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## RESTORATION AND CONSERVATION

Friday, April 23

Room 250 – Olin Rice Hall

### 1:15 WELCOME AND INTRODUCTORY REMARKS

### 1:30 THE EFFECTS OF RECREATIONAL TRAMPLING ON THE FLORA OF SHOVEL POINT

Michael A. Farris and Matthew Doane Department of Biology, Hamline University, St. Paul, MN 55104

Shovel Point is located approximately 80 km northeast of Duluth on the North Shore of Lake Superior and is visited by over 200,000 people each year. We examined the effects of trampling caused by humans on vegetation patterns. We established 23 transects perpendicular to the southern cliff edge and spaced 10 m apart. Herbaceous vegetation was sampled every three meters along the 30 meter transects, while trees were sampled in 10x10 m plots. Blueberry, mosses, and lichens were the most common taxa, followed by three-toothed cinquefoil and false lily-of-the-valley. These species generally showed a bimodal distribution, either being very common or very rare within a particular plot. Species such as rose, starflower, and big-leaf aster were restricted to the cooler northern half of the study area. Bare soil, gravel, and bare rock were indicators of heavy trampling. Taxa such as cinquefoil and grasses were more common in these areas, suggesting a higher tolerance of disturbance or an inability to colonize the more undisturbed areas. White spruce make up over 66% of the adult conifer community, but less than 10% of the seedling community. White spruce adults are equally abundant on the cliff edge and in the forest interior; seedlings are most rare at the cliff edge. Balsam fir seedlings, saplings, and adults all increase in frequency from the cliff edge to interior. Trampling is having the greatest effect on the southern cliff edge, and various strategies are available to reduce adult tree and soil loss in this zone.

### 1:50 NATURAL HABITAT RESTORATION AND ENVIRONMENTAL STUDIES AT ST. OLAF COLLEGE

Kathleen L. Shea Department of Biology, St. Olaf College, Northfield, MN 55057

Habitat restoration ecology and local conservation projects have provided a variety of experiential learning opportunities for St. Olaf students. Based on plans developed mainly by Biology faculty and students nearly 120 acres of agricultural land adjacent to campus have been restored to forest, prairie, and wetland habitats since 1988. The 56 acres of forest were planted with local native hardwoods found in maple-basswood and oak forests. A northern Minnesota coniferous habitat was established for educational purposes. Five species of native tall grasses were used for the prairie plantings. Many of the wildflowers were collected locally, grown in the greenhouse and transplanted to prairie sites. The five wetlands, totaling 13 acres of surface water, were constructed as part of a U.S. Fish and Wildlife Service program on previously drained wetland sites. Up to 400 waterfowl have been observed on the largest wetland during spring migration. An additional 44 acres have been converted from conventional to a more sustainable agricultural system. The restoration areas have been the subject of student research on topics such as tree growth and survival, waterfowl migrations, and control of reed canary grass. The natural areas have become an integral

part of campus life and are used for field trips, environmental education and recreation. Additional local conservation topics, such as developing a trail system linking Fairbault and Northfield and assembling information on natural history at the county and local level, have been studied as part of the Environmental Studies senior seminars.

### 2:10 STUDY OF WILD-RICE FLORETS: IMPORTANCE FOR CONSERVATION

Qin Qin Liu, Department of Biology, University of Minnesota, Duluth, 10 University Drive, Duluth, MN 558 12

Conserving wild rice is very important for aquatic ecosystems in Minnesota and for new crop development. Understanding the reproductive process in wild rice is essential for conservation efforts to preserve this important natural resource. The dynamic sex expression and sex determination in wild rice florets were studied by myself and several of my students. This information will aid in conserving the diversity of this aquatic species.

### 2:30 RECONSTRUCTING THE HISTORIC ECOSYSTEMS OF SWEDE HOLLOW

Virginia Card, Natural Sciences Department, College of Arts and Sciences, Metropolitan State University, 700 East Seventh Street, St. Paul, MN 55106.

Swede Hollow is a small deep valley between Dayton's Bluff and downtown St. Paul, about ten hectares in size and fifteen to thirty meters below street level. As part of the Lower Phalen Creek Restoration Plan, the stated goals for Swede Hollow include the reconstruction of its 'historic ecosystems.' While this term is open to multiple interpretations, one component is certainly the pre-settlement plant communities. The modern history of Swede Hollow can be divided into 3 periods: pre-settlement (pre-1840s), settled (1840s to 1950s), and recent (1950s to present). It was the goal of this project to find out what the vegetation of Swede Hollow was before human settlement in the mid-1800's, and this goal was incorporated into the new Ecology class of Metropolitan State University in the spring of 1999. Students in the class collected data on the current composition and distribution of woody plants in Swede Hollow, analyzed size-class distributions of several mixed species groves, examined historical records and photographs, and visited analogous sites in nearby Mounds View and Battle Creek Parks. Paleocological analysis of pond sediments was not possible because the ponds are less than 40 years old. Results suggest that the area supported oak savanna on the upper-most slopes, mesic oak forest on middle to lower slopes, and floodplain forest on the valley floor. Dry cliff vegetation may have existed on the patches of exposed sandstone and limestone. Former house sites were identifiable by the presence of ornamental exotics such as catalpa and flowering dogwood.

### 2:50 BREAK

### 3:10 EAGANBACH

### 3:30 CONSERVATION OF FRESHWATER MUSSELS IN THE ST. CROIX RIVER

Daniel J. Hornbach, Department of Biology, Macalester College, 1600 Grand Avenue, St. Paul, MN 55105

The St. Croix River was designated a Wild and Scenic River by the Federal government in 1968. It received this designation because of its relative pristine condition, including an extremely high level of water quality and resultant biodiversity. The Nature Conservancy recently included the St.

Croix as among the watersheds in the United States that are critical for the conservation of fish and mussel species. There are 40 mussel species in the St. Croix River, including two on the federally endangered species list. These species represent a majority of the mussel fauna found in the Upper Mississippi River drainage. With the recent invasion of zebra mussels into the Mississippi River, and their devastating impact on native mussels, the St. Croix has been considered a refuge for many of the Upper Mississippi Species. I will describe a number of research efforts that have been conducted with Macalester College students to assist resource managers in developing management strategies for mussels. These research efforts have included long-term monitoring programs, examination of the habitat requirements for many mussel species (especially endangered species), examination of relocation as a strategy to move mussels from harms way, the impact of point-source dischargers on mussel communities, the impacts of zebra mussels on native mussel physiology and molecular genetics studies aimed at understanding the life-cycle of mussels. Much of this work has been incorporated into endangered species recovery plans developed for the US Fish and Wildlife Service and is used by the National Park Service in managing the St. Croix River.

**3:50 INVASIVE SPECIES CONTROL AT THE KATHARINE ORDWAY NATURAL HISTORY STUDY AREA**

*Elizabeth Machado Svenson, Department of Biology, Macalester College, 1600 Grand Avenue, Saint Paul, MN 55105*

The Katharine Ordway Natural History Study Area (KONHSA) was purchased by Macalester College in 1969 through funds donated by Katharine Ordway. The KONHSA was conceived as an outdoor laboratory for students and our programs remain true to this mission. The site was chosen for its varied habitats, including wetlands, oak savanna, flood plain forest and high quality remnant prairie. Minnesota's County Biological Survey has identified here the state-endangered sand-gravel prairie habitat, Tubercled rein orchid (*Platanthera flava*) and Tall nut-rush (*Scleria triglomerata*). Early KONHSA management did not recognize the importance of invasive and successional species control for preserving prairie remnants. By 1980, a Sumac (*Rhus spp.*) forest covered much of our grassland. Although successfully controlled by 1984, Sumac trees are still found throughout the prairie. The Eurasian Buckthorn (*Rhamnus cathartica*) and Honeysuckle (*Lonicera sp.*) are also now present at KONHSA, although not yet in great numbers. Our control strategy for these woody species includes regular controlled burning and repeated tree removal. Recently, our invasive species control program has focused on a 1-acre wetland and 26 prairie patches dominated by Reed Canary Grass (*Phalaris arundinacea*), an aggressive alien. Our *Phalaris* control efforts include repeated burning, mowing and herbicide application. Ultimately, we aim to restore *Phalaris* patches with a vigorous, diverse collection of native plants. Since September 1998, we have collected 20 pounds of fall-flowering native seed representing 46 species and propagated about 10,000 seedlings representing 36 species. We anticipate planting these seeds and seedlings in targeted restoration patches during spring 2000.

**4:10 IMPACT OF OAK SAVANNA RESTORATION ON THE BREEDING BIRD COMMUNITY**

*Mark A. Davis, Department of Biology, Macalester College, 1600 Grand Avenue, St. Paul, MN 55105*

Fire was reintroduced into the oak woodlands of Cedar Creek Natural History Area, Bethel, MN, thirty five years ago in order to restore the native oak savanna environment. Although several studies have investigated the impact of prescribed burning on

the vegetation, few studies have examined fire's effects on the animal communities in these environments. In summer 1995 and 1996, ten Macalester students worked with me to study the impact on the breeding bird community of reintroducing fire into the oak woodlands. Breeding birds were censused in seven different burn units (8-18 ha in size) that had experienced different frequencies of controlled burns since 1964 (0-26 burns). Birds were detected by sight and on the basis of their courtship calls. The results showed that as savanna restoration proceeds, there is a general decline in predominantly insectivorous species, particularly those that feed in the upper canopy region, and a general increase in omnivorous species, particularly those that feed on the ground and in the lower canopy. Woodpecker abundance also increased during restoration. The shifts in the species and feeding guilds were correlated with changes in burn frequency and several measures of vegetation structure. The results indicated that a gradual restoration process using fire would likely promote greater bird diversity through the creation of a more diverse vegetation structure than a more rapid process involving physical removal of trees and shrubs from the site.

**BUSINESS AND ECONOMICS**

*Saturday, April 24*

*Room 241 – Olin Rice Hall*

**8:00 A NEW CONCEPT: INTERNAL AUDIT AND MANAGEMENT CONSULTING**

*Stuart M. Stoller, Business Administration Department, Augsburg College, CB 315, 2211 Riverside Avenue, Minneapolis, MN 55454*

The purpose of my new course, "Internal Audit and Management Consulting," is twofold: first, to introduce the material to the students and, second, to develop within them the skills to progress into a business professional.

Historically within a four-year accounting program, students have been trained in accounting, economics, and various classes of business administration, which represent accounting's technical core. Now a new focus in accounting education prepares future accountants with all the skills necessary to be successful in today's business environment.

I suggest that the traditional core leaves students under-prepared. Integral with an accountant's technical training should be the ability to write and speak effectively, learn problem solving techniques within an unstructured environment, develop a sense of creativity and imagination, and have a good understanding of the interpersonal skills needed to be an effective conduit of information. This can be accomplished by introducing more of these skills within already existing core classes and by participation in a course where these skills are of primary purpose. In this proposed course, students:

1. apply classroom skills to an existing enterprise.
2. are exposed to problem solving in an unstructured environment.
3. develop highly interpersonal skills.
4. evolve a sense of teamwork and ability to interrelate their business discipline.

Today, graduates must hit the ground in their new jobs at a full spring. In days of doing more with less, students must have more skills that cost businesses less.

### 8:20 GREENING MINNESOTA BUSINESSES: CASE STUDIES OF MOTIVATIONS

*Jamie Partridge, Assistant Professor of Management, St. John's University/College of St. Benedict, 37 S. College Avenue, St. Joseph, MN 56374*

*Ernie Diedrich, Professor of Economics, St. John's University/College of St. Benedict, 244 Engel Hall, Collegetown, MN 56321-2000*

The authors assert that businesses are increasingly becoming more environmentally sound by a) establishing operations that provide valuable environmental services (e.g., composting, waste reduction), as well as b) transforming existing operations to become more environmentally friendly. The authors have selected particular companies in Minnesota to include in this study that have consciously become "greener." The long-term result of this study will be to generate a set of case studies that could be used by anyone interested in the "greening of business."

We hypothesize that environmentally conscious businesses fall into two distinct categories:

**Self-Interest/Self-Preservation:** These companies need to comply with state and federal regulations and thus are required to cut back on the amount they pollute. Many of these companies also recycle, reduce, and reuse because it is cost effective to do so. Finally, these companies may also use their "environmentalism" as a public relations and marketing tool.

**Altruism/Environmental Ethic:** These companies want to promote the reduction of feedstock, the reuse of materials, and recycling because they "feel" that this is the right thing to do. One could also argue that these companies also benefit from good public relations and utilize their "environmentalism" as a marketing tool.

It is the authors' expectations that most "greener" businesses are greening in order to be more profitable. The authors examine companies for instances where they meet or exceed environmental regulations and then draw conclusions about the companies that fall into the two categories of self-interest/self preservation and altruism/environmental ethic.

### 8:40 ABUSIVE SUPERVISION AND SUBORDINATES' COPING STRATEGIES

*Robert J. Nelson, Department of Management, College of Saint Benedict, 37 South College Avenue, St. Joseph, MN 56374*

Organizational members face many sources of stress. This study examined a particular source of stress that some subordinates must deal with: working for an abusive supervisor. Drawing upon a theory of stress and coping that has been developed primarily by researchers in social psychology, this study tested the goodness of fit hypothesis, which suggests that individuals select coping strategies based on perceived assessments about the degree to which they can control or influence the source of their stress. Using a self-selected sample of subordinates who believe they work for an abusive supervisor, respondents self-reported their supervisor's abusive behaviors and their own coping behaviors with an eight page written survey that they filled out and returned. I then used a follow-up telephone interview to administer a survey designed to measure nine dimensions of psychological distress. Results did not support the goodness of fit hypothesis. Exploration of the reasons for this lack of support identified a finding of particular interest: respondents exhibited elevated levels of psychological distress significantly ( $p < .001$ ) higher than one would expect to find in a normal

random sample of the adult population. I speculate about the source of these elevated distress levels.

### 9:00 THE ROLE OF BILATERAL CONTRACTS IN A COMPETITIVE BULK POWER MARKET

*Glenn S. Barnette, Gustavus Adolphus College, 800 West College Avenue, Saint Peter, Minnesota 56082-1498*

In 1996, the Federal Energy Regulatory Commission (FERC) required electric utilities to establish competitive wholesale markets under the control of Independent System Operators (ISO's). These entities, which have no financial interest in the electricity industry, organize markets for electricity and manage the hourly dispatch on the grid.

Theoretically, the market clearing price and order of dispatch could be determined by either (1) a daily bid process (or spot market) or (2) a system of bilateral contracts. Most of the economic literature treats generation as a single commodity and argues that the spot market should determine the order of dispatch and compensation to the generators. Neither economic theory nor the experience in Great Britain demonstrates that the spot market alone can guarantee sufficient investment to retain system reliability.

In a more realistic model, power plants provide two services: capacity and energy. Furthermore, the plant operators can choose from a range of feasible technologies so that plants with lower fixed costs have higher variable costs and vice versa. To guarantee sufficient capacity, the ISO establishes a market for capacity as well as energy and requires distributors to secure minimum capacity contracts as a condition for accessing its grid. If separate bidding processes determine prices for capacity and energy, the low fixed cost technology will dominate the capacity market. Since these plants are less efficient for base load than high fixed cost capacity, both the generators and wholesale customers could enjoy a gain by negotiating bilateral contracts for intermediate and base load capacity.

### 9:20 AN INTERACTIVE SYSTEM FOR PERFORMANCE AUDITING: A QUANTITATIVE TECHNIQUE

*Stephen L. Woebler and John E. Powell, College of Business, Minnesota State University, Mankato, P.O. Box 8400, Mankato, MN 56002-8400*  
*School of Business, University of South Dakota, 414 East Clark, Vermillion, SD 57069*

Current G.A.O. Auditing Guidelines for Government Organizations require the auditor to conduct a performance audit. The performance audit format includes a review of resource allocation efficiency. At present there are no other objective techniques available for conducting this phase of the performance audit.

The recently developed goal programming technique can produce the optimal resource allocation scheme for a particular entity being examined. The inclusion of goal programming in a performance auditing system can greatly enhance the auditor's ability to evaluate resource allocations. The technique instills a degree of objectivity in evaluations, provides evidence to support conclusions, and offers a method to improve future resource allocations. Program directors can subsequently employ goal programming to plan future resource allocations.

To test the applicability of goal programming to an existing performance auditing system, a case study was conducted on a government program where performance auditing was in operation. An interactive system for performance auditing was developed to serve the user in planning and control.

**9:40 STATES AND MARKETS AND COMPUTERS: USING THE WEB TO LINK STUDENT RESEARCH**

*David W. Schodt and Bruce R. Dalgaard, Department of Economics, St. Olaf College, Northfield, MN 55057-1098*

This paper reports on a project developed in an interdisciplinary course entitled "Pathways to Progress: State versus Markets in Asia and Latin America" taught by the authors during academic year 1998-99.

The course focused on economic institutions, in general, and markets and national governments, in particular, and the ways these economic agents influence the well-being of individuals within society. The course introduced two major theoretical approaches to the ways in which individual and societal well-being are influenced. One approach suggests that the national government can serve as the catalyst for economic development and economic change; the other approach outlines free functioning markets as the mechanisms by which economies develop and prosper.

These theoretical constructs were but the background since the major purpose of the course was to compare and contrast the specific economic development approaches of economies in Asia and in Latin America. Included in the discussion were questions such as: How are decisions made in an economy? How can we assess individual and societal well-being? What is the appropriate balance between state and market for successful economic performance? What explains the different paths taken by countries?

Students in the course were divided into two groups. One examining countries in Latin America; the other countries in Asia. Every student researched and wrote a paper on a country in one of the two regions. Each paper documented the country's performance over the period 1975-1997 and provided some preliminary explanations for the observed performance. These papers were entered onto the course homepage for review by other students within each group.

Using the individual country studies on the homepage, each regional group wrote a single synthesis reporting the performance of the selected countries and offering an explanation that focused on the role of the state. These papers were also placed on the course homepage.

For these stages of the process students were encouraged to access web sites and download information then use this information for review and response to drafts as they appeared on the homepage.

Finally the entire class came together to write a paper that compared differences in the performance of countries in the two regions and sought to come to a conclusion about the degree to which performance could be explained by differences in policies pursued by governments in Asia and Latin America. This final class paper was circulated via web sites to students and faculty at other institutions and feedback was encouraged.

This paper will report the results of the process of compiling these country and cross region studies through the course web site as well as the conclusions on regional development strategies.

**10:00 COST BENEFIT ANALYSIS OF A HYPOTHETICAL REGULATION OF THE TOBACCO INDUSTRY**

*Erin Melican and Bruce R. Dalgaard\*, Department of Economics, St. Olaf College, Northfield, MN 55057-1098*

The purpose of this project is to discover the costs and benefits of a certain government action, namely the

prohibition of tobacco similar to the prohibition of alcohol attempted earlier this century. For purposes of making the costs and benefits easier to ascertain, this study assumes the federal government will enact the prohibition. The project then concentrates on two states, North Carolina and Minnesota, and investigates the possible costs and benefits resulting from tobacco prohibition.

Minnesota and North Carolina were chosen for specific reasons. Minnesota was chosen because it is a state that neither grows tobacco nor has tobacco processing facilities; thus few people actually rely on tobacco for their livelihoods. North Carolina was chosen because many people do depend on tobacco for jobs; these jobs include growing and harvesting as well as processing, shipping, and marketing tobacco.

In this paper, costs and benefits are considered for both the public and private realm. Public costs include the loss of excise taxes, increased unemployment and its associated costs, and those costs associated with a rise in "black market" activities. Government benefits are fewer expenditures associated with fires, the elimination of tobacco subsidies, and a decrease in health care expenditures. The private costs are a loss of income for farmers who grow tobacco and employees involved in the production and sale of tobacco products. Private benefits are increased worker productivity and decreased private health care expenditures.

This paper presents the cost-benefit model used in the analysis and reports the results of the assessment.

The results that come from this model indicate that government action would be extraordinarily detrimental to North Carolina and actually beneficial to Minnesota. North Carolina would lose hundreds of millions of dollars annually if public and private costs and benefits are combined. Minnesota would receive net benefits of hundreds of thousands of dollars.

\*Erie Melican is a senior economics major. This paper is based on her senior thesis which Bruce Dalgaard supervised.

**10:20 BREAK**

**10:40 IMMIGRANT LABOR MARKETS - THE STARTING SALARIES OF FOREIGN-BORN AND US-BORN PH.D.s**

*Gabriel G. Manrique, Economics and Finance Department, Winona State University, Winona, MN 55987*

Changes to US immigration laws since 1965 have significantly affected US labor markets. In addition to allowing more non-European immigrants, the changes have also allowed more immigration based on skills and training. This has increased the number of foreign-born Ph.D.s working in the USA, many of whom first arrived as graduate students. These trends are clear in the National Science Foundation's (NSF) longitudinal data on scientists and engineers used for this study.

Among those who received their Ph.D. in 1970 and whose first job was teaching, only 15% were foreign-born. But among those who received their Ph.D. in 1990, 25% were foreign-born. The trend is more pronounced among those who first took a non-teaching job. Among 1970 Ph.D. recipients only 17% were foreign-born. By 1990, this had more than doubled to 38%.

Using NSF data, we tested for differences between starting salaries of US-born and foreign-born Ph.D.s. There are reasons to expect starting salary differentials. There may be discrimination in the labor market since most new immigrants belong to minority ethnic groups in the USA. Foreigners face

barriers to entry due to immigration laws. To comply with these laws, employers incur substantial additional costs which discourages employers from hiring aliens regardless of qualifications. Foreigners may be viewed as initially having lower marginal products because they are adjusting to new conditions. And foreigners may have less knowledge of job markets which may limit their initial job opportunities.

We sorted respondents by the year in which they received their Ph.D., academic field, type of employment, and nativity. We tested for differences in mean starting salaries. While we found some statistically significant differences between native and foreign-born Ph.D.s, the differences were neither pervasive across disciplines nor consistent over time. Where differences occurred, the mean starting salaries of natives tended to be higher than those of foreign-born Ph.D.s

Among the respondents whose first jobs after the Ph.D. were non-academic, differences appeared more frequently in chemistry, biology, engineering, and agricultural sciences. Among the faculty Ph.D.s, the mean salary differences were also statistically significant in these fields. However, in later years, the differences for faculty were no longer significant in chemistry, agricultural sciences and biology.

#### **11:00 SHOPPING PATTERNS OF WEST BROADWAY CONSUMERS**

*David P. Brennan, University of St. Thomas*

American cities are being hollowed out by suburban residential, economic, and retail development. West Broadway in the Near North area of Minneapolis typifies what has happened. This paper describes shopping patterns of consumers on West Broadway.

A total of 363 shoppers were interviewed on West Broadway during the summer of 1997. The survey was used to define the trade area and to profile shoppers, purchase behavior, purchase patterns, and new stores wanted.

West Broadway has a compact trade area. Median household income is relatively low with per capita income very low. Most people drive when shopping, but 27 percent walk and 12 percent take the bus. Weekly shoppers account for 98% of all shopping trips. Shoppers want a greater variety of stores, improved security, and better environment.

#### **11:20 LANGUAGE AS AN AGENT OF MARKETING PERFORMANCE**

*Richard Rexeisen, University of St. Thomas*

Language is a powerful agent of individual thought, concept development and resulting behavior. Language also impacts our ability to coordinate activities and to engage in meaningful exchange. While cross-cultural, multi-lingual translation faux pas are widely recognized, problems that occur due to words conveying multiple meaning within a given language has not received similar attention. The purpose of this paper is to highlight several important examples of where costly problems can and do occur as the result of divergent and sometimes contradictory meanings associated with words used in internal business communications. For example, the word *opportunity* is used to represent both an external environmental condition, essential to an effective SWOT analysis, and also is used to characterize a potential action that can be taken (e.g., an opportunity to develop a new product). If these two meanings are confused while conducting a SWOT analysis, an all too common mistake, the critical reasoning process is corrupted. The mistake is further compounded by the false confidence generated by the appearance of engaging in what is otherwise viewed to be a systematic planning

process. Furthermore, in those cases where common meaning is communicated, examples can be identified where significant marketing opportunities are missed due to a failure to understand the rich, contextual meaning associated with the underlying concept (a kind of marketing myopia). The manuscript then concludes by recommending various strategies for minimizing the problems identified in the paper.

#### **11:40 FACTORS INFLUENCING 8TH GRADE BASIC STANDARDS TEST SCORE DIFFERENTIALS AMONG MINNESOTA SCHOOL DISTRICTS**

*Donald M. Salyards, Winona State University, Department of Economics, Somsen Hall, Johnson & Sanborn Streets, Winona, MN 55987*

##### **Purpose of the Study**

In February of 1998 the Minnesota Department of Children, Families and Learning spearheaded Basic Standards Tests for all eighth graders in every Minnesota school district. For the first time in the history of Minnesota education an identical comprehensive test was administered to students in the state's 400 school districts. The purpose of the study is to determine what institutional factors have contributed to test score differentials among districts. The results of such a study may be helpful in crafting legislation and public policy to affect higher test score outcomes among Minnesota school districts.

##### **Methodology**

The study is a cross-sectional regression analysis of factors influencing test score differentials. February 1998 eighth grade Basic standards Test scores were used, which included both reading and mathematics values. Some of the institutional (independent) variables in the study included: adjusted net tax capacity per weighted average daily membership, percent of students requiring special education services, percent of students on AFDC, the drop out rate, per pupil district expenditures, percentage of students on reduced lunch assistance, percent of students with limited English proficiency, average teacher salaries and fringe benefits, the degree of private school competition affecting the school district, and the percentage of the district's teachers on the maximum step.

##### **Results**

Preliminary results indicate that the only significant variable explaining test score differentials is the percentage of students on AFDC. In this case a significant and (expected) negative correlation existed between the variables. None of the other independent variables appear to have significantly affected 8th grade reading or math test score differentials.

#### **12:00 CHEATING ON MULTIPLE CHOICE TESTS: DISTRIBUTION OF RESPONSE SIMILARITIES**

*Michael H. Gieske, Department of Economics, Winona State University, Winona, MN 55987*

In order to determine whether having similar response patterns on an exam implies cheating, a large number of multiple choice exams (>1000) across a wide range of disciplines are analyzed to estimate the population distribution of response patterns. Within each exam, in turn, each student's responses are compared to every other student's responses and the standard deviations from the mean are recorded. Questions addressed include: Is the distribution of similar and dissimilar response patterns normally distributed, or is it skewed? Do similar responses on multiple choice tests imply cheating or are similar responses simply a likely occurrence due to similar learning experiences? Has the distribution changed during the last decade (possibly indicating a shift in

students' attitudes toward cheating)? And does the distribution in Economics courses differ from that of other disciplines?

The data indicate that response patterns are normally distributed, permitting probability estimates of the likelihood of students having similar answers merely by chance. Thus, cautiously, providing evidence of possible cheating.

Further analysis of the data indicated that the distribution did not vary over the years examined; and that the distribution of response similarities did not differ between Economics exams and university wide exams generally,

**12:20 THE USE OF LISTSERVS TO ENHANCE CLASSROOM ASSIGNMENTS**

*Sara B. Barbor and Connie L. Braun, Department of Business Administration and Academic Technologies Center, Winona State University, Winona, MN 55987*

As high technology becomes more available for use in the classroom, instructors must never allow the technology to overshadow the pedagogy. In the effort to develop pedagogically sound and meaningful uses of high technology, we offer three examples of the use of listservs or maillists. First, the Southard example requires students to subscribe to a professional listserv, read the exchange of messages for a set period of time, and post a question. A second example can be found in the graduate Technical Communication program at Mercer University-Atlanta where students, each of whom is assigned 40 entries, are required to formulate a single list of references through research and sharing of findings via listserv. This program includes many distance learners from around the world, so the listserv or maillist becomes the primary means of communication. Third is the Oakes example, where students are required to subscribe to a class listserv, formulate and post a question, research the topic, collect responses from classmates, analyze the data, and present results. An important observation is that the instructor loses control of the dissemination of information in such a class and thus needs to increase flexibility and adaptability, but gains valuable experience as a facilitator or guide.

**GEOGRAPHY**

*Saturday, April 24  
Room 301 – Olin Rice Hall*

**8:30 ACQUIRING ABANDONED RAILROAD RIGHTS-OF-WAY FOR PUBLIC USES: THE ROOT RIVER TRAIL**

*Doug Pribyl, Geography Department, University of Minnesota, Social Sciences 414, 267 19th Ave. South, Minneapolis, MN 55455*

The process of acquiring railroad rights-of-way for public recreational trail begins with the abandonment of the right-of-way by the railroad company. During the abandonment process all parties with an interest in acquiring the right-of-way make their claim, form alliances, and map their strategy. Abandonment thus helps establish context. I will examine both the abandonment and acquisition of the railroad right-of-way that ultimately resulted in the creation of the Root River Trail in southeastern Minnesota. Examining the acquisition process also provides an opportunity to understand how public policy was defined and how that policy ultimately influenced the final outcome.

**8:50 MINNESOTA'S WETLANDS: CURRENT PUBLIC POLICY**  
*Ingrid Weinbauer, Geography Department, University of Minnesota, Social Sciences 414, 267 19th Ave. South, Minneapolis, MN 55455*

The debate over the value of wetlands, and their resulting drainage, has been the paramount water issue since Minnesota gained statehood in 1858. Surface water was viewed as a common enemy and wide-scale drainage was the order of the day early in the twentieth century. Wetlands were considered "undesirable wastelands." Yet the changing awareness of the value of wetlands by the public have greatly influenced lawmakers on drainage and wetland issues up to this date.

This paper will outline the current federal and state law and policy regarding wetlands in the state of Minnesota, discuss the main players involved in determining and administering the policy, and evaluate and discuss the strengths, successes, and deficiencies in current wetland policy.

**9:10 BASIC (TO) GEOGRAPHY IN MINNESOTA**  
*Rod Squires, Geography Department, University of Minnesota, Social Sciences 414, 267 19th Ave. South, Minneapolis, MN 55455*

The Northwest Ordinance enacted by the Continental Congress in 1787, and re-enacted by Congress in 1789, and the Land Act of 1796, incorporating the main features of the Land Ordinance of 1785, defined how the United States would expand. As a consequence, individuals migrated into the continental interior to become landowners, demanding the promised benefits of government. The provisions contained in the Northwest Ordinance and the Land Act, in fact, underlie the organization of space in Minnesota.

**9:30 TERRACE DEVELOPMENT ON THE EASTERN FLANK OF THE BLACK HILLS, SOUTH DAKOTA**

*Jeff L. Knapp, University of St. Thomas, Geography - LOR 306, 2115 Summit Ave. St. Paul, MN 55105-1096*

Streams on the eastern flank of the Black Hills of South Dakota have developed a series of extensive Holocene strath terraces. Studies have identified these as the Rapid Terrace (25,000 ybp), and the geomorphologic progressively younger terraces referred to as the Sturgis Terrace (undated), Bear Butte Terrace (undated), and Farmingdale Terrace (undated). All are the result of Cheyenne River entrenchment and subsequent nickpoint migration up tributaries. One such tributary, French Creek, flows eastward from the central portion of the Black Hills. Holocene terraces have not been previously studied along French Creek. Other studies have been conducted along streams immediately to the north and significantly south of French Creek. Through this presentation, I propose a geomorphology development model of French Creek and correlate its terraces with other regional terraces.

**9:50 STUDY OF A NEIGHBORHOOD EARLY WARNING SYSTEM IN HAMLINE-MIDWAY**

*Eric Myott, University of St. Thomas and Hamline Midway Rehabilitation Corporation, 1112 Randolph #9, St. Paul, MN 55105/ 651-695-0127 / mylloe@hotmail.com*

An Early Warning System (EWS) for neighborhoods is developed to detect and prevent housing problems. EWS is both a data model to detect existing and potential problem properties and a system to prevent those problems from becoming worse. The preliminary EWS model, developed for Hamline-Midway, is based on data indicators that detect susceptibility for structural problems at neighborhood buildings or fiscal distresses of owners or tenants in the community. A Geographic Information System was used to generate the maps, graphs and statistics for EWS. The

Hamline-Midway project revealed findings about data accuracy and availability, the ability for the indicators to detect housing distress, and the use of the model to solve problems in communities. The final analysis shows spatial patterns of distress in the neighborhood and the correlation of different housing distress indicators.

**10:10 SAINT PAUL SCHOOL BOUNDARIES AND  
SEGREGATION, A HISTORICAL PERSPECTIVE**

*Benjamin Bushee, University of St. Thomas, 2115 Summit Ave.,  
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Were the St. Paul Public School boundaries originally drawn to segregate certain groups of people? Alternatively, did the school boundaries reflect the segregated region of St. Paul at the time they were drawn? How did the demographics of the school boundaries change over the years? Have the school boundaries changed over time to reflect changing demographics? The implication could be that certain neighborhoods were segregated within one school boundary to keep specific groups out of other school boundaries. On the other hand, the school boundaries may have been drawn with spatial considerations in mind, and not necessarily specific demographics of the neighborhoods in St. Paul, as the factor in deciding where the boundaries would be drawn. The focus of this paper is St. Paul's Public School boundaries compared with the demographics of St. Paul. Using past U.S. Census block group data, I will compile a demographic profile of the area encompassed in each school boundary to see if there is a correlation between demographics and where the boundaries were drawn. Furthermore, I will examine any changes in St. Paul Public School boundaries and the demographics within those boundaries over the course of time.