PETROLEUM WATCH
California Energy Commission
May 2017

Recent Petroleum News and Outside Analyses

Prices

- **Crude Oil Prices:** Brent and West Texas Intermediate (WTI) crude prices closed on April 28 at $49.46 and $47.02, respectively (**Page 2**).
- **California Retail Gasoline Prices:** On the week of April 24, prices increased to $3.02, an increase of $0.02 since the end of March. Through April, California prices averaged $0.59 higher than the national average (**Page 4**).
- **California Retail Diesel Prices:** On the week of April 24, prices reached $2.95, an increase of $0.05 from the end of March. Through April, California prices averaged $0.36 higher than the national average (**Page 5**).

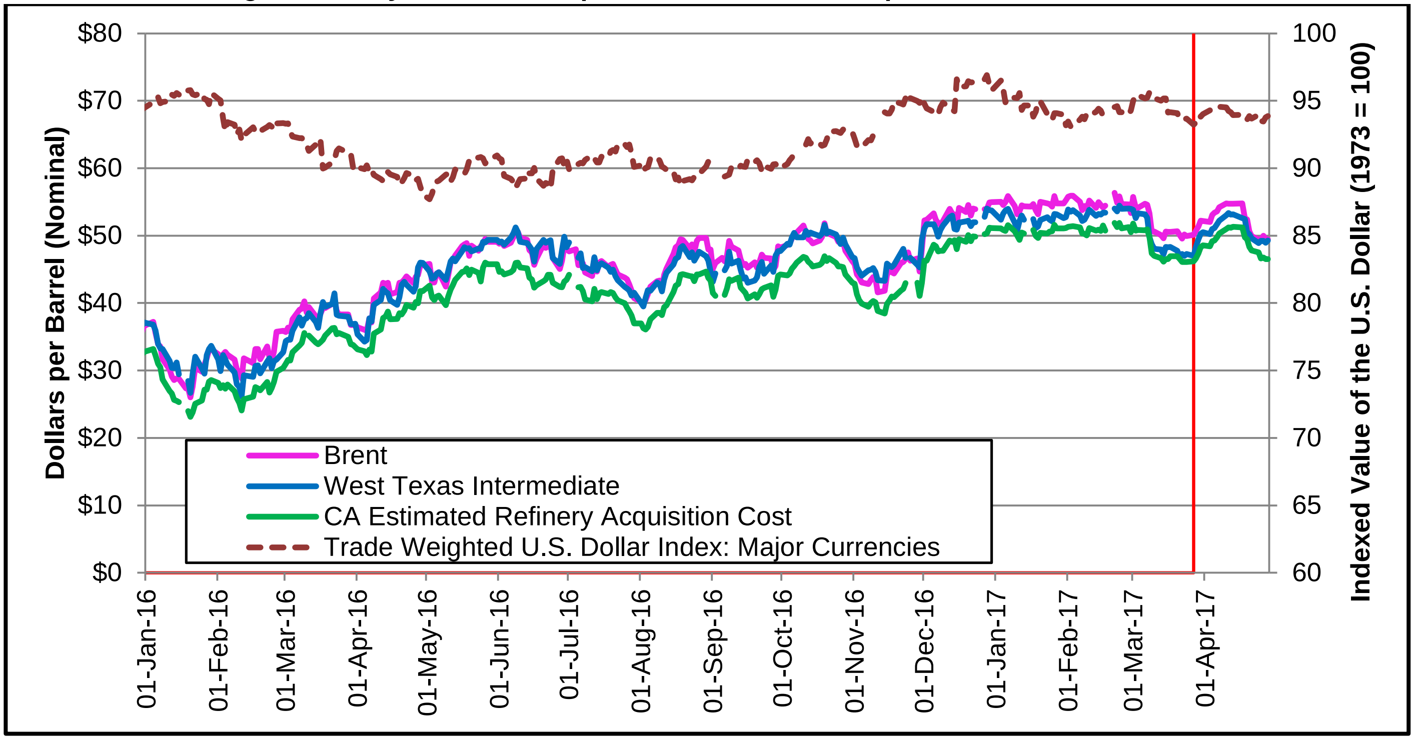
Refining News

- **Air Products Wilmington Plant:** On April 3, the Wilmington hydrogen plant experienced a breakdown, which resulted in a flaring on April 9. This breakdown could impact hydro-treatment and hydro-cracking operations for refineries in the area. The facility supplies hydrogen to Phillips 66 Wilmington, Valero Wilmington, and Tesoro Los Angeles refineries. Flaring reportedly stopped on April 10.
- **PBF Torrance Refinery:** On April 5, the Torrance refinery reported to the South Coast Air Quality Management District a flaring that would take place on April 6. The flaring is expected to last through July 10 as the refinery is expected to undergo maintenance.
- **Tesoro Los Angeles Refinery:** On April 26, the 380,000 barrel-per-day (bpd) refinery was forced to shut down after it experienced a power outage that resulted in some flaring. Tesoro announced April 28 that operations would reach full recovery by the beginning of May.
- **Valero Benicia Refinery:** On May 5, the Benicia refinery had electricity service interrupted, and the refinery started to flare, the Benicia Police Department advised residents downwind of the incident to report to shelter in place; the advisory was lifted by 2:00 pm.

Product of the Energy Assessments Division’s Supply Analysis Office.

Crude Oil Prices

Figure 1: Daily West Coast Spot Crude Oil Prices, September 2015 to Present



Source: U.S. Energy Information Administration (EIA), Oil Price Information Service (OPIS), and Federal Reserve Bank of St. Louis.
Note: Red lines on all graphs indicate end of previous *Petroleum Watch* data. Areas to the right indicate new data since last month.

Spot crude oil prices decreased in April and remain at the lowest levels since the start of 2017 (**Figure 1**). Prices for all grades of crude oil fell sharply on April 17 through April 24, with Brent falling $5.34 to $49.45 and WTI falling $3.72 to $48.90. The California Estimated Refiner Acquisition Cost (CA-RAC)[1] dropped a proportionate amount of $3.73 to $47.51. April marks the first time in 2017 that Brent has traded below $50 for more than a day.

The price for Brent crude oil is seen as a financial indicator for global crude oil demand. A low Brent price indicates that current global demand is sluggish or oversupplied. Leading indicators are a mixed bag on the future of crude oil prices. Historically, crude prices move up during the summer on anticipation of increased driving. Recent Organization of the Petroleum Exporting Countries' (OPEC) supply cuts brought Brent to above $50 at the beginning of 2017. The cuts now show limited effectiveness as the price fell in April, and U.S. Energy Information Administration (EIA) data showed rising production rates in the United States to offset OPEC's cuts, putting downward pressure on prices. The competing forces of summer demand against increased domestic production will determine where crude oil prices will head in the near term.

Crude Oil Prices

April 2017 vs 2016
(Percent Change)

Brent	**26% higher**
WTI	**25% higher**
CA-RAC	**31% higher**

April 2017 Averages

Brent	**$52.29**
WTI	**$51.06**
CA-RAC	**$49.07**

April 28, 2017

Brent	**$49.46**
WTI	**$49.31**
CA-RAC	**$46.54**

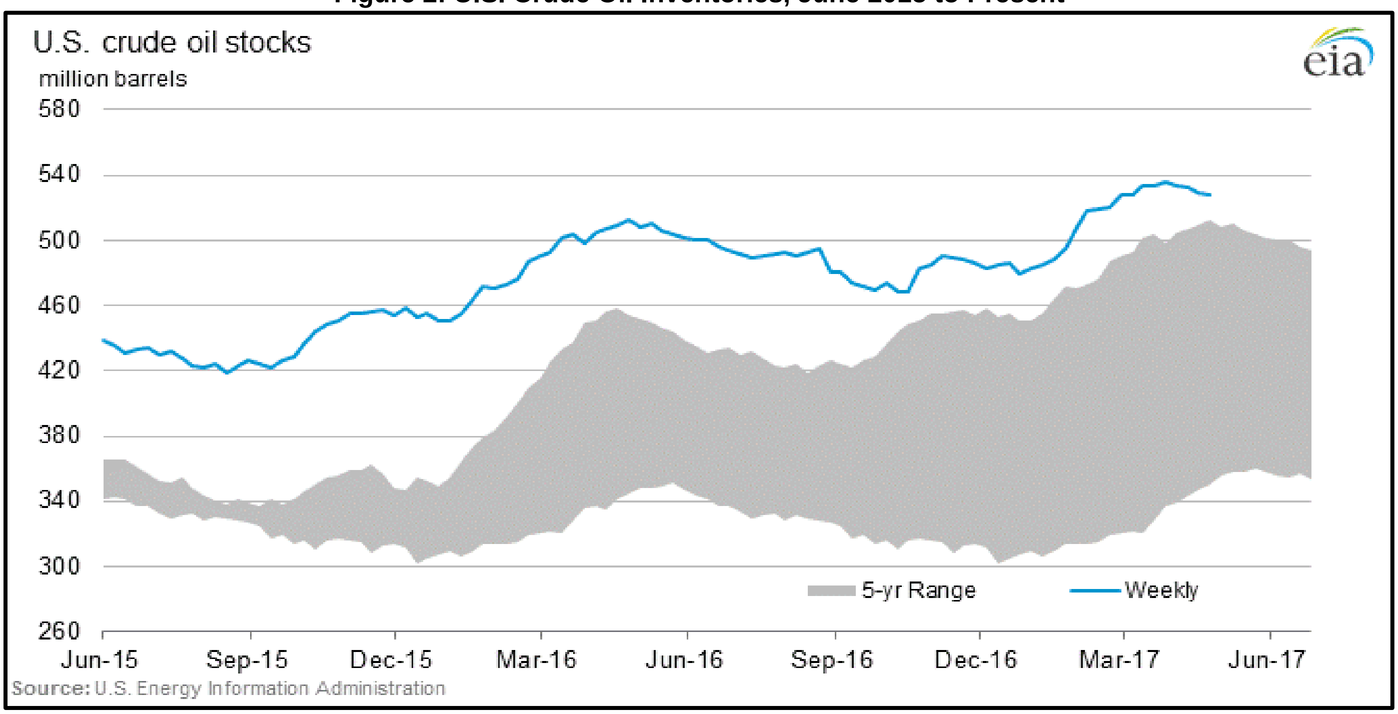
1 California estimated refiner acquisition cost (CA-RAC) is a weighted average of the prices of California (San Joaquin Valley) crude, Alaskan crude, and foreign crude.

Crude Oil Production and Storage

U.S. crude oil inventories have fallen slightly since April's *Petroleum Watch* (**Figure 2**), despite the fact that all other measurements for petroleum supply rose across the United States (domestic crude oil production, refinery inputs, and imports). These trends suggest that U.S. petroleum demand has significantly increased since April's *Petroleum Watch*.

- U.S. crude oil production for April is estimated by the EIA at 9.26 million barrels per day (bpd), an 110,000 bpd increase over March levels. This is a 340,000 bpd increase from a year ago when production levels reached 8.92 million bpd. Imports rose 310,000 bpd in April to an estimated 8.26 million bpd, up from 7.95 million bpd in March. When compared to import levels from April 2016, this is an increase of 430,000 bpd.
- U.S. crude oil refinery inputs increased by 1.1 million bpd from March input levels, finishing April at 17 million bpd. Refinery inputs are 950,000 bpd higher than year-ago levels.
- Crude oil inventories in the United States decreased by 7.7 million barrels during April to 528.8 million barrels. Current inventories are 15.7 million barrels higher than one year ago.

Figure 2: U.S. Crude Oil Inventories, June 2015 to Present



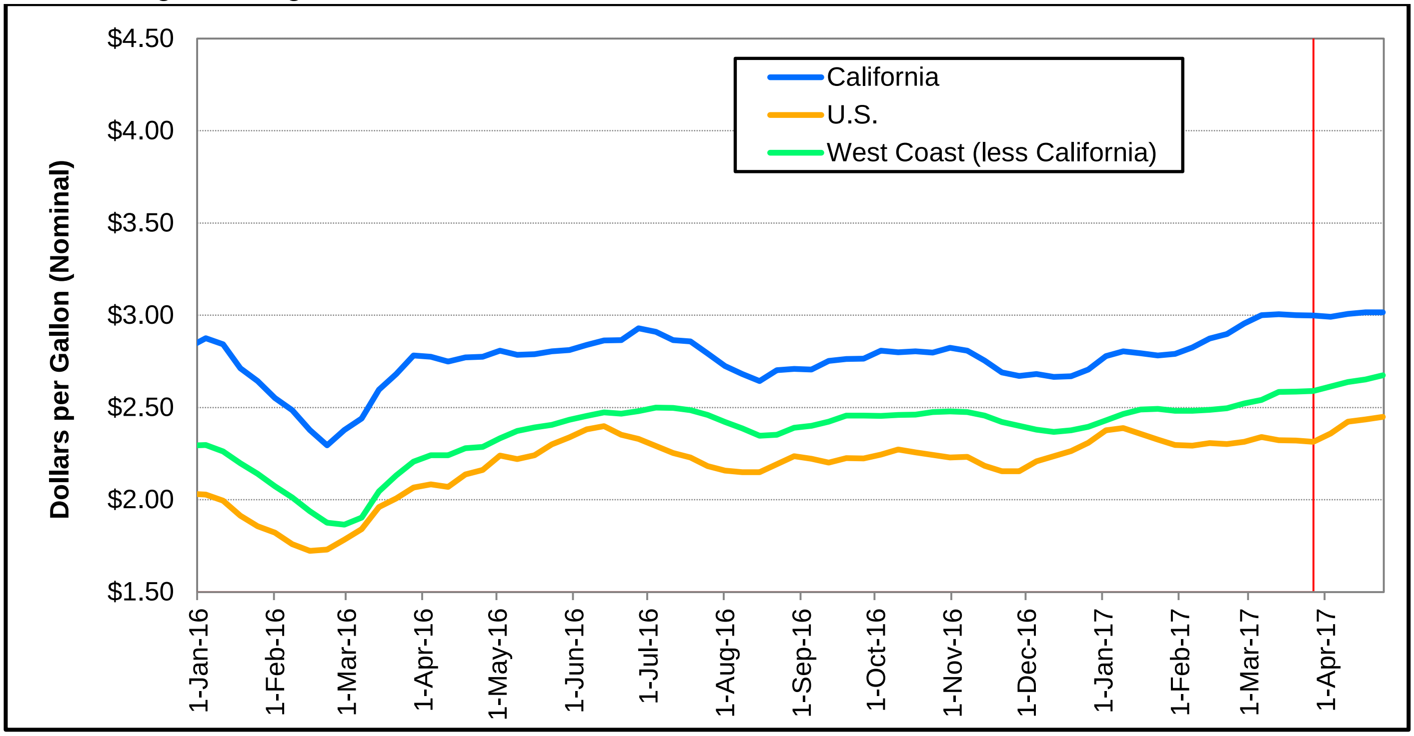
Source: U.S. EIA

- According to OPEC's April *Monthly Oil Market Report*, total OPEC production decreased by 152,500 bpd to 31.93 million bpd. OPEC's target number for cutbacks set in November 2016 was 32.5 million bpd. The decrease in prices was an unexpected response to the supply cutbacks. OPEC forecasts a "0.6 million bpd" increase in demand for OPEC crude this year.[2]

2 OPEC *April Monthly Report*, page i: www.opec.org/opec_web/static_files_project/media/downloads/publications/MOMR%20April%202017.pdf.

Gasoline and Diesel Retail Prices

Figure 3: Regular Grade Gasoline Retail Prices, California vs. West Coast vs. United States



Source: U.S. EIA

In the last week of April, all three regions (California, the United States, and the West Coast less California) reached the highest gasoline price yet in 2017 at $3.02, $2.45 and $2.67 respectively. As U.S. and West Coast prices steadily increased throughout April, the monthly differentials of California to U.S. and to West Coast retail differentials dropped by $0.09 and $0.07, respectively. The April 2017 average regional prices are all higher than a year-ago prices (see table), but 17 percent, 12 percent, and 13 percent below the average summer 2015 prices respectively. The first half of 2015 experienced strong gasoline demand nationwide due to lower gas prices and improved economic activity.

The EIA predicts[3] higher U.S. prices[4] this summer compared to 2016 because of expected higher crude oil prices. Crude oil is a major component for gasoline prices, and Brent crude sets the tone for crude pricing. This prediction is based on anticipation that supply cuts by OPEC will continue (**Page 3**) throughout 2017, forcing the price of crude oil higher through lowering supply.

Gasoline Prices

April 2017 vs 2016 (Percent Change)	
California	**9% higher**
U.S.	**14% higher**
West Coast	**17% higher**

April 2017 Averages	
California	**$3.01**
U.S.	**$2.42**
West Coast	**$2.64**

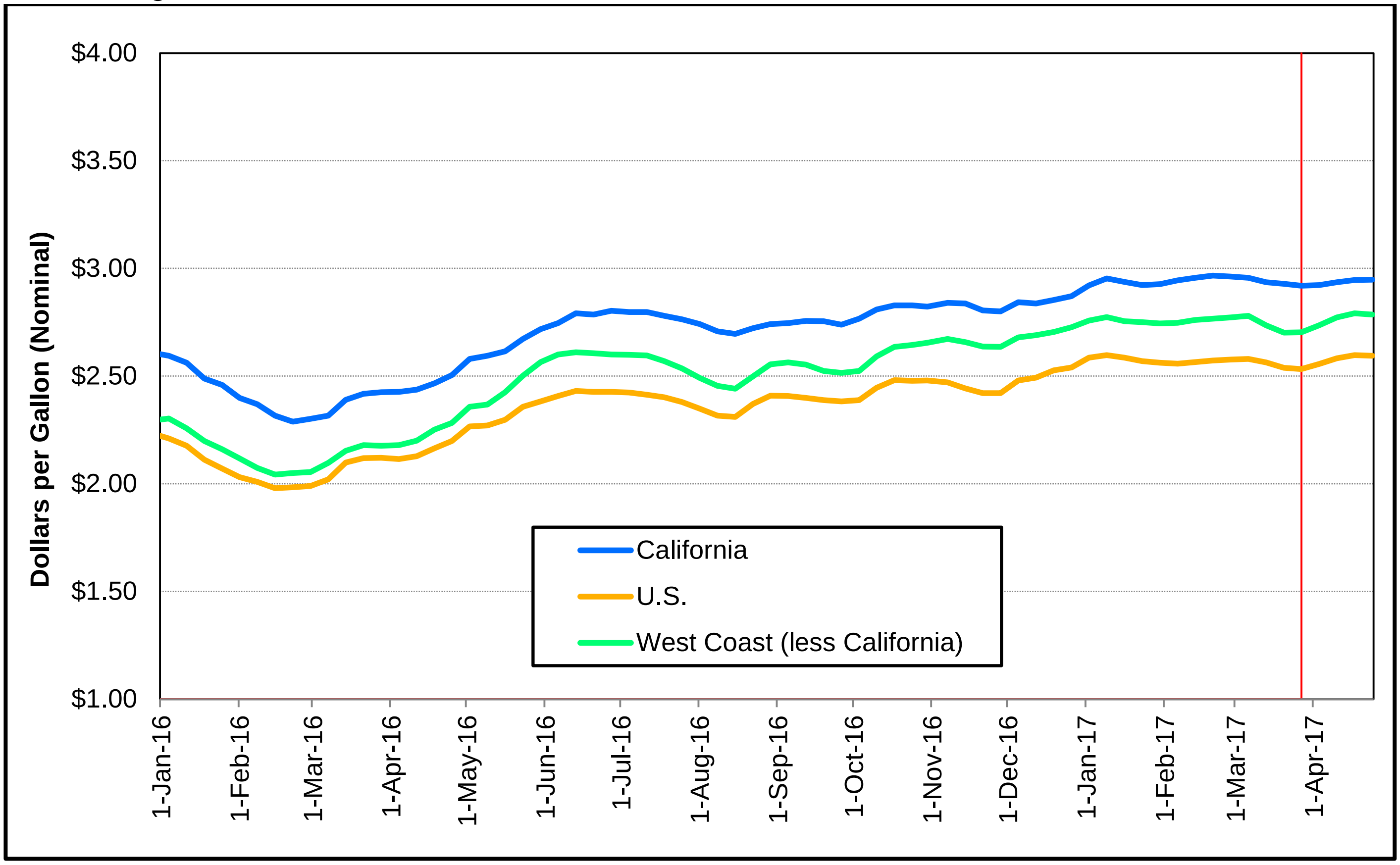
Week of April 27, 2017	
California	**$3.02**
U.S.	**$2.45**
West Coast	**$2.67**

3 U.S. Energy Information Administration (EIA), This Week in Petroleum, April 12, 2017: https://www.eia.gov/petroleum/weekly/archive/2017/170412/includes/analysis_print.php.

4 U.S. prices are an average of all gasoline prices in all 50 states.

3 https://www.eia.gov/finance/markets/products/prices.php.

Figure 4: No. 2 Diesel Ultra-Low-Sulfur Retail Prices, California vs. PADD5 vs. United States



Source: U.S. EIA

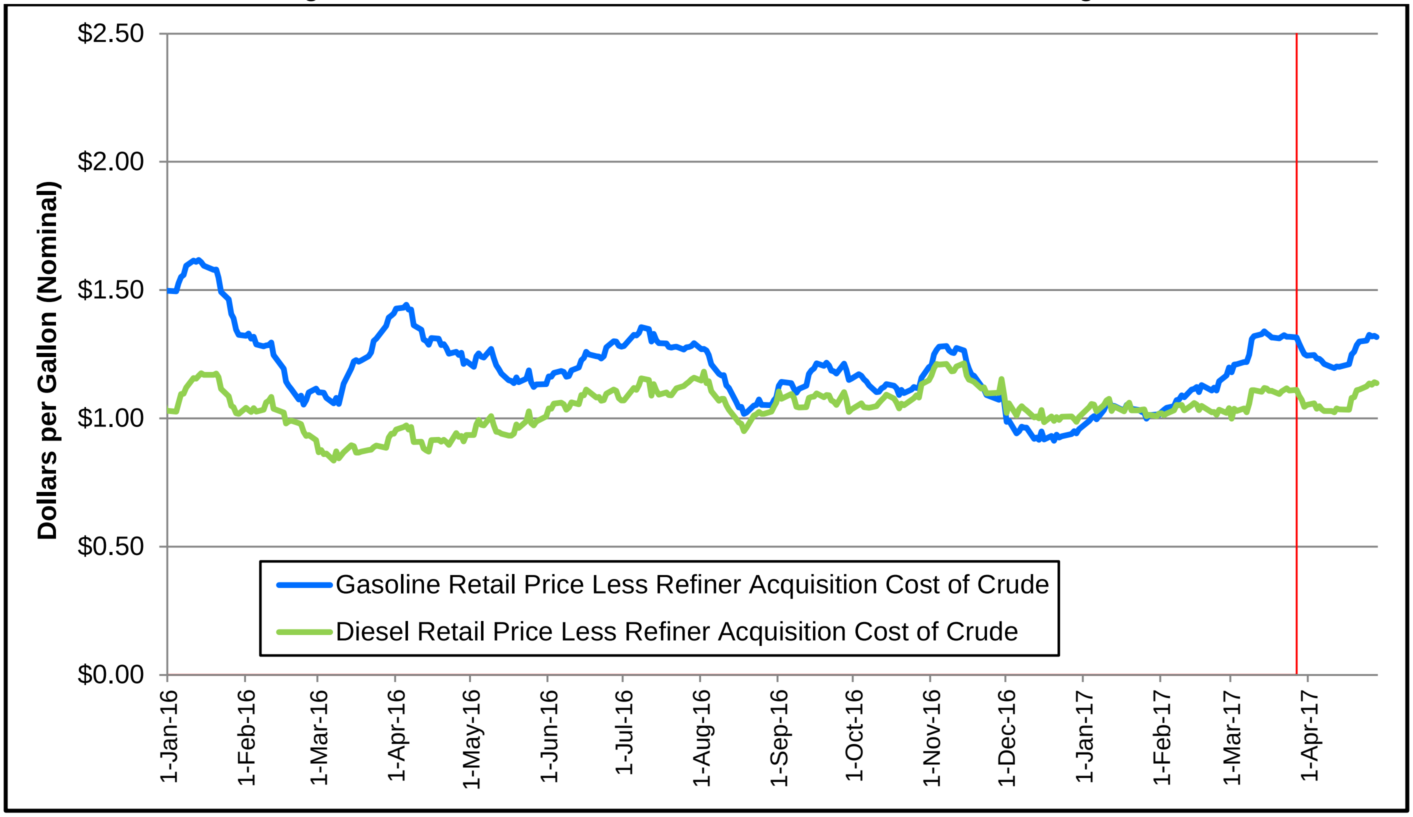
During the first quarter of 2017, the California diesel retail price averaged $2.94 per gallon and fluctuated between $2.92 and $2.97. Diesel prices during April changed little, averaging $2.94 and remaining 19 percent higher when compared to the same time last year. California gasoline retail price increased $0.01 to $3.02 in April, which is $0.07 higher than diesel price. All year, the California diesel price has roughly averaged $2.94, while diesel production has stayed strong within the high five-year band, ending the week of April 28 at 2,692 thousand barrels (**Figure 9**).

U.S. and West Coast (less California) diesel prices during April have been 20 to 24 percent higher compared to the same month last year. Diesel prices rose $0.04 to $0.05 since the beginning of the month to $2.60 for U.S. and $2.79 for West Coast (less California) ending April 24. Future diesel demand nationwide depends on United States economic activity, which is a mixed bag. While unemployment rates for California and the nation stand at 5 percent and lower (an indication of a strong economy), inflation remains in the 2 to 3 percent per year range (as measured by the consumer price index), indicating that the economy is stagnant. If the economy remains at current growth rates, diesel prices should remain at roughly the same levels, but any speeding up of growth should apply upward pressure on prices.

Diesel Prices

April 2017 vs 2016 (Percent Change)	
California	**19% higher**
U.S.	**20% higher**
West Coast	**24% higher**
April 2017 Averages	
California	**$2.94**
U.S.	**$2.58**
West Coast	**$2.77**
Week of April 24, 2017	
California	**$2.95**
U.S.	**$2.60**
West Coast	**$2.79**

Figure 5: CA-RAC to Ex-Tax California Gasoline and Diesel Margins



Source: U.S. EIA and OPIS

For the March 28 to April 28 period, the California Refiner Acquisition Cost of CA-RAC-to-retail margins for gasoline increased $0.03 to $1.32, while the diesel margin increased $0.05 to $1.14 (**Figure 5**). Both gasoline and diesel CA-RAC-to-retail margins followed a similar trend in April as both began the period slowly declining. On April 11 gasoline and diesel reached an April low of $1.20 and $1.02, respectively, before climbing back up to the April 28 values.

As warmer weather and longer days encourage more travel ahead of the summer driving season, gasoline and diesel inventory levels will deplete more quickly, and increasing demand will push up retail prices. Anticipating this, the initial decline during the first half of April was likely due to the large increase in production and inventory for both gasoline (**Figure 8**) and diesel (**Figure 9**) throughout March. Retail prices for gasoline (**Figure 3**) and diesel (**Figure 4**) stayed stable varying only by $0.03 during April contributing to the decrease of both margins.

Crude to Retail Margins

April 2017 vs 2016
(Percent Change)

Gasoline	**5% lower**
Diesel	**17% higher**

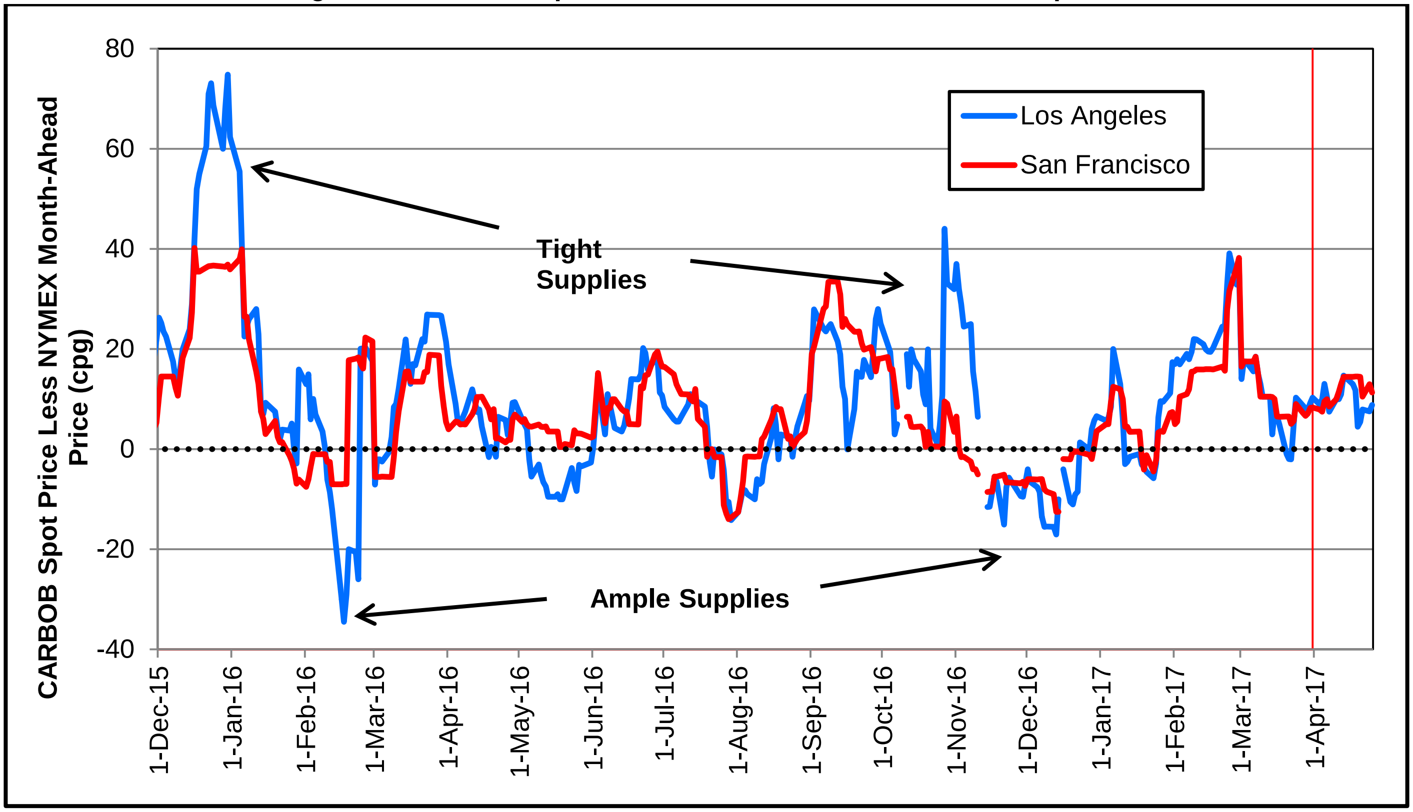
April 2017 Averages

Gasoline	**$1.25**
Diesel	**$1.07**

April 28, 2017

Gasoline	**$1.32**
Diesel	**$1.14**

Figure 6: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

The Los Angeles (LA) and San Francisco (SF) gasoline spot–futures differentials in April averaged $0.10 and $0.11, respectively, close to March 2017 averages (**Figure 6**). This was a calm month for wholesale markets despite many refinery issues in both regions, due to sustained production levels above the five-year band and a buildup of inventories in March and February (**Figure 8**).

The LA spot gasoline spread rose to $0.13 on April 5 with news of planned maintenance at PBF Torrance refinery and Wilmington area refiners such as Phillips, Valero and Tesoro purchasing at the open market, possibly due to impacted hydrogen supplies (**Page 1**). Both LA and SF-less-New York Mercantile Exchange (NYMEX) gasoline price differentials peaked at $0.15 on April 13, right before the spring holiday weekend. Healthy production rates supplemented by imports forced the LA spot spread to $0.05 on April 19, the lowest of the month. Forced shutdowns at the Tesoro Los Angeles and Chevron El Segundo refineries reduced production, and the LA gasoline spot premium increased again to $0.09 on April 26 before falling to $0.08 on April 28.

The SF-less-NYMEX spot market remained strong and steady despite issues with Pacific Northwest refineries, as well as the indefinite shutdown of a Valero Benicia refinery hydrocracker unit.

Gasoline Spot–Futures Spread

March 2017 vs 2016

Los Angeles	**5¢ lower**
San Francisco	**3¢ higher**

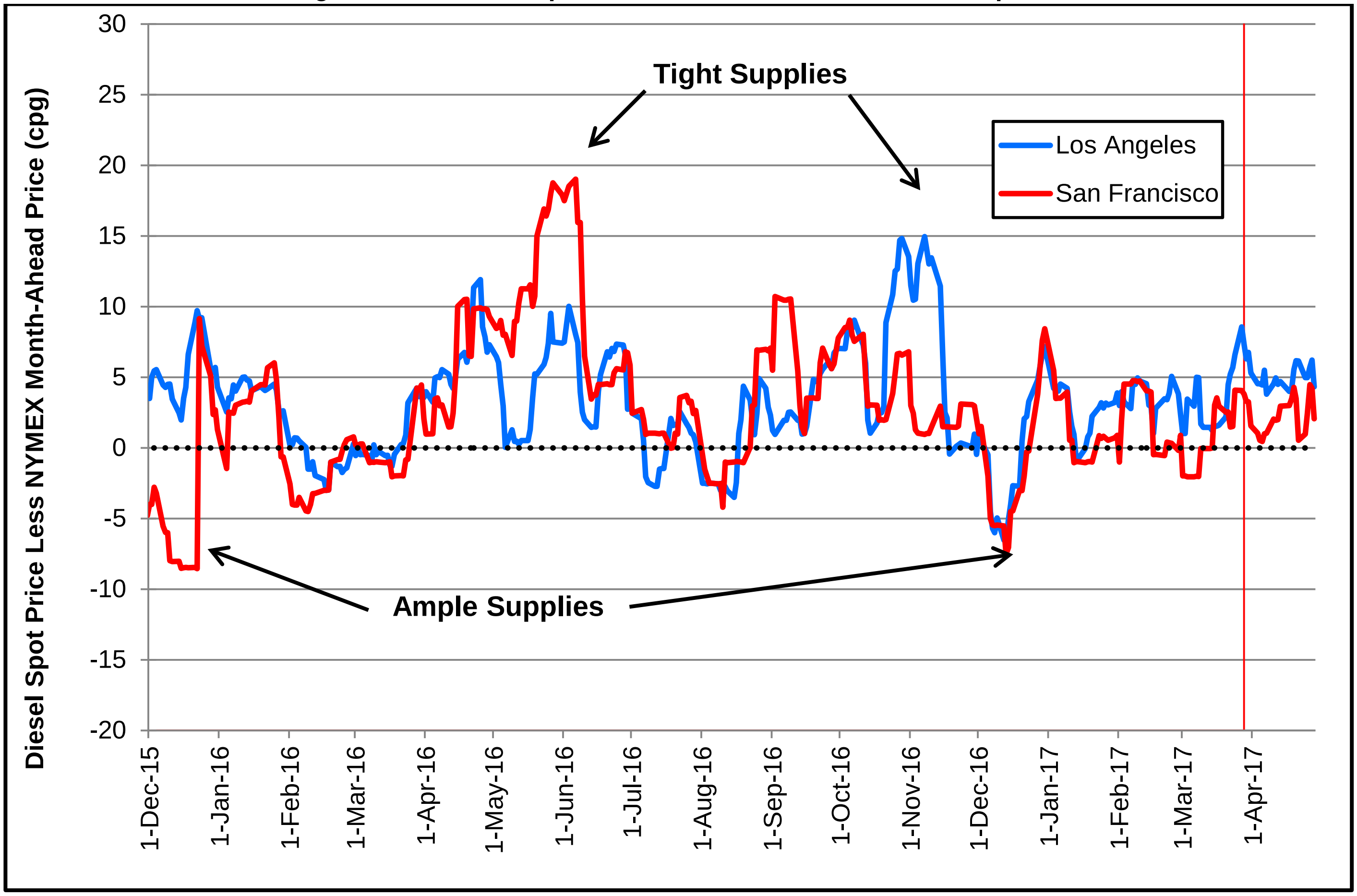
March 2017 Averages

Los Angeles	**9¢**
San Francisco	**10¢**

March 31, 2017

Los Angeles	**10¢**
San Francisco	**8¢**

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

After spiking at the end of March, the LA-less-NYMEX diesel differential fell to $0.04 and increased a week later to $0.05 on April 3 (**Figure 7**). As a result, the LA-less-NYMEX diesel differential averaged $0.05 for the rest of April. From March 27 to April 28, the LA diesel spot price has been at least $0.01 higher than the SF spot price. Over the same period, Southern California diesel inventories fell more than 200,000 barrels, while Northern California diesel increased more than 150,000 barrels (**Figure 9**).

During the first week of April, SF-less-NYMEX diesel averaged below $0.01 which increased to $0.04 on April 19. During the remainder of the month, SF-less-NYMEX decreased to $0.02 on April 28. Northern California's diesel inventories rose 251,000 barrels at the beginning of April and decreased 166,000 barrels at the end of April, demonstrating a relationship to the differential.

Diesel Spot–Futures Spread

April 2017 vs 2016

Los Angeles	1¢ lower
San Francisco	4¢ lower

April 2017 Averages

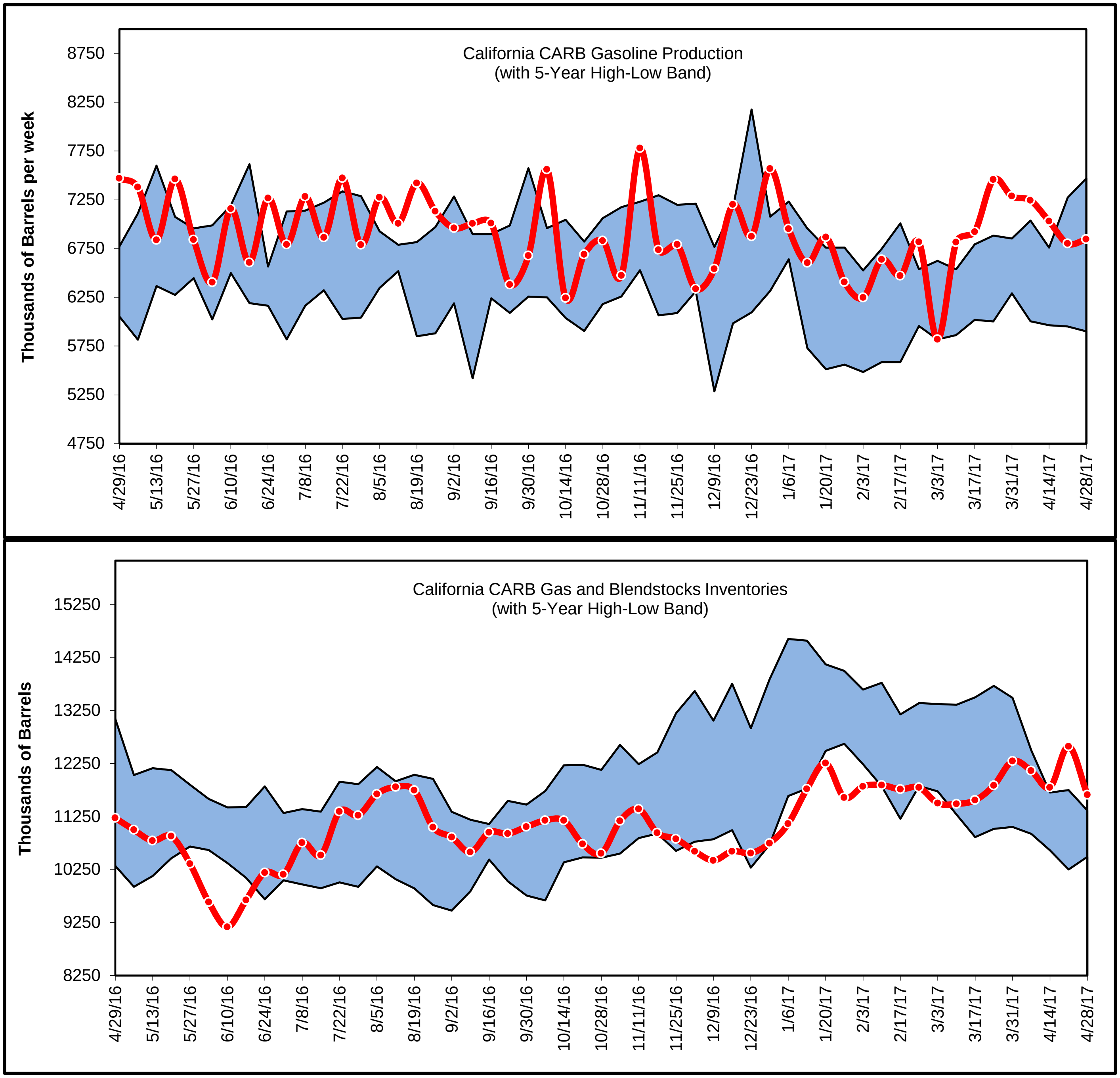
Los Angeles	5¢
San Francisco	2¢

April 28, 2017

Los Angeles	4¢
San Francisco	2¢

California Gasoline and Diesel Production and Inventories

Figure 8: Gasoline Production and Inventories

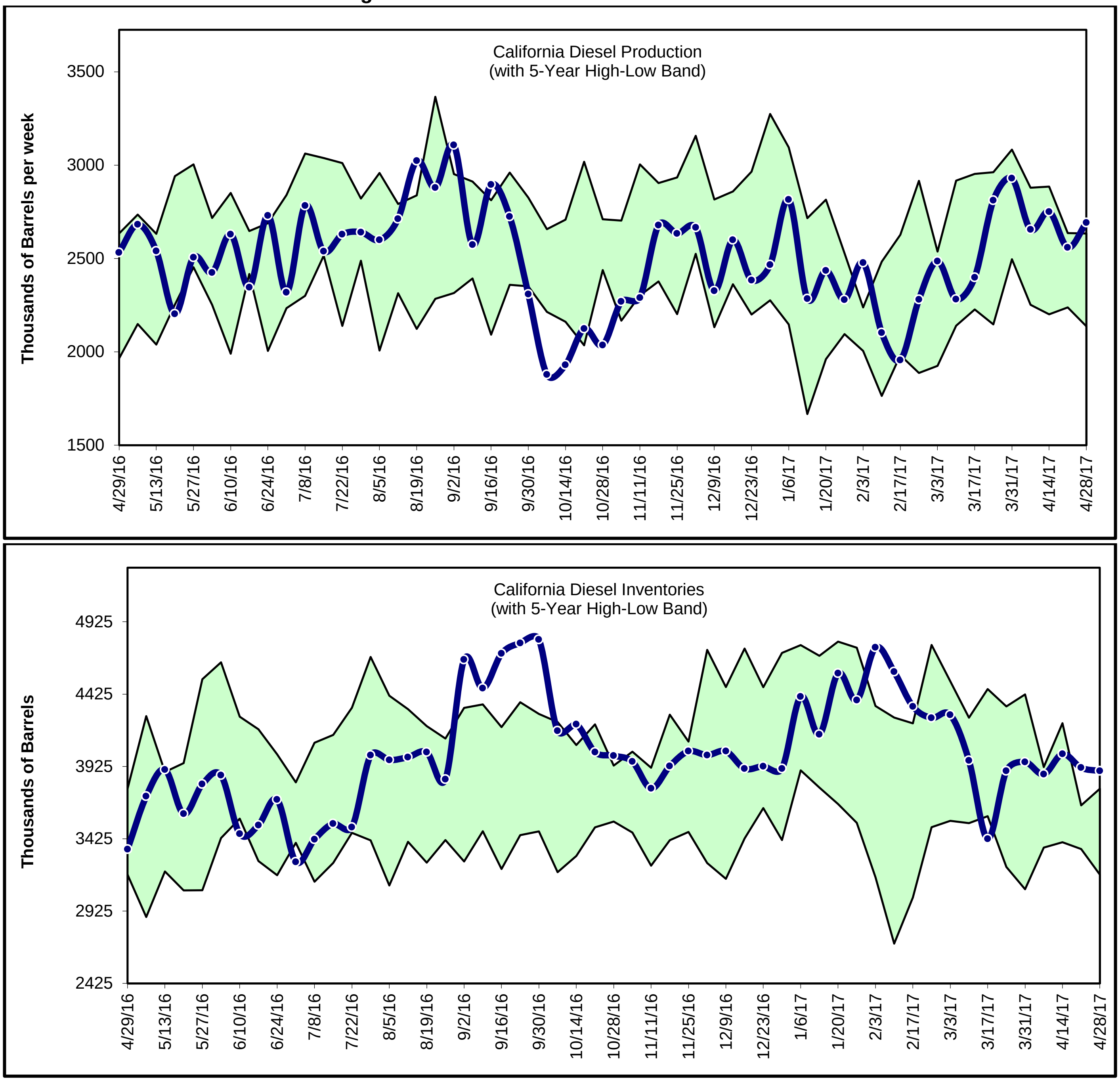


Source: PIIRA data

California gasoline production began above the five-year band at 7.2 million barrels per week (bpw) on April 7 before dropping 0.4 million bpw to 6.8 million bpw on April 21 (**Figure 8**). April's production averaged 7 million bpw compared to 6.8 million bpw in April 2016.

California gasoline inventories increased above the five-year band at 12.8 million barrels on April 21, which was the highest inventory level since February 2016. It remained above the five-year band for the rest of the month and finished April at 11.7 million barrels. Overall, April's inventory averaged 0.8 million barrels higher compared to the same time last year.

Figure 9: Diesel Production and Inventories



Source: PIIRA data

California diesel production has decreased since March 31 (**Figure 9**) but remained at the top of the five-year band from April 7 to April 21, averaging 2.6 million bpw. During the week of April 28, it jumped above the five-year band to 2.7 million bpw. This is slightly higher than the year-to-date 2017 average of 2.5 million bpw.

In April, California inventory levels stayed steady at 3.9 million barrels ending comfortably above the five-year band. April Inventory levels averaged at 3.9 million barrels, a level that is 0.4 million barrels higher than the same time last year.