



2018 Baseline Oil and Gas Inventory

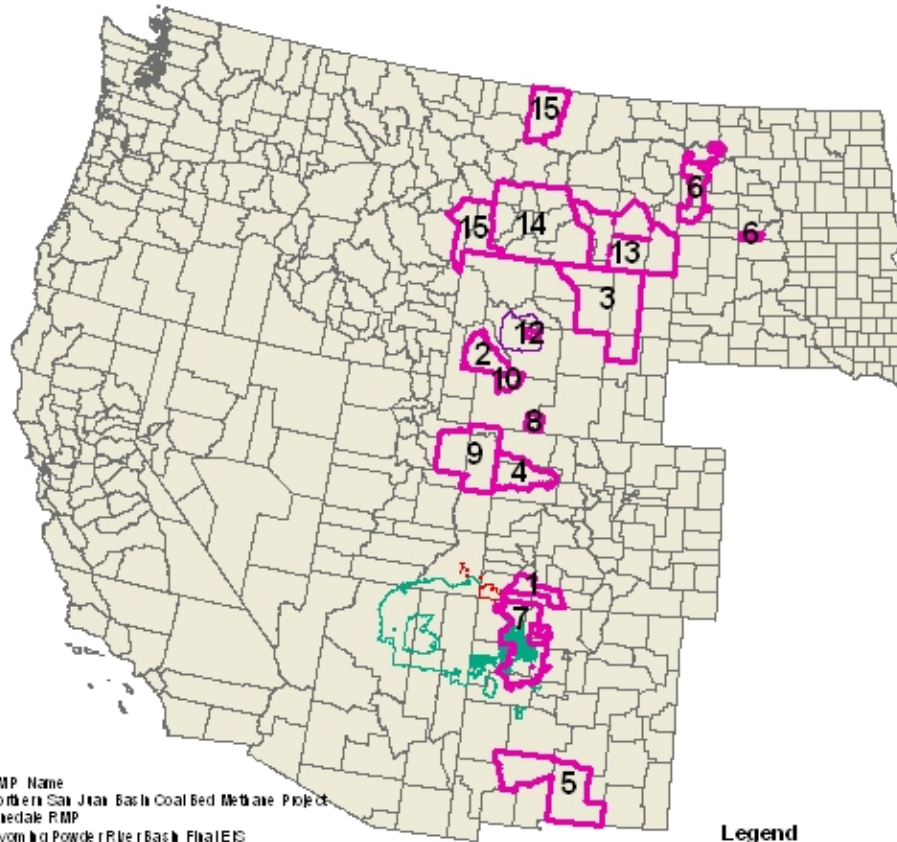
Methodology and Preliminary Results

September 7, 2005

Oil and Gas Projection Method

- ⇒ Grow county and tribal level emissions based on estimated growth in oil and gas production
- ⇒ Sources of data
 - Local
 - Resource management plans (BLM)
 - Alaska Department of Natural Resources projections
 - Regional – Energy Information Administration
- ⇒ Adjust for post-2002 on-the-books controls

Resource Management Areas



RMP ID	RMP Name
1	Northern San Juan Basin Coal Bed Methane Project
2	Pinedale RMP
3	Wind and Powder River Basin Final EIS
4	White River Resource Area RMP EIS
5	RMP EIS for Mineral Leasing and Development in Sierra and Otero Counties
6	Dakota Prairie Grasslands Oil and Gas Leasing
7	Farmington Proposed Resource Management Plan and Final EIS
8	Desolation Plateau Natural Gas Field Development Project
9	Draft Vertical Resource Management Plan
10	Jack Morrow Hill Coordinated Activity Plan
12	Wind River Natural Gas Project
13	Powder River and Billings Resource Management Plans - Powder River
14	Powder River and Billings Resource Management Plans - Billings
15	Powder River and Billings Resource Management Plans - Special Consideration

- Legend**
- Resource Management Areas
 - Tribes**
 - Navajo Nation
 - Ute Mountain Ute
 - Arapaho and Shoshone
 - County Growth

$$G = \frac{(W_{02} + W_f - W_p)}{W_{02}}$$

where:

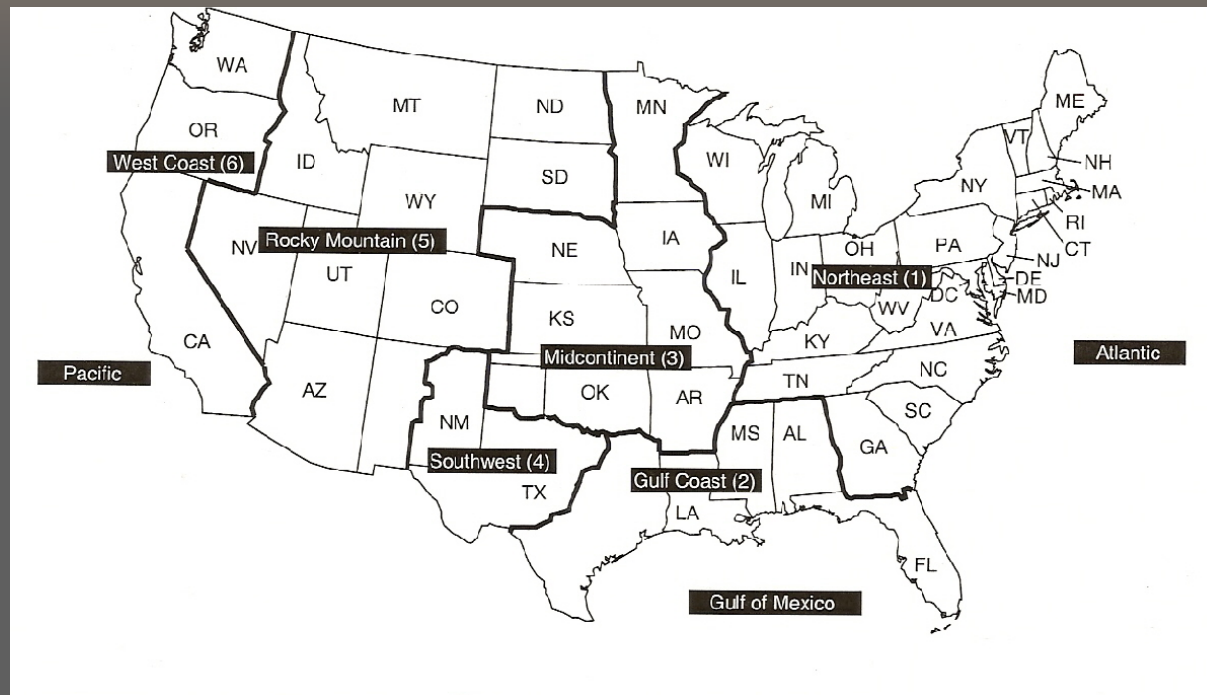
G = the 2002 to 2018 growth factor

W_{02} = the wells (oil/gas/CBM) active in 2002

W_f = the wells (oil/gas/CBM) forecast to be added by 2018

W_p = the wells (oil/gas/CBM) estimated to be plugged and abandoned by 2018

EIA Growth Regions

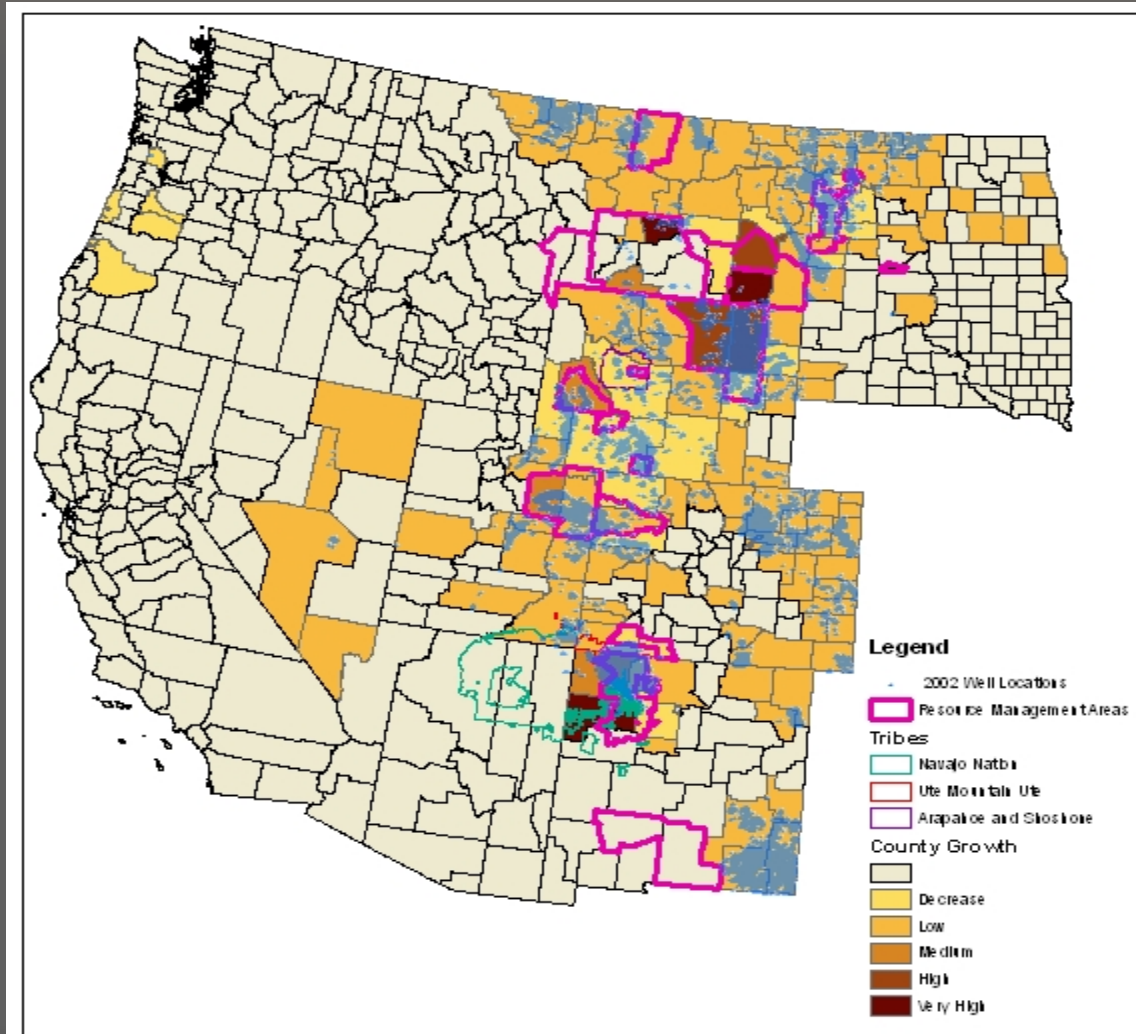


Growth factors derived from EIA projections

Region	Oil Production	Gas Production
Rocky Mountain	1.334	1.458
Southwest	0.866	1.354
West Coast	0.601	0.568

Areas of Growth

Map of Growth in Gas Production



2018 Draft Area Source NOx Emissions (uncontrolled)

Area	Drill Rigs	Compressor Engines	Minor NOx Processes	CBM Pump Engines	Total
Tribes	435	4,126	1,820	15	6,395
Alaska	874	-	2	-	876
Colorado	4,402	-	20,849	1,861	27,112
Montana	2,586	3,155	7,100	*	12,840
Nevada	26	48	7	-	81
New Mexico	10,225	75,754	22,673	268	108,920
North Dakota	868	2,995	146	*	4,009
Oregon	-	42	7	-	48
South Dakota	38	414	68	-	521
Utah	3,612	3,679	3,976	*	11,266
Wyoming	8,678	20,315	9,920	8,214	47,126
Total	31,744	110,526	66,568	10,358	219,196

Emissions for Sierra and Otero, New Mexico not yet included

*Emissions for CBM in Montana, North Dakota and Utah not yet included

Post-2002 Oil and Gas Controls

⇒ On-the-books (included)

- Nonroad compression engine emissions standards
- Nonroad spark-ignition engine emissions standards
- Colorado – included in point source inventory

⇒ Proposed (not included)

- Montana – proposed rule to limit PTE to 25 TPY
- Utah – new rules under development

Draft 2018 Baseline Area Source O&G NOx Emissions

Area	Drill Rigs	Compressor Engines	Minor NOx Processes	CBM Pump Engines	Total
Tribes	215	342	1,820	1	2,378
Alaska	431	-	2	-	433
Colorado	2,172	-	20,849	154	23,175
Montana	1,277	261	7,100	*	8,638
Nevada	13	4	7	-	24
New Mexico	5,046	6,278	22,673	22	34,019
North Dakota	429	248	146	*	823
Oregon	-	3	7	-	10
South Dakota	19	34	68	-	121
Utah	1,782	3,679	3,976	*	9,437
Wyoming	4,281	20,315	9,920	681	35,196
Total	15,663	31,165	66,568	858	114,254

Emissions for Sierra and Otero, New Mexico not yet included

*Emissions for CBM in Montana, North Dakota and Utah not yet included

Percent Change in Area Source NOx Emissions from 2002 to Draft 2018

Area	Drill Rigs	Compressor Engines	Minor NOx Processes	CBM Pump Engines	Total
Tribes	8 %	- 82 %	137 %	- 87 %	- 17 %
Alaska	- 51 %		- 79 %		- 51 %
Colorado	- 62 %		31 %	- 90 %	0 %
Montana	22 %	- 87 %	50 %		11 %
Nevada	- 47 %	- 88 %	42 %		- 62 %
New Mexico	- 24 %	- 84 %	68 %	- 90 %	- 44 %
North Dakota	- 72 %	- 91 %	- 17 %		- 82 %
Oregon		- 95 %	- 43 %		- 88 %
South Dakota	- 47 %	- 88 %	45 %		- 67 %
Utah	164 %	55 %	86 %		82 %
Wyoming	- 14 %	189 %	58 %	- 52 %	79 %
Total	- 28 %	- 45 %	53 %	- 73 %	- 9 %

Remaining Issues

⇒ Areas with no 2002 activity

- Sierra and Otero, New Mexico
- CBM development in Montana, Utah and North Dakota

⇒ Other

- Lack estimate of growth in Alaska drilling
- Incorporate additional control information if provided