

## **Minutes from the 3-24-08 CWC TIE Ohio Basin Project Exploratory Committee**

Present:

Doug Alsdorf (representing the CWC and MPS)  
Nick Basta (FAES)  
David Bromwich (SBS)  
Jeff Daniels (MPS)—by phone  
Joseph Fiksel (ENG))  
Berry Lyons (representing MPS for Andrea Grottoli)  
Jialin Lin (SBS)  
Richard Moore (FAES/OARDC)  
Frank Schwartz (MPS)  
Hal Walker (ENG)

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The first point of discussion was whether there should be a geographic limitation on the proposals. The grant proposal stated “Ohio Basin Watershed” which has two meanings, one as the hydrologic unit associated with the Mississippi Basin and the second which is an Ohio customary definition referring to those watersheds in Ohio which flow into the Ohio River. However, some researchers interested in participating in the Ohio project have research involving the Great Lakes watershed or wish to pursue research projects that involve the larger region. There was not a definitive answer to this question so the committee moved on to see if there could be a coalescing of ideas or themes. Below are three ideas that emerged from the discussion.

### **Idea 1: Key Legacy and Emerging Issues in Water and Energy** (Hal Walker initiated this discussion)

The Ohio Basin has both legacy and emerging issues regarding the relationship between water and energy. Energy production, particularly as it relates to the historic use of coal, but also for ethanol production, is dependent upon water for part of the process. The use of coal and biofuels in Ohio is forecast to increase over the next ten years. This will affect the water supply in the basin. Equally, the outflow of water from the old and new energy processes will affect water quality in many ways such as water temperature which affects stream biota or filtration of surface water to underground water used for drinking. Historically there have been issues with acid mine drainage. Investigation of this research problem will follow the CWC proposal's three lines of thinking including how abrupt climate change has and will affect the relationship between energy and water in the Ohio Basin.

### **Idea 2: Modeling Scenarios of Water Quality and Quantity in the Ohio Basin** (Nick Basta initiated this discussion with input from Richard Moore)

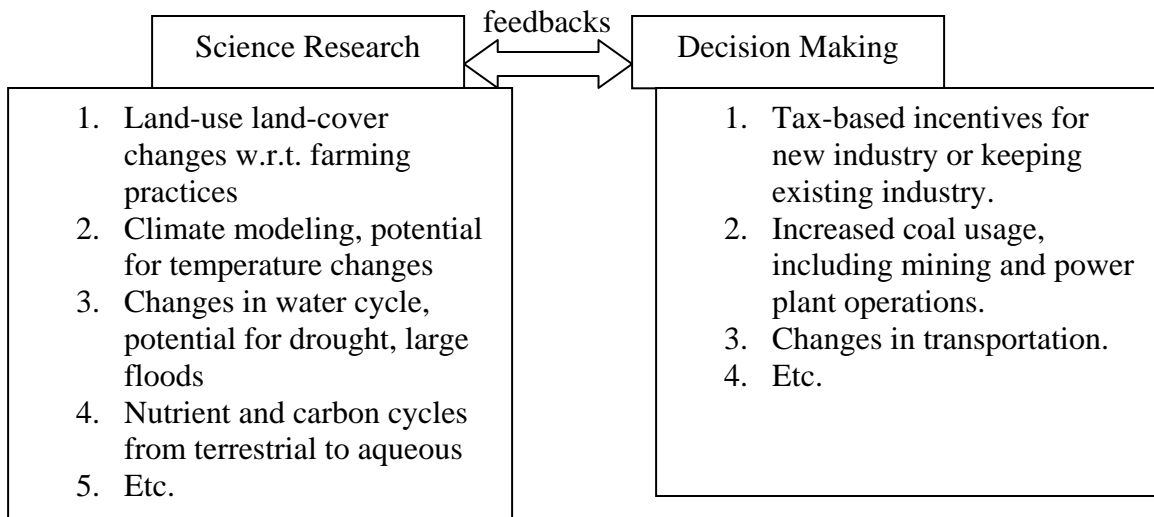
Based on past, current, and future climate forecasts and water use in the Ohio Basin, what scenarios are most likely to occur in the next ten years? As a result of abrupt climate change, will Ohio receive more rainfall, and if so, what scenarios are likely to result? Both urban and rural areas in the Ohio Basin are presently experiencing water quality and quantity problems that include pharmaceuticals, bacteria, chemicals, and nutrients. The origin of these problems ranges from urban use to rural agricultural land use and loss of headwater stream and wetlands structure and function affecting the retention of water and nutrient cycling of carbon, phosphorus, and nitrogen. These have regional consequences beyond the Ohio Basin. A scaling approach ranging from HUC 14 digit watersheds such as Sugar Creek subwatersheds including headwater streams to larger HUC 4 digit basins such as the Muskingum and Scioto basins would be utilized to measure the effect into the larger HUC 2 digit Ohio Basin (USGS Water Resource Region 05) and Mississippi Basin and Gulf of Mexico. Although data from existing USGS gauge stations will be used, some additional gauges may be necessary. Policy recommendations for mitigation of the present trend scenarios will be incorporated into new scenarios.

**Idea 3:** Consequences of Ohio's Energy Future Under Abrupt Climate Change (Joseph Fiskel and Jeff Daniels introduced this idea)

Air quality and water in the Ohio Basin will be vulnerable to the consequences of possible energy choices. For example, based on David Tilman et al (*Science* February 7, 2008) article "Land Clearing and the Biofuel Debt", Ohio's choices regarding coal, biofuels from agricultural crops, or biofuels from waste biomass or biomass grown on degraded or abandoned agricultural lands will have significant consequences to the overall carbon debt and GHG. Scenarios amplifying the range of variability will be used to create a framework for practical solutions and applications of science in conjunction with Ohio Energy Advisor Mark Shanahan and the University Clean Energy Alliance of Ohio (UCEAO). The framework would include how science will be used to mitigate the impacts of scenarios and inform decisions regarding policy intervention.

The group then discussed a framework for a possible Ohio core project. This was separated into three steps.

Step 1: The overarching theme is process-oriented and based on the feedbacks between science and decision making. The following helps illustrate the theme.



Step 2: Within this framework, questions can be asked. Although there are a host of questions, ideally, the potential Ohio core project would ask those that can be addressed by existing OSU faculty and can garner new money. These are largely scenario-related and demonstrate the feedbacks between decision-making upon science and how science might help make quality decisions.

Examples include:

1. With the increase of 20% in precipitation, what would the future of agriculture look like? Addressing this would require knowledge of past climate and related LULC.
2. Suppose that the State of Ohio enacts a policy of subsidizing a certain industry, how would this impact nutrient and carbon cycles in Ohio?
3. What is the potential for drought in Ohio, i.e., like what we saw in Georgia this past summer? What would be the impacts on agriculture and industry and what are the best policy decisions under such a drought scenario?
4. The three ideas noted above can also be brought-in with this approach.

Step 3: The first two steps, along with the three ideas and further solicitations from faculty, will then be written-up as a core project idea. Before final submission to the CWC, the core project idea should be taken to Mark Shanahan, who is Governor Strickland's energy advisor, and taken to Chris Korleski, who is the Director of Ohio EPA, and taken to others to determine potential buy-in from non-OSU groups.