National Oil & Gas Workgroup Repository

Activity data for O&G drilling and production, HC containing geologic formations; Emission Factors by facility and equipment type; Emissions inventories and available tool for inquiry and access; Regulatory Programs; NEPA planning process; State of the science literature articles and reports.



Background information from the WRAP [web](http://wrapair.org/forums/ogwg/index.html)

A.L Mitchel, *et al.*, ES&T **2015**, *Environmental Protection Agency figures for emissions from [O&G Transmission and Storage] sectors may be missing a large number of methane leaks.*

A.R. Brandt *et al.,* **Science, 2014,** Methane emissions from U.S. and Canadian natural gas systems appear larger than official estimates

K. McKain *et al*., **PNAS 2014**, *Methane emissions from natural gas infrastructure in Boston MA are larger than national and state inventories.*

**Meetings**

**State of the Science**

Commercial Activity Reports

* ISH rig activity
* HPDI production reports

State Databases

* Colorado – O&G Facilities GIS - [web](http://dnrwebmapgdev.state.co.us/mg2012app/)
* North Dakota - Department of Mineral Resources, Oil and Gas Division - [web](https://www.dmr.nd.gov/oilgas/)
* Utah – AGRC [web](http://gis.utah.gov/data/energy/oil-gas/) – interactive GIS map [web](http://mapserv.utah.gov/oilgasmining/)

U.S. EIA

* [Natural gas exploration and reserves](http://www.eia.gov/dnav/ng/ng_enr_top.asp)
* [Natural gas respondent surveys](http://www.eia.gov/cfapps/ngqs/ngqs.cfm?f_report=RP1)

Other resources

* Intermountain Oil and Gas BMP Project – GIS systems for O&G [web](http://www.oilandgasbmps.org/resources/gis.php) – includes links to interactive GIS based mapping tools from BLM, USGS, Colorado O&G Conservation Commission, Utah, Montana, Wyoming, New Mexico

**Activity**

**Background**

EPA tools

* Clearinghouse for Inventories and Emissions Factors (CHIEF) [web](http://www.epa.gov/ttn/chief/index.html) – key emission factors databases and tools are listed below
* Software and tools [web](http://www.epa.gov/ttn/chief/software/)
	+ SPECIATE v4.4
	+ AP42 – compilation of air pollutant emissions factors by source category
* O&G Area Source Emissions Estimation tool – link to ppt on wrap site, is there a link for the tool?

BLM emissions tool kits (Check with Aumann)

**Emissions Factors**

WAQDW (we should differentiate 3State modeling platforms from EPA platforms)

* WAQDW Studies - [web](http://views.cira.colostate.edu/tsdw/Studies/)
* Basin level inventories (are there disaggregated inventories at the basin level in 3State?)

EPA

* Clearinghouse for Inventories and Emissions Factors (CHIEF) [web](http://www.epa.gov/ttn/chief/index.html) – key inventories are listed in the sub bullets
	+ Emissions Inventories [web](http://www.epa.gov/ttn/chief/eiinformation.html) – includes 2011 NEI and 2014 NEI documentation.
	+ Emissions Modeling Clearinghouse [web](http://www.epa.gov/ttn/chief/emch/index.html) – includes 2011NEIv2 based platform (2011v6.2), Ozone NAAQS Emissions Modeling Platform (2011v6.1) for 2011, 2018 & 2025, etc.
* EIS Gateway – [web](https://eis.epa.gov/eis-system-web/) – Emissions Inventory Gateway (requires user ID and password)
* US Environmental Protection Agency, flight (Facility Level Information on GreenHouse gasses Tool) [www.ghgdata.epa.gov/ghgp](http://www.ghgdata.epa.gov/ghgp) - 2013 Greenhouse Gas Emissions from Large Facilities.

Emissions Reconciliations

* Top down vs. bottom up studies link (filters articles page on this subject)

**Emissions Inventories**

National

* US Environmental Protection Agency (2014) Greenhouse Gas Reporting Program, Subpart W, Petroleum and Natural Gas Systems Subpart W Rulemaking Resources. [web](http://www.epa.gov/ghgreporting/reporters/subpart/w-regdocs.html)

State

* Colorado Oil & Gas Conservation Commission [web](http://cogcc.state.co.us/) – includes complaints data base, etc.

Tribal

* Tribal Minor New Source Review Rule - [web](http://www.epa.gov/air/tribal/tribalnsr.html)

Other resources

* Intermountain Oil and Gas BMP Project – law and policy [web](http://www.oilandgasbmps.org/laws/index.php)

**Regulatory Programs**

* Western Air Quality Data Warehouse - [web](http://views.cira.colostate.edu/tsdw/)

**NEPA Planning**

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DISCLAMER

**Meetings**

**State of the Science: Articles & Reports**

US Environmental Protection Agency, Office of The Inspector General (2014), Improvements Needed in EPA Efforts to Address Methane Emissions From Natural Gas Distribution Pipelines, Report No. 14-P-0324. [www.epa.gov/oig/reports/2014/20140729-14-P-0325.pdf](http://www.epa.gov/oig/reports/2014/20140729-14-P-0325.pdf)

The White House (2014) Climate Action Plan: Strategy to Reduce Methane Emissions. [www.whitehouse.gov/sites/default/files/strategy\_to\_reduce\_methane\_emissions\_2014-03-28\_final.pdf](http://www.whitehouse.gov/sites/default/files/strategy_to_reduce_methane_emissions_2014-03-28_final.pdf)

Mitchell, A. L., Tkacik, D. S., Roscioli, J. R., Herndon, S. C., Yacovitch, T. I., Martinez, D. M., . . . Robinson, A. L. (2015). Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants: Measurement Results. *Environmental Science & Technology*. doi: 10.1021/es5052809

McKain, K., Down, A., Raciti, S. M., Budney, J., Hutyra, L. R., Floerchinger, C., . . . Wofsy, S. C. (2015). Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts. Proceedings of the National Academy of Sciences. doi: 10.1073/pnas.1416261112

Correction for Allen et al., Measurements of methane emissions at natural gas production sites in the United States. (2013). Proceedings of the National Academy of Sciences, 110(44), 18023. doi: 10.1073/pnas.1318658110

Allen, D. T., Torres, V. M., Thomas, J., Sullivan, D. W., Harrison, M., Hendler, A., . . . Seinfeld, J. H. (2013). Measurements of methane emissions at natural gas production sites in the United States. Proceedings of the National Academy of Sciences, 110(44), 17768-17773. doi: 10.1073/pnas.1304880110

Caulton, D. R., Shepson, P. B., Santoro, R. L., Sparks, J. P., Howarth, R. W., Ingraffea, A. R., . . . Miller, B. R. (2014). Toward a better understanding and quantification of methane emissions from shale gas development. Proceedings of the National Academy of Sciences, 111(17), 6237-6242. doi: 10.1073/pnas.1316546111

Chang, R. Y.-W., Miller, C. E., Dinardo, S. J., Karion, A., Sweeney, C., Daube, B. C., . . . Wofsy, S. C. (2014). Methane emissions from Alaska in 2012 from CARVE airborne observations. Proceedings of the National Academy of Sciences, 111(47), 16694-16699. doi: 10.1073/pnas.1412953111

Heath, G. A., O’Donoughue, P., Arent, D. J., & Bazilian, M. (2014). Harmonization of initial estimates of shale gas life cycle greenhouse gas emissions for electric power generation. Proceedings of the National Academy of Sciences, 111(31), E3167-E3176. doi: 10.1073/pnas.1309334111

Hristov, A. N., Johnson, K. A., & Kebreab, E. (2014). Livestock methane emissions in the United States. Proceedings of the National Academy of Sciences, 111(14), E1320. doi: 10.1073/pnas.1401046111

Jackson, R. B. (2014). The integrity of oil and gas wells. Proceedings of the National Academy of Sciences, 111(30), 10902-10903. doi: 10.1073/pnas.1410786111

Johnson, D., Covington, A., & Clark, N. (2014). Environmental and Economic Assessment of Leak and Loss Audits at Natural Gas Compressor and Storage Facilities. Energy Technology, 2(12), 1027-1032. doi: 10.1002/ente.201402086

Johnson, M. S., Yates, E. L., Iraci, L. T., Loewenstein, M., Tadić, J. M., Wecht, K. J., . . . Fischer, M. L. (2014). Analyzing source apportioned methane in northern California during Discover-AQ-CA using airborne measurements and model simulations. Atmospheric Environment, 99(0), 248-256. doi: <http://dx.doi.org/10.1016/j.atmosenv.2014.09.068>