2017 Budget

Load Forecast

(Step 1 of 3)

The Budget Process

Each year, in November, OPALCO staff prepare a budget for the following year. There are three elements of the budget:
- Load Forecast
- Budget
- Rates

The Load Forecast models the anticipated weather to predict how much energy will be needed.

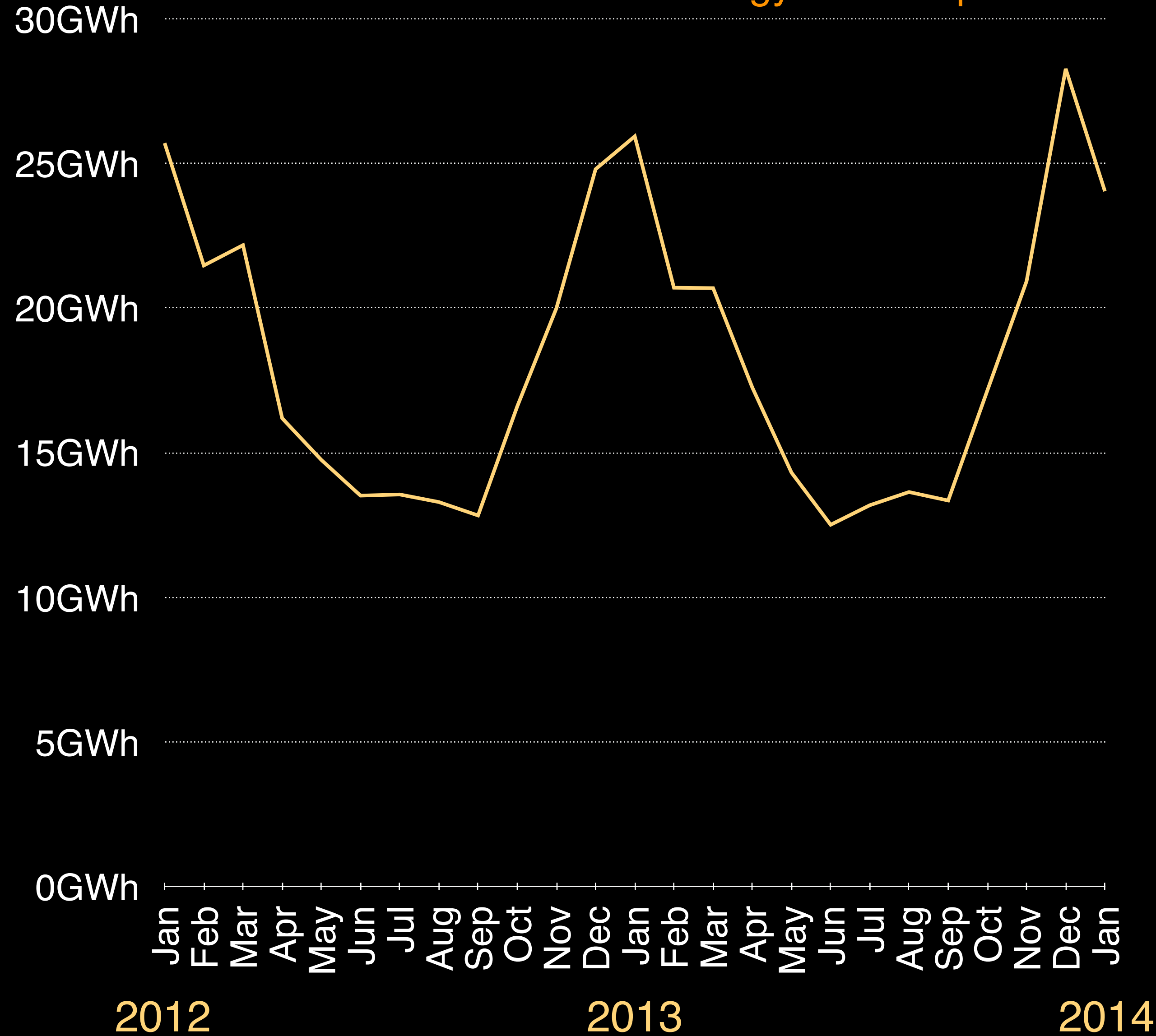The Budget lays out anticipated expenses and revenue for operations and capital projects.

Rates are set to produce enough revenue to cover expenses, given the anticipated kWh sales from the Load Forecast

Rule of Thumb

each 1 million kWh sold = $100,000 in revenue

The Load Forecasting Process

OPALCO Member Total Energy Consumption

Chart Y-axis: 30GWh, 25GWh, 20GWh, 15GWh, 10GWh, 5GWh, 0GWh

Chart X-axis: Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan

2012   2013   2014

OPALCO member energy use doubles in the winter due to darker colder winters requiring more heat and lighting than in summer.

The colder the winter, the greater the load.

OPALCO tracks Heating Degree Day (HDD) trends as well as sea water temperature to predict future weather and anticipated load kWh. It is as much art as science. So revenue depends on the unpredictability of the weather.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

Monthly SJC HDD Compared to Global El Niño and La Niña Years
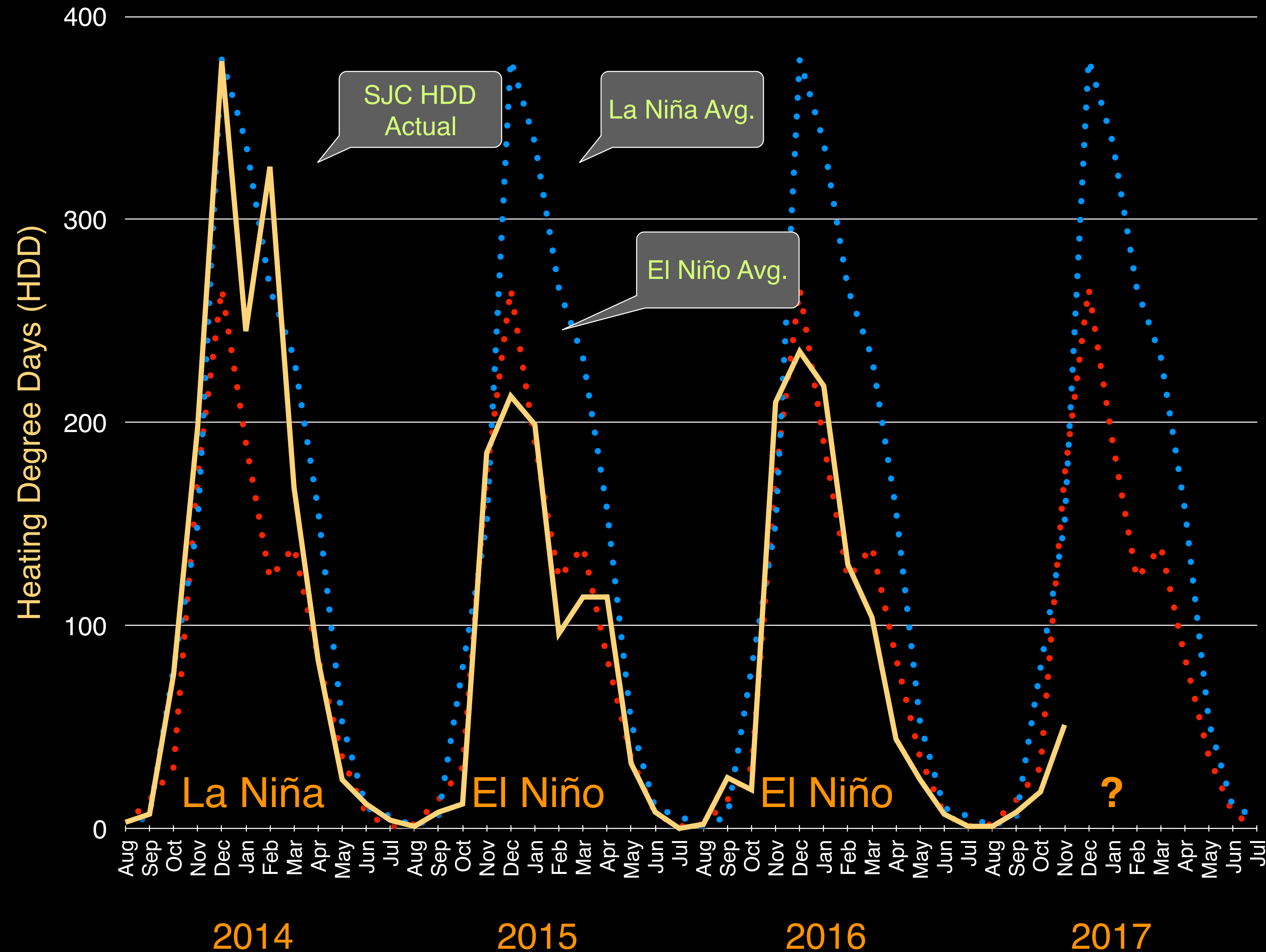
La Niña weather cycles are colder and wetter than El Niño cycles. The colder the winter, the more HDD. The more HDD, the more kWh of load.
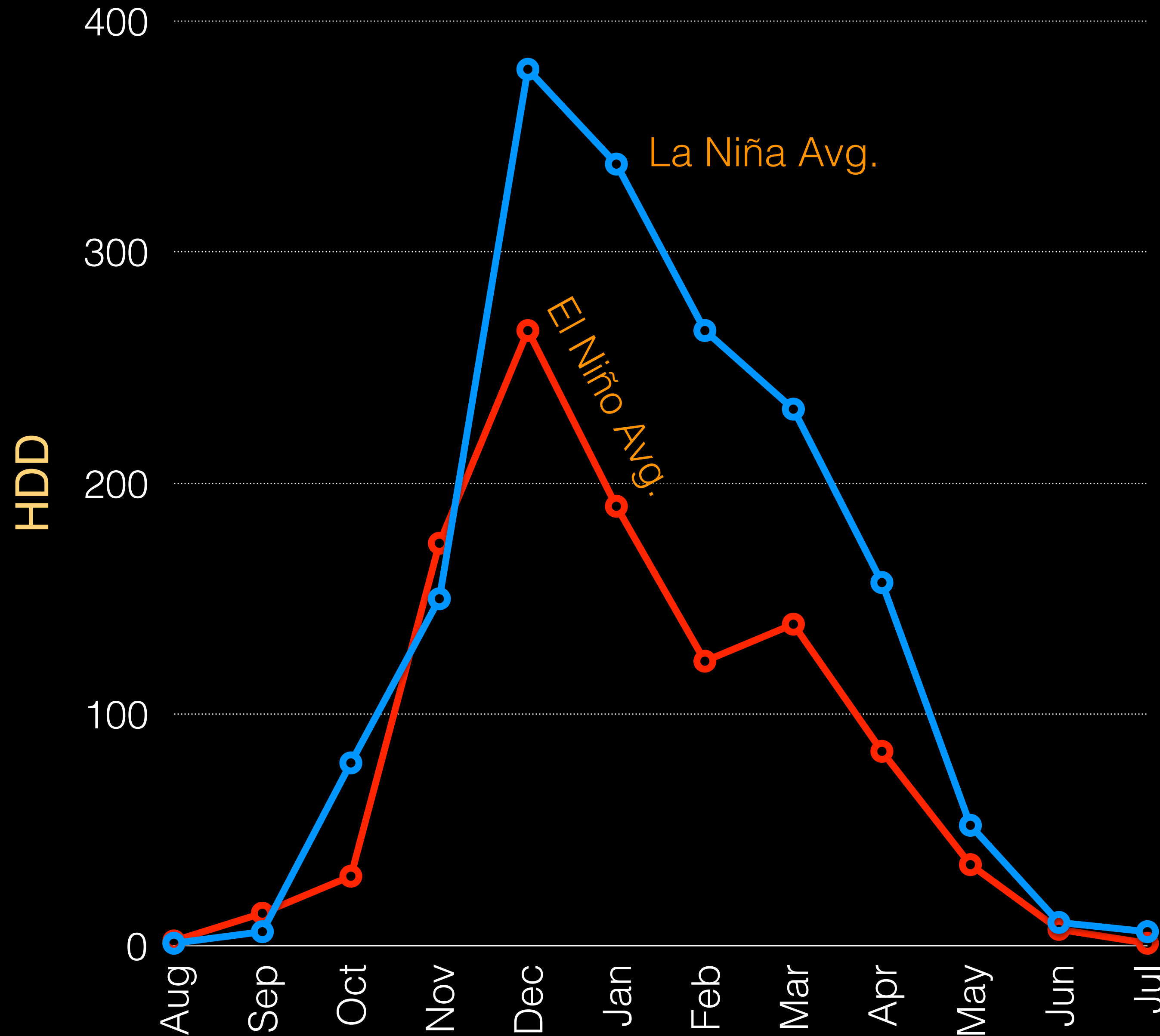
2014, a typical cool La Niña year, was followed by two very warm El Niño winters and lower kWh.

Though 2017 looks like it will be a weak La Niña, it is starting out unusually warm.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

Monthly SJC HDD Sorted into Global El Niño and La Niña

La Niña Avg.

El Niño Avg.

HDD

400

300

200

100

0

Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul

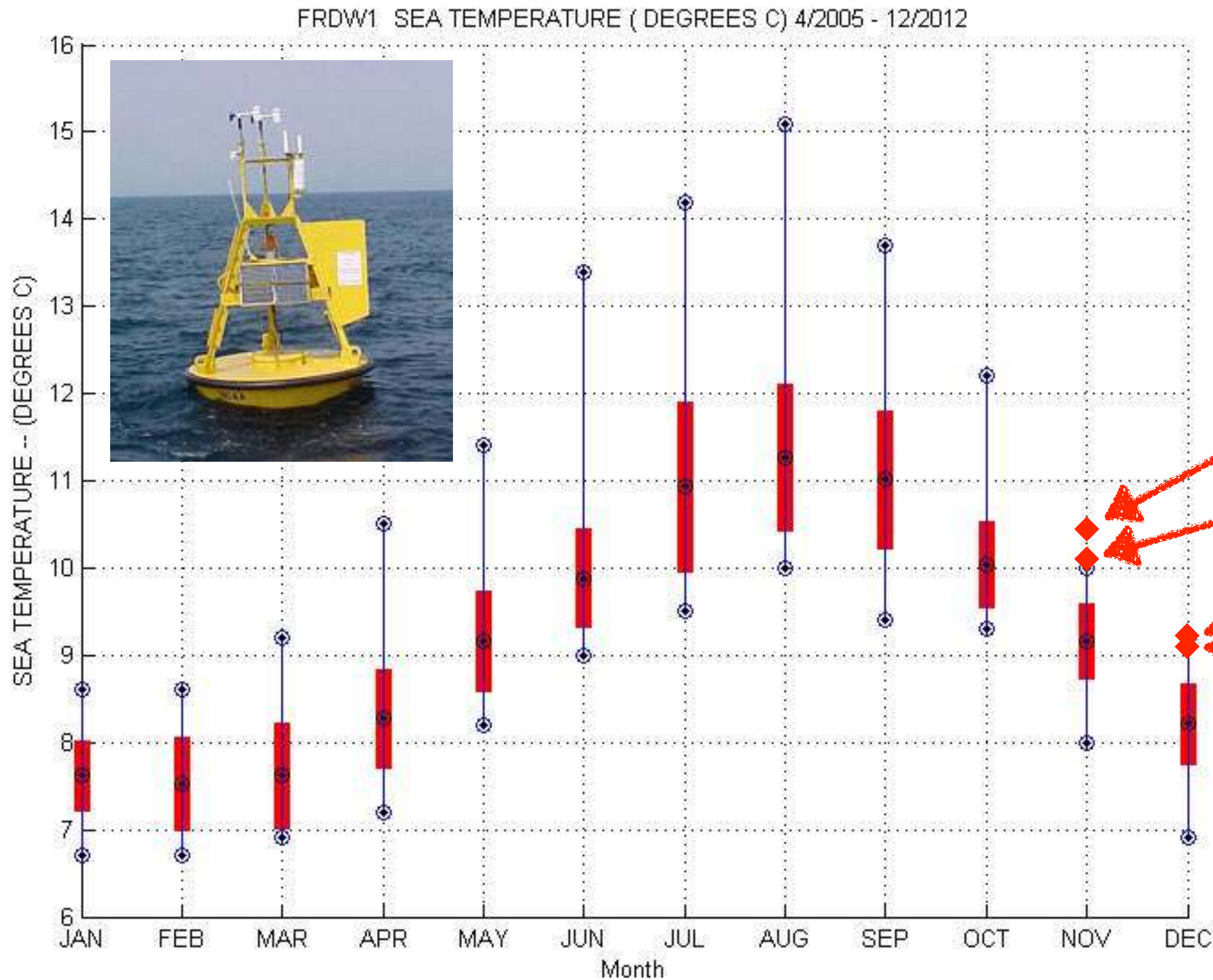Cooler La Niña weather cycles tend to be especially strong in December through April.

This is where most of the load kWh, and therefore revenue, are generated.

If it is a warm El Niño cycle, then kWh and revenue can be significantly reduced.

This is why predicting the weather is so important to load forecasting and budget.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

FRDW1 SEA TEMPERATURE (DEGREES C) 4/2005 - 12/2012

The temperature of the Salish Sea also influences and moderates our local weather. If the surrounding sea is warmer, we tend to have a warmer winter.

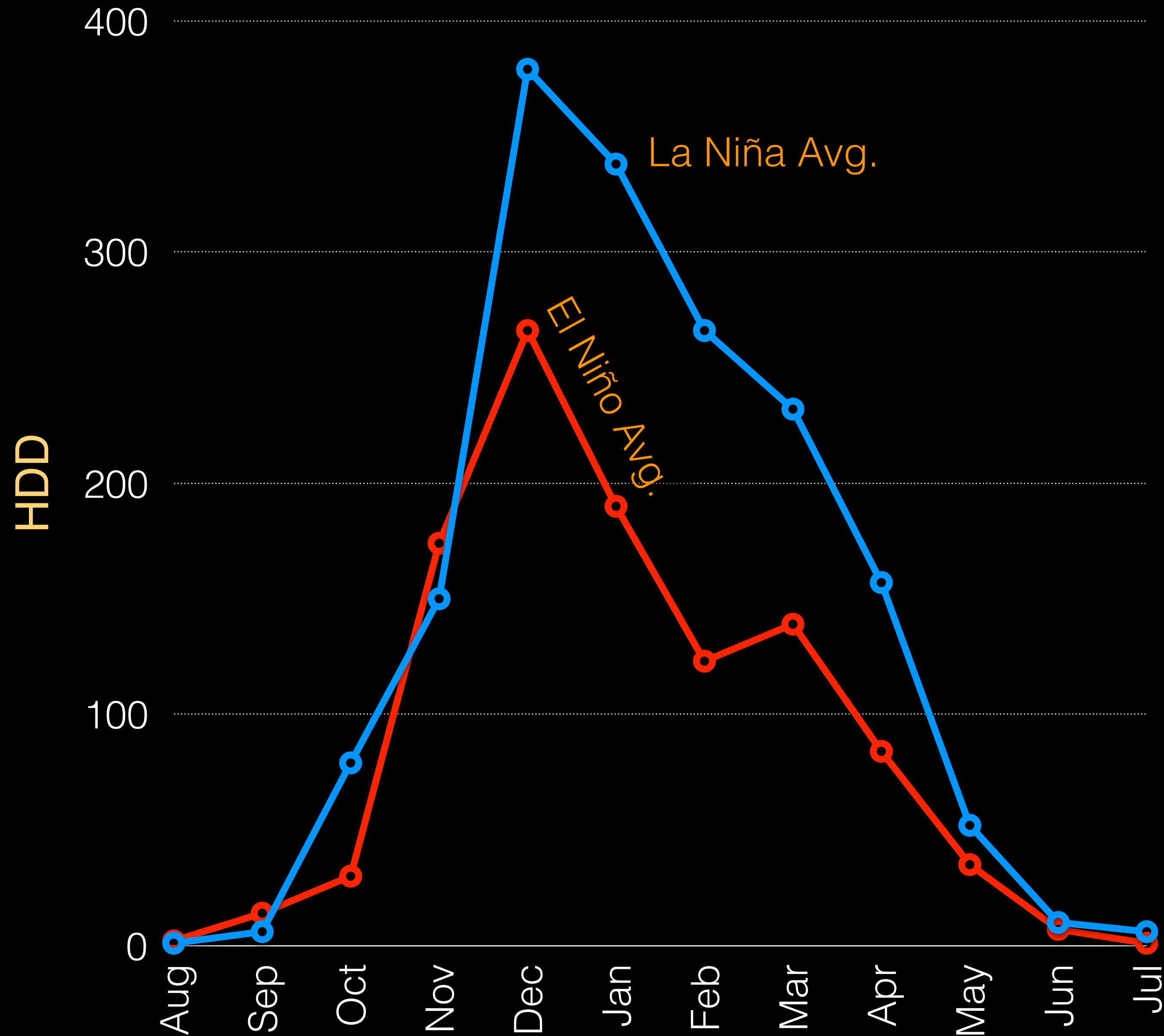The warmer the winter, the lower the HDD and kWh, and therefore the lower the revenue.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

Source: NOAA, National Data Buoy Center - Friday Harbor Buoy

Monthly SJC HDD Sorted into Global El Niño and La Niña

HDD

400

300

La Niña Avg.

El Niño Avg.

200

100

0

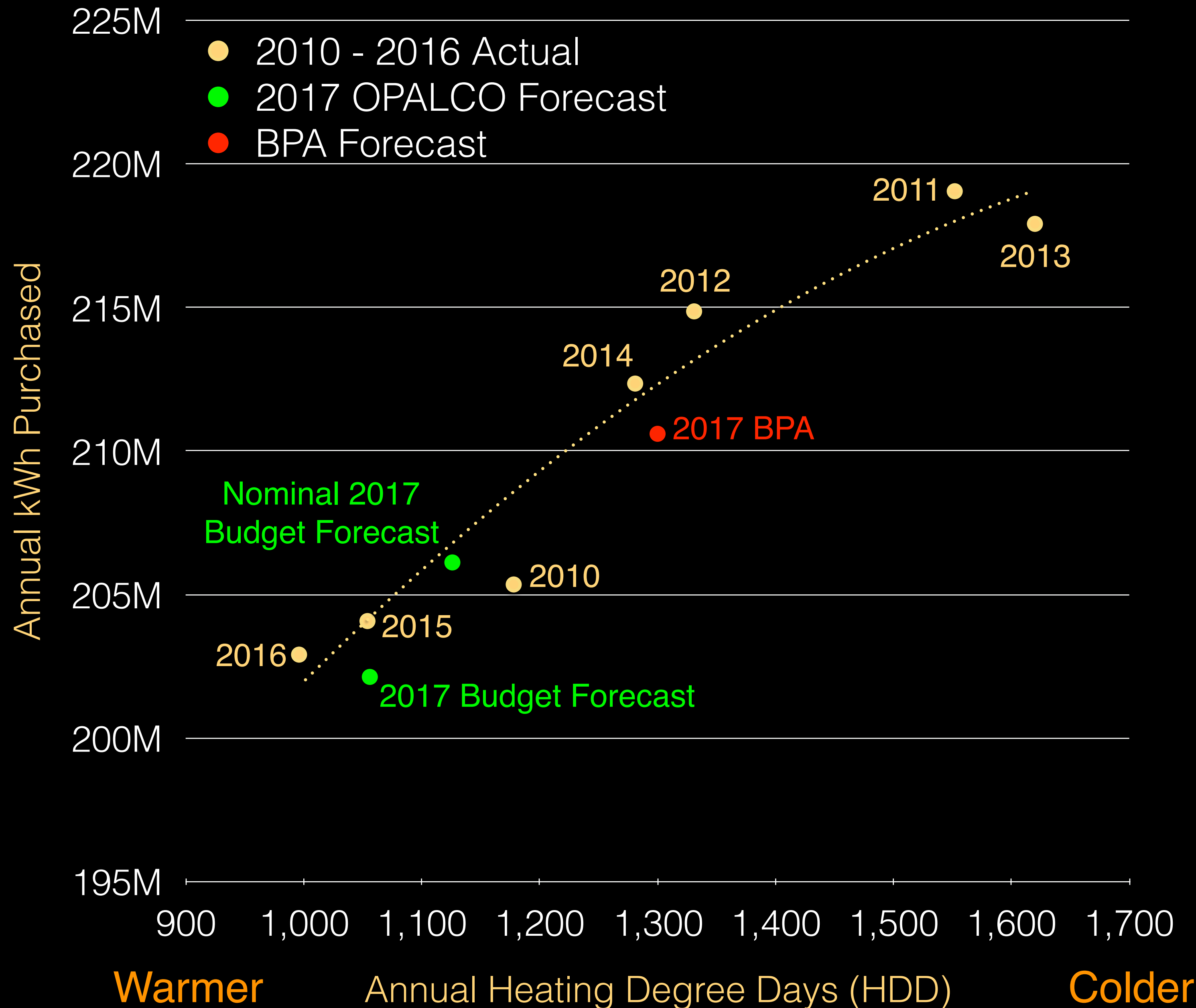Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul

Cooler La Niña weather cycles tend to be especially strong in December through April.

This is where most of the load kWh, and therefore revenue, are generated.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

Annual kWh Purchased

- 2010 - 2016 Actual
- 2017 OPALCO Forecast
- BPA Forecast

2011
2013
2012
2014
2017 BPA
Nominal 2017 Budget Forecast
2010
2016
2015
2017 Budget Forecast

225M
220M
215M
210M
205M
200M
195M

900 1,000 1,100 1,200 1,300 1,400 1,500 1,600 1,700

Warmer   Annual Heating Degree Days (HDD)   Colder

Bringing it all together, OPALCO predicts an HDD of about 1,050 and load of about 202 million kWh purchased from BPA.

This forecast is conservative. BPA predicts an HDD of about 1,300 and corresponding load of about 211 million kWh.

If the La Niña is stronger, the nominal forecast is for about 206 million kWh of load.

Rule of Thumb

Temperature ➜ HDD ➜ kWh ➜ $

The Budget Process

This completes Part 1 of the Budget Process – The Load Forecast.

The Load Forecast models the anticipated weather to predict how much energy will be needed.

Step 2 – The Budget, lays out anticipated expenses and revenue for operations and capital projects.

In Step 3 – Rates are set to produce enough revenue to cover expenses, given the anticipated kWh sales from the Load Forecast.
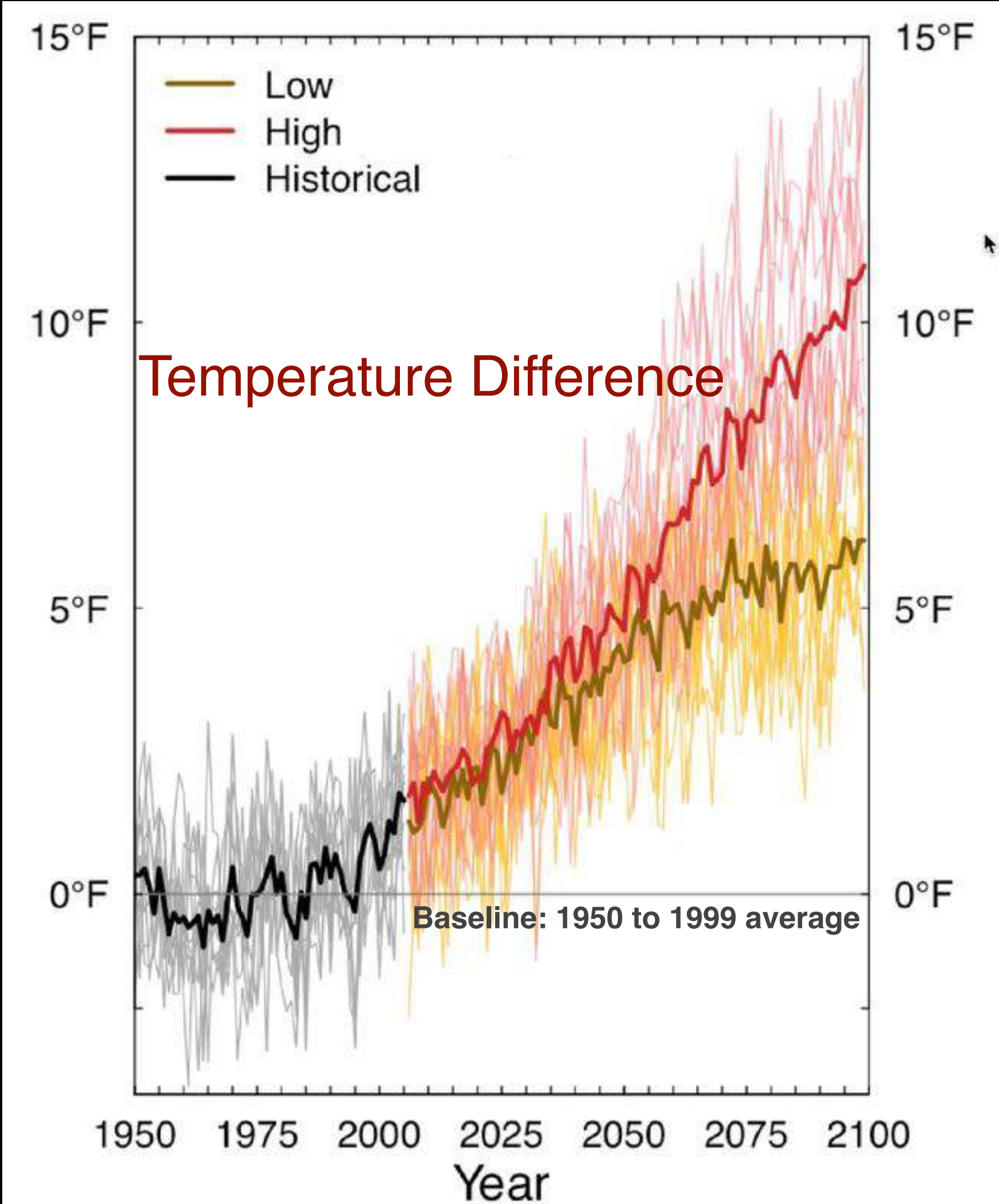
Appendix

The following slides provide additional data related to weather prediction, long range warming trends, uncertainty in forecasting La Niña and El Niño weather cycles, and temperature variation impact on financial metrics.

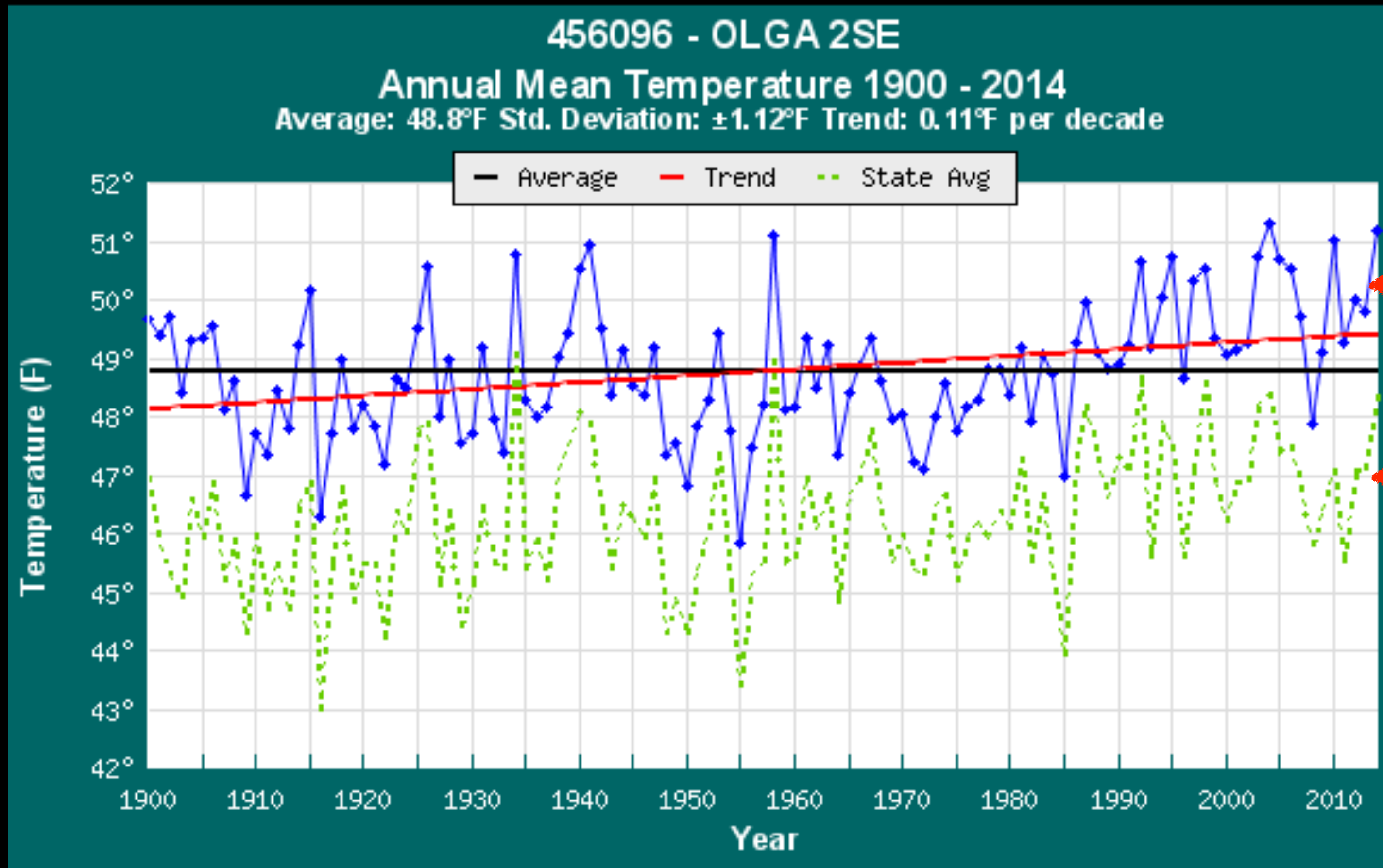# Regional Warming Trend: Washington State

WA Annual Mean Temperature
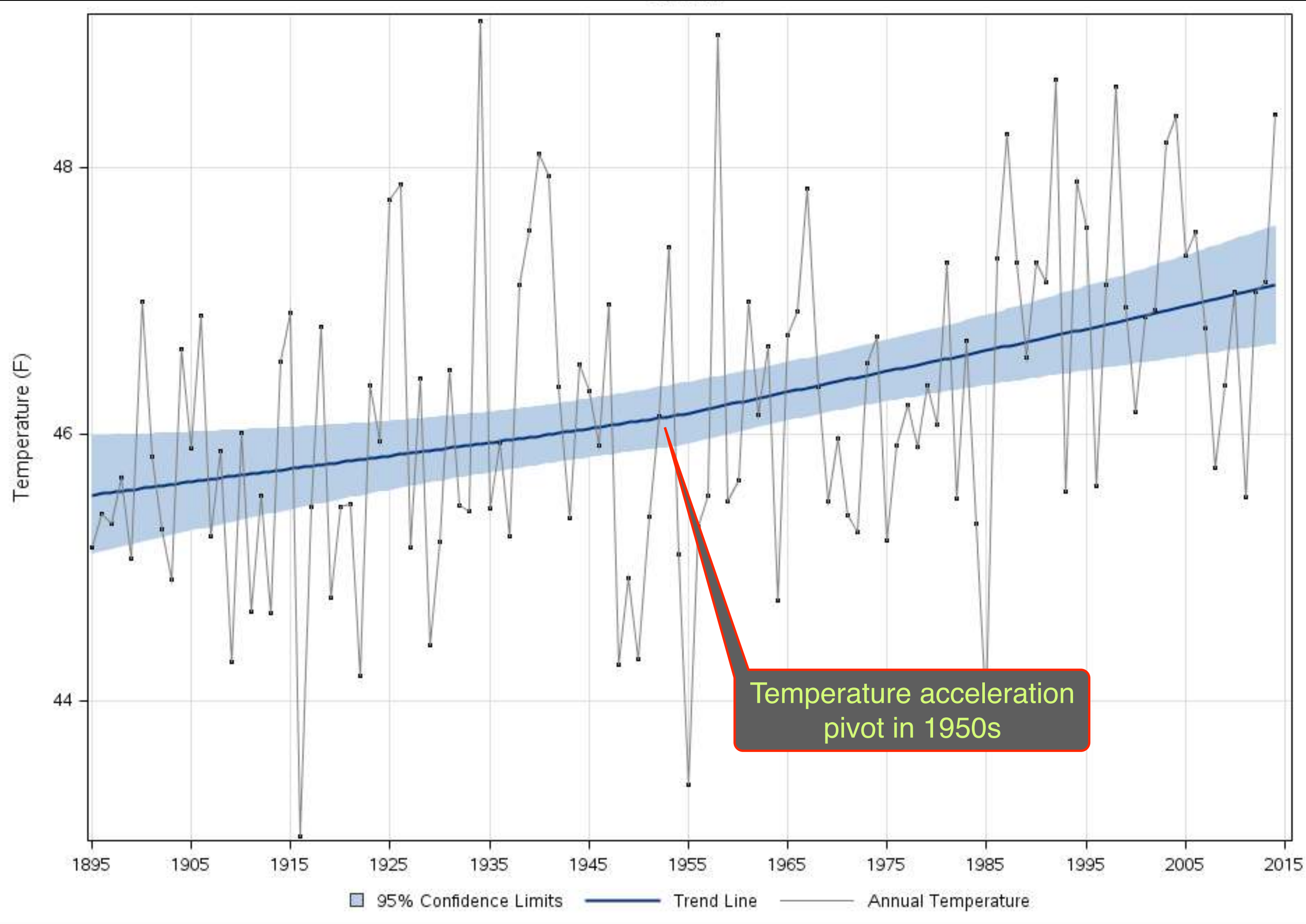
Temperature Difference
(relative to 1950 to 1999 average)

Temperature acceleration pivot in 1950s

Temperature Difference

Baseline: 1950 to 1999 average

Local Trend Warmer Than WA: Olga Weather Station

456096 - OLGA 2SE
Annual Mean Temperature 1900 - 2014
Average: 48.8°F Std. Deviation: ±1.12°F Trend: 0.11°F per decade
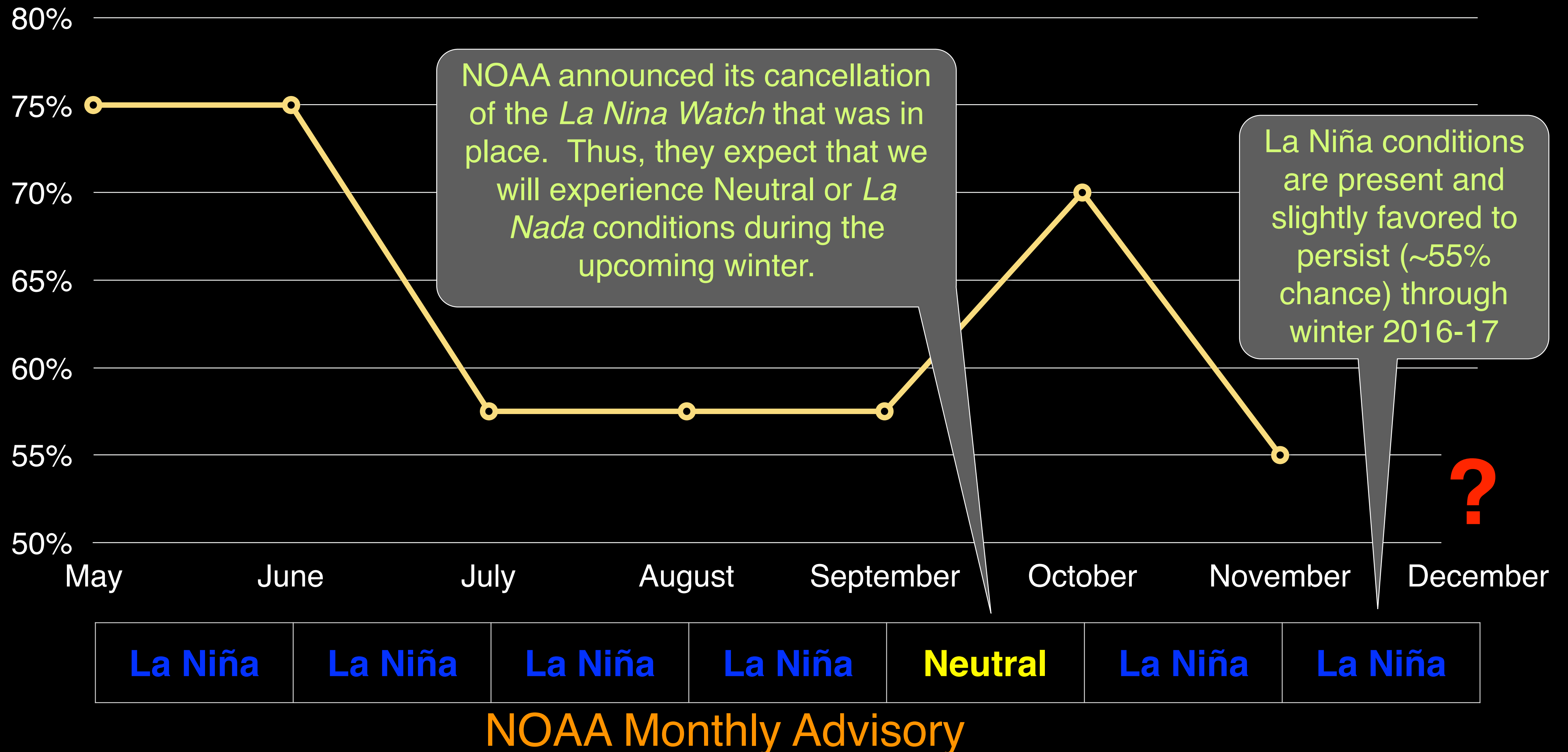
Olga

WA State

Headline

- Olga has one of the longest consistently measure temperature records in the state.

- Olga and the county, is warmer than State average, due to the moderating influence surrounding Salish Sea

- Since 1986, temperature is significantly above 20th century average

Source: NOAA, UW Climate Impacts Group

Global El Niño: May be followed by extended La Niña
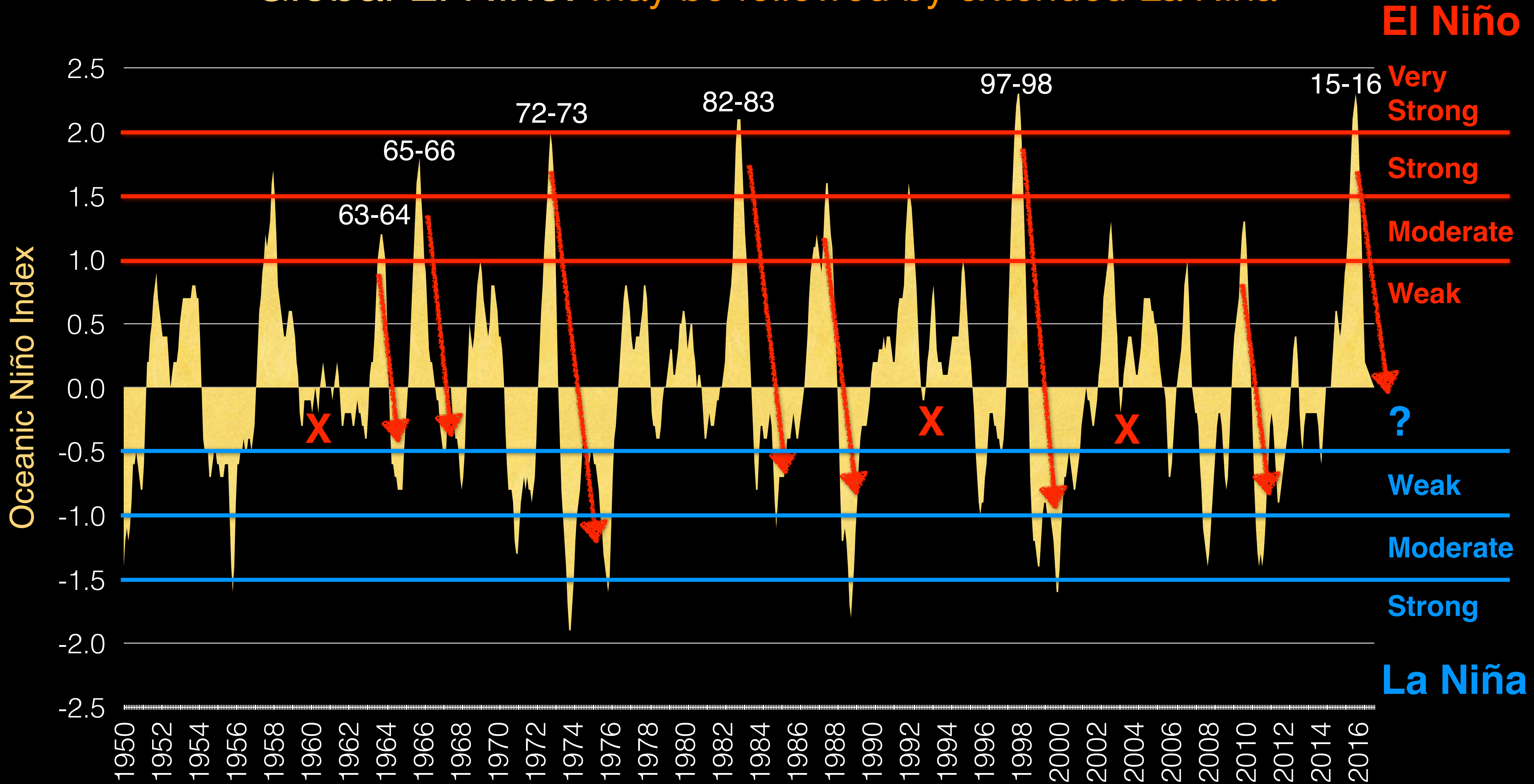
Rule of Thumb

Weather Cycle	Avg. Water Temp (F°)	Avg. Air Temp (F°)	Anual HDD	Annual kWh (M)
La Niña	48.3	48.5	1,677	221
El Niño	50.0	51.3	1,064	204
Niño - Niña	1.7	2.8	-613	-17.2
Margin change	-$720,000	-$425,000	$2,000	$70,000
per increase in:	F°	F°	HDD	M kWH

annual average temperature