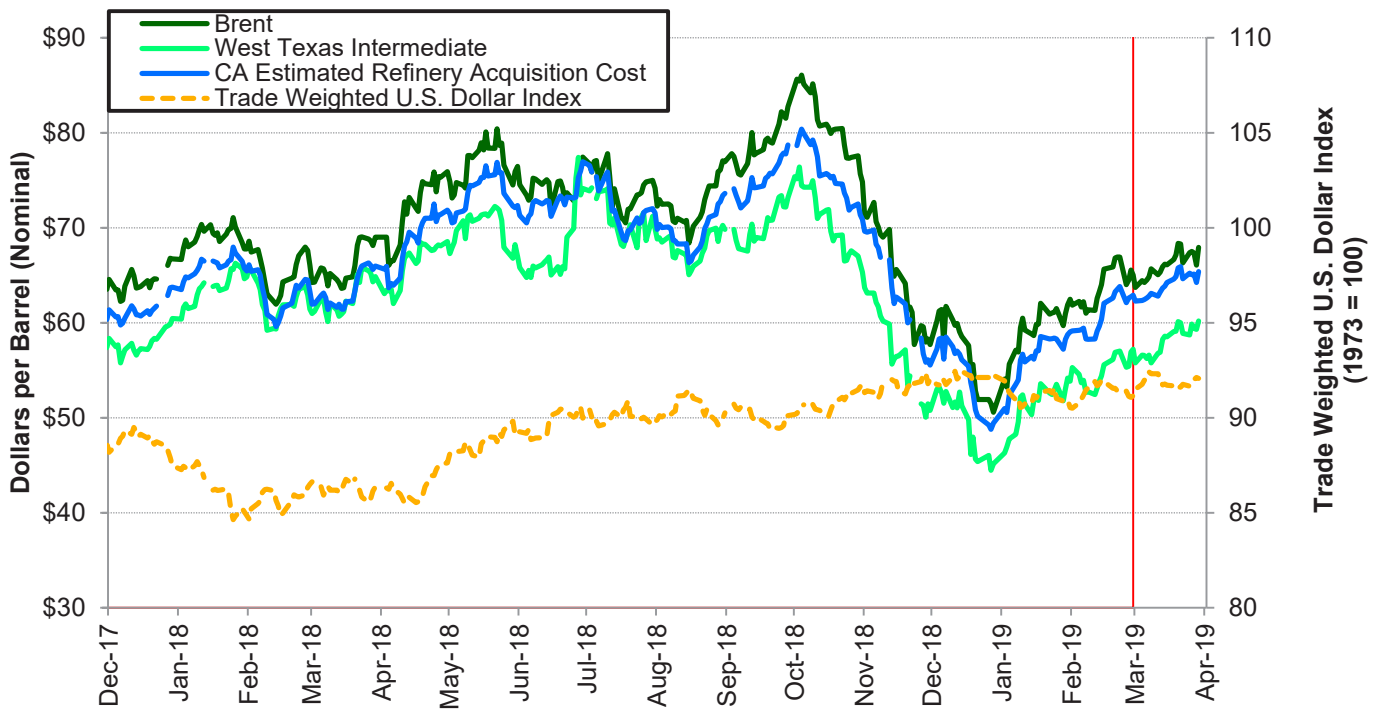


CRUDE OIL PRICES

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

March 2019 vs 2018

(Percentage Change)

Brent 0% change

WTI 7% lower

CA-RAC 1% higher

March 2019 Averages

Brent \$66.14

WTI \$58.15

CA-RAC \$64.00

March 29, 2018

Brent \$67.93

WTI \$60.19

CA-RAC \$65.39

Crude oil spot prices continued to climb in March as Brent, WTI, and California Refinery Acquisition Cost (CA-RAC) had monthly average increases of 4, 6, and 5 percent respectively.¹ WTI broke past the \$60 threshold for the first time since November 2018 and closed the session at a monthly peak of \$60.19. Meanwhile, Brent maxed out at \$68.35 on March 20 and CA-RAC reached \$65.89 on March 21 (Figure 1).

The Brent-WTI differential averaged \$7.99 for March, \$0.89 lower than for February. The spreads ranged from \$6.79 to \$9.89 in March, which is slightly narrower than February's range of \$6.57 to \$10.07. Since the start of 2019, Brent crudes have traded at an average premium of \$8.23 compared to WTI crudes.

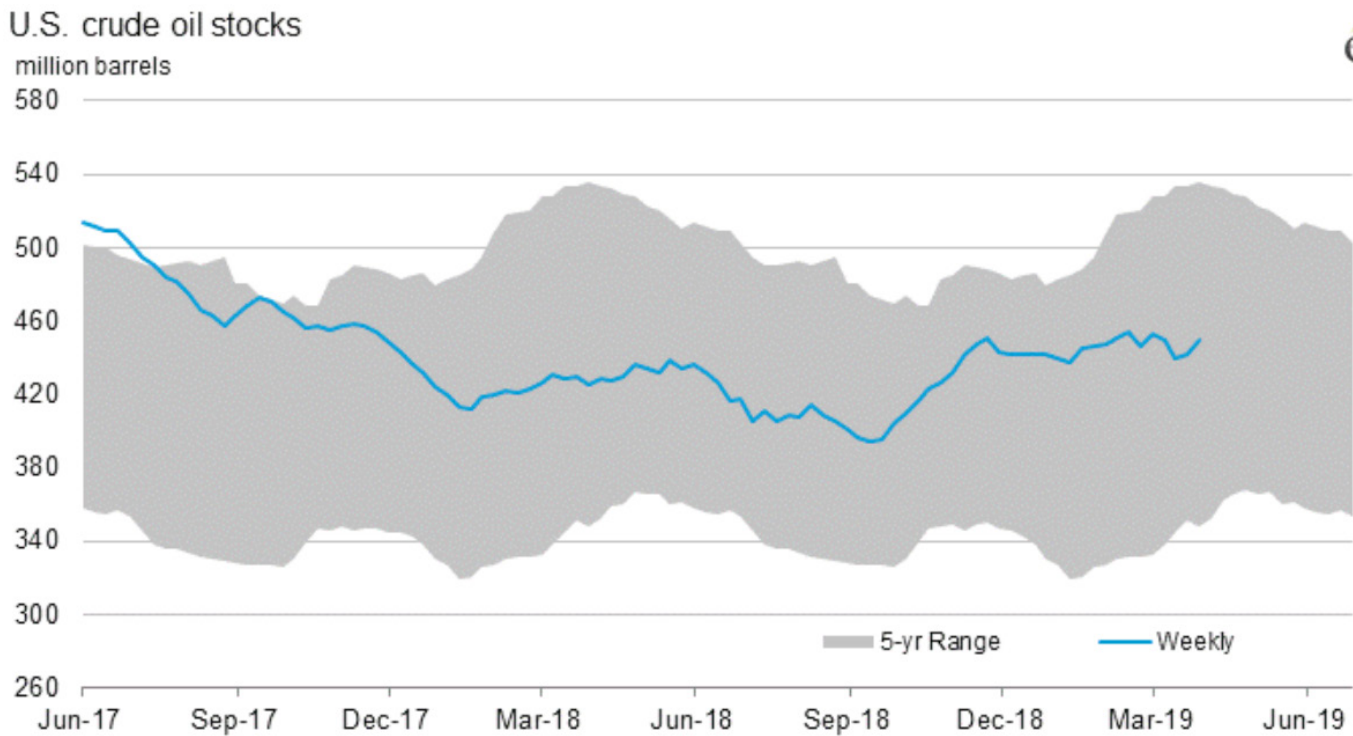
Despite the unabated rise in U.S. crude production (page 3), U.S. prices kept pace with Brent's growth rate. The forces responsible for this month's momentum are the same forces that drove prices upward in February. Russia and the Organization of the Petroleum Exporting Countries (OPEC) upheld their promise to slow production by 1.2 million barrels per day (bpd) while the United States continued market sanctions on Iranian and Venezuelan oil exports.²

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 amid OPEC's ongoing supply cuts, U.S. sanctions," Reuters, March 28, 2019, <https://www.reuters.com/article/global-oil/oil-prices-rise-amid-opecs-ongoing-supply-cuts-u-s-sanctions-idUSL3N21G09U>.

CRUDE OIL PRODUCTION & STORAGE

Figure 2: U.S. Crude Oil Inventories



Source: U.S. Energy Information Administration

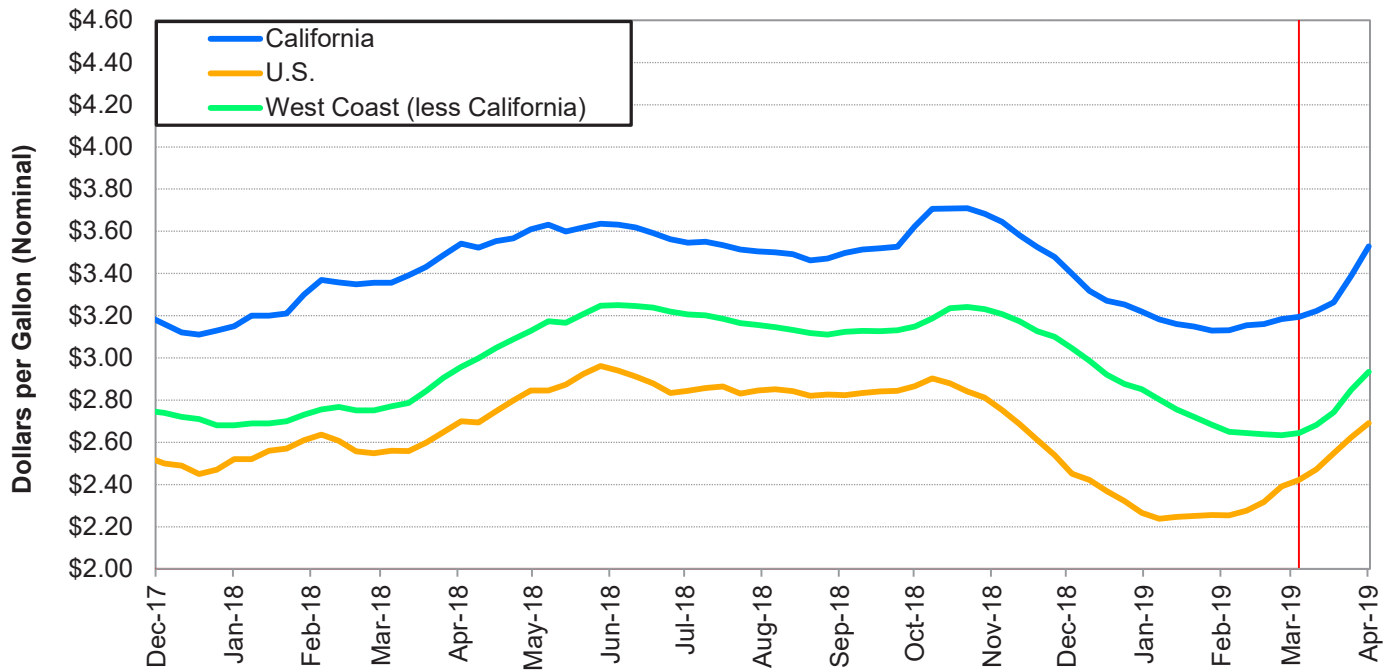
- U.S. crude oil production for March averaged 12.1 million bpd. This amount is 125,000 bpd higher than the February average of 11.97 million bpd. This is a 1.68 million bpd increase from March 2018, when production averaged 10.42 million bpd.
 - Crude oil imports increased from February's average by 45,000 bpd to 6.745 million bpd in March. Compared to March 2018 imports, this number is a decrease of 932,000 bpd.
 - U.S. crude oil refinery inputs had a minimal decrease of 25,000 bpd since February, finishing March at a four-week average of 15.975 million bpd. Refinery inputs are 740,000 bpd lower than a year ago.
 - U.S. crude oil inventory in March rose by 3.5 million barrels to 449.5 million barrels. Current inventories are 24.2 million barrels higher than March 2018 inventories.
 - According to OPEC's March Monthly Oil Market Report, total February OPEC production decreased by 221,000 bpd to 30.55 million bpd.³ Their global demand forecast for 2019 decreased slightly from 100.0 million bpd to 99.96 million bpd.
- Both imports and refinery inputs remained relatively unchanged from February while inventory levels rose, signifying that crude demand has stagnated. Even though demand has been gradually declining, U.S. production has yet to slow down. This is primarily due to surging output from the Permian Basin, which supplied 4.1 million bpd in March; overcoming Saudi Arabia's Ghawar field which has been the world's top producing field, with a production capacity of 3.8 million bpd.⁴

³ OPEC March Monthly Oil Market Report, page iii, page 45: http://www.opec.org/opec_web/en/publications/338.htm.

⁴ "The Biggest Saudi Oil Field Is Fading Faster Than Anyone Guessed," Bloomberg, April 2, 2019. <https://www.bloomberg.com/news/articles/2019-04-02/saudi-aramco-reveals-sharp-output-drop-at-super-giant-oil-field>.

GASOLINE AND DIESEL RETAIL PRICES

Figure 3: Gasoline Retail Prices



Source: U.S. Energy Information Administration

GASOLINE PRICES

March 2019 vs 2018

(Percentage Change)

California	4% lower
U.S.	3% lower
West Coast	3% lower

March 2019 Averages

California	\$3.27
U.S.	\$2.52
West Coast	\$2.73

Week of March 25, 2019

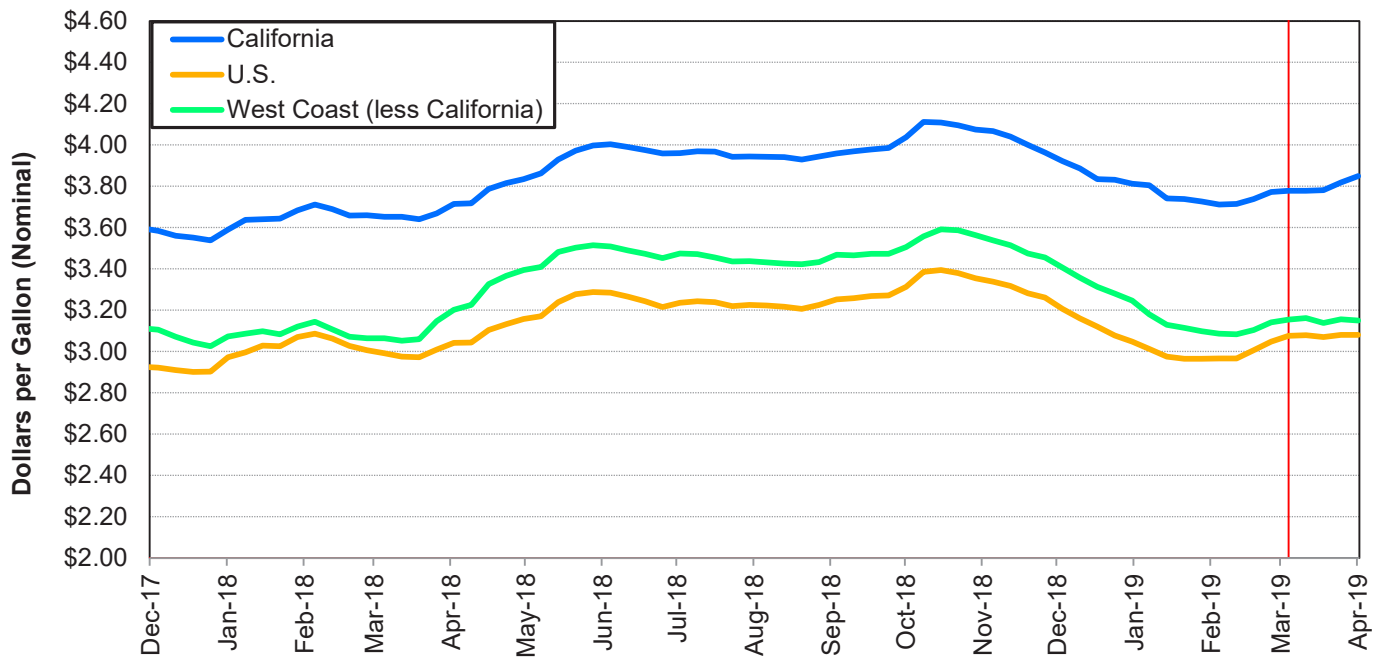
California	\$3.39
U.S.	\$2.62
West Coast	\$2.85

Gasoline retail prices rose across the United States. The California retail gasoline price increased \$0.19 from \$3.20 on March 4 to \$3.39 on March 25 and continued to increase to \$3.53 on April 1 (Figure 3). Despite a price hike of \$0.33 price from March 4 to April 1, the price remained 4 percent lower compared to same month last year. During that same time, the United States and West Coast (less California) prices followed a similar trend and increased \$0.27 and \$0.29 from March 4 to April 1, respectively.

With prices across the United States on an upward trend during the first quarter, the cost of a barrel of oil has been on the rise too (Figure 1). From January 7 to March 25, the U.S. gasoline price increased \$0.39 from \$3.18 to \$3.62 and Brent, WTI, and Alaska North Slope crude prices increased an average of \$13.63 for the first quarter (sidebar). In California, the largest price increases were on March 17 and March 21 following issues at several refineries (page 1).

GASOLINE AND DIESEL RETAIL PRICES

Figure 4: Diesel Retail Prices



Source: U.S. Energy Information Administration

DIESEL PRICES

March 2019 vs 2018

(Percentage Change)

California	4% higher
U.S.	3% higher
West Coast	2% higher

March 2019 Averages

California	\$3.79
U.S.	\$3.08
West Coast	\$3.15

Week of March 25, 2019

California	\$3.82
U.S.	\$3.08
West Coast	\$3.16

Diesel retail prices remained steady across the United States while prices in California increased at the end of March (Figure 4). The United States and West Coast (less California) prices followed a similar pattern, opening on March 4 at \$3.08 and \$3.16, respectively. Both prices remained until March 18 when the United States price dropped \$0.01 to \$3.07 and the West Coast price dropped \$0.02 to \$3.14. The United States and the West Coast prices returned to \$3.08 and \$3.16, respectively, on March 25. The California price began at \$3.78 on March 4 where it remained until March 25 when the price increased \$0.04 to \$3.82.

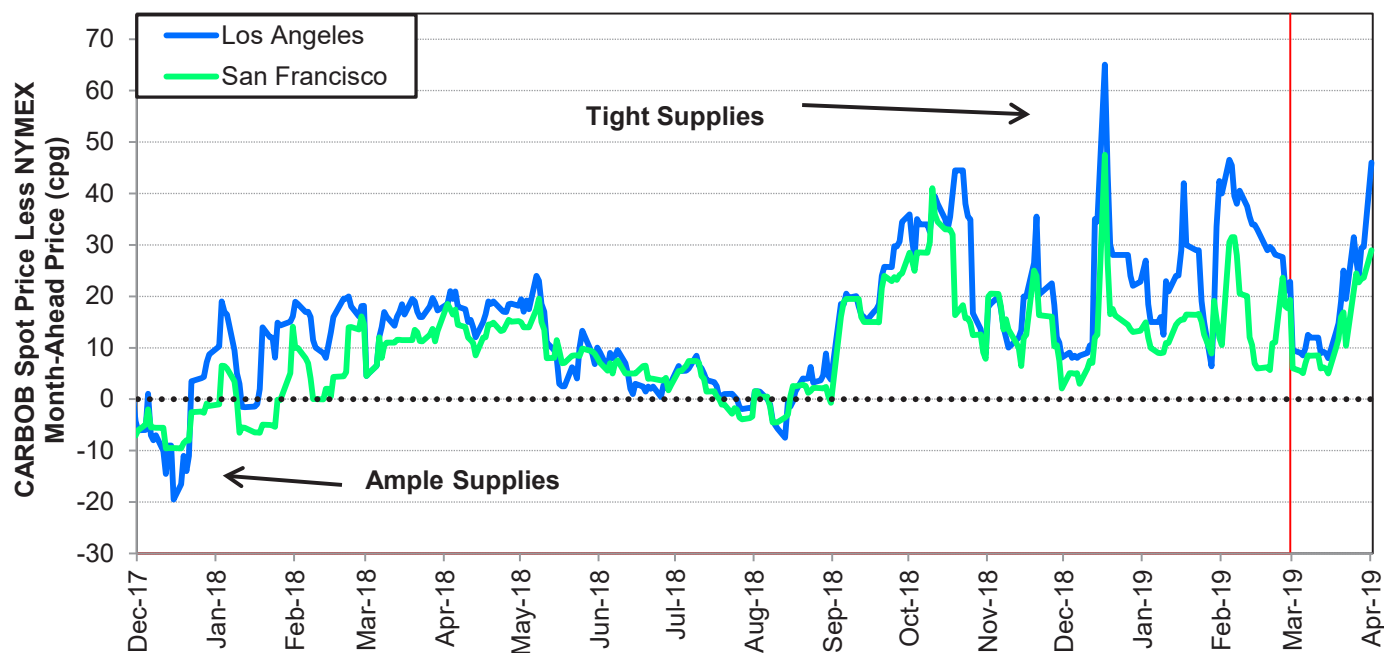
Diesel prices in California increased despite above average production and inventories. The first three weeks of March, starting March 4, California prices stayed at \$3.78 despite production and

inventories at or above the five-year band according to *Weekly Fuels Watch*.⁵ High production and inventory should have put downward pressure on prices. The fact prices increased indicates an increase in demand in California because of the start of the spring planting season. Starting the week of March 25, refinery issues (page 1) began to affect diesel production and inventory, which caused prices to rise.

Historically, diesel prices increase in April. Demand tends to increase in April due to the warmer weather allowing for more agricultural and shipping activities. In addition to the increased demand, refinery issues will be ongoing in April. These issues will keep upward pressure on diesel prices.

SPOT MARKET SPREADS

Figure 5: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. Energy Information Administration and OPIS

GASOLINE SPOT - FUTURES SPREAD

March 2019 vs 2018

Los Angeles 1¢ higher

San Francisco 1¢ higher

March 2019 Averages

Los Angeles 16¢

San Francisco 12¢

March 29, 2019

Los Angeles 30¢

San Francisco 24¢

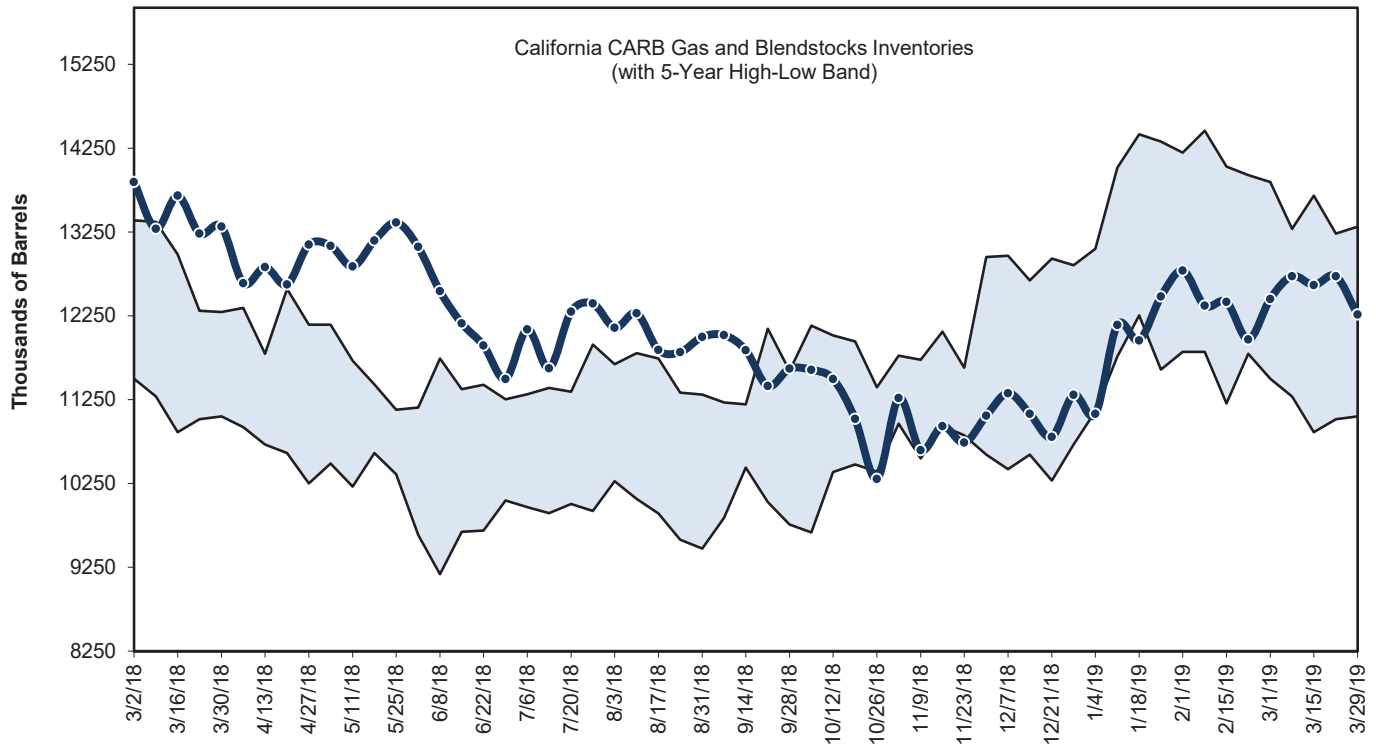
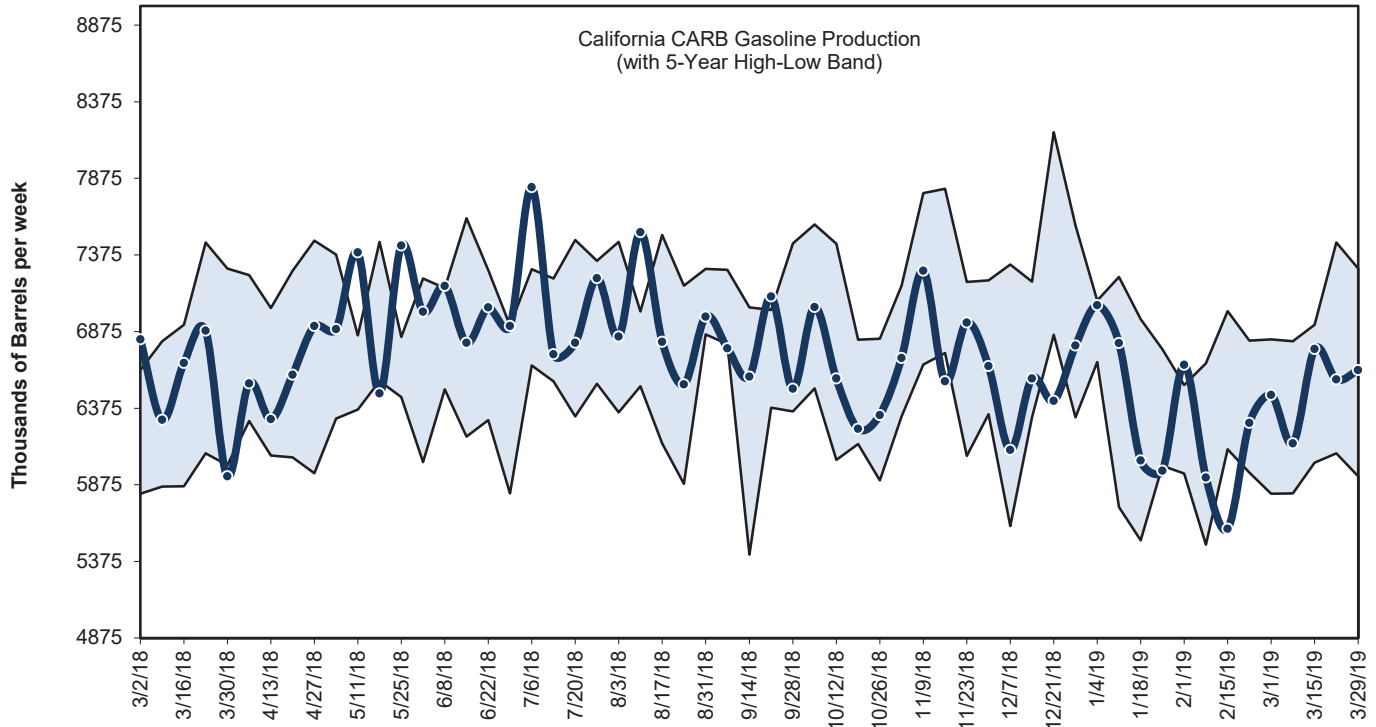
The Los Angeles (LA) and San Francisco (SF) gasoline spot less New York Mercantile Exchanges (NYMEX) futures spreads were \$0.10 and \$0.06, respectively, on March 1 (Figure 5). The spreads increased to \$0.13 for LA on and \$0.09 for SF on March 7. The spreads then decreased to monthly lows of \$0.08 for LA and \$0.05 for SF on March 15. The LA spread reached a monthly high of \$0.31 March 25. On March 29, the LA spread was \$0.30, and the SF spread was \$0.24, a monthly high for SF.

While the monthly average was lower for March than for February, prices are on the rise. Multiple issues at refineries in Northern and Southern California caused the spreads to increase through the last half of March (page 1). The spreads will continue to be elevated until the refineries have completed repairs.

California gasoline production was within the five-year band during March. Production increased from 6.5 million bpw on March 1 to 6.6 million bpw on March 29 (Figure 6). Production in Northern and Southern California was within the five-year band except for the week of March 22 when production in Northern California dipped below the band.⁶ California gasoline inventories decreased from 12.5 million barrels to 12.2 million barrels between March 1 and March 29, respectively. Inventories in Northern California remained well within the five-year band during March. However, inventories in Southern California were below the five-year band from the week of March 1 through the week of March 22.

SPOT MARKET SPREADS

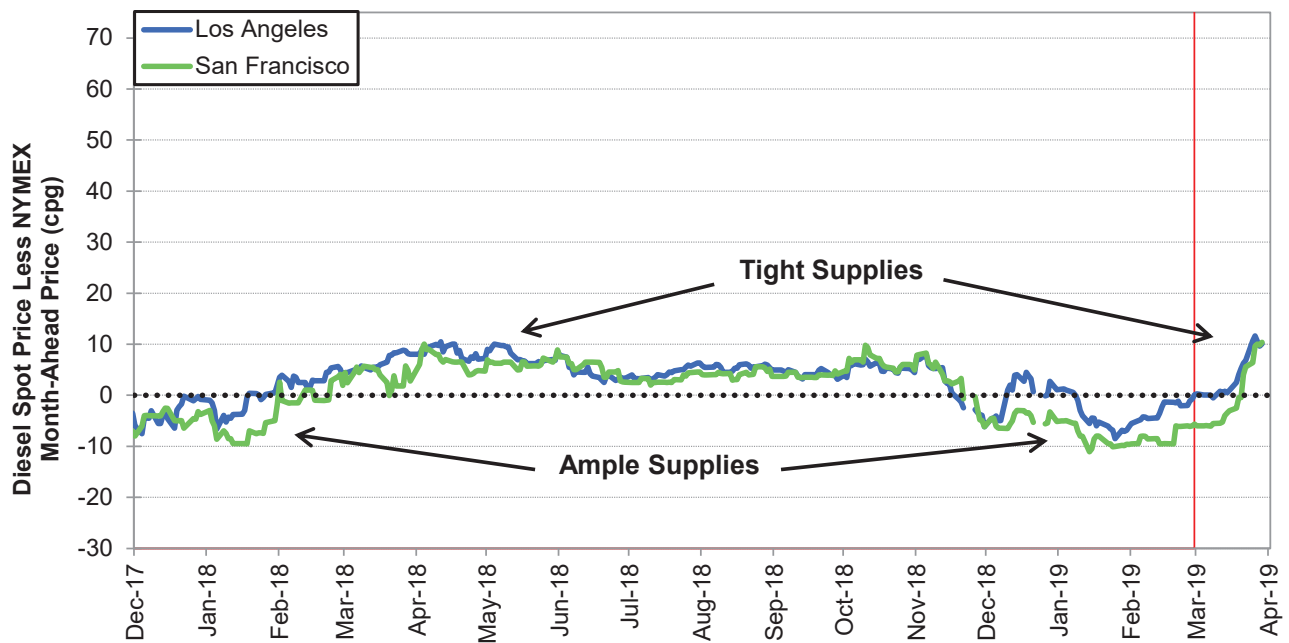
Figure 6: Gasoline Production and Inventories



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 OPIIS

DIESEL SPOT - FUTURES SPREAD

March 2019 vs 2018

Los Angeles	3¢ lower
San Francisco	4¢ lower

March 2019 Averages

Los Angeles	4¢
San Francisco	0¢

March 29, 2019

Los Angeles	10¢
San Francisco	10¢

The LA diesel spot to NYMEX spread opened March at \$0.00 and remained mostly above NYMEX (**Figure 7**). The SF spread kicked off March at \$0.06 below NYMEX and ended March higher than LA spread, the first time since November 2018. The March spreads were the widest since November 2017. The LA spread hit a low of \$0.01 below NYMEX on March 8 and a high of \$0.12 above NYMEX on March 26, a \$0.13 increase. The SF spread hit a low of -\$0.06 on March 7 and a high of \$0.10 on March 29, a \$0.16 increase.

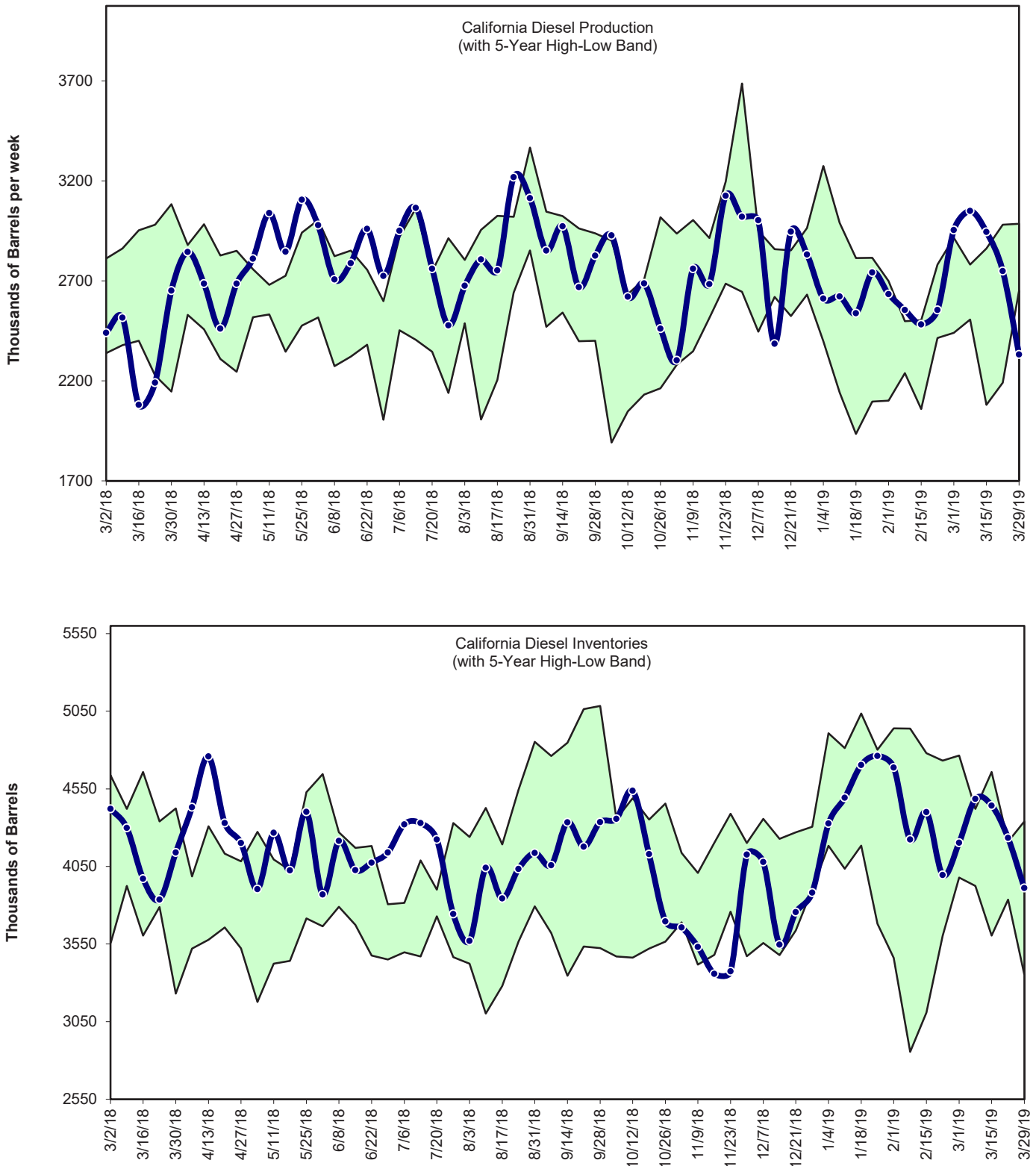
Refinery outages in Northern and Southern California caused diesel spreads to rise beginning March 15. On March 15, a fire broke out at Phillips 66 Wilmington Refinery raising supply fears and causing LA diesel spot prices to move into positive territory the

following Monday, March 18 (**page 1**). Valero Benicia, began shutting down their refinery on March 24 because of air restrictions (**page 1**). The SF spot spreads responded by increasing \$0.03 on March 26 while the LA market also reacted with a large single day increase of \$0.04 on March 25 (**Figure 6**).

California diesel production and inventories followed similar trends, peaking on March 8 and began declining through March 29 (**page 9**). On March 29, Southern California diesel production was 400 thousand barrels below the five-year minimum of 1.2 million barrels. California diesel inventories averaged 4.26 million barrels in March, or 60,000 barrels higher than February 2019. Supply concerns due to the string of refinery issues put upward pressure on spot prices throughout March.

SPOT MARKET SPREADS

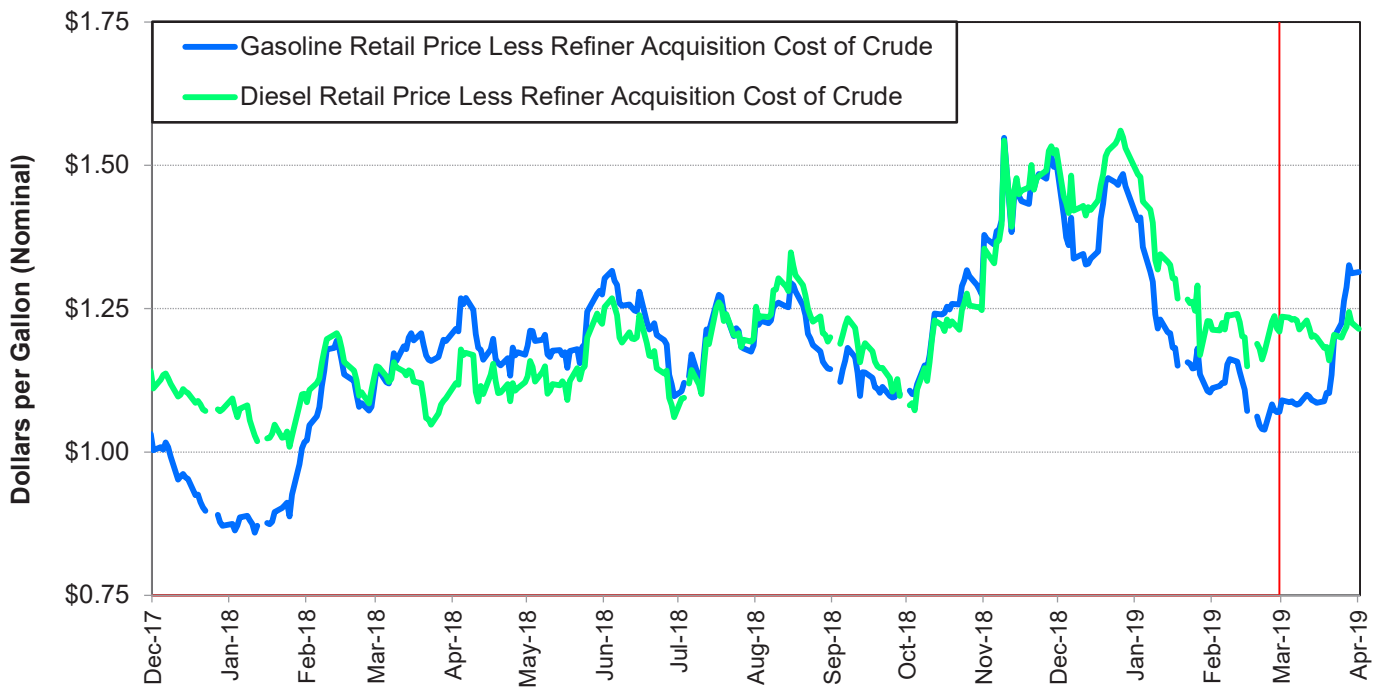
Figure 8: Diesel Production and Inventories



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

March 2019 vs 2018

Gasoline	2% lower
Diesel	9% higher

March 2019 Averages

Gasoline	\$1.14
Diesel	\$1.21

March 29, 2019

Gasoline	\$1.31
Diesel	\$1.23

Gross gasoline margins increased noticeably in the middle of March (Figure 9), reaching a \$1.30 at the end of the month. This climb began on March 20 at \$1.10 and occurs at the same time as the spot market spreads (page 6) for both LA and SF increase. All of these increases appear to be a result of numerous refinery issue in both Northern and Southern California. The first of these issues was the March 15 fire at the Phillips 66 Wilmington Refinery and supply issues that were exacerbated by the March 24 shutdown of the Valero Benicia refinery in the Bay Area. While California production and inventory appears normal, the increased buying on the spot markets (indicated by increased

spot market spreads) appears to show that the California gasoline market is tight and thus pushing up retail prices and margins.

Unlike the gasoline margin, the diesel margin has remained steady and currently appears unaffected by the refinery issues. This margin remained under \$1.25 throughout the month of March, starting the month at \$1.24, reaching a low of \$1.16 on March 20, and returning to \$1.24 on March 28. That said, increased spot differentials in the LA and SF markets (page 8) indicate that California is likely to see an increase in the diesel margin as well.



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