

*The Appalachian Research Initiative for  
Environmental Science (ARIES):*

**Addressing the Environmental Research  
Needs of the Appalachian Energy  
Industry**

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**Professional Engineers in Mining  
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# What is ARIES?

- ❑ ARIES is a research initiative addressing potential upstream (mining, drilling and processing) and downstream (water, land, air) environmental, public health and community wellbeing effects of the mining, gas and energy sectors in Appalachia with a focus on scientific inquiry and research, fostering publication and contributing to the relevant literature, and engaging in outreach efforts to share and disseminate research results
- ❑ ARIES is industry-funded and supported, but independent and researcher-led

# Major Research Areas of ARIES

- Energy production in Appalachia
  - Coal mining
  - Natural gas
    - CBM
    - Shale gas
  - Electricity generation
    - Water, CWB and CCS
  - Bio-Energy and Bio-Fuels
  - Renewables

# ARIES Funding

- Industrial Affiliate Partners committed to fund ARIES with a grant of over +\$10 million over the five years of the program (almost \$15 million before mergers!)
- This is a membership program agreement with established annual levels of support
- ARIES in Year 5 of its life
- New funding strategies being considered and developed

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# ARIES Member Companies

- Alpha Natural Resources
- Arch Coal
- Natural Resource Partners
- TECO Coal Corporation
- Patriot Coal Corporation
- Norfolk Southern Corporation

Coal associations are participants

In discussions with other companies interested to join

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# ARIES Research Partners

- Virginia Tech
  - VCCER at VT is the managing entity for ARIES
- West Virginia University
- University of Kentucky
- Ohio State University
- Pennsylvania State University
- University of Pittsburgh
- Marshall University
- Edward Via College of Osteopathic Medicine
- Consultants in Epidemiology & Occupational Health LLC  
(Georgetown, George Washington & Johns Hopkins)

# Broadly, Research Areas Address:

- Environmental Management
  - Water Impacts
  - Waste Placement
- Zero-Impact Mining Systems
- Community Development
  - Economic
  - Social

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# ARIES Research

- In total, over 70 Academic Researchers, 75 Graduate and Undergraduate Students and 30 Academic Departments representing Colleges of Engineering, Science, Agriculture, Forestry, Liberal Arts and Human Sciences, Arts and Sciences, Public Health, Business and Medicine at 13 institutions
  - As of September 2015, ARIES sponsored research have produced nearly 100 peer-reviewed publications
  - In April 2013, ARIES sponsored with SME the “Environmental Considerations in Energy Production” Symposium in Charleston, WV
  - Second ECEP Conference in Pittsburgh, September 20-23
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# ARIES Research Highlights

- Salamanders in Appalachian coalfields respond to disturbance of any kind, not just coal mining, and return with restoration of riparian vegetation
- Conductivity in streams is elevated by residential impacts. This increase more persistent than that from mining
- Low-birth weight in coal mining counties directly related to 3 times higher level of smoking among expectant mothers in those counties
- Publications listing:  
[www.energy.vt.edu/ARIES/aries-publications.asp](http://www.energy.vt.edu/ARIES/aries-publications.asp)

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# ARIES Outreach

- ARIES\_VT on Facebook
  - Twitter: @ARIES\_VT
  - ARIES website: [www.energy.vt.edu/ARIES](http://www.energy.vt.edu/ARIES)
  - Example of ARIES ongoing work:  
[Marshall University "Creek Geeks"](#)
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# Benefits of ARIES

- Answers basic questions about cause and effect
- Allows for development of best practices and innovation
- Reduces environmental costs and promotes addressing key issues
- Removes regulatory conflicts by creating new focus on real problems and science
- Informs the public discussion and creates opportunity for “**social license**”

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# Environmental Considerations in Energy Production 2015

## ❑ [ECEP 2015](http://www.ariesevents.org) ([www.ariesevents.org](http://www.ariesevents.org))

- Peer-reviewed proceedings
- Technical sessions
- Top experts in plenary sessions
- Networking events

Omni William Penn Hotel, September 20-23

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# ARIES Challenges

- End of funding
  - Bad time to seek more support
  - Science needed now more than ever
  - Cadre of expertise assembled and growing...but may not be sustainable
  - We need advice and input
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# ARIES

For more information:

<http://www.energy.vt.edu/ARIES>

Or call:

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