

HEI Energy Research Program

Plans for Exposure Literature Review and Research Planning

Donna Vorhees, HEI Director of Energy Research

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Presentation Overview

- HEI's Energy Research Program and its scope
- HEI Energy Research Committee's approach to reviewing the literature and planning for research – starting with this workshop – and anticipated products
- Workshop overview
- Ways to stay involved as the Committee continues its research planning

HEI's Energy Research Program

Purpose of the program: Fill knowledge gaps about potential population exposures and health effects from onshore development of oil and natural gas from unconventional resources (UOGD) across the United States

Approach:

- Energy Research Committee oversees literature reviews, research planning, and original research
- All work implemented and peer-reviewed independently from sponsors with widespread public engagement and reporting of all results
- Modeled directly after the approach HEI has used for 35 years to answer questions about air quality and health

Products: Policy-relevant literature reviews and research

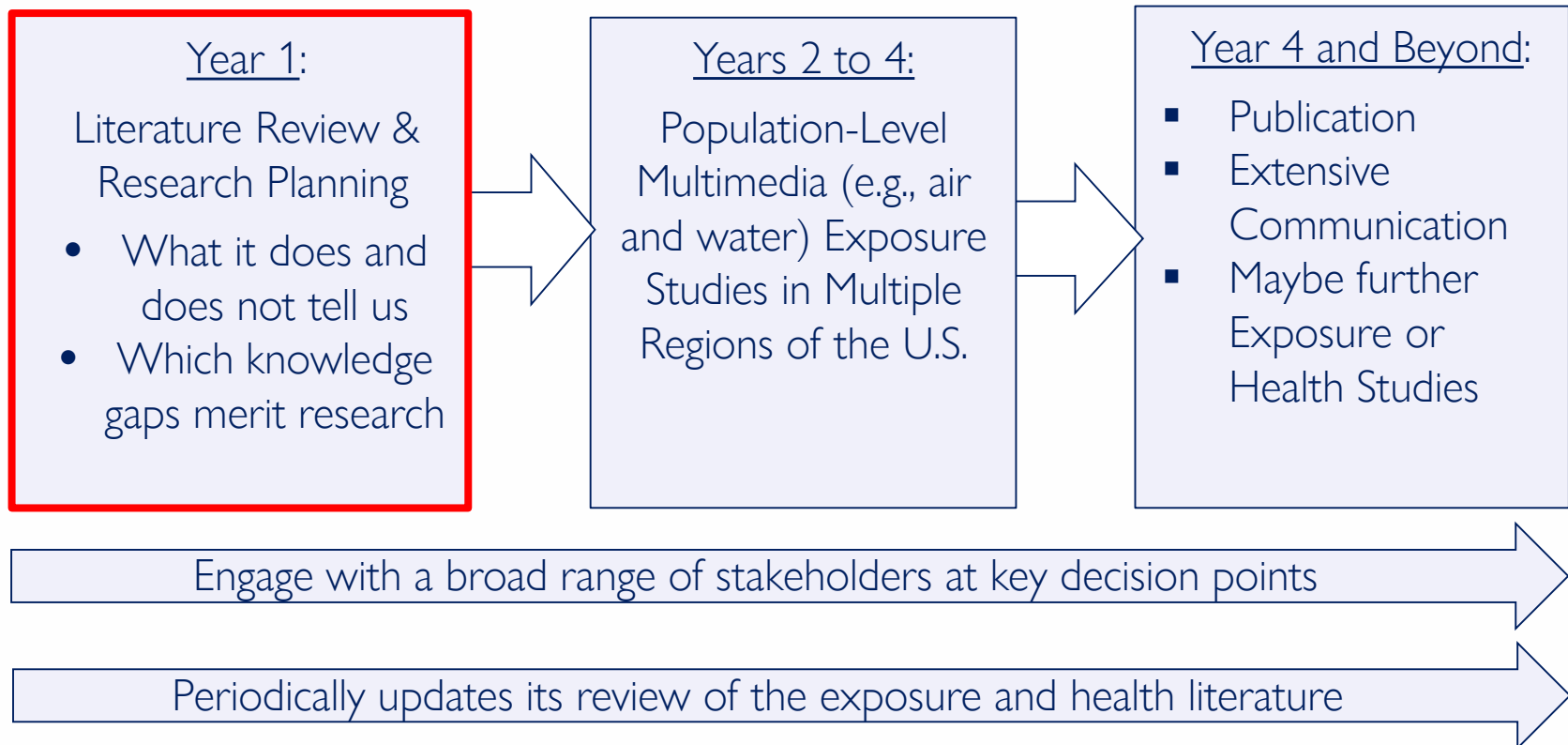
Intended beneficiaries: Regulators, industry, environmental organizations, community groups, academic researchers, and others



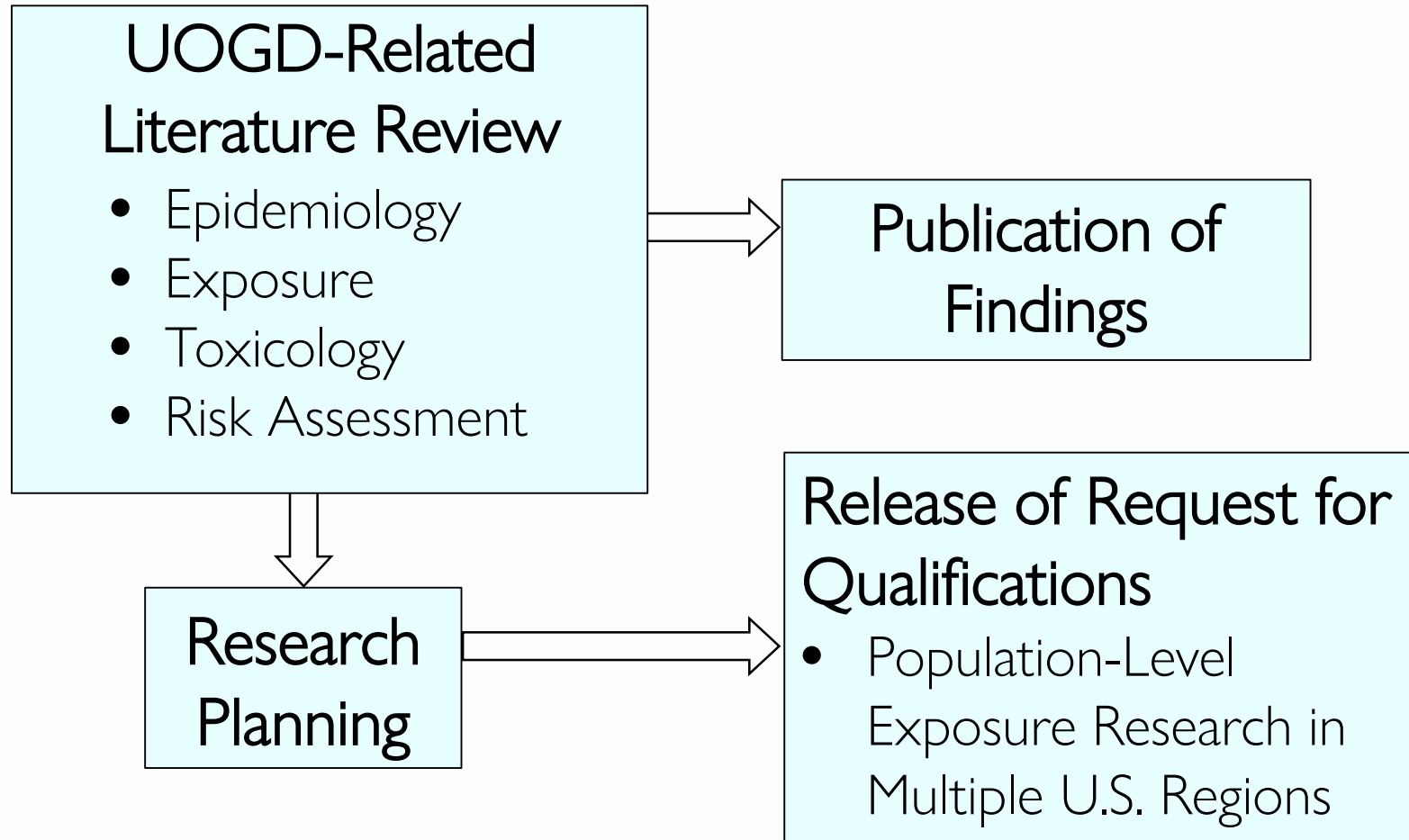
Energy Research Program in a broader context

- UOGD brings benefits
 - Domestic oil and gas
 - Less expensive chemical feedstock helps the chemical industry
 - Job creation
 - Air quality benefits from proportionally greater use of natural gas than coal or oil
 - Increased local government and business revenues and lease payments
- But also risks
 - Environmental (e.g., methane emissions and climate change)
 - Ecological (e.g., habitat fragmentation)
 - Community change
 - Human exposures and effects (e.g., chemical releases to the environment)
- Heterogeneous distribution of benefits and risks among individuals and communities

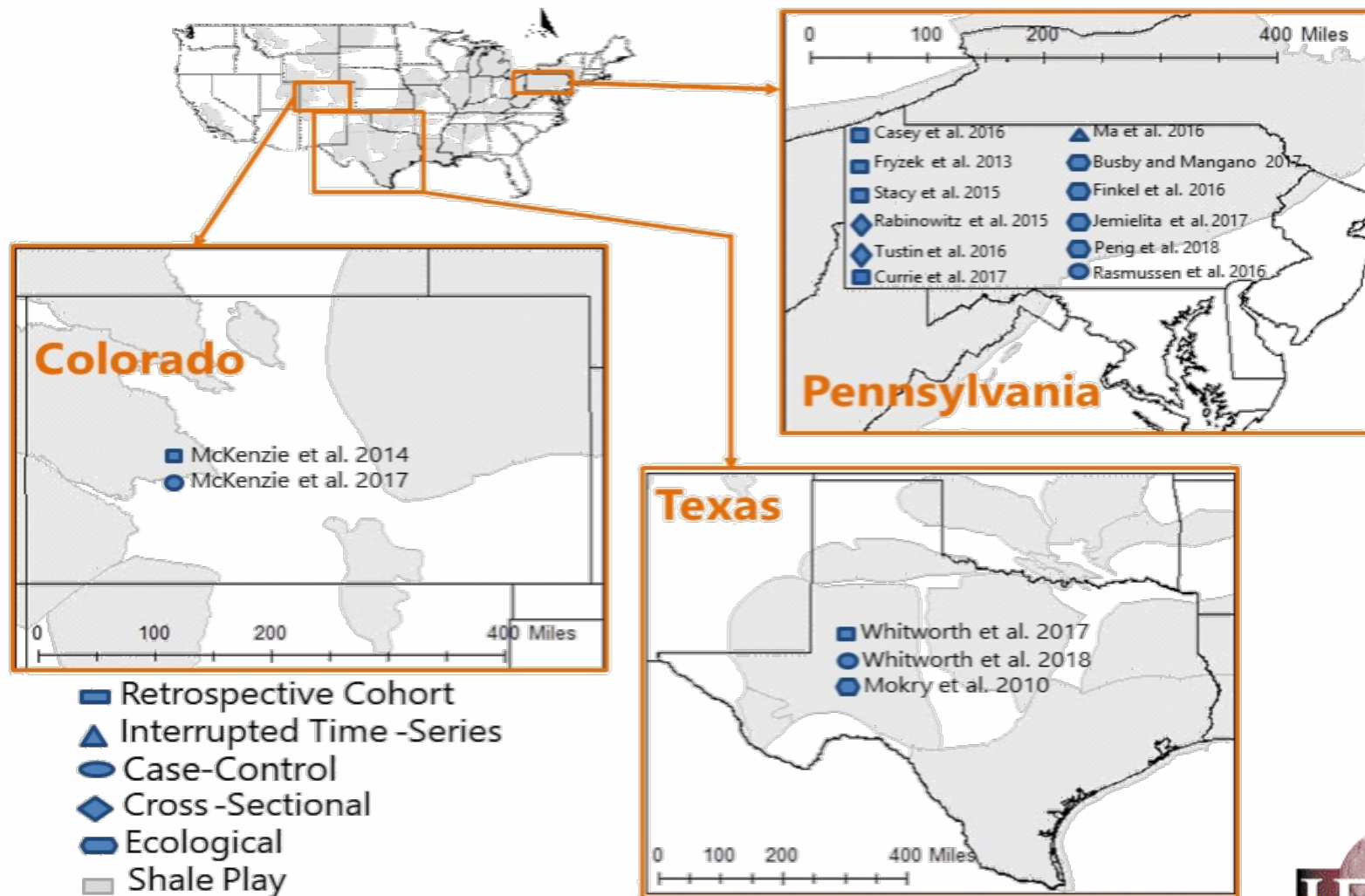
Vision for a Multi-Year Research Program



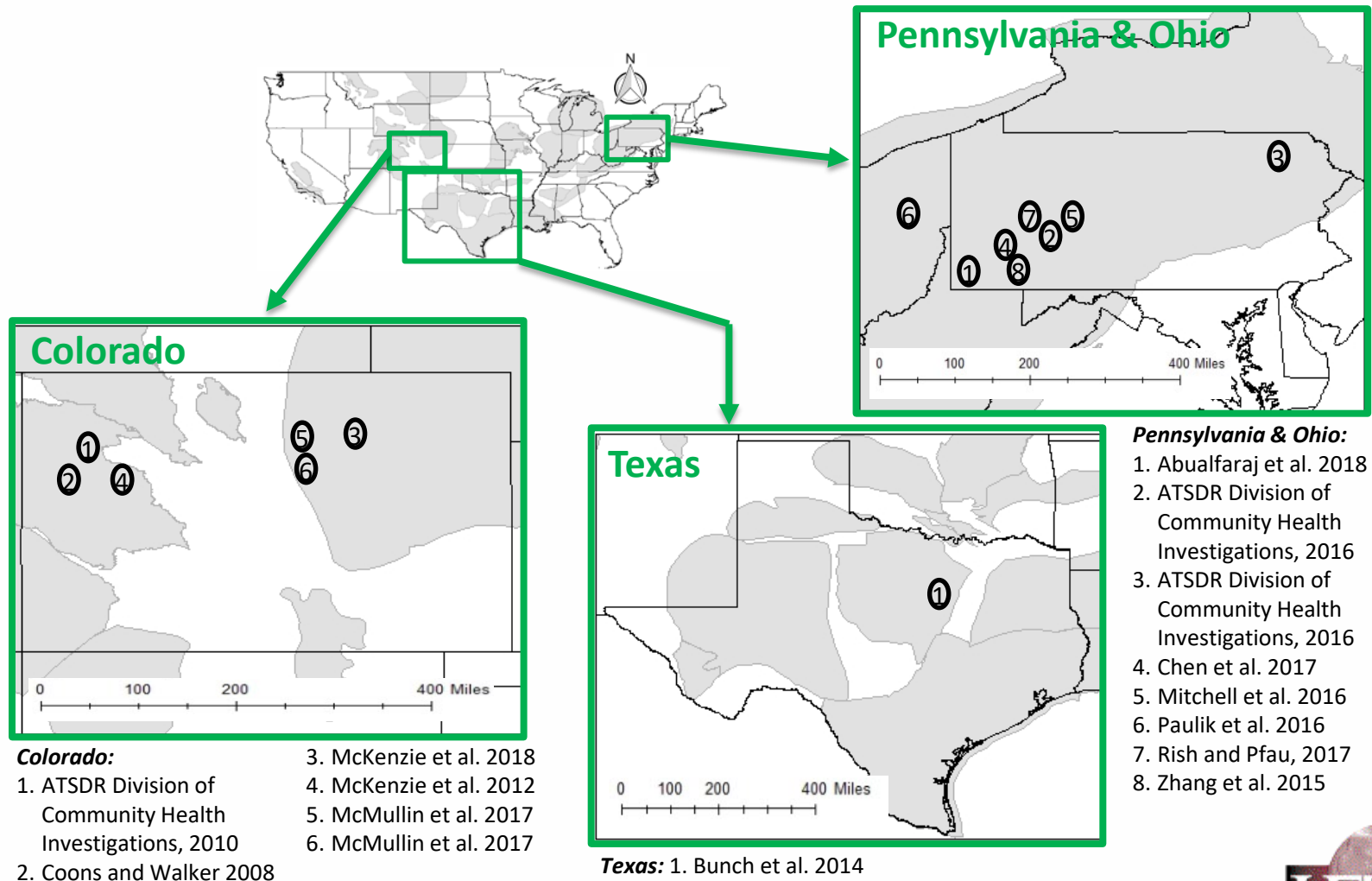
Year I Tasks and Products



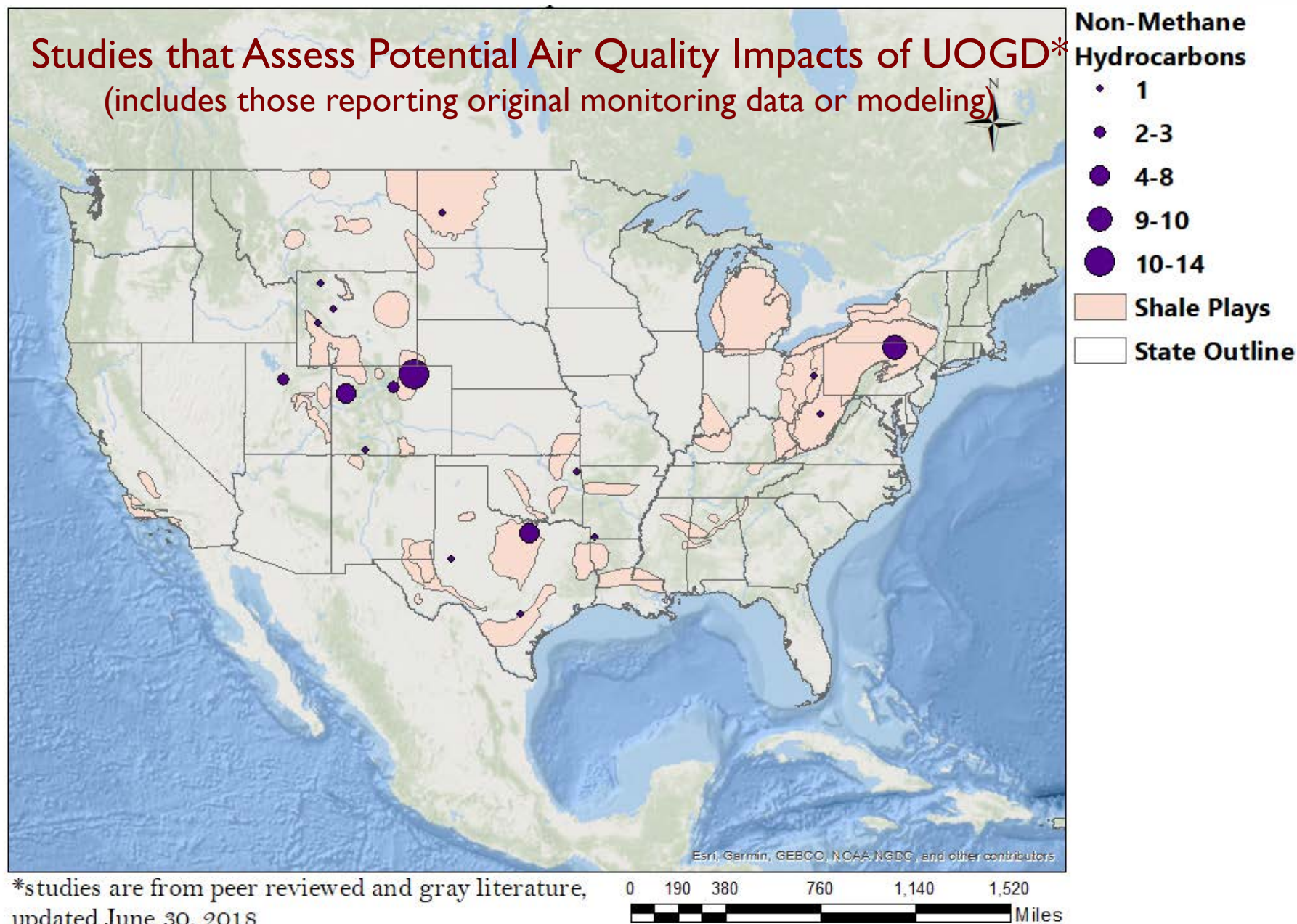
UOGD epidemiology (the subject of a separate ongoing review by the Committee)



UOGD human health risk assessments



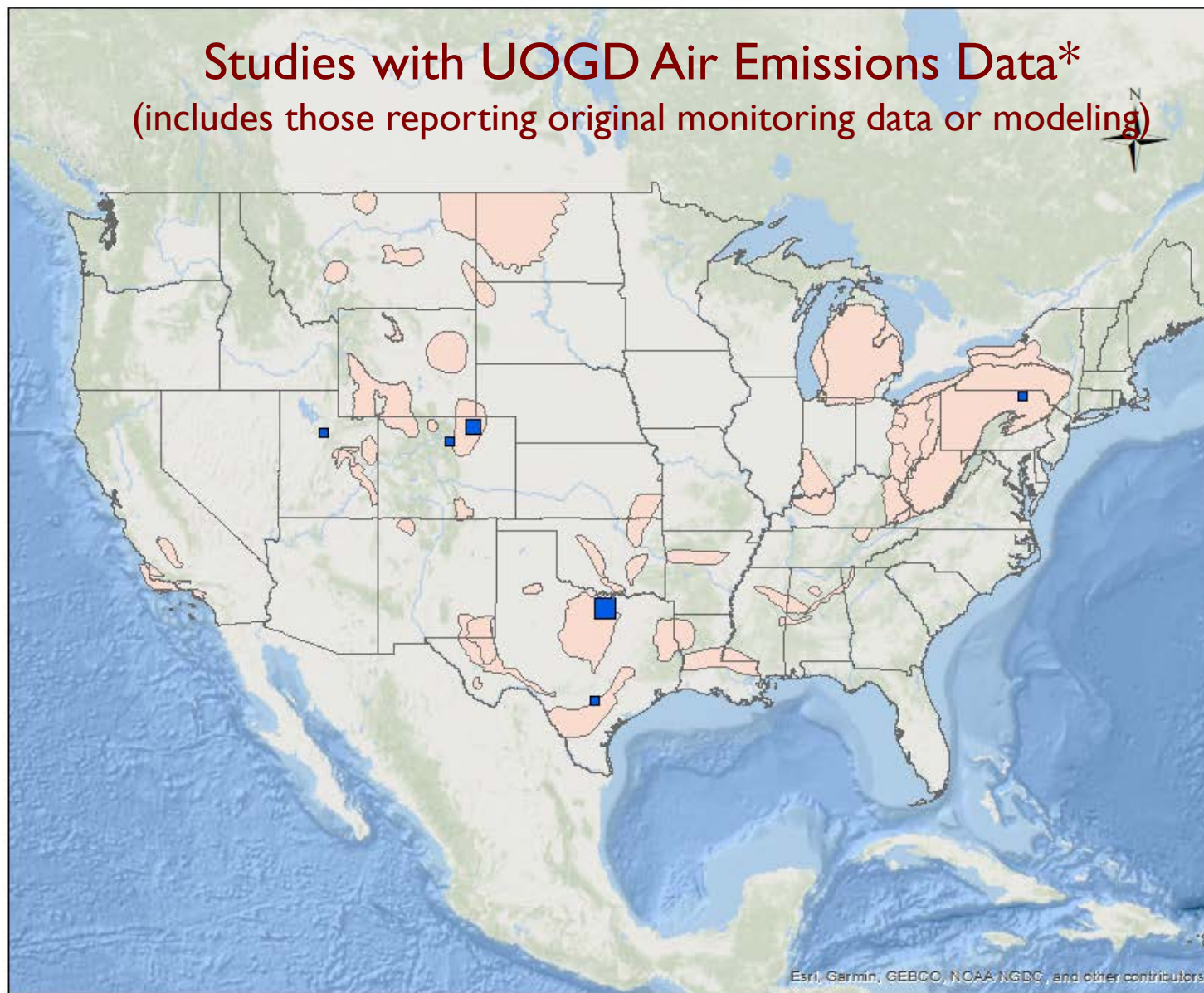
Studies that Assess Potential Air Quality Impacts of UOGD* (includes those reporting original monitoring data or modeling)



*studies are from peer reviewed and gray literature,
updated June 30, 2018

Studies with UOGD Air Emissions Data*

(includes those reporting original monitoring data or modeling)



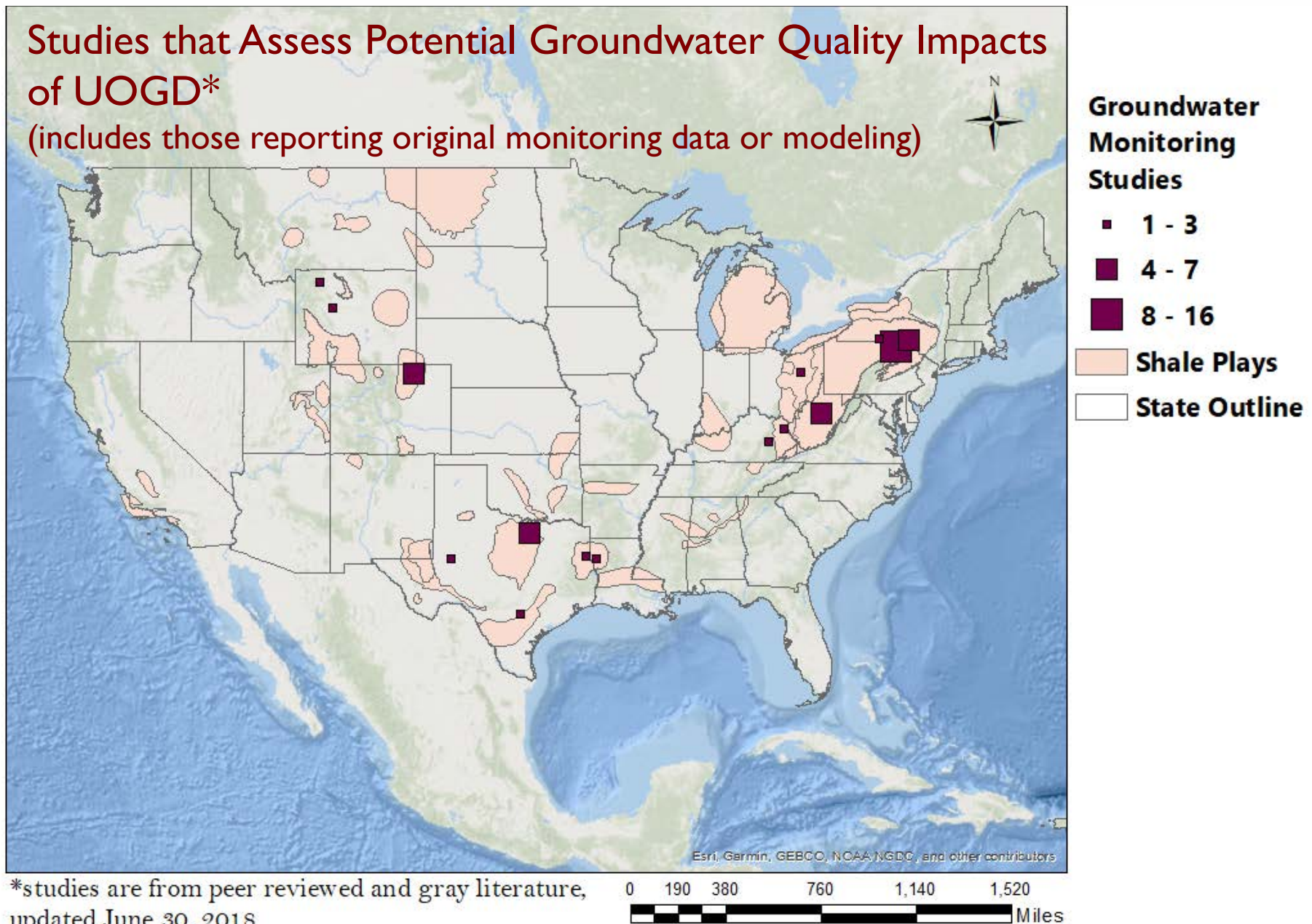
- Emissions Inventories**
- 2 - 4
 - 5 - 6
 - 7 - 8
- Shale Plays
- State Outline

*studies are from peer reviewed and gray literature, updated June 30, 2018

0 190 380 760 1,140 1,520 Miles

Studies that Assess Potential Groundwater Quality Impacts of UOGD*

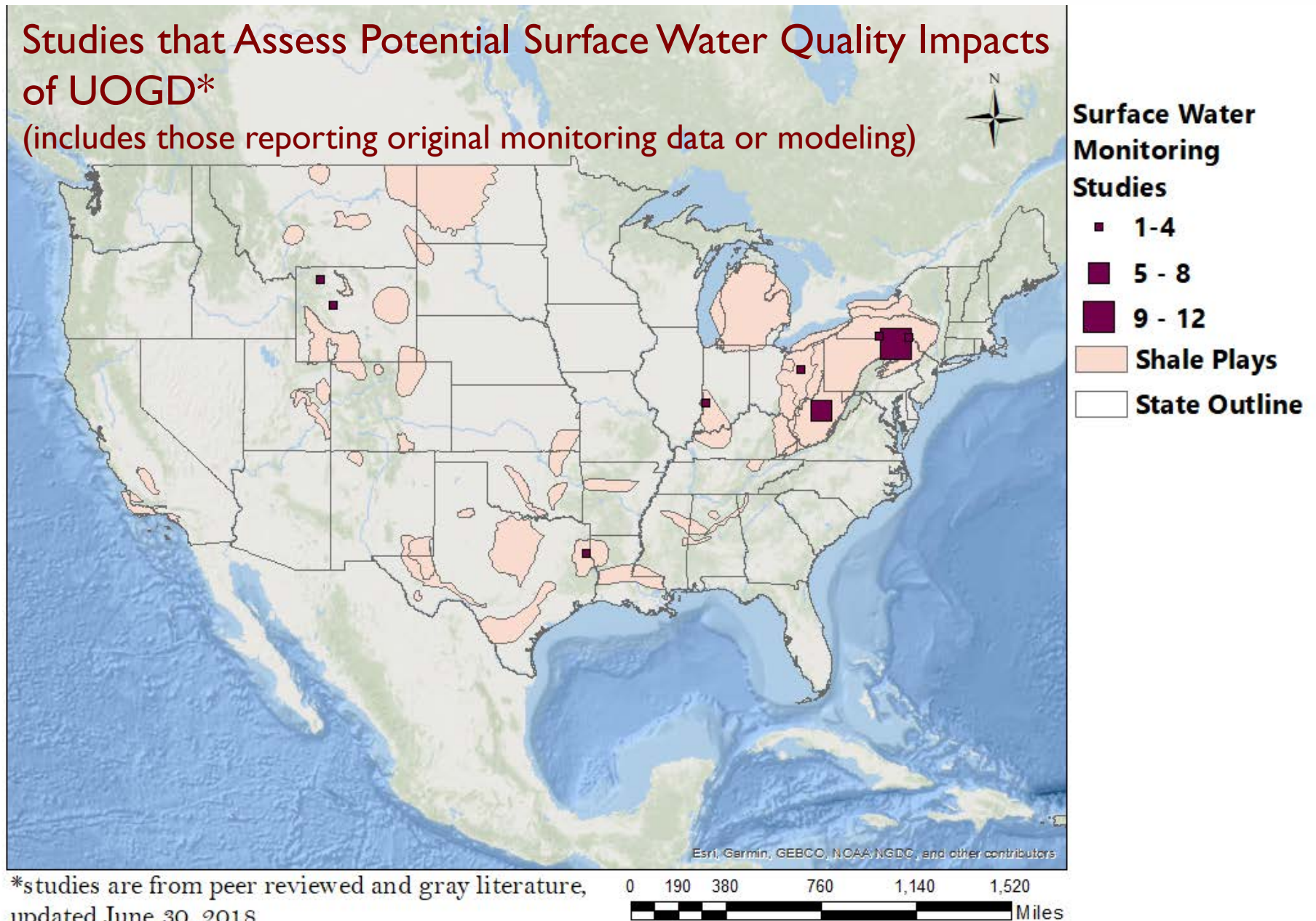
(includes those reporting original monitoring data or modeling)



*studies are from peer reviewed and gray literature, updated June 30, 2018

Studies that Assess Potential Surface Water Quality Impacts of UOGD*

(includes those reporting original monitoring data or modeling)



*studies are from peer reviewed and gray literature, updated June 30, 2018

General Approach to Year I Tasks

1. Develop a good understanding of UOGD operations across regions and over time
2. **Gather and review literature**, including peer-reviewed and gray literature and other data sources, to understand the potential for UOGD-specific exposure and health risk
3. **Solicit information and recommendations** from a broad range of experts (including two workshops, starting with this one)
4. Frame the review in a conceptual model of potential UOGD exposures to guide research planning
5. Define research priorities for funding

Workshop Overview

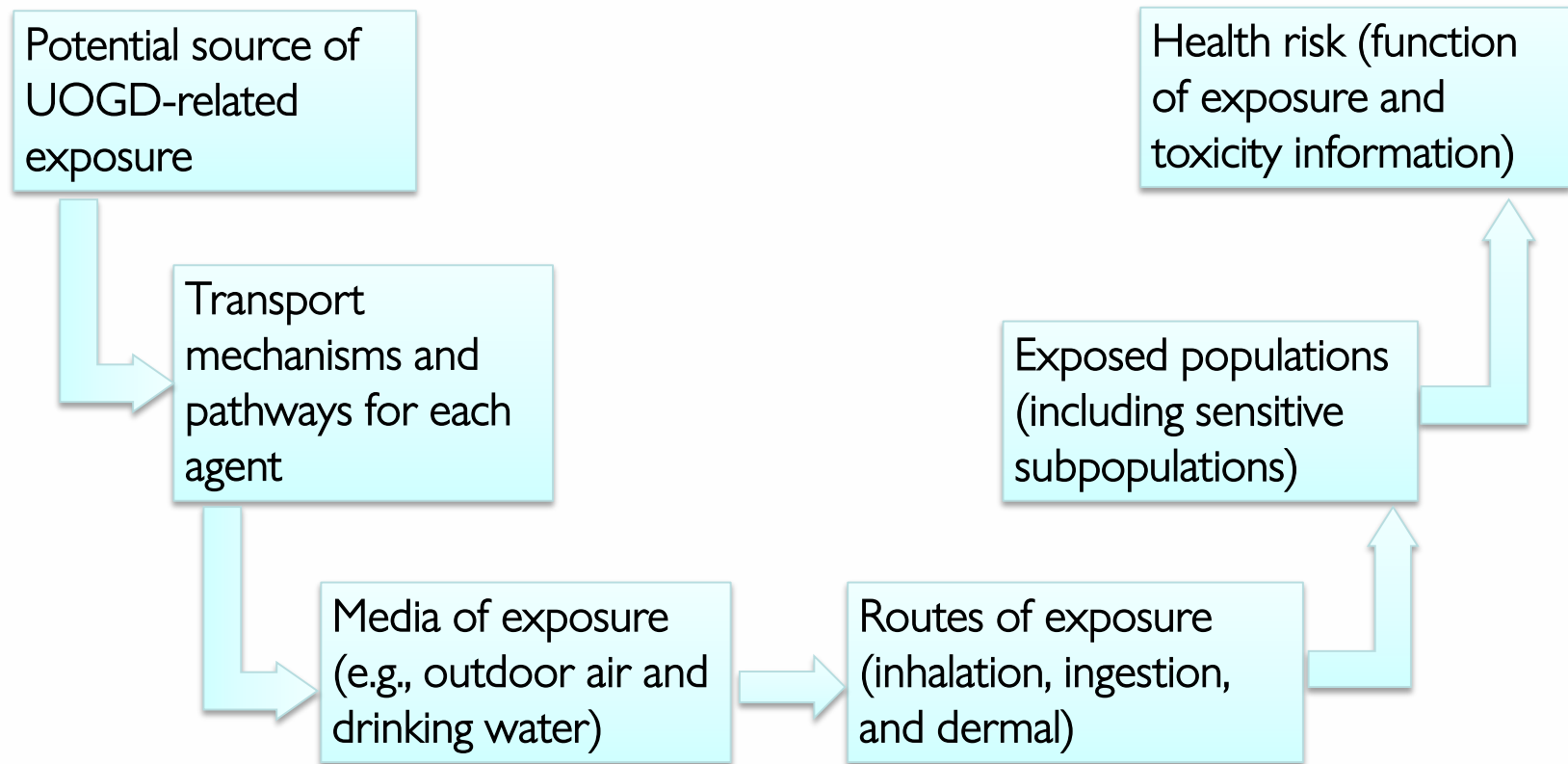
- Hear presentations about industry practice and literature relevant to assessments of potential human exposure and effects
- View posters describing ongoing research
- Contribute your ideas:
 - During Q&A with speakers and discussion sessions
 - Two group exercises
 - To two charts posted in the room:
 - Your responses to workshop charge questions
 - Your thoughts about potential exposure pathways that should be included in the Committee's conceptual model of exposure

Workshop Charge Questions

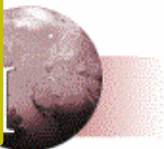
- What does the literature tell us?
- What does the literature not tell us?
- What are your recommendations for criteria for prioritizing research?
- What are your recommendations for population-level exposure research?
- What are your recommendations for further literature review and data analysis before the September workshop to help in defining research priorities?

Please share your thoughts with us on the chart posted in our meeting room or on the smaller version in your workshop packet

Conceptual Model of Exposure to Support Research Planning



Please share your thoughts with us on the chart posted in our meeting room or on the smaller version in your workshop packet



Next Steps and How You Can Continue to Participate

- **July 25, 2018:** Submit your responses to charge questions and thoughts on the conceptual model of exposure
- **July 31, 2018:** HEI will post a brief summary of workshop
- **July-September 2018:** The Committee will conduct additional review of the literature and other information for discussion at a September workshop
- **September 12-14, 2018:** Participate in a second research planning workshop during this timeframe

Thank You

Donna J. Vorhees

dvorhees@healtheffects.org

<https://www.healtheffects.org/energy>

