Community Information Sharing and Induced Seismicity

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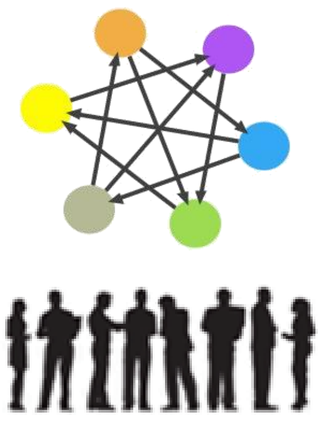
Project Overview

Research Summary

This work seeks to understand ***how groups and individuals in communities experiencing induced seismicity evaluate and share information*** regarding the earthquakes and the oil and gas development activities associated with the quakes.

Our multi-phased approach accomplishes this through: (1)interviews with community stakeholders, (2)webcrawling social media networks, (3)conducting a household survey, and (4) testing and disseminating the findings of fellow CCIS researchers.



Research Questions

(i) *Who are the **actors and groups** that are mobilizing at the community level in **support of** or in **opposition to** the oil and gas development activities associated with induced seismicity?*

(ii) *Who is central to the debate? What are the characteristics of information sharing networks that develop?*

(iii) *What **information** about risks associated with these industrial activities, and specifically induced seismicity, is **used and disseminated** to support groups' interests and position?*

(iv) *What **sources** of information are seen as **trustworthy, knowledgeable, and legitimate**? What about these sources influences how community members perceive them?*

(v) *How is the **information** about risks of induced seismicity generated from this research **adopted and disseminated** within these community knowledge-sharing networks?*

Phase 1: Interviews

What We've Done:

Conducted interviews with community members in Edmond and Fairview, OK, and Weld County, CO, seeking to understand where people receive information from, how individuals evaluate information and sources, and their beliefs regarding the cause of the quakes. Used qualitative coding techniques to analyze these data.

What's Next:

- Interviews helped shape the household survey (see Phase 3).
- Targeted interviews will follow as needed based on the results of Phase 2 and Phase 3.

What We Found:

- Disconnect between experts and lay people: academics, oil and gas pros. value and share complex technical information, which lay people can't understand; some in scientific community did not see use in tailoring their message to be more accessible.
- People valued sources and their information based on trustworthiness, accessibility, and assessed subject expertise.

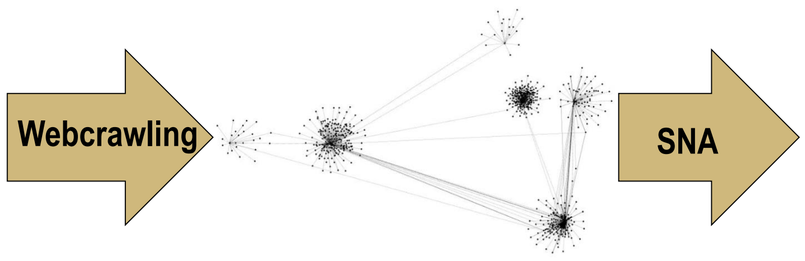
Phase 2: Webcrawling

Goals of Webcrawling

- Identify information-sharing networks online
- Identify central individuals
  - Target for follow up interviews and dissemination
- Analyze information being shared through these networks

Process

Publicly available Twitter and Facebook data



- Central Actors
- Network Structure
- Subgroups
- Frequently Shared Stories and Information

Preliminary Results

- Spike in mentions of the quakes and their causes after an earthquake
- Twitter network becomes *more* disconnected, despite shared topic of discussion
- Facebook data collection ongoing; current results show small overlap in groups discussing topics related to quakes
- Further analysis will help address Research Questions i, ii, and iii.

Phase 3: Household Survey

Survey Development

- Questions and hypotheses based on literature, interview work (see Phase 1)

Hypotheses explore multiple factors:

- Source credibility, trust, legitimacy
- Frequency of interaction with source
- Factors contributing to earthquakes
- Perceived benefits and risks of oil and gas development

Timeline

- Pilot used to determine most effective approach

Pre-Test Schedule

Approach #	Step	Week 1	W2	W3	W4	W5	W6
1	Solicitation Letter	■	■				
	Follow up w/$2 Incentive			■	■		
	Final follow up					■	■
2	Solicitation letter w/$2 Incentive	■	■				
	Follow up			■	■		
	Final follow up					■	■
3	Solicitation Letter	■	■				
	Survey Booklet w/$2 Incentive			■	■		
	Follow up letter					■	■

- Results of pilot will drive final data collection
- Data collection expected to be complete Jan '18

Expected Contributions to Project

- Addresses parts of Research Questions i, ii, and iv.
- Helps determine typologies of individuals and identify ways to distribute findings pertaining to Research Question v and Phase 4.
- Addresses factors that impact support and opposition to oil and gas development, impact of earthquakes.

Phase 4: Testing and Dissemination of Information

Current Plans & Goals

- Using the findings from phases 1-3, we will seek to determine best ways to present and disseminate findings of CCIS.
- Test methods for accessibility, legitimacy, and trustworthiness of results based upon identified typologies.
- Currently determining whether to use experiments (pre-/post- tests); policy capturing; or communication design.

Proposed Methods

- Distribute findings after testing through social media
  - Central individuals, boundary spanners
  - Can track shares, comments, reactions/favorites
- Set up website hosting articles
  - Can track hits, where users came from, possibly IP information
- Proposed Methods are a work in progress, any and all feedback and suggestions are welcome!