

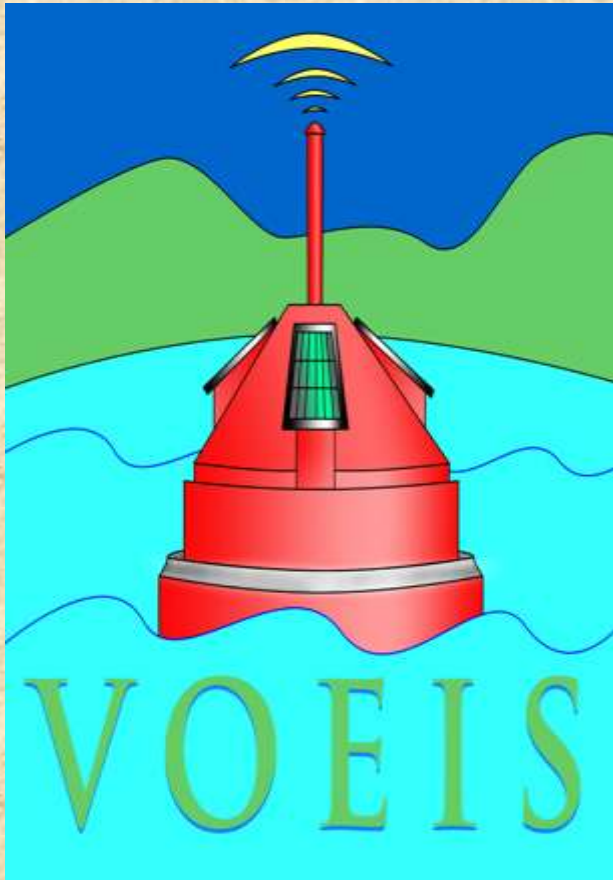
**NSF-EPSCoR Track 2 Update**  
***Virtual Observatory and Ecological Informatics System (VOEIS):***  
**Cyberinfrastructure and Environmental Sensors on Kentucky Lake and Flathead Lake and Associated Watersheds: a partnership between**  
**Kentucky and Montana**





To create an End-to-End Cyberinfrastructure and Test-bed of

1. Distributed Field Sensors
2. Sensor Development
3. Data Management
4. Data Distribution
5. Simulation Modeling
6. Visualization Modeling
7. Distribution of Knowledge, Education and Outreach



# PARTNERSHIPS

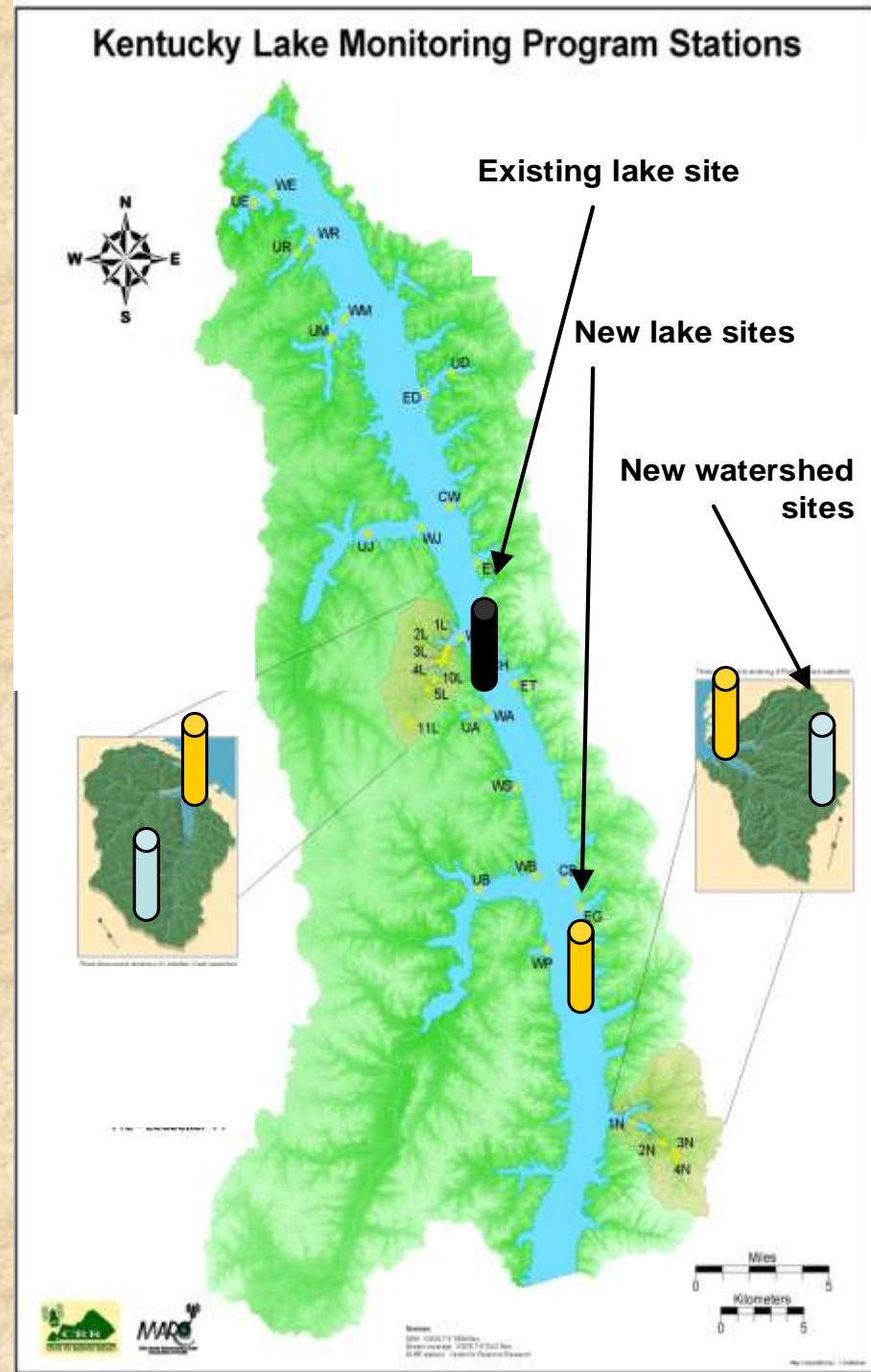
# KENTUCKY STUDENTS IN MONTANA



**FIRST JOINT  
MEETING AT  
FLATHEAD LAKE  
BIOLOGICAL  
STATION**

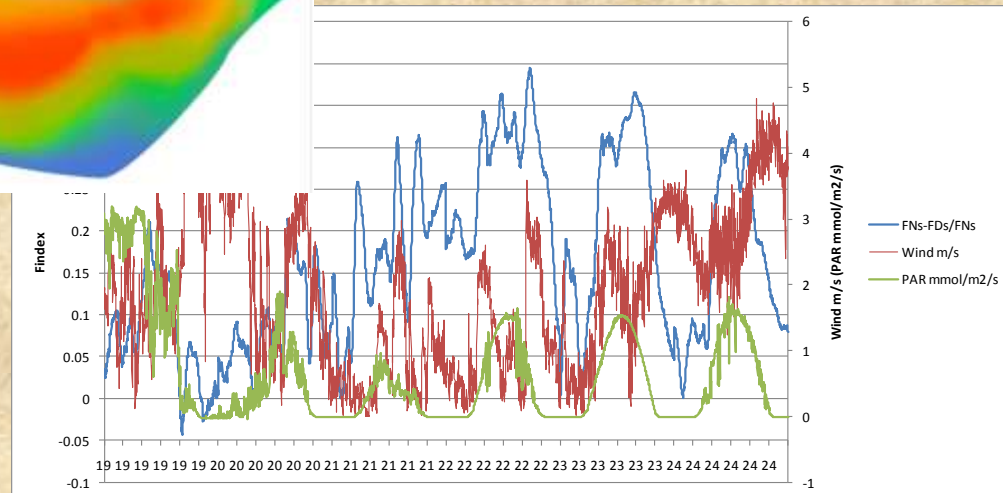
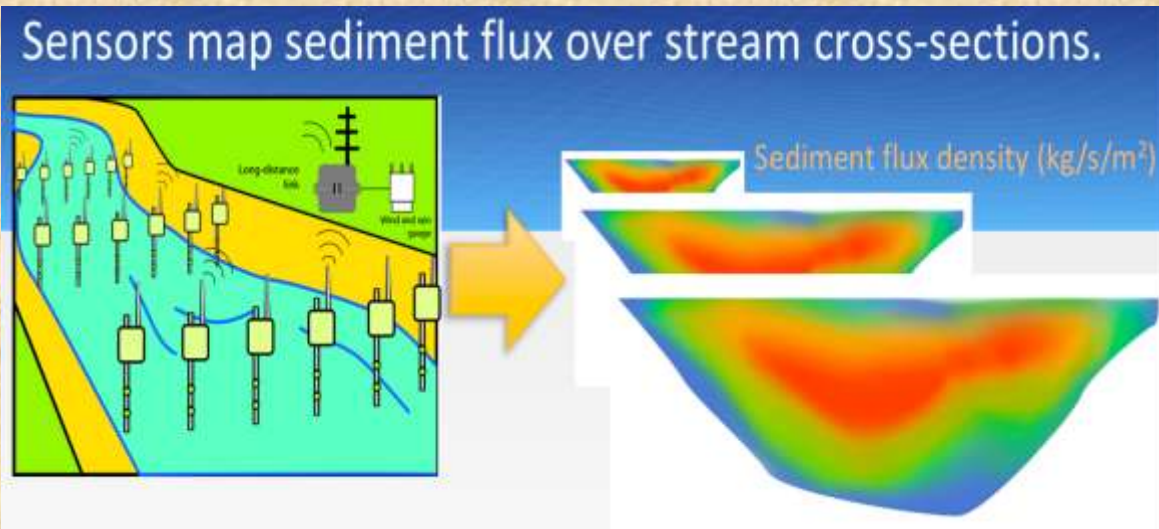


# SENSOR DEPLOYMENT



# SENSOR DEVELOPMENT AND VISUALIZATION

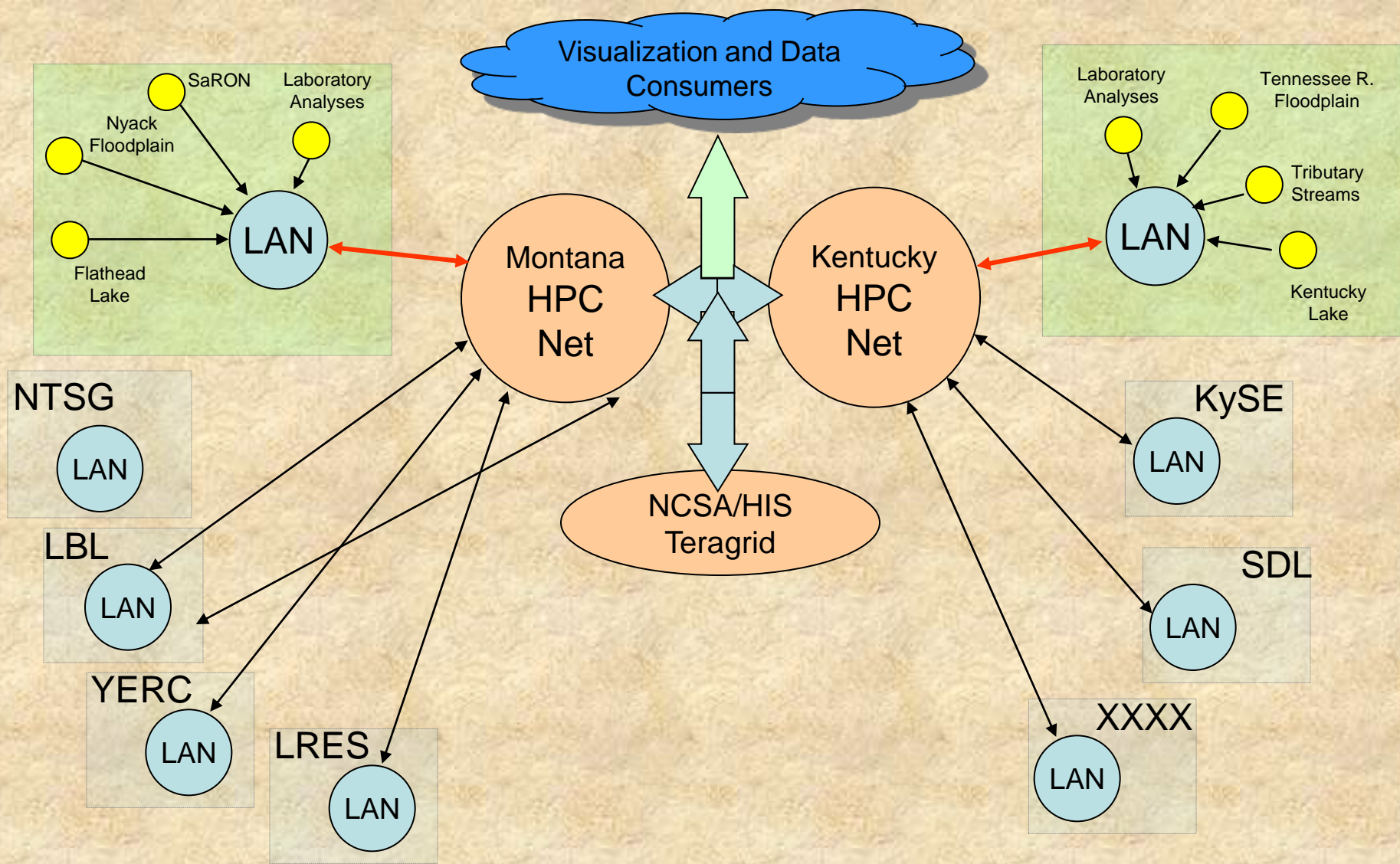
Data Products: multifaceted, advanced analyses, simulations, visualizations; Data access through secured web portals based on the NMI Open Grid Computing environment project and TeraGrid's Science Gateways. Visualization modules will draw upon the NCSA Visualization Group; traditional publications, education, outreach and training products.



**Data Collection, Management, and Routing:** Legacy data and real-time data from deployed sensors are being moved via innovative wireless, satellite, cell, and/or combinations of systems. Deployment of new sensors and new data routing are developed and demonstrated using new hardware and software.

**Preprocessing, Metadata, Quality Control, Management:** The VOEIS collaboration team is integrating all previously separate management systems and protocols into a single interactive management platform and implementing state-of-the-art data provenance (processing history) tracking, and addressing quality control issues.

**Storage and Serving Products:** Data are being transformed into common formats, stored locally, with the capacity for rapid sharing regionally and globally. Data sharing includes bi-directional flows between storage and analysis, simulation, and visualization.



**Biological Station Sensor Test-beds**

- Cisco-collaborative Lake and River sensor test-bed

**Field Sensors and Laboratory Analyses**

- Real-time Streaming Sensor Network
- Logger/Field data

**Regional LAN Nodes**

- Legacy computing Infrastructure
- Preparatory data processing
- Existing Model Leveraging
- Data Archival and Management

**MT, KY and NCSA Cyber HPC networks**

- Centers for virtual analysis and modeling of regional data
- Cyber staff and graduate students
- Regional data interpretation

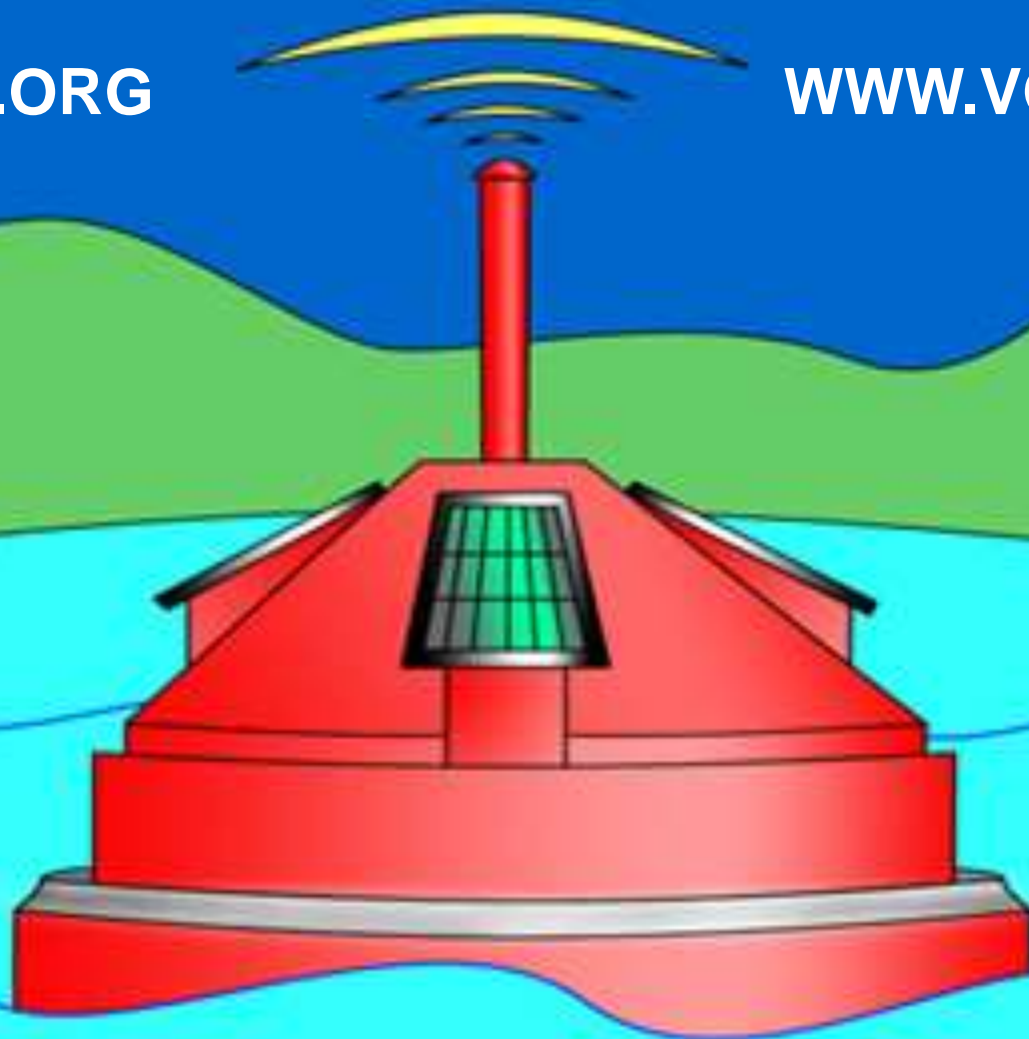
**The Kentucky Water Resources Research Institute (KWRRI) Robinson Scholars Program (RSP) partner to educate high school students about water quality issues. The Water Pioneers Program targets college-bound high school students who reside in impacted areas, particularly Appalachia who will participate in week-long summer program. Water Pioneers students partner with local groups, school systems, Eastern Kentucky PRIDE educators, and/or Water Watch volunteers to implement their community projects. Robinson Scholars address water quality problems in their communities and increase awareness of Best Management Practices for water quality while collecting data and visual documentation. Their projects will culminate with events and local summits involving parents, local officials, decision makers, school administrators, teachers, Kentucky Division of Water employees, and others.**

## **EDUCATION**



[WWW.VOEIS.ORG](http://WWW.VOEIS.ORG)

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VOEIS