

e-Soils

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Programmatic Significance

The appeal of distributed learning is the “potential it engenders: to enable educational institutions to expand access to historically under-served populations;” populations where access to quality information has typically been lacking.¹ This appeal mirrors the University of Minnesota’s mission to exchange knowledge with the community — in a form that is accessible to them — and to help communities respond to changes and/or problems within their environment. With this in mind, the Department of Soil, Water, and Climate (SWAC) is proposing to build upon the technology of previously funded TEL projects (i.e. the *e-Course 2002* and the *e-Library* prototype)² by developing informational nodes; a node being identified as a basic principle or concept in soil science. Nodes will consist of a combination of text, images, animation, and/or movies pulled into the *e-Course 2002/e-Library* hybrid (hereinafter referred to as *e-Soils*). Associated with these nodes will be database variables such as objectives, keywords, assignments and exercises (including a visual laboratory-type component), exam/quiz questions and user evaluation of satisfaction and effectiveness. These nodes will become part of *e-Soils* — a library of soil principles and concepts, and their associated variables, available to fulfill multiple course requirements and multiple outreach functions (See Table 1).

Table 1. Identified distributed learning niches for *e-Soils*

Use	Developer/Instructor	Audience
Online Course(s)	SWAC	Students (on/off campus), K12, Professional Development Credits, Soil Science Certification Review, Certified Crop Consultants, Others?
Review Modules	SWAC Instructors	Students enrolled in upper level SWAC courses
Presentations	Outreach/Extension Personnel	Farmers and Agronomic Professionals, K12
Employee Training	SWAC	Government Employees (County, State, and Federal Levels), Fertilizer and Seed Dealer Employees

The greatest advantage of *e-Soils* will be its ability to develop multiple Web-based distributed learning courses depending on the audience, as well as “just in time” courses, modules, and/or presentations — delivered via PowerPoint, CDROM, posters, informational handouts, etc. — to address local situations and needs within communities. SWAC envisions *e-Soils* as serving as a model for distributing core knowledge; core knowledge that can be used as an ongoing source of information as well as used to create and address “teachable moments” as the need arises.

Evaluation Plan

e-Soils will be evaluated on four levels — content relevance and accuracy; content satisfaction and effectiveness (tracked via learner outcomes); interface usability; and delivery techniques and technology. The nodes and variables will be developed under the supervision of a SWAC content knowledge expert. Once complete, a review period will be established for other SWAC knowledge experts to provide feedback on the relevance and accuracy of the content. As each node and/or a group of nodes will have an evaluation variable, content satisfaction and effectiveness as well as interface usability will be ongoing through audience feedback. In addition, evaluative mechanisms will be available regarding user interface issues for those

¹ Dasher-Alston and Patton, 1998. Evaluation Criteria for Distance Learning. *Planning for Higher Education*, 27: p. 13

² Department of Rhetoric and the College of Agricultural Food and Environmental Sciences

developing *e-Soils* products.³ Finally, a media needs analysis will identify those delivery techniques and technology that is best suited for individuals involved with developing and using *e-Soils* products.

Budget, Time Table, and Staff

No hardware or software needs are anticipated for *e-Soils* development as appropriate and up-to-date software has already been purchased,⁴ and existing hardware is sufficient for project employment. Instead, funding will be focused on identifying/developing content nodes and appropriate variables, evaluating content accuracy and relevance, and interface usability (See Table 2). We believe there is significant potential for outside sponsorships of *e-Soils* products (see section on Collegiate/Department support) and believe that second year costs will be covered by a combination of other grant funding and/or sponsorship funding

Table 2. *e-Soils* programmatic costs

Staff	Wage	Hrs/Wk	Tot Wks	Cost	Provider
Information	\$27.34 / hour + \$8.45	10.5	52	\$9,770.67	TEL Grant
Technology	fringe (30.90%) =			<u>\$9,770.67</u>	COAFES/SWAC
Professional	35.79/hour			\$19,541.34	

Development of *e-Soils* nodes and variables will occur during 2003 along with content and usability evaluation, media needs analysis, and securing sponsorship funding. The following year (2004) will be dedicated to identifying and working with Mentee(s) as well as continued evaluation of content effectiveness (See Table 3).

Table 3. *e-Soils* development time tables

Tasks 2003-2004	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Identify/contact potential sponsors	X	X										
Identify nodes/variables	X	X										
Media needs analysis		X	X									
Develop nodes/variables			X	X	X	X	X	X	X	X	X	X
Evaluation	← evaluation of content/usability by SWAC experts →											
Tasks 2004-2005	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Implementation/ Mentorships	← Identify Mentee (s), develop appropriate <i>e-Soils</i> products →											
Evaluation	← Effectiveness of content via learner outcomes/user feedback →											

Co-investigators on this TEL grant include two individuals from the Department of Soil, Water, and Climate. Dr. George Rehm will serve as the content knowledge expert. As Professor and Extension Soil Scientist (Ph.D. in Soil Fertility), Dr. Rehm has been involved with extension and outreach activities since 1969 and has exhaustive knowledge of basic soils science concepts. Jenni Swenson will serve as product developer. As an Information Technology Professional,

³ As we are building on previously developed technological infrastructures, with proven interface usability, we do not anticipate this evaluative level as being overly constrictive to the project.

⁴ Such as Macromedia Authorware 6.5, Dreamweaver 4, Flash 5.0 authoring solutions for e-learning; ColdFusion application development and suite; Dazzle Digital Movie Creator (Movie Star);; Adobe Photoshop 6.0 image editing software; AudioGrabber 1.81 audio retriever; GoldWave digital audio editor; Wildform/Flix Flash video encoding product.

Ms. Swenson (M.A. in Rhetorical Theory/Scientific and Technical Communication; M.S. in Soil Genesis/Classification) has developed several multimedia projects within SWAC over the last five years.

Collegiate and Department Support

In addition to matching funds from SWAC/COAFES, there is potential for significant sponsorship of this project outside of the college (e.g. seed/fertilizer companies and/or government agencies), as well as avenues for revenue production through content delivery (See Table 4). SWAC professors, from numerous areas of expertise, will also devote time to reviewing the content and accuracy of the nodes and corresponding variables.

Table 4. Possible revenue sources from *e-Soils*

Use	Developer/Instructor	Cost
Online Course(s)	SWAC	Tuition-based
Review Modules	SWAC Instructors	Free
Presentations	Outreach/Extension Personnel	Free
Employee Training	SWAC	Individually Negotiated Contracts

e-Soils will address COAFES strategic initiatives through its potential for education and outreach. *e-Soils* innovations will include:

1. an improvement in departmental teaching through an increase in information access and consistency in core knowledge delivery
2. an exchange of knowledge with both rural and urban communities by providing online courses, presentations, and/or employee training
3. the creation of “teachable moments” with “just in time” modules that respond to local problems and address local needs
4. an intensive evaluative and feedback process that will guide both the development and content accuracy/relevance of nodes and variables as well as the quality of information delivery and audience uptake.

Mentorship Phase

Ideally, we will work with a series of Mentees near the end of this project in order to address the different avenues for *e-Soils* product development. Dr. John Lamb, Professor of Basic Soils 2125, has agreed to employ *e-Soils* as an online course during the spring of 2004. We will also identify two other Mentees — one at the level of interaction with the public (e.g. an extension presentation to meet local needs), and one in industry/government (e.g. employee training programs).