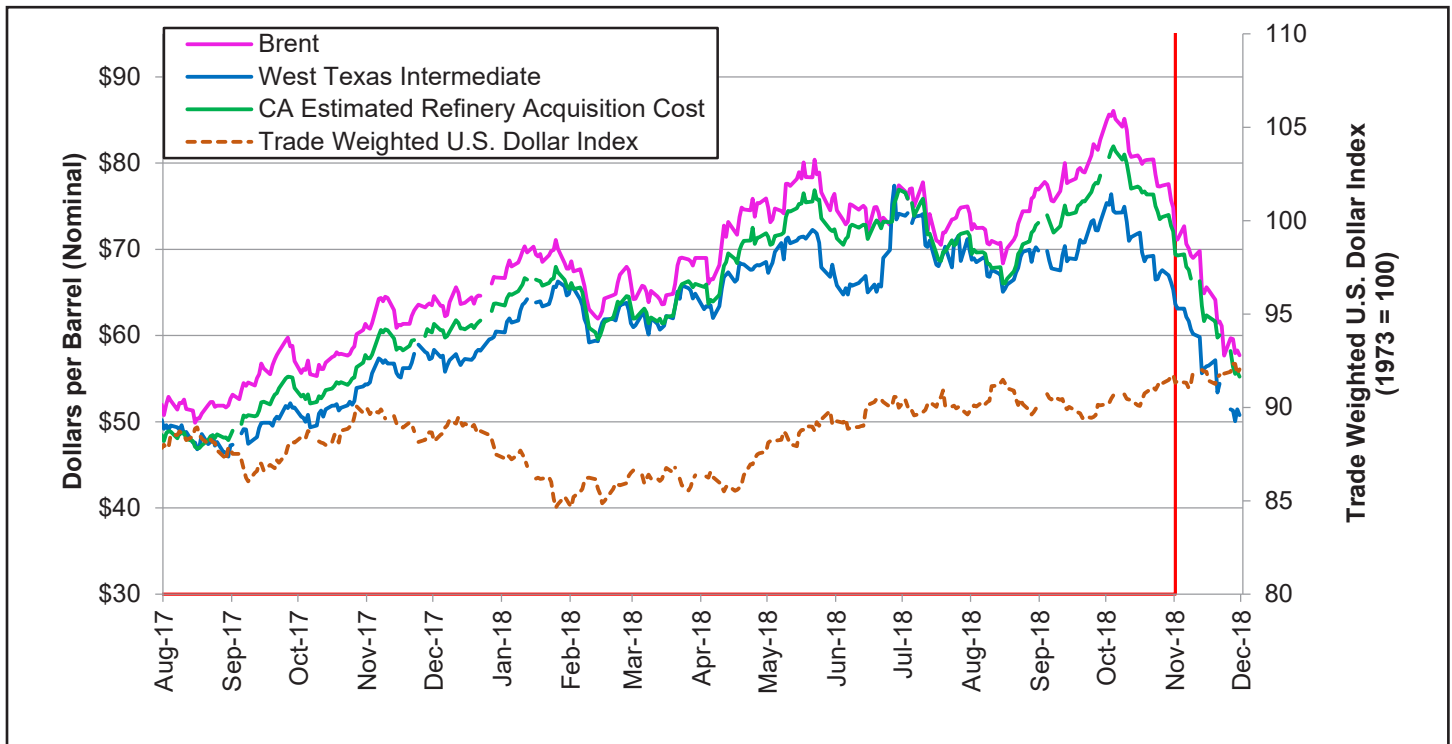


CRUDE OIL PRICES

Figure 1: Daily West Coast Spot Crude Oil Prices



Source: U.S. Energy Information Administration (EIA), Oil Price Information Service (OPIS) and Federal Reserve Bank of St. Louis.

CRUDE OIL PRICES

November 2018 vs 2017

(Percent Change)

Brent 3% higher

WTI 1% higher

CA-RAC 5% higher

November 2018 Averages

Brent \$64.75

WTI \$56.96

CA-RAC \$62.45

November 30, 2018

Brent \$57.71

WTI \$50.78

CA-RAC \$55.24

Weakening economic indicators and strong production data brought crude oil spot prices to the lowest prices seen since November 2017 (**Figure 1**). Since the previous *Petroleum Watch*, spot prices for all grades were the highest on October 30. Brent was at \$75.68, WTI was at \$66.18, and California Estimated Refinery Acquisition Costs (CA-RAC) was at \$72.73.¹ Crude oil spot prices fell throughout November with the lowest prices closing on November 30 (**sidebar**). By November 30, Brent, WTI, and CA-RAC had fallen by \$17.97, \$15.40, \$17.49, respectively.

The price difference between Brent and WTI narrowed to less than \$7.00. Sellers of WTI could not maintain the discount while prices were falling across the

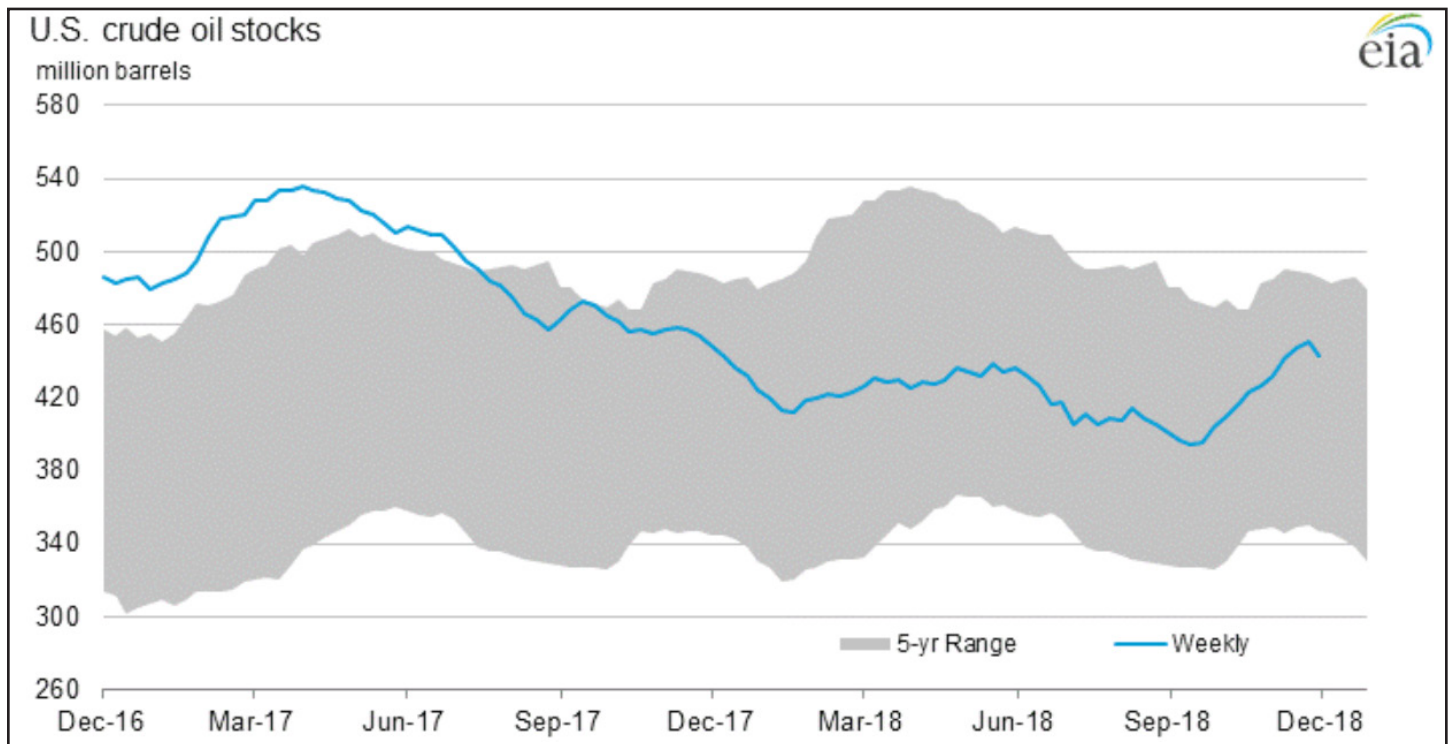
world. WTI fell by \$2.47 less than Brent. This fall brought the Brent-minus-WTI spread closer to levels seen in 2017.

Crude oil spot prices went from the highest prices seen since 2014 to the lowest to date for 2018. Demand indices showed increasing demand (**page 3**), but fear of a global economic slowdown overshadowed any news that would have strengthened prices. On November 11, the Organization of Petroleum Exporting Countries (OPEC) pledged to cut production to stop prices from sliding further.² This is in stark contrast to October 23, less than a month ago, when OPEC desperately signaled that it would strengthen production to prevent skyrocketing prices. Crude oil prices will continue to fluctuate as long as uncertainty over global economic health remains.

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

² "Oil prices rise as Saudi Arabia signals production cut," *The Guardian*, November 12, 2018 <https://www.theguardian.com/business/2018/nov/12/oil-prices-saudi-arabia-production-opec-khalid-al-falih>.

Figure 2: U.S. Crude Oil Inventories



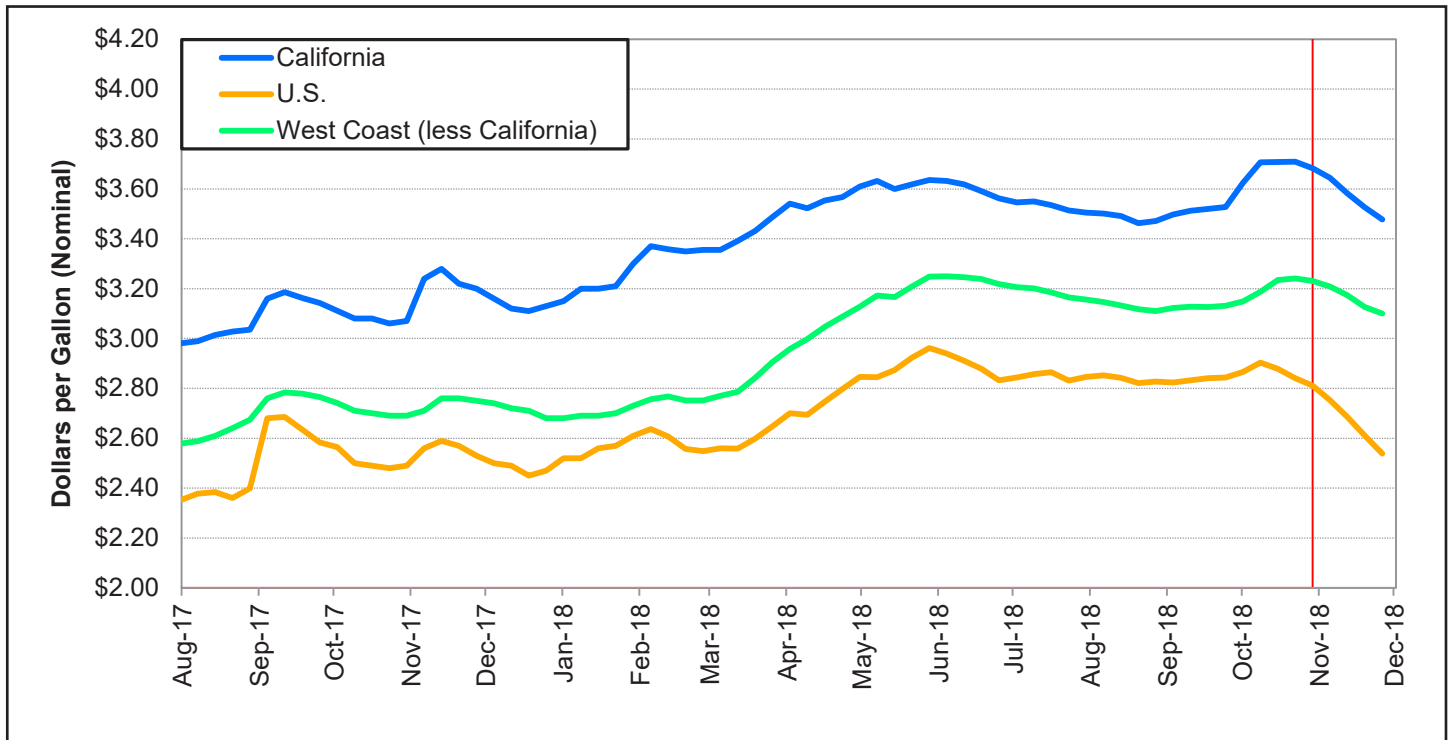
Source: U.S. Energy Information Administration

- U.S. crude oil production for November averaged 11.70 million barrels per day (bpd). This amount is 650,000 bpd higher than October's average of 11.05 million bpd. This is a 2.03 million bpd increase from November 2017, when production was 9.67 million bpd.
 - Crude oil imports increased over October by 81,000 bpd to 7.59 million bpd in November. Compared to November 2017 imports, this is an increase of 81,000 bpd.
 - U.S. crude oil refinery inputs increased by 772,000 bpd since October, finishing November at a four-week average of 17.08 million bpd. Refinery inputs are 173,000 bpd higher than a year ago.
 - Average U.S. crude oil inventory in November slightly increased from October to 443 million barrels from 426 million barrels. Current inventories are 4.9 million barrels lower than one year ago.
 - According to OPEC's November *Monthly Oil Market Report*, total October OPEC production increased by 127,000 bpd to 32.90 million bpd.³ OPEC revised down its crude oil demand growth forecast for the rest of 2018, down 40,000 bpd to 1.50 million bpd, with total oil demand for the rest of 2018 at 98.79 million bpd.
- Refinery inputs continue to increase as crude oil prices continue to fall (**page 2**). Crude oil stocks decreased after posting consecutive gains since September 2018 (**Figure 2**). The increase in inputs combined with falling crude prices imply product demand has increased enough that refiners needed to draw from inventories.
- Falling inventories could indicate problems in domestic crude oil production. Eliminating this possibility, the United States continues to report historically high production rates week after week. Despite the signs of ample supply, U.S. crude oil imports show year-over-year increases since November 16, furthering the case for increasing demand.

³ OPEC November *Monthly Oil Market Report*, page iii, page 57: http://www.opec.org/opec_web/en/publications/338.htm.

GASOLINE AND DIESEL RETAIL PRICES

Figure 3: Gasoline Retail Prices



Source: U.S. Energy Information Administration

GASOLINE PRICES

November 2018 vs 2017

(Percent Change)

California	10% higher
U.S.	3% higher
West Coast	15% higher

November 2018 Averages

California	\$3.56
U.S.	\$2.65
West Coast	\$3.15

November 26, 2018

California	\$3.48
U.S.	\$2.54
West Coast	\$3.10

Gasoline retail prices continued to decline from October into November (Figure 3). The monthly average prices for California, United States, and West Coast (less California) decreased by \$0.13, \$0.21, and \$0.06, respectively (sidebar). On November 26, the average price for a gallon of gasoline was \$3.48 in California, \$2.54 in the United States, and \$3.10 on the West Coast. The price difference between California and the United States was \$0.94. This is the largest difference since August 2015. At almost a dollar less, the U.S. price dropped much faster than California.

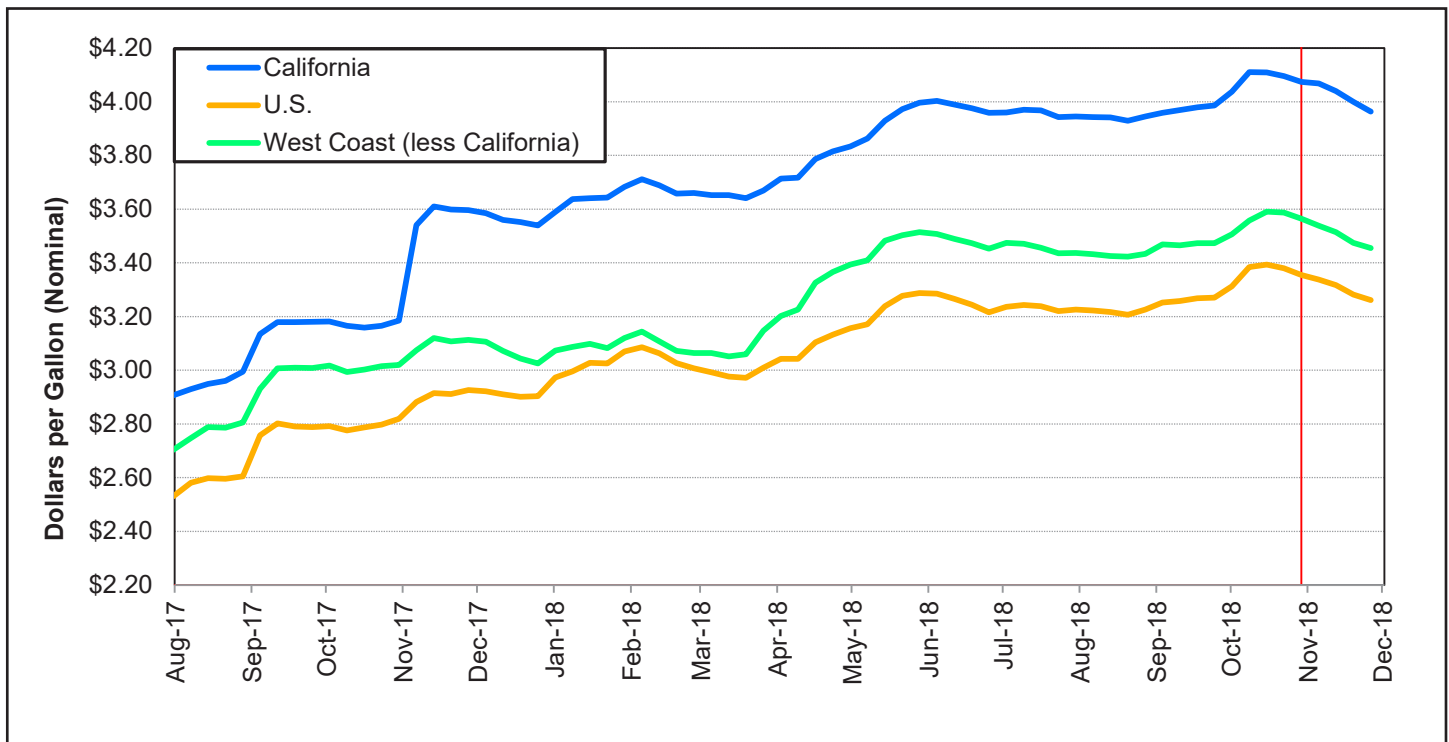
One factor directly related to gasoline prices is crude oil prices. Crude oil prices fell greatly in November amid heavy global production (page 2), with too much supply leading to lower prices. This

principle was shown in the U.S. prices as the falling cost of crude oil prompted gasoline prices to fall. California prices did not fall as quickly because supplies were tight in November. Low inventories were due to maintenance at several refineries. Gasoline inventories were 1.76 million barrels lower year over year and near the bottom of the five-year range (page 8).

In autumn, refineries switch from summer to winter-blend gasoline. This switch also contributes to lower prices because winter-blend gasoline is less expensive to produce.

GASOLINE AND DIESEL RETAIL PRICES

Figure 4: Diesel Retail Prices



Source: U.S. Energy Information Administration

DIESEL PRICES

November 2018 vs 2017

(Percent Change)

California	12% higher
U.S.	13% higher
West Coast	13% higher

November 2018 Averages

California	\$4.02
U.S.	\$3.30
West Coast	\$3.50

Week of November 26, 2018

California	\$3.96
U.S.	\$3.26
West Coast	\$3.46

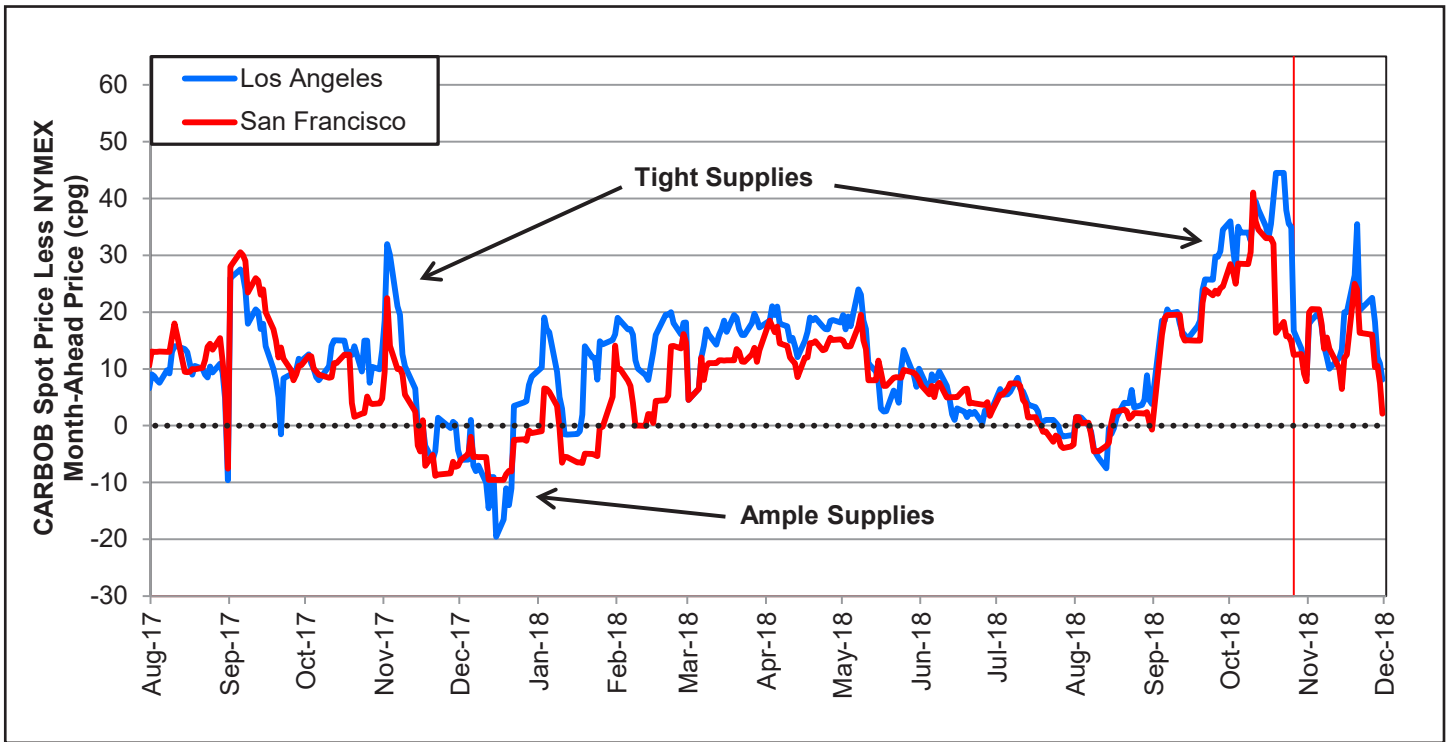
Retail diesel prices in California fell in November (**Figure 4**). For the month, the average price for a gallon of diesel was \$4.02 (**sidebar**). This is \$0.07 lower than the October average of \$4.09. The month started with an average price of \$4.07. By November 26, the price fell to \$3.96.

The United States and West Coast (less California) prices also fell. The November average for the United States was \$3.30. This is \$0.07 lower than the October average of \$3.37. The West Coast (less California) November average was \$3.50. This was a decrease of \$0.06 from the October average of \$3.56.

Crude oil prices have been declining since early October (**Figure 1**). U.S. crude inventories had been growing since mid-September, then declined in the last week of November (**Figure 2**). The low prices and strong inventories have helped bring down diesel prices. Retail prices are likely to continue to decline to catch up to the drops in crude oil prices and California diesel spot prices (**page 8**).

SPOT MARKET SPREADS

Figure 5: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. Energy Information Administration and OPIIS

GASOLINE SPOT - FUTURES SPREAD

November 2018 vs 2017

Los Angeles	10¢ higher
San Francisco	13¢ higher

November 2018 Averages

Los Angeles	17¢
San Francisco	14¢

November 30, 2018

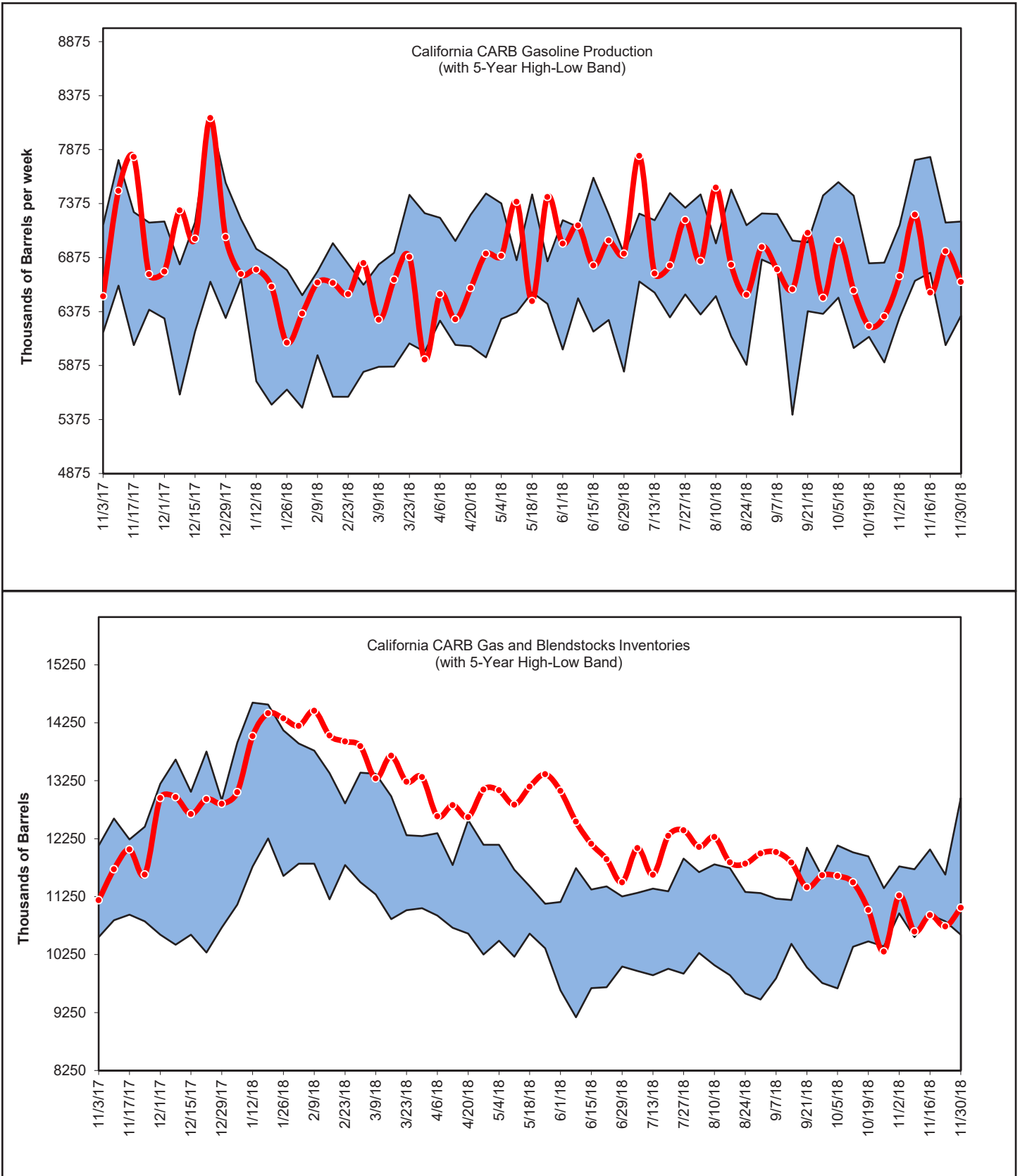
Los Angeles	8¢
San Francisco	2¢

The Los Angeles (LA) and San Francisco (SF) gasoline spot less New York Mercantile Exchanges (NYMEX) futures spreads declined this month. The LA average for November was \$0.17, \$0.15 less than October (sidebar). The SF average was \$0.14, \$0.10 less than October. From October 31 to November 20, the LA spread increased from \$0.09 to \$0.35, respectively. The LA spread then decreased to a monthly low of \$0.08 on November 30 (Figure 5). The SF spread followed a similar trend. From October 31 to November 20, the SF spread increased from \$0.08 to \$0.24, respectively. The SF spread then decreased to a monthly low of \$0.02 on November 30.

California gasoline production was strong for all weeks of the month except November 16. On November 16, production was 6.5 million barrel per week (bpw) and was below the five-year band by 184,000 barrels (Figure 6). Inventory averaged 10.9 million barrels in November. This average was 1 percent above the five-year-band low of 10.7 million barrels. From a historical view, gasoline production and inventories are likely to increase into early next year. The increase is likely because of the early season winter-blend fuel that refineries started producing in November.

SPOT MARKET SPREADS

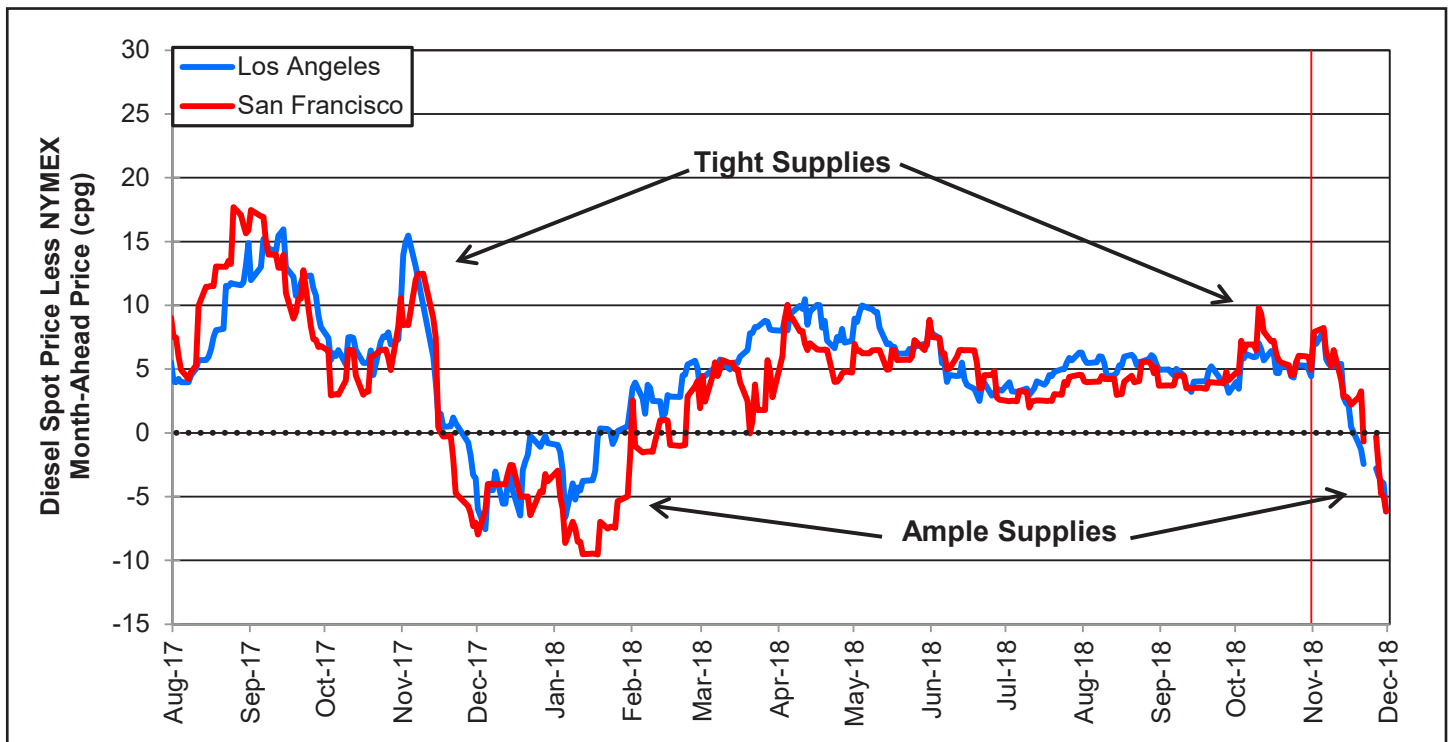
Figure 6: Gasoline Production and Inventories



Source: California Energy Commission PIIRA data

SPOT MARKET SPREADS

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. Energy Information Administration and OPIS

DIESEL SPOT - FUTURES SPREAD

November 2018 vs 2017

Los Angeles	3¢ lower
San Francisco	same

November 2018 Averages

Los Angeles	2¢
San Francisco	3¢

November 26, 2018

Los Angeles	-6¢
San Francisco	-6¢

The LA and SF spreads declined into negative territory at the end of the month (Figure 7). On November 1, the LA and SF spreads started at \$0.08. On November 5, prices began to slide. The LA and SF spreads both declined to \$0.03 on November 13. Then SF commanded a premium with the largest gap between LA and SF on November 20 at -\$0.01 and \$0.03, respectively. By November 30, the LA and SF gap narrowed. LA lost \$0.05 and SF lost \$0.09, ending at -\$0.11 for LA and -\$0.08 for SF.

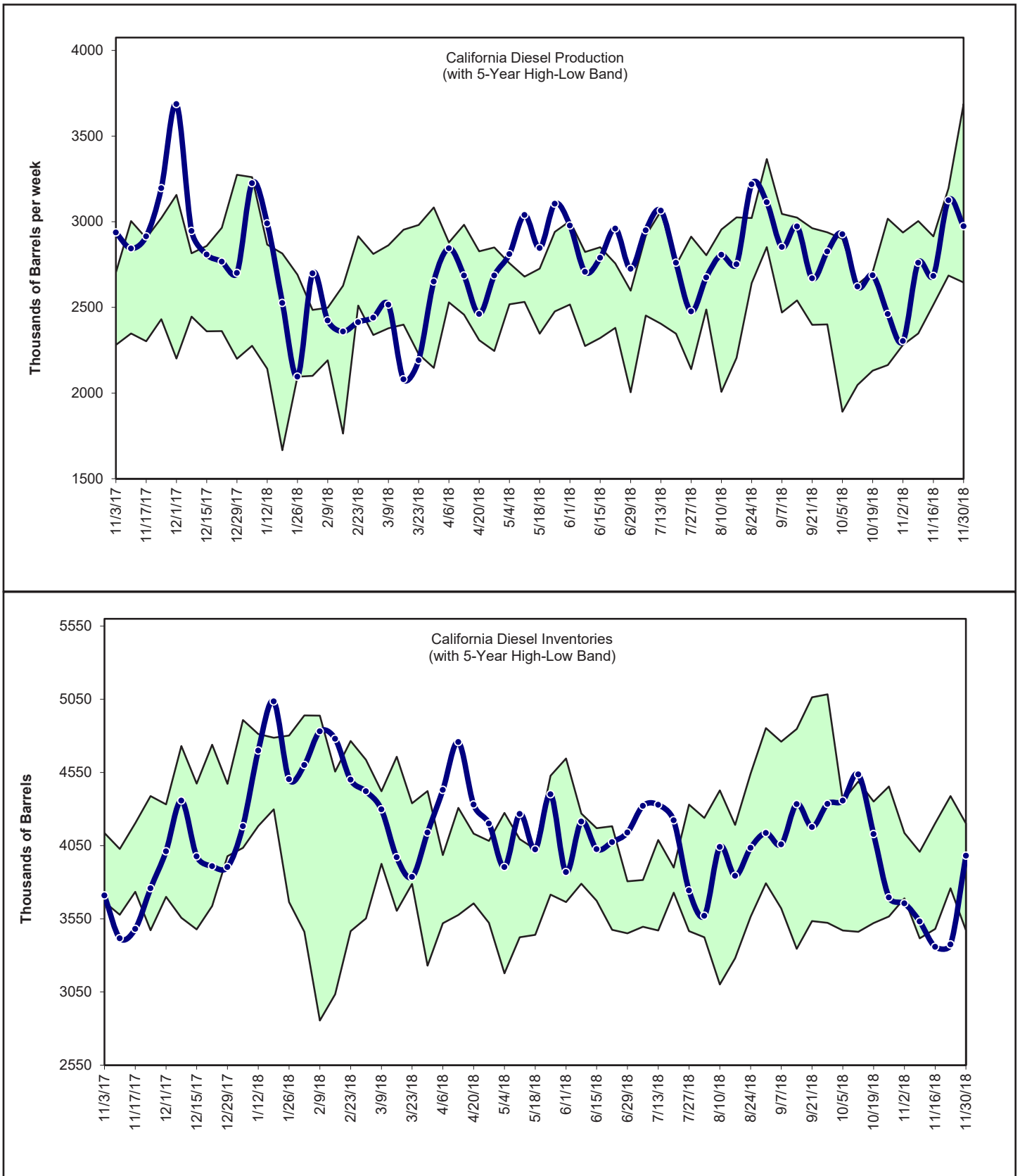
This is the second year in a row that the LA and SF spreads ended November at a discount. Despite

lower inventory, the spreads fell after November 5. NYMEX future prices found support with high heating oil demand that kept prices higher than California. This trend should continue into December assuming no major refinery events.

Production started at 2.3 million barrels per week (bpw) on November 2 (Figure 8). On November 30, production increased to 30 million bpw. This added 700,000 bpw to production for the month. Inventories started at 3.7 million barrels and dipped to 3.4 million barrels on November 16. Inventories bounced back and reached 4 million barrels on November 30.

SPOT MARKET SPREADS

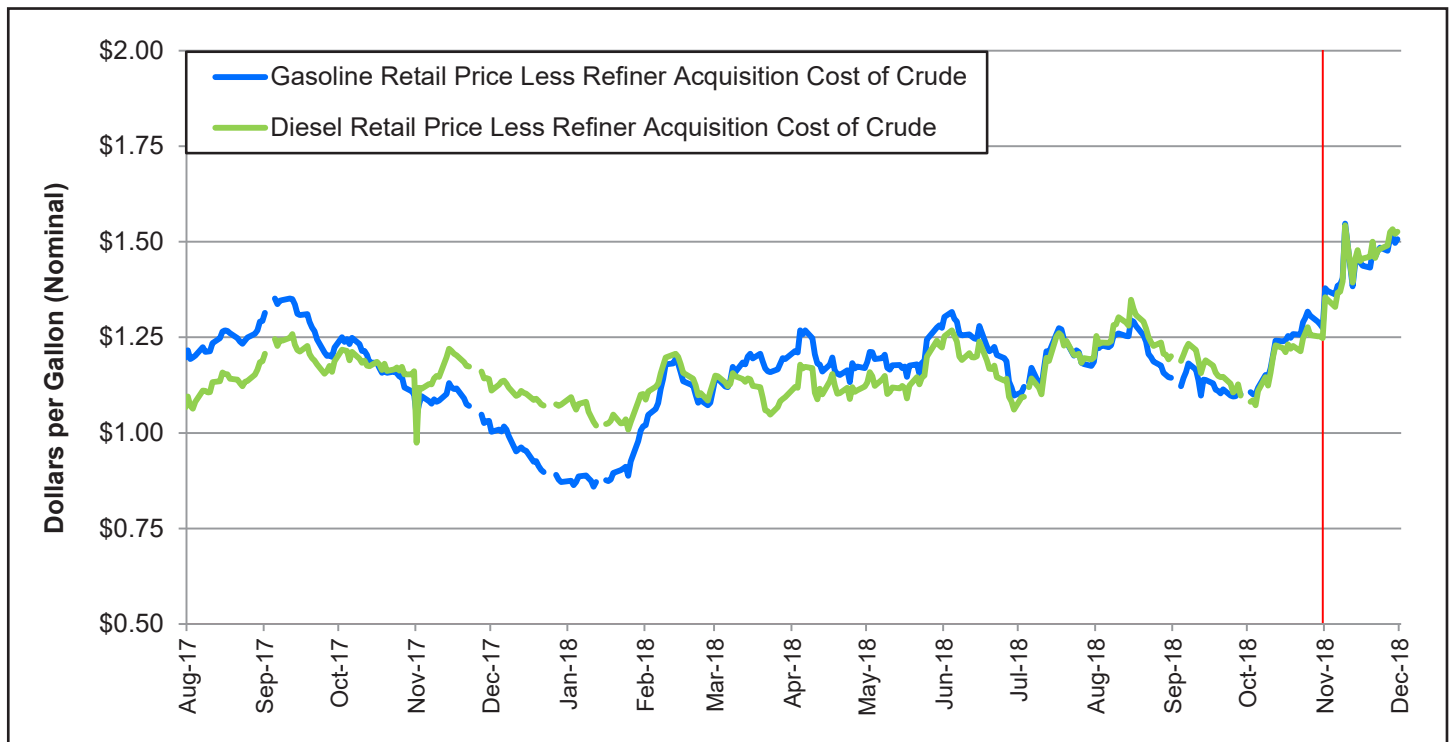
Figure 8: Diesel Production and Inventories



Source: California Energy Commission PIIRA data

GROSS MARGINS

Figure 9: Gross California Gasoline and Diesel Margins



Source: U.S. Energy Information Administration and OPIS

CRUDE TO RETAIL MARGINS

November 2018 vs 2017

Gasoline	34% higher
Diesel	26% higher

November 2018 Averages

Gasoline	\$1.45
Diesel	\$1.45

November 30, 2018

Gasoline	\$1.51
Diesel	\$1.53

Gross margins for California gasoline and diesel were below \$1.35 for most of 2017 and all of 2018. The margins rose to more than \$1.50 in November 2018 (**Figure 9**). The increase appears to be the result of a large drop in CA-RAC prices. This drop outpaced the nationwide declines in gasoline and diesel retail prices. California appears well supplied with fuel as the gasoline spread is in parity and the diesel spread is discounted to NYMEX. It is likely that these margins will fall as retail prices catch up to the normal price relationship to crude oil. This will occur through an increase in crude oil prices or a continued decrease in retail prices.

Another interesting trend emerged in the gross margins. Since February 2018, gasoline and diesel gross margins have averaged a \$0.02 difference from one another. From 2014 to 2017 the difference averaged \$0.08. More importantly, these margins varied noticeably over the years. No other recent time span showed them to be this close. It is unknown if this is a sign of the stability of the current California fuels market or something else.