

Introduction

Secondary sources are increasingly popular sources of network data. They are promising sources of longitudinal, historical network information that allow researchers to avoid non-response bias and recall error. We map information-sharing relationships among participants in local government policymaking about high-volume hydraulic fracturing (fracking) in the State of New York, 2008-2014, using two different data sources: newspaper articles and public archival documents. We use an original computer program and social network statistics to identify similarities and differences in the municipal networks produced by each technique, and explore the benefits and drawbacks of using these different secondary sources to estimate networks.

Materials and Methods

We analyze 45 pairs of municipal fracking governance networks. In each pair, one network is constructed from local newspaper accounts of local events where fracking activism, debates, and policymaking occurred (e.g., hearings, rallies), while the other is constructed from documentation of discussion about fracking at the municipality's monthly or bimonthly public meeting of its legislature. We used articles from 64 local newspapers, linked to municipalities by status as newspaper of record or by evidence of local coverage. Articles were identified via an automated and manual application of a customized search protocol involving keywords and municipality names. Public meeting minutes were downloaded from web archives and/or requested pursuant to the state's Freedom of Information Law.

In news articles, pairs of actors attending the same fracking-related event (e.g. city council meeting, film screening) were assigned an undirected tie. In public meeting minutes, ties were inferred among actors documented as participating in fracking-relevant discussions or actions.

We compare pairs of networks describing the same municipality but estimated using different data sources. We also compare within and across pairs the presence and position of policy entrepreneurs, individuals identified in a 2014 statewide survey of municipal clerks (31% response rate, n=481) as playing a key role in fracking policymaking in the municipality (Arnold et al. 2016). An original program, written in Python, returns information on common actors and relationships in pairs of networks.

Acknowledgments

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Results

Table 1. Comparing Network Content

	Meeting Minutes Networks Mean (Min - Max; SD)	Newspaper Networks Mean (Min - Max; SD)
Number of unique nodes	45.6 (8 - 117; 32.6)	44.2 (6 - 164; 38.6)
Number of unique ties	643.6 (24-3025; 782.4)	253 (9-975; 237.5)
Policy entrepreneurs found	77.5% of all anti PEs 73.9% of all pro PEs	50% of all anti PEs 43.5% of all pro PEs
<i>Shared features</i>		
Node overlap (count)	6.5 (0-32; 7.3)	
Tie overlap (count)	9.3 (0-82; 17.8)	

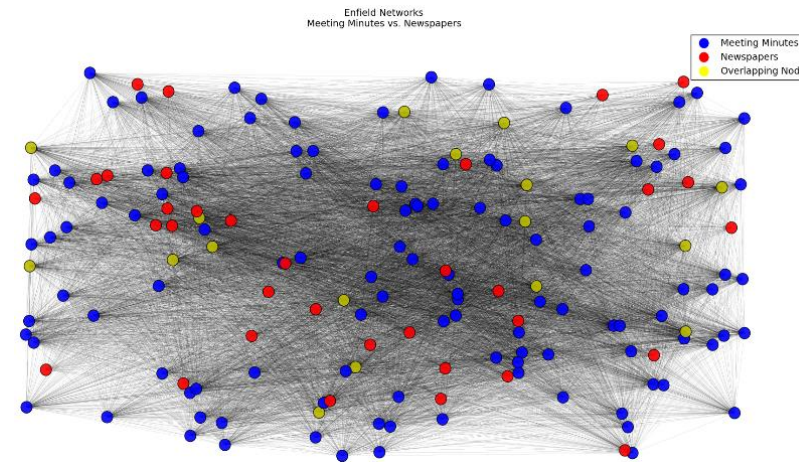


Table 2. Comparing Network Structure

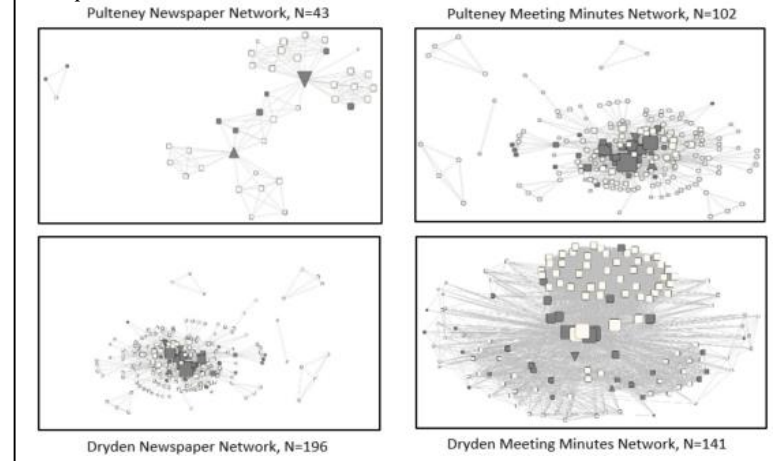
	Meeting Minutes Networks Mean (Min - Max, SD)	Newspaper Networks Mean (Min, Max, SD)
Nodes	52.2 (8 - 141; 36.6)	50.7 (7 - 196; 42.5)
Ties	652.9 (24-3106, 792.2)	262.3 (9-977, 244.313)
Components	1 (1-2, 0.1)	3.5 (1-8; 3.8)
Average geodesic distance	1.6 (1.1 - 2.0; 0.2)	1.7 (1-3.3; 0.7)
Graph density	0.43 (0.21 - 0.89; 0.17)	0.28 (.04-0.63; 0.17)

References

Arnold, Gwen, Le Anh Nguyen Long, and Madeline Gottlieb. 2016. "Social Networks and Policy Entrepreneurship: How Relationships Shape Municipal Decision Making about High-Volume Hydraulic Fracturing." *Policy Studies Journal*, DOI: 10.1111/psj.12175.

Results

Node size indicates degree centrality. Overlapping nodes are gray. Anti-fracking policy entrepreneurs (PEs) are downward triangles; pro-fracking PEs are upward



Key Findings

- Overlap (common nodes and ties) is variable but overall low.
- Newspaper networks tend to be bigger.
- Meeting minutes (MM) networks tend to be more integrated.
- MM networks have many more unique ties.
- Policy entrepreneurs were more consistently found in MM networks, where they had higher degree centrality.

Next Steps

- Examine how contextual variables map to actor engagement in networks.
- Examine the roles (occupations) of overlapping and unique nodes.
- Register ties that were supportive or antagonistic as such.
- Explore the potential connection between network data source and venue type, and whether a node's presence/role in networks emphasizing different venues can indicate venue-shifting.

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