Exploring the Impacts of Natural Gas Drilling in the Chesapeake Bay Watershed

A Workshop Proposal

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STAC Steering Committee Members

- Charles Abdalla (PSU)
- Randy Chambers (College of William and Mary)
- Natalie Gardner (CRC)
- Kurt Gottschalk (USFS)
- Robert Howarth (Cornell)
- Matthew Johnston (CRC)
- Denice Wardrop (PSU)

Proposed Steering Committee Members

- Kelly O. Maloney , USGS
- Representative from EPA Region 2 or 3
- Philip M. Gschwend, MIT
- Lew Linker/Gary Shenk
- Susan J. Riha, Cornell University
- James R. Grace, Penn State University

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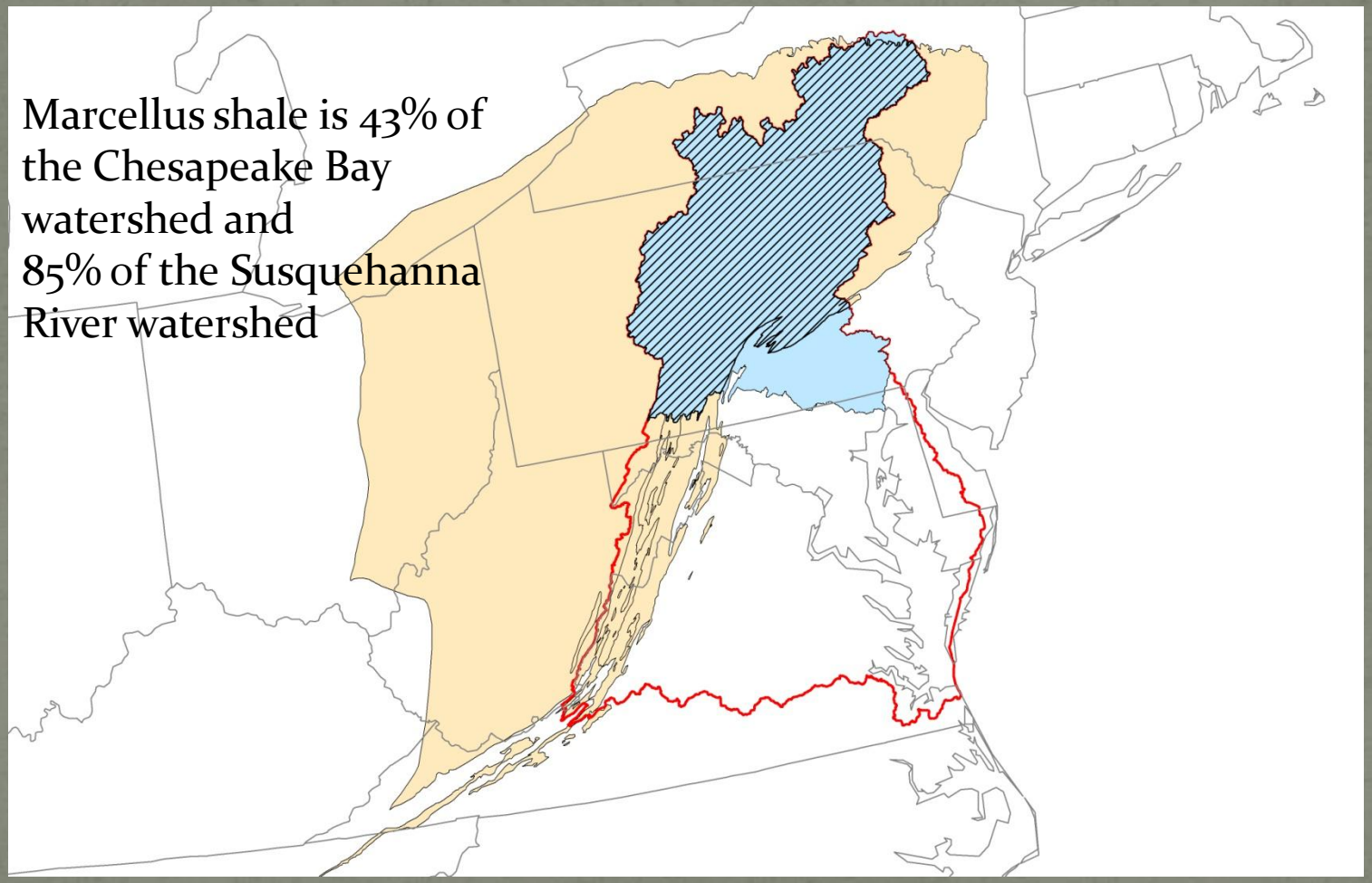
Workshop Objectives

- To review and synthesize the collective research available regarding natural gas drilling's environmental effects
- To identify the impacts (i.e. water quality and quantity, land cover, TMDL, and localized nitrogen pollution) that natural gas drilling will pose to the Chesapeake Bay Watershed
- To identify and prioritize future research needs

Why Chesapeake Bay and STAC?



Map and data prepared by Randy Chambers

Direct Water Quality Impacts

- Immediate, short-term impacts occurring during the time of drilling, production and transportation.
- Such impacts could include:
  - sediment deposition
  - leakage of hydrofracturing chemicals
  - increased dissolved solids
  - increased stormwater runoff
  - impacts of water extraction for the hydrofracking
  - etc.

Indirect Water Quality Impacts

- More long-term impacts occurring as a result of past drilling, production and transportation or impacts caused by existing, long-term infrastructure.
- Such impacts could include:
  - removal of forest cover
  - changes in land use
  - water use
  - diversion of surface and groundwater
  - etc.

Additional Ecological Impacts

- These are the impacts to the environment outside of water quality.
- Such impacts could include:
  - loss of critical habitat
  - changes in ecosystem diversity (changes in vegetation types)
  - air pollution impacts (nitrogen in particular)
  - soil compaction and pollution impacts
  - etc.

Justification

- The ability to meet TMDL targets may be impacted by the Bay Model not taking Marcellus shale gas drilling into consideration
- In particular, the cumulative regional environmental impacts of Marcellus shale gas drilling is not well understood and so cannot be adequately accounted for in the Bay Model
- The extent of Marcellus shale in the watershed may prevent local governments from meeting their TMDL requirements

Justification, continued

- The first step in informing EPA and Chesapeake Bay Program managers of the cumulative environmental effects of natural gas drilling within the Chesapeake Bay Watershed.
- The results from the workshop and the identification of future research needs will help guide the Chesapeake Bay Program's ability to deal with a rapidly emerging industry.

Workshop Products

- The report will summarize the state-of-the-science regarding environmental impacts of natural gas drilling
- The report will identify and prioritize specific research gaps

Marcellus Research

- At least 6 federal agencies/departments are conducting or funding Marcellus impact research
  - Department of Energy, National Energy Technology Lab
  - Environmental Protection Agency
  - US Geological Survey
  - US Forest Service, Northern Research Station
  - US Department of Agriculture
- In addition, Universities, state governments, and industry are doing research.
- There is a real need to bring these parties together

Forest Service/Penn State Marcellus Science Meeting

- US Forest Service, Northern Research Station has funded Penn State to hold a meeting "Ecological Stewardship of Gas and Oil Development" to bring together all of the scientists working in the area
- Will be held in February or March 2012 at Penn State
- We propose piggybacking our workshop to this meeting and using it for much of the research summary

Logistics

- We would hold our workshop for one day following the Penn State science meeting, probably in the Penn State area
- About 30 invited participants who would attend the science meeting and then our workshop
- Proposed budget approximately $7,500