



RFF Research on Property Values and Truck Traffic

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and
Resources for the Future

Impact on the Housing Market

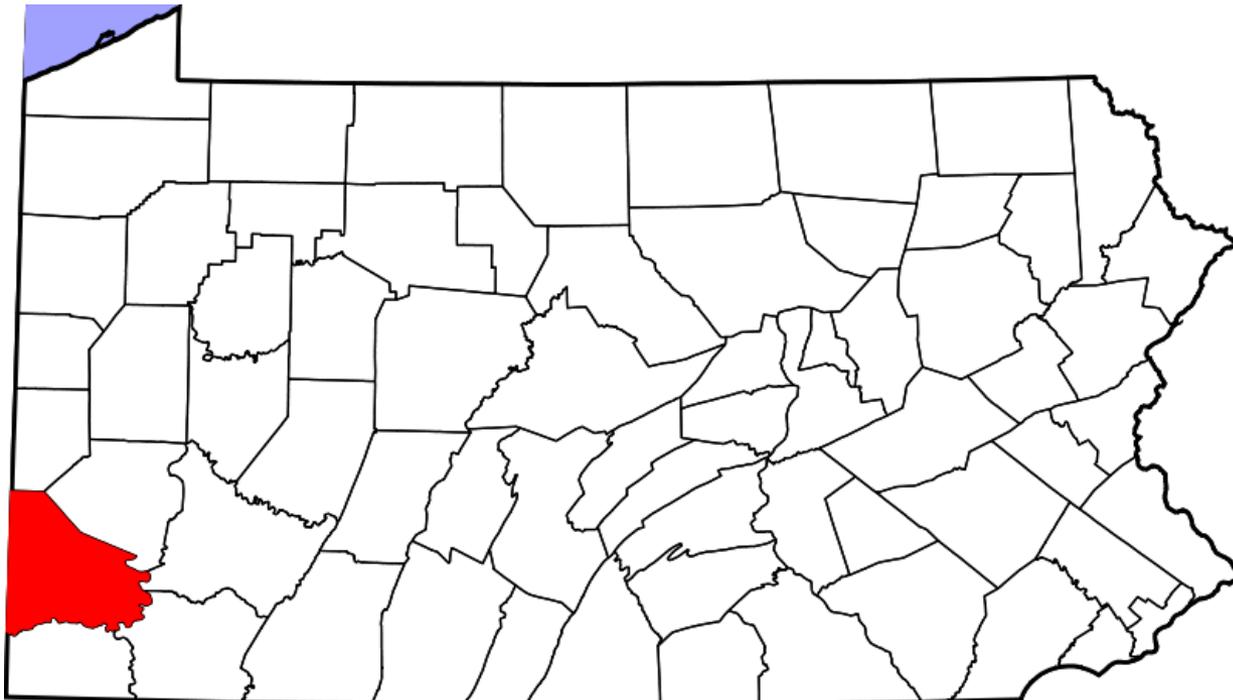
Joint work with:

Beia Spiller (Environmental Defense Fund)

Christopher Timmins (Duke University)

Previously presented:

- Washington County, PA, 2004-2009
- Housing market impacts of groundwater contamination risk

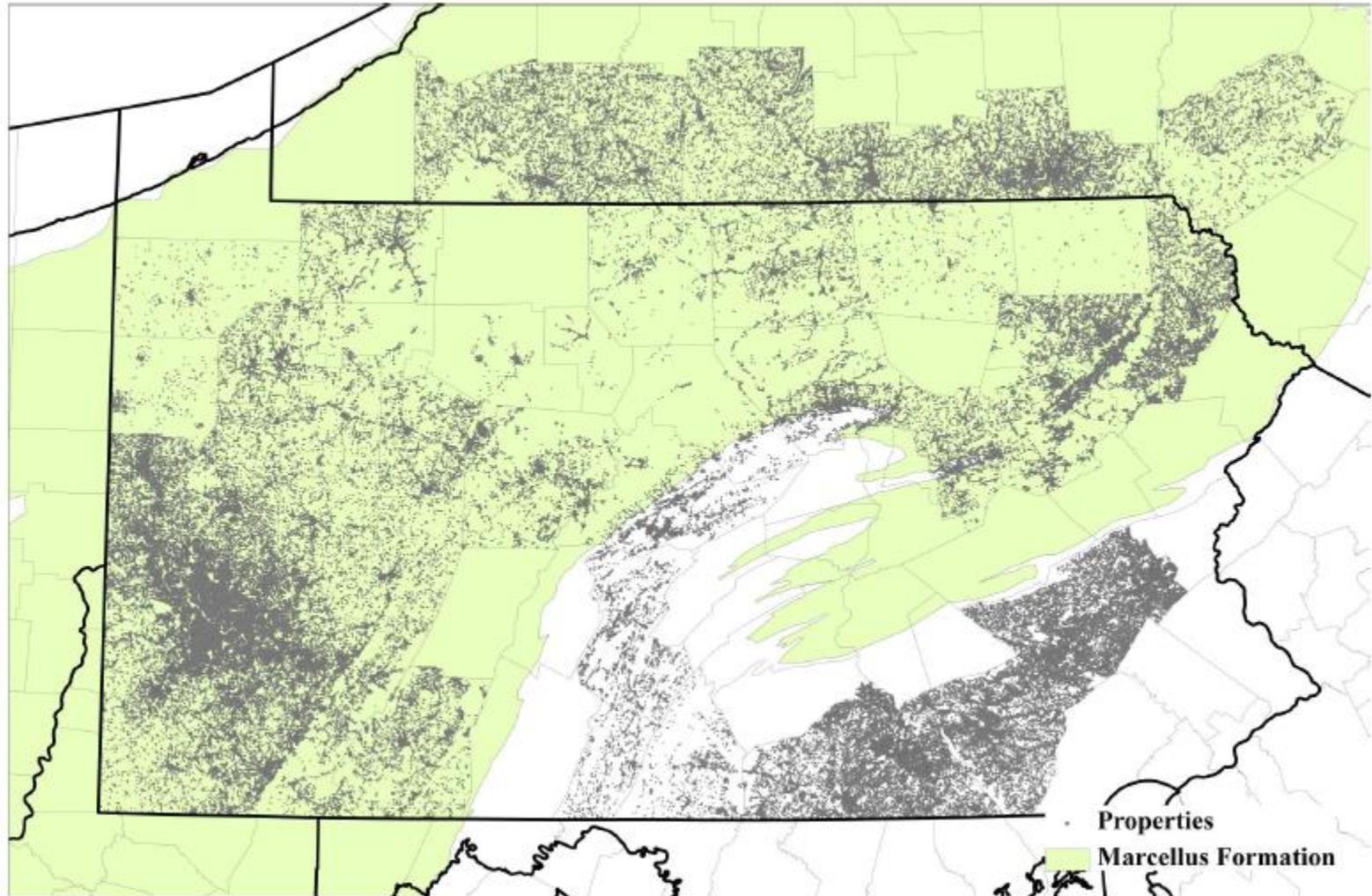


New Work:

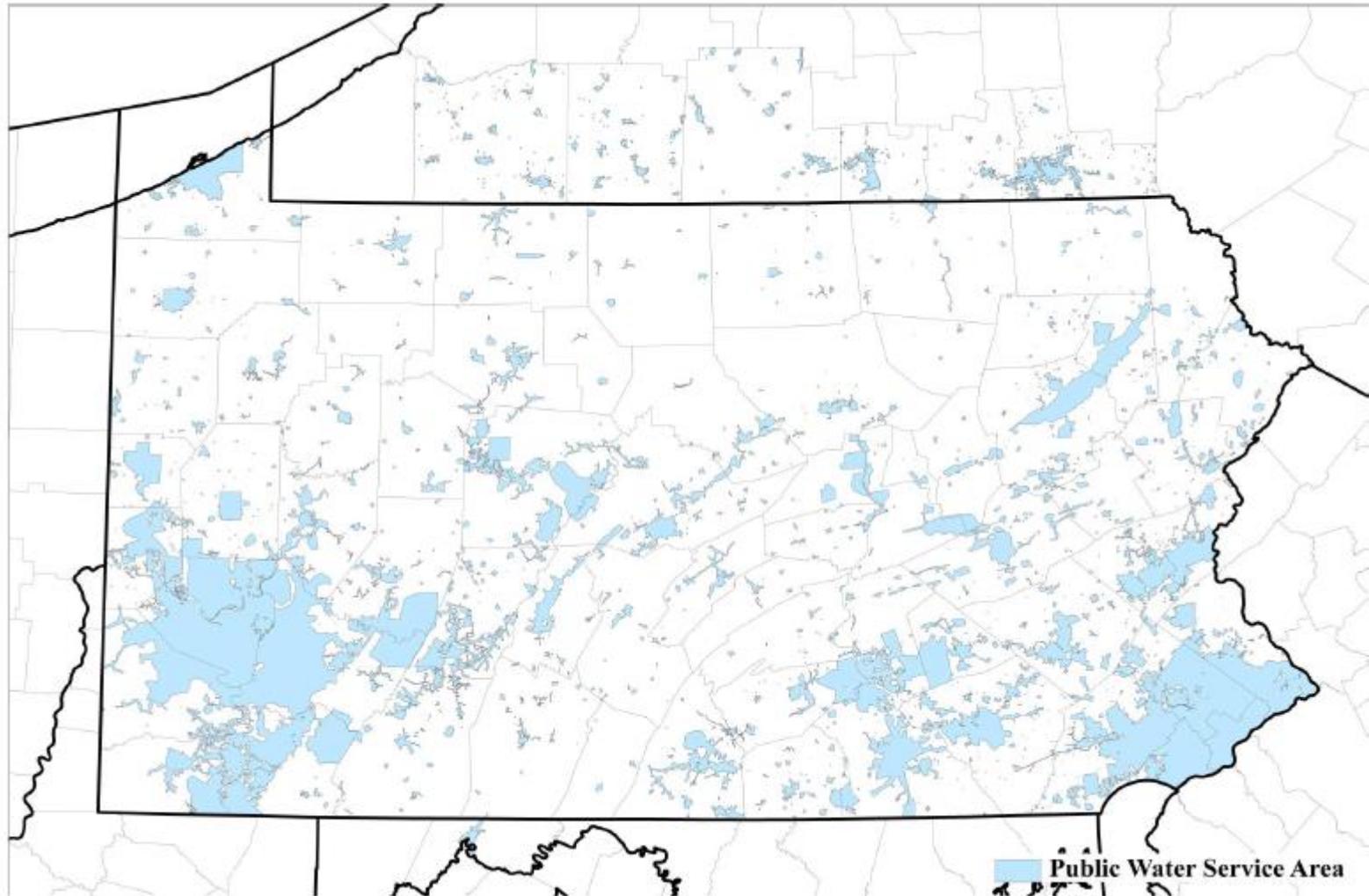
Quantify the *full* housing market impacts of hydraulic fracturing:

- groundwater contamination risk
- lease payments and other externalities associated with proximity (noise, light, air pollution, truck traffic/road damage/congestion)
- broader local economic impacts and externalities

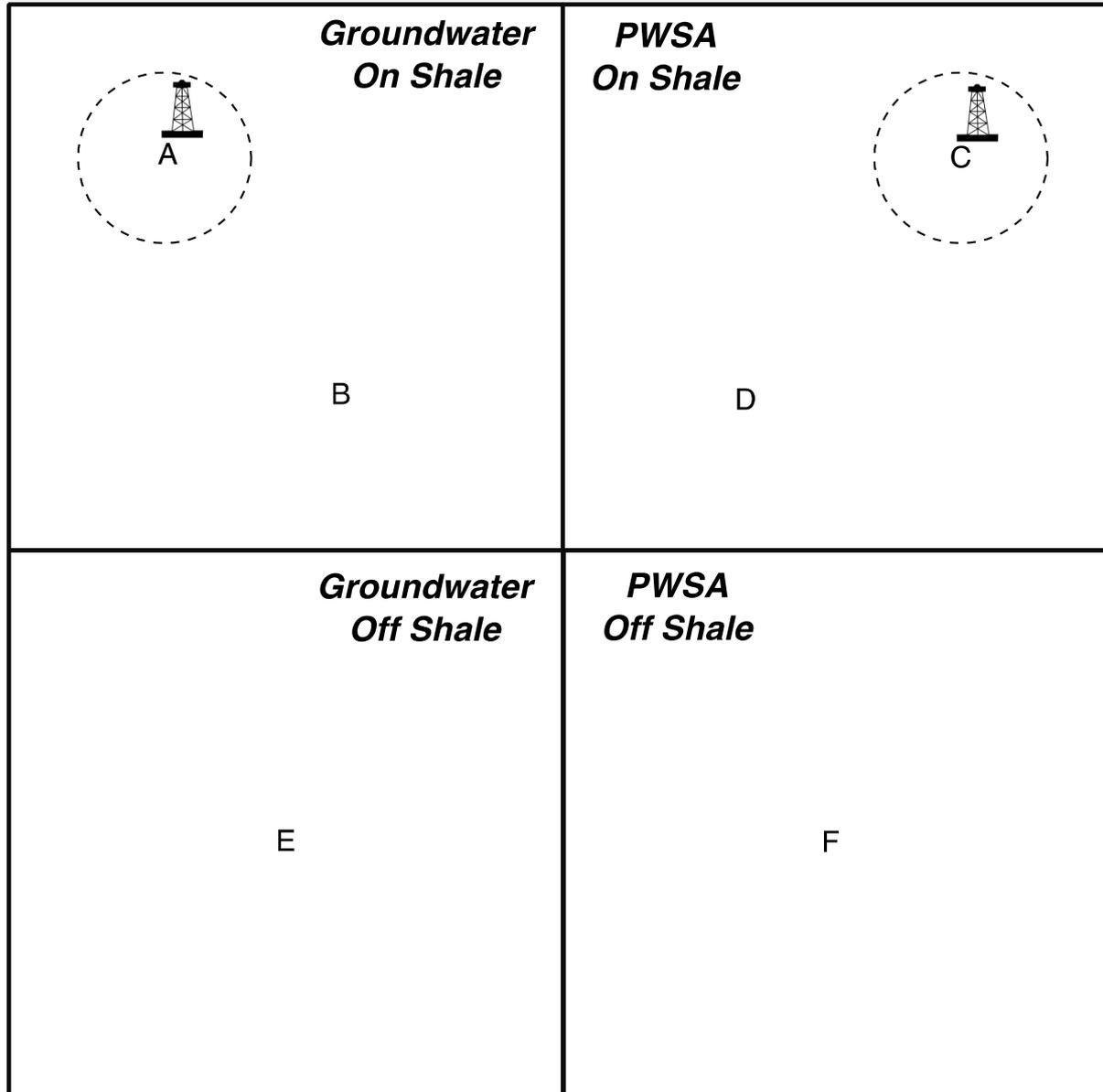
Property Sales in PA and NY, 1994-2012 (CoreLogic)



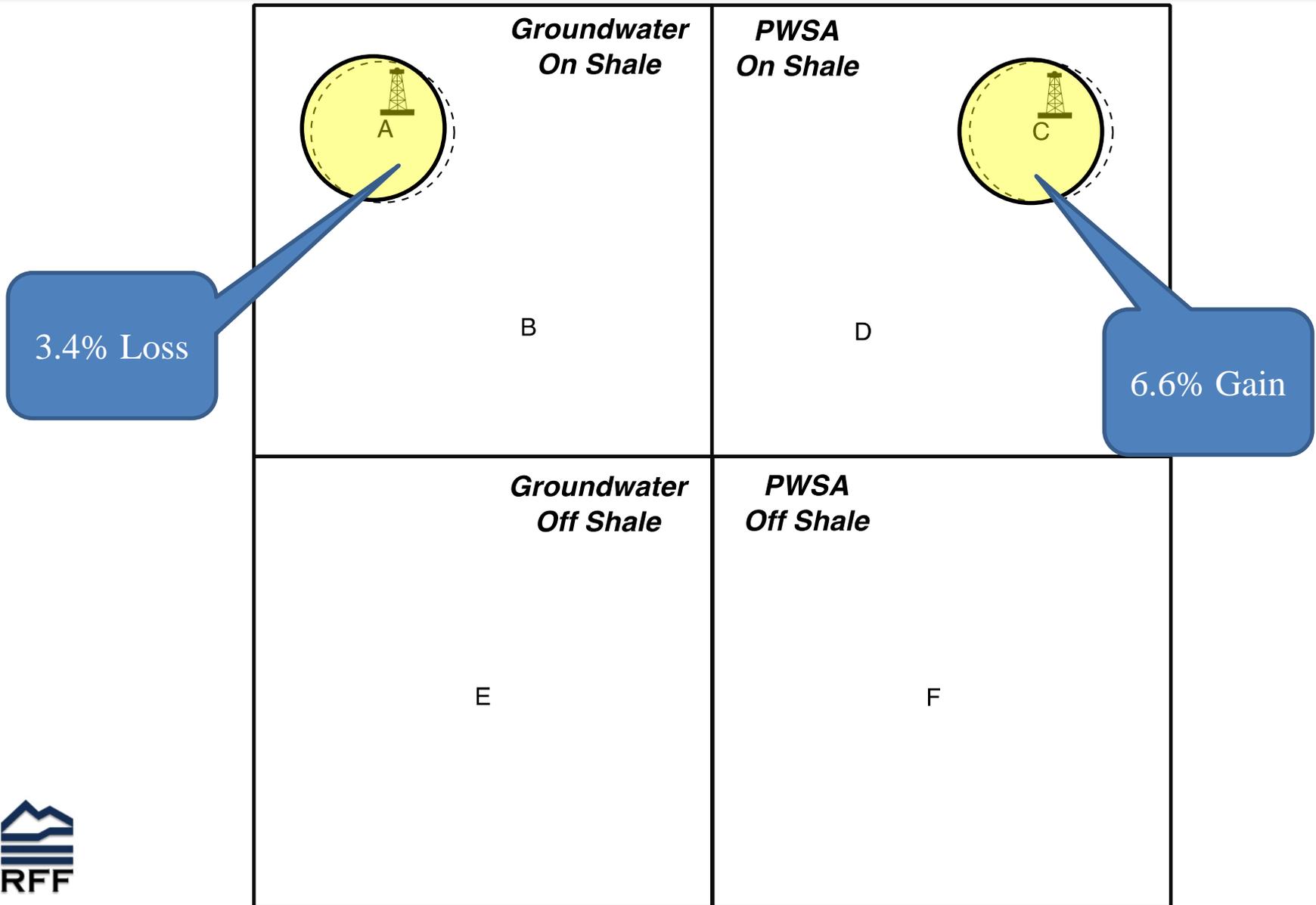
Public Water Service Areas



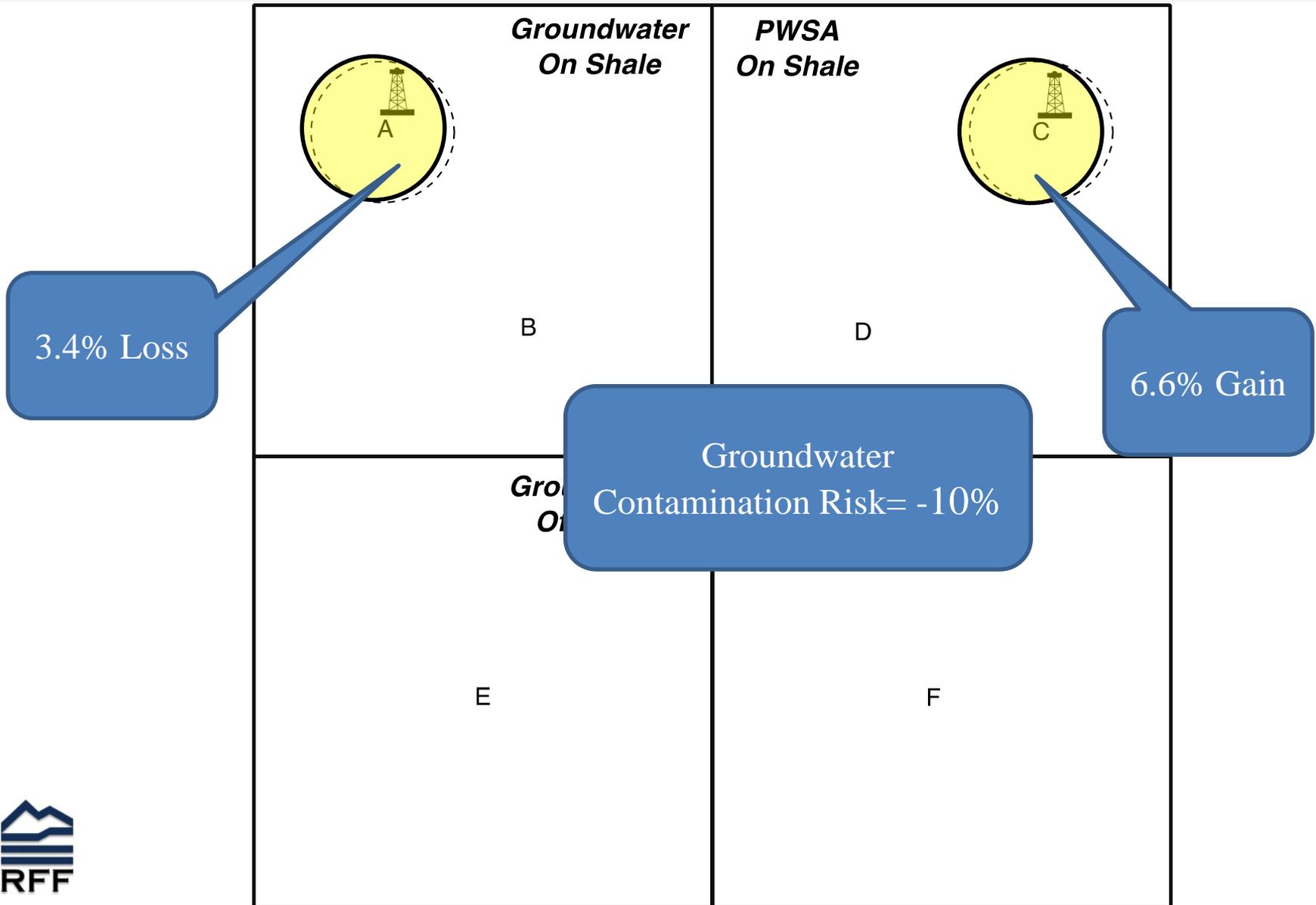
Identifying the Effects



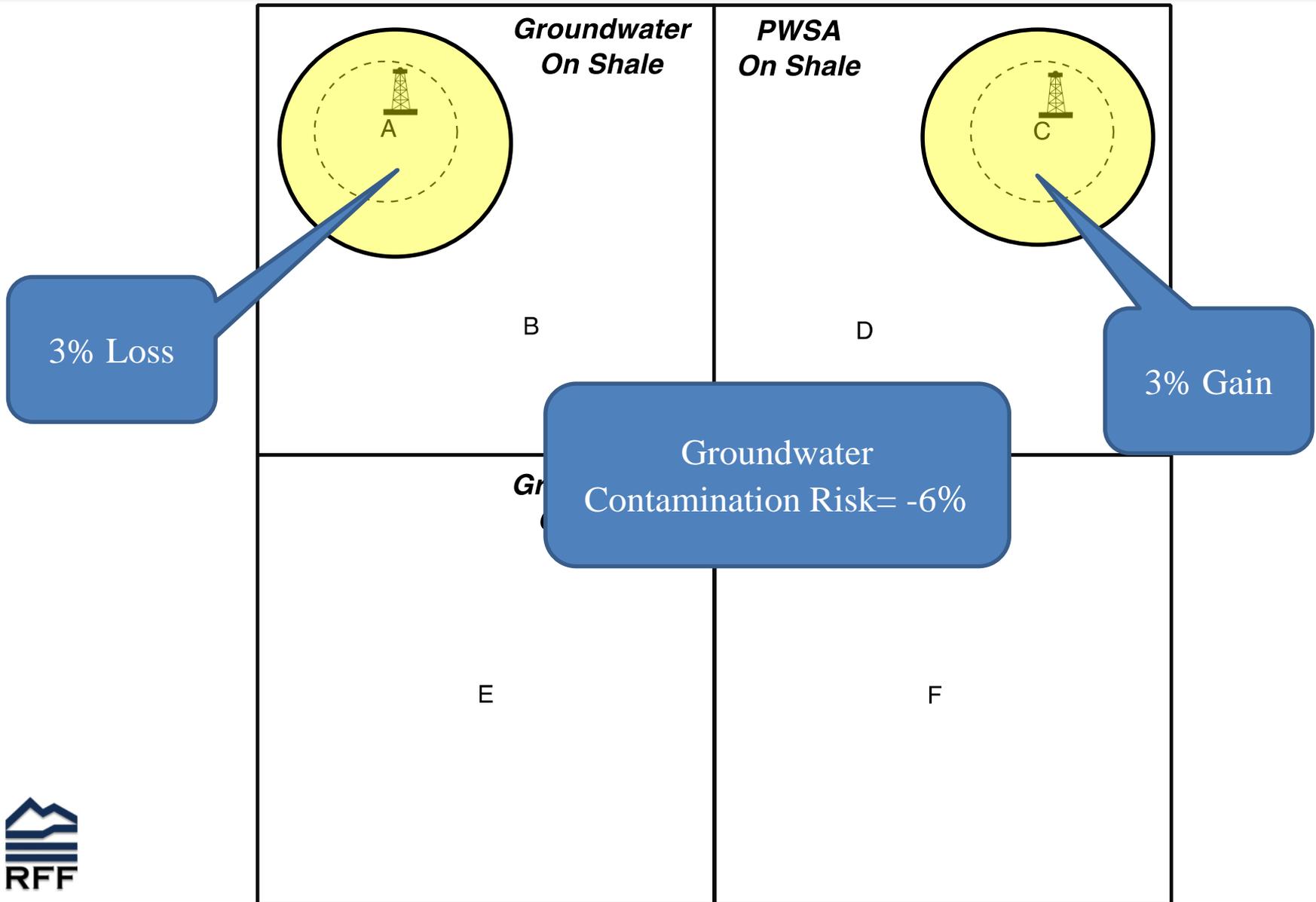
Effect of Adjacency (1.5km)



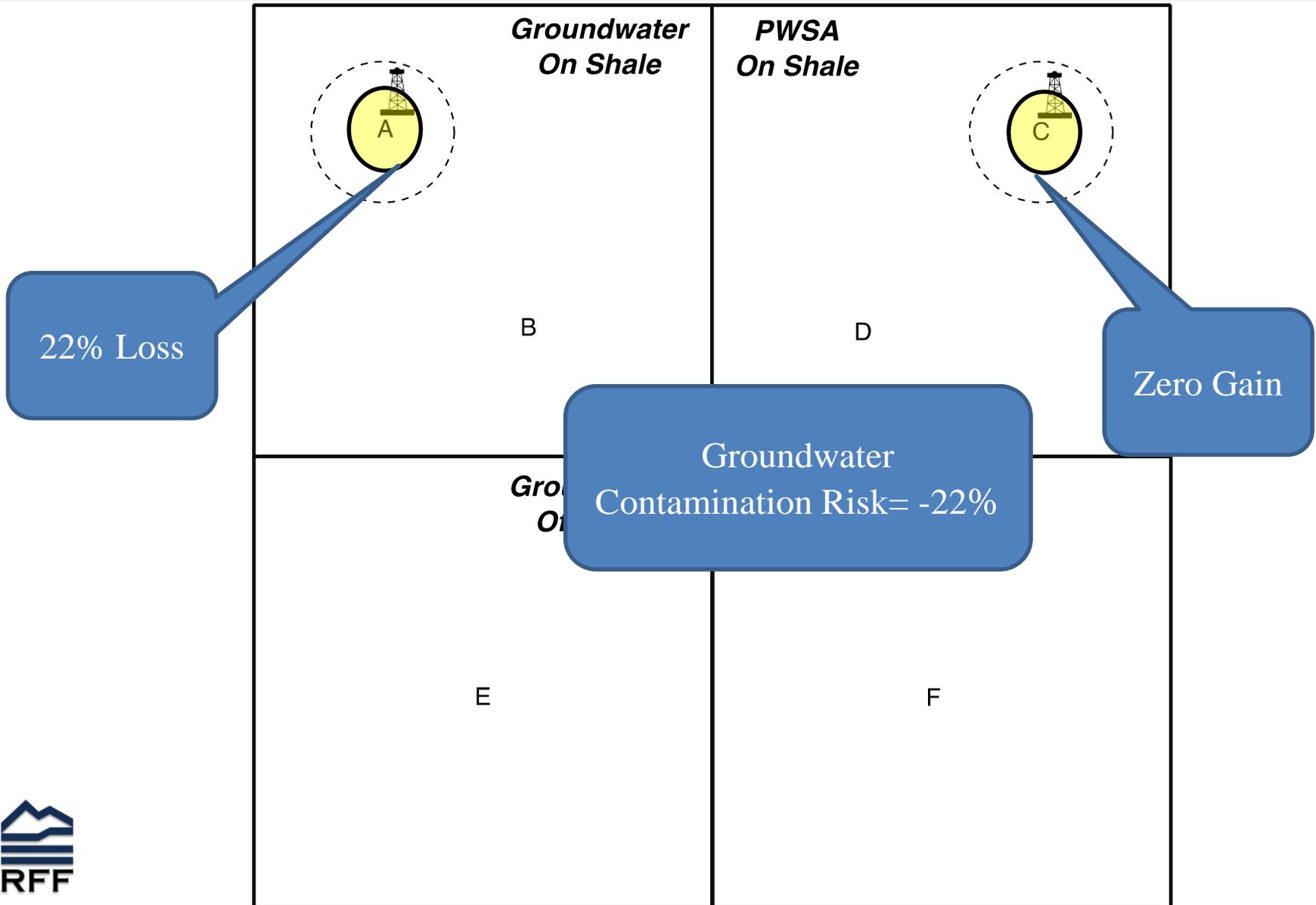
Effect of Adjacency (1.5km)



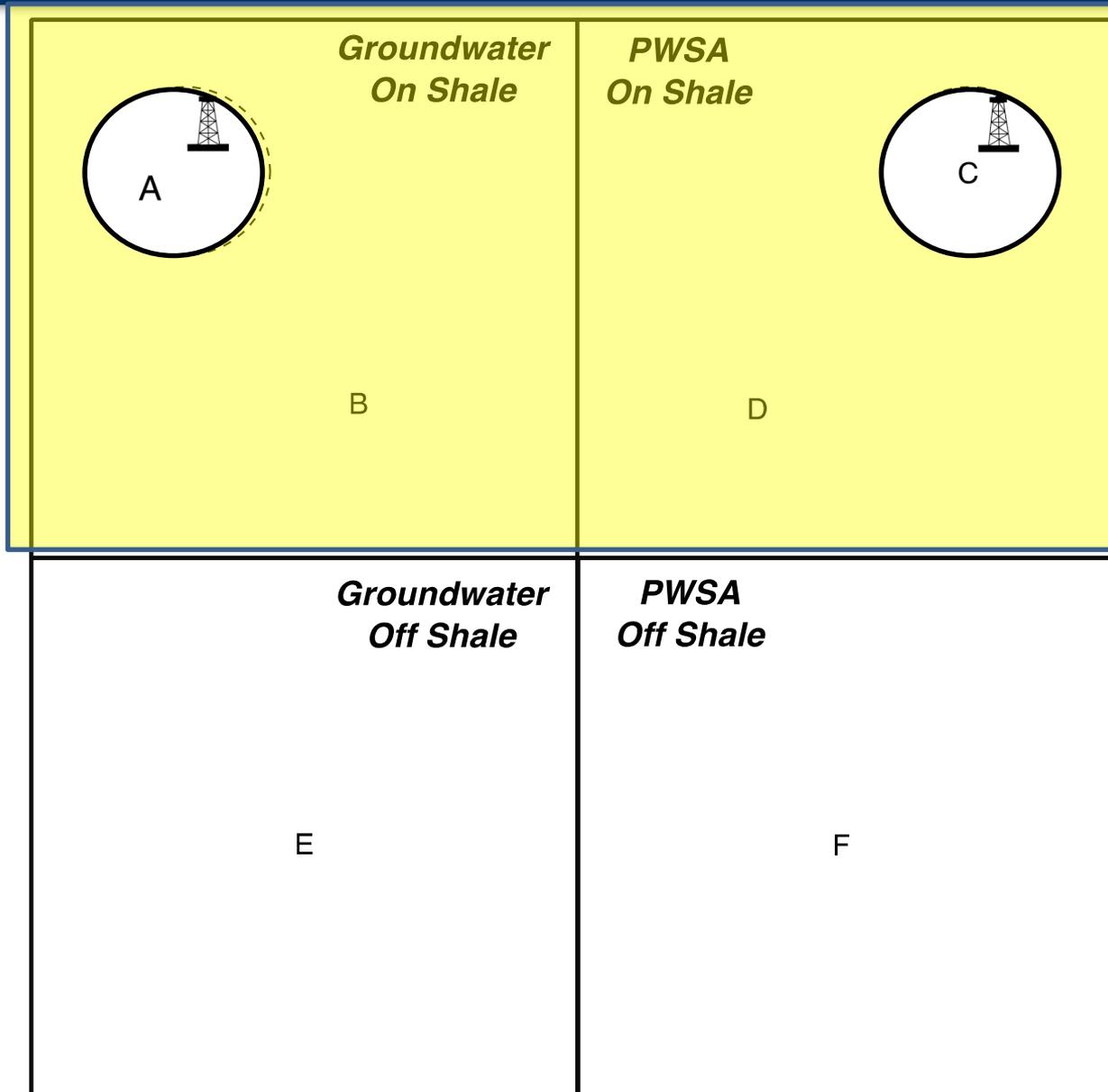
Effect of Adjacency (2km)



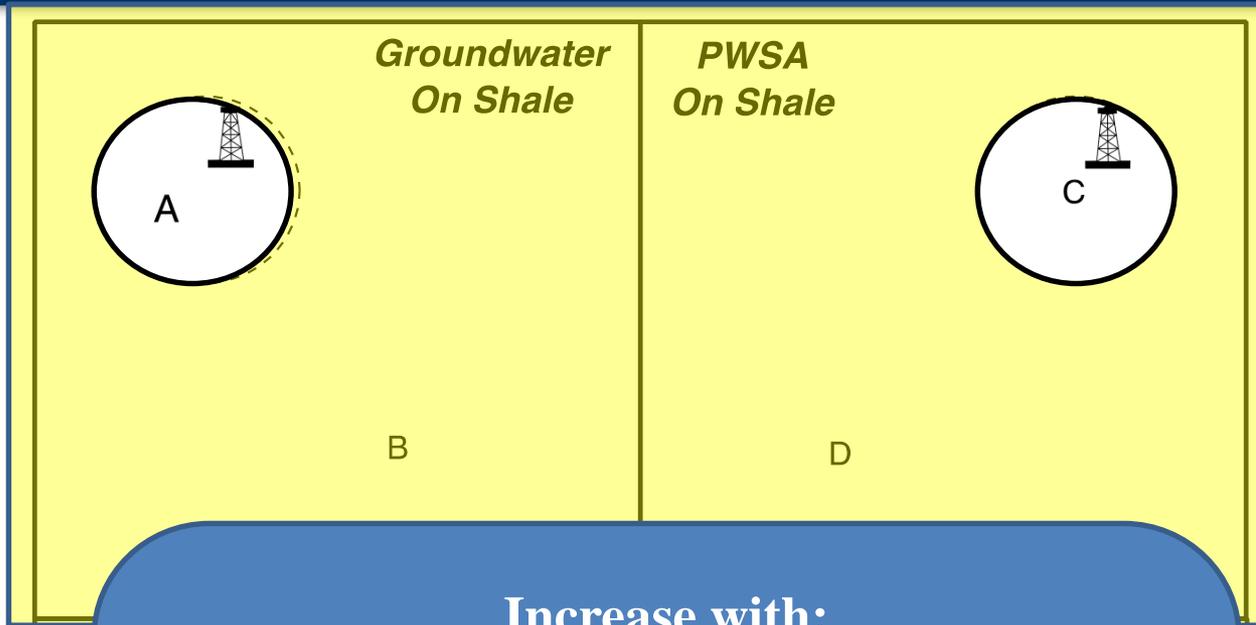
Effect of Adjacency (1km)



Effect of Vicinity (20km)



Effect of Vicinity (20km)



Increase with:

- more gas production (.3% with avg. prod.)
- new wells (2% with 10 new)
- old wells (.6% with 10 old)

Decrease with:

- old undrilled permits (3% with 10 old)
- new undrilled permits (1.3% with 10 new)

Summary

- (1) Evidence of a net-negative effect of adjacency for groundwater dependent homes.
 - Suggests costly regulations to prevent groundwater contamination may be efficient.
- (2) Evidence of a net-positive effect of adjacency when piped water.
- (3) Vicinity effects suggest modest boom/bust cycle from well bores within 20 km.

Impact on Truck Traffic on Vehicle Crashes

Joint work with:

Jessica Chu, Alan Krupnick (RFF)

Stefan Staubli (U. of Calgary and RAND)

Jove Graham, Xiaqin Tang, Jennifer Irving, Stephen Sellers,
Joshua Crisp, Daniel Horwitz, David Carey (Geisinger
Health System)

Background

Hydraulic Fracturing:

- Requires vast quantities of water and produces vast quantities of wastewater
- The water is primarily brought to and from wells via tanker trucks
- Each well might require 890 to 1,340 truck trips

Research Question

Does growth in shale gas extraction affect the number and/or severity of traffic accidents?

- Anecdotal evidence (e.g., “Deadliest Danger Isn't at the Rig but on the Road,” New York Times, May 14, 2012)
- Survey of experts: shale gas related road congestion was highlighted as a high risk by industry (Krupnick et al., 2013)

Possible mechanisms:

- More trucks on the road (increase frequency and size distribution)
- Boom town effect: more drivers and/or shift in demographics
- Shale truck traffic might be different: highway safety exemptions

Detailed Data

Unconventional wells in Pennsylvania (PADEP and DCNR)

- Location and drilling date of all shale gas wells

Traffic counts over the period 2005 to 2012 (PennDOT)

- Distinguishes between truck traffic and all other traffic

Traffic accidents between 1997 and 2012 (PennDOT)

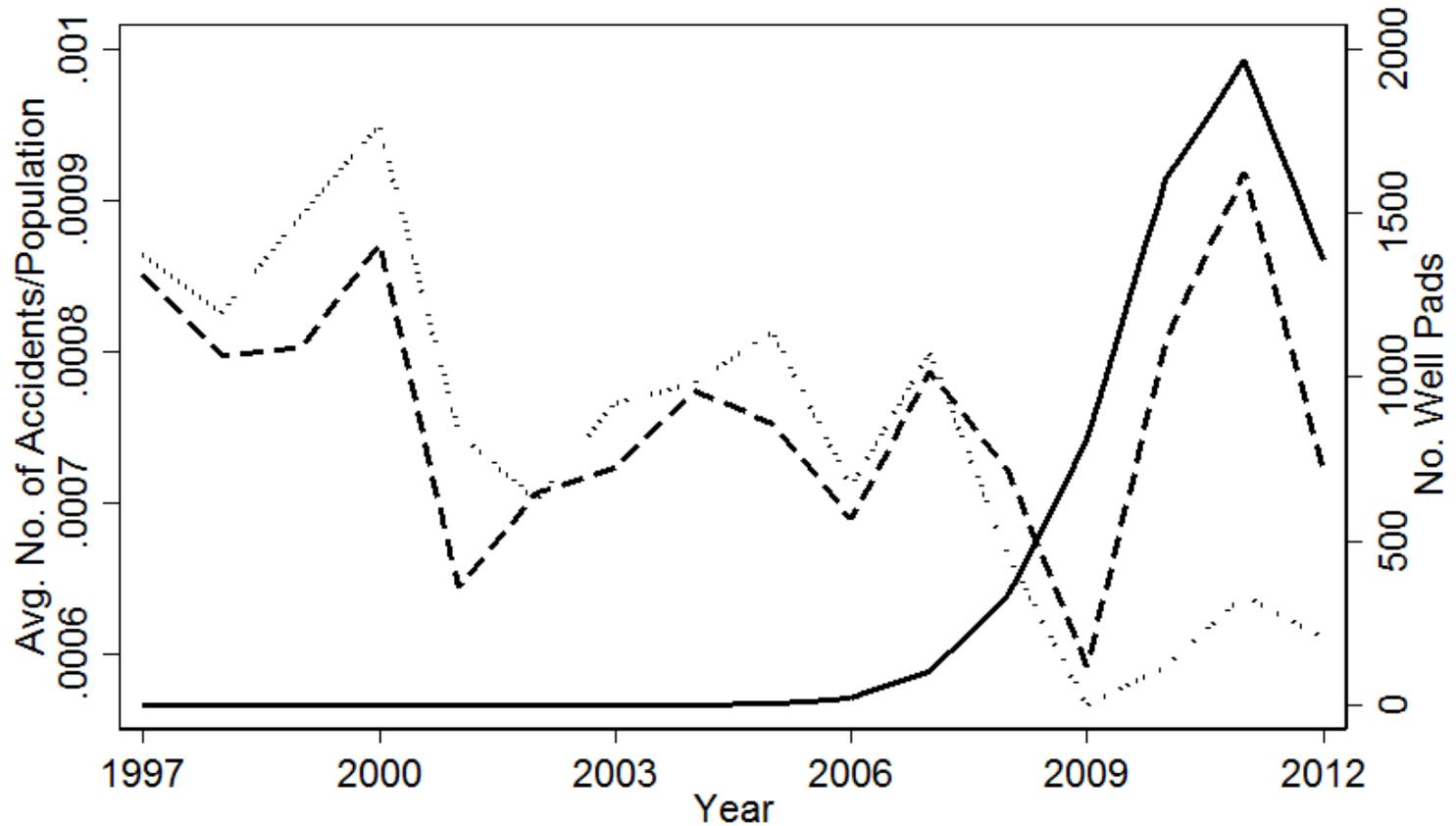
- Type of vehicles involved, exact location, time of the accident
- Severity of accident: type of injuries and number of fatalities

County level population between 1997 and 2012 (Census)

- Population counts in 10 year intervals by gender



Suggestive Evidence



- Accidents in counties with more than 20 wells
- Accidents in counties with less than 20 wells
- Well pads drilled

Findings

Exploit variation in number of wells across counties in regression:

- compare counties with wells (treatment group) to counties without wells (control group) over time
- population controls, time trends, county-level unobserved characteristics

Find an increase in:

- Accidents (.6% per well drilled in month)
- Accidents involving a truck (2% per well drilled in month)
- Percent of accidents with a fatality (1.5% per well drilled in month)

Summary

Find evidence that accidents rates and accident severity increases with shale gas development in the same county.

- Impact on emergency medical services and long term rehabilitation
- Understanding these costs could direct resources towards prevention

Thank you!

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