Implementation of FracTracker.org: A GeoWeb platform to manage and communicate shale gas information

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Background

Natural gas drilling in shale formations worldwide employs relatively new extraction techniques and has incited extreme pro- and anti-drilling sentiments. The influx of natural gas drilling in the Marcellus Shale (See Figure 1.) of the northeastern United States necessitates better-informed decision-making, especially because of the potential challenges presented by this developing industry.

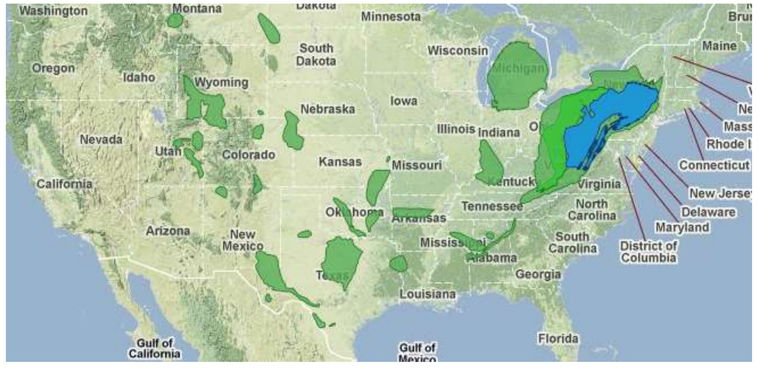

Figure 1. All shale gas plays in the continental U.S. The Marcellus is highlighted in blue. Snapshot created using FracTracker's DataTool (data.fractracker.org)

Data & Information Gaps

Prior to the inception of FracTracker in June 2010, valid data and information were difficult to access in the public realm. Regulation was based on more traditional approaches to gas and oil drilling, and it did not specify electronic data collection, storage, and dissemination procedures. Some industry data, such as field violations, were recorded on paper by the Pennsylvania Department of Environmental Protection (PA DEP). Other types of public data were simply difficult to access.

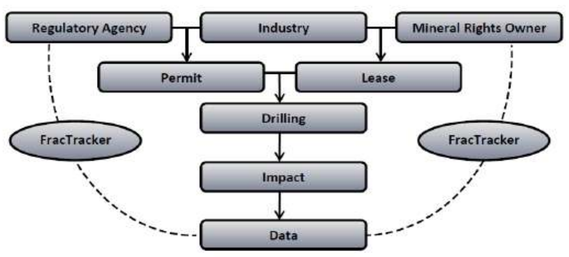

Figure 2. The process of obtaining drilling permissions in PA, including data feedback loops. FracTracker intervenes primarily during the exchange of data between drilling, regulatory agencies, and mineral rights owners (Michanowicz, et. al, 2011).

To connect data-owners to information-seekers, we developed FracTracker.org. (See Figure 2.) FracTracker is a collaborative GeoWeb project that incorporates an online data-mapping tool (the DataTool) and weblog to encourage the identification of spatial patterns that could indicate environmental and public health threats.

Implementation Methods

FracTracker was implemented in three stages in the Marcellus field using:

1. Meetings with community gatekeepers such as the PA DEP, PA Fish and Boat Commission, and PennDOT
2. Informational and training-based stakeholder meetings with groups such as PennEnvironment, Trout Unlimited, and Dickinson College
3. Public-private partnerships, e-communication campaigns, and training webinars

Results

Since its inception, project partners have held over 85 events involving FracTracker across 5 states with over 130 unique groups. These events are being supplemented by a new consultant in New York State to further expand the project's geographic reach.

FracTracker's blog has been visited 20,000 times by people from 85 countries. DataTool usage shows approximately 83,000 distinct visits from 104 countries. Presently there are 1,800 registered users on the DataTool. CHEC has also conducted three training webinars and distributed three e-newsletters to improve upon users' self efficacy. (See Figure 3.)

FracTracker is also being utilized by various media sources, such as the Pittsburgh Post-Gazette's Pipeline project, to inform their readership of natural gas drilling issues. (See Figure 4.) This collaboration will increase the reach of FracTracker; the PG's daily audience is 200,000 for their print articles and 1 million for their website (Pittsburgh Post-Gazette, 2009). Similar outreach collaborations with other media outlets are currently in discussion.

Figure 3. Screen shot of FracTracker's second E-Newsletter (tinyurl.com/3oes9os)

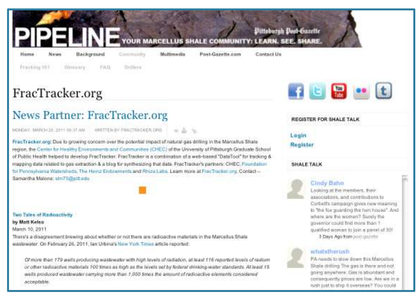

Figure 4 Screen shot of Pittsburgh Post-Gazette Pipeline collaboration (website) (shale.sites.post-gazette.com)

Conclusions

FracTracker exhibits significant potential to improve shale gas data and information sharing and decision-making on a large scale. User responses indicate that this tool can provide valuable, difficult-to-find information but that additional user interface design research needs to be conducted to improve the usability of the DataTool. CHEC is also considering building the blog into a larger, more categorical, website in order to better-store qualitative data.

Public Health Implications

FracTracker can be used to compare data and identify spatial patters related to the natural gas industry to better understand the span of social, economic, land use, political, environmental, and public health considerations. (Ex: Figure 5 and Figure 6.)

Figure 5. Snap shot created using the DataTool overlaying Marcellus well permits (yellow dots), wells drilled (blue dots) and poverty rates in Southwestern PA (shades of red). Notice the high concentration of wells in Greene and Fayette counties.

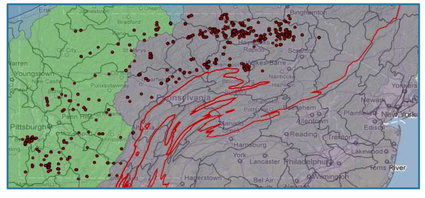

Figure 6. Snap shot created using the DataTool. Each dot represents a location of a Marcellus Shale violation. The Marcellus Shale formation extent is outlined in red. Watershed regions include the Ohio (light green), Atlantic (purplish gray), and Great Lakes basin (bluish green).

FracTracker has spawned numerous collaborations and networking among geographically-scattered entities. Continued preparation and prevention of potential impacts are essential since unconventional energy extraction is still in its infancy worldwide. FracTracker has the potential to aid in this endeavor by increasing access to credible information, reducing environmental injustices, and informing better decision-making to prevent negative impacts on public health and the environment.

FracTracker Partners

- Center for Healthy Environments & Communities (CHEC), University of Pittsburgh Graduate School of Public Health: chec.pitt.edu
- Rhiza Labs: rhiza.com
- Foundation for PA Watersheds: pennsylvaniawatersheds.org
- The Heinz Endowments: heinz.org

References

- Michanowicz, D., Malone S., Kelso, M., Christen, C., Volz, C.D. (2011). Utilizing Web-Based Public Participation Geographical Information Systems: Filling Gaps of the Marcellus Shale Natural Gas Industry. 2011 International Conference on Society and Information Technology, Orlando FL.
- Pittsburgh Post-Gazette. (2009). "Media Kit." ABC Audit. Accessed 4-1-11: www.post-gazette.com/mediakit/14.asp