



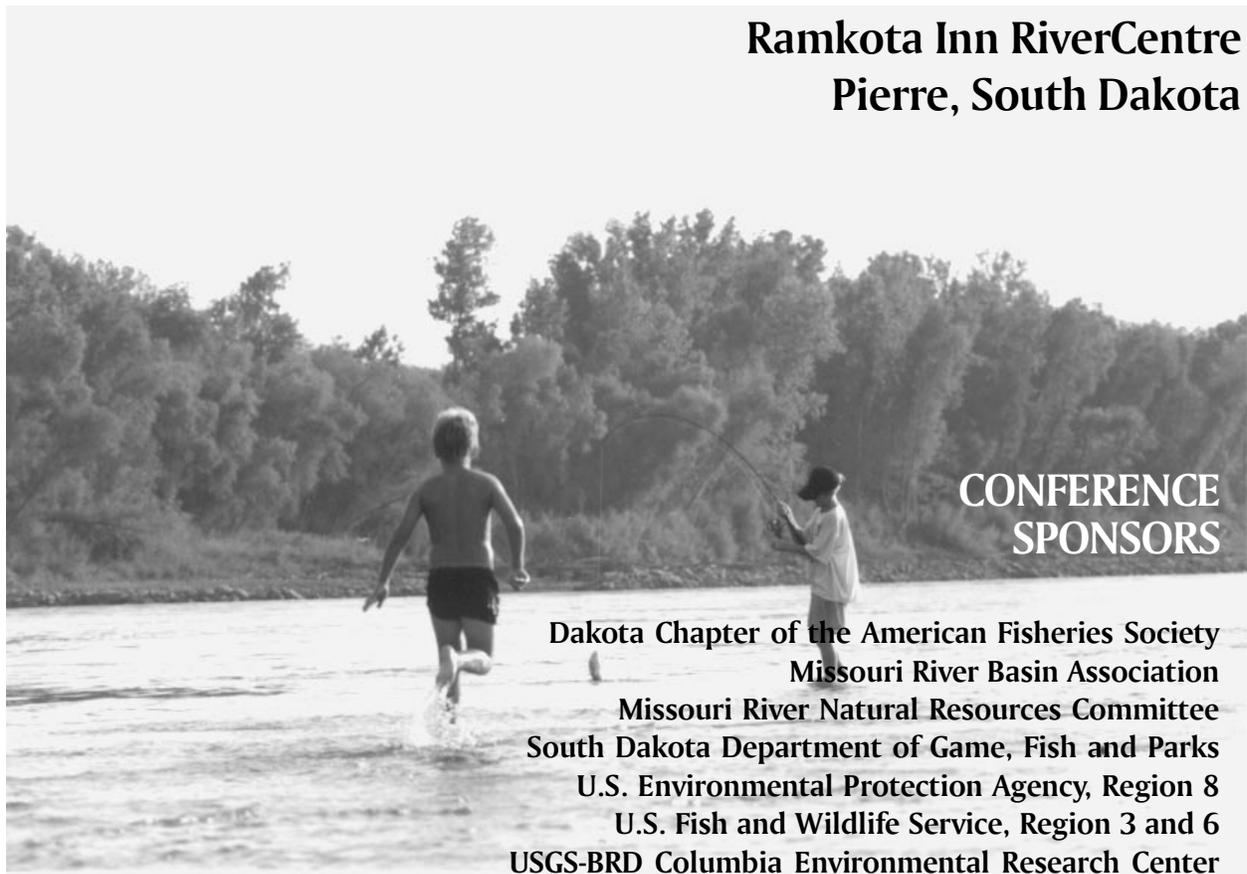
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# Sustaining the Missouri River for Future Generations

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**March 21-24, 1999**

**Ramkota Inn RiverCentre  
Pierre, South Dakota**



## **CONFERENCE SPONSORS**

**Dakota Chapter of the American Fisheries Society  
Missouri River Basin Association  
Missouri River Natural Resources Committee  
South Dakota Department of Game, Fish and Parks  
U.S. Environmental Protection Agency, Region 8  
U.S. Fish and Wildlife Service, Region 3 and 6  
USGS-BRD Columbia Environmental Research Center**

# welcome

## *..... to South Dakota and the 3rd Annual Conference on Natural Resources of the Missouri River Basin!*

THANK YOU for coming to Pierre, along the banks of the Missouri River. We have a special relationship with the Missouri River here in South Dakota. The "River" runs across our state, dividing it almost in half. People even refer to where they live as west river or east river. West of the Missouri, it is drier and prairie-like with more ranches. East of the River, there are more wetlands with higher rainfall and better farming conditions.

The River was important to South Dakota residents even before Lewis & Clark came through on their journey to the Pacific Ocean. Native tribes lived along the River and made their living from its abundance. Lewis mentioned the abundance of wildlife and productivity of the land in his journals.

So it goes today, the River and now the reservoirs are still important to South Dakotans and their non-resident visitors. It has become a gathering spot for anglers and campers. In 1998, there were 635,000 fishing trips made to the Missouri River in South Dakota. Anglers fished 3.25 million hours, caught 4.1 million fish and kept over a million walleye. In the summer, whether you are heading east or west, you'll see a steady stream of vehicles pulling boats towards the Missouri. They are anglers hoping to catch a few fish. As with all wildlife populations, the fish too have their ups and downs, but there are always opportunities on the "River."

There are lots of other things to do in the Missouri River valley besides fishing. I was born and raised in Pierre and learned about the River before the dams were built. I experienced the flood of 1952. I love the incredible bird migrations that occur up and down the Missouri River corridor. Take a hike along the River while you're in Pierre and you'll see.

We are here to talk about sustaining the Missouri River for future generations. The future is what we have and it is vitally important. There has been habitat lost along the river. What's left of the old River and what's already been replaced is very important to South Dakotans and its visitors. We are all in this together and we need to work together to share information on taking care of the River for the future. Let's share our special stories and thoughts about the River.

*On behalf of the Steering Committee, we hope your participation in the conference will be rewarding. If you have any questions, seek out a Steering Committee member with a "host" ribbon.*

**Jim Riis, Steering Committee Chairman**

## STEERING COMMITTEE

**Mark Albers**

U.S. Fish and Wildlife Service

**Chuck Berry**

USGS - South Dakota Cooperative Fish and Wildlife Research Unit

**Eileen Dowd Stukel, Jim Riis, & Cliff Stone**

South Dakota Department of Game, Fish and Parks

**Pam Haverland, Jeanne Heuser, & Mark Laustrup**

USGS - Biological Resources Division  
Columbia Environmental Research Center

**Ken Iverson & Christine Yackley**

Missouri River Corridor Program

**Mike LeValley**

Missouri River Natural Resources Committee

**Richard Opper**

Missouri River Basin Association

**Greg Power**

North Dakota Game and Fish Department

**Ayn Schmit**

U.S. Environmental Protection Agency, Region 8

**Tom Young**

U.S. Bureau of Indian Affairs

**Gene Zuerlein**

Nebraska Game and Parks Commission

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*Steering Committee*

<i>Chairman:</i>	Jim Riis
<i>Arrangements:</i>	Eileen Dowd Stukel
<i>Audio-Visual:</i>	Mark Albers
<i>Exhibits:</i>	Mark Laustrup
<i>Panel Session:</i>	Chuck Berry
<i>Papers and Posters:</i>	Cliff Stone
<i>Plenary Session:</i>	Mike LeValley
<i>Publications:</i>	Jeanne Heuser

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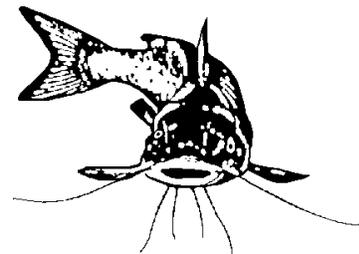
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The abstracts printed in the Conference Program have received only minor editing and the responsibility for their accuracy remains with the authors. Conference organizers do not regard these proceedings as a publication and, unless permission is obtained from the authors, abstracts should not be quoted in the scientific literature.





South Dakota Department of Tourism

## conference schedule overview

<b>Sunday</b> <b>March 21</b>	Noon to 7:30 p.m. 1:00 - 4:00 p.m. 7:00 - 9:00 p.m.	Registration Field trip (leaving every hour) Social and presentation on Captain Grant Marsh
<b>Monday</b> <b>March 22</b>	8:00 a.m. - 5:00 p.m. 8:00 a.m. - Noon Noon - 1:15 p.m.  1:15 - 5:00 p.m. 5:30 - 7:00 p.m.	Posters and exhibits displayed Plenary session Lunch with Leonard Andera's Lewis & Clark Reenactment Paper presentations Social with Missouri River slideshow
<b>Tuesday</b> <b>March 23</b>	8:00 a.m. - 5:00 p.m. 8:30 a.m. - Noon Noon - 1:00 p.m. 1:00 - 5:00 p.m. 5:30 p.m. 6:30 p.m.	Posters and exhibits displayed Panel discussion Lunch on your own Paper presentations Cocktail Hour Banquet with Tony Dean presentation
<b>Wednesday</b> <b>March 24</b>	8:00 a.m. - 11:40 a.m. 11:40 a.m. Noon 1:00 p.m. - 4:00 p.m.	Concurrent Paper sessions Closing remarks - Conference adjourns Post-conference meetings

# Sunday, March 21

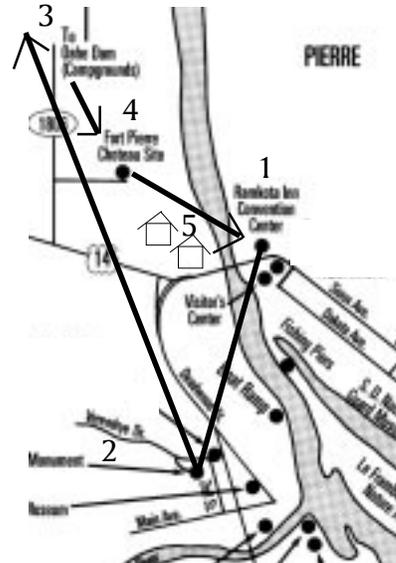
**Noon to REGISTRATION**

**7:30 p.m.** Ramkota Inn RiverCentre Atrium

**1:00 to FIELD TRIP (leaving every hour)**

**4:00 p.m.** Meet in the Ramkota Atrium

Begin at the Ramkota Inn RiverCentre (1)  
 Stop at the LaVerendrye Monument with its scenic overview of the Missouri River (2)  
 Tour Oahe Dam and Powerhouse (3)  
 Visit Ft. Pierre Chouteau (4)  
 Drive through a new housing development constructed in the river's flood plain (5)



**Lake Oahe and Dam** - Oahe Dam is one of the six main stem projects operated by the U.S. Army Corps of Engineers in the upper Missouri River basin. Lake Oahe is the 4th largest reservoir in the United States with a storage capacity of 23.5 million acre-feet, a shoreline of 2,250 miles, and a maximum depth of 205 feet. It is 231 miles long, extending from Pierre, SD, north to Bismarck, ND.

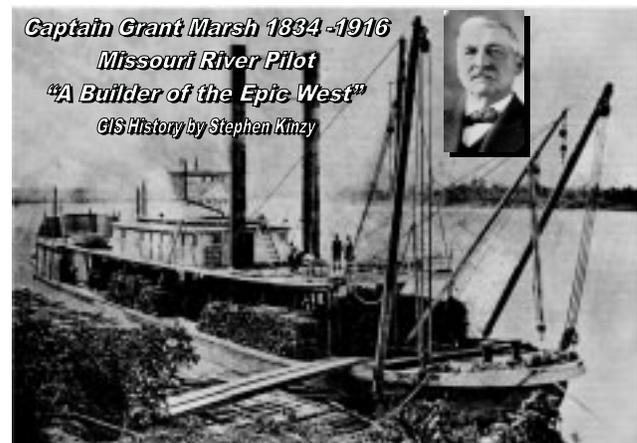
**LaVerendrye Monument** - French Canadian Explorers Chevalier and Louis LaVerendrye buried a lead plate at this site in 1743 while seeking a route to the Pacific Ocean. The plate was an important historical find, providing evidence of the earliest known Europeans in this region. This French expedition established France's claim to the region for the king of France, which eventually led to the Louisiana purchase in 1803.

**Ft. Pierre Chouteau** - The largest fur trading fort on the upper Missouri was located here from 1831-1855. Sioux Indians brought about 17,000 buffalo robes a year and other furs to trade for guns, tobacco, blankets, kettles, beads and other supplies. At times, hundreds of tipis covered the Ft. Pierre plain. Steamboats from St. Louis delivered trade goods to the fort and returned loaded with robes bound for New York.

**7:00 to OPENING SOCIAL - Captain Grant Marsh Presentation**

**9:00 p.m.** Cash bar and appetizers, Ramkota Atrium (next to the Amphitheater).

Captain Grant Marsh was a Missouri River steamboat captain from 1840-1880. Stephen Kinsey from the Environmental Systems Research Institute (ESRI), developers of ArcView and ArcInfo software, will give a multi-media GIS historical-biographical presentation about Captain Marsh with particular emphasis on the Missouri River and the Battle of Little Big Horn.



## Monday, March 22 - morning

7:00 a.m. **REGISTRATION** - Ramkota Inn RiverCentre

### PLENARY SESSION

8:00 a.m. **Welcome**

Gary Drewes, Mayor of Pierre, South Dakota  
Jim Riis, Conference Chairman, South Dakota Department  
of Game, Fish, & Parks, Pierre, South Dakota

8:10 a.m. **Plenary Session Introduction**

Mike LeValley, Missouri River Natural Resources Committee  
Coordinator, Missouri Valley, Iowa

8:15 a.m. **Thinking Seven Generations Ahead**

Louis DuBray, Vice-Chairman, Cheyenne River Sioux Tribe,  
Eagle Butte, South Dakota

8:30 a.m. **The Natural History Lessons of Lewis and Clark:  
Presettlement Landscapes and Modern Uses of Science**

Dr. Daniel Botkin, President, the Center for the Study of the  
Environment, Arlington, Virginia

9:15 a.m. **The Economic Consequences of Watershed  
Management: Values, Impacts, and Equity**

Dr. Ed Whitelaw, President, ECO Northwest and Professor  
of Economics, University of Oregon, Eugene, Oregon

10:00 a.m. BREAK

10:30 a.m. **Science and Values in River Restoration in the Grand  
Canyon - the Glen Canyon Dam Experiment**

Dr. Richard Marzolf, Chief, Branch of Regional Research,  
United States Geological Survey, Reston, Virginia

11:15 a.m. **Sustaining the Natural Resource, Cultural, and  
Economic Values of the Missouri River -  
Native American Perspectives**

Wes Martel, President, Wind River Associates, Fort Washakie,  
Wyoming

Plenary Session  
Speaker Bios  
on Pages 12-14

Noon **LUNCH**

Lewis and Clark Reenactment by Leonard Andera

## Monday, March 22 - afternoon

### PAPER PRESENTATIONS

Moderator: Doug Hansen, South Dakota Department of Game, Fish & Parks

- 1:15 p.m. *Master Manual Update.* Richard Opper, Missouri River Basin Association, Lewistown, MT
- 1:35 p.m. *An Overview of the Missouri River Land Transfer Bill and South Dakota Strategy for Implementation.* Rick Collignon, South Dakota Department of Game, Fish, & Parks, Pierre, SD
- 1:55 p.m. *Enhancing Natural Resources for the Native Americans in the Missouri River Basin.* Richard Bad Moccassin, Mni Sose Intertribal Water Rights Coalition, Rapid City, SD
- 2:15 p.m. *Missouri River Restoration.* Ron Kucera, Missouri Department of Natural Resources, Jefferson City, MO
- 2:35 p.m. *The Geospatial Component of the Missouri River InfoLink.* Mark Laustrup, USGS-BRD, Columbia, MO

2:55 PM BREAK

Moderator: David Galat, USGS-BRD, Cooperative Fish and Wildlife Research Unit

- 3:20 p.m. *Aquatic Assessment of the Northern Great Plains.* Thomas R. Johnson, Environmental Protection Agency, Region 8, Denver, CO
- 3:40 p.m. *Environmental Monitoring and Assessment Program: An Assessment Framework for the Upper Missouri River Basin.* Eric Hyatt, Environmental Protection Agency, Region 8, Denver, CO
- 4:00 p.m. *Multiple Attribute Decision-making Approach to Sustainable Management of the Missouri River.* Tony Prato, University of Missouri, Columbia, MO
- 4:20 p.m. *A Decision Support System for Information Management and Water Quality Assessment in Dardenne Creek.* Dave Connett, University of Missouri, Columbia, MO
- 4:40 p.m. *The GEWEX Continental-scale International Project (GCIP) and its Plans for the Missouri River Basin.* Rick Lawford, NOAA Office of Global Programs, Silver Spring, MD

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5:30 p.m.  
EVENING SOCIAL

Missouri River  
Slideshow by  
Gene Zuerlein  
Nebraska Game and  
Parks Commission

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Dinner on-your-own

## Tuesday, March 23 - morning

### Sustaining the Missouri River for Future Generations **PANEL DISCUSSION**

8:30 a.m. - Noon

*The panel will address the following questions:*

- How does your interest affect sustainability of the river for multiple uses?
- How do other uses of the river affect the sustainability of your interest?

#### Moderator

Chuck Berry, USGS-BRD, South Dakota Cooperative Fish and Wildlife Research Unit, South Dakota State University, Brookings, SD

#### PANEL MEMBERS

- Mike Dwyer, Upper Missouri Water Association, Bismarck, ND
- Don Johnston, Public Works Department, Flandreau, SD
- Scott Jones, Lower Brule Tribe, Lower Brule, SD
- Mike Kayser, Department of Tourism, Pierre, SD
- Tom Olsen, the Outpost Lodge and Marina, Pierre, SD
- Chad Smith, American Rivers, Lincoln, NE
- Christine Yackley, Missouri River Corridor Program, Onida, SD

Noon **LUNCH - On Your Own**



Naturally formed chute on Lisbon Bottoms, Big Muddy National Fish and Wildlife Refuge, near Glasgow, Missouri

## Tuesday, March 23 - afternoon

### PAPER PRESENTATIONS

Moderator: Tom Gengerke, Iowa Department of Natural Resources

1:00 p.m. *Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Project.* Robert G. Dimmit, U.S. Army Corps of Engineers, Kansas City, MO

1:20 p.m. *Characteristics & Evolution of a Side-channel Chute on the Lower Missouri River.* Robb Jacobson, USGS-BRD, Columbia, MO

1:40 p.m. *State of the Floodplain: Dynamics of Selected Areas after 1993 Flooding along the Missouri River.* Curt S. Niebur, Washington University, St. Louis, MO

2:00 p.m. *Decommissioning of Privately Owned Dams: the Effects of Deregulation in Montana.* Aart Dolman, Great Falls, MT

2:20 p.m. *Fish and Wildlife Resources and Bank Stabilization on the Upper Missouri River.* William Bicknell, U.S. Fish and Wildlife Service, Bismarck, ND

2:40 p.m. BREAK

Moderator: Bradley Young, South Dakota State University

3:00 p.m. *Reservoir Deltas: Processes and Impacts.* John Remus, U.S. Army Corps of Engineers, Omaha District, Omaha, NE

3:20 p.m. *Use of Continuous Seismic Reflection to Assess the Composition of the Missouri River Bed.* Steve Sando, USGS, Huron, SD

3:40 p.m. *Pipeline Transport of Large Volumes of Solids.* C.A. Shook, Edmonton, Alberta, Canada

4:00 p.m. *Conversion of the Pick-Sloan System to a Sustainable System: The Pipeline Transport of Silt.* Howard Coker, University of South Dakota, Vermillion, SD

4:20 p.m. *Missouri River Corridor Program of South Dakota.* Christine Yackley, Missouri River Corridor Program, Onida, SD

4:40 p.m. *Water Demands from Five Missouri River System Tributaries in Kansas.* Thomas A. Eddy, Emporia State University, Emporia, KS

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5:30 p.m.  
Cocktail Hour

6:30 p.m.  
BANQUET

Presentation by Tony Dean:  
outdoor writer,  
television and  
radio producer,  
multi-species angler,  
and river/reservoir  
system expert.

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## Wednesday, March 24

### PAPER PRESENTATIONS - CONCURRENT SESSION I

#### Water Quality, Vegetation, Birds, and Amphibians

Moderator: Dave Ode, South Dakota Dept. of Game, Fish & Parks

8:00 a.m. *Water Quality of a Remnant Riparian Wetland along the Missouri River.* Dale Blevins, USGS-WRD, Independence, MO

8:20 a.m. *Pollution in Big Spring Creek: A Success Story.* Isaac Opper, Elementary School Student, Lewistown, MT

8:40 a.m. *Corps Planted & Natural Plant Recolonization on the Benedictine Bottoms.* Joseph Curry, Benedictine College, Atchison, KS

9:00 a.m. *Historical Description of Benedictine Bottoms Missouri River Flood Plain Plant Biodiversity.* Sarah Kafka, Benedictine College, Atchison, KS

9:20 a.m. *Avian Use of Missouri River Flood Plain Wetlands.* Dale Humburg, Missouri Department of Conservation, Columbia, MO

9:40 a.m. *Waterbird Use of a Chute & Flood Plain Wetland Complex during Spring Migration.* Ellen Ehrhardt, USGS-BRD, Columbia, MO

10:00 a.m. BREAK

Moderator: Scott Larson, U.S. Fish and Wildlife Service

10:20 a.m. *Waterbird Use of Lower Missouri River Flood Plain Wetlands.* Amanda McColpin, University of Missouri, Columbia, MO

10:40 a.m. *Birds Respond to Habitat, 1998, Piping Plover and Least Tern Survey Results.* Casey Kruse, Army Corps of Engineers, Yankton, SD

11:00 a.m. *Can the Missouri River Play a Role in Piping Plover Recovery in the Northern Great Plains?* Nell McPhillips, U.S. Fish and Wildlife Service, Pierre, SD

11:20 a.m. *Amphibian Use of Flood-created Wetlands on the Missouri River Flood Plain.* Rochelle B. Renken, Missouri Department of Conservation, Columbia, MO

11:40 a.m. **CLOSING REMARKS - Next year's conference host: Greg Power, North Dakota Game and Fish Department, Bismarck, North Dakota**

## Wednesday, March 24

### PAPER PRESENTATIONS - CONCURRENT SESSION II

#### Fish and Macroinvertebrates

Moderator: Gerald Mestl, Nebraska Game and Parks Commission

8:20 a.m. *Benthic Macroinvertebrates Associated with Specific Habitats and Substrates in the Lower Missouri River.* Barry Poulton, USGS-BRD, Columbia, MO

8:40 a.m. *Biodiversity Patterns of Terrestrial Macroinvertebrates on the Benedictine Bottoms in Northeast Kansas.* Liesa Hummel, Benedictine College, Atchison, KS

9:00 a.m. *Habitat Use and Catch Rates of Benthic Fishes in the Missouri River.* Bradley Young, South Dakota State University, Brookings, SD

9:20 a.m. *Electrofishing in the Missouri River in the Vicinity of the AmerenUE Labadie Power Plant.* Kenneth W. Lynn, Ameren Corp., St. Louis, MO

9:40 a.m. *Use of Backwater Habitats by Native Fishes in the Missouri River, ND.* Shannon Fisher, South Dakota State University, Brookings, SD

10:00 a.m. BREAK

Moderator: Shannon Fisher, South Dakota State University

10:20 a.m. *Changes in Walleye Population Status and Angler Use and Harvest Patterns in Lake Oahe, South Dakota.* John Lott, South Dakota Game, Fish & Parks, Pierre, SD

10:40 a.m. *Understanding Changes in Rainbow Smelt Distribution and Abundance and their Effects on Condition and Angler Catchability.* Wayne Nelson-Stastny, SD Game, Fish, and Parks, Pierre, SD

11:00 a.m. *Trends in Selected Cyprinid Populations in the Lower Missouri River.* Joanne Grady, U.S. Fish and Wildlife Service, Columbia, MO

11:20 a.m. *Morphometric and Meristic Differences among Missouri River Sicklefin Chubs.* Doug Dieterman, University of MO, Columbia, MO

**11:40 CLOSING REMARKS - Next year's conference host: Greg Power, North Dakota Game and Fish Department, Bismarck, North Dakota**

## Daniel B. Botkin

Daniel Botkin is a scientist who studies life from a planetary perspective, a biologist who has helped solve environmental issues ranging from the conservation of entire ecosystems like Mono Lake, California to endangered species such as salmon, and a writer about nature. His professional goal is to help stakeholders find ways to solve environmental problems from a sound scientific basis that also maintains a healthy economy.

Botkin is President of the Center for the Study of the Environment, Santa Barbara, CA, and Professor of Biology, George Mason University, Fairfax, VA. His most influential book, *Discordant Harmonies: A New Ecology for the 21st Century* is helping change the way the citizens, agencies, and corporations view environmental issues. Botkin's most recent book, *Our Natural History: The Lessons of Lewis and Clark* uses the adventures of the explorers to explain what the American west was really like before it was changed by European settlement. A new book with a spring 1999 publishing date, *Passage of Discovery: The American Rivers Guidebook to the Natural History of the Travels of Lewis and Clark*, continues this theme, providing more than 40 essays about locations to visit and learn about nature before it was changed by modern technological civilization.

Within science, Botkin is probably best known for the development of the first successful computer simulation in ecology, a computer model of forest growth known generically as a 'forest gap model' that has developed into a subdiscipline in ecology with more than 50 versions in use worldwide. Botkin has also been a pioneer in the study of ecosystems and wilderness. A leader in the application of advanced technologies to ecological science, he was one of the first to apply satellite remote sensing to the study of forests and the use of computer-based geographic information systems to environmental issues.

A frequent public speaker, Botkin brings an unusual perspective to his subject. Well-known for his scientific contributions in environment, he has also worked as a professional journalist and has degrees in physics, biology, and literature. His books and lectures show how our cultural legacy often dominates what we believe to be scientific solutions. He discusses the roles of scientists, business people, stakeholders, and government agencies in new approaches to environmental issues. Botkin has been on the faculty of University of California, Santa Barbara and Yale School of Forestry and Environmental Studies. His degrees are: B.A. (Physics; University of Rochester) M.A. (Literature, University of Wisconsin) and a Ph.D. (Biology, Rutgers University).

## Ed Whitelaw

Ed Whitelaw is president of ECONorthwest and professor of economics at the University of Oregon. He has a Ph.D. in economics from MIT and more than 25 years of experience transforming sound economic analysis into sound public policy. Whitelaw has unparalleled knowledge of regional economics. He has served as an advisor to several governors, regional institutions, utilities and corporations. Whitelaw has testified before legislative and congressional committees, state and federal courts on resource-management issues.

Whitelaw recently prepared a conceptual manual to assess the socioeconomic consequences of ecological restoration projects for rivers and floodplains, and applied this methodology in a case study of the Vermillion River in South Dakota for the Environmental Protection Agency. He is currently working with multi-disciplinary teams on three other EPA projects: to evaluate the economic consequences of ecosystem-management decisions in Oregon's upper Willamette River Basin, to develop a method for estimating the downstream costs of timber-production activities on the city of Salem, Oregon, and to analyze the ecological, demographic, and economic opportunities and constraints of riparian restoration. He has been an invited speaker on the economic valuation of watersheds at the Watershed Partnerships Seminar for the U.S. Office of Personnel Management.

Whitelaw was recently co-principal investigator for a three-year study for the National Science Foundation to describe, explain and communicate the relationships of forested ecosystems and regional economies in Oregon, Alaska, New Mexico, North Carolina, New Hampshire and Wisconsin. He was the lead economist for the U.S. Fish & Wildlife Service in the "God Squad" hearings, and was invited to President Clinton's Forest Conference to address the long-run impacts of resource-management alternatives on the region's economy, as well as giving testimony to related U.S. House and Senate Committees.

## G. Richard Marzolf

G. Richard Marzolf began his professional career at Kansas State University where he studied river impoundments of the Great Plains. He was on the faculty there, teaching limnology and experimental field ecology from 1962 until 1988, with short-term visiting professorships at University of Oregon, University of Wisconsin, University of Oklahoma, and Michigan State University during that period. He studied problems presented by high suspended sediment loads in reservoirs that created conditions of light limitation.

Marzolf's interest in materials exported from prairie watersheds to reservoirs led to investigations, with students, of tallgrass prairie ecology. His interest in the Kings Creek watershed led to its inclusion in the USGS Hydrologic Benchmark Network in 1979 and to the establishment of a long-term precipitation chemistry data set. He was the originating PI on the NSF/LTER at the Konza Prairie.

From 1981 to 1985 Marzolf chaired NSF's national coordination committee for the LTER network of sites. In 1988 he accepted an endowed professorial chair of the Commonwealth of Kentucky where he helped to establish the long-term limnological program on Kentucky Lake reservoir and studied other TVA reservoirs. He served on the Water Science and Technology Board of the National Academy of Science from 1986 until 1991. As a function of the board he chaired the committee to review the Glen Canyon Environmental Studies of the Bureau of Reclamation until joining the U. S. Geological Survey in 1991 to work on Lake Powell and help coordinate USGS efforts on the Colorado River in the Grand Canyon. He continues work on Lake Powell and the Colorado River tailwater in Glen Canyon/Grand Canyon with interest in the biological processes that mediate water qualities of the Colorado River.

In 1996 he moved to USGS headquarters in Reston, VA to assume duties as Chief, Branch of Regional Research, in the Eastern Region of the Water Resources Division's National Research Program. He has an A.B. from Wittenberg College, 1957, and a Ph.D from the University of Michigan, 1967.

## Wesley L. Martel

Wesley Martel is the vice-president of Wind River Associates, a consulting firm specializing in work with Tribal governments and programs. This work involves the development of tribal laws supporting major policies which guide social and economic development. The work also gives consideration to the traditional and cultural aspects of tribal life that dictate environmental protection and sensible use of resources. Tribal governments must ensure that technical and administrative capabilities are in place to exercise tribal sovereignty wisely.

Martel has served for many years on the Shoshone Business Council of the Wind River Reservation. He was a member of the Wind River Tax Commission during the time when a Severance Tax ordinance was developed and implemented on the Reservation. This tax was challenged in court by several dozen oil and gas companies, but all levies, fines and penalties were subsequently upheld. As Chairman of the Shoshone and Arapaho Tribes Fish and Game Committee, Martel established a Game Code for the Reservation which regulated hunting and worked to establish comprehensive fisheries and wildlife management plans for Wind River. Tribal goals and objectives, which included protecting tribal sovereignty, were discussed and presented to minimize tribal hunter objections and tribal political concerns.

Martel is Chairman of the Wind River environmental Quality Commission which established the Shoshone and Arapaho Tribal Water Code. This code set forth the Tribes as the primary management and enforcement agency of the water resources of the Wind River Reservation. The Wind River Water Rights case was the first major Indian Water Rights case to proceed up to the U.S. Supreme Court through the procedures established by the McCarran Amendment.



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