Inland Waters Research Institute

KANSAS CITY, MISSOURI

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A LABORATORY DEVOTED TO THE INTEGRATIVE RESEARCH AND INNOVATION OF THE ECOLOGY AND ECONOMY OF WATER, HUMAN HEALTH, RENEWABLE ENERGY, NUTRIENT PRODUCTION AND OTHER RELATED AREAS OF DISCOVERY.

We are only now beginning to understand the degree of integration between all natural systems in the world in which we live. In 2001, scientists from four great international global research institutions published a declaration stating that. "The Earth system behaves as a single, self-regulating system, comprised of physical, chemical, biological and human components.[1]" It has also been recently revealed that our man made systems and human activity on earth are profoundly impacting this Earth system. The impact of carbon dioxide on climate has been well documented; however, water is equally important to the sustaining of our way of life and has not received the appropriate amount of resources for scientific investigation. The inland water systems of the United States provide valuable resources but are in jeopardy due to lack of understanding of how our actions impact them.

BACKGROUND

Recent events reinforce the need to better understand our natural water systems. The lingering effects of Katrina upon the population of New Orleans and the increasing severity of floods in the Midwest, as experienced in Iowa and other areas last summer, indicate that water systems have a great impact on human health and safety. Communities across the country are facing difficult issues of water quality and supply. Aquifer levels continue to drop due to agricultural activities and the increasing demand of urban areas. In Atlanta, the largest user of electricity is the water utility, and the City faced the catastrophic scenario of nearly running out of water last year. Pollutants, artificial nutrients, and eroded soil from the Mississippi River are damaging the Gulf of Mexico at an increasing rate. Colorado and other western states are valuing land based on water and water access rights. San Diego and other coastal communities

[1] The Revenge of Gaia. New York: Basic Books. xvi.

face uncertain futures because of questions over water supply and security. The United States is not alone; international water problems are a growing concern and may soon join energy as one of the greatest threats to security worldwide.

Water issues are becoming increasing important locally as well. Kansas City and St. Louis both face water management problems due to combined storm and sanitary sewers that place enormous financial burdens on their urban populations. The massive amount of energy used in harvesting, pumping, and cleaning water contributes to carbon emissions and climate concerns. In the Kansas City metropolitan area, over twenty municipalities contribute to the problem, and this fragmented organization poses challenges to finding a comprehensive solution. Seventy percent of the globe's freshwater supply is utilized in food production, and the Midwest economy is closely linked to water though the production of food. The Missouri and other Midwestern rivers are heavily impacted by agriculture. If water is no longer readily or economically available, what will happen to our economy?

We believe that water is an immense resource for the State of Missouri, and we propose an institute to study the inland waterways, rivers and aquifers. The institute would address issues of urban water management, sprawl, farming practices, climate change, boating and recreation, Federal policies, programs, regulations and other forces impacting the health of our natural water systems. Potential partners for the research endeavor include the University of Missouri, Federal and State agencies including Departments of Natural Resources, US Army Corps of Engineers, Environmental Protection Agency, and others.

When we try to pick out any one thing in nature, we find it hitched to everything else in the universe.

–JOHN MUIR

TRIPLE BOTTOM LINE

There are many constituents in the issues of water management having diverse opinions and interests. The largest group of constituents is the human population. Each human being is approximately 65% water and operates as a dynamic water processing facility. We are very efficient filtration systems capable of removing impurities from the human water cycle while depositing other impurities directly or indirectly into inland and other water systems. Clean, fresh water is essential for the health and well being of humanity. Abundant clean, fresh water is equally important for sustaining a healthy economy and preserving vibrancy and resiliency nature.

The Inland Waters Research Institute will approach its work to balance the issues of people, nature and economy. Triple bottom line is critical as each system—**humanity, the environment and our economy**—must each be healthy and thriving. The institute will focus in areas of commonality, specifically researching water as the most valuable resource in our society's future.


MISSISSIPPI RIVER WATERSHED


Will water join carbon
as the next currency of
the global economy?

PROPOSAL

We propose to create a National Inland Waters Research Institute in Kansas City with strong links to Missouri's universities and other educational institutions. The National Renewable Energy Laboratory and the other national laboratories serve as models for the Institute. The primary focus of the Institute will be the ecology of water systems, the economy of water, renewable energy and nutrient production. Other areas of investigation within the scope of water systems research include: human health issues, water security, aquatic life, urban water systems, aquifer health, river systems management, agricultural impact, climate impact, air quality, energy consumption, and soil erosion.

Funding would be derived from grants, federal sources, private research partnerships, and other innovative programs.

The Institute would employ scientists and other research professionals and would be managed by a contract manager. The Midwest Research Institute is a logical choice for that role.

Inland Waters Research Institute

MISSION

Integrative Research

Ecology of water systems

Economy of water

Renewable energy and nutrient production

Water management

Health and well-being

Education and outreach

National security

BACKGROUND

Summary

No centralized, inland waters institute with proposed broad mission

There are numerous examples of more specialized centers:

- California "National Water Research Institute" focused on safe drinking water
- ASU "Water Quality Center" safe drinking water focus
- "Arizona Water Institute" closed in July due to budget cuts
- USGS and USDA centers at many Universities, with conservation, quality and management focus

PROPOSAL

Create a federally-funded Institute

Follow the National Renewable Energy Laboratory model

Strongly integrate academic, industrial and Government partners

LOCATION

Headquarters in Kansas City, MO, riverfront

Research hubs at confluences of major rivers in the watershed

STARTING PARTNERS	ROLES / RESPONSIBILITIES	CHALLENGES	NEXT ACTIONS
Industry BNIM Burns & McDonnell Black & Veatch Tetra Tech URS CDM HDR **Not-for-profit City/State/Federal** Midwest Research Institute Kansas City, Missouri Dept. of Natural Resources Envir. Protection Agency US Dept. of Agriculture Dept. of Transportation US Geological Survey Food & Drug Administration National Institute of Standards & Technology Port Authority US Army Corps of Engineers Mo-Ark Association Mid America Regional Council **Academic** Regional Universities & Colleges	**BNIM** Creation **Burns & McDonnell** Construction **MRI** Operation Other partners to be determined	Water institutes exist with more specific purposes - the unmet need, unique niche and customer to be defined Political and scientific feasibility, and existing competition require examination Determine legislation and champion to help drive the initiative Gather information from stakeholders regarding additional partners, locations and methods of inclusion and cooperation	**Receive stakeholder input** **Solicit funding for next steps** **Phase 1:** Scope definition, gap analysis, team arrangement and proposal development, est. $1.5M **Phase 2:** Facility construction, est. $250M **Phase 3:** Management and operation, est. $100M/year


BNIM

Inland Waters Research Institute

BNIM + Midwest Research Institute

2 October 2009