Natural Gas Supply Issues: Gulf Coast Supply Trends and Implications for Louisiana

Energy Bar Association – New Orleans Chapter

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David E. Dismukes, Ph.D.
Center for Energy Studies
Louisiana State University

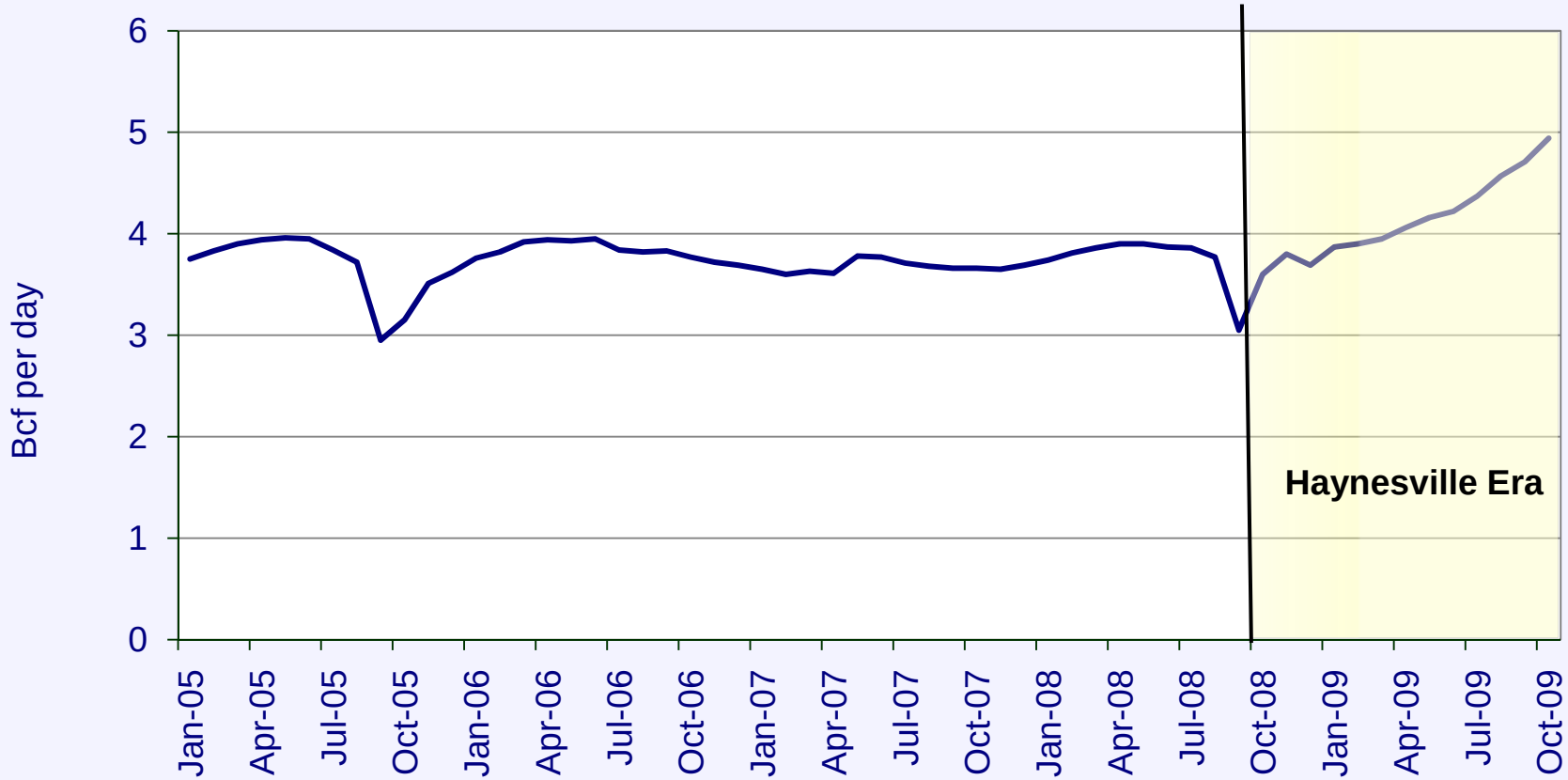
Overview of Topics

- Recent Louisiana Natural Gas Production Trends & Implications for Louisiana
- Ongoing Production Challenges & Diversity Across Haynesville
- What About LNG?
- Other Emerging Opportunities
- Conclusions

Trends and Implications for Louisiana

Louisiana Gas Production

Louisiana natural gas production was relatively constant until late 2008. Production became explosive given new production from Haynesville shale parishes.



Source: Energy Information Administration, U.S. Department of Energy.

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Haynesville Shale Quick Facts


Duke Energy Gas Transmission Canada

- **$2.4 billion in new business sales within the state of Louisiana in 2008 created by Haynesville Shale activity.**
- **As a result, approximately $3.9 billion in additional household earnings** (much of this from lease and royalty payments).
- **32,742 jobs created in 2008 due to Haynesville Shale activity.**
- **$153.3 million in state and local tax revenues in 2008 due to Haynesville Shale activity.**
- **Conservative estimate.** Data sampled included seven of the largest natural gas extraction firms, leaving out as many as ten other small to mid-size firms operating in the Haynesville Shale.

Source: The Economic Impact of the Haynesville Shale on the Louisiana Economic in 2008. By Loren C. Scott for the Louisiana Dept. of Natural Resources.

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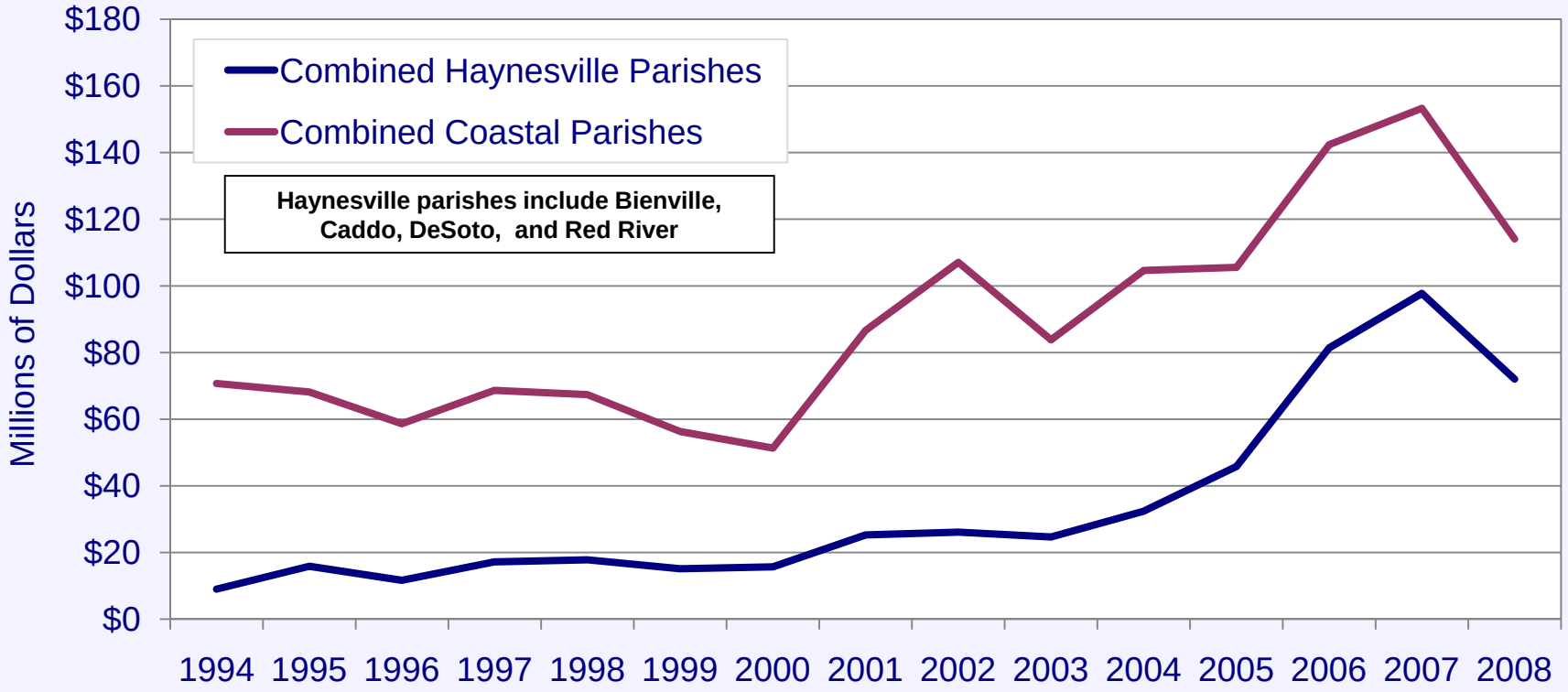
Haynesville and Coastal Parishes Natural Gas Severance Tax Revenue

Natural gas severance revenues have grown throughout the state, but have been particularly significant for the Haynesville parishes.



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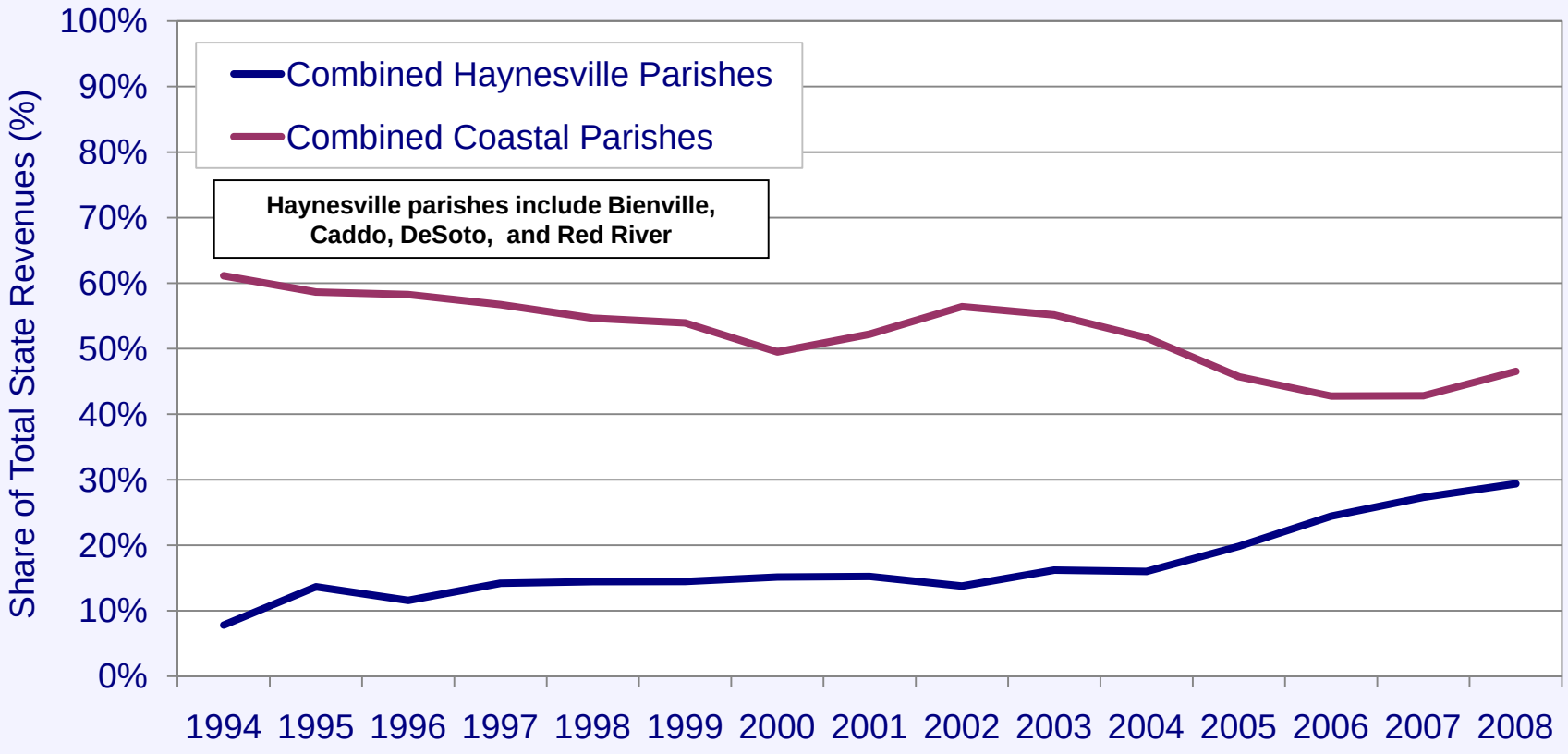
Haynesville and Coastal Parishes Share of Total State Natural Gas Severance Revenue

The Haynesville parishes' share of total severance revenue receipts has increased from less than 10 percent in 1994 to almost 30 percent in 2008.



Challenges and Diversity

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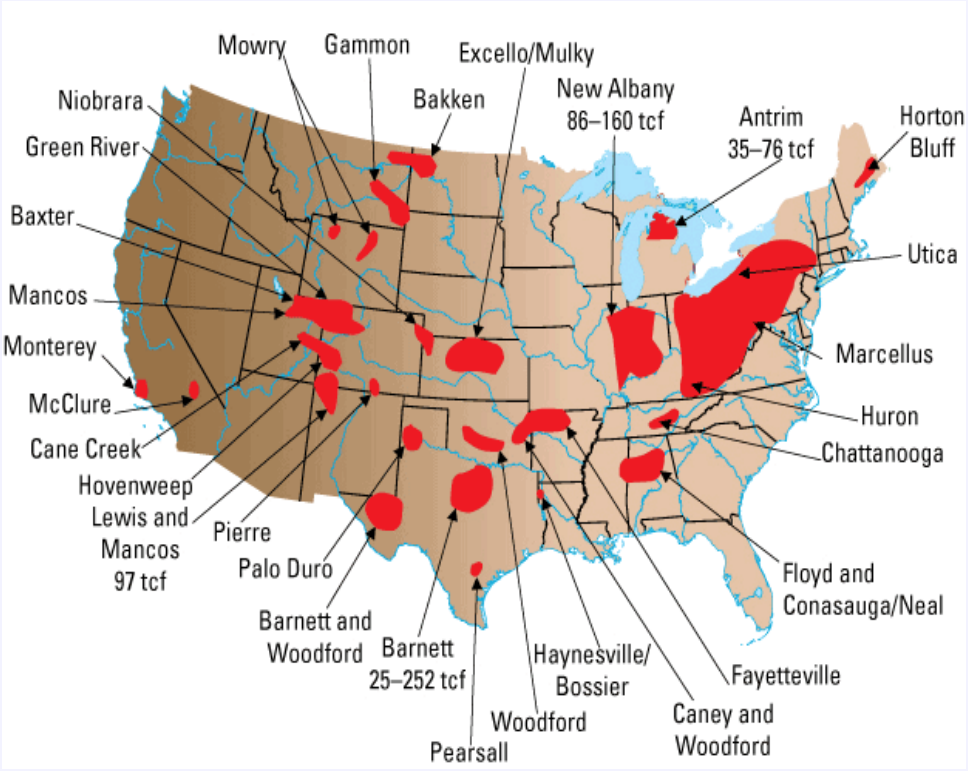
Daily Henry Hub Prices (1998-Present)

While price volatility is always an issue for energy investments, the sheer free-fall of gas prices from their July, 2008 high has been staggering.

Survival in a low-gas price environment is one of the single biggest challenges for shale producers throughout the U.S.

Source: Intercontinental Exchange.

Forward-Looking Challenges



- **Analysis of shale resources over the past three years has focused very heavily on identifying and characterizing the resource.**
- **Significant emphasis on understanding its magnitude.**
- **This has been an important contribution since many producers now have a good appreciation for the opportunities in shale development.**

- **Other stakeholder groups, such as investors, policy makers, regulators, interest groups and the general public are also starting to understand and appreciate the importance of these resources.**
- **Challenge over the next three to five years will be in understanding the winners and losers within the various plays.**
- **Can be as much variation in production within some of these plays and between them.**

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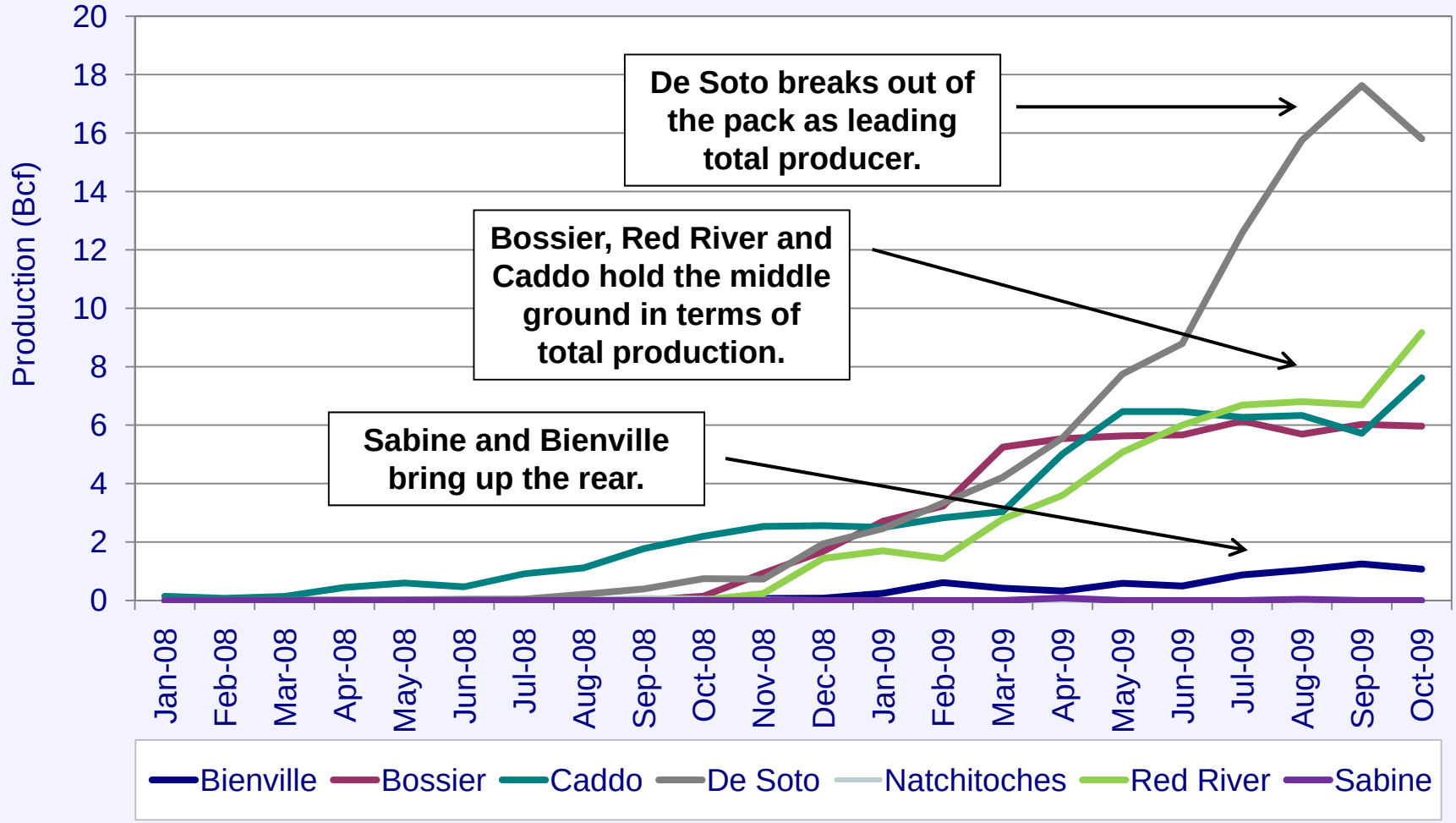
Total Louisiana Haynesville Production by Parish

Prior to January 2009, there was relatively close movement in production trends across the six major Haynesville producing parishes. Afterwards, you see a break into three different camps.



Preliminary work compiled by the Center for Energy Studies.

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Variation in Initial Production Levels of Haynesville Wells

Production rates show some different stories. DeSoto has an average IP rate well below other parishes despite its commanding lead in total production.

Bossier, considered a "moderate" from total production perspective is clearly seeing strong IP rates, on average, with a maximum in excess of 26 million per day.

	Number of Wells	Production			
		Average	Variability	Minimum	Maximum
		---------- (MMcf per day) ----------			
Bossier	3	11.237	5.631	3.924	26.619
Caddo	31	1.838	2.037	0.004	10.698
De Soto	14	1.370	2.233	0.008	15.191
Red River	5	3.145	4.252	0.013	23.012
All Parishes		2.370	3.480	0.004	26.619

Preliminary work compiled by the Center for Energy Studies. Only wells with complete 12 month history of production used for comparisons.

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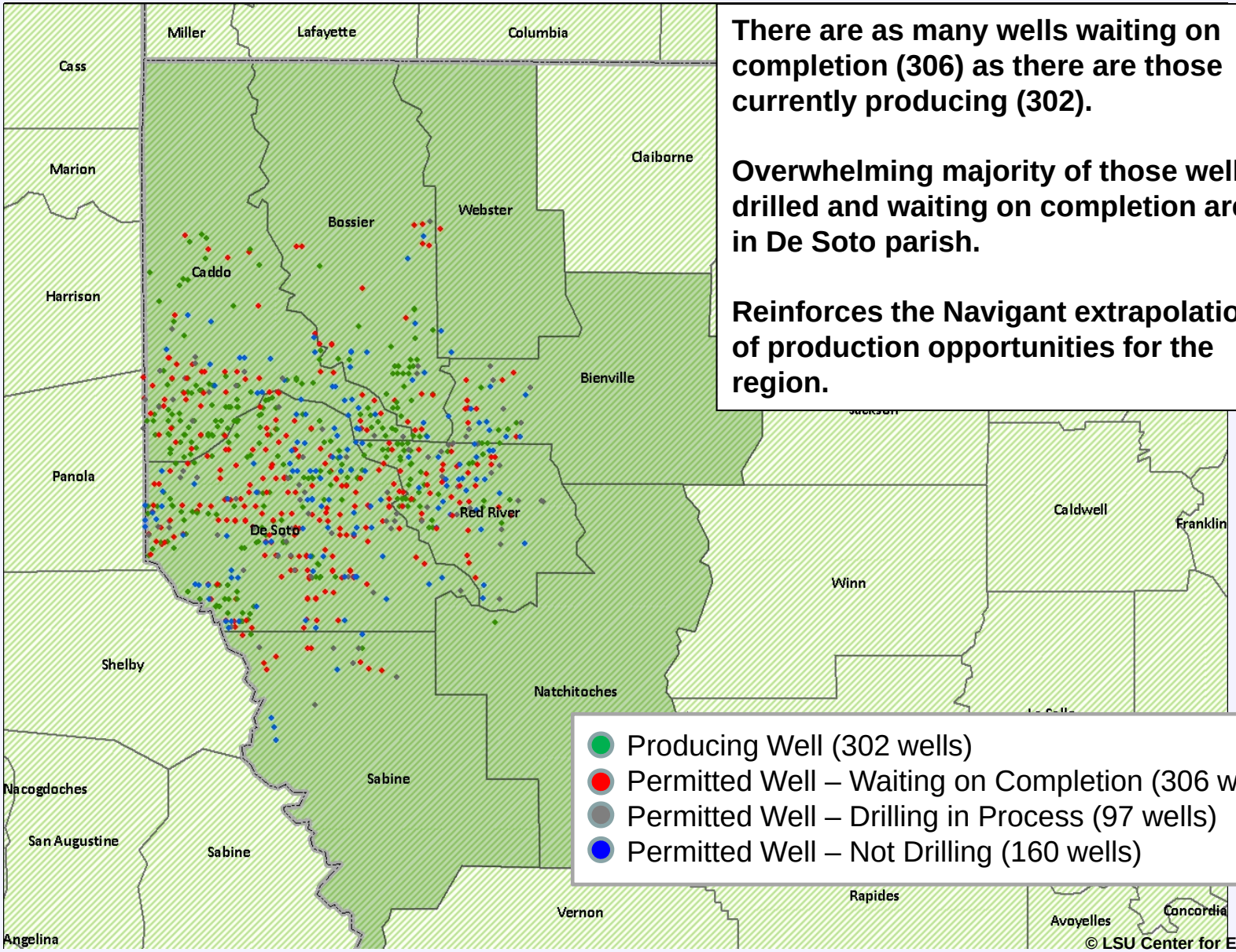
Distribution and Status of Haynesville Wells



There are as many wells waiting on completion (306) as there are those currently producing (302).

Overwhelming majority of those wells drilled and waiting on completion are in De Soto parish.

Reinforces the Navigant extrapolation of production opportunities for the region.

- Producing Well (302 wells)
- Permitted Well – Waiting on Completion (306 wells)
- Permitted Well – Drilling in Process (97 wells)
- Permitted Well – Not Drilling (160 wells)

What About LNG?

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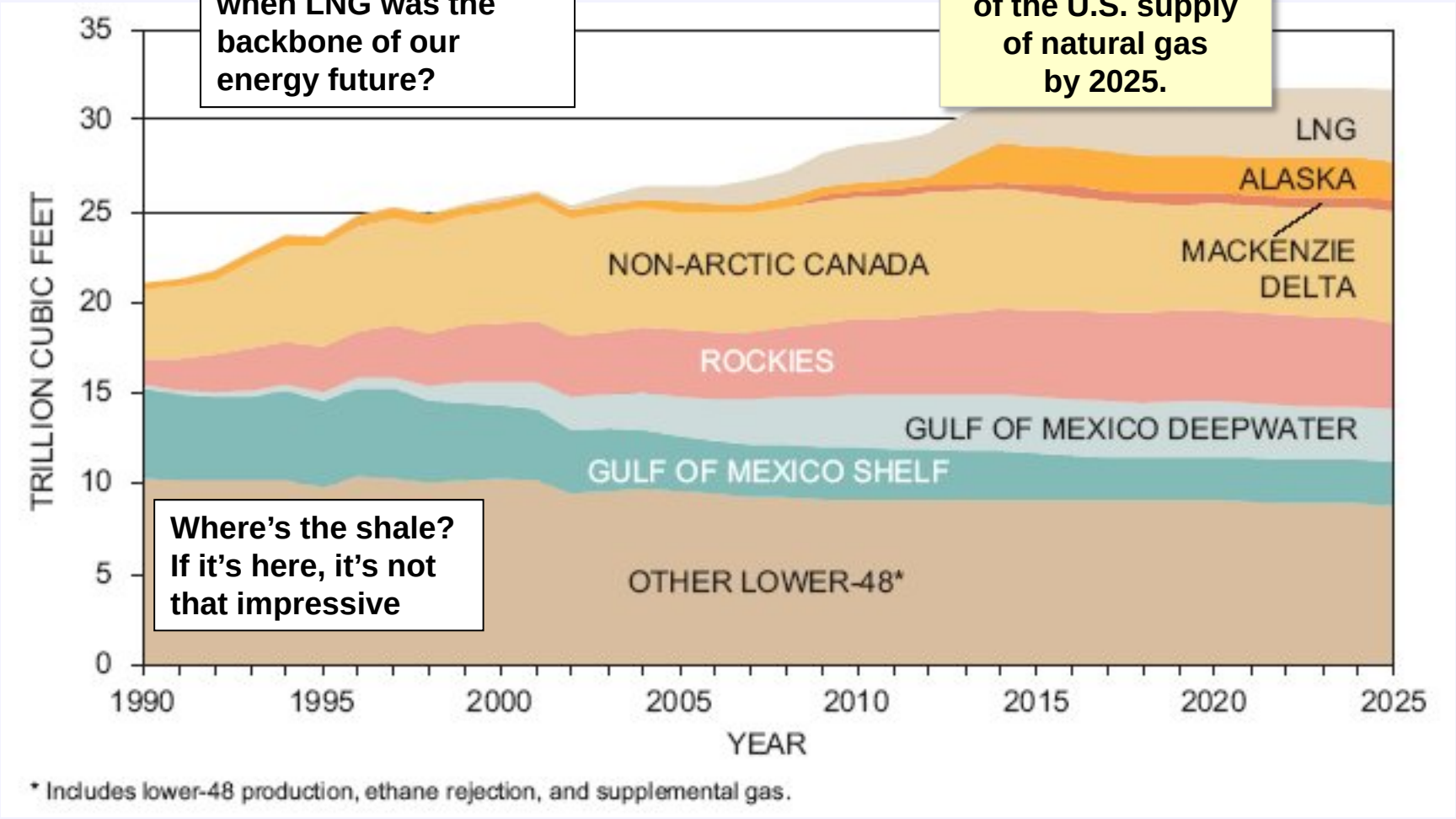
U.S. and Canadian Natural Gas Supply

Anybody remember when LNG was the backbone of our energy future?

LNG provides 14% of the U.S. supply of natural gas by 2025.



Where's the shale? If it's here, it's not that impressive

Source: National Petroleum Council

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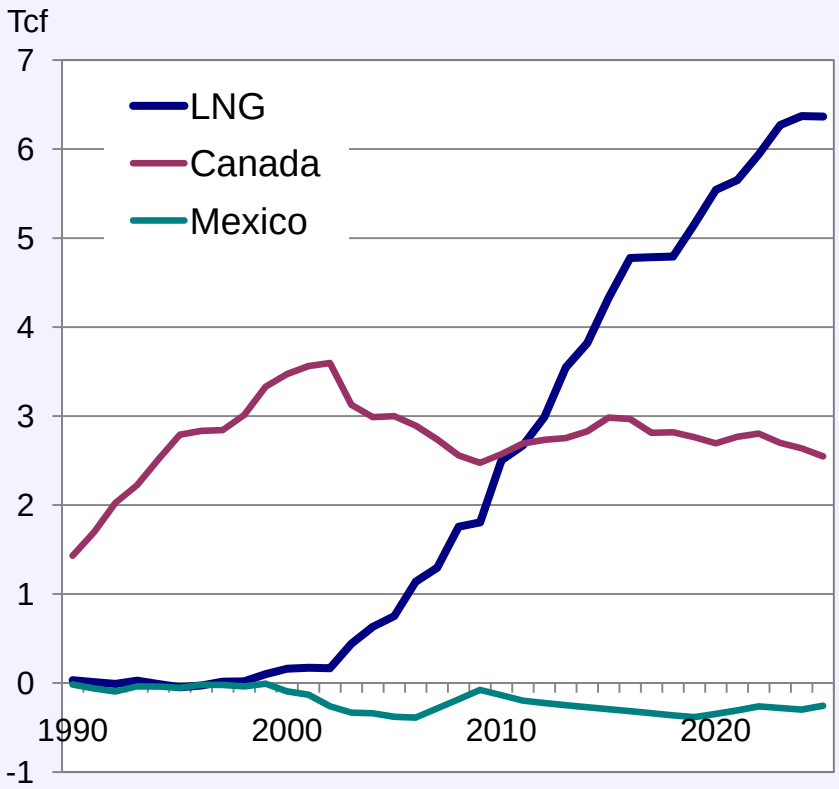
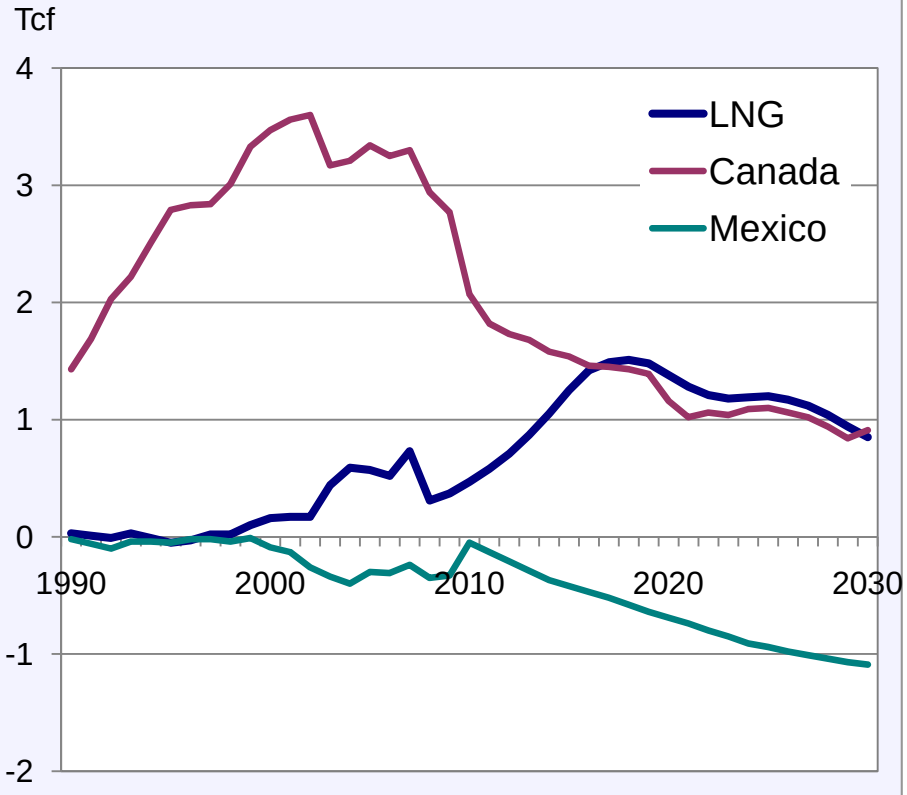
Net U.S. Imports of Natural Gas 2005 Versus 2009 Outlook

What a difference four years can make….

EIA Annual Energy Outlook, 2005



EIA Annual Energy Outlook, 2009



Source: Energy Information Administration, U.S. Department of Energy.

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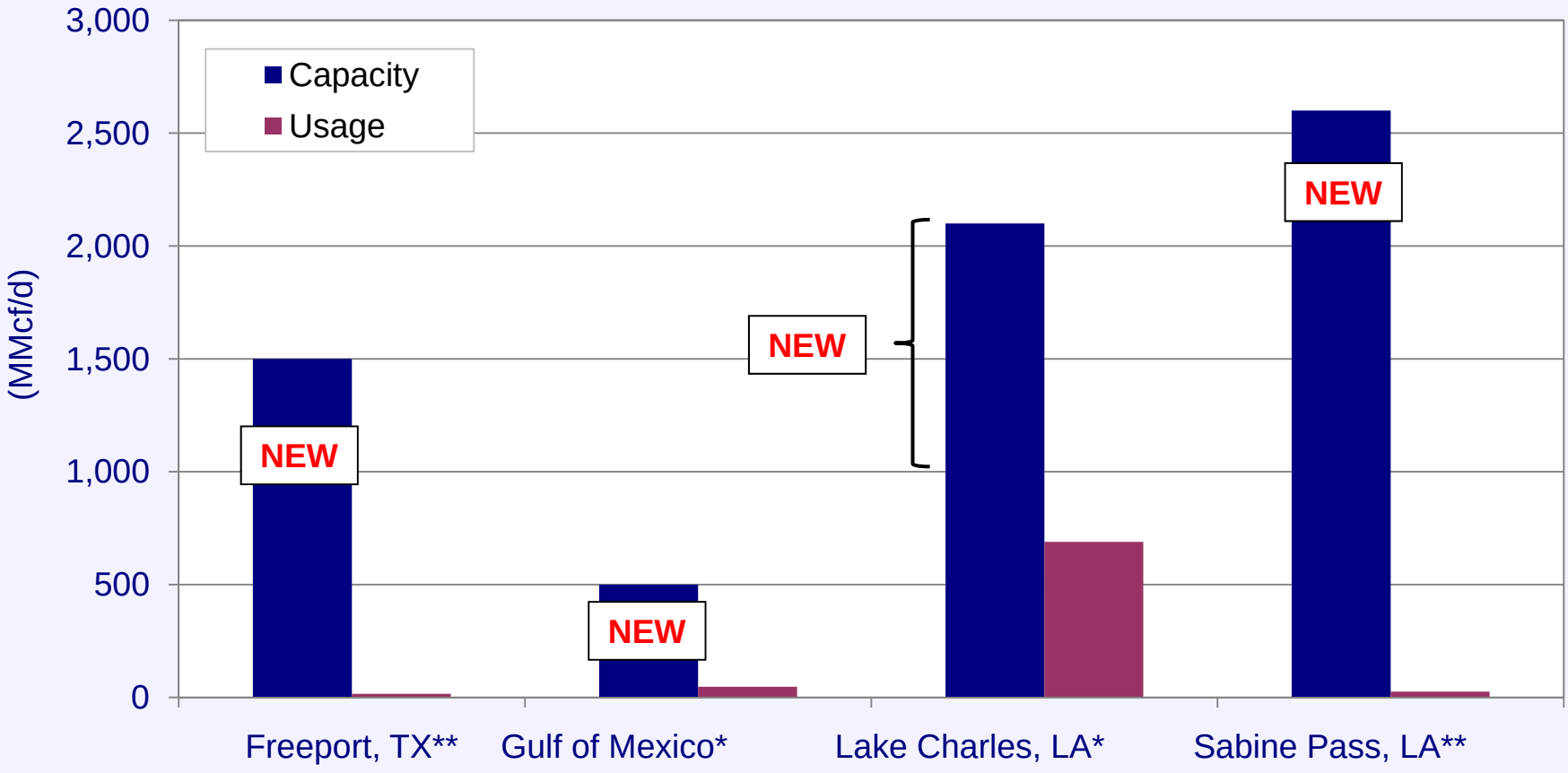
GOM LNG Terminals
Usage vs. Capacity, 2007 and 2008



Note: * indicates 2007 data; ** indicates 2008 data.

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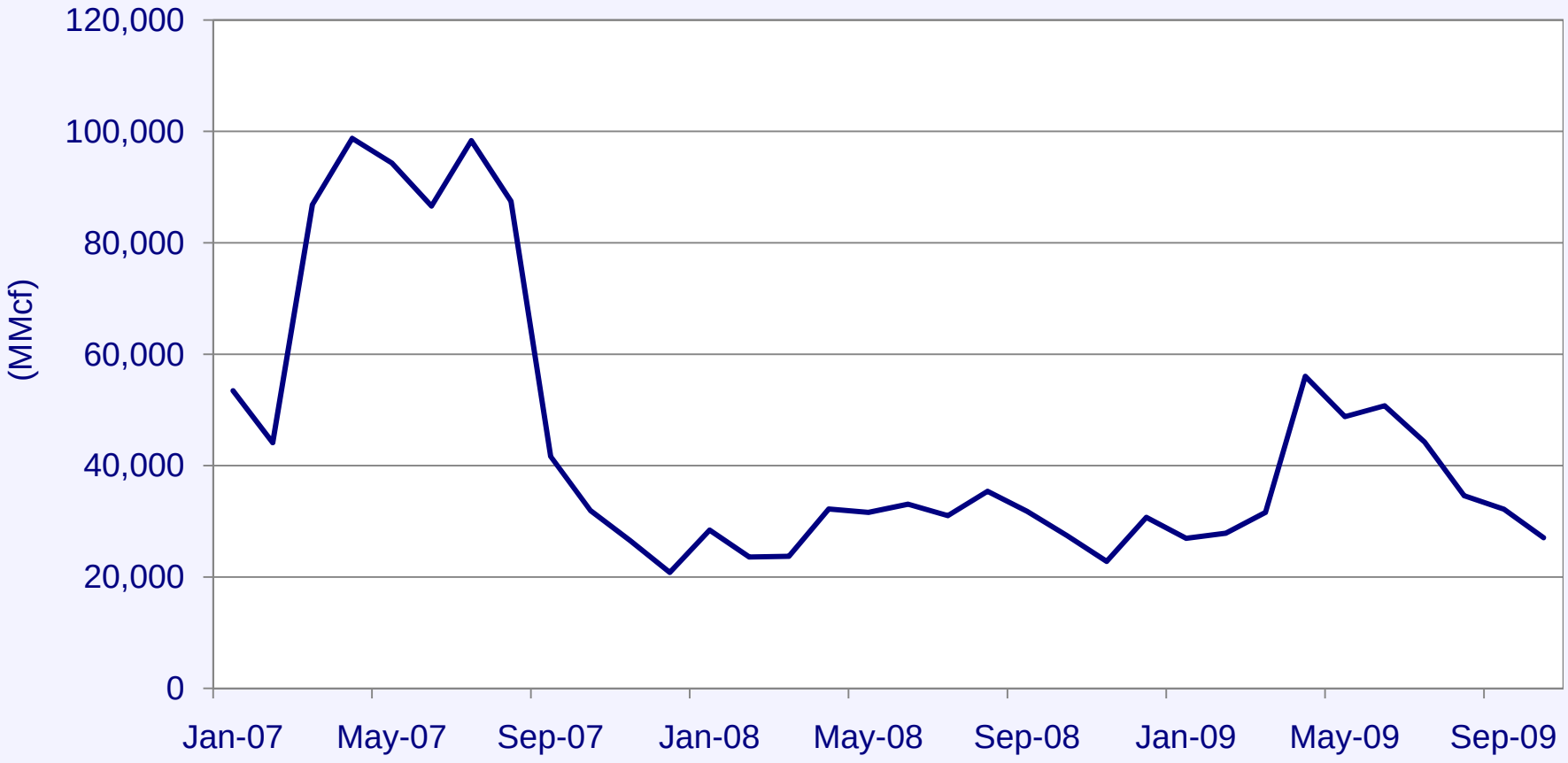
U.S. LNG Imports



Note: * indicates 2007 data; ** indicates 2008 data.

Emerging Opportunities

McMoran Exploration Co. Find

- On January 20th, McMoran Exploration Co. announced a Davy Jones ultra-deep well find.
- Oil and Gas Journal: 2 Tcf or more.
- Located in 20 feet of water 10 miles south of Marsh Island
- Drilled to 28,603 feet.
- 200 net feet of sand natural gas pay.
- O&GJ: “The exploration could revive exploration on the GOM shelf. It could be one of the largest discoveries in decades.”

Source: McMoran Exploration Co, Oil and Gas Journal

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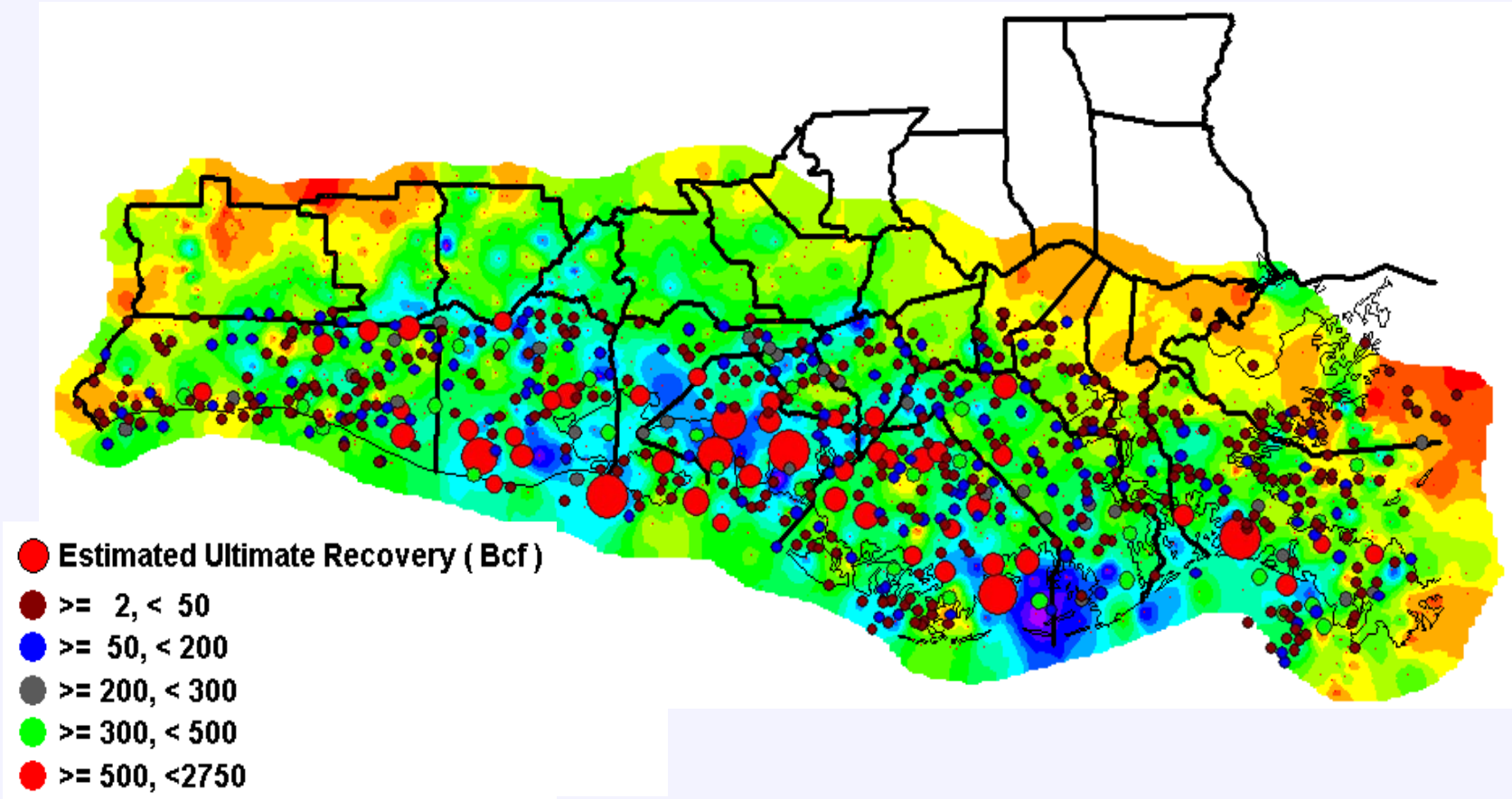
Schlumberger Estimates of Field Size Distribution for South Louisiana Deep Wells (2002 Estimate)



Source: Schlumberger Estimates, PTTC Workshop on Deep Drilling, LSU Center for Energy Studies, 2002.

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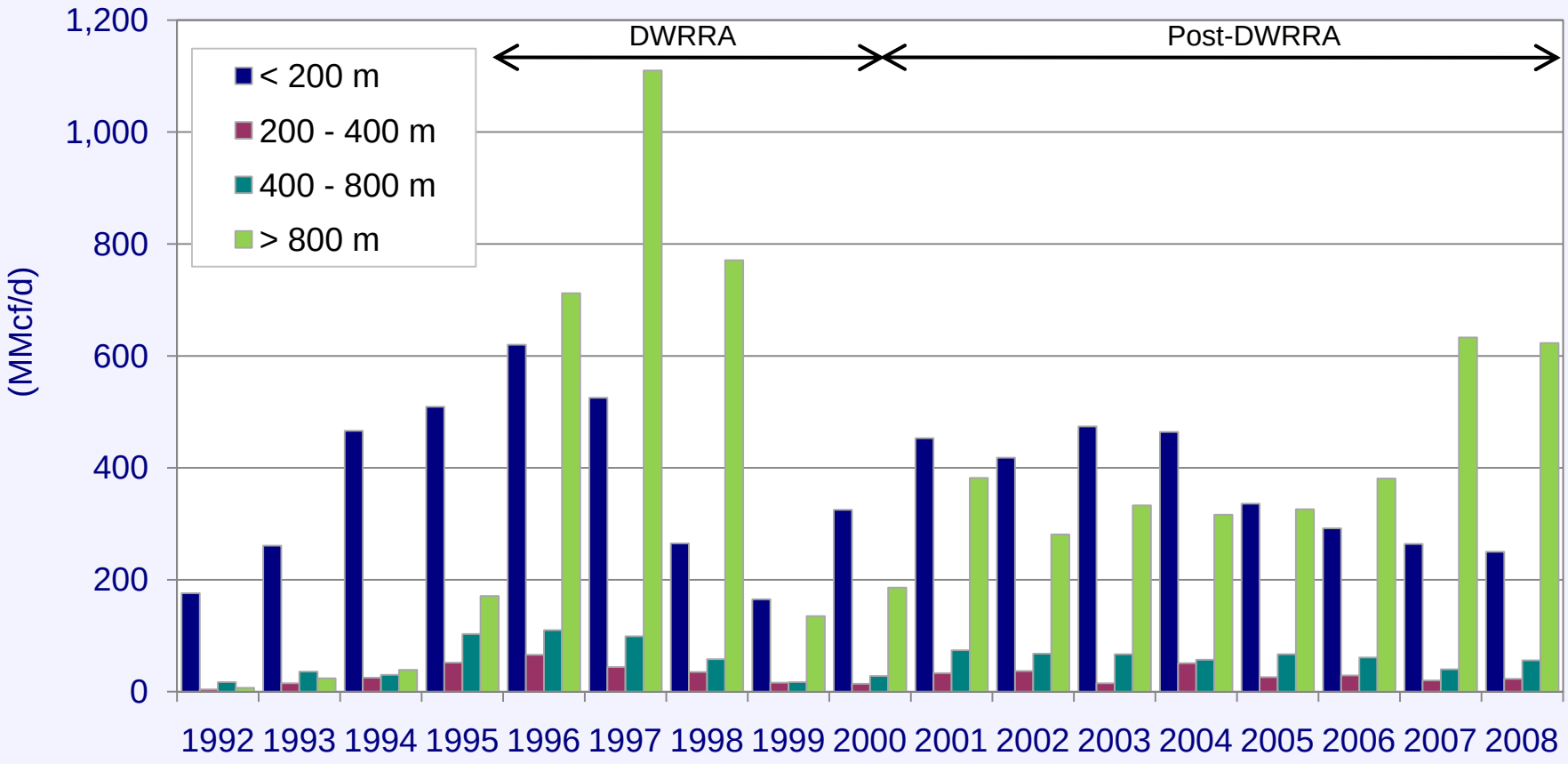
Number of Leases Issued by Year and Water-Depth Category

In 2008, over 65 percent of all GOM leases issued were in water depths greater than 800 feet.



Source: Minerals Management Service

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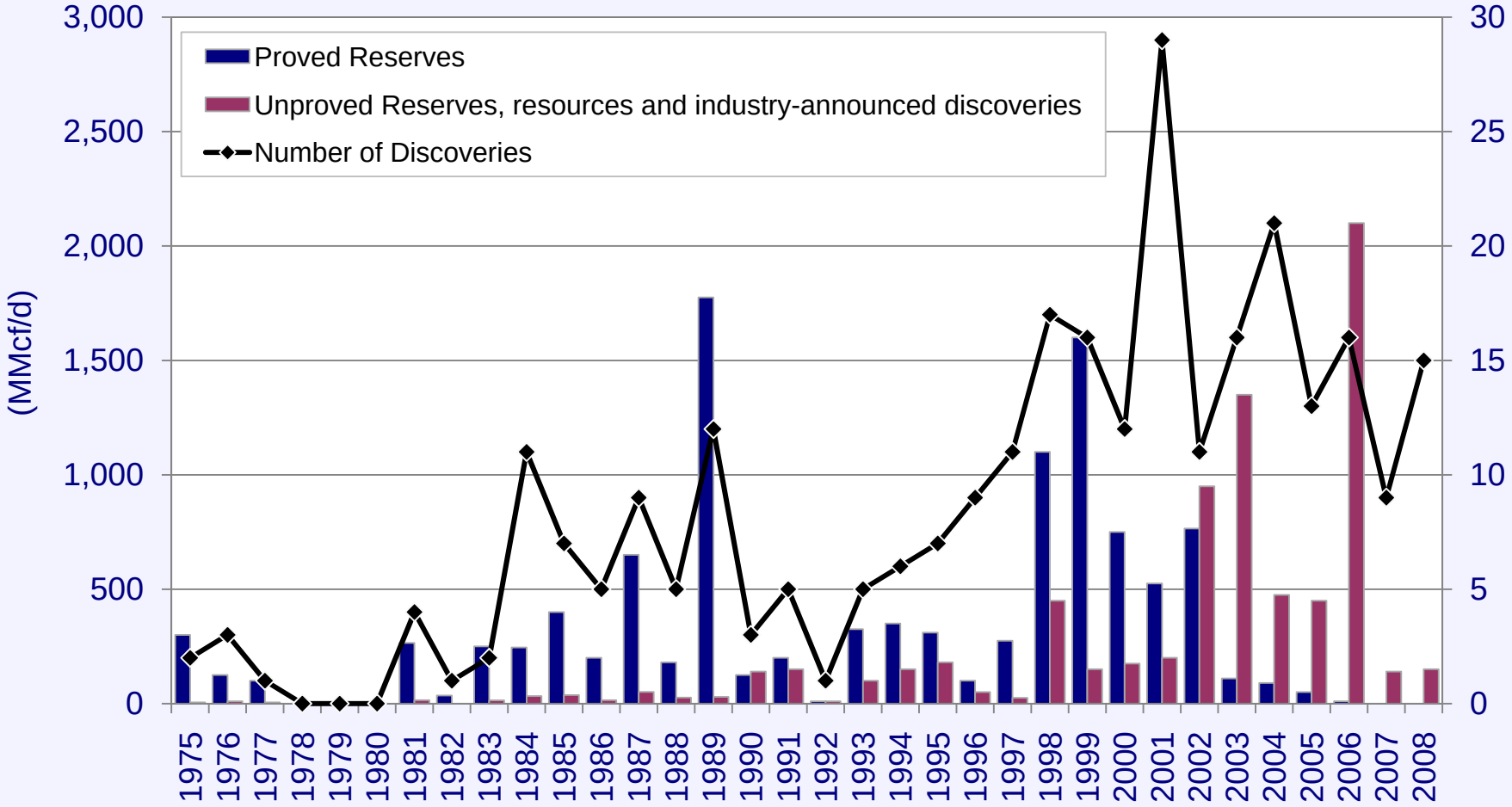
Number and Volume of Deepwater Discoveries

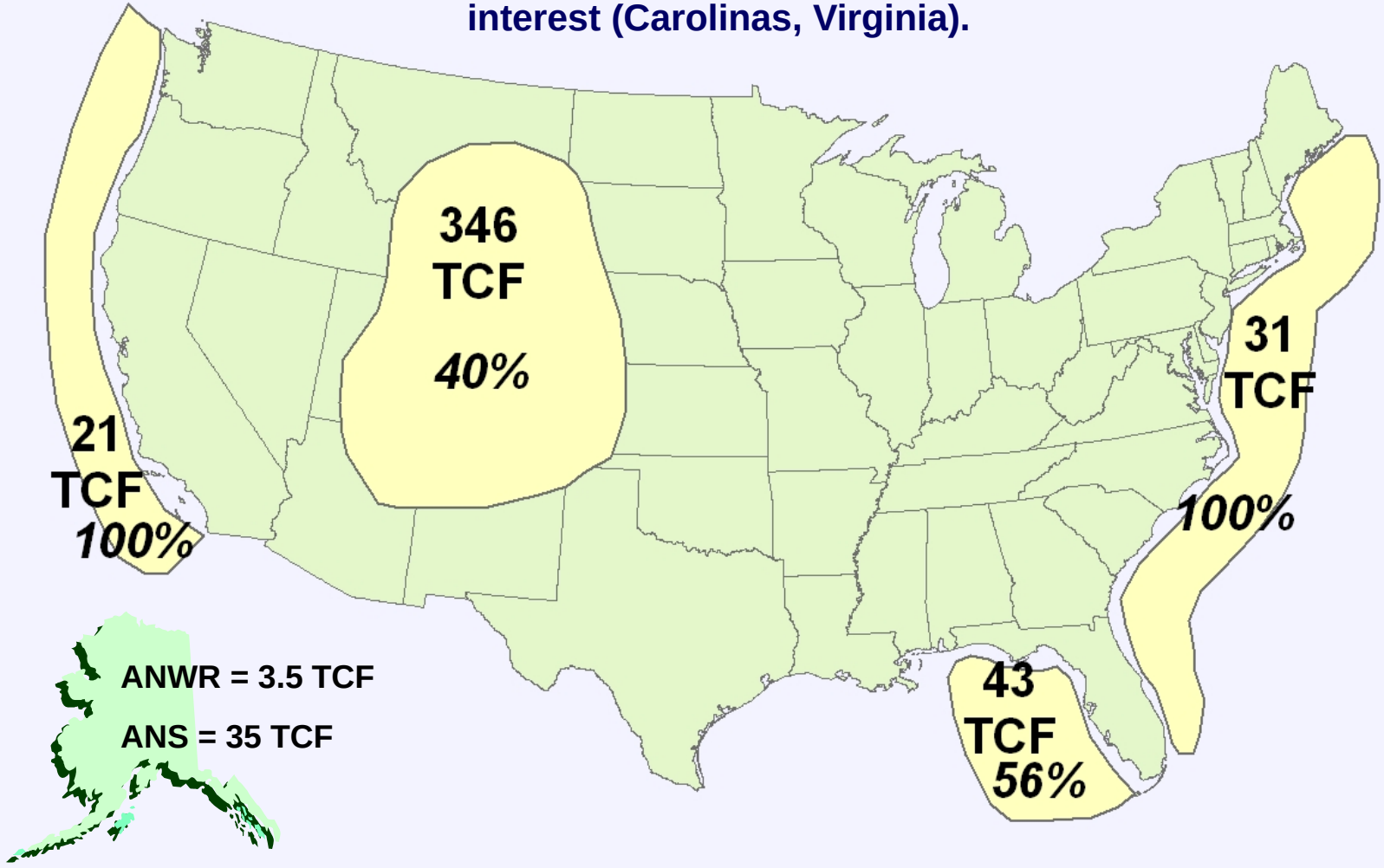
While there continues to be formidable natural gas reserves, deepwater is materializing as more of a big crude play than gas.



Note: Graph is estimated.
Source: Minerals Management Service

Resource Estimates – Restricted Areas
Estimated Percentage Restricted

Frontier areas still in play given the release of the offshore drilling moratoria. Several Atlantic seaboards states expressing an interest (Carolinas, Virginia).



Source: Independent Petroleum Association of America

Conclusions

Take-Away Points

- **Understatement to note shale is a game changer – the large unknowns are to what extent, and how far, these opportunities can spread – particularly abroad.**
- **Shale clearly changes energy market dynamics, short run issues, domestically, more on demand-side than supply.**
- **Important to not take our eye off the ball and neglect the importance of these resources (i.e. tax increases, dramatic changes in state mineral revenue regimes, environmental regulations)**
- **LNG will always provide discipline to the market (margin cost of importing can be very low).**
- **Existing opportunities (Rockies, Alaska, deepwater) are still there and new opportunities (frontier areas, deep drilling) continue to materialize (i.e., substitutes and alternatives)**

Questions, Comments, & Discussion

dismukes@lsu.edu

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