Strategic Plan for the Geospatial Teaching, Research, and Outreach in CNR

The CNR Geospatial Steering Committee, March 31, 2008

Current Mission for the Geospatial Learning Center

Established in 1995, the Remote Sensing and Geographic Information Systesm (RS/GIS) Lab is a resource for the College of Natural Resources (CNR) and supports faculty, students and staff from all departments in the CNR at the University of Idaho.

This lab is actively involved in teaching, research and outreach using the computer-based technologies of geographic information systems, remote sensing techniques and global positioning tools. Our lab's primary mission focuses on education related to the utilization of spatial and non-spatial digital data and tools for the manipulation, analyzing and storing of these data sets to provide lab users with tools to manage the natural and cultural features of the landscape.

Current Teaching Involvement and Facility

In conjunction with the recent renovation, facilitated by CNR administration, faculty, staff and a donation from Tom and Teita Reveley, the Remote Sensing and GIS Laboratory was renamed to the Geospatial Learning Center. The Geospatial Learning Center is currently providing a computer facility and geospatial expertise to 20 different courses within CNR (http://www.cnr.uidaho.edu/rsgis/education.htm) of which seven courses use the laboratory regularly during the semesters while the remaining 13 courses use the lab only sporadically for 1-4 laboratory exercises during the semester. The use of the facility could and is expected to increase but is limited by the number of computers in the laboratory and the ability to provide geospatial expertise to this large number of faculty, students, and stakeholders.

The need for an increased number of computers is currently being addressed, as the laboratory is undergoing renovation with an increase in the number of workstations from 17 to 24. The renovated locale will also be equipped with a divider wall to enable teaching of two smaller classes/workshops simultaneously.

Geospatial Steering Committee

A Geospatial Steering Committee was formed in the fall of 2007 with representatives from all departments in CNR and one representative from the Department of Geography. The focus of this committee is to develop a strategic plan for the Geospatial Learning Center to guide geospatial activities in teaching research, and outreach. Current committee members are: Ray Dezzani (Geography), Paul Gessler (Forest Resources), Tom Gorman (Forest Products), Ed Krumpe (Conservation Social Science), Karen Launchbaugh (Rangeland Ecology and Management), Janet Rachlow (Fish & Wildlife), Alistair Smith (Forest Resources), Eva Strand (Rangeland Ecology and Management), Lee Vierling (Rangeland Ecology and Management).

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GOAL 1 – Teaching/Learning: *To establish CNR and the UI as a dynamic center for creating, integrating, and disseminating knowledge in remote environmental monitoring, GIS, and spatial analysis*.

Objective A: To provide a workspace that is fully equipped with modern hardware and software tools necessary to perform first class spatial analysis using GIS, remote sensing, and GPS.

Strategy 1: Allocate funds to support a Geospatial Learning Center director (currently 40% of Eva Strand's time) to administer the budget, use, hardware and software needs, personnel needs, revenue streams, etc.

Strategy 2: Develop the Digital Help Desk and Geospatial Practicum to provide answers to the most frequently asked questions when starting in spatial analysis, GIS and Remote Sensing

Strategy 3: Implement a CNR *Geospatial Consulting Fellowship* which is collectively funded by the departments of CNR. The TA will have the opportunity to complete an MS degree in one of the CNR departments while assisting with administrative tasks, teaching, and providing geospatial expertise to graduate and undergraduate students in the Geospatial Learning Center.

Geospatial Learning Center Director, Geospatial Consulting Fellow or Geospatial Practicum students are available to provide guidance in GIS and remote sensing project design, analysis techniques, data access, software manipulations etc. to CNR students, staff, and faculty. Consultation is available during weekly consultation hours posted on the door of the Geospatial Learning Center (~15 hours / week). Although these activities are already ongoing they could be better organized and supported by additional laboratory staff and students. In particular, a Geospatial Practicum (NR404 Special Topics) could be offered for 1-2 cr. every semester. Students taking the Geospatial Practicum could assist fellow undergraduate students (3-5 hrs per week) in the practical nuances of geospatial analysis.

Strategy 4: Develop a revenue stream to cover the costs for equipment, software and personnel. For example:

- Implement a lab fee structure for courses that are using the lab facility and software.
- Implement a workshop series to create revenue
- Increase revenue via grant proposals
- Rent the lab facility for workshops taught by a variety of UI and community groups

Objective B: Provide courses in geospatial analysis covering the theory and applications of geospatial tools in natural resource science and management across the CNR disciplines.

Strategy 1: Develop a Geospatial Landscape Analysis Minor at CNR

Geospatial landscape scale analysis is an important component of natural resource management. All land managing agencies store landscape data in GIS databases ranging from fire perimeters and wildlife migration corridors to grazing allotments and forest management units. We propose that it is timely for CNR to offer a minor in Geospatial Landscape Analysis. The majority of the courses required for the minor are already in place, additional courses are offered by the Department of Geography.

Strategy 2: Re-introduce NR402 – GIS Applications in Natural Resources as a classroom course (2 cr.) rather than an exclusively on-line course.

NR402 – GIS Applications in Natural Resources is a 1 credit course that was taught by Eva Strand at CNR 2000-2005. The course introduced hands-on GIS applications to about 30 seniors and graduate students per year. The course was originally implemented to avoid inefficient one-on-one tutoring of GIS and spatial analysis. In 2006 the course was converted to an on-line course (upon request from the 401 program and the CNR administration) and was made available to 401-series students as well as other off- and on-campus students. There is currently no classroom version of NR402. Over the last year we have observed an increased demand for one-on-one tutoring in the GIS lab by graduate students and students taking the on-line course and other courses within and outside the college requiring spatial analysis components. The student requests relate to selection of appropriate scale data, locating data, projecting data, and selecting appropriate analysis techniques.

As a response to this increased demand for spatial analysis education we (Eva Strand) propose to develop Rnge4xx (2cr) to fill the niche that NR402 used to fill while taught in the class- room. The first credit in Rnge4xx will remain very similar to the current on-line version of NR402 while the second credit in Rnge4xx will be project based where students work independently (under supervision of the instructor) to complete spatial analysis tasks which require locating appropriate data, selection of analysis techniques and scales, and proper reporting through maps and written documents. Topics from all CNR departments will be covered, but students will have an opportunity to select analyses relevant to their field of study. This course will also provide opportunities for graduate students to work on their projects, and undergraduate students to work on senior projects in class. Service learning opportunities will be created for interested students. **The overarching objective of the course is to enable students to independently and professionally complete spatial analysis projects.**

Strategy 3: Develop a sequenced plan of courses to incorporate components of geospatial technology in selected CNR courses and increase inclusion of geospatial courses in curriculum requirements.

A long-standing mission for the Geospatial Leaning Center is to serve CNR students and assist instructors in developing geospatial applications for existing courses. We are currently providing expertise and exercises in spatial analysis to over 10 CNR courses (e.g. Wlf315, Rnge429, For274, Rnge357, For427, Wlf448, ForP230, Rnge456 For424, For527). This mission will remain and additional courses will be incorporated upon request by individual CNR instructors.

Strategy 4: Offer CNR short-courses in the use of GPS/GIS technology

A thorough understanding of GPS/GIS technology and theory is critical for CNR students and stakeholders. GPS data collection is used in the majority of CNR disciplines; for example in collection of wildlife telemetry data, vegetation plot data, stand inventory data, locating cultural monuments, and mapping recreational opportunities. Each spring the Geospatial Learning Center will offer a 1-2 day GPS/GIS integration short-course, which will be available to students in CNR and across the UI campus. These short courses could be an effective avenue for transfer students to 'get up to speed' on geospatial tools and techniques and GPS data collection using recreational grade GPS units (Garmin, Magellan etc.), Trimble units, and units attached to a PDA (Personal Digital Assistant using ArcPad). These short courses will be open to off-campus participants.

Objective C: To provide a pool of geospatial equipment such as GPS units, laser range finders, etc. that would be available for teaching, research and outreach within CNR.

Strategy 1: Raise funds for the initial purchase of equipment and develop policies for the use and maintenance of these resources.

GOAL 2 – Geospatial Research – *To provide opportunities and resources for research programs that center on geospatial analysis and understanding of natural resources.*

Objective A: To initiate research projects and provide support for research programs across CNR that integrates geospatial technology.

Strategy 1: Create policies and opportunities to make the Geospatial Learning Center available for graduate and undergraduate student research at times when it is not used for teaching, particularly in the summer season.

The Geospatial Learning Center personnel will initiate research projects in collaboration with CNR faculty from all departments, other geospatial entities within the UI, and the local community. These projects will contribute to the funding of the teaching lab and support temporary additional laboratory assistants and student workers. We foresee that these research projects will be funded via competitive grants and contracts.

Strategy 2: Develop a Digital Help Desk – answers to the most frequently asked questions when starting in spatial analysis, GIS and Remote Sensing

GOAL 3 – Geospatial Outreach – *Integrate geospatial research and teaching efforts in CNR with a broader audience starting with other colleges within the University of Idaho and the state, federal agencies (USFS, BLM, USGS, USFWS, NPS), state agencies (IDF&G, IDL), tribal and county government and other stakeholders.*

Objective A: Support current efforts within the region that provide frameworks for disseminating geospatial data.

Strategy 1: Engage in data sharing and collaboration with the InsideIdaho geospatial portal personnel, a data server housed at the UI Library, which stores and provides access to regional geospatial datasets via the Internet and the UI Library.

Strategy 2: Participate in the America View program. The goals for America View are to promote the availability and use of remote sensing data to federal and state agencies, higher education, K-12 education, tribal, city and county government, and private entities.

Representatives from the University of Idaho, Idaho State University and Boise State University have recently become members in the national AmericaView program initiated by the USGS. The goals for America View are to promote the availability and use of remote sensing data to federal and state agencies, higher education, K-12 education, tribal, city and county government, and private entities. Formation of the IdahoView consortium has initiated collaboration between higher education institutions within the state. We foresee improved collaboration among all users of geospatial information as IdahoView increases its membership and initiates educational outreach programs. The Geospatial Learning Center will play an important role in the success of IdahoView with its ability to offer guidance in the use of modern geospatial analysis techniques and training workshops in the use of analysis tools.

Strategy 3: Develop a framework for geospatial data sharing within CNR.

Objective B: Engage the broader public regarding geospatial technology and applications with a threefold purpose of 1) gaining a better understanding for the regional geospatial research needs, 2) disseminate geospatial research results and techniques, and 3) generate interest in geospatial technology that may result in funded collaborative research projects.

Strategy 1: Offer workshops and short courses in the use of a variety of geospatial techniques and applications to the community at large for example land managers/owners, teachers, and bioregional planners.

Within the last five years the Geospatial Learning Center has offered 18 professional workshops in GIS to federal and state agencies, tribal and county government, and private entities. The teaching facility is also made available to agencies and private entities for teaching, and we are here reimbursed for the use of the facility. Several outreach events to K-12 education could occur annually. These activities could be greatly expanded and would serve several purposes:

- Fulfill the outreach component of the Geospatial Learning Center vision and the CNR vision
- Initiate collaboration with workshop participants
- Bridge the gap in understanding between academia and stakeholders of possible and proper use of geospatial technology and the need for geospatial analysis locally and regionally
- Expose and involve teaching assistants and Geospatial Ambassadors in outreach and workshop planning
- Contribute funding to the teaching facility

Examples of short-course offerings are:

- Introduction to spatial analysis with ArcGIS
- Analysis of raster data using Spatial Analyst
- Developing wildlife habitat models
- GPS data collection with ArcPad
- Introduction to remote sensing
- Intermediate remote sensing
- Advanced remote sensing
- Remote sensing in fire applications

Strategy 2: Engage in service learning and initiate the Geospatial Ambassadors group.

The proposed Geospatial Ambassadors is a group of undergraduate CNR students that have a particular interest in specializing in the use of geospatial technology to address natural resource and cross-disciplinary issues. These students apply for membership to the Geospatial Ambassadors and are required to take a suite of courses in geospatial technology and pass an introductory exam to be granted membership. The Ambassadors operate under the leadership of the Geospatial Learning Center staff or faculty members within CNR. This group would meet 3-4 times throughout the academic year for seminars, workshops and other functions to foster advanced knowledge in the use of geospatial technology. The Geospatial Ambassadors will be required to periodically perform functions such as computer care, software maintenance, and helping other students with geospatial tasks in the Geospatial Learning Center in return for the opportunity to work on funded projects. The Geospatial Learning Center staff and other interested faculty members are responsible for seeking funds through collaboration and project initiation with other UI Colleges in addition to off-campus partners invited from nearby universities, USFS Research Stations and other federal agencies, National Laboratories such as INEEL and PNNL, state agencies such as Idaho Fish&Game and Idaho Department of Lands, Tribal and County government and private industry.

Strategy 3: Establish a UI Geospatial extension program, which would sponsor geospatial outreach specialists to work with industry and other individuals in the natural resource fields to develop workshop and other learning experiences targeted to specific communities of interest and help guide geospatial research at the UI.