

Information Access for Research on Shale Impacts: **Availability of Groundwater Quality Data**

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AirWaterGas

NSF Sustainability Research Network
www.airwatergas.org

"A MASTERPIECE"

-Eric Kohn, Indiewire

"A MUST WATCH"

-Verne Gay, Newsday



"SENSATIONAL...
A piece of beautiful
cinema...Rough-hewn
and poetic."

-Robert Koehler, Variety

"MESMERIZING...
Warmhearted...
Darkly humorous."

-Hank Stuever, Washington Post

"VOLCANIC...
With humor and
inquisitiveness,
Fox has delivered
2010's most alarming
wake-up call."

-Michael Tully, Hammer To Nail

GASLAND

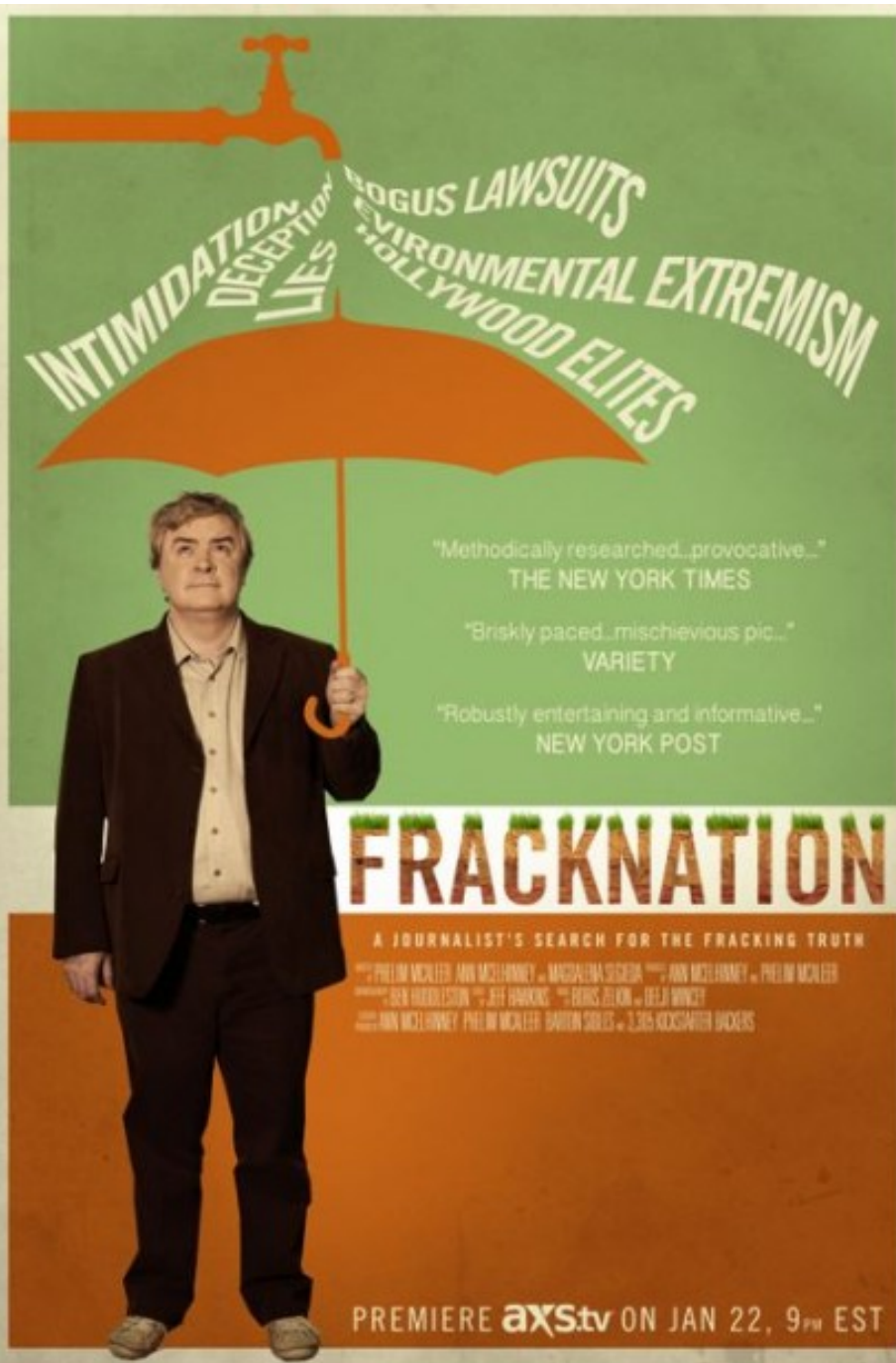
A FILM BY JOSH FOX

Can you light your water on fire?

IN THEATERS
FALL 2010

AN INTERNATIONAL WOM PRODUCTION "GASLAND" A FILM BY JOSH FOX EDITED BY MATTHEW SANCHEZ
PRODUCED BY TRISH ADLESIC, JOSH FOX AND MULLY GANDOUR WRITTEN AND DIRECTED BY JOSH FOX

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"Methodically researched...provocative..."
THE NEW YORK TIMES

"Briskly paced...mischievous pic..."
VARIETY

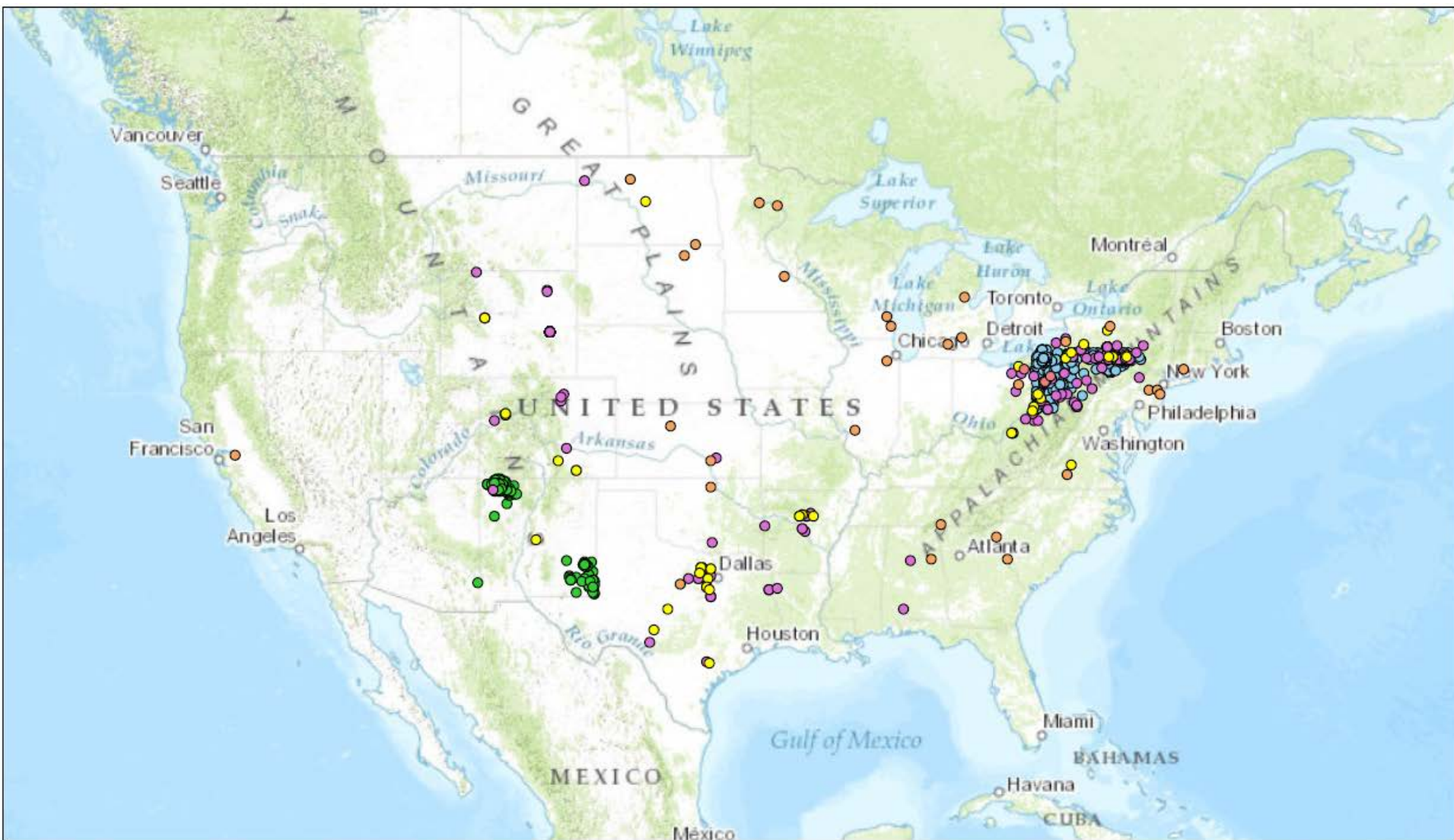
"Robustly entertaining and informative..."
NEW YORK POST

FRACKNATION

A JOURNALIST'S SEARCH FOR THE FRACKING TRUTH

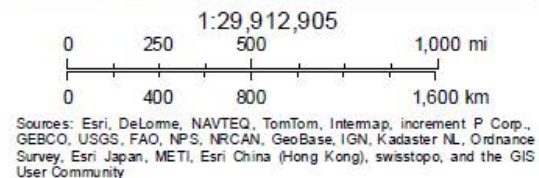
PRODUCED BY PHILIP MCKEEVER, ANN MCELHINNEY, AND MAGDALENA SEGURA
WRITTEN BY PHILIP MCKEEVER, ANN MCELHINNEY, AND MAGDALENA SEGURA
DIRECTED BY PHILIP MCKEEVER, ANN MCELHINNEY, AND MAGDALENA SEGURA
CASTING BY BEN BODOLSTON, JEFF HARRISON, ERIC JELSON, AND DEBRA WINCEY
EDITED BY ANN MCELHINNEY, PHILIP MCKEEVER, GAVIN SIBLEY, AND JAMES KOCKSANTER DICKERS

PREMIERE axstv ON JAN 22, 9PM EST



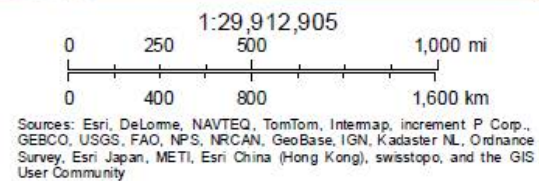
June 17, 2013

- Visitor Submitted Impacts
- Pipeline Incidents Contaminating Groundwater
- NRDC Suspected Contamination Events
- List of the Harmed Suspected Water Incidents
- NM Contamination Events
- Groundwater_RTK_for_upload



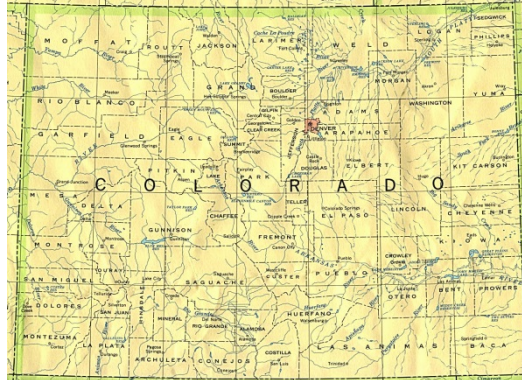


June 17, 2013



QUINNIPIAC
UNIVERSITY

Poll



FRACKING POLL

- Men: 60% For, 30% Against
- Women: 42% For, 38% Against
- Republicans For, Democrats Against



SOURCE: QUINNIPIAC UNIVERSITY

COLORADANS SUPPORT OIL AND GAS FRACKING

LOSING FAITH

NUCLEAR DEAL

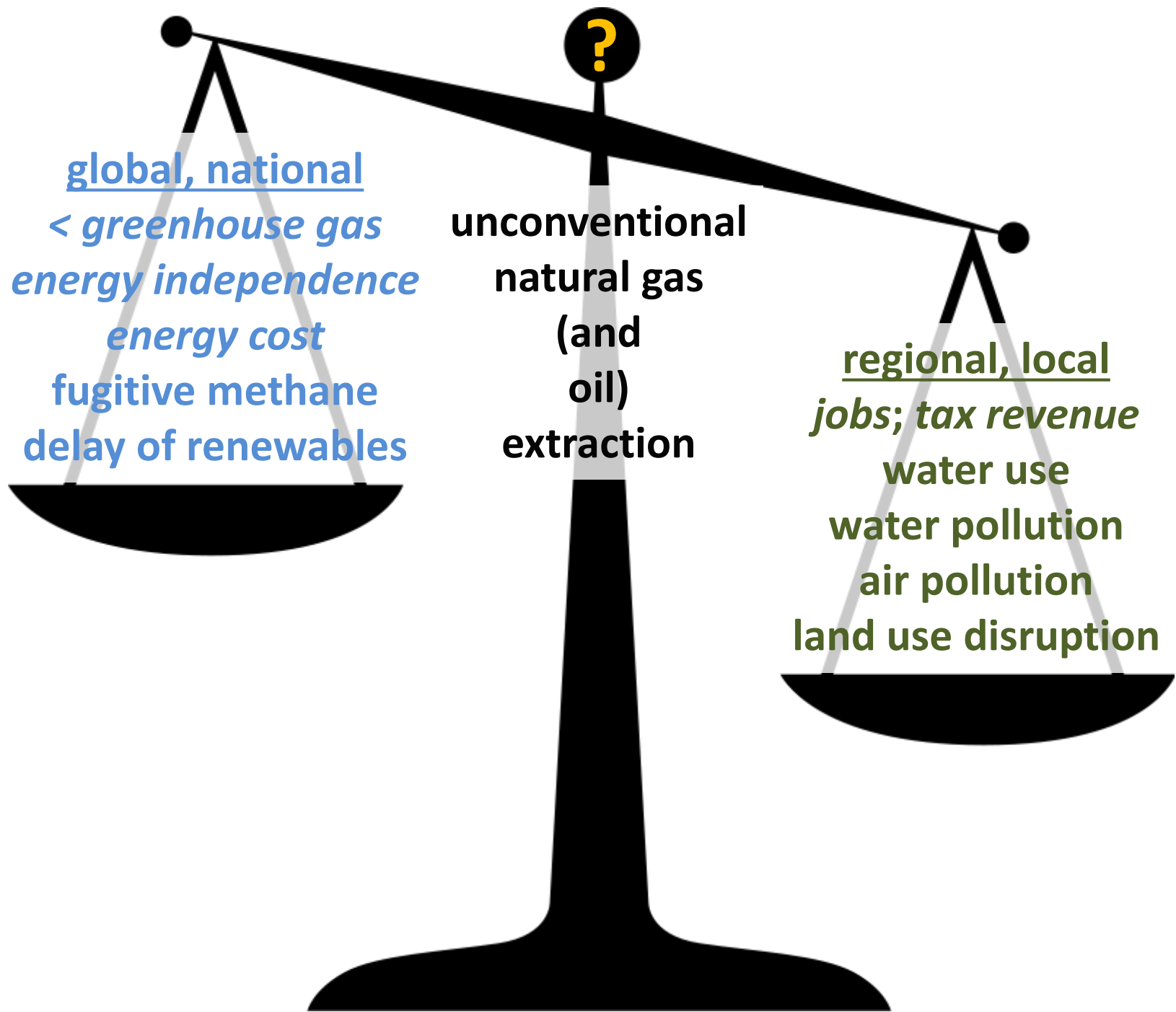
STORE COLLAPSE

47. Do you support or oppose the use of fracking, a drilling method that uses high-pressure water and chemicals to extract oil and natural gas from underground rock formations?

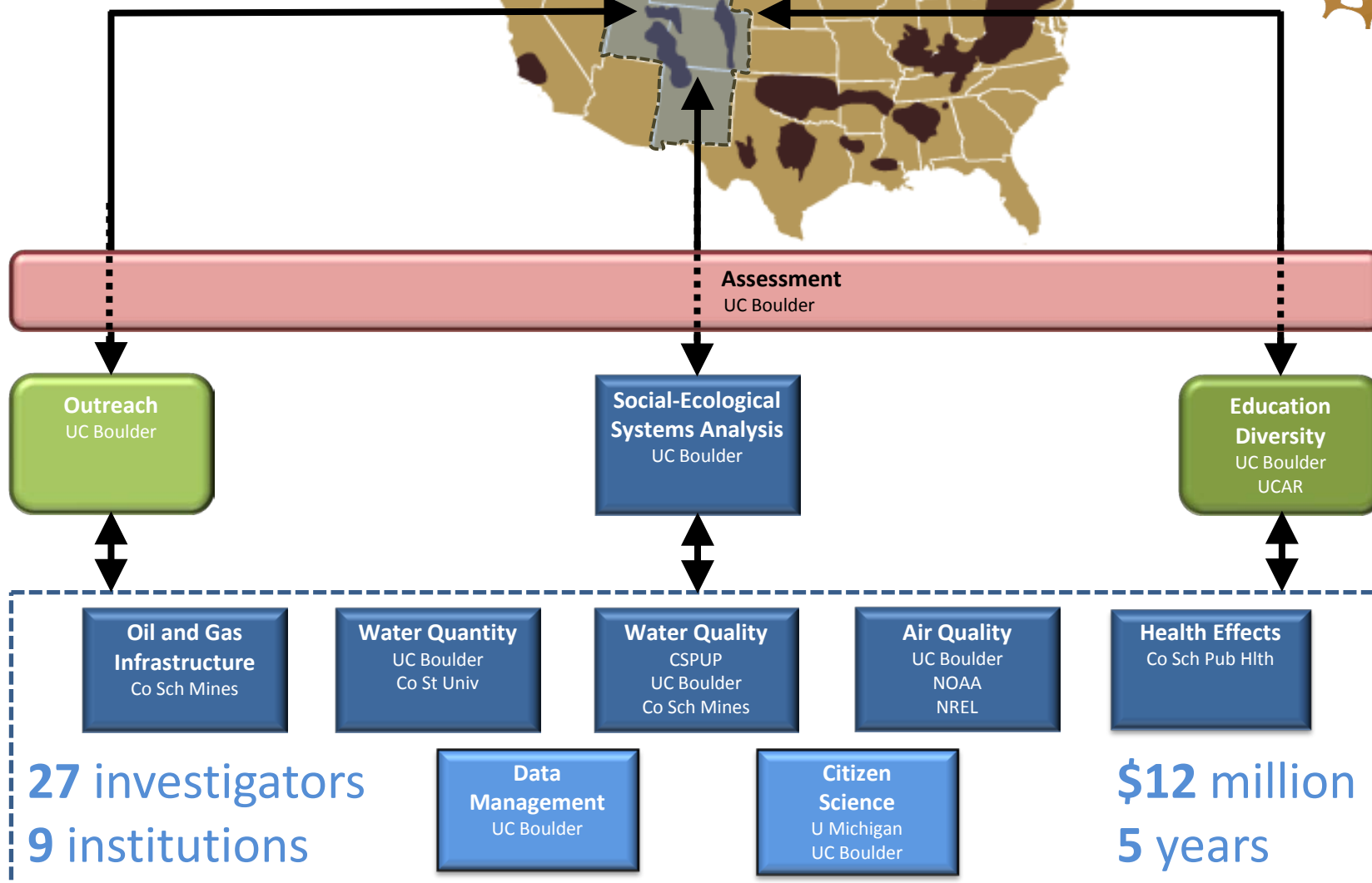
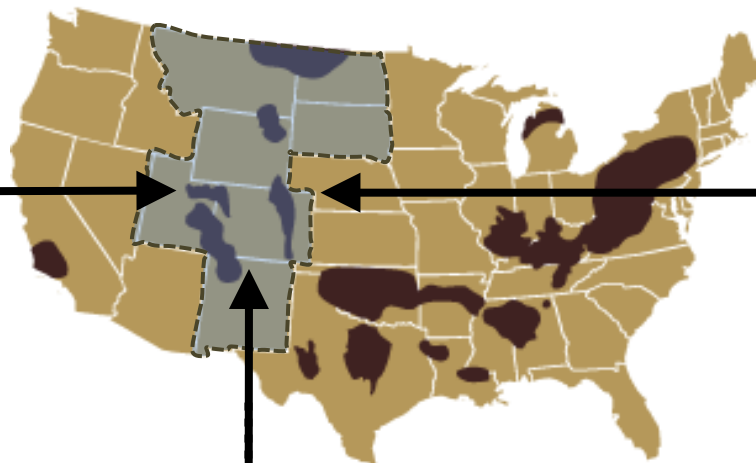
| | Tot | Rep | Dem | Ind | Men | Wom | Wht | Hsp |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| Support | 51% | 80% | 26% | 51% | 60% | 42% | 52% | 46% |
| Oppose | 34 | 9 | 54 | 32 | 30 | 38 | 34 | 33 |
| DK/NA | 16 | 11 | 20 | 16 | 11 | 21 | 14 | 21 |

48. Do you think fracking is a very safe method to extract oil and natural gas from the ground, somewhat safe, not very safe, or not at all safe?

| | Tot | Rep | Dem | Ind | Men | Wom | Wht | Hsp |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Very safe | 20% | 40% | 4% | 19% | 26% | 14% | 21% | 11% |
| Smwht safe | 36 | 41 | 31 | 37 | 38 | 33 | 36 | 38 |
| Not very safe | 16 | 6 | 26 | 15 | 14 | 18 | 16 | 17 |
| Not at all safe | 18 | 5 | 27 | 18 | 16 | 19 | 17 | 17 |
| DK/NA | 10 | 8 | 12 | 11 | 6 | 15 | 10 | 17 |



AirWaterGas.org

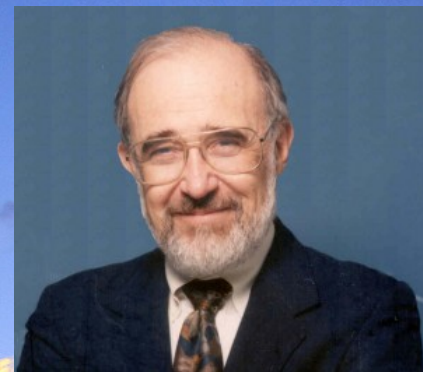


"A MASTERPIECE"

Eric Kohn, IndieWire

"A MUST WATCH"

Vanna Gray, Newsday



AirWaterGas.org

What We Know, What We Don't Know, and What
We Hope to Learn about Natural Gas Development

FrackingSENSE

February 26 - May 22 **MOST TUESDAYS**
6:30 p.m. | Hale 270 | CU Boulder Campus

AN INTERNATIONAL WOV PRODUCTION "GASLAND" A FILM BY JOSH FOX EDITED BY MATTHEW SANCHEZ
PRODUCED BY TRISH ADLESIC, JOSH FOX AND MULLY GANDOUR WRITTEN AND DIRECTED BY JOSH FOX
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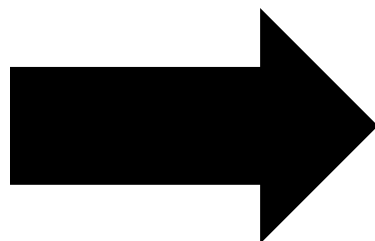
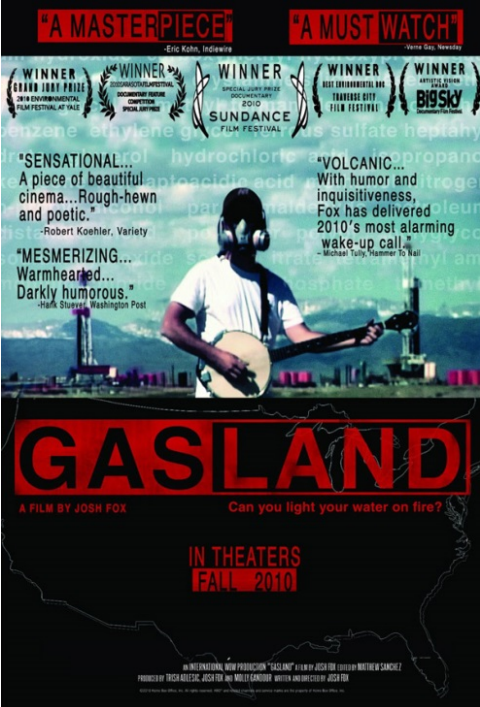
PREMIERE **axs**tv ON JAN 22, 9 PM EST



WELL IMPROVEMENT COMPANY
FORT COLLINS, CO

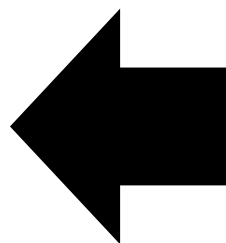
WELLIMPROVEMENTCO.COM
303-AAA-6472

1670UKP



**FRACKING
FLUID 596+
CHEMICALS**

“Since 2008, we have not had one instance of groundwater contamination associated with drilling and hydraulic fracturing.”



Why Does Colorado Have the Toughest Hydraulic Fracturing Disclosure Rule in the Nation?



Because the environment matters.

Beneath the surface of Colorado sits some of the nation's most significant oil and natural gas deposits—resources that could contribute to American energy independence beginning now. Technological advances in drilling and hydraulic fracturing now enable us to safely harvest these critical resources while providing over 107,000 jobs and \$32 billion to the state's economy. But all the energy, jobs, and money won't be worth much if we destroy our environment in the process.

And we're not about to let that happen.

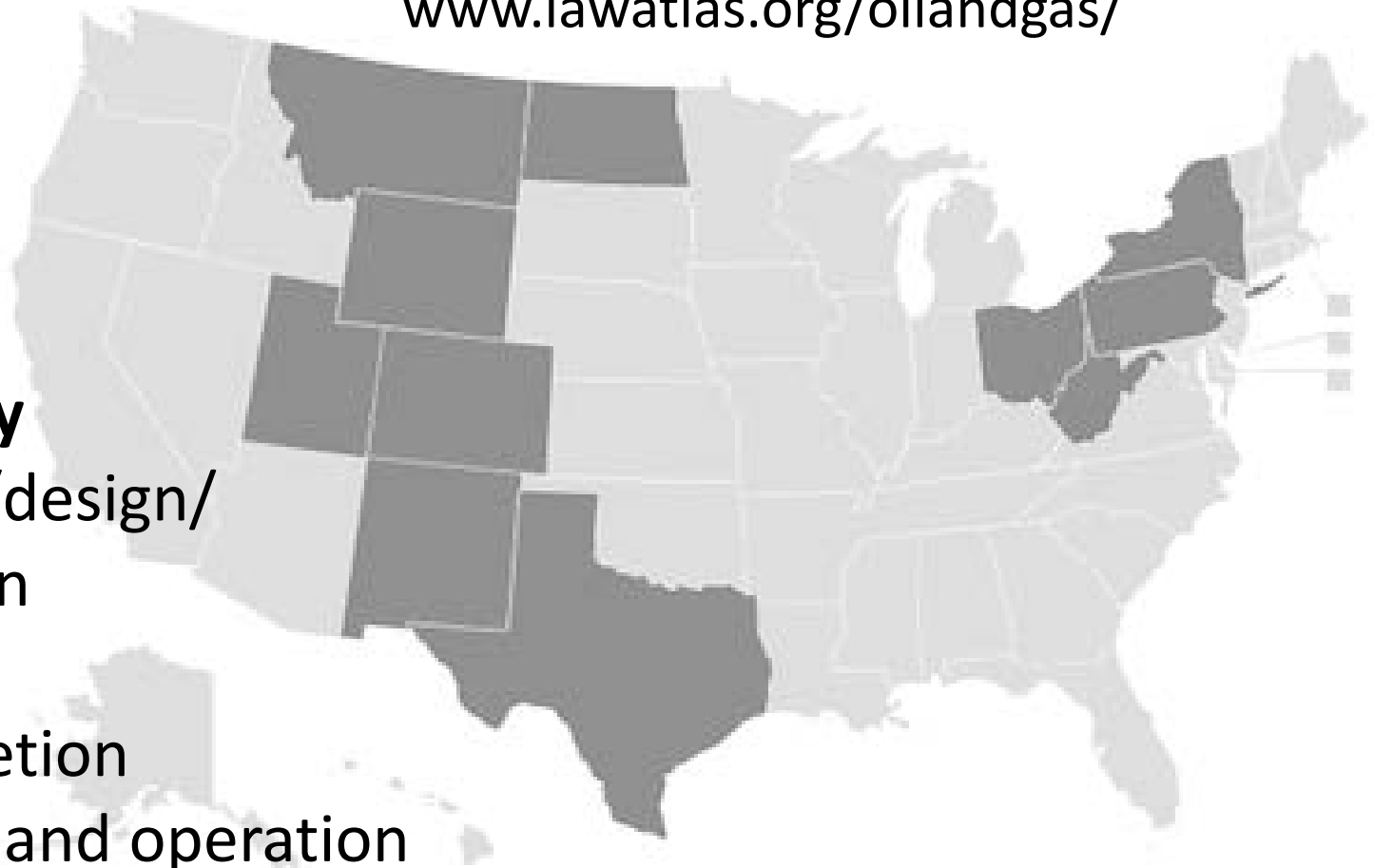
That's just one of the reasons why Colorado recently passed the toughest Hydraulic Fracturing Disclosure Rule in the nation. The rule, unanimously approved by the Colorado Oil and Gas Conservation Commission, requires drillers to disclose all the chemicals in hydraulic fracturing and their concentrations. No other states require such a detailed disclosure.

“In Colorado, we've proven that industry and the conservation community can come together to solve problems. We can create jobs, promote energy security and protect our environment.” – John W. Hickenlooper, Governor

This message is brought to you as a public service by the Colorado Oil & Gas Association.



www.lawatlas.org/oilandgas/



Water Quality

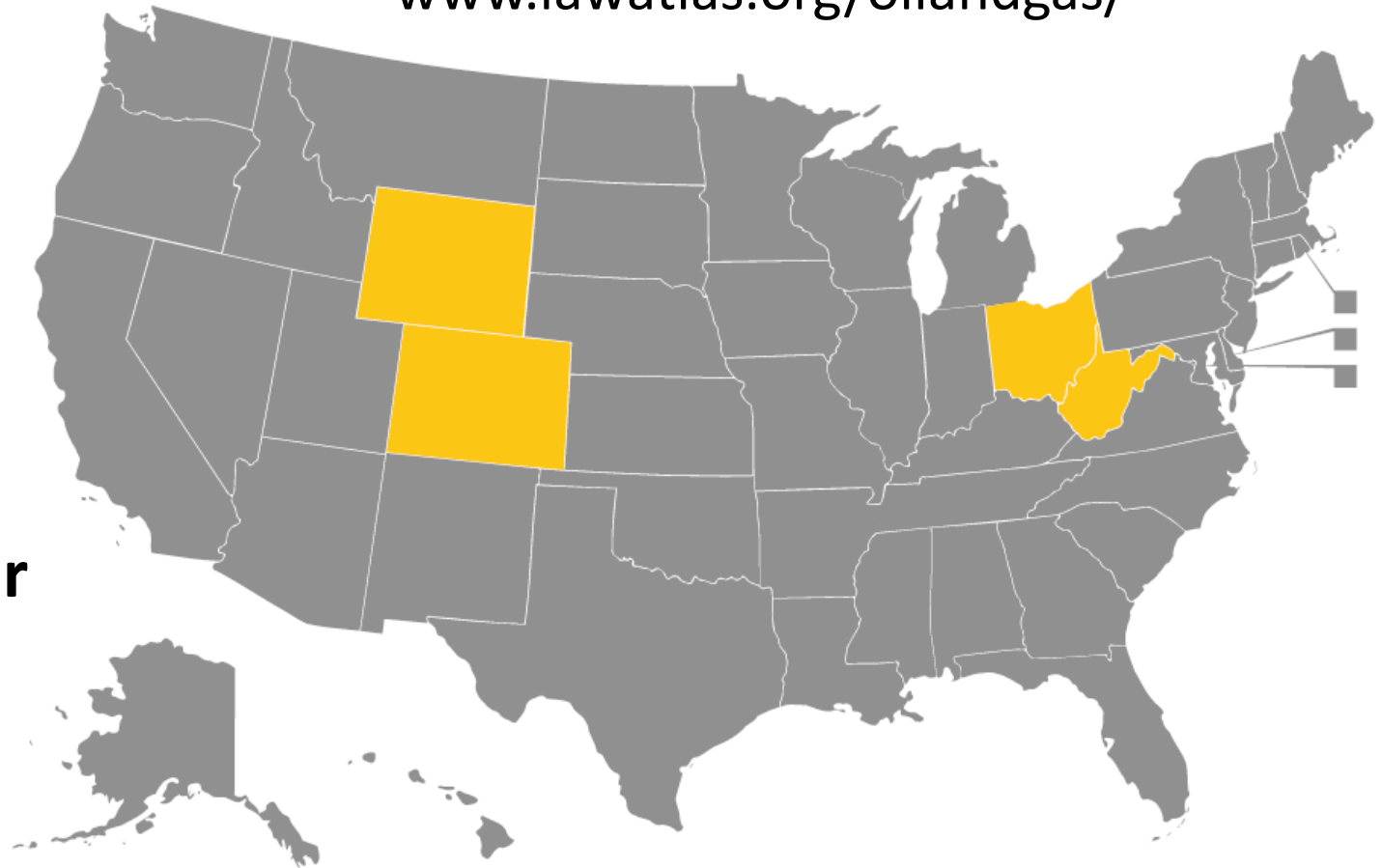
- permitting/design/construction
- well drilling
- well completion
- production and operation
- reclamation



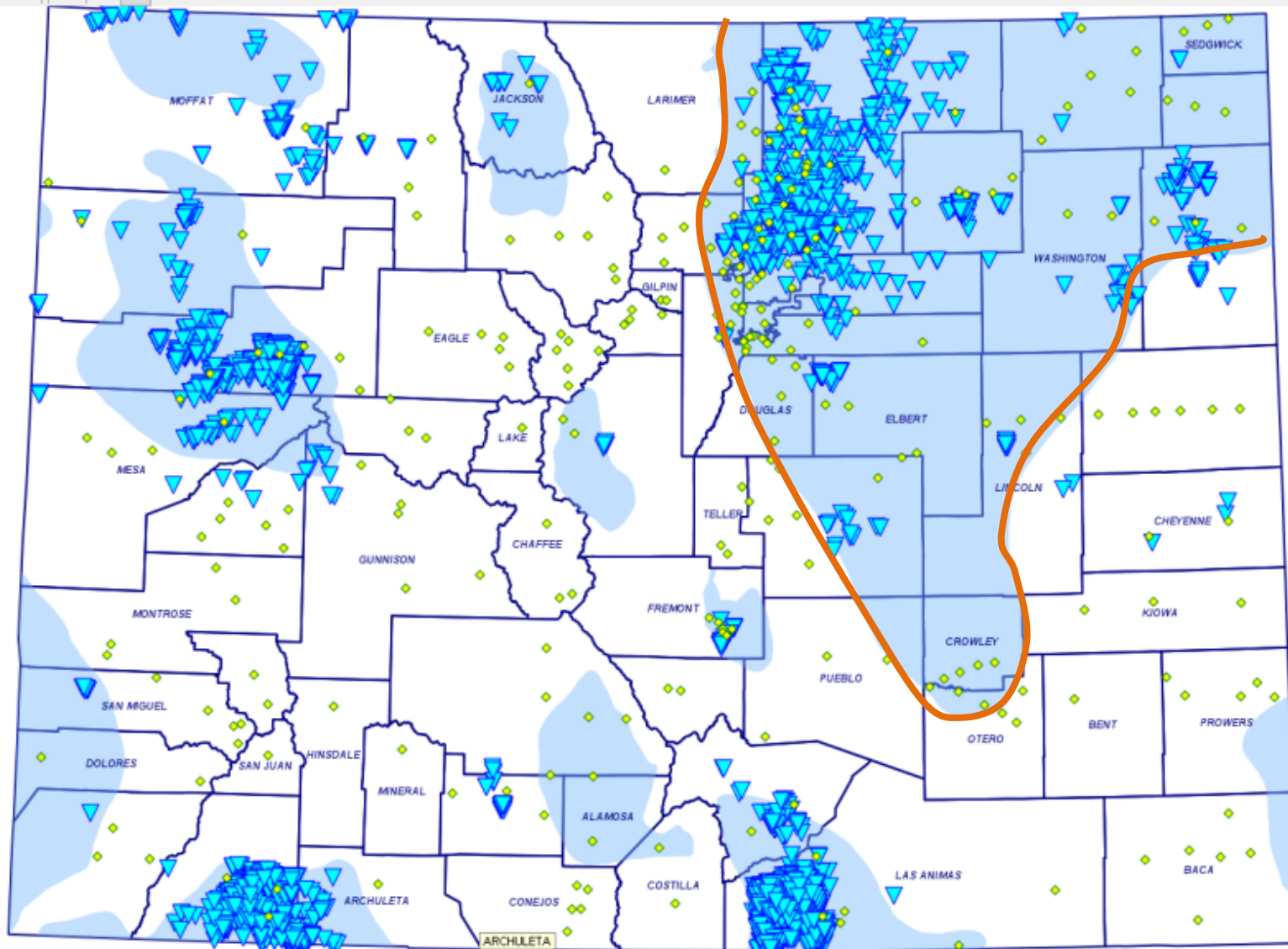
Intermountain Oil and Gas BMP Project

www.lawatlas.org/oilandgas/

**States with
baseline
groundwater
monitoring
regulations**



- ☒ Oil & Gas Basins
- ☒ O&G Facilities
- ☐ Permits
- ☐ Pending Permits
- ☐ Pending2As (Diamond)
- ☒ COGCC Data
 - ☐ Directionals
 - ☒ COGCC Rules
 - ☐ O&G Fields
 - ☐ SeismicPermits
- ☒ Water/Gas Sampling Data
 - ☒ Sites w/Lab Data
 - ☐ Sample Sites
- ☐ Roads & RRs
- ☐ Water Resources
- ☐ SecTwpRng
- ☐ Wildlife CPW
- ☐ State Lands
- ☐ Indian Lands
- ☐ BLM Lands
- ☒ Surface Lands
 - ☒ City Points
 - ☐ Places
 - ☒ Counties
 - ☐ Relief Image
- ☒ Special Projects
- ☒ Geology
- ☐ Topos24K



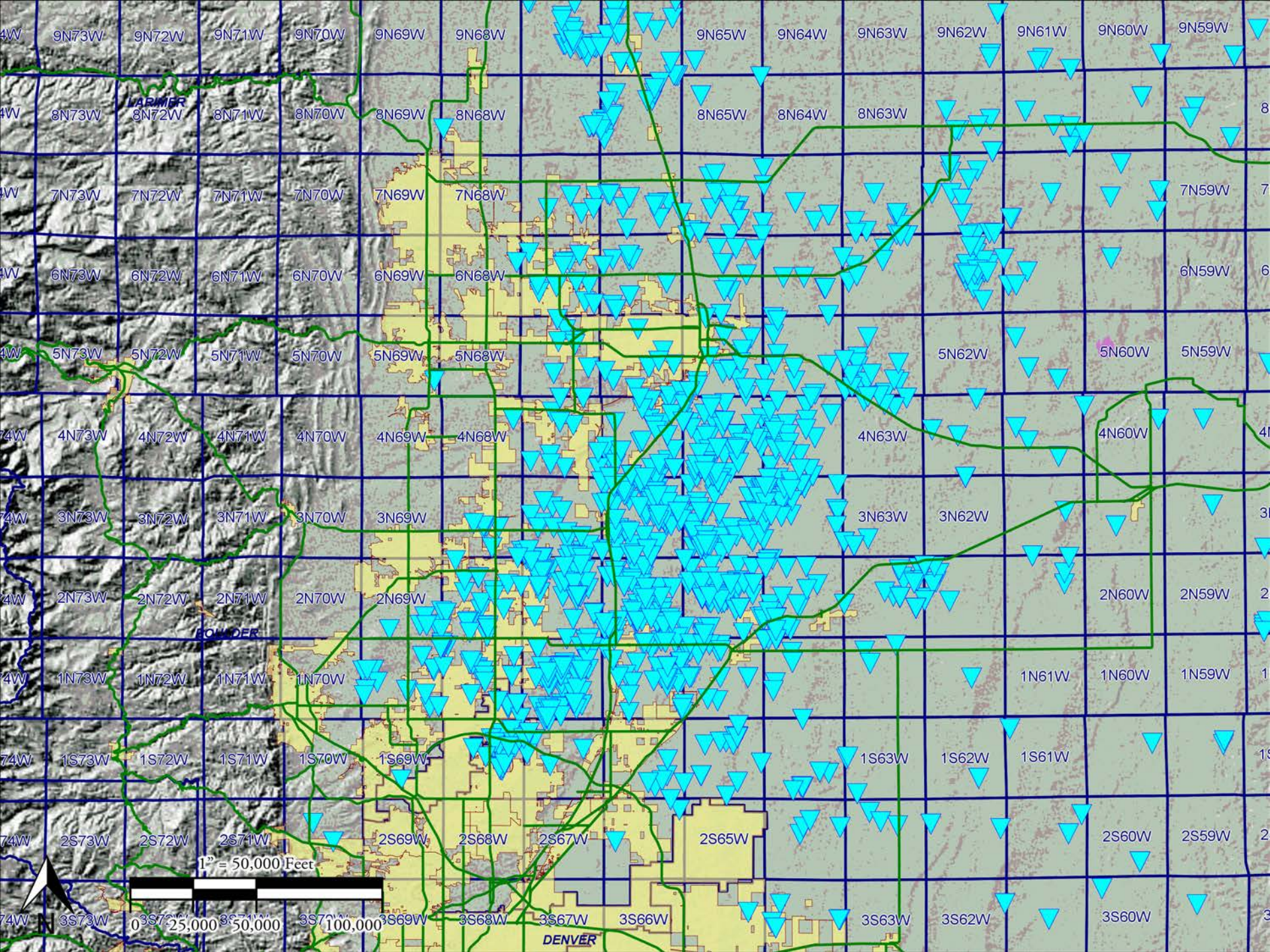
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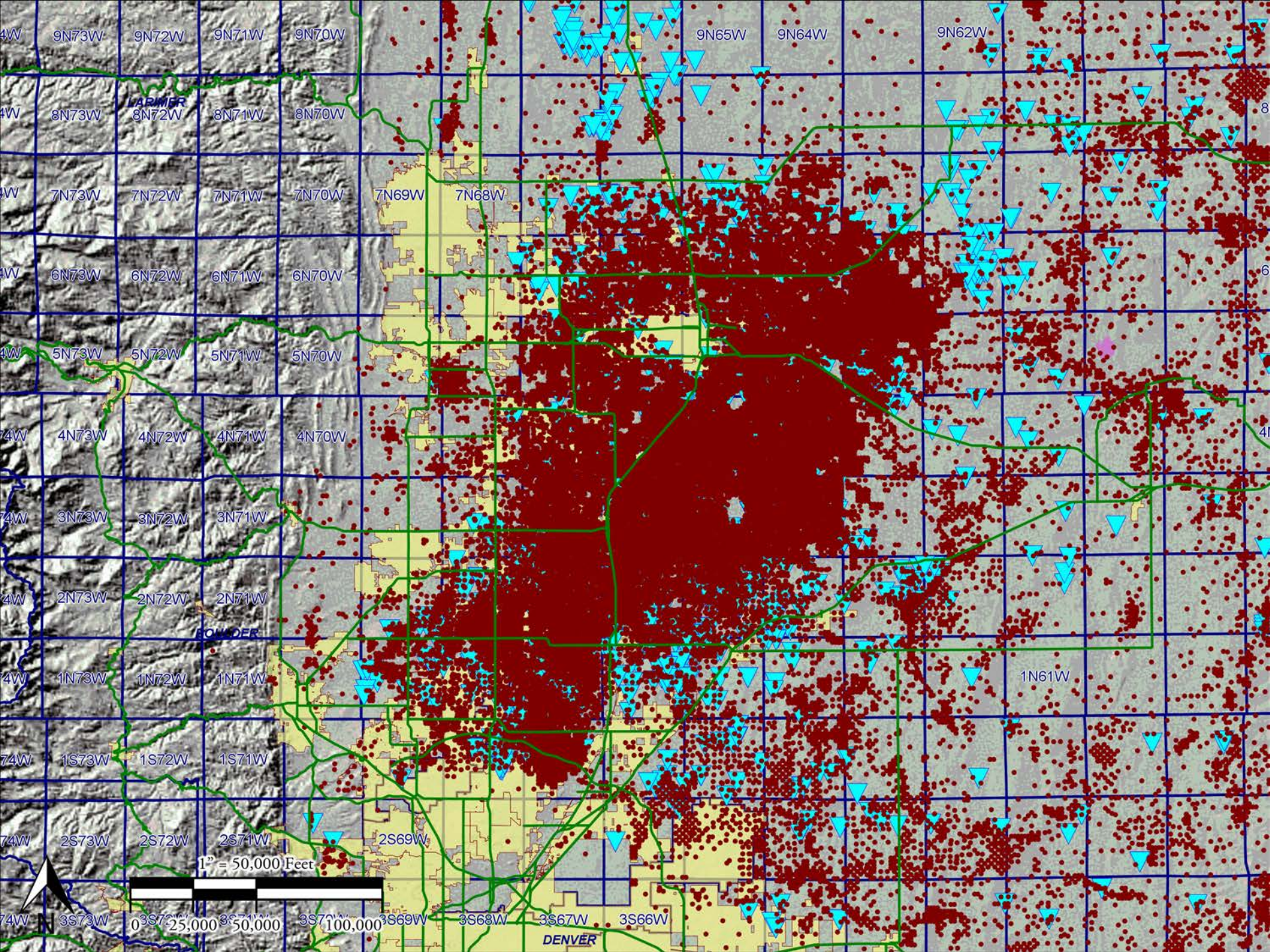
0 features selected

1: 2004509

435.36 x 281.12 (mi)

COGCC: <http://dnrwebmapgdev.state.co.us/mg2012app/>

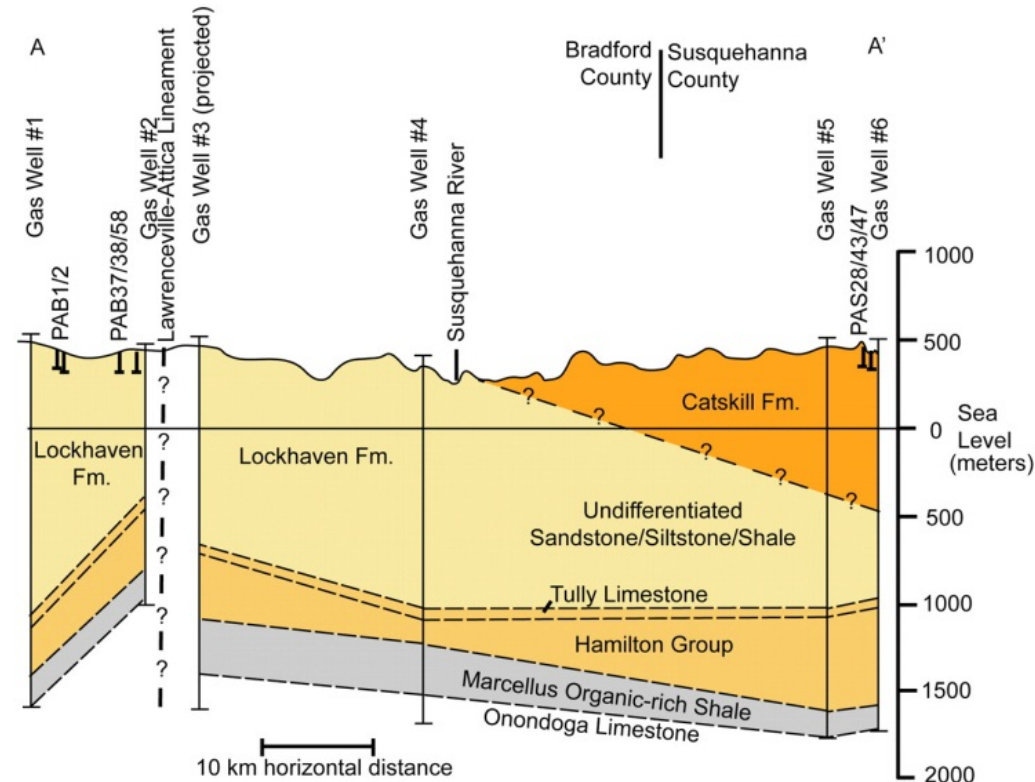
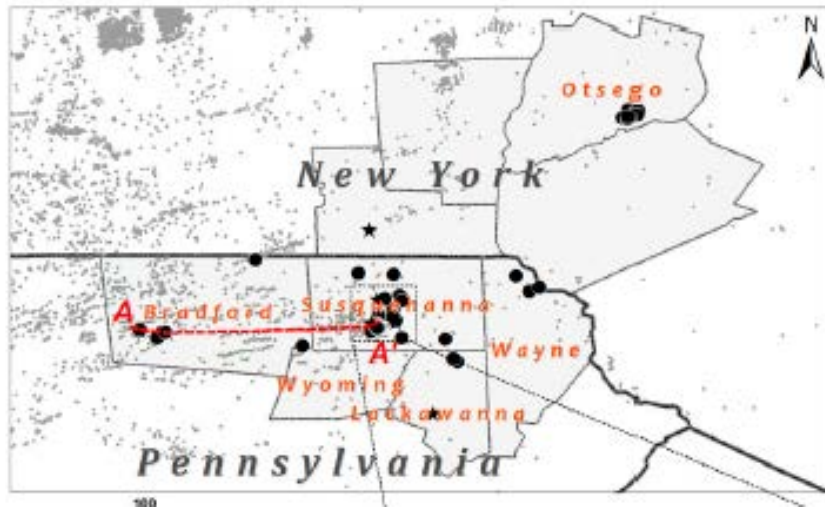






Matt Lepore, COGCC director

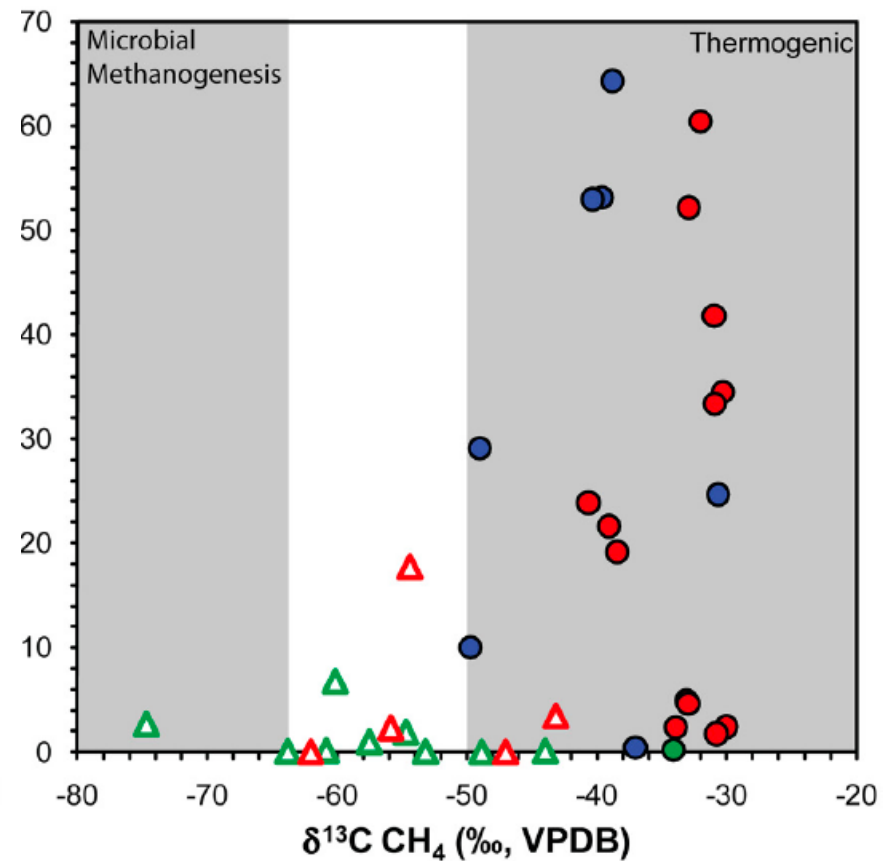
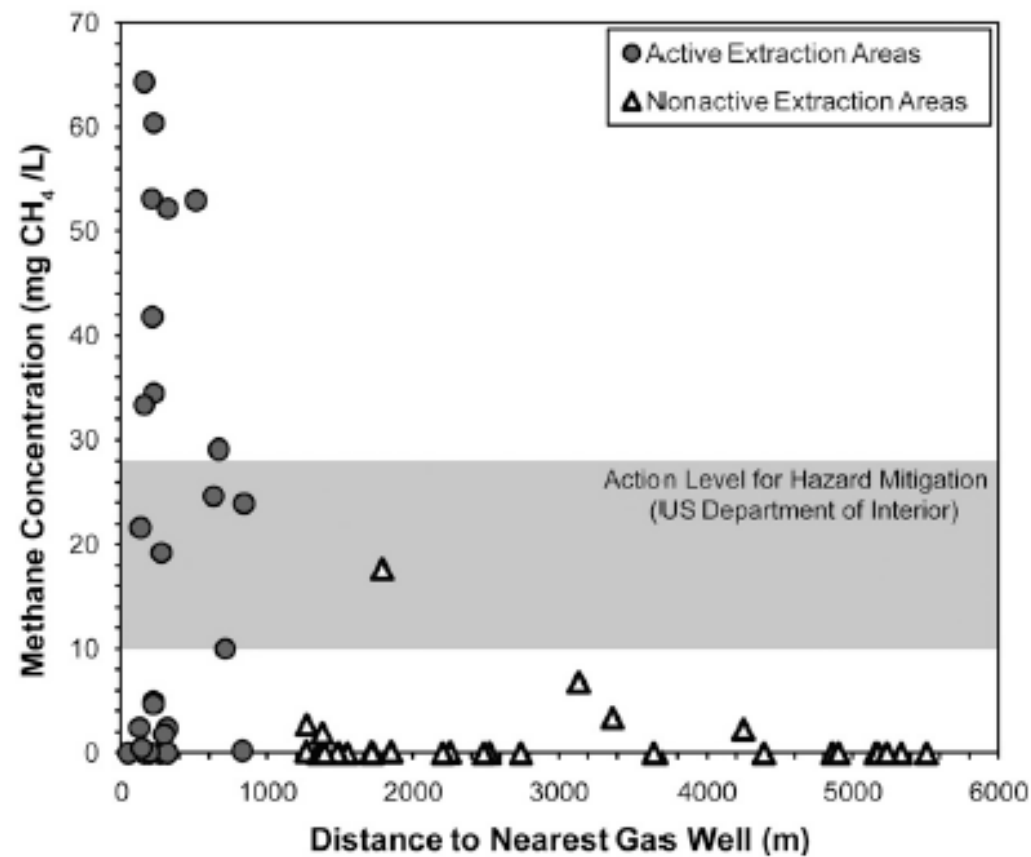
The mission of the
Colorado Oil and Gas Conservation Commission
(COGCC) is to
**foster the responsible development of
Colorado's oil and gas natural
resources.**



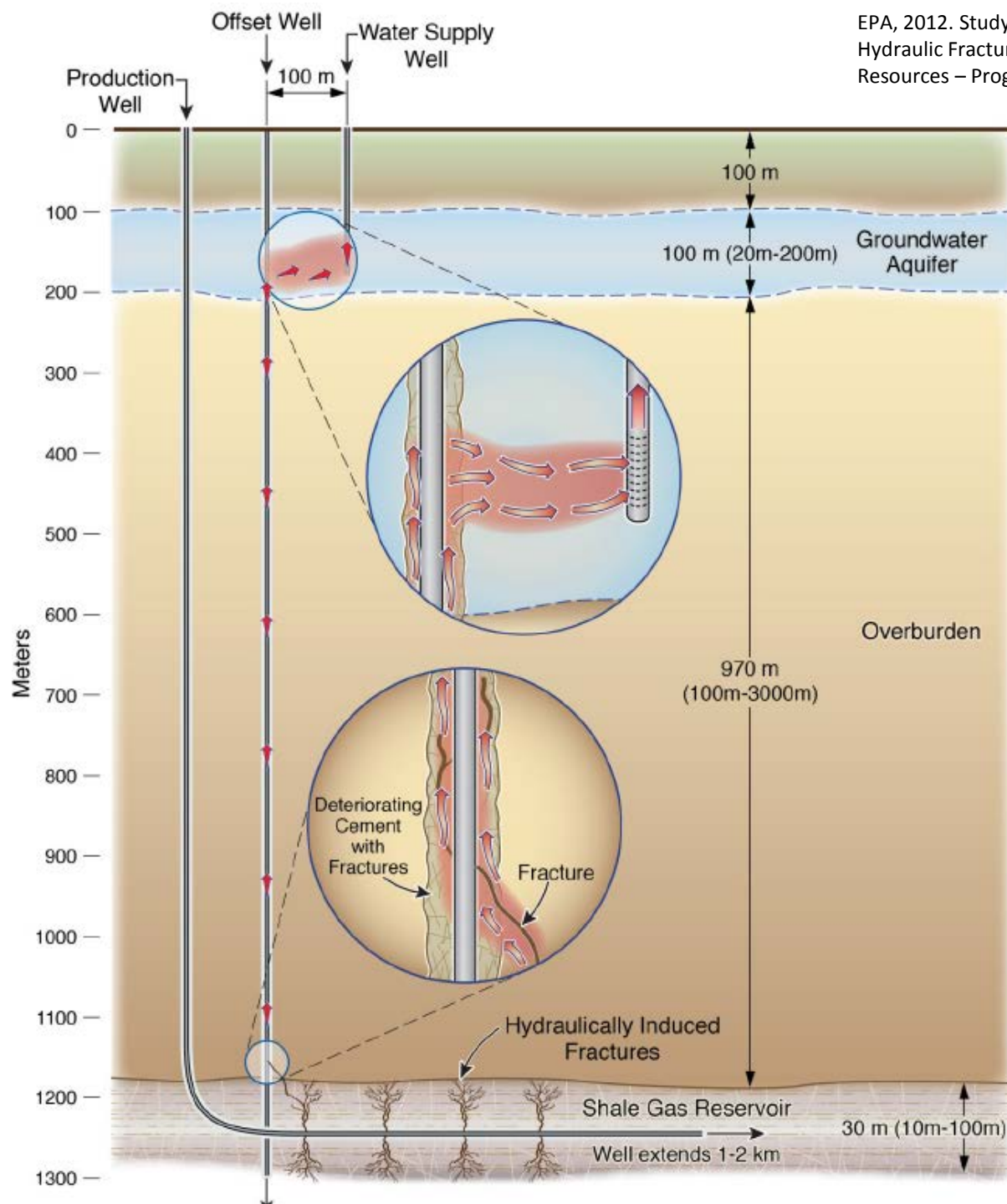
Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing

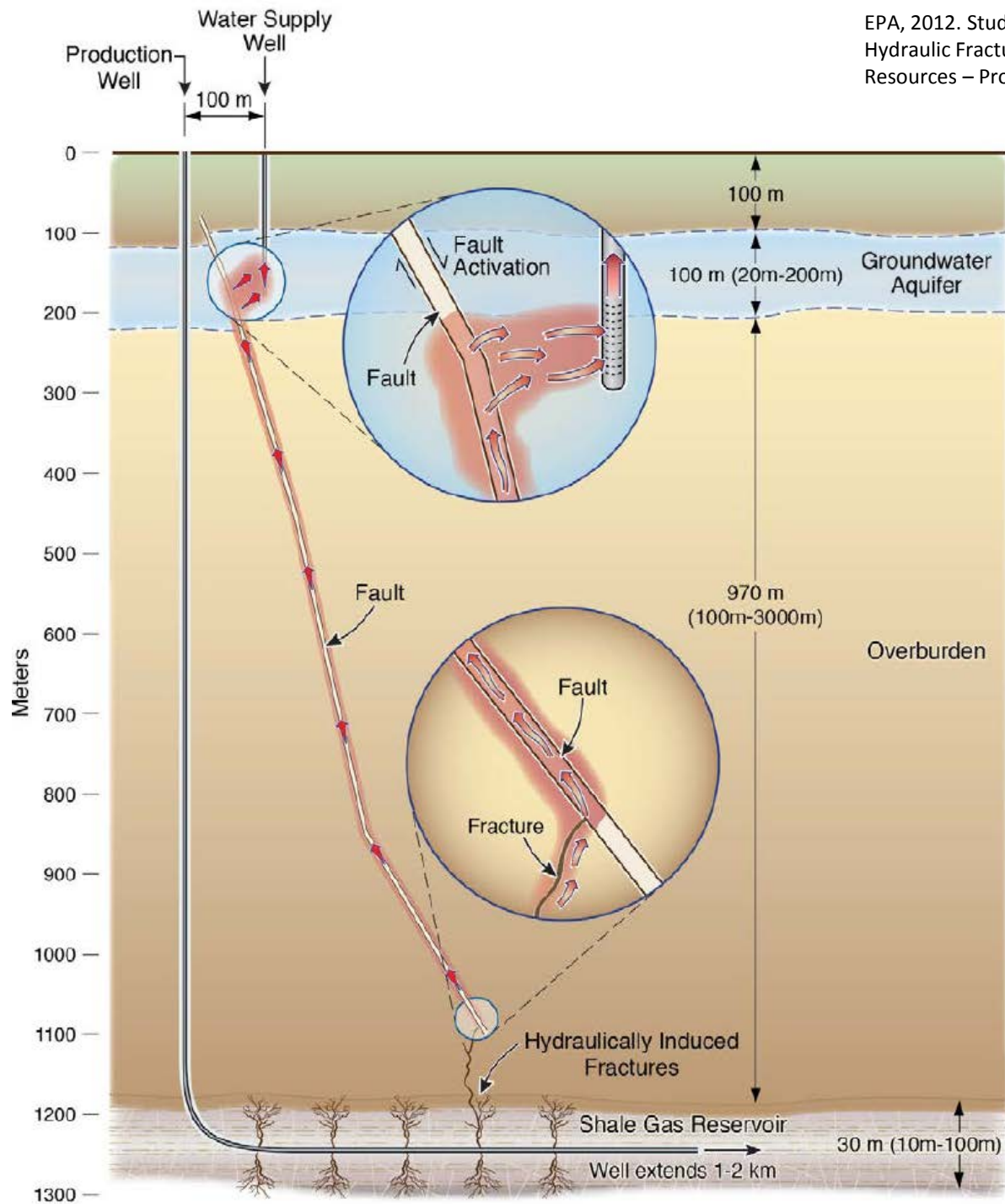
Stephen G. Osborn^a, Avner Vengosh^b, Nathaniel R. Warner^b, and Robert B. Jackson^{a,b,c,1}

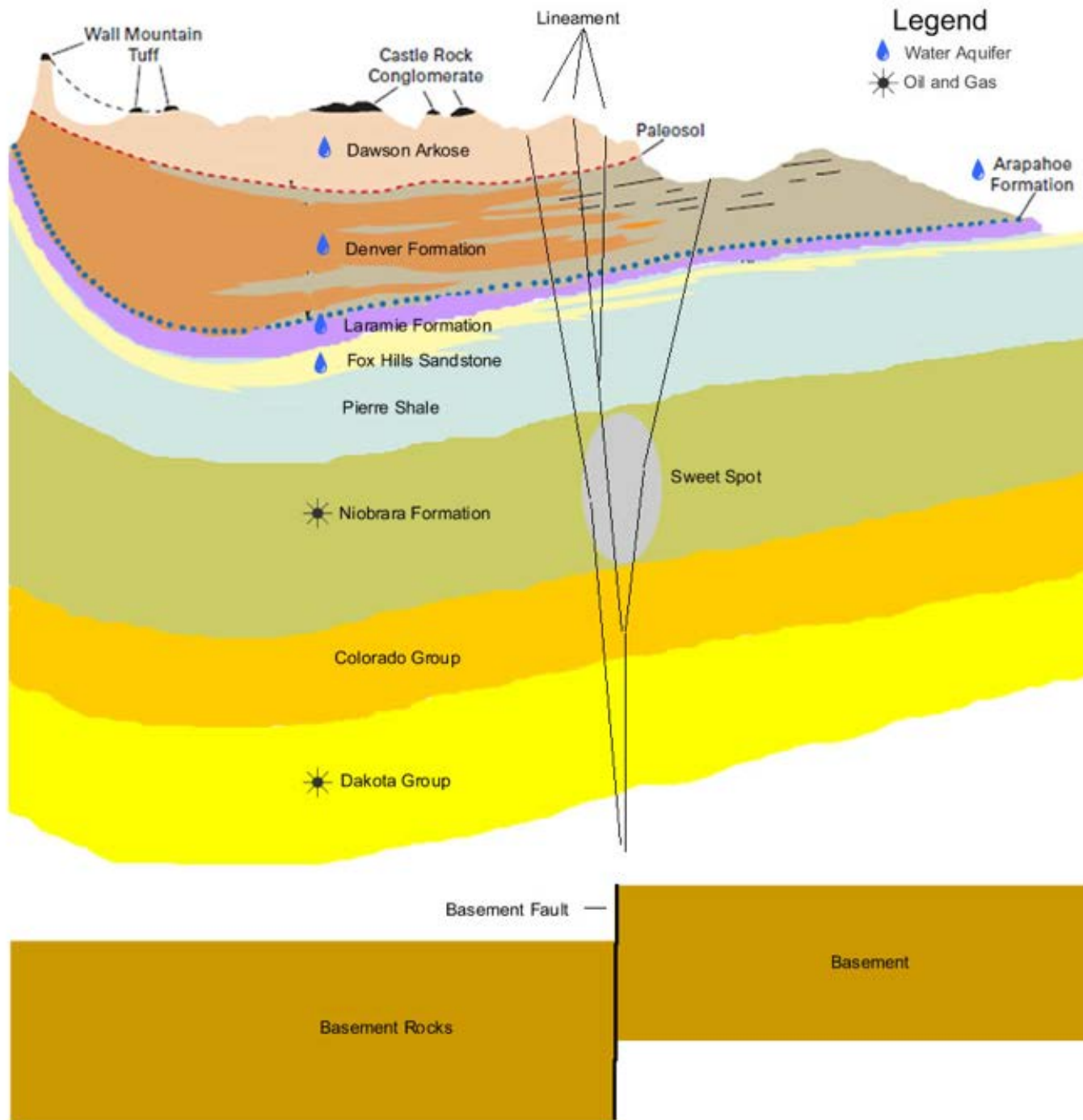
^aCenter on Global Change, Nicholas School of the Environment, ^bDivision of Earth and Ocean Sciences, Nicholas School of the Environment, and ^cBiology Department, Duke University, Durham, NC 27708

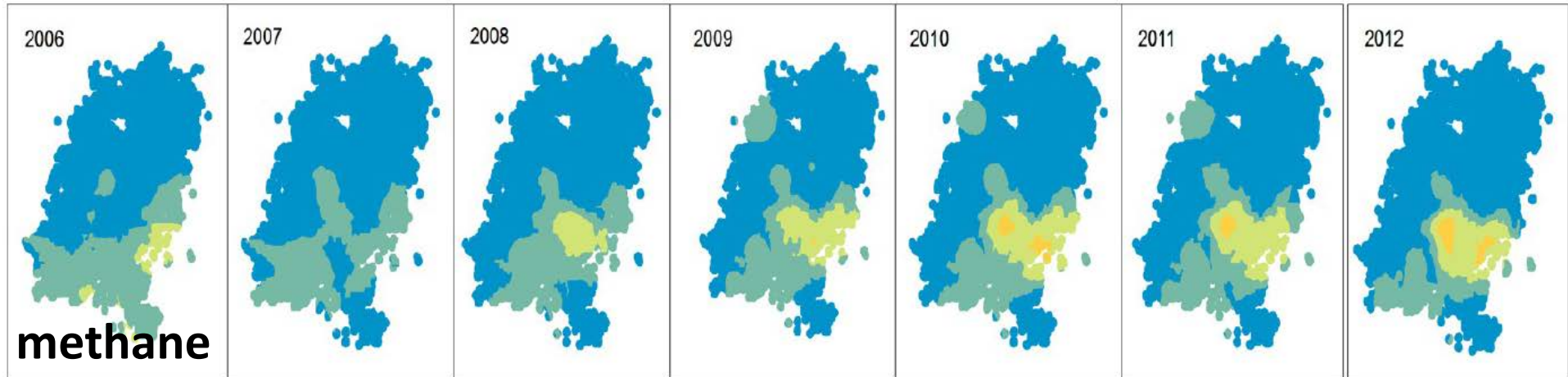


Osborn et al., 2011. *Proc. Natl. Acad. Sci.* **108**(20), 8172-8176





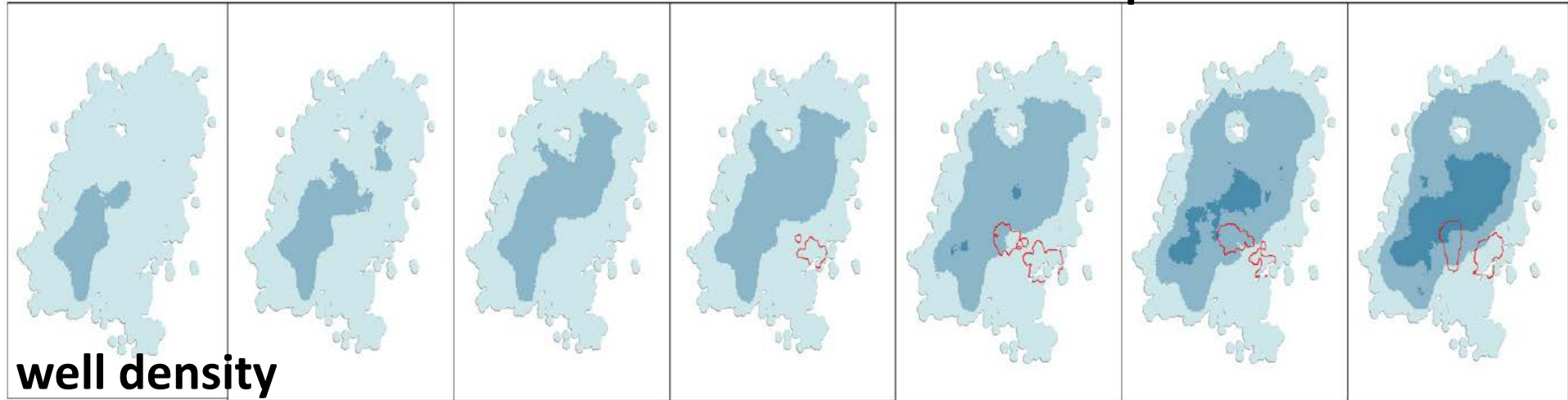




Methane Concentration, mg/L 0 - 2 2 - 5 5 - 10 10 - 15 15 - 25 25 - 32

229 samples

Wattenberg Field, COGCC



Well Density 0 - 5 5 - 10 10 - 15 15 - 20

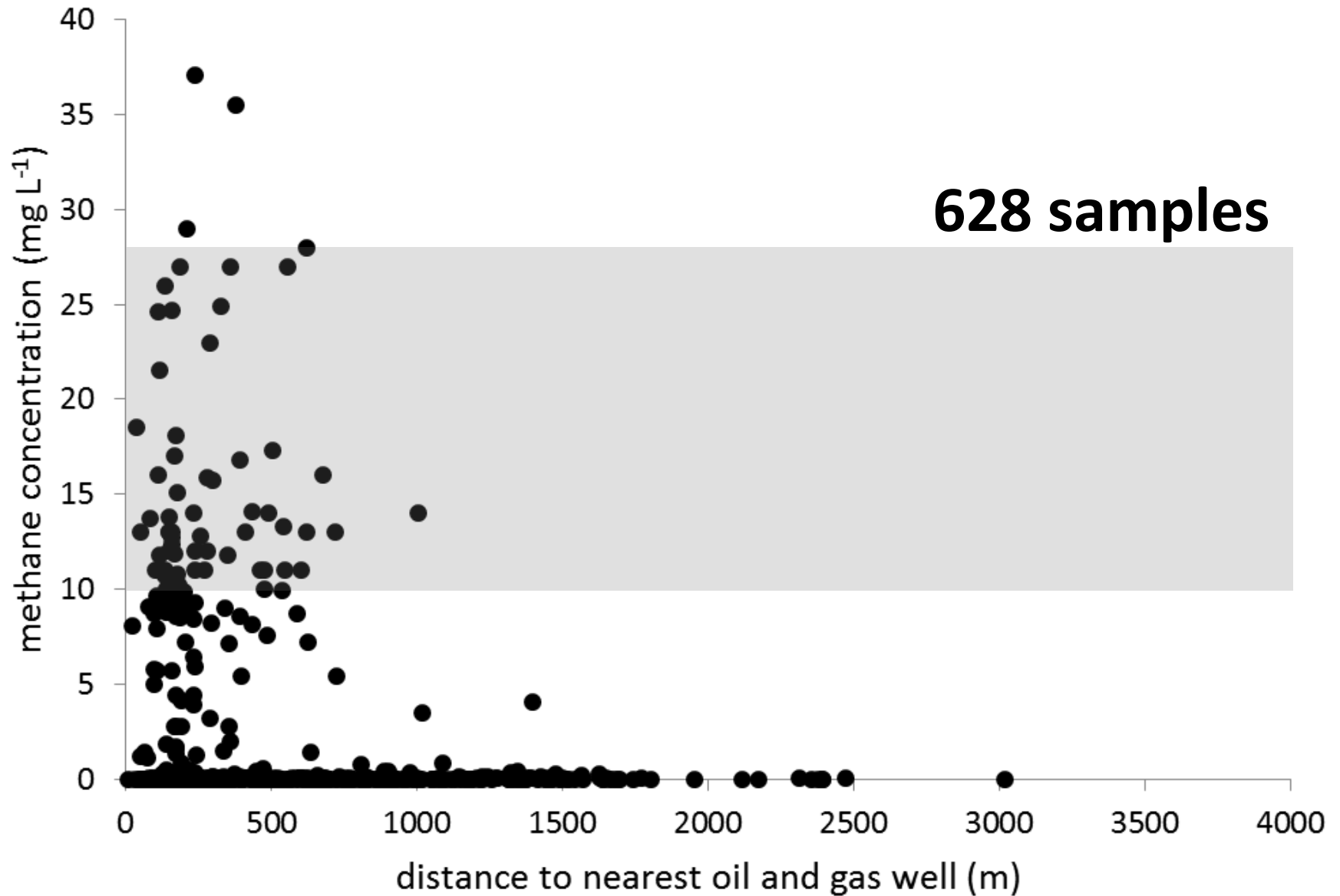
Dissolved Methane (predicted) > 8 mg/L

Distribution and Origin of Groundwater Methane in the Wattenberg Oil and Gas Field of Northern Colorado

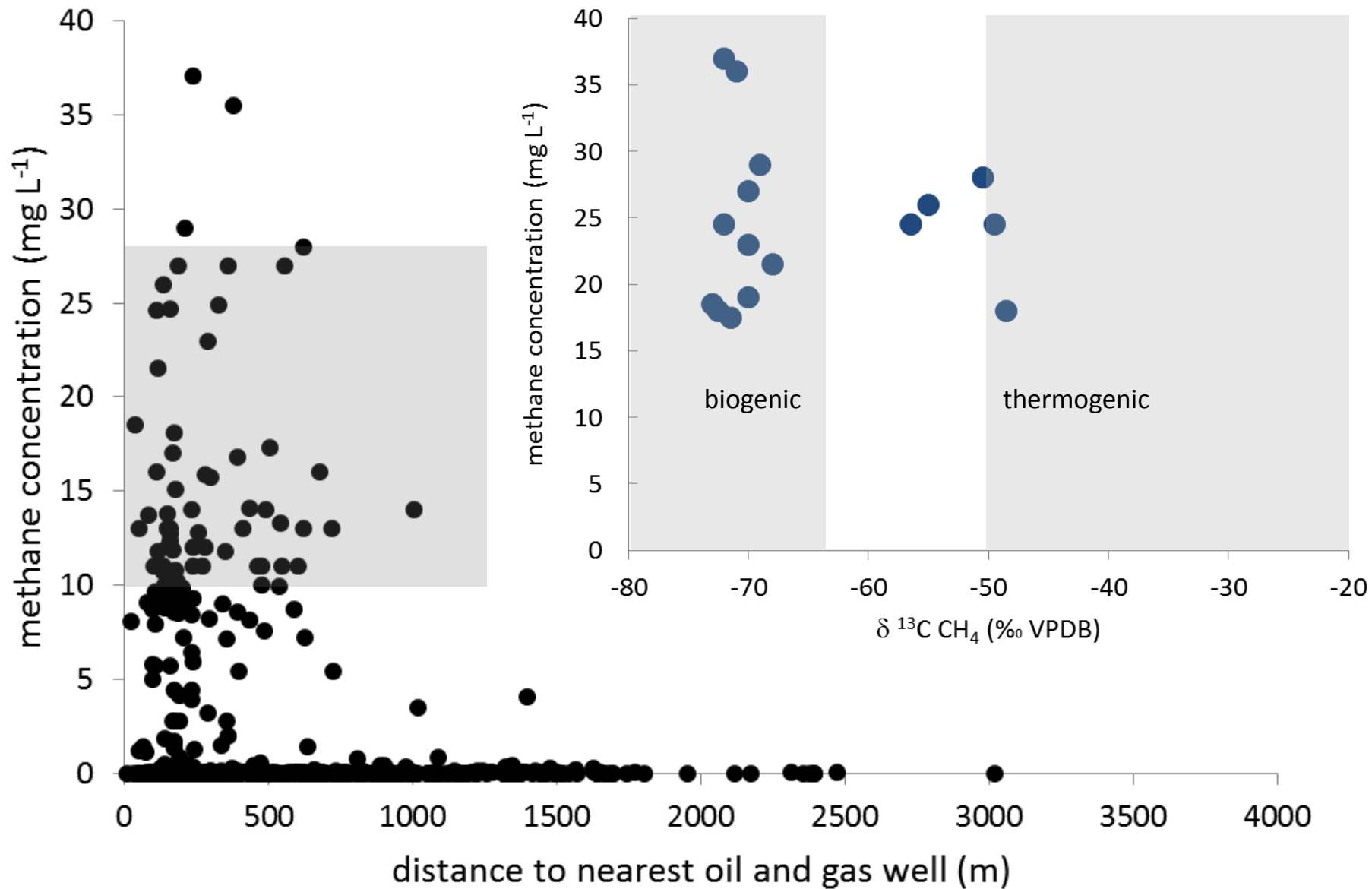
Huishu Li and Kenneth H. Carlson*

Department of Civil and Environmental Engineering, Colorado State University, 1372 Campus Delivery, Fort Collins, Colorado 80523-1372, United States

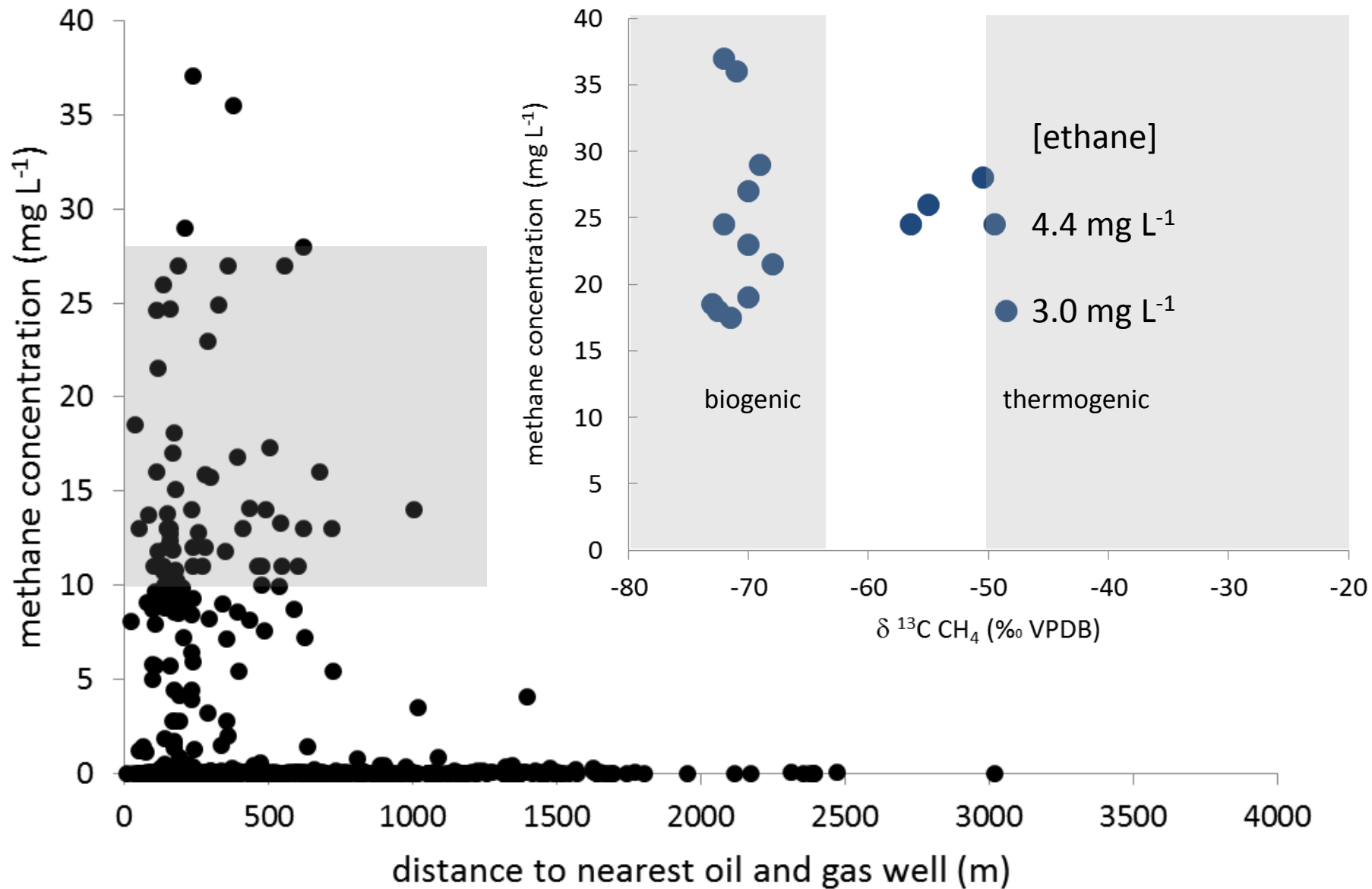
Denver-Julesburg Basin



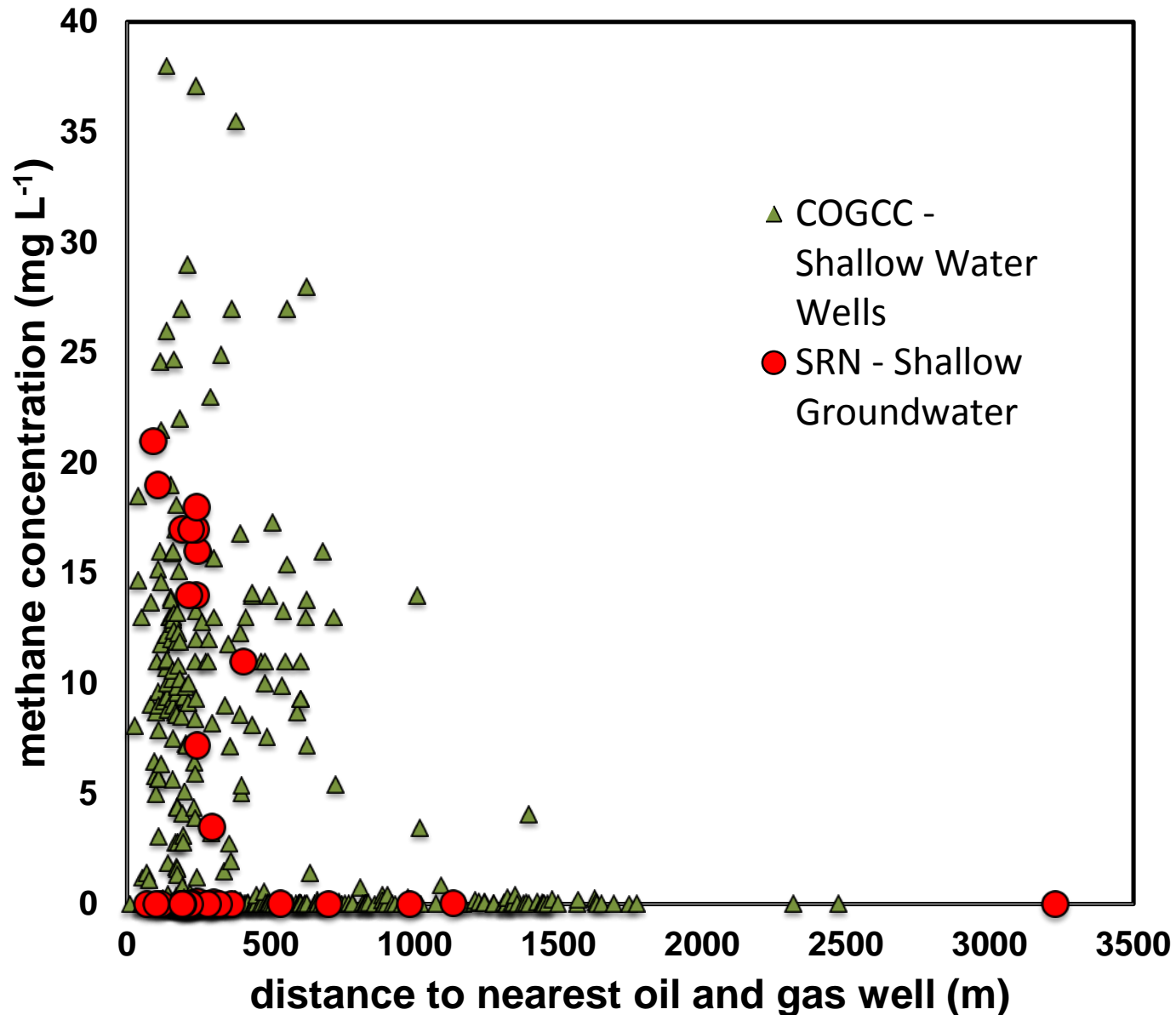
Denver-Julesburg Basin



Denver-Julesburg Basin



Denver-Julesburg Basin



- **Data collected, is being collected, is abundant**
- **Data hard to access on not accessible**
- **Data can be analyzed to test hypotheses about potential flow paths**
- **Analyses can be used for risk assessments**
- **Risk assessments can be used to inform public and guide regulation and policy development**