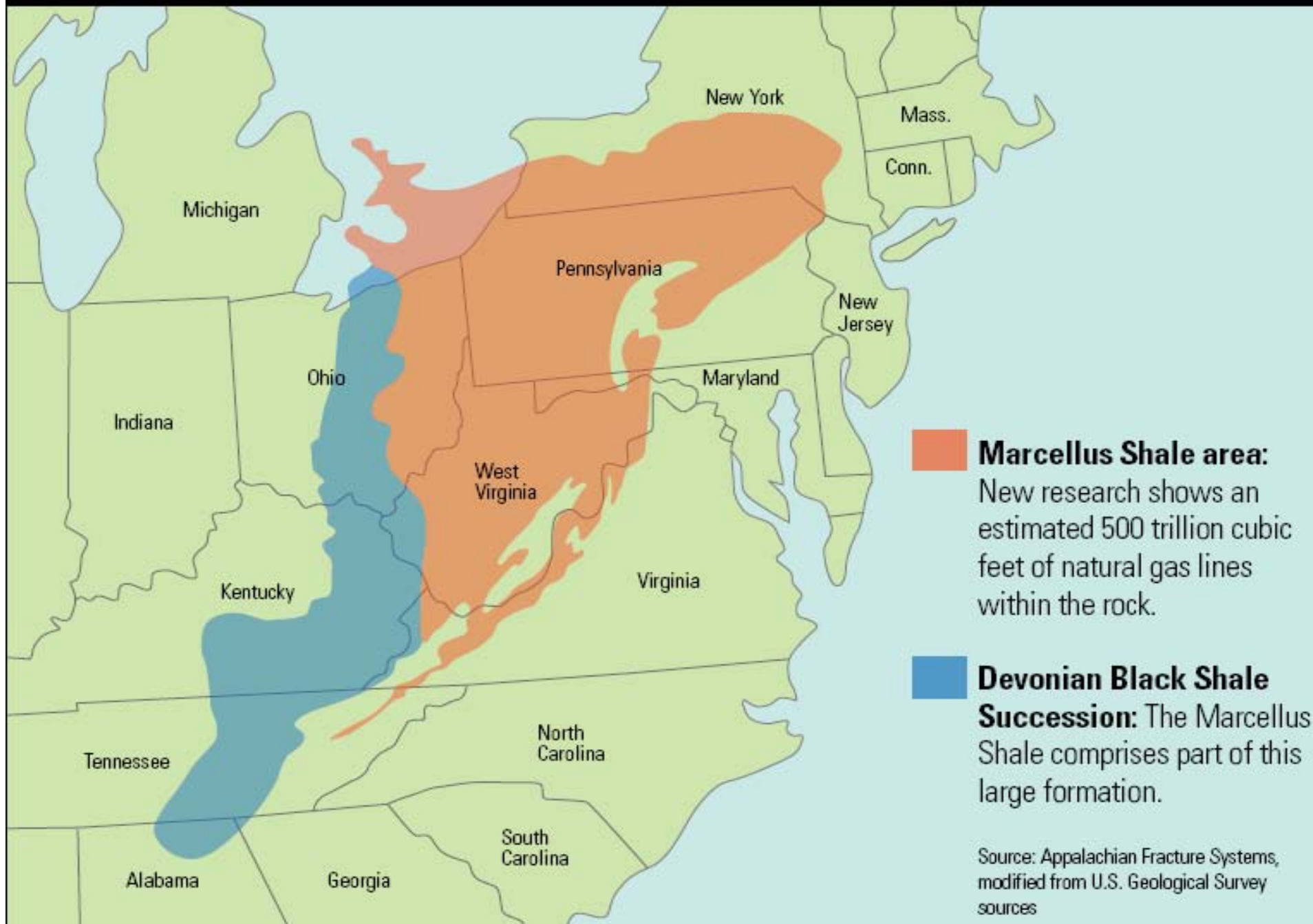


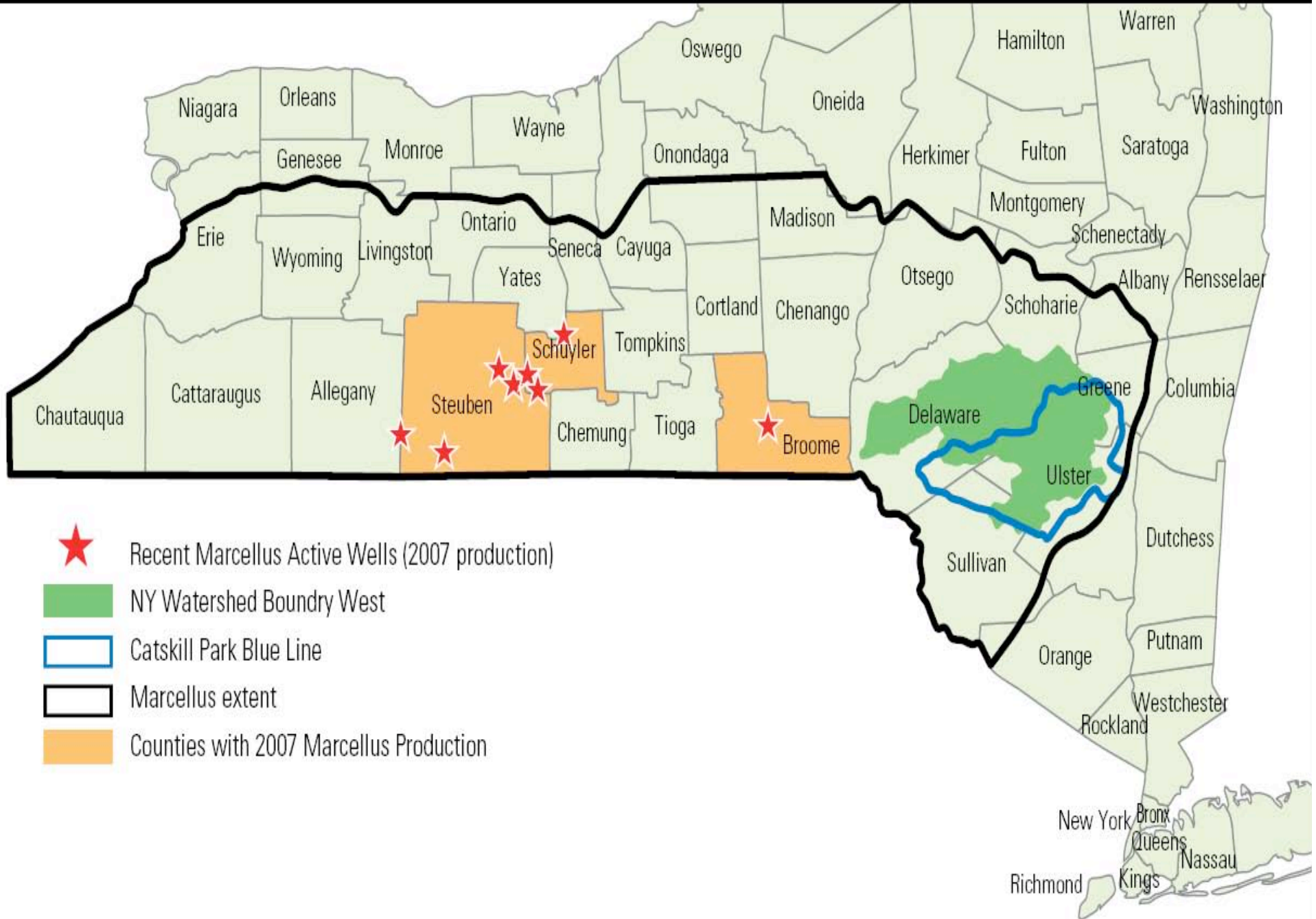
# Panel on Environmental and Water Issues

Robert H. Harris, Ph.D.  
Moderator

# The Marcellus Shale Formation



# Marcellus Shale Extent 2007 Production – Recent Wells



# Schematic of Hydrofracturing Marcellus Shale

# Potential Environmental Impacts

- ***Clearing of land for well pads, wastewater impoundments, and roads***
- ***Truck traffic to haul water, wastewater, and equipment to and from site***





# Potential Environmental Impacts

- ***Contamination of ground and surface water from hydrofracking***
  - More than a million gallons of water may be required to hydrofrack one well
  - Fracking fluids contain 1-2% organic chemicals, including friction reducers, biocides, surfactants, and scale inhibitors

# Potential Environmental Impacts

- ***Disposal of wastewater residuals and brine***
  - "Produced Water" and recovered fracking fluids may be contaminated with synthetic chemicals, hydrocarbons, heavy metals, TDS, and radionuclides



