# PETROLEUM WATCH
# California Energy Commission
# December 2016

## Recent Petroleum News and Outside Analyses

### Prices

- **Crude Oil Prices:** Brent and West Texas Intermediate (WTI) crude prices closed at $48.24 and $45.66 on November 28, respectively. Prices through November are $5.00 higher than last year (**Page 2**).
- **California Retail Gasoline Prices:** On November 28, prices had decreased to $2.67, a loss of $0.13 since the end of October. Through November, California prices averaged $0.30 higher than the national average (**Page 4**).
- **California Retail Diesel Prices:** On November 28, prices had reached $2.80, a decrease of $0.02 from the end of October. Through November, California prices averaged $0.37 higher than the national average (**Page 5**).
- **Crude Oil News:** On November 30, the Organization of Petroleum Exporting Countries (OPEC) agreed to cut production to 32.5 million barrels per day (bpd), a total cut of 700,000 bpd over the current production rates starting January 2017. As part of this agreement, Russia (non-OPEC producer) has agreed to cut 600,000 bpd of production as well. These cuts are expected to provide an upward pressure on future crude oil prices.

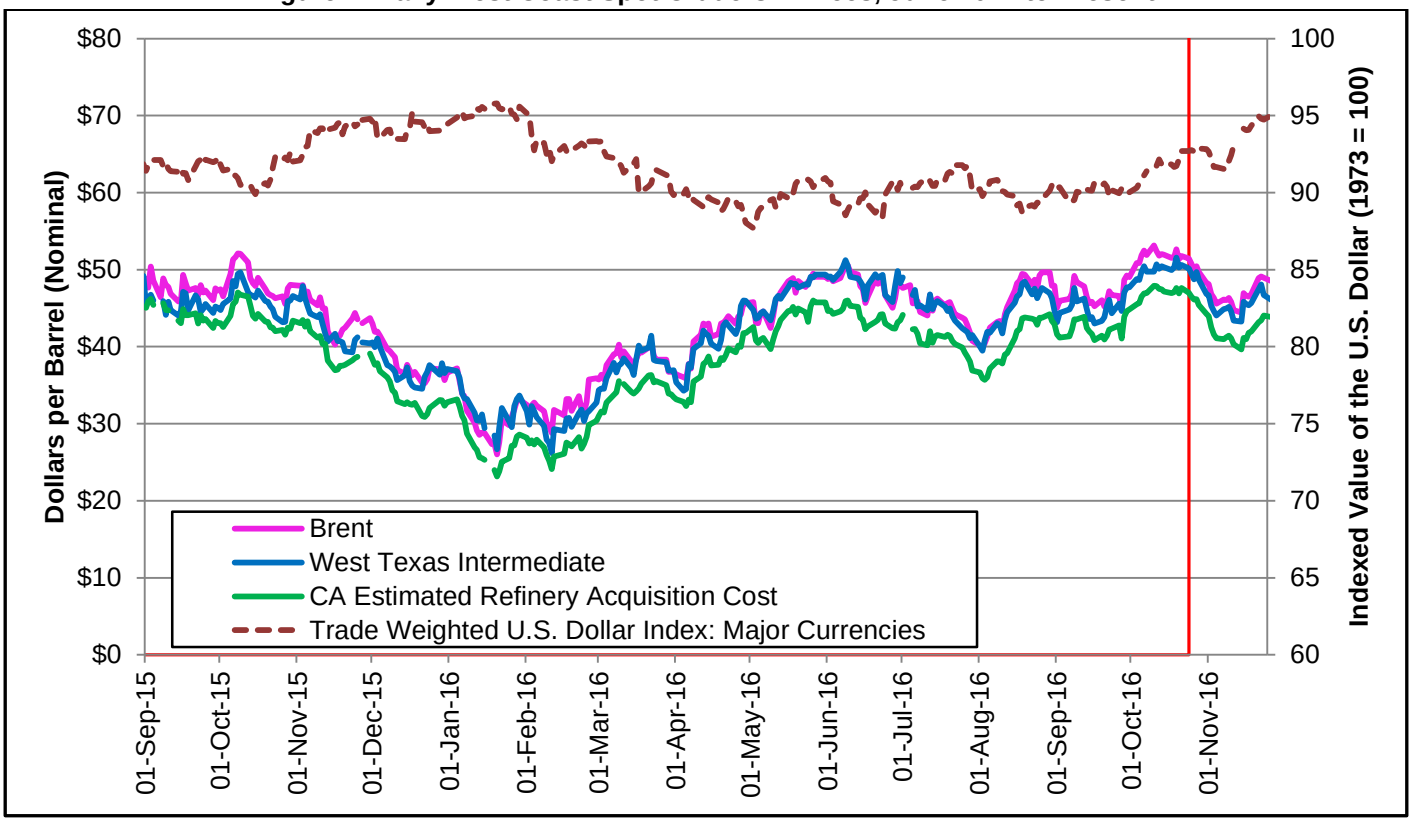
### Refining News

- **Chevron Richmond:** On November 21, the refinery completed planned maintenance on Richmond's 28,000 bpd catalytic reformer; other units are expected to be back online on December 1.
- **Shell Martinez:** On November 9, the refinery completed unplanned maintenance on the 70,000 bpd fluid catalytic cracking unit. The unit had an unplanned shutdown on November 3.
- **Phillips 66 Wilmington**: On November 25, the refinery shut down two reformer units for unplanned maintenance, bringing 39,000 barrels per day offline.
- **PBF Torrance**: On November 11, the 155,000 bpd refinery restarted after a fire started near the alkylation unit. The refinery immediately ran at reduced rates and returned to full rates on November 21.

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

# Crude Oil Prices

**Figure 1: Daily West Coast Spot Crude Oil Prices, June 2014 to Present**




Source: U.S. Energy Information Administration (U.S. 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.

From late October through early November, crude oil prices continued to decline, with both Brent and West Texas Intermediate (WTI) reaching a low on November 14 of $44 and $43 per barrel respectively (**Figure 1**). Since then, prices have rebounded, with Brent reaching $49 on November 22 and WTI staying a bit lower at $48. At the same time, the California Estimated Refiner Acquisition Cost (CA-RAC) [1] of crude oil rose from $39.65 to $43.44, an increase of 9.5 percent.

Prices for all grades of crude oil remained 5 percent or higher above year-ago levels. Throughout this period, CA-RAC remained about $3 lower than WTI and $5 lower than Brent prices.

On November 30, the Organization of Petroleum Exporting Countries (OPEC) agreed to cut production, starting January 2017, to 32.5 million bpd, a decline of 700,000 barrels over the current production rates. This announcement signaled a future reduction in supply and pushed Brent prices to increase to $50 range by the end of November.

## Crude Oil Prices

**November 2016 vs 2015**
**(Percent Change)**

| | |
|---|---|
| **Brent** | **6% higher** |
| **WTI** | **7% higher** |
| **CA-RAC[1]** | **5% higher** |

**November 2016 Averages**

| | |
|---|---|
| **Brent** | **$46.81** |
| **WTI** | **$45.41** |
| **CA-RAC** | **$41.90** |

**November 28, 2016**

| | |
|---|---|
| **Brent** | **$48.24** |
| **WTI** | **$45.66** |
| **CA-RAC** | **$43.72** |

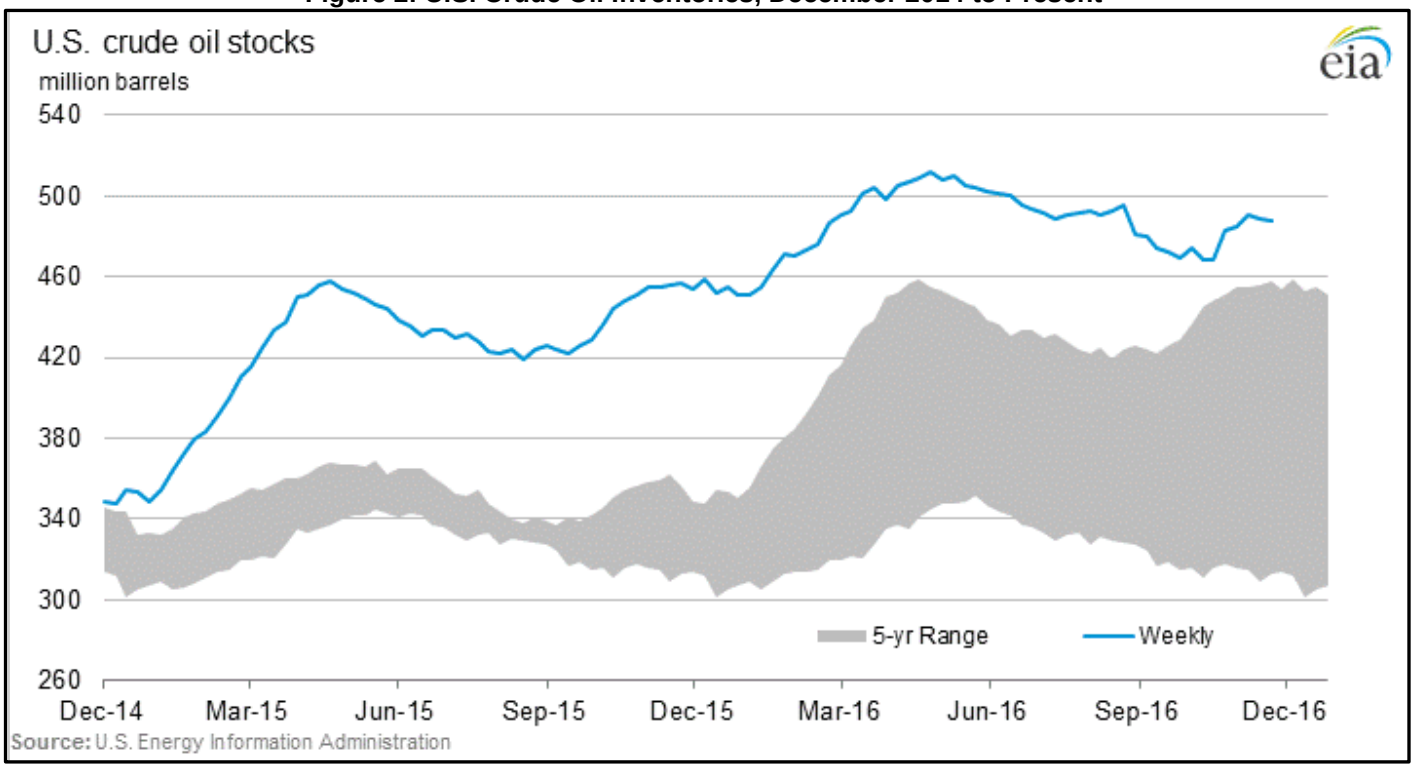
1 California estimated refiner acquisition cost is an estimate of the average price of crude oil paid by California refineries. Energy Commission staff estimate a weighted average of the prices of California (San Joaquin Valley) crude, Alaskan crude, and foreign crude.

# Crude Oil Production and Storage

U.S. crude oil inventories have remained steady since November's *Petroleum Watch* (**Figure 2**). Domestic crude oil production and imports rose, but refinery inputs climbed to seasonal highs as refineries across the United States completed planned maintenance, leading to little change in inventories.

- U.S. crude oil production for November is estimated by the U.S. Energy Information Administration (EIA) at 8.6 million barrels per day, a slight elevation from August levels. This is still a 600,000 bpd decline from year-ago production levels of 9.2 million bpd. Imports rose in November to an estimated 7.9 million bpd, up from the 7.6 million bpd in October. When compared to import levels from November 2015, this is an increase of 450,000 bpd.
- U.S. crude oil refinery inputs recovered from the lows set in October, finishing November at 16.3 million barrels per day. 2016 crude oil inputs still trail their rates from 2015 by 150,000 bpd. Refinery inputs will likely rise and recover in December as capacity is brought back on-line after maintenance is completed and holiday driving demand begins.
- Crude oil inventories in the United States increased by 800,000 barrels during November to 485.8 million barrels. Nevertheless, the gap between year-ago (a previous five-year high) and current inventories remains large, at 32.2 million barrels. The lack of change from last month indicates that refiners have managed their supply chain well despite refinery maintenance during autumn.

**Figure 2: U.S. Crude Oil Inventories, December 2014 to Present**

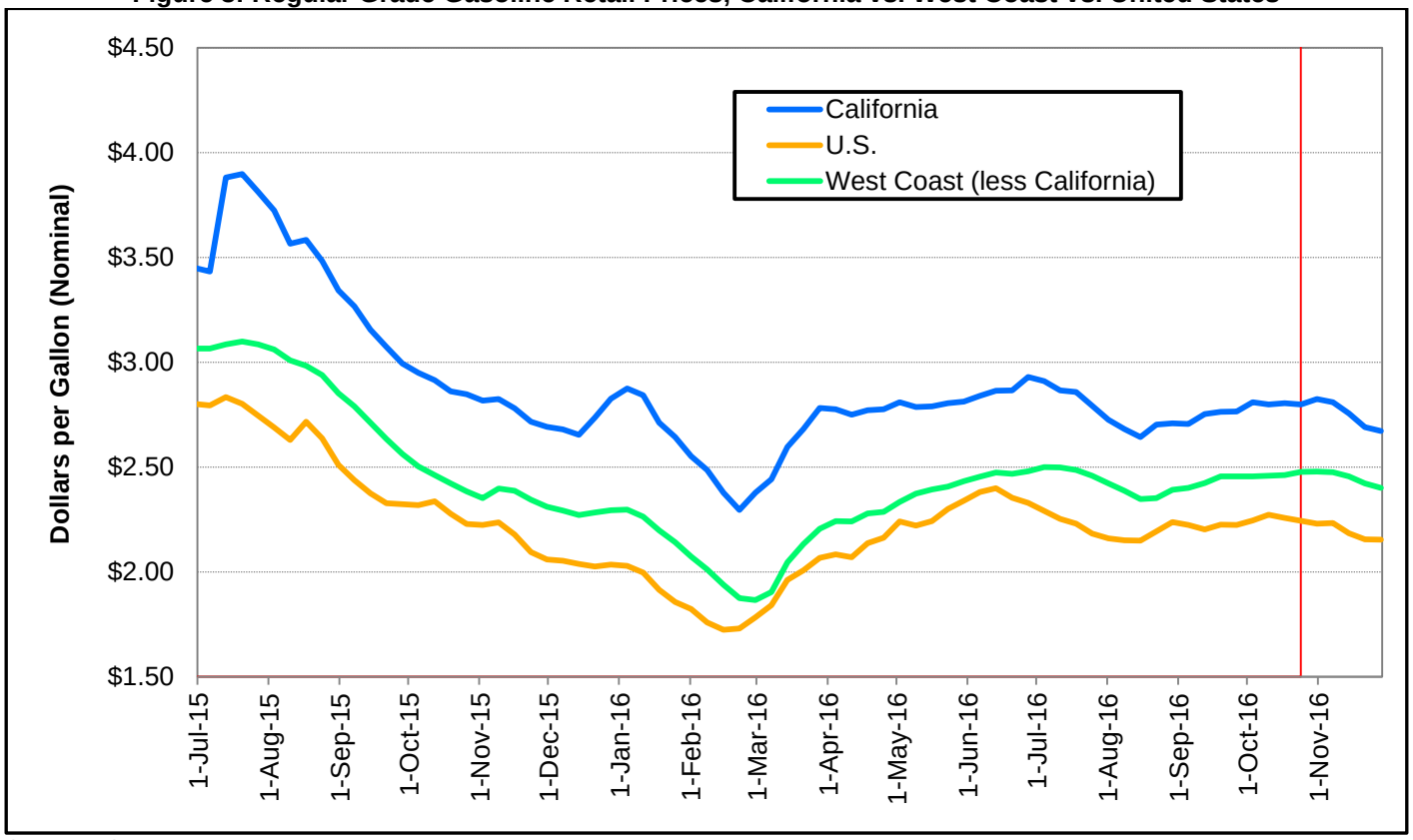



Source: U.S. EIA

- According to OPEC's November Monthly Oil Report, Saudi Arabian crude output held steady from 10.5 million bpd in September to 10.5 million bpd in October. This production level remains 232,000 bpd above the second quarter average of 10.15 million bpd. Total October OPEC production increased to 33.6 million bpd, up 240,000 bpd from September.

# Gasoline and Diesel Retail Prices

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




Source: U.S. EIA

Since the last month's *Petroleum Watch*, average California regular gasoline prices decreased $0.13 to $2.67 on the week of November 28. The shift from summer to easier-to-supply winter-blend gasoline was a factor in the decrease for California gasoline prices. With this decrease, the retail gasoline price for the month of November is 1 percent lower than same month last year.

On November 28, California's retail gasoline price was $0.52 higher than the U.S. retail price and $0.27 higher than prices in West Coast states (minus California). The last time California's retail gasoline price was this close to the West Coast price was on January 5, 2015 at $0.24 higher. November's gasoline prices throughout the U.S. averaged $0.06 lower from October (**Figure 3**).

## Gasoline Prices

**November 2016 vs 2015**
**(Percent Change)**

| | |
|---|---|
| **California** | **1% higher** |
| **U.S.** | **1% higher** |
| **West Coast** | **3% higher** |

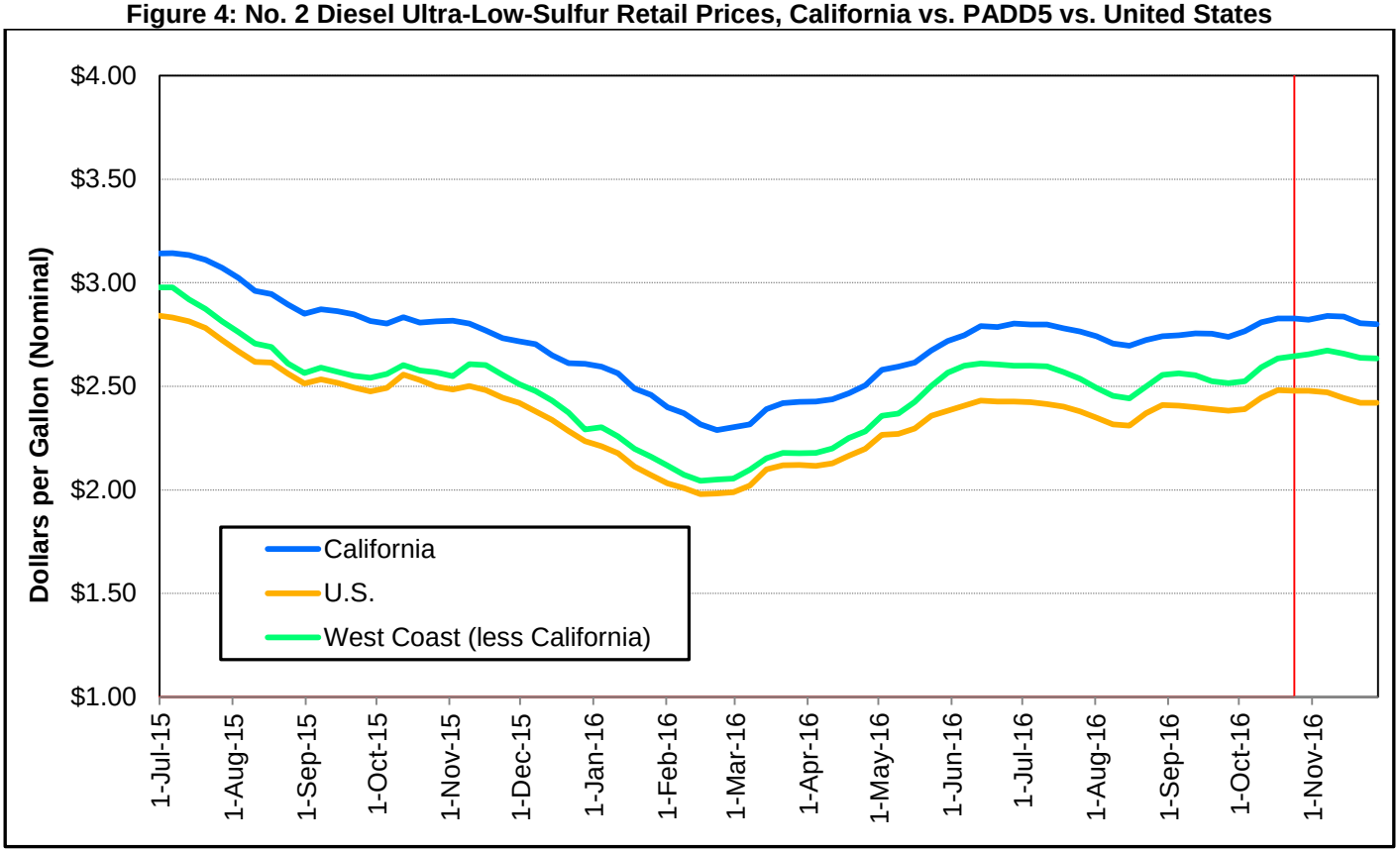
**November 2016 Averages**

| | |
|---|---|
| **California** | **$2.73** |
| **U.S.** | **$2.18** |
| **West Coast** | **$2.44** |

**Week of November 28, 2016**

| | |
|---|---|
| **California** | **$2.67** |
| **U.S.** | **$2.15** |
| **West Coast** | **$2.40** |

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




Source: U.S. EIA

California diesel prices were steady in November, ending the month at $2.82 **(Figure 4)**, an increase of $0.01 compared to October. U.S. prices separated from California, falling $0.04 to end the month at $2.42. California prices averaged $0.36 higher than U.S. prices through the first half of November, but this increased to $0.40 in the last two weeks of November. Previously, California had consistently averaged over $0.35 U.S. retail prices throughout 2016.

Beginning in November 2016, the average price of diesel was close to the average price of gasoline. Prior to 2015, diesel fuel maintained a premium to gasoline prices by more than $0.20 over the past five years. This differential has reached $0.13 in California due to unplanned refinery outages that have impacted California refinery gasoline producing units in 2015 and 2016 more than diesel producing units. Gasoline prices should fall back to the historical levels below diesel fuel as supplies are replenished with refineries restarting from planned maintenance and the switch to winter-blend gasoline.

## Diesel Prices

**November 2016 vs 2015**
**(Percent Change)**

| | |
|---|---|
| California | 2% higher |
| U.S. | 1% lower |
| West Coast | 3% higher |

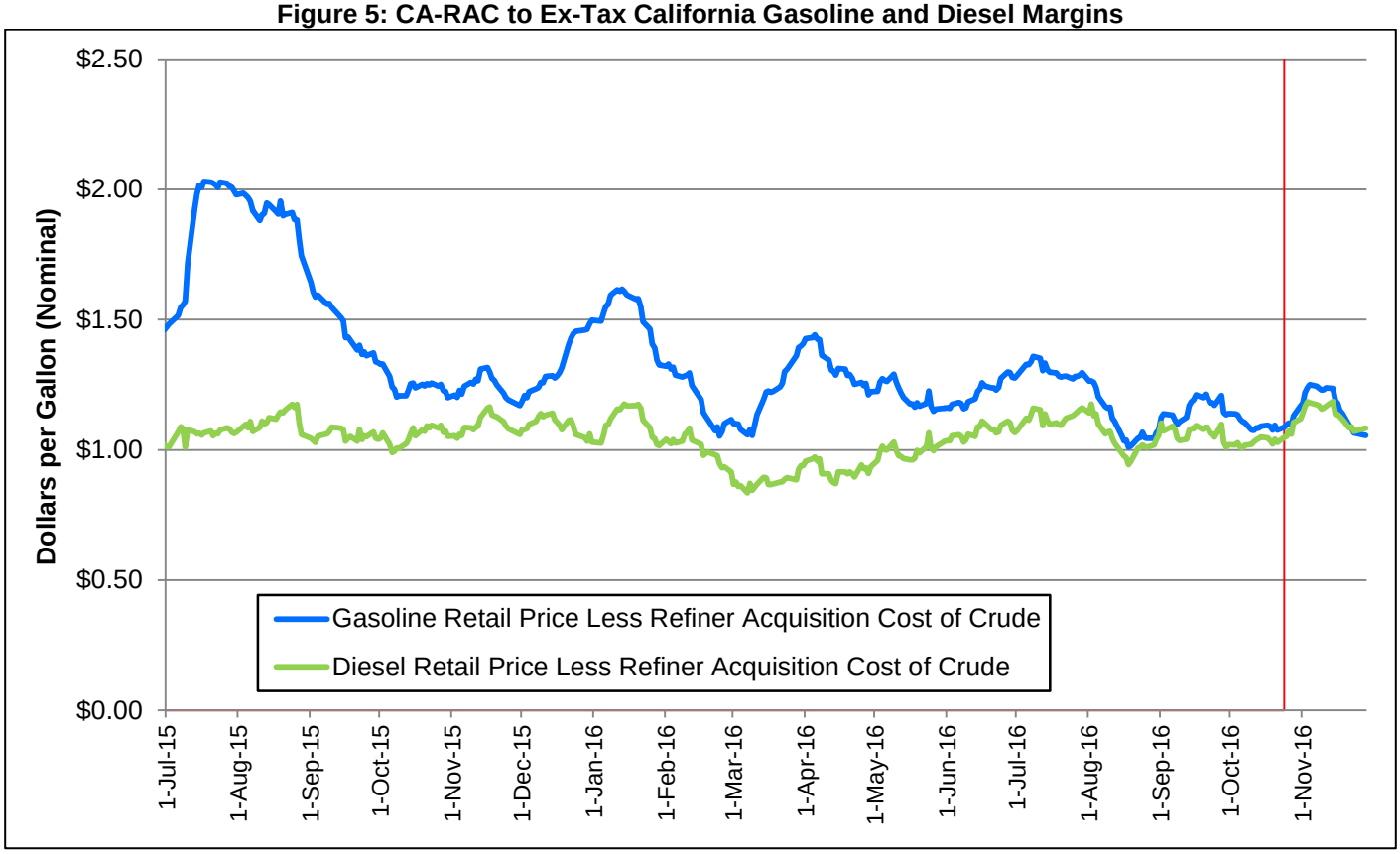
**November 2016 Averages**

| | |
|---|---|
| California | $2.82 |
| U.S. | $2.44 |
| West Coast | $2.65 |

**Week of November 28, 2016**

| | |
|---|---|
| California | $2.80 |
| U.S. | $2.42 |
| West Coast | $2.64 |

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




Source: U.S. EIA and OPIS

Between October 24 and November 14, the California Refinery Acquisition Cost (CA-RAC)-to-ex-tax retail gasoline margin increased $0.15 to $1.24, and the diesel margin increased $0.14 to $1.19 (**Figure 5**). Since the increases, both margins decreased back to $1.06 for gasoline and $1.08 for diesel on November 28.

Before Thanksgiving Day, the gasoline margin price dropped below the diesel margin price at $1.08 and $1.09, respectively. February 25, 2015, was the last time the gasoline margin price was lower than the diesel margin price.

Overall, margin prices have fallen within 5 percent compared to the same month last year, and the November average ends up at $1.18 per gallon for gasoline and $1.14 per gallon for diesel.

**Crude to Retail Margins**

**November 2016 vs 2015**
**(Percent Change)**

| | |
|---|---|
| **Gasoline** | **5% lower** |
| **Diesel** | **4% higher** |

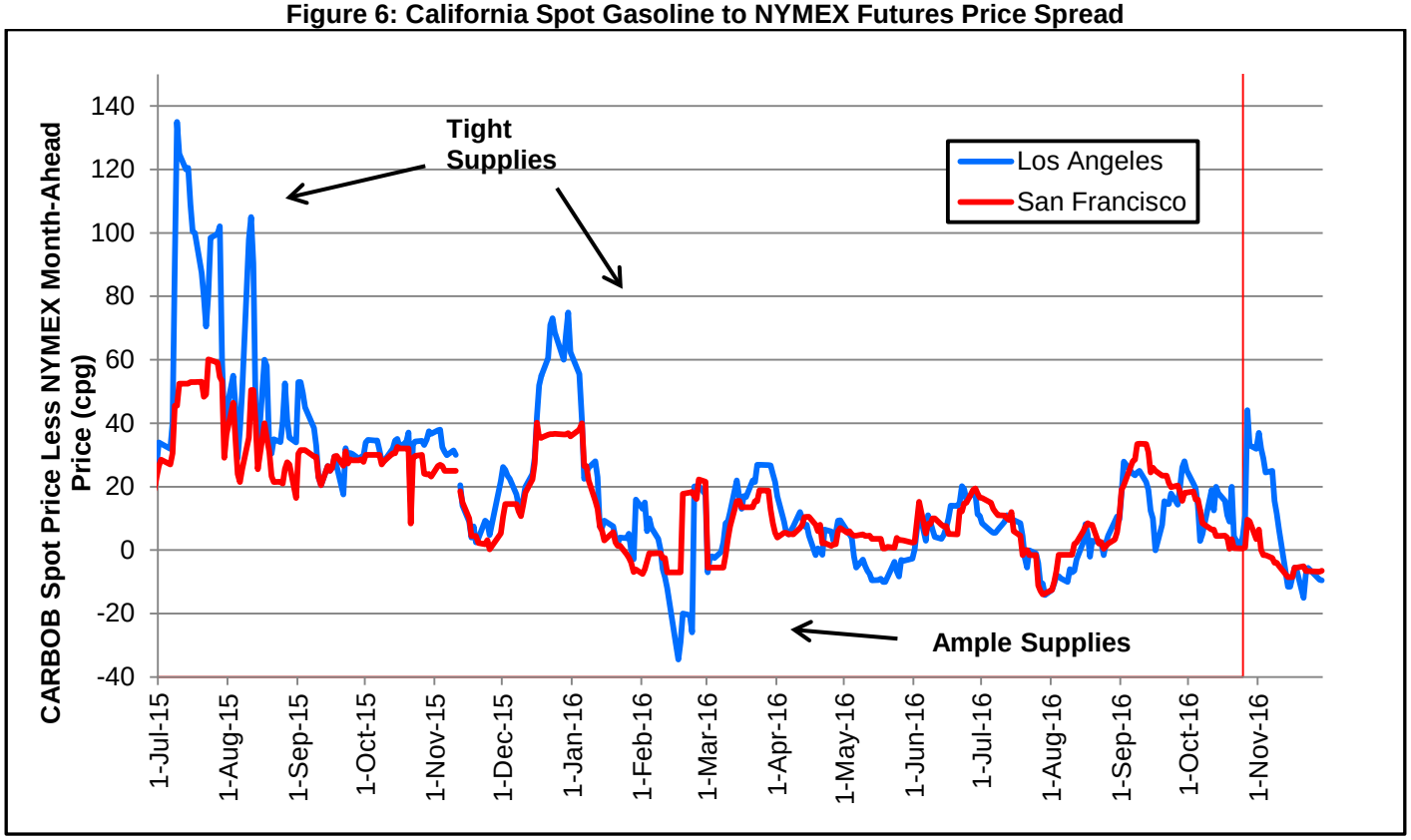
**November 2016 Averages**

| | |
|---|---|
| **Gasoline** | **$1.18** |
| **Diesel** | **$1.14** |

**November 28, 2016**

| | |
|---|---|
| **Gasoline** | **$1.06** |
| **Diesel** | **$1.08** |

**Figure 6: California Spot Gasoline to NYMEX Futures Price Spread**




Source: U.S. EIA and OPIS

After setting new 2016 highs at the end of October, the Los Angeles (LA) gasoline spot market differential to the New York Mercantile (NYMEX) futures price consistently fell throughout the month of November, reaching a negative differential by end of the month (**Figure 6**). This initial jump in the LA-less-NYMEX differential appeared to result from concerns in the trading community regarding the availability of prompt delivery gasoline[2] in the LA market, as several refineries in the area were conducting maintenance. As those concerns were dissipated due to lack of demand, the differential fell quickly by averaging a decrease of roughly $0.04 a day. The initial jump in LA spot prices did bleed over into the retail market; according to EIA data, the difference between LA and San Francisco (SF) city retail gasoline price increased to $0.12 during the last week of October and first two weeks of November.

The SF-less-NYMEX futures spread showed a continued downward trend in November after rising slightly at the beginning of the month, falling from $0.07 at the start of the month to -$0.06 on November 29. This spread remained low despite the California refinery work, likely due to normal production and strong early month inventories for gasoline in Northern California (**Figure 9**).

**Gasoline Spot–Futures Spread**

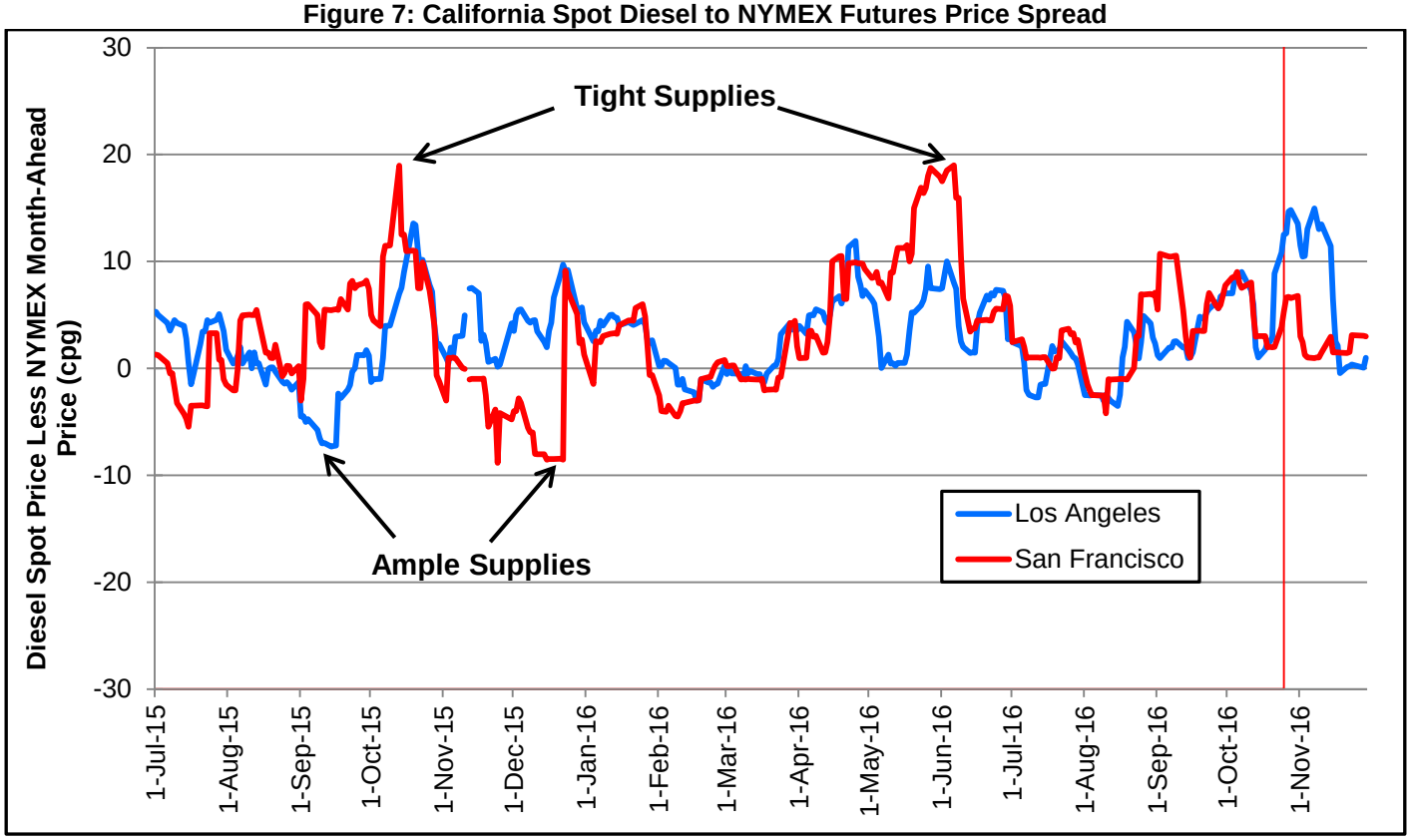
| November 2016 vs 2015 | |
|---|---|
| Los Angeles | 14¢ lower |
| San Francisco | 18¢ lower |

| November 2016 Averages | |
|---|---|
| Los Angeles | 5¢ |
| San Francisco | -4¢ |

| November 29, 2016 | |
|---|---|
| Los Angeles | -9¢ |
| San Francisco | -6¢ |

2 *Prompt delivery* is an industry term that means that delivery of the product must be completed in the next few days (24 to 72 hours).

**Figure 7: California Spot Diesel to NYMEX Futures Price Spread**




Source: U.S. EIA and OPIS

The LA-less-NYMEX diesel spot market differential went through a complete reversal during the two halves of November. The LA diesel spot market became strong in the last week of October due to issues with Southern California refineries and hydrogen supplies[3]. It continued to remain so until mid-November, when improved hydrogen supply was available to boost California Air Resources Board (CARB) diesel production and caused a sharp fall in LA diesel spot prices. The increase in local supplies combined with the increasing NYMEX futures prices, caused by news of the planned global crude output reduction, narrowed the LA-less NYMEX spread to almost zero in the latter half of the month (**Figure 7**).

November saw the highest year-to-date LA-less-NYMEX values, with a high of $0.15 on November 7 and a monthly average of $0.07, although it ended at $0.01 on November 29.

The SF-less-NYMEX differential was steady due to lack of any Northern California refinery issues. After a very brief period at a high of $0.07 during the last week of October, it fell in the first few days of November and stayed within $0.03 for the entire month.

**Diesel Spot–Futures Spread**

| November 2016 vs 2015 | |
|---|---|
| Los Angeles | 4¢ higher |
| San Francisco | 4¢lower |

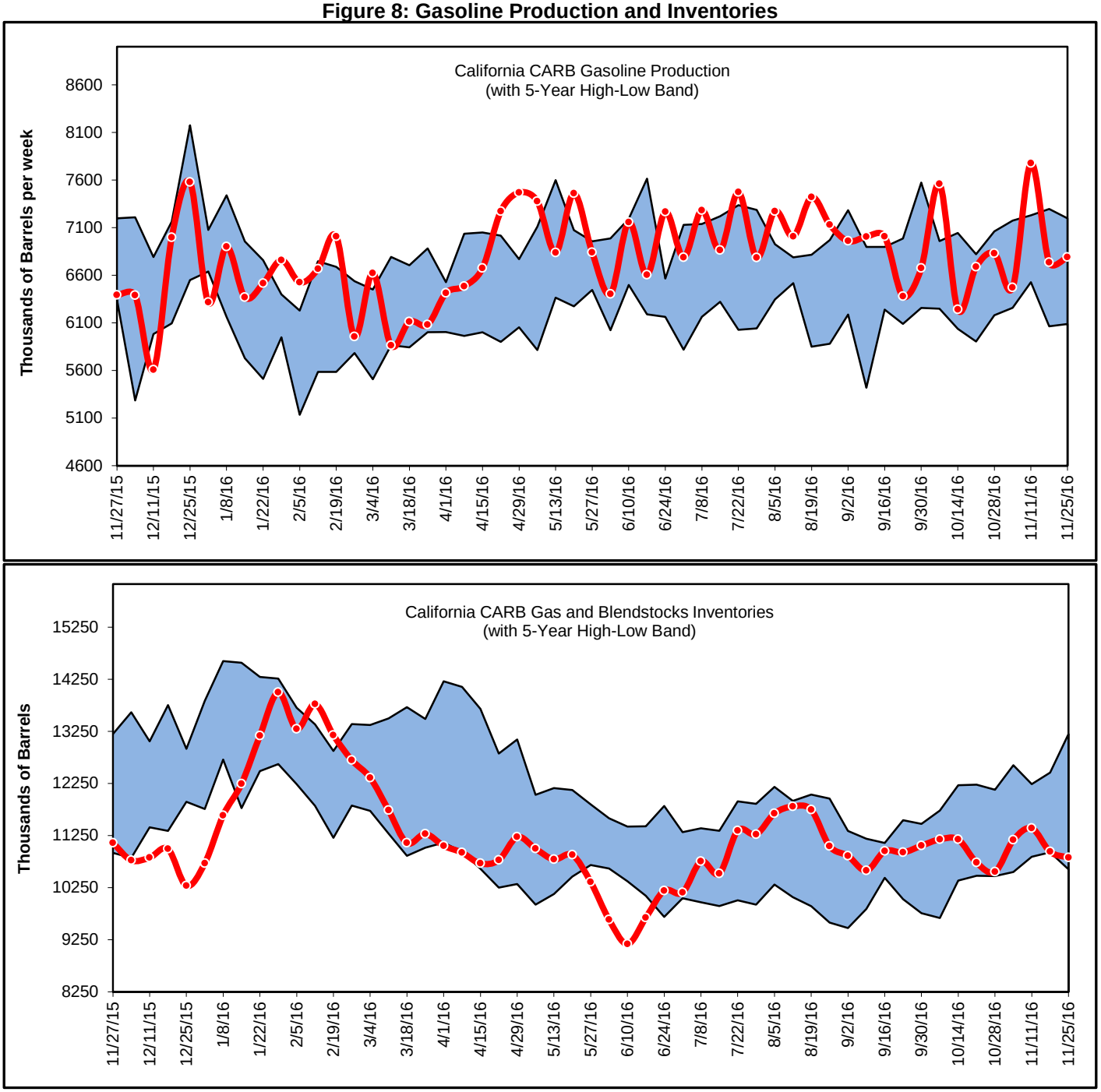
| November 2016 Averages | |
|---|---|
| Los Angeles | 7¢ |
| San Francisco | 2¢ |

| November 29, 2016 | |
|---|---|
| Los Angeles | 1¢ |
| San Francisco | 3¢ |

3 Hydrogen is an essential input for refinery hydrotreater units. These units create cleaner diesel fuel that is low in sulfur and aromatics, helping reduce smog pollution.

# California Gasoline and Diesel Production and Inventories

**Figure 8: Gasoline Production and Inventories**

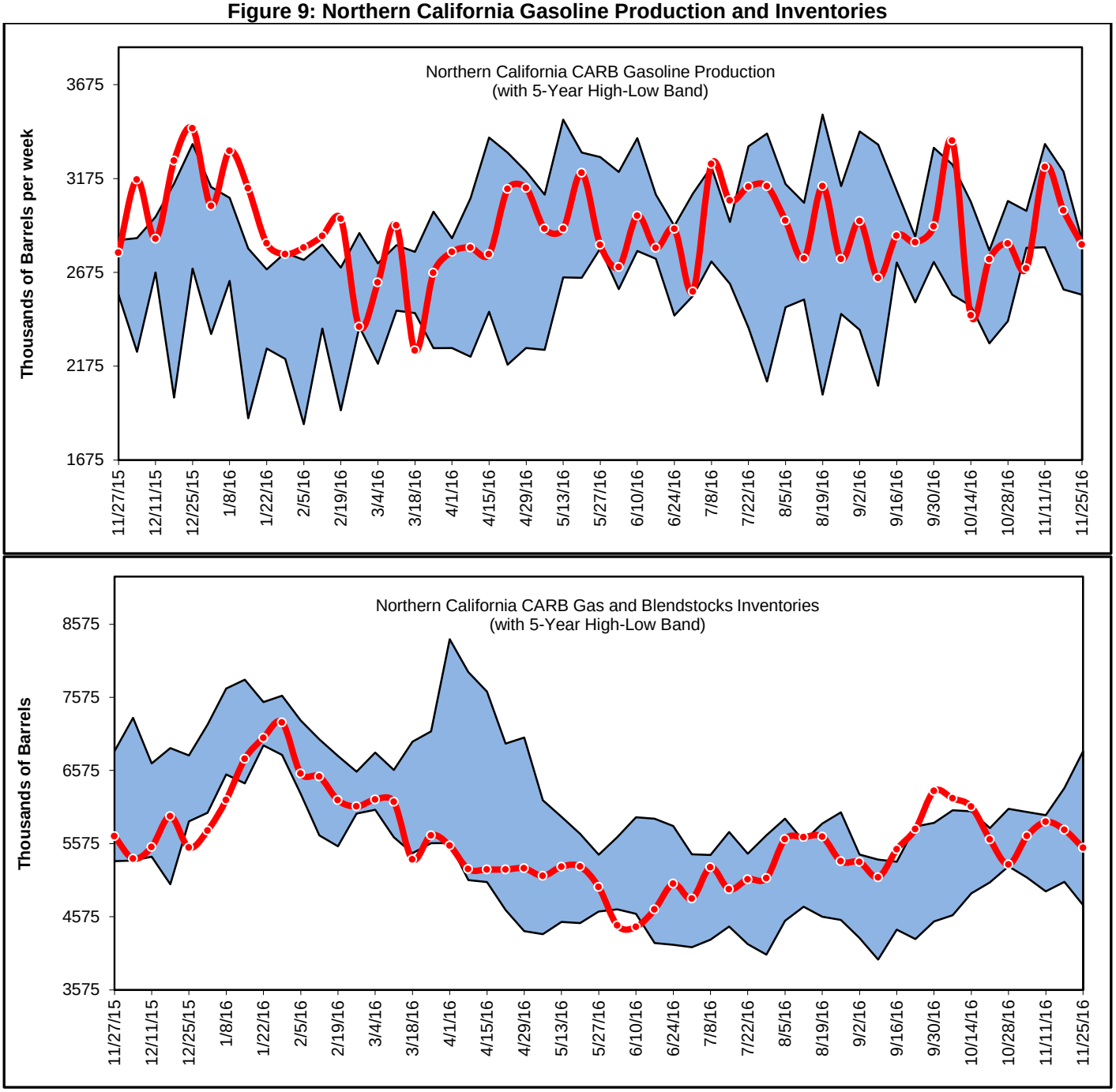



Source: PIIRA data

California gasoline production reached a five-year high on November 11 at 7.8 million barrels per week (bpw). This set a new high for the year with levels not seen since December 2014 (**Figure 8**). The reason may have been the number of refineries coming back from seasonal maintenance around the same time.

California gasoline inventories around the same period remained steady with an average level of 11 million barrels compared to 11.2 million barrels the previous year. The increased demand in driving due to the Thanksgiving holiday offset higher production numbers, contributing to the low, steady inventory level.

**Figure 9: Northern California Gasoline Production and Inventories**

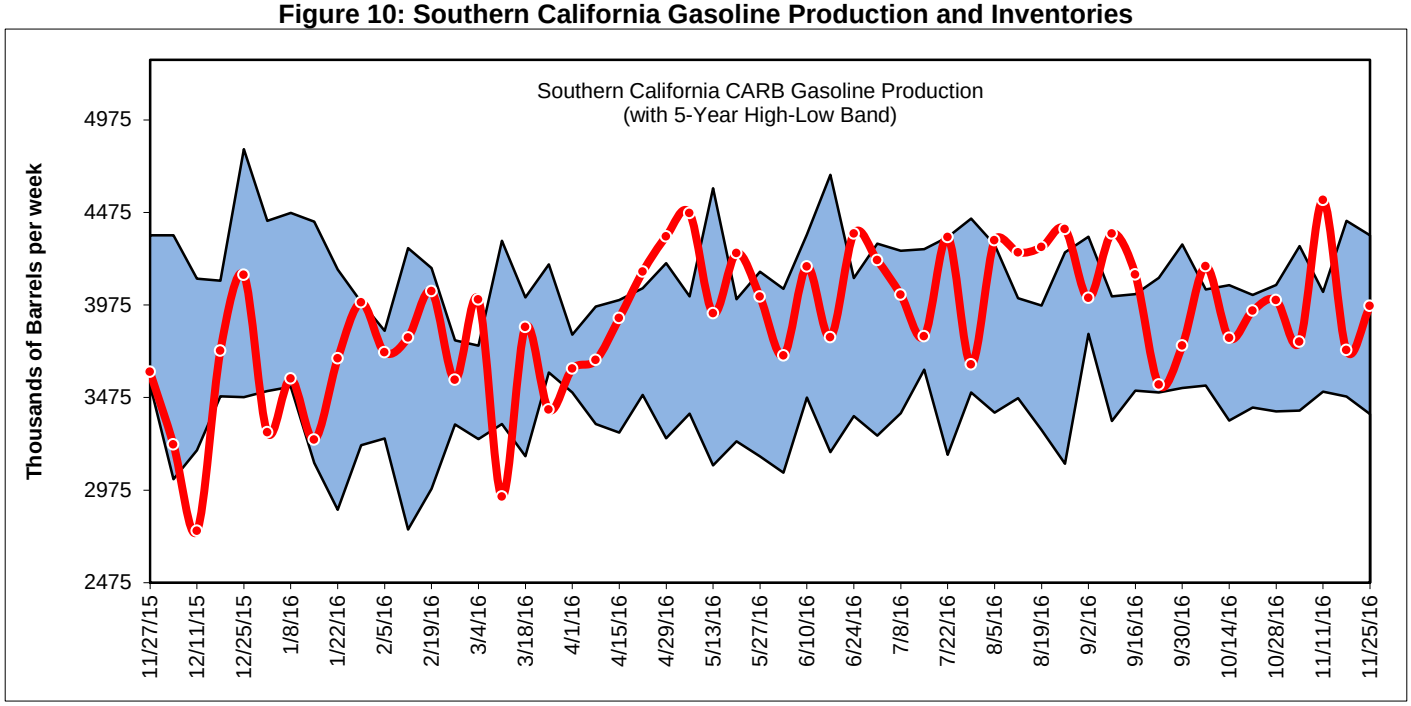


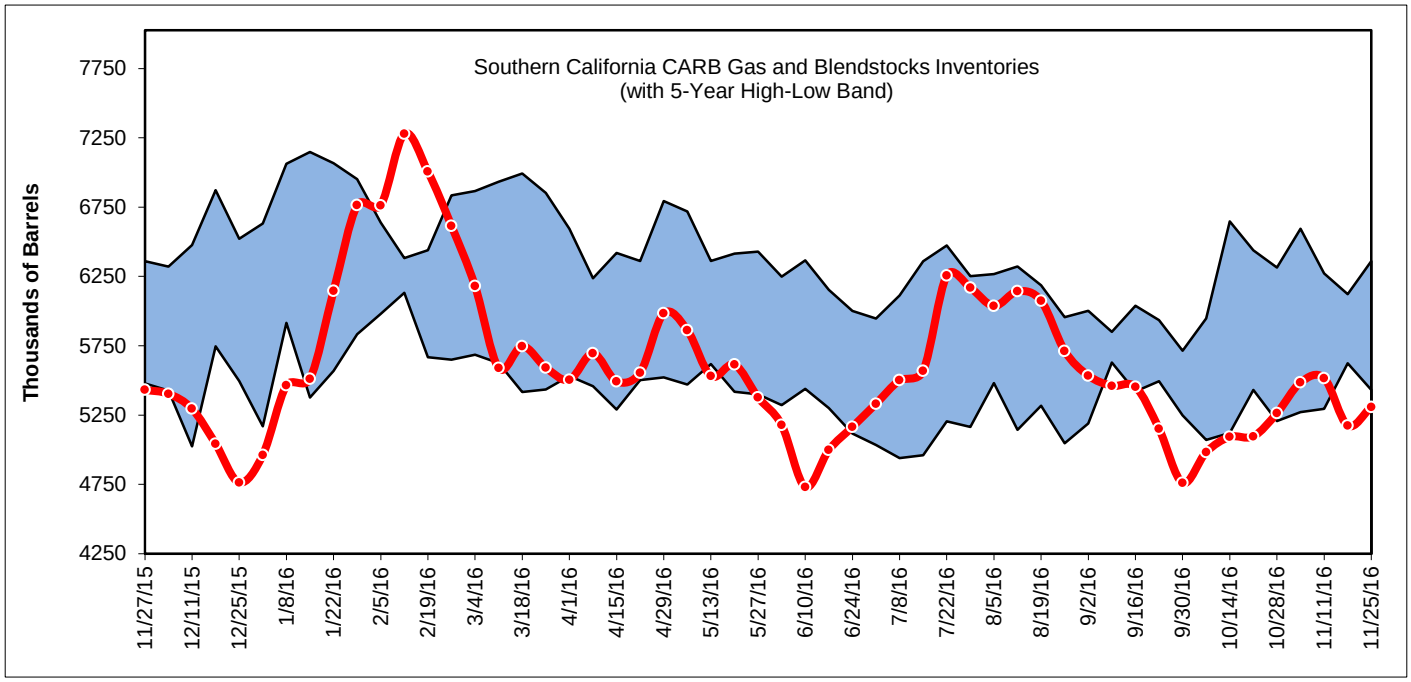

Source: PIIRA data

Northern California gasoline production peaked on November 11 at 3.2 million bpw before dropping back down to 2.8 million bpw on November 25 (**Figure 9**). The production average during this time is close to last year's average at 2.9 million bpw.

Inventory levels began at 5.3 million on October 28 and peaked on November 11 at 5.9 million barrels, before settling at 5.5 million barrels on November 25. Gasoline inventories for November averaged 5.6 million barrels compared to 5.8 million barrels a year ago. A drop in crude runs at refineries contributed to lower inventory levels.

**Figure 10: Southern California Gasoline Production and Inventories**



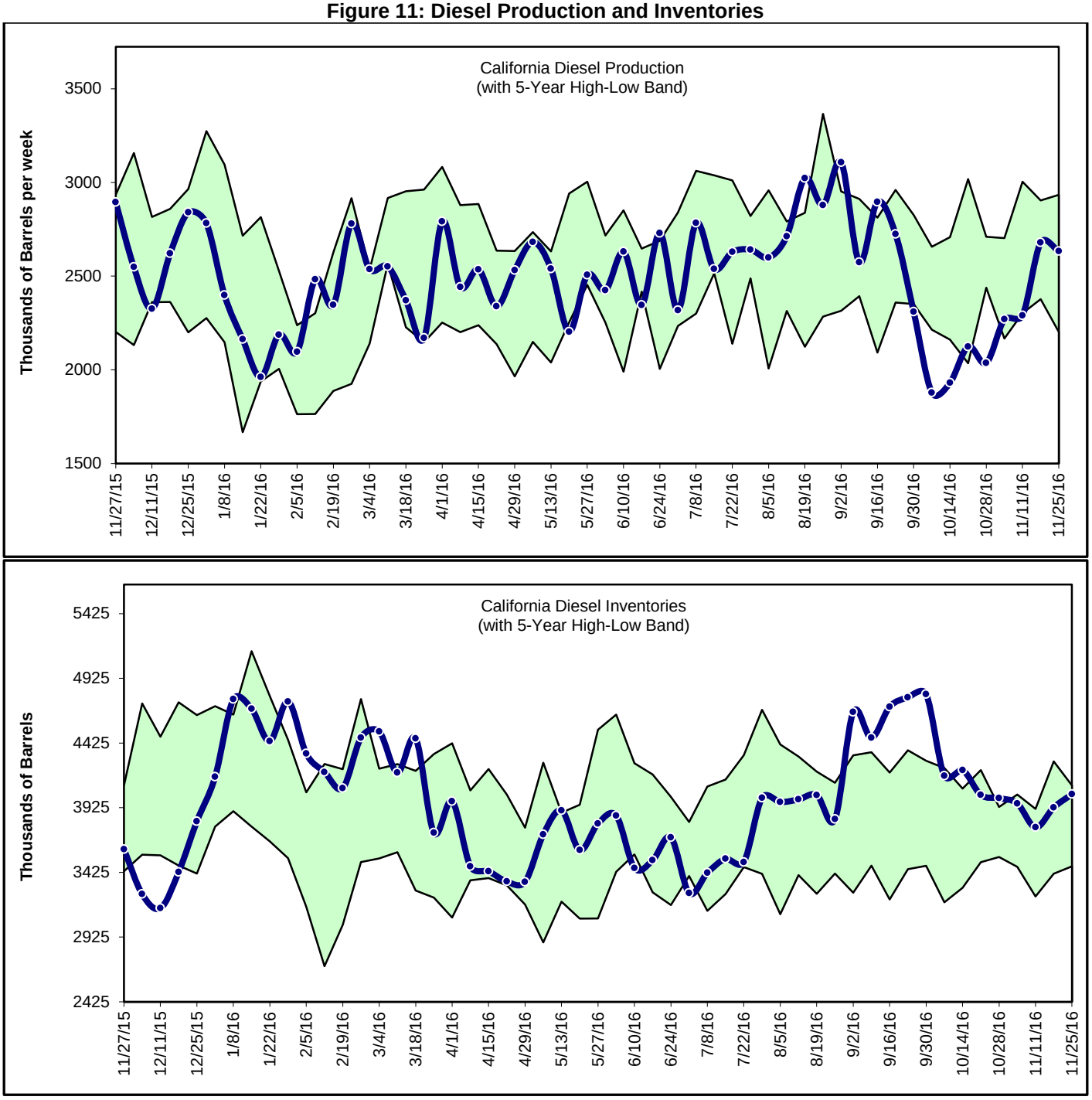




Source: PIIRA data

Southern California gasoline production during the week of November 11 rose above the five-year band to 4.5 million barrels before ending at 4 million barrels on November 25 (**Figure 10**). Southern California has not experienced this kind of production since December 2014, just before the 2015 incident at ExxonMobil's Torrance refinery. Gasoline production averaged within the high end of the five-year band at 4 million bpw compared to 3.5 million a year ago.

Inventory levels struggled to stay within the five-year band, averaging at 5.4 million barrels compared to 5.5 million barrels a year ago. This is likely due to the forced shutdown of units at PBF Energy and Phillips 66 refineries in Southern California.

**Figure 11: Diesel Production and Inventories**




Source: PIIRA data

From October 28 through November 25, California diesel production was below the five-year band at 2 million barrels per week and slowly rose, before settling at 2.6 million barrels per week on November 25. Overall, diesel fuel production remained healthy as most maintenance at refineries has affected gasoline producing units this season (**Figure 11**).

California diesel inventories from October 28 through November 25 remained steady around the top of the five-year band and averaged at 3.9 million compared to 3.5 million a year ago.