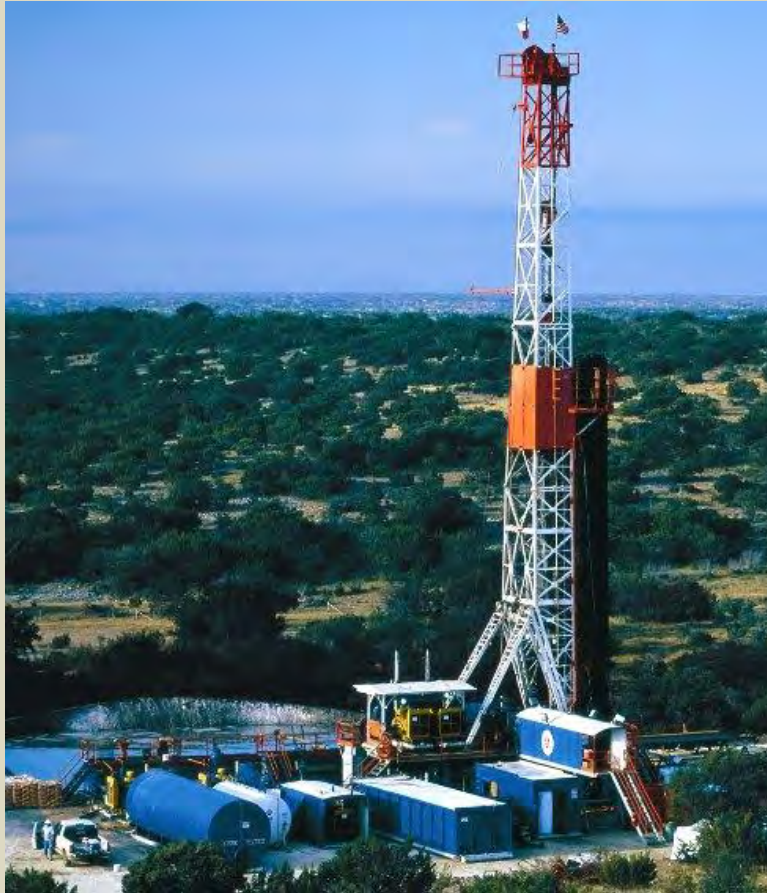


# Drill Rig Activity & Regulation in the Continental US

GPWG Meeting #4

August 22, 2013

# Permian (TX, NM) Drill Rig Examples



# Marcellus (PA, OH, WV, NY) Drill Rig Examples



# North Slope Drill Rig Examples: DS-1J Development



# Cook Inlet Drill Rig Examples: Saxon Rig 169 & 147



# Survey of Rig Equipment in Lower 48 and Alaska

Rig	Owner	Location	Drawworks (hp)	Depth (ft)	Primary Power (kW)	Aux. Power (Mud Pumps) (hp)	Heater/Boiler (MMBTU)
RIG 220	Union Drilling Inc.	Barnet Shale	1,500	20,000	3,675	3,200	?
RIG 227	Union Drilling Inc.	Barnet Shale	1,000	-	3,675	3,200	?
RIG 58	Union Drilling Inc.	Marcellus Shale	1,600	-	5,250	3,660	?
RIG 63	Union Drilling Inc.	Marcellus Shale	1,000	-	910	3,200	?
RIG 124	Union Drilling Inc.	Marcellus Shale	900	-	800	2,600	?
RIG 209	Union Drilling Inc.	Marcellus Shale	1,000	-	3,200	1,205	?
RIG 205	Union Drilling Inc.	Permian Basin	2,000	12,000	-	1,840	?
RIG 221	Union Drilling Inc.	Permian Basin	1,500	20,000	5,250	3,200	?
RIG 230	Union Drilling Inc.	Permian Basin	1,080	-	-	3,200	?
Rig #101	Independence Contract Drilling	Oklahoma	1,600	-	5,250	3,200	?
Rig #102	Independence Contract Drilling	Permian Basin	1,600	-	5,250	3,200	?
Rig #320	Patterson-UTI	Williston Basin	1,500	-	4,095	3,200	?
RIG #344	Patterson-UTI	Williston Basin	1,500	-	4,095	3,200	?
RIG 2	Patterson-UTI	Weatherford Shale	600	-	671	2,000	?
Rig #187	Patterson-UTI	Texas	1,500	-	4,095	3,200	?
Rig #9	Beaver Drilling	unknown	-	11,811	566	1,700	?
Rig #12	Beaver Drilling	unknown	-	9,843	470	1,700	?
RIG 88	SST Energy	Utah	1,500	18,000	3,750	2,600	Yes
RIG 53	SST Energy	SE Wyoming	800	12,500	2,400	2,000	Yes
RIG 58	SST Energy	Williston Basin	1,200	16,000	3,300	2,600	Yes
Rig 14	Doyon	Alaska - North Slope	1,250	-	2,711	1,224	20
Rig 16	Doyon	Alaska - North Slope	1,000	-	3,643	1,200	11
Rig 141	Doyon	Alaska - North Slope	2,000	-	2,718	752	13
Rig 9ES	Nabors	Alaska - North Slope	-	-	2,822	113	16
Rig 17E	Nabors	Alaska - North Slope	-	-	2,610	1,579	14
Rig 429	Nabors	Alaska - North Slope	-	-	4,200	469	11
Rig 1	Nordic-Calista Services	Alaska - North Slope	750	10,000	1,360	1,100	10
Rig 2	Nordic-Calista Services	Alaska - North Slope	750	11,000	1,950	1,600	10
Rig 3	Nordic-Calista Services	Alaska - North Slope	900	16,000	3,306	2,000	11
Rig 33E	Nabors	Alaska - North Slope	-	-	5,250	818	18
Rig 14E	Nabors	Alaska - North Slope	-	-	3,000	805	16
Rig 19	Doyon	Alaska - North Slope	2,000	-	4,752	483	19
Rig 147	Saxon	Alaska - South Central	630	-	1,510	1,700	8
Rig 169	Saxon	Alaska - South Central	665	-	1,510	1,700	8
Rig 191	Patterson	Alaska - South Central	2,000	-	4,095	3,200	9
Rig 5	Kuupkik	Alaska - South Central	-	-	1,200 (a)	1,000	7
Artic Fox	Doyon	Alaska - South Central	600	-	1,400	1,875	15

This may be a difference between L48 and Alaska rigs

**Notes:**

Data collected from rig vendor web sites and from the KRU Transportable Drill Rig Title V Permit (AQ0909TVP01).

(a) Provides power for drawworks, top drive and one mud pump.

# 22-year average rigs per week by state – numbers represent active drilling rigs

## Notes from Baker Hughes:

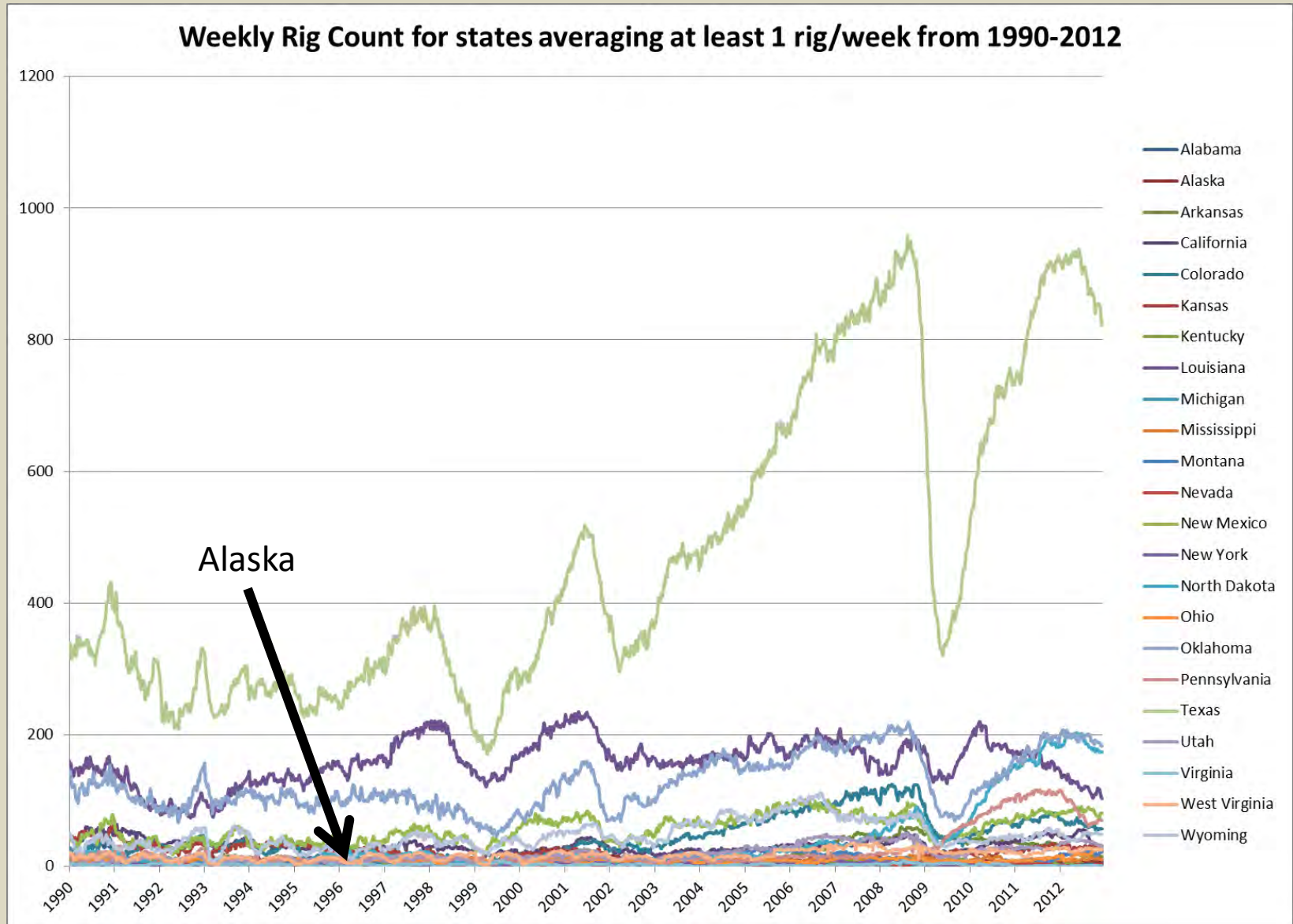
The Baker Hughes North American Rotary Rig Count is a weekly census of the number of drilling rigs actively exploring for or developing oil or natural gas in the United States and Canada.

The Baker Hughes Rotary Rig count includes only those rigs that are significant consumers of oilfield services and supplies and does not include cable tool rigs, very small truck mounted rigs or rigs that can operate without a permit. Non-rotary rigs may be included in the count based on how they are employed. For example, coiled tubing and workover rigs employed in drilling new wells are included in the count.

1990-2012	Average Rigs/week
Texas	474
Louisiana	159
Oklahoma	127
N. Mexico	57
Wyoming	48
Colorado	45
N. Dakota	38
California	32
Penn.	24
Kansas	20
Utah	19
W. Virginia	17
Arkansas	16
Mississippi	10
Montana	10
Ohio	10
Alaska	9
Alabama	6
Kentucky	5
Michigan	4
N. York	3
Virginia	2
Nevada	2

# US Drill Rig Activity

Source: <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-reportsoter>

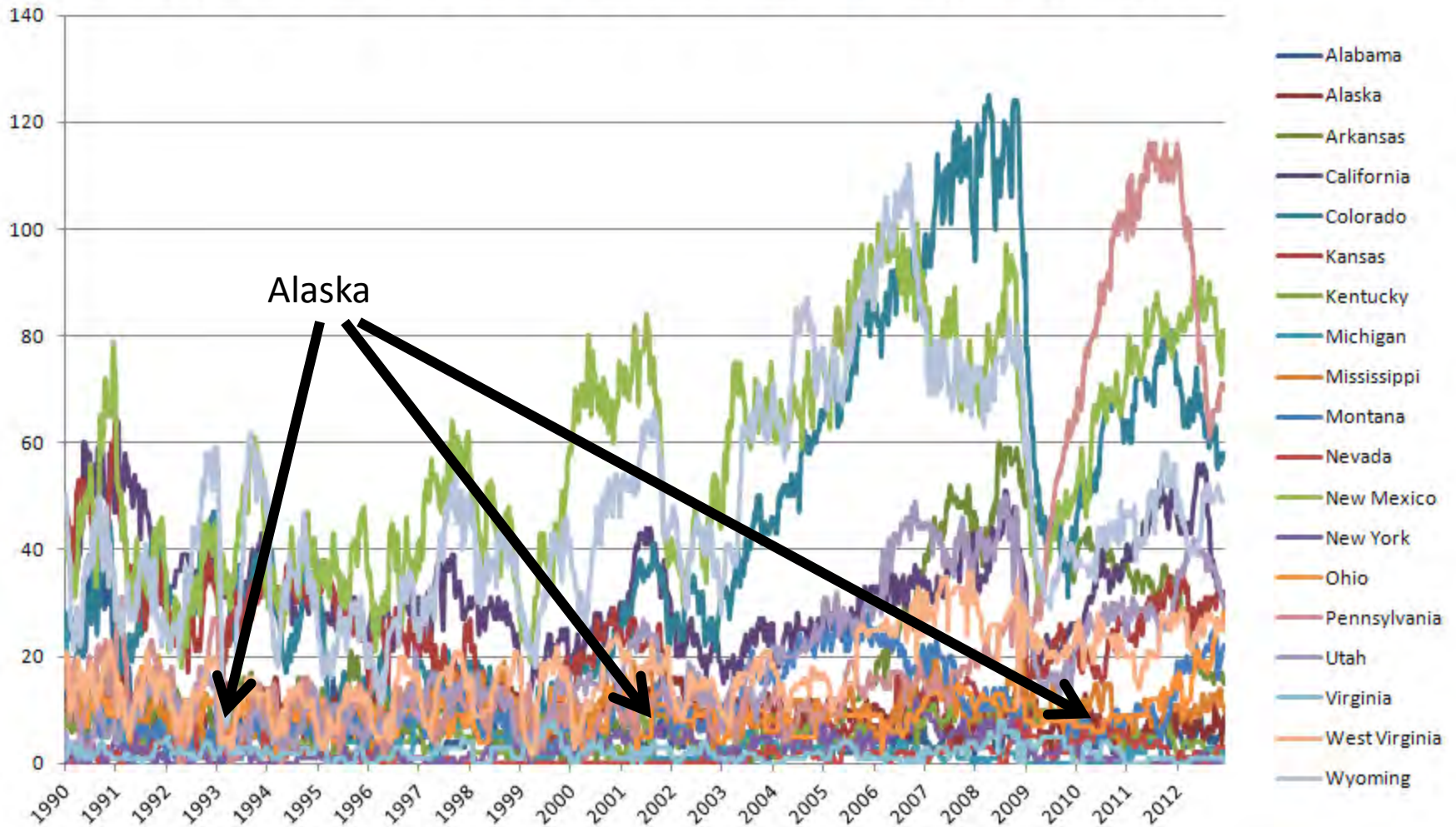




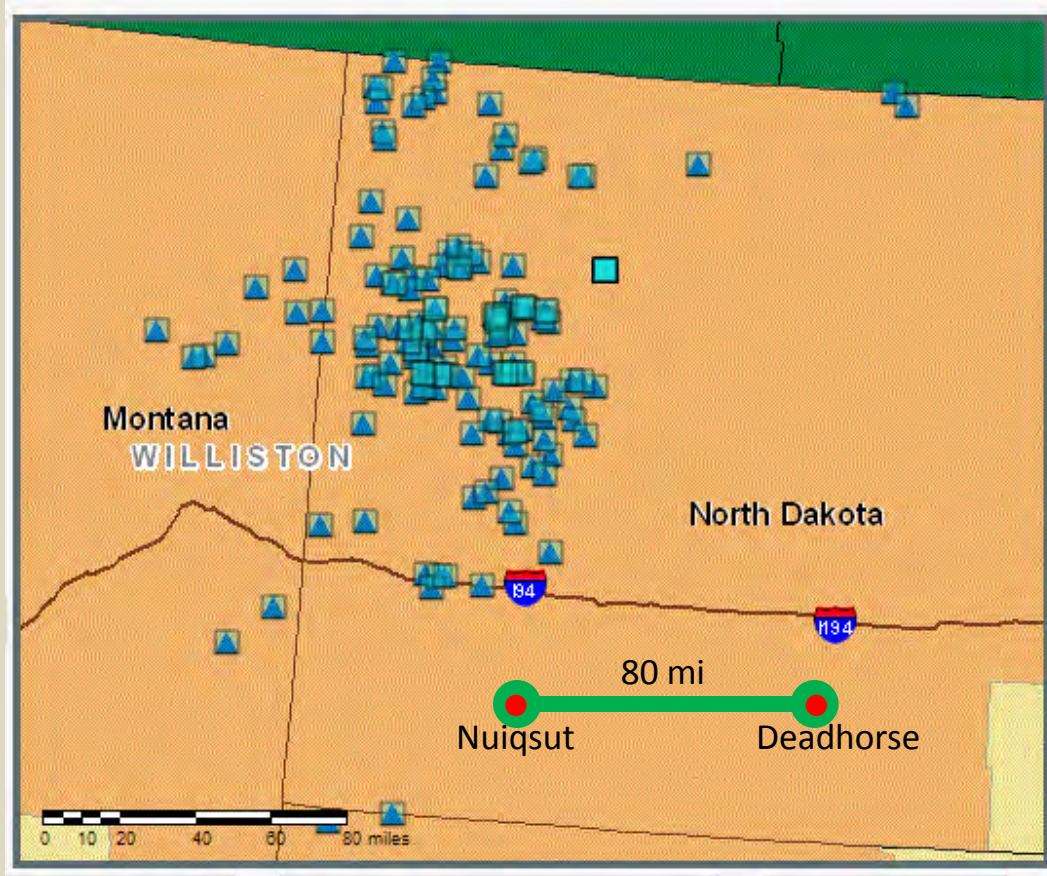
# Selected States Drill Rig Activity

Source: <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-reportsoter>

## Weekly Rig Counts for same states except TX, OK, LA, ND: 1990-2012





# Current Drill Rig Density - Williston



Week Ending 2-AUG-2013

**181** active rigs in the basin

-  Represents one Drill Rig (oil)
-  Represents one Drill Rig (gas)



(ref <http://gis.bakerhughesdirect.com/RigCounts>)

# Current Drill Rig Density - Permian



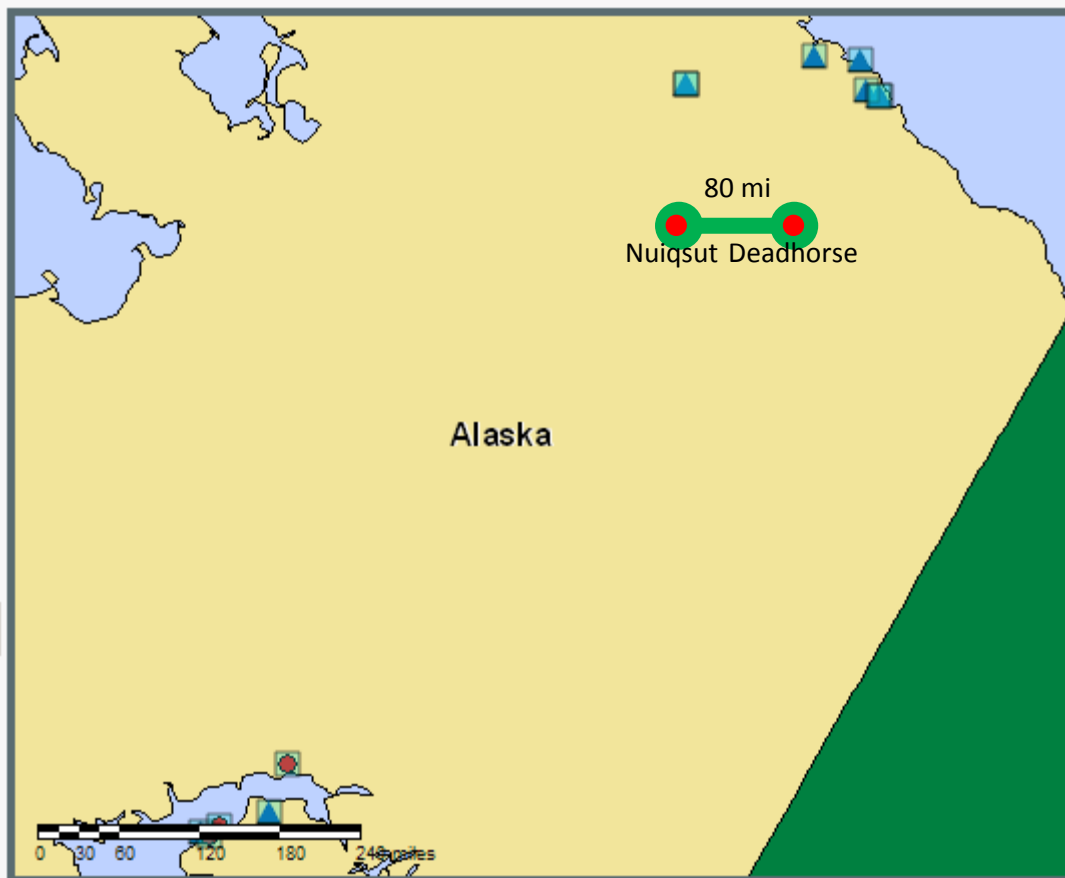
Week Ending 2-AUG-2013

**463** active rigs in the basin

-  Represents one Drill Rig (oil)
-  Represents one Drill Rig (gas)

(ref <http://gis.bakerhughesdirect.com/RigCounts>)

# Current Alaska Drill Rig Density



Week Ending 2-AUG-2013

**12** active rigs in Alaska (**5** on the North Slope)

- ▲ Represents one Drill Rig (oil)
- Represents one Drill Rig (gas)

(ref <http://gis.bakerhughesdirect.com/RigCounts>)

# Air Regulatory Programs in 15 Other States Investigated

- California
- Colorado
- Kansas
- Louisiana
- Montana
- New Mexico
- New York
- North Dakota
- Ohio
- Oklahoma
- Pennsylvania
- Texas
- Utah
- West Virginia
- Wyoming

	Drilling Rig Permit Program	Compliance Modeling Required	Rig in-use Requirements
Alaska	Yes	Yes	Yes
California	District specific	District specific	District specific
Colorado	No	No	No
Kansas	No	No	No
Louisiana	No	No	No
Montana	No	No	No
New Mexico	No	No	No
New York	No	No	No
North Dakota	No	No	No
Ohio	No	No	No
Oklahoma	No	No	No
Pennsylvania	No	No	No
Texas	No	No	No
Utah	No	No	No
West Virginia	No	No	No
Wyoming	JPAD-BLM	No	JPAD-BLM

### Notes:

1. Non-Att= Requirements may apply to drill rigs in non-attainment areas
2. In the Jonah-Pinedale Anticline Development (JPAD) area of Wyoming, rig NOx emissions are limited as a result of a BLM NEPA decision. The requirements are enforced through a state-issued permit.
3. California drill rig rules are very stringent and affect ozone non-attainment areas.
4. CO and WV, also with ozone non-attainment areas, considering rig regulatory programs.

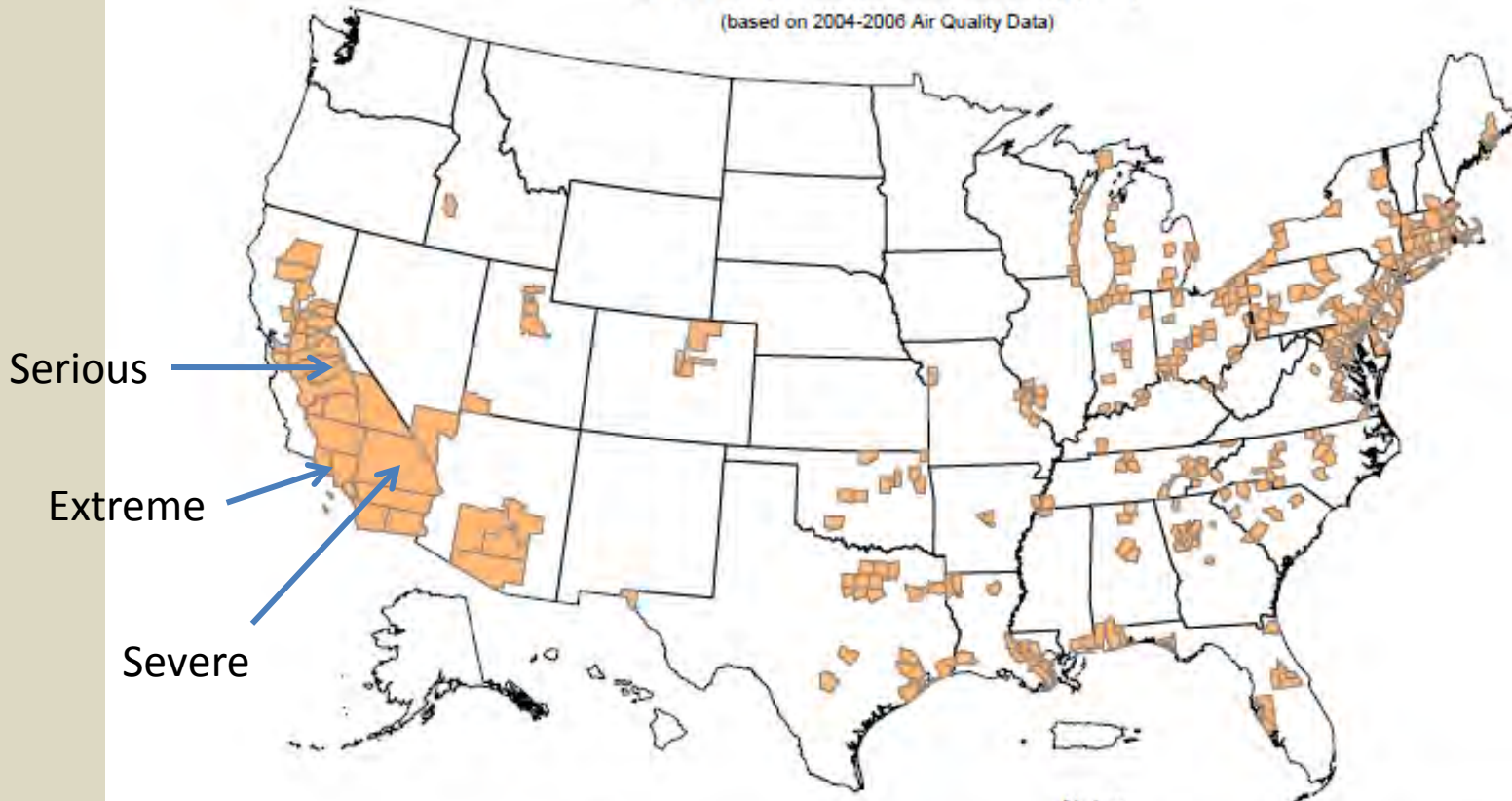
# Ozone Nonattainment Areas



Estimates are based on the most recent data (2004 – 2006). EPA will not designate areas as nonattainment on these data, but likely on data from 2006 – 2008 or later, which we expect to show improved air quality.

## Counties with Monitors Violating the 2008 8-Hour Ozone Standard of 0.075 parts per million (ppm)

(based on 2004-2006 Air Quality Data)



Notes:

<sup>1</sup> 345 monitored counties violate the 2008 8-hour ozone standard of 0.075 parts per million (ppm).

<sup>2</sup> Monitored air quality data can be obtained from the AQS system at <http://www.epa.gov/ttn/airsaqs/>

# Summary

- Alaska drilling rig activity and density is very low compared to other oil & gas producing states
- Alaska drilling rig equipment is similar to equipment found on rigs in other states; only the heaters might be a bit larger
- Ambient air data collected around Alaska rigs shows the NAAQS aren't threatened
- PA is engaged in similar ambient air studies in the Marcellus Shale region and is reaching the same conclusion. See, for example:

[http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus\\_NC\\_05-06-11.pdf](http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus_NC_05-06-11.pdf)