

# Understanding Potential Impacts on Local Communities

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Resources for the Future Webinar Series:  
A Community Risk-Benefit Matrix of Unconventional Gas and Oil Development  
June 15, 2017 | 3:30–4:30 p.m. EDT



# The Health Effects Institute (HEI)

- A nonprofit corporation chartered in 1980 as an independent research organization
- Structured to provide high-quality, impartial, and policy-relevant science, often in controversial settings
  - Starting with balanced funding from government and industry and, frequently, other public and private organizations in the United States and around the world to support major projects or research programs
- An overview of HEI, information on its current research program, and all published HEI reports are available for downloading, free of charge, at [www.healtheffects.org](http://www.healtheffects.org).



# HEI's Special Committee



Developed a multidisciplinary, impartial guide for future research about potential adverse effects of onshore unconventional oil and natural gas development on:

- human health and well-being,
- communities,
- ecological health, and
- the environment.

The guide provides recommendations for research to better understand and to prevent or minimize potential impacts

\*Alan Krupnick of RFF served as an advisor to the Committee





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October 2015

## Strategic Research Agenda on the Potential Impacts of 21st Century Oil and Natural Gas Development in the Appalachian Region and Beyond

HEI Special Scientific Committee on Unconventional Oil and Gas Development in the Appalachian Basin

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- Richard King Mellon Foundation
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## HEI Special Committee: *Strategic Research Agenda*

- Released in late 2015 after extensive stakeholder consultation and expert review
- Identifies key research questions as a foundation for moving forward
- Building on this, HEI is initiating a Energy Research Program to fill knowledge gaps identified about potential population exposures across the US



# The HEI Special Committee's research recommendations\*

| Area of Research                              | Purpose   |
|---|---|
| <b>Stressor and Exposure Characterization</b> | To improve understanding of whether exposures of potential concern are occurring  |
| <b>Health and Well-Being Assessment</b>       | To improve understanding of whether potential public and worker health, ecological health, and well-being effects are occurring |
| <b>Evaluation of Most-Effective Practices</b> | To enhance practices that minimize or prevent impacts   |

\*Start by building on research that has already been completed or is underway (e.g., USDOE, USGS, NIOSH, Industry, NGOs, Academia)



# HEI's Special Committee highlighted the need for researchers to account for cross-cutting themes

**Background Conditions** - what was there before unconventional oil and natural gas development?

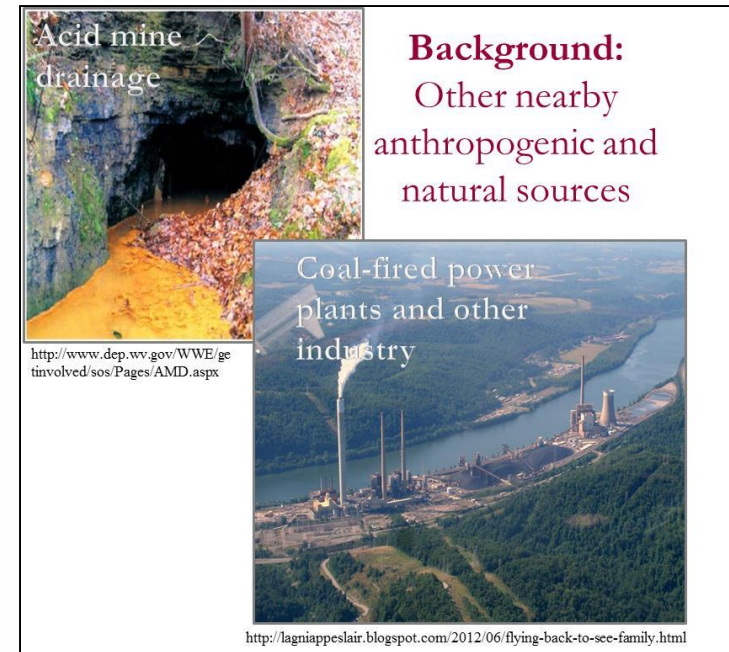
**Benefits** – e.g., can an improved economy and infrastructure result in better health care or fewer traffic accidents?

**Spatial and Temporal Variability** - e.g., in oil and gas operations (multiple stages, technical innovation and regulatory change over time) and in the frequency, duration, and magnitude of potential exposures

**Spatial Variability** - e.g., geology and meteorology

**Operator Variability**

**Physiological Variability** - in response to exposures



# RFF's work represents a useful step forward and complements the work of HEI's Special Committee

- RFF builds on the work of HEI's Special Committee by focusing on the health literature specifically, and including more recent studies and describing them in greater detail
- RFF endeavors to communicate science to a lay audience – a challenging but essential step to advancing an informed public dialogue
- In its commentary on various studies, RFF clearly conveys the challenge faced by environmental health researcher's conducting observational studies (e.g., issues related to the cross-cutting themes noted earlier)



## The authors themselves are often careful to describe limitations of their studies. Some examples:

| Paper                 | Exposure Metric  | Author's Recommendations   |
|-----------------------|--|--|
| Tustin et al. 2016    | Activity index accounting for distance, dates and durations of development activities, and production volume | “Further research, including more sophisticated exposure and outcome measurements, is necessary...”                          |
| Rasmussen et al. 2016 |  | “Whether these associations are causal awaits further investigation, including more detailed exposure assessment.”           |
| Casey et al. 2015     |  | “Use direct environmental sampling to more accurately capture exposure...”   |
| Jemielita et al. 2015 | # of wells per zip code; # of wells per km <sup>2</sup>  | “Further studies are necessary to determine whether specific toxicants or combinations are associated with responses”        |
| Stacy et al. 2015     | Inverse distance weighted count of wells within a 10-mile radius   | “Need for larger studies, in regio-specific fashion, with more precise characterization of exposure over an extended period” |
| McKenzie et al. 2014  |  | “Greater specificity in exposure estimates is needed to further explore these associations.”                                 |





# HEI's Next Step: a new Energy Research Program

**Goal:** Answer questions about potential human exposure and risks from development of oil and natural gas from unconventional resources

**Approach:** That used by HEI for 35 years to answer questions about air quality and health

## Year 1:

### Exposure and Health Literature Review & Research Planning

- Overseen by a Research Committee screened for appropriate expertise, conflicts-of-interest, and bias to ensure balanced perspective and impartiality\*

\*An Advisory Committee will provide guidance to the Research Committee. It will consist of experts from industry, state regulatory agencies, public health organizations, and others with important knowledge to inform the committee's review.

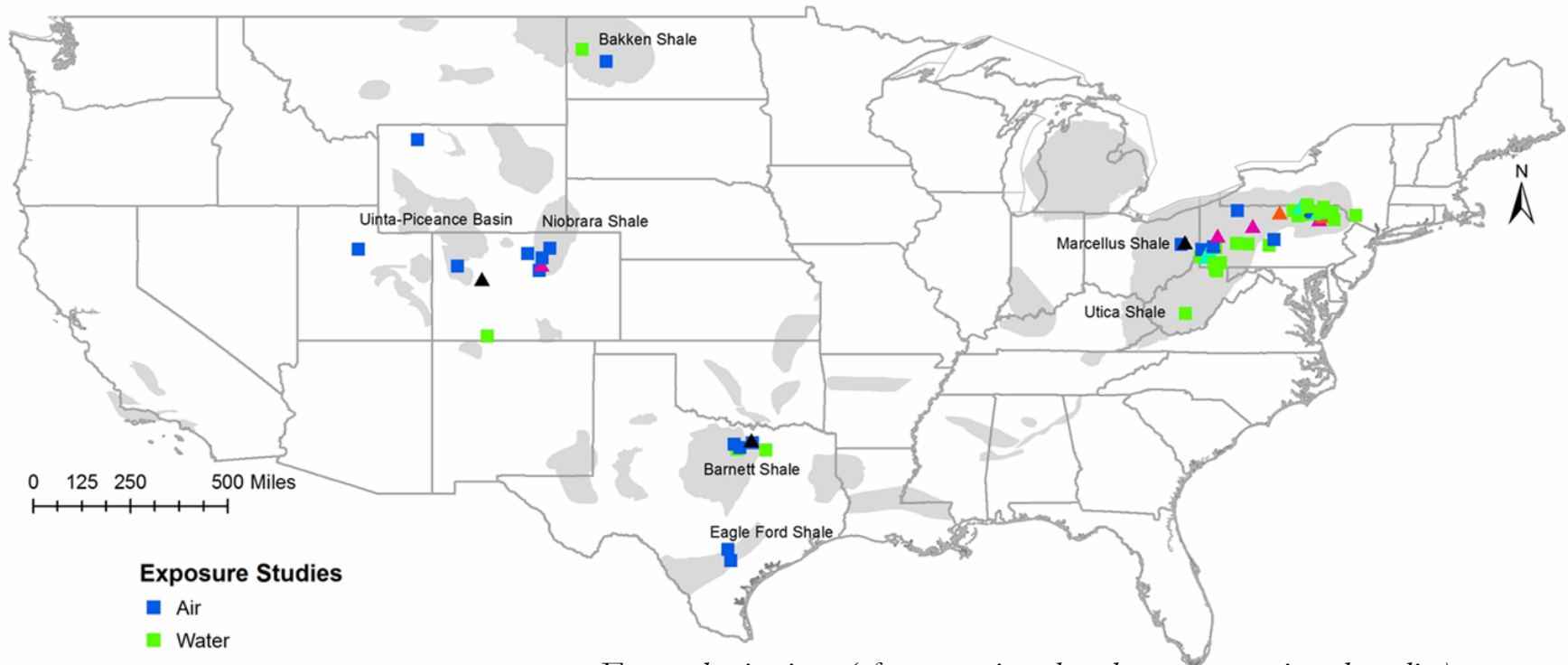
## Years 2 and beyond:

### Population-Level Exposure Studies in Multiple US Regions

- Extensive Communication (technical and lay audience summaries)
- Maybe Health Studies



# Tracking the growing body of peer-reviewed literature



*For study citations (of peer-reviewed and non-peer reviewed studies):*

<https://www.healtheffects.org/unconventional-oil-natural-gas/bibliography>

*\*We welcome recommendations for relevant data and research that should be part of our systematic review\**



# Thank You

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