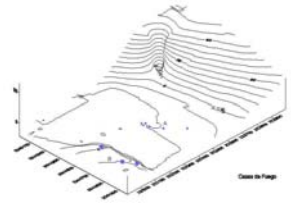
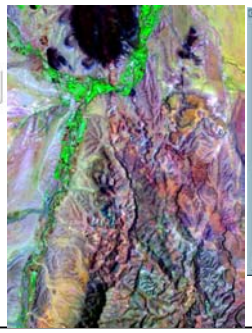
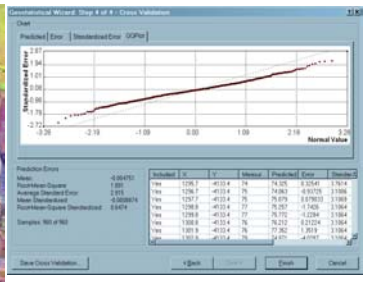
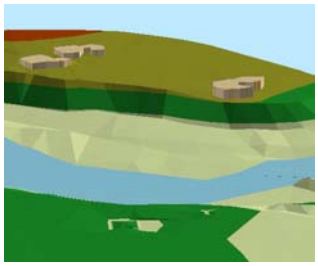
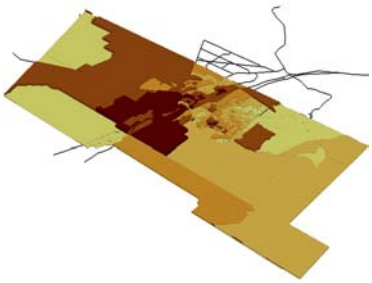
INTEGRATING GEOSPATIAL PERSPECTIVES IN THE ANTHROPOLOGY CURRICULUM AT THE UNIVERSITY OF NEW MEXICO (UNM)





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MARCH 2005

INTEGRATING GEOSPATIAL PERSPECTIVES IN THE ANTHROPOLOGY CURRICULUM

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Requested by:

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Chair, Department of Anthropology

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CONTENTS

I INTRODUCTION

Many students in the Department of Anthropology have begun to employ geospatial analysis in their research. Today's scientific community demands a synthetic and interdisciplinary approach to research, and more and more, this involves a spatial component. We, Veronica Arias, Heather Richards, and Judith van der Elst, are three such students. We have cultivated interest in geospatial approaches by taking the initiative to establish an interdisciplinary workgroup focused on conducting projects that apply geospatial perspectives to anthropological research. In addition to utilizing geospatial methods and techniques for research purposes, we are also dedicated to introducing such approaches into undergraduate education in the Department of Anthropology at the University of New Mexico (UNM). We believe that proficiency in geospatial perspectives including methods, techniques, and analysis is essential for a successful career in all subfields of anthropology. This report provides an overview of our efforts and accomplishments. In addition, it lays out our future plans and recommendation to successfully implement geospatial perspectives in Anthropology.

II FORMATIVE STAGES

In 2002, we established the Archaeological Geospatial Working Group (AGW) in recognition of the increasing need for geospatial methods in anthropological research. The group's ultimate objective is to stimulate geospatial and interdisciplinary research at UNM. Members of AGW believe in the value of creating and fostering an environment at UNM that facilitates and cultivates geospatial research. The members of AGW have undertaken several small archaeological projects utilizing Geographic Information Systems (GIS) and Photogrammetry, which have offered interested graduate and undergraduate students practical, applicable experience and publication possibilities. Project results have been presented as papers and posters at professional meetings of varied disciplines at the local, national, and international levels. For more information, please go to http://www.unm.edu/~agw

In addition to undertaking these projects, many of which are in cooperation with New Mexico state agencies, we have also participated in several workshops to increase our knowledge in geospatial analysis. These workshops vary in topic and are either focused on how to integrate geospatial perspectives into our own research or how to integrate geospatial technology into teaching. One such workshop entitled "GIS and Spatial Modeling for Use in Undergraduate Education", held at Ohio State University from June 28-July 2, 2004, was organized by the NSF sponsored Center for Spatially Integrated Social Science, through their SPACE (Spatial Perspectives on Analysis for Curriculum Enhancement) program. During this workshop, we, Veronica Arias, Heather Richards, and Judith van der Elst, developed a course syllabus for *Geospatial Analysis in Archaeology* (ANTH 373), a course we are currently teaching in the Department of Anthropology at UNM. The directors of CSISS were impressed with our accomplishments and innovative ideas during this workshop; therefore, they invited us to participate in the SPACE planning meeting at the University of Santa Barbara held this past December 2004. (In fact, our course syllabus serves as a sample for Geospatial Analysis in Archaeology on the CSISS webpage. For more information, please go to http://www.csiss.org/learning_resources/content/syllabi/#archaeology). The goal of this meeting was to generate ideas and organize the 2005 SPACE workshops. At this meeting, we presented the organizers of next year's SPACE workshops with an update on our course

development, which served as an example to develop ideas for future workshops. CSISS has been very supportive of our efforts at UNM and has offered scholarship and award opportunities, instructional tools, pedagogical resources, and has offered to collaborate on efforts to organize symposia at upcoming professional meetings and conferences. In addition, our affiliation with CSISS has introduced us to a wider community of social scientists interested in integrating geospatial perspectives in the social sciences and interdisciplinary research (Janelle and Goodchild 2004). For more information, please go to http://www.csiss.org

III GEOSPATIAL ANALYSIS IN ARCHAEOLOGY (ANTH 373)

Our initial efforts have resulted in the development of a newly offered course in the Department of Anthropology, (ANTH 373) Geospatial Analysis in Archaeology, a course we are teaching this Spring 2005 Semester. **Geospatial Analysis in Archaeology** explores various geospatial methods and techniques to address archaeological questions. Although the course is designed for archaeologists and those engaged in anthropological research, much of the material to be discussed is applicable to researchers of other social sciences.

Course Description:

This newly offered class is designed for students interested in applying geospatial technologies, such as Geographical Information Systems (GIS), remote sensing, and Global Positioning Systems (GPS) to anthropological and archaeological research. The objectives of the course include: familiarize students with spatial concepts and spatial analysis; formulate and evaluate archaeological questions relating to geospatial approaches; learn geospatial techniques such as GIS and remote sensing, and; go from the field to the lab (data collection, data conversion, data integration, data analysis). The class consists of two components – a lecture and weekly lab exercises. Moreover, students fill out weekly evaluations that provide feedback so that the instructors can tailor the course to better suit the student's needs and assess student comprehension. Our pedagogical training was in large part provided by the SPACE workshop. In addition, we are using WebCT as an online resource to facilitate our teaching. For more information, please contact the authors.

Data for this class is provided by several New Mexico state agencies and students work on real-world archaeological projects that will benefit the archaeological community as a whole. In fact, many students are working on projects that will contribute to the preservation efforts of archaeological sites in conjunction with the Galisteo Basin Archaeological Sites Preservation Act. In addition, several fieldtrips have been scheduled to provide additional hands-on experience.

In order to facilitate student interaction with the New Mexico archaeological community and bring together academia and cultural resource managers, we are organizing a forum comprised of faculty, cultural resource managers, and students to discuss the importance of spatial perspectives in education. This forum will provide students with a unique opportunity and provide us with information to be used to improve our course, Geospatial Analysis in Archaeology, and to develop additional courses focused on spatial perspectives in Anthropology. In addition, a 'gap' exists in the education of anthropology students and real-world requirements by cultural resource managers, the employers of many recently graduated archaeology students. By bringing together faculty, cultural resource managers, and students, ideas will be generated to bridge this 'gap' to better prepare undergraduates for future employment.

Furthermore, as graduate students we have benefited tremendously from teaching this course. It has enriched our own knowledge and understanding of geospatial analysis, provided us with additional hands-on experience with GIS software, data management, and analysis. These skills will be applied not only to our own research, but also to teaching future courses.

IV FUTURE PLANS / RECOMMENDATIONS

Geospatial science is a field that is rapidly developing and changing the way social scientists approach research. Moreover, knowledge of geospatial methods, techniques, and analysis has become mandatory in many professional careers. It is essential that the university provide an adequate educational program in which geospatial technologies are well integrated. The Archaeological Geospatial Working-group (AGW) and the course, Geospatial Analysis in Archaeology, is a step in the right direction; however, we have thought of more

ways to encourage and promote the teaching of geospatial perspectives at UNM, including the development of additional geospatially-focused courses in Anthropology. Such courses would move beyond archaeology to teach geospatial methods, analysis, and applications to all sub-fields of Anthropology. We intend to present the faculty with a proposal to teach another course focused on spatial perspectives in anthropology; this newly proposed course would move beyond archaeology to apply such perspectives to the broader field of anthropology. This would be another step in developing a broader curriculum integrating geospatial perspectives in anthropology at UNM. We also plan to attend additional workshops, offered by CSISS and other organizations, in order to continue our pursuit of knowledge in this field.

Furthermore, we, in collaboration with Professor Jim Boone, plan to submit a National Science Foundation (NSF) proposal for a *Course, Curriculum, and Laboratory Improvement (CCLI)* Grant in May 2005. This program focuses on projects that contribute to the knowledge base of undergraduate education research and practice and seek to build a community of scholars who work in related areas of undergraduate education. The program accepts proposals that include one, several, or all of the following components: conducting research on undergraduate teaching and learning; creating learning materials and teaching strategies, developing faculty expertise; implementing education innovations, and; assessing learning and evaluating innovations. This program focuses on three phases of development. We will submit a proposal for Phase 1: Exploratory Projects with at total budget up to $150,000.

Software request:

In order to facilitate integrating geospatial perspectives in anthropology at UNM, we would like to request that the Department of Anthropology share in the University-wide site license for ArcGIS 9 (ESRI). Since this license will be used for educational purposes, it is available through CIRT for $1500. This will provide an unlimited number of licenses per year. We have included a list of faculty and students from the Department of Anthropology, who would like to support this request, (see appendix).

V RESOURCES

References

Archaeological Geospatial Working-group (AGW): http://www.unm.edu/~agw

Center for Spatially Integrated Social Science (CSISS): http://www.csiss.org

Computer & Information Resources & Technology (CIRT): http://www.unm.edu/cirt

Contact: – Libby Henry ehenry@unm.edu

Environmental Systems Research Institute (ESRI): http://www.esri.com

Janelle and Goodchild (2004) *Spatially Integrated Social Science,* Oxford University Press

National Science Foundation: http://www.nsf.gov

Selected resources

Liverman et al. (1998) *People and pixels: linking remote sensing and social science*, National Research Council (U.S.) Committee on the Human Dimensions of Global Change

Geospatial Analysis in Archaeology (Anth 373) required textbook-

Wheatley and Gillings (2002) *Spatial Technology and Archaeology: the archaeological applications of GIS*, Taylor & Francis

Participating state agencies:

Archaeological Records Management Section (ARMS), New Mexico Historic Preservation Division, Santa Fe, New Mexico.

Land Use Department, Santa Fe County, New Mexico.

National Park Service (NPS), Salinas Pueblo Missions National Monument, New Mexico.

Office of Archaeological Studies (OAS), Museum of New Mexico, Santa Fe, New Mexico.

Other relevant links:

Anthropological Center for Training and Research on Global Environmental Change: http://www.indiana.edu/%7Eact/

Archaeology Data Service: http://ads.ahds.ac.uk/

Center for Advanced Spatial Analysis: http://www.casa.ucl.ac.uk/news/index.htm

Center for Advanced Spatial Technologies: http://www.cast.uark.edu/cast/projects/

Center for the Study of Institutions, Population and Environmental Change

http://www.indiana.edu/%7Ecipec/

Spatial Analysis Laboratory: http://sal.agecon.uiuc.edu

Virtual Worlds in Archaeology Initiative

http://www.learningsites.com/VWinAI/VWAI_participants.htm

VI APPENDIX

These individuals have shown their support by signing the following statement*:

I support a request for the Department of Anthropology at the University of New Mexico to share in the University-wide site license for the GIS software package ArcGIS 9.

Students

Faculty

* *The list is omitted for privacy reasons*