

Abstract

The US EPA has spent more than three decades regulating and helping clean up leaks from underground storage tanks (USTs) but the EPA has a complicated regulatory relationship with federally recognized American Indian tribes. While progress has been made in leak prevention, health effects of UST leaks on residents of tribal territories remain not well studied. In this paper, I modify a model of UST leak effects on housing prices to estimate health outcome differences between residents in and out of federally recognized lands. I find an increase of 15% in annual hospital visits and 11% sick days taken.

Data

Underground Storage Tanks (USTs) can contain many different products, including nuclear waste.[1] However, since only petroleum and hazardous materials are federally regulated in USTs, and most USTs on tribal lands in the US contain petroleum products, I will narrow the scope of this proposal to leaks from petroleum USTs. The challenging data to collect for this analysis would be household level health indicators.

Cursory analysis can begin with the leaks data, geographic boundaries of tribal lands, and health data. Namely:

- Leak location
- Leak start date
- Leak end date (date the tank is stopped from leaking)
- Leak clean-up end date (date the leaked petroleum has been cleaned up to federal standards)
- US Tribal land geographic boundaries (shapefile) – for purposes of examining differences of enforcement, these would be federally-recognized geographic boundaries that determine how the state government views jurisdiction of regulatory authority. Much land in the US is disputed (if not legally, then on social platforms), but these would be the boundaries that the federal government recognized at the time of the leak. From what I know, these boundaries have remained relative unchanged since 1871.
- Household annual number of visits to the hospital (the year before and after the leak)
- Household annual number of visits to the doctor (the year before and after the leak)
- Household annual expenditure on medications and other health aids (the year before and after the leak)
- Household ages

There are likely many more health data that would need to be collected and I would refer to recent health economics research for that.

Analysis

The main research question is: are effects from underground storage tank leaks larger for residents of tribal lands than for other US residents? To test this, I can add a fourth layer of differencing onto Muehlenbachs et al.'s tripple difference approach [5] – a difference between residents of tribal and non-tribal lands. Muehlenbachs et al. estimated the effects of shale gas development on housing prices, however, the housing market is significantly different on tribal lands and the sale of houses is likely much more sparse. An important outcome however is health effects, so I adapt the model to estimate differential health outcomes instead of housing values. This would be differences in: time (before and after the leak), space (within and outside of 1/4 mile of the leak), drinking water supply (ground water vs. piped-supply water), and landtype (tribal land vs. not).

Framing

After a very cursory literature search, there seems to be little previous research on environmental impacts in tribal communities in the US. In particular, there seems to be little economics research on federal regulation of environmental problems caused by private entities on tribal lands. I think this paper could be positioned as joining a sparse literature of economics on how the outcomes of federal and state governments' environmental regulations differs between tribal and non-tribal jurisdictions, especially in the regulation of private firms for public health concerns.

I wanted to narrow the scope of this paper to focus on differential outcomes between state-recognized tribal territories and other US lands. There are many components to UST leaks (prevention, notification, cleanup, enforcement, licensing, effects of the leak) and a larger analysis might be able to combine some of these. At my current stage, it seems like focusing a string of papers on each part of this process would be most feasible. This paper that focuses on health impacts fits into a larger framework of understanding the parts of federal and state regulation that interact with tribal governance and sovereignty, and how this relationship and different resources spent can change environmental and public health outcomes.

References

- [1](US EPA, OLEM. “Leaking Underground Storage Tanks Corrective Action Resources.” Overviews and Factsheets, December 8, 2014. <https://www.epa.gov/ust/leaking-underground-storage-tanks-corrective-action-resources>.)
- [2](US EPA, OLEM. “Underground Storage Tanks (USTs).” Collections and Lists, December 19, 2013. <https://www.epa.gov/ust>.)
- [3](US EPA, OLEM. “Underground Storage Tanks (USTs) Program in Indian Country.” Overviews and Factsheets, December 9, 2014. <https://www.epa.gov/ust/underground-storage-tanks-usts-program-indian-country>.)
- [4](“Stanford Study Reveals the Changing Scope of Native American Groundwater Rights – and Opportunities for Better Freshwater Management,” August 3, 2018. <https://news.stanford.edu/press/view/22397>.)
- [5](Muehlenbachs, Lucija, Elisheba Spiller, and Christopher Timmins. “The Housing Market Impacts of Shale Gas Development.” *American Economic Review* 105, no. 12 (December 1, 2015): 3633–59. <https://doi.org/10.1257/aer.20140079>.)
- [6](US EPA, OLEM. “Report to Congress on the Underground Storage Tank Program in Indian Country - 2005 Energy Policy Act.” Overviews and Factsheets, January 22, 2014. <https://www.epa.gov/ust/report-congress-underground-storage-tank-program-indian-country-2005-energy-policy-act>.)
- [7](EPA, Office Of Underground Storage Tanks. “Report To Congress On Implementing And Enforcing The Underground Storage Tank Program In Indian Country.” EPA, August 2007. https://www.epa.gov/sites/default/files/2014/01/documents/rtc_finalblnkpgs.pdf.)