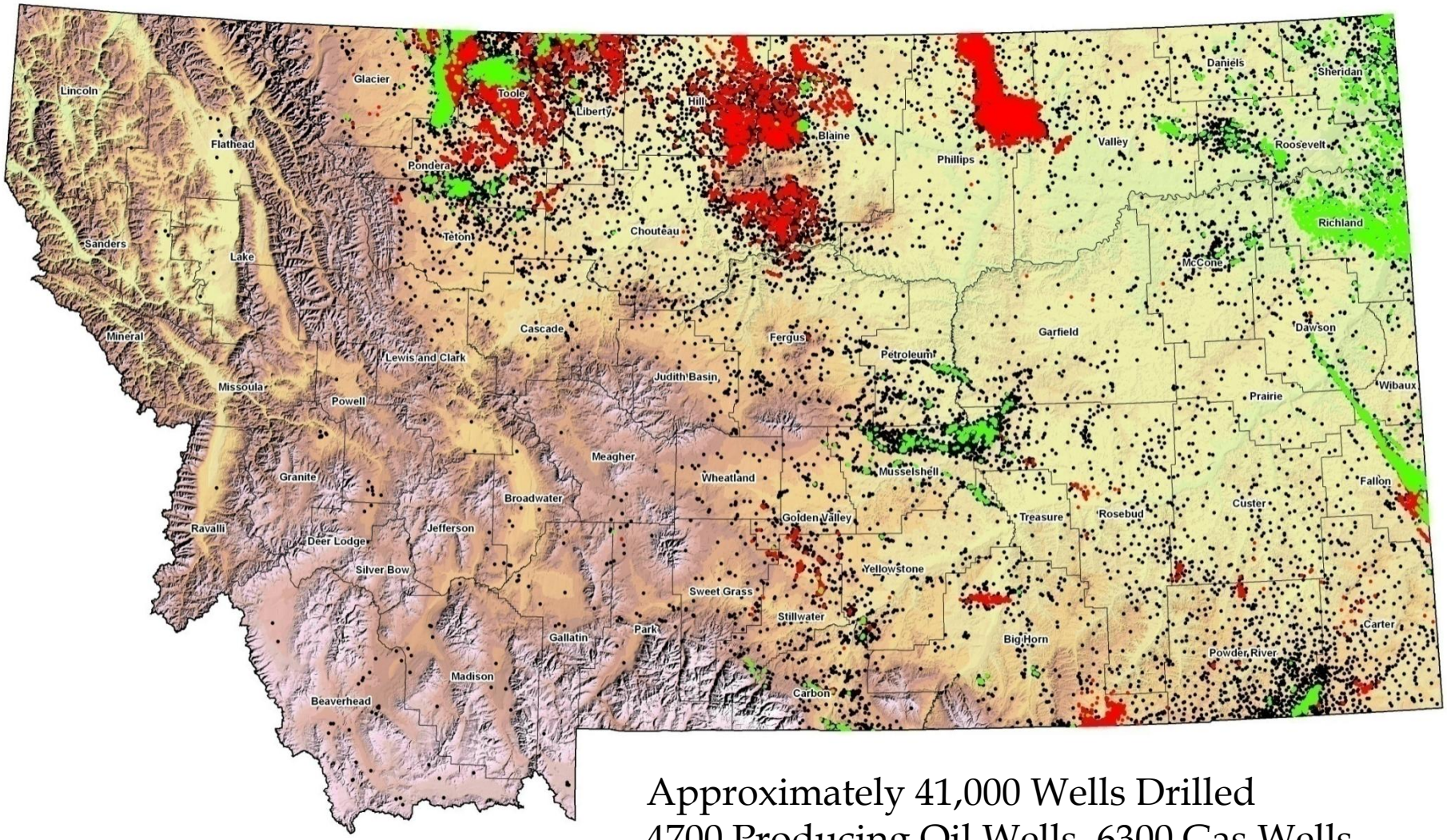
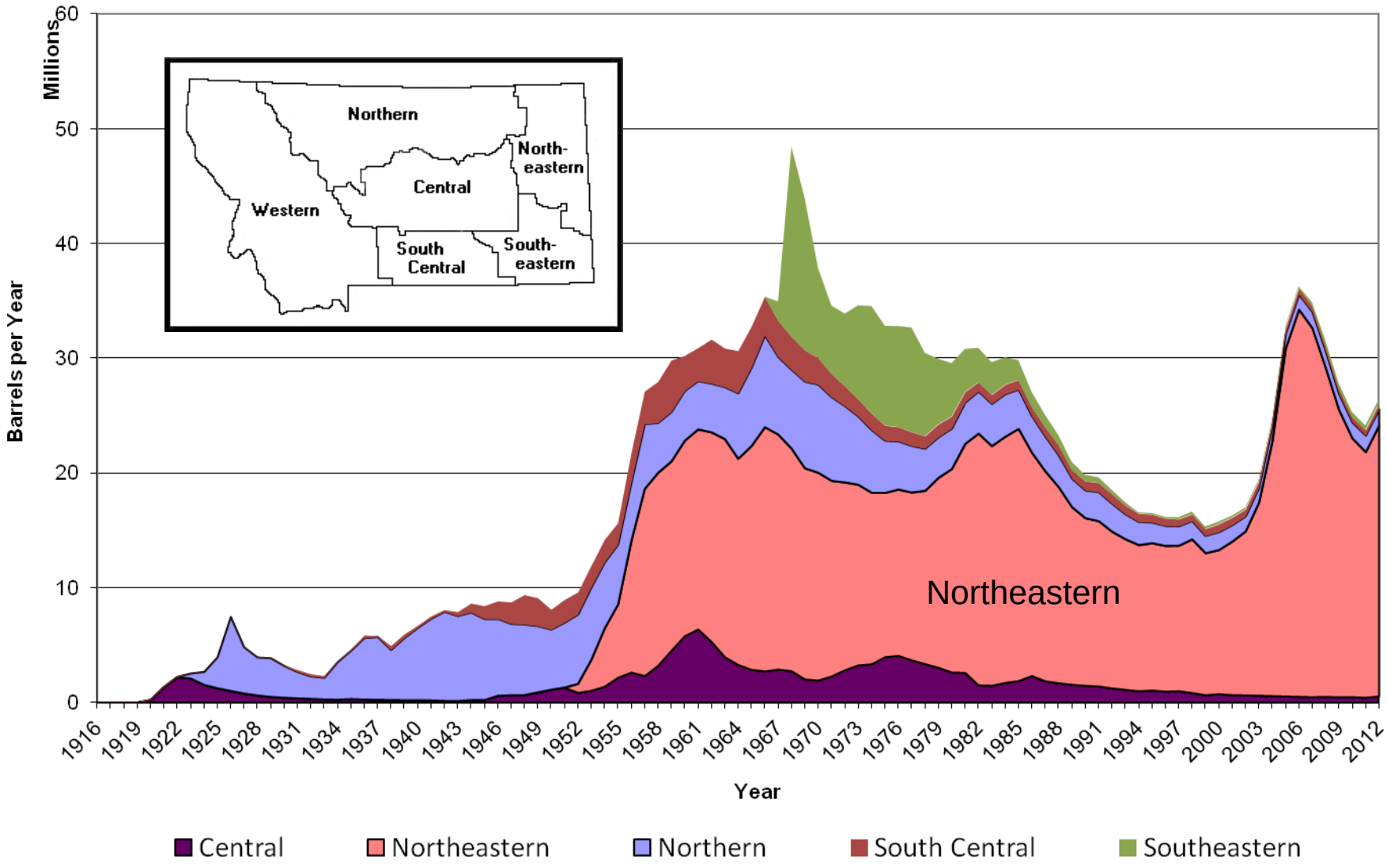
2013 Montana Update

Montana Oil and Gas Activity

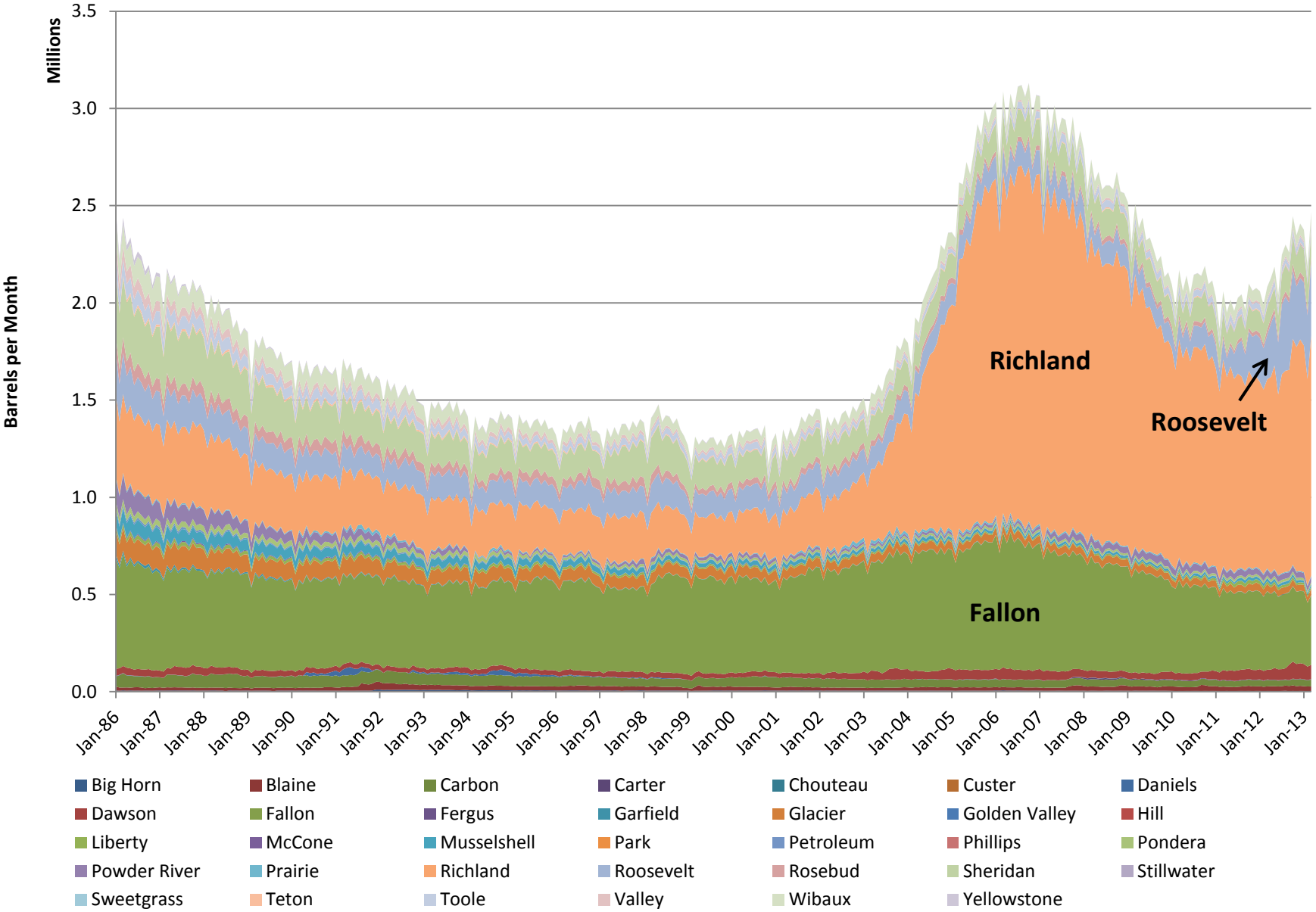


Approximately 41,000 Wells Drilled
4700 Producing Oil Wells, 6300 Gas Wells

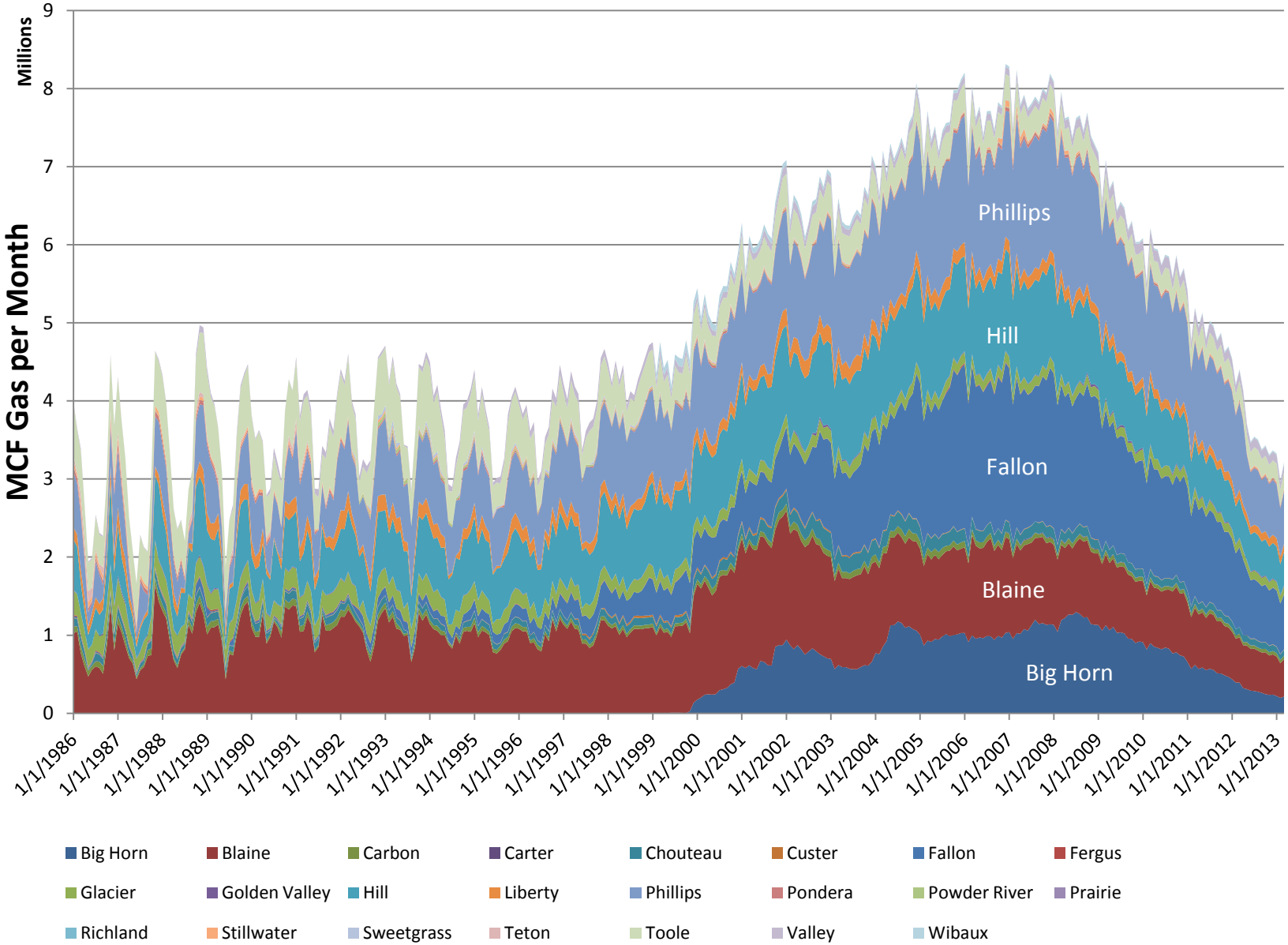
Historical Production

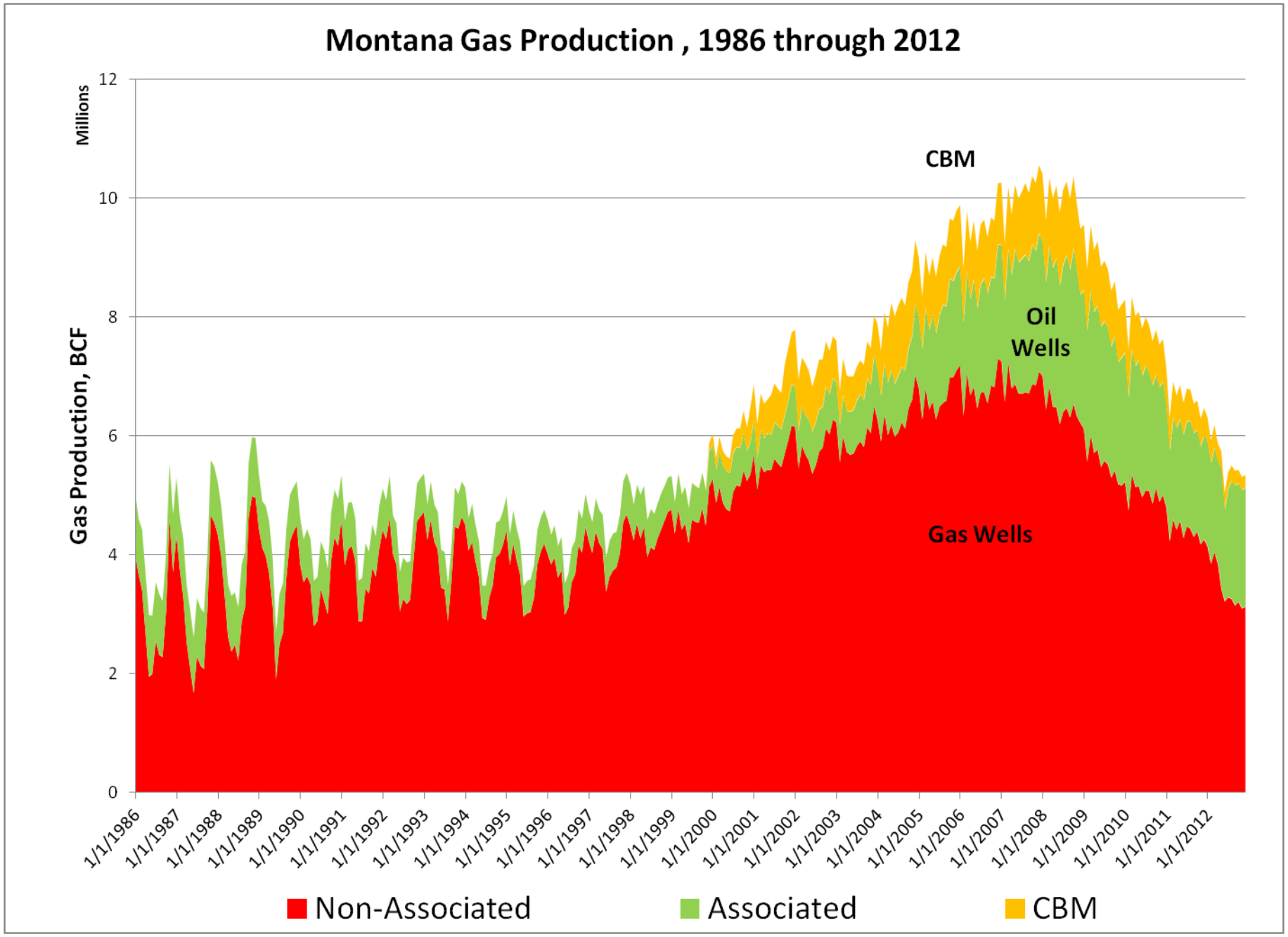


Montana Oil Production by County, Through March 2013



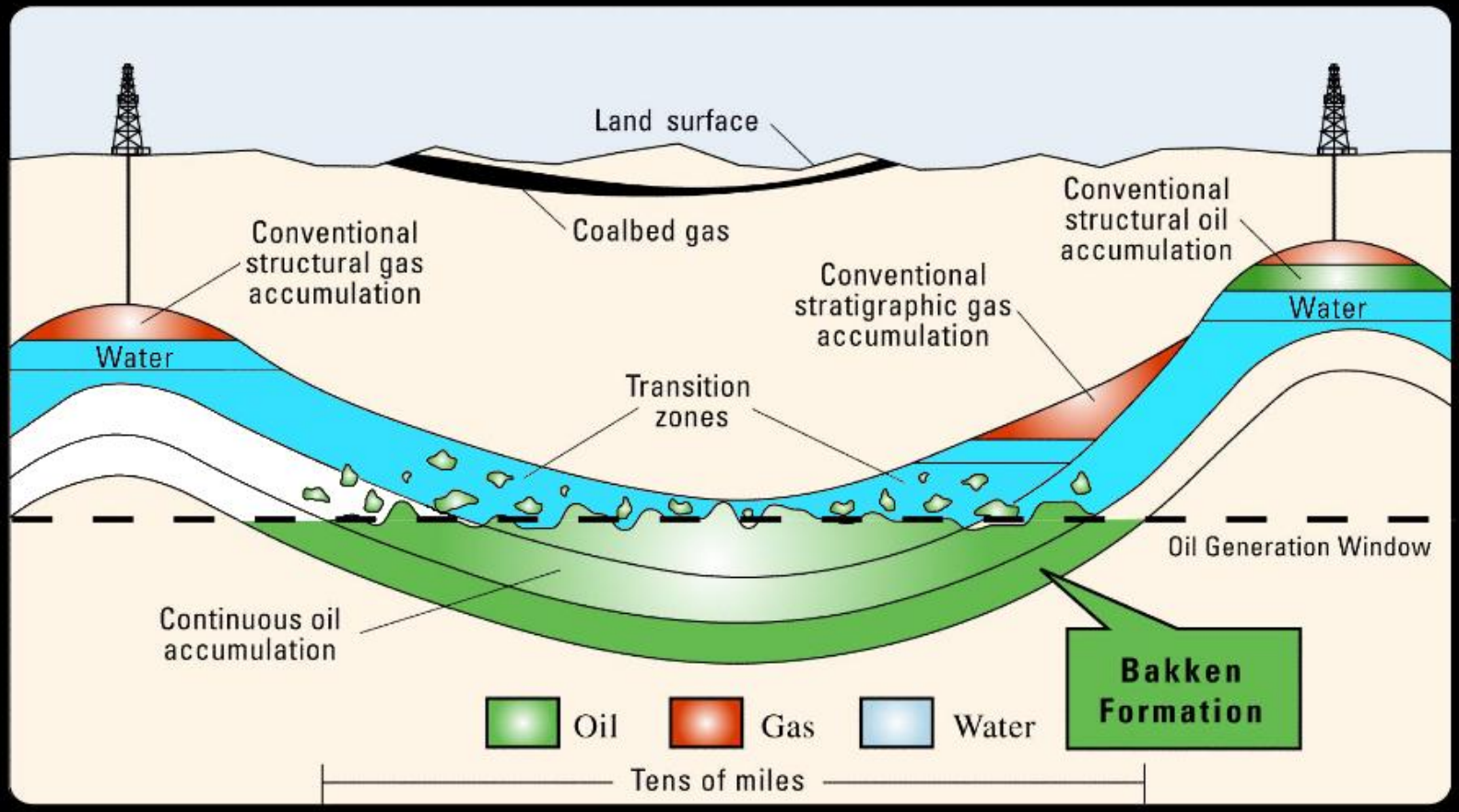
Monthly Gas Production by County Through March 2013




Montana Gas Production , 1986 through 2012
Millions
Gas Production, BCF
12
10
8
6
4
2
0
CBM
Oil Wells
Gas Wells
1/1/1986
1/1/1987
1/1/1988
1/1/1989
1/1/1990
1/1/1991
1/1/1992
1/1/1993
1/1/1994
1/1/1995
1/1/1996
1/1/1997
1/1/1998
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
Non-Associated
Associated
CBM

Conventional vs Continuous Resources

Continuous Shale Accumulations

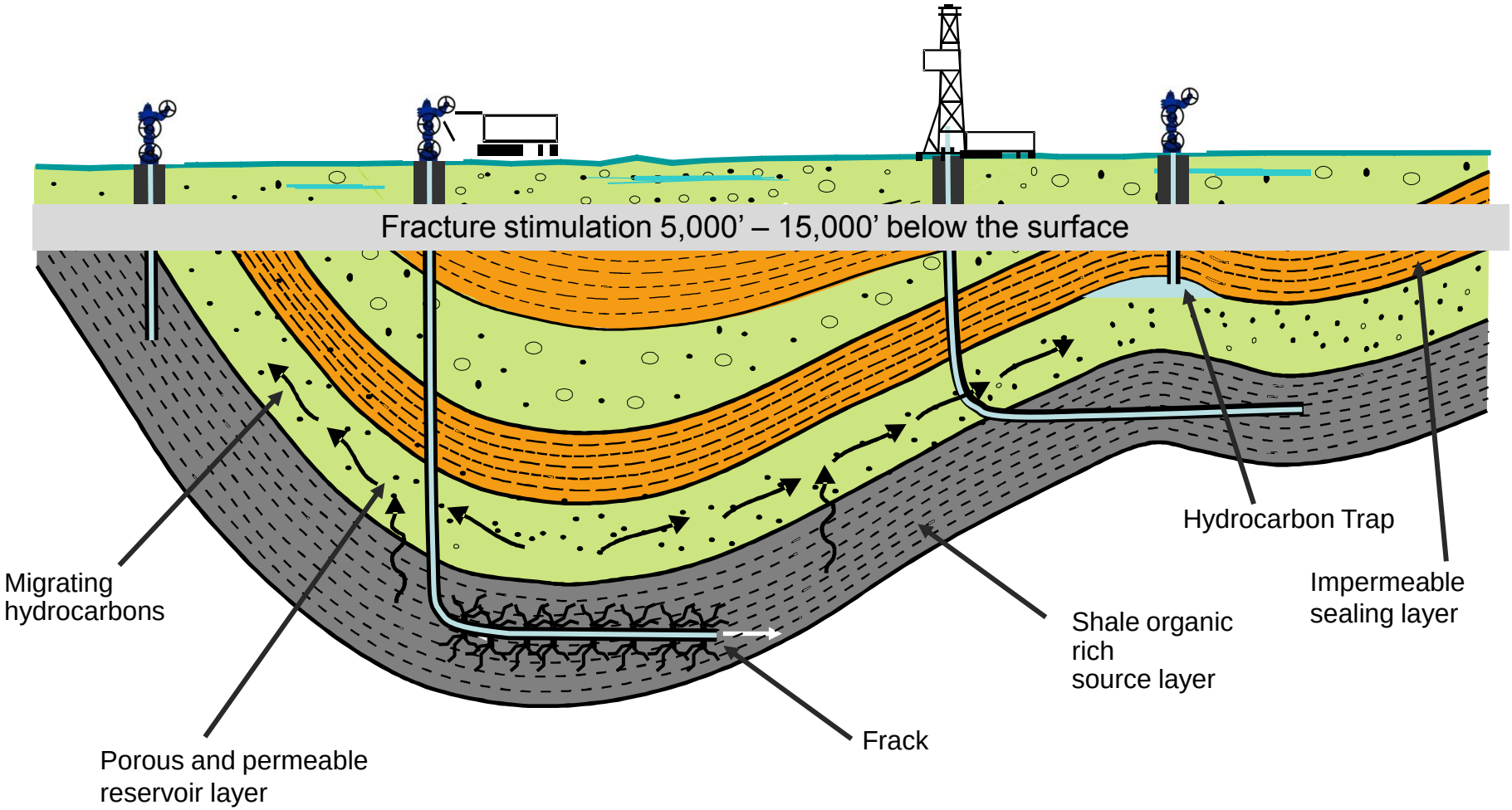


REQUIREMENT… the shale is now, or was at sometime in its history, within the oil or gas generation window

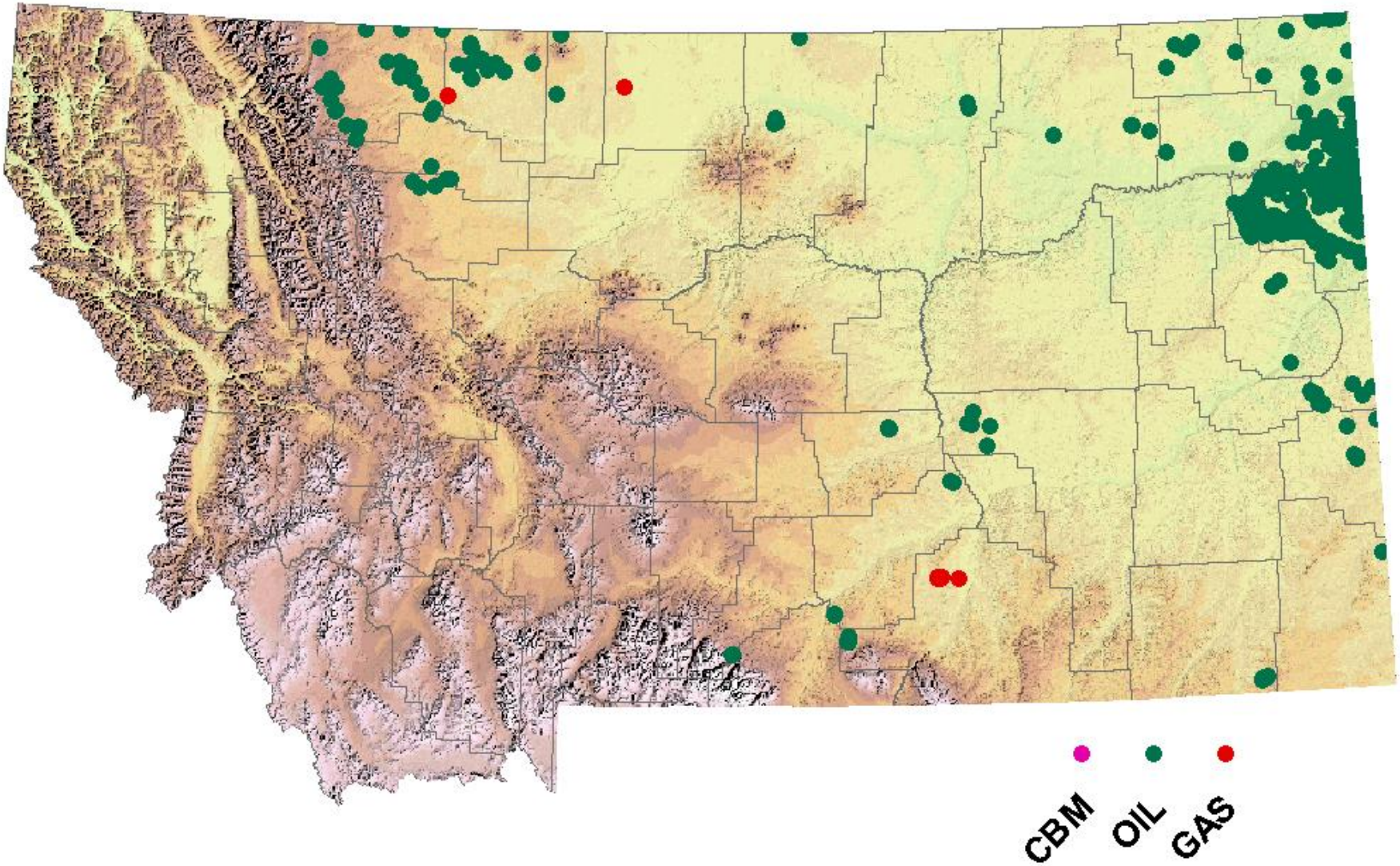
USGS

Technology's Role

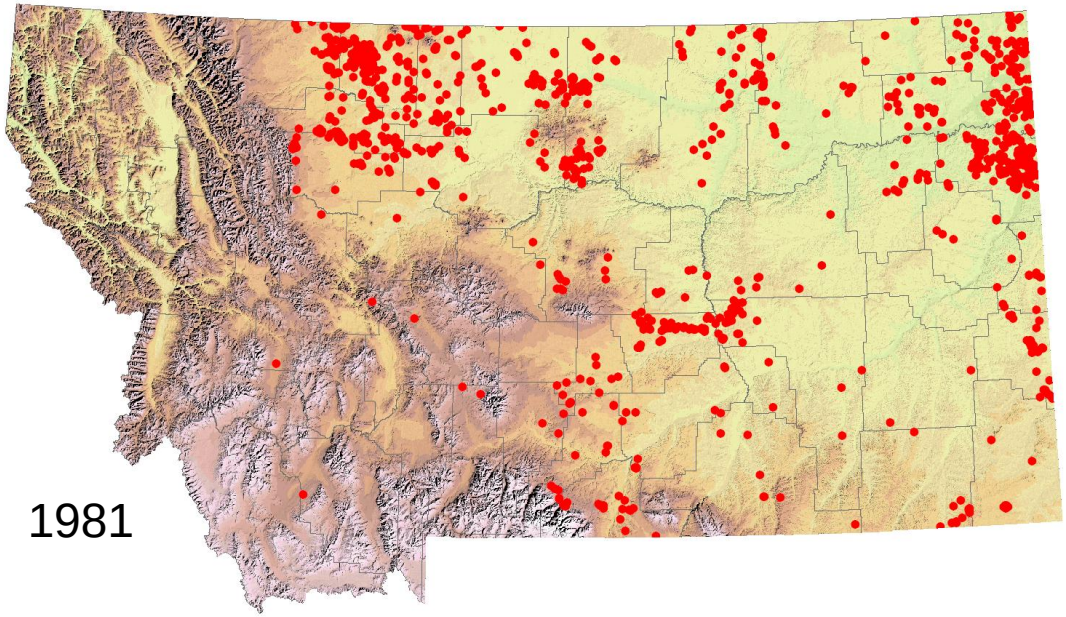
Why the revolution?



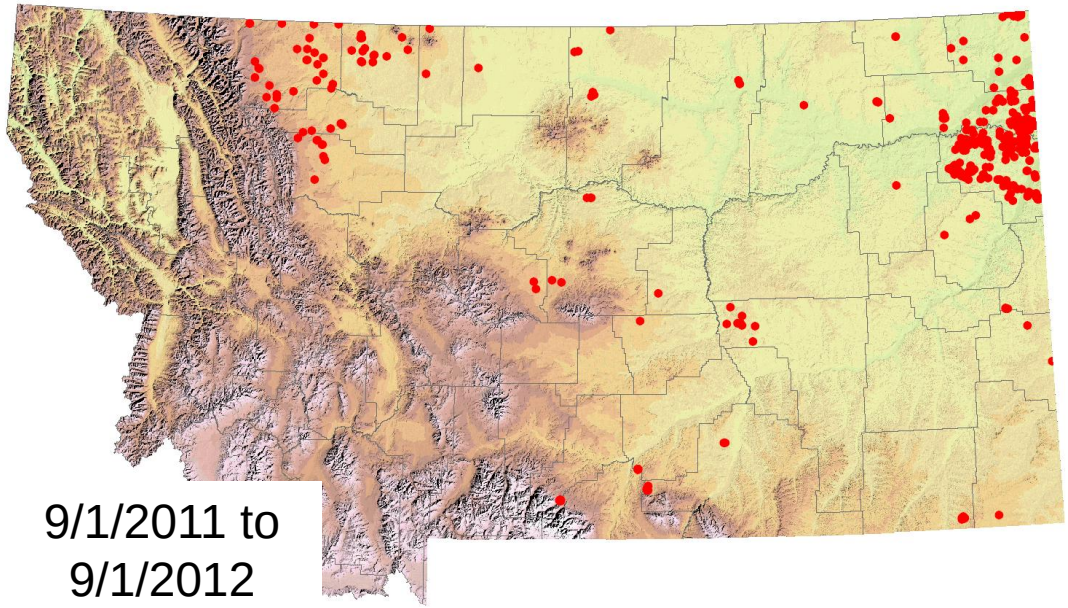
Permits Issued After January 1, 2012



1981 vs. Current Activity

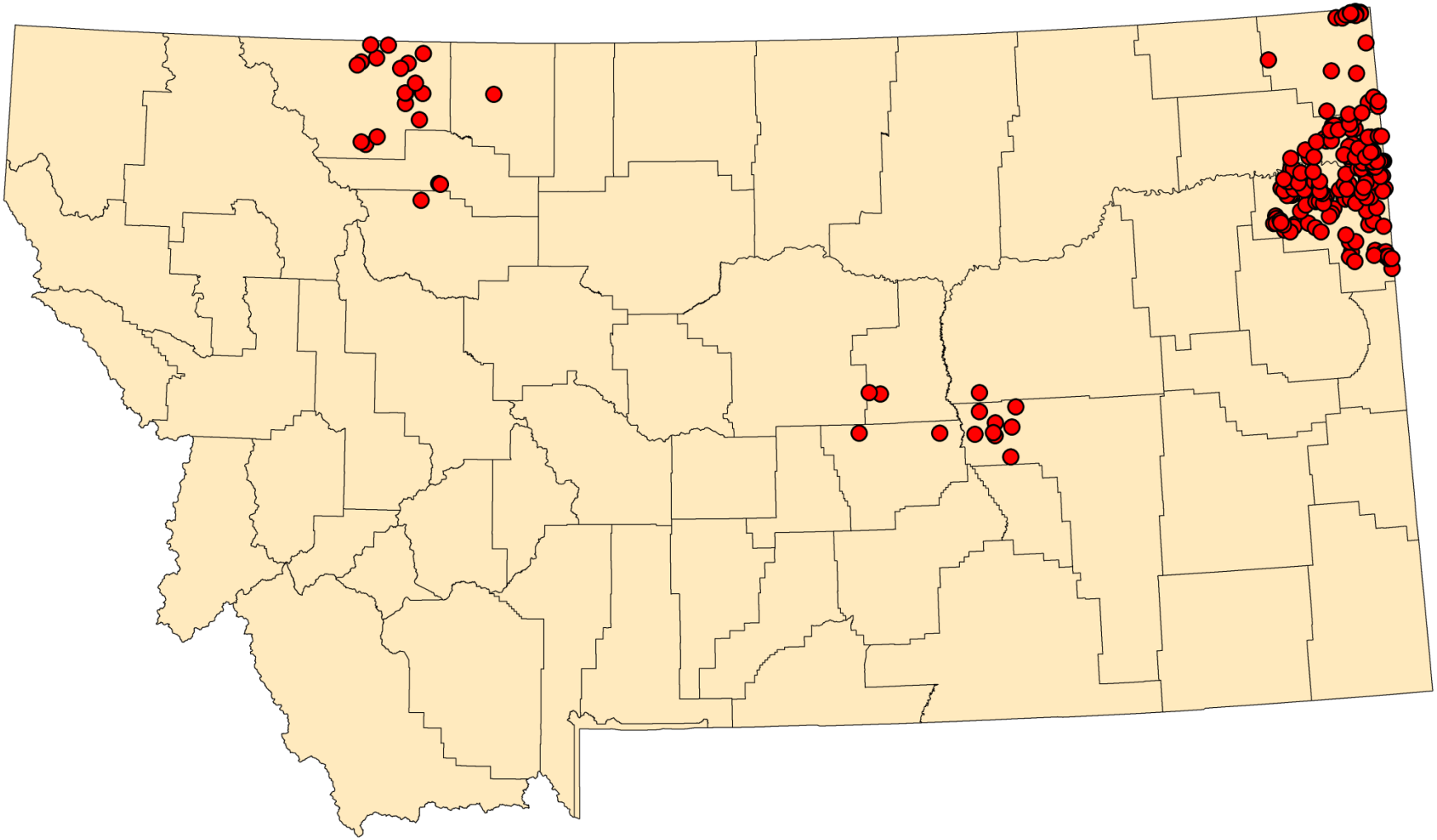


1981



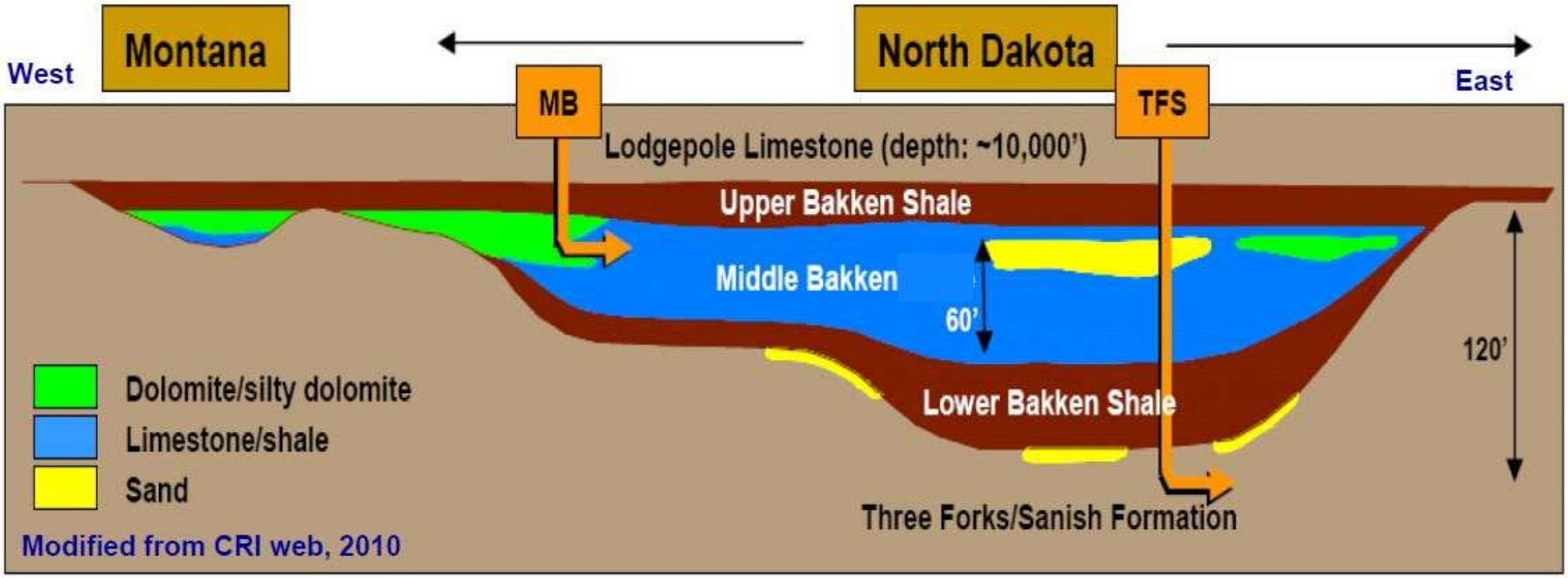
9/1/2011 to
9/1/2012

Drilling Permits, Horizontal Wells

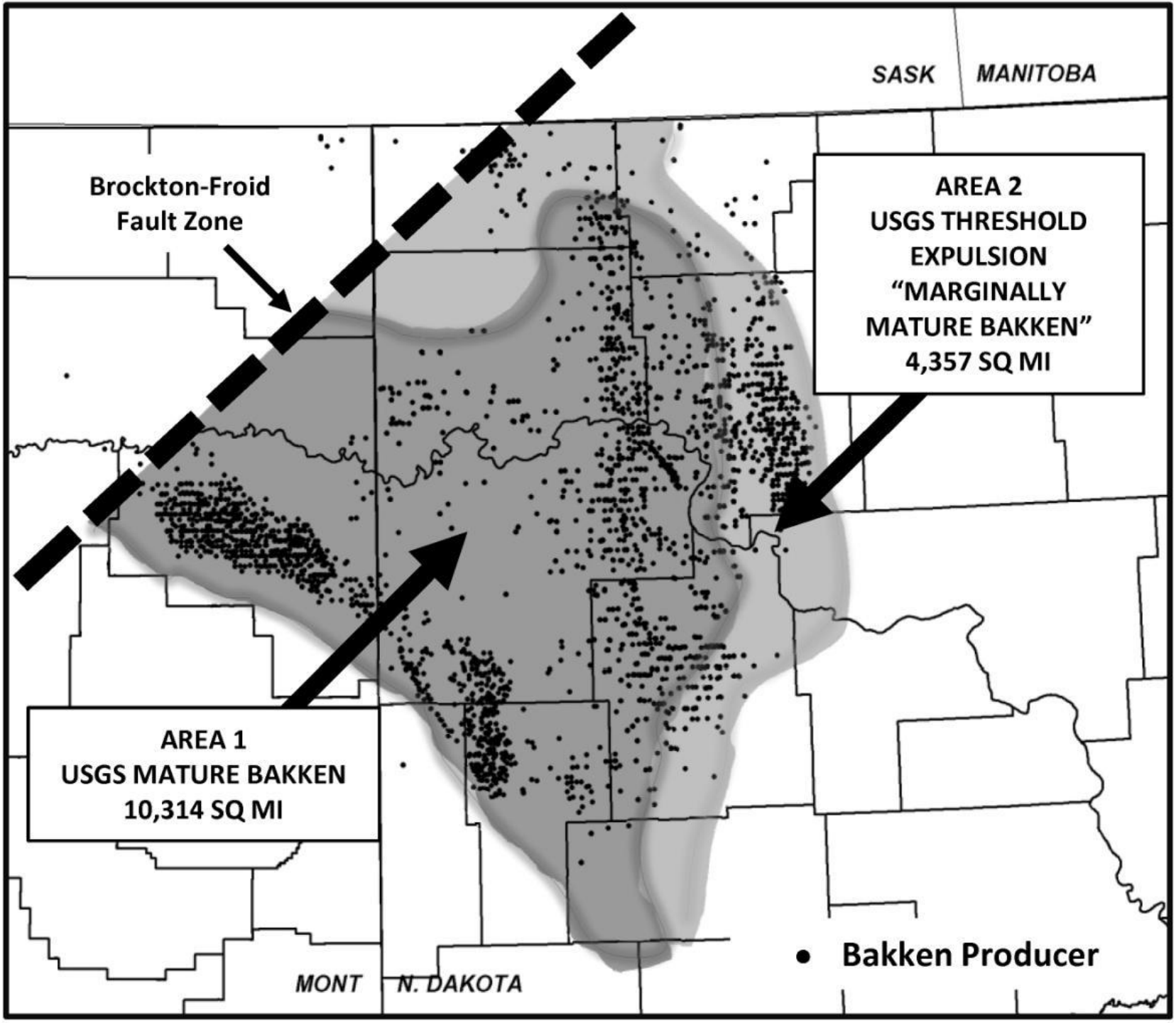


Horizontal Oil Shale Activity

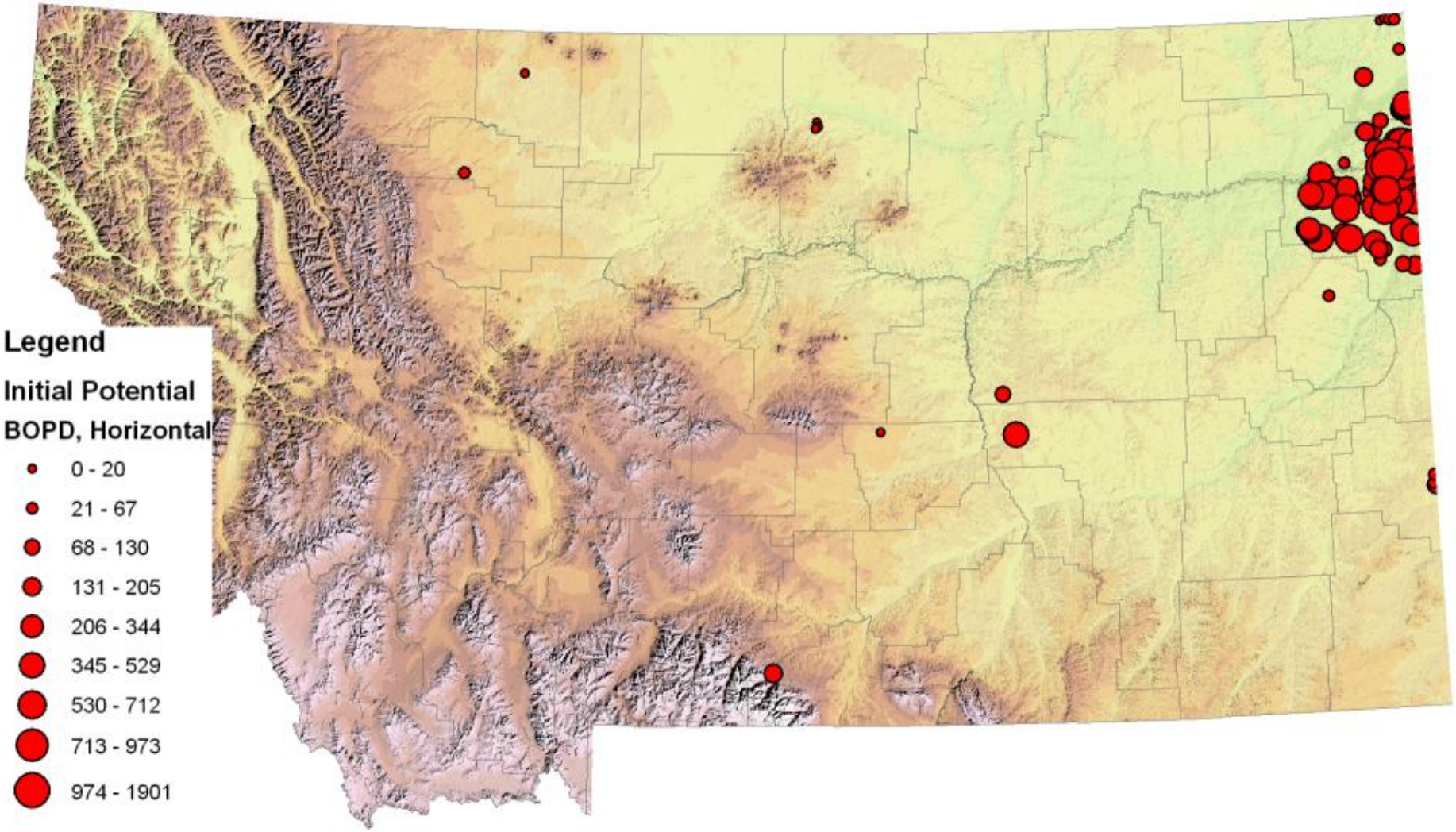
Middle Bakken / Three Forks Pay Variation

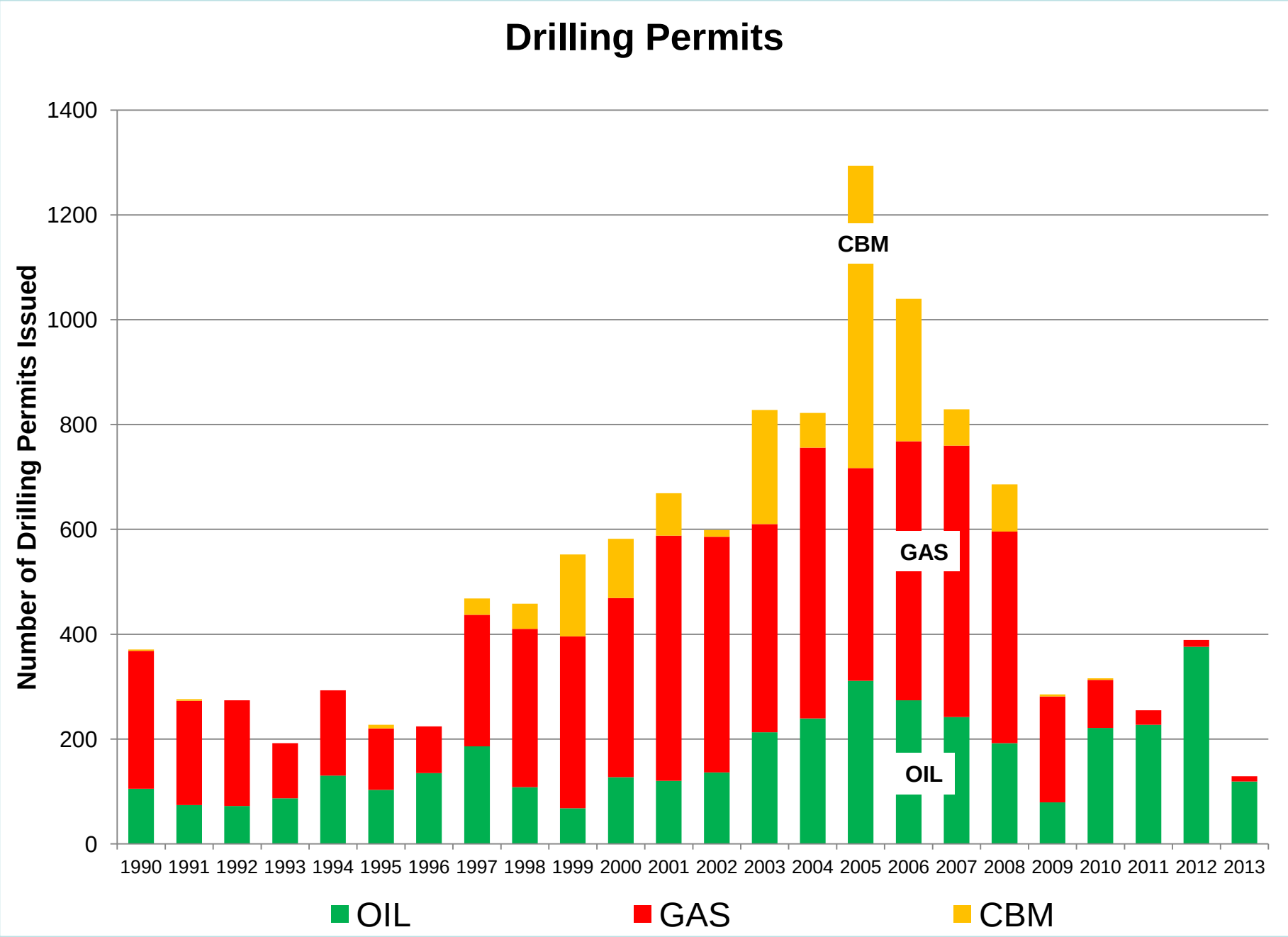


- **Middle Bakken pay not a shale lithology**
  - Complex, laterally varying lithology & play types
  - Stratigraphic / diagenetic trap drivers
- **Underlying Three Forks 'non-shale' play potential established 2008**
  - Also sourced by Bakken shale
  - Dual zone development underway


SASK
MANITOBA
Brockton-Froid
Fault Zone
AREA 2
USGS THRESHOLD
EXPULSION
"MARGINALLY
MATURE BAKKEN"
4,357 SQ MI
AREA 1
USGS MATURE BAKKEN
10,314 SQ MI
Bakken Producer
MONT
N. DAKOTA

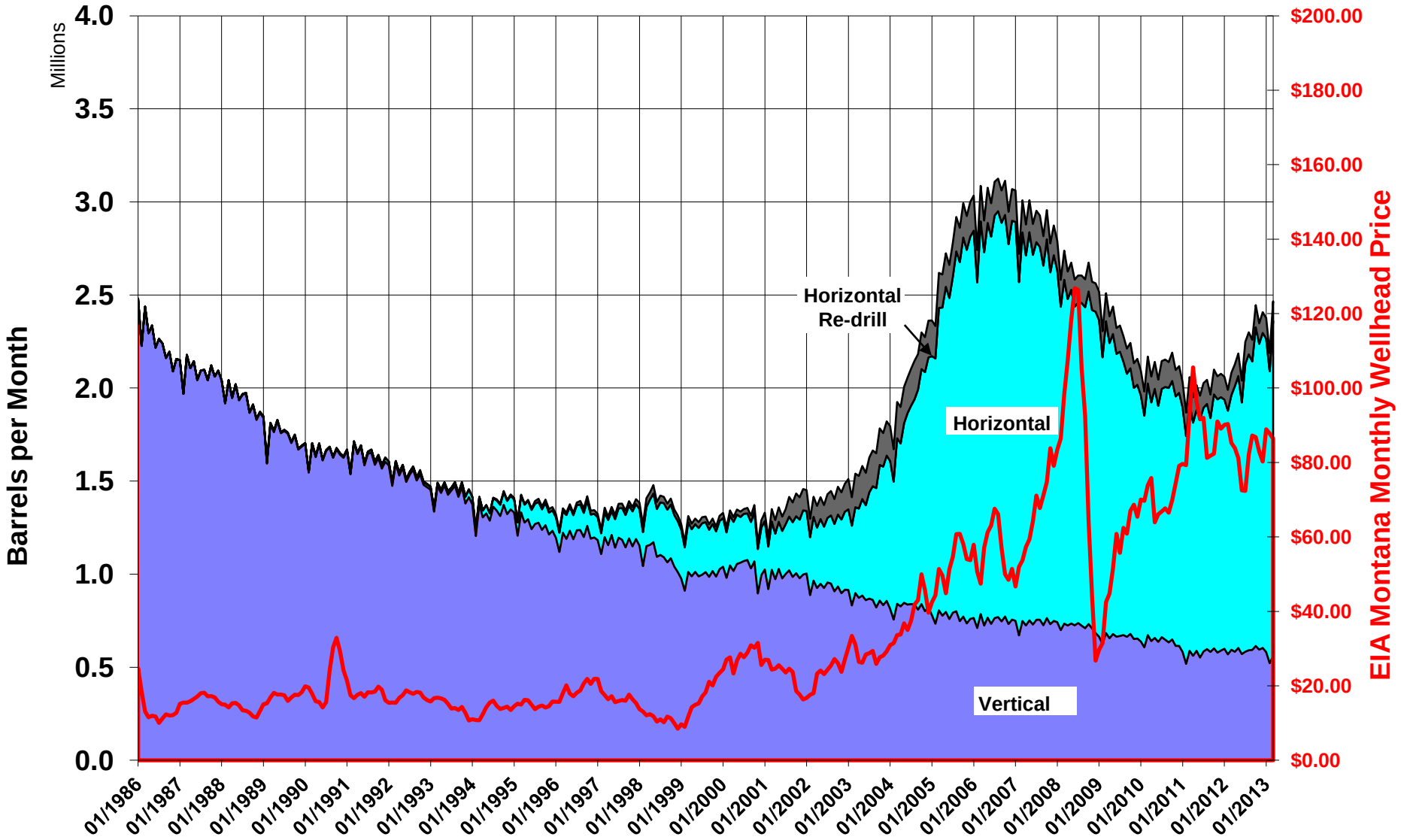
Reported Initial Potential, All Horizontal Wells Since January 2012




Drilling Permits
Number of Drilling Permits Issued
1400
1200
1000
800
600
400
200
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
CBM
GAS
OIL
OIL
GAS
CBM

Industry Rig Count Vs. Wells Spudded

Monthly Oil Production, Vertical vs. Horizontal Wells
January 1986 through March 2013



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