

‘Fracking’ and Technological Momentum: Risks, impacts, and justice of the oil and gas extraction socio-technical system in Colorado

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OR

How I learned to stop worrying and make a decision on Proposition 112

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Yes or no on 112

One word answer

...

Okay so yes or no on 112

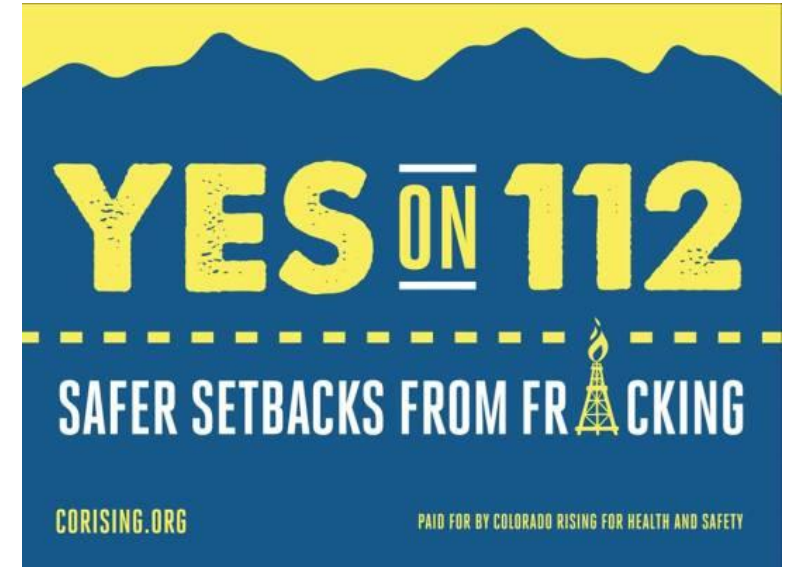
Can u just tell me

About Proposition 112

Current setbacks 500ft. (homes) and 1000ft. (schools and high occupancy).

Proposition 112

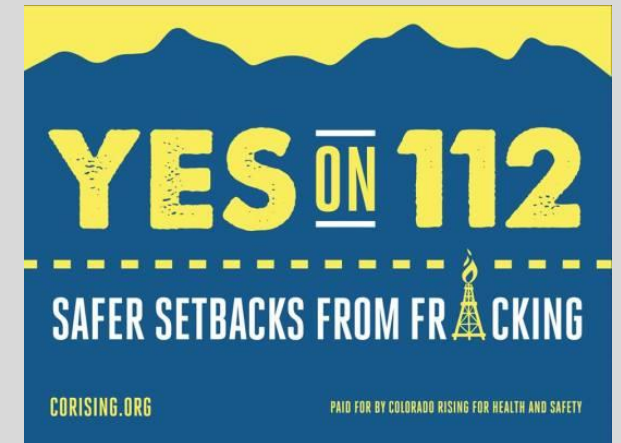
- 2500 ft. setback for NEW oil and gas from occupied structures, water ways, and “vulnerable” areas.
- Empowers county and municipal government to define “vulnerable”



About Proposition 112

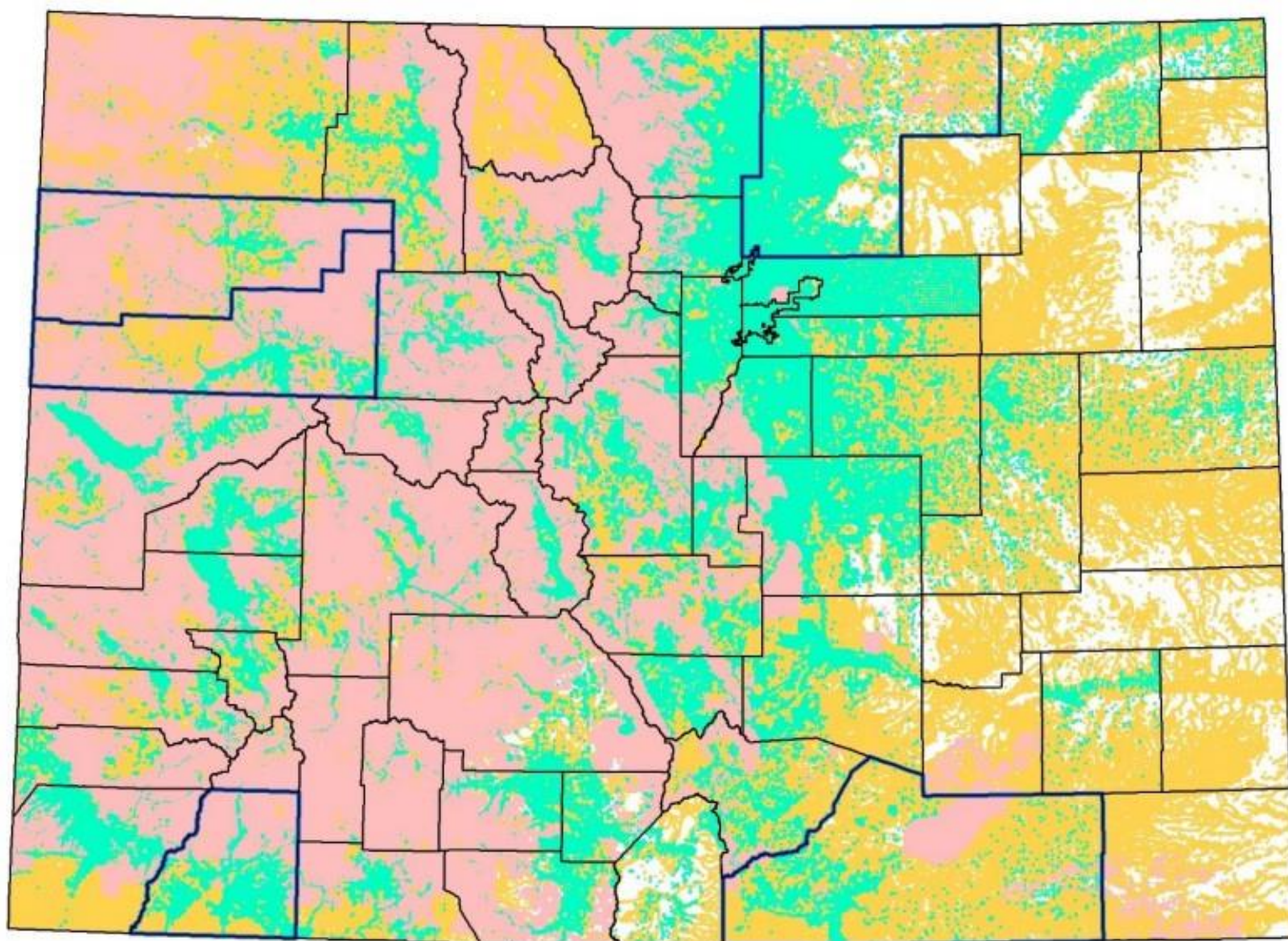


Heath & Safety
vs.
Jobs& Economy



government to define “vulnerable”



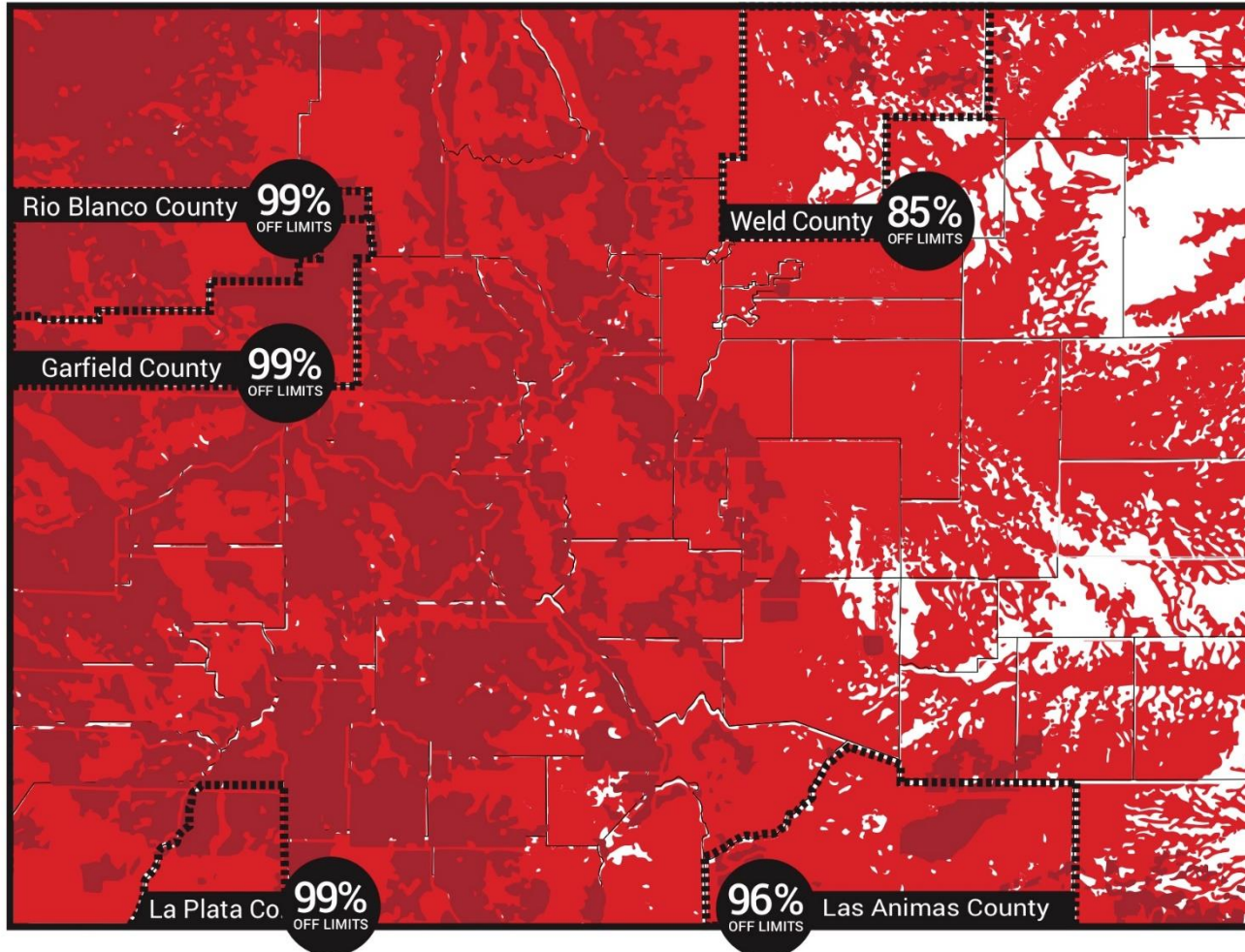


0 15 30 60 90 120
Miles

- 2500 ft Buffer for Occupied Structure(s)
- 2500 ft Buffer for Vulnerable Areas
- Federal Lands (Source: BLM, 2018)
- Top 5 Producing Counties

Source: COGCC

IF THE SETBACK MEASURE WINS, COLORADO LOSES



 Area off limits for new natural gas and oil development by adopting setbacks of 2500 ft.

 Federal lands that could be open to natural gas and oil exploration due to 2500 setback in the rest of the state.

INITIATIVE 97
WOULD
ELIMINATE
OVER
200,000
JOBS

2500 FT SETBACKS
WOULD MAKE

85%
OF COLORADO
OFF LIMITS

↓
FORCING
ENERGY
PRODUCTION
ONTO
**FEDERAL
LANDS**

IF THE SETBACK MEASURE WINS, COLORADO LOSES

Off-limits

54% of total land surface
85% of non-federal land

Top-5 producing counties
61% of total land surface
94% non-federal land

Source: COGCC



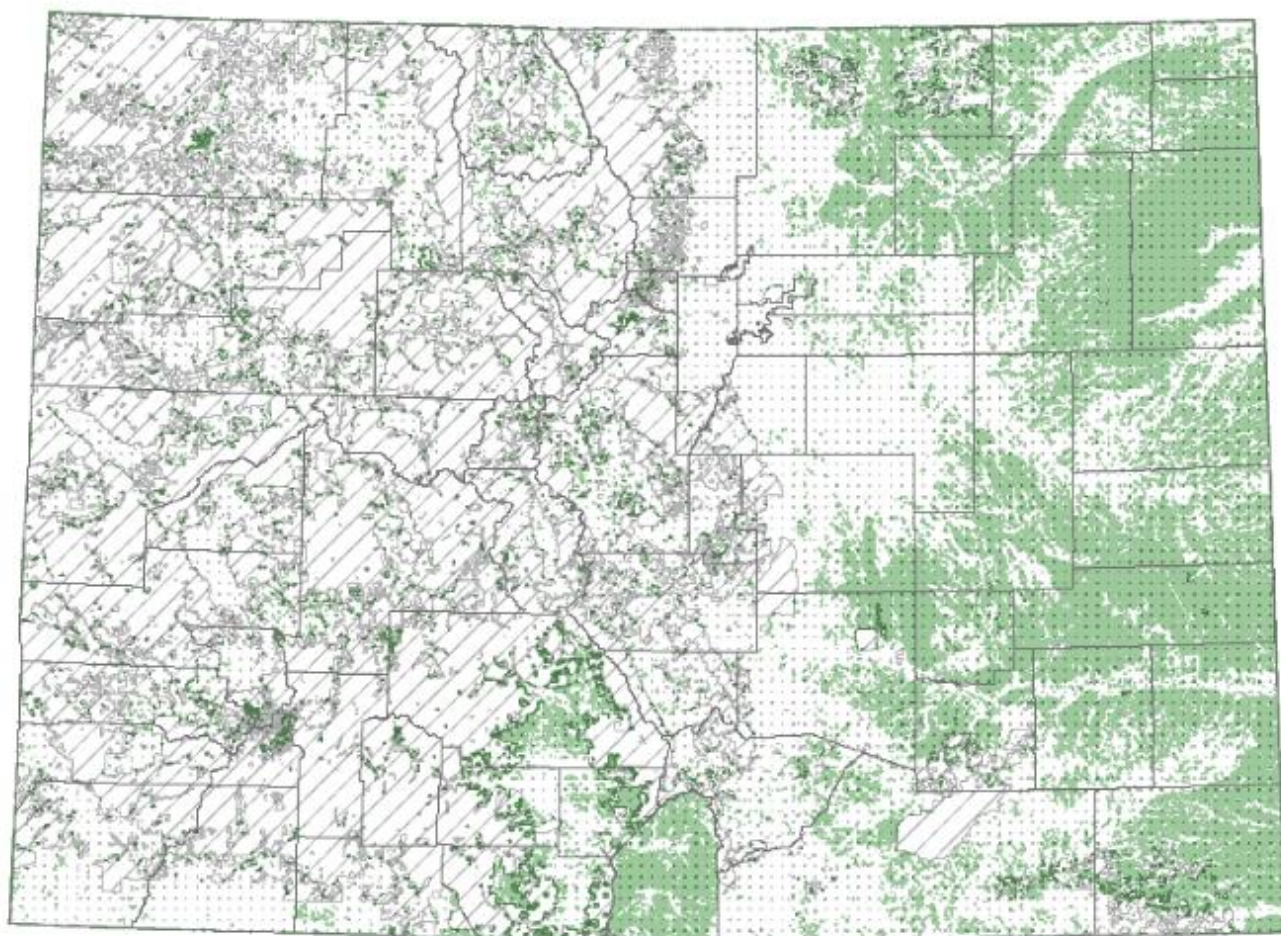
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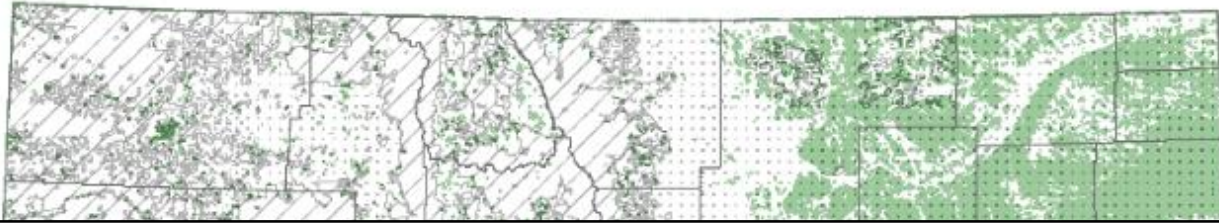
PROTECTCOLORADO



Legend

-  County Boundaries
-  Nonfederal Land
-  Federal Land
-  Accessible Non-federal Subsurface

Source: Maniloff, 2018



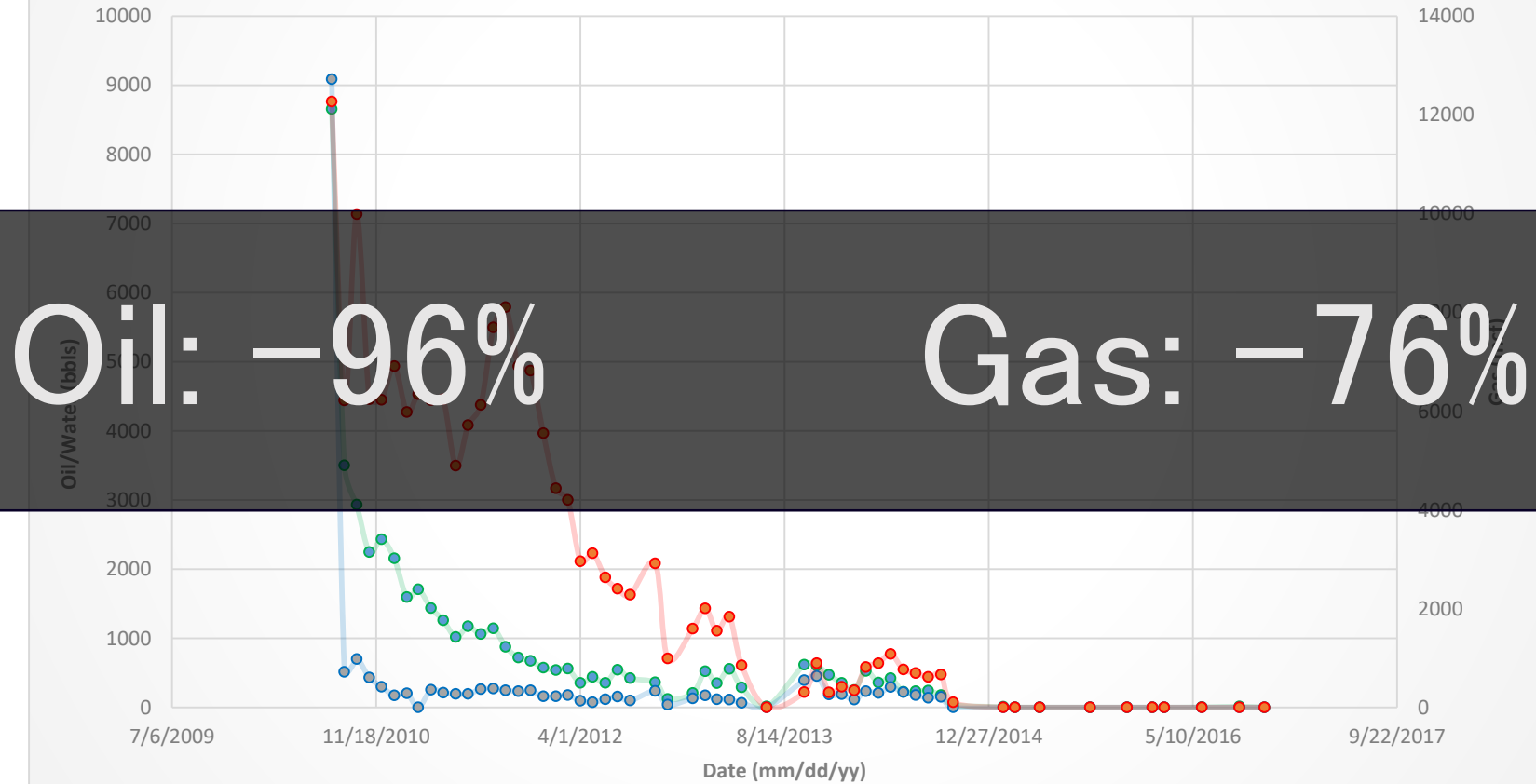
Off-limits
58% of non-federal subsurface

Source: Maniloff, 2018



Niobrara Well Production DJ Basin

Oil Water Gas



An offshore oil drilling rig is silhouetted against a vibrant orange and yellow sunset sky. The rig's tall derrick and various platforms are visible, with some lights glowing from the base. In the background, a range of mountains is visible on the horizon. The overall scene conveys a sense of industrial activity in a natural setting.

Health v. Economic Impact?

“There is no credible science or definitive evidence that says the setback in Colorado needs to be any larger than it already is.”

-Dan Haley, President, Colorado Oil and Gas Association (COGA)

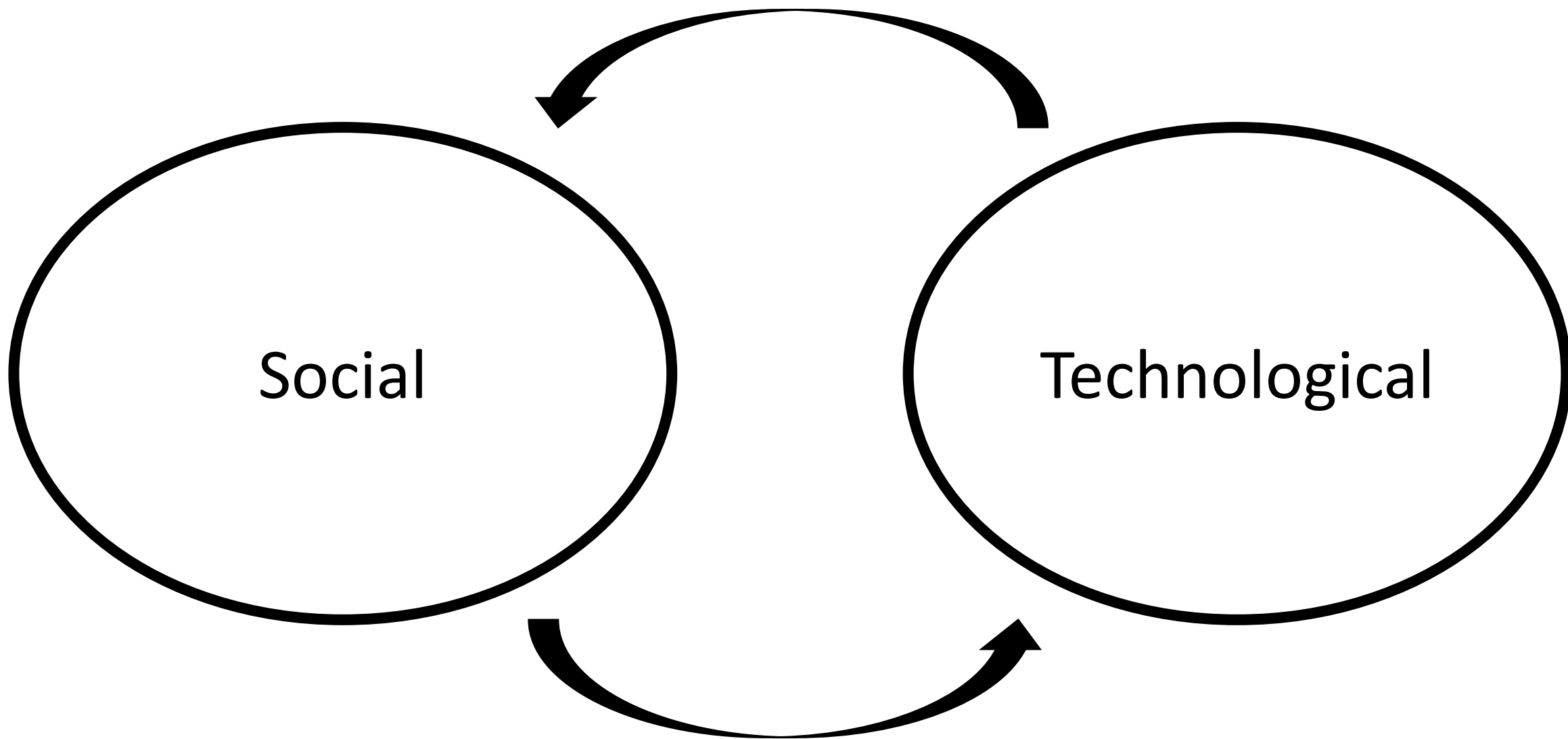
“The [setback] wasn’t based on anything, and now all these studies are coming out – peer-reviewed studies – that of course oil and gas likes to denounce [as] not valid.”

– Heidi Henkel, Colorado Rising

Technology and Risk

- Risks of technology: eco-catastrophic, dialectical
- Role of science in understanding risk
 - Risk Society (Beck, 1992)
 - Political Ecology (Robbins, 2011; Forsyth, 2004)

Technology as a change agent: has inherent risk but risks are distributed and manifest in hazards based in-part on socio-political landscape



Socio-Technical Systems

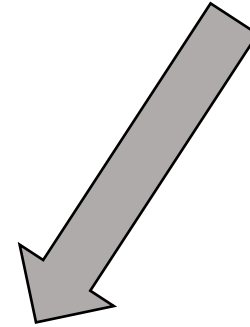
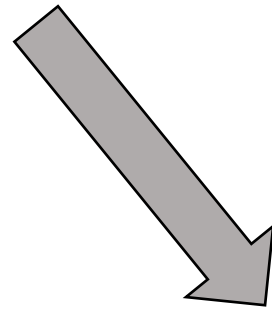
- Interaction of social and technical forces that create complexity
- Risk that factors technological and social drivers
- Adaptability and malleability of technology and systems



What is Technological Momentum?

Social Construction
(Bijker & Pinch, 2012)

Technological Determinism
(Winner, 1978)



Technological
Momentum
(Hughes, 2012)

- System features
 - Physical and non-physical components
- System motivations and goals
 - Reduce uncertainty
 - Consolidation
 - Centralization
 - Increase decision-making authority for system experts
 - Incorporation of 'environmental factors'
 - Intra-system sharing
- Subsystems and rationale for defining subsystem
 - Defining sub-system is political



Why 'technological momentum' and does it inform a decision on 112?

Study Design

Subjects: Weld County CO, companies, COGCC, state/municipal government, and stakeholders.

Quantitative Analysis

Industry activity (COGIS) as controlled by commodity prices (WTI and Henry Hub) and population density (US Census and USGS).

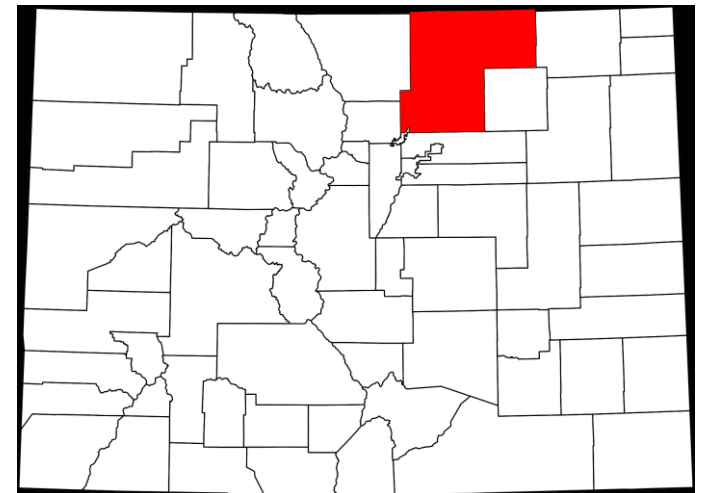
Qualitative Analysis

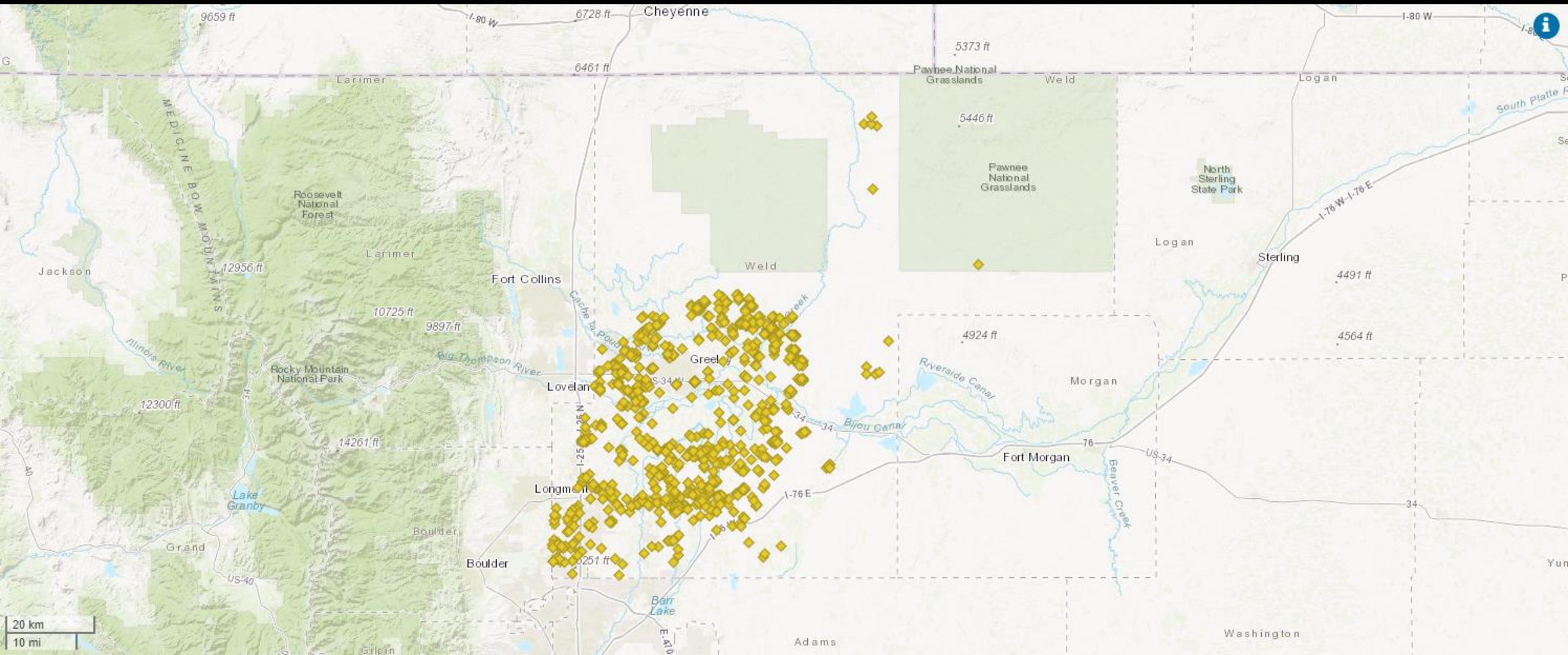
Interviews (N=15)

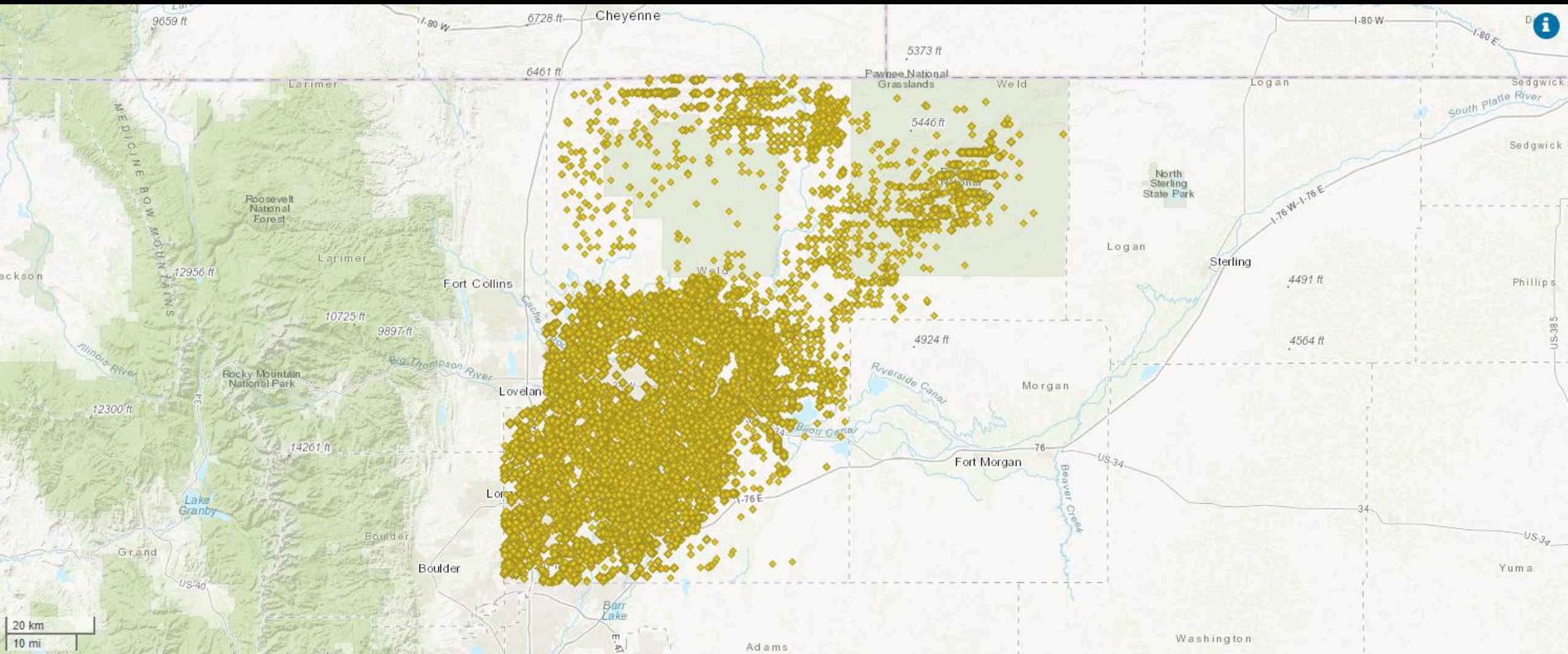
Policy analysis

Artifact analysis

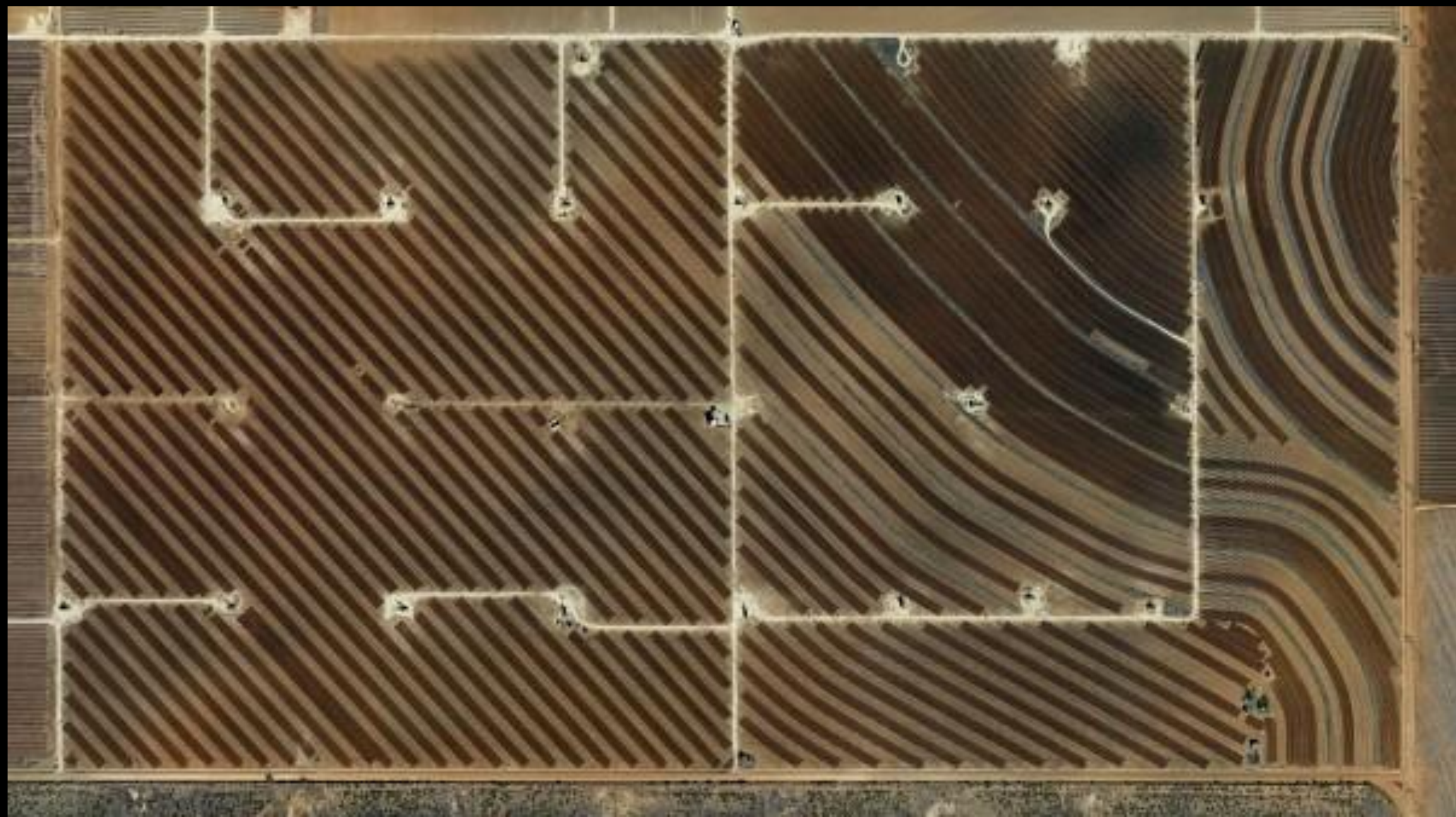
Field observations



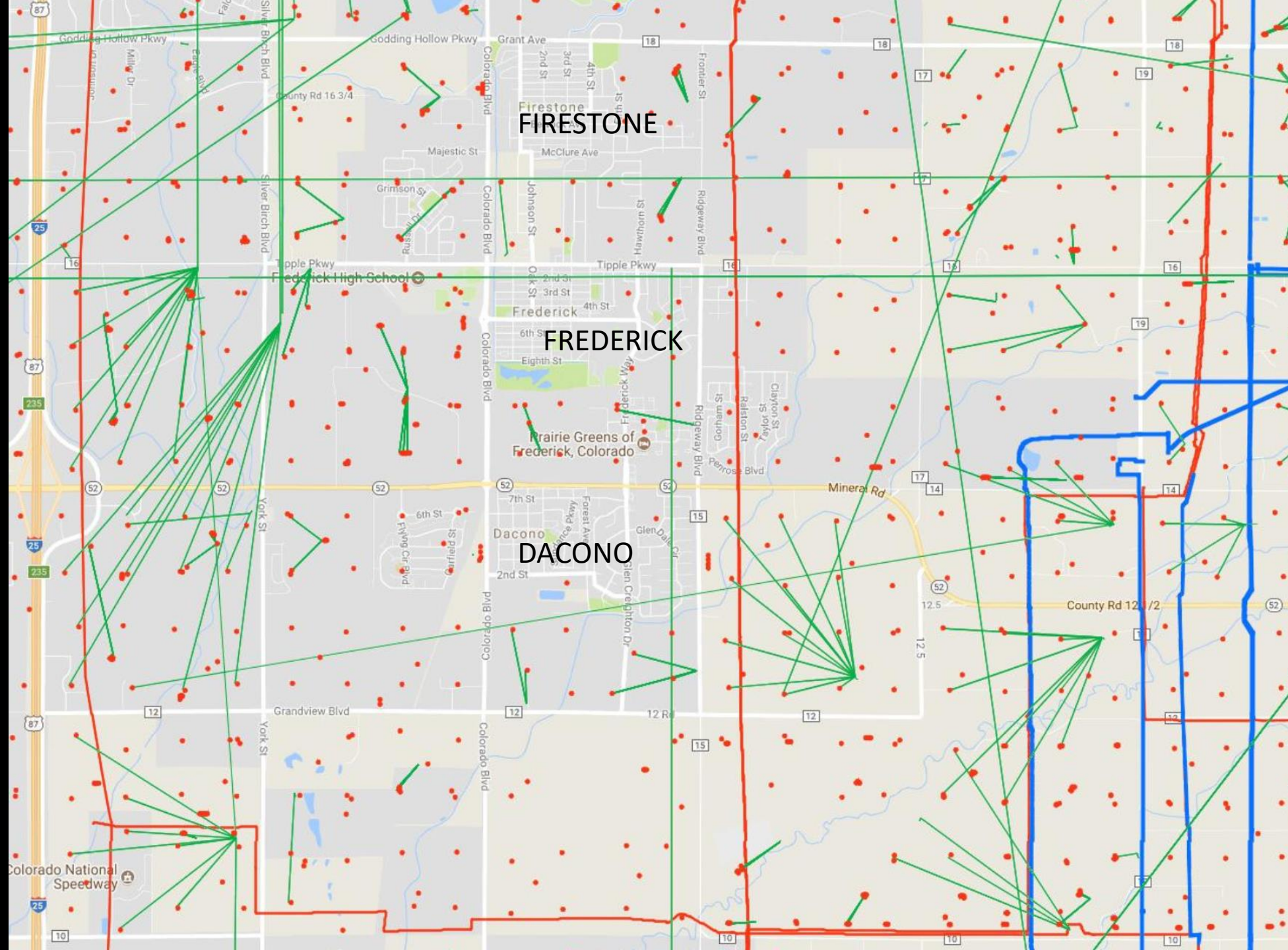












Legend

-  Erie Town Hall
-  Hazardous Liquid Pipelines
-  Gas Transmission Pipelines
-  Oil & Gas Flow Lines
-  County Boundaries
-  Oil & Gas Wells



PUBLIC RELEASE: 29-OCT-2018

Study reconciles persistent gap in natural gas methane emissions measurements

The Colorado State University-led study resulted from a large, multi-institutional field campaign

COLORADO STATE UNIVERSITY

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PUBLIC RELEASE 23 OCT 2013
“This was an unusually coordinated effort.”

Study reconciles persistent gap in natural gas methane emissions measurements
“Applicability of these results to other production basins is not known, the researchers say, without understanding the timing of emissions in those other basins”

The Colorado State University-led study resulted from a large, multi-institutional field campaign

COLORADO STATE UNIVERSITY



Current 'State of the System'

- Continued growth of industry and municipalities
- Difficulty in researching and assessing environmental and health impacts
- Barriers to engagement
 - Participation in decision-making processes
 - Lived experience health complaints.
- Split estates and state primacy
- State-to-state differences



‘Black Boxing’ and Accessibility

- Meta-power, lack of recourse and issues of representational and distributed justice. (Malin, 2018)
- Uncertain or inaccessible decision-making and evidence inputs
- ‘Invisibilization’ of impacts
- Dismissal of lived experience?
- Over-reliance on system ‘experts’?
- 112 health further relies on assessment and decision-making structures that promote business as usual?

Evolving System

- Operator decisions and priorities
 - Industry cooperation with regulation and enforcement
 - Mitigation, BMPs, MOUs, and technology change
 - Willingness to single-out “bad actors”
 - “Sustainability” practices
 - History of state regulation (setbacks 2013, 2014 methane, mapping 2017)

Evolving System

- Operator decisions and priorities
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 - “Sustainability” practices
 - History of state regulation (setbacks 2013, 2014 methane, mapping 2017)
- Reconciliation studies of emissions and changing strategies of (air quality) research

What does this mean for 112?

- “Scientization” of environmental and health risks?
- Asking what we ‘ought’ to do?



“A 500ft setback has no basis in a scientific reality at all, neither does a 2500ft setback. It’s just pulling numbers out of a hat. [But scientific research] informs positions...and [it] supports the fact that this is hazardous.” (Municipal Elected Official)

“[but] what if this industry were perfectly safe, what if this drilling for oil and gas was perfectly safe and we still said, no...we don’t want this. And what if we said that? We have the right to say that, it’s our community.”

-(Municipal Elected Official)

What does this mean for 112?

- “Scientization” of environmental and health risks?
- Asking what we ‘ought’ to do?
- Is it an over-correction for an evolving system?



Alternative Frames for 112

- 112 as symbolic action on fossil fuels
- Disrupting a system with “high momentum” or strong “path-dependency”
- Empowering surface owners and sub-state level government
- Climate change and natural gas bridge fuel

What did I tell my friends?

Sunday 17:12

Yes or no on 112

One word answer

Today 17:13

Okay so yes or no on 112

Can u just tell me

What did I tell my friends?

Today 17:13

Okay so yes or no on 112

Can u just tell me

Today 18:47

Maybe

Delivered

Sunday 17:12

Yes or no on 112

One word answer



YES

NO





Questions?

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