

Southern Regional Soil Survey Conference

2010 New Technologies Committee Report

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Develop and document procedures, processes, and standards that will be used to integrate GIS, remote sensing, landscape modeling, and other similar technologies into the mainstream of the soil mapping and landscape inventory program.

1. Identify new inventory techniques that have emerged recently. Identify the strengths and weaknesses of these new techniques
 - a. VNIR
 - i. Strengths
 1. one each MRLA Region already
 - ii. Weaknesses
 1. Initial cost of modeling software is high
 2. Need to improve the penetrometer development with the use of Soil Probe
 - b. 3-D Scanners
 - i. Strengths
 1. Volume and various mathematical ratios fairly quickly
 2. Fairly inexpensive
 3. 3 D object
 - ii. Weaknesses
 1. Requires the more than the normal graphics card
 2. Low speed of scanning
 - c. Digitizing pens
 - i. Strengths
 1. Transfer lines directly to the computer
 2. Relatively inexpensive

- ii. Weakness
 - 1. Need special paper, which could be overcome, but do have to have a license to print the paper
- d. Digitizing screens (21 inch touch screen)
 - i. Strengths
 - 1. Increase production (up to 30%)
 - 2. More precise line placement
 - 3. Working with base map on screen
 - ii. Weakness
 - 1. Cost
 - 2. IT Support
- e. PXRF-hand held X-ray fluorescence useful especially heavy metal, gypsum
 - i. Strengths
 - 1. Elemental composition
 - 2. Trace elements and variability in the samples
 - 3. Particularly useful in urban settings
 - 4. Portability
 - ii. Weakness
 - 1. Initial Cost
 - 2. Less precise than lab methods, but can be calibrated
- f. TEUI Terrain Ecological Use Inventory-Statistical Application – Fortner
 - i. Strengths
 - 1. Good Statistical package
 - ii. Weakness
 - 1. Spatial package is weak
- g. PC Ordination Software-Cut time in clustering similar soils for a geographic area. (Interdisciplinary Forest Group) – Curtis Talbot
 - i. Strengths
 - 1. Statistical package
 - ii. Weakness
 - 1. Not well documented
 - 2. Other GIS packages such as ArcGIS can do the same thing
- h. R statistical software
 - i. Strengths
 - 1. As powerful as SAS or other statistical packages
 - 2. Free
 - ii. Weakness
 - 1. Issues with CCE certification because it is free
 - 2. Mainly command line driven
- i. SIE Application – Developed at Dartmouth University ArcGIS interface – Henry Ferguson, Daryl Kautz
 - i. Strengths
 - 1. Training available

2. Fast rather than Model Builder and ArcGIS
 3. Better Landscaping
 - ii. Weaknesses
 1. IT Certification-not a big problem
2. Identify potential new technologies to support field activities in the processing of existing digital spatial data
 - a. Maintain/Update Soils Applications before new operating systems are implemented
 - b. Garmin Map78 GPS (Map76 Garmin are no longer supported by Garmin)
 - c. Trimble or other less expensive (Pro XYZ) GPS which can use ArcPad software, PHAROS
 - d. Truly ruggedized tablet computers - New Toughbook
 - e. 1:24000 digital Geology layer
3. Identify new technologies and methodologies that can support and/or enhance digital soil survey activities
 - a. Elevation for the Nation (LiDAR Acquisition)
 - i. Develop a standard protocol for LiDAR and IFSAR acquisition
 - b. Develop Standard Terrain Derivatives
 - c. Develop Standard Models and document; Use a website for this information
 - d. Support 3rd party vendors in developing of Smartphone Soil Applications
 - e. National Soils Geographic Database including point and lab data
 - i. Storing NASIS, Lab and point data in one place.
 - f. Fully integrate spatial and tabular data
 - g. Gridded SSURGO
 - h. Create list of users and location of technology (expand on Doolittles geotechnical list)