Preview

* Project Overview
* Project Methods/Fieldwork
* Preliminary Findings
* Social Sustainability in Context of Intersecting Natural Resource Dependencies
Environmental Sociology

* Social Environments ↔ Biophysical Environments

* How do societies, and segments of society, interact with the natural world?
* How are resources (goods and bads) distributed within society?
* What does this mean for socio-environmental sustainability?
Environmental Sociology?

* Natural Resources and Community Sustainability
  * (Krannich and Luloff 1991; Smith et al., 2001; Jacquet 2014)

* Environmental Justice and Environmental Health
  * (UCC Study/GAO/ Bullard, 1983-89; Brown 2007; CIRG 2013)

* Neoliberalized Political Economies (governance and regs)
  * (Castree 2008, 2010; Harvey 2007; Finewood & Stroup 2013)

* Social mobilization around environmental inequality
  * (Brown and Mikkelson 1991; Brown 2007; Jaffee 2012)

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Unconventional Drilling’s Context & Process

Lower 48 states shale plays

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Unconventional Drilling’s Context & Scale

- Utilized in 15+ states; over 146,000 wells added in last decade (EIA 2012)
- Variety of communities as sites of extraction, many spatially isolated or impoverished

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Colorado Context – O&G Production

Map of Active Oil and Gas Wells in Colorado.

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Colorado water resources → Scarce and contested

* Over-allocated
  * Volumes → Heavily weather/climate-dependent
  * Complex layers of senior/junior rights and specific designated uses for water
    * (Jones and Cech, 2009; Schorr, 2012)
Sociological Responses – Divided Public, Corrosive Communities

**Supporters:**
- Bridge Fuel, climate friendly
- Reduces coal consumption
- US energy independence
- Jobs

**Opponents:**
- Environmental health and implications
- Boom-bust cycles
- Not climate friendly (methane and fugitive emissions)

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Environmental and Health Concerns

- Environmental / Water Concerns
  - Chemicals used?
  - Water pollution and flowback fluid storage/spillage
  - Air pollution
  - Earthquakes

- Health
  - Water pollution and human health outcomes...
  - Methane emissions/air pollution
  - Stress / Long-term impacts to quality of life (NIH)

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Energy, Water, and Ag Nexus

- Unconventional O&G production’s demand for potable water intersects with demands for water from agriculture (dominant) and municipal uses (growing) in northern Colorado

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1) How have various institutions and groups allocated water for unconventional O&G production in northern Colorado?
2) What do reallocations look like on the ground?

And what role have different institutions/actors played?
* 3) How socially sustainable are these shifts in resource allocation, especially as multiple modes of NR dependence intersect?
Multiple methods for triangulation
- In-depth Interviews (N=40)
- Ethnographic data collection/farm and company visits
- Participant Observation
- Archival/Regulatory Analyses
While industry may consume small percentage of state’s water, the industry overall has substantial and important impacts on Colorado water markets.

Even impacts access to markets and designation of water rights in long term.

Water to extinction also removed water from hydrologic cycles (and from future access).
“The oil and gas people can essentially set the market price to lease shares of water. And the price of rental water has gotten so high, especially in dry years, that only oil and gas companies can afford it. Farmers especially are priced right out.”

--Colorado water market expert & Conservancy District board member
Unconventional O&G industry needs land and water to operate

Approach (Weld County) farmers/ditch companies or municipalities to buy/lease shares of water

Industry now more likely to approach farmers/ranchers/ditch companies than towns
  * New water purification technologies
  * Public controversy
  * Want to own wells drilled in to non-tributary aquifers

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“We see Colorado farmers and ranchers as our partners in this new economy here in Colorado. We have made an extraordinary effort to develop agreements with farmers that are quite beneficial to them because we depend on what they can offer us – or not.”

--Noble Energy Water Resources Energy Manager
Ditch companies → mediate needs of their farmer member-owners and the wealthy O&G industry

- Many companies above DJB have leased “right color” water to O&G companies if excess supply available
- Have leased space, facilitated transportation of other water through their ditches, gates
- Or lease storage space in reservoirs

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The ditch companies – and shareholders – benefit immensely from these informal subsidies.

“We have been able to waive assessments for our shareholders, pay for and execute damages to our infrastructure from the 2013 floods, and invest in new equipment and other improvements due to lease monies coming from the oil and gas folks.”

--Manager of a Northern Colorado Ditch Company
Strategy #1:
- Shorter-term leases with farmers/municipalities for land and water, pipeline space
- Want to move water using pipelines rather than trucks
- Use relationships with farmers to secure land

Strategy #2:
- Buy tracts of land with (senior) water rights attached
- Lease farmland to access non-tributary groundwater
  - Corp gets water right but “in family’s name”
Strategy #1: Informal subsidies benefit farmer

“There is no more adaptable creature than the farmer. And farmers here have adapted to this industry because it gives them some relief from all the pressures they face as they try to sell commodity crops that have been bringing in no money.”

--Conservancy District Director

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Strategy #2: O&G companies become landowners/rights-holders **and** lease land/water from farmers

“We’re trying to be aware of our water and land holdings but also cultivate a strong ag-energy-community relationship.”
Looking Ahead... Booms and Busts

- Is this a sustainable model for actors, institutions, the industry?

- Boom/bust economies intersect in Weld County (ag and O&G production)

- Ditch company “dependence” on O&G income → temporary, unstable

- Farmer/rancher “dependence” on O&G income → temporary, unstable

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Danger of perpetuating overlapping “addictive economies” due to normalization of industrialization and privileging of (free) market systems

Parallels in Pennsylvania
- Informal subsidies from leases/bonuses acted as subsidies
- Already busting in NE PA
- Some farmers not paid or lost certification

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Next Steps, Future Research

* 5-10 more interviews! More ethnography!

* Monitor boom/bust effects over time and across sector

* Monitor effects of wet/dry years over time and across ditch company