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Geography: 1983-2007

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UNIVERSITY OF NORTH DAKOTA
1883-2008
CELEBRATING 125 YEARS

GEOGRAPHY: 1983-2007



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This account provides an update of the history of the Department of Geography at the University of North Dakota since the comprehensive history written by Dr. Ralph Brown in the early 1980s. Most of the material has been assembled from the Annual Reports submitted by the department each year. There has been no systematic format to the Annual Reports so this compilation, as a result, is somewhat uneven. Every effort has been made to compile as complete an anthology of departmental events as is possible. Still, the update must reflect some of the editorial influences of the writer.

OVERVIEW

The history of the Department of Geography between 1983–2007 can be summarized by four words that represent four time periods in the life of the department: (1) Promise, (2) Crisis, (3) Transition, and (4) Renewal. Each phase will be examined separately.

Promise

Dr. Brown's history presents the 1970s as a low point in the life of the department. The university faced difficulties recruiting and retaining quality qualified faculty, and the graduate program was temporarily suspended by the administration. Several new faculty members were hired to rebuild the program and they quickly achieved a significant level of success. By 1983 the department had a quality faculty, large class enrollments, large numbers of undergraduate majors and graduate students, and a traditional curriculum with an emerging concentration in remote sensing, cartography, and meteorology. Outreach in geographic education was strong, and the department was administering a growing number of contracts and grants through the recently created University of North Dakota Institute of Remote Sensing (UNDIRS). The department also provided basic instruction in meteorology for the growing Aviation program at UND.

Crisis

Beginning in 1983 the State of North Dakota experienced significant economic challenges related to declining oil production, a severe drought, declining commodity prices, and an inability to diversify its economy through manufacturing, technology, tourism, and information services. These problems led to a period of level state funding for higher education and a severe budget crisis at the University of North Dakota (and elsewhere within the North Dakota University System). Faculty faced six consecutive years with no pay raises and, not surprisingly, numerous faculty members, often the most marketable and the most professionally mobile, left the university.

Within only a few years Drs. Bernt Wills and Ralph Brown retired, Dr. Kang-Tsung Chang resigned to accept a position at the University of Idaho, Dr. Roland Mower accepted a position at Emory-Riddle Aeronautical University, and Dr. William Dando resigned to become Chair of the Department of Geography at Indiana State University. The continued lack of support from the University for UNDIRS eventually led to its decline. Student enrollments, which peaked at 109 undergraduate majors, 39 conferred degrees, and 23 graduate students in 1987, eventually declined as a result of the turnover.

Institutional competition also threatened the department. The meteorology program that had been housed in the Department of Geography for more than a decade was transferred to the Department of Meteorological Studies within the recently created Center for Aerospace Sciences (CAS). Astronomy was similarly transferred to the Department of Physics, and the remote sensing program began to face competition from a duplicate program in the Department of Space Studies within CAS. Finally, the budget crisis brought increasing competition for General Education Requirement enrollments from a host of departments across campus as academic units focused on increasing their student numbers in an attempt to strengthen their position at the institution. As a consequence, enrollment in large student

credit hour-generating courses within the department began to drop relative to past enrollments, although they continued to remain strong in an absolute sense. A reduction in the number of Lab Science credits required by the University also had a large negative impact upon the department since such a large part of its mission had been to provide service courses to the University. Although the number of graduate students remained high, the program began to suffer from a chronically high percentage of non-completers that drew the attention of the Graduate School during its program reviews.

Transition

A significant period of transition began in 1989 when three new faculty members were hired within a six-month period: Drs. Jack Hammen, Paul Todhunter, and Lowell Goodman. They joined the recently hired Dr. Mohammad Hemmasi, and two long-term faculty members: Drs. Douglas Munski and John Wyckoff.

The period 1989-1995 marked a transition period that was at times awkward as the department attempted to reorganize and focus on new ventures. Funding from the National Geographic Society (NGS) led to the establishment of the North Dakota Geographic Alliance under the co-directorship of Dr. Douglas Munski and Mr. Curt Eriksmoen. This potential significant long-term source of funding, visibility and service for the department was eventually lost when the University of North Dakota administration was unable to commit to the long-term matching funds required by the NGS, and another institution within the NDUS was able to make such a financial commitment. Dr. Jack Hammen brought significant expertise in remote sensing and geographic information systems to the department, but he faced an uphill battle in establishing a program in geographic techniques due to lack of institutional support for a functioning computer laboratory within the department, and continued *de facto* administrative support of duplicative efforts at UND. By 1995 the funding of the Geographic Analysis and Remote Sensing Laboratory (GARSL) had reached a crisis condition as the laboratory consisted of an incoherent and unworkable mix of workstations with varying hard-disk storage capacity and processing speed, and insufficient funding to maintain site licenses. The final threat occurred when the department cooperated in the University's effort to work with CAS in writing a grant proposal to the United States Department of Agriculture to fund the building of an Institute of Earth System Science that would house the Departments of Atmospheric Science and Space Studies, both part of CAS, and the Department of Geography, which was part of the College of Arts and Sciences (CA&S). In 1992 the Department moved into the new Institute for Earth System Science. It immediately became apparent that some administrators wanted the geography program transferred from CA&S to CAS. Although the Department of Geography listened to such overtures it continued in its resolve to remain within CA&S. When this became apparent a long and protracted cool relationship developed with CAS that eventually led to efforts by CAS to have the department moved from the building to make room for emerging CAS initiatives. At this time CAS also changed the graduation requirements for its Aviation major that eliminated a field of concentration for its students. Because the field of concentration required 20 credits and the geography major at the time required only 32 credits, and because the Department of Geography had long been committed to servicing the Aviation major the department experienced an immediate and significant drop in the number of its majors.

In the mid-1990s the department began a more successful transition in its rebuilding efforts. In 1995 the faculty decided to discontinue its practice of admitting students into the graduate program on a provisional basis. Although there was concern over maintaining an adequate number of graduate students, the policy change worked out well. The quality of graduate students began to improve, graduate students completed higher quality theses and independent studies, graduate student and faculty morale improved, more graduate students presented their research at professional meetings, and the percentage on non-completers declined significantly. In 1997 the department received its first Student Technology Fee award from the University. This program, initiated under President Ken Baker, provided a pool of money for technology related to student instruction. This award, the first of many in

succeeding years, provided much needed funds to establish a viable student computer laboratory for instruction in geography in general, and the emerging field of geospatial technologies in particular. At the same time the Department approached the Dean of the CA&S to convert the department's weather observer graduate service assistantship (GSA) position to a computer laboratory GSA position to maintain the hardware and software in GARSL. By 1998 the department had reorganized its curriculum to focus upon four undergraduate tracks: (1) liberal arts, (2) community and urban development, (3) environmental geography, and (4) geographic education. Track 1 was a liberal arts track designed for the student wishing to complete a general university degree in geography. Track 2 concentrated upon preparing students for work in the area of community and urban development. This track formalized the successful program in economic development that Dr. Lowell Goodman had developed over the past ten years and broadened it with additional offerings in urban geography, community development, and related coursework. Track 3 coupled the traditional coursework in physical geography with the emerging departmental offerings in geospatial techniques to prepare students for professional work in natural resource management. Track 4 continued the long-standing departmental efforts in geographic education.

Renewal

The refocusing of the department upon these four tracks coincided in time with the new presidency of Dr. Charles Kupchella, who immediately required each department to develop a Strategic Plan to guide its direction and to serve as a basis for resource allocation and program assessment at the University. With the new Departmental Strategic Plan in place the department then proceeded to hire Drs. Bradley Rundquist and Devon Hansen in 2000 to provide critical capacity to the environmental geography and community and urban development tracks, respectively. The later hires of Drs. Greg Vandenberg, Kevin Romig, and Enru Wang continued to provide additional capacity in these new areas of concentration. All of the tracks are designed to provide a foundation in general geographic education, along with upper-level instruction in one substantive area (environmental geography, community and urban development, or geographic education) and upper-level instruction in a core of geospatial techniques.

The results of these changes have been quite positive. More students are now presenting the results of their research at professional meetings in oral or poster formats, and several graduate students have published their research in quality professional journals. The greater focus to the graduate and graduate programs has led to a large increase in the number of summer internship opportunities, and cooperative education experiences. More importantly, geography graduates have been placed in an impressive and diverse array of entry-level positions within the state and region. In 2005 the department's efforts to strategically realigning itself to the strategic mission of the CA&S and the University were rewarded with the allocation of a 7th permanent tenure-track position.

In 2008, the department continues to face several challenges. It continues to explore ways of obtaining funding for a full-time geographic information system staff professional to operate and maintain GARSL, and to explore and develop contract and grant opportunities. This need has been consistently requested over the past 25+ years, in the stated need for a laboratory technician (1980s), a staff cartographer (1990s), or a GIS staff professional (2000s). The Department continues to face difficulties in establishing more formal linkages with programs across campus, such as the College of Business and Public Administration, CAS, and the Center for Rural Health, for which its coursework or expertise could lead to mutually beneficial synergistic relationships. Duplication of efforts continues to be condoned or even encouraged across campus, such as the new graduate program in Earth System Science and Policy, and the proposed Bachelors programs in Environmental Studies. The department continues to search for ways to increase the level of faculty research, the number and quality of research publications, and the number of grant and contract proposals in light of its heavy teaching responsibilities. And the Department continues to work to attract and

retain quality new faculty in light of departmental resources and university compensation that, although improved considerably over the past decade under the leadership of Presidents Baker and Kupchella, are still low relative to our peer institutions.

The list below gives some of the more important events in the life of the department over the period 1983-2007.

SIGNIFICANT EVENTS IN THE DEPARTMENT'S HISTORY (Selected)

- 1983-89: Lean years at UND; Program eventually suffers as key faculty leave or retire.
- 1985: Dr. John C. Hudson, Northwestern University, is the featured speaker at the Annual GTU Spring Awards Banquet.
- 1985 Review of UND Institute for Remote Sensing by the UND Committee on Bureaus, Institutes, and Centers recommends no appropriated funding for UNDIRS. UNDIRS continues to lack a full-time computer technician.
- 1985: Dr. Bernt Lloyd Wills, Professor Emeritus, dies on 26 July 1985.
- 1985: Dr. Bernt Lloyd Wills Memorial Scholarship established.
- 1986: Dr. Chang resigns from UND effective 15 August 1986.
- 1986: Dr. Ralph Brown retires from UND effective 16 August 1986.
- 1987: Enrollment peaks at 109 undergraduate majors, 39 degrees conferred, 23 students in the graduate program.
- 1988: Sponsor of the Annual Meeting of the Prairie Division, Canadian Association of Geographers in 1988 (Minot, ND), 1994 (Minot, ND), 2000 (Devils Lake, ND), and 2006 (Rugby, ND).
- 1980s: GFAPB classes grow then die out.
- 1988: Dr. William Dando resigns from UND effective 31 December 1988.
- 1989: Department cooperates with the Center for Aerospace Sciences to develop a proposal to the USDA for a Institute for Earth System Science building (\$8.4 million) (joint effort between Geography, Atmospheric Sciences, and Space Studies).
- 1990s: Dr. Lowell Goodman establishes a successful undergraduate/graduate program in economic development that leads to the formation of our Community and Urban Development track.
- 1990-93 Department formally houses the North Dakota National Geographic Alliance under the co-directorship of Dr. Munski.
- 1995: Co-sponsor of the Annual Meeting of the Great Plains/Rocky Mountain Division, Association of American Geographers, Rapid City, SD (with South Dakota State University) in October 1995.
- 1995: Department no longer accepts provisional students into the graduate program, improving the quality of our graduate students, and significantly improving the completion ratio, and the quality of our theses/independent studies.
- 1996: Geography Department becomes connected to the Internet (November 1996)
- 1997: Department receives first Student Technology Fee Grant to purchase microprocessors for the computer laboratory – Geographical Analysis and Remote Sensing Laboratory (GARSL).
- 1997: Department converts Weather Observer GSA to a Computer Lab Manager GSA to oversee and manage day-to-day operations in GARSL.
- 1997: Bachelor of Science in Education degree is terminated.
- 1997: Department formally develops four undergraduate foci: (1) liberal arts, (2) community and urban development, (3) environmental geography, (4) geographic education.
- 1998: Dr. Lowell Goodman announces his retirement effective 15 August 1998.
- 2000: GARSL become adequate to departmental needs through successful Student Technology Fee Awards.
- 2000: Department develops a strategic plan as a part of President Kupchella's hire. The plan guides departmental efforts into the future.

- 2001: Dr. Munski begins first of ongoing service as tour guide to the Statewide Bus Tour for New Faculty and Administrators.
- 2002: Dr. Munski resumes formal working relationship UND's summer Getting Started Program for incoming students.
- 2002: Department receives North Dakota State Board of Higher Education approval for a Graduate Certificate in Geographical Information Science to be offered on-campus beginning with the 2002-2003 academic year.
- 2004: Dr. Darrell Napton of South Dakota State University visits the department on 24 February 2004 as part of a Gamma Theta Upsilon/Association of American Geographers Visiting Geographical Scientist Program Award.
- 2005: Department receives approval to convert Dr. Seidel's Temporary Position to a 7th permanent position.
- 2005: Dr. Devon Hansen continues to develop closer ties with the Metropolitan Planning Office (MPO), including the GF/EGF MPO Internship Program.
- 2006: First cohort of students for the on-line Graduate Certificate in Geographical Information Science begins with the 2006-2007 academic year.

The department has been located in three locations over the period 1983-2007. For nearly 15 years the department was in Gillette Hall. Though ideally situated, the limited teaching and laboratory space was a significant problem. In 1989 the department had an opportunity to be part of a grant proposal to the United States Department of Agriculture to secure funds for a \$8.4 million Earth System Science Institute on the western edge of campus. Seeing this as an opportunity to be part of a new opportunity, and wishing to contribute to the future of the university the department agreed to participate. Dr. John Wyckoff was instrumental in helping to write the proposal. Upon moving to the ESSI in spring 1992 it quickly became apparent that some campus administrators had the intention of having the department relocated from the College of Arts and Sciences to the Center for Aerospace Sciences. Since this option was never formally mentioned in the early stages of the proposal, and because of the natural and long historical ties of the Department of Geography within the College of Arts and Sciences the geography faculty were reluctant to be administratively relocated. Once this decision became finalized, the department became, in a sorts, persona non grata. This less than satisfactory working situation was resolved by Provost John Ettling and Dean Martha Potvin when it was decided that the department would relocate back to the east side of campus, providing that comparable or better quality space could be found. Fortunately, Dean Potvin was able to use college resources to renovate a portion of Ireland Hall, and in the summer of 2004 the department moved back to the main campus core.

DEPARTMENT OF GEOGRAPHY LOCATIONS: 1983-2007

- Gillette Hall, 1977-March 1992.
- Clifford Hall, March 1992–August 2004.
- Ireland Hall, August 2004-2008.

Considering the many challenges that face UND in retaining qualified faculty members, the department has had a relatively stable faculty over the period 1983-2007. Four faculty retired at UND – Brown, Goodman, Hemmasi, Seidel, after long tenures at the university; two left academic for personal reasons – Edwards, Hammen. Numerous faculty members have also taken positions at other universities, which is an indication of the quality of faculty hires the department has enjoyed. These include: Anderton (Northern Michigan), Chang (Idaho), Dando (Indiana State), Dyer (Ohio), Mower (Emory-Riddle), Romig (Texas State University, San Marcos), and Wyckoff (West Florida). Several other faculty members were only hired on a short-term basis – Boken, Lockwood, and Thakur. Only one faculty

member has been given a terminal contract over the past 25 years. The department has generally been a friendly one that seeks to provide a supporting environment for new faculty.

DEPARTMENT OF GEOGRAPHY FACULTY 1983-2007

John B. Anderton, Assistant Professor 1996-99, Ph.D. University of Wisconsin, Madison.
Vijay Kumar Boken, Visiting Assistant Professor 1999-2000, Ph.D. University of Winnipeg.
Ralph C. Brown, Professor 1971-85, Ph.D. Syracuse University.
Kang-Tsung Chang, Associate Professor 1976-80, Professor 1981-86, Ph.D. Clark University.
William A. Dando, Associate Professor 1975-80, Professor 1980-88, Ph.D. University of Minnesota.
James Dyer, Assistant Professor 1992-95, Ph.D. University of Georgia.
Judson Edwards, Assistant Professor 2002-03, Ph.D. University of Southern Mississippi.
Lowell R. Goodman, Associate Professor 1989-99, Ph.D. University of Iowa.
John L. Hammen III, Assistant Professor 1989-95, Associate Professor 1995-99, Ph.D. Indiana State University.
Devon Hansen, Visiting Assistant Professor 1999-2000, Assistant Professor 2000-06, Associate Professor 2006-08, Ph.D. University of Utah.
Mohammad Hemmasi, Associate Professor 1986-92, Professor 1992-2004, Ph.D. Indiana University.
Floyd Hickok, Visiting Assistant Professor 1980-85, Assistant Professor 1986-89, Ph.D. University of California, Davis.
Jin-Kyu Jung, Visiting Assistant Professor 2007-2008, Ph.D. State University of New York, Buffalo.
Catherine Lockwood, Instructor 1996-96, Ph.D. Candidate, University of Minnesota.
Roland D. Mower, Associate Professor 1974-83, Professor 1983-87, Ph.D. University of Kansas.
Douglas C. Munski, Temporary Assistant Professor 1978-79, Assistant Professor 1979-84, Associate Professor 1984-92, Professor 1992-2008, Ph.D. University of Illinois.
Kevin Romig, Assistant Professor 2004-06, Ph.D. Arizona State University.
Bradley C. Rundquist, Assistant Professor 2000-04, Associate Professor 2004-08, Kansas State University.
Robert Seidel, Temporary Assistant Professor 1988-90, Assistant Professor, Special Appointment 1990-2004, Ph.D. University of North Dakota.
Sudhir Thakur, Visiting Assistant Professor 2004-05, Ph.D. The Ohio State University.
Paul E. Todhunter, Assistant Professor 1989-93, Associate Professor 1993-1999, Professor 1999-2008, Ph.D. University of California, Los Angeles.
Greg Vandeberg, Assistant Professor 2004-2008, Ph.D. Kansas State University.
Enru Wang, Special Assistant Professor 2005-06, Assistant Professor 2006-2008, Ph.D. University of Washington.
John W. Wyckoff, Assistant Professor 1979-84, Associate Professor 1984-91, Ph.D. University of Utah.

Our administrative staff has experienced almost no turnover during the period in question. Ms. Charlotte Minier served as the principle administrative staff member for seven years. The department was then able to hire Ms. Cindy Purpur away from Industrial Technology; she has now served the department for 21 years.

ADMINISTRATIVE STAFF – FULL-TIME

Charlotte Minier, 1980-87.
Cindy Purpur, 1987-2008.

For the most part, the department has had a rotating chair system consisting of a three-year term, with an additional three-year renewal term possible, but not standard procedure. The department seems to feel that different chairs bring different skills to the position, and has encourages a rotation of the position.

CHAIRS

Kang-Tsung Chang 1981-84.
Roland D. Mower 1984-87.
John W. Wyckoff 1987-91.
Douglas C. Munski 1991-93.
Mohammad Hemmasi 1993-96.
Paul E. Todhunter 1996-99.
Mohammad Hemmasi 1999-2002.
Paul E. Todhunter 2002-2008.

The department has had a strong tradition of developing faculty that has resulted in a long history of successful faculty tenure bids. For the most part all faculty members who left the university did so for personal reasons or to secure a position at a different university. Tenure decision years are indicated below for the faculty members that received tenure over the period 1983-2007.

TENURE DECISIONS

1985 Dr. John Wyckoff
1985 Dr. Douglas Munski
1992 Dr. Mohammad Hemmasi
1993 Dr. Paul Todhunter
1993 Dr. Lowell Goodman
1995 Dr. John Hammen
2006 Dr. Bradley Rundquist
2006 Dr. Devon Hansen

There have been a number of changes in the geography curriculum over the past 25 years that have been driven by several significant factors. In the mid-1980s the developing Center for Aerospace Sciences (CAS) initiated a program in Meteorological Studies (later renamed Atmospheric Sciences) and began to hire several academic meteorologists. Quite understandably the meteorology offerings that were housed in the Geography Department at that time were relocated to CAS, resulting in the loss of several courses. Similarly, the Department of Physics hired a physicist with teaching and research interests in astronomy that resulted in the transfer of that general education class to the Physics Department.

Another significant change was the continued emergence of geospatial techniques within the discipline of geography. Although the department had a significant set of remote sensing and cartography courses in the 1980s, these technical courses grew in number during the 1990s with the emergence of geographical information systems and the later development of geographical information sciences.

Another driving factor was the issue of common course numbering (CCN) initiated by the North Dakota University System to facilitate the transfer of credits between NDUS institutions. This led to several name and course numbering changes. The department also began to become more focused in the 1990s. Prior to this time the department emphasized a traditional liberal arts and regional curriculum, supplemented with selected remote sensing and cartography courses. With the emphasis upon departmental mission statements initiated by President Kupchella, the department began to focus on three academic foci: (1) environmental geography, (2) community and urban development, and (3) geographic

education. All three foci were to be linked by a common set of geotechnical courses. All three foci, and the geospatial technique courses supporting them, were recognized by the faculty as an excellent fit to the college's mission statement and the needs of the State of North Dakota.

An attempt was also made to make a more flexible curriculum to avoid curriculum paperwork every time a faculty member change occurred within the department. The undergraduate geography curriculum listed in the 1982-84 university catalogue is listed below, followed by the same curriculum taken from the 2007-2009 undergraduate catalogue. A list of the specific change follows. This is followed by a similar listing of the graduate geography curriculum for the same two periods and the changes over the same time period.

CURRICULUM CHANGES: NEW COURSES, DELETED COURSES, NAME CHANGES

Undergraduate Geography Courses: 1982-84

121/L: Physical Geography
151: Cultural Geography
152: Economic Geography
161: World Regional Geography
262: Geography of North America I
271: Map Reading and Interpretation
275: Introduction to Remote Sensing
319: Geography for Teachers
333: Meteorology
334: Climatology
354: Conservation of Resources
369: Geography of North Dakota
372: Cartography
373: Graphics and Air Photo Interpretation
377: Quantitative Applications in Geography
421: Seminar in Physical Geography
423: Astronomy
452: Location of Economic Activity
453: Historical Geography
455: Political Geography
457: Urban Geography
462: Geography of North America II
463: Regional Geography
472: Map Design
475: Remote Sensing Applications and Analysis

Undergraduate Geography Courses: 2007-09

121/L: Global Physical Environment
134/L: Introduction to Global Climate
151: Human Geography
161: World Regional Geography
262: Geography of North America I
263: Geography of North Dakota
271: Map Reading and Interpretation
319/L: Geography for Teachers
322: Environmental Hazards
334/L: Climatology
352: Economic Geography
354: Conservation of Resources
362: Geography of Canada

374/L: Environmental Remote Sensing and Air Photo Interpretation
377/L: Quantitative Applications in Geography
419: Methods and Materials in Geographic Education
421: Selected Topics in Physical Geography
452: Selected Topics in Economic Geography
453: Historical Geography
457: Urban Geography and Planning
458: Community Development
462: Geography of North America II
463: Regional Geography
471/L: Cartography and Computer-Assisted Mapping
474/L: Introduction to Geographic Information Systems (GIS)
475: Digital Image Processing

Undergraduate Course Changes: 1983-2007

121/L: Physical Geography renamed to Global Physical Environment
134/L: Introduction to Weather and Climate added and later renamed to Introduction to Global Climate
151: Cultural Geography renamed to Human Geography
152: Economic Geography renumbered to 352
231: Aviation Meteorology added and later deleted (moved to Atmospheric Sciences Department)
271: Map Reading and Interpretation renamed to Map Use and Interpretation
275: Introduction to Remote Sensing renamed and renumbered to 374 Environmental Remote Sensing and Air Photo Interpretation; also added 374L: Environmental Remote Sensing and Air Photo Interpretation Laboratory
319: Geography for Teachers added a laboratory section 319L
322: Natural Hazards added and later renamed to Environmental Hazards
333: Meteorology deleted (moved to Atmospheric Sciences Department)
337: Cooperative Education added and later renumbered to 397
353: Physical Meteorology added and later deleted (moved to Atmospheric Sciences Department)
362: Geography of Canada added
369: Geography of North Dakota renumbered to 263
372/L: Cartography deleted
373/L: Graphics and Air Photo Interpretation deleted with some material moved to 374
375: Remote Sensing Systems added and later deleted
377: Quantitative Applications in Geography added a laboratory section 377L: Spatial Analysis Laboratory
421: Seminar in Physical Geography renamed to Selected Topics in Physical Geography
422: Geography of Water Resources added and later deleted
423/L: Astronomy deleted (moved to Physics Department)
436: Synoptic Meteorology added and later deleted (moved to Atmospheric Sciences Department)
452: Location of Economic Activity renamed to 452: Selected Topics in Economic Geography
455: Political Geography renamed Geopolitics and later deleted
457: Urban Geography renamed to Urban Geography and Planning
458: Community Development was added
471: Computer-Assisted Cartography added and later merged with Cartography to create Cartography and Computer-assisted Mapping; added a laboratory 471L: Computer Mapping Laboratory
472: Map Design deleted
474/L: Introduction to Geographic Information Systems (GIS) added with a laboratory

475: Remote Sensing Applications and Analysis renamed to Digital Image Processing

Graduate Geography Courses: 1982-84

501: Geographic Thought and Philosophy
521: Seminar in Physical Geography
551: Seminar in Cultural Geography
552: Seminar in Economic Geography
560: Seminar in Regional Geography
575: Seminar in Remote Sensing
576: Field Methods and Analysis in Geography
578: Seminar in Geographic Research and Writing
591: Directed Study in Geographical Problems
595: Research Topic in Geography

Graduate Geography Courses: 2007-09

501: Geographic Thought through Time
521: Advanced Physical Geography
537: Graduate Co-operative Education
541: Seminar in Geography
551: Advanced Human Geography
560: Seminar in Regional Geography
574: Advanced Techniques in Geographic Information Systems
575: Seminar in Remote Sensing
576: Field Methods and Analysis in Geography
578: Geographic Research and Writing
591: Directed Study in Geographical Problems

Graduate Course Changes: 1983-2007

501: Geographic Thought and Philosophy renamed Geographic Thought through Time; also changed to 2 credits
521: Seminar in Physical Geography renamed Advanced Physical Geography
537: Graduate Co-operative Education added
541: Seminar in Geography added
551: Seminar in Cultural Geography renamed Seminar in Human Geography and then renamed Advanced Human Geography
552: Seminar in Economic Geography deleted
560: Seminar in Regional Geography deleted
574: Advanced Techniques in Geographic Information Systems added
578: Seminar in Geographic Research and Writing renamed Geographic Research and Writing; also changed to 2 credits
595: Research Topic in Geography deleted

The department has been fortunate to have had numerous outstanding undergraduate and graduate students over the years. Although the department has not kept consistent records on these awards, the following is a partial and representative list.

STUDENT AWARDS

1985 – Fulbright-Hays Fellowship to Columbia (Ross Keys)
1985 – Outstanding Graduate Student Nomination (Scott Williams)
1985 – Phi Beta Kappa: Laurie Wutzke
1987 – Christina Dando serves as an Intern with the National Geographic Society in Washington, DC (January-April 1986)
1997 – Phi Beta Kappa: Stuart Milakovic

- 2001 – Mr. Lee Saunders is a McNair Scholar with the McNair Foundation Program.
- 2003 – Mitch Schull is selected as a GIS Intern with the International Water Resources Institute in Colombo, Sri Lanka.
- 2003 – Phi Beta Kappa: Torgrim Hoydahl
- 2004 – Charles Geraci is selected for a Western Governors' Association / NASA Earth Science Applications Division DEVELOP program internship for Summer of 2004.
- 2005 – Phi Beta Kappa: Emily Grewe
- 2005 – Mr. Jim Crayne is a McNair Scholar with the McNair Foundation Program.
- 2005 – Mr. Paige Baker is a McNair Scholar with the McNair Foundation Program.
- 2006 – Phi Beta Kappa: Zach Karsky
- 2006 – Mr. Chris Sanders receives an internship with the NASA Student Internship Program (SIP) for the summer of 2006, working at the NASA Goddard Space Flight Center in Greenbelt, MD.
- 2007 – UND Graduate School Award for the most outstanding graduate thesis (Mr. Charles Geraci)

The department also awards the B.L. Wills Memorial Scholarship once or twice a year to the most outstanding undergraduate geography major. Consistent records of this award have also not been kept, but the following partial list was reconstructed from departmental records.

B.L. WILLS MEMORIAL SCHOLARSHIP

- Fall 1986: Jeffrey Hammerlinck
- Spring 1987: Terry Peasland
- Fall 1997: Kurt Fraser
- Spring 1998: Denise Tolness
- Fall 1999: Jeffrey Schild
- Spring 2000: Mark Redington
- Fall 2000: Sharon Grzeskowiak
- Spring 2001: Steve Moe
- Fall 2001: Ben Ehreth
- Spring 2002: Toni Peck
- Fall 2002: Torgrim Hoydahl
- Spring 2003: Mitch Schull
- Fall 2003: Erik Moe
- Fall 2004: Emily Grewe
- Spring 2005: Jim Crayne
- Fall 2005: Chris Sanders
- Spring 2006: Rodney Iverson
- Fall 2006: Zach Karsky
- Spring 2007: Kelly Dezell
- Fall 2007: Ben Prusca

The faculty has always been encouraged to seek external funding in the form of competitive grants and contracts. Departmental efforts in this area have been uneven with time due to high teaching loads, large service commitments, limited institutional support for research, and an uneven number and quality of graduate students. A partial list of major grants and contracts is given below. This listing is restricted to extramural funding exceeding approximately \$10,000 or more.

MAJOR FACULTY GRANTS AND CONTRACTS (Selected)

- 1985-89 W.A. Dando and D.C. Munski, National Science Foundation, 'Pre-College Earth Science Meteorology and Climatology Materials,' \$242,579.
- 1985-88 W.A. Dando and J. Schlichting, National Council for Soviet and East European Research, 'Soviet Agriculture Research Project,' \$45,884.
- 1988 W.A. Dando, North Dakota State Board of Higher Education, 'Summer Institute in Earth Science Meteorology and Climatology,' \$22,683.
- 1989 Dr. John Hammen III receives \$120,000 equipment grant from Intergraph Corporation for the purchase of GIS hardware/software.
- 1990-91 D.C. Munski, J.Hammen, L. Goodman, North Dakota State Board of Higher Education Eisenhower Mathematics and Science Education Grant, 'Applying Location and Place to Human-Environment Interaction to Present Earth Systems Science in Grades 4-9,' \$29,312.
- 1991-95 D.C. Munski, National Geographic Society, 'North Dakota National Geographic Alliance,' total of \$55,000.
- 1992 Dr. John Hammen, US EPA, 'Wellhead Protection Data Management Plan for the City of Larimore, ND,' \$31,757.
- 1991-93 Dr. D.C. Munski, West Central Geography Academy for Teachers, 'North Dakota Geographic Education Regional Outreach Activities,' total of \$24,000.
- 1992-95 Dr. D.C. Munski, North Dakota Department of Public Instruction, 'North Dakota Geographic Education Programming,' total of \$50,000.
- 1994-95 Dr. Paul E. Todhunter, National Institute for Global Environmental Change (DOE) - Great Plains Regional Center, 'Climate Change in the Mid-Continent of North America,' \$153,750.
- 2003: Drs. Paul Todhunter and Bradley Rundquist (Co-PIs), National Science Foundation, 'A Test of Borehole Paleoclimatology as a Method to Quantify Radiative Climate Forcing,' \$385,768, 2003-2006.
- 2005 Drs. D. Hansen and M. Hemmasi, Office of Urban Development, Grand Forks, North Dakota, 'Needs Assessment and Housing Market Analysis for the City of Grand Forks Five-Year (2005-2009) Consolidated Plan,' \$15,500.
- 2004: Dr. B.C. Rundquist, U.S. Geological Survey and AmericaView Inc, 'North Dakota View,' Funding of \$89K, \$84K, and \$55K during first three non-probationary years.

Some of the more significant awards that faculty have received are listed below. This partial list was extracted from past Annual Reports and other documents.

FACULTY AWARDS AND HONORS (Selected)

- 1988: Dr. W.A. Dando receives Burlington Northern Foundation Faculty Achievement Award for 'Excellence in Teaching, Research, Creative Activity, and Service' at the UND Founders Day Banquet (25 February 1988).
- 1988: Dr. D.C. Munski receives B.C. Gamble Award for 'Excellence in Teaching' at the UND Founders Day Banquet (25 February 1988).
- 1990: Dr. D.C. Munski receives UND Division of Continuing Education Dedicated Teaching and Service Award (27 March 1990).
- 1990: Dr. D.C. Munski receives L & A. Saiki UND Student Government Faculty Advisor Award (22 February 1990).
- 1991: Dr. Lowell Goodman is invited to present his paper 'Geography and Industrial Development' at the 1991 South Dakota State Annual Geography Convention in Brookings, SD.
- 1991: Dr. Douglas C. Munski receives the Outstanding Advisor Award from the ACT/NACADA Recognition Program for Academic Advising (16 October 1990).
- 1991-92 Dr. John Wyckoff is President of the North Dakota Academy of Science.
- 1991 Dr. D.C. Munski receives Distinguished Teaching Achievement Award from the National Council for Geographic Education.

- 1995: Dr. D.C. Munski is President of the Great Plains/Rocky Mountain Division of the Association of American Geographers.
- 1999: Dr. Mohammad Hemmasi is elected Chair of the Geography of Religions and Belief Systems Specialty Group of the Association of American Geographers for 1999-2001.
- 2002: Dr. Paul Todhunter teaches at the American College of Norway during the Spring Semester 2002.
- 2003: Dr. Todhunter serves as Chair of the Graduate School Committee, University of North Dakota, 2003-2004, 2005-2006.
- 2007: Dr. Munski serves as Chair of the University Senate, University of North Dakota, 2006-2007.
- 2005: Dr. Paul Todhunter is invited to present his paper 'Let the (Property) Buyer Beware: The Myth of the 100-Year Floodplain,' at the 2005 South Dakota State Annual Geography Convention in Brookings, SD.
- 2005: Dr. D.C. Munski receives the UND Foundation/Bertin C. Gamble Faculty Award for Excellence in Academic Advising at the Founders Day Banquet.
- 2007: Dr. Douglas C. Munski is named the National Award Winner for 2006 of the University Continuing Education Association's Excellence in Teaching Award selected for the 2006 National Faculty Service Award. He then is named the National Award Winner at the Association's Annual National Conference on April 13, 2007 in Vancouver, British Columbia.
- 2007: Dr. Bradley Rundquist is named Book Review Editor of *Photogrammetric Engineering and Remote Sensing*.

MASTERS THESES AND INDEPENDENT STUDY TITLES: 1983-2007

2007	Scott A. Abel	THE IMPACT OF HUMAN LANDSCAPE FEATURES AND ASSOCIATED PREDATOR INFLUENCES ON DUCK NEST SURVIVAL IN THE PRAIRIE POTHOLE REGION
	Tina N. Billups	STAYING POWER: AGING-IN-PLACE IN LARIMORE, NORTH DAKOTA
	Julie M. Gallagher	THE APPLICATION OF REMOTE SENSING LiDAR DATA FOR THE DETECTION OF CULTURAL RESOURCES IN A FORESTED ENVIRONMENT: AN EXAMPLE FROM ISLE ROYALE NATIONAL PARK, MICHIGAN
	Lisa M. Kuchy	REMOTE SENSING-BASED STUDY OF LAND-COVER CHANGES RELATED TO MINING AND ITS IMPACTS ON MARINE FAUNA: A CASE STUDY IN GOA, INDIA
	Kristofor P. Parson	PREDICTING SELENIUM IN PINTO BEANS USING LINEAR REGRESSION AND GIS
2006	Lane D. Cowger	LIBERIAN REFUGEES IN THE RED RIVER VALLEY: A GEOGRAPHY OF HOPE
	Alex Feidler	THE GEOGRAPHY OF METHAMPHETAMINE IN NORTH DAKOTA
	Charles C. Geraci	REMOTE SENSING ASSESSMENT OF WIDESPREAD SALT CEDAR INFESTATION AND BIOLOGICAL CONTROL IN NORTHWEST NEVADA
	Joshua J. Johnston	GEOGRAPHIC VARIABLES AFFECTING BALD EAGLE NEST LOCATIONS IN THE RED RIVER VALLEY OF NORTH DAKOTA AND MINNESOTA
	William Vandevander	THE FEASIBILITY OF REESTABLISHING PROFESSIONAL BASEBALL IN GRAND FORKS, NORTH DAKOTA
	Gary S. Votaw	BIAS IN SEVERE THUNDERSTORM AND TORNADO WARNINGS ISSUED BY THE NATIONAL WEATHER SERVICE IN THE DOPPLER RADAR ERA: A SPATIAL-TEMPORAL EVALUATION
2005	Mark R. Engel	INVESTIGATING THE POTENTIAL OF SNOWMOBILING TO PROMOTE THE ECONOMIC DEVELOPMENT OF NORTH DAKOTA'S RENDEZVOUS REGION
	Kyle A. Glazewski	INTEGRATION OF GIS AND SMOKE PLUME DISPERSION MODELING FOR PRESCRIBED BURNS AT GRAND FORKS AIR FORCE BASE
	Sharon Grzeskowiak	PLANNING FOR CULTURAL/HERITAGE TOURISM FOR EAST GRAND FORKS, MINNESOTA
	Nsalambi V. Nkongolo	SPATIAL VARIABILITY OF NITROUS OXIDE (N ₂ O) EMISSIONS AND SOIL PROPERTIES IN A JAPANESE LOWLAND SOIL

	Sarita Pachhai	COMPARISON BETWEEN 1-M LIDAR AND 30-M NED DIGITAL ELEVATION MODELS FOR TEMPORARY FLOODWATER STORAGE ESTIMATIONS IN THE RED RIVER OF THE NORTH BASIN
	Md Shahriar Pervez	LAND COVER DYNAMICS AND CONVERSION OF AGRICULTURAL LAND IN NORTHWESTERN BANGLADESH, 1973-2003
	Brent E. Pringle	USING HIGH SPATIAL RESOLUTION IMAGERY TO MAP LEAFY SPURGE AND CANADA THISTLE IN THE NORTH UNIT OF THEODORE ROOSEVELT NATIONAL PARK
2004	Heather D. Braaten	THE DIASPORA OF TIBETAN BUDDHIST MONASTIC INSTITUTIONS ONTO THE AMERICAN LANDSCAPE
	David A. Brookman	REMOTE SENSING AND PREDICTIVE MODELING OF SALT CEDAR (TAMARIX) IN THE NORTHERN GREAT PLAINS
	Ryan P. Brooks	A PLAN FOR RESIDENTIAL AND COMMERCIAL DEVELOPMENT IN THE POINT AREA, EAST GRAND FORKS
	Scott B. Dubsky	GUAM'S COMPETITIVE ECONOMIC ADVANTAGE: THE IMPACT OF THE UNITED STATES MILITARY PRESENCE AND JAPANESE TOURISM
	David E. Dyrud	SEEKING THE ECONOMIC COMMUNITIES OF NORTH DAKOTA: A COMPREHENSIVE COUNTY CONSOLIDATION STUDY
	Diane C. Holden	WALSH COUNTY, NORTH DAKOTA: MITIGATION AS A NON-STRUCTURAL FLOOD CONTROL MEASURE – A PRACTICAL APPLICATION IN GIS
	James A. Rush	A CONTEMPORARY GEOGRAPHY OF SOUTHEASTERN NORTH DAKOTA'S MANUFACTURING SUCCESSES
	Lee R. Saunders	MINORITIES AND LOW-INCOME PEOPLE IN THE RICHMOND-PETERSBURG AND ROANOKE METROPOLITAN STATISTICAL AREAS AT RISK OF EXPOSURE TO ENVIRONMENTAL HAZARDS
2003	Paul R. Sethre	ASSESSING OPEN WATER EXPANSION FROM 1991-2002 IN THE DEVILS LAKE BASIN OF NORTH DAKOTA USING SUBPIXEL CLASSIFICATION OF REMOTELY SENSED DATA
	Earl K. Davis	CREATING A COMPREHENSIVE MAP OF ROATAN, HONDURAS, USING GIS
	Steven A. Moe	DEVELOPMENT OF AN AUTOMATED METHOD TO DETECT CHANGE IN WINTER WHEAT ACREAGE USING REMOTELY SENSED DATA AND GIS
	Casey J. Mutzenberger	APPLICATION OF GIS IN THE SURVEYING AND MANAGEMENT OF PIPING PLOVER AND LEAST TERN
2002	Scott S. Kroeber	IMPROVING POINT SOURCE PRECIPITATION ESTIMATES USING WSR-88D RADAR DATA IN GEOGRAPHICAL INFORMATION SYSTEMS

	Nathan F. Smith	IMAGING SPECTROMETRY TO MAP POTENTIAL WILDFIRE FUELS AT THEODORE ROOSEVELT NATIONAL PARK, NORTH DAKOTA
2001	Balint Nangia	REGIONAL ECONOMIC DEVELOPMENT IN HUNGARY IN THE 1990s
	Heith M. Dokken	REMOTE SENSING OF MARIJUANA: A PREVENTITIVE METHOD OF LAW ENFORCEMENT
	John I. Menzies	A CHANGE DETECTION COMPARISON OF DEFORESTATION IN RÔNDONIA, BRAZIL AND SOUTHERN BOLIVIA USING SATELLITE IMAGE CLASSIFICATION (1975-1998)
2000	Chris Atkinson	WAVE-TRANSPORTED BOULDERS IMBRICATED NEAR MARQUETTE, MICHIGAN, AS INDICATORS OF PAST LAKE SUPERIOR STORM ACTIVITY
	Gordon Robertson	AN EXAMINATION OF THE LANDSCAPE HISTORY OF THE NORTHWOODS: HUMAN MANAGEMENT EFFECTS ON THE LANDSCAPE AT ITASCA STATE PARK, MINNESOTA
	Martin Boganowski	THE DEVELOPMENT OF ENVIRONMENTAL JUSTICE INDICES FOR URBAN AREAS OF THE UNITED STATES
	Maria Elisa S. Valeroso	SPATIAL DIMENSIONS AND PATTERNS OF REGIONAL DEVELOPMENT IN THE PHILIPPINES
	Nick A. Hegge	AN ANALYSIS OF THE ECONOMIC BASE OF ORTONVILLE, MINNESOTA
1999	Deborah M. Pawley	THE RED RIVER FLOOD OF 1997: THE ROLE OF GOVERNMENT AGENCIES IN THE FLOOD PLAIN
	Doug Ottke	AN ENVIRONMENTAL HISTORY OF THE 19 TH CENTURY MARQUETTE IRON RANGE
	Joshua D. Stevenson	A GIS APPROACH TO TRAIL SYSTEM ADDITIONS AT TURTLE RIVER STATE PARK
	Kristopher T. Peterson	WHITEBARK PINE (PINUS ALBICUALUS) DECLINE AND RESTORATION IN GLACIER NATIONAL PARK
1998	Grant Carlson	ECONOMIC EFFECTS OF THE 1997 FLOOD ON THE RED RIVER VALLEY
	Naim P. Zeibak	NEAREST NEIGHBOR ANALYSIS OF VARIOUS SOCIAL GATHERING SITES IN GRAND FORKS, NORTH DAKOTA
1997	Carl V. Dabols	A COMPARISON OF OBJECTIVE AND SUBJECTIVE APPROACHES TO TEMPORAL SYNOPTIC CLUSTERING: A CASE STUDY OF THE MINNEAPOLIS-ST. PAUL URBAN HEAT ISLAND
1996	Miles S. Clow	THE IMPACT OF THE STAGGERS RAIL ACT ON NORTH DAKOTA FARM INCOME

- Jason T Archbold A PLANNING STRATEGY FOR THE GRAND FORKS COMMUNITY IN CONVERTING ITS MILITARY BASE TO CIVILIAN USE
- Jody T. Gunderson A THEORETICAL MODEL FOR CHANGING COUNTY BOUNDARIES BASED ON DIMINISHING POPULATIONS AND REVENUE SOURCES
- Karen E. Butler AN ANALYSIS OF ENVIRONMENTAL AND ANTHROPOGENIC CONTROLS ON INDOOR RADON DISTRIBUTION IN GRAND FORKS, NORTH DAKOTA
- Kent P. Wood A REGIONAL FRAMEWORK FOR THE DETERMINATION OF ECONOMIC DEVELOPMENT DISTRICTS IN THE STATE OF WYOMING
- Scott Wilson MERCER COUNTY: A STUDY OF THE CULTURAL LANDSCAPE, WITH AN ANALYSIS OF ECONOMIC GROWTH POTENTIALS
- 1995 Brian W. Savage LAND-USE IN THE FRINGE REGIONS OF MONTANA'S BOB MARSHALL WILDERNESS
- Jeffrey S. Ueland RELIGIOUS AFFILIATION AND SOCIO-ECONOMIC STATUS IN WINNIPEG, MANITOBA: A MULTIVARIATE APPROACH
- Nancy A. Godon CLIMATOLOGY OF BLOWING DUST OCCURRENCES FOR FARGO, NORTH DAKOTA: 1948-1993
- Thomas Williams A GEOGRAPHIC ANALYSIS OF TORNADO HAZARD PERCEPTION IN FARGO AND WEST FARGO, NORTH DAKOTA
- Verna M. Kentner READING THE CULTURAL LANDSCAPE THROUGH NECROGEOGRAPHY: A STUDY OF GRAVEYARDS AND ETHNICITY IN POLK COUNTY, MINNESOTA
- 1994 David A. Hampsten AN ANALYSIS OF URBAN HISTORIC GEOGRAPHY: METROPOLITAN GRAND FORKS, NORTH DAKOTA, 1874-1914
- Ian Kitch A SPATIAL ANALYSIS OF AN URBAN FISHERY: A CASE STUDY OF WINNIPEG, MANITOBA
- Kathleen M. Spencer CARTOGRAPHIC REFERENCE SOURCES FOR NORTH DAKOTA EARTH SCIENCE STUDIES AND GEOGRAPHIC INFORMATION SYSTEMS
- 1993 Chris Meindl CONFLICT OVER LAND USE IN NORTH DAKOTA'S PRAIRIE POT HOLE REGION: HISTORIC AND GEOGRAPHIC PERSPECTIVES ON PUBLIC POLICY
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- Devon A. Hansen GEOGRAPHICAL ANALYSIS OF POPULATION REDISTRIBUTION IN NORTH DAKOTA, 1960-1990

- Dion J. Wiseman STREAMFLOW RESPONSE OF AN AGRICULTURAL WATERSHED TO PHYSICAL AND ANTHROPOGENIC CHANGES
- Gordon Brandvold A COMPARISON OF RAIL WAY STRATEGIES ACROSS THE DRIFT PRAIRIES OF NORTH DAKOTA
- Mark A. Van Daalen TEMPERATURE AND PRECIPITATION CLIMATOLOGY OF THE NORTH DAKOTA PRAIRIE POT HOLE REGION, 1895-1990
- Melford J. Johnson THE IMPORTANCE OF MANUFACTURING IN THE ECONOMIC DEVELOPMENT OF GRAND FORKS: A CASE STUDY
- Scott C. Roper GEOGRAPHICAL BIAS IN THE NEWSPAPER COVERAGE OF BASEBALL IN NORTH DAKOTA, 1890-1920
- 1992 Cynthia Kordecki DISTRIBUTION ANALYSIS OF PREHISTORIC BURIAL MOUNDS IN NORTH DAKOTA
- Harleen J. Young THE HISTORICAL GEOGRAPHY OF SWISS SETTLERS AT THE RED RIVER COLONY 1821-1826
- Kirk Jensen ECONOMIC BASE AND INDUSTRIAL DEVELOPMENT DIRECTIONS FOR DEVILS LAKE
- Mel Johnson ANALYSIS OF MANUFACTURING INDUSTRY IN GRAND FORKS
- Mitchell L. Catanzaro NUCLEAR WAR ON THE PRAIRIE
- 1991 Christopher C. Braendlin CANADIAN CONSUMERS AND THE GRAND FORKS TRADE AREA
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- Jamison B. Huhner CONSUMER CHARACTERISTICS AND LONG DISTANCE OUTSHOPPING
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- 1989 James Schimmer THE GEOGRAPHY OF TREE CLAIMS IN GRAND FORKS COUNTY, NORTH DAKOTA
- Jill Rudnitski PHYSICAL GEOGRAPHY CONCEPTS: PRELUDE TO UNDERSTANDING WORLD ISSUES
- Kari Brekke CHANGING ACCESSIBILITY FOR TOURISM IN THE AURLAND MUNICIPALITY OF NORWAY
- Robin O. Rapai A REMOTE SENSING TECHNIQUE FOR ASSESSING PLANT SPECIES DIVERSITY
- 1988 Kenneth C. Dagal ETHNOGEOGRAPHY OF MIDDLE MISSOURI RIVER

INDIANS: 1738- 1889

- Garry L. Running IV LATE HOLOCENE CLIMATIC EPISODES OF THE JAMES RIVER VALLEY, NORTH DAKOTA
- 1987 Bruce N. Dahlman UPLAND SEDIMENTS AND CLIMATIC EPISODES OF THE HOLOCENE
- Denis E. Mudderman A GEOGRAPHY OF JUNIOR HIGH EARTH SCIENCE METEOROLOGY AND CLIMATOLOGY IN THE UNITED STATES
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- Robert C. Pekowsky VIDEOGRAPHY: A POSSIBLE ALTERNATIVE FOR AIRBORNE REMOTE SENSING DATA ACQUISITION
- Ross D. Keys THE IMPACT OF COAL MINE DEVELOPMENT ON COLUMBIA'S GUAJIRA REGION: MONITORING CHANGE IN THE ENVIRONMENT
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- Paula H. Lee TERRAIN, CLIMATE AND VEGETATION IN THE BADLANDS OF THE LITTLE MISSOURI RIVER IN NORTH DAKOTA