prairierivers network

UMR Current

A publication on the Upper Mississippi River by Prairie Rivers Network
The Illinois Affiliate of the National Wildlife Federation

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Update on WRDA

Water Resources Development Act

Congress overrode the president's veto of the $23 billion WRDA bill in early November, the first override of a Bush presidential veto.

Loss of an UMR Fixture

Death of Mark Beorkrem

In November we lost a long-time UMR advocate. Mark fought for both essential environmental restoration and reasonable navigation expenditures. Among his many important positions on environmental and conservation groups he was the co-chair of the Corps Reform Network, which was established to rein in the power of the Corps of Engineers, as well as the Sierra Club's UMR expert. Mark was honored as one of Lt. Governor Quinn's environmental heroes in December 2007. He will be truly missed.

If you would like to subscribe to the newsletter or contribute to its content please contact Brad Walker: River Restoration Program Coordinator at bwalker@prairierivers.org.

INSIDE THIS ISSUE

More Corn, More Problems for the UMR?

According to the US Department of Agriculture-National Agricultural Statistics Service the amount of corn planted in Illinois in 2007 increased to a record estimated 12.9 million acres, up from 11.3 million acres in 2006. The projections by most people watching US agriculture, at least for the near-term, indicate continued high planting acreage for corn for the entire US Corn Belt. What will more corn planted mean for the Upper Mississippi River (UMR) environment?

The expansion of the corn-ethanol industry has been driven largely by tax incentives in federal Energy Policy Acts. A December 2007 report by the Great Lakes Commission (1) indicated that 29.2% of the projected 81.2 million acres of harvested corn in the U.S. during 2008/2009 will be used in ethanol production. By 2016/2017 this amount is projected to increase to 30.9% of 82.8 million acres, a total of 25.6 million acres, producing 4.35 billion bushels of corn for ethanol. According to the National Corn Growers a bushel of corn can produce about 2.8 gallons of ethanol, so by 2016/2017 about 12.2 billion gallons of ethanol could be available.

In November 2006 data from the Renewable Fuels Association (RFA) indicated that there was about 5.1 billion gallons of ethanol capacity. By January 2008 data from RFA shows that ethanol capacity had increased to nearly 7.9 billion gallons with an additional 5.6 billion in capacity under construction. The Institute for Agriculture Trade Policy (IATP) (2) estimated in December 2006 that by 2012 corn ethanol production will grow to nearly 9 billion gallons. However IATP also wrote that there are many corn-ethanol plants that are being planned that could potentially increase capacity to about 19 billion gallons by the end of 2008 if all plants were constructed. Although this upper level capacity is unlikely by the end of 2008 it would require about 6.8 billion bushels of corn or about 40 million acres of harvested corn at an average of 170 bushels per acre. That is an increase of about 13.4 million acres. A legitimate question is where this additional corn acreage will come from. Will it be taken from land planted in other crops, from erosion-prone land in expired Conservation Reserve Program contracts or

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both?

Corn is not a particularly environmentally friendly crop even when planted with the best management practices, especially when it is planted in an industrial monoculture manner. Corn exposes large portions of the field to the elements causing unsustainable soil erosion, as well as requiring a lot of fertilizers and pesticides to attain high yields, which can pollute our water supply. Long-term planting of corn can decrease soil fertility, causing a negative feedback necessitating even greater amounts of soil supplements to maintain yields that then further decrease soil fertility. Corn also requires a lot of water to produce high yields. In areas of low rainfall or during drought periods large volumes of irrigation water are required to augment rain. Drawing large amounts of water from aquifers for irrigation can have negative impacts upon stream flows and water availability for people.

Corn is typically planted by preparing the field ahead of time by completely plowing under the previous year's plant remains. This exposes the soil to water and wind, increasing erosion on farm fields. Conservation methods such as low or no-till practices are not conducive to corn planting because of difficulties of planting in existing plant material. The Institute for Water Resources at the Michigan State University estimated that sheet erosion could increase up to 36 percent if more cropland is continuously planted in corn (1). Eroded soil ends up as sedimentation in the UMR basin and is arguably already the most significant environmental problem in the UMR. Increased erosion will exacerbate the sedimentation problem in the UMR. Another related concern is that corn stubble, the stalks left on the field after harvest, may also become a biomass source for ethanol. Corn stubble provides some level of soil erosion protection and as it decomposes adds essential carbon and other nutrients to the soil. The removal of stubble would serve to not only increase the erosion of the normal corn planting process but also further deplete soil fertility requiring the addition of more soil inputs to maintain productivity (3).

Soil inputs have been essential to dramatically increasing crop yields, particularly fertilizers and pesticides. These materials have also been significant non-point pollution sources within the UMR beginning in the 1950s. Since then the use of synthetic nitrogen has increased about 1,100 percent (4). Corn is heavily dependent upon inputs for its high productivity using about 40 percent of the nitrogen and about 38 percent of the phosphates placed on U.S. croplands (1). When a farmer decides to abandon soil fertility improving crop rotations by planting corn continuously there is a yield drop over time due to decreasing fertility (1). To counter this problem, farmers usually increase their fertilizer use, compounding the non-point pollution problem. Unfortunately, not all of the fertilizer applied is absorbed into the soil or by the crops. The unused fertilizer runs off of the farm fields and into streams and rivers ultimately being deposited into the oceans. Nitrate and phosphate pollution can cause increased growth of algae and water plants decreasing available oxygen for fish and other water life. This can lead to hypoxia, the largest example in the U.S. being the Dead Zone in the Gulf of Mexico thought by most experts to be primarily the result of fertilizer runoff from Midwestern farms.

Water shortages are another environmental problem that may be intensified by the increased planting of corn and then using the corn to produce ethanol. Corn requires large volumes of water to grow. Irrigated areas that use water beyond the recharge rate from aquifers can cause serious long-term drops in the aquifer level. Purdue University estimates that water percolation below the root zone may decrease up to 15 percent in a field planted in continuous corn. This will reduce available water to aquifers and streams (1). Large volumes of water are also required to operate an ethanol plant. For a 50 million gallon ethanol plant between 175 million to 300 million is expected to be used each year, with up to 95 percent of this water permanently lost to the watershed (1). A related problem is the large volumes of wastewater generated by ethanol plants. A 100 million gallon ethanol plant being built in Rogersville, Missouri will produce about 400,000 gallons of contaminated wastewater each day that could pollute area water sources if it is not properly treated (5).

It is important to note that there will be some definite winners during this corn-ethanol boom. A few large companies that produce seeds, fertilizers and pesticides will make a lot of money selling their products to farmers (6) (7) and the more corn acreage planted and the greater the depletion of soil fertility the more their profits will be. It is not so obvious whether farmers and ethanol producers will benefit as much since their monetary gain is influenced directly by corn and input prices. Because the U.S. uses around 120 billion gallons of gasoline each year, even the upper volume of 19 billion gallons (13.3 billion gallons of gasoline equivalent fuel) produced by corn-ethanol will be only about 11 percent of our annual consumption. This may have a small positive impact upon fuel availability but potentially a larger negative impact upon the average American's food costs because of the conversion of 40 million acres of cropland to corn for ethanol.

The main losers will likely be the UMR and those who

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enjoy using it. As one can glean from the above discussion, two current major UMR problems could be significantly and negatively impacted by the corn-ethanol boom; increased sedimentation and degraded water quality.

And ultimately it will be the U.S. taxpayers who will have to pay the bill for any increased river restoration needs required from the transgressions of corn-ethanol. [References on page 8] ❖

ARTICLES IN UPCOMING ISSUES

Articles we are planning for upcoming issues of the newsletter include: ecosystems of a typical UMRS pool, ecological status of the UMRS, detailed coverage of individual pools, and restoration funding. We will also include reoccurring articles on restoration issues, tourism and the status of the PRN Program.

Submission of articles by readers is also welcomed; inclusion will be subject to content and length limitations.

UM River Education

Upper Mississippi River Education Program

Recently we began wondering just how well our environmental education system is working in this country, especially on environmental issues that we work on. After years of observing people in meetings, in the media and from newspaper comments the thought was that it may not be working all that well. Since we are obviously not in the position to alter this condition on a national scale we began to consider just how we might make a dent in this problem on a local level and within our realm of expertise.

In January 2007 Prairie Rivers Network began working with representatives of the National Great Rivers Research and Education Center (NGRREC), Southern Illinois University – Edwardsville and Sierra Club to form an Upper Mississippi River (UMR) committee to review how much the UMR was covered within the curriculum of several high schools in Madison County, Illinois. By February we were somewhat shocked to determine that there was a general lack of attention to the river in classrooms within a county that was directly bordered by the largest and most important river in our country. One of the most telling comments we received from people we meet with was that his children knew more about the Amazon River than the Mississippi River.

The committee unanimously agreed to try and locate some teachers who taught river related environmental issues and ask them if they taught about the UMR specifically. If they did not, we asked if they would they be interested in incorporating the UMR within their curriculum. We quickly found two teachers, one working at Alton High School and another working at Edwardsville High School, who both acknowledged that they did not include the UMR specifically but would be very interested in including it. They confirmed that they did not believe many local teachers covered the river.

After hearing this we had to decide as a group if we were really willing to try and change the status quo, acknowledging that some extensive work would be involved – again we decided to go forward.

This decision set us on the path of developing a group of classroom presentations that covered important river topics using the UMR as the example; allowing the teachers to work within state Educational Literacy requirements. Each of the PowerPoint presentations can be modified as the teachers see fit or used as is. We also developed several classroom activities that the teachers can use to supplement the presentations as well as an extensive reference library to help support the teacher's knowledge. Both teachers were provided all of this information on a CD in early July 2007 so they could use it to plan their 2007/2008 curriculums.

Through our discussions with the teachers they indicated that a field trip would be a helpful and interesting addition to the program. This idea blossomed into an all-day event in which student participation was key. The day would begin with a river experience followed by an afternoon of critical thinking, evaluation, and decision making.

On October 26th, the fieldtrip started with 60 eager students from Alton and Southwestern High Schools. Despite intermittent rain, we were able to tour the Melvin Price Locks and Dam, where the Corps was very flexible and worked with our tight schedule. Following the Lock and Dam, we toured the National Great Rivers Museum near Alton and the students

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were able to watch a 25-minute video on the history of the river.

Our afternoon was spent at the beautiful campus of Principia College located on the bluff above the river. The students discussed two UMR related river issues; the Gulf of Mexico "Dead Zone" and Floodplain Reconnection and presented their ideas of possible solutions of these issues. In addition to providing facilities and refreshments; students from the College helped facilitate the afternoon session. River experts; John Chick from the Illinois Natural History Survey, Curt McMurl, of US Fish and Wildlife Service, Drew DeRiemacker of the Natural Resources Conservation Service and Todd Stole, of The Nature Conservancy kindly provided their time and knowledge, assisting the students in developing their solutions. Our day ended with interesting and informative comments by the experts to the students regarding the student's solutions and career opportunities in environmental and conservation fields.

We will evaluate the success of this pilot project and decide during early 2008 whether we will attempt to expand the program. Our current hope is that other schools in the immediate area, including middle schools, will be interested. Ultimately we would like all schools located near the UMR, maybe even all of the schools in Illinois, covering the river in their curriculums. Schools would be encouraged to include lessons of the river in history, political science, literature, economics, music, and art classes as well.

Exposing all students to river issues, as well as other environmental issues, can only help in how well we are able to resolve these difficult problems.

If we only focus upon educating the next group of environmental specialists, they will likely be destined to report the continuing decline of the environment.

But if we focus upon holistically educating the entire school population about the environment, those future environmental experts might just have the unprecedented opportunity to report on the recovery of the environment. ❖

Ecological Economics

Does our current economic system help or hinder ecosystem restoration? Maybe the answer to that question lies within the answer to a larger question - Has our current economic system helped or hindered the protection of the environment?

These are obviously very difficult questions to answer but by asking the questions we hope to invite people to investigate and evaluate the economic fundamentals and values that have driven this country for its entire existence.

The United States was founded at almost the same exact point in time that the framework of our economic system was created – Adam Smith's Classic Economic theory or as it is typically known, capitalism. This theory establishes value as the income portion that was added to raw materials by the labor used to produce goods. The accumulation of value or capital has been a primary pursuit by most of us.

We have extended Classic Economics to a new level through Neoclassical Economic theory. The basic principles of this theory are that people:

1. act rational in their purchases;
2. seek to maximize their personal utility and companies maximize profits;
3. and have perfect knowledge regarding their economic activities.

Three other major concepts are part of the theory:

1. Supply and Demand (Market Theory)
2. Unlimited economic growth since wealth is derived primarily from human labor and resource substitutability

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3. Capital itself can increase capital

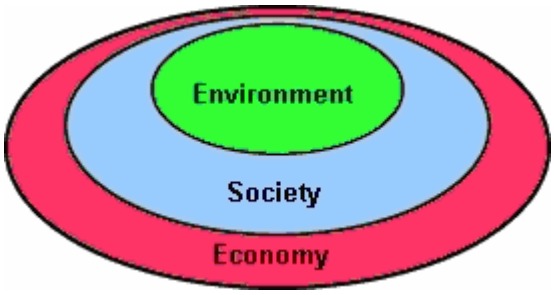
A quick review of the above principles and concepts shows a lack of any direct reference to the value of natural resources or the environment. Many problems such as pollution, species loss, and ecological services that are not accounted for in models are typically considered externalities – essentially someone else's problem to deal with, often a future generation.

But there have been other economic theories. Classic Economic theory was a departure from what is considered by many to be the first formal economic theory, developed by the French Physiocrats in the 1760s. Nature was the strong component of the Physiocrats *laissez faire* economic philosophy but it focused upon the ability to produce agricultural products from fertile land. Wealth thus was created through the production of food and fiber and any surplus of these products, especially food, allowed economic and population growth. They did not believe that the manufacturing industry produced a net gain, unlike agriculture. But the Industrial Revolution and Adam Smith's writings, among other issues, ended the Physiocrats influence and also any meaningful inclusion of nature in a major economic discipline for two centuries.

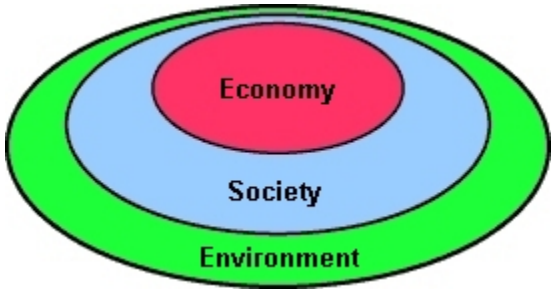
The development of the field of Ecological Economics (not to be confused with environmental economics – a subset of neoclassic economics) in the 1970s was influenced by 19th century economist John Stuart Mill who questioned perpetual economic growth. Ecological Economics, likely developed out of growing concern in the 1960s for our degrading environment, considers the environment and resources within the analysis of the world economy and combines economics with the realities of ecology and physics, incorporating their relationships and linkages. It acknowledges:

1. All physical resources, both renewable and nonrenewable, come from nature
2. In order to have resources and a clean environment for the future we must consider the sustainability of ecosystems today
3. The world is finite with limited resources
4. We do not know what the impact of our activities will have on the future so we should be cautious and prudent in our decisions

A simple graphical contrast between the macro-level general neoclassical and ecological views is shown below. As an aside, there are some extreme neoclassical views that would not include the environment in the top graphic at all.



Neoclassical World View



Ecological Economics World View

Put into the above perspective it is easier too understand how the environment, and even society, are often not considered a priority in the neoclassical way of thinking. The economy is foremost and the other portions are supportive and embedded. An important implication is that there is no constraint upon economic growth (or societal growth), as is indicated in the above listed second major Neoclassical Economic theory.

The ecological economics world view graphic is not implying that humans are subservient to the environment but that human society is totally dependent upon the environment for all essential natural resources. It places the economy as a part of human society. Since the environment can not grow, unlike society and the economy, both human society and the economy are limited in their growth. The goal would then be to establish and maintain our activities within these limits.

There are few views that are so fundamentally different in their underlying framework. Unfortunately, for many reasons including issues of protection of profits, maintaining power, a lack of general environmental literacy and little political will to question the status quo, there is little debate occurring regarding this difference. Part of the reason also has to do with the self-imposed isolation of economics from other relevant disciplines.

Over time many scientific theories have been shown to be erroneous or completely wrong. Scientists study, research and debate their

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contrasting theories through the academic system, eventually the best theory takes hold. But economics is not a natural science because there are no natural or universal laws that govern it. Economics is a social science based upon analyzing people and their actions within the economy but its isolation has insulated it from critical review. At least two of the above principles of neoclassical economics cannot be defended as laws; people are not necessarily rational and they do not have perfect knowledge. It could be argued that the ability to manipulate people's actions and level of information is a major cause of our environmental problems (as well as a primary source of profit for some companies).

One of the other major concepts of neoclassical economics is Market Theory, which works quite well at a micro level. However, market theory has many limitations, especially when we move to a macro level regarding the environment and other species. Just how can the market adequately deal with something that is irreplaceable yet has no market, such as the air we breathe and other ecological services essential to life? How can it reasonably place a value on other species?

If we limit the focus primarily upon people and their economic actions as we have always done, there is no definitive way to show that one economic system is better than another, let alone that one may have a fundamental problem. But what if the view is widened to include the ecological concepts of carrying capacity, natural resource dependency and finite resources?

The disparity between the frameworks of these two economic theories must be reconciled before we can really establish long-term, workable policies to address environmental protection and restoration. We are not arguing about endangered species here, the issue is the protection of all species including humans. It will not be enough to put economists and ecologists in the same room and let them fight it out. Both disciplines must understand each other's fundamentals first.

It is unlikely that economists will make the initial move so maybe it is time for environmentalists and conservationists to step into the realm of economics and challenge the status quo in order to help elevate this academic debate into the public arena.

For those who are interested, please read For the Common Good by Herman E. Daly and John B. Cobb or Ecological Economics by Herman E. Daly and Joshua Farley, which have been sources for portions of this article. Information on the Physiocrats came from several articles on the topic. ❖

River Wanderings

By Brad Walker

Last issue I talked about a couple of interesting state parks in southern Illinois. In this issue I am working my way further north along the Mississippi River stopping at a historic fort in Randolph County and a world-renown Native American site that straddles St. Clair and Madison Counties.

I took this trip on Halloween, which was a beautiful day and turned out to be the transition from Indian summer to fall.

Several miles west of the town of Prairie Du Rocher in Randolph County, off of Illinois Route 155, is the Fort de Chartres State Park. The area was settled by the French in the early 1700s and Prairie Du Rocher, one of the oldest French settlements remaining in the U.S., was settled in 1722. The town contains several interesting historical buildings.

The main attraction at the nearby state park is Fort de Chartres, a rebuilt portion of the stone fort built in the 1750s. The replica includes the north and portions of the east and west walls. There are also several stone buildings with one replicating 18th century living conditions and another housing the park's museum. Large portions of the original foundations are also exposed for view.

In 1673, through their Canadian colony, the French claimed what they called the Illinois Country and had great plans to exploit the area for its furs and precious metals. The French government granted the Company of the Indies monopoly powers and moved government control to New Orleans in 1718. These actions lead to a settlement of Prairie Du Rocher and the construction of a series of forts nearby. The only metal found was lead, causing the Company of the Indies to abandon the area, but fur trading and agriculture were generally financially worthy ventures.

The stone fort was actually the third fort built by the French in the immediate area. The previous two were wooden stockade type structures and did not withstand the wet environment of the Mississippi River floodplain. But even the stone fort did not survive intact for long. The French ultimately

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surrendered the Illinois Country to the British in 1763 after the Seven Years' War. The British saw no use in the fort and left it to nature in 1771.

Restoration has been done in stages going all the way back to 1917 when there were no portions of the walls remaining above ground.

The museum has some interesting exhibits worth viewing. Several historical reenactments and other events are held at the park throughout the year. The 38th Annual Rendezvous at Fort de Chartres will be held in June 2008.

On my way to the next location on my day's venture I stopped at the Fults Hill Prairie Nature Preserve, a 532-acre area containing pristine native loess prairies on the bluffs above the Mississippi River. I thought I would quickly walk the 1.25-mile trail through the preserve but was confronted with a long series of steep steps just to get to the lower reach of the bluff. By the time I got to the top of the stairway I was really feeling the strain, to put it lightly. The words on the sign down below started to have more meaning to me; "Trail Difficulty – Extreme" and "dangerous areas exist within this preserve". I realized I was alone on my trek and that with my luck, while falling down a slope breaking my leg, I would land on my cell phone. So I took a photo of the view and carefully climbed back down the stairs to my car. This preserve is undoubtedly a beautiful place, but a bit of training before time and bringing a healthy partner is recommended.

CAHOKIA MOUNDS

It is hard for me to believe now that it took me 15 months to wander over to this wonderful place. It should have been one of the first places I visited when I moved to the area.

The 2,200 acre Cahokia Mounds State Historic Site is located on Collinsville Road west of Collinsville and along the border between St. Clair and Madison Counties. The original Mississippian Indians settled the site around 700 AD and at its peak during the 1200s covered about 4,000 acres and contained between 10,000 to 20,000 people. Archeologists estimate that there were about 120 earthen mounds but only about 80 remain today, 70 of them are within the state historic site.

The United Nations Educational, Scientific and Cultural Organization designated it as a World Heritage Site in 1982, understandable considering it contains the largest prehistoric earthen structure in the New World. Monks Mound, named after French monks that farmed it during the early 1800s but used largely by the original builders for ceremonial purposes, covers about 14 acres and is about 100 feet high. A much smaller mound, identified as Mound 72, has around 300 bodies buried within it.

Towards the end of the societies existence, during the mid to late-1100s, log walls were built around the central area of the city for both separating classes and defense. The latter reason may have become the more important one since the walls were rebuilt several times. The estimated 20,000 logs used to build the nearly 2-mile long wall had to have placed a heavy strain on the local forests. The city was abandoned for unknown reasons in the late 1300s but many experts believe it was related to resources depletion.

The site has a great museum with a variety of exhibits detailing many of the aspects of the city as well as its resident's lives. Several hours can be easily spent going through the museum.

The site has several hiking trails with the longest being about 10 miles long that allow you to walk through or near forests, marshes and prairies. There

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are also paths around the mounds and a stairway to the top of Monk's Mound, which I will take on my next trip.

Historical places like this have always awestruck me. Cahokia Mounds was on the upper end of the scale for me. It is both inspiring and sobering walking the site of an advanced communal society that survived 700 years; with people living their lives, learning new things and ultimately undermining their ability to survive. There are good lessons for us to learn from these people, if we are willing to listen to their ghosts. ❖

References: More Corn, More Problems for the UMR?

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(2) Staying Home: How Ethanol will Change U.S. Corn Exports, Institute for Agriculture Trade Policy, December 2006

(3) Ethanol Debate at Enviro Commission, Expert warns state about ethanol pollution, QC Times, August 09, 2007

(4) Contaminants in the Mississippi River, 1987-92, U.S. Geological Survey Circular 1133, 1995, http://pubs.usgs.gov/circ/circ1133/

(5) Ethanol plants come with hidden cost: Water, Bill Lambrecht, St. Louis Post-Dispatch, 4/15/2007

(6) Miracle grow, Cargill's well-connected fertilizer unit wows Wall Street, dumps on Florida, Tom Philpott, 11 Jan 2008, Gristmill, http://gristmill.grist.org/story/2008/1/11/81421/7106?source=weekly

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Protecting Illinois' Streams

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