

Assessment of Oil and Gas Resources in the Upper Jurassic Haynesville and Bossier Formations, U.S. Gulf Coast, 2016

Open-File Report 2018–1135

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By Stanley T. Paxton

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**U.S. Department of the Interior
U.S. Geological Survey**

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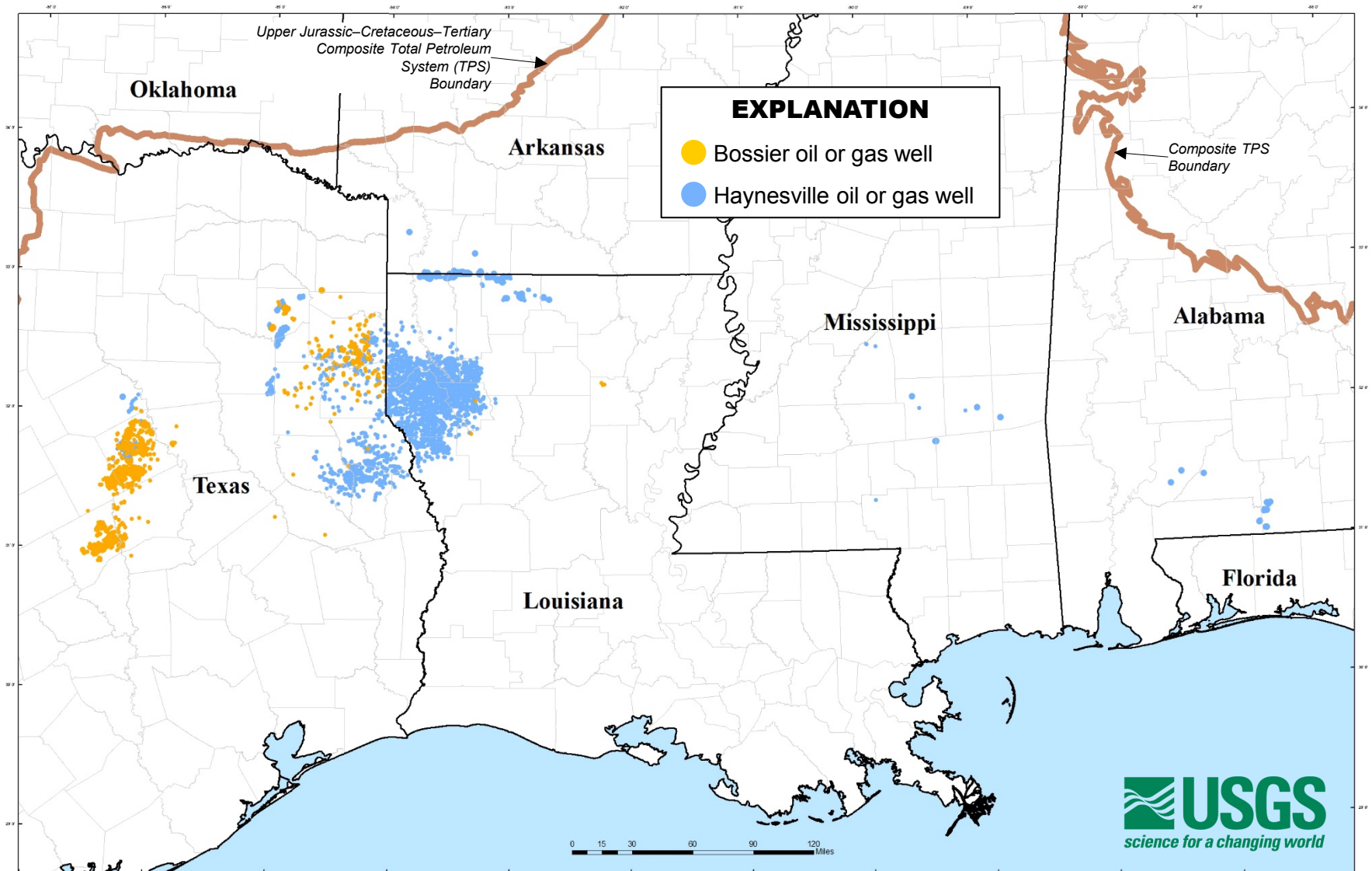
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Assessment of the Haynesville and Bossier Formations

- **Haynesville Formation conventional oil and gas production began in the late 1930s; Bossier Formation production began in the early 1970s**
- **Production of continuous gas resources from both formations began in 2006-7**
- **Last assessed by USGS in 2010**
- **Most current activity is focused on natural gas production from Haynesville and Bossier shales using horizontal wells and hydraulic fracturing**

Haynesville and Bossier Production



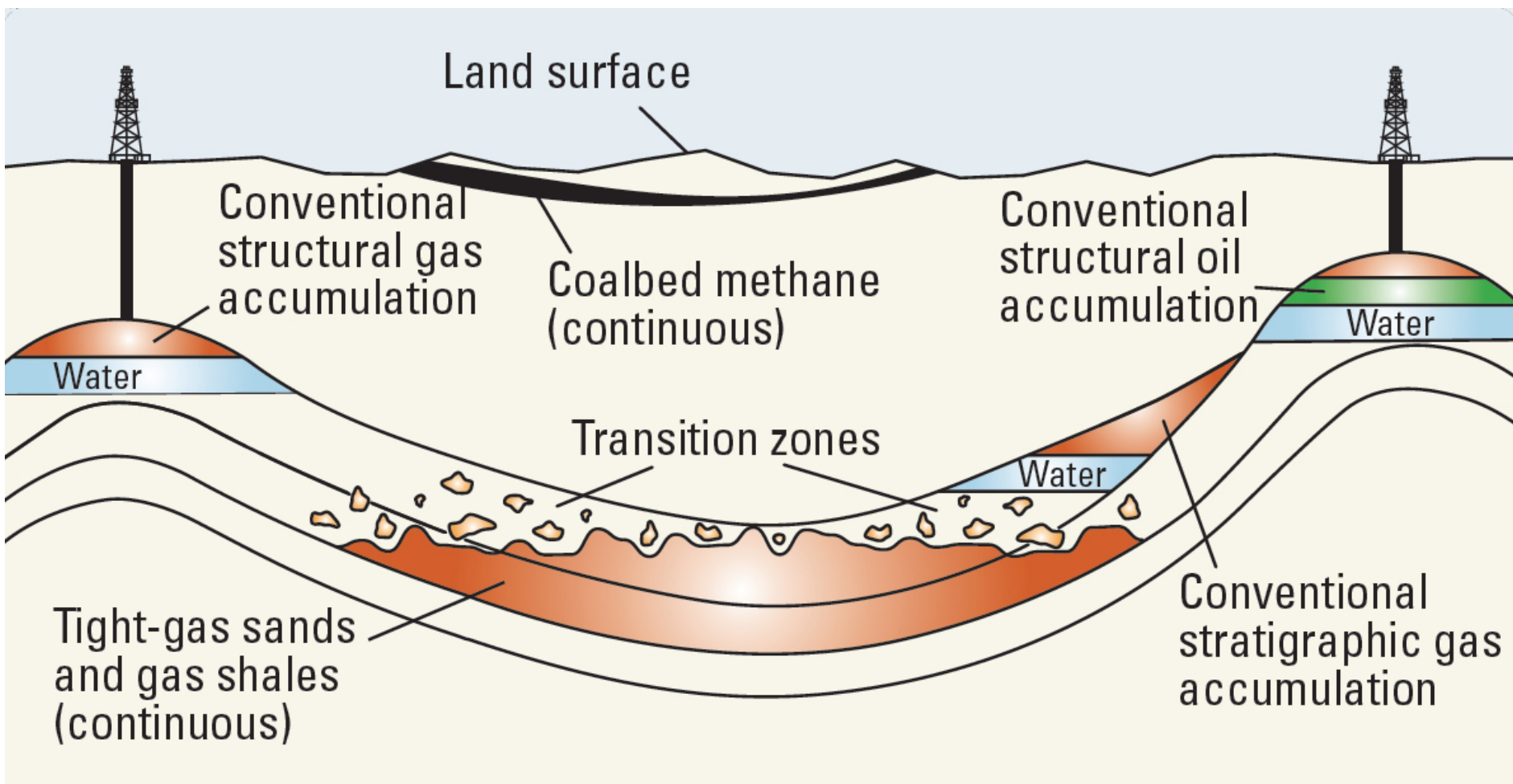
Haynesville and Bossier Natural Gas by the Numbers

- **27.3 trillion cubic feet of natural gas (TCFG) consumed by the United States in 2015¹**
- **Texas and Louisiana are major producers of United States natural gas**
- **Cumulative gas production as of August 2016²**
 - **Haynesville Formation: 13.2 TCFG**
 - **Bossier Formation: 2.9 TCFG**

¹U.S. Energy Information Administration, 2016

²IHS Markit™, 2016

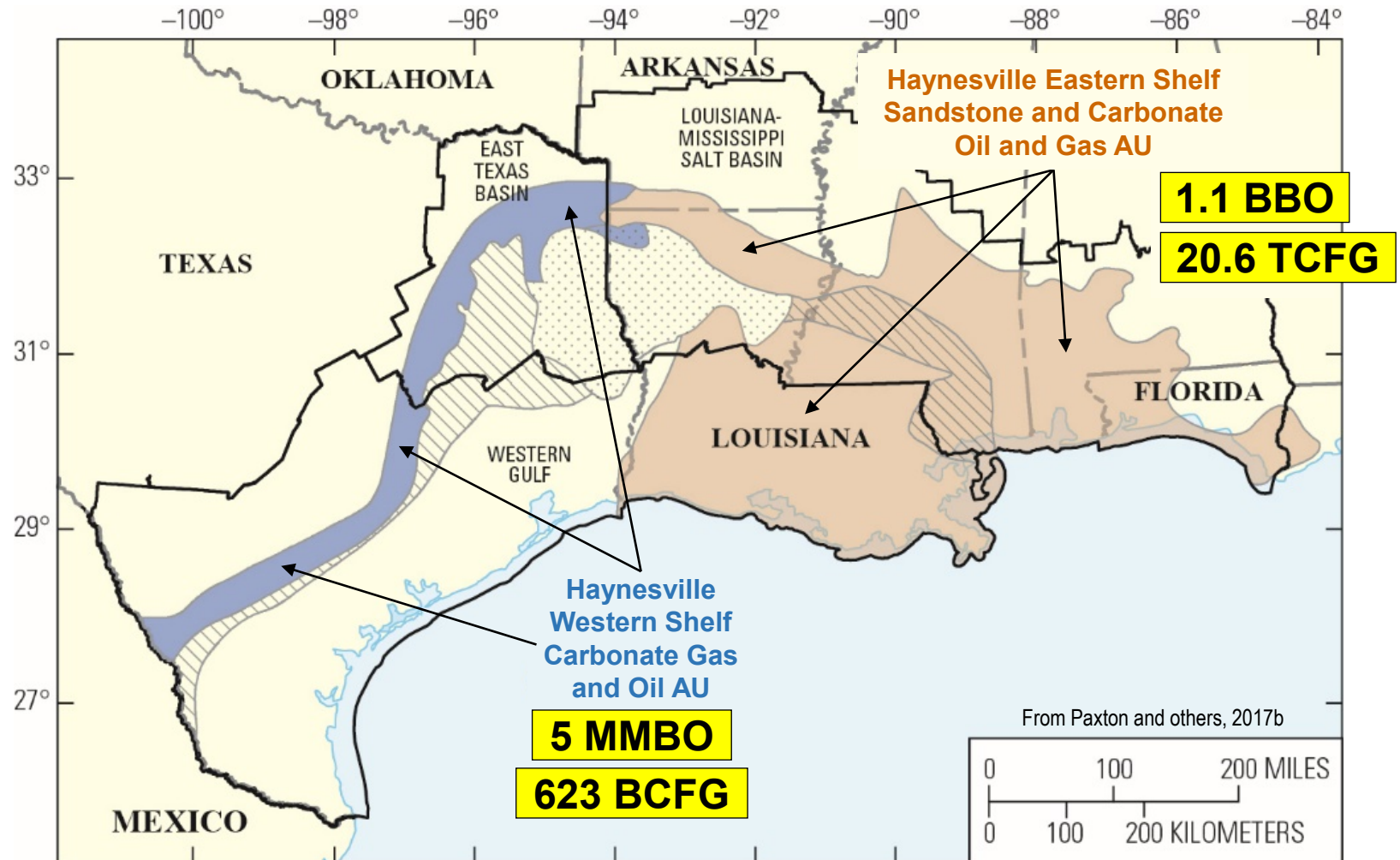
Conventional versus Continuous Resources



USGS Assessment Methodology for Continuous-Type Accumulations

- Based on geology and geologic models
- Identify and outline Total Petroleum System(s) and Assessment Units
- Emphasis on undiscovered, technically recoverable resources
 - *Not* economically recoverable resource estimates
 - *Not* in-place resource estimates
 - *Not* reserves

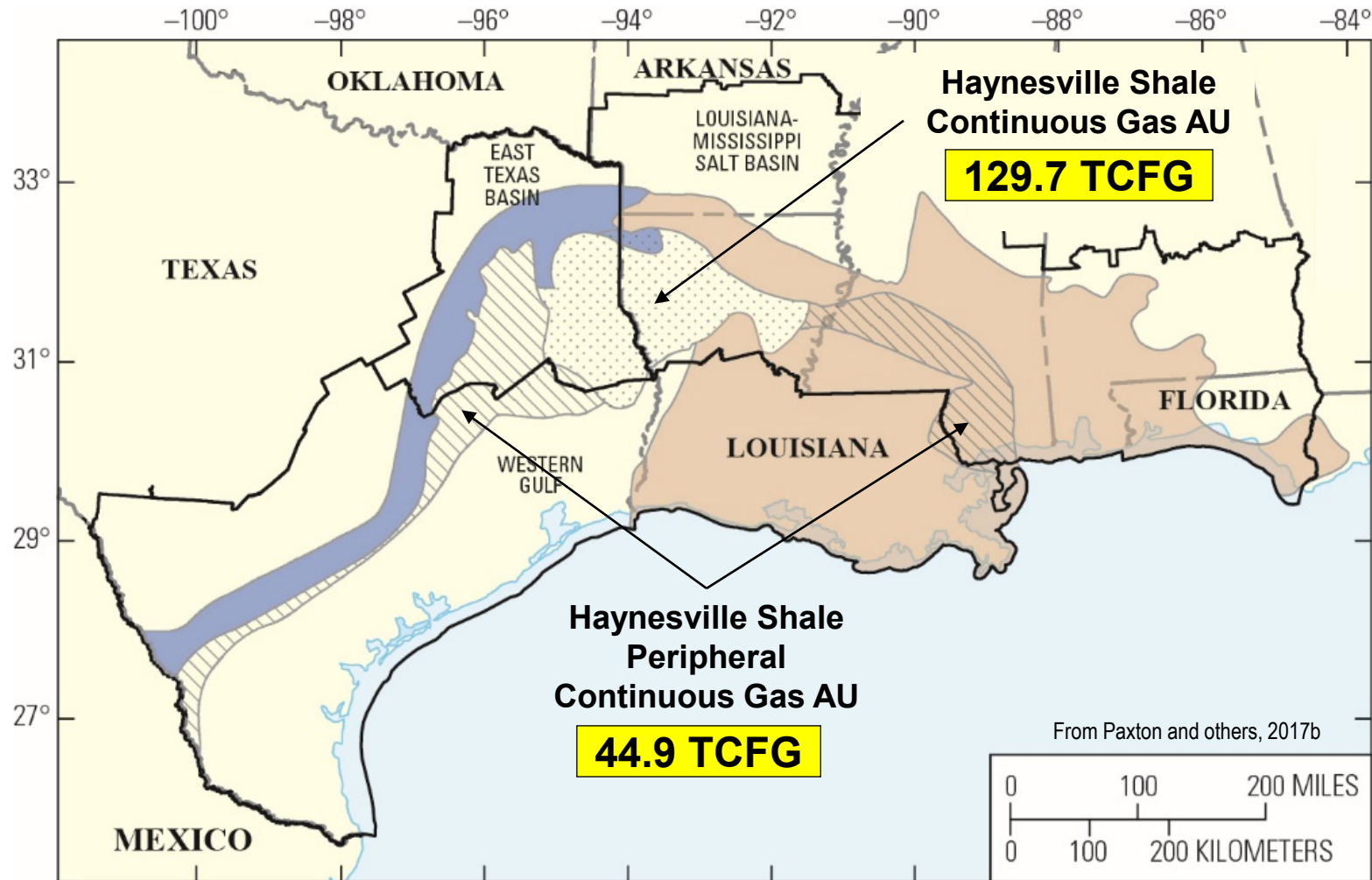
Haynesville Formation Mean Assessment Results Per Conventional AU



Base Map Source: U.S. Department of the Interior National Park Service (December, 2009)

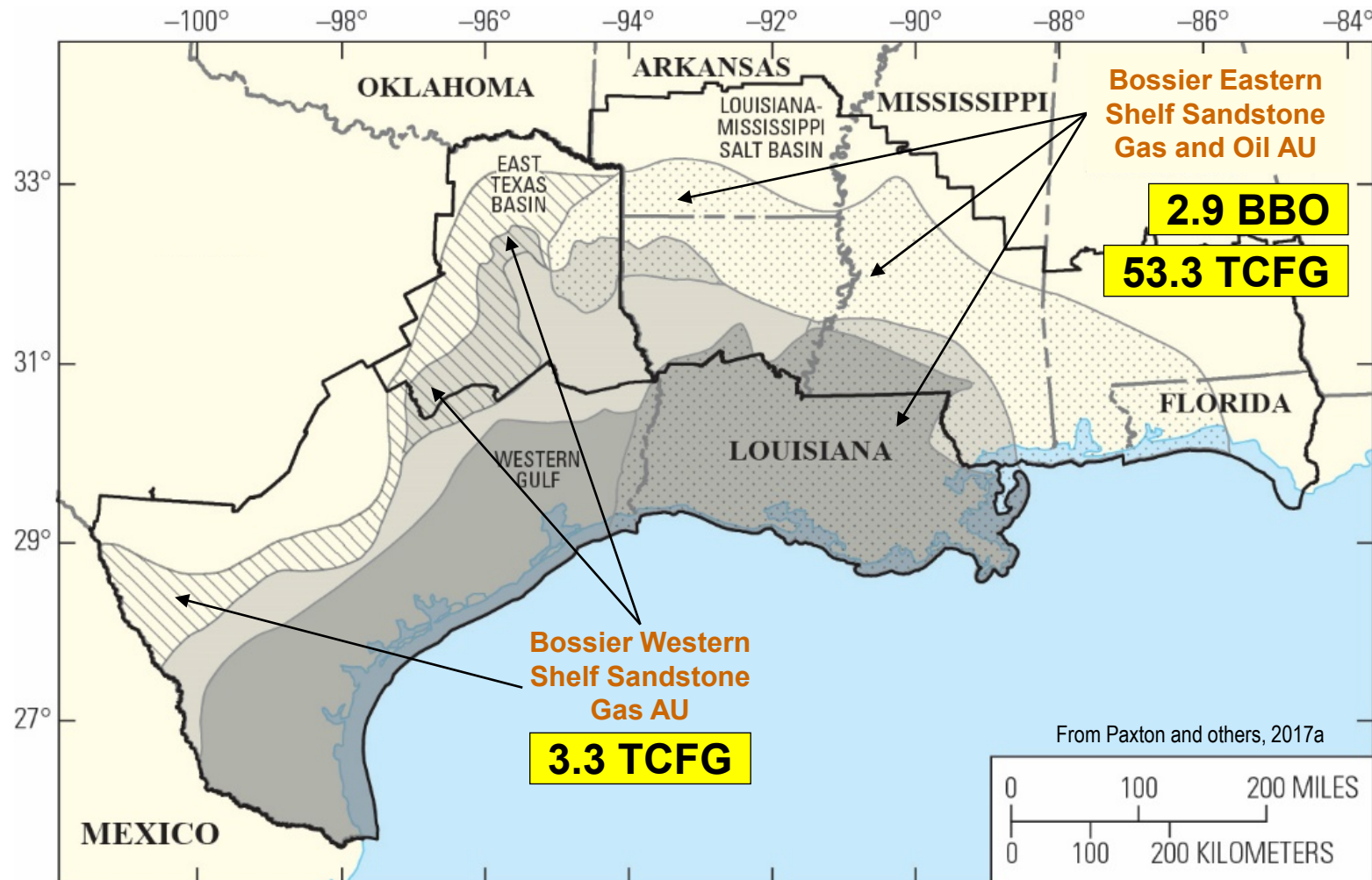
[AU, Assessment Unit; BBO, billion barrels of oil; TCFG, trillion cubic feet of gas; MMBO, million barrels of oil; BCFG, billion cubic feet of gas]

Haynesville Formation Mean Assessment Results Per Continuous AU



Base Map Source: U.S. Department of the Interior
National Park Service (December, 2009)
[AU, Assessment Unit; TCFG, trillion cubic feet of gas]

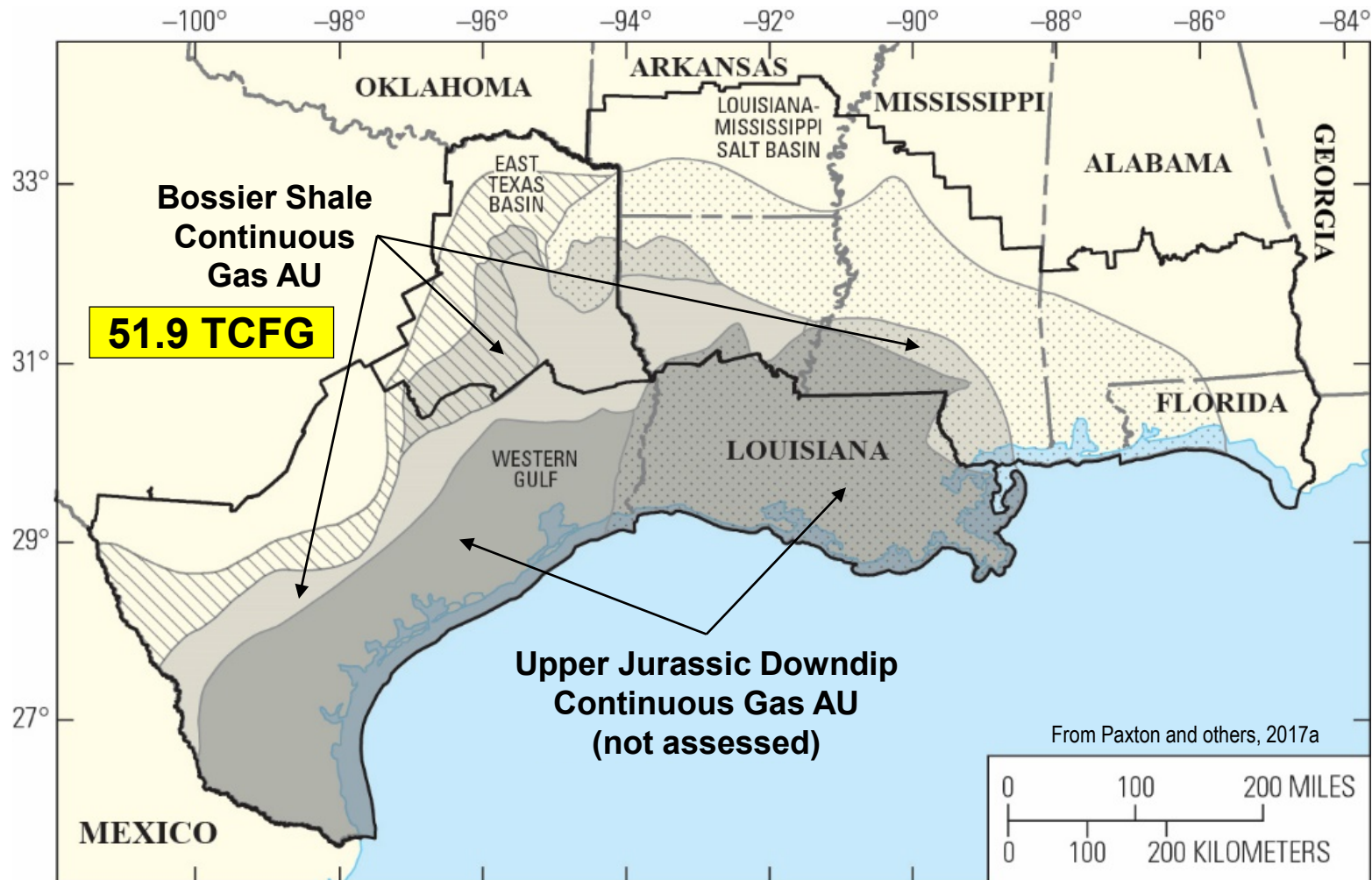
Bossier Formation Mean Assessment Results Per Conventional AU



Base Map Source: U.S. Department of the Interior
National Park Service (December, 2009)

[AU, Assessment Unit; BBO, billion barrels of oil;
TCFG, trillion cubic feet of gas]

Bossier Formation Mean Assessment Results Per Continuous AU



Base Map Source: U.S. Department of the Interior
National Park Service (December, 2009)
[AU, Assessment Unit; TCFG, trillion cubic feet of gas]

Haynesville and Bossier Formations Assessment Summary (Combined)

Undiscovered, technically recoverable resources

Mean resources (7 assessment units)

- Oil: 4.0 billion barrels of oil
- Gas: 304.4 trillion cubic feet of gas (TCFG)
- Natural gas liquids: 1.0 billion barrels of natural gas liquids

***304.4 TCFG (F95-F5* range from
133.4 TCFG to 564.4 TCFG)***

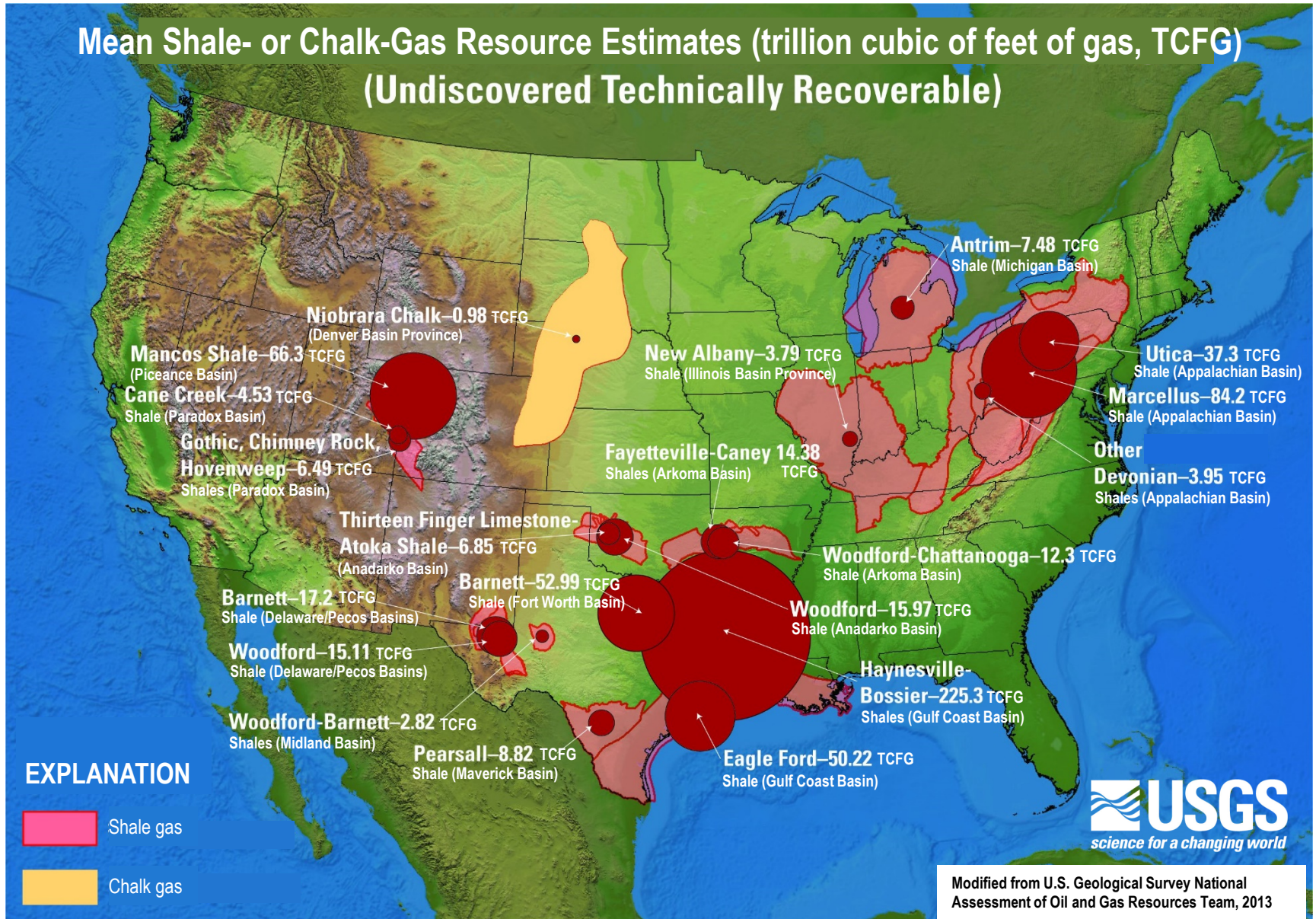
*F95 = 95-percent probability that the gas volume (in the two formations combined) will contain at least 133.4 TCFG.

F5 = 5-percent probability that the combined gas volume will be as large as 564.4 TCFG.

Haynesville and Bossier Formations

Largest Continuous Gas Resource Assessed by the USGS

Mean Shale- or Chalk-Gas Resource Estimates (trillion cubic feet of gas, TCFG)
(Undiscovered Technically Recoverable)



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