

Minnegram On-line

September 1998

The Water Resources Center is pleased to report some recent staff additions that continue the expansion of the Center's water research and education efforts in the last two years. The Center is in the process of filling the water education coordinator position vacated by Barbara Liukkonen, who has taken a year's leave of absence with the Rivers Council of Minnesota.

The Center's new **faculty associate**, Steve Taff, an associate professor and extension economist with the Department of Applied Economics and an adjunct professor with the Department of Forest Resources, hopes to stimulate social science research in water issues and sees economic analysis as a natural component of Center projects. "Like all economists, I believe that resources have no inherent value except as imparted by humans," said Taff. Taff will also represent the interests of the University in issues of water policy with legislature and government agencies. One current interest in water policy is whether or not wetland protection regulations reduce property values. In work Taff and a graduate student did in Dakota County, no demonstrable effect was shown, but future studies in other parts of the state may reveal a stronger connection.

The new outreach positions represent a continued partnership with the Board of Water and Soil Resources (BWSR) and the Natural Resources Conservation Service (NRCS). Educators in Duluth, Morris, New Ulm, St. Paul, and the southeastern counties, coordinated through the Center, conduct and coordinate education efforts on the management of soil and water resources.

James Anderson, co-director, describes the new outreach partnerships as the culmination of years of effort on the part of many people to create a team to address water and environmental problems. "We now have available five positions covering most areas of the State coordinated through the Water Resources Center. They are all connected with the common theme of conducting and coordinating education efforts on management of soil and water resources. This gives us the unique opportunity to assist local water education efforts in all parts of the state from a multidisciplinary perspective," said Anderson. He adds that programming in partnership with the state agencies should dramatically increase in coverage and content.

Ron Struss began work in August as the metropolitan area watershed education coordinator, a position funded jointly with the BWSR. Struss works with watershed management organizations to develop educational strategies as they review and revise their watershed plans. His focus is to help local citizens explore ways to improve citizen involvement in the watershed planning process. He is also planning an urban water quality conference for March 1999.

Derek Fischer, a conservation agronomist located in the New Ulm office of BWSR, works to connect local government units with industry, Extension, and other agencies on issues surrounding nutrient management and conservation tillage. Fischer plans to set up local partnerships between SWCD and Extension staff and local representatives of industry.

Jodi DeJong will begin work this fall as an education coordinator in cooperation with the NRCS at the Experiment Station in Morris. DeJong's position is modeled after the southeastern position held by Kevin Blanchet. Blanchet coordinates the EQIP program and conducts educational efforts in crop nutrient management, pest management, grazing, and tillage.

Another BWSR cooperative position, held by Kamal Alsharif, serves the 42 counties in northern Minnesota. His position piloted the BWSR-Extension cooperation which resulted in the metro and southern positions.

A biennial report describing these changes as well as the research and teaching accomplishments of the Water Resources Center over the period of 1996-1998 is in preparation with an expected publication date of mid-November and will be available from the Center.

Goby Population Found in Duluth-Superior Harbor

Two teenagers from Superior, Wisconsin, discovered a thriving population of round gobies (*Neogobius melanostomus*), an exotic fish, in the Duluth-Superior harbor near Barker's Island Marina.

"Unfortunately, this is the most significant confirmed report of a goby infestation in the Duluth-Superior harbor to date," said Doug Jensen, Exotic Species Information Center coordinator for the University of Minnesota Sea Grant program. "This also shows that anglers, especially youth, are getting the message about exotic species. One of the teenagers said he remembered how to identify the round goby based on television news coverage and a recent newspaper article," said Jensen.

"Anglers are often the first to find new infestations," said Jensen. "We are concerned because this new infestation increases the potential for accidental spread by anglers to other waters.

"The other big news is that gobies now infest all of the Great Lakes," said Jensen. "Lake Ontario was the lone hold-out until this month. Infestations in the first two North American inland lakes were also found this summer."

Gobies are considered undesirable because they compete with native fishes for habitat, disrupt the aquatic ecosystem, and are a nuisance to anglers. The goby is an aggressive, small, bottom-dwelling fish that is mostly slate-gray, with frog-like raised eyes, a prominent black spot on the dorsal (top) fin, and a distinctive, fused, scallop-shaped pelvic (bottom) fin. Identification cards are available in most Sea Grant and natural resource agency offices around the Great Lakes.

Round gobies were first discovered in North America in 1990 in the St. Clair River near Detroit. They were introduced through ballast water discharged by transoceanic ships coming from the gobies' native waters in the Caspian Sea and Black Sea in the Baltic region of Eurasia. Round gobies were first found in Lake Superior in the summer of 1995.

"To minimize their spread, possession of live round gobies by anglers is illegal in most of the Great Lakes states and Ontario," said Jay Rendall, Exotic Species Program coordinator for the Minnesota Department of Natural Resources. "In Minnesota, it is illegal to possess or transport round gobies. However, it is legal to possess a frozen goby with the intent to transport it to a local office for positive identification."

Anyone who catches a round goby in Lake Superior or any inland lake should not throw it back alive. They should kill the fish by freezing and contact Minnesota Sea Grant at (218) 726-8712, the fisheries office of a local natural resource agency, or a U.S. Fish and Wildlife Service office.

SeaGrant News Release

Two University of Minnesota research projects funded through WRRRI regional competition

Two University of Minnesota research projects were selected for funding in the 1998 regional Water Resources Research Institute (WRRRI) competitive grants competition. Of the 54 proposals submitted from 13 states in the north central region, the regional WRRRI directors selected 15 projects to be funded. Selection of the projects involved a two-step, peer review process. The two funded projects were among a group of four projects submitted by the WRC to the regional competition.

Both projects, which are two-year studies, address water issues of considerable interest to scientists and water managers in Minnesota: water quality and nutrient pollution in rivers and mercury pollution in lakes.

Controls on biomass nutrient ratios in streams and rivers

Excessive nutrient loads continue to degrade lotic habitats. Without knowing the overall stoichiometry of conversion of these inorganic nutrients into biomass, managers cannot produce highly accurate predictive models. **Robert Sterner**, Associate Professor, and graduate student **Andera Plevan**, both of the Department of Ecology, Evolution, and Behavior were awarded a grant to 1) study the carbon: nitrogen: phosphorous stoichiometry in streams and rivers in Minnesota, 2) describe the degree of nutrient limitation as it relates to C:N:P stoichiometry, and 3) test a mechanistic model of how light and nutrients relate to the conversion of N or P into aquatic biomass.

Role of organic matter binding and chemical reactions in mercury cycling

Fish consumption advisories due to high mercury levels are issued in over 500 Minnesota Lakes and thousands of other lakes across the United States, Canada, and Europe. Despite the advances that have been made with the last decade, there are still critical gaps in the understanding of cycling and transport of methylmercury. **Paul R. Bloom**, Professor, Department of Soil, Water, and Climate, and **Patrick Brezonik**, Professor, Department of Civil Engineering, were awarded a grant to study the 1) strength of binding Hg^{+2} and CH_3Hg^+ to natural dissolved organic matter (NDOM), and 2) evaluate the role of Hg^{+2} and CH_3Hg^+ complexation by NDOM in mediating the photoreduction of these species to elemental Hg.

Sea Grant Web Site Recognized

The University of Minnesota Sea Grant Web site, <www.d.umn.edu/seagr/>, was named site of the month in July by the Great Lakes Information Network (GLIN). The site features 820 pages of information about programs, publications and activities of the Minnesota Sea Grant, which is a scientific research and public education program focused on Lake Superior and Minnesota's inland waters. Specific topics include aquaculture, fisheries, water quality, tourism, and recreation studies, listings of workshops and events, and an extensive collection of exotic species information. The site also features the Glossary of the Great Lakes, a compendium of definitions and terms, and Visualizing the Great Lakes, over 500 images from all around the Great Lakes.

Extension's alternative on-site demonstration project educates public about septic systems

To demonstrate proper design and construction practices of on-site treatment systems, three failing septic systems in the Twin Cities Metro Area are being replaced with alternative systems and documented in an educational video. The video, expected to be available in the winter, will include site conditions, construction, monitoring, maintenance, and social concerns about alternative systems. Three fact sheets, each describing one demo site, its specific situation, and the alternative septic system installed, will be available as companion pieces to the video.

An estimated 70% of the septic systems located in the Twin Cities metropolitan area do not provide adequate wastewater treatment. Ultimately, these failing systems have significantly negative impacts on regional rivers such as the Mississippi and Minnesota. By illustrating how individuals can make decisions and invest in appropriate technology to protect water quality, Extension researchers and educators are hoping that the video will encourage property owners to upgrade failing systems and properly maintain their existing systems.

University of Minnesota to host Workshop on Natural Organic Matter

A two-day workshop concerning Natural Organic Matter (NOM) in soil and water is being held on October 23 and 24 in Borlaug Hall on the St. Paul Campus. Invited speakers will present current NOM research in the following areas: 1) structure of humic materials, 2) interactions of NOM with xenobiotic organic compounds, 3) interactions of NOM with metals and clays, 4) the role of NOM in water treatment, and 5) the role of NOM in stimulation of plant growth. Posters on the aforementioned topics will also be presented. The workshop is being sponsored by a group of University faculty investigating the possibility of forming a center for NOM research at the University of Minnesota. For further information on the final program and registration materials contact Dr. Ruilong Liu at (612) 625-8104 or E-mail: rliu@soils.umn.edu.

On-line bibliography of lake management and planning resources

The Minnesota Lakes Association (MLA) has just completed an on-line bibliography of over 600 resources related to lake management and planning. It includes publications, audiovisual material, environmental education curriculums, and various other information sources.

The bibliography is part of the MLA's Sustainable Lakes Project, a collaborative project with the University of Minnesota's Center for Urban and Regional Affairs (CURA) and funded by the Legislative Commission on Minnesota Resources (LCMR), to create a model for community-based lake management.

The bibliography was developed for citizen education, though professionals will also find it a useful resource. It is organized by easy-to-use index categories, cross-referenced for more comprehensive use, and references are rated according to their usefulness to lake associations and citizens. Visit the website at <http://www.mnlakeassn.org>.

St. Anthony Falls Laboratory: Celebrating 60 years of ingenuity

The University of Minnesota's St. Anthony Falls Laboratory (SAFL) is considered one of the finest hydraulic laboratories in the world. Recognized for its research in river engineering, hydraulic and fluid mechanics, and computational models, SAFL is currently in its 60th year of operation.

has again been catapulted into the limelight with its newest invention, the "Jurassic Tank". Considered by many to be the most elaborate geologic modeling tank of its kind, this six-by-thirteen meter tank has received much attention within the last year and even earned a spot in the reputable journal, Scientific American.

Built during the height of the depression in 1938, the laboratory is literally carved from the original limestone edge that once formed the Falls of St. Anthony. The meticulously planned facility was tailored made to optimize the natural supply of water from the Mississippi. Operating by diverting water from the river, the lab can accommodate flows up to 300ft³/second. This unique supply of continuously flowing water into the laboratory is what allows for the numerous array of experimentation that takes place in the facility.

Designed by its first director, Dr. Lorenz G. Straub, SAFL built its grandiose reputation by using hydraulic models to provide the solutions to a variety of hydraulic and river engineering problems, creating specialized instrumentation, and performing extensive research in naval hydrodynamics.

The first project at SAFL was the St. Anthony Falls Navigation Project which led to the creation of the Mississippi River Model. Built on a scale of 1:50, this model stayed in place until the 1950's.

Internationally known as "the river doctor", Straub, who died in his office on Oct 27, 1963, dedicated his life to the continual development of SAFL .

In more recent times, the classical research of hydraulics and river engineering has been expanded to include computer stimulation and modeling, numerical modeling and geophysical fluid dynamics.

Celebrating its 60th year of operation, the University of Minnesota laboratory is one of the largest and most renowned facilities of its kind in the United States. Receiving international recognition, the lab is host to numerous scientists' from around the world as well as several post doctoral students, graduate students, and undergraduate students.

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Symposium to celebrate Eville Gorham's accomplished career

George M. Woodwell will be the keynote speaker at the November 7 symposium honoring Regents Professor, Eville Gorham 36 years at the University of Minnesota. A faculty member from the Department of Ecology, Evolution and Behavior, Gorham is most widely known for his research investigating the biogeochemistry of wetlands and chemistry of atmospheric precipitation. The theme of the celebration will encompass related topics in biogeochemistry, ecosystem ecology, and global change. The symposium will be held at the Earle Brown Center on the St. Paul campus. For more information, see the web site at <http://biosci.cbs.umn.edu/eeb/Gorham/>. To register, contact Sue Julson at (612) 624-6777 or e-mail: julso001@tc.umn.edu.

RECENT PUBLICATIONS

Wet Atmospheric Deposition of Pesticides in Minnesota, 1989-1994. P.D. Capel, M. Lin and P.J. Wotzka. 1998. USGS-Water Resources Investigation Report 97-4026. Available from the USGS, call: (612) 783-3100.

Water-quality assessment of part of the Upper Mississippi River Basin, Minnesota and Wisconsin ground-water quality in an urban part of the Twin Cities Metropolitan Area, Minnesota, 1996. W.J. Andrews, A.L. Fong, L. Harrod and M.E. Dittes. USGS-Water Resources Investigation Report 97-4248. Available from the USGS, call: (612) 783-3100.

Great Lakes Exotic Species II. February 1998. Great Lakes Research Review. Available from the Great Lakes Research Consortium, call (315) 470-6816 or Fax (315) 470-6970.

Water Quality in the Red River of the North Basin. Minnesota, North Dakota, and South Dakota, 1992-95. J.D. Stoner, D.L. Lorenz, R.M. Goldstein, M.E. Brigham, and T.K. Cowdery. USGS Circular 1169. Available from the USGS, call: (612) 783-3100.

The Effects of a Record Flood on the Aquatic Vegetation of the Upper Mississippi River System: Some Preliminary Findings. May 1998. A. Sprink and S. Rogers. USGS LTRMP Reprint 98-R007. Available from the USGS, call (612)783-3100.

Superior Pursuit: Facts About the Greatest Great Lake. August 1998. Available at no cost from the Minnesota Sea Grant, call (218) 726-6191.

New Publication of the US Geological Survey, Publications issued January-March 1998. USGS Permanent catalog, list 1074-1076. Available from the USGS, call (612)783-3100.

University of Minnesota-Duluth expands water facilities

Early in September, the University of Minnesota-Duluth (UMD) officially announced its plans to build the University's newest water-related facility. The Center for Freshwater Research and Policy will serve as the central means of communication for research conducted in establishments such as the Large Lakes Observatory, the Natural Resources Research Institute and the Minnesota Sea Grant. The Center will also augment the research of these facilities by using their findings to encourage changes in water laws and policy. Timothy Holst, associate dean of UMD's College of Science and Engineering, was named the director of the new center. Holst and other University officials believe that the new center will increase UMD's influence as a leader in freshwater research both nationally and internationally.