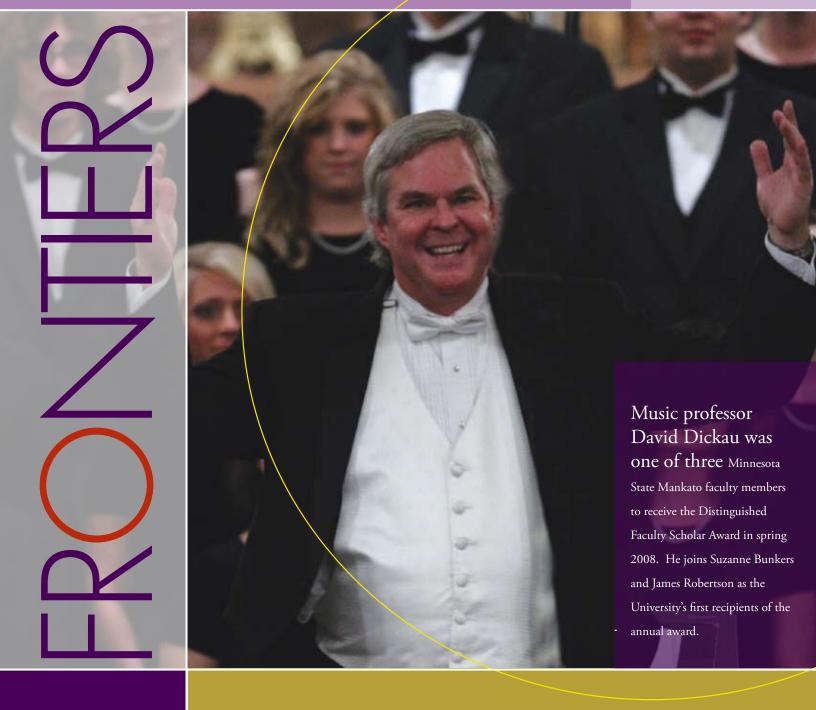




DISCOVERY | CREATIVITY and INNOVATION on CAMPUS



Art professor Matthew Willemsen explores issues related to branding. His current body of work considers how brand characteristics create notions of value for products, services, and even individuals. The detail is from a series of prints entitled " Multiple Impulses".

College of Graduate Studies and Research Dr. Anne Blackhurst Dean of Graduate Studies and Research

Graduate Studies Chris Mickle Director of Graduate Programs

Research and Sponsored Programs (RASP) Michelle Carter Interim Director

Center for Excellence in Scholarship and Research (CESR)

Dr. Steve Bohnenblust Director

McNair Achievement Program (MAP) Laura Bartolo Interim Director

Undergraduate Research Conference (URC) Dr. Trent Vorlicek Dr. Gina Wenger Co-Chairs

Institutional Review Board (IRB) Dr. Trish Hargrove IRB Coordinator

Dr. Mary Hadley Dr. Annelies Hagemeister Co-Chairs

FRONTIERS

Designer Kristin Higginbotham

Photographer Bridget Fowler Quality 1-hr. Foto

Writer Kelcey Woods-Nord David Chapman

Print Coordinator Doug Fenske

The mission of FRONTIERS is to celebrate the scholarly and creative accomplishments of Minnesota State Mankato faculty and students and inform the campus community of research-related opportunities. FRONTIERS is published three times per year by the College of Graduate Studies and Research and distributed to Minnesota State Mankato faculty, staff, and graduate students. The College of Graduate Studies and Research welcomes ideas for feature stories and other content consistent with the mission of the newsletter. Please e-mail story ideas to cesr@mnsu.edu.

GOT PHOTOS?

Minnesota State

UNIVERSITY

 Θ

Faculty who have high-quality digital photographs of recent research or creative projects are the College of Graduate Studies and Research for inclusion in upcoming issues of FRONTIERS or TOMORROW. Photographs should be at least 200 dpi and should be accompanied by a brief caption describing the project and the photo. E-mail photographs (in jpg or tif format) to anne.blackhurst@mnsu.edu.

GRADUATE STUDIES & RESEARCH



THE SECRET LIVES OF PLANTS Two faculty members in the College of Education conduct

research that will inform teacher preparation programs and improve educational outcomes for Minnesota's increasingly diverse student population.

A CELEBRATION OF SCHOLARSHIP

In their combined 70 years at Minnesota State Mankato, the first three recipients of the Distinguished Faculty Scholar Award have made lasting contributions to the fields of literature, music, and criminal justice.

FRONTIERS



A COMMITMENT TO QUALITY

With the support of grant and contract funding, students and staff in the Water Resource Center are dedicated to improving water quality in the Minnesota River Basin.

UN-DEBATABLE AMBITION

When Zeke Sorenson begins his master's program in communication studies at Kansas State University, he'll be well on his way to realizing his ambition of becoming a collegiate debate coach. Sorenson credits the McNair Achievement Program and his mentor, James Dimock, for helping him achieve his goals.

DEPARTMENTS

4 CESR 7 RASP 10 GSR 13 URC 15 MAP 16 A THOUSAND WORDS



CELEBRATION OF SCHOLARSHIP

In spring 2008, the Center for Excellence in Scholarship and Research recognized professors Suzanne Bunkers, David Dickau, and James Robertson as Minnesota State Mankato's first Distinguished

Faculty Scholars. Combined, the three recipients have taught at Minnesota State Mankato for over 70 years—during which they have achieved national prominence for their scholarly and creative work.

Robertson, who teaches in the Department of Sociology and Corrections, came to Minnesota State Mankato in 1980 after working in a research center at the University of California, Berkeley, School of Law. "I came to this university with anything but a concrete research agenda," says Robertson. "Diverse work and educational experiences had honed my research skills but not my interests."

When Robertson arrived, the department asked him to teach a course on correctional law. Because prisoner rights had been unheard of until the late 1960s, it was a relatively new subject. Little research had been done and few publications were available at the time—which gave Robertson the perfect opportunity to make his mark. "I was lucky to get in at the ground level," he explains. "My career evolved as the field evolved, and there were a lot of opportunities to explore areas that other scholars hadn't yet."

Twenty-eight years later, after publishing more than fifty individually authored journal articles, Robertson is known as one of the leading figures in the field of correctional law. His articles are read regularly

continued on page 6



CENTER FOR EXCELLENCE IN SCHOLARSHIP and RESEARCH MINNESOTA STATE UNIVERSITY, MANKATO Professor of music David Dickau (far left-hand corner) conducts the 2007 Choral Invitational Concert at Saints Peter and Paul Catholic Church. As a leading choral composer, Dickau has been commissioned to write compositions enjoyed by audiences worldwide.



DAVID DICKAU, SUZANNE BUNKERS, AND JAMES ROBERTSON

A CELEBRATION OF SCHOLARSHIP continued from page 4

by law students and scholars and are also consulted frequently by both judges and lawyers. As a result of his work, drastic changes have been made in prisoner rights, especially with regard to prison rape. "Thanks in part to Dr. Robertson's work in drawing public attention to this horrible problem, action is being taken by the government to address it," states Dr. Michael B. Mushlin, a professor of law at Pace Law School.

While Robertson is busy providing prisoners a voice, Bunkers is working to create a platform for a different group of unknowns: female diary authors. Currently one of a few internationally known diaries scholars, Bunkers joined Minnesota State Mankato's English department in 1980 and immediately began creating new courses related to women's literature and life writing.

Bunkers was familiar with life writing—which consists of shorter pieces about a person's life and relationships—as she had been writing and publishing her own personal stories while in graduate school. "My own writing led to my interest in other women's diaries," explains Bunkers. "I wanted to be able to study women whose lives were unknown and forgotten."

Bunkers' initial research on unknown women's diaries eventually led to something much deeper. She began to care about the women and their stories, and she spent a significant amount of time researching their background information, the contexts of their diaries, and the ways in which the diaries came into the public domain. "I learned that it was impossible to stay detached and objective," says Bunkers.

Her detailed research on the lives of these women has led to eight published books, including scholarly editions of previously unpublished diaries and her own creative nonfiction, In Search of Susanna-a memoir based on Bunkers' own experiences and memories in combination with her research. "I found the research so captivating that I not only want to read about these women, but I want to write about them as well," she says. "That's the goal for me-to find value in these works and then communicate that value to others."

Dickau, a professor in the Department of Music and the third Distinguished Faculty Scholar, expresses a similar sentiment when speaking about his choral compositions. After an early career working with orchestras and choirs in large churches, Dickau joined the

Minnesota State Mankato faculty in 1991. One of his major goals after leaving the world of church music was to take recognized poetry and set the lyrics to music for choirs. "It was something that I really wanted to do...that I desired to do," says Dickau.

In doing so, Dickau has carved himself a niche in the musical world. He's been commissioned by local, state and national organizations, ranging from the Minnesota All-State Choir to the Charles A. Lindbergh Foundation. "I've been really fortunate to have had people ask me to write music for them," he says. "I didn't plan it as a career, but one of the greatest things about it is that it leads to a personal connection I would not have made otherwise."

For example, Dickau was commissioned by Timothy Sawyer, the Director of Choirs at Northwestern College, to write a piece to be performed by Sawyer's choir as a musical gift for the people of Dresden, Germany. The performance was in honor of the rebuilding of their church, where thousands of innocent refugees were killed when the church was bombed near the end of World War II. Both Dickau and his wife accompanied the choir to Dresden to hear the premier of the piece and were able to speak with several survivors of the bombing following the concert. "It was a humbling and moving experience to talk with these survivors and feel like I somehow had been honored to touch history." savs Dickau.

And that's only one example. Dickau's compositions are being used across the nation to express the thoughts and feelings of many. And although he enjoys the composing process, it is experiences like the one in Dresden that make his work worthwhile. "It really is a cathartic event," he says. "It's the power of the text and the music. It helps people communicate and express their innermost feelings-that's what it's all about."

It is clear that Robertson, Bunkers, and Dickau have distinguished themselves as outstanding scholars in their fields. While their distinguished careers have earned them national recognition and acclaim, they are grateful for the University's recognition of their accomplishments through the Distinguished Faculty Scholars Award. "I was happy and honored," says Robertson, "but also very humbled because I was in such good company."

RASP RESEARCH and SPONSORED PROGRAMS MINNESOTA STATE UNIVERSITY, MANKATO



A COMMITMENT TO QUALITY

Dr. Shannon Fisher is a busy man. As the Director of the Water Resources Center (WRC), he is responsible for the overall operation of the center, which provides research and data collection, outreach and consultation, technical assistance, and training related to the management of water resources. In addition, he is an assistant professor of biology and serves as the Executive Director for the Minnesota River Board—a board comprised of representatives from most of the 37 Southern Minnesota

MSU graduate student Matt Ribikawski (center) records data as Bill Lamoreux (right) and Carey Christensen check water clarity on Crystal Lake recently. MSU is conducting a study of excess nutrients for state pollution officials. Photo courtesy of Scott Kudelka

continued on page 8



A COMMITMENT TO QUALITY continued from page 7

counties within the Minnesota River Basin who work to improve and protect the water quality within the Minnesota River Basin. With so many roles to fill, it's hard to imagine Fisher having time to secure the grants and contracts necessary for the WRC to operate, but with the help of his team he manages to do so. In fact, during the 2008 academic year, Fisher secured 11 contracts and 3 grants totaling \$852,787 and earning him the *Excellence in Grants and Contracts* award from the Office of Research and Sponsored Programs.

Despite his obvious success, Fisher is quick to admit he couldn't do it alone. The WRC, located in Trafton Science Center, employs 8 full-time staff, 4 graduate students, and up to 20 undergraduate students annually. Fisher gives ample credit to his team for the center's accomplishments. "I might be the director, but the WRC wouldn't survive without the staff and students we have," he says. "They are exceptional and the reason that we have been so successful."

Clearly, the relationship is mutually beneficial. As the center takes on more projects, resulting in more revenue, a certain percentage of that revenue is allocated for student employment. Kimberly Musser, the Assistant Director of the WRC, explains that the center was originally envisioned as a place where students and staff could get involved in water quality projects across the region and actively take part in applied research. "We help students get hands-on experience working on real-world projects, explains Musser."

James Fett, a senior double major in the Ecology and Environmental Sciences programs, has been working for the WRC for almost two years and has benefitted in multiple ways. Not only has he been able to get out into the field and take water samples himself, but he has also been trained in official protocol, has conducted and presented two independent research projects, and has made several connections with potential employers. "My experience at the WRC has certainly contributed to my success so far," he says, "and I have no doubt it will continue to do so in the future."

Preparing students for their future in the field is exactly what Fisher hopes the center will accomplish. "When I think about the WRC's role here on campus," says Fisher, "it really boils down to providing a bridge between academic and experiential education."

But that isn't all the center is about. Dealing with water quality—especially in the Minnesota River Basin, which is likely the most polluted waterway in the state—requires an excitement for the job. Water quality changes are hard to implement and the impact takes time to realize, so it's important for people working in the field to be not only patient, but passionate as well. And Fisher has just the people for the job. "It's not just our work, it's our life, says WRC Communications Coordinator Scott Kudelka. "It goes beyond just work—it's paddling the rivers, fishing the rivers, protecting the future of those waters for future generations."

RASP HONORS TOP GRANT AND CONTRACT RECIPIENTS

In April 2008, the Office of Research and Sponsored Programs (RASP) held its second annual recognition event in honor of grant and contract recipients during the preceding year. In addition to honoring all faculty and staff who received grant or contract support, RASP recognized the following outstanding achievements.



EXCELLENCE IN GRANTSMANSHIP AWARD: George Corey

George Corey has been an integral part of Upward Bound since he joined the program as an assistant director in 1979. Since then, he has taken over as the Director of the program and ensured that the program continues to receive federal funding. He was awarded the Excellence in Grantsmanship Award after procuring \$440,907.00 in grant support from the

Department of Education.

One of the TRIO programs, Upward Bound is designed to motivate lowincome, potential first-generation college students to graduate from high school and pursue a post-secondary degree. Upward Bound staff work with students throughout the school year, as well as during the summer, to provide them instruction and tutoring that will help them succeed both presently and in the future. ""We not only want to make them aware of opportunities, but we want them to take advantage of them on their own and continue their self-improvement," explains Corey. Dr. Bruce Jones, professor of automotive engineering technology, along with professors Gary Mead and Dr. Vince Winstead, secured five contracts totaling \$696,604.00 through the Minnesota Center for Automotive Research. The contracts support hands-on research projects for undergraduate and graduate students and are a result of the Center's partnerships with several government agencies, national corporations, and state research organizations.

Bruce Jones

Although the Center was initially supported through competitive grants, the high-quality work done by students in the past, as well as their professional work ethic and the publication of several research papers, has created a demand for the Center's services. "We now have several organizations that contact us for our services directly," says Jones. As a result, RASP awarded Jones the 2008 Excellence in Contracting Award.





EXCELLENCE IN CONTRACTING AWARD:



NEW FACULTY INITIATIVE AWARD: Mary Regan

Dr Mary Pa

Dr. Mary Regan, who joined the School of Nursing last fall, was awarded the New Faculty Initiative Award as a result of her efforts to secure external funding to further her extensive research agenda.

"Mary came in and hit the ground running," says interim RASP Director Michelle Carter. "She displays the tenacity of a new faculty member who fully takes advantage of the services offered by RASP and the university."

Regan's research program, which began as a part of her dissertation in 2004, focuses on how nurses' conceptions of the risks inherent in childbirth increase their use of technologies known to increase the utilization of caesarean sections.

EXCELLENCE IN GRANTS AND CONTRACTS:

Shannon Fisher (See article, page 7).

GSR MINNESOTA STATE UNIVERSITY MANKA

Students collect soil from local wetlands, which they will analyze for evidence that allelochemicals released by invasive plant species may have altered the soil's microbial community—thereby creating a hostile environment for other plants.



THE SECRET LIVES OF PLANTS

We tend to think of plants as passive organisms: their seeds rely on wind and animals for dispersal, and they can't relocate if local conditions change. The immobile nature and quiet beauty of plants trick the human brain into characterizing them as peaceful denizens of nature: the strong, protective oak tree; the delicate, alluring orchid.

While these iconic depictions help us identify with the natural world, they simultaneously hinder us from thinking about the competitive struggle within the plant kingdom. When we do think about this struggle, we tend to think about plants outcompeting each other for limited resources-if one plant grows faster and blocks light from reaching other plants, it gains a competitive advantage. For many, this is not terribly exciting stuff-especially compared to a pride of lions chasing down a baby gazelle-and it goes a long way toward explaining the absence of a Plant Planet cable channel.

But there is more to the world of plant competition than most of us realize. It turns out that some plants actively fight their neighbors with an arsenal of chemical weapons. Under normal circumstances, this chemical warfare results in a stalemate of sorts-some plants attack,

others defend, and borders are drawn. But when the attacking plant is an invasive species, you've got a potentially serious problem on your hands. "Exotic species may be bringing 'novel weapons' from their native ranges here to North America that our native wetland plants are not adapted to and have no defense against," says Dr. Bradley Cook, assistant professor of biology at Minnesota State Mankato.

Some of these "weapons" in question are known to plant biologists as allelochemicals, and they represent an exciting area of research that may force us to rethink what we know about plants and how they behave.. Cook and his student researchers have been studying competitive strategies in non-native wetland plants for four years, and their work has led to new insights into the invasive success of these species.

Imagine a typical Minnesota wetland ringed with elegant, swaying cattails. This picture is a symbol of ecosystem health, right? Unfortunately, in real life, the cattail you're most likely to see is a non-native invasive species, Typha angustifolia. And why this species

By David Chapman

Assistant professor of biology Brad Cook (third from left, *in red cap) involves students in his research on invasive* plant species, such as the narrow-leaf cattail.

is outcompeting native wetland plants may hinge on its use of allelochemicals.

When Cook and graduate student Meghann Jarchow and undergraduate Indumini Weeramantri ran a controlled study examining competition between the invasive cattail and a native species of bulrush, they found that when they ameliorated the effects of the cattail's allelochemicals, the native bulrush was the better competitor. But when the cattail's allelochemicals were uninhibited, the invasive cattail was the clear winner—the native species had no natural defense against the apparent barrage of chemicals that the cattail released into the soil environment. "Allelopathic effects have been observed in other cattail species but not in Typha angustifolia," says Cook. "This has been one of the most surprising and interesting results from our research."

To help obtain these results, Cook runs a lab that emphasizes cooperation among his graduate and undergraduate researchers. "I

continued on page 12



THE SECRET LIVES OF PLANTS continued from page 11

try to instill an *esprit de corps* in the lab among undergrads and grads alike to share what they are doing and to help each other with their research," says Cook. "When one of us harvests an experiment, we coordinate a time when we all can work together to get it done quickly."

This sense of common purpose has helped Cook's team produce new understanding about the secret lives of invasive plants. In addition to the cattail studies, other research in the lab, in collaboration with Dr. Tim Secott, a microbiologist, and the focus of graduate student Sean Wheelock, has discovered some evidence of an unusual mechanism used by the invasive reed canary grass. Unlike other competitive mechanisms that act directly on a plant's nearest neighbors, reed canary grass's chemicals appear to act instead on the microbial community in the soil. By changing the microbial community, the chemicals make the soil an inhospitable environment for other plant species. To put it bluntly, says Cook, "this is weird."

Of course, plants at war is a metaphor just as flawed as passive and peaceful plants. War and peace require will and conscious action,

and plants lack the centralized nervous system required for both. In some respects, this makes their interactions even more impressive. On a cellular level, they are hardwired to accept and respond to physical and biological cues from their environments. And though we aren't accustomed to thinking about plants as being quick on their feet, Cook's studies indicate that Typha angustifolia regulates its chemical mix. "This species appears to produce different amounts and types of allelochemicals, depending on what plants are its neighbors," says Cook. "Hence, it somehow 'senses' what's around it."

Cook believes that developing an understanding of these competitive strategies will eventually aid resource managers in the fight against invasive species. "We have a tendency to try to eliminate unwanted plants via the use of chemical herbicides without knowing or understanding what makes them thrive," he says. "Without knowing or understanding the mechanism for their success, our management of these species can be ineffective, inefficient, or even facilitate their invasion."

And there's good reason to fight the invasion. Although plant ranges have been expanding and contracting throughout time, the current spread of invasive species is occurring at an unprecedented rate. The rise of human movement on a global scale is directly responsible for this wave of plant dispersal, and the pace is too fast for native plants to adapt.

Consequently, these plant dispersals are major contributors to the degradation of native biodiversity, which is a good indicator of overall ecosystem health. "Biological diversity is important, not simply because we may discover a new 'wonder drug' produced by some rare plant in a remote jungle somewhere, but because plant diversity plays an important role in the resiliency or stability of an ecosystem to provide food and habitat for other organisms-including humans," says Cook.

The current wave of human-caused plant dispersals is more than just an academic concern. In fact, according to a report by the Nature Conservancy, about 40% of the plants and animals on the federal threatened and endangered species list are on that list primarily because of competition with invasive species.

For his part, Cook hopes to continue to identify the mechanisms that allow some non-native species to become invasive. "My hope is that our research will make management or control of these species more effective and efficient."

With 5,000 alien plant species established in U.S. ecosystems, there's a lot of work to do.

Zeke Sorenson's passion for speech and debate is evident the

moment you speak with him. His voice is dynamic as he explains how the sport has helped shape him into the person he is today. "Being active in speech and debate has helped me in so many areas of my life," he explains. "It's developed my critical thinking skills, impacted my educational decisions, and played a huge role in my daily life." Originally from Washington, Sorenson attended a community college in Cheyenne, Wyoming for two years and competed on the school's forensics team. His coaches in Cheyenne had connections to the forensics team at Minnesota State Mankato. After meeting and interacting with the team at the national tournament, Sorenson decided to transfer to Minnesota State Mankato to earn a four-year degree in Speech Communication, compete on the forensics team, and focus on his aspirations of attending graduate school and becoming a collegiate forensics coach.

Once on campus, Sorenson discovered an opportunity that would set him well on his way to realizing his dreams-the McNair Achievement Program. "My coaches knew I was interested in continuing my education and they knew I qualified for the program, so they encouraged me to apply," explains Sorenson. Because he already had a clear-cut vision for his future, the McNair program simply provided Sorenson with the resources he needed to reach his goals. "Zeke was one of those students who came in with a lot of direction," says McNair Interim Director Laura Bartolo. "He could articulate where he wanted to go and what he wanted to do. All we had to do was partner

with him to get him there."

un-debatable ambition

One component of that partnering

role is providing scholars with faculty mentors. Sorenson chose to work with James Dimock, assistant coach of the speech team and instructor of speech communication. Dimock already knew Sorenson from class and was impressed with his work ethic, critical thinking skills, and commitment to education. However, he also knew that if Sorenson wanted to move on to a graduate program, he would need a better understanding of the unspoken rules and norms that often exist in academia. "It's very difficult to succeed if you are unaware of or don't understand these hidden expectations," says Dimock. "I think that one of the purposes of McNair mentors is to help scholars navigate the unknown, which hopefully creates more options for them in the end."

Sorenson took full advantage of his mentorship with Dimock, as well as the McNair program itself. He completed an independent research project, presented his findings at multiple conferences, and visited several graduate schools—and, consequently, received competitive offers from multiple programs. "Zeke did everything we asked him to and more," says Bartolo. "As a result, he was in the position of picking between two really attractive graduate packages."

Sorenson has decided to attend Kansas State University (KSU) in the fall where he will pursue a Master of Arts in Communication Studies and be a graduate assistant coach for the forensics team. At KSU, he'll rely on his dedication, enthusiasm, and hard work to move one step closer to his ultimate goal of coaching collegiate forensics. "Zeke is one of the finest students to come through our program," says Bartolo. "He is very deserving of the things he is going to achieve and the things he's going to experience. He did it all himself."

MAP MCNAIR ACHIEVEMENT PROGRAM MINNESOTA STATE UNIVERSITY MANKATC

McNair Scholar and June 2008 graduate Zeke Sorenson (left) was mentored by James Dimock, assistant coach of the speech team and instructor of speech communication. Sorenson is attending Kansas State University, where he is pursuing a Master of Arts in Communication Studies and serving as a graduate assistant coach for the forensics team.





Brian Welch presents Instrumentation to Monitor Bridge Foundation on the Crosstown Project. Welch was mentored by assistant professor of mechanical and civil engineering Aaron Budge.

Since 1999, the Undergraduate Research Conference (URC) has showcased some of the best faculty-student collaborations on campus and provided a venue for celebrating the investigative and creative accomplishments of Minnesota State Mankato undergraduates. The tenth annual conference was no exception. A record number of students participated in the conference, which also featured a record number of poster sessions, oral presentations, exhibitions, and performances.

A PERFECT 10

Cassie Neiman presents her poster session, Coding of Emotions and Logic when Making Decisions, at the 10th annual Undergraduate Research Conference. Neiman's project, which was conducted under the mentorship of assistant professor of psychology Emily *Stark, was one of 65 poster* sessions.

Brendon Watts presents Spectral Properties of a Class of Bipartite Graphs at the 10th annual URC. Watts was mentored by assistant professor of mathematics and statistics In-Jae Kim.

0

 B^T



Miwako Fujikata presents her poster session, Priming the Bicultural Mind, to Dean of the College of Social and Behavioral Sciences John Alessio. Fujikata, who was mentored by associate professor of psychology Vinai Norasakkunkit, was a URC small grant recipient.

URC UNDERGRADUATE RESEARCH CONFERENCE Minnesota State University, Mankato



College of Graduate Studies & Research Minnesota State University, Mankato 115 Alumni Foundation Center Mankato, MN 56001

A Thousand Words

A table lies in wait for guests of honor at the 2008 URC luncheon, the culminating event of the two-day conference. In addition to honoring top student presentations, the luncheon featured a keynote address by Assistant Vice President of Academic Affairs Brenda Flannery.

