

Propane Market Fundamentals



For

Upper Peninsula Energy Task Force

November 13, 2019 | Escanaba, Michigan

By

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EIA mission: independent statistics and analysis

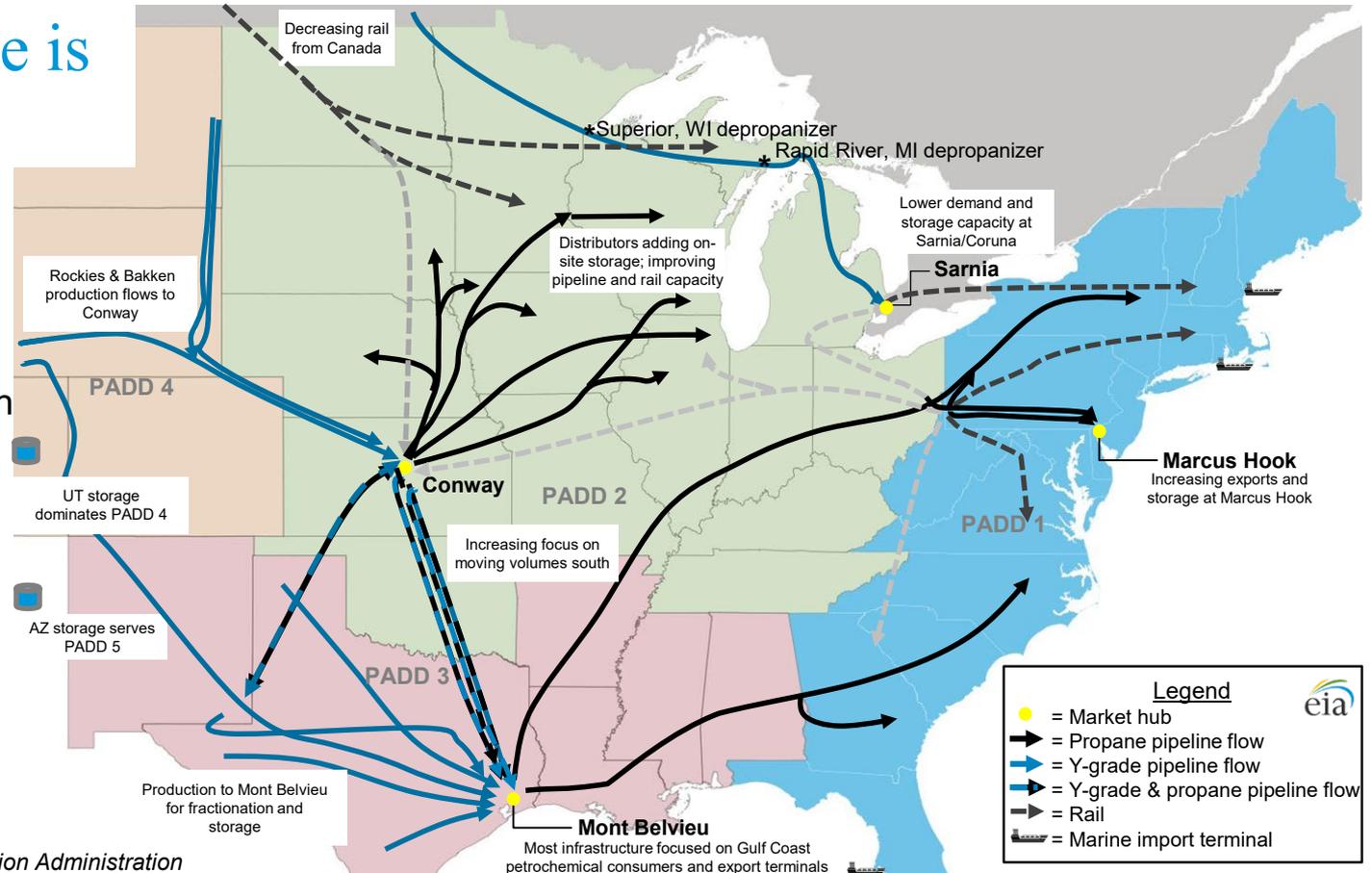
- EIA was created by the U.S. Congress in 1977
- EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment
- EIA is the Nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. Government
- EIA does not propose or advocate any policy positions

Overview

- Propane infrastructure continues to evolve as exports become the main driver of demand
- After a “golden-age,” rail movements of hydrocarbon gas liquids (HGL) are declining as new pipelines come online
- Producers continuously seek to maximize “net-back value” – the net return to the producer after accounting for processing and shipping
- Midwest demand is driven by residential/commercial and agricultural demand
- Imports from Canada play an outsized role in how the Midwest market is supplied

Propane-focused infrastructure is changing

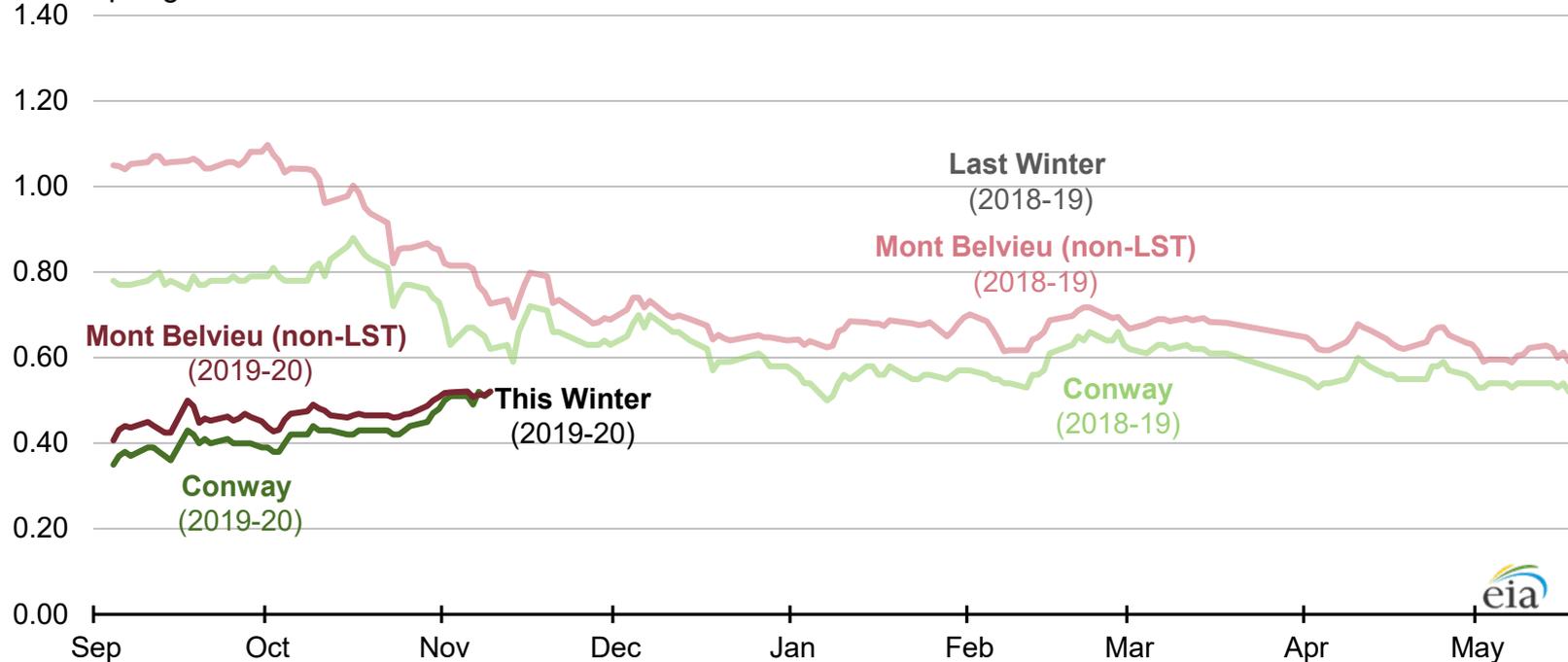
- Mariner East 2 pipeline began operations Dec. 2018
- Sterling III expansion done in 2019Q1
- Western Canada's new marine export terminal opened March 2019



Mt. Belvieu, TX and Conway, KS prices now on-par as strong winter heating and grain drying elevate demand above average levels for this time of year

Propane spot prices (Conway, KS and Mont Belvieu, TX)

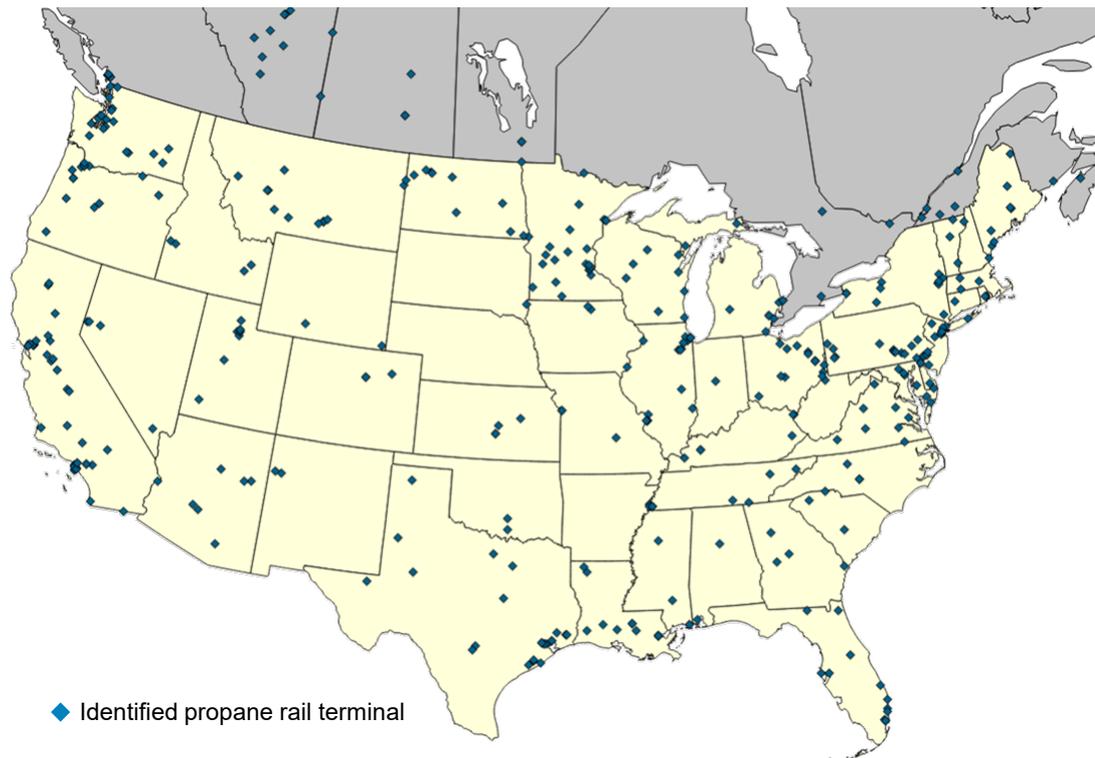
dollars per gallon



Source: EIA, Bloomberg, data through November 11, 2019

Rail, now tracked by EIA, serves markets pipelines don't reach, or when pipeline capacity is constrained

- EIA began publishing [HGL-by-rail data](#) in February 2017
- Identified over 1,000 rail stations handling propane, butanes, and/or propylene
- Nearly 700 of these stations serve the consumer propane market
- Data is available for movements within PADD, between PADDs, and to/from Canada
- Along with the data, EIA released a [Webinar](#) explaining the utility and impact of the HGL-by-rail data

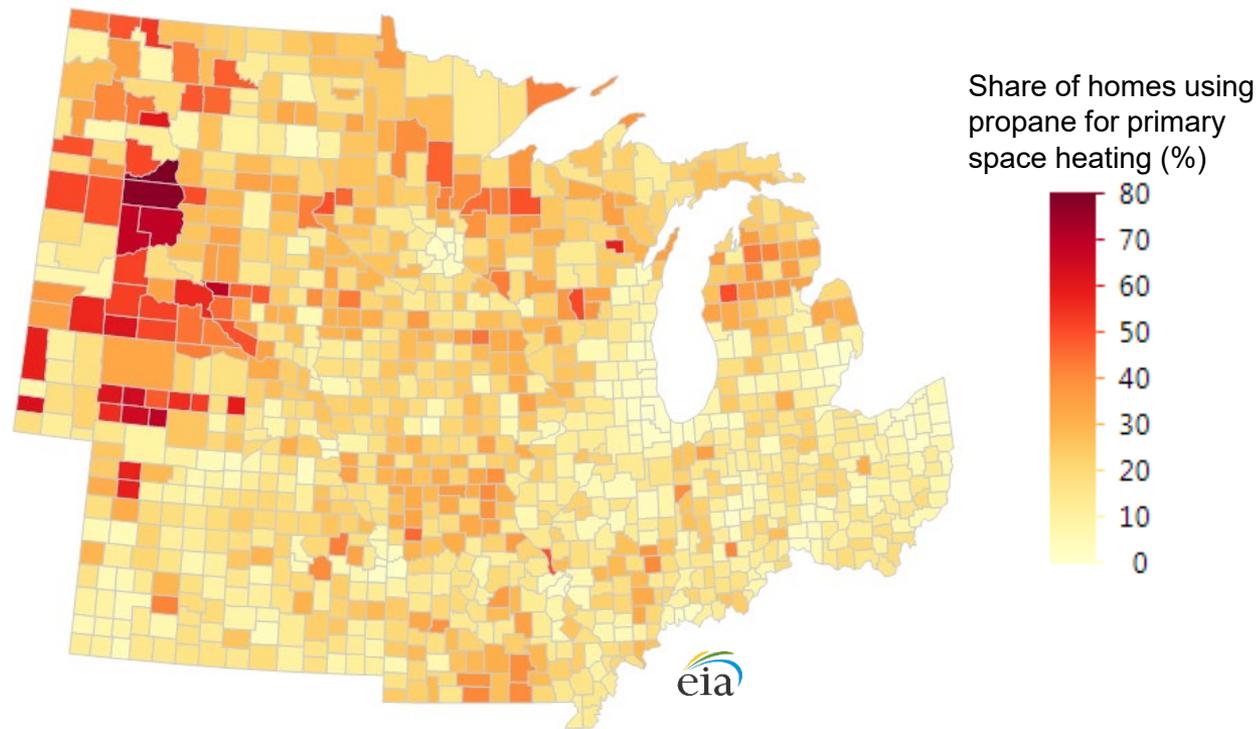


Source: EIA, based on data shared with the Surface Transportation Board

Nearly all Midwest households using propane for space heating are in single-family homes in rural areas

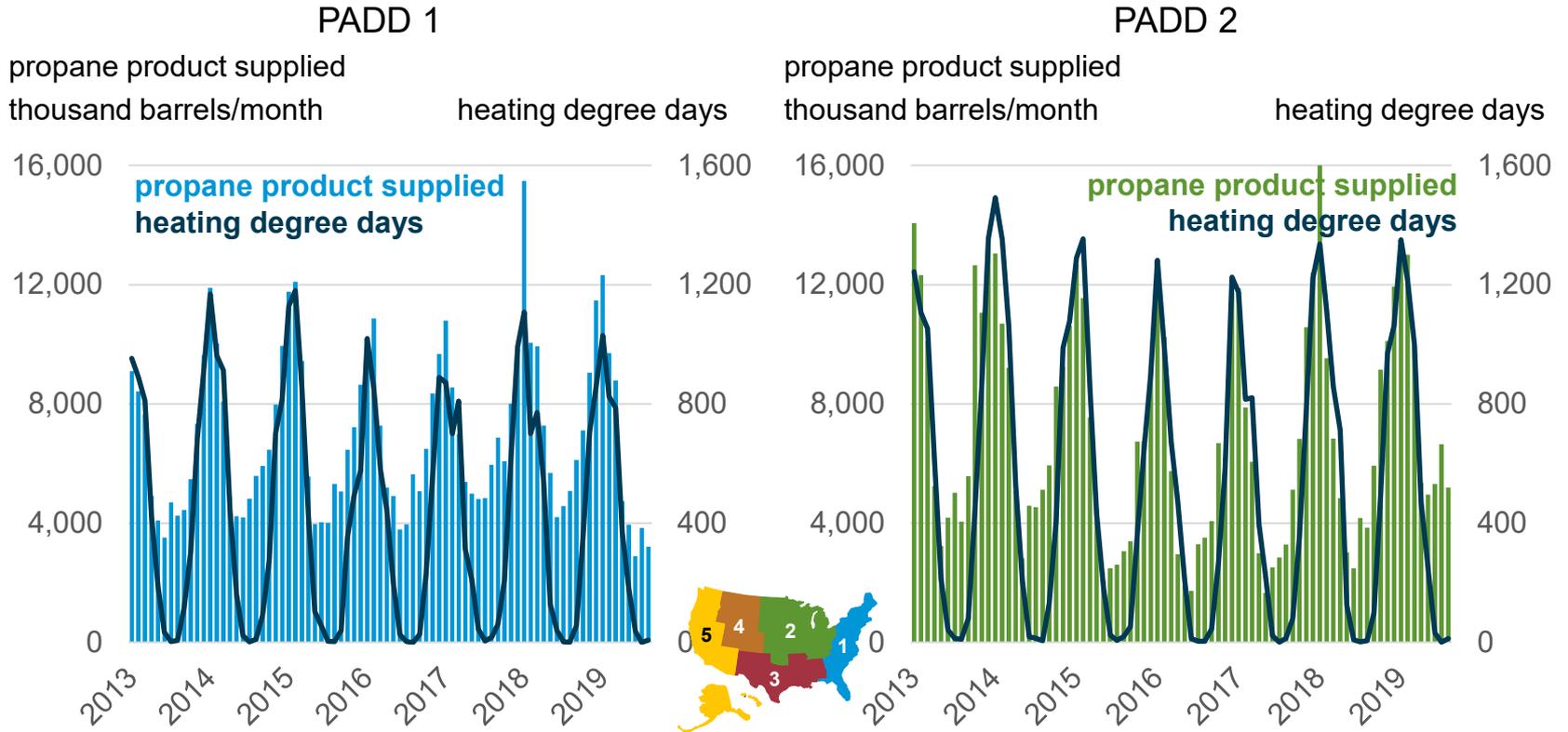
Of homes that use propane for space heating:

- 83% are in rural areas
- 97% are single-family or mobile homes



Source: U.S. Census Bureau, 2011-2015 American Community Survey

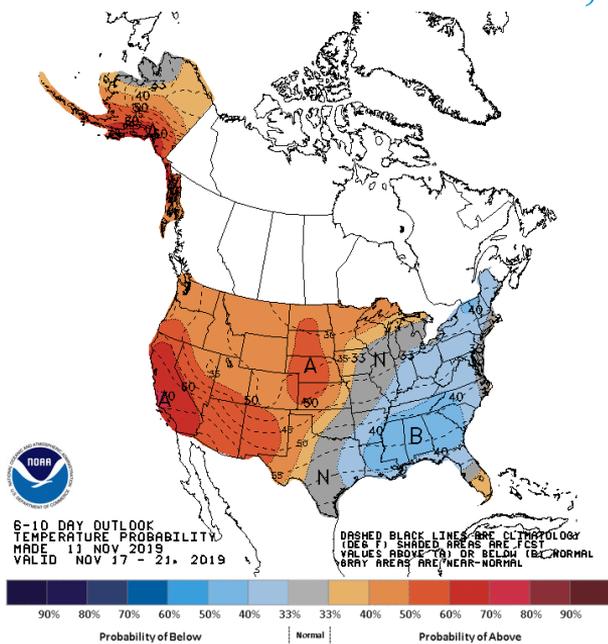
Product supplied closely tracks with heating demand



Source: EIA [Propane Product Supplied](#); National Oceanic and Atmospheric Administration, [Weighted Heating Degree Days](#)

NOAA's projected temperatures:

November 17 – Nov. 21, 2019, and November 19 – Nov 25, 2019



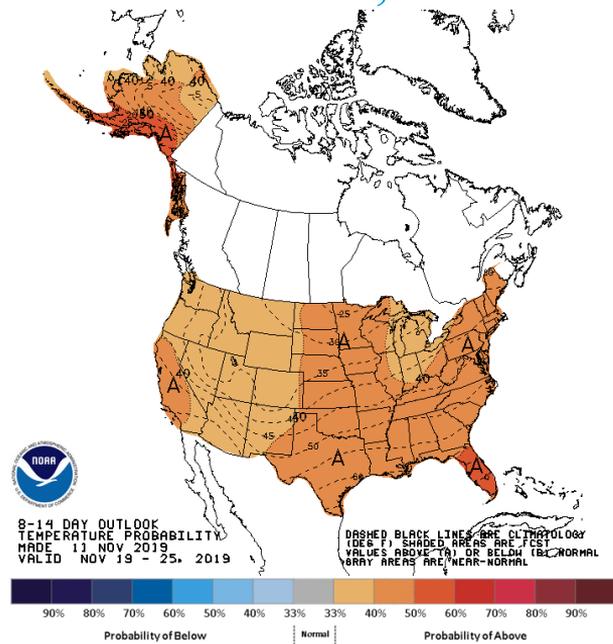
A = temperatures above normal

N = equal chance that temperatures are above normal, normal, or below normal

B = temperatures below normal

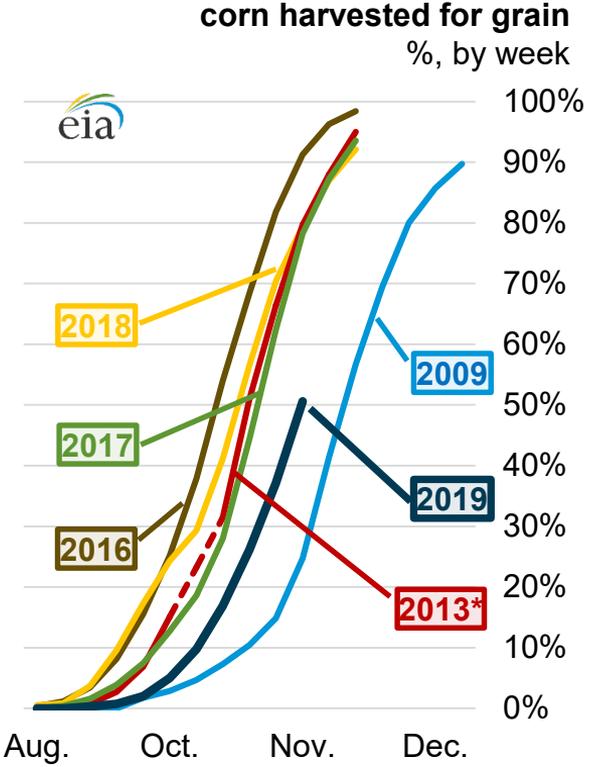
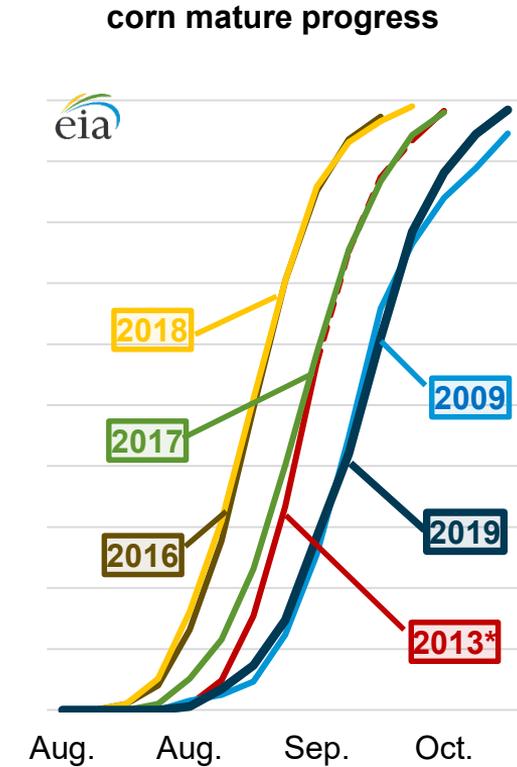
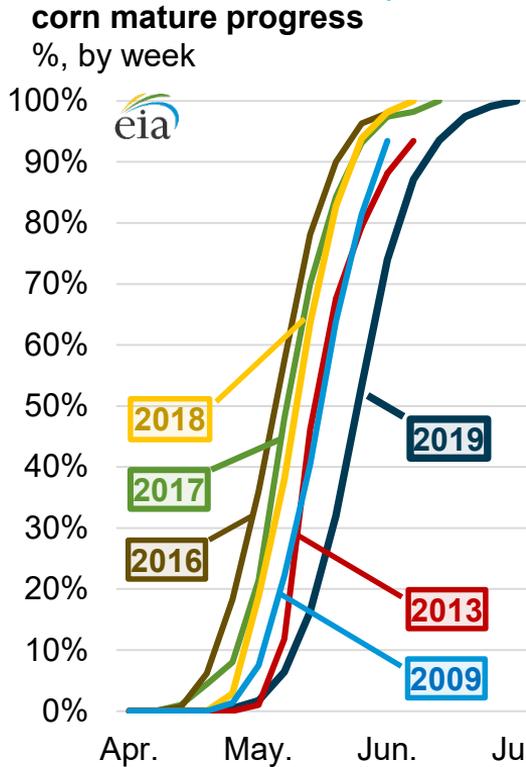
Source: [NOAA](#), Nov. 11, 2019

Petroleum Administration for
Defense Districts (PADDs)



- NOAA forecasts high probability of above-normal temperatures west of the Mississippi, with lower temperatures early in the forecast giving way to above-average temperatures across the east later in the forecast.
- After multiple weeks of above-average heating fuel demand across the Midwest and East, the warming trend should result in lower-than-average heating fuel demand later in November, allowing propane retailers especially to begin refilling their depleted inventory

Delay in 2019 harvest, and associated grain drying demand, were forecasted early



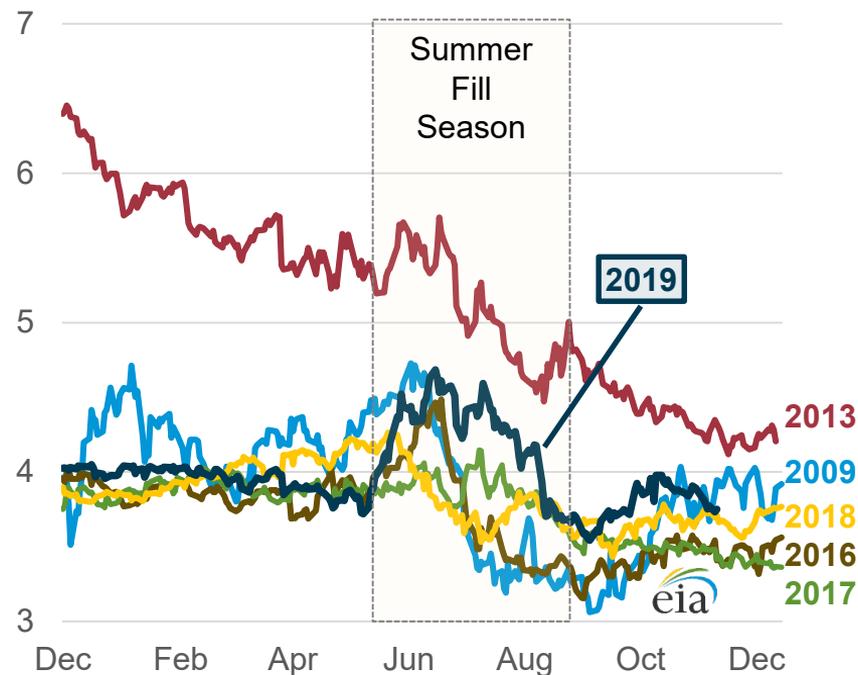
Source: USDA [National Agricultural Statistics Service](#)

* USDA 2013 data incomplete. Weeks 40 and 41 not available.

Elevated corn futures prices during the summer fill season provided economic impetus for end-use stock building of propane for drying

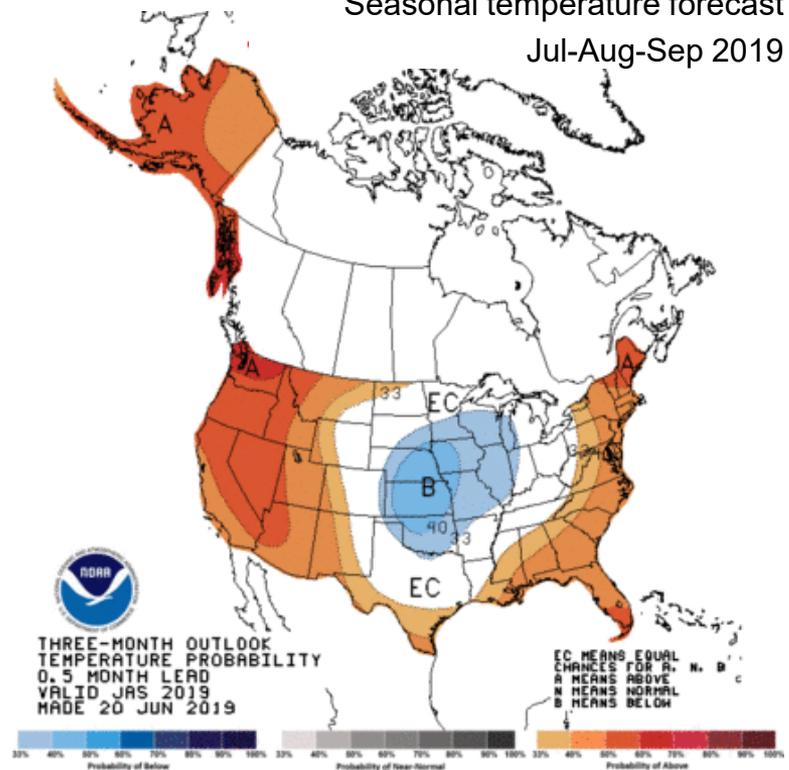
corn futures price for delivery in December

\$/bushel



Seasonal temperature forecast

Jul-Aug-Sep 2019



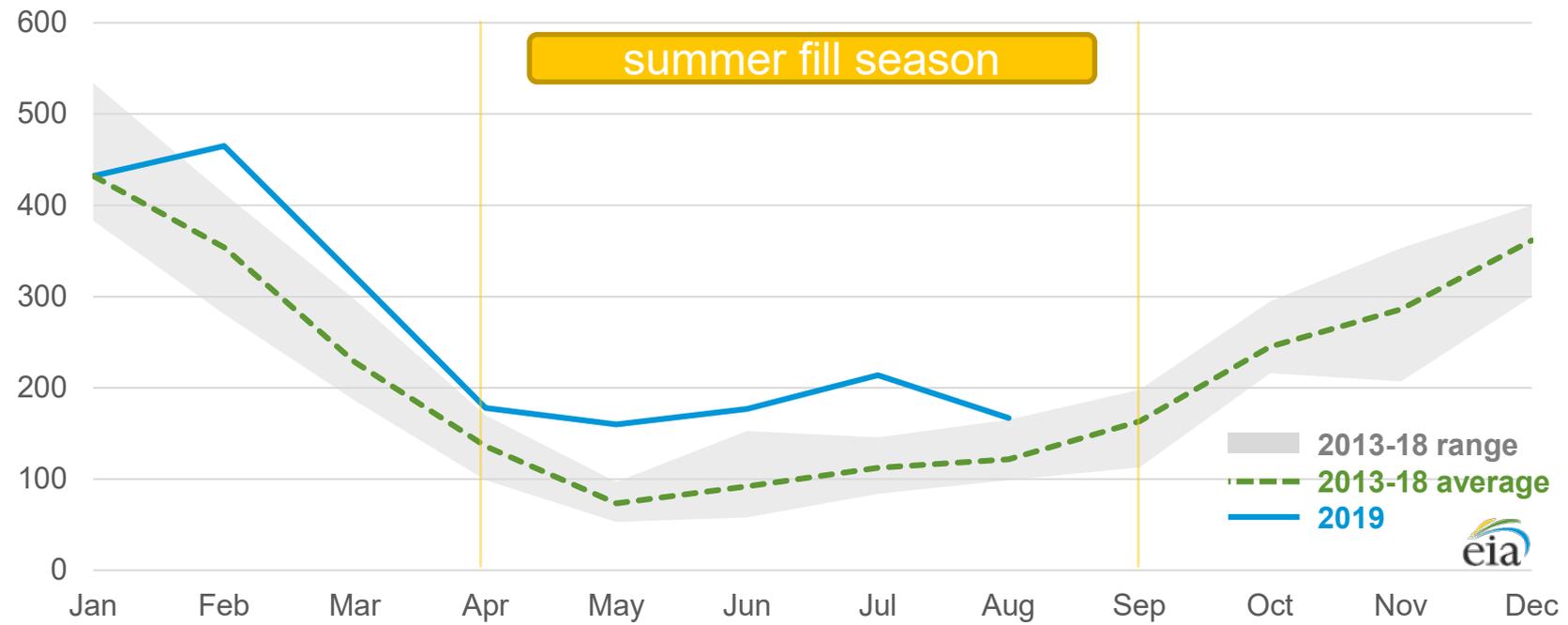
Sources: USDA [National Agricultural Statistics Service](#); Bloomberg

Source: NOAA, June 20, 2019

2019 Midwest propane product supplied in the summer was above the 5-year range, suggesting strong inventory build at the end-use level

Midwest (PADD 2) product supplied of propane

1,000 b/d



Source: U.S. Energy Information Administration, [Midwest \(PADD 2\) Product Supplied of Propane](#)

With pipelines on allocation, Conway-linked Midwest markets see premium expand. As source of incremental supply, Edmonton also rises

propane spot prices
dollars per gallon

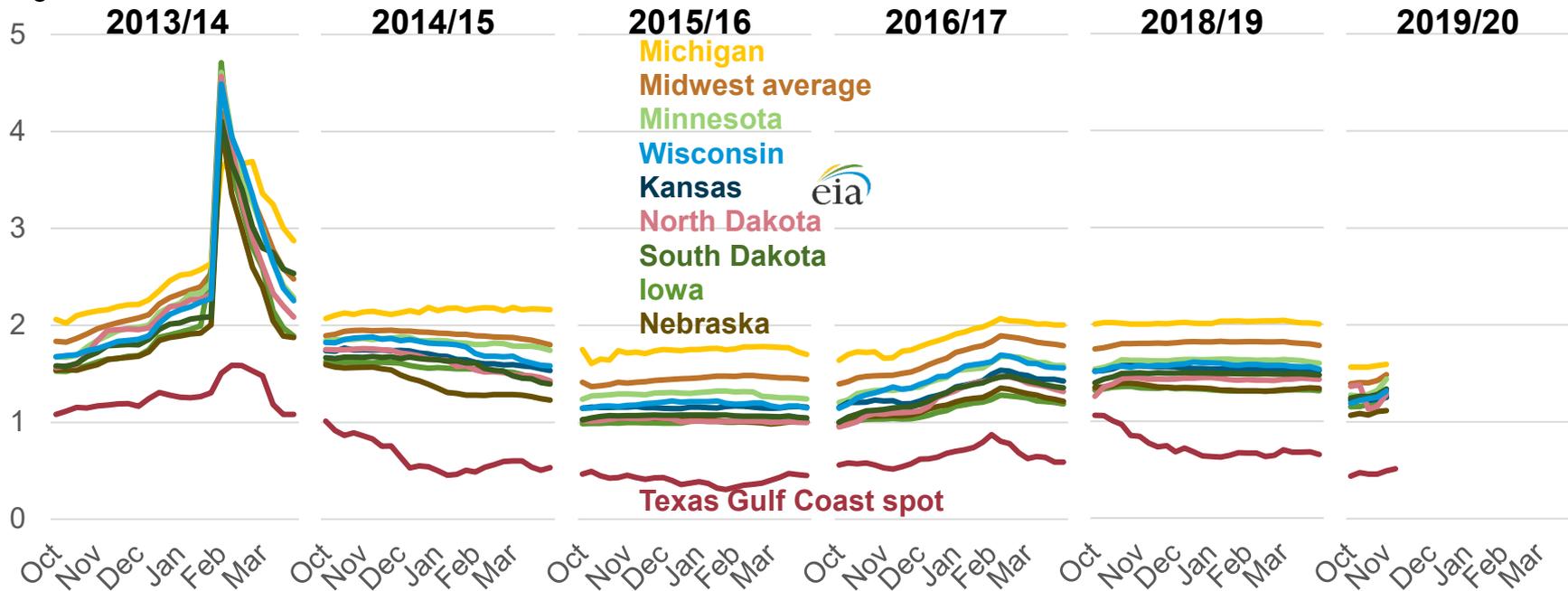


Source: EIA, Bloomberg, data through November 11, 2019

EIA's weekly residential will-call propane price data for Midwest states shows a major anomaly in the 2013/14 winter

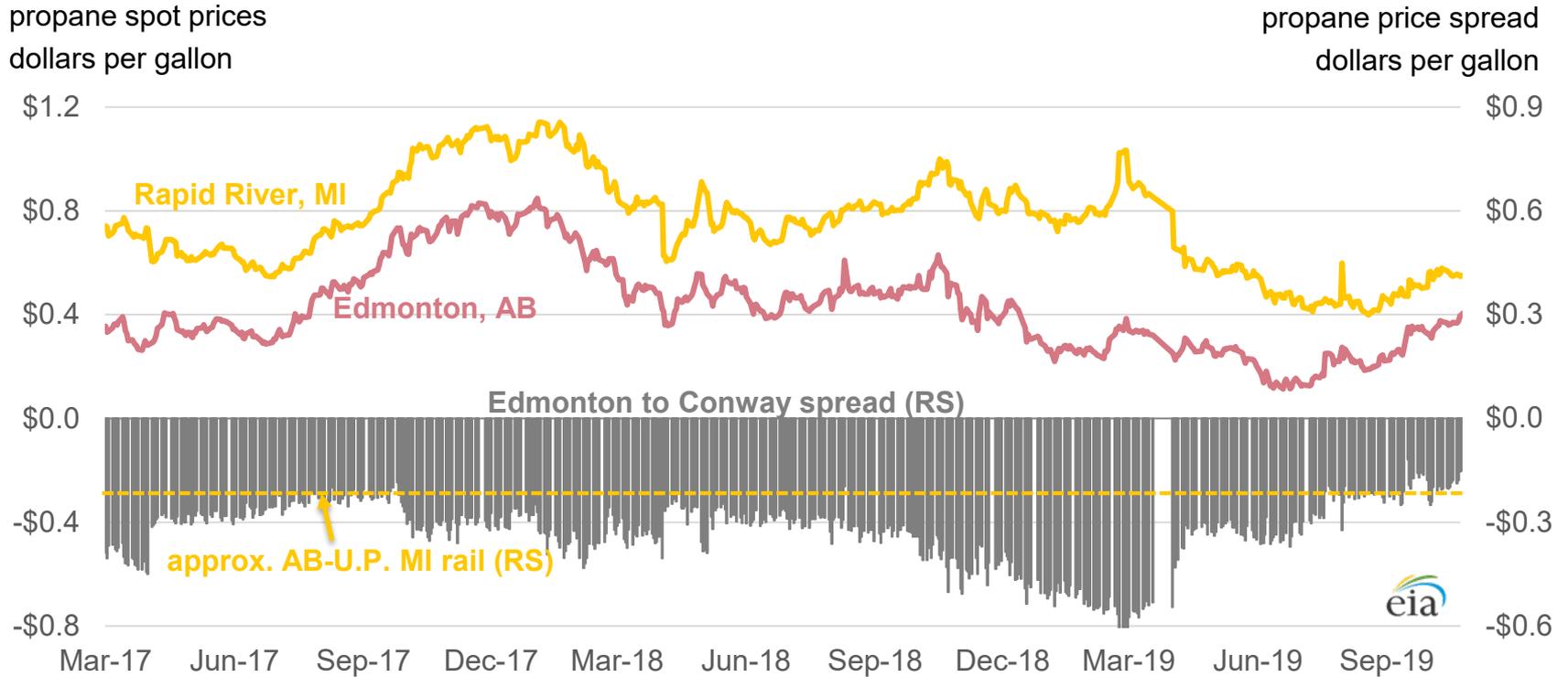
Residential delivered propane price in selected states

\$/gallon



Source: U.S. Energy Information Administration, [Heating Oil and Propane Update](#); EIA, [Weekly Mont Belvieu, TX Propane Spot Price FOB](#)

Most of the year, U.P. wholesale propane prices are sufficiently high to pull rail cargos from Edmonton; capacity may act as a constraint

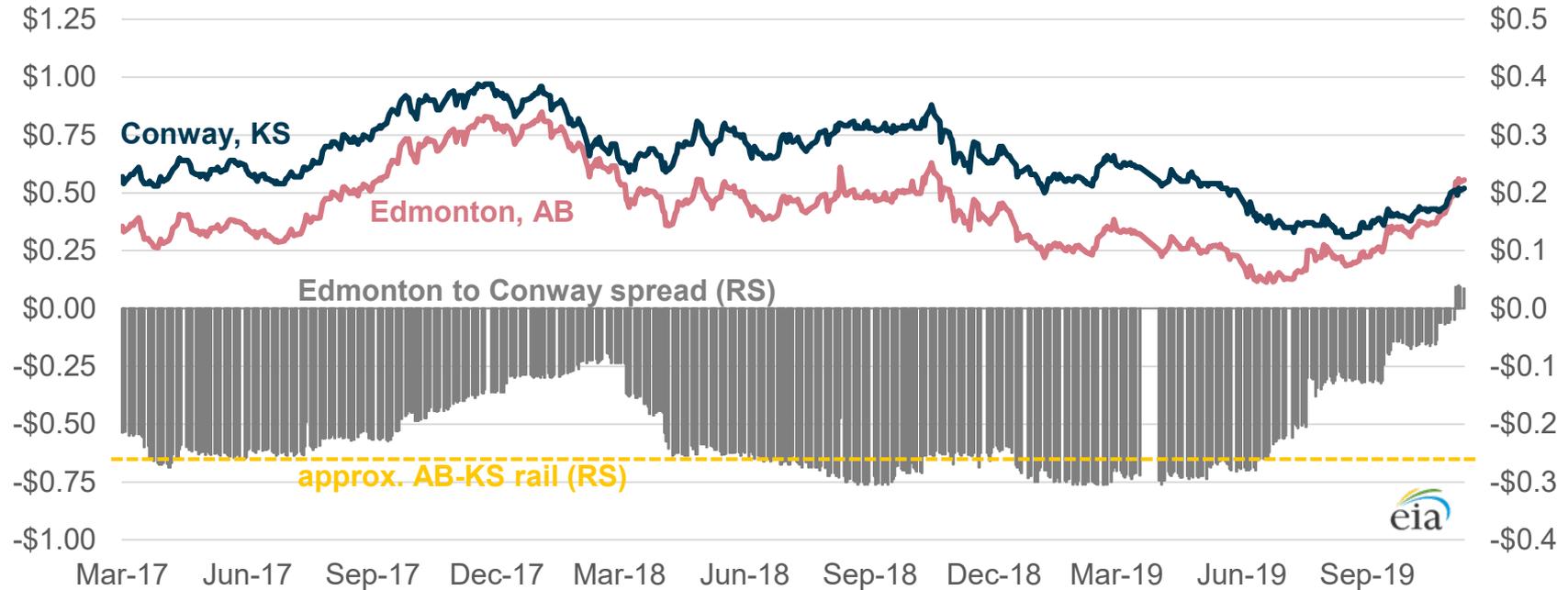


Source: EIA, Bloomberg, data through November 11, 2019

Since opening of the Ridley Island Propane Export Terminal in British Columbia, discount for propane at Edmonton has dropped substantially

propane spot prices
dollars per gallon

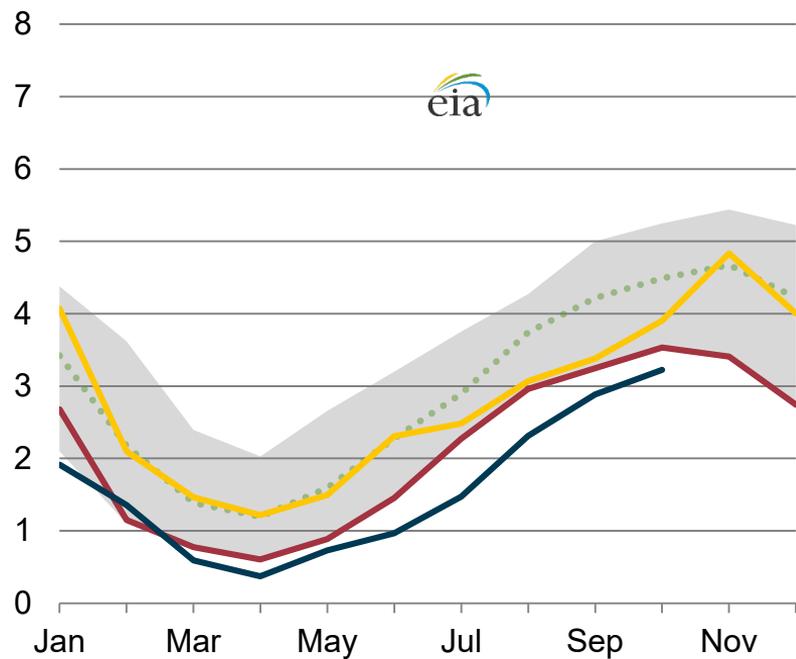
propane price spread
dollars per gallon



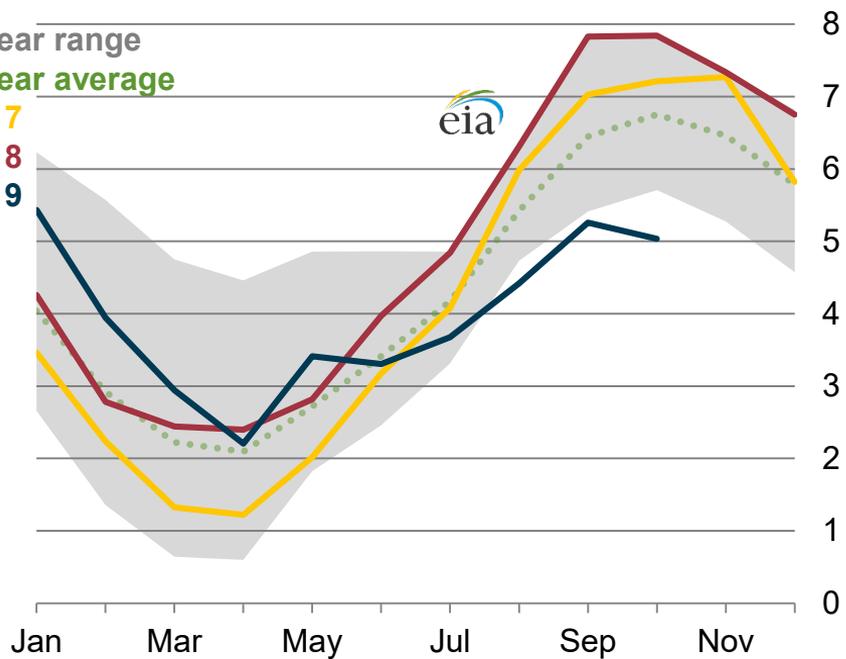
Source: EIA, Bloomberg, data through November 11, 2019

Lower demand in E. Canada resulted in less dedicated storage capacity; W. Canadian marine exports have caused a downward shift in stocks

propane inventories in Eastern Canada
million barrels



propane inventories in Western Canada
million barrels



Source: Canada's [National Energy Board](#)

As a major storage hub, Sarnia received growing volumes of railed-in propane for storage during summer season. This is changing

PADD 2 (Midwest) rail shipments of propane to Canada
thousand barrels per month



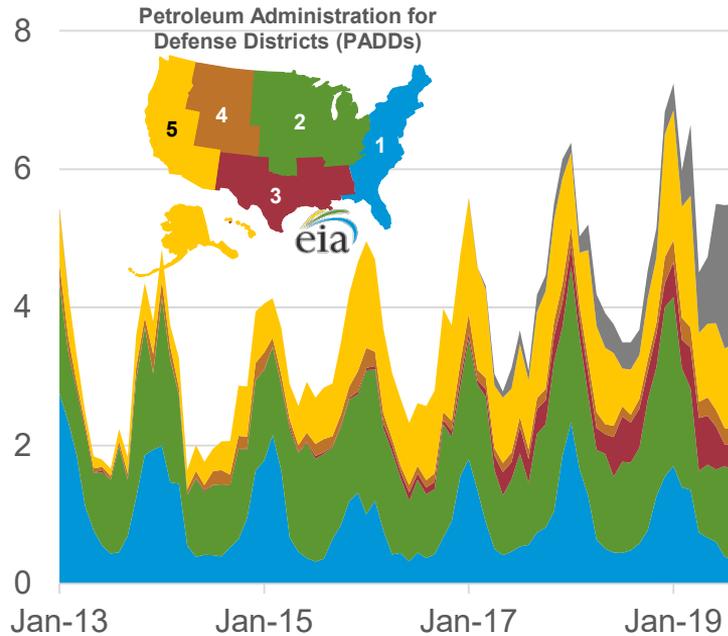
PADD 1 (East Coast) propane exports overseas
thousand barrels per month



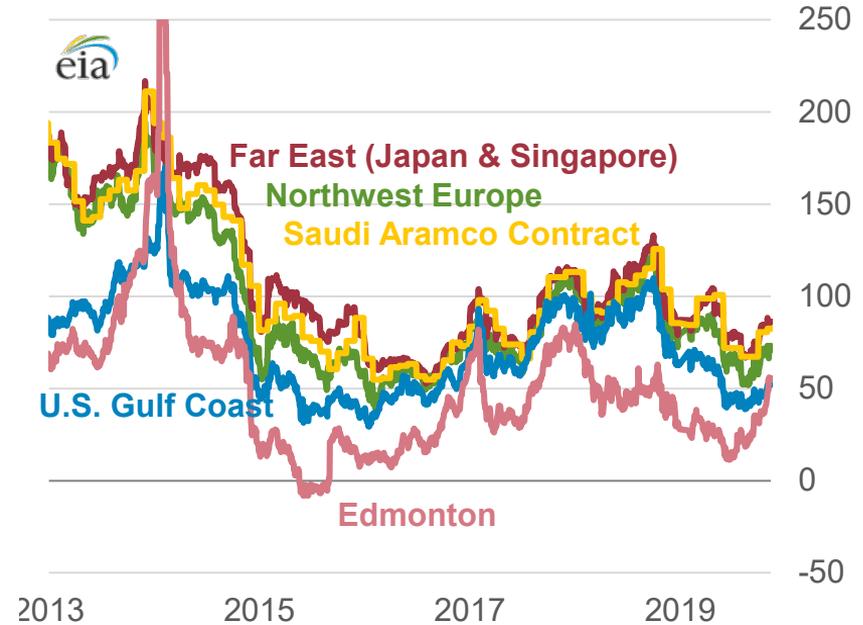
Source: U.S. Energy Information Administration [Movements of Crude Oil and Selected Products by Rail](#); [PAD District Exports by Destination](#)

Canadian exports also redirecting flows away from PADD 2 to overseas markets, where premiums are significantly higher

Canadian exports of propane by destination
million barrels per month



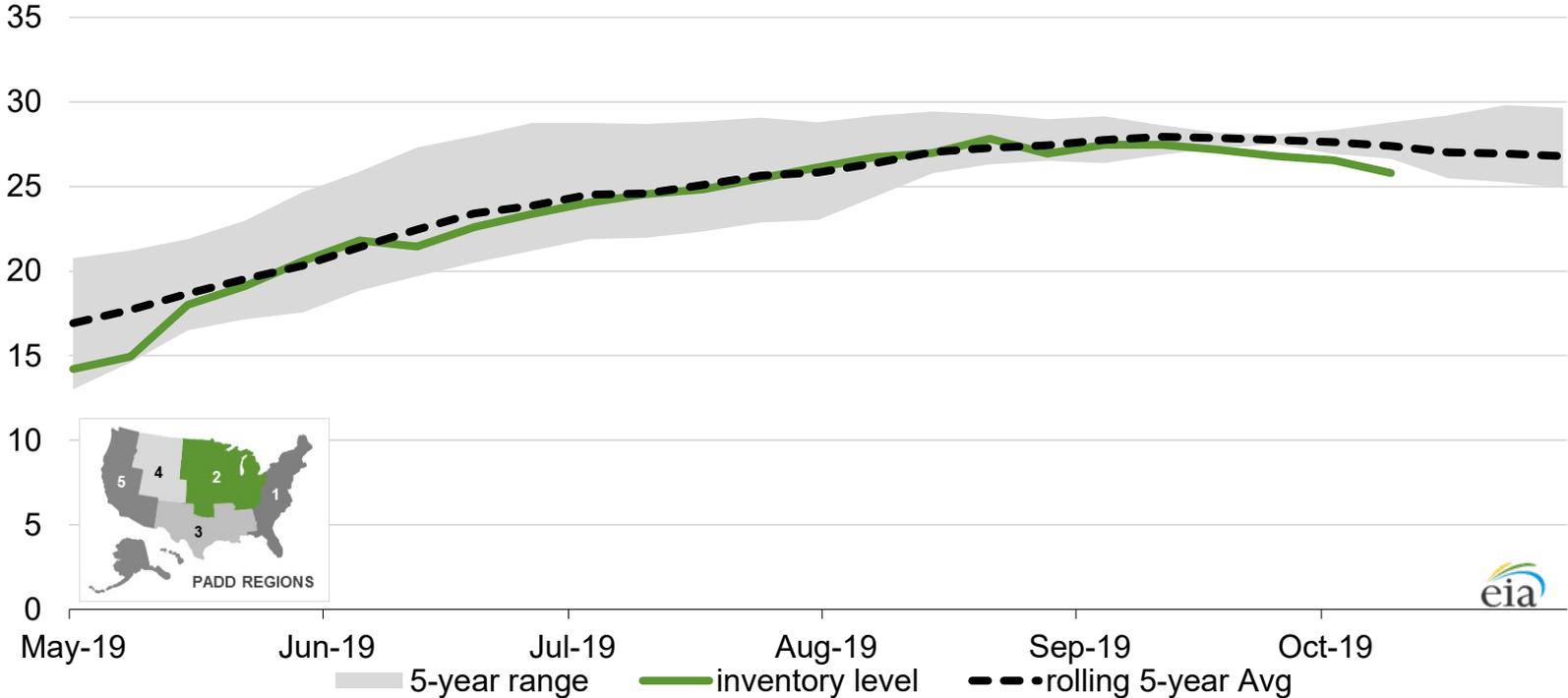
propane spot prices
\$/U.S. gallon



Source: Canada Energy Regulator, [Export volume by destination - Query](#)

PADD 2 (Midwest) propane inventories below the 5-year range

PADD 2 propane* inventories
million barrels

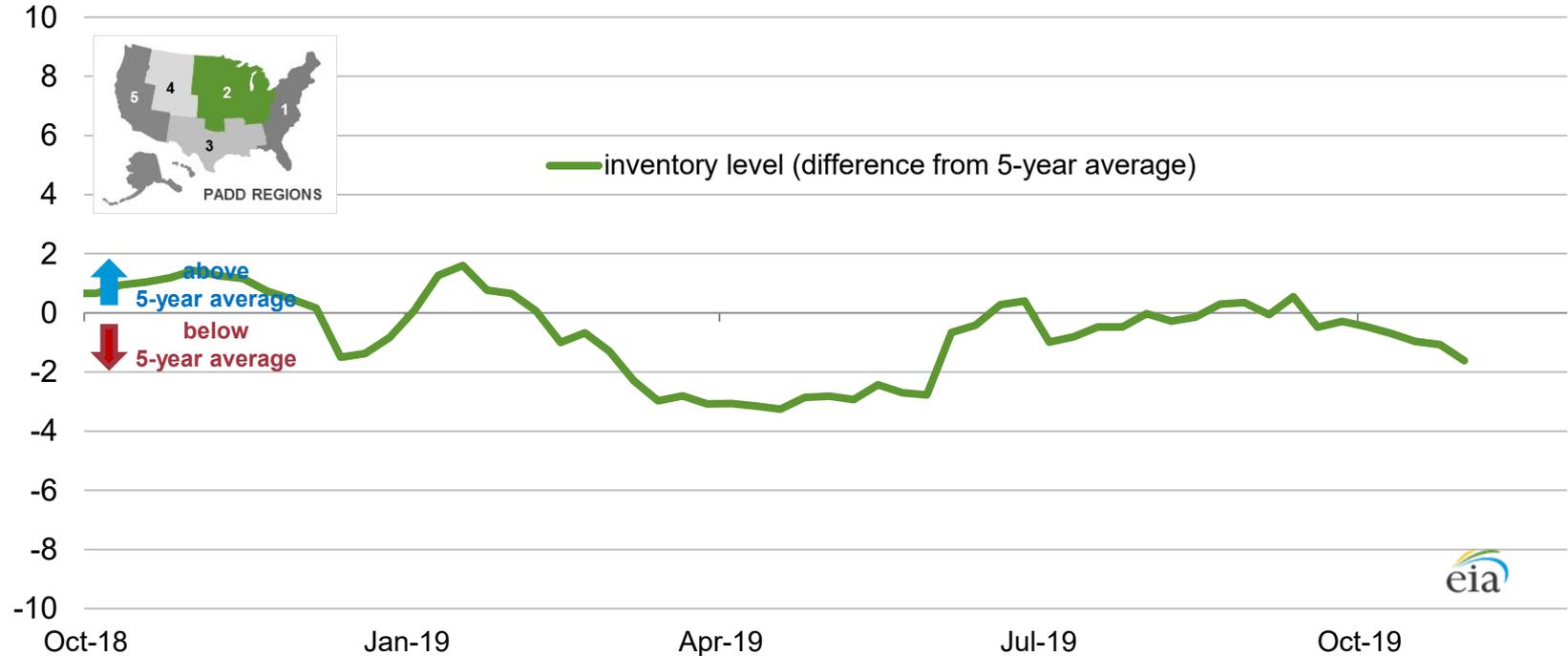


Source: EIA, Weekly Petroleum Status Report, data through November 1, 2019

*propane/propylene for fuel use only

PADD 2 (Midwest) propane inventories below 5-year-average levels

PADD 2 propane* inventories, difference from 5-year average
million barrels

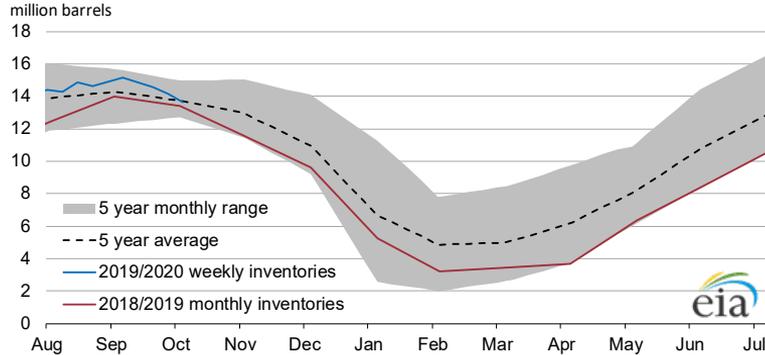


Source: EIA, Weekly Petroleum Status Report, data through November 1, 2019

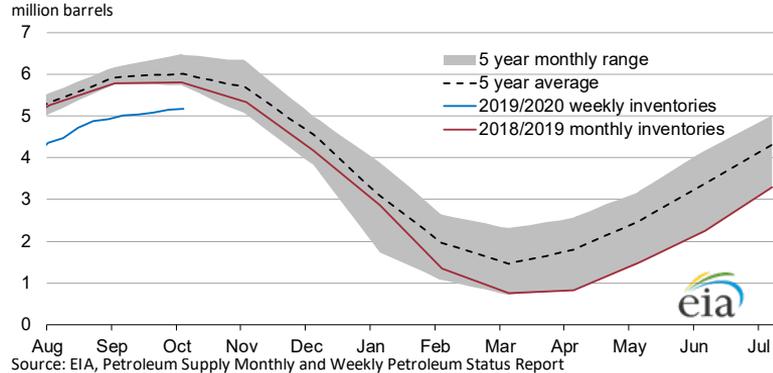
*propane/propylene for fuel use only

Selected state propane* inventories

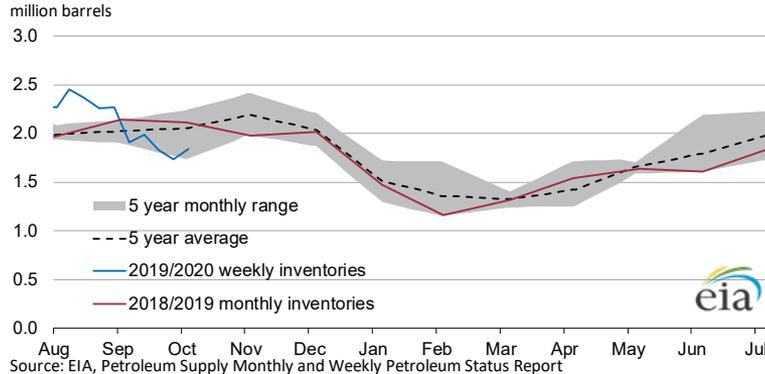
Kansas propane/propylene stock at refineries, terminals, and natural gas plants (not pipelines)



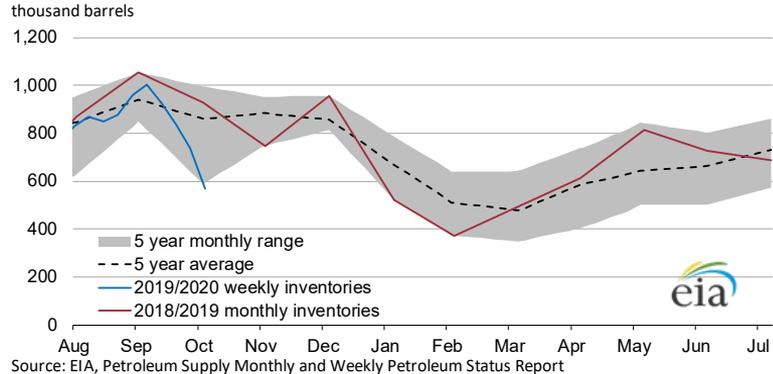
Michigan propane/propylene stock at refineries, terminals, and natural gas plants (not pipelines)



Illinois, Indiana, Ohio propane/propylene stock at refineries, terminals, and natural gas plants (not pipelines)



Iowa, Minnesota, Wisconsin propane/propylene stock at refineries, terminals, and natural gas plants (not pipelines)

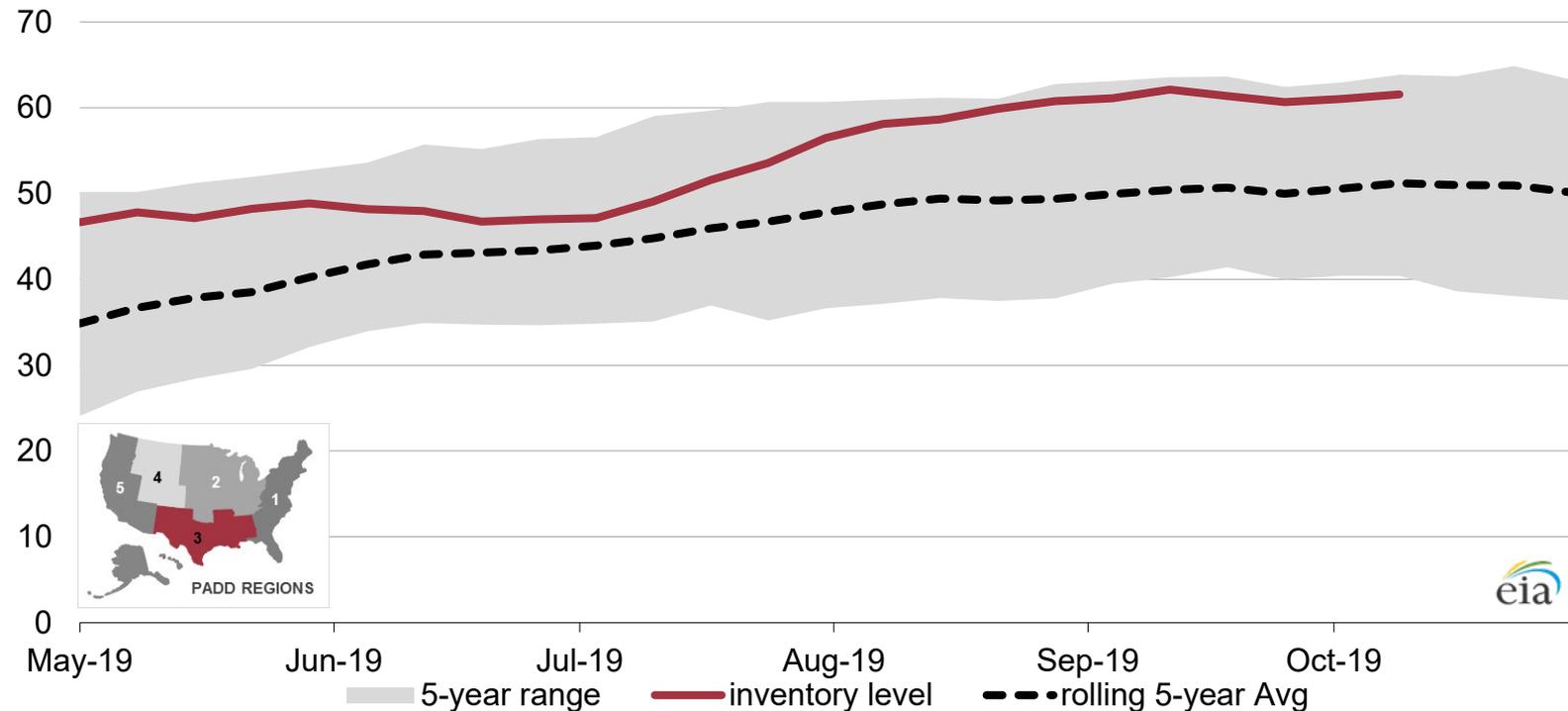


Source: EIA, Weekly Petroleum Status Report, data through November 1, 2019

*propane/propylene for fuel use only

PADD 3 (Gulf Coast) propane inventories near the top of the 5-year range

PADD 3 propane* inventories
million barrels

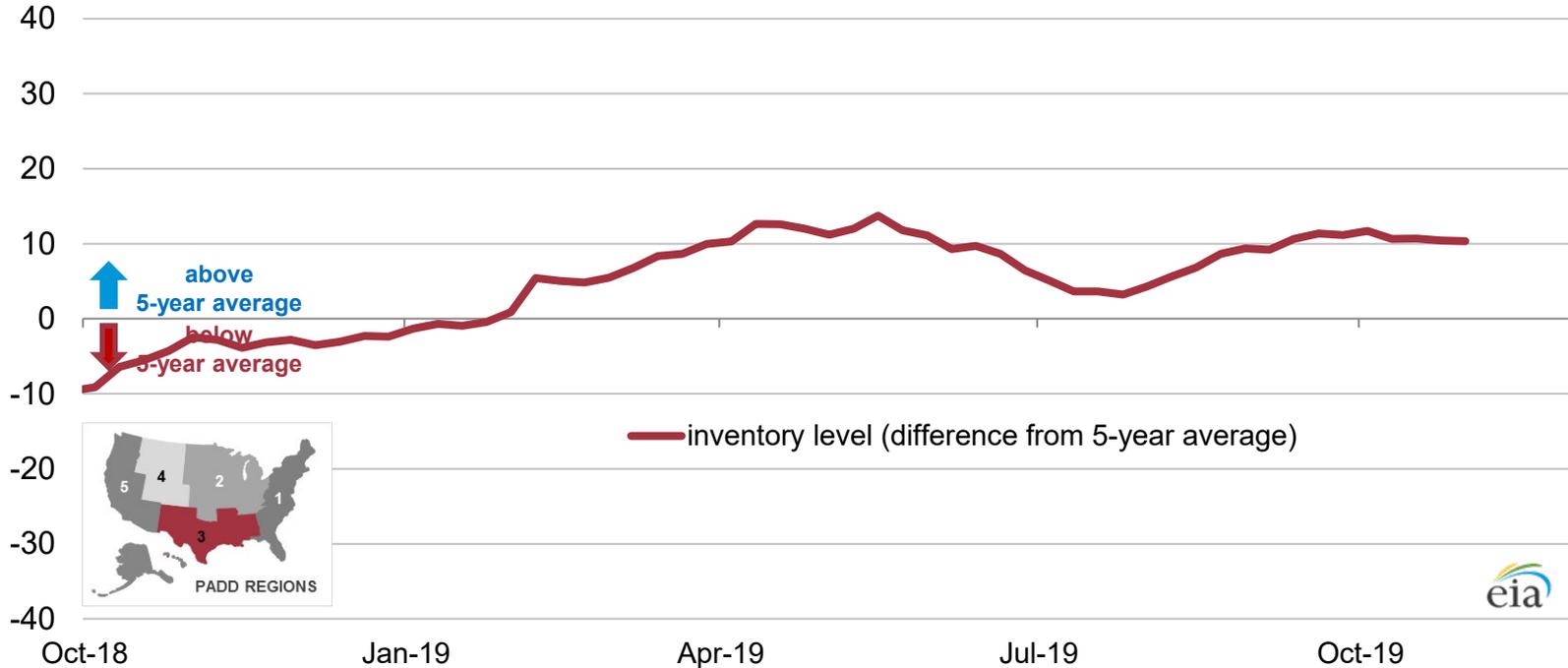


Source: EIA, Weekly Petroleum Status Report, data through November 1, 2019

*propane/propylene for fuel use only

PADD 3 (Gulf Coast) propane inventories above 5-year average levels

PADD 3 propane* inventories, difference from 5-year average
million barrels



Source: EIA, Weekly Petroleum Status Report, data through November 1, 2019

*propane/propylene for fuel use only

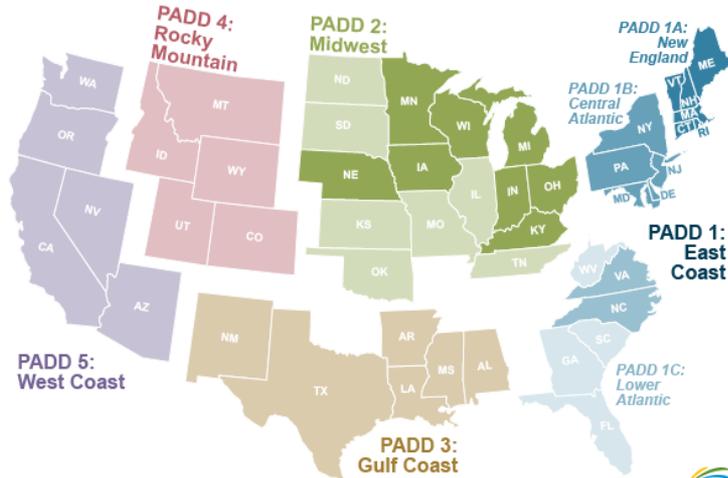
State Heating Oil and Propane Program (SHOPP) updates

- SHOPP is a collaborative program between states and EIA that provides weekly wholesale and retail prices for heating oil and propane at the state level.
- EIA expanded SHOPP in October 2014 to include 14 additional states in propane price data collection. In 2016, EIA added 10 new states to its wholesale propane price publication. This should be taken into consideration when comparing the average prices for the U.S., PADD 1, PADD 1B, PADD 1C, and PADD 2 averages.
- EIA has been providing more granular inventory data to states on a weekly basis since the 2016/2017 heating season.
- EIA implemented two new samples for residential heating oil and propane in October 2019. Under the new [sampling methodology](#) EIA is publishing [standard errors](#) for SHOPP prices.

Maps of states participating in Winter Fuels Survey

Petroleum Administration for Defense Districts

Winter Heating Fuels Survey — PADD 1 and 2 represented States



HEATING OIL



PADD 1: East Coast

PADD 1A: New England
Connecticut New Hampshire
Maine Rhode Island
Massachusetts Vermont

PADD 1B: Central Atlantic
Delaware New Jersey
District of Columbia New York
Maryland Pennsylvania

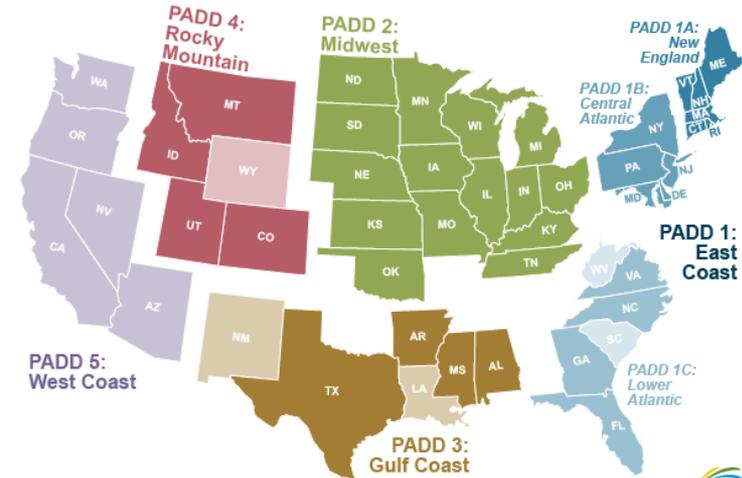
PADD 2: Midwest

Indiana Minnesota
Iowa Nebraska
Kentucky Ohio
Michigan Wisconsin

PADD 1C: Lower Atlantic
North Carolina Virginia

Petroleum Administration for Defense Districts

Winter Heating Fuels Survey — PADD 1, 2, 3, and 4 represented States



PROPANE



PADD 1: East Coast

PADD 1A: New England
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

PADD 1B: Central Atlantic
Delaware
Maryland
New Jersey
New York
Pennsylvania

PADD 1C: Lower Atlantic
Florida
Georgia
North Carolina
Virginia

PADD 2: Midwest

Illinois Nebraska
Indiana North Dakota
Iowa Ohio
Kansas Oklahoma
Kentucky South Dakota
Michigan Tennessee
Minnesota Wisconsin
Missouri

PADD 3: Gulf Coast

Alabama Mississippi
Arkansas Texas

PADD 4: Rocky Mountain

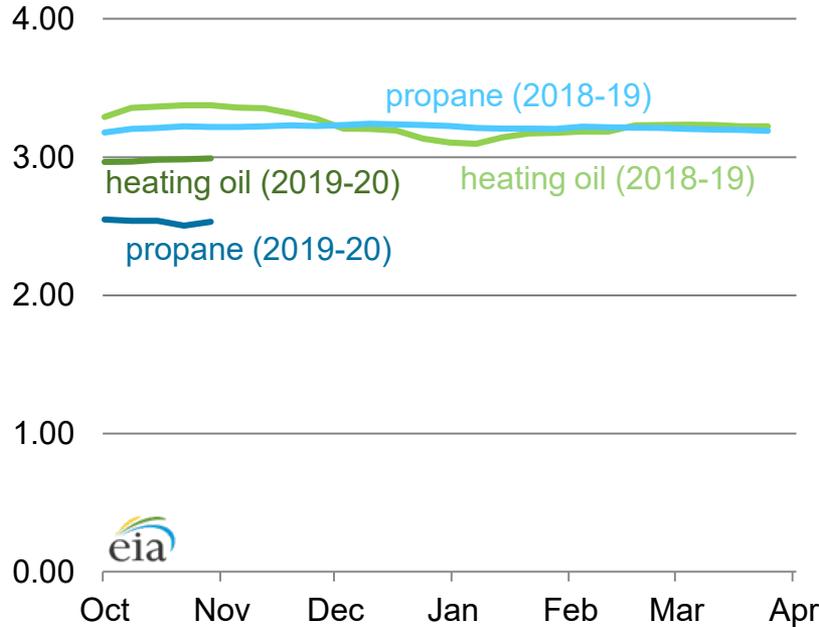
Colorado Montana
Idaho Utah

Source: EIA, [Heating Oil and Propane Update](#)

Retail propane prices this heating season below prices reported for the same week last year in PADDs 1 and 2

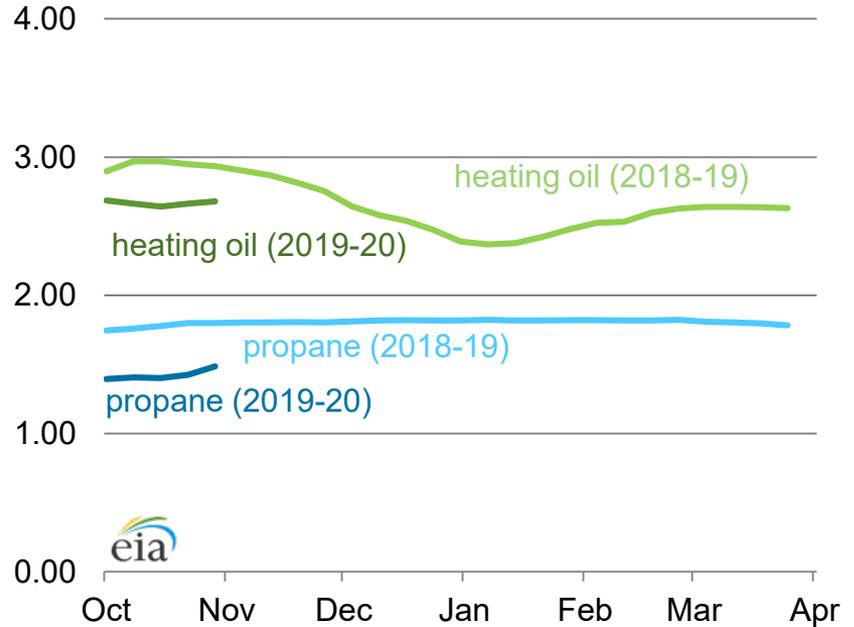
PADD 1

dollars per gallon



PADD 2

dollars per gallon

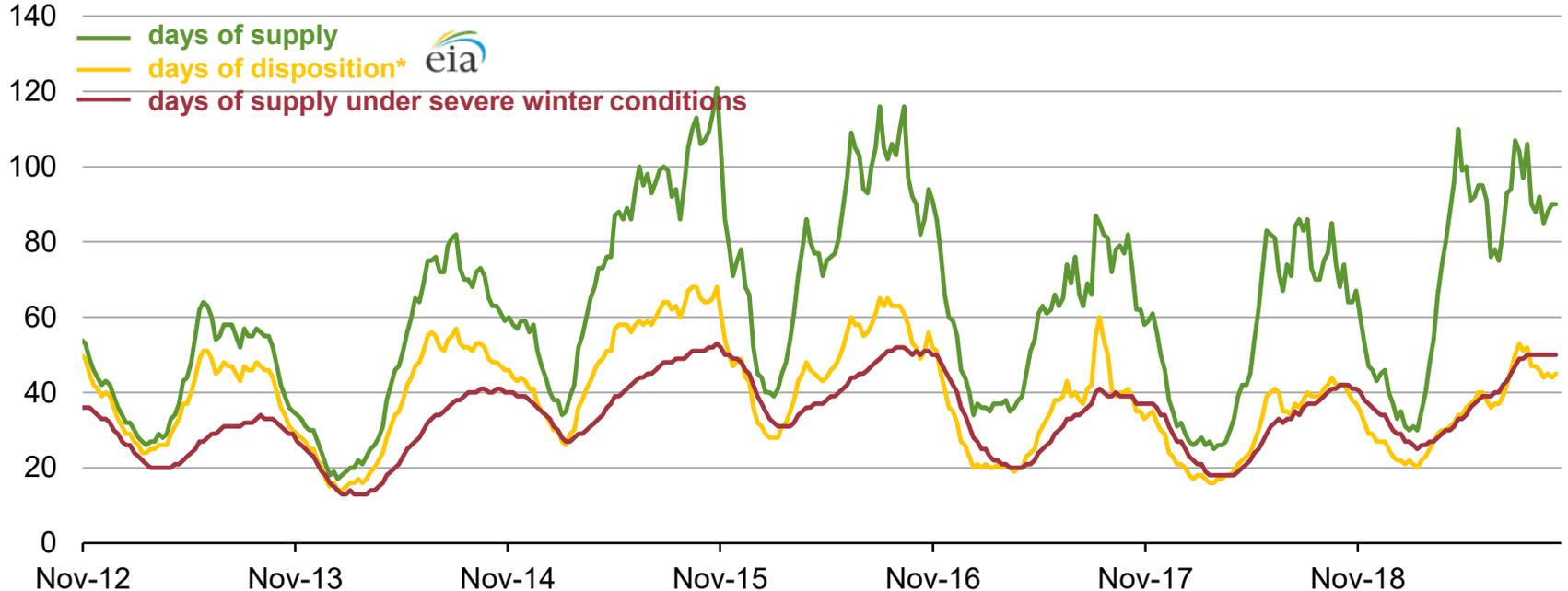


Source: State Heating Oil and Propane Program, data through November 4, 2019

Various days-of supply/disposition measures

U.S. weekly stocks of propane/propylene

days of supply & disposition



Note: *disposition = domestic product supplied + exports

For more information, please see EIA's [webinar on Propane Market Indicators and Measures of Supply Adequacy](#)

Source: U.S. Energy Information Administration, Weekly Petroleum Status Report, data through November 1, 2019

For more information

U.S. Energy Information Administration home page | www.eia.gov

State Energy Data Portal | www.eia.gov/state

Winter Heating Fuels Site | www.eia.gov/special/heatingfuels/

Movements of Propane by Rail |

http://www.eia.gov/dnav/pet/pet_move_railNA_a_EPLLPA_RAIL_mdbl_m.htm

Today in Energy | www.eia.gov/todayinenergy

Short-Term Energy Outlook | www.eia.gov/steo

Energy Explained – Hydrocarbon Gas Liquids |

http://www.eia.gov/energyexplained/index.cfm?page=hgls_home

Annual Energy Outlook | www.eia.gov/aeo

International Energy Outlook | www.eia.gov/ieo

Monthly Energy Review | www.eia.gov/mer