Indiana Water Monitoring Council
Maximizing resources through improved communication, coordination, data sharing, and collaboration

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Water Resource Management

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West Boggs Renovation

West Boggs used to be a premier bluegill and bass fishing lake drawing anglers from throughout 81 Indiana counties, Kentucky, Michigan, and Ohio. A lake renovation in 1994 was successful in increasing the number of angler visits to the lake annually by 71%. In 1999 alone, these anglers spent an estimated $1.1 million in the local community to enjoy the great fishing experience the lake could provide.

Unfortunately, the quality of the fishery declined when undesirable fish to pre-renovation levels. From 2004 to 2010, recreational boating decreased by 11% and the number of angler visits decreased by 63%. The once million dollar fishery is now reduced to bringing in approximately $326,400 annually. “The less anglers that come to the lake, the less money is distributed to the local community,” said Brian Schoenung, Chief of Fisheries. “Anglers buy bait, food, gas, and lodging in the area, bringing economic gain and tourism to the community. In a small town, the nearly $800,000 dollars lost annually can have a big impact.”

The fisheries renovation at West Boggs was completed in early October. The renovation process started with relaxed bag limits on the lake to encourage anglers to take advantage of the remaining fish. Two fish salvage operations for adult bass and catfish will take place before the renovation, with tournament bass anglers aiding in fish salvage this spring/summer. A chemical eradication of fish using rotenone was applied by trained DNR staff in the West Boggs watershed.

Rotenone is a naturally occurring substance in several plant seeds and stems and an EPA regulated piscicide. It is quickly detoxified in the environment, having virtually no effect on mammals and birds that may come in contact with it. After the fish eradication, the lake will be allowed to refill, and the salvaged fish as well as hatchery raised game fish will be stocked.

West Boggs Renovation Continued…

"The fisheries renovation will not only make for better fishing, but has the ability to revitalize a small community," said Schoenung. "Small family-run businesses often depend on these anglers spending funds in their stores. The increased quality of the fishery will draw boaters and anglers that will invest in the future of the fishery and the county."

Dave Kittaka, District Fisheries Biologist, said the lake's fish population is a fairly complicated dynamic. Prior to 2000, he said there was no gizzard shad in the lake, so there was a tremendous bluegill and bass population. Now, the gizzard shad population has outgrown the rest of the food chain and created a severe imbalance. Carp also are a problem.

Kittaka said that small gizzard shad can be a food source for largemouth bass. But, he explained, the gizzard shad isn't the same as the shad used as bait in fishing shows people might see on TV. The gizzard shad in West Boggs Creek Reservoir is commonly 8 to 14 inches long, but can reach 18 inches, according to DNR information. According to Mike Axsom, park superintendent, once the gizzard shad reaches 6 inches, it's too large to serve as a food source for other fish.

Undesirable species also degrade water quality the way they filter feed, according to Kittaka. He said they eat microscopic algae and insects off the lake bottom, which resuspends the organic matter, previously trapped on the bottom and muddies the water. The more organic matter that gets stirred up, the more nutrients become available for microscopic algae to grow in the lake.

"Back in 1999 we did a survey to determine who fished and what they caught," Kittaka said, adding there were 30,778 fishing trips on West Boggs Creek Reservoir from April through October before the shad arrived. "We've been monitoring since 2002 when we found gizzard shad."

Kittaka said that in 2010, there were 5,214 fishing trips, a considerable drop in attendance. So, the decision was made to renovate. "Anglers aren't going to fish where there are no fish," he said.

Save the Date!

The Indiana Water Monitoring Council will be hosting its annual symposium entitled: **Indiana Agriculture and Water Monitoring**" at the Indiana Government Center South on **December 11, 2014** from 9:00 am to 3:30 pm.

This year's symposium will focus on helping participants realize the importance of monitoring for both water quantity and quality as it relates to agricultural practices and planning.

Presentations by water scientists, researchers, and members of the agriculture community will help identify what types of monitoring and practices have been and are being done and will help frame the discussion on what important gaps may still exist.

Topics on nutrient management and soil health, useful monitoring networks and techniques, conservation practices, soil moisture monitoring, and emerging agriculture irrigation practices are being planned.

You can register for the free symposium here: http://www.inwmc.org/page-303781

The full symposium agenda can be found here: http://www.inwmc.org/Resources/Events/2014%20Agriculture%20Symposium/InWMC%202014%20Fall%20Symposium%20Agenda.pdf

InWMC Highlights Water Issues in Indiana and Solutions Through Monitoring

Several challenges face Indiana's water resources today, and citizens need concise information regarding these problems to increase their awareness. To meet this need, the Indiana Water Monitoring Council is developing a series of web pages intended to educate the general public, heighten support for monitoring efforts and spotlight those water-resource professionals who are working to resolve problems or minimize societal impacts.

Each of these "water resource issues" web pages, which are being developed by InWMC members and other experts in the water resources field, includes related information resources and additional content to address knowledge gaps or provide citizens with a course of action when they have concerns or encounter problems.

Web pages are available for the following topics at www.inwmc.org:

- Arsenic in Indiana groundwater
- Biological integrity of surface water
- Drought
- Flooding
- Nutrients in surface water and groundwater
- Pathogens in surface water and groundwater

More pages (or fact sheets) are under developed and/or planned, Please contact InWMC president, Shawn Naylor, if you'd like to participate.

U.S. EPA Ambient Water Monitoring

Did you know…ambient monitoring means observing or measuring selected features of an aquatic ecosystem and is essential to surface water protection. It is performed in order to assess the health of an aquatic ecosystem and its ability to support human uses. Ambient monitoring is also used to identify problems or changes early on, provide insight into the causes of problems, and determine whether water quality goals have been achieved. Designing an effective ambient monitoring program involves four elements:

- Determining what information is needed
- Choosing the appropriate indicators. methods, and sites for monitoring
- Determining the time of year, day, and frequency of the monitoring to be done
- Assuring the quality of the results

There are several methods to monitor water conditions:

- Chemical measurements monitor the chemical concentrations in water, sediments, and fish tissue
- Physical measurements of general conditions, such as temperature, potential of hydrogen (pH), flow, watercolor, and the condition of stream banks and lakeshores
- Biological measurements of the abundance and variety of aquatic plant and animal life, and the ability of test organisms to survive in sample water

Monitoring can be conducted in several ways - at regular sites on a continuous basis, at selected sites on an as-needed basis to answer specific questions, on a temporary or seasonal basis, or on an emergency basis.

EPA continued…

Increasingly, monitoring efforts are aimed at determining the condition of entire watersheds. This is because of increased understanding of the importance of watershed-based management, which itself reflects the interconnectedness of all types of waterbodies and a recognition of the impacts of land-based activities on the waters that drain the land, including those beneath the ground.

Tribal governments have key monitoring responsibilities and may implement monitoring programs. Pollution control decisions are based on data collected by tribes, as well as federal and state governments and private entities. EPA provides technical assistance on how to monitor, as well as how to report water quality monitoring findings to the federal government. EPA also provides grants for pollution control activities, which tribes (and states) may use to support monitoring programs. Tribes may seek to obtain grants under Sections 104 and 106 to carry out effective water pollution control programs.

CWA Section 106 grants may be used to fund a wide range of water quality activities, including: water quality planning and assessments; development of water quality standards; ambient monitoring; development of total maximum daily loads (TMDLs); issuing permits; groundwater and wetland protection; nonpoint source control activities (including nonpoint source assessment and management plans); and watershed assessments.

CWA Section 104 grants may be used to focus on innovative demonstration and special projects. Among the efforts eligible for funding are research, investigations, experiments, training, environmental technology demonstrations, surveys, and studies related to the causes, effects, extent and prevention of pollution.

You can read more about water resources from the U.S. EPA here:
http://www.epa.gov/tribalcompliance/waterresources/wrwaterdrill.html

Rule 5 Trained Individual Lunch and Learn hosted by the White River Alliance SAVE THE DATE!

Join the MS4's of the White River Alliance for a lunch and learn session about the upcoming Rule 5 Trained Individual Contractor's Workshop. This free session is open to all contractors, engineers, project managers, real estate agents, generally anyone involved in land moving or construction activities. Come enjoy a free lunch while learning:

- Water quality concerns
- Stormwater impacts
- How your actions can improve or degrade water quality
- Most of all, we want to hear your feedback about our program and learn how we can better help you manage your sites for cleaner water!

Two sessions are scheduled:

Noblesville
When: 12/17/2014, Time: 12:00 – 1:00 PM ET
Where:
At Noblesville City Hall A214
16 S. 10Th Street
Noblesville, IN 46060

Zionsville
When: 12/18/2014, 12:00 – 1:00 PM ET
Where:
Zionsville Town Hall
1100 West Oak Street
Zionsville, IN 46077

New Satellite Data Will Help Farmers Facing Drought

BY: ROSALIE MURPHY JPL EARTH AND TECHNOLOGY DIRECTORATE, NASA

About 60 percent of California is experiencing "exceptional drought," the U.S. Drought Monitor's most dire classification. The agency issued the same warning to Texas and the southeastern United States in 2012. California's last two winters have been among the driest since records began in 1879. Without enough water in the soil, seeds can't sprout roots, leaves can't perform photosynthesis, and agriculture can't be sustained.

Currently, there is no ground- or satellite-based global network monitoring soil moisture at a local level. Farmers, scientists and resource managers can place sensors in the ground, but these only provide spot measurements and are rare across some critical agricultural areas in Africa, Asia and Latin America. The European Space Agency's Soil Moisture and Ocean Salinity mission measures soil moisture at a resolution of 31 miles (50 kilometers), but because soil moisture can vary on a much smaller scale, its data are most useful in broad forecasts.

Enter NASA's Soil Moisture Active Passive (SMAP) satellite. The mission, scheduled to launch this winter, will collect the kind of local data agricultural and water managers worldwide need.

SMAP uses two microwave instruments to monitor the top 2 inches (5 centimeters) of soil on Earth's surface. Together, the instruments create soil moisture estimates with a resolution of about 6 miles (9 kilometers), mapping the entire globe every two or three days. Although this resolution cannot show how soil moisture might vary within a single field, it will give the most detailed maps yet made.

"Agricultural drought occurs when the demand for water for crop production exceeds available water supplies from precipitation, surface water and sustainable withdrawals from groundwater," said Forrest Melton, a research scientist in the Ecological Forecasting Lab at NASA Ames Research Center in Moffett Field, California. "Based on snowpack and precipitation data in California, by March we had a pretty good idea that by summer we'd be in a severe agricultural drought," Melton added. "But irrigation in parts of India, the Middle East and other regions relies heavily on the pumping of groundwater during some or all of the year." Underground water resources are hard to estimate, so farmers who rely on groundwater have fewer indicators of approaching shortfalls than those whose irrigation comes partially from rain or snowmelt.

For these parts of the world where farmers have little data available to help them understand current conditions, SMAP's measurements could fill a significant void.

Some farmers handle drought by changing irrigation patterns. Others delay planting or harvesting to give plants their best shot at success. Currently, schedule modifications are based mostly on growers' observations and experience. SMAP's data will provide an objective assessment of soil moisture to help with their management strategy.

"If farmers of rain-fed crops know soil moisture, they can schedule their planting to maximize crop yield," said Narendra Das, a water and carbon cycle scientist on SMAP's science team at NASA's Jet Propulsion Laboratory in Pasadena, California. "SMAP can assist in predicting how dramatic drought will be, and then its data can help farmers plan their recovery from drought."

"Scientists see tremendous potential in SMAP," Melton said. "It is not going to provide field-level information, but it will give very useful new regional observations of soil moisture conditions, which will be important for drought

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www.inwmc.org

Satellite Data continued…

monitoring and a wide range of applications related to agriculture. Having the ability provided by SMAP to continuously map soil moisture conditions over large areas will be a major advance."

For more information about SMAP, visit:

http://smap.jpl.nasa.gov/

NASA monitors Earth's vital signs from land, air and space with a fleet of satellites and ambitious airborne and ground-based observation campaigns. NASA develops new ways to observe and study Earth's interconnected natural systems with long-term data records and computer analysis tools to better see how our planet is changing. The agency shares this unique knowledge with the global community and works with institutions in the United States and around the world that contribute to understanding and protecting our home planet.

For more information about NASA's Earth science activities in 2014, visit:

http://www.nasa.gov/earthrightnow