small areas of the central Pacific. SSTs were above average in the eastern Pacific.



Depth of cool water

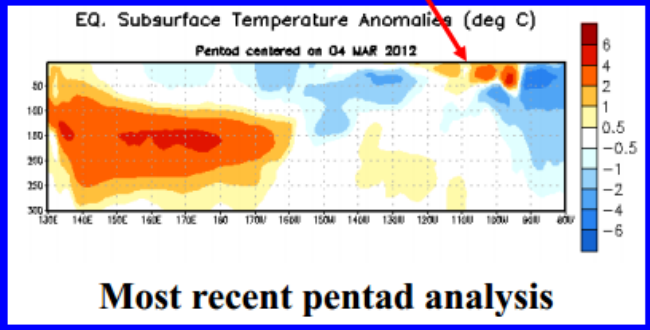
Sub-Surface Temperature Departures (°C) in the Equatorial Pacific



Time

Longitude

- During the last two months, negative subsurface temperature anomalies weakened across the Pacific.
- During the recent period, strong near-surface warming is evident in the eastern equatorial Pacific.



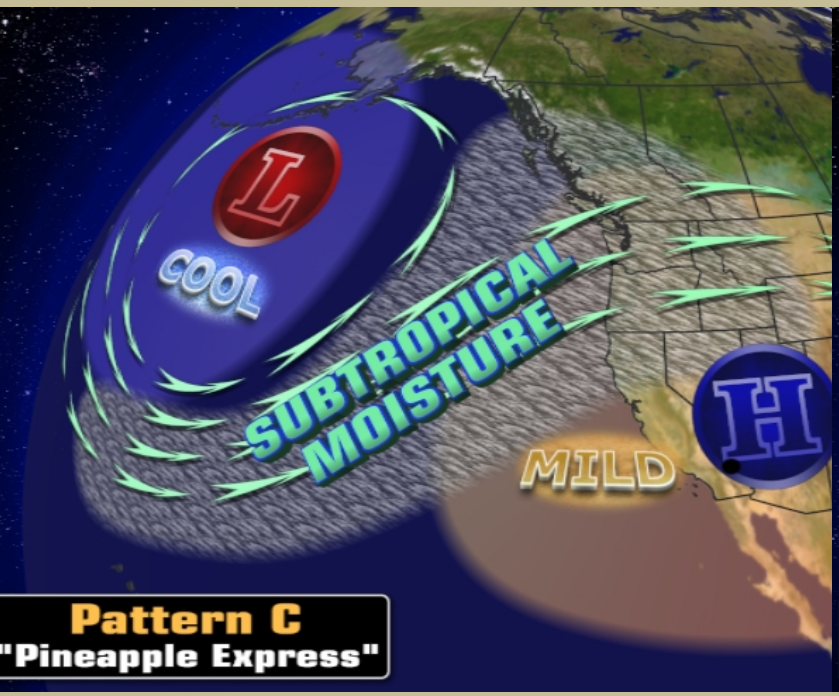
Most recent pentad analysis

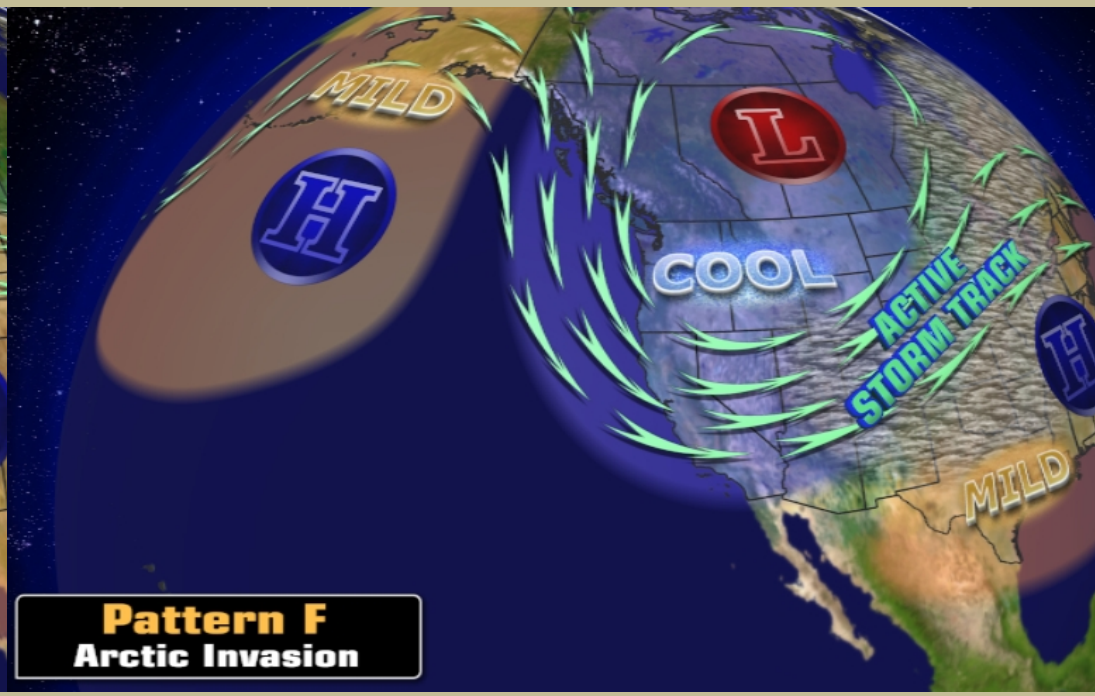
Warming

2010 to 2012 patterns

December 20-22, 2010
Deep moisture, waves of rain, high snow levels

Dry and Cold
Cool Santa Ana

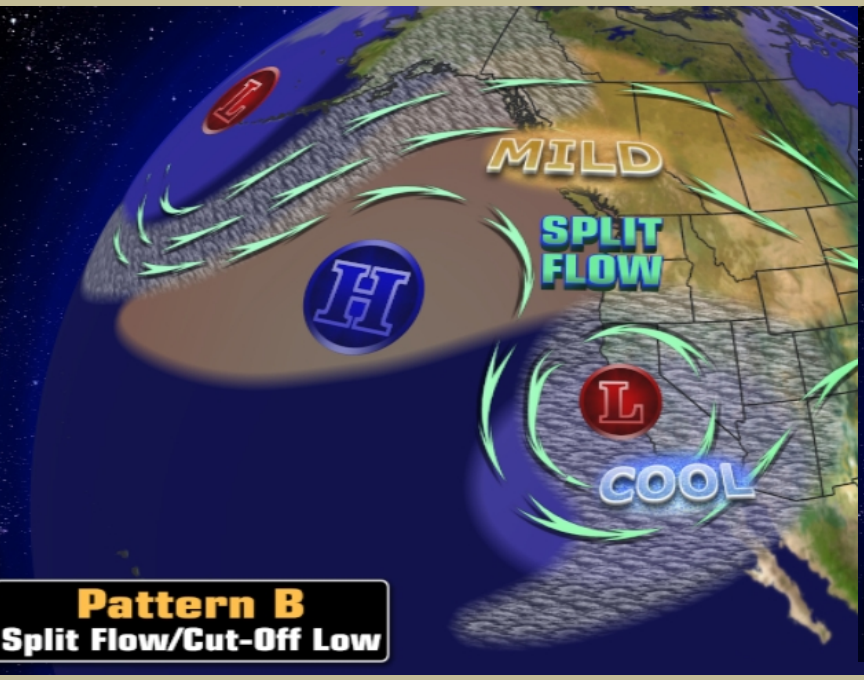




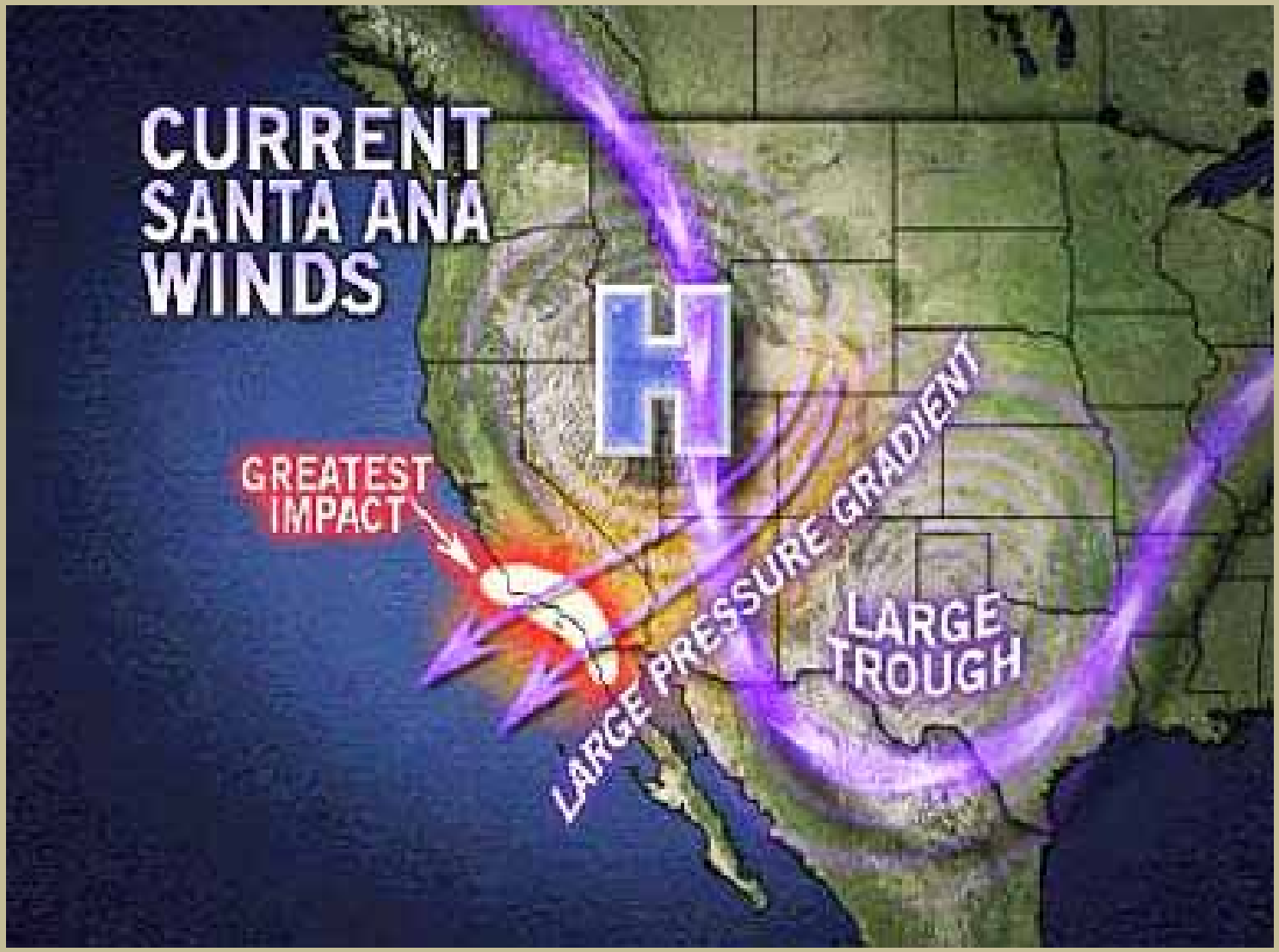
2010 to 2012 patterns

Cool showers and
low snow levels

Extended Dry Periods

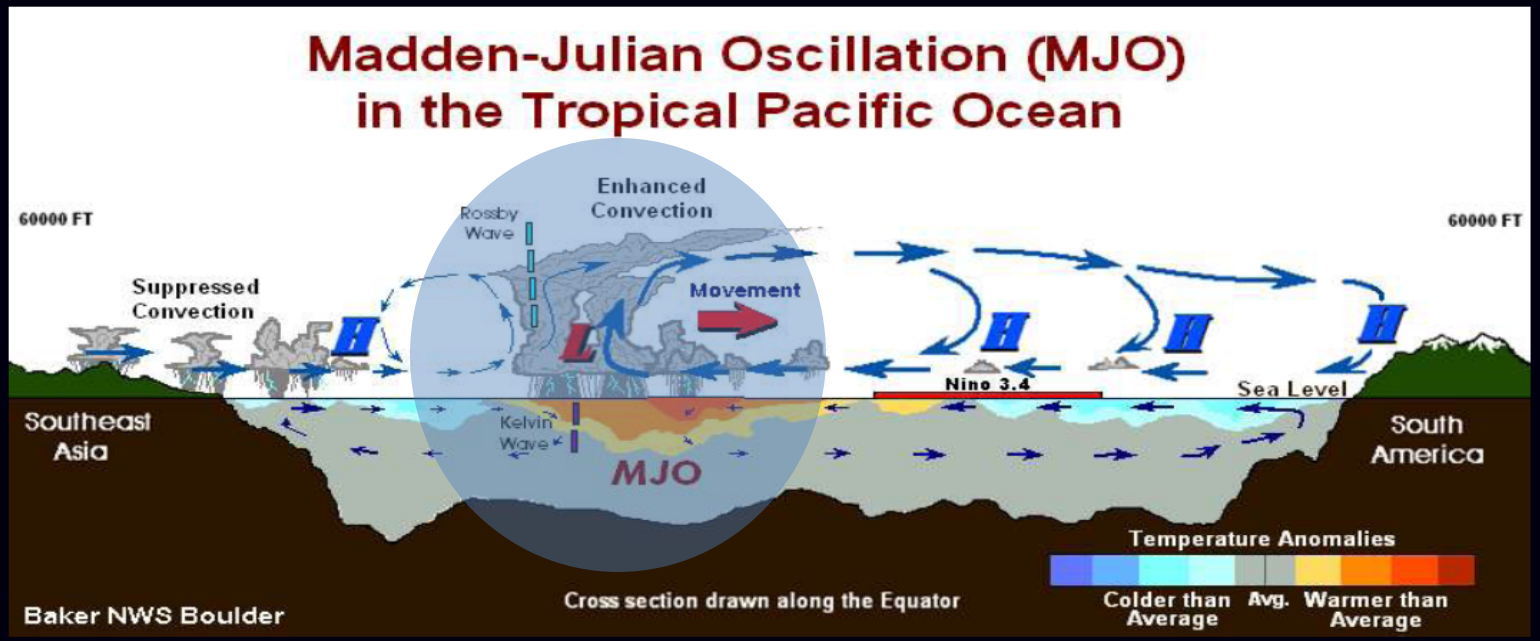


High Pressure/Cold Air Shallow Great Basin Passing Weather System to East



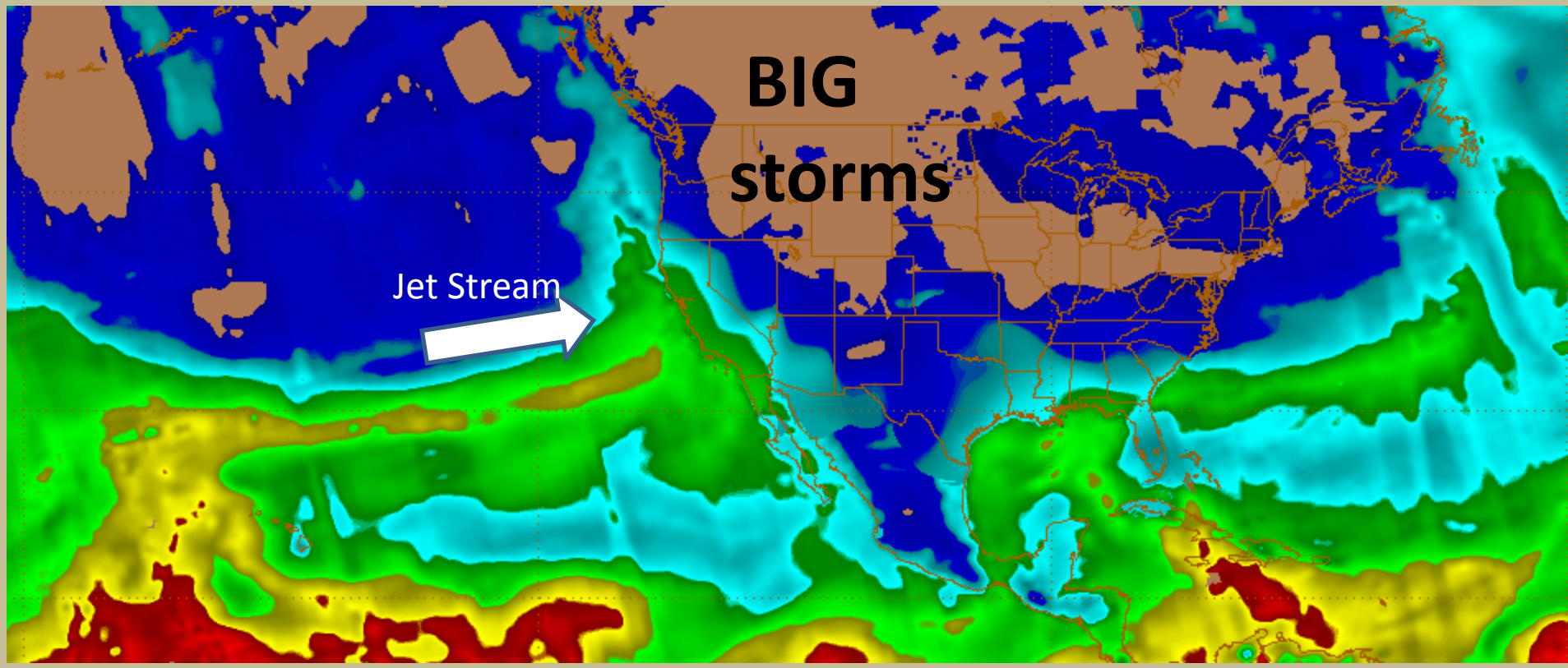
2011-12 climate

Its more than La Nina, MJO!



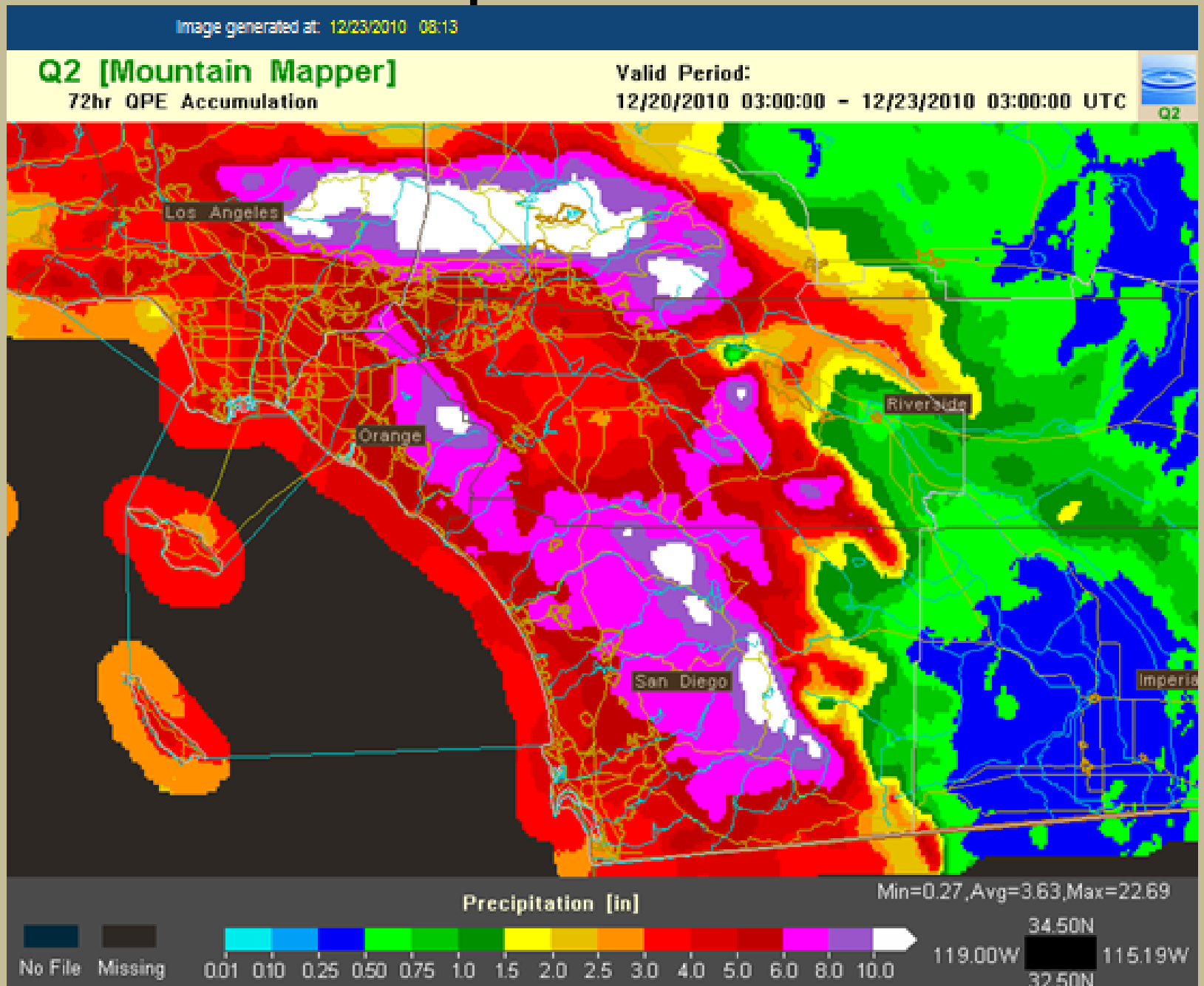
Interseasonal variations in wind and temperature produced by the 30-60 Day Tropical Wave, better known as the Madden-Julian Oscillation (MJO), can have a significant impact on global atmospheric and oceanic circulations. As its name implies, the time it takes for most MJOs to cross the Pacific Ocean varies from 30 to 60 days with the average around 45 days. Strong MJO activity is often observed during weak La Niña and ENSO-neutral years, while weak or absent MJO activity is typically associated with strong El Niño episodes. MJOs of moderate to strong intensity crossing the eastern equatorial Pacific can have a significant influence on weather patterns over the western and central United States. Predicting the start of an MJO is quite difficult and forecasting its eventual magnitude can be nearly as difficult.

Deep moisture plume pointed at Southern California across the east Pacific poised to move onshore Friday evening December 17



highest moisture in yellow and red

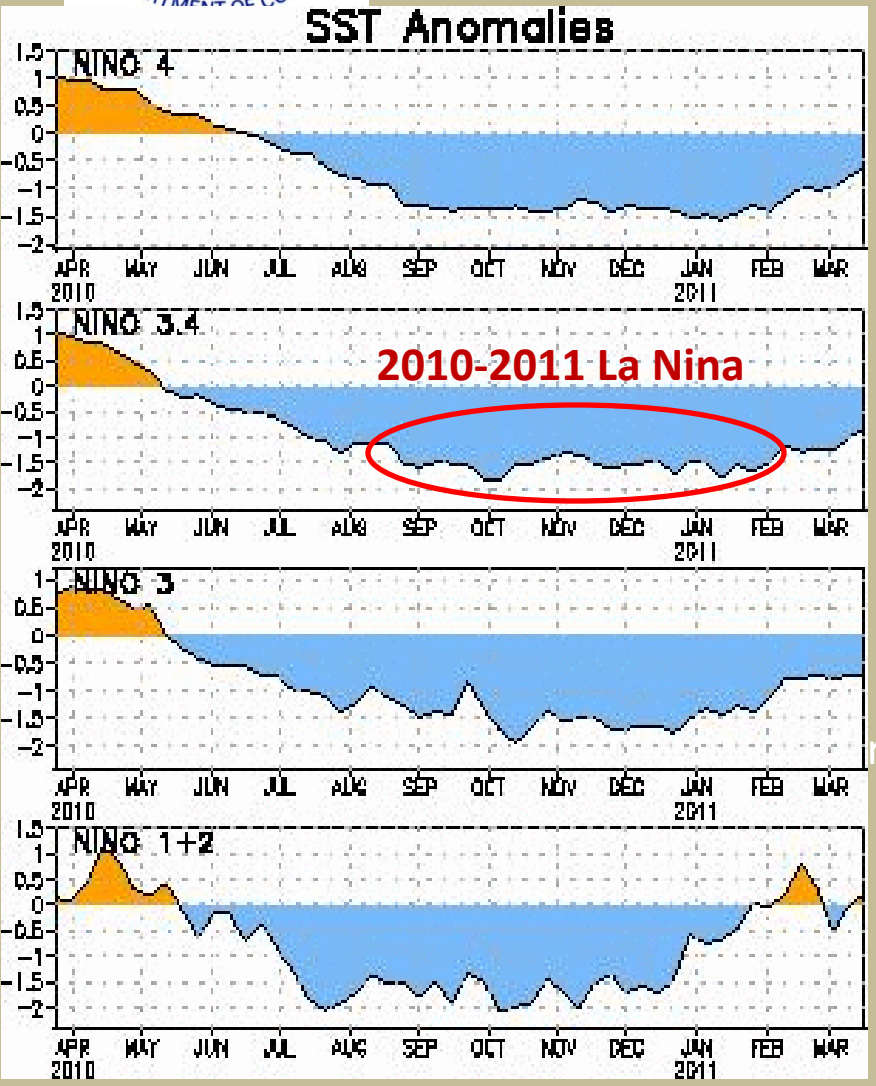
Precipitation Total



Heavy Rain and Flooding
Turn Around Don't Drown

Flooding and Landslides

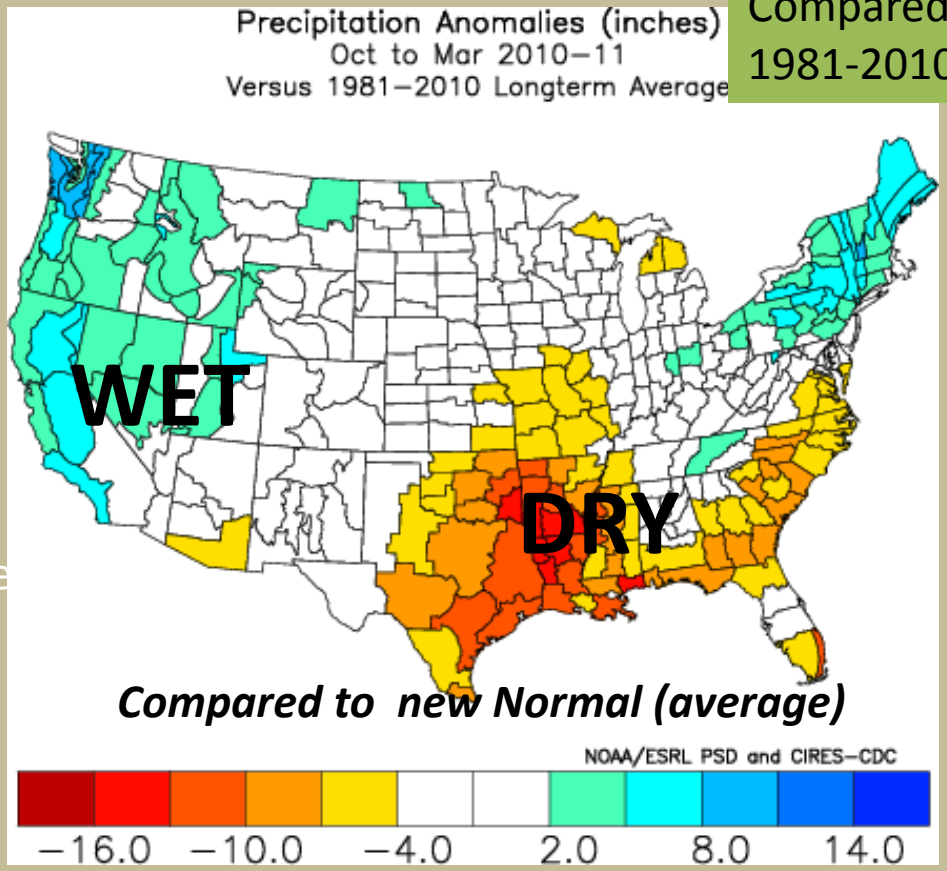
ENSO La Nina Comparison 2010-2011
This La Nina for California was much wetter



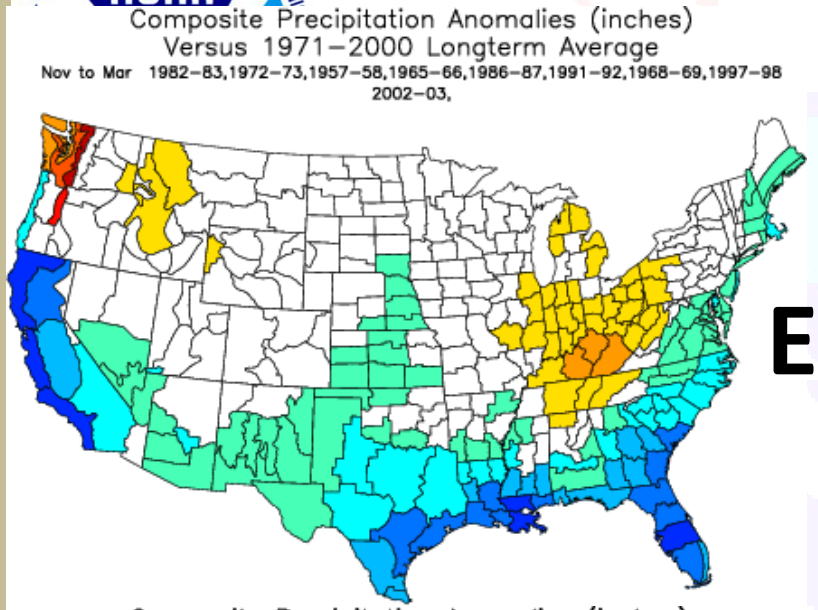
October to March

2011

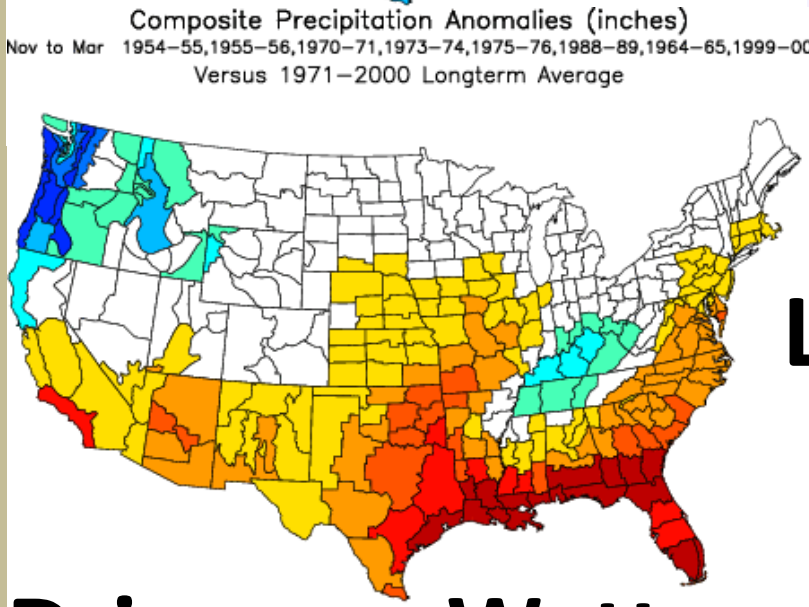
2010-11 Compared to 1981-2010



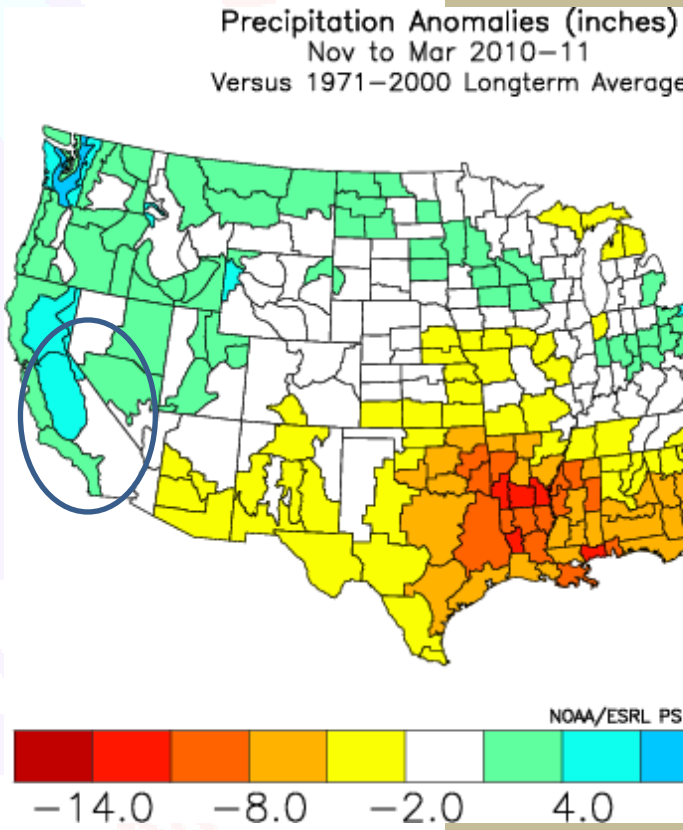
ENSO years of the past combined (November to March)



El Nino



La Nina



Drier **Wetter**

La Nina and 2010-11 Comparison

Southwest CA Climate Division 2010/11 Precipitation Totals, Percent Rank, & Past La Nina Stats

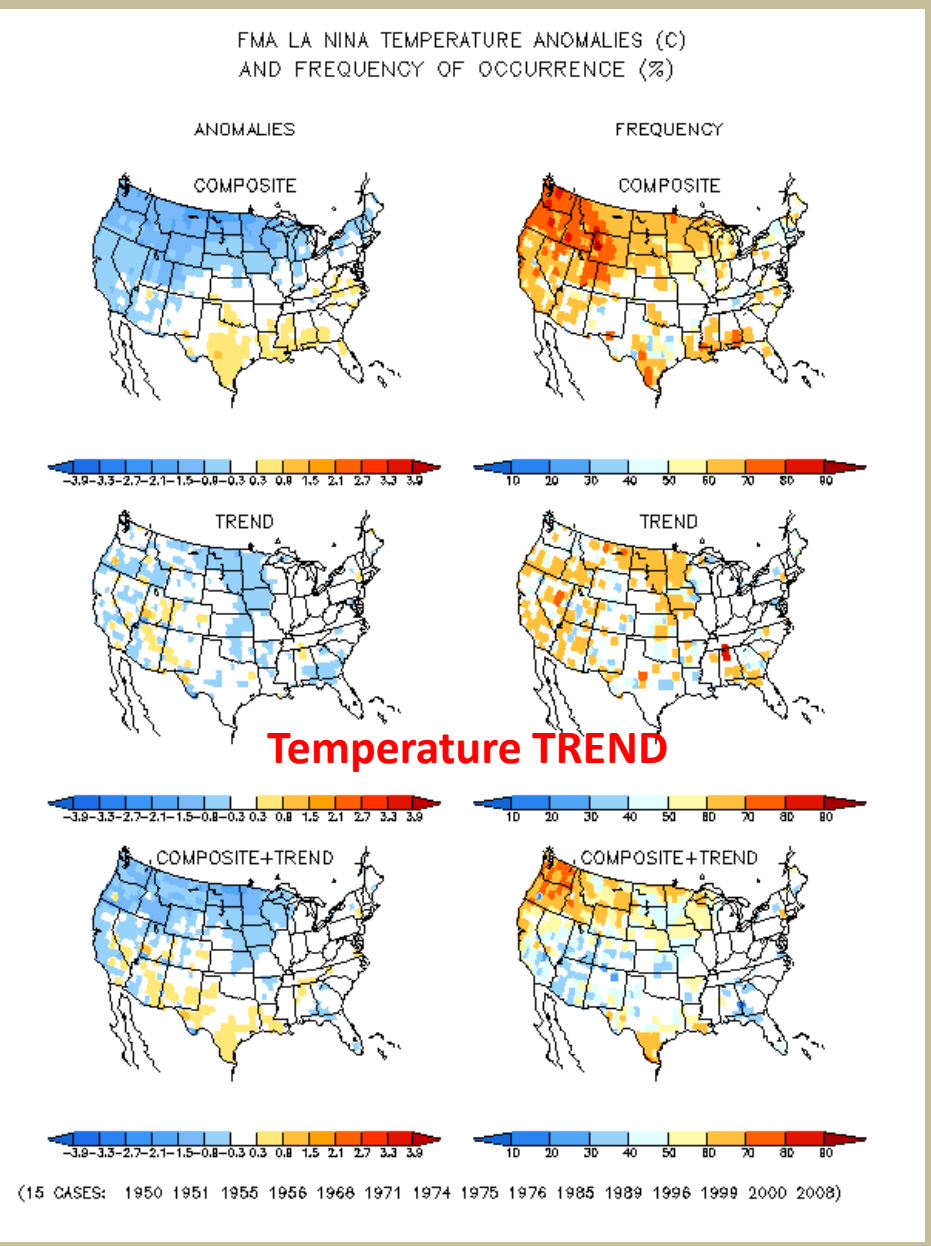
Period	La Nina Median	La Nina Top Quartile	Old La Nina Record	2010/2011	2010/2011 Pct Rank (array 1931/32:2009/10)
SON	1.3 in.	1.8 in.	3.2 in.	3.7 in.	76.9
OND	2.7 in.	3.9 in.	7.2 in.	13.0 in.	99.3
NDJ	5.0 in.	6.5 in.	10.3 in.	11.6 in.	86.9
DJF	6.4 in.	7.7 in.	10.0 in.	12.9 in.	82.3
JFM	6.8 in.	8.0 in.	10.8 in.	7.6 in.	50.4

Month	2010/2011	2010/2011 Pct Rank (array 1931/32:2009/10)
Sep	0.1 in.	35.1
Oct	2.2 in.	93.6
Nov	1.4 in.	62.6
Dec	9.3 in.	100.0
Jan	0.8 in.	21.2
Feb	2.7 in.	53.8
Mar	4.1 in.	75.4

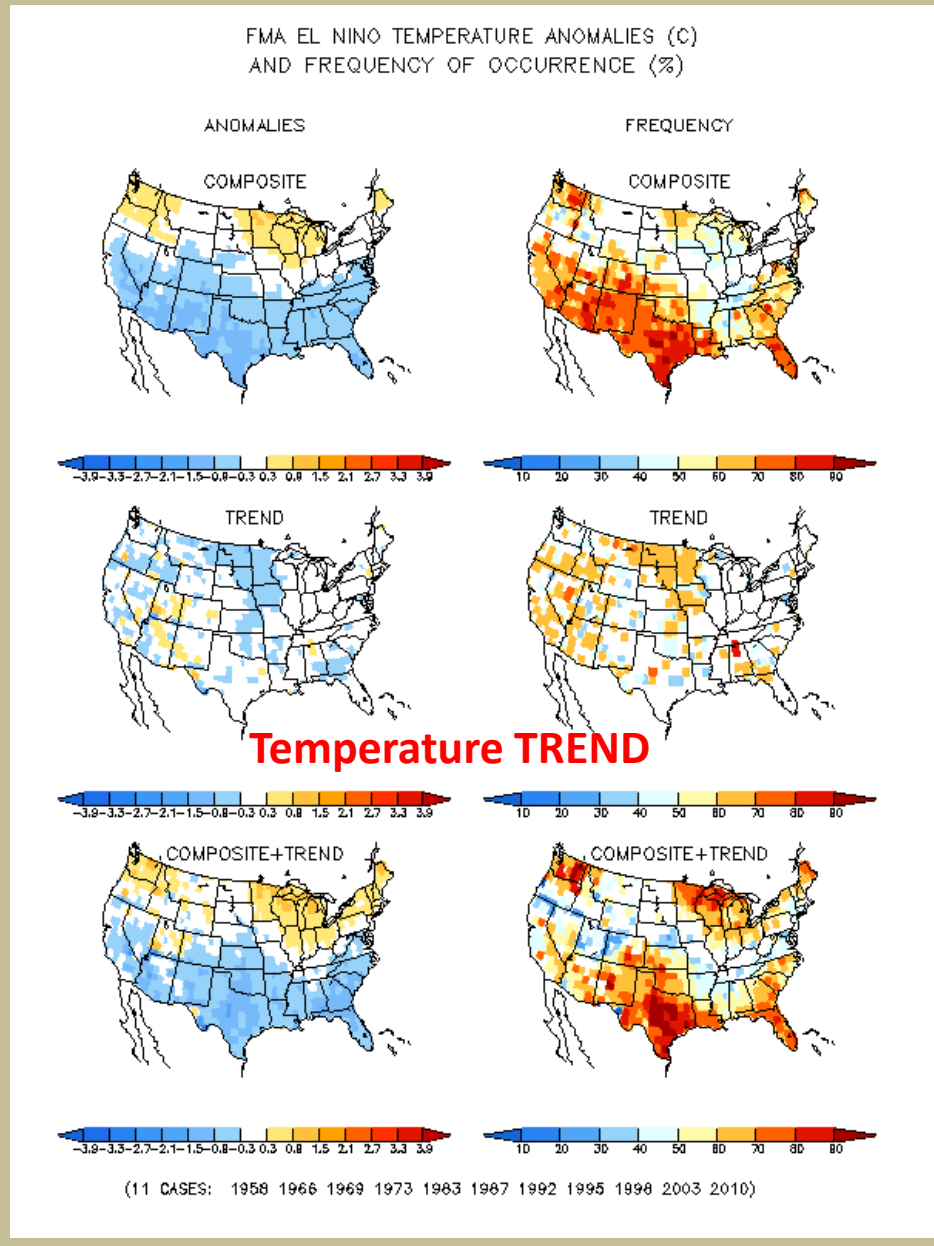
NOTE: Old Dec Rec'd 7.7" in 1940

February – March - April

La Nina Prediction El Nino



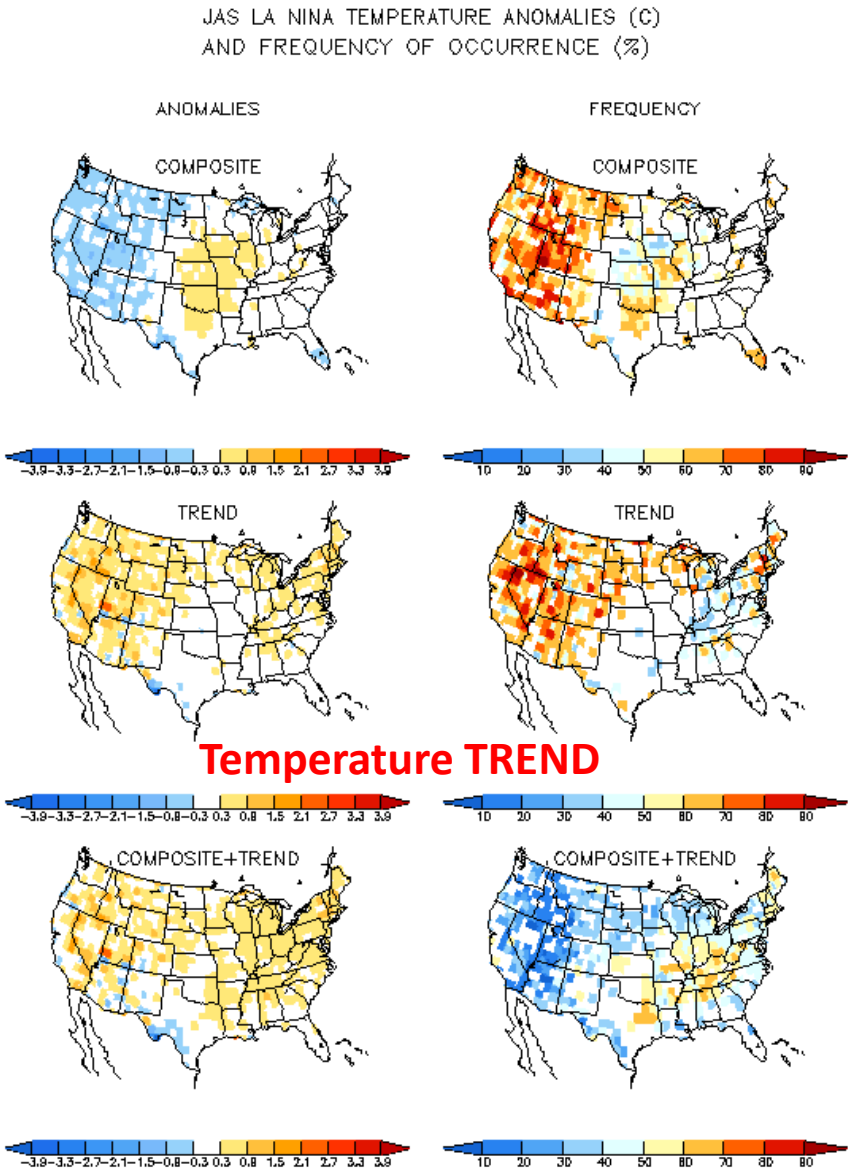
Temperature TREND

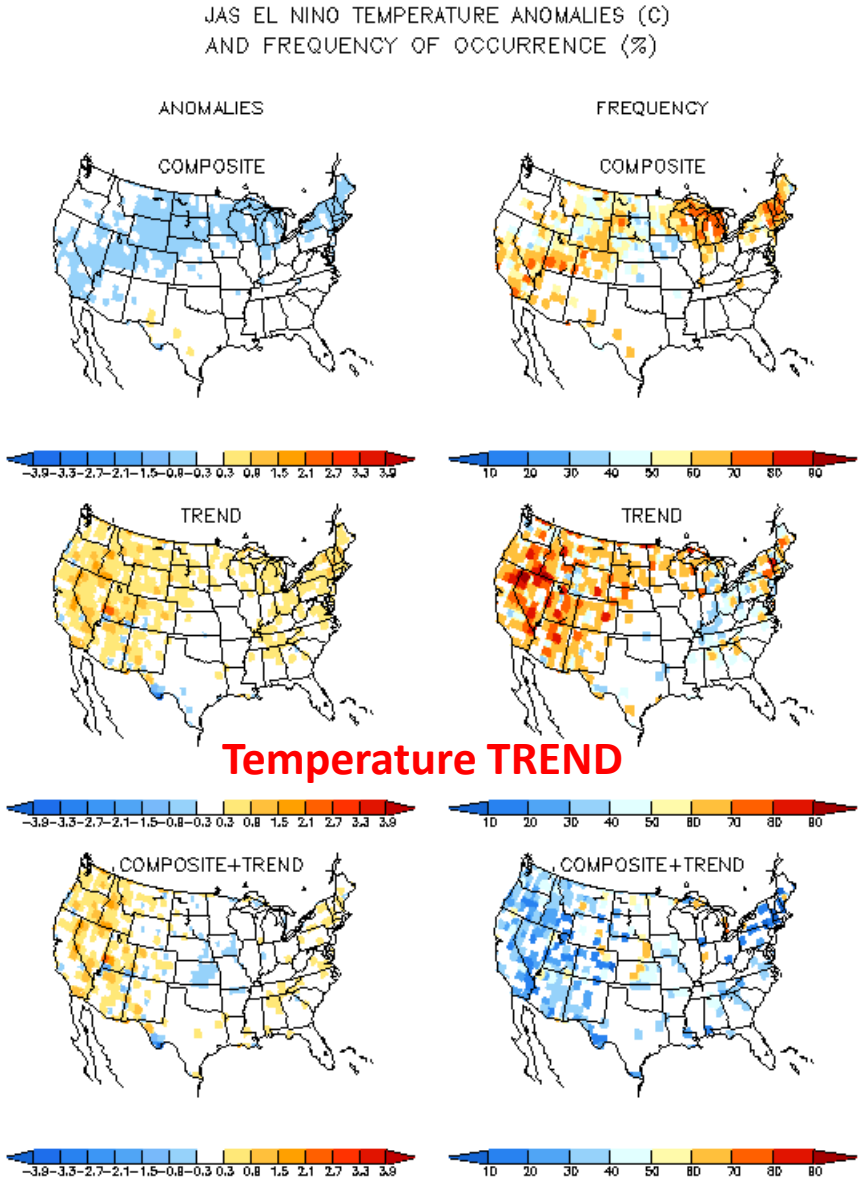


Temperature TREND

July-August-September

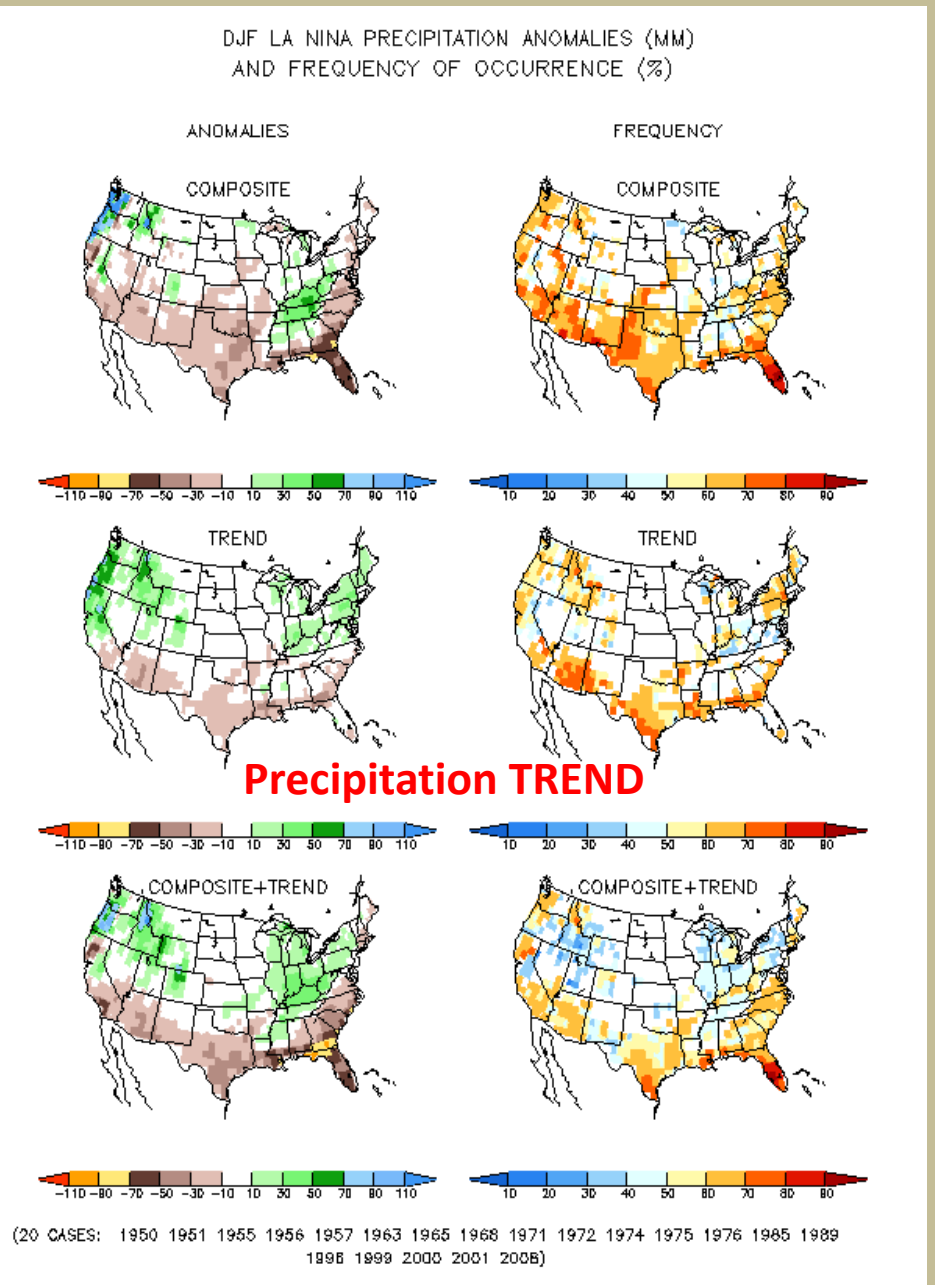
La Nina Prediction El Nino

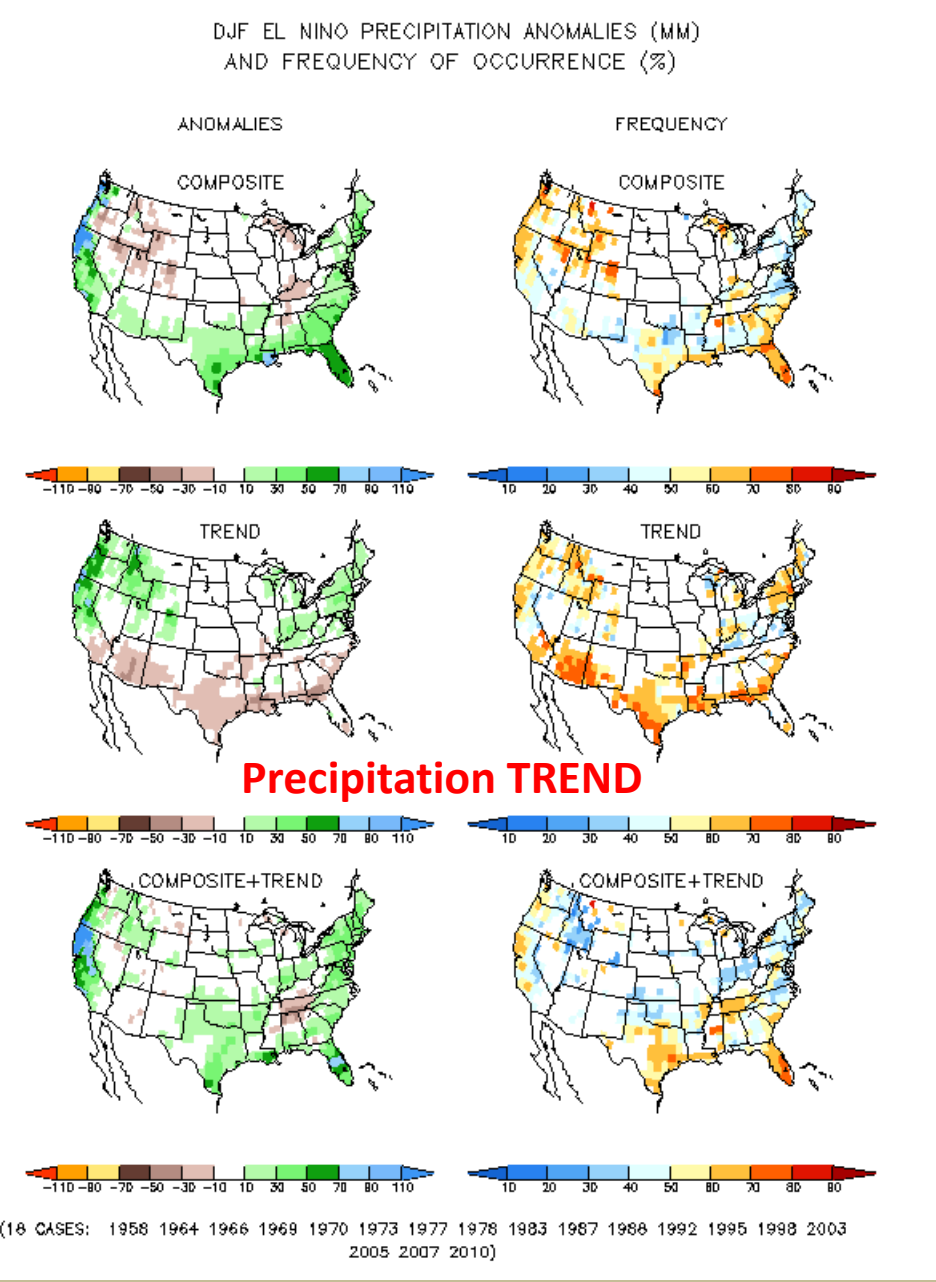




December-January-February

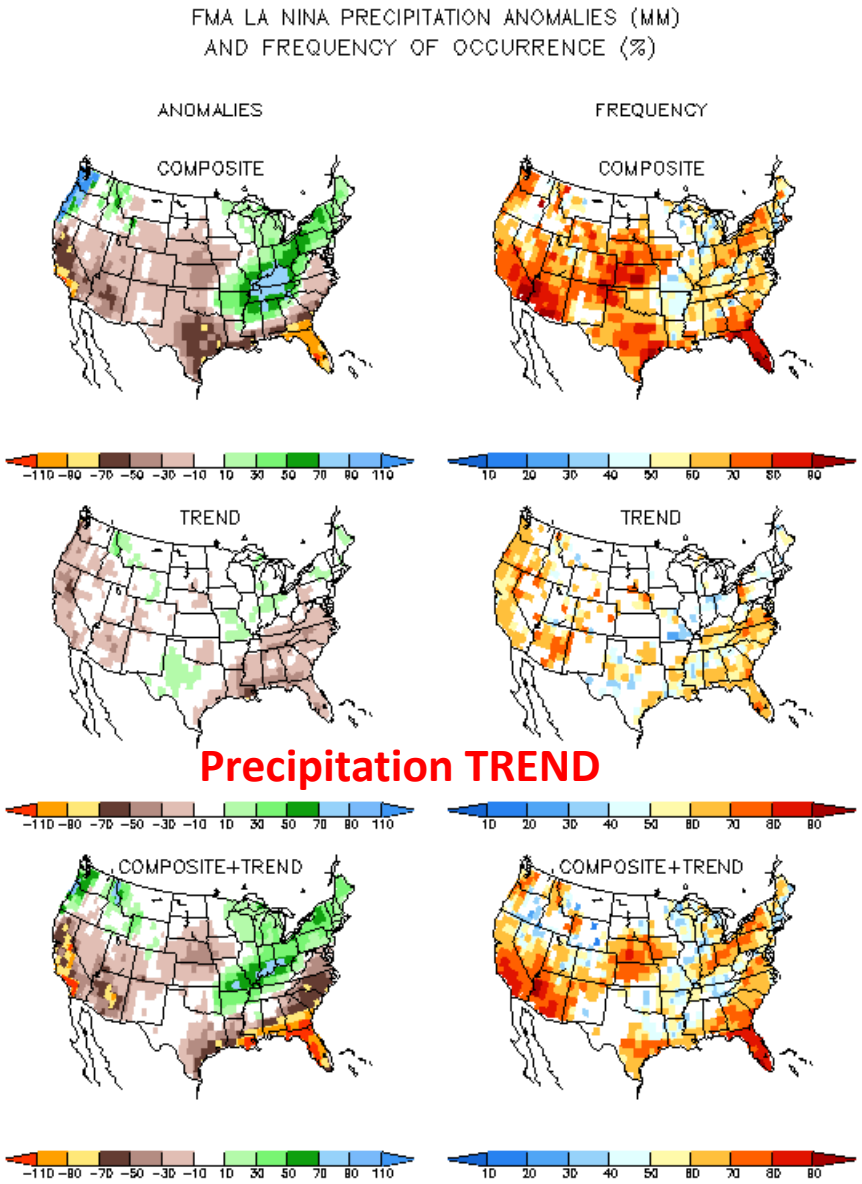
La Nina Prediction El Nino

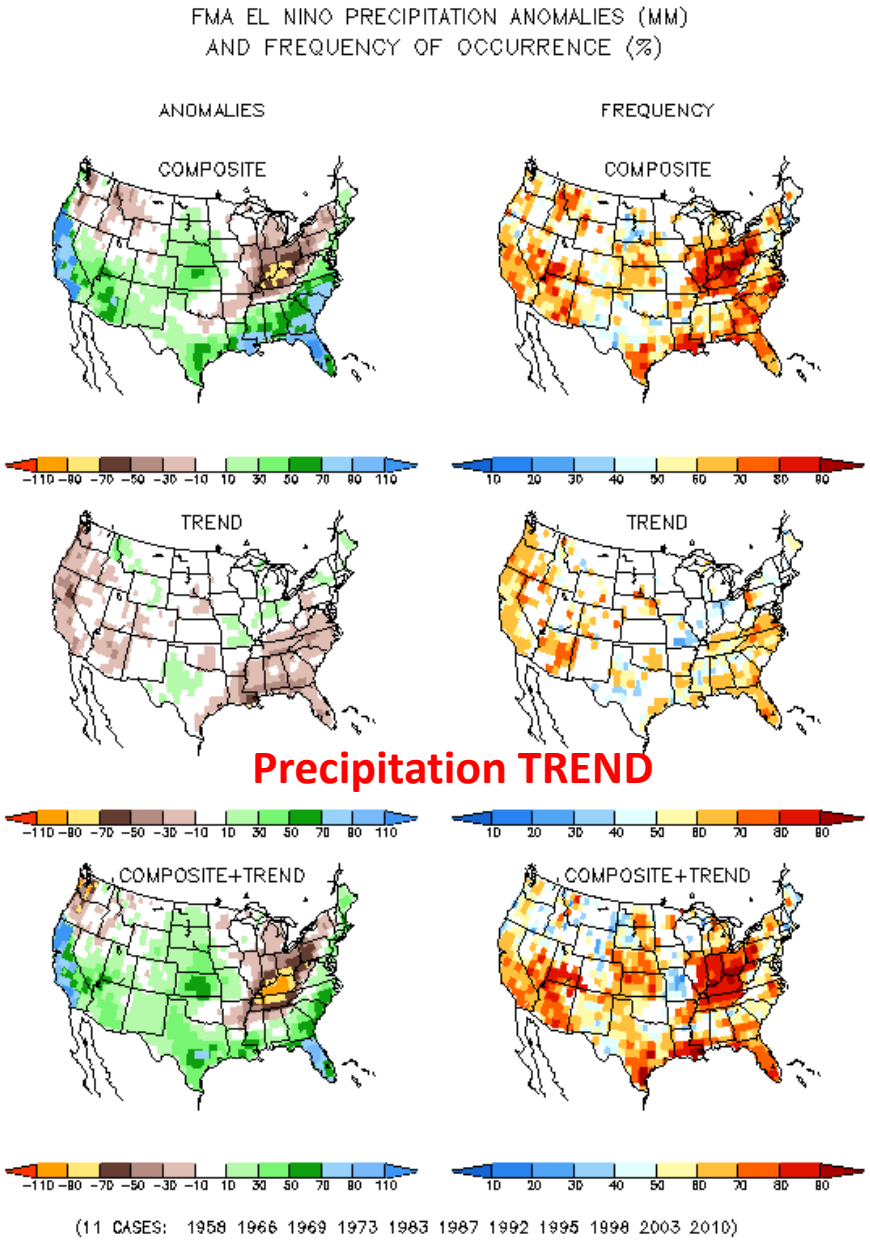




February-March-April

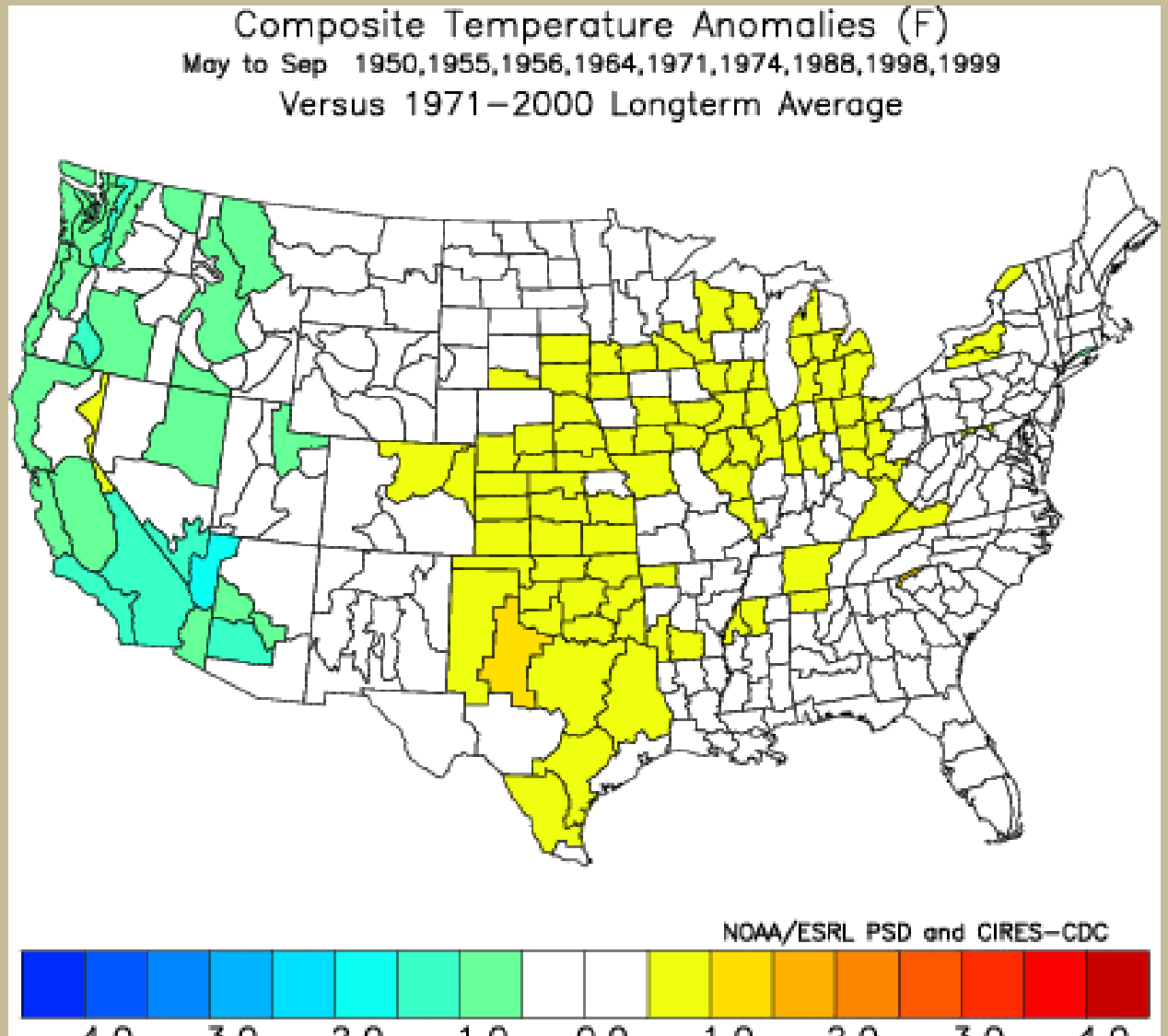
La Nina Prediction El Nino



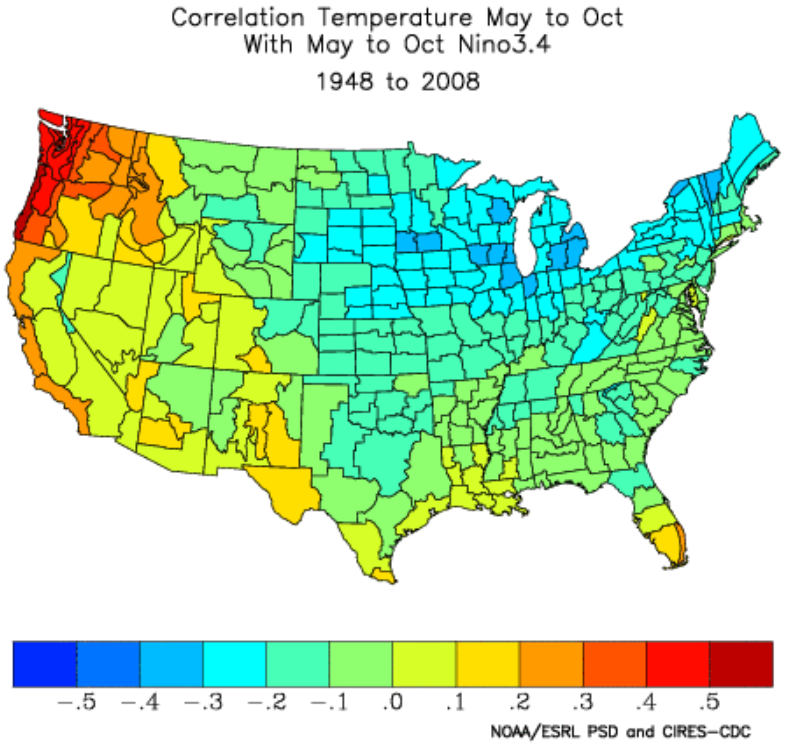


May to September Temperature

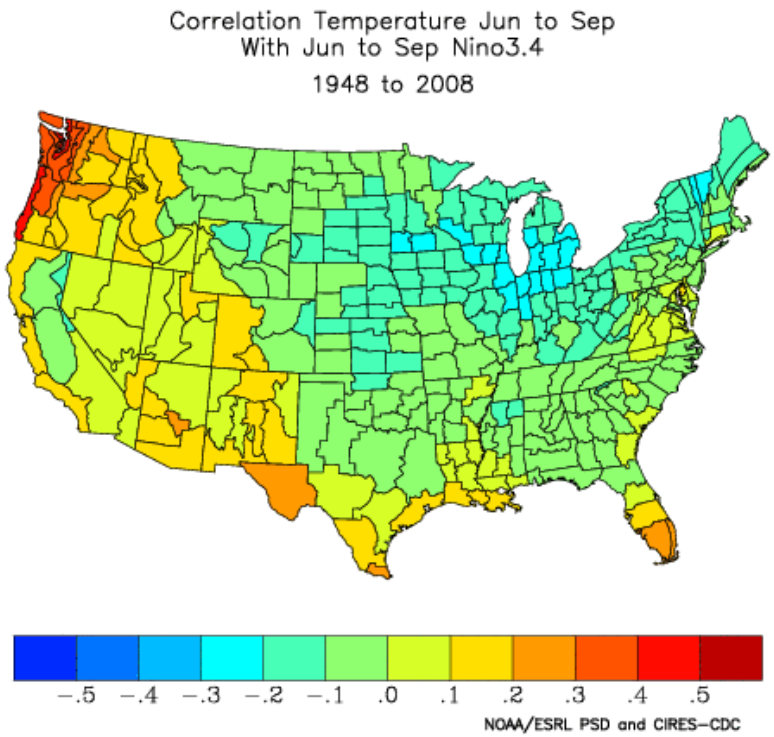
La Nina



Correlation for May to October for ENSO

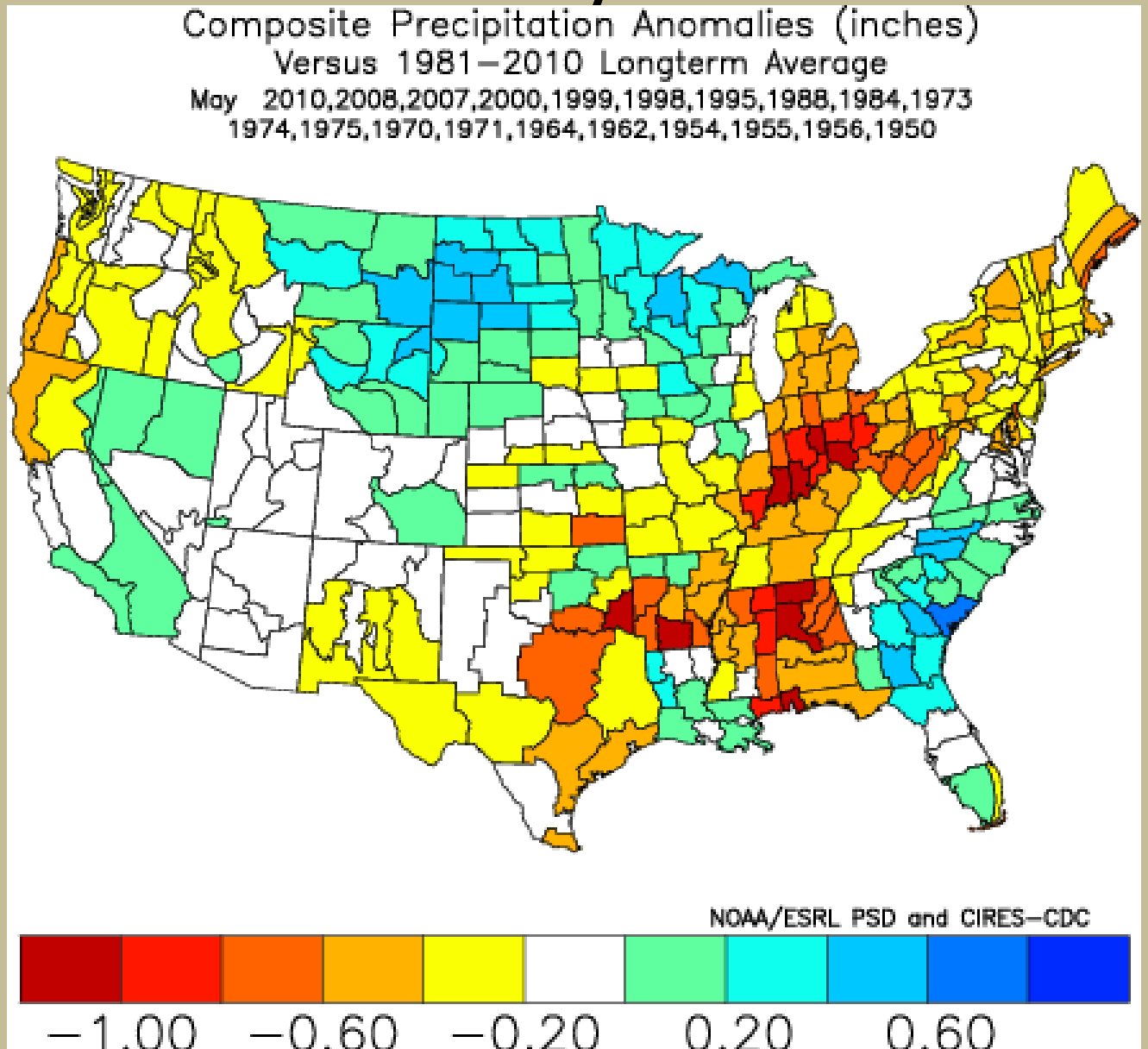


Correlation for Temperature June to September with ENSO



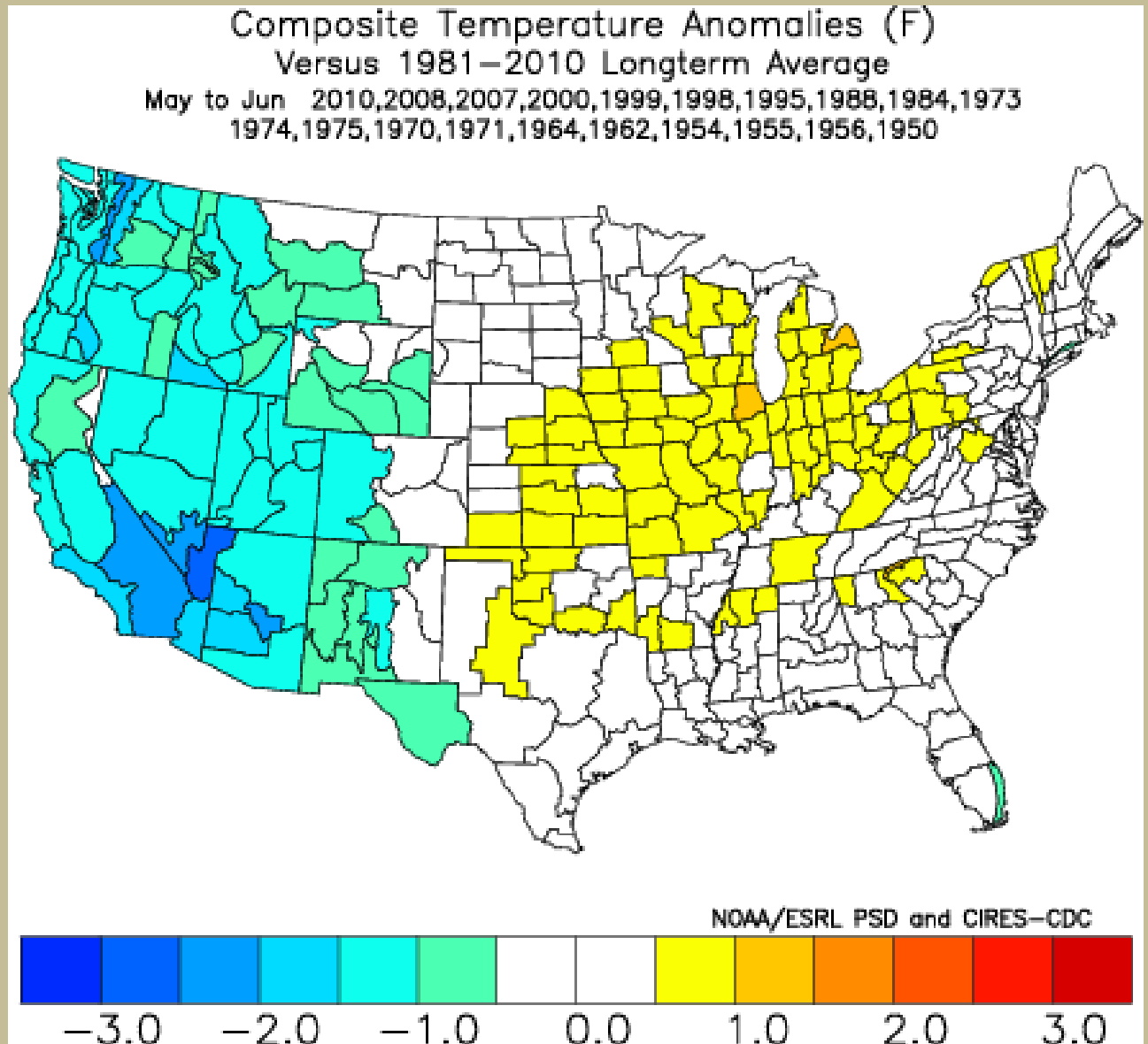
May temperature anomaly

La Nina years



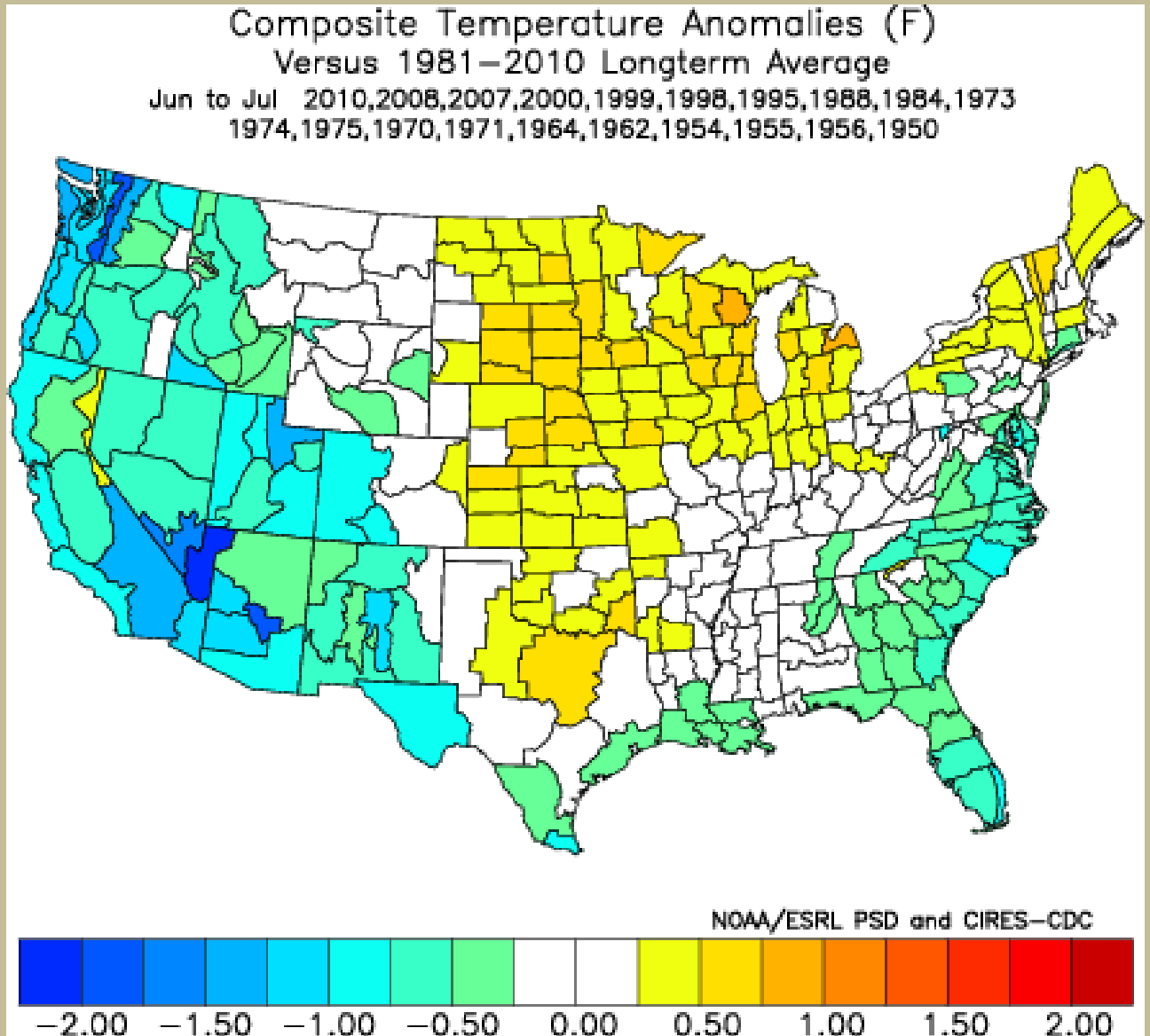
May to June Temperature Anomaly

La Nina Years



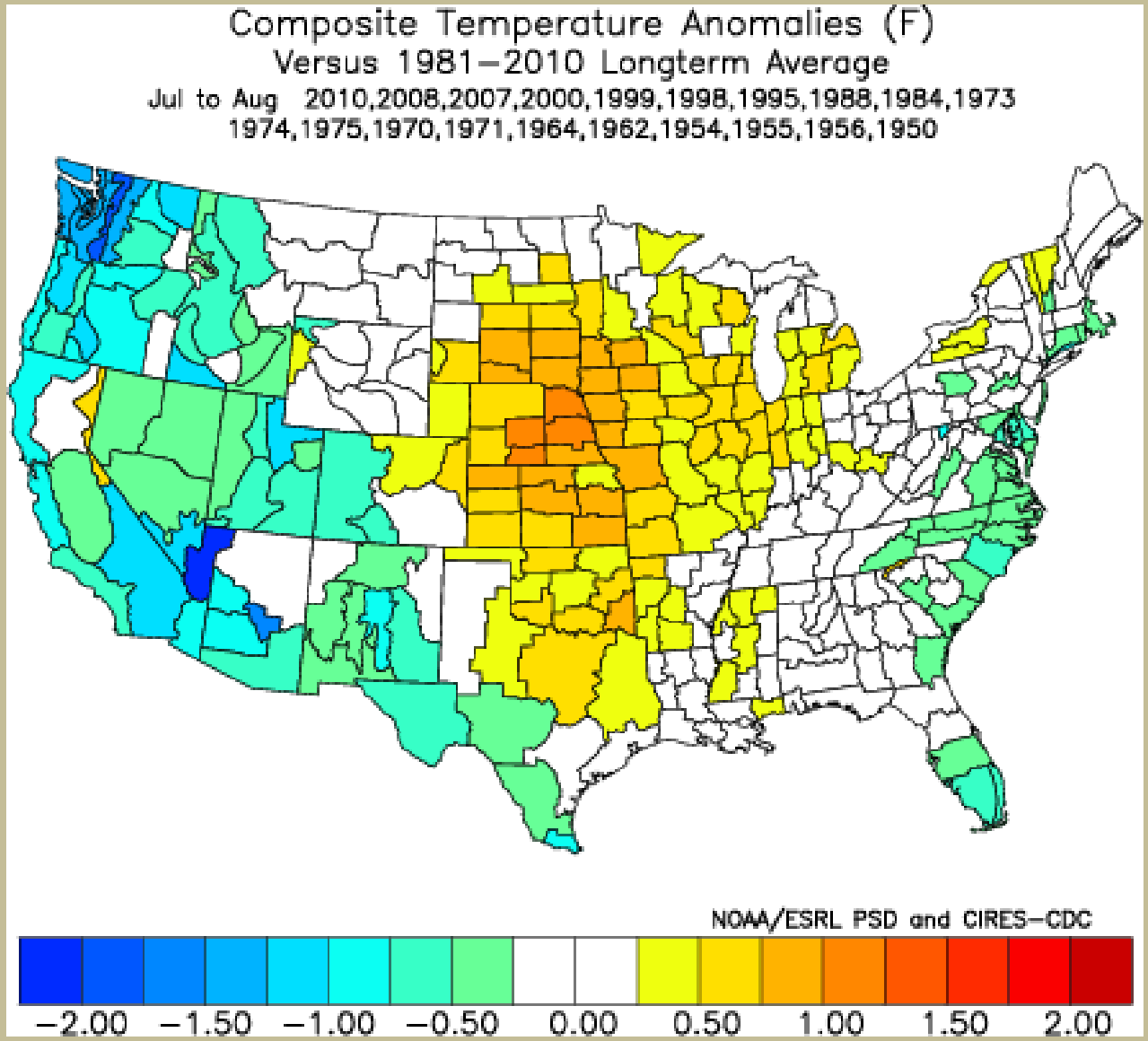
June to July Temperature Anomaly

La Nina years



July to August Temperature Anomaly

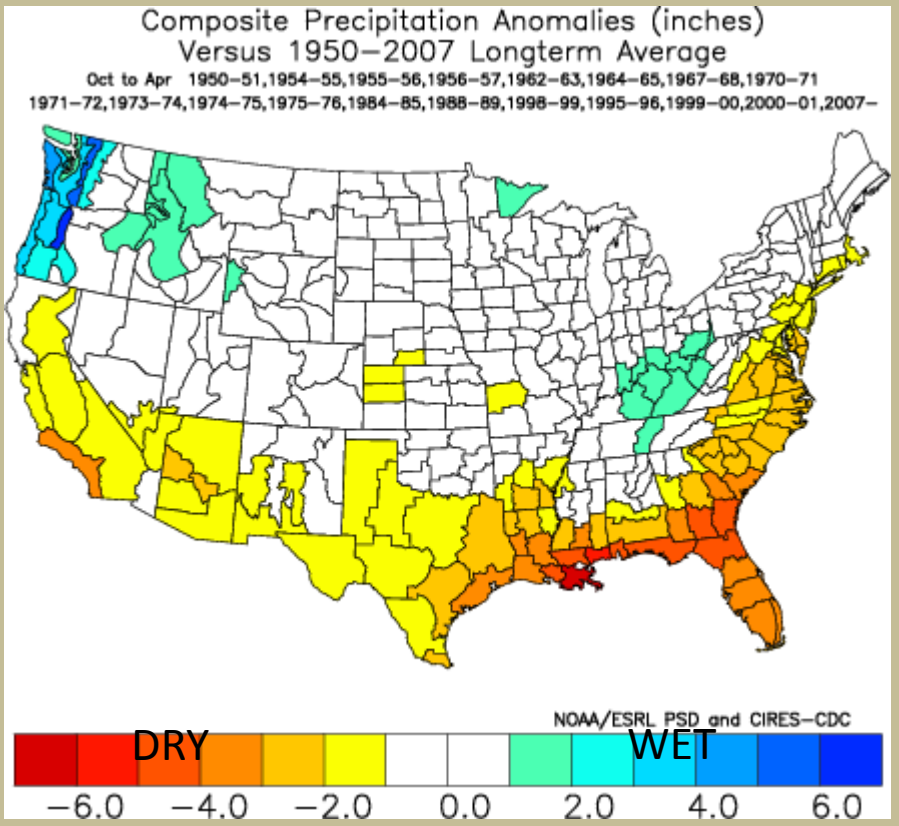
La Nina



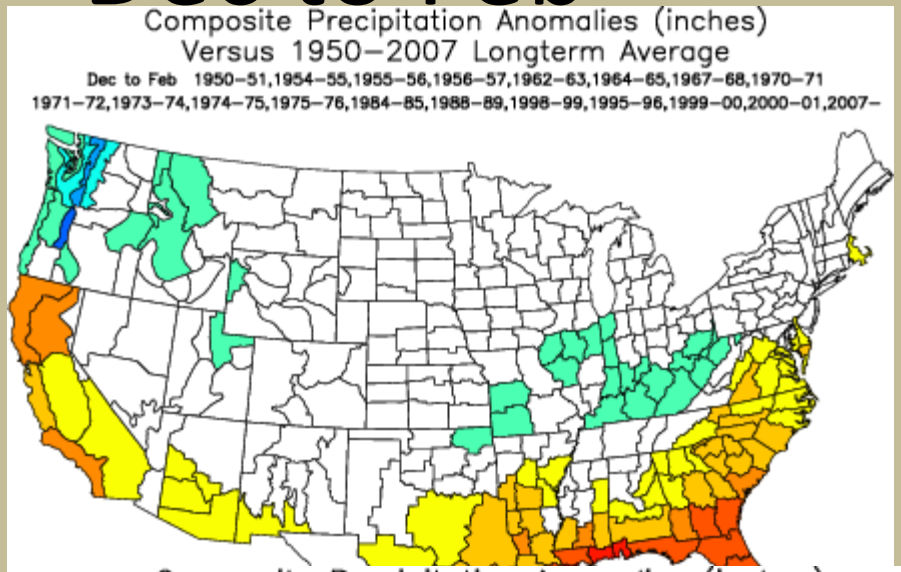
Oct to Apr

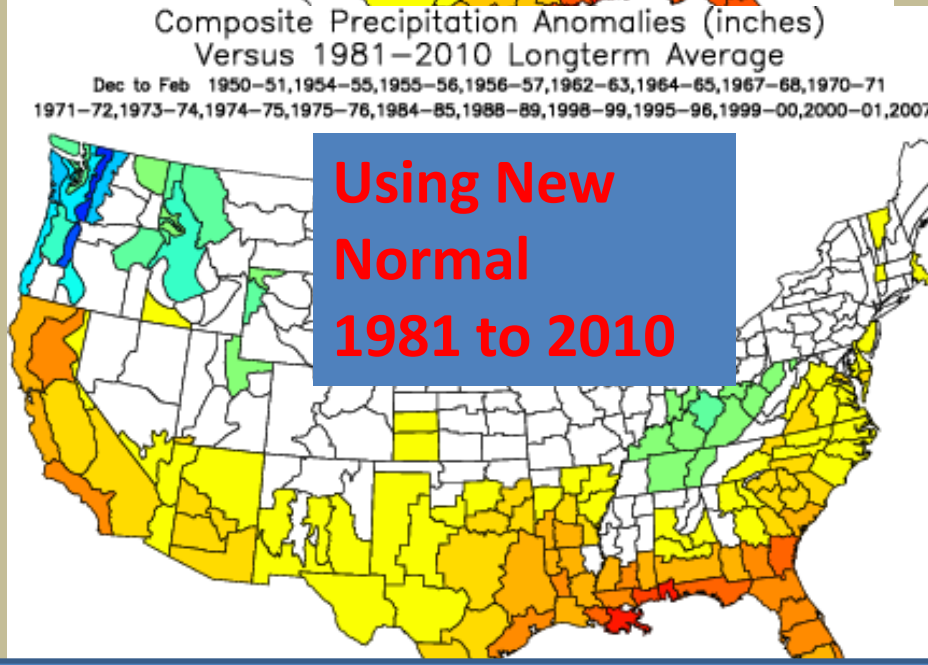
All La Nina years

Compared to 1950 to 2007 average



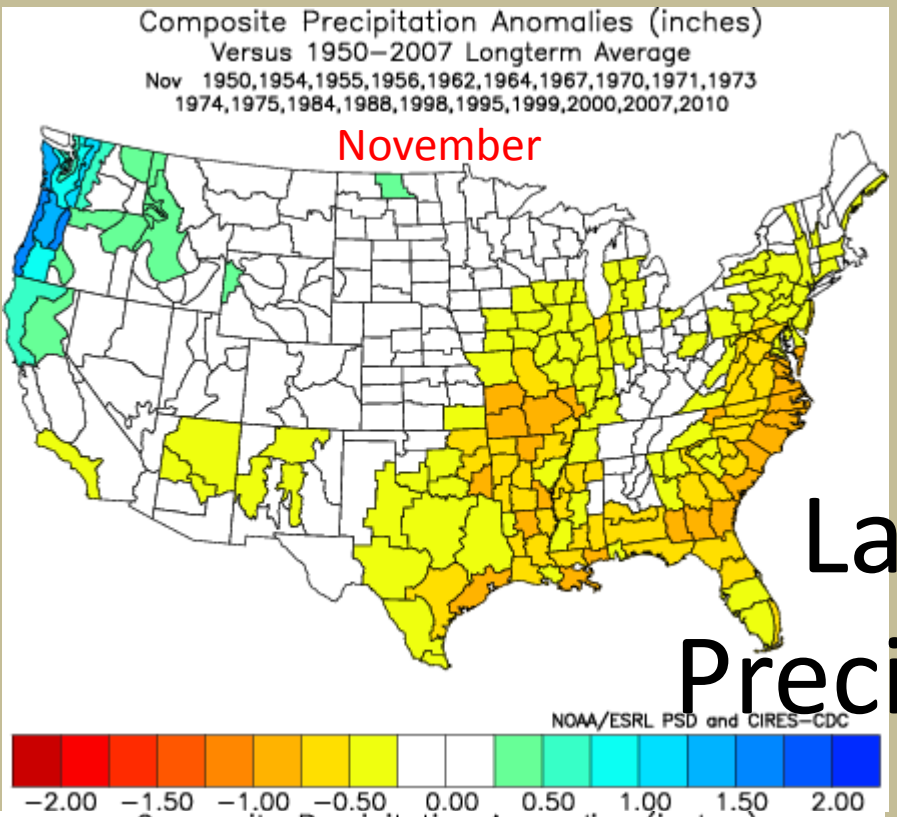
Dec to Feb

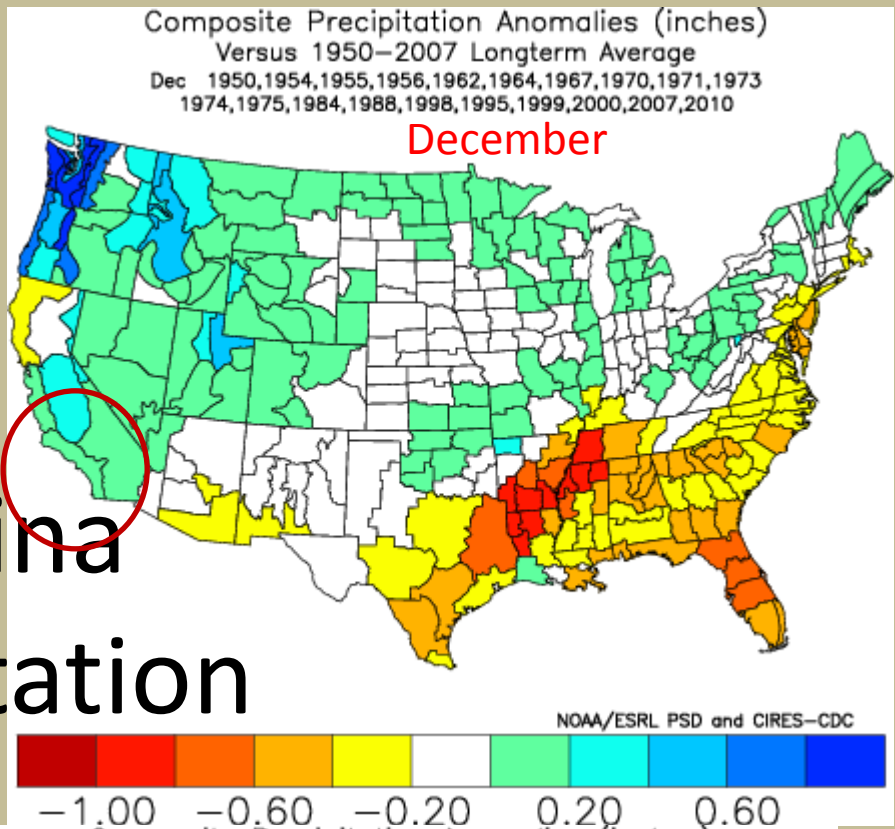


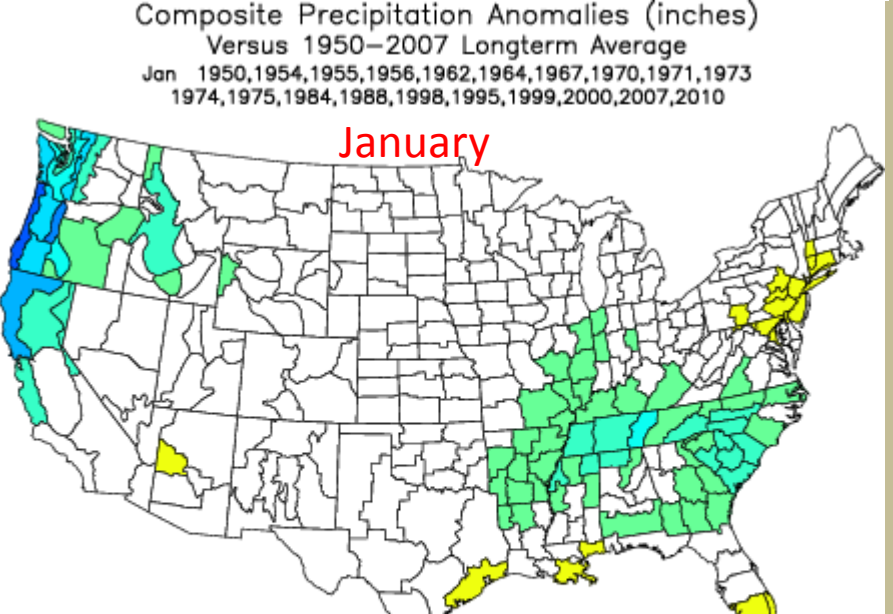


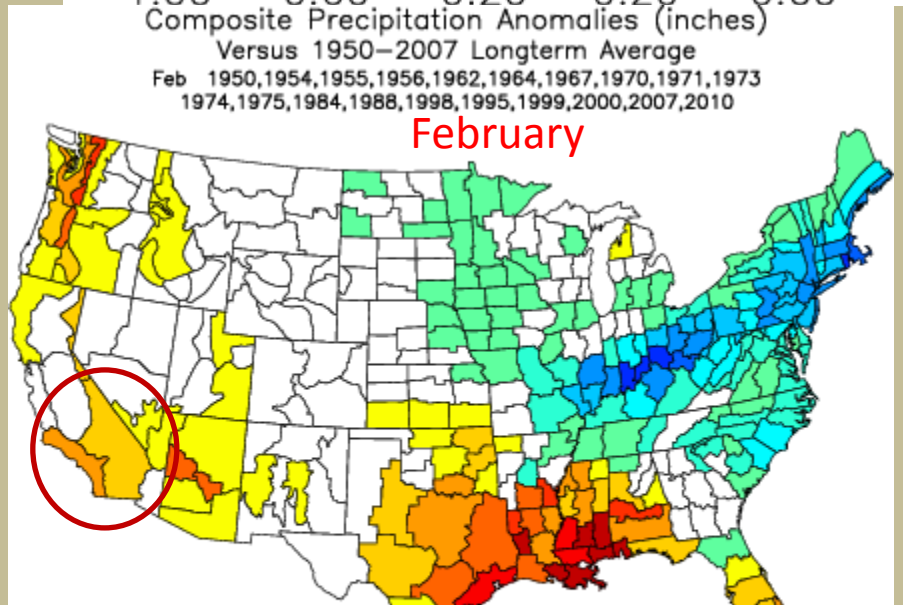
La Nina break down per CLIMATE ZONE and monthly periods

La Nina Precipitation



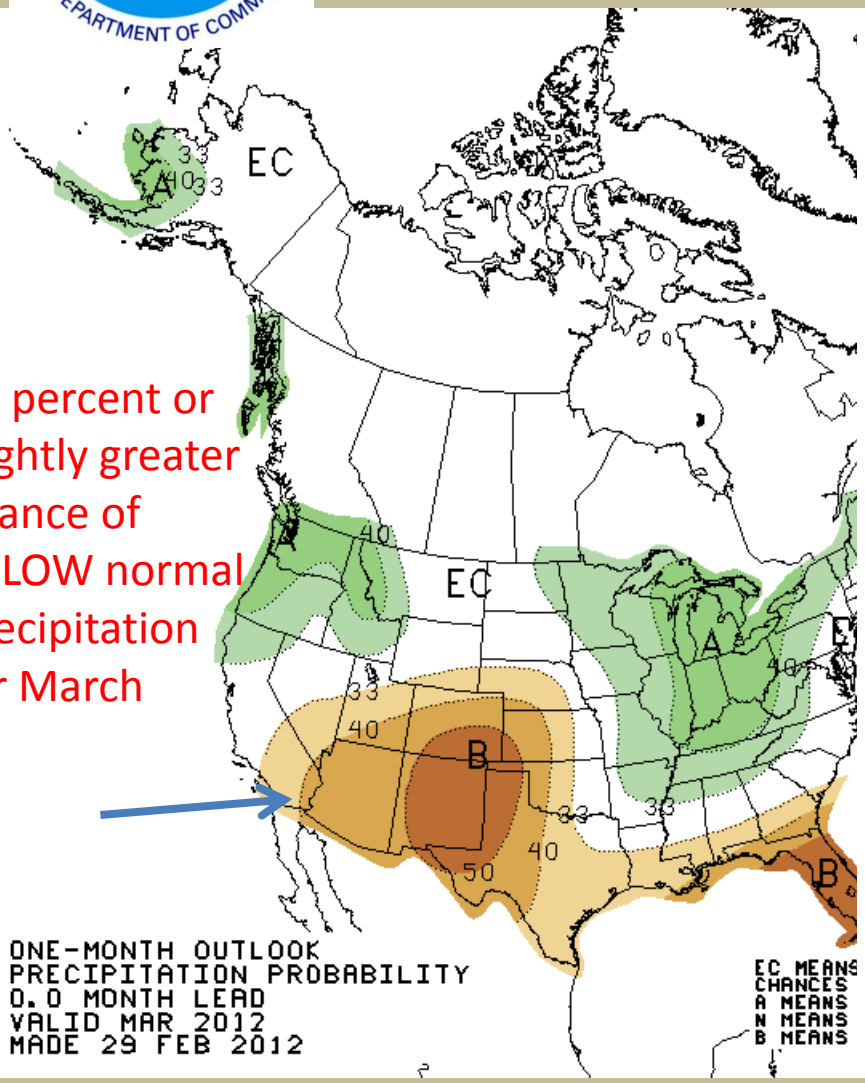


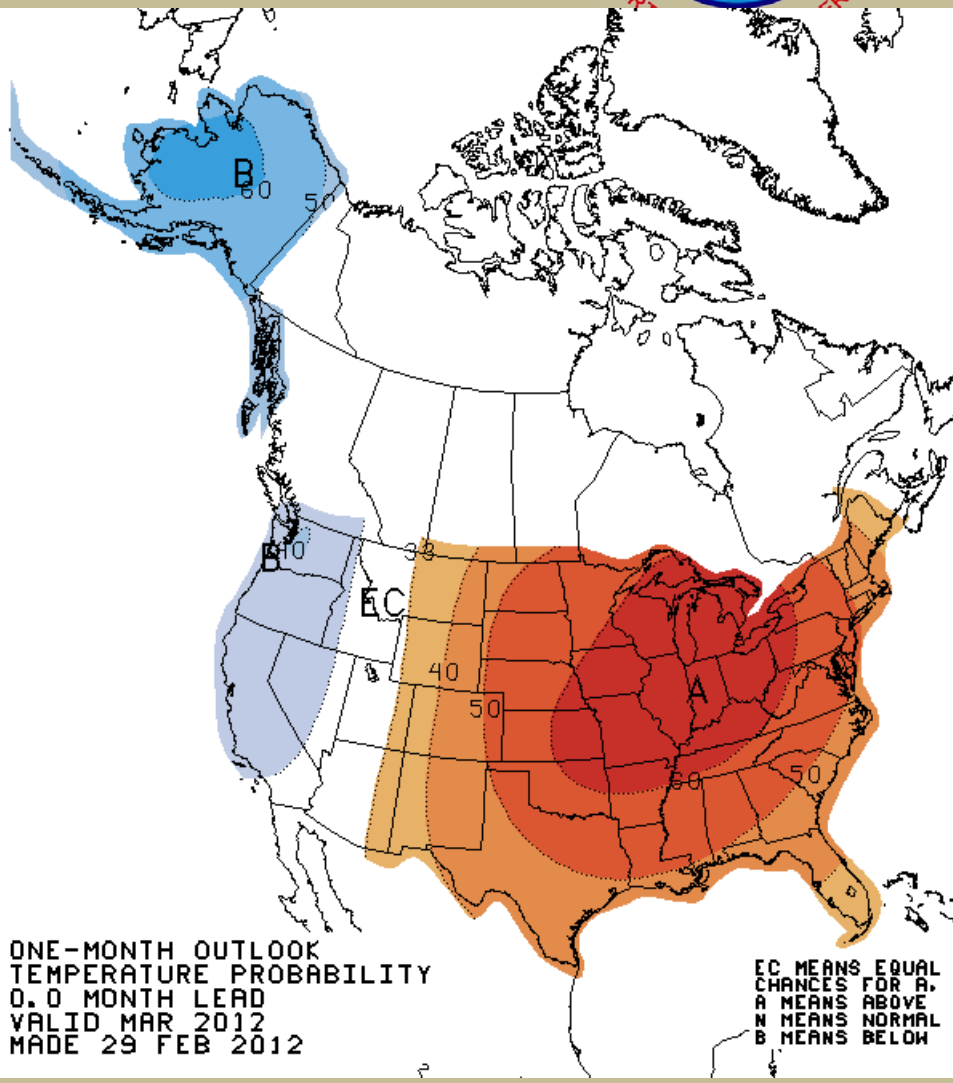




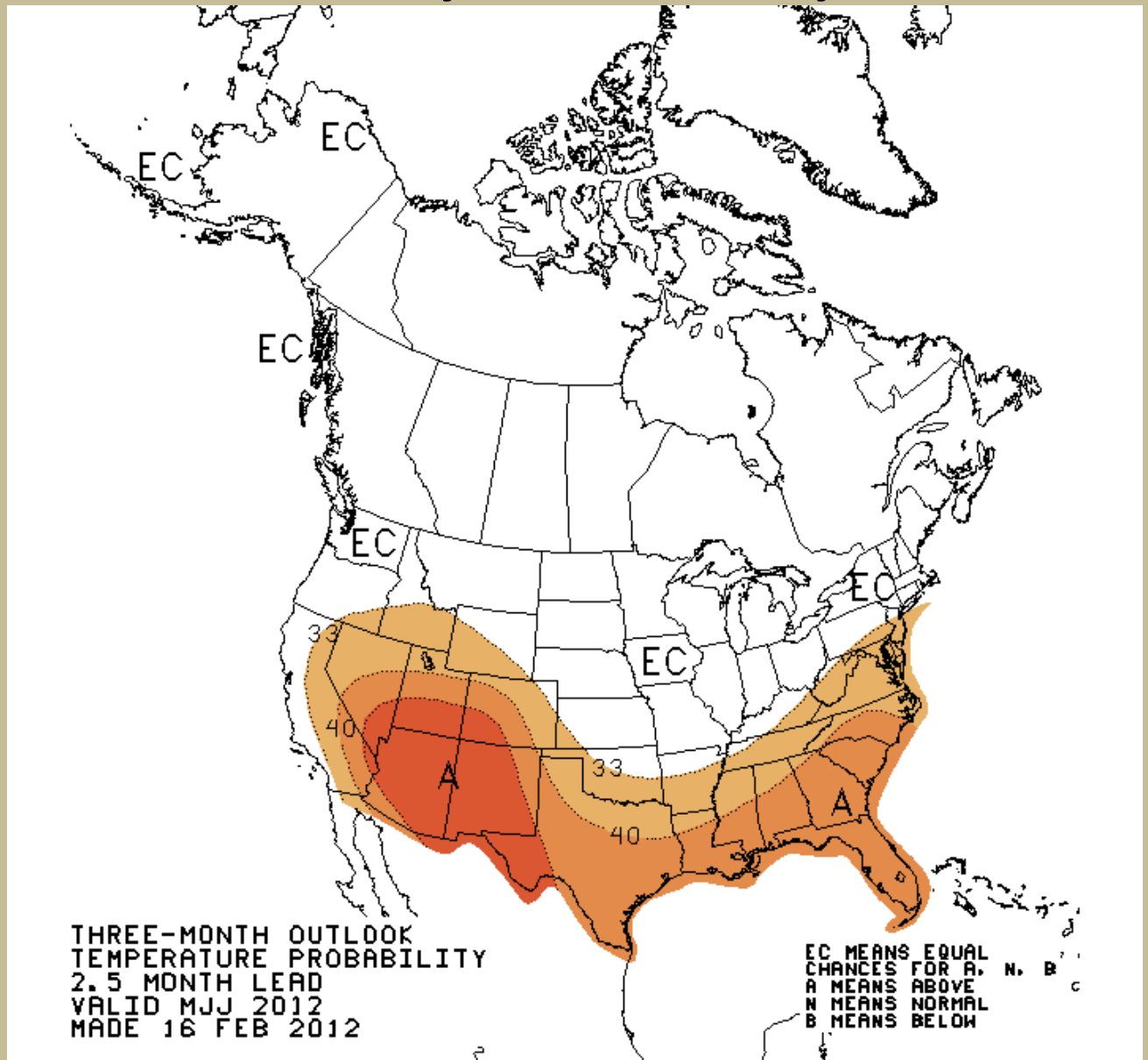
Precipitation and Temperature
Outlook for March

40 percent or slightly greater chance of BELOW normal Precipitation for March

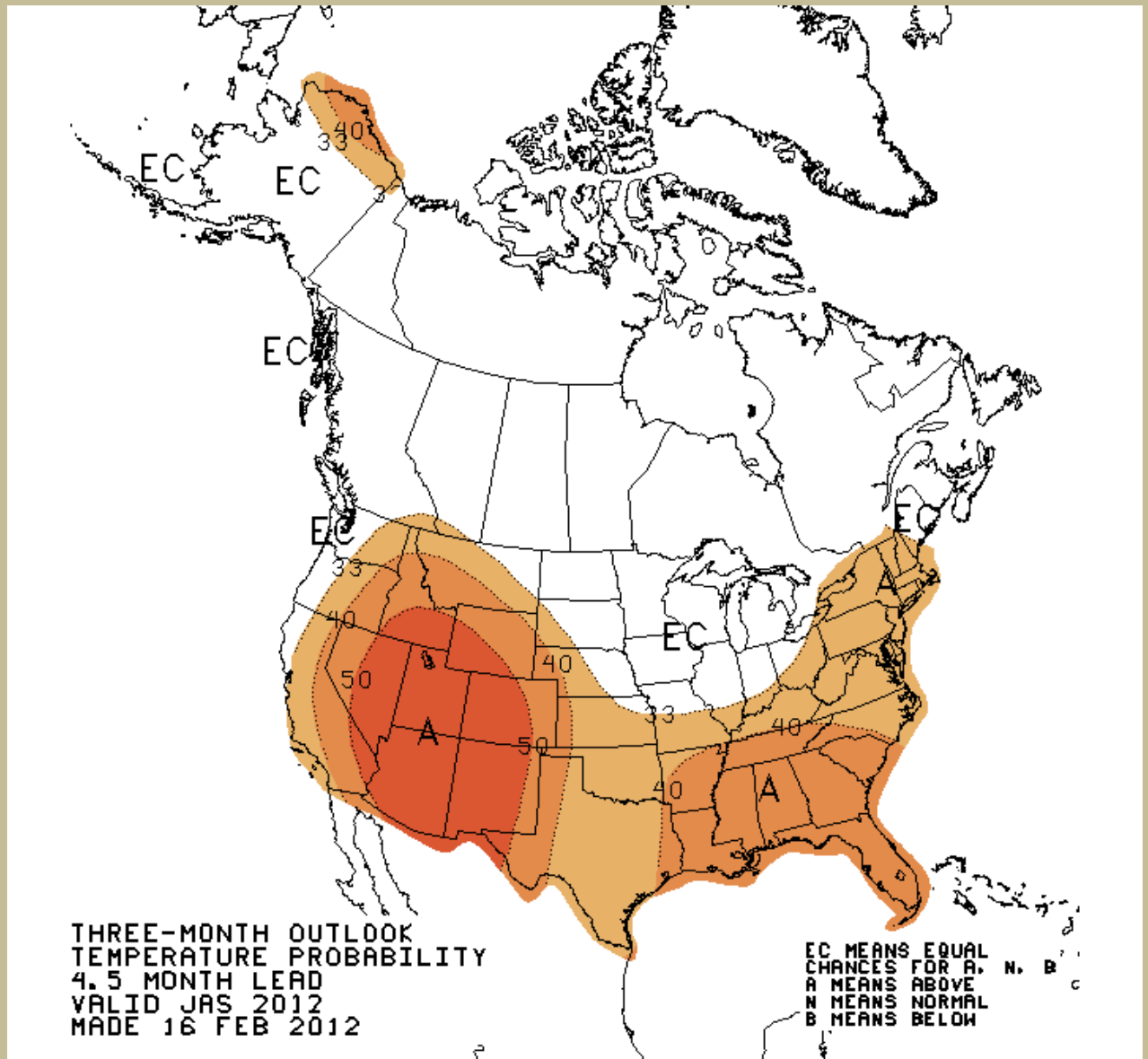




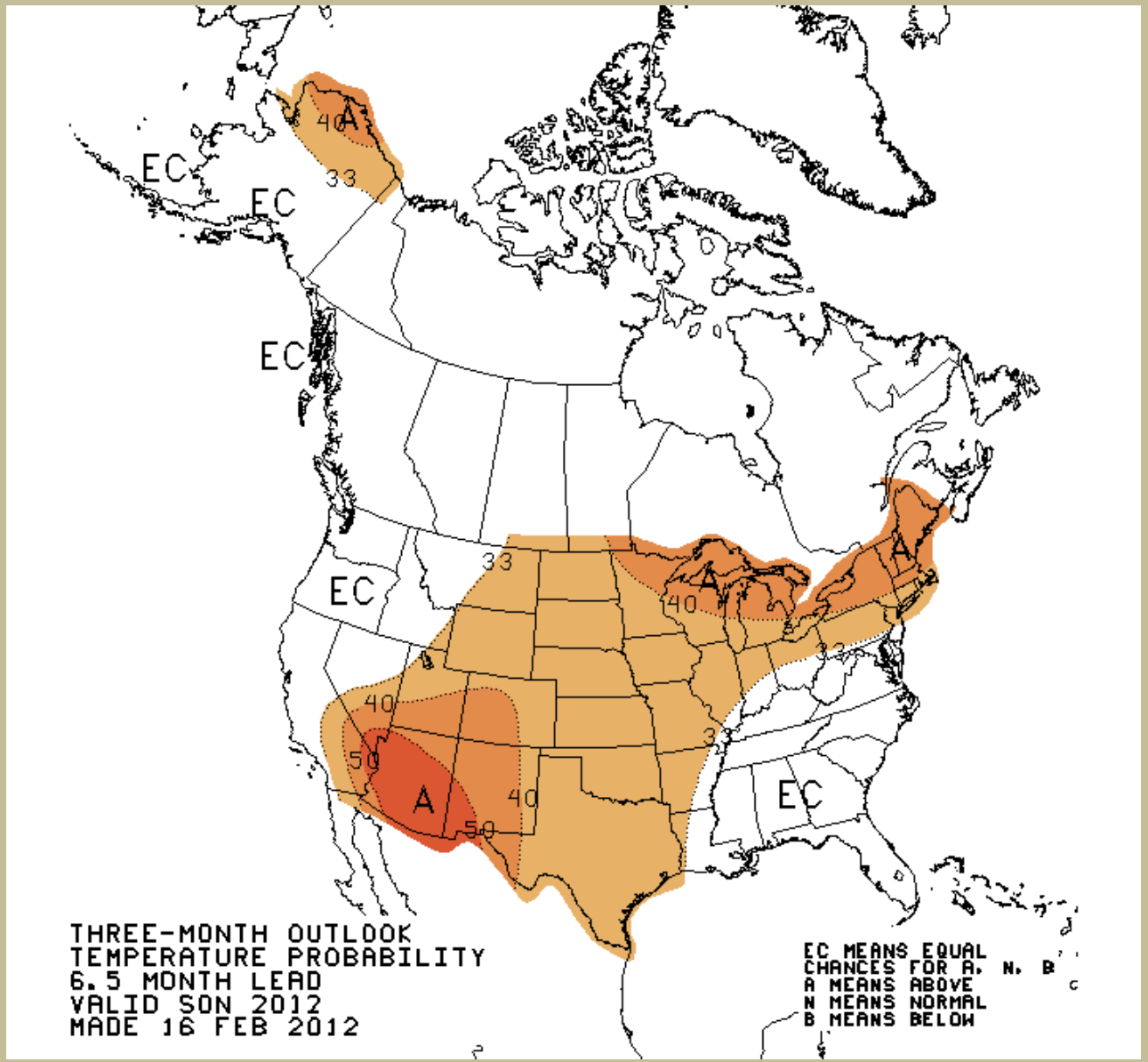
Temperature outlook
May-June-July



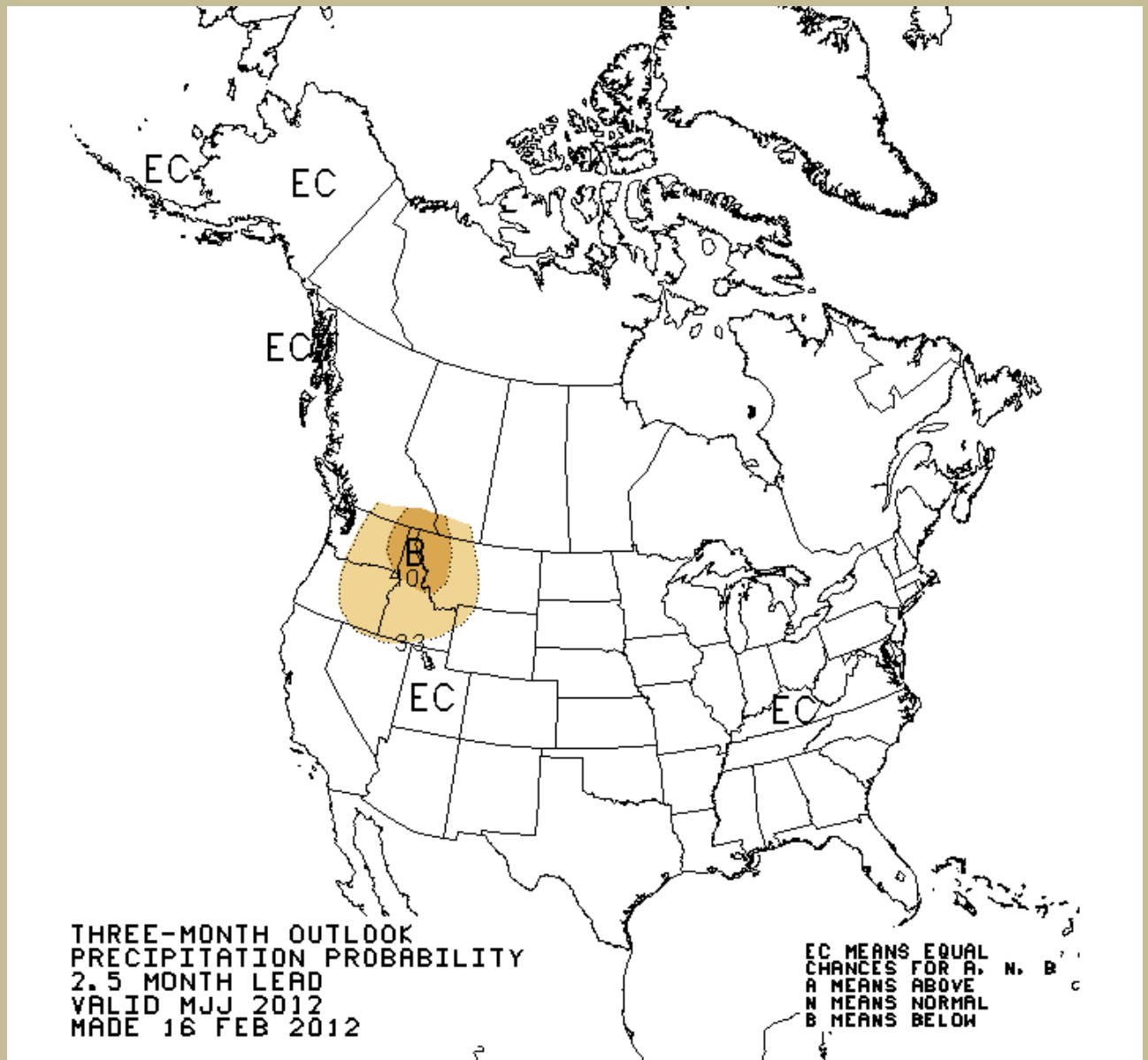
Temperature outlook
July –August- September



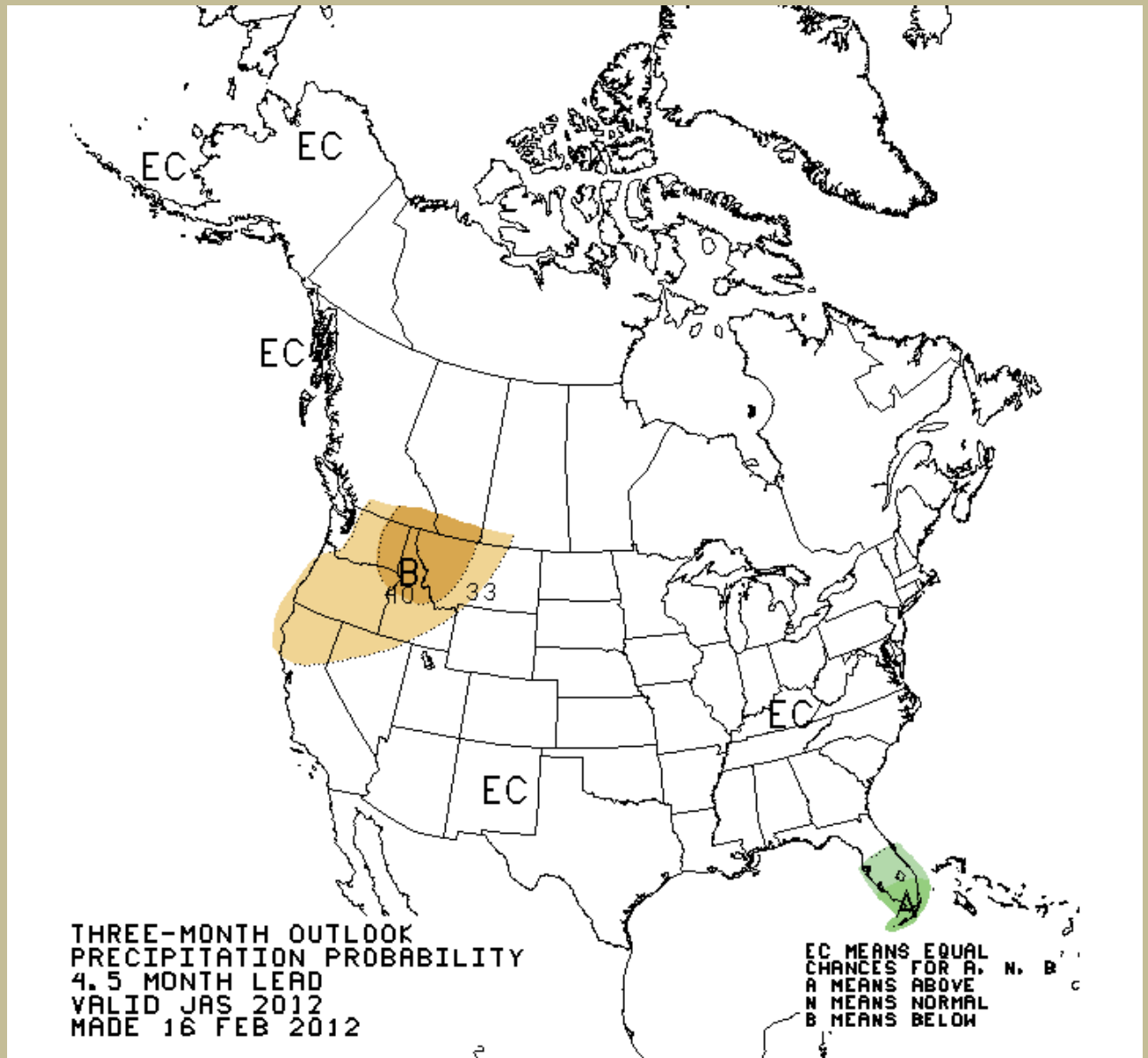
Temperature outlook September-October-November



Precipitation outlook
May-June-July



Precipitation outlook July-August-September



Precipitation outlook September-October-November