

Hybrid Poplar Research... applied landscape ecology

by Cathy
Podeszwa

Scientists from the Biology Department and Natural Resources Research Institute have teamed up to evaluate a new agricultural crop, hybrid poplar, as wildlife habitat.

Hybrid poplar (*Populus sp.*) is a short-rotation, woody crop which is being developed as a potential source of energy and fiber. Poplar has the potential to meet a significant portion of U. S. energy needs, but millions of acres of agricultural land would have to be converted to hybrid poplar plantations. Concerns have been raised about the environmental issues related to such a substantial landscape change.

Environmental impacts related to production were studied extensively during the first sixteen years of hybrid poplar development by researchers at the North Central Experiment Station of the U.S. Department of Agriculture Forest Service. Water resources issues, soil

nutrient properties, and soil sustainability were all studied, but nothing was known about the potential effects on biodiversity.

In 1992, Dr. Don Christian of the Biology Department and Dr. Gerald Niemi and JoAnn Hanowski from NRRRI's Center for Water and the Environment received funding from the North Central Forest Experiment Station, the U. S. Department of Energy's Biofuels Feedstock Development Program, the National Audubon Society and the

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front row (left to right): Katie Standke, Sarah Crawford, Cathy Podeszwa; back row: Dr. Don Christian, Mark Nelson, Jeremy Mott

Collins Retires to "Holliewood"



North and west of Floodwood, Minnesota is a 93 acre tract of land friends and acquaintances call "Holliewood". On part of the property stands an assortment of buildings, among them a log structure. This is the site cleared and built, with retirement in mind, by Dr. Hollie Collins, currently teaching his final quarter here at UMD. For the past three years, he has been on a phased retirement, teaching classes during the fall and spring quarters, leaving the rest of the year free to nurture the garden and orchard, initiate a forest management plot and to complete the log building.

The log house is a long-time dream now fulfilled. He selected the huge poplar trees for the project, removed the bark, and with hand tools and minimal help, fitted each log into place. The result is a unique and modern two

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New Faculty

Faculty Staff news

During this academic year, the UMD Biology Department has been strengthened and enriched by the addition of the following new faculty members. Welcome!



Dr. Merry Jo Oursler is completing her first year as an assistant professor in the department. Dr. Oursler came to us from the Mayo Graduate School in Rochester, Minnesota, where she was a consultant in the Department of Biochemistry and Molecular Biology. Her research expertise is in the areas of osteoporosis and cancer-induced bone destruction and she is currently establishing a research lab facility here on campus. In addition, Dr. Oursler has had teaching responsibilities this past year in General Biology (Biol 1111) and Cellular Biology (3245) and is involving a number of undergraduates in her research lab.



Dr. John Pastor, a researcher at the Center for Water and the Environment at the Natural Resources Research Institute (NRRI), has been part of a team-teaching effort in Ecology Seminar (Biol 8871) and, with Dr. Anne Hershey, has taught Ecosystems Ecology (Biol 5776). He will be involved in the course for non-majors (Biol 1102) and is developing a new course in mathematical ecology. Dr. Pastor is an ecosystems ecologist with expertise in herbivore-ecosystem interactions, nutrient cycling, climate change and forest ecology. He is not entirely "new" to the department, since he has formerly taught courses here and has been a member of the Biology Graduate Faculty.



Dr. Arun Goyal joined the Biology faculty last December. He was educated in India and Australia, then served as a postdoc and assistant professor at Michigan State University. He has extensive research experience, mostly in the areas of photosynthesis, photorespiration and carbon concentration mechanisms in plants and algae, but also has broader research interests in osmoregulation, bioremediation of hazardous waste and phytopharmaceuticals. Besides establishing a research program here, Dr. Goyal will be teaching Plant Physiology, General Botany, Plant Biochemistry and Plant Molecular Biology. He and his wife Archana, who holds a PhD in genetics and plant breeding, and two children are established in Duluth and find the community and schools very friendly.

Hollie Collins cont. from p1

bedroom home with all the conveniences, the interior finished to complement the woodland setting.

Dr. Collins' teaching and research career, spanning 33 years, has been spent at UMD. He holds a doctorate from Michigan State University, where his academic emphasis was on fish behavior and ecology. Throughout the years, Dr. Collins has been called upon to teach a broad spectrum of courses in the Biology department, including Ichthyology, Animal Behavior, Natural History of Vertebrates, Limnology, Histology and Ecology labs. His affable classroom manner, broad background and wealth of first-hand information about the out-of-doors have been woven skillfully into the classroom. Early in his career he was selected as the recipient of the Horace T. Morse Award for Outstanding Teaching.

Professor Collins has been heavily involved in outreach programs in the community as well, speaking and writing on a variety of biological topics for the Duluth Zoo, the Izaak Walton League, the Duluth News Tribune nature section and responding to questions from legislators and others on environmental issues. His list of professional accomplishments also include contract activity with the U.S. Forest Service, National Park Service, EPA Support Services and the St. Louis Watershed Commission. An avid hunter, fisherman, nature-lover and collector of wild edibles, there are few outdoor biological phenomena he has not seen, tasted, experienced or studied.

Since the early 80's, Dr. Collins has provided guidance to more than 22 Master's degree students in the areas of fisheries biology, mammalian behavior and leech culture. His

most current research, with former graduate students Andy Edwards and Pat Brown, was an early investigation into the life history and population dynamics of the Eurasian ruffe. The ruffe is currently the focus of extensive research in the Great Lakes. During the mid-80's, Collins also received Minnesota Sea Grant funding to study the biology of the little-known bait leech, *Nepheleopsis obscura*. As a result of that research effort, some pioneering work was published on the life history and culture of the economically-important "black gold" leech species.

On a more personal note, Hollie and his wife Barb, well-known for her culinary skills, are the parents of three married daughters, Jan and her husband Paul, together with their

children Andrea, Ariel and Laurel live on a small hobby farm about 20 miles away. Jody, recently married to coastguardsman Barry, lives in Duluth and works as an audiologist. Lori and her husband Jeremy, in the U.S. Army, live in Nashville where Lori is employed in a research clinic.

The retirement scene for Hollie Collins will be a busy one. While he and Barb are comfortably settled in their country life and in the Floodwood community, there is much to be done. A furious storm two summers ago left many acres of downed and uprooted trees to be dealt with.....the garden requires ongoing attention..... the orchard needs pruning and grafting and bees for pollinationin winter the deer wander in to be fed..... the property needs to be rid of "varmints" the grandchildren need spoiling..... and there are fish waiting to be caught.

The Indispensable Staff

Biology staff members assist the faculty and students in many ways, helping to keep the department operating smoothly and efficiently. Pictured right are (from left to right) Deb Shubat, Senior Research Plot Technician, who maintains the greenhouse; Ruth Hemming, Executive Secretary; Randy Hedin (seated), Laboratory Services Coordinator; and Mary Simon, Accounts Specialist



Visit With a Professor Emeritus

The featured Professor Emeritus for this issue is **Dr. Blanchard Krogstad**. Dr. Krogstad and his wife Doris (a former piano teacher) retired on the same day - May 31, 1984. Several weeks later, they left Duluth and moved to his old family homestead located between Winger and Fosston, Minnesota, where they still reside. Keeping up with the gardening, the orchard and the numerous volunteer activities have kept the Krogstads busy for the past 13 years.

Dr. Krogstad began his UMD career in 1954 after several years of teaching at St. Olaf College. His doctoral work, in zoology, was taken at the University of Minnesota. While his academic interests included a broad spectrum of ecological areas, he often focused on life histories of insects. While a professor at UMD, Dr. Krogstad spent many summers at the University of Minnesota Forestry and Biological Station. He also spent a year-long sabbatical in Chapingo, Mexico as a staff member in the Rockefeller Foundation Program "The Green Revolution", advising students, assisting in the planning of a graduate program in entomology and being involved in research. Later he spent a sabbat-

ical year at Xalapa, Veracruz working with the Instituto Mexicano del Cafe, conducting research on insect pests in coffee plantations. His research activity resulted in many publications on insect pests of agricultural crops and forests.

Professor Krogstad was a valuable asset to the University community, serving on numerous All-University as well as UMD Campus and Departmental committees. He was also active in professional organizations, particularly the Society of Sigma Xi, the Minnesota Academy of Science, the American Institute of Biological Sciences and the American Association of University Professors. His strong leadership qualities earned him chairman status in several of these.

An award-winning teacher, Dr. Krogstad had excellent rapport with his classes, often interjecting subtle, deadpan humor in his lectures and lab presentations. And no one who was in his entomology, natural history of invertebrates or comparative anatomy of invertebrates classes will forget those awesome lab tests. Krogstad was often the recipient of the "POW" (Professor of the Week) award, a distinction which students bestowed on the professor who gave the "meanest" exam of the week. Despite his rigorous demands in class,

he was always available as a resource and mentor for students and could be counted on to participate in faculty-student activities.

Dr. Krogstad continues to be busy and involved in local community issues and organizations. He has given generously of his time and talents over the years as a volunteer, currently serving as a trustee with First Care Medical Services in Fosston and as a director of the Fosston-Winger bank. In addition he is working with the University of Minnesota Extension Agent, collaborating on insect pests in the area. Currently he participates in a long-term ecological research project in Itasca State Park, attempting to control pine bark beetles, using pheromones in the trapping effort. In his "spare" time, this energetic retiree plays with his long-time hobby of amateur radio - he has his own 60 foot tower and antennas - and enjoys his worldwide contacts. He returned in March from a kayaking trip in lower Baja, California with his brother.

The three Krogstad children all have bachelor's degrees from UMD. Jineen, in addition, has a PhD from the University of Illinois, is independently employed and married to an organic chemist at Abbott Labs in Illinois.

Third in a Series



Rolf has a master's degree in music from the University of Iowa, but has since entered the computer field and is now Director of Information Systems for Pace Analytical Labs in Minneapolis. He is married and has two sons. Bruce is a graduate of Luther Seminary in St. Paul and is the Lutheran

Campus pastor at the University of Minnesota, Morris, campus. He is married with a teenage daughter.

Together, the Krogstads have travelled to a number of foreign countries in their retirement; their best experiences thus far were in Norway and New Zealand. This spring they

will visit England, Scotland and Wales. When at home, they both enjoy gardening and their orchard. As Blanchard said, "One needs grapes for wine-making and honey bees for pollination (and mead)".

Hybrid Poplar Research... cont. from p1

University of Minnesota to provide information relating to plantation effects on the biodiversity of small mammals and birds. Their research has been funded continuously since 1992, to provide long-term data to guide plantation development.

Preliminary research focused on monitoring small mammals and birds on experimental plots to determine which species were present, how abundant they were, and what changes occurred over time. Other common agricultural lands were monitored as well, for comparison with hybrid poplar. One tracking study in winter investigated medium and large mammal use of plantations. Analyses of data collected during the monitoring studies have been published in the scientific journals **Journal of Wildlife Management, Biomass and Bioenergy, and Conservation Biology.**

Three graduate students also chose thesis projects on small mammal usage of plantations. On the landscape scale, **Mark Nelson** and assistant **Jeremy Mott** evaluated species diversity and abundance of small mammals in sixteen plantations at sites in Minnesota, Wisconsin and South Dakota. This work allowed **Mark** to characterize the response of animals to plantations in various stages of development — a situation that will occur as more plantations are implemented.

Cathy Podeszwa focused on small mammal short- and long-term responses at the site level. She and assistant **Katie Standke** used live-trapping techniques to monitor animal movement during a breeding season in two areas: one containing a young plantation with an open canopy (a site in Minnesota), the other an older plantation with a closed canopy (a site in South Dakota). **Cathy** was able to follow the use of plantations and adjacent land types by individuals over a breeding season, and to determine how mammal species changed as a plantation aged. She was also able to evaluate the frequencies of animal movement across plantation boundaries.

Within plantations, **Sarah Crawford** compared animal presence and abundance in areas of healthy plantation vegetation with neighboring areas of failed trees. **Sarah** chose varying sizes of "patches" and analyzed variables related to vegetation structure and type to determine animal associations. She was assisted in her field work by **Nicole Colaizy.**

Monitoring of birds and small mammals will continue this summer. In addition, concerns about poplar plantation effects have led the group to begin research on the sharp-tailed grouse. There is evidence that grouse, a state-listed native species, are sensitive to dense blocks of trees near dancing grounds, the areas in which they gather to breed. **Dr. Christian** is currently surveying landscapes around both active and defunct dancing grounds. He hopes to determine the landscape effects of tree height and width near the dancing grounds on the behavior of breeding grouse.

Grants and Publications

by Donald P. Christian

Research activities by Biology faculty and students resulted in numerous publications in the past year. The following are some of those that were accepted or published recently. Due to space limitations, only co-authors linked to UMD Biology are indicated. Please write to the Biology Department or individual faculty for more information about these research activities:

Don Christian

Effects of mechanical strip-thinning of aspen on small mammals and breeding birds in northern Minnesota, *Canadian Journal of Forest Research*, 1996 (coauthors include former graduate student Marlys Reuvers-House, who teaches school in Alaska, JoAnn Hanowski, and Jerry Niemi; JoAnn, a scientist at NRRRI, received her BS and MS degrees in biology from UMD, as did Jerry, who is a professor in the department)

Patterns of variation in cranial size and shape in two coexisting gerbilline rodents, *Zeitschrift für Säugetierkunde*, 1996.

Bird and small mammal use of short-rotation hybrid poplar plantations, *Journal of Wildlife Management*, 1997 (co-authors include Pat Collins, who earned BS and MS degrees at UMD and currently works for the Minnesota DNR in Two Harbors, and JoAnn Hanowski and Jerry Niemi).

Wintertime use of hybrid poplar plantations by medium-sized mammals and deer in the midwestern U.S., *Biomass and Bioenergy*, 1997.

Plus see coauthored papers listed under Jerry Niemi and John Pastor.

Arun Goyal

Association of glycolate oxidation with photosynthetic electron transport in algal and plant chloroplasts, *Proceeding of the National Academy of Science, USA*, 1996.

Anne Hershey

Seasonal changes in chlorophyll a response to nutrient amendments in the French River, a North Shore tributary of Lake Superior, *Journal of the North American Benthological Society*, 1996 (lead author is former Biology graduate student Nan Allen).

Stream food webs, chapter in "Methods in stream ecology," 1996, Academic Press.

Global warming impacts on lake trout in arctic lakes, *Linnology and Oceanography*, 1996.

Stream macroinvertebrate communities, in "Ecology and Management of Streams and Rivers in the Pacific Northwest Coastal Regions," to appear soon, Springer-Verlag

Long-term effects of *Bacillus thuringiensis israelensis* (Bti) and methoprene on non-target insects in Minnesota wetland ecosystems, to appear soon in *Ecological Applications* (coauthors include Jerry Niemi).

Effects of salmon carcass decomposition on aufwuchs growth and wood decomposition, to appear soon in *Canadian Journal of Fisheries and Aquatic Sciences* (lead author is former biology graduate student Amy Fisher Wold).

Randy Hicks

Temperate viruses and lysogeny in Lake bacterioplankton, soon to appear in *Linnology and Oceanography* (lead author is former biology graduate student Mark Tapper).

Raj Karim

In vitro synergistic effects of six plant extracts against HSV-1 and HSV-2 in HEP2 Cells, *Proceedings - NCUR*, 1996 (coauthors are former undergraduate students Aaron Johnson, Shara Johnson, Satoshi Takida, and Matt Thompson)

Jerry Niemi (Jerry is a professor in the department and director of Center for Water and the Environment at the Natural Resources Research Institute, UMD)

Bird community dynamics in boreal forests, in "Conservation of faunal diversity in forested landscapes," 1996, Chapman and Hall, London.

Effects of edge type and patch shape on avian communities in a mixed conifer-northern hardwood forest, *The Auk*, 1996 (lead author is former Biology graduate student Rita Hawrot).

Response of breeding and migrating birds to extremely low frequency electromagnetic fields, **Ecological Applications**, 1996 (lead author is JoAnn Hanowski).

Recent trends of breeding birds in Minnesota and Minnesota forested regions - 1966-1993, **The Loon**, 1996 (coauthors include JoAnn Hanowski).

Use of graph theoretical and geometrical molecular descriptors in structure-activity relationships, invited chapter in "From Chemical Topology to Three Dimensional Geometry", 1997, Plenum Press (coauthors include Greg Grunwald, a UMD Biology alumnus).

Predation of artificial ground nests at two types of edges in a forest-dominated landscape, **Condor**, 1997 (coauthor is former Biology graduate student Tim Fenske).

Effects of two mosquito control agents on growth and reproduction of red-winged blackbirds (*Agelaius phoeniceus*), **Journal of the Minnesota Academy of Science**, 1997 (coauthors include JoAnn Hanowski).

Management of northern hardwood-conifer landscapes for the conservation of neotropical migrant birds, in "Management of mid-western landscapes for the conservation of neotropical migratory birds," 1996, USDA Forest Service.

Lack of edge effect in nesting success of breeding birds in managed forest landscapes, **The Auk**, 1997 (coauthors include Tim Fenske).

Influence of within-plantation heterogeneity and surrounding landscape composition on avian communities in hybrid poplar plantations, to appear soon in **Conservation Biology** (lead author is JoAnn Hanowski, other co-author is Don Christian).

Concluding remarks: raptor responses to forest management - a holarctic perspective, to appear soon in **Journal of Raptor Research**.

Effects of changing landscape pattern and land cover data variability on ecoregion discrimination across a forest-agriculture gradient, to appear soon in **Landscape Ecology**.

Plus see co-authored papers listed under Don Christian and Anne Hershey

Merry Jo Oursler

Regulation of bone cell function by gonadal steroids, chapter in "Osteoporosis," 1996, Academic Press.

Human breast cancer induces osteoclast activation and increases the number of osteoclasts at sites of tumor osteolysis, **Journal of Orthopedic Research**, 1996.

Correlation of estrogen receptor level and avian osteoclast estrogen responsiveness, soon to appear in **Journal of Bone and Mineral**

Research.

John Pastor

Carbon and nutrient mineralization and fungal spore composition of vole fecal pellets in Minnesota, **Ecography**, 1996 (coauthors include Don Christian)

Biodiversity and ecosystem processes in boreal regions, chapter in **Functional Roles of Biodiversity: A Global Perspective**, Wiley Press, 1996.

Unsolved problems of boreal regions, **Climatic Change**, 1996.

Linkages - an individual-based forest ecosystem model, **Climatic Change**, 1996.

Multiple nutrient limitations in peatlands: a call for a new paradigm, **Wetlands**, 1996 (coauthors include former biology graduate student Carmen Chapin).

Effect of moose movement and habitat use on GPS collar performance, **Journal of Wildlife Management**, 1996.

Interactions among nitrogen, carbon, plant shape, and photosynthesis, **The American Naturalist**, 1996.

Species-area curves and diversity-productivity relationships in beaver meadows of Voyageurs National Park, U.S.A., **Oikos**, 1996.

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Grants and Publications cont. from p7

Litter decomposition in western red cedar and western hemlock forests on northern Vancouver Island, British Columbia, *Canadian Journal of Botany*, 1996.

Nitrogen cycling and the control of chaos in a boreal forest model, chapter in *Control and Chaos*, Mathematical Modelling Series, 1997.

Herbivores, the functional diversity of plant species, and the cycling of nutrients in ecosystems, to appear soon in *Theoretical Population Biology*.

A spatially-explicit model of moose foraging and energetics, to appear soon in *Ecology*.

Mel Whiteside

Quantitative sampling techniques for young fish from diverse lake habitats, *Archives for Hydrobiology, Special Issues in Advanced Limnology*, 1997

In addition to the above research publications, Biology faculty gave 34 poster or oral presentations at regional, national, and international meetings. Faculty continued to be very successful in gaining grant funding to support their research. During the past year, 23 funded research projects were in effect in the department. Ten new projects initiated during 1996 and the first part of 1997 totalled about \$500,000. These grants do not include funding obtained by Jerry Niemi and John Pastor, whose grant projects are run through the Natural Resources Research Institute.

From the Department Head

by Donald P.
Christian

The past year has been bittersweet for the department. We were all saddened by the unexpected death in January 1997 of Bette (Elizabeth) McNamara (see "In Memoriam"). Bette had kept many aspects of departmental logistical operations running. While many people complain about having one boss to contend with, Bette's "boss" in essence was the entire biology faculty. Her job placed many demands on her, and she fulfilled her responsibilities with care and good humor. We share a sense of loss with Bette's family and close friends.

We are saying goodbye and best wishes to Dr. Hollie Collins, who is retiring at the end of this year after 33 years as a faculty member here. As most alumni know, Hollie has taught a tremendous diversity of courses throughout his career. He has been a key faculty member in the department for many years, and his contributions will be missed. I, along with many other faculty, thank Hollie for his guidance and friendship, as well as all that he has done for the department. Best wishes for a long and happy retirement.

The department has also experienced many positive changes in the last year. The addition of three new faculty (see "New Faculty") to the department has brought us new energy, direction, and perspective. In last year's newsletter we noted the pending faculty appointments of Dr. Merry Jo Oursler as an assistant professor and Dr. John Pastor as a professor. Drs. Oursler and Pastor are now members of the faculty, along with Dr. Arun Goyal, who joined us as an assistant professor in December. All three of these new faculty have been making significant contributions to departmental instructional and research programs. Former undergraduate and graduate student Randy Hedin has been doing a stellar job as a temporary laboratory services coordinator since February. The department also hired Carol McLean to work this spring bringing us up to speed in areas of safety training, chemical safety, and hazardous waste disposal. Carol brings a wealth of experience to the job, including her work at several military installations in the Pacific the past several years.

This was the inaugural year of the department's new B.S. major program in cell biology, offered along with the B.S. and B. A. biology majors. We expect to graduate our first students in this program this coming spring! We are excited about this new opportunity for students, including the positive ways that our research and instructional missions are feeding off of each other. Although I have mentioned several aspects about our initiatives in cellular biology, the depart-

In Memorium ...

Dr. Ed Flaccus

by Helen Hanten



Dr. Edward Flaccus, former Associate Professor of Biology at UMD, died on September 7, 1996, in Hanover, New Hampshire. Those who remember his tenure at Duluth from 1958 to 1968 recall his contributions in the areas of botany and ecology, and his commitment to non-violence. After leaving Duluth, he served for a year as a visiting scientist at Brookhaven National Laboratory and then taught at Bennington College in Vermont until his retirement in 1986.

Dr. Flaccus was born in Lansdowne, Pennsylvania and attended high school in Philadelphia. He earned a bachelor's degree in science from Haverford College, a master's degree from the University of New Hampshire and his doctorate from Duke University in 1959. He was a long-time member of the Religious Society of Friends (Quakers). During World War II he was drafted as a conscientious objector and served in civilian public service. Following the war, he did volunteer relief work for the American Friends Service Committee in Germany, working with German nationals and displaced persons.

His wife, Sally, died in 1992. He is survived by three children and three grandchildren. Memorials may be sent to American Friends Service Committee at 1501 Cherry Street, Philadelphia, PA 19102.

ment continues to have strong instructional and research programs in ecology, especially aquatic ecology. The faculty grants and publications section elsewhere in this newsletter provides details about some of the faculty and student research accomplishments in these areas. Faculty have invested tremendous effort this year at revising our curriculum for the pending (fall 1999) conversion to the semester system. We have tried to take advantage of this change as an opportunity to critically evaluate our curriculum. Another major initiative in the department this past year was the remodelling of a laboratory to house Dr. Anne Hershey's research program in aquatic ecology.

The department continues to work at strengthening and improving our programs, which we see as representing a positive "blend" among significant funded research programs, undergraduate education, graduate education and training, and outreach of biological knowledge and understanding. While we have received significant university support in our efforts to develop new programmatic areas in biology, the institutional resources we are provided have not given us the opportunity to develop the strengths that we need to, and that our students deserve. The contributions of friends and alumni continue to be important resources in our efforts to grow and improve, and I want to thank the many friends and alumni for their generous contributions to the Biology Gift Account and the Jack Hargis Lecture Fund this past year. We deeply appreciate your generosity. If you wish to contribute to departmental programs, you may do so through the Development Office, Darland Administration Building, UMD, Duluth, MN 55812, earmarked "Biology Department" or "Hargis Lecture Fund." Donations to the Hargis Lecture Fund are used solely to fund a lecture visit to UMD by a distinguished environmental scientist. The department uses contributions to the gift account for a variety of purposes related to our educational mission. Donors should feel free to designate a particular use for their gift, including a specific educational or research purpose in the department. We remind you that many corporations and organizations match individual donations to educational institutions, and urge you to inquire whether your employer will match a contribution you might make to UMD Biology.

I send you the best wishes of the Department and our thanks for your continuing support. As in previous newsletters, I urge you to consider visiting the department when you are in Duluth so that you can see personally some of the changes in the department and some of the new directions that we are pursuing. Of course, we always are interested in hearing from alumni about important events in your lives.

In Memorium...



**Bette
McNamara**

Members and friends of the UMD Biology Department were saddened to learn of the death, on January 25, 1997, of Elizabeth ("Bette") McNamara. Bette served as the laboratory services coordinator in the department from 1981 until her death. She had previously worked also in animal services for the UMD School of Medicine. Bette's many responsibilities in the department included the ordering of laboratory supplies and chemicals, maintaining stockroom supplies of materials for teaching and research, provision of training for use of equipment and handling of hazardous wastes, and the scheduling, training and supervision of student workers.

Bette was born in Indianapolis, graduated from Cathedral High School in St. Cloud, Minnesota and held a B.S. degree from UMD. She lived in the Clover Valley area for more than 25 years, where she raised horses and was a member of several area riding clubs. Bette is survived by her parents, nine brothers and sisters and their families, a special friend, Jim Aspoas, and many co-workers and friends. Memorial contributions may be sent to Animal Allies Humane Society in Duluth.

Master of Science Degrees, 1996

Michele M. Barlow
Sarah L. Crawford
Randy A. Hedin

Lisa A. Schulte
Mark A. Tapper

Graduate Student news

New Graduate Student Profiles

NEW GRADUATE STUDENTS

Rebecca Forman earned her bachelor's degree from Trinity University in San Antonio, Texas, but has returned home to Minnesota to pursue a graduate degree. She is working with Dr. Mel Whiteside to determine the impact of *Bythotrephes cederstroemi* (an exotic zooplankton) on the chydorid communities of several Duluth-area lakes since its introduction in the late 1980's.

Kay Rezanka, a native of Pequot Lakes, MN, did her undergraduate work at Gustavus Adolphus College in St. Peter, where she also worked as a biology lab coordinator and instructor. This summer, she will be working with advisor Dr. Anne Hershey on a project investigating the food web structure of Amity Creek using stable isotope (15N) analysis.

Kevin Wolfe, a graduate of UMD and native of Bloomington, MN, is working with Dr. QinQin Liu. His master's research focuses on the cell cycle and cell death in the maize male sterile mutants "ms2" and "polymitotic".

Other New Biology Graduate Students:
Michael Gillespie, Genevieve Kysley and Thomas Jabusch.

CONTINUING GRADUATE RESEARCH

Aquatic ResearchLake Superior and the St. Louis River

Kevin Flynn is collaborating with Dr. Jon Holy of the UMD Medical School on a project to develop a novel way to control

xenobiotic fish species in Lake Superior. Currently, they are using monoclonal antibodies to investigate antigens that may be involved in fertilization in the Eurasian ruffe. Specifically, these antibodies have been used for immunocytochemistry on cryostat and paraffin sections of testes and will be used to screen cDNA libraries of zebra fish and ruffe.

Jim Gangl is researching the effects of Eurasian ruffe (*Gymnocephalus cernuus*) on the benthic macroinvertebrate community of the St. Louis River estuary, Lake Superior. This is one part of a much larger study, funded by Minnesota Sea Grant, involving researchers throughout the Great Lakes region. The portion of the study done by scientists from the Natural Resources Research Institute, including Dr. Carl Richards, Dr. Anne Hershey, Dr. Rich Axler and Dr. Jeff Schuldt, involves the use of mesocosms to examine how ruffe compete for food with native fish such as yellow perch.

Other graduate students working on issues related to Eurasian ruffe include **Tamara Swanson** and **Pat Brown**.

Jay Sandal and **Seth Moore** are both pursuing research on Lake Superior. Jay is analyzing data collected by Superior Lakewatch volunteers, and is advised by Dr. Mel Whiteside. Seth is using morphometric measurements to determine population differences in siscowet trout. His advisor is Dr. Carl Richards.

Aquatic ResearchNorth Shore Streams

Andy Wold's research, under the advisement of Dr. Anne Hershey, focuses on comparing water quality in North Shore streams vs. Duluth urban streams draining into Lake Superior. Andy will compare wetland, forested and urban streams by examining algal accrual, decomposition, food web dynamics, nutrient limitation and retention of organic matter.

Aquatic ResearchToolik, Alaska

Gretchen Gettel is investigating the effects of different fish assemblages on food web structure in arctic lakes. Gretchen is in the Water Resources program, and is advised by Dr. Anne Hershey.

Jim Lee is collaborating with a graduate student from the University of New Hampshire, Dave Arscott, on a project examining nutrient stresses on aquatic mosses and epiphytes in an arctic Alaskan stream. His thesis work, with Dr. Anne Hershey, focuses on aquatic insect/aquatic moss interactions in arctic streams where naturally-occurring coarse particulate organic matter is scarce. Jim hopes to determine how a nutrient-enrichment-induced glut of organic matter impacts the aquatic insect community, and if, in turn, these aquatic insects have an impact on organic matter processing.

Tyler Lampella and **Frank Kaszuba** are finishing analyses of projects done in Alaskan streams. Both work with Dr. Anne Hershey.

Terrestrial Research

Nick Danz is presently working on a project with advisor, Dr. Dave Schimpf, investigating the transmittance of light (both photosynthetic photon flux density and red:far-red ratios) through abscised leaves of northern deciduous taxa. An undergraduate assistant has anatomically classified the leaves as either "sun" or "shade," allowing Nick to run statistical analyses on these data.

Cathy Podeszwa has been assisting Dr. Don Christian on work related to sharp-tailed grouse (*Tympanuchus phasianellus*) habitat. Part of the project is designed to determine features of good quality grouse habitat, relative to areas from which grouse have disappeared. Cathy has written a press release to obtain information on dancing grounds from members of the general public, and will be entering dancing ground information into a GIS database.

Cindy Hale is working with Dr. John Pastor of NRRJ on a project to enhance and protect structural and biological diversity in northern hardwood forests. They are surveying an age range of hardwood stands in the Nemadji State Forest, and will run model simulations to determine which management strategies are most likely to enhance and/or

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preserve old-growth features in a managed landscape. They also hope to run a follow-up study to implement some of these strategies and compare their field results to the model's predictions.

Medical Research

Paula (Holter) Hedin is currently working with Dr. Arlen Severson in the UMD Medical School's Anatomy Department on detecting the production of bone sialoprotein in human coronary artery smooth muscle cells. This protein is normally found in

bone, but has also been found in the CASM cells, indicating that it may help form atherosclerotic plaques. Paula is also collaborating with Drs. Lois Heller and Alice Adams of the Physiology Department (also at the Med School) on the effects of high blood pressure and cytomegalovirus on the production of atherosclerosis in rat aortas.

Other Biology Graduate Students: Charlie Barnes, Steve Garske, Anne Gingery, Rick Gítar, Michele Hughes, Kurt Johnson, Scott McGovern, Del Nordman, John Terwilliger, Paul Tucker, Chris von Rabenau and Joan Weyandt-Fulton.

GRADUATE STUDENT RESEARCH HONORS

Two UMD Biology graduate students won awards for their scholarly accomplishments. Charlie Barnes won the Alexander Anderson Fellowship, given by the University of Minnesota Graduate School. This supported his field research on interactions between small mammals and mycorrhizal fungi. Charlie's major advisor was Don Christian. Shane Yokom was recognized for best paper presented by a student at the Lake Superior Biological Conference. His talk was titled "Recovery of a Mine Pit Lake Following Removal of Aquacultural Loading". Shane's major advisors were Rich Axler and Mike McDonald.

Graduate Teaching Award



Catherine Podeszwa, originally from Fridley, MN, was selected to receive the "Outstanding Graduate Teaching Assistant Award" for the 1995-96 academic year. Cathy served, over the past three years, as a teaching assistant for a number of laboratory classes, including General Ecology, General Biology, Animal Biology and Biology and Society. She recently completed her master's degree based on research involving movement patterns of small mammals in hybrid poplar plantations (see first page article). While a graduate student, Cathy was actively involved in departmental activities, serving as the graduate student representative to the department, and as a board member and contributing writer to this newsletter. She was recently hired by the Student Affairs Office of the College of Science and Engineering as an academic advisor. We congratulate Cathy and are pleased that she will be working closely with the Biology Department in her new position.

Bachelor's Degrees awarded in 1996

Bachelor of Applied Science (CEHSP)

Dana J. Bahr, Ottertail, MN
Sven E. Berglund
Lynn D. Dahring, Detroit Lakes, MN
Darren M. Goutley, Greenfield, MN
Sharon L. Haldeman, Waterford, WI
Britt K. Johnson, Albert Lea, MN
Jeffrey A. Kolehmainen, Duluth, MN
James L. Kyes, Cottage Grove, MN
Martha H. Larson, Duluth, MN
Robert A. Mancini
Teresa L. Ophelm Monson, Duluth, MN
Blaine R. Nelson, Hastings, MN
Travis L. Stewart

Bachelor of Arts (CLA)

Kristine M. Gerga, White Bear Lake, MN
Christine B. Kinney, Oakdale, MN
Elizabeth A. Roginski, Cloquet, MN
Jason S. Saloum, Duluth, MN
Virginia S. Temple, Rochester, MN

Bachelor of Science (CSE)

Tiffany E. Bergh, Eagen, MN
Sammi R. Pohl Bletsch, Mason, WI
Patrick L. Buckwalter, Kasson, MN
Michael P. Carney, Plymouth, MN
Cheryl M. Colbenson, Rochester, MN
Katherine M. Cook, Roseville, MN
Linda M. Cook
Jesse J. Crane, South St. Paul, MN
Sarah C. Duncan

Juliette M. McCaffrey
Erin J. Meyer, Hutchinson, MN
Ashley H. Moerke, Stevens Point, WI
Amy L. Muelhbauer, New Hope, MN
Shelly J. Newman, Sturgeon Lake, MN
Del R. Nordman

Becky L. Norton, St. Francis, MN
Rebecca A. Opland, Stillwater, MN
Barbara A. Peichel, Fairfax, MN
Jamie M. Pelzel, Fairfax, MN
Erika M. Peterson, Eden Prairie, MN
Ryan T. Reuter, Henning, MN
Todd D. Rose, Kandiyohi, MN
Andrea L. Rosen, Fargo, ND

Shawn D. Severson, Lindstrom, MN
Patrick W. Shannon, Peace, MN
Darren I. Simon, Farmington, MN
Eric R. Slapnicher, Hastings, MN
Cara L. Smith, Zumbrota, MN
Katie M. Standke, Cold Spring, MN
Brian D. Stoterau, Shoreview, MN
Shane M. Swanson, Willmar, MN
Nathan W. Swanstrom, Apple Valley, MN
Jesse M. Ternus, Anoka, MN
Matthew C. Thompson
Heather N. Trom, Blooming Prairie, MN
Michael S. Tupy
Shaun G. Weller, Rochester, MN
Jennifer L. Wiisanen, Superior, WI
Kevin W. Wolfe, Bloomington, MN

Sonia L. Durand, Duluth, MN
Mary J. Eischens, Park Rapids, MN
Jennifer E. Englund, Stillwater, MN
Jessica E. Erickson, Cloquet, MN
Scott D. Fisher, Oakdale, MN
Christopher R. Friese, Red Wing, MN
Chad N. Fylling, Brooklyn Park, MN
Jeffrey R. Geddes, East Grand Forks, MN
Katherine C. Goldman, Saginaw, MN
Alissa K. Guildner, Farmington, MN
Michael P. Haedt, Madelia, MN
Jennifer R. Hanneken, Pierz, MN
Angela L. Hasbargen, International Falls, MN
David M. Haugen, Duluth, MN
Daniel R. Held, Red Wing, MN
Rebecca A. Hertaus, Maple Grove, MN
Damon D. Holmes, Duluth, MN
John M. Houle, Mounds View, MN
Jennifer C. Jacobson, Hopkins, MN
Aron J. Johnson, Columbia Heights, MN
Jessica L. Johnson, Taylors Falls, MN
Lori M. Johnson, Shafer, MN
Chad H. Kamann, Norwood, MN
Shane Kirilin, Aroca, MN
Sarah S. Knott, Forest Lake, MN
Allyz D. Kramer, Waseca, MN
Jenna A. Krogh, Medford, MN
Lori D. Lukovsky
Anthony J. Macioce, Proctor, MN
Todd B. Martin, Hugo, MN

Senior Spotlight

by Aubie Bundy
and Kim Miller

As seniors in the Biology Department, this last year is something we look forward to and dread at the same time. We look forward to not having exams, papers and presentations to deal with. We must also choose where we will go after receiving our bachelor's degree. Yet again, we must leave behind familiar faces and try something new. For some, this means more college in the form of grad school or professional school. For others, this means getting a full-time job. There are also many who have not decided where to go next. Some will take a year or two off before moving ahead and others will continue where they left off. Whichever path we decide to follow, the decisions we make today will greatly affect our futures. Wherever those decisions take us, we have all been influenced by our years at UMD.

Pete Czarnecki has been influenced by work he has been involved in at the Minnesota Zoo. He has worked summers there for the past six years. Pete will graduate this spring with a major in biology and a minor in chemistry. He will work with the Minnesota Zoo this summer and hopes to work with the DNR in the future. Graduate school may be in the plans, but he is not sure yet.

Pete lives off campus with one roommate and says, "It is nice, at the end of a long day, to actually leave campus". Pete has been a member of the Biology Club since his sophomore year and has enjoyed the club-sponsored extra-curricular activities like bowling and volleyball. He is from Apple Valley, MN which is south of the twin cities. He chose UMD as a school because it is a lot smaller than the twin cities campus.

Two classes stand out as having been exceptional in Pete's mind. One was Plant Ecology with Dr. Schimpf. He liked the small class size and the one-on-one relationship with the professor. The other class, Linnology, taught by Lyle Shannon, was an excellent experience because of the field work.

Kristen Frykman will graduate after the summer session. She is staying through the summer to work on a UROP project. Kristen transferred to UMD from Virginia Tech in the spring of 1995. She says that although Virginia Tech had more classes and more options than UMD, there was not the opportunity to know her professors. "That is a great advantage here at UMD", she says. Kristen has been a member of the Biology Club since she first arrived here two years ago. She has enjoyed getting to know other biology majors and loves being involved with all the activities. Kristen is helping to plan the spring Biology Club camping trip.

Kristen lives off campus and shares a house with roommates and the apple of her eye, her Alaskan husky, Sabaka. "Living off campus," she says, "affords me privacy and the option of cooking."

Kristen is happy to be graduating, but like so many of us, is not sure what to do next year. Her interests lie in molecular biology and genetics. She also loves the outdoors and would like to find a way to pursue both, believing that people should enjoy everything and integrate their interests. For example, she wants to find a balance between technology and nature in her life. She says, "Try to see both in the light of one another."

John Juaire is a biology major with an American Indian studies minor who will be graduating after the summer session. He has been at UMD since the fall of 1994, but prior to that, attended Northland College and St. Thomas. John likes the variety and diversity of classes here at UMD and the natural resources program. He spoke highly of the stream ecology class taught by Anne Hershey, saying "It was the coolest class I ever had". He will be studying the field ecology of nine North Shore streams. He hopes to work at NRRJ this summer and stay on full time in the fall. He has worked at NRRJ for the past two years with Carl Richards.

John is also working with Frank Kutka in an entrepreneurial venture gathering and selling native plant seeds. The seeds, especially marsh marigold seeds, will be used for wetland restoration projects.

John lives off campus and thinks it has been a great experience. "It gives people a taste of real life and responsibility." When asked what he believes, John said that whatever you believe is personal and adds to diversity. People shouldn't try to force their opinions on one another, but should respect that we all believe different things.

Angie Freed has enjoyed her classes here at UMD more as time has gone on, which is a ray of hope to freshmen struggling through introductory biology. Angie's hard work has resulted in her being accepted into the UMD School of Medicine. She is very excited to be realizing a lifelong goal and has known all along that she wanted to be a doctor. The UMD School of Medicine is especially suited to her interest because it has a strong rural care emphasis.

Getting involved is important to Angie, and when asked if she had any advice to give, she encouraged spending time getting involved. Angie has been participating in research since last spring. She has been studying how hormones produced by the endocrine system affect the immune system. Research has been a great experience for her and has rounded out her career as an undergraduate biology major.

Angie is from Remer, MN, a town of about 350 people. She lives off campus now and works in a group home. Helping others is very important to her. Also important to Angie is her faith in God. Her spirituality, her faith in God, has provided "a strength

The recipient of the annual Odlaug Award for the 1995-96 academic year was Ashley Moerke. The award is presented annually in honor of Professor Odlaug, a former department head, to an outstanding student who also shows strong leadership qualities and service to the department. The recipient selects a reference book of their choice. Ashley received a B.S. degree in Biology at the fall 1996 commencement. During her undergraduate career at UMD, she was involved in extensive field and laboratory research in aquatic ecology under the direction of Dr. Anne Hershey, both in Minnesota and in Alaska. Ashley currently is applying to graduate programs in ecology.

T.O. Odlaug Award

The recipient of the annual Odlaug Award for the 1995-96 academic year was Ashley Moerke. The award is presented annually in honor of Professor Odlaug, a former department head, to an outstanding student who also shows strong leadership qualities and service to the department. The recipient selects a reference book of their choice. Ashley received a B.S. degree in Biology at the fall 1996 commencement. During her undergraduate career at UMD, she was involved in extensive field and laboratory research in aquatic ecology under the direction of Dr. Anne Hershey, both in Minnesota and in Alaska. Ashley currently is applying to graduate programs in ecology.

Biology Club News

by Deb
Erickson

Five elected officers worked hard this year to provide an educational and social outlet for biology undergraduates. The main focus of the Biology Club is to make students comfortable in school by providing a network of friends, a place to find answers to questions and situations to meet faculty outside the classroom. The club officers coordinated many social activities to bring interested students together and to introduce faculty on a more personal level. Currently, 125 members receive news and announcements on the email alias. Some of the activities this year were: a fall hike at Gooseberry State Park followed by a picnic on the shore of Lake Superior and several evenings of bowling, sledding, snow football and smelting. The club also took a winter trip to Camp du Nord for a weekend of relaxation and bonding. Club-sponsored intramural volleyball (the "Biohazards") and soccer ("HSP70") teams provided an outlet for stress and an



Biology Club Officers for '96-'97 seated: Brad Alsop, Historian and Deb Erickson, President; standing (left to right): Lisa Zarns, Secretary; James Benzie, Vice-President; and Sandy Fritzlzar, Treasurer

advantage of the opportunity to ask about research, graduate schools, summer employment and a variety of other things. Another event sponsored by the Biology Club was a talk by Janet Pribyl, a career services counselor. She shared information about the types of jobs available to biology students after graduation and the best ways to prepare for a job hunt. During this spring quarter, the club will schedule "office hours", times during which upperclass members will be available to answer students questions about classes, teachers or tutoring.

The Biology Club raised funds for activities several times this year. The fund-raisers included environmental T-shirt sales, plant sales and baking cookies for the weekly departmental seminars. The club is constantly looking for fun and innovative ways to bring biology majors together and to provide them with helpful information about college life. Interested students are always welcome to join and should stop by Life Science 235 for more information.

opportunity for exercise. This spring, students will go camping at Split Rock State Park and will host the annual spring picnic for faculty and students.

In addition to the social activities, the club provides services for the students, the department and the community. In the fall, club members participated in a community-wide event by cleaning up Chester Bowl Park. During the winter quarter, the club hosted the second annual "Meet the Professors and Graduate Students" holiday party. This gave students and faculty the opportunity to converse in an informal setting. Students took

UROP (Undergraduate Research)

by Aubie
Bundy

UMD's Undergraduate Research Opportunities Program provides students with the financial support necessary to conduct a research project in collaboration with a faculty sponsor. Faculty mentors help students develop research skills on a project often related to their own on-going research. Valuable experiences not available in the classroom are provided by such research.

This program has been beneficial to both faculty and student participants. Biology students selected to participate in the 1996 UROP program are listed below with their project title and faculty sponsor.

Brad Alsop and Aubie Bundy (C.M. Belk)
"Evidence for a Novel Zn²⁺ Transporter Regulated by Known Proto-Oncogene Transcription Factor myb"

Aubie Bundy (M.J. Oursler) "Effects of Growth Factors Secreted by Metastatic Breast Cancer Cells on Osteoclast Activity"

Jonathan Delf (C.E. Firling) "The Effects of Sodium Zeolite A on the Rate of Bone Ossification in Developing Chick Embryos"

Tim Duffy (R. Hicks) "The Abundance and Productivity of Heterotrophic Bacteria near the WLSDD Sewage Effluent in the Duluth-Superior Harbor"

Debrah Erickson (M.J. Oursler) "The Role of C-src Signaling Pathway in Osteoclast Activity"

Michelle Kramer (M.R. Karim and R. Carlson) "In-vitro Effects of Betulin and Betulinic Acid on HSV-1 and HSV-2 Using Vero Cells"

John Leech (A. Klemer) "A Study of Zooplankton-Phytoplankton Interactions and Their Effect on the Ecological State of L. Pequayan Lake"

Ashley Moerke (A. Hershey) "Growth Rate of Slimy Sculpin in an Arctic Lake"

Jill Nezworski (G.J. Niemi) "Trends in the Northern Goshawk Population"

Minh Chau Nguyen (M.R. Karim and R. Caple) "Characterization of Active Components of Vietnamese Plant Extracts Against HSV - 2"

Becky Norton (D.P. Christian) "Response of Small Mammals to Experimentally Supplemented Snow Depths"

Kevin Wolfe (Q.Q. Liu) "Analysis of the Plant Cell Death Process Using the Maize Male Sterile Mutants ms2 and ms10"

Biology Seniors Receive National Recognition

The Council on Undergraduate Research (CUR) has selected a paper by UMD undergraduate students **Jeff Ross** and **Joshua Ramseyer** and research mentors **Dr. Conrad Firling (Biology)** and **Dr. Arlen Severson (Anatomy and Cell Biology)** for presentation at the 1997 Undergraduate Research Poster Session on Capitol Hill, Washington, D.C. Their presentation is entitled "Detection of bone matrix proteins in sections of atherosclerotic lesions" and is one of forty-six papers selected by NCUR in a national competition. The poster will be displayed in the Dirksen Senate Office Building for members of congress and representatives of the National Science Foundation (NSF), National Institutes of Health (NIH), and the National Aeronautical and Space Administration (NASA).

WAY TO GO!

The Biology Department faculty and staff are proud of our graduates and their accomplishments.

At the time of this publication, the following seniors have been notified of acceptance to the professional or graduate schools listed below. Best of luck!!

Joshua Bartoe -
College of Veterinary Medicine,
Ohio State University
Aubie Bundy -
M.S. program, University of
Minnesota, Duluth
Angela Freed -
UMD School of Medicine
Jamison Harker -
UMD School of Medicine
Max Kostecki -
Pacific University College of
Optometry at Portland, OR
Mike Ling -
University of Minnesota
School of Dentistry
Tanner McKenna -
University of Minnesota
School of Dentistry
Suzette Olson -
University of Minnesota
School of Dentistry
Tonya Pierce -
Molecular Biology doctoral program
at University of Missouri, Columbia
Tom Pink -
University of Minnesota
School of Dentistry
Jessica Steen -
Northwestern College of Chiropractic

Alumni News

Darwin Dalen (BS '91) is currently an associate optometrist in a group practice in Cambridge, MN. He received his doctorate in optometry in 1995 from Ferris State University College of Optometry.

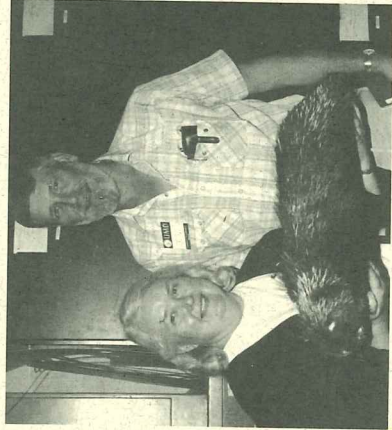
John Krenz (MS '88) is a post-doctoral fellow in the molecular biology program at the University of Missouri. He is developing genetic markers to use in field studies of the evolution of mate choice in the gray tree frog. John and his wife, Elaine, are happy to be "offspring-impaired".

Matthew Oakes (BS '94) is working at West Publishing Company in Eagan, MN as an Information Product Coordinator.

Timothy Studer (BS '92) is a '96 graduate of the University of Osteopathic Medicine and Health Sciences. Since last July, he has been in residence in family practice at the Fargo Family Practice Center, Fargo, ND.

Craig Badger (BA '78) lives in Guatemala where he trains Peace Corps volunteers for various programs in El Salvador. He travels between Guatemala and sites in El Salvador and has also worked with refugees in Guantanamo Bay, Cuba.

All-Class Reunion



Last July the UMD campus celebrated its centennial with an All-Class-Reunion. In preparation for returning alumni, the Biology Department scheduled a workshop on forest ecology and management, led by Don Christian. Current research activity in the department was pictured in a classroom poster session. A popular gathering place was the greenhouse window on second floor where

James Sandelin (BA '63) is retired from his position as a compliance officer with the Food and Drug Administration, New Orleans, LA. He is pursuing a second career as an international consultant in food quality assurance.

Mark Schlangen (BAS '94) has been teaching life science and physical science in St. Paul for the last few years and is the Science Department Head of the new Skyview Community School. His wife, Mary Palm, is a student at the Veterinary School at the University of Minnesota.

Grant Ness attended UMD in the late 80's and would like to contact biology students also attending during that time. He has been employed in Alaska as a commercial fisherman and in construction. Grant's address is P.O. Box 240454, Douglas, AK, 99824

Joseph Richter (MS '78) is the executive director of FARMS International, Inc, a Christian development agency working in Asia. The emphasis of the organization is on microeconomic loans and discipleship. A new program has recently been established in Albania, helping to release families from poverty.

snapshots of Biology faculty and former students were displayed. Another center of attraction was the faculty and staff departmental photo collection, dating back to the early 1950's. An informal reception in the conference room brought a number of alumni, current faculty and professors emeritus together to renew acquaintances and talk about old times - the classes, the field trips and the people who contributed to the memories.

In the photo left, Margaret Paige Hibberd and Dr. Hollie Collins pose with Margaret's porcupine, still part of the department collection, which she prepared in 1966 as a requirement for the mammalogy class.

Gifts and Donations

_____ by Donald P. Christian

Our records show that the following alumni and friends made a donation to the Biology Gift Account or the Jack Hargis Lecture Fund during 1996. We deeply appreciate their generosity and thoughtfulness. Their gifts have helped us fulfill our educational mission.

- Sheila Arimond, Hibbing, MN
- David Bearman, Memphis, TN
- Thomas Becker, Clive IA
- Edward Betsu, Madison, WI
- Margaret Dooley, Turtle, OK
- Thomas Douville, Louisville, CO
- Mary Ebert, Cincinnati, OH
- Paul and Helen Hanten, Duluth, MN
- Anne Hershey, Duluth, MN
- Phyllis and Lawrence Jensen, Hermantown, MN
- Edward Lance, Rochester, MN
- Joseph Mayasich, loquet, MN
- Stephen Stroup, Altamonte Springs, FL
- 3M Foundation (matching contribution)
- Lloyd Turinen, Eau Claire, WI
- Scott Wolff, Duluth, MN

the life scientist-'97

an annual newsletter for alumni, faculty,
staff, students, and friends of the
UMD Biology Department

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Alumni Update

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UMD degree _____
(MS,BS,BAS,BA)

What's new? (promotions, special recognitions, change of job, civic
involvement, family, research, travel, etc.)
