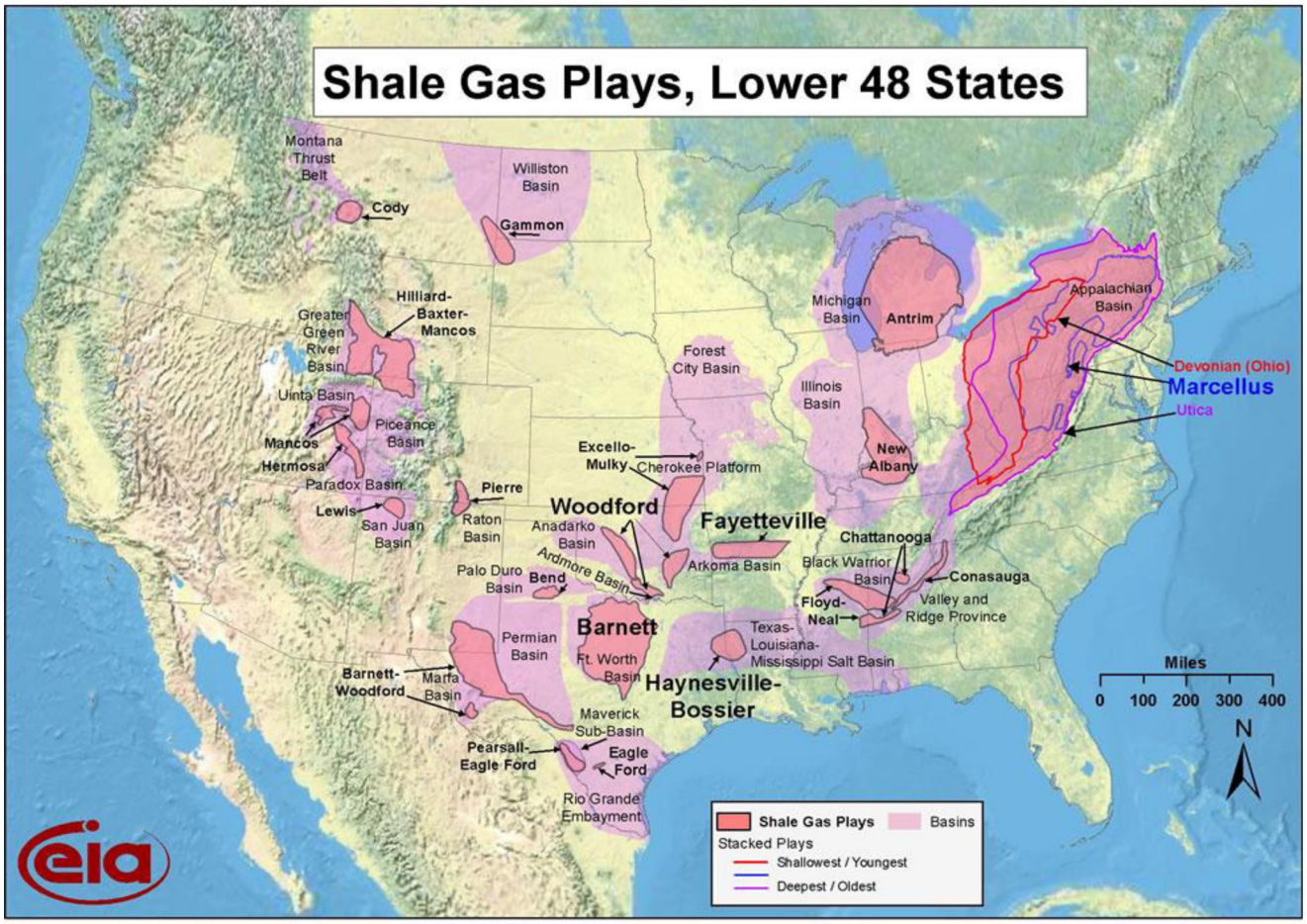
Where is shale gas found in the United States?

Shale gas is located in many parts of the United States. These deposits occur in shale **"plays"** – a set of discovered, undiscovered or possible natural gas accumulations that exhibit similar geological characteristics. Shale plays are located within large-scale basins or accumulations of sedimentary rocks, often hundreds of miles across, that also may contain other oil and gas resources.[1] Shale gas production is currently occurring in 16 states.



Source: Energy Information Administration based on data from various published studies.
Updated: March 10, 2010

Map source: U.S. Energy Information Administration

[1] U.S. Government Accountability Office, Report to Congressional Requesters, "Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks," page 14, GAO-12-732, September 2012.

Shale Gas, Horizontal Drilling and Hydraulic Fracturing Development Technological Highlights

1821

First commercial U.S. production of natural gas from shale from a shallow dug pit in Fredonia, N.Y.

In 1947, Standolin Oil (Amoco) conducted the first experimental fracturing in the Hugoton field in southwestern Kansas. Photo: JPT Online, Society of Petroleum Engineers, http://www.jptonline.org/index.php?id=481

Late 1940s

Hydraulic fracturing first used to stimulate oil and gas wells. First experimental hydraulic fracturing treatment pumped in 1947 in Grant County, Kansas. First commercial use occurs in 1949 in Stephens County, Okla.

1970s

Development of downhole motors – a key component of directional drilling technology, accelerates. DOE sponsors R&D to improve shale and other unconventional gas extraction.

1980s to 1990s

Partnering with DOE and the Gas Research Institute, Mitchell Energy combines larger fracture designs, rigorous reservoir characterization, horizontal drilling and lower cost approaches to hydraulic fracturing to make drilling in Texas's Barnett Shale economical.

1800s

1930s

1940s

1950s

1970s

1980s

1990s

2000s

1860s to 1920s

Natural gas, including shale gas from Appalachian and Illinois basins, is limited to use in cities close to wells.

1930s

Technology developed to lay large pipelines to transmit gas to northeastern cities; first horizontal well is drilled.

1950s

Hydraulic fracturing becomes commercially accepted process. More than 100,000 individual hydraulic fracturing treatments performed by 1955.

Marcellus Shale outcrop in Highland County, Va. Photo: James Coleman, U.S. Geological Survey

2000s

2003-2004 – Led by the Barnett Shale play, about 2 billion cubic feet (Bcf) of gas per day are produced from U.S. shales; operators begin exploring the Marcellus shale play in Pennsylvania. *2005-2010* – Gas production from Barnett Shale grows to about 5 Bcf daily; development of other major shale plays begins. *2010 – Present*: DOE research continues to promote shale exploration, development and environmental protection.

Sources: U.S. Department of Energy, National Energy Technology Laboratory; U.S. Government Accountability Organization; "Economic Report of the President," 2012.

Photo: U.S. Geological Survey, New York Water Science Center

SHALE STAT: Between 1978 and 1992, DOE invested about $137 million in the Eastern Gas Shale Program, which helped develop and demonstrate directional and horizontal drilling technology.

Source: Economic Report of the President, February 2012, Chapter 8, page 256