Water Follows the People: The State of the Plate River Ecosystem after 150 Years of Flow Regulation

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Addressing those gathered at the 2009 Goodwin-Niering Interdisciplinary Conference on Water Scarcity and Conflict, Ellen Wohl discussed the past, present and future prospects of the South Platte River Ecosystem in Colorado. The South Platte River Basin is a large area that stretches between Colorado, Nebraska and Wyoming that encompasses a drainage area of several river and stream systems that originate in the Rocky Mountains. Since the time of the early Western American settlers, human activity has had drastic effects on the stability of the Platte River Basin ecosystem and the health of the rivers that feed into it. Ellen Wohl talked about the main environmental and biological concerns for the future of the Colorado River system both as a natural habitat for several species and a resource for people who live off the water that comes from the Rockies.

Ellen Wohl currently teaches Fluvial Geomorphology at Colorado State University where she has been a faculty member since 1999. She received her BS in geology from Arizona State University in 1984 and her PhD in geosciences from the University of Arizona in 1988. Professor Wohl began her talk with a discussion of how early American frontiersman first diverted various river and stream systems in Colorado for irrigation and transportation needs.

According to Wohl the industries that have most impacted the health of the South Platte River Ecosystem have been the timber industry, mining and railroad. Each of these industries brings dramatic changes to natural landscapes, be it by cutting down trees which increases water runoff into rivers or dynamite excavation to open mine shafts, these projects have been proven to alter river behavior.

Furthermore, Wohl said that because Western states water rights operate on the Prior Appropriation system, early Western settlers in the 1800s started numerous irrigation projects to divert the flow of river systems in order to gain ownership of water rights. Under the Prior Appropriation water rights system, the first person to use a quantity of water from a source or alter the path of a river or stream has priority to the source over anyone else who also draws water from it. This "first come, first serve" system encouraged settlers to come out West and encouraged the unregulated diversion of several streams in Colorado. In her book, "Virtual Rivers," Wohl explains that people in the late 1880s and 90s started irrigation companies in Colorado in an attempt to make profit from farmers down stream that needed irrigated water delivered to them. Wohl explains that the various irrigation projects made the availability of water go up, thus attracting more farmers.

With the farmers came the cattle ranchers who set up feedlots, which have grown in size from year to year and exist to this day. The ranchers fed the cows corn, alfalfa and hay, all crops requiring irrigated water. As the demand for these crops increased, water consumption also

increased. During her presentation, Wohl also touched on the fact that the feedlots produce a large amount of animal waste, which can run off into river systems, thereby polluting them when the amount is extremely high. The use of pesticides on large-scale farms in Colorado has also created contamination in the ground water and in river and stream systems nearby the farms. As the chemical contamination of rivers increases, so do the chances of damage to the river species and threats to human health.

While many of these early river diversion projects interrupted natural stream flows and damaged the South Platte River Ecosystems, Wohl also talked about how fur trappers impacted river ecosystem health in the 1800s. According to Wohl, beaver dams play an important role in the creation of still water micro-ecosystems in which several species of biological life can thrive. When fur trappers moved out West, they managed to wipe out a large majority of the beaver population. This meant that old beaver dams degraded and eventually fell apart, causing the destruction of many of these still water areas important for insect hatching. The dams also served as important barriers for river sediment, and as they began to disappear, there were more and more floods, which caused "channel downcutting and increased sediment transport" (Wohl in Virtual Rivers, 12).

Looking at contemporary threats to the health of the South Platte River Ecosystem, Wohl explained that urban water use in Colorado is becoming more intensive as population has increased in recent years. With many more Americans moving to small Colorado mountain towns, the demand for water has increased rapidly, and irrigation systems are beginning to draw much more water from the river systems. This means that the stream system is changing in the plains in Colorado, altering the flood patterns that provide water to the native plants and animals, thus disturbing the functionality of the ecosystem. Wohl said that various species of birds (Whooping Crane, Piping Plover) and fish have suffered from such changes in stream health.

Population increase also means an increase in recreational activities such as skiing that require water consumption. Many ski mountain resorts rely on snowmaking for the early and late parts of the ski season, which requires extremely large amount of water. According to Wohl, the ski industry is finally showing signs of worry in regards to its business practice as droughts have become longer and water more scarce.

Global warming, an environmental hazard that poses a world wide threat to life on this planet as we know it, is beginning to affect natural water cycles in Western states. Wohl spoke briefly about how many climate scientists agree that as we move forward, we will begin to see how global warming will make the climactic extremes more extreme than they are today. This means that wet areas will become wetter, while dry areas will most likely become drier and hotter. The rivers and streams that flow in the South Platte Basin collect much of their water from melting snow that runs off every year from the Rockies. As the effects of climate change become more apparent, Wohl said she would expect the snows to melt sooner in the year and faster, making the water runoff harder to store. This will negatively affect Colorado agriculture, especially later in the summers when the weather is dry and the supply of water begins to run low. Wohl also expects to see longer droughts in Colorado, which can ruin harvests.

Wohl ended her speech by suggesting that raising public awareness through educational campaigns about the Colorado River system is important. She said that river restoration projects are important to nurse the damaged ecosystems back to good health, but that people must also learn to use less water and make lifestyle changes in order to prepare for the future in which water scarcity in the West will become much more apparent. Wohl focused on the importance of preserving the River ecosystem in its entirety instead of focusing solely upon saving individual species of fish or birds. She writes in Virtual Rivers, "If we are to preserve our natural inheritance, including the rivers that constitute such a vital portion of that inheritance, we must first understand the forms and functions of natural systems, and then regulate our actions to preserve those forms and functions…The integrity of a uniquely lovely and inspiring landscape rests on our choice" (177).

References:

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Additional Resources (contributed by Kevin Izzo '10):

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