



PETROLEUM WATCH

California Energy Commission

January 2017

Recent Petroleum News and Outside Analyses

Prices

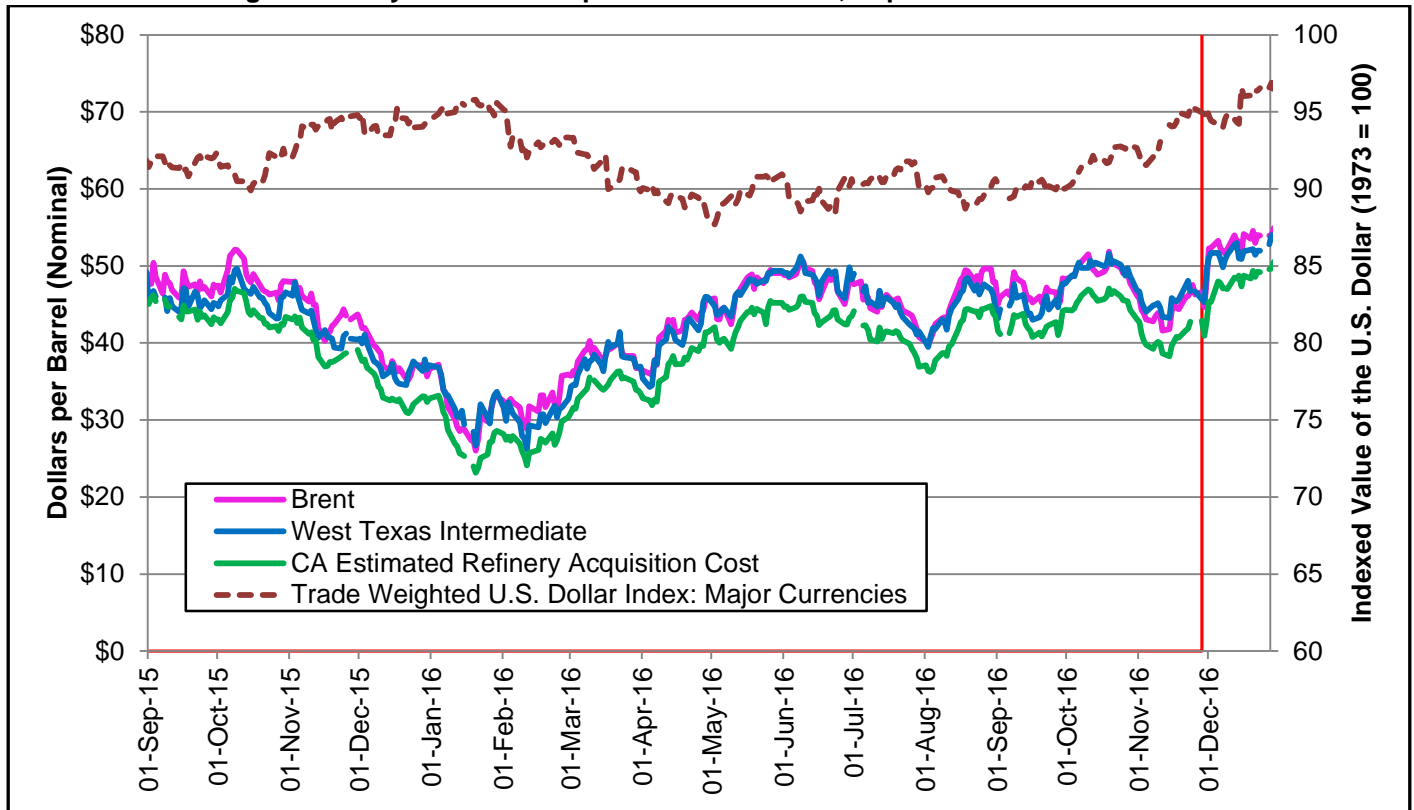
- **Crude Oil Prices:** Brent and West Texas Intermediate (WTI) crude prices closed at \$56.09 and \$50.72 on December 28, respectively. Prices through December are \$15.05 higher than last year (**Page 2**).
- **California Retail Gasoline Prices:** On December 26, prices increased to \$2.71, a gain of \$0.04 since the end of November. Through December, California prices averaged \$0.43 higher than the national average (**Page 4**).
- **California Retail Diesel Prices:** On December 26, prices reached \$2.87, an increase of \$0.07 from the end of November. Through December, California prices averaged \$0.34 higher than the national average (**Page 5**).

Refining News

- **Chevron Richmond:** On December 19, the refinery restarted multiple units that were involved with seasonal maintenance that began October 1 and were scheduled to return December 1.
- **Phillips 66 Rodeo:** On December 28, the refinery shut down two hydrocracker units due to hydrogen shortages.

Crude Oil Prices

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

Crude oil prices have increased since late November. Brent and WTI moved from \$46.54 and \$46.72 per barrel on November 23 to \$54.96 and \$53.75 per barrel on December 30, respectively (Figure 1). At the same time, the California Estimated Refiner Acquisition Cost (CA-RAC) of crude oil rose from \$42.77 to \$50.53, an increase of 18 percent.

Prices for all grades of crude oil remained 40 percent or higher above year-ago levels. Throughout December, CA-RAC remained \$3 lower than WTI and \$5 lower than Brent prices. The increase of crude prices can be attributed to OPEC’s November 2016 agreement to cut production starting January 2017.

In short, 2016 has been a pricey year for crude oil as CA-RAC faced a change in price from \$23 on January 20 to \$50.53 on December 30, an increase of 118 percent.

<u>Crude Oil Prices</u>	
<u>December 2016 vs 2015</u>	
<u>(Percent Change)</u>	
Brent	40% higher
WTI	40% higher
CA-RAC ¹	43% higher
<u>December 2016 Averages</u>	
Brent	\$53.29
WTI	\$51.97
CA-RAC	\$48.31
<u>December 30, 2016</u>	
Brent	\$54.96
WTI	\$53.75
CA-RAC	\$50.53

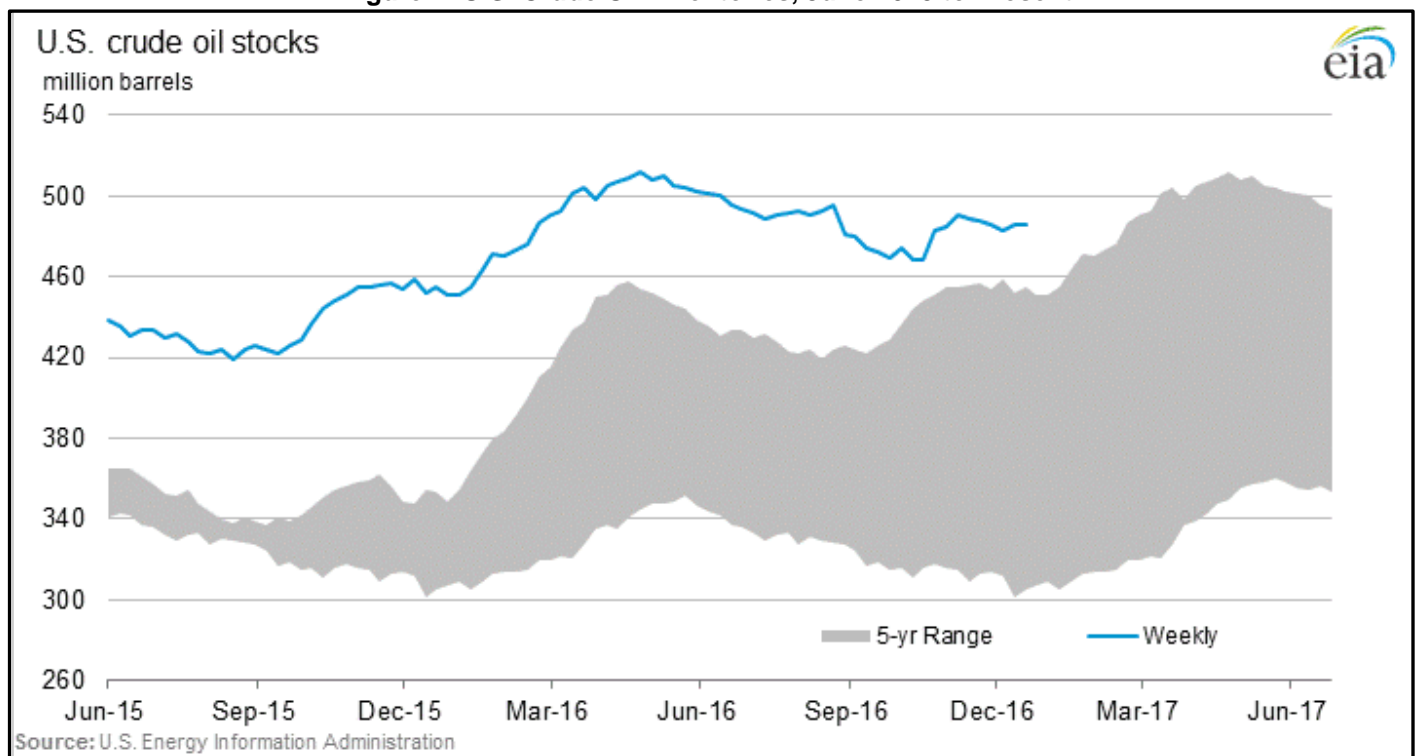
¹ California estimated refiner acquisition cost is an estimate of the average price of crude oil paid by California refineries. Energy Commission staff estimates a weighted average of the prices of California (San Joaquin Valley) crude, Alaskan crude, and foreign crude.

Crude Oil Production and Storage

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

- U.S. crude oil production for December is estimated by the U.S. Energy Information Administration (EIA) at 8.7 million barrels per day (bpd), a slight 100,000 bpd increase over November levels. This is still a 400,000 bpd decline from year-ago production levels of 9.2 million bpd. Imports rose in December to an estimated 8.1 million bpd, up from the 7.7 million bpd in November. When compared to import levels from November 2015, this is an increase of 220,000 bpd.
- U.S. crude oil refinery inputs remained steady with levels seen in November, finishing December at 16.5 million bpd. Refinery inputs will likely rise and peak in January as remaining capacity is brought back on-line after maintenance is completed and driving demand tapers.
- Crude oil inventories in the United States increased by 300,000 barrels during December to 486.1 million barrels. The gap between year-ago (a previous five-year high) and current inventories remains at 31 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, June 2015 to Present

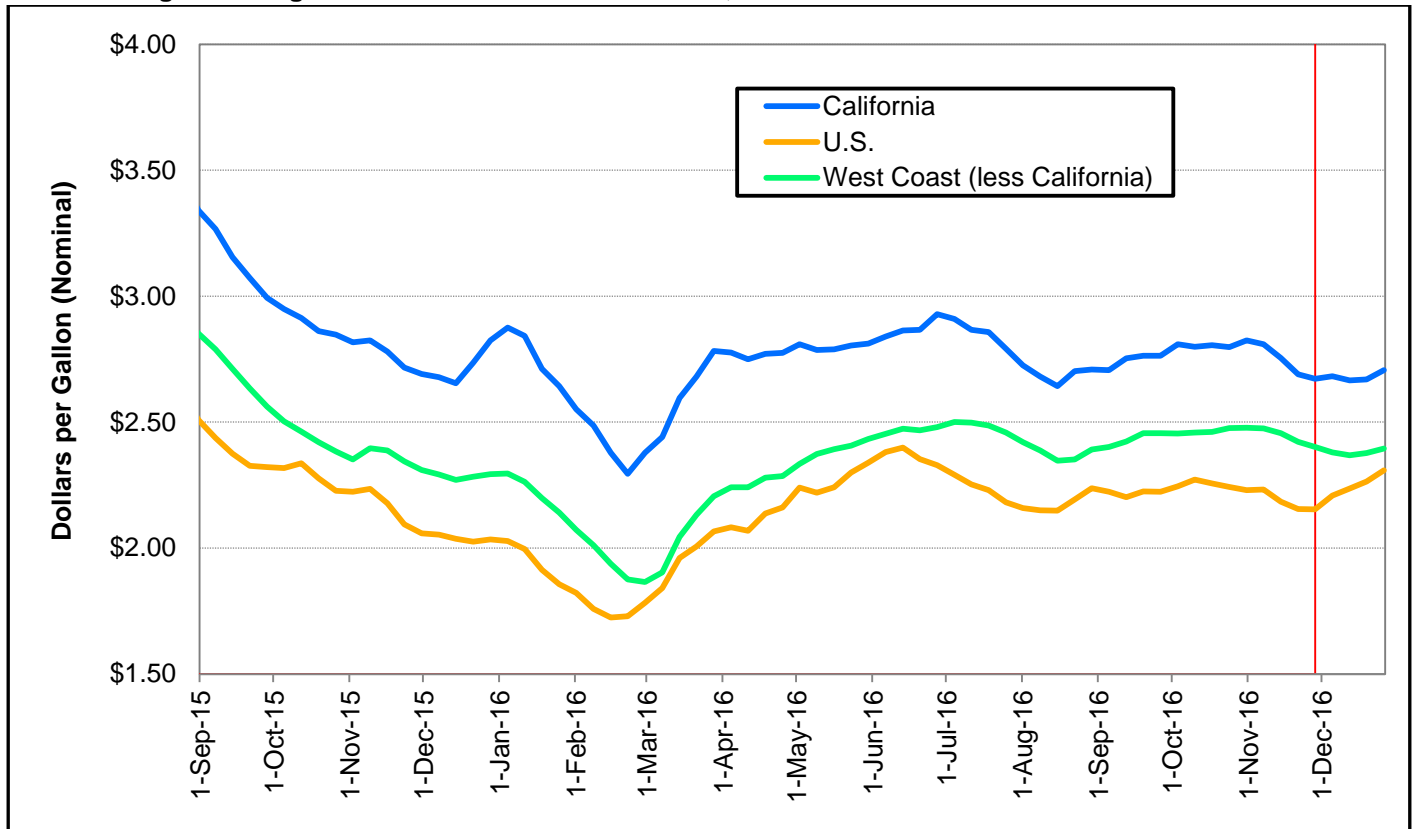


Source: U.S. EIA

- According to OPEC's November Monthly Oil Report, Saudi Arabian crude output held steady from 10.5 million bpd in October to 10.5 million bpd in November. This production level remains 80,000 bpd below the third quarter average of 10.595 million bpd. Total November OPEC production increased to 33.8 million bpd, up 150,000 bpd from October.

Gasoline and Diesel Retail Prices

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



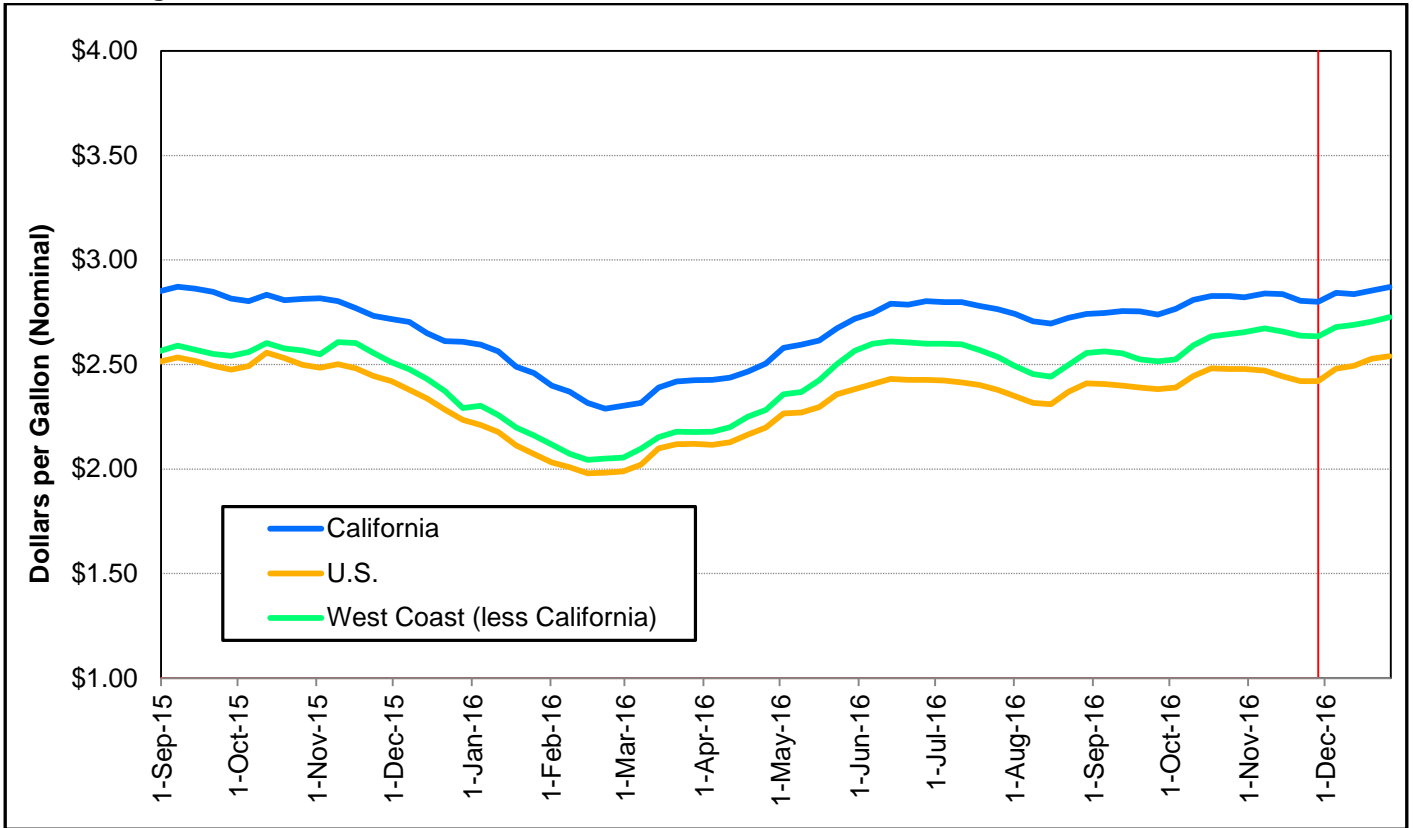
Source: U.S. EIA

Gasoline prices rose slightly throughout December, as average California regular gasoline prices increased \$0.04 to \$2.71 on December 26. Gasoline prices rose in line with crude oil prices but remain 2 percent lower than December 2015 (Figure 3).

U.S. gasoline prices increased \$0.16 to \$2.31 on December 26. In December California's retail gasoline price was \$0.40 higher than the U.S. retail price and \$0.31 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 in January 2015, at \$0.40 higher. Gasoline prices throughout the United States averaged \$0.06 lower from October.

Gasoline Prices	
December 2016 vs 2015	
(Percent Change)	
California	2% lower
U.S.	11% higher
West Coast	3% higher
December 2016 Averages	
California	\$2.68
U.S.	\$2.25
West Coast	\$2.38
Week of December 26, 2016	
California	\$2.71
U.S.	\$2.31
West Coast	\$2.40

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



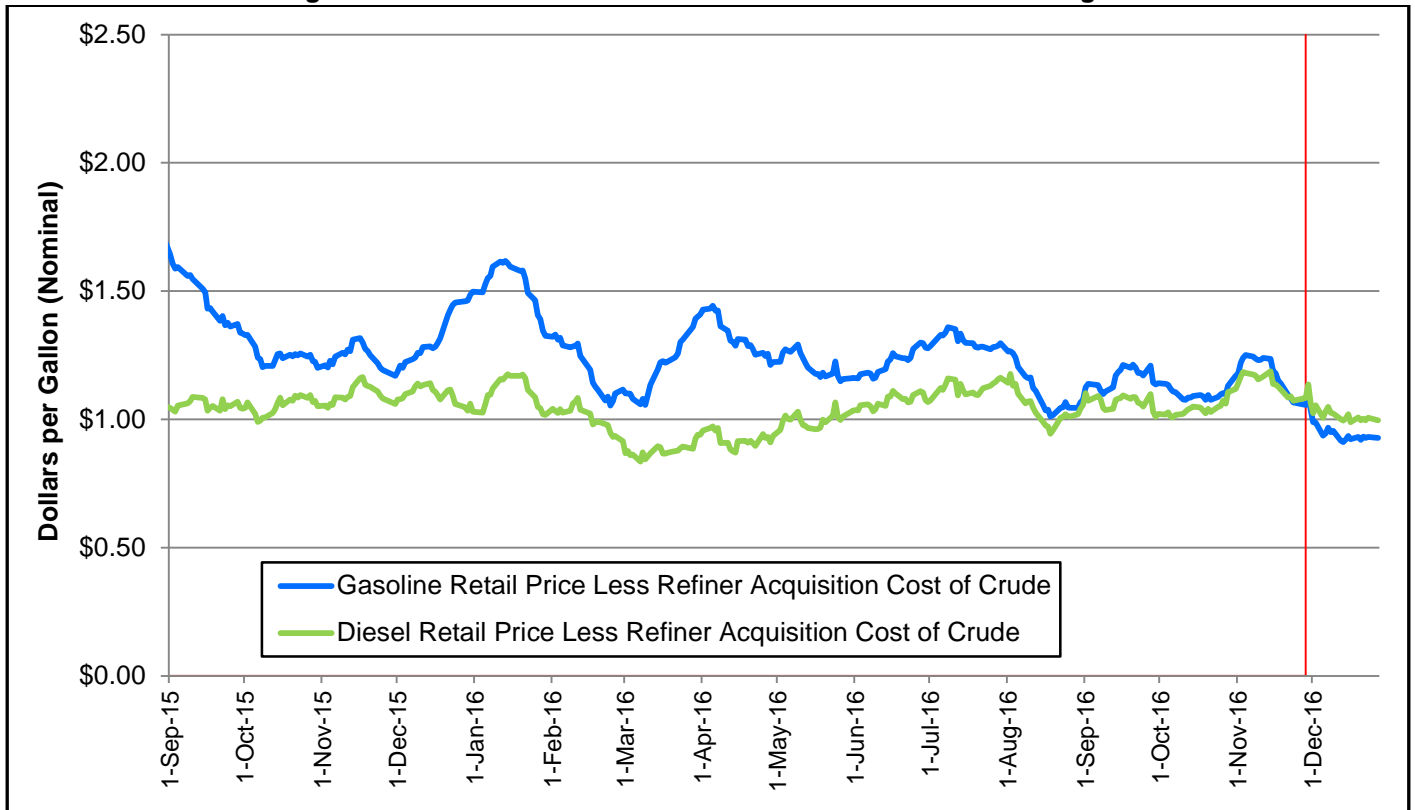
Source: U.S. EIA

California diesel prices increased in December reaching \$2.87 on December 26 (**Figure 4**), an increase of \$0.07 compared to the last week in November. U.S. prices rose faster than California, increasing \$0.12 to end the month at \$2.52. California prices averaged \$0.36 higher than U.S. prices through the first half of December, but this decreased to \$0.33 in the last two weeks of December. California consistently averaged \$0.35 over U.S. retail prices throughout 2016.

Prior to 2015, diesel fuel maintained a premium to gasoline prices by more than \$0.20 over the previous five years. Gasoline rose above diesel in 2015 due to a turbulent year of unplanned refinery outages. Gasoline prices stayed an average of \$0.12 higher than diesel for 20 months. December 2016 saw gasoline prices fall back to historical norms below diesel as refineries returned from planned maintenance. Retail diesel was marked \$0.16 higher than gasoline on December 26.

<u>Diesel Prices</u>	
<u>December 2016 vs 2015</u>	
(Percent Change)	
California	2% higher
U.S.	1% lower
West Coast	3% higher
<u>December 2016 Averages</u>	
California	\$2.85
U.S.	\$2.51
West Coast	\$2.70
<u>Week of December 26, 2016</u>	
California	\$2.87
U.S.	\$2.54
West Coast	\$2.72

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



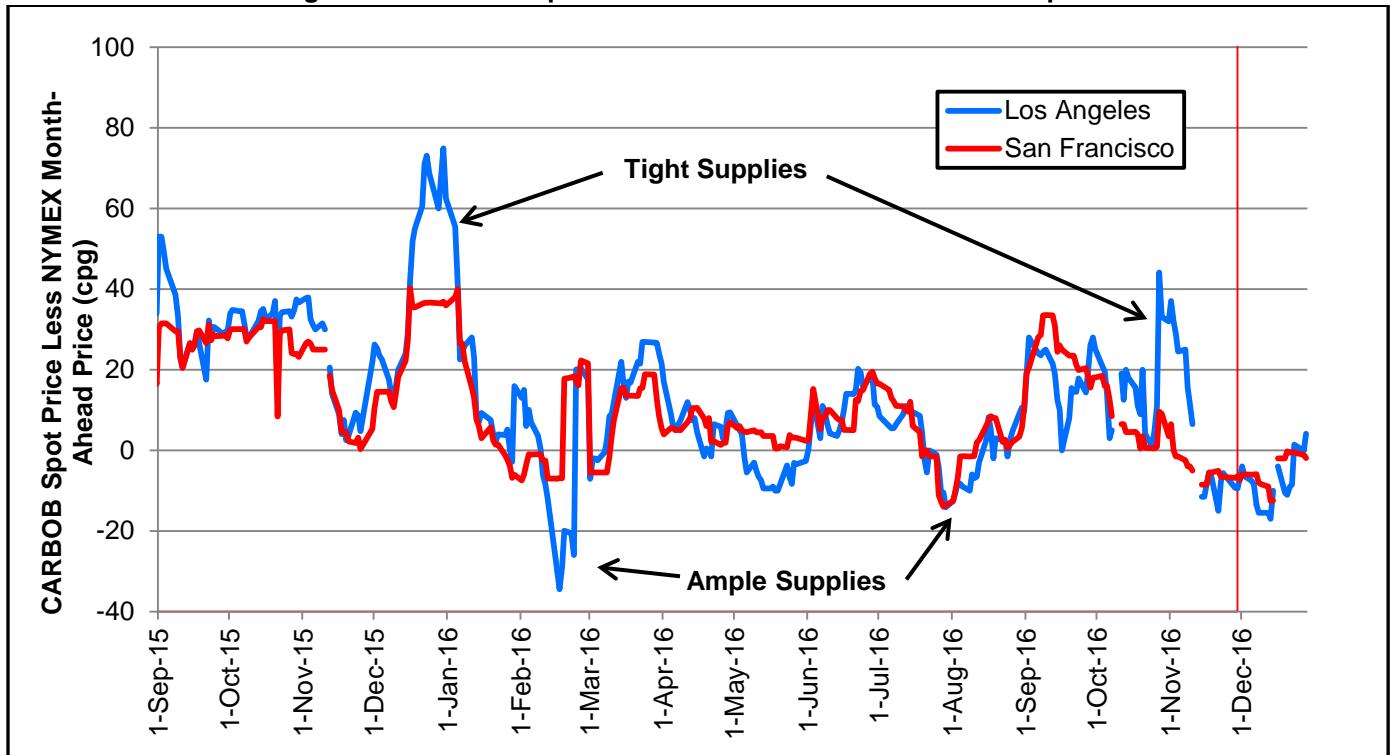
Source: U.S. EIA and OPIS

For December, the California Refinery Acquisition Cost (CA-RAC)-to-ex-tax retail gasoline margin decreased \$0.15 to \$0.93, while the diesel margin decreased \$0.08 to \$1.00 (**Figure 5**). This marks the first month that the gasoline margin has averaged under \$1.00 and less than the diesel margin since February 2015. Both margins have decreased since the same month last year, 29 percent and 7 percent lower respectively.

In 2016, the California gasoline margin reached the highest level of \$1.62 early on January 13 and the lowest level at \$0.91 on December 13. The diesel margin, on the other hand, had an opposite experience. That margin set an annual low at \$0.84 on March 7 and an annual high at \$1.19 on November 14.

<u>Crude to Retail Margins</u>	
<u>December 2016 vs 2015</u>	
(Percent Change)	
Gasoline	29% lower
Diesel	7% lower
<u>December 2016 Averages</u>	
Gasoline	\$0.94
Diesel	\$1.14
<u>December 27, 2016</u>	
Gasoline	\$0.93
Diesel	\$1.08

Figure 6: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

December Los Angeles (LA) and San Francisco (SF) less New York Mercantile Exchange (NYMEX) spot gasoline price differentials ended 2016 on a calm note. After reaching \$0.44 on October 27, the LA-less-NYMEX differential started December at -\$0.04 and didn't exceed \$0.04 at any point in the month. Of the 18 days in December that both markets traded (gaps in chart data represent Thanksgiving holiday), 16 days finished with a negative LA-less-NYMEX differential with -\$0.17 occurring on December 13 (Figure 6).

The SF-less-NYMEX differential started December in the negative as well. Unlike the LA-less-NYMEX differential, the SF-less-NYMEX differential never rose into the positive range in December. During the month, it reached a high of a negative quarter of a penny and a low of -\$0.12.

Both differentials stayed negative due to California refiners' continual increasing production of gasoline throughout December (Figure 8). While both Northern and Southern California refiners increased their production in December, Southern California increased its production from roughly 4 million barrels per week (bpw) to 4.5 million bpw in the final week of 2016 (setting a new production high for the year¹). Northern California production rose from roughly 2.4 million bpw to 2.8 million bpw, but unlike Southern California, it stayed on the low end of the five-year high-low band.

Gasoline Spot-Futures Spread

December 2016 vs 2015

Los Angeles	50¢ lower
San Francisco	31¢ lower

December 2016 Averages

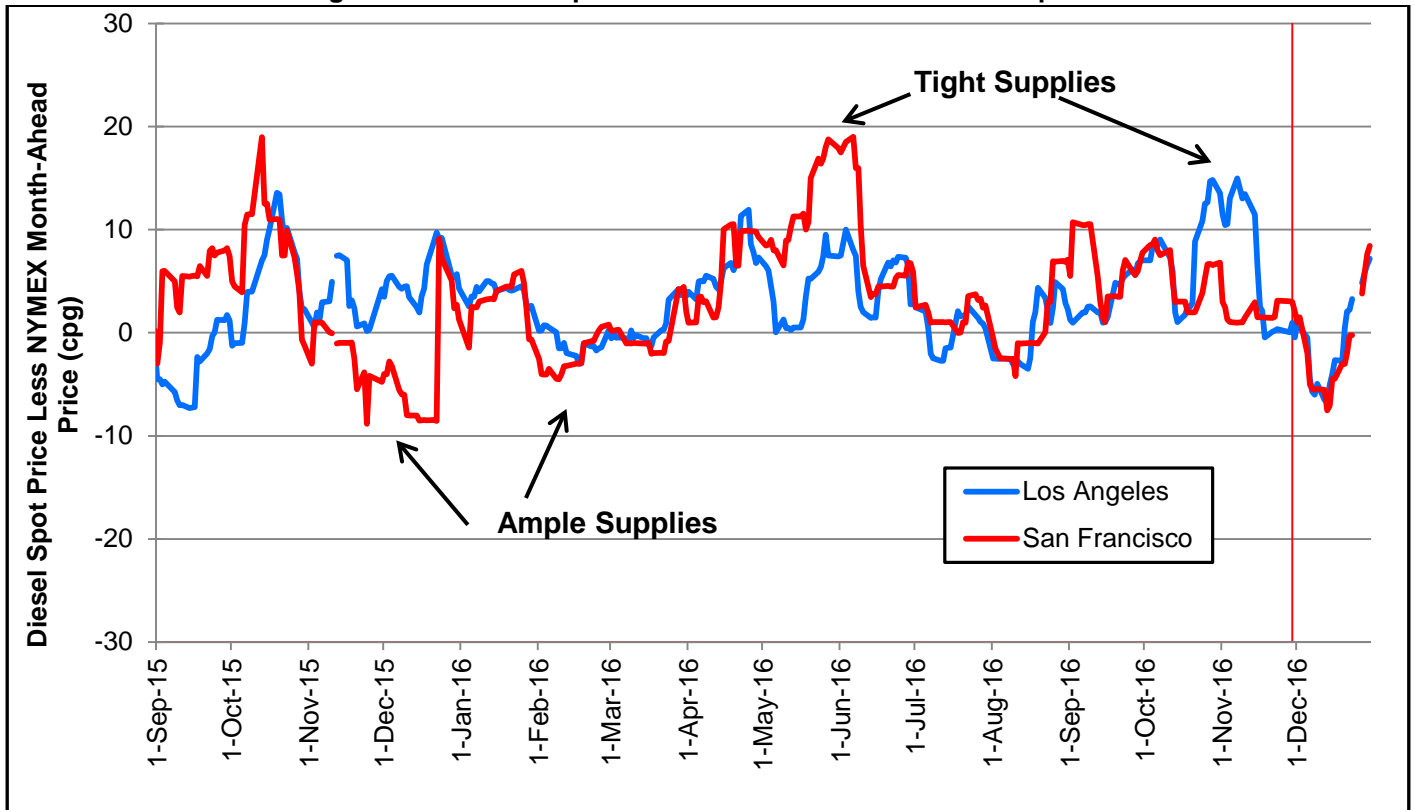
Los Angeles	-8¢
San Francisco	-5¢

December 28, 2016

Los Angeles	4¢
San Francisco	-2¢

¹ See Energy Commission Weekly Fuels Watch at http://www.energy.ca.gov/almanac/petroleum_data/fuels_watch/output.php.

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

Both LA-less-NYMEX and SF-less-NYMEX diesel spot market differentials saw yet another reversal in December 2016 (Figure 7). On November 29, both spreads started \$0.01 above NYMEX on December 1. On December 13, both LA and SF differentials decreased to -\$0.07, the largest discount of the year. Within a week, the spread was positive, with LA and SF spreads increasing sharply to roughly \$0.08 on December 30. These rising spot market differentials appear to reflect lower California diesel production in December and the lowest diesel inventories in the past four months (Figure 11). This could be due to the delayed restart of the Chevron Richmond refinery hydrotreater or the hydrocracker shutdown at Phillips 66 Rodeo refinery.

Irrespective of December's differential increase, the December average LA-less-NYMEX and SF-less-NYMEX differentials were still negative at -\$0.01 and -\$0.02 respectively, which are \$0.06 lower and \$0.02 higher than a year-ago averages.

For 2016, the highest SF-less-NYMEX differential was \$0.19 in early June caused by loss of production from two Northern California refineries undergoing maintenance, while the highest LA-less-NYMEX differential was \$0.15 in early November due to hydrogen supply issues at Southern California refineries.

Diesel Spot-Futures Spread

December 2016 vs 2015

Los Angeles	6¢ lower
San Francisco	2¢ higher

December 2016 Averages

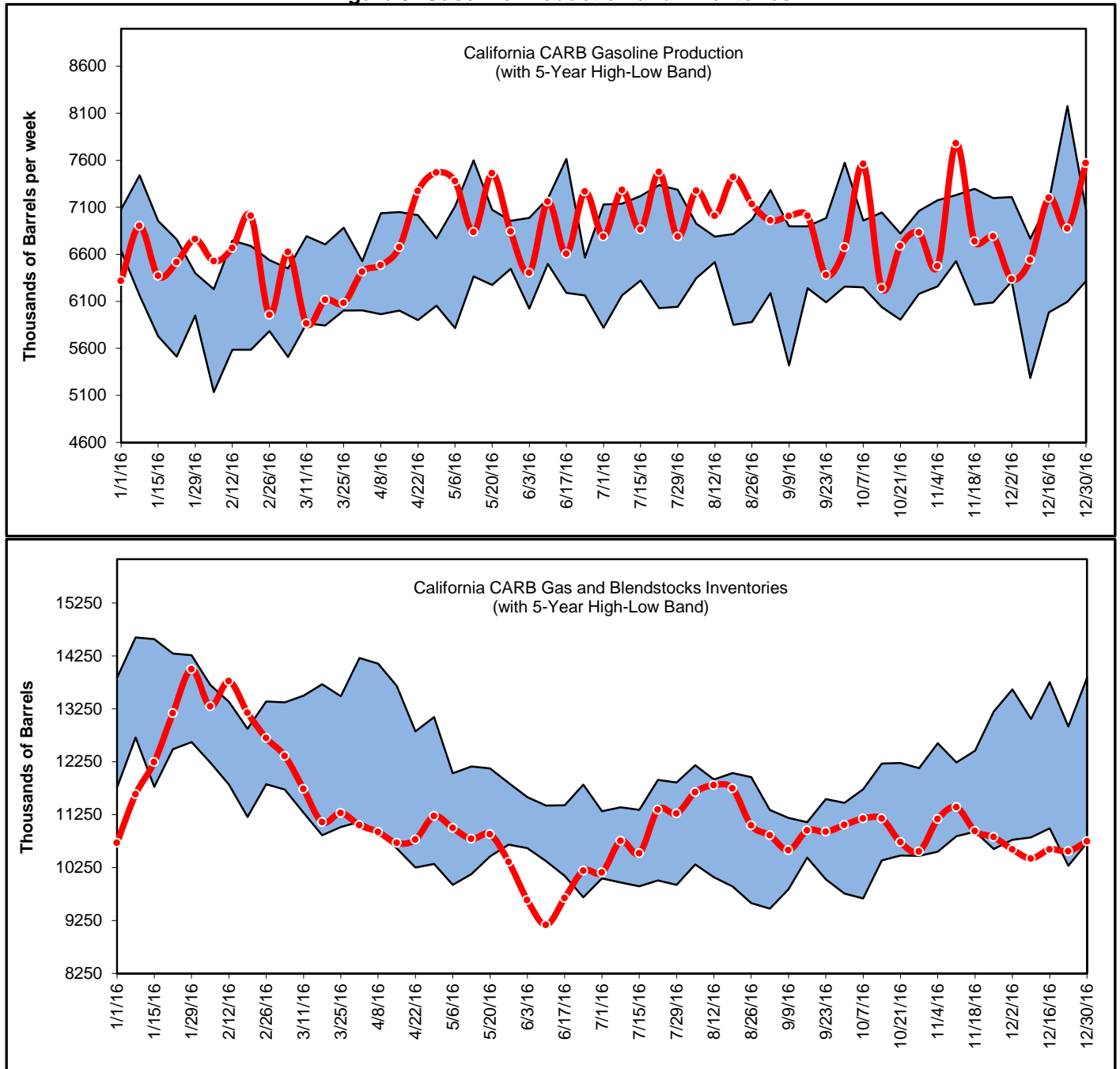
Los Angeles	-1¢
San Francisco	-2¢

December 30, 2016

Los Angeles	7¢
San Francisco	8¢

California Gasoline and Diesel Production and Inventories

Figure 8: Gasoline Production and Inventories

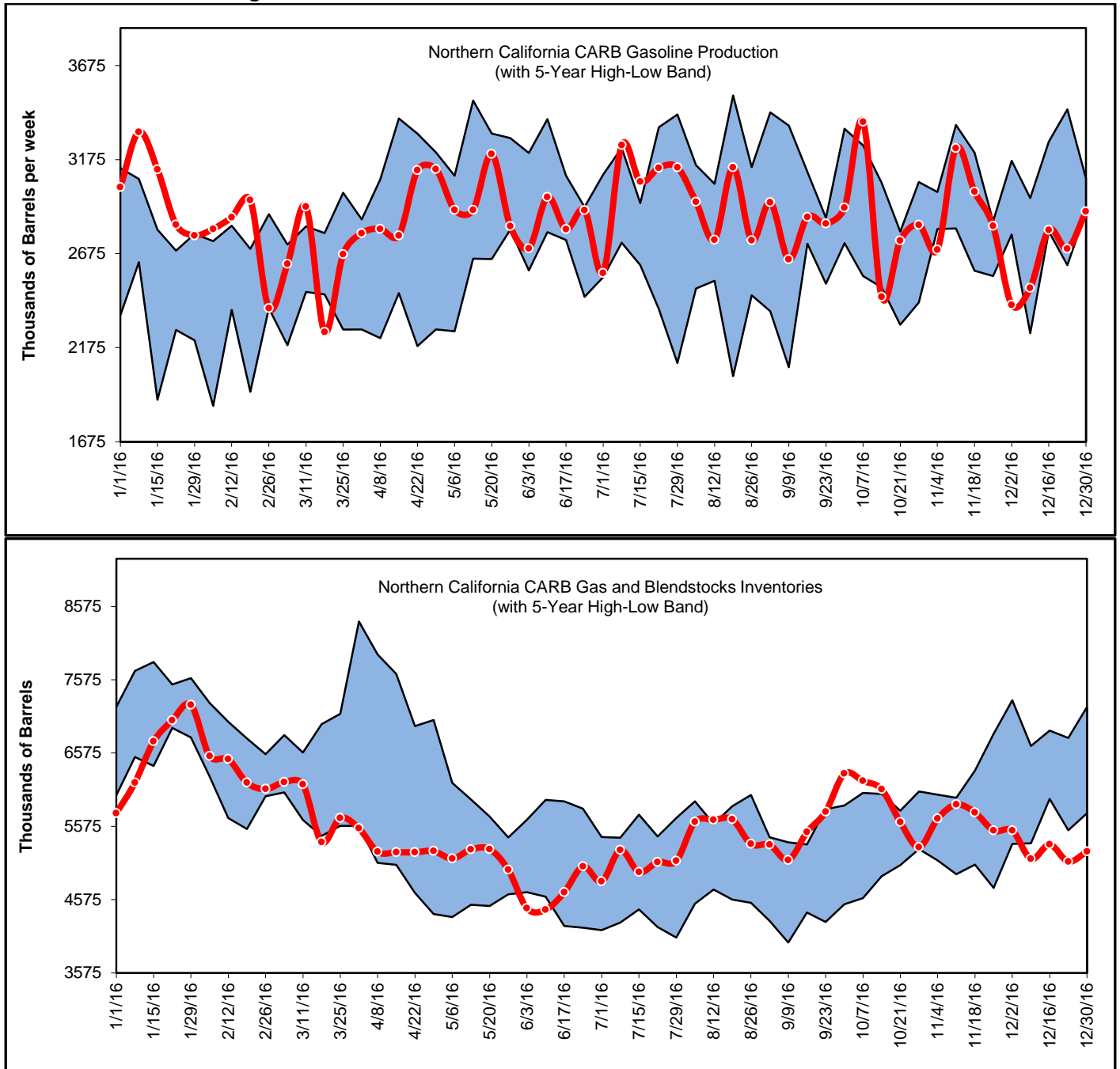


Source: PIIRA data

California gasoline production from November 25 through December 30 began at 6.3 million barrels per week (bpw) and ended above the five-year band at 7.6 million bpw. Production averaged at 6.9 million compared to 6.6 million bpw a year ago. This ramp in production is due to refineries wrapping up winter turnaround activities (**Figure 8**).

California gasoline inventories the same time dipped in the first half of December as demand was strong during the holidays with the cheapest retail prices at the pump in three months according to EIA. Despite that, inventory levels averaged 10.6 million barrels, similar to 2015.

Figure 9: Northern California Gasoline Production and Inventories

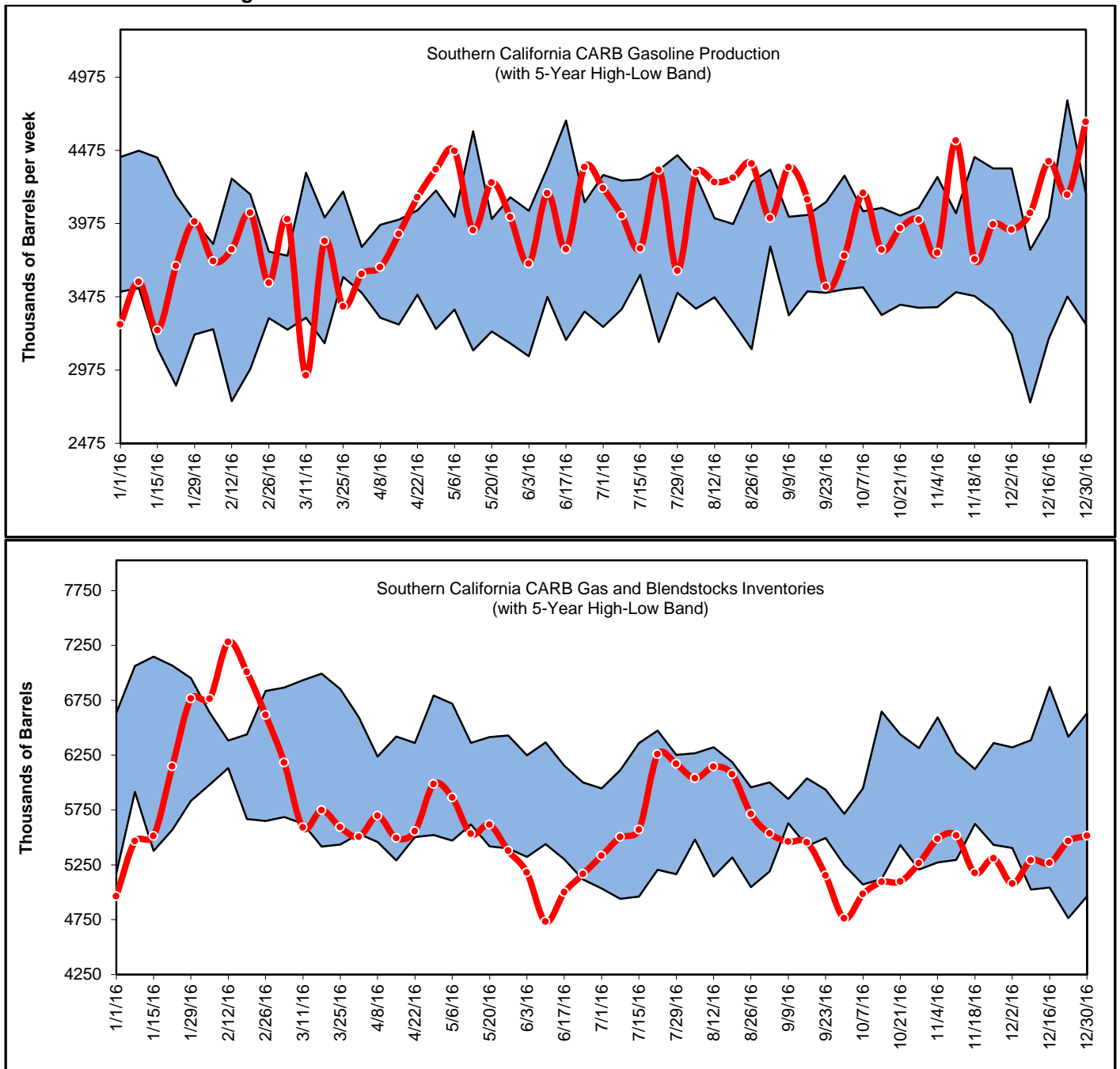


Source: PIIRA data

Northern California gasoline production hovered around the five-year band and on December 30 ended at 2.9 million bpw. This is likely due to the winter turnaround work at the Chevron Richmond refinery (**Figure 9**).

Inventory levels during this time began at 5.5 million barrels on November 25 and finished below the five-year band on December 30 at 5.2 million barrels. Northern California gasoline inventory levels reflected the lack in production as it averaged at 5.3 million barrels compared to 5.6 million barrels in 2015.

Figure 10: Southern California Gasoline Production and Inventories

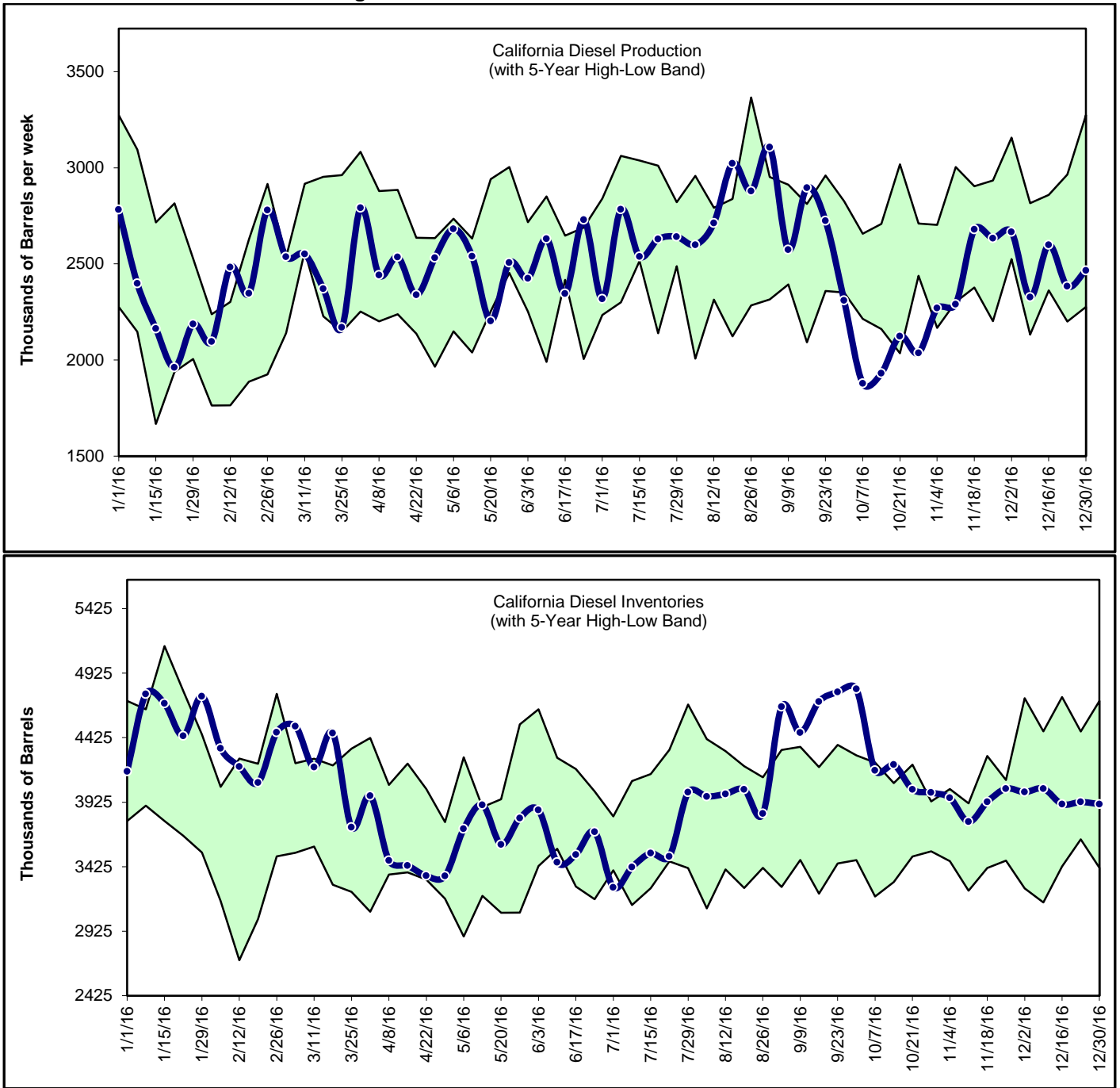


Source: PIIRA data

Southern California gasoline production during the week of November 25 through December 30 stayed around the top of the five-year band as it began at 4 million bpw and finished at 4.7 million bpw, setting a new high (**Figure 10**). Production levels averaged much higher than last year at 4.2 million bpw compared to 3.4 million bpw in 2015. This is likely a result of Southern California refineries wrapping up the winter turnaround and to compensate the low production and inventories levels in Northern California.

Southern California inventory levels during the same period began at 5.3 million barrels and slowly rose to 5.5 million barrels.

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 bpw 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.