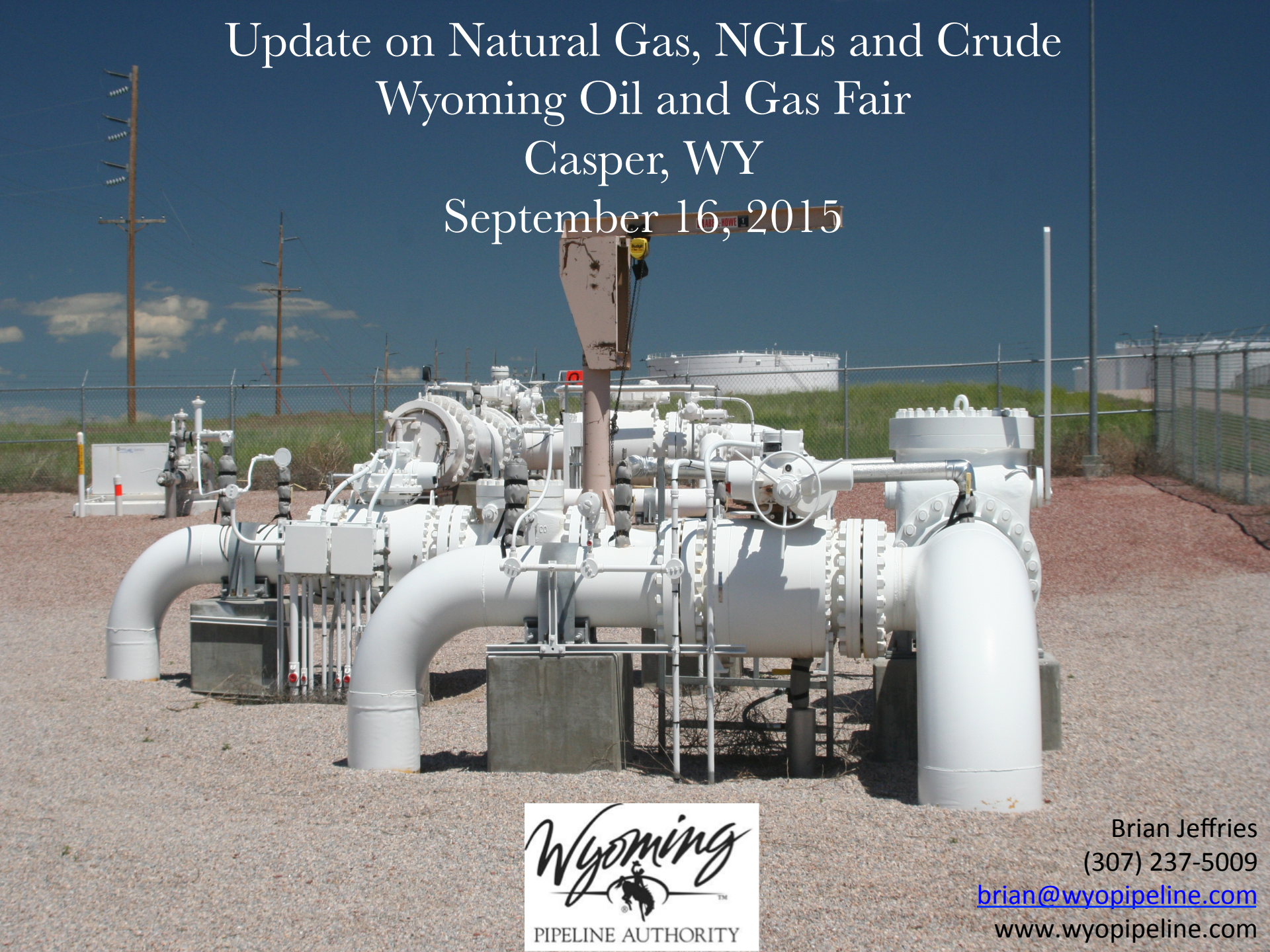
Update on Natural Gas, NGLs and Crude
Wyoming Oil and Gas Fair
Casper, WY
September 16, 2015



Wyoming PIPELINE AUTHORITY

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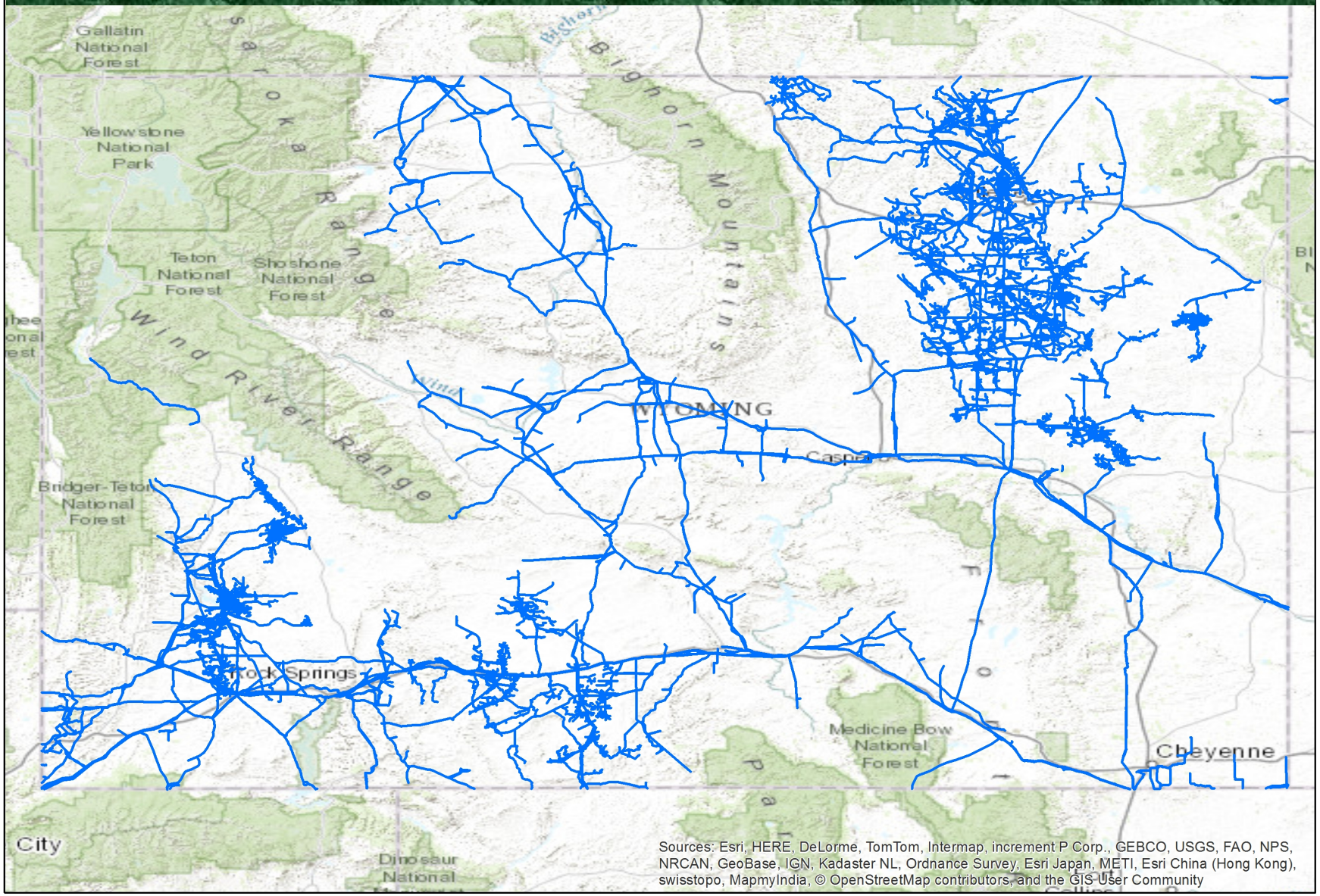
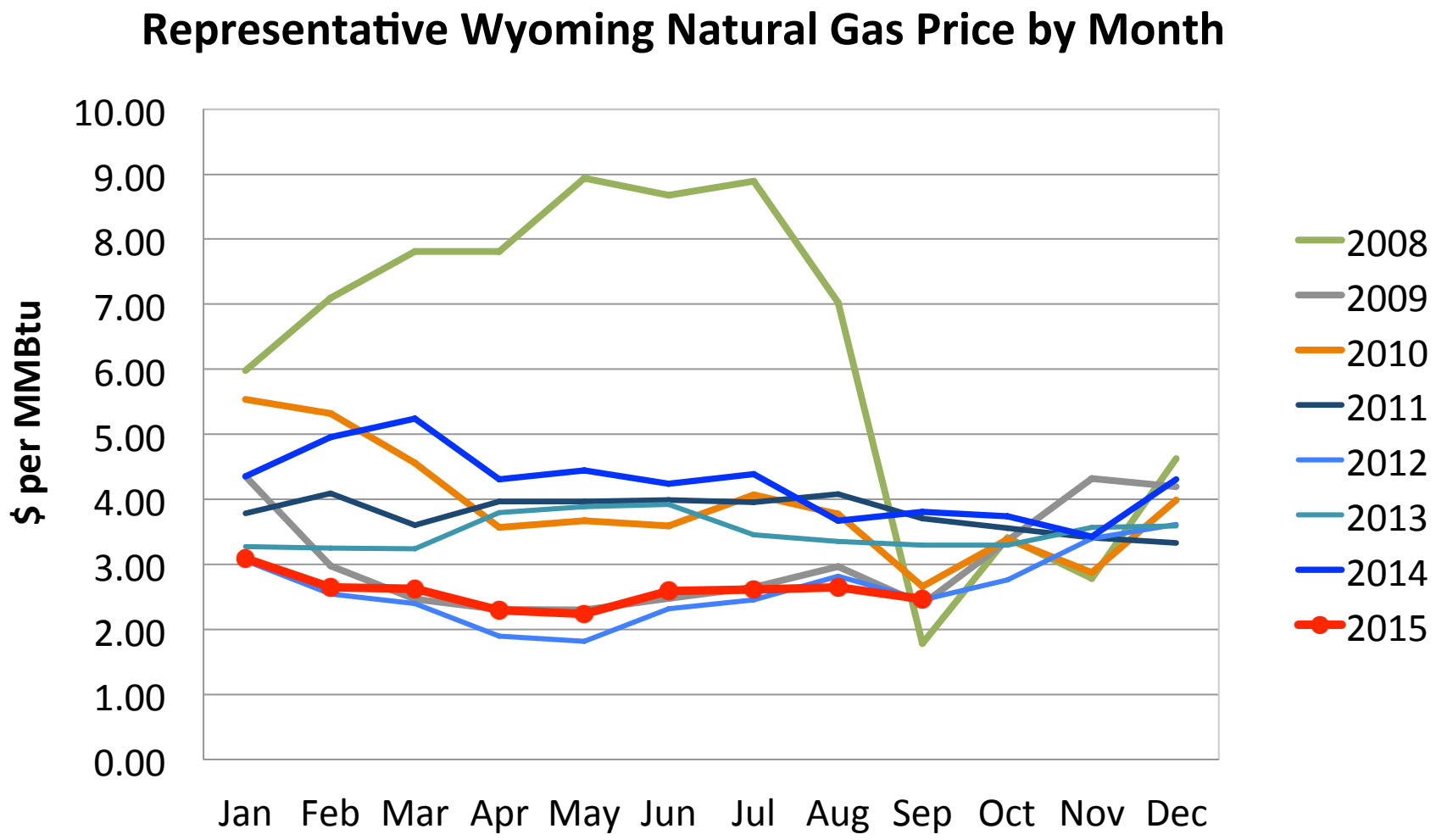
Wyoming natural gas network

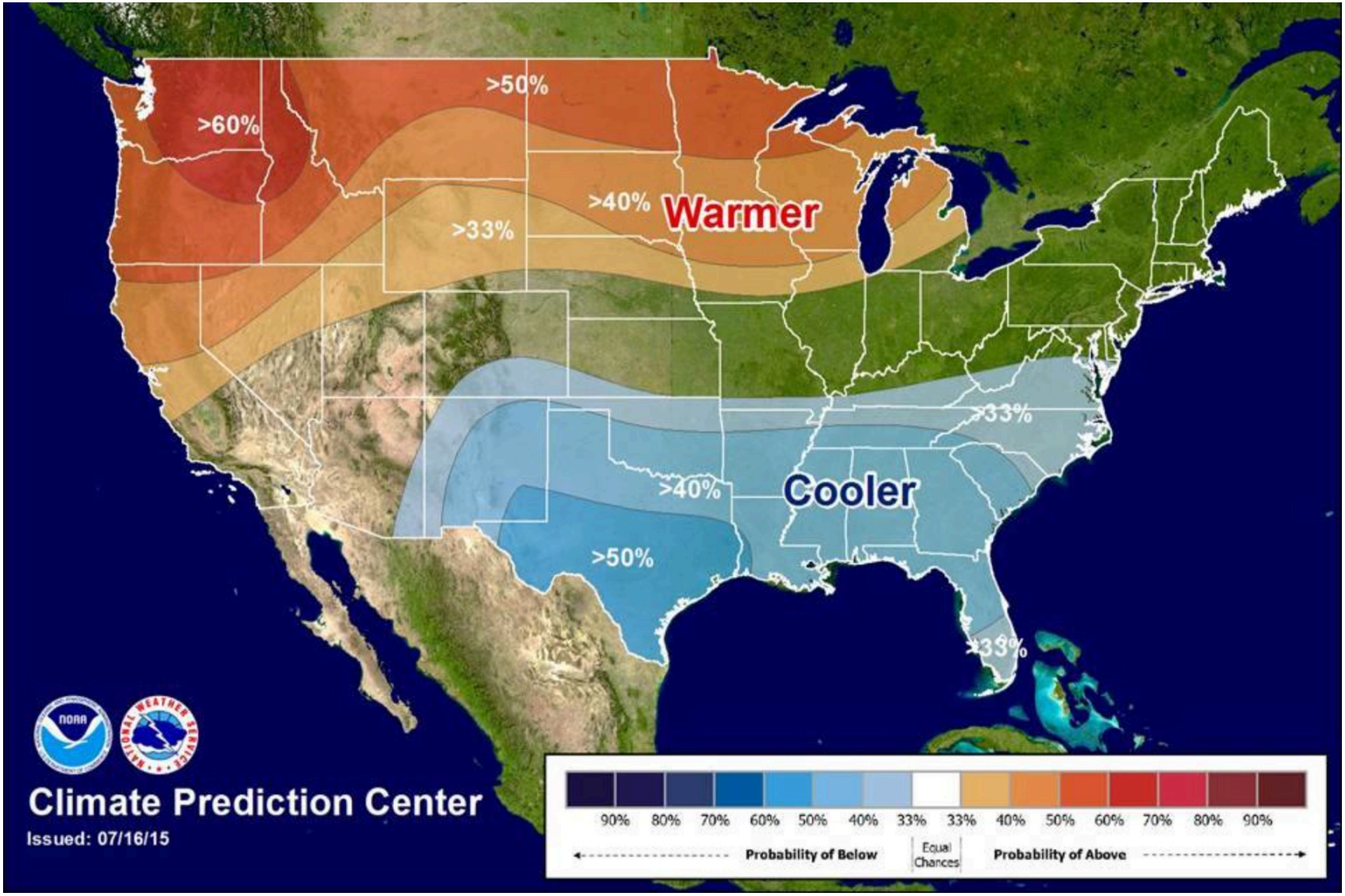


Natural gas prices flat

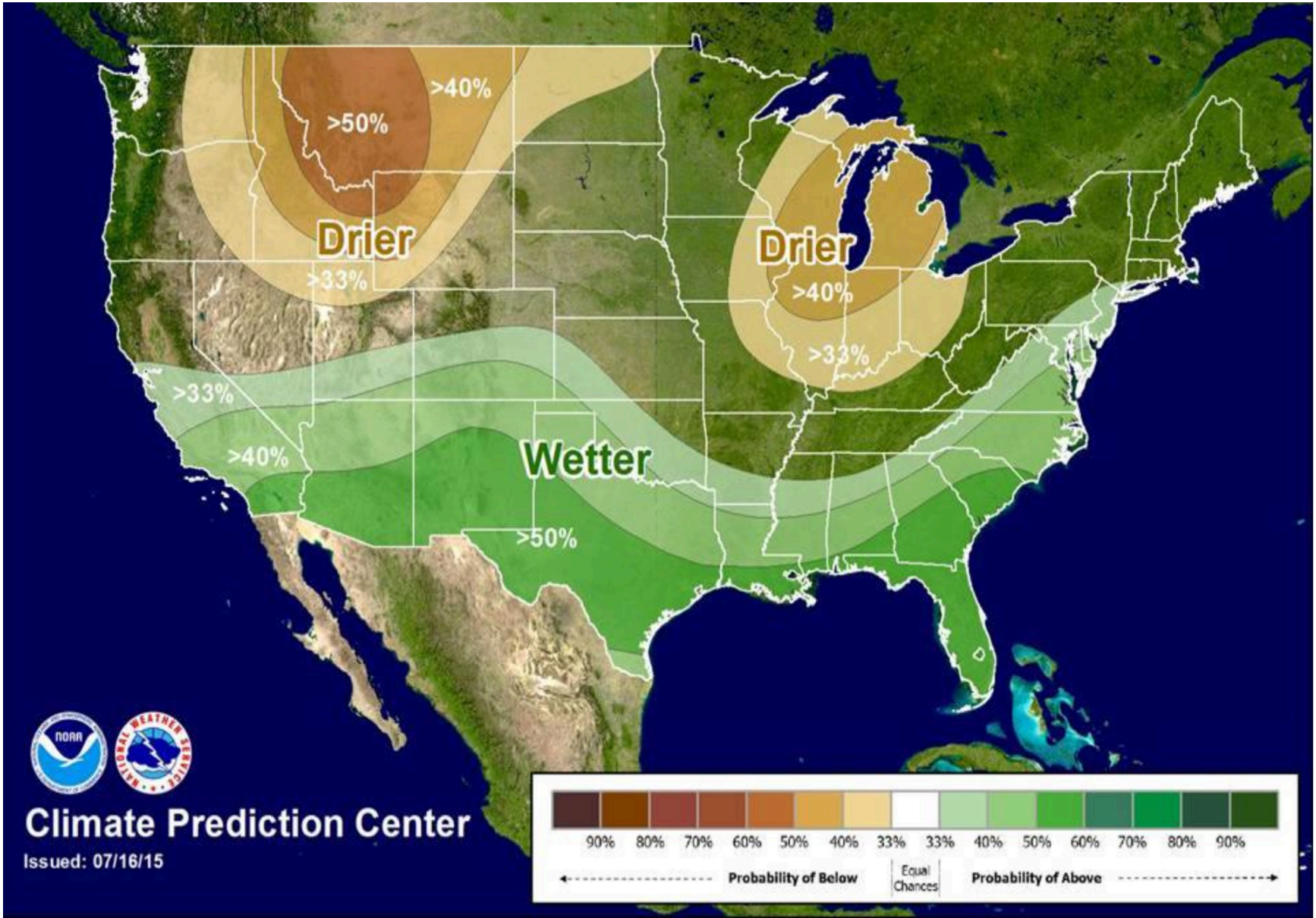


Price: CIG Monthly Index prior to 2012, average of CIG, KERN and NWPL thereafter

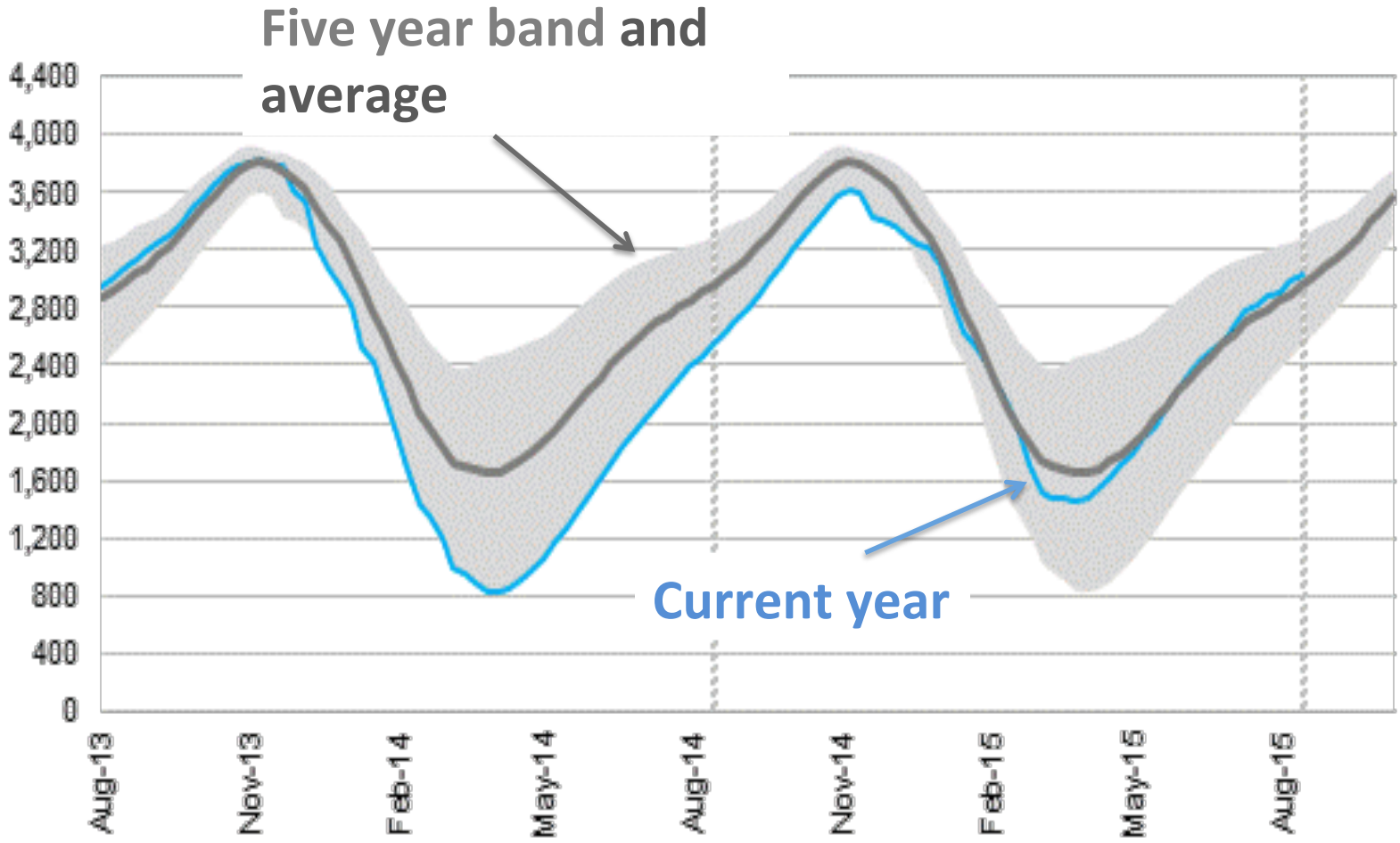
Winter forecast not bullish for natural gas



Winter precipitation forecast



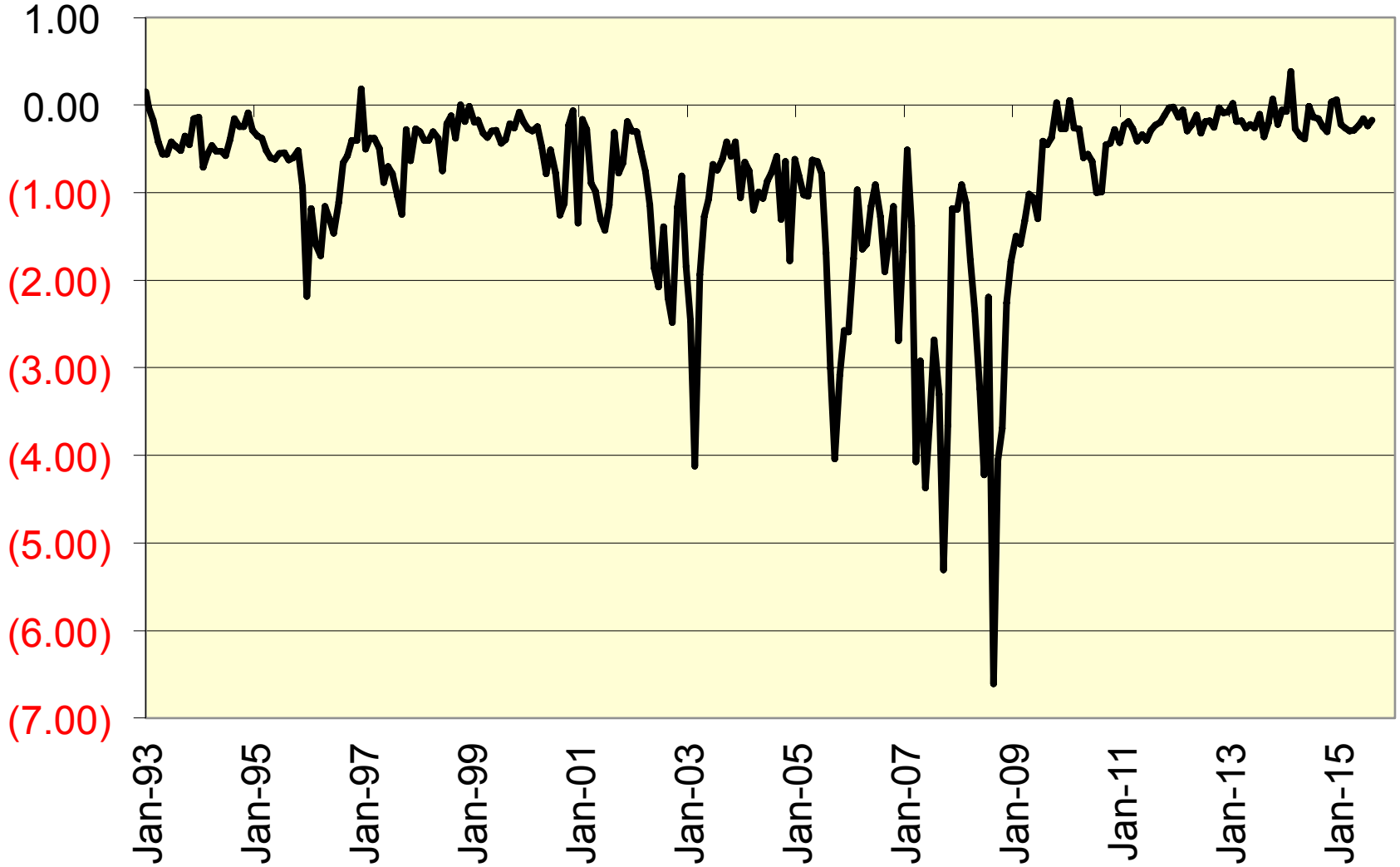
Natural gas storage rising above 5 year average



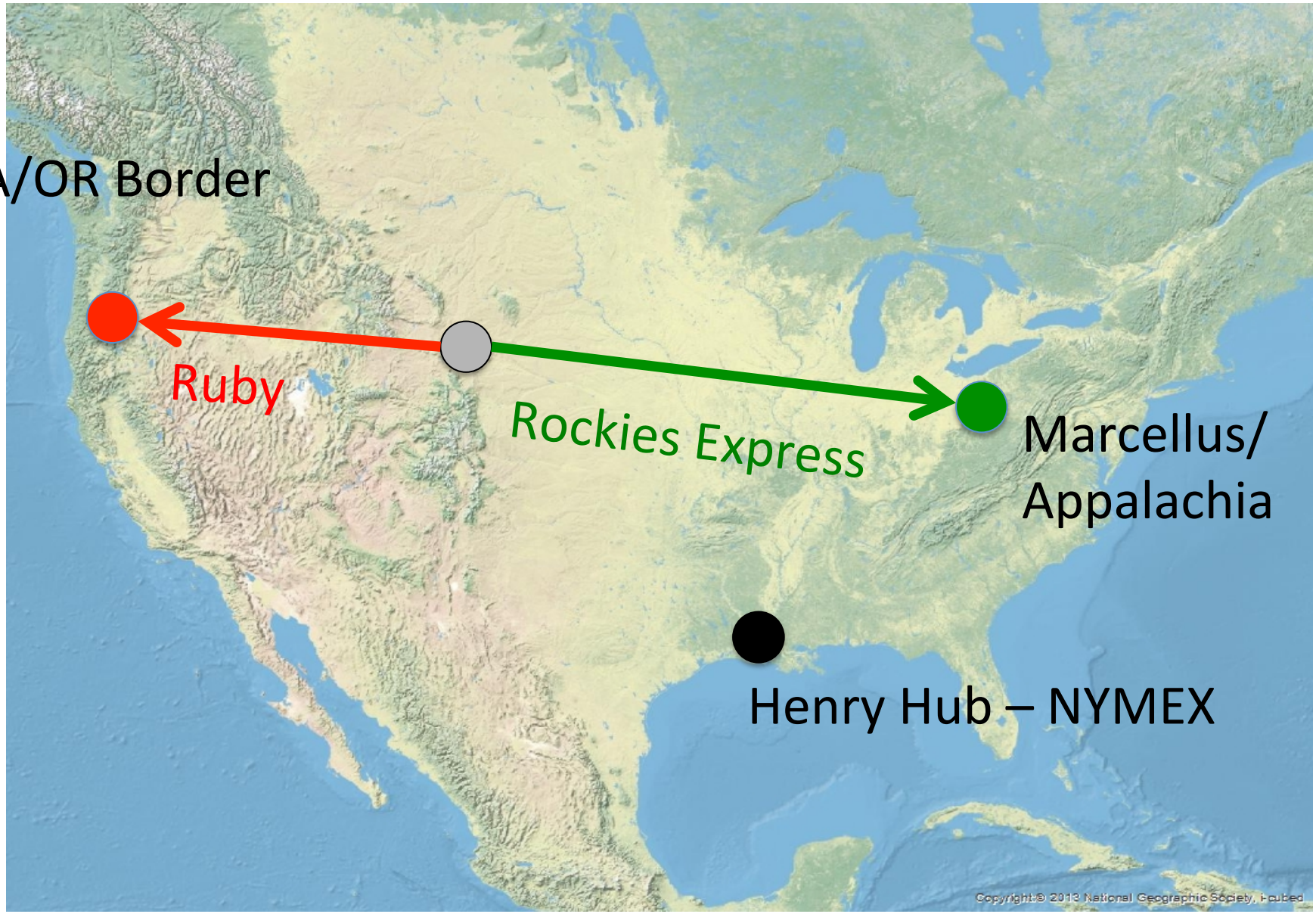
Source: EIA

Differential has remained narrow

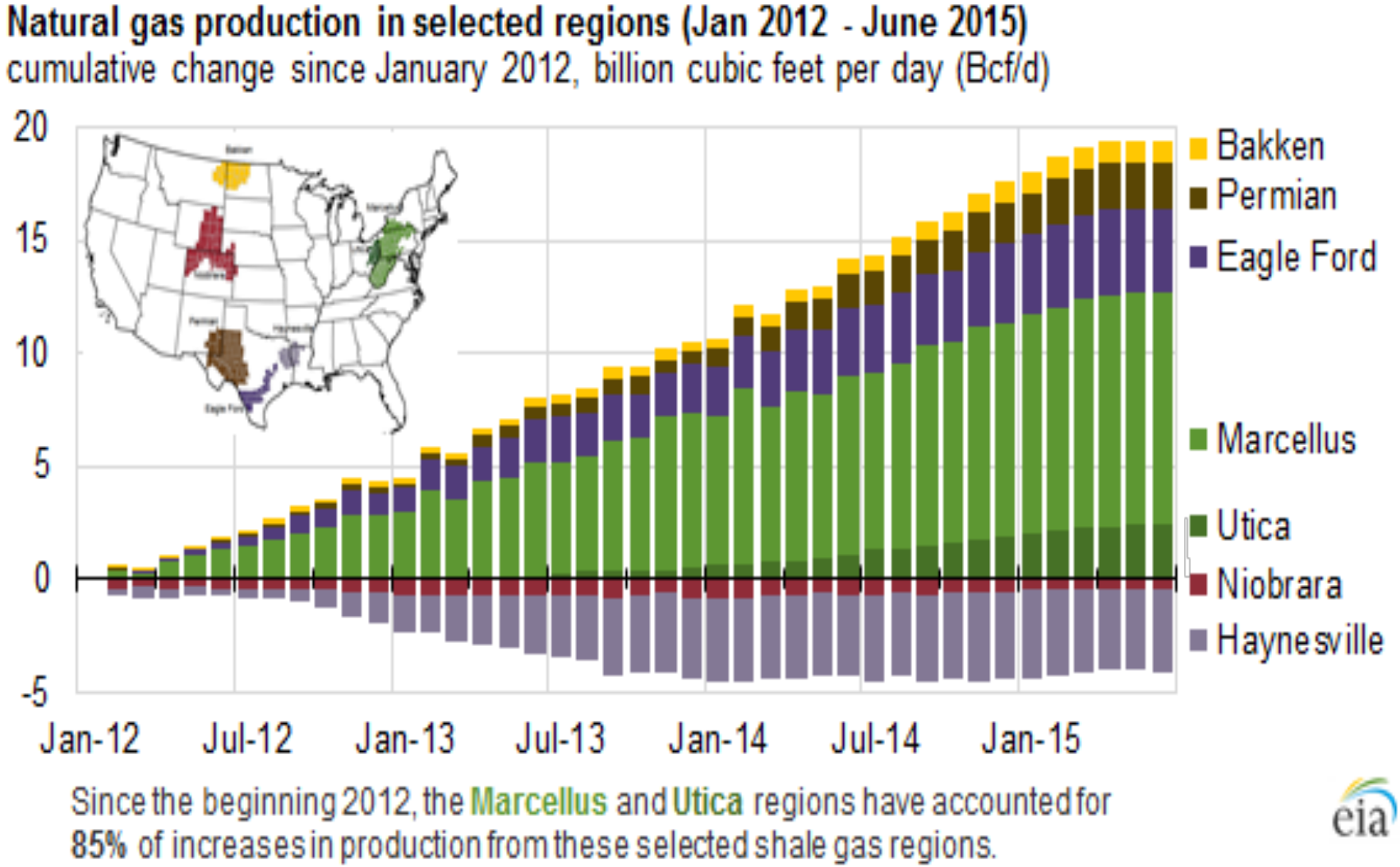
Natural gas price difference between Wyoming and Louisiana



Two large projects have driven the differential

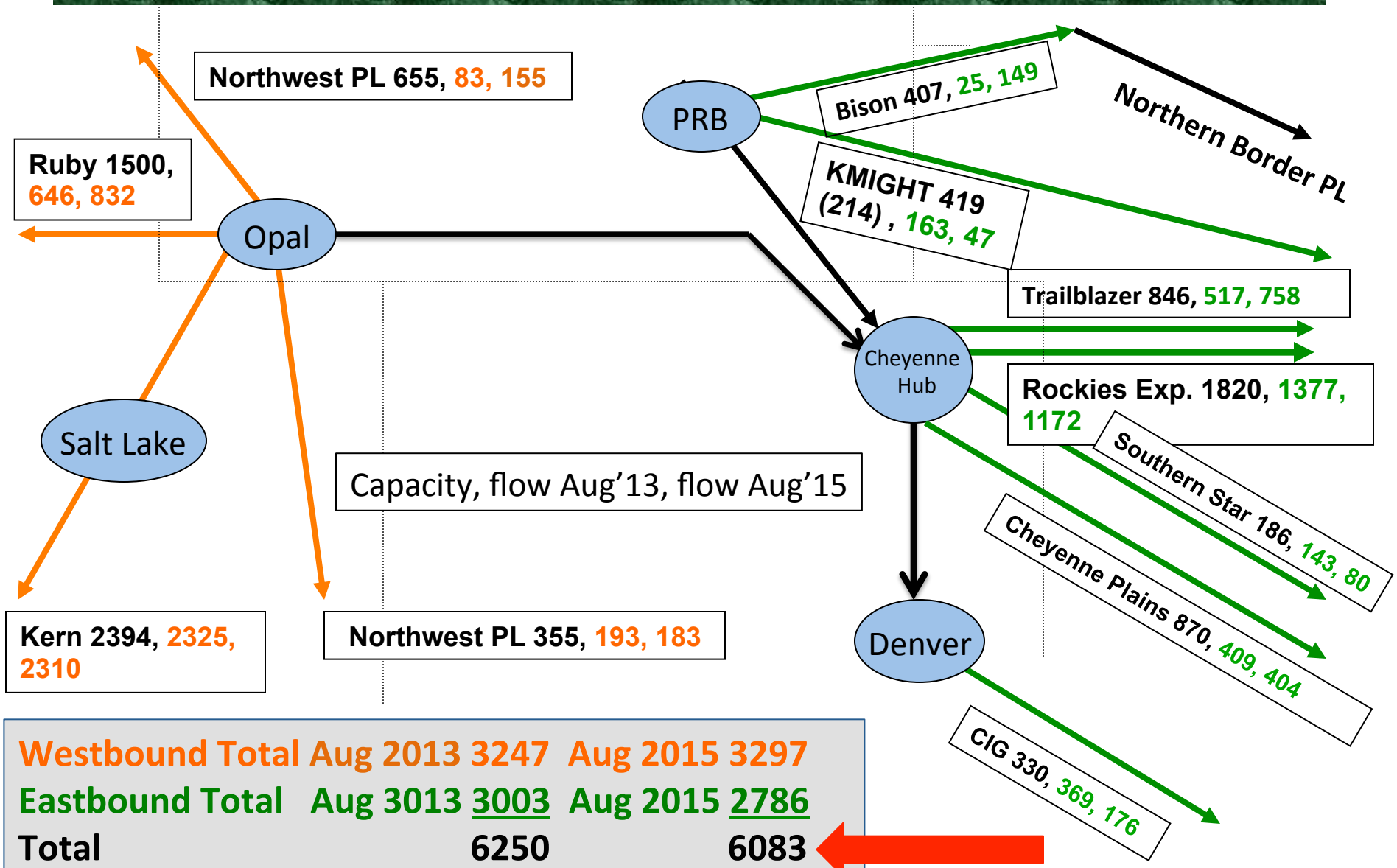


However, shale plays will impact WY future



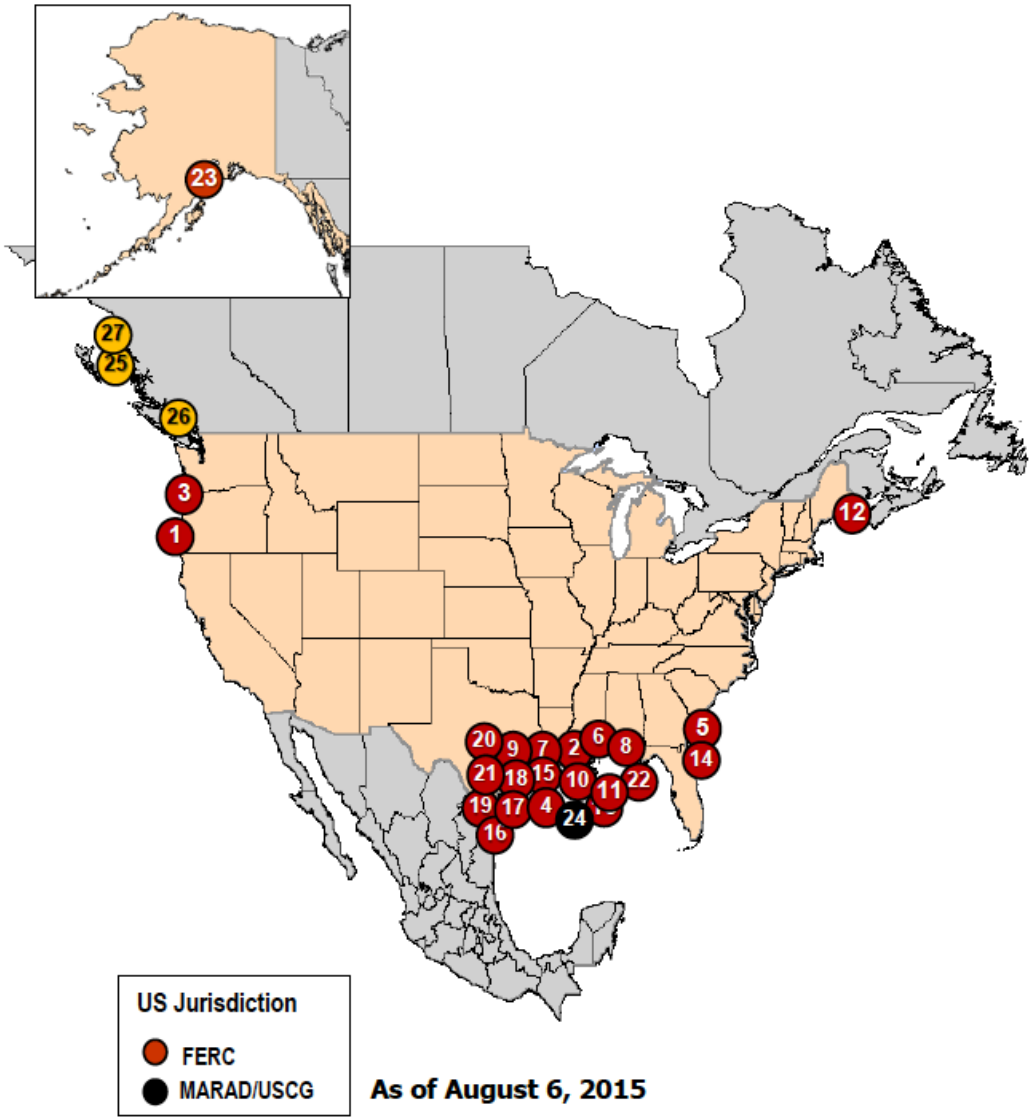
Source: EIA

No large change in Rockies export flow - yet



Westbound Total	Aug 2013	3247	Aug 2015	3297
Eastbound Total	Aug 3013	3003	Aug 2015	2786
Total		6250		6083

LNG exports will expand market access



PROPOSED TO FERC

Pending Applications:

1. **Coos Bay, OR:** 0.9 Bcfd (Jordan Cove Energy Project) (CP13-483)
2. **Lake Charles, LA:** 2.2 Bcfd (Southern Union – Lake Charles LNG) (CP14-120)
3. **Astoria, OR:** 1.25 Bcfd (Oregon LNG) (CP09-6)
4. **Lavaca Bay, TX:** 1.38 Bcfd (Excelerate Liquefaction) (CP14-71 & 72)
5. **Elba Island, GA:** 0.35 Bcfd (Southern LNG Company) (CP14-103)
6. **Lake Charles, LA:** 1.07 Bcfd (Magnolia LNG) (CP14-347)
7. **Sabine Pass, TX:** 2.1 Bcfd (ExxonMobil – Golden Pass) (CP14-517)
8. **Pascagoula, MS:** 1.5 Bcfd (Gulf LNG Liquefaction) (CP15-521)
9. **Freeport, TX:** 0.34 Bcfd (Freeport LNG Dev) (CP15-518)

Projects in Pre-filing:

10. **Plaquemines Parish, LA:** 1.07 Bcfd (CE FLNG) (PF13-11)
11. **Plaquemines Parish, LA:** 0.30 Bcfd (Louisiana LNG) (PF14-17)
12. **Robbinston, ME:** 0.45 Bcfd (Kestrel Energy – Downeast LNG) (PF14-19)
13. **Cameron Parish, LA:** 1.34 Bcfd (Venture Global LNG) (PF15-2)
14. **Jacksonville, FL:** 0.075 Bcf/d (Eagle LNG Partners) (PF15-7)
15. **Hackberry, LA:** 1.4 Bcfd (Sempra - Cameron LNG) (PF15-13)
16. **Brownsville, TX:** 0.54 Bcfd (Texas LNG Brownsville) (PF15-14)
17. **Brownsville, TX:** 0.94 Bcfd (Annova LNG Brownsville) (PF15-15)
18. **Port Arthur, TX:** 1.4 Bcfd (Port Arthur LNG) (PF15-18)
19. **Brownsville, TX:** 3.6 Bcfd (Rio Grande LNG – NextDecade) (PF15-20)
20. **Freeport, TX:** 0.72 Bcfd (Freeport LNG Dev) (PF15-25)
21. **Corpus Christi, TX:** 1.4 Bcfd (Cheniere – Corpus Christi LNG) (PF15-26)
22. **Plaquemines Parish, LA:** 2.80 Bcfd (Venture Global LNG) (PF15-27)
23. **Nikiski, AK:** 2.55 Bcfd (ExxonMobil, ConocoPhillips, BP, TransCanada and Alaska Gasline) (PF14-21)

PROPOSED TO U.S.-MARAD/COAST GUARD

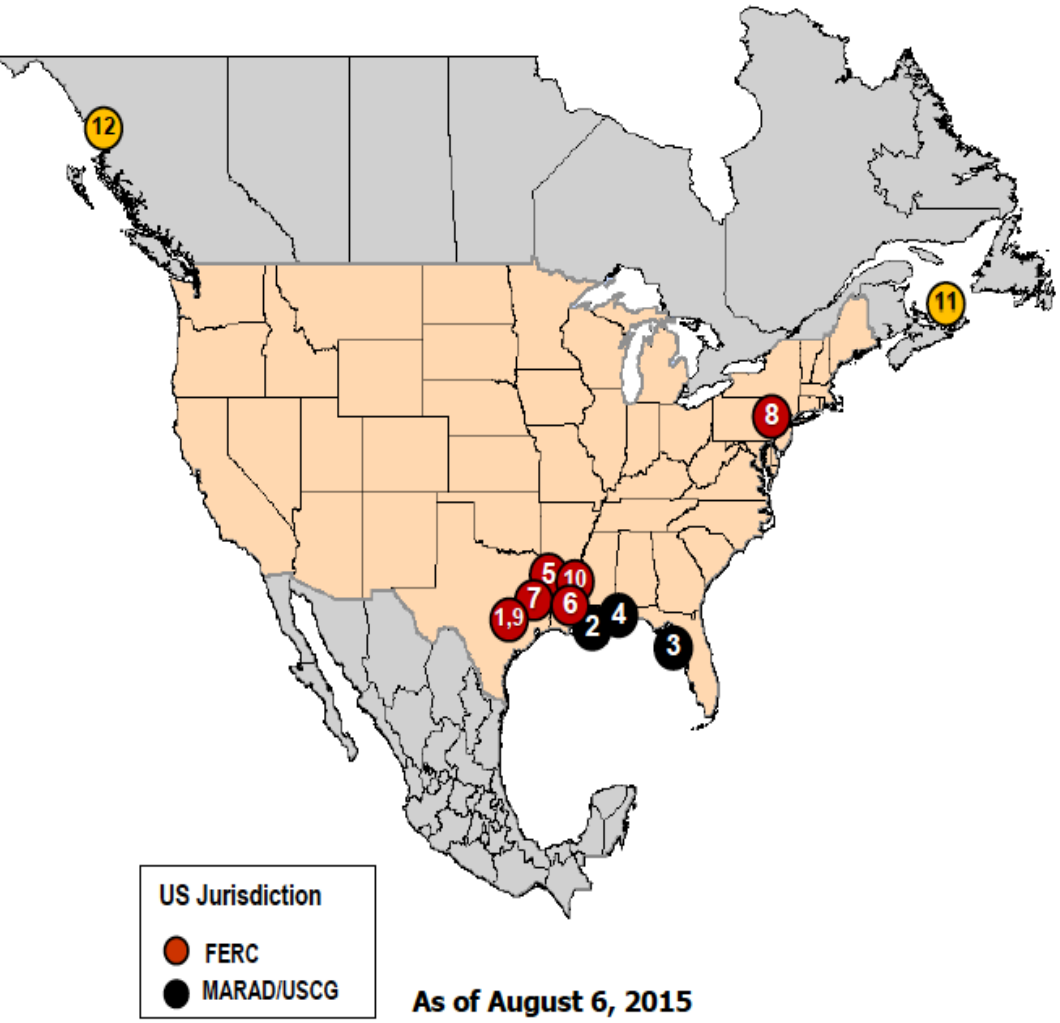
24. **Gulf of Mexico:** 1.8 Bcfd (Delfin LNG)

PROPOSED CANADIAN SITES

25. **Kitimat, BC:** 1.28 Bcfd (Apache Canada Ltd.)
26. **Douglas Island, BC:** 0.23 Bcfd (BC LNG Export Cooperative)
27. **Prince Rupert Island, BC:** 2.74 Bcfd (Pacific Northwest LNG)

Source: FERC

Nearly all LNG under construction is in US Gulf



Import Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC

1. **Corpus Christi, TX:** 0.4 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)

APPROVED - NOT UNDER CONSTRUCTION - MARAD/Coast Guard

2. **Gulf of Mexico:** 1.0 Bcfd (Main Pass McMoRan Exp.)
3. **Offshore Florida:** 1.2 Bcfd (Hoëgh LNG - Port Dolphin Energy)
4. **Gulf of Mexico:** 1.4 Bcfd (TORP Technology-Bienville LNG)

Export Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC

5. **Sabine, LA:** 2.76 Bcfd (Cheniere/Sabine Pass LNG) (CP11-72 & CP14-12)
6. **Hackberry, LA:** 1.7 Bcfd (Sempra–Cameron LNG) (CP13-25)
7. **Freeport, TX:** 1.8 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction) (CP12-509)
8. **Cove Point, MD:** 0.82 Bcfd (Dominion–Cove Point LNG) (CP13-113)
9. **Corpus Christi, TX:** 2.14 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)

APPROVED – NOT UNDER CONSTRUCTION - FERC

10. **Sabine Pass, LA:** 1.40 Bcfd (Sabine Pass Liquefaction) (CP13-552)

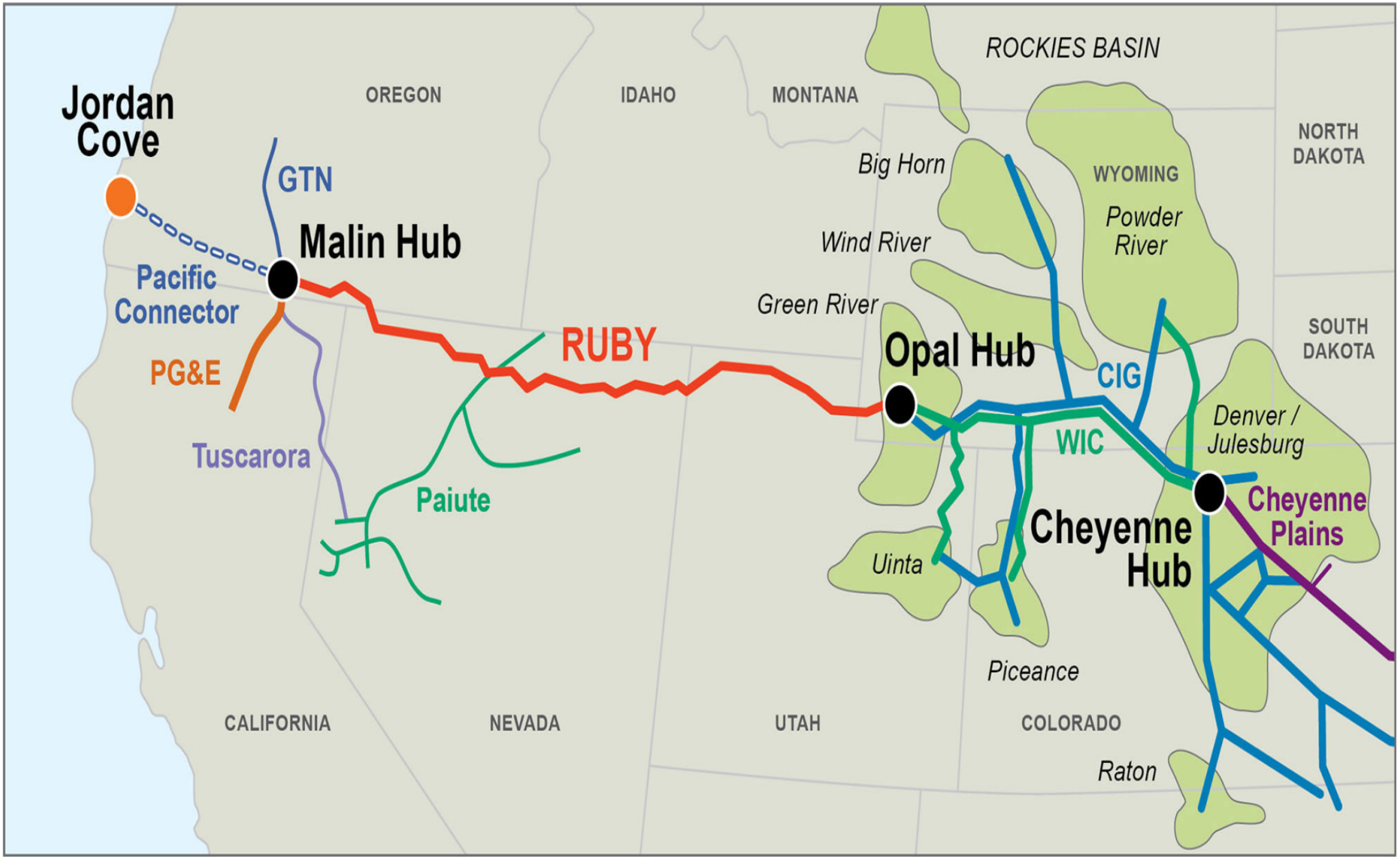
Canada

APPROVED – NOT UNDER CONSTRUCTION

11. **Port Hawkesbury, NS:** 0.5 Bcfd (Bear Head LNG)
12. **Kitimat, BC:** 3.23 Bcfd (LNG Canada)

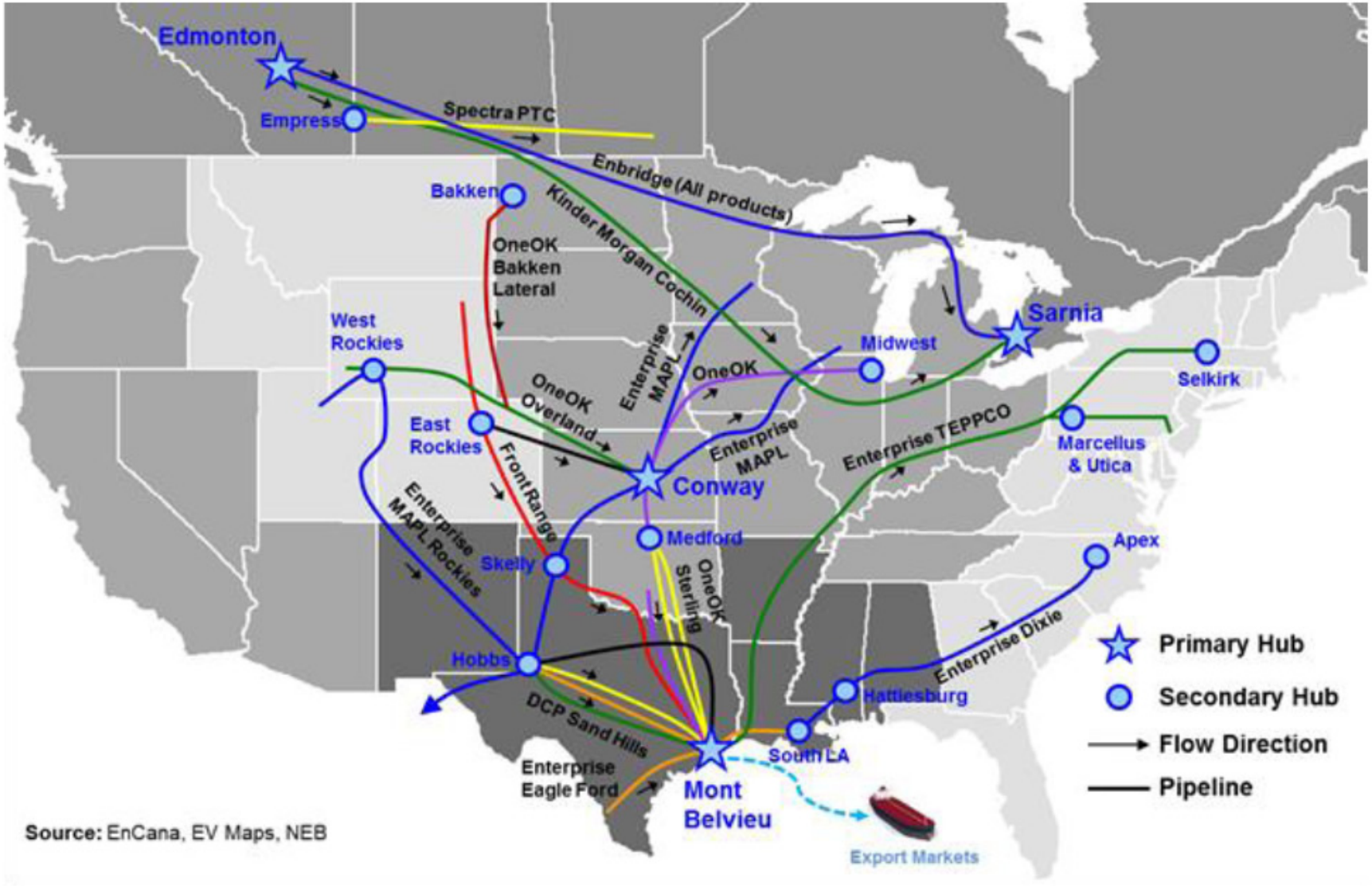
Source: FERC

Jordan Cove is the most closely linked to Rockies

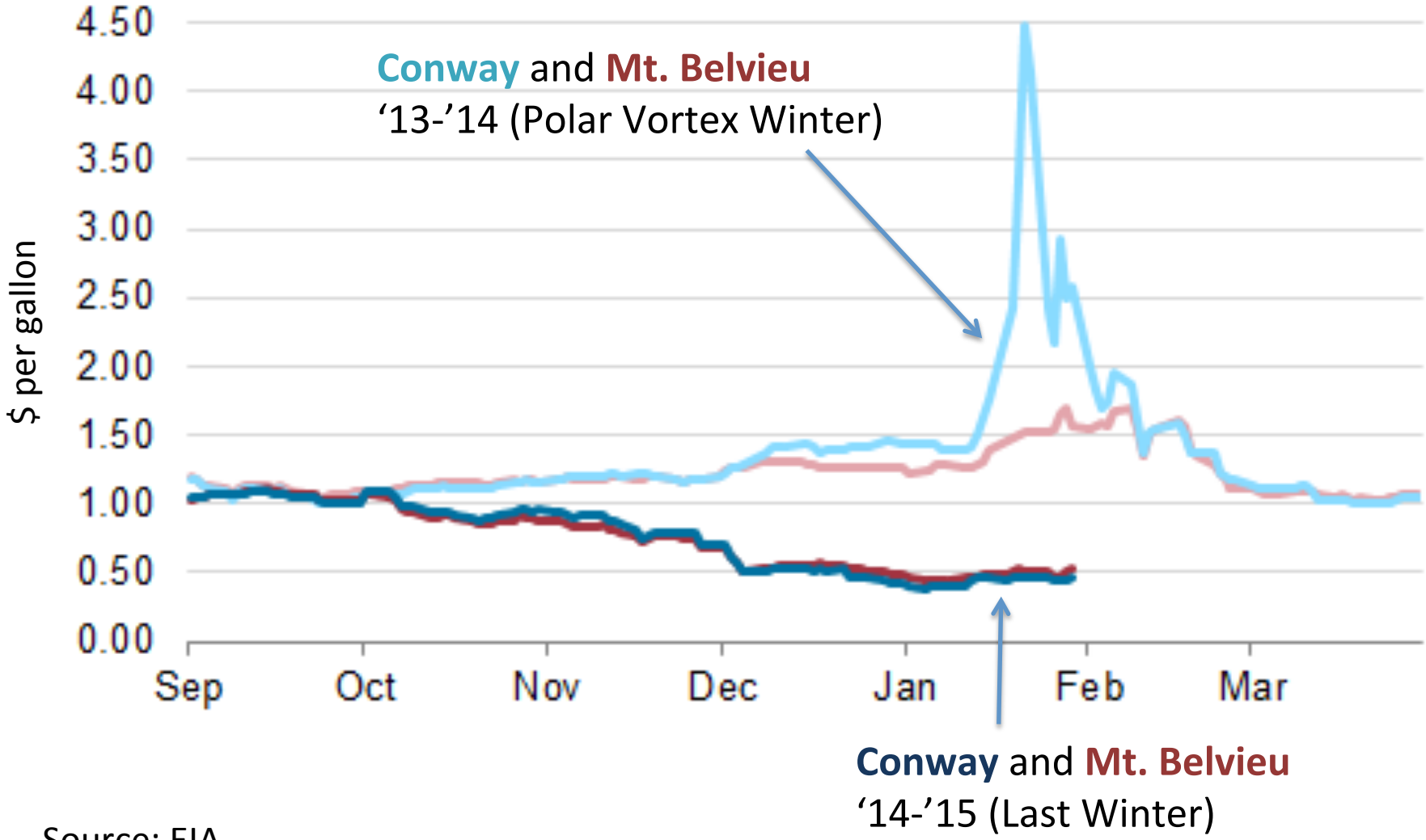


Wyoming's NGL Network

NGL pipeline grid

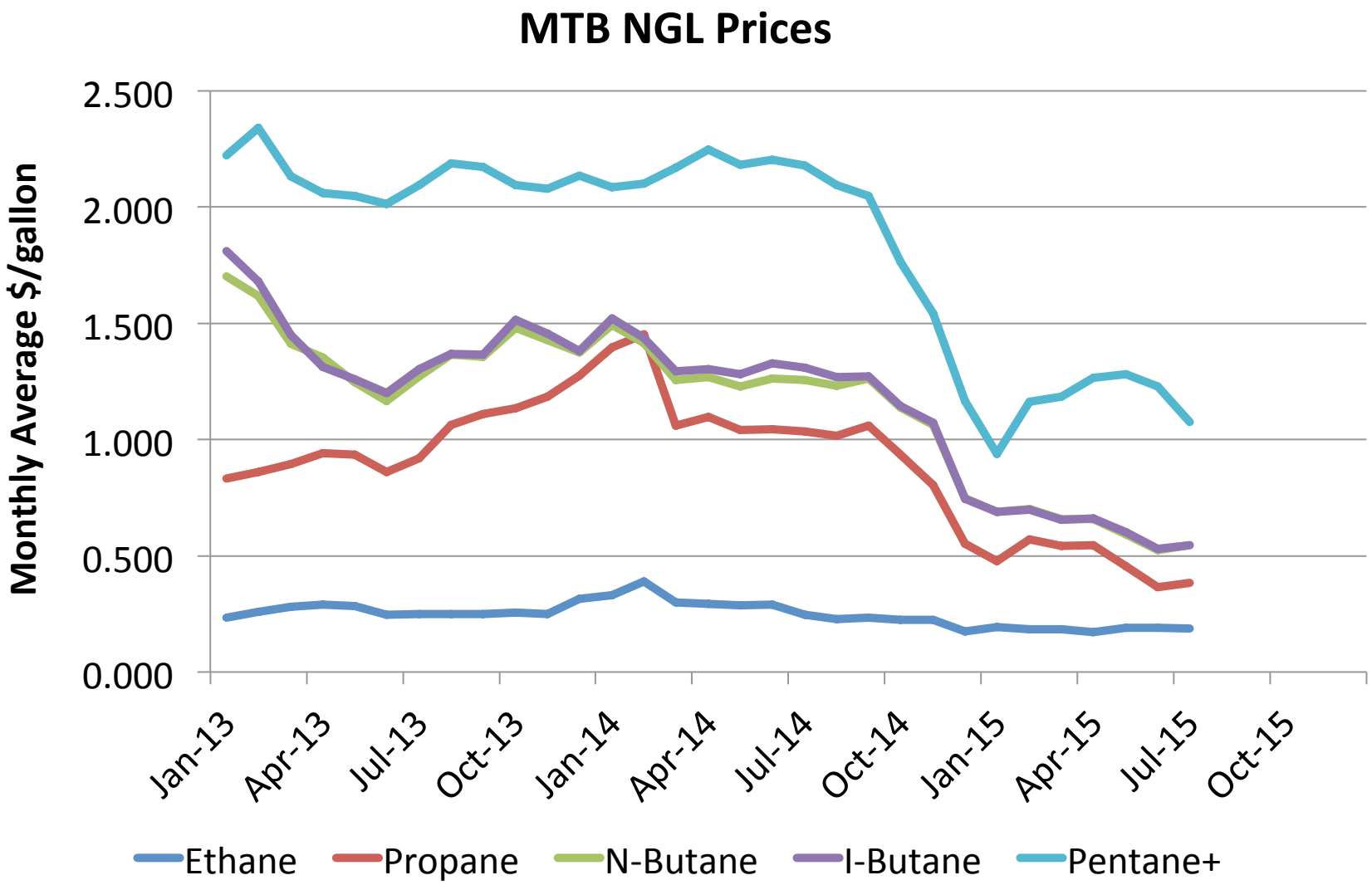


Propane prices last two winters

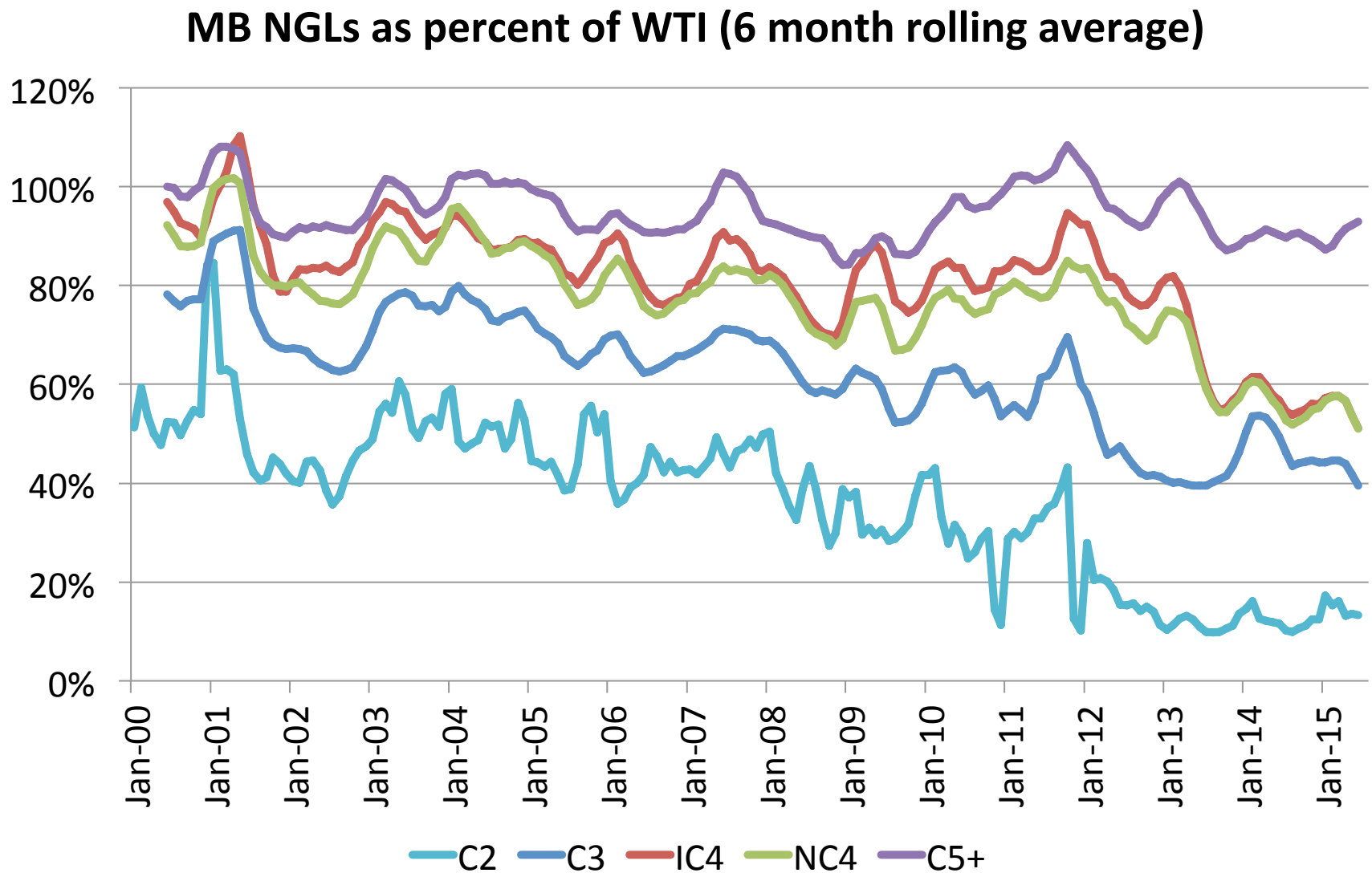


Source: EIA

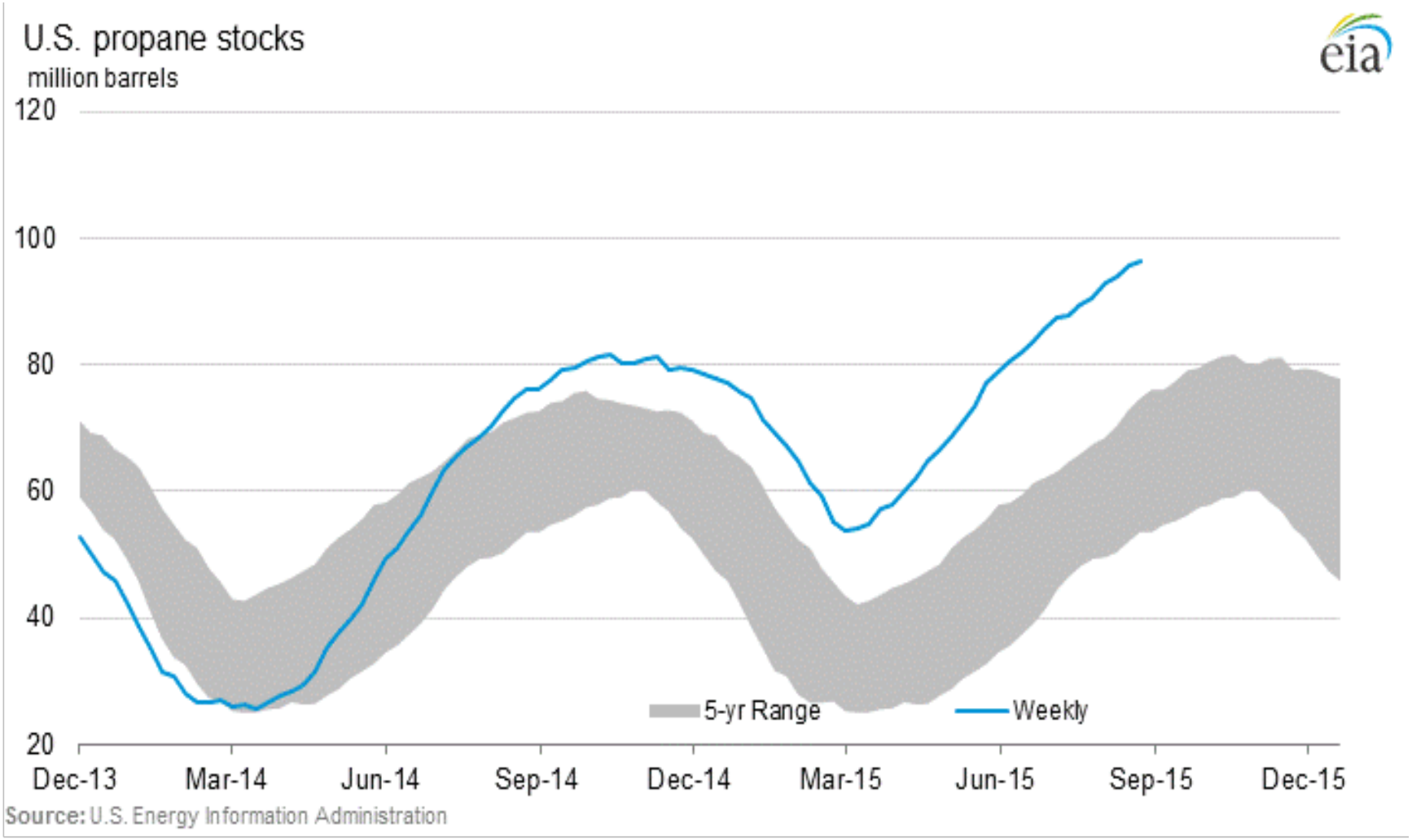
Price of NGLs falling



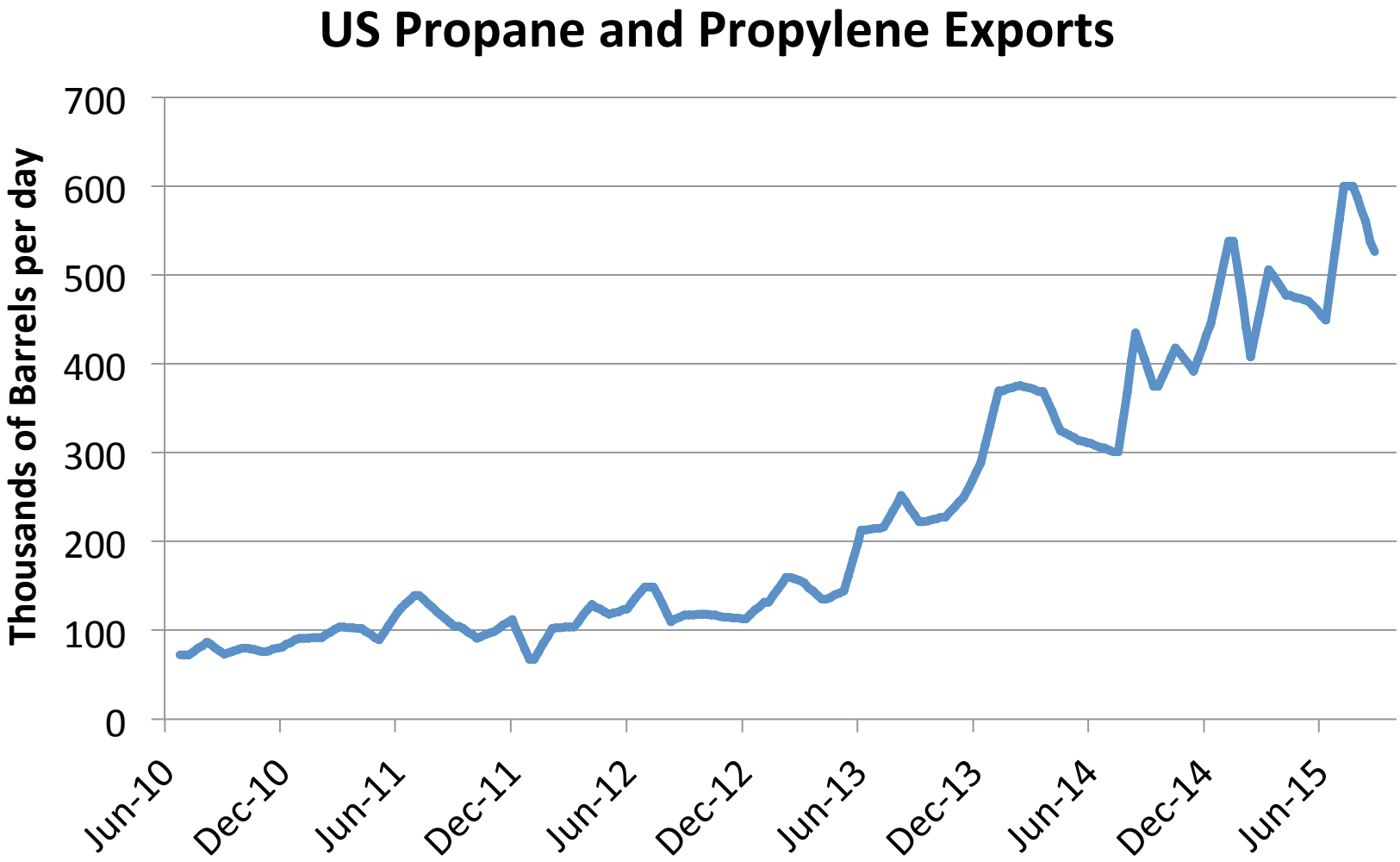
NGL value as percent of crude falling



Propane in storage stocks very high

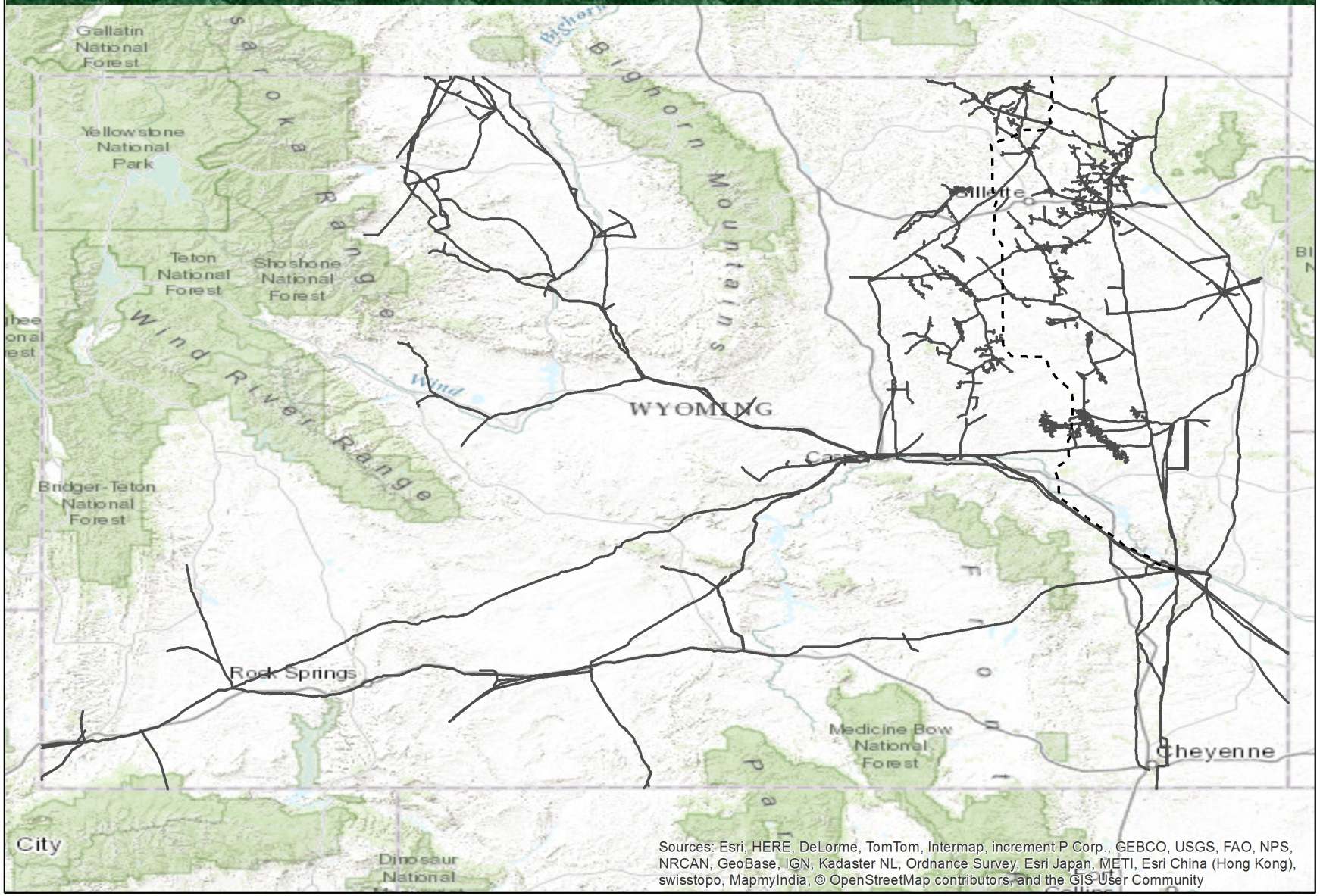


Propane exports are rising

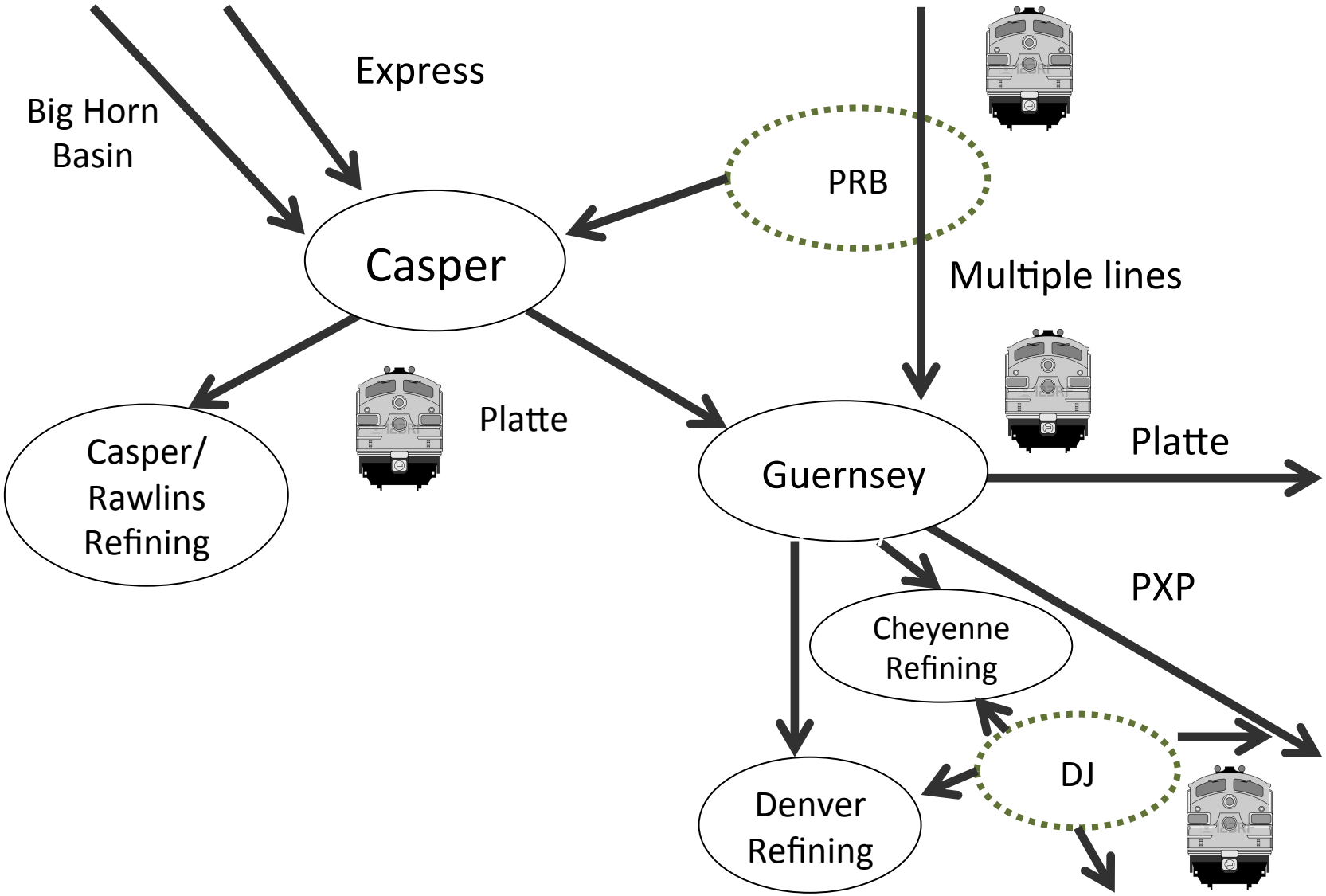


Source: EIA 4-week average

Wyoming crude pipeline network

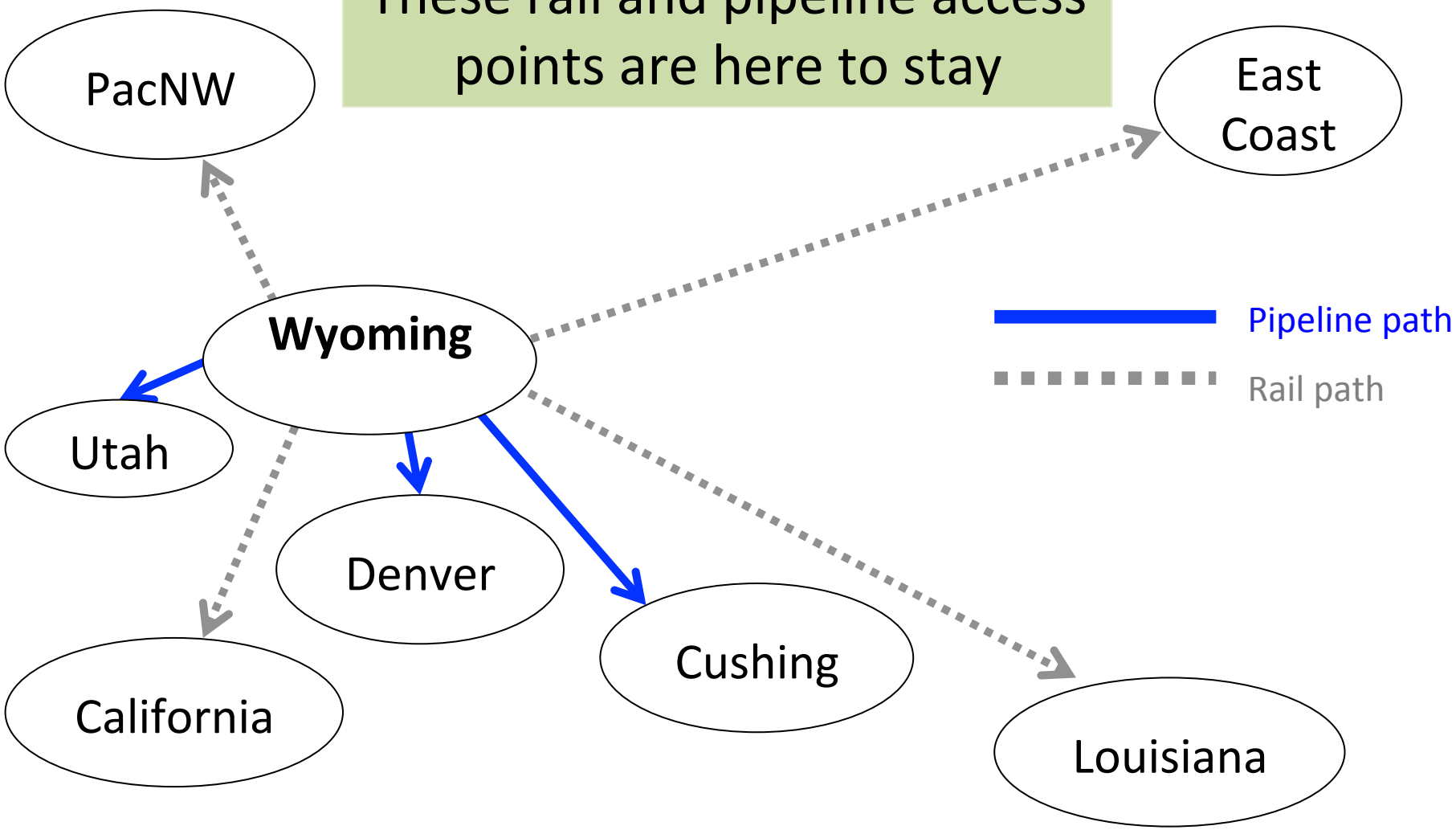


General diagram of WY crude network

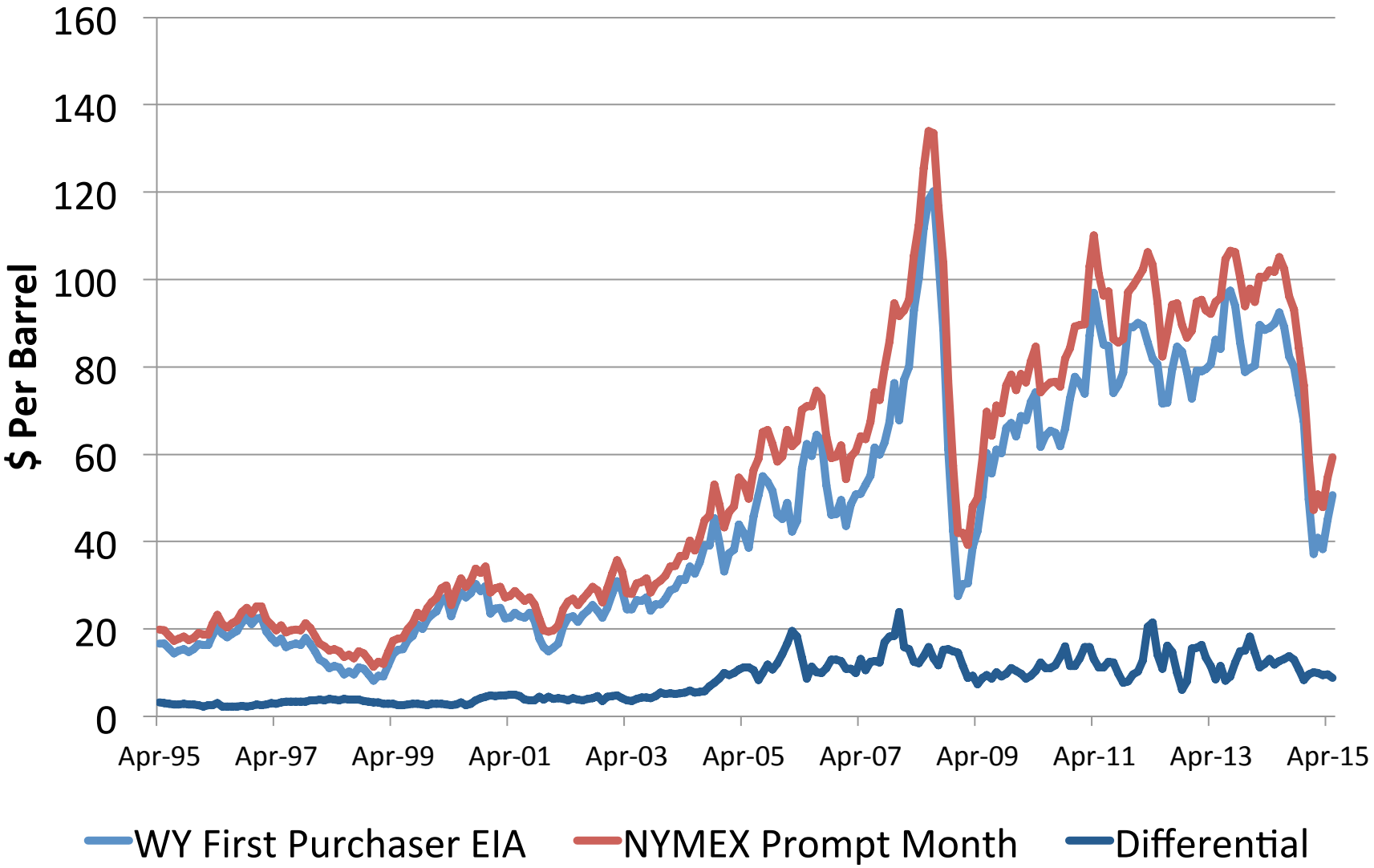


General diagram of network beyond WY

These rail and pipeline access points are here to stay

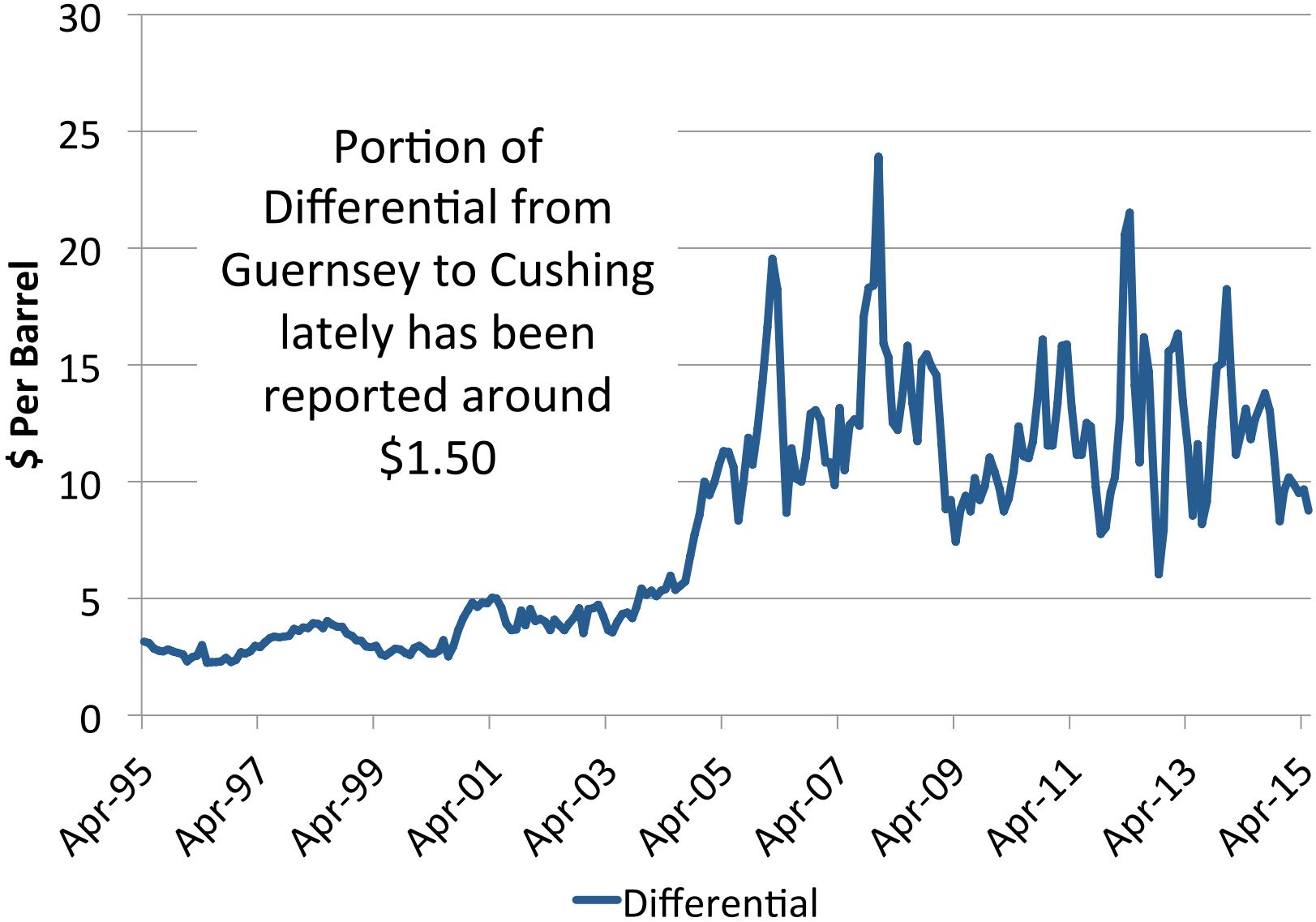


WY Crude prices and differential

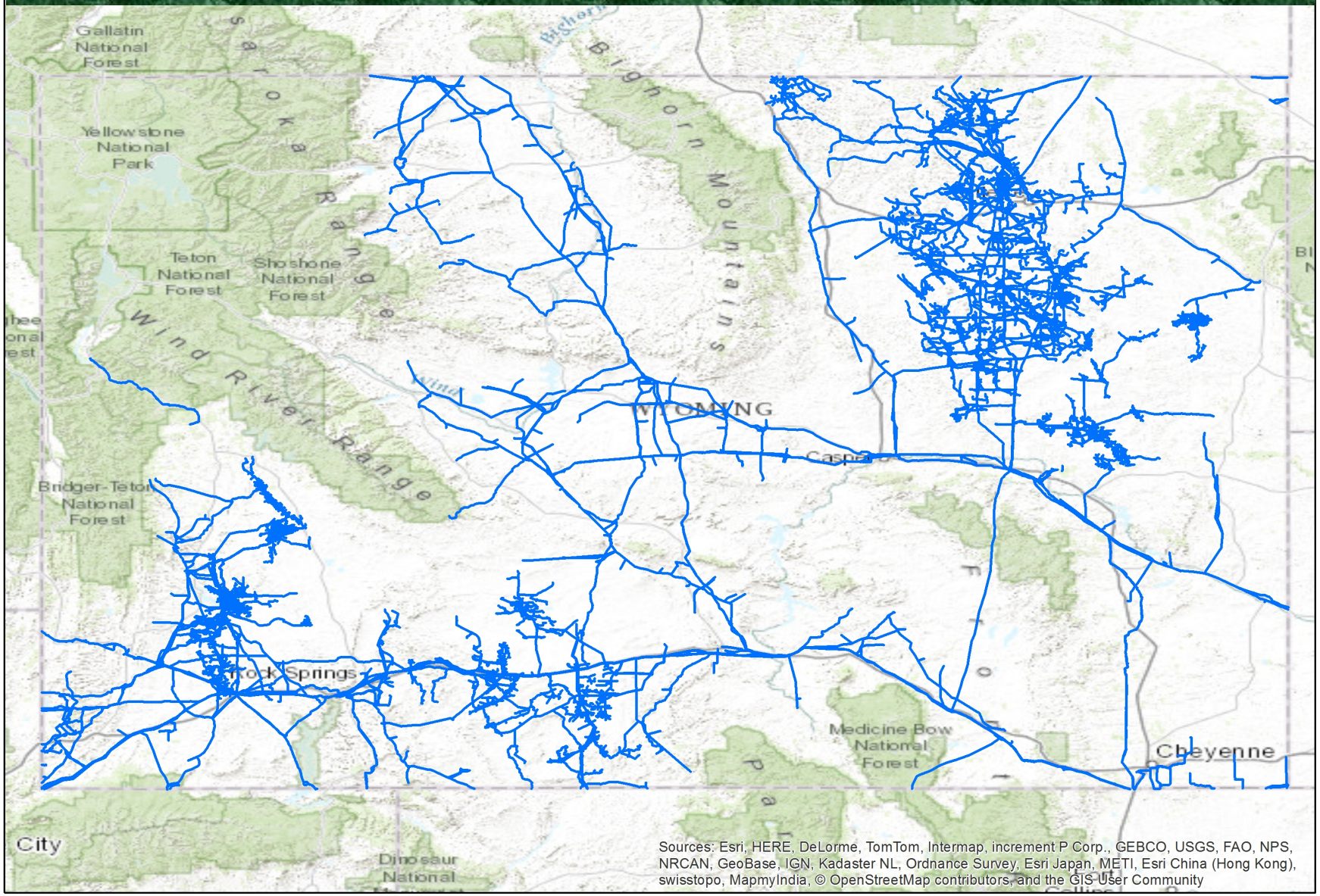


Source: EIA

Differential from WY pad to Cushing, OK



Wyoming energy is abundant and durable



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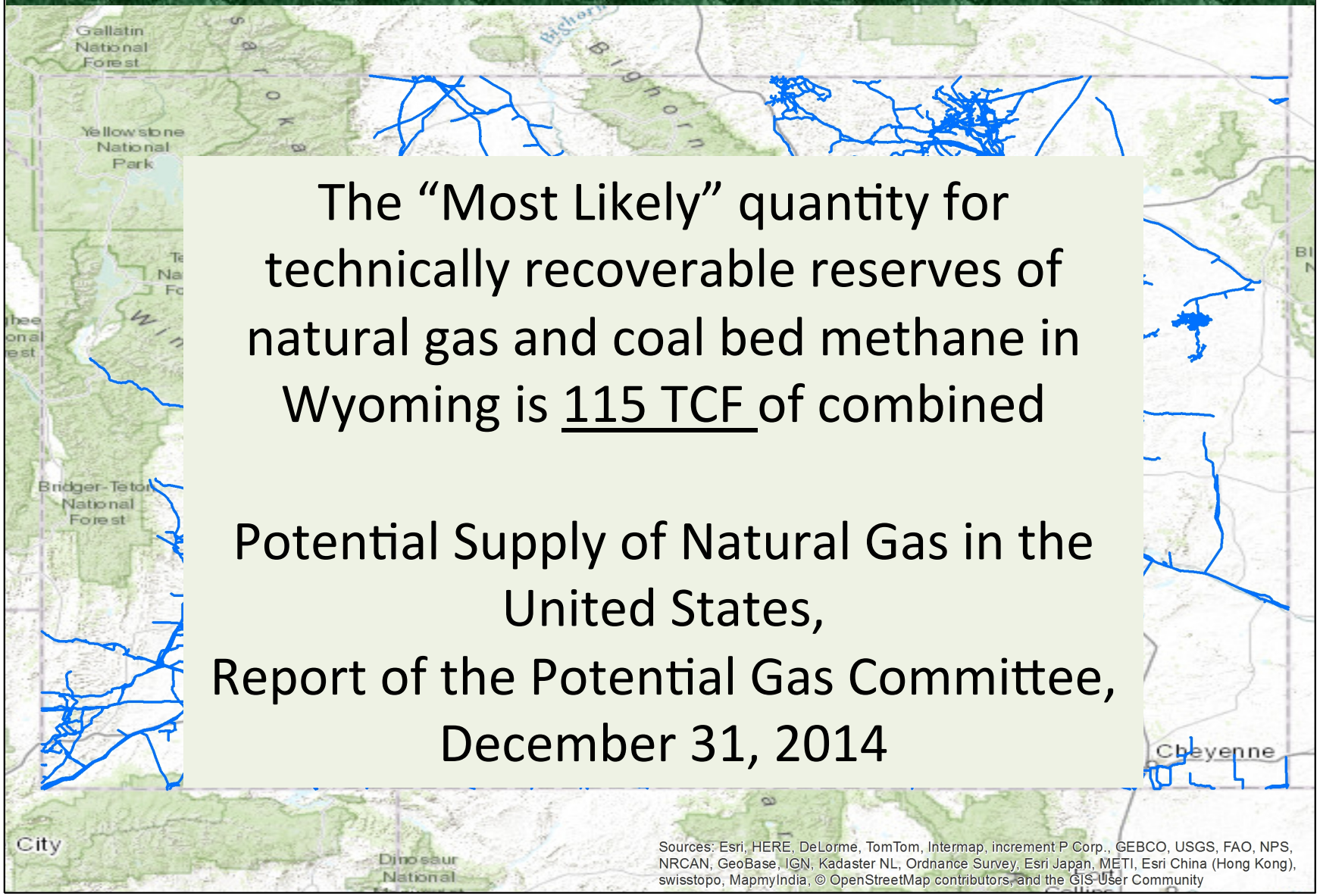

The "Most Likely" quantity for technically recoverable reserves of natural gas and coal bed methane in Wyoming is <u>115 TCF</u> of combined

Potential Supply of Natural Gas in the United States,
Report of the Potential Gas Committee,
December 31, 2014

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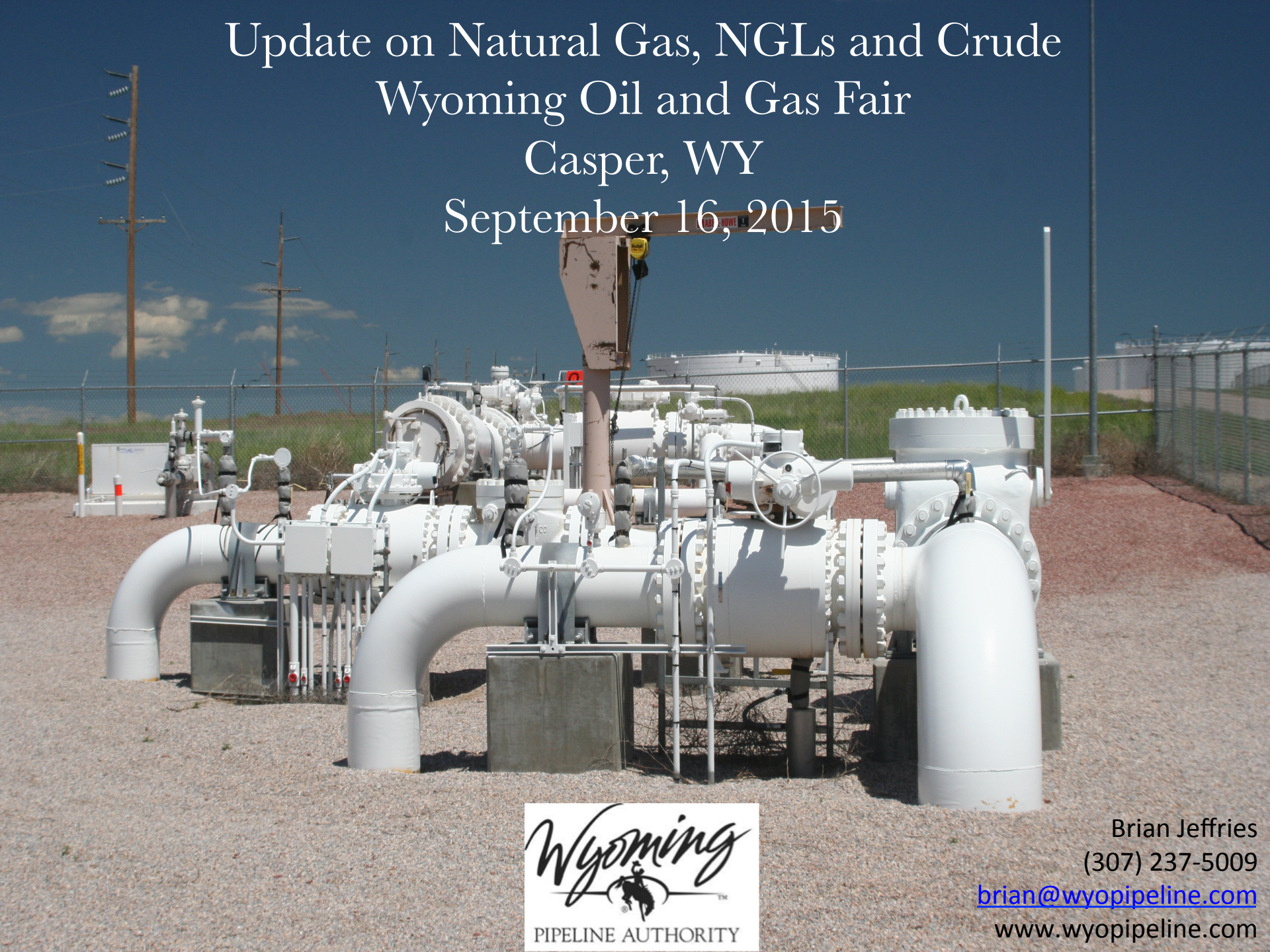

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