



PETROLEUM WATCH

California Energy Commission

March 2018

Recent Petroleum News

Prices

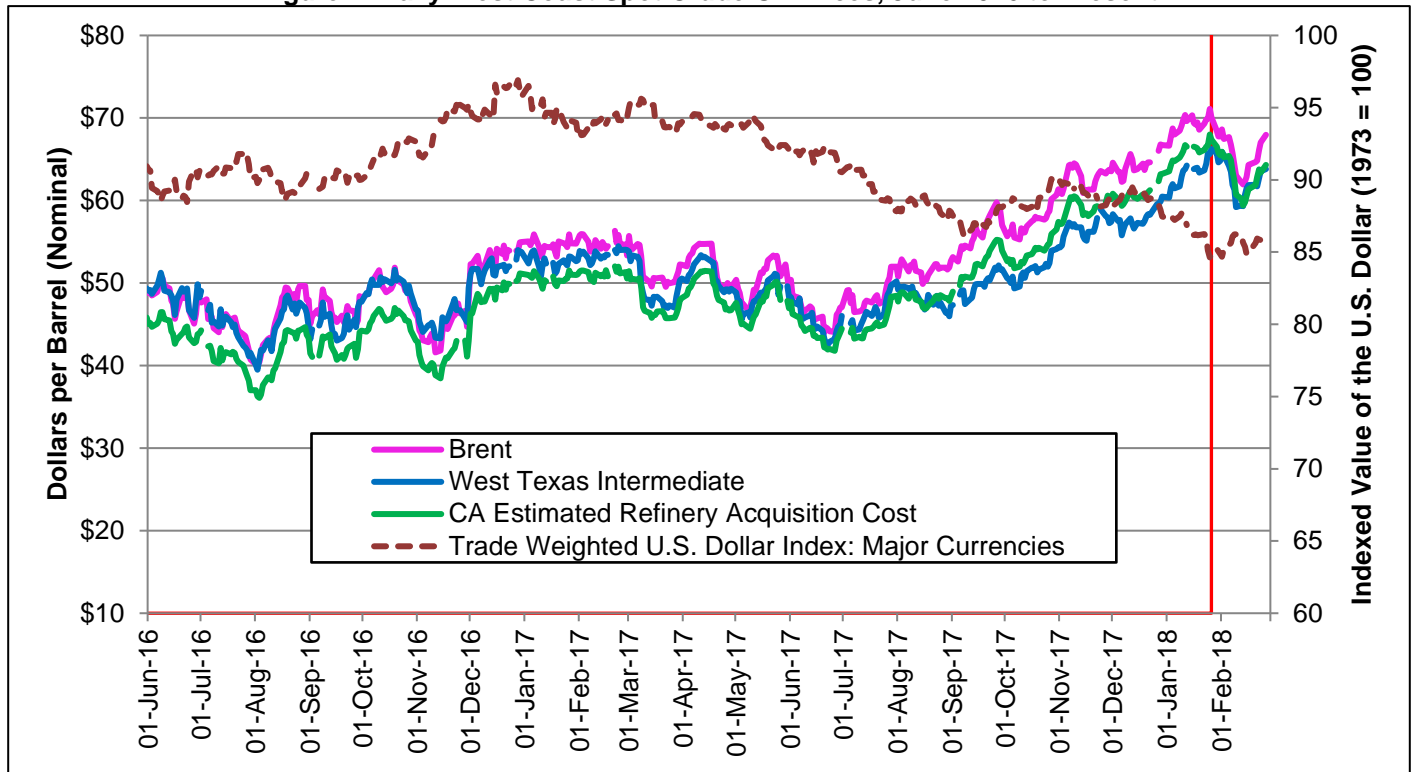
- **Crude Oil Prices:** Brent and West Texas Intermediate (WTI) crude prices closed at \$65.16 and \$62.23, respectively, on February 26 (**page 2**).
- **California Retail Gasoline Prices:** On February 26, prices reached \$3.36, an increase of \$0.60 since the end of January. Through February, California prices averaged \$0.77 higher than the national average (**page 4**).
- **California Retail Diesel Prices:** On February 26, prices reached \$3.66, an increase of \$0.08 from the end of December. Through January, California prices averaged \$0.63 higher than the national average (**page 5**).

Refining News

- **Andeavor Carson Refinery:** On January 10, the refinery underwent planned maintenance on an atmospheric distillation unit, a diesel hydrotreater, a delayed coker, and a catalytic reformer. This work was completed on February 22.
- **Andeavor Wilmington Refinery:** On January 3, the refinery underwent planned maintenance on the reforming and hydrotreating units. This work was completed on February 1.
- **Chevron El Segundo Refinery:** On January 15, the refinery underwent planned maintenance on the alkylation and fluid catalytic cracking units. Work is scheduled to be completed by March 22.
- **Valero Wilmington Refinery:** On January 10, the refinery underwent planned maintenance on the distillation, hydrotreating, coking, and reforming units. The refinery restarted units on February 6.

Crude Oil Prices

Figure 1: Daily West Coast Spot Crude Oil Prices, June 2016 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.

On February 1, the Brent crude oil price was just under \$70 a barrel, but in mid-February crude oil prices for Brent, West Texas Intermediate (WTI), and California Estimated Refiner Acquisition Cost (CA-RAC) fell to \$62, \$59, and \$59, respectively (Figure 1).¹ This was a 14 percent reduction in crude oil prices for both Brent and CA-RAC and a 10 percent reduction for WTI. These price reductions quickly reversed themselves by the end of February, with all three grades returning close to February’s initial values. February price averages for Brent, WTI, and CA-RAC were 6, 2, and 5 percent less than January because of the midmonth dip, even though prices at the end of February were nearly the same as January.

The brief fall in crude oil prices in February was the result of strong inventory data and weaker-than-expected financial indicators. Energy Information Administration (EIA) data on United States crude oil inventories showed increases four of the five weeks since the end of January (page 3). The reversal of inventory draws broke market expectations after a yearlong trend of falling inventories. Meanwhile, the United States dollar index to major currencies remained relatively flat, increasing less than 1 percent from the beginning to the end of the month. Instead, the S&P 500 index started February at \$2,822 and then dropped to \$2,581 on February 8, coinciding with the fall of crude oil prices in mid-February.

| <u>Crude Oil Prices</u> | |
|-------------------------------|-------------------|
| <u>February 2018 vs 2017</u> | |
| <u>(Percent Change)</u> | |
| Brent | 27% higher |
| WTI | 21% higher |
| CA-RAC | 31% higher |
| <u>February 2018 Averages</u> | |
| Brent | \$65.15 |
| WTI | \$62.23 |
| CA-RAC | \$62.68 |
| <u>February 26, 2018</u> | |
| Brent | \$67.96 |
| WTI | \$63.81 |
| CA-RAC | \$64.30 |

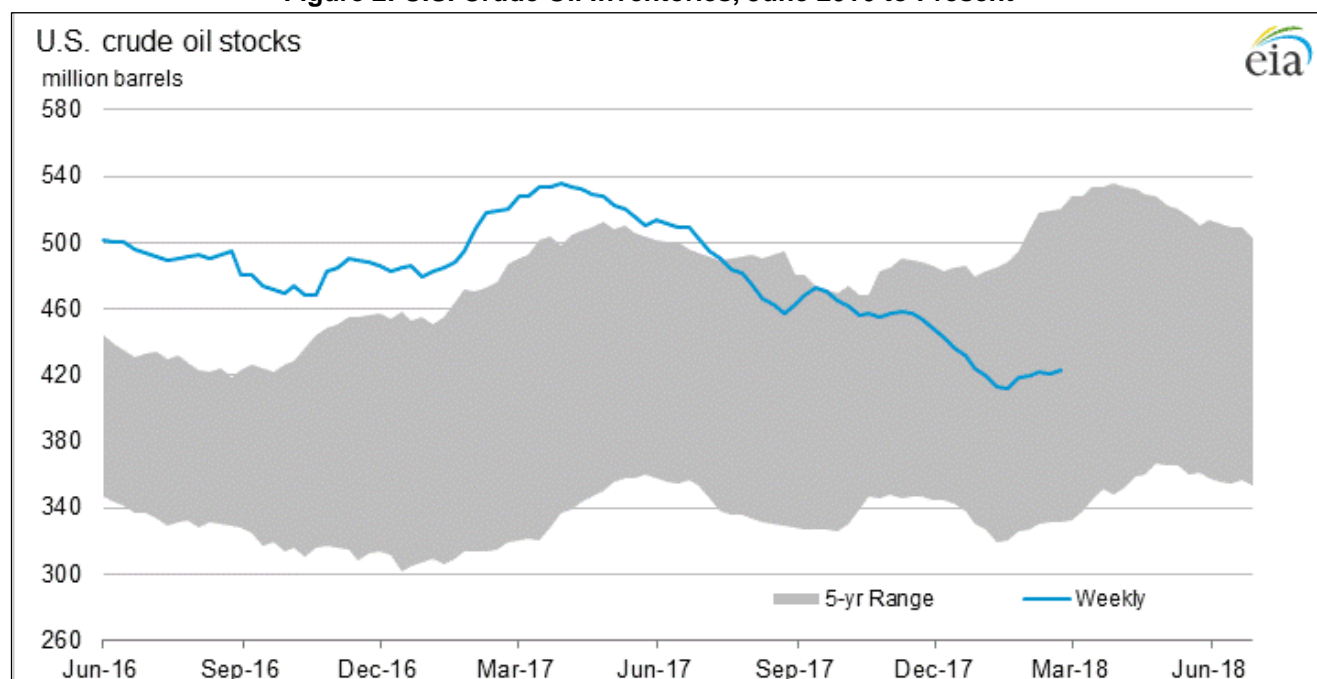
¹CA-RAC is a weighted average of the prices of California (San Joaquin Valley) crude, Alaskan crude, and foreign crude.

Crude Oil Production and Storage

Monthly crude oil production and crude inventories increased, while crude imports and refinery input levels decreased since January's *Petroleum Watch* (Figure 2).

- U.S. crude oil production for February was estimated at 10.27 million barrels per day (bpd), 32,000 bpd higher than January's monthly average of 9.95 million bpd and the highest production rate recorded by EIA. This is a 1.27 million bpd increase from a year ago, when production levels were 9 million bpd.
- Crude oil imports decreased by 560,000 bpd to 7.52 million bpd in February. Compared to import levels from February 2017, this is a decrease of 656,000 bpd.
- U.S. crude oil refinery inputs decreased by 500,000 bpd since January's *Petroleum Watch*, finishing February at a four-week average 16.1 million bpd. Refinery inputs are 713,000 bpd lower than year-ago levels.
- Crude oil inventories in the United States increased by 3.2 million barrels during February to 423.5 million barrels. Current inventories are 97.7 million barrels lower than one year ago.

Figure 2: U.S. Crude Oil Inventories, June 2016 to Present



Source: U.S. Energy Information Administration

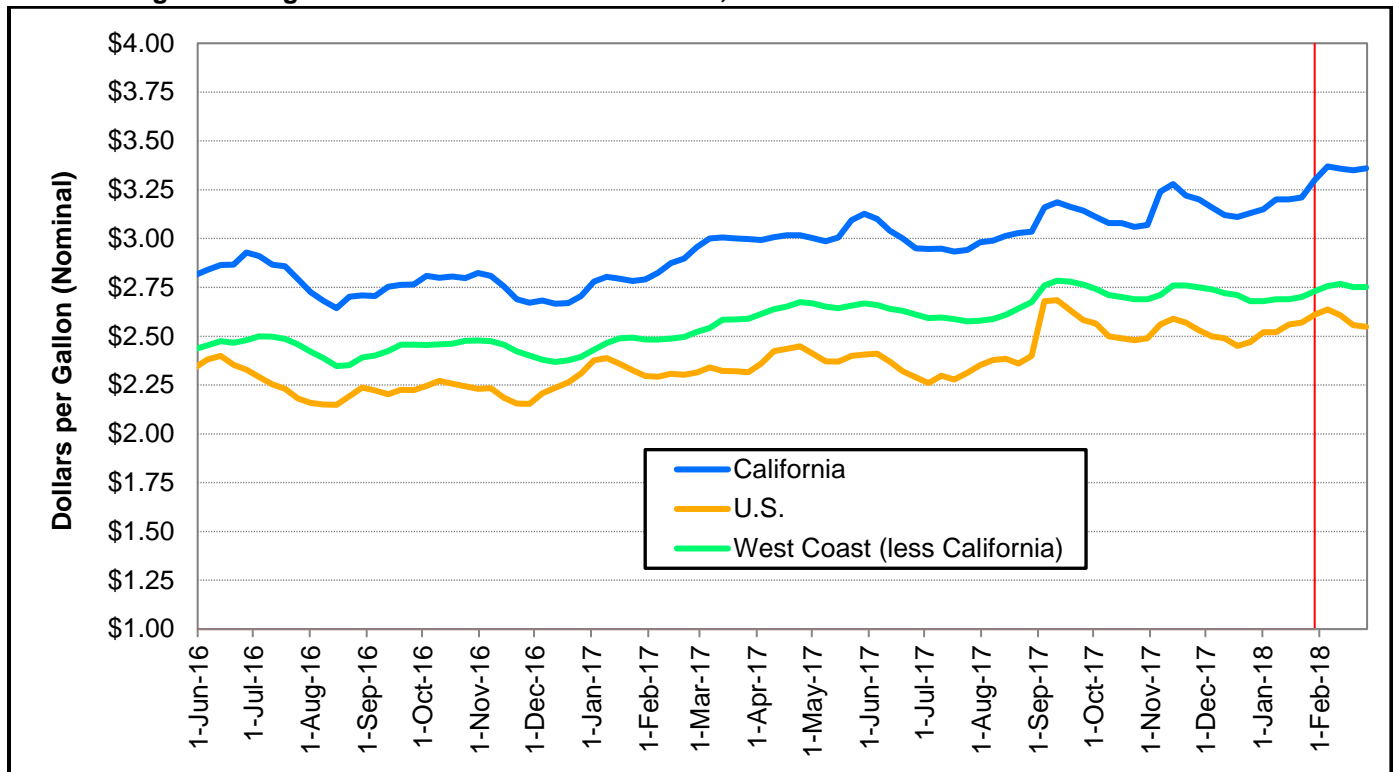
U.S. crude oil production continues increasing and reaching historical highs, as recorded by the EIA. Crude oil inventories increased four of the past five weeks. Refinery inputs typically fall during this season as the low demand for products allows refiners to conduct maintenance at refineries across the United States. The surge in crude oil production and the reduction in refinery inputs have reduced reliance on imported crude into the United States.

According to the Organization of Petroleum Exporting Countries' (OPEC) February *Monthly Oil Market Report*, total January OPEC production decreased by 8,100 bpd to 32.3 million bpd. OPEC's crude oil demand estimate for the rest of 2018 is 32.9 million bpd, just 0.1 million bpd higher than the estimate for 2017.²

² OPEC February Monthly Oil Monthly Report, page i, page 56: http://www.opec.org/opec_web/en/publications/338.htm.

Gasoline and Diesel Retail Prices

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



Source: U.S. Energy Information Administration

California gasoline retail prices remained steady during February and decreased only \$0.01 from \$3.37 on February 5 to \$3.36 on February 26 (Figure 3). West Coast (less California) gasoline prices followed a similar trend, decreasing \$0.01 to end February 26 at \$2.75 a gallon. Gasoline prices across the United States had the greatest decrease, \$0.09, and remained 12 percent higher compared to last February. The California retail prices were at a \$0.81 premium over the rest of the United States on February 26. The last time California’s retail prices were above \$0.81 was on January 11, 2016 with prices at \$0.85, while U.S. gasoline prices were \$2.00 a gallon.

In February, California refiners moved from winter-blend to summer-blend gasoline. Summer-blend gasoline has a lower Reid vapor pressure (RVP) specification that is harder to produce.³ During the transition to summer gasoline blend on February 12, gasoline wholesale prices for California were 5 percent below the monthly average price, and the lowest rack prices sold 5-6 percent below the monthly average between February 12 and February 15. This indicates that refiners had little difficulty in making the RVP transition this year.

Gasoline Prices

February 2018 vs 2017 (Percent Change)

| | |
|------------|------------|
| California | 16% higher |
| U.S. | 12% higher |
| West Coast | 10% higher |

February 2018 Averages

| | |
|------------|--------|
| California | \$3.36 |
| U.S. | \$2.59 |
| West Coast | \$2.76 |

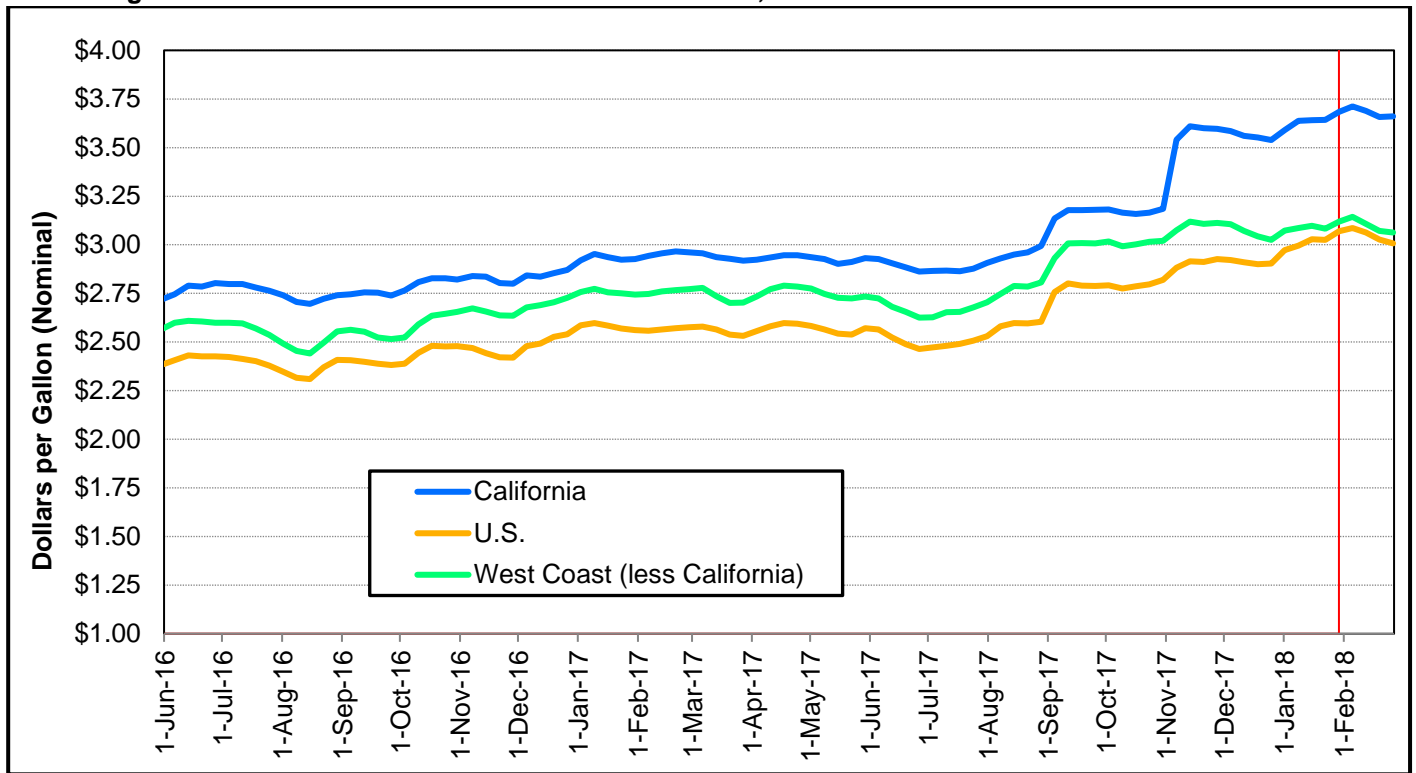
Week of February 26, 2018

| | |
|------------|--------|
| California | \$3.36 |
| U.S. | \$2.55 |
| West Coast | \$2.75 |

³ Reid vapor pressure is a measure of the volatility of gasoline that is defined as absolute vapor pressure in pounds per square inch (psi) when the liquid is brought to a temperature of 100°F (37.8°C).

Historical patterns show gasoline retail prices across the United States increasing from February to April by an average of 11 percent. This translates to California retail prices potentially increasing to \$3.73 at the end of April.

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



Source: U.S. Energy Information Administration

Retail diesel prices in California remained high at \$3.68 per gallon and 24 percent higher when compared to the same time last year. Since the previous *Petroleum Watch*, California diesel prices were at \$3.68 on January 29, before increasing \$0.03 to \$3.71 on February 5 (Figure 4). California diesel prices decreased \$0.05 from February 5 to February 19 to \$3.69 and remained steady until the end of February. February diesel prices averaged \$3.68 for California. This is the highest monthly average since \$3.81 in November 2014, when California diesel prices were as high as \$3.86 a gallon.

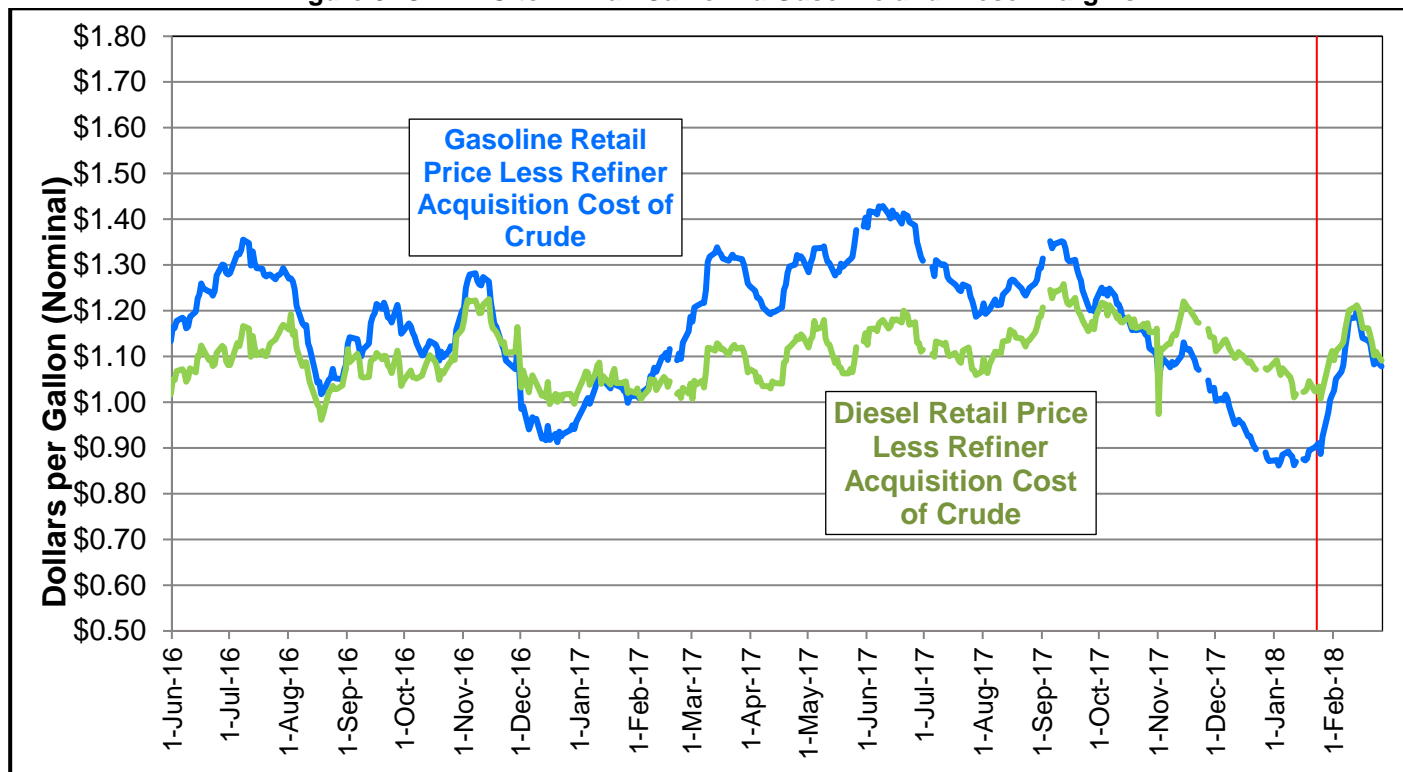
Diesel prices across the United States averaged \$3.05 per gallon and decreased through February. United States diesel prices decreased \$0.08 from February 5 at \$3.09 to \$3.01 on February 26. West Coast (less California) followed a similar trend as the United States by decreasing \$0.08 from \$3.14 on February 5 to \$3.06 on February 26 (sidebar). As of February 19, the West Coast minus United States diesel price has narrowed to \$0.04. West Coast prices are rarely less than U.S. diesel prices, with the last occurrence from December 2014 to April 2015. During that time, California prices were \$0.12 to \$0.32 more than U.S. prices.

California's diesel supply has been high through the year, but production was below the five-year band after February 23 (Figure 9).

| <u>Diesel Prices</u> | |
|----------------------------------|------------|
| February 2018 vs 2017 | |
| (Percent Change) | |
| California | 24% higher |
| U.S. | 19% higher |
| West Coast | 12% higher |
| February 2018 Averages | |
| California | \$3.68 |
| U.S. | \$3.05 |
| West Coast | \$3.10 |
| Week of February 26, 2018 | |
| California | \$3.66 |
| U.S. | \$3.01 |
| West Coast | \$3.06 |

Diesel demand will increase due to the rising use of diesel from farming equipment in the spring. As a result, diesel prices may see an increase in the upcoming months.

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



Source: U.S. Energy Information Administration and OPIS

CA-RAC to ex-tax retail gasoline and diesel margins reversed the five-month decline throughout February 2018 (Figure 5). Typically gasoline retail prices decline relative to the year through December then rebound in January to February. Gasoline margins rose from \$0.86 to \$1.05 from mid-January to February 2. Diesel margins minimally changed from \$1.01 to \$1.09 on over the same January-to-February period. California retail gasoline prices peaked on February 6 and dropped \$0.02 by the end of February. Retail diesel prices peaked and dropped \$0.04 over the same period.

Product margins are still following a typical winter pattern so far, a gentle decline from October through January with a strong uptick starting late January. Margins followed a similar pattern in winter 2016/2017 as well, with gasoline margins falling below diesel margins. If this winter pattern holds, then gasoline margins should continue increasing in March as driving season comes back for 2018.

Crude to Retail Margins

February 2018 vs 2017 (Percent Change)

| | |
|----------|------------|
| Gasoline | 5% lower |
| Diesel | 17% higher |

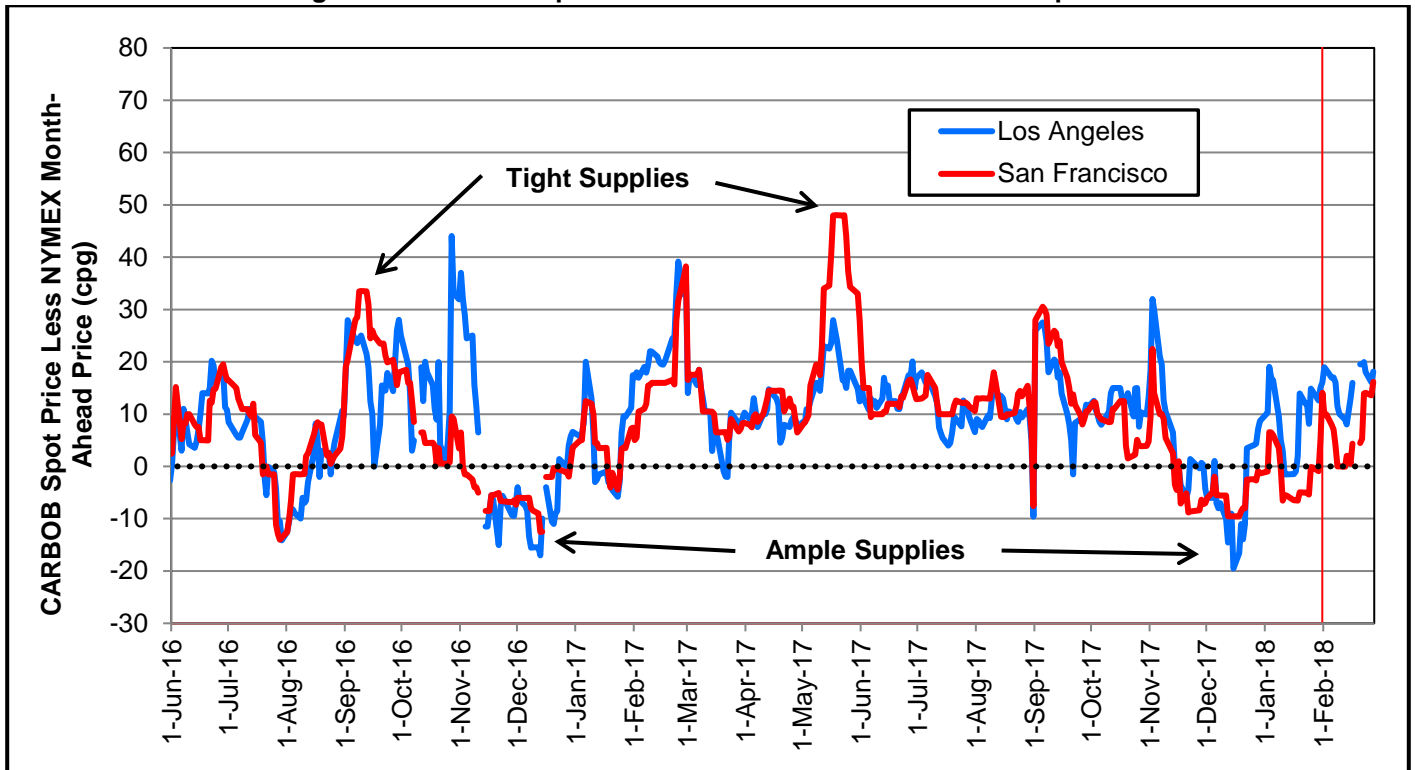
February 2018 Averages

| | |
|----------|--------|
| Gasoline | \$1.17 |
| Diesel | \$1.21 |

February 26, 2018

| | |
|----------|--------|
| Gasoline | \$1.08 |
| Diesel | \$1.09 |

Figure 6: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. Energy Information Administration and OPIS

Los Angeles (LA) and San Francisco (SF) gasoline spot market differentials to the New York Mercantile Exchange (NYMEX) futures price remained positive throughout February (Figure 6). On February 1, LA and SF commanded premiums of \$0.19 and \$0.10, respectively. By February 12, LA and SF would lose these premiums and end the day at \$0.09 and \$0.00. This large drop in price was a market reaction to strong production and inventory levels published on February 9.⁴ On February 14, LA and SF prices rebounded and regained February 5 values. LA and SF ended February at \$0.18 and \$0.16 and held monthly averages of \$0.15 and \$0.06, respectively, which are \$0.07 and \$0.10 less than February 2017.

Traditionally, spot gasoline in February trades at higher prices than the current market premium because of increasing demand and refinery maintenance. The five-year average premiums for LA and SF are \$0.20 and \$0.14. Prices this year have remained lower due to production values being high on the five-year band and inventories levels being above the five-year band (Figure 8).

The difference between LA and SF prices showed how RVP specifications, with lower RVP being expensive, influence market prices. On February 1, LA switched to 5.99 pounds per square inch (psi) RVP, while SF switched to 12.5 psi RVP, making LA prices \$0.09 higher than SF spot prices.

Gasoline Spot-Futures Spread

February 2018 vs 2017

| | |
|----------------------|------------------|
| Los Angeles | 5¢ lower |
| San Francisco | 10¢ lower |

February 2018 Averages

| | |
|----------------------|------------|
| Los Angeles | 15¢ |
| San Francisco | 6¢ |

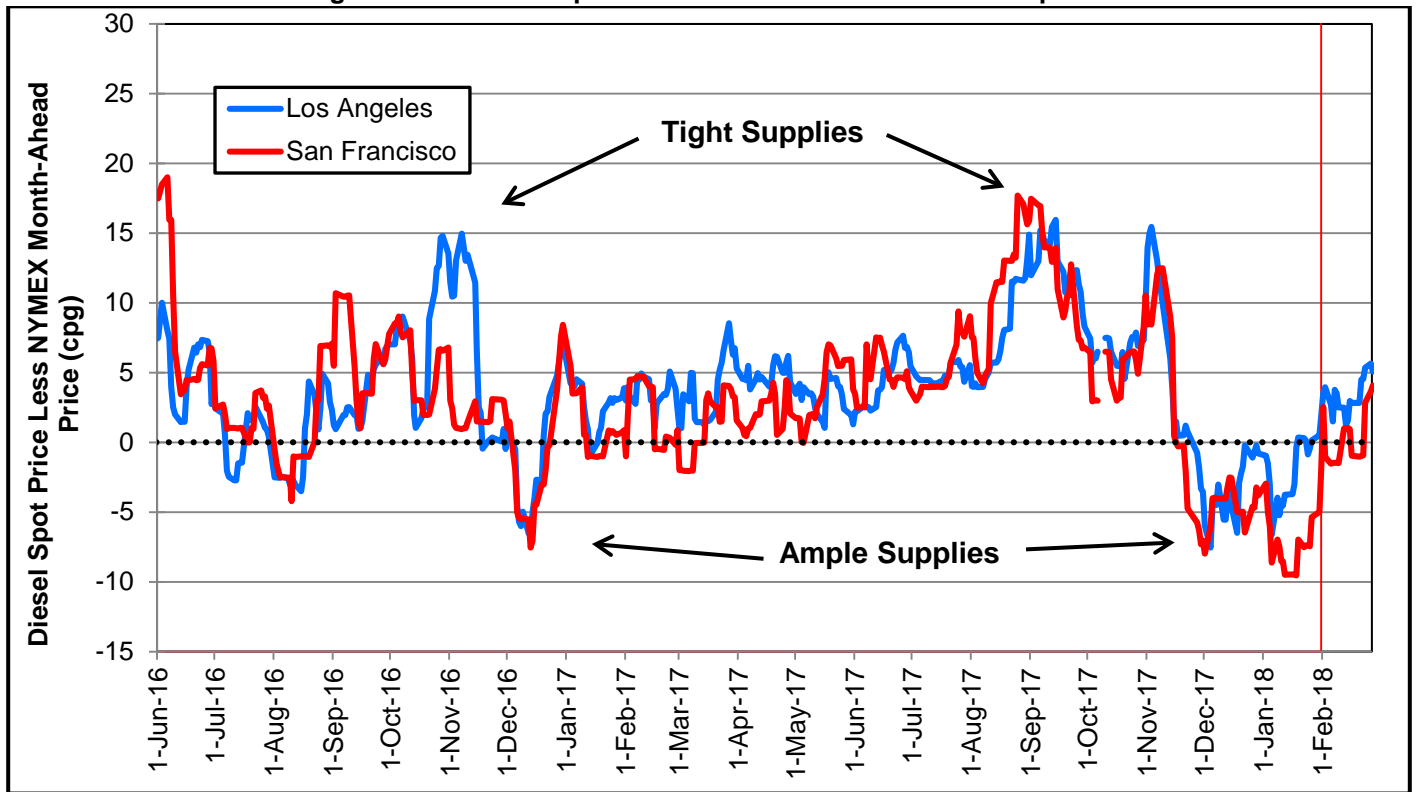
February 27, 2018

| | |
|----------------------|------------|
| Los Angeles | 18¢ |
| San Francisco | 16¢ |

⁴ California Energy Commission. February 9 2018. "Weekly Fuels Watch Report.":
http://www.energy.ca.gov/almanac/petroleum_data/fuels_watch/output.php

On February 27, the SF market switched to the 5.99 psi RVP specification, and on that day SF-to-LA difference then narrowed to \$0.02, with the difference between the prices being local market forces.

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. Energy Information Administration and OPIIS

The LA-less-NYMEX diesel spot differential showed modest volatility in February before making steady gains beginning on February 23. On February 1, the price was \$0.04, and the LA differential fluctuated between \$0.01 and \$0.03 until February 27, when the differential moved to \$0.05. SF diesel prices showed greater range in February. SF price spreads on February 1 were \$0.02 and dropped to the monthly low of -\$0.01 the following day, remaining there for a week. The SF differential would temporarily spike into positive territory before going back to -\$0.01 on February 16. Prices would finally stay positive the following week, with SF prices ending at \$0.04 on February 27.

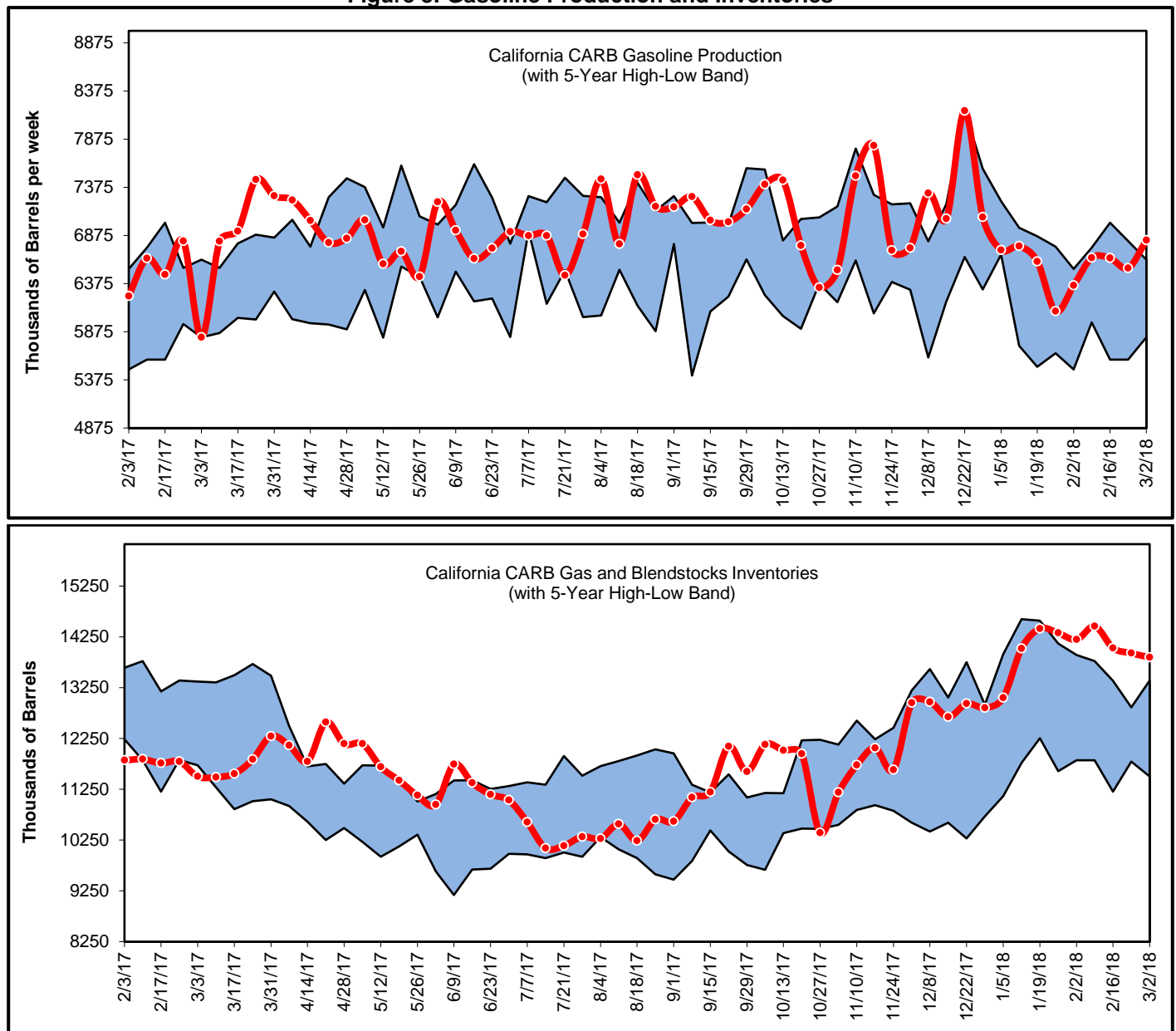
Throughout February, production overall started strong and slowly decreased, going below the five-year band, while California inventory levels remained in the upper portion of the five-year band. The NYMEX price was within \$0.02 of the five-year average, but both LA and SF prices are above five-year averages when historically these spreads are negative. This signals a stronger demand for diesel that is not within the seasonal norms. It will be interesting to see what diesel differentials will do in March. California’s planting season begins in March, creating a greater demand for diesel, but it is possible that this rising demand is not reflected in the differentials if winter storms continue to strike the East Coast.

| <u>Diesel Spot-Futures Spread</u> | |
|-----------------------------------|----------|
| February 2018 vs 2017 | |
| Los Angeles | 0¢ even |
| San Francisco | 2¢ lower |
| February 2018 Averages | |
| Los Angeles | 3¢ |
| San Francisco | 0¢ |
| February 27, 2018 | |
| Los Angeles | 5¢ |
| San Francisco | 4¢ |

If the storms continue, there could be an extended period where East Coast demand for heating oil matches West Coast demand for diesel, thus keeping the diesel differentials lower than expected.

California Gasoline and Diesel Production and Inventories

Figure 8: Gasoline Production and Inventories



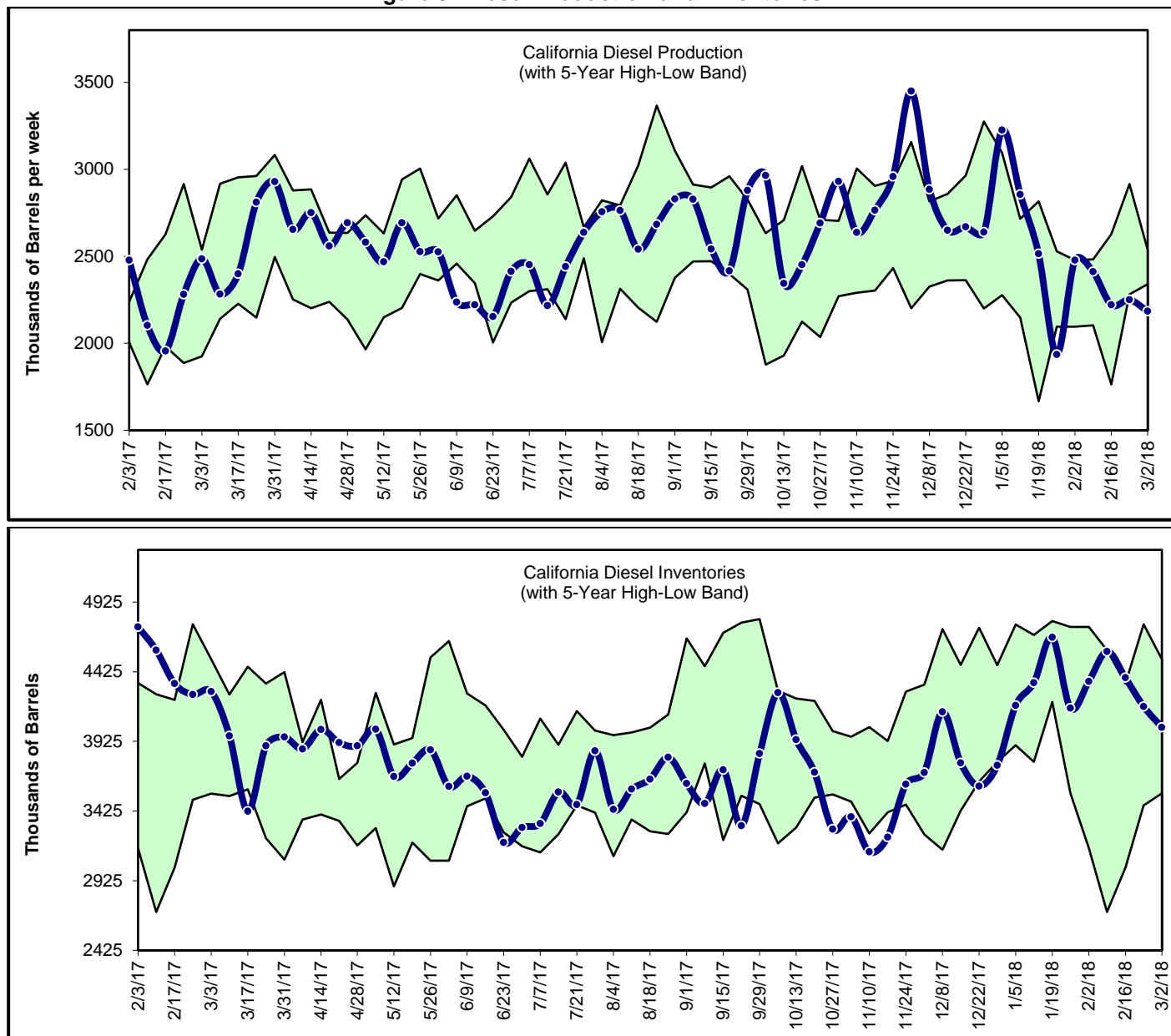
Source: PIIRA data

California gasoline production increased throughout February. Weekly gasoline production through March 2 maintained a monthly average of 6.6 million barrels per week (bpw), 0.1 million bpw higher than January 2018. Refiners were at low of 6.3 million bpw on February 2, with production recovering to 6.3 million bpw the following week. California production is stronger than previous years, as production in February 2017 maintained a 6.4 million bpw monthly average.

Historically, California gasoline inventory levels will build in February in anticipation of scheduled maintenance. This February gasoline inventories continued to strengthen from the previous *Petroleum*

Watch. Peak inventory levels reached 14.5 million barrels on February 9. Since then, inventory levels have decreased 600,000 barrels to 13.9 million barrels on March 2. This year's inventory levels are the strongest in the past five years.

Figure 9: Diesel Production and Inventories



Source: PIIRA data

California diesel production continues to fall. A brief increase on February 2 (**Figure 9**) was followed by production decreases three of the following four weeks, to a monthly low of 2.2 million bpw on March 2. February's diesel production low is still 0.8 million bpw stronger than February 2017, when production had a monthly average of 1.6 million bpw.

California diesel inventories will rise in February for similar reasons to those for gasoline, to allow refineries to undergo maintenance without cutting off supply. Diesel inventory levels followed a similar pattern to diesel production rates. Inventory levels peaked at 4.6 million barrels on February 9 and fell to 4.0 million barrels by March 2. California diesel inventories averaged 4.3 million barrels, putting February 2018 at the same level as the February 2017 average.