Northeast Cooperative Soil Survey Conference

June 19-23, 2000

Newport News, Virginia

Inside

1 Agenda

2 Committee Reports

3 NRCS State and University Reports

4 Business Meeting

5 Technical Speakers

6 Field Tour

7 Mailing List

8 By-laws

9 1998 Proceedings

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Newport News, Virginia

The Northeast Cooperative Soil Survey Conference is held every two years with meeting locations rotating throughout the thirteen northeastern states. The participants of this conference are representatives of federal, state, and local agencies, universities, and private sector associations that are a part of the National Cooperative Soil Survey of the United States.

The year 2000 conference is hosted in the Tidewater Region of Virginia. In addition to committee work sessions, reports and speakers, there is a day long field trip planned for midweek of the conference where we will observe soils, land use, wetlands, cropping systems, soil restoration/mitigation sites.

Northeast Cooperative Soil Survey Region

Equal Opportunity Statement

Northeast Cooperative Soil Survey Conference
June 19-23, 2000
Omni Newport News Hotel, Newport News, VA

Monday June 19, 2000

Registration - Lobby of Omni Newport News Hotel, Newport News VA
9:00AM-12 Noon

Moderator David Kriz, State Soil Scientist, Richmond, VA

1:05 PM - 1:15 PM	Introduction & Welcome	NRCS Virginia Willis Miller
1:15 PM – 1:30 PM	Welcome to VA-- "Value of National Cooperative Soil Survey Effort in VA" James Baker, Virginia Tech, Blacksburg	
1:30 PM – 1:45 PM	Schedule of Events & Housekeeping	David Kriz
1:45 PM – 3:00 PM	Breakout Rooms for Committees-- Research Needs Soil Taxonomy SSURGO /Map Finishing Site Specific/High Intensity Mapping Hydric Soils	
3:00PM – 3:30 PM	Break	
3:30 PM – 5:00 PM	Committee Meetings continued	
5:30 PM – 7:00 PM	Social – Hospitality Room/ Poster Session	

Tuesday June 20, 2000

8:00 AM- 10:00 AM Committee Meetings

10:00 AM- 10:15AM Break

General Session--Technical Papers
David Harper, NRCS, VA Soil Scientist, Moderator

10:15 AM—10:40 AM	***Urban Soil-Dietary Risks*** Joyce Scheyer NSSC, Lincoln NE
10:40AM—11:00 AM	***Update on Sub Aqueous Soils*** Marty Rabenhorst, University of MD
11:00 AM—11:20 AM	***Anne Arundel Co Sulfate- Deep Special Study*** Marty Rabenhorst, University of MD
11:20 AM—11:40 AM	***Forest Soil Nutrient Cycling*** Steve Carpenter, NRCS, WV
11:40 AM- 12 Noon	***Wetland Restoration*** Peter Veneman, University of MA, Amherst, MA
12 Noon – 1:00 PM	Lunch

General Session--Technical Papers
Mark Van Lear, NRCS VA Soils Scientist, Moderator

1:00 PM – 1:45 PM	***SSURGO/Map Finishing Updates*** Mike Kortum, NCGC, NRCS, Ft. Worth TX Ken Lubich, NRCS Madison WI
1:45 PM—2:15 PM	***Soil QualityUse-Dependent Database*** Cathy Seybold, SQI, NRCS, Corvalis
2:15 PM –2:45 PM	***Precision Farming in Caroline Co, VA*** Henry Mount, NSSC, NRCS, Lincoln NE
2:45 PM—3:00 PM	***University Perspective—*** John Galbraith, Virginia Tech., Blacksburg VA
3:00 PM –- 3:30 PM	Break

General Session--Technical Papers
Barrie Wolf, NRCS , VA Soil Scientist, Moderator

3:30 PM –4:00 PM — ***Soil Survey Update—County Perspective***
Danny Hatch, Fauquier Co. VA
Alex Blackburn, Loudoun Co. VA

4:00 PM—4:20 PM — ***Wetlands Institute***
Leander Brown , WI, NRCS, Laurel MD

4:20 PM—4:40 PM — ***Ecto-mycorhyzial Fungi Mantles as an Indicator of Drained Hydric Soils***
Bruce Vasilas, Lenore Vasilas, Al Rizo, University of Delaware

4:40 PM—5:00 PM — ***National Society of Consulting Soil Scientists--Viewpoint***
Donn Smith, Manassas VA

5:00PM – 5:30 PM Instructions for Field Tour

Wednesday June 21, 2000

Meet buses at Omni Newport News Hotel at 8:00 AM. Lunch will be provided with the field trip.

8:00 AM – 5:00 PM — Virginia Coastal Plain and Tidewater Soil Survey Field Tour

6:00 PM--7:00 PM — Manager's Special Upstairs Bistro at the Hotel

Thursday June 22, 2000

8:00 AM – 9:00 AM — Break Out Session--
NEC-50
NRCS

General Session
Dabney Eastham, NRCS, VA Soil Scientist, Moderator

9:00 AM – 9:15 AM — NEC-50 Break out Report

9:15 AM – 9:30 AM — NRCS Break Out Report

9:30 AM – 9:45 AM	Silver Spade Award – Pete Veneman, UMA
9:45 AM – 10:15 AM	Break
10:15 AM – 10:30 AM	Committee #1 Report –Research Needs
10:30 AM –10:45 AM	Committee #2 Report – Soil Taxonomy
10:45 AM- 11:00 AM	Committee #3 Report – SSURGO/Map Finishing
11:00AM – 11:15AM	Committee #4 Report –Site Specific/High Intensity Soil Survey, NCSS Standards
11:15 AM – 11:30 AM	Committee #5 Report – Hydric Soils
11:30 AM – 11:45 AM	Committee Reports Questions and Discussion
11:45 AM – 12:00 Noon	MRLA Offices (12, 13, 14) Report- Regional Issues
12:00 Noon – 1:00PM	Lunch
1:00 PM – 1:30 PM	NE Cooperative Soil Survey Conference Business Meeting Maxine Levin, NENCSSC Steering Team Chair
1:30 PM – 1:50 PM	Horace Smith, Division Director, NRCS, Washington DC "Soil Survey Priorities for the New Millennium" Response to questions from business meeting
1:50 PM – 2:00 PM	Instructions for Field Trip & evening Cookout Banquet **Meet at Buses at 2:00 PM**
2:00 PM – 5:30 PM	Field Tour- Virginia Tidewater HGM sites
6:00 PM – 10:00 PM	Cookout Banquet, Ft. Story Virginia Beach Buffet dinner served at 6:45-7:45 PM

Friday June 23, 2000

8:00 AM – 10:00 AM	Submit Reports for Compilation of Proceedings NRCS State and University Reports Committee Reports Technical Speakers Break Out Sessions Business Meeting

Northeast Cooperative Soil Survey Conference, YR2000 Committees

Committee 1: Research Needs

Chair: Joyce Scheyer NSSC, Lincoln NE
Vice Chair: Ray Bryant, Professor, Cornell University, Ithaca NY

Members:
Harvey Luce, Professor, University of Connecticut, Storrs CT
Richard Shaw, Project Leader, NRCS, Annandale NJ
Jim Brown, State Soil Scientist, NRCS, Annapolis MD
Mary Beth Adams, USFS Representative, Parsons WV
Steve Carpenter, NRCS MO13
(Support: Steve Fischer, MO 12 NRCS Amherst MA)
Anthony Jenkins, NRCS, Fayetteville WV

The major goal of the committee is to improve communication of soil survey research needs and activities in the NE Conference area within the NE NCSS at all level.

Committee Charges:

Update and document progress on ongoing committee charges:

1. Identify, document and prioritize the critical research for soil survey in the NE
2. Identif500(I)(l.)(e)5(n)1wt aS ammi1w r

Northeast NCSS Research Needs Committee
Committee 1 Report: June 2000

The Research Needs Committee Members Are:
Chair: Dr. Joyce Scheyer, NSSC, Lincoln, NE
Vice Chair: Dr.Ray Bryant, Cornell University
Members: Prof. Harvey Luce, UCONN; Dr. Richard Shaw NRCS NJ;
Jim Brown, NRCS, MD; Dr. MaryBeth Adams, USFS, WV;
Steve Carpenter, NRCS, MO-13
Support: Anthony Jenkins, SSPL, WV; Steve Fischer, SDQ Specialist, MO-12
On-site Participants: Dean Cowherd, NRCS MD; Dr. John Galbraith, Virginia Tech;
Dr. Laurie Osher, U Maine

Major Discussion Topics (with written input from Fischer and Shaw)

* Soil Phosphorus
* Soil Carbon Inventory and Dynamics
Scaling of Data:
Accessibility to Data
Forest Soil Nutrient Cycling
Anthropogenic Impacts on Soils
Regulated Materials
Soil Characterization to Support Soil Survey Updates
* Morphological Indicators of Paleo-water table levels
Application of Soil Databases
Precision Soil Management

* see proposal below for this topic

Recommendations: Research Needs

Provide summaries of Research Needs using a template suitable for preliminary funding proposals from various sources.
Encourage technical presentations on topics listed as research needs for the 2001 National NCSS Meeting and the 2002 Regional NCSS Meetings.

* The following Research Need Summaries were submitted at the meeting by the Northeast Research Needs Committee 2000: Dr. Joyce Scheyer, Dr. Ray Bryant, Stephen Carpenter, Dean Cowherd, Dr. John Galbraith, and Dr. Laurie Osher

- Characterizing Soils to Determine Threshold Level of P sorption
- Quantification of Soil Organic Carbon Storage and Estimation of Carbon Storage Potential (CSP)
- Hydrologic Indicators in Soils

Characterizing Soils to Determine Threshold Level of P Sorption

Purpose: To mprove management of phosphorus in animal and municipal wastes
Area of Emphasis: Nationwide

Project Description: Threshold Behavior of Phosphorus Sorption in Soils:
Extraction Procedures provide thresholds for differentiating among soils.
Acid-glacial parent materials or Al-controlled soils may behave similarly.
Soils can be stratified by MLRA, Parent Material, surface properties.
Develop soil groupings based on threshold values, Ca, Fe, and Al content.
Soil organic carbon dynamics influence P sorption and need to be measured.
Relate results to published EPA threshold of 30% (water soluble P)
Compare P methods: CaCl2 extraction (WV), Morgan's, Mehlich-3, and Bray-P

Expected Results and Experimental Design:
Sample in Catenas of similar parent materials with varying P content (based on management history).
Evaluate different methods to measure P including soluble P and bio-available P using resin strips).
Test for associated soil properties: organic carbon (OC), cation exchange capacity (CEC), pH, complete soil chemistry, particle sizes, aggregate stability.

Resources for Completion: Two Years - $2 Million

Contacts: Dr. Ray Bryant, Cornell (for further write up) or Steve Carpenter, NRCS
Submitted by: Northeast NCSS Research Needs Committee

Quantification of Soil Organic Carbon Storage and Estimation of Carbon Storage Potential (CSP)

Purpose: To assist decision-makers in setting carbon credits based on environmental as well as political boundaries. Criteria will provide information for conservation of natural resources (i.e. own congressional districts)
Area of Emphasis: Nationwide

Project Description: Soil Organic Carbon Storage
Study soil C dynamics of land use change to soil depths of 20 cm, 1 meter, or greater based on pedogenesis
Improve estimation of existing SOC storage on different soils
Link ecological surveys w/ underlying soil properties (on sites of varying SOC)
Develop method to partition C storage in plant biomass with soil C on a volumetric basis (interagency)
Stratify by MLRA
Link to NRI for baseline data

Expected Results and Deliverables: Quantification of Soil Organic Carbon (SOC)
Matrix of soils and land management practices to predict carbon storage potential (CSP).
Regional and national level improvements to existing computer models (such as CENTURY) using existing soil survey data.

Resources for Completion: Five years - $8 Million

Primary contacts: Dr. Laurie Osher, University of Maine; Steve Carpenter, NRCS
Submitted by: Northeast NCSS Research Needs Committee

Quantifying and Qualifying Hydrologic Indicators in Soils

Purpose: Measure and monitor wetland functions to improve understanding of the relationship between USDA National Hydric Soils Field Indicators, wetland functions according to the USArmy Corps of Engineers Hydrogeomorphic (HGM) wetland model, and other soil properties and soil hydrology. Fill gaps in the hydromorphologic knowledge base and site property database for all soil series that occur in wetlands.

National Emphasis and Priority: Identification, restoration, creation and enhancement of wetlands to comply with Section (404) of the Clean Water Act and Food Security Act other federal programs associated with nutrient cycling, carbon sequestration, wetland inventory, wildlife habitat, rare and endangered plants, and water quality.

Project description: Hydrologic Indicators

Inventory current research studies and surveys and compile the results according to HGM wetland type (URL http://itre.ncsu.edu/cte/hgm_print.html). Set up long-term (5 year) measuring and tracking (monitoring) of hydrologic changes and environmental conditions in unstudied wetland soils, with paired sites in disturbed and undisturbed reference areas.

Conduct studies to correlate hydrology and site properties to allow extrapolation of results to similar but un-instrumented areas. Test and verify hydric soil indicators by Major Land Resource or Soil Survey Division Region with special emphasis on floodplains and problematic (dusky red, bright yellow, and dark gray/black) parent materials that have wetland hydrology yet do not exhibit hydric soil morphology. Measure and track hydrology dynamics in representative soils to distinguish current from relict redoximorphic features.

Expected Results and Deliverables:

A refined water table record by HGM wetland type and NRCS soil series including maximum and minimum height, seasonal occurrence, and duration. Sets of morphologic indicators for each type of wetland and for all associated soil series that indicate hydrologic dynamics.

Beficiaries include regulators of wetland use and management. Organizations such as The Nature Conservancy, USDA, and USFWS that restore and mitigate wetlands voluntarily. Organizations and individuals that must comply with federal regulatory policies. Organizations responsible for enforcing federal regulations concerning use and management of wetlands. Policymakers who determine federal regulatory programs and funding. Planners who design wetlands and stormwater retention basins in nonhydric uplands soils.

Reference sites include: Wetland Science Institute (URL http://www.pwrc.usgs.gov/wli/)

- USArmy COE HGM - (URL http://www.wes.army.mil/el/wetlands/wlpubs.html)
- Penn State University Cooperative Wetlands Center (URL http://www.cas.psu.edu/docs/CASDEPT/FOREST/wetlands/cwchome.htm)
- Society of Wetland Scientists (URL http://www.sws.org/)
- FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES (URL http://www.statlab.iastate.edu/soils/hydric/fieldind/fieldind.html)

Resources for Completion: Two years literature review, data compilation, and site setup time, then five years of monitoring, and one year of analysis and reporting. $7 Million.

Contact: Dr. John Galbraith, Virginia Tech
Reviewed by: Mid-Atlantic Hydric Soils Committee
Submitted by: Northeast NCSS Research Needs Committee

Discussion Notes on Additional Research Needs Topics

Scaling of Data

Example is small wetland Histosols that ofgten are lost in the mapunit
Note that Soil Science Society of America Journal now requires taxonomic unit ID

Accessibility to Data

Linking research data to mapped series
Web site links would be good for monoliths and research data on similar soils

Forest Soil Nutrient Cycling

Ca, Mg, and Al saturation (some study funded by Forest Service)
Links to soil organic carbon
Link to water quality and stream quality data
Impacts of pollution on forest health/production/regeneration
Shallow soils with diagnostic horizons near the surface:
    Example of Suncook Spodosol under tillage becoming an Inceptisol

Anthropogenic Impacts on Soils

Properties, interpretations, and correlation
Highway udorthents-smooth commonly used

Regulated Materials

Background concentrations of metals, phosphorus, and other materials are needed
Driving force for research is funding and politics, not scientific thresholds

Soil Characterization to Support Soil Survey Updates

Ongoing basic genesis research for characterization
Vertisols and Vertic subgroups
CEC activity groups
Glauconitic soils
Soil compaction under various land uses including urban
Fragipans and argillic horizons
Andic properties in Cryic soils at high elevations

Application of Soil Databases

Digital SSURGO data going out to counties for planning
How do you produce an interpretation for a complex map unit when named soils and/or inclusions rate out differently?
Minzenmeyer's booklet on aggregating data is available
Example: shrink-swell location in a map unit
Need geostatisticians to model anad develop a template for examination of 1-2 critical properties as spatial variability. A deeper layer of GIS.
Public education

Precision Soil Management (PSM)

Guidance from NRCS is needed on applications of high-tech tools such as GPR, portable XRF metal and organic detectors, Hyperspectral data, magnetic resonance (EM meter).
Example: McLeese prototypes.
What information from Order 2 soil surveys is useful for the transition?
Be able to defend our own product and assist with PSM objectives.
Develop standards for Order 1 mapping

Northeast Cooperative Soil Survey Conference, YR2000 Committees

Committee 2: Soil Taxonomy

Chair: Bob Engel , Soil Taxonomy, NSSC Lincoln NE

Members:

Ned Ellenburger, Project Leader, Bedford PA
David Kingsbury, MO 13 Corelator, NRCS, Morgantown WV
Peter Veneman, Professor, University of Massachusetts, Amherst, MA
Mark Stolt, Professor, University of Rhode Island, Kingston, RI
Bruce Thompson, MO Leader 12, NRCS Amherst MA
Stephen Carpenter, MO Leader 13, NRCS Morgantown WV
Roy Vick, MO Leader 14, NRCS Raleigh NC

The goal of the Soil Taxonomy Committee is to:

1. Sponsor and coordinate Soil Taxonomy workshops.
2. Sponsor proposals.
3. Look over proposal or changes in Soil Taxonomy in detail.

Proposals are sent to the National Soil Survey Center, Soil Taxonomy section and then distributed to all 4 regional committees and all the State Soil Scientists. It is up to the State Soil Scientists to distribute soil taxonomy proposals and changes to any other state or university cooperators.

Committee Charges:

1. Follow up on Taxonomy proposals of 1998-2000.
2. Identify and prioritize Regional Soil Taxonomy and correlation issues as recommendations for action by MLRA offices 12, 13, &14.
3. Proposal recommendations to Research Needs Committee for analyzing data support for Soil Taxonomy issues.

Northeast Cooperative Soil Survey Conference, YR 2000 Committee
June 19-20, 2000

Committee 2: Soil Taxonomy Report

Participating Members

- **David Kingsbury – MO 13, Morgantown, West Virginia**
- **Peter Veneman – University of Massachusetts, Amherst, Massachusetts**
- **Bruce Thompson – MO 12, Amherst, Massachusetts**
- **Roy Vick, MO 14, Raleigh, North Carolina**
- **Ned Ellenberger – Bedford, Pennsylvania**
- **Henry Mount – Chair, NSSC, Lincoln, Nebraska**

Barrie Wolf from Hot Springs, Virginia also participated in the discussions.

Charges

1. **Follow up on taxonomy proposals of 1998-2000.**
2. **Identify and prioritize regional soil taxonomy and correlation issues by MLRA offices 12, 13, and 14.**
3. **Propose recommendations to Research Needs Committee for analyzing data support for soil taxonomy issues.**

Proposals Reviewed

We examined 15 proposals from around the country to change soil taxonomy. Six of these proposals do not impact soil survey activities in the Northeast region. Four additional proposals and suggestions were brought before the committee.

Follow-up Items

1. **A carryover proposal from the previous work planning conference in Bangor, Maine was to change the keys to mineralogy so that soils with isotic mineralogy key out after soils with micaceous or paramicaceous mineralogy. <u>This was integrated into the keys for mineralogy classes in the 2nd edition of Soil Taxonomy</u>.**
2. **Maryland has proposed Subaquic subgroups to great groups of Entisols. Five new subaqueous soil series are now out for peer review.**
3. **A proposal has been initiated from the MO office in Indianapolis to change the criteria for spodic subgroups. The specifics of this proposal need to be distributed to states in the Northeast.**
4. **A proposal by Minnesota requests that the keying order be changed for great groups of Mollisols. It is proposed that the keying order (in part) be aquic, oxyaquic, and pachic subgroups. Previously, the keying order was pachic, aquic, and then oxyaquic.**
5. **Proposed revisions to the criteria for the glauconitic mineralogy family (20% pellets) need to be considered. This entails identifying glaucanite in the silt and clay fractions as part of the criteria. This will impact soils in New Jersey and Maryland if not approved.**

6. **The Indianapolis MO has proposal to add Oxyaquic Arenic subgroups to Hapludalfs. If added to Hapludalfs, it should be added to Hapludults. The keys as presently defined could impact changes in series concepts and correlation activities for MO 14.**
7. **There is another fragipan/densic materials proposal under consideration. Vermont submitted this proposal.**
8. **It was verbally suggested the definition for densic materials be modified and that densic material criteria for slaking in water should not apply to materials weathered from bedrock.**
9. **MO13 formally proposed to change the name of andic subgroups in MLRA 130 to amorphic subgroups. This was originally proposed during 1992.**
10. **There was a committee request to revise the Rhodic criteria for to Ultisols mirror those of the Alfisols as specified in the 2nd edition of Soil Taxonomy.**
11. **The taxonomy committee requested that the new master horizons and subordinate distinctions for anthropogenic soils be distributed to all our NCSS clients.**
12. **Activity classes are causing some concern in the Northeast. For instance, laboratory data for the Paxton soil shows three different activity classes. The inference of activity classes for new soils cannot be applied uniformly. While changes in soil taxonomy have been good, the impact of some changes, i.e., activities classes, have not been fully thought-out prior to the implementation phase.**
13. **The Haplumbrepts and Dystrochrepts great groups have been combined into Dystrudepts in soil taxonomy. Consequently, Haplumbrepts now key out as humic subgroups of Dystrudepts. However, soils that once keyed out as Umbric Dystrochepts now key out as Typic Dystrudepts. The recognition of Umbric Dystrochrepts are now lost. The umbric nature of these soils are now series criteria. While this change is causing some problems in both the west and east, it will not likely change in the near future unless a new subgroup is proposed. One thought would be to call the thin umbric soils as the Humic subgroups and Dystrudepts that have more than 25 cm of umbric epipedons would be called Umbric subgroups.**
14. **No items were proposed as recommendations to the Research Needs Committee for analyzing data support for soil taxonomy issues**

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HENRY R. MOUNT
Soil Scientist
NSSC – Lincoln, Nebraska

Attachment:

SOIL TAXONOMY

Bob Engel & Henry Mount

The Keys to Soil Taxonomy were published in 1998 and the Second edition of Soil Taxonomy was published in 1999. Since then we have made no revisions to these documents. We have had, in effect, an unofficial moratorium for the past two years. We have, however corrected some errors. The corrected documents along with a listing of the errata are posted on the NSSC web site.

During the last two years we concentrated on updating the soil classification database. Many of the pedons with laboratory data (SOI-8 forms) and of the official series descriptions (OSD's) have been updated. Many of the MO areas have most or all of the classifications updated. This project is continuing, but has slowed this year because of limited travel funds.

During that period many requests for improvements to Soil Taxonomy have been received. We are planning to start sending these requests out for review. The staff dedicated to working on taxonomy at the National Soil Survey Center is now down to one person. Until the staff is increased the preparation and distribution of amendments for review and finalization of amendments will be slower than in the past.

Taxonomy updates awaiting action:

The Bismarck North Dakota MO staff requests these additions.

> A proposal to add several subgroups that were used in the great group of Borolls prior to the great group being deleted. Some of these subgroups were added to Udolls, but not Ustolls.
>
> The great group Dystrustepts is of larger extent than expected. The great group needs several new subgroups for use in the Bismarck North Dakota MO.
>
> A proposal to add udic subgroups to several frigid Ustolls, mostly in South Dakota, that were Udic Borrolls.
>
> A proposal to change the color criteria of aquic Hapludolls.

A proposal from the Northeast and MO 14 to add subaquic subgroups to several great groups of Entisols, mostly in Maryland, that are permanently under water. Similar taxa also are being considered in Texas.

A proposal from St. Paul MN on changing the keying order of the aquic, oxyaquic, and pachic subgroups. The keying order of these subgroups is inconsistent among the great groups of Mollisols. The order in the more recently added great groups is aquic, oxyaquic, and pachic in that order. Originally pachic was keyed first. When the oxyaquic subgroups were added the hope was that they would identify all soils with a water table within a meter of the surface that failed other aquic criteria.

The following proposals are from the MO office in Indianapolis IN.

> Travis Neely provided documentation showing that several soil series that were classified as spodic subgroups failed to meet the new criteria. They recommend the spodic subgroup criteria be changed
>
> The addition of an Arenic Oxyaquic subgroups to Hapludalfs.
>
> From Don Franzmeier, Purdue University
>
> In Indiana and other states dense glacial till, usually designated as Cd horizons, qualifies as a fragipan according to the current definition. The two kinds of horizons differ significantly, however. To separate the two kinds of horizons, Don proposes that the definition of a fragipan include the clause, "It has a neutral or acid reaction (pH <7.3)"
> [Don has agreed to change the proposal to “It is not effervescent”.]

Stephen Gourley sent a detailed report of a Northeast Fragipan Study. His proposal concludes that the definition of evidence of pedogenesis in the fragipan definition is too broad. He asks that structure and redox features be removed from the evidence of pedogenesis.

Tom Hahn MO 6, Lakewood CO, called our attention to the fact that Cryepts could be less than 25 cm deep. Thus we propose to add the underlined text to the definition of Eutrocryepts.

KCA. Cryepts that have one or both of the following:

1. Free carbonates within the soil; or

2. A base saturation (by NH4OAc) of 60 percent or more in one or more horizons between 25 and 75 cm from the mineral soil surface or immediately above a root limiting layer if at a shallower depth.
Eutrocryepts, p.

Del Fanning, Maryland and MO 14 Raleigh, NC proposed revisions to the glauconitic mineralogy family.

MO 9, Temple TX proposed adding a Crd horizon designation for bedrock that slakes in water (densic material).

Joe Chiaretti MO 3, Reno, NV proposes adding an oxyaquic subgroup to Torripsamments.

A proposal from MO 13 Morgantown WV to change the name of the andic subgroups in the Appalachian Mountains to amorphic subgroups.

The following class was requested by Hari Eswaren for use in Thailand. No supporting information was provided.

FAA. Aquerts that have within 100 cm of the mineral soil surface: either

A sulfuric horizon; or Sulfidic materials.
Sulfaquerts, p. 245

Sulfaquerts

These are the acid sulfate Aquerts (cat clays). They are extremely acid and toxic to most plants if have been drained and oxidized. They are mostly dark gray and have straw-colored mottles of iron sulfate (jarosite) within 100 cm of the soil surface. They are mainly in coastal marshes near the mouths of rivers that carry sediments that are free of carbonates or have low carbonate content. They generally contain an appreciable amount of organic carbon. They are only known to occur in Thailand. Most of these soils support a sparse stand of acid and water tolerant plants. A few areas are used for rice production.

Northeast Cooperative Soil Survey Conference,
YR2000 Committees

Committee 3: SSURGO/Map Finishing

Chair: Bruce Stoneman, NRCS Richmond VA

Members:
Debby Anderson, MO14, NRCS Raleigh NC
Lindsay Hodgman, NRCS, Orono ME
Steve Indrick, NRCS, Syracuse NY
Ronnie Lee Taylor, NRCS, Somerset NJ
Jim Ware, NRCS, Washington, DC
Ken Lubick, NRCS, Madison WI
Kathy Swain, NRCS, Concord NH
Mike Schramm/Tommy Parham, NCGC, Ft. Worth
Rick Day, Pennsylvania State University, University Park, PA
Caroline Alves, NRCS, Williston VT
Barbara Alexander, NRCS, Storrs CT
Darlene Monds, MO13, NRCS, Amherst, MA
Tim Prescott, MO13, NRCS, Morgantown WV
Charles Delp, NRCS, Summerville, WV

This committee has been in place since the 1994 NE NCSS Conference. The goal of this committee is to continue to communicate between NE NCSS cooperators on development of SSURGO and GIS products within the Northeast.

Committee Charges:

A. Discuss and formulate consensus on questions that were proposed at the 1998 NE Conference Meeting of the committee:

1. Evaluate the best formats for data distribution. With GRASS being phased out, if DLGs are continued as the format of choice, is it necessary to have separate attribute files for the labels?
2. Which states and Digitizing Units have been the most successful in producing SSURGO data? What are they doing right?
3. Is it possible for the Digitizing Units to write our IDI-Gs and let SSURGO data producers submit ARC/INFO overages (in order to maximize the number of surveys certified)?
4. Should we be archiving data by quad? By county? Both?

5. How do we update the SSURGO maps when error are found? Should this be done on a quad basis rather than re-certifying the entire county? Should each quad have a date of the last edit performed?
6. How do we provide digital soils data to FSA? When do they want to have data on a countywide basis? Is this our responsibility?

B. Review recommendations from 1998 NE Conference Committee meeting. Are there recommendations that need further consideration?
C. How are map finishing problems being addressed in the NE Region and what further suggestions can be made to solve problems?
D. What further training is needed in the NE as related to SSURGO and map finishing?

Northeast Cooperative Soil Survey Conference, YR2000

Committee 3: SSURGO/Map Finishing Report

Chair: Bruce Stoneman, NRCS Richmond VA

Members:
Debby Anderson, MO14, NRCS, Raleigh, NC
Steve Indrick, NRCS, Syracuse, NY
Ronnie Lee Taylor, NRCS, Somerset, NJ
Ed White, NRCS, Harrisburg, PA
Mark Van Lear, NRCS, Rocky Mount, VA
Ken Lubick, NRCS, Madison, WI
Mike Kortum, NRCS, NCGC, Ft. Worth, TX
Tim Prescott, MO13, NRCS, Morgantown, WV
Charles Delp, NRCS, Summerville, WV

This committee has been in place since the 1994 NE NCSS Conference. The goal of this committee is to continue to communicate between NE NCSS cooperators on development of SSURGO and GIS products within the Northeast.

Committee Charges:

E. Discuss and formulate consensus on questions that were proposed at the 1998 NE Conference Meeting of the committee:

7. **Evaluate the best formats for data distribution. With GRASS being phased out, if DLGs are continued as the format of choice, is it necessary to have separate attribute files for the labels?**

Although archiving will continue with the DLG format, ARC coverages and export files are now also being archived and are available on the NCGC ftp site. At the national level, there are ongoing discussions as to whether Arc View shape files might also be archived.

8. **Which states and Digitizing Units have been the most successful in producing SSURGO data? What are they doing right?**

All digitizing units are now certifying and creating archive files. They all now have the capability to accept data in various formats. The digitizing units have annual meetings where new ideas and methods are shared.

Some states have partnerships with state agencies and others to do digitizing. They have contacted digitizing units to find out what quality control items they can run on the data before submitting it to the digitizing unit. This has resulted in higher quality data.

Map compilation is still somewhat of a bottleneck in the process. There is a need for continued training.

9. **Is it possible for the Digitizing Units to write our DLGs and let SSURGO data producers submit ARC/INFO overages (in order to maximize the number of surveys certified)?**

Yes, most digitizing units will accept data as Arc coverages.

10. **Should we be archiving data by quad? By county? Both?**

The current archive routine creates Arc coverages and export files for both quads and whole survey area. This should be continued to serve various users.

11. **How do we update the SSURGO maps when error are found? Should this be done on a quad basis rather than re-certifying the entire county? Should each quad have a date of the last edit performed?**

Contact the digitizing unit with corrections. Since we are archiving both quads and the whole survey area, we will need the re-certify both. The metadata should show which quad was corrected and the date. It would be nice if we could update the tabular data (MUIR) separately from the spatial data

12. **How do we provide digital soils data to FSA? When do they want to have data on a countywide basis? Is this our responsibility?**

Both quads and countywide (soil survey area) data are available on the NCGC ftp site.

F. Review recommendations from 1998 NE Conference Committee meeting. Are there recommendations that need further consideration?

The first five recommendations in the following recommendation section are carried forward from the previous committee. They have been slightly modified. All other recommendations from the previous committee were discussed and deemed essentially complete.

G. How are map finishing problems being addressed in the NE Region and what further suggestions can be made to solve problems?

A few states are doing their own digital map finishing. Digital map finishing sites have been created and are just getting set up and are working on the first few surveys.

H. What further training is needed in the NE as related to SSURGO and map finishing?

Continued training is needed in map compilation, especially on project soil surveys with people who have not done it recently.

Continued training is needed for digital map finishing. States need to work with the digital map finishing sites to provide them what they need.

Training is needed on using the spatial and tabular data together. Training is needed from the perspective of basic soil services to provide information to others and from the perspective of how can we use the data ourselves to assist in mapping and correlation.

Recommendations

1. NCGC should provide guidelines as to what tolerances should be used in ARC/INFO for fuzzy, dangle, weed, grain, nodesnap, snap, and precision. They should also discuss the advantages and disadvantages of various tolerances. They should similarly provide guidelines, advantages and disadvantages for scan resolutions and thinning vs. smoothing in LT4X.

2. Create a new “Compilation Technical Specification” booklet that is geared towards creating digital data.

3. NSSC should provide courses and training materials in the use of spatial and tabular data both for basic soil services and also soil survey activities such as mapping and correlation.

4. NCGC should amass all information on ArcScan and other digitizing software packages and provide procedures to produce SSURGO soils data.

5. Improve the data delivery to internal and external GIS data users who are confused by the current tabular data.

6. NSSC should provide guidance and tools to find and populate the numerous null values that resulted from moving data from SSSD to NASIS.

7. There needs to be a clearer definition of the official copy of the soil survey. It needs to consider the edits in both the spatial and tabular data in SSURGO.

8. NCGC should modify the current SSURGO archive aml’s to have an option for just updating the spatial or tabular data.

9. This committee should be continued, but with an emphasis on using SSURGO data rather than creating it.

Northeast Cooperative Soil Survey Conference, YR2000 Committees

Committee 4: Site Specific Soil Survey/High Intensity Soil Survey, NCSS Standards

Chair: Steve Hundley, State Soil Scientist, Durham NH
Vice Chair: Mark McClain, National Society of Consulting Soil Scientists(Alternate Donn Smith)

Members:

Chris Evans, University of New Hampshire, Durham NH
Russ Briggs, NY State University, Syracuse, NY
Danny Hatch, VA Association of Professional Soil Scientists, Warrenton, VA
Shawn McVey, NRCS Storrs CT
Bill Jokela, University of Vermont, Burlington VT
Norman Kalloch, NRCS, Bangor, ME
Henry Mount, NSSC, Lincoln NE
John Davis, NRCS Beltsville MD
Mark Alley VPI&SU, Blacksburg, VA
Mike Lynn, SMAPS, Manassas VA
Jim Doolittle, NSSC, NRCS, Newtown Square, PA
Ed Ciolkosz, Pennsylvania State University, University Park, PA
Mark Crouch, MO14, NRCS Richmond VA
Roy Pyle, MO13, NRCS, Morgantown WV
Tyrone Goddard, NRCS, Syracuse, NY
Everett Stuart, NRCS, Warwick RI
Cathy Seybold, SQI, NRCS, Corvalis OR

The goal of this committee is to increase communication and knowledge of site specific/high intensity soil mapping. There has been some activity in the Northeast in establishing standards for site specific/high intensity soil mapping as well as research in its application.

Committee Charges:

1. Formalize Guidelines for NE. How do these guidelines compare with those of the National Society of Consulting Soil Scientists?
2. Consult with legal advice to determine if there is a boundary between order 1 soil surveys and site specific investigations.
3. What needs do consulting soil scientists and university soil scientists have with interpretations of site specific/high intensity soil mapping? What are the interpretations that address the needs of other disciplines?
4. How can NASIS address these interpretation needs with interpretation modules?
5. What are the most recent technology tools for high intensity mapping? (Consult with Jim Doolittle before the conference.)

Year 2000 - Northeast Cooperative Soil Survey Conference
June 19-23, 2000
Newport News, VA

<u>Technical Committee #4:</u> Site-Specific Soil Survey/High Intensity Soil Survey/NCSS Standards

Chair: Steve Hundley, State Soil Scientist, Durham, NH
Committee members present:

Steve Hundley, NRCS, Durham, NH
David Kriz, NRCS Richmond, VA
Donald Parizek, NRCS, Windsor, CT
Roy Pyle, NRCS, Morgantown, WV
Phillip Cobb, VaTech, Staunton, VA
Gary Whitley, VaTech, Fincastle, VA
David Harper, NRCS, Lawrenceville, VA
Willis Miller, NRCS, Richmond, VA
Cathy Seybold, NRCS, Soil Quality Institute, Corvallis, OR
Pam Thomas, VaTech, Blackburg, VA
Norm Kalloch, NRCS, Orono, ME
Marc Crouch, NRCS, Richmond, VA
Alex Blackburn, Loudoun Co. VA
Danny Hatch, Fauquier Co. VA

Committee Charges from the Soil Survey Division:

1. Formalize guidelines for the Northeast. How do these guidelines compare with those of the National Society of Consulting Soil Scientists?
2. Consult with legal council on advice to determine if there is a boundary between Order 1 soil surveys and Site-Specific investigations.
3. What needs do consulting soil scientists and university soil scientists have with interpretations of site-specific/high intensity soil mapping? What are the interpretations that address the needs of other disciplines?
4. How can NASIS address these interpretation needs with interpretation modules?
5. What are the most recent technology tools for high intensity mapping?

Committee Charges from the National Soil Survey Center:

6. The NASIS work group at the NSSC has indicated that consulting soil scientists can get a NASIS login to supplement their high intensity onsite needs with generated interpretations. Are there any NASIS gurus in the consulting soil scientist profession? Is anybody taking advantage of this opportunity?
7. As of now, NCSS Order 1 standards (NSSH Part 655.04) are generic and intended to transcend all land uses. Should Order 1 soil survey standards be the same for research, precision farming, high intensity investigations, woodland productivity, etc?

Introduction by Steve Hundley:
National Cooperative Soil Survey, Site-specific soil mapping standards have been in use in New Hampshire since 1994. They have been endorsed by the NRCS Soil Survey division. They have been written into New Hampshire state land-use legislation and town ordinances and the New Hampshire Office of State Planning has published a guidance document for town planning boards to use concerning the need and application of Site-specific soil mapping standards. They are the required mapping standards for consulting soil scientists in New Hampshire and have been applied successfully for the past 6 years.

The National Cooperative Soil Survey needs to be more pro-active in establishing uniform standards across the country; otherwise we could end up with 50 different standards for each state. The NH/VT standards has established some boiler plate standards and recognize a state supplement for NH and VT where specific criteria is recognized, specific to each state.

Steve is suggesting this committee support the drafting of a white paper that addresses the issue of site-specific soil mapping standards with specific recommendations to be submitted to the Soil Survey Division requesting a response.

Discussion:
The correlation procedures, and state legend development in New Hampshire may not work in other states. Virginia, for example, has a series legend about 4 or 5 times larger than New Hampshire and Virginia does not have a state-wide legend to work from. The workload to manage a legend for soil consultants to use would be enormous.

The NRCS in New Hampshire provides training in NCSS standards as part of an MOU with the State board of Certification. Maine also provides training in NCSS standards to private soil consultants. In other states, where no MOU exists, or CEU's are not required, there is no mechanism to see that training is provided.

Maine has had high intensity soil mapping standards in place since 1985. Their standards have been written into state legislation. They have been very successful. Very difficult to conform to NH/VT standards without causing major political upheaval. Maine sees no practical advantage to switch to "new standards". Drainage class interpretive limits is one example. Maine has established criteria, in place for many years, written into state land use regulations. Attempting to change drainage class interpretive limits would be catastrophic.

Even though the NSSC is making NASIS available to soil consultants, no-one is aware of any consultant taking advantage of this opportunity. Steve believes the complexity of NASIS and unfriendly nature of the program will keep consultants away for a long time. Steve mentioned NASIS has the capability of performing a core dump of attribute data into an excell spreadsheet. This data is easy to use and manipulate and is being made available to private consultants. The consultants are very happy with retrieving NASIS data in this manner.

The attribute data in NASIS is satisfying most of the needs of the private consultant. The most significant attribute asked for, that is currently available, is background levels of heavy metals in parent material. Virginia is working on collecting some of this data, as is Pennsylvania. It is a massive workload.

Order 1 mapping Vs Site-Specific mapping. The term Order 1 is an NRCS in-house term used to describe 1 of 5 different levels of mapping precision provided by the National Cooperative Soil Survey. "Site-Specific" is a generic term used by the private consultant, the academic sector, and others to describe high intensity mapping of soil resources. For the NH/VT soil mapping standards, the terms are synonymous, because the site-specific standards conform to the standards of the NCSS, referred to as Order 1. Other types of soils mapping for site-specific interpretations may not necessarily conform to NCSS standards. The two terms should not necessarily be used interchangeably. The VA county soil scientists have a different view of the definition of site-specific. The mapping of Farquier co. at a scale of 1:2,400 is considered an Order 1 survey, but it is far from being considered "site-specific". Site-specific should refer specifically to those surveys that are at a sufficient level of precision to make site-specific land use decisions, such as septic system placement or home construction. The site-specific soil mapping standards in New Hampshire cover all mapping from a scale of 1;12,000 and larger. Doing a soil survey at a scale of 1:12,000 for the forestland application of municipal sludge is considered site-specific for the purpose in which the mapping is intended to be used.

There was discussion that Order 1 mapping as defined by the National Cooperative Soil survey should always produce a multi purpose product. Whereas, a site-specific map is produced for a specific need and intended use, and the soil map may be a single purpose product. Everyone agreed the NRCS should indorse mapping standards that produce multi-purpose products only. Single propose products would not fall within the standards of the national cooperative soil survey.

This committee should be addressing the Order 1 soil mapping standards as currently defined in the National Soil Survey Handbook. It may not be in the purview of this committee to address individual states needs in terms of developing site-specific soil mapping standards that go beyond the "umbrella" already established in the NSSH. The consensus of the committee is that the NSSH adequately covers Order 1 (site-specific) soil mapping standards and that it has been written in a manner that will allow different regions of the country to establish more specific that are applicable to their state or region.

Summary:

Charge #1: Formalize guidelines for the Northeast, how do the guidelines compare with those of the NSCSS? The National Soil Survey Handbook adequately addresses the basic guidelines for establishing site-specific (Order 1) soil mapping standards. Because of the diverse nature of soil programs, state legislation, and level of activity of private consultants across the country, it would be impractical to refine the standards (make more restrictive) further than they currently are.

According to Steve Hundley, in his work with the National Society of Consulting Soil Scientists, the NSCSS indorses the Site-Specific Soil Mapping Standards for New Hampshire and Vermont as a framework for other regions of the country to follow, when the establishment of site-specific mapping standards is desirable.

Recommendation #1: This committee recommends the NRCS Soil Survey Division encourage efforts by State Soil Scientists in the development of Order 1/Site-Specific soil mapping standards when an identified local need exists.

Recommendation #2: This committee recommends the NRCS Soil Survey Division should encourage states to increase cooperative efforts with the private sector soil scientist in providing workshops, training and other educational opportunities pertaining to National Cooperative Soil Survey Standards.

Charge #2: Order 1 Vs Site-Specific.

Legal council was not consulted. The term Order 1 is an NRCS in-house term used to describe 1 of 5 different levels of mapping precision provided by the National Cooperative Soil Survey. "Site-Specific" is a generic term used by the private consultant, the academic sector, and others to describe high intensity mapping of soil resources. For the NH/VT soil mapping standards, the terms are synonymous, because the site-specific standards conform to the standards of the NCSS, referred to as Order 1. Other types of soils mapping for site-specific interpretations may not necessarily conform to NCSS standards. The two terms should not necessarily be used interchangeably. (It should be noted the Site-Specific Soil Mapping Standards for New Hampshire and Vermont are not NCSS Standards, per se, they are New Hampshire and Vermont standards that conform to the standards of the NCSS.)

Recommendation #3: Cooperative efforts should be initiated to develop more refined definitions for "Order 1", and "Site-Specific" as well as " High Intensity" and "High Resolution" soil surveys.

<u>Recommendation #4:</u> Cooperative efforts should be established to define Order 1 and Site-Specific in terms of the scope of soil map products allowed under NCSS guidelines.

Charge #3: Interpretation needs by the soil consultant and universities.
The attribute data in NASIS is satisfying most of the needs of the private consultant. The most significant attribute asked for, that is currently unavailable, is background levels of heavy metals in parent material. Virginia is working on collecting some of this data, as is Pennsylvania. It is a massive workload. Questions were raised as to how NRCS will provide interpretations, and generate NASIS data, for uncorreltated mapping concepts recognized by the private soil consultant but not officially recognized and correlated by NRCS. This is a good question.
In New Hampshire, the state soil scientist has provided state legend numbers for soil concepts not currently recognized in the state-wide legend. These soils have fairly significant differientiae, but have not been recognized because of limited extent. One prime example are down-drainage soils over bedrock. New Hampshire does not have any soils in the legend that recognize moderately well drained, or somewhat poorly drained soils over bedrock, although the soil science community know they exist. These soils must be recognized at the site specific level. At the present time, the private consultant is providing the appropriate interpretations for these soils.

<u>Recommendation #5:</u> The NCSS, NSCSS and the academic sector establish appropriate protocols and assign responsibilities for developing NCSS interpretations in NASIS for mapping concepts not currently correlated within the National Cooperative Soil Survey.

Charge #4 & #6: How can NASIS address interpretation needs?
Even though the NSSC is making NASIS available to soil consultants, no one is aware of any consultant taking advantage of this opportunity. NASIS is very complex and user-unfriendly. The nature of the program will keep consultants away for a long time. NASIS has the capability of performing a core dump of attribute data into an excell spreadsheet. This data is easy to use and manipulate and is being made available to private consultants. The consultants are very happy with retrieving NASIS data in this manner.

Charge #5: Most recent technology tools for Order 1/site-specific mapping.
This committee did not have the time or have the needed participants to discuss the technology tools currently available in assisting in producing Order 1/Site-Specific soil map products. This topic should be addressed at the next National Cooperative Soil Survey Conference.

<u>Recommendation #6:</u> Cooperative efforts should be established to assess the latest technology in field tools to help develop Order 1 and Site-Specific soil surveys. Who owns these tools? Can they be shared among disciplines?

Charge #7: Should Order 1/Site-Specific standards require creation of a multipurpose product, or allow for selective purpose products?
The National Soil Survey Handbook implies use-specific soil surveys are allowed within the standards. There was discussion that many consultants see strength in National Cooperative Soil Survey Standards because they result in the development of a multipurpose product. The NSSH currently allows for both types of site specific soil map products to be produced. Because of the wide diversity of soil resource needs across the country, the standards should be left alone to provide flexibility in their use.

It is recommended the Technical Committee on Order 1/Site-Specific Soil Mapping Standards continue:
This committee believes that, even though the NSSH adequately addresses guidelines for site-specific mapping, there are continuing issues and concerns that should be clarified.

<u>Recommendation #7:</u> The recommendations of this committee should be presented before the National Cooperative Soil Survey Conference in 2001.

1. The NCSS roll in site-specific mapping is changing rapidly as this activity continues to evolve and proliferate across the country. Some individuals believe it is important for the NCSS to be more involved in carrying out Order 1 (not necessarily site-specific) soil survey operations. Others believe with the limited staff and resources within the NCSS, the NCSS focus must be on MLRA project soil surveys and soil survey updates, and leave the Order 1 stuff to the private sector. This committee, and others like it in other regions of the country, need to keep abreast of evolving issues and technology surrounding the needs for Order 1/site-specific mapping. Concern was expressed that meeting again in two years is not sufficient. A committee on Order 1/site-specific mapping needs to meet more frequently or hold teleconferences.

2. In some parts of the country there is a critical need to train private soil consultants how to map using the standards of the National Cooperative Soil Survey. All parts of the country need to enhance technology transfer between public sector and private sector soil scientists. Donn Smith, President of the National Society of Consulting Soil Scientists expressed a need for increased sharing of expertise and sharing training opportunities. Should the NCSS open doors to private consultants (who are not part of the NCSS) to participate in NRCS training courses? Should the State Soil Scientist be responsible for organizing/coordinating training in NCSS standards within their state where there is an identified need?

3. Further discussion and resolution is needed to determine if NCSS Order 1soil mapping standards should allow for the development of single-purpose products. The consensus of this committee is that it should not. The NCSS

Order 1 standards should be based on mapping soils according to our taxonomic system of soil classification, regardless on intended use of the survey. This is not to imply a soil scientist cannot design map units to meet customer needs and intended use of the soils information.

4. Current NSSH guidelines indicate a high intensity soils map must be digitized to comply with Order 1 standards. Many consulting soil scientists are producing site specific soil maps that never see a digitizing tablet. This requirement needs review.

5. Should there be more refined definitions of the terms “Order 1”, “Site-Specific” and “High Intensity” and “High Resolution” soil surveys? They mean different things to different people in different parts of the country.

6. This committee did not have the time or have the needed participants to discuss the technology tools currently available in assisting in producing Order 1/Site-Specific soil map products. This topic should be addressed at the next National Cooperative Soil Survey Conference.

7. What are the responsibilities of the NCSS (state soil scientist, or MO office) to provide soil interpretations for soil concepts recognized by a private

Northeast Cooperative Soil Survey Conference, YR2000 Committees

Committee 5: Hydric soils

Co-Chair (Mid-Atlantic Hydric Soils Team)-Lenore Matula-Vasilas, NRCS Baltimore MD /Ralph Spagnola(215)814-2718
Co-Chair (New England Hydric Soils Team)-Pete Fletcher (508) 697-9344 /Steve Gourley, NRCS, Burlington VT

Members- (selected by Chairs for these 2 groups)

Bill Taylor, NRCS, Holden MA
Andrew Williams, MO12, NRCS, Amherst MA
Shawn Finn, MO12, NRCS, Amherst, MA
Leander Brown, Wetland Institute, NRCS, Laurel MD
Carl Robinette NRCS, Cumberland, MD
Bruce Vasilas, Professor, University of Delaware, Newark, DE
Marty Rabenhorst, Professor University of Maryland, College Park MD
Jerry Quesenberry, NRCS, Smithfield VA
Lee Daniels, Professor, VA Tech, Blacksburg VA
Phil Tant, MO14, NRCS Raleigh NC
Jason Teets, NRCS, White Sulfur Springs, WV
Steve Carlisle, NRCS, Seneca Falls, NY
Edward Stein, NRCS, Cooperstown NY

Potential Committee Charges: (Final Selection of Charges will be by 2 teams)

1. Coordinate regionally proposals, field studies and reviews.
2. Share information and training between Hydric soils teams in New England and Mid-Atlantic.

Hydric Soils Committee
Co-Chairs:
Ralph Spagnolo
Pete Fletcher (Steve Gourley)

Topics for Mid-Atlantic and New England Committees to Focus on and Discuss at NE Committee Meetings

- Facilitating Research in the NE
- Comparison of Indicators
- Consistency Issues Dealing with Policy (FSA, 404, State Programs)
- New and Problem Hydric Soil Series
- Training - ensuring consistency to both public and private
- Field and Office Information (cheat sheets, field guides, etc,)
- Hydric Soil Identification Problems
- Data Integrity

Tasks for the NE Hydric Soils Committee

- Develop an e-mail list to facilitate communication between committees
- Conduct joint meeting between New England and Mid-Atlantic Committees or send a few members of each committee to the other's meeting
- Set up a discussion forum for hydric soils in the NE
- Have a representative from the NTCHS always at the NE meeting

Highlights of Corps of Engineers New Nationwide Permit Revisions and New Permit and Jurisdictional Determination Appeals Process

General Changes to Nationwide Permits (NWPs)

- Maximum acreage for all replacement NWPs is ½ acre
- 1/10 acre threshold for reporting requirement
- Restricted use of NWPs in the 100 year floodplain.
- No above grade fills in floodway above the headwaters
- Eliminated use of NWPs in impaired waters
- NWP 27 (restoration) applies to tidal waters as well

Summary of Nationwide Permit 40
Agricultural Activities

Authorizes building pads for farm buildings, drainage tiles, drainage ditches, mechanized landclearing, land leveling, and similar activities.

Conditions for USDA program participants:
1. Categorical minimal effects determinations
2. ½ acre ceiling
3. NRCS certified wetland delineation required
4. NRCS approved compensatory mitigation plan, if required
5. Authorizes farm buildings in farmed wetlands only

Conditions for non-program participants:
1. ½ acre ceiling
2. Public notice required over 1/10 acre
3. Wetland delineation required
4. Compensatory mitigation required

Appeals Process

In the past, the only way to appeal a jurisdictional determination or permit was to go to court. The Corps of Engineers now has a process in place for appealing jurisdictional determinations as well as permits. Because of this, many Corps districts are now requiring much more documentation from the applicant as well as the evaluator in order for the applicant to get a permit.

For more information:

www.nao.usace.army.mil/Regulatory/PN/NWP-Final/NWP-Final.pdf

www.usace.army.mil/inet/functions/cw/cecwo/reg/press/

NCSS ACTIVITIES IN CONNECTICUT

The Connecticut Statewide Soil Survey Update project started in 1991. Currently, field mapping activities are 99 percent complete for this project (113/114 quads) with the remaining acreage, 35,000 acres, being located in the northwest corner of CT. Acceptable joins have been completed with MA, NY, and RI for the statewide soil survey. Field mapping on the remaining acreage is expected to be completed this calendar year.

The survey has been broken into 5 subsets for correlation and SSURGO certification. Subsets 1 & 2 have signed classification and correlation documents. Subset 1 is SURGO certified and archived. Subsets 2 & 3 will be sent for certification this fiscal year. In all, these first three subsets cover approximately 65 percent of the Connecticut Statewide Soil Survey Update.

In cooperation with CT DEP and the University of Connecticut (UConn), about 80 percent (93/114 quads) of the new statewide soil survey data is digitized and available to the public as interim digital data on the UConn Map And Geospatial Information Center (MAGIC) site. The site, http://magic.lib.uconn.edu/, provides the digital data in ARC export, Map Info, and AutoCad formats for public use.

Special field studies started recently include: Lab sampling 8 of our CT soils to help update our soil database, provide answers to interpretive problems, and provide training to staff soil scientists; Installing 5 soil temperature sites, in cooperation with the Storrs Agricultural Experiment Station, to better define our mesic-frigid temperature break, to look at the temperature differences between mineral and organic soils, and to determine the effect drainage class has on soil temperature; and assisted Dr. David Orwig, Harvard University, with soil descriptions and lab analysis of 8 sites in Connecticut dealing with the Ecosystem Response to Hemlock Woolly Adelgid Outbreaks in Southern New England.

In addition to providing staff, Donald Parizek, for a soil survey detail to Puerto Rico, we have added a Soil Scientist Student Trainee, Debbie Frigon, and a Landscape Ecologist, Dr. Charlotte Pyle to our staff. As a Landscape Ecologist, Charlotte is using soil surveys to help communities explore the patchiness and pattern of suburban sprawl.

With over 3 million people and a growing economy, CT's soil resources are intensively used. Updates of soil series, soil database information and tracking land use changes are ongoing. Technical services to assist people in the proper use of soil information continue to be important also. Some examples of these activities include:

- During FY00, staff in CT filled requests from several partners for NRI information relating to land use and land cover statistics for Connecticut. Some of this information was included in a publication dealing with Farmland preservation and was also presented to the State Legislature. During the rest of the fiscal year, we will focus our attention on the re-release of 1997 data and then on the 2000 data collection cycle.
- Participated in technical support for 2 Realtor's workshops, 1 Sanitarian's workshop, 2 workshops for Inner-city Kid's Environmental Days, and a workshop with Cooperative Extension on The Natural World. Over 800 people received training at these events.
- Provided leadership and technical support for Statewide Envirothon workshops and competition. Provided a soil workshop with participation from over 200 students and teachers representing 45 schools.
- Margie Faber serves as the NRCS Liaison to the Globe Program, an international environmental education program.
- Urban Soils Assistance on the North & South Branches of the Park River in Hartford, CT, where we assisted with Design Workshops and heavy metal testing in areas proposed for use as playgrounds and community food gardens.

Special activities planned for the remaining year and next year include:

- 2 GIS workshops with Cooperative Extension targeting land use decision makers in the Quinebaug and Shetucket watersheds. The workshop focus is on understanding and using natural resources data in GIS applications and emphasizes the difference between the proper use and the misuse of digital soil data.
- Conducting a Soil Characterization Study including 9 pedons from CT & RI. The study ties together 3 ongoing agency projects and provides a foundation to support future technical soil activities in the state in addition to providing information for the soil survey.
- Completing soil interpretations for
  - Conservation Tree and Shrub Groups
  - Stormwater Runoff Suitabilities
  - Soil-Vegetation Correlation of Floristic Communities

DELAWARE STATE REPORT

Delaware Soils Staff:

Annapolis State Office

James H. Brown
State Soil Scientist for Delaware

William Dean Cowherd
Assistant State Soil Scientist for Delaware

Delaware State Office

Diane Shields
MLRA 149A Project Leader
Delaware/Maryalnd

Georgetown Field Office

Phil King
Project Soil Scientist

Charles Hanner
Soil Scientist

University of Delaware – Newark, Delaware

Bruce Vasilas
Assist. Prof. of Soil Science

Special Projects Completed This Fiscal Year

- Fungi As Indicator of Drained Hydric Soils

Educational Materials

- Bookmarks
- Science Teacher Packets

Maine Agricultural and Forest Experiment Station Cooperator's Report

Laurie Osher
Assistant Professor
University of Maine

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Research Project Title: Soil Organic Matter and Soil Quality

This research will quantify carbon storage in Maine soils, investigate the effect of changing land use on soil carbon storage and loss, and identify the role of organic amendments in improving the soil's response to water stress. The objective of this research is to enhance our understanding of the role of soil organic matter (OM) in soil quality. The research will include studies of the mechanisms of OM sequestration and loss, and investigate the role of soil OM in maintaining and improving soil quality and soil productivity. The specific objectives are:

(1) Quantify soil C content in soils after land use change.

Different land uses, on what were once similar soils, can result in significant changes in soil properties, including losses (or gains) of soil OM. In Aroostoock County, Maine, soils that have been tilled for agricultural land use have significantly different morphology than those that are covered by forest vegetation. Incorporation of the eluvial (E) and spodic (Bhs) horizons into the plowed layer (Ap horizon) by tillage results in exposure of the organic carbon-rich Bhs soil materials to microbial decomposition and erosion. This research will quantify the changes in soil carbon and describe the changes in soil morphology as a result of land use change.

(2) Evaluate the impact of OM amendments on soil moisture holding capacity of agricultural soils.

The preliminary work will be completed on samples from a soil management study where manure and compost was applied for 8 years to 48 plots, while 48 plots in the same study were managed without manure or compost additions. These experiment sites are in Aroostoock County. After completion of this preliminary study, other sites will be selected for investigation. Soils will be analyzed to determine bulk density, soil OM content, aggregate stability and soil moisture release during conditions of water stress. The soil moisture release experiments will be completed in the laboratory using the pressure plate and pressure membrane apparatus.

(3) Quantify differences in soil morphology and chemistry along natural and land use gradients.

For natural gradient studies, sites will be selected to hold soil-forming factors, (climate, parent material, topography/relief, organisms, time) other than those being studied, constant. For land use studies, agricultural sites will be selected that would have been similar to control sites if they had not been subjected to land use change. Fieldwork will include characterization of soils to a depth of two meters or to a limiting layer. Bulk soil sampling will be accompanied by collection of gas flux and/or dissolved organic matter content, water extractable C and N, and where applicable, stable isotope composition.

Soil Survey Program – Maine
Norman Kalloch
Northeast Cooperative Soil Survey Conference
June 19 – 23, 2000

There are seven field soil scientists engaged in production of soil survey activities in Maine. Most mapping is being done in the unorganized townships. The soil information is used as a planning tool for paper companies and other large landowners to maximize woodland productivity and to protect water quality.

A GS-12, statewide Soil Survey Project Leader located in Dover-Foxcroft, Maine oversees and directs production activities in the state and serves as the liaison with the MO-12 office. This project leader ensures consistency and continuity of Maine's mapping activities.

One entry level soil scientist was hired in 1998 and another entry level position is currently vacant. A high priority for Soil Survey Program Leader is to hire three soil scientists to replace the expected retirements of experienced field soil scientists in the next 1 to 2 years.

Maine has two soil resource specialists that provide most of the basic soil services the state. This allows field soil scientists to spend the majority of their time on soil survey production activities. Technical assistance is mostly for urban uses although it includes education, on-site assistance for NRCS projects and assistance to towns.

One soil scientist is assigned to GIS activities for SSURGO support and other soil digitizing efforts. This soil scientist also serves as Database Manager for NASIS. About 40% of the state has digitized soil data. The past two years Maine has cooperated with the state of New York to compile at least one soil survey a year for SSURGO digitizing. This work is being done by two temporary soil survey compilation technicians.

In FY2000 the major mapping emphasis is to complete all Native American Indian lands (approximately 200,000 acres) as well as to complete the field mapping in two soil surveys areas.

University of Maryland/Maryland Agricultural Experiment Station Report

Martin C. Rabenhorst
Department of Natural Resource Sciences & Landscape Architecture

Over the last three to four years, we have been working to adjust to the merger of the department of Agronomy and the department of Horticulture and Landscape Architecture into a new department named *Natural Resource Sciences and Landscape Architecture*. The department has approximately 40 faculty, about 10 of which are specialized in soil science. In July of 1999, Professor Del Fanning retired from the department and was made Professor Emeritus. Because we have not yet hired a replacement for Del, he agreed to teach his course in Soil Morphology, Genesis, and Classification on a contractual basis during the fall semesters of 1999 and 2000. We are expecting to be able to advertise for a soils faculty position in *Soil Landscape Relations and Information Systems* within the next year.

The department continues to teach and support approximately 30 students, which are emphasizing soil science in their studies. About one third are in our traditional "soils" major in the department (actually *Conservation of Soil Water and Environment*) and approximately two thirds are Environmental Sciences and Policy majors which have selected the *Soil, Land and Water* option, which has a significant emphasis in soil science. Providing adequate pedological training to our students continues to be an important issue as we try to prepare them for possible careers related to soil survey. In addition to our teaching of Soil Morphology, Genesis, and Classification (Del's course - NRSC414) we are pursuing several other avenues. Our course in Soil Survey and Land Use (NRSC415) has been updated and the lab portion has been expanded to include a significant GIS component using ARCVIEW. Soil judging continues to be an important venue for teaching soil morphology and exposing students to a wide variety of soils from around the region and the country. In 1999 and 2000, the UMD soil judging team qualified in the regional contests and attended the national contests in Arizona and Idaho where they finished 9th and 6th out of a field of approximately 23 teams. Also for the last three years I have developed and taught an intensive three week summer field course in Soil Morphology (4 credits) which meets 5 days/wk for 10-12 hrs/day. During the course, which meets mostly in the field, we emphasize skills in making accurate soil morphological descriptions by examining a wide variety of soils from across the state of Maryland. Also, during this summer (2000) four of our current or recently graduated students are working for the NRCS in Maryland where they are getting valuable training by assisting soil scientists with morphological descriptions and transecting of map units as several new soil survey updates get underway.

Several pedological research projects continue at UMD, many of which are associated with soil hydromorphology. Below is a list of projects currently underway.

1. Propensity of Soils to Develop Redoximorphic Color Changes
2. Factors of Subaqueous Soil Formation
3. Morphological Indicators of Hydric Soils in Piedmont Flood Plain Wetlands
4. Surface Horizon Morphology of Sandy Hydromorphic Soils
5. Hydromorphology of Problem Soils Formed in High Chroma, Loamy Parent Materials in near Coastal Environments
6. Origin of silty deposits in proximity to Chesapeake Bay

MARYLAND STATE REPORT

Maryland Soils Staff:

Annapolis State Office

James H. Brown
State Soil Scientist for Maryland

William Dean Cowherd
Assistant State Soil Scientist

Rebecca Hickman
Secretary

Patrick Barry
Cartographer/NRI Coordinator

Jennifer Ritner
Cartographer

Annapolis

Susan Davis
Project Soil Scientist

Cumberland

Carl Robinette
Soil Scientist

Aaron Friend
Soil Scientist

Easton

Carla Baker
Soil Scientist

Benjamin William
Biological Aide

Ellicott City

Valerie Cohen
Project Soil Scientist

Andy Piri
Soil Scientist

Stephon Thomas
Soil Scientist Trainee

Frederick

Joseph Kraft
Project Soil Scientist

Jared Beard
Soil Scientist

LaPlata

Ed Earles
Soil Scientist

Suzy Parks
Soil Scientist

Princess Anne

Susan Demas
Soil Scientist

Position Vacant
Soil Scientist

Alexander Hall
Biological Aide

Salisbury

James Brewer
Project Soil Scientist

Snow Hill

Vacant MLRA 153D
Project Leader for
Maryland/Delaware

Upper Marlboro

David R. P. Verdone
Soil Scientist

Stephanie Goglia
Soil Scientist

Aberdeen Proving Ground

George Teachman
Soil Scientist

Baltimore Corps of Engs

Lenore J. Matula-Vasilas
Soil Scientist

East Regional Office

John Davis
Soil Resources Specialist

Wetland Science Institute

Leander Brown
Soil Scientist

University of Maryland - College Park, Professors

Dr. Martin Rabenhorst
Professor of Pedology

Dr. Delvin Fanning
Professor of Soil Science

Special Projects Completed This Fiscal Year

- Geomorphic Study on Walton Silts
- HGM Project
- BPR Watershed Study
- Special Studies on Heavy Metals – Emphasis on Arsenic in Urban Areas and Orchards

Educational Materials

- Maryland Sassafras Soil Posters
- Book Marks for Maryland
- Science Teachers Packets
- Soils Explorer Developed for Washington County
- Phosphorus Index CD – Developed in Conjunction with University
- Soils Health Card

MASSACHUSETTS REPORT
NORTHEAST COOPERATIVE SOIL SURVEY WORK PLANNING CONFERENCE
JUNE 19-23, 2000
NEWPORT NEWS, VIRGINIA

Massachusetts has two update soil surveys operational at this time. They were started in the early 1990's and in each case are presently staffed with a project leader and a soil scientist. The original concept for each project soil survey was for the State of Massachusetts to find a total of four soil scientists that would result in each soil survey having four mappers with an anticipated completion in four or five years. It has only been in the last two years that each survey has had two members on a regular basis. Both surveys are 50 to 55 percent completed.

Mapping goals are impacted by a heavy demand for basic soil services. The urban setting of each of these soil surveys is the cause of this need for soil survey information. In order to relieve this impact, a GS-12 Basic Soil Services position will be advertised in the near future to replace the position formerly held by Pete Fletcher who retired two years ago.

Soil Survey Digitizing

Massachusetts has six published soil surveys on analog orthophotography at a scale of 1:25,000. These are the metric ortho's that USGS started in the 1980's. Five of the soil surveys have been certified and archived by the Missouri digitizing unit. The sixth survey is presently at the digitizing unit and is awaiting certification. Barnstable County (Cape Cod) has been digitized in the state by NRCS personnel. It had the eastern part completed for use by the National Park. The major problem with digitizing Barnstable County is the fact that the orthoquads are off set to fit the landmass and the corners are located out in the ocean. Because of this situation, matching between quads has resulted in a set of unique location problems for the digitizers.

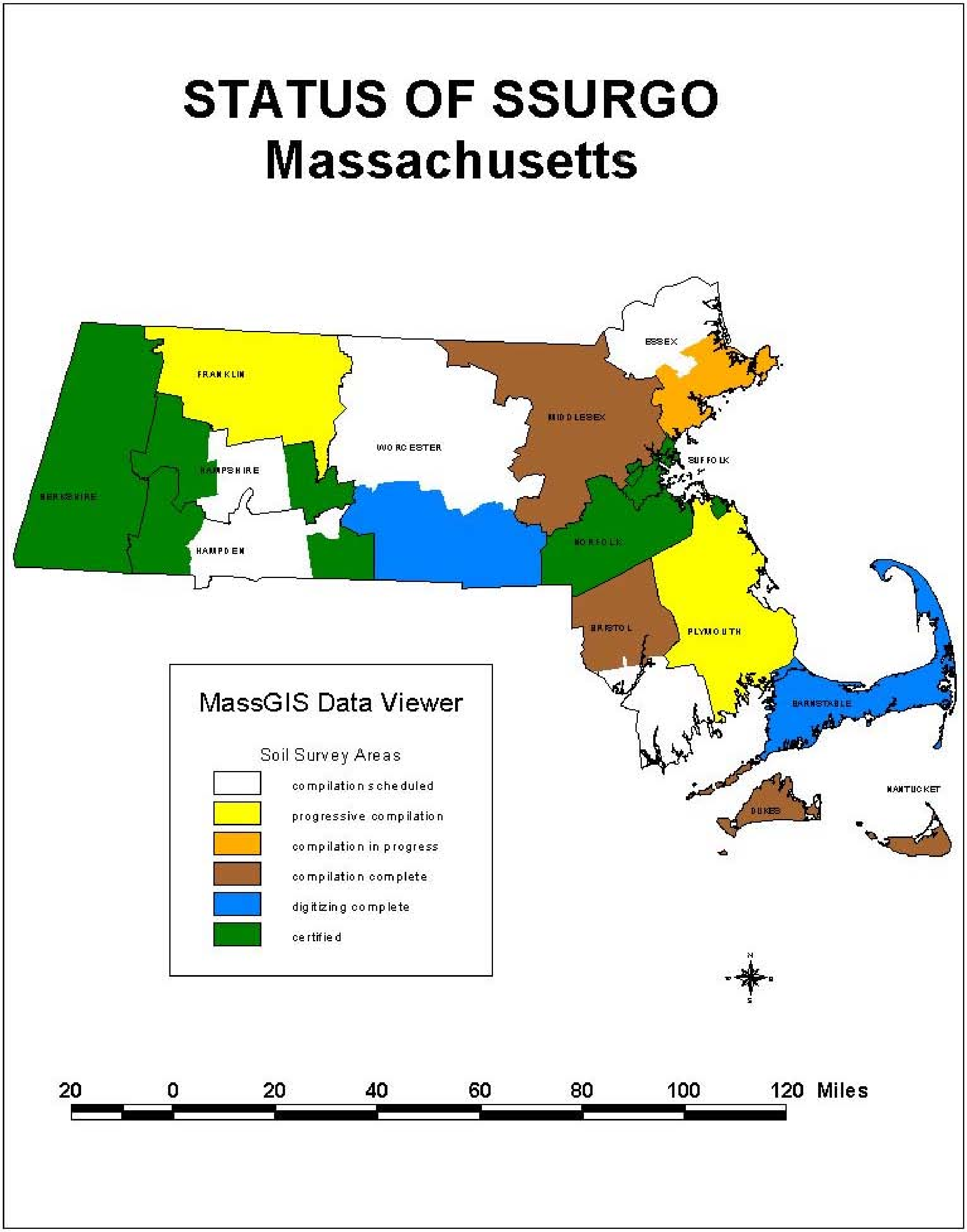
The Massachusetts State Executive Office of Environmental Affairs (EOEA) (Mass/GIS and Department of Food & Agriculture) have a Memorandum of Understanding (MOU) with NRCS to conduct the digitizing of published soil surveys. This in-kind arrangement is valued at $125,000 a year. They produce the digitized soil surveys in State Plane Coordinates format and then reproduce it in UTMs so we can request certification and archiving. Once it is archived by the Missouri Digitizing Unit, Mass/GIS places their version on the WEB along with the attribute data for use by anyone needing the data. The state also has entered into a MOU with Soils to pay for setting up and providing the staff to compile the remaining soil surveys in Massachusetts. Because of hiring restrictions by state government, NRCS has hired two compilers (both college graduates with degrees in geography) that work out of the state office in Amherst. One ARC/INFO specialist (graduate of Clark University in geography) has also been hired to assist with the digitizing process at the Food & Agriculture facilities in Lancaster, Massachusetts. The funding is reimbursable but it is basically pass through funds. It will represent $140,000 of input to the SSURGO process.

In addition to the analog work that has been completed, Massachusetts has new DOQs for each county east of Worcester County. This has allowed us to compile Bristol County, North; Bristol

County, South; Dukes County; and Nantucket County. We are presently working on Essex County, North; Essex County, South and Middlesex County. NCGC has notified me that the remaining 20 CDs of DOQs for the state are now at their office. Therefore, in the near future we will have new DOQs for Worcester County, NW so we can initiate recompilation and digitizing. Both Worcester County, NW and Middlesex County were completed in the early 1990s but the publication base was from 1977. It was not a suitable base for publication since both counties are bedroom communities to Boston. The new DOQs were flown between 1995 and 1998. Although the publication has been delayed for a long time, I believe the finished product will be more usable by those individuals using soils information.

As mentioned earlier, we will be advertising for a GS-12 Basic Soils Services position located at West Wareham, Massachusetts. As of Monday morning of this meeting, Drew Adam, ICCS for the Northeast has taken the District Conservationists position in Brattleboro, Vermont. We will be advertising to fill the ICCS position shortly.

BRUCE W. THOMPSON
State Soil Scientist


STATUS OF SSURGO
Massachusetts
ESSEX
FRANKLIN
MIDDLESEX
WORCESTER
SUFFOLK
HAMPSHIRE
BERKSHIRE
NORFOLK
HAMPDEN
BRISTOL
PLYMOUTH
BARNSTABLE
NANTUCKET
DUKES
MassGIS Data Viewer
Soil Survey Areas
compilation scheduled
progressive compilation
compilation in progress
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certified
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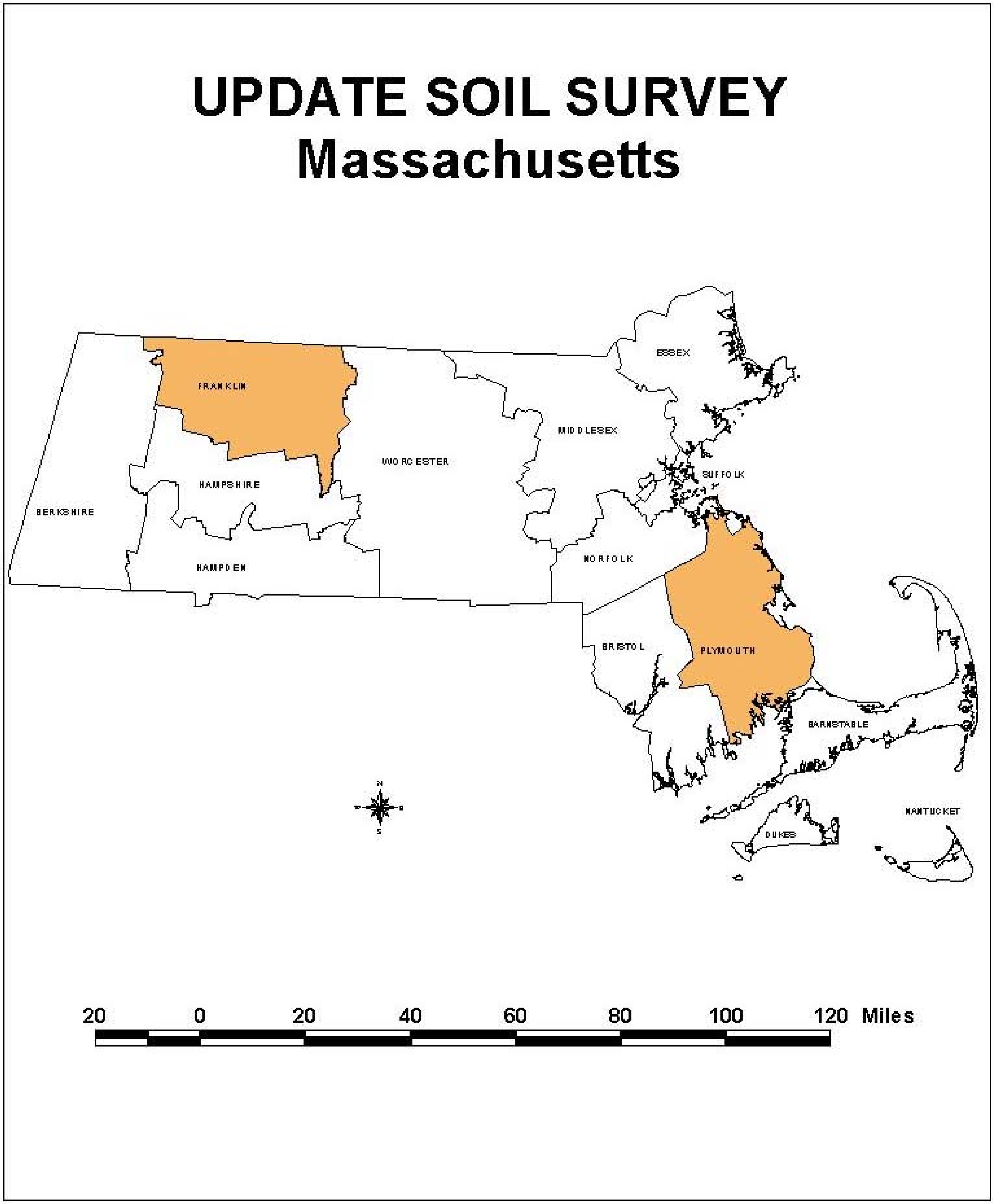

UPDATE SOIL SURVEY
Massachusetts
FRANKLIN
HAMPSHIRE
BERKSHIRE
HAMPDEN
WORCESTER
MIDDLESEX
ESSEX
SUFFOLK
NORFOLK
BRISTOL
PLYMOUTH
BARNSTABLE
DUKES
NANTUCKET
20 0 20 40 60 80 100 120 Miles

Northeast Cooperative Soil Survey Workshop
Newport News, VA

New Hampshire Report
June 2000

New Hampshire Cooperative Soil Survey

The cooperative soil survey program in New Hampshire continues to be a joint effort with the Vermont soils program. Both New Hampshire and Vermont share staff across state lines in an effort to utilize staff resources to greatest efficiency and to provide highest quality customer service.

The infrastructure of the joint soils program was established to fully support the national initiative to manage soil survey by MLRA and to recognize some degree of separation between the project soil survey program and providing technical soil services. The initial framework of this infrastructure has been established with the identification of two MLRA project offices, (Concord, NH and St. Johnsbury, VT) and two regional offices handling technical soil services (White River Junction, VT and Lancaster, NH). Although the positions needed to fill these four offices have not been officially approved and filled, many of the responsibilities have been delegated to the incumbents, staff-sharing has been implemented, and many proactive initiatives are currently underway.

During fiscal year 1999, the Vermont Soils Staff provided a total of 5,400 acres of soils mapping in support of the soil survey update of Merrimack County, New Hampshire and an additional 40 staff days were provided for the collection of field documentation in support of soil survey legend development. Vermont staff time was provided to assist in the preparation and presentation of the Merrimack-Belknap Soil Survey Review. During fiscal year 1999, the New Hampshire soils staff provided a total of 26,900 acres of soils mapping in Caledonia and Essex Counties, Vermont.

Two Soil Resource Specialist positions are being proposed to cover the two-state region. Certain aspects of the position responsibilities are currently being carried out by Soil Resource Specialists currently located at soil survey project offices. These individuals have authority to carry out technical soil services in the adjoining state, and field offices have been notified as to who should be contacted for Technical Soil Assistance. Each position covers an 11 to 13 county area. The areas of responsibility have been identified so as to provide the best service from a logistics standpoint. Comments from the NRCS field staffs have been very positive in that services are handled faster and more efficiently. The individuals handling the technical soil services positions are relieving some of the responsibilities previously handled by the soil survey project leaders and production soil mappers. This has allowed the project leaders to spend more time on soil survey program activities and allows for increased mapping production. This program has led to new partnerships across state lines and has opened up new lines of communication between NRCS and our customers. The public, our conservation partners, and NRCS field offices are getting to know the soil scientist who is providing technical services. Having one person cover a specified region allows for the development of relationships and increased confidence by the customer.

Assistance is provided to the University of Vermont, University of New Hampshire and other colleges. Both Soil Resource Specialists serve on graduate student advisory boards and provide instruction. A significant portion of the workload is assisting state and local governing bodies such as regional planning commissions, town conservation commissions, town planning boards including local land trusts and real estate agencies.

Assistance has been provided to numerous private soil consulting firms and engineering firms. Assistance is provided to several professional societies and organizations such as the Society of Soil Scientists of Northern New England, New Hampshire and Vermont Association of Wetland Scientists, New Hampshire-Vermont Chapter of the Soil and Water Conservation Society the Audubon Society, Nature Conservancy, and the New England Interstate Water Pollution Control Commission.

It is recognized that the New Hampshire and Vermont soil survey program have established goals and objectives that are mutually exclusive and each State respects the individuality of each program and the importance of addressing state-specific needs. Each State has an individual Soil Survey Plan of Operations with identified performance measures. Each State maintains their own plan to meet State objectives while insuring compatibility with the joint New Hampshire-Vermont program. This joint two-state effort is currently recognized in the NRCS Strategic Planning and Accountability Business Plan. The following goals pertain specifically to the joint soil survey program and address activities of mutual interest intended to enhance and strengthen this cooperative soil survey effort.

- Establish two GS-12 MLRA Project Leader positions with full oversight authority for project soil surveys within their MLRAs. These positions will have full position responsibilities as identified in the National Soil Survey infrastructure.

- Establish a coordinated NASIS training, implementation, and maintenance plan. Data consistency needs to be maintained within each state and within the MLRA's. The dataset managers for each office will establish a coordinated NASIS program.

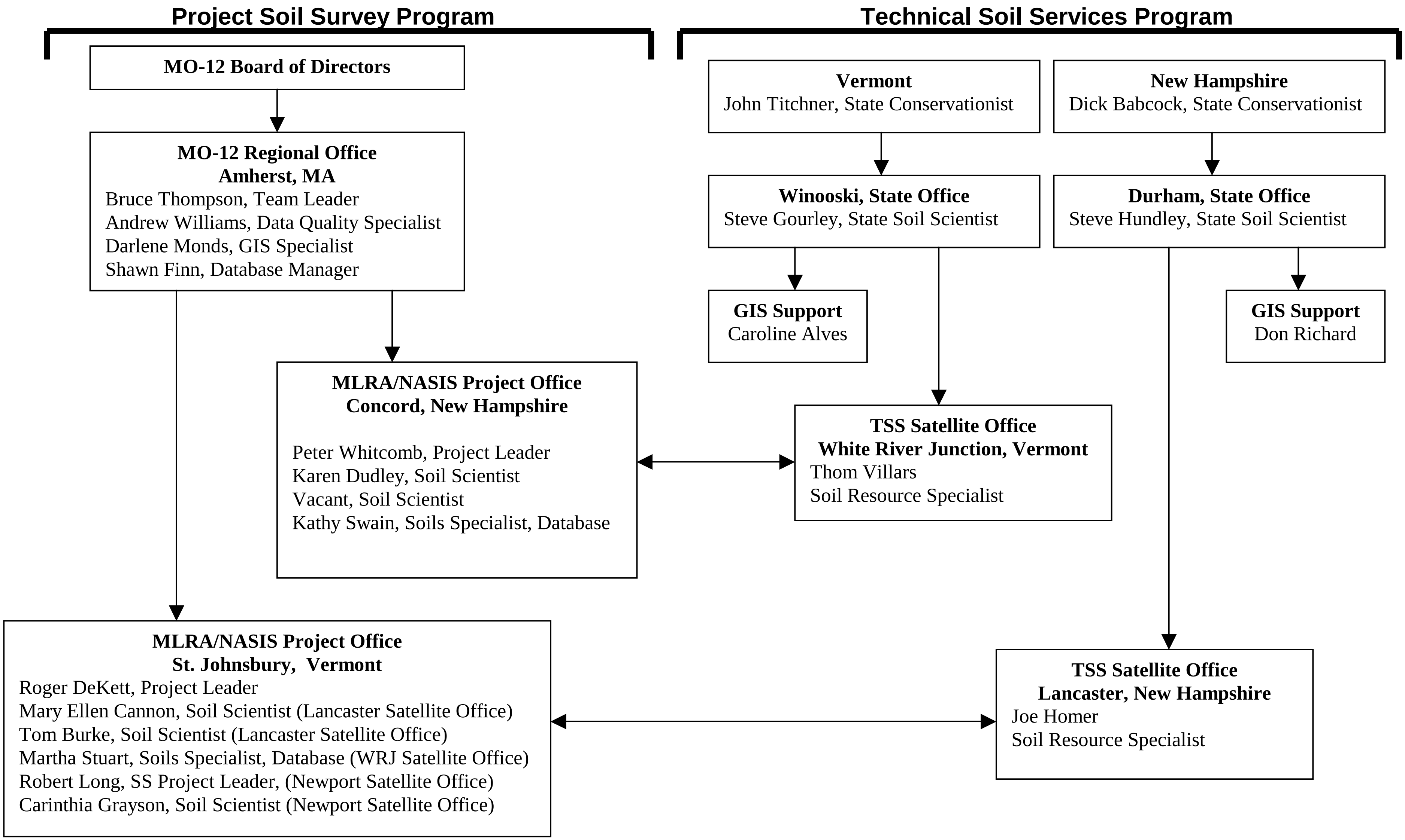
- Establish two GS-12 Soil Resource Specialist positions that will have authority over managing a pro-active technical soil services program within their area of authority. These positions will establish a program plan that provides for the greatest efficiency in providing customer service throughout the region.

- The TSS Program in NRCS lacks national coordination, is ad-hoc and is mostly reactive. It is based largely on the initiative and enthusiasm of dedicated soil scientists and a significant portion of the TSS program does not get adequately reported in the Performance and Results Measurement System (PRMS). It is currently difficult to place Soil Resource Specialists under the CO-01 Program because much of the TSS workload is not directly linked to identified core work products. Initiating this proactive TSS program in the two-state region will require establishing a manageable reporting system that will adequately reflect accomplishments in the PRMS system and in the NRCS Strategic Planning and Accountability Business Plan.

New Hampshire – Vermont Cooperative Soil Survey Program

Significant Lines of Program Direction

F/Y2000



COMPARATIVE FIELD STUDY OF WETLAND BOUNDARY INDICATORS
Mascoma Headwaters, Dorchester, New Hampshire
June 2000

By: Steven J. Hundley, Project Leader, NRCS, Durham, NH
Joseph Homer, Project Coordinator, NRCS, Lancaster, NH
Karen Dudley, Data Analyst, NRCS, Concord, NH

In the Fall of 1995, the NRCS soils staff in New Hampshire commenced an intensive field study to compare and evaluate the field indicators used for wetland identification in Northern New England. The objective of this study is to increase our understanding of hydric soil properties indicative of wetland conditions and document field indicators that support wetland hydrology and vegetative criteria. This study looks at the concerns and issues that emerge when applying consistent protocols for identifying and mapping spatial variability of wetlands in Northern New England.

A portion of this study is funded by the National Wetlands Science Institute. Instrumentation and technical support is being provided by the Global Change Initiative, the National Soil Survey Laboratory and the National Water and Climate Center. This study is also receiving technical support and assistance from the U.S. Army Corps of Engineers, New England Division, U.S.E.P.A. Region 1 and the U.S. Fish and Wildlife Service. The project includes involvement from the New Hampshire Wetlands Bureau, New Hampshire Department of Environmental Services and the New Hampshire Office of State Planning. The project has the endorsement from the New Hampshire Association of Natural Resource Scientists and the Society of Soil Scientists of Northern New England.

A 40-acre parcel was selected at the headwaters of the Mascoma River in Dorchester, New Hampshire. The property is under a conservation easement and is owned by Mr. Jordy Everts, who has granted permission for the Natural Resources Conservation Service to conduct soil investigations. A point grid, serving as intensive ground control, was installed over the entire 40 acres. A global positioning system, was used to georeference each control point, and the parcel boundary itself, for digitization into the New Hampshire NRCS GRASS Geographic Information System. Preliminary piezometers and thermisters were installed to monitor ground water and soil temperature.

In the Spring of 1996, teams of scientists from NRCS, USCOE and USEPA mapped and recorded the boundary of the three criteria used to identify and delineate wetlands. A 1:1,200 base map was used to delineate the boundary of wetland hydrology, hydrophytic plant communities and the hydric soil boundary. All of these maps were digitized into the GRASS GIS for comparative evaluation.

The initial comparative evaluation revealed a need to suggest some revisions in hydric soil indicators and to re-evaluate the start and length of the growing season. Initial findings indicate a soil temperature of 5°C at 50cm is not a good indicator for the start of the growing season in the frigid temperature regime of Northern New England. This supports the findings of the National Research Council in their 1995 report titled: Wetlands: Characteristics and Boundaries.

As a result of preliminary findings, several recommendations have been submitted to the National Technical Committee on Hydric Soils. The intensity of the data collection on soil properties and behavior has increased and an intensive study and documentation to determine more suitable indicators for identifying the duration of the growing season has commenced based on recommendations made by the National Research Council. In the Fall of 1996, four vegetative plots were established to monitor bud swelling, vegetative emergence and growth in the Spring. Since that time, an additional four vegetative plots have been established. Soil temperature probes and dataloggers were installed at most of the plots.

During the summer of 1997, NRCS engineers in New Hampshire surveyed the 40-acre parcel to develop a 2-foot contour map. The NRCS soil scientists have completed a high intensity soil survey. Both maps have been digitized into the GRASS GIS.

The Global Change Initiative approved funding to provide instrumentation at three locations within the 40 acre study site to collect continuous readings on soil temperature, soil moisture, groundwater level, redox potential, air temperature, relative humidity and solar radiation. With assistance from the National Soil Survey Laboratory, representative soils were described and sampled for complete characterization. During the Summer of 1998, the National Water and Climate Center established the first Soil Climate Analysis Network (SCAN) site in the Country. This data collection site has a complete weather station in addition to collecting soils data, in real time, that is transmitted to the National Water and Climate Center three times a day. In addition to collecting the soils data as mentioned previously, the SCAN site collects data on precipitation, air temperature, wind speed and direction, solar radiation, snow pack depth and water content of the snow pack.

Armed with substantially more information on environmental conditions and soil behavior within the 40-acre parcel, the teams of scientists are re-mapping the boundary of wetland indicators. A revised start to the growing season is being tested, and the requested revisions to field indicators of hydric soils will be employed. Soil water behavior is being compared against soil morphology to help document measurable soil features indicative of significant saturation. A result of findings will be submitted to the National Wetlands Science Institute, Global Change Initiative, the National Technical Committee for Hydric Soils, as well as the other cooperators in this project in the Spring of 2000.

This Comparative Field Study of Wetland Boundary Indicators is the only one of its kind in New England. It is receiving widespread interest because of the documentation it is providing to accurately identify and delineate wetlands as well as providing technical support for carrying out federal and state wetland regulations. The study is also providing a wealth of information on the morphology of hydric soils and their behavioral characteristics adding valuable data to our reservoir of knowledge about wetland ecosystems.

NRCS National Cooperative Soil Survey
Site-Specific Soil Mapping Standards in New Hampshire
June 2000

The National Cooperative Soil Survey in New Hampshire has come to the aid of the private soil consultant by developing site-specific soil mapping standards that conform to the standards of the National Cooperative Soil Survey (NCSS). As land-use conflicts increase, and the potential for litigation increases, the private consultant needs the security of soil map products that are science based, technically sound and legally defensible. The National Cooperative Soil Survey provides this level of security.

The site-specific soil mapping standards established in New Hampshire have been endorsed by the NRCS Soil Survey Division and the National Association of Consulting Soil Scientists. The soil scientists in Vermont have adopted the standards and New York State is taking action that will establish the site-specific standards as the standard of preference for the Empire State Pedologists.

This cooperative relationship with the private sector soil scientists has had significant beneficial impact on the NCSS program. Consultants receive training in NCSS mapping standards and they, in turn, provide supporting soils documentation and help with soil interpretations. In New Hampshire they have taken the lead roll in getting soil resource information recognized in state land-use legislation and required as part of the permitting process. The NCSS has become highly respected by the NH Department of Environmental Service (DES) and the New Hampshire Office of State Planning (OSP). A guidance document for planning boards has been published as a joint effort of DES and OSP that explains the proper use of soil resource information in subdivision and site plan reviews.

This cooperative relationship has resulted in greater recognition of the NRCS Soil Survey Program in New Hampshire. The NCSS has gained more respect and the confidence of State policy makers, and the NRCS is providing more significant input at the State level by participating on State committees dealing with land use issues.

NEW JERSEY REPORT
NORTHEAST COOPERATIVE SOIL SURVEY WORK PLANNING CONFERENCE
June 23, 2000

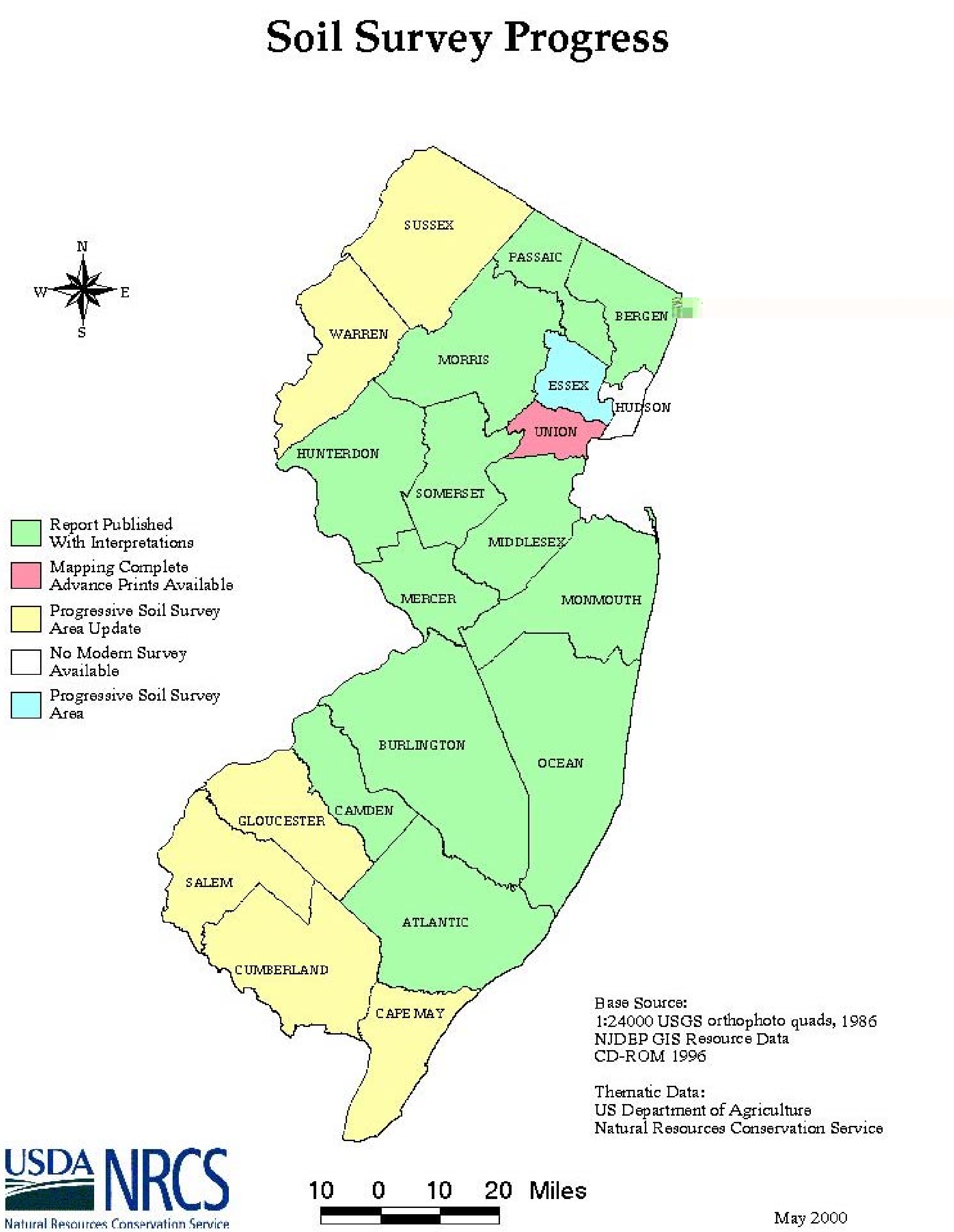
New Jersey current has seven (7) soil scientists and two (2) GIS specialists:

Hackettstown Service Center	Fred Schoenagel	Soil Scientist
North Jersey RC&D/ Field Support Office Annandale, NJ	Richard Shaw Edwin Muniz	Project Leader Soil Scientist
State Office/Central Jersey Field Support Office Somerset, NJ	Ronnie Taylor H. Chris Smith Gary Casabona ShayMaria Silvestri	State Soil Scientist Assistant State Soil Scientist Resource Conservationist/GIS Resource Conservationist/GIS
South Jersey RC&D/ Field Support Office	Scott Kennan Seth Gladstone	Project Leader Soil Scientist

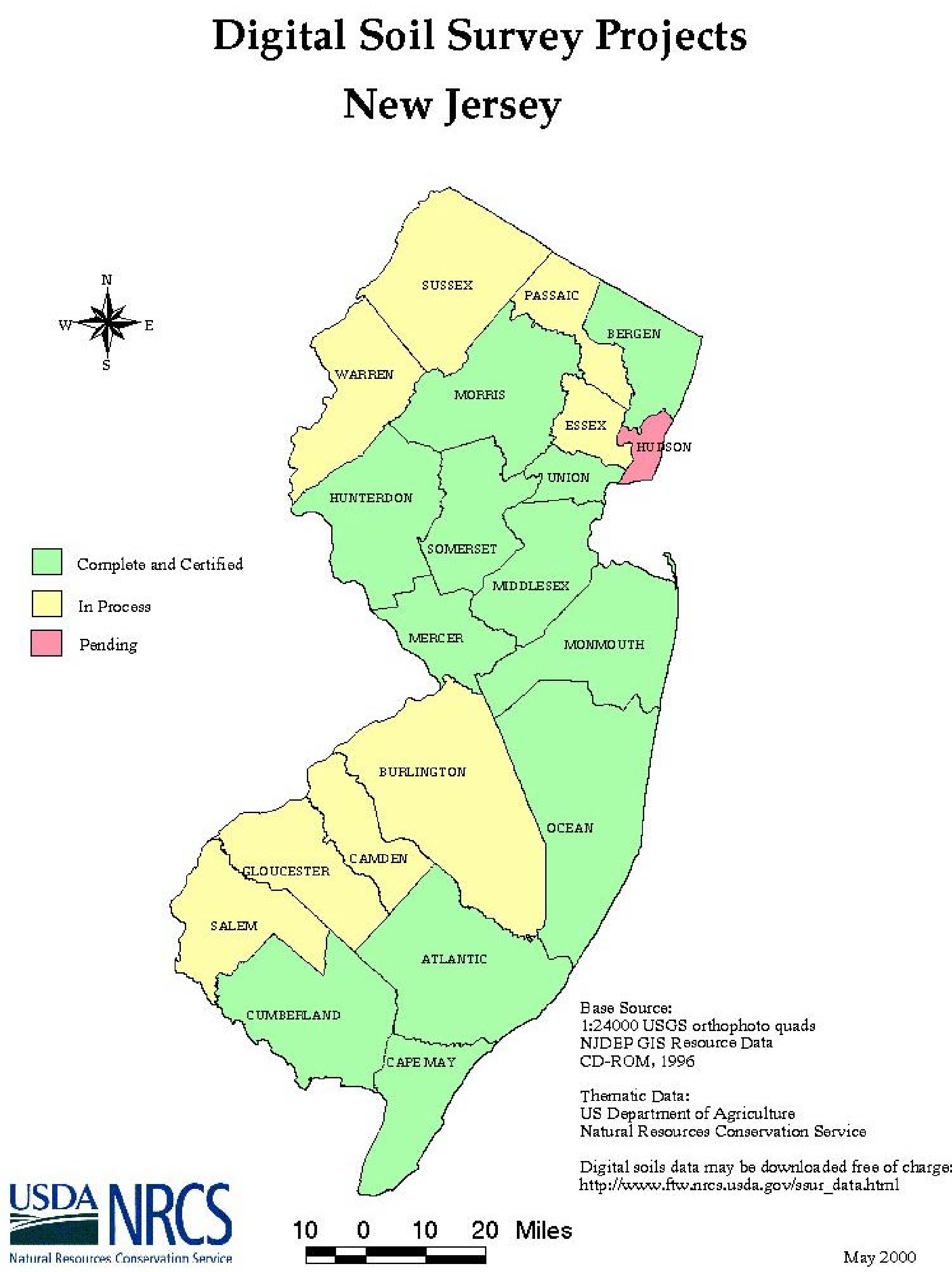
Attachment A is the current status of soil survey progress. Within the next two (2) years, we expect to publish the updates for Cape May, Cumberland, Salem, Sussex and Gloucester Counties. We also expect to publish the initial Soil Survey Report for Essex County, New Jersey.

Attachment B is the current status of the digital soil survey projects. Currently, twelve counties have certified digital soil surveys. Within two years, 20 of New Jersey's 21 counties will be certified. We do still have three counties scheduled for immediate updates (Warren, Mercer and Camden).

ATTACHMENT A



ATTACHMENT B



Pennsylvania Cooperative Soil Survey Program Status – June 2000

Pennsylvania has an up-to-date Soil Survey Web Site (**http://www.pa.nrcs.usda.gov/soils/pasoils.htm**) that contains the status of Soil Surveys, digitizing and staff. The Cooperative NRCS Pennsylvania Map Compilation and Digitizing Center on the Penn State Campus in the Land Analysis Lab also has a web site (**http://lal.cas.psu.edu/usdanrcs.htm**) where digital soil data can be accessed. The Land Analysis Lab at Penn State has a prototype digital soil survey for part of Centre County, Pennsylvania available with a web browser at their web site (**http://www.webgis.psu.edu**).

A current issue getting much attention in Pennsylvania is Land Use. The state legislature is voting on a land use bill. Pennsylvania was 2nd nationally with the highest rate of farmland conversion in the last NRI report, and has a very aggressive farmland preservation program. MLRA 148 was identified as the second most threatened (conversion of prime farmland to development) MLRA in the nation in the American Farmland Trust's "Farming on the Edge" report. These factors have caused an increasingly high demand and use of digital soil survey data for the land use planning and farmland preservation. The State has just provided funds to complete the soil survey digitizing in Pennsylvania.

Pennsylvania Soil Survey Staff

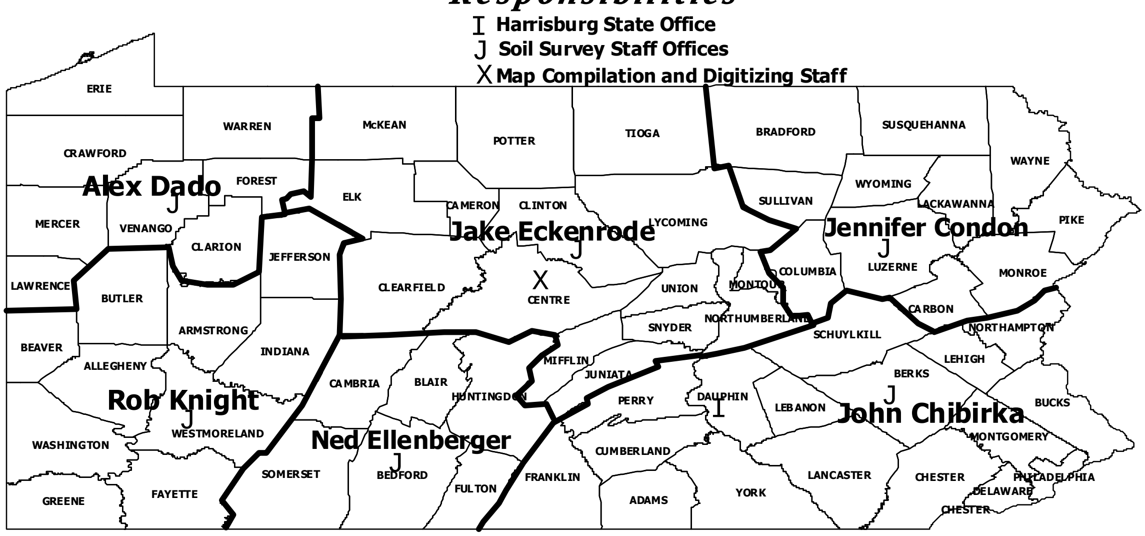
Harrisburg State Office –-	Ed White, State Soil Scientist
	John Hudak, Assistant State Soil Scientist and NRI Lead
	Panola Rivers, NASIS Soil Data Manager
	Judy Shutt, Part Time Clerk
	Marcie Rushinski and Kirsten Williams, Cartographic Technicians, GIS&DMF
Colocated with the Land --	Tim Craul, SSURGO Team Supervisor
Analysis Lab at Penn State	Mike McDevitt, Soil Scientist
	Allison Mowery, Cartographic Technician
Project Soil Staff--	W. Rob Knight, Greensburg, PA
	Alex Dada, Greensburg, PA (to Venango County 10/2000)
	John Chibirka, Leesport, PA
	Jake Eckenrode, Lamar, PA
	Jennifer Condon, Plymouth, PA
	Ned Ellenberger, Bedford, PA

Pennsylvania

USDA-NRCS Soil Scientist

Soil Survey Maintainence and Technical Soil Services

Responsibilities



Pennsylvania Soil Survey Offices all have Windows NT computers with NASIS remote access and ARCVIEW GIS. The PSU-Land Analysis Lab and PA NRCS GIS staffs have provided training and GIS data to Soil Scientists. The soil scientists can input point, transect, and other field collected data, edit and revise digital soil data, analyze existing digital soil data with other data layers and maintain the soil surveys in a digital environment. The Pennsylvania State University Soil Characterization database has been georeferenced and soil scientists have a copy of the data on their GIS computers to use in soil survey updating, analysis and maintenance. Entire state coverage of Digital Orthophotographs is complete and available to soil scientists and NRCS staff.

The 2000 Pennsylvania Soil Survey Planning Conference will be in September. The topic will be the National Soil Information System (NASIS). Cooperators and stakeholders will be shown the potential of NASIS and then have a discussion to analyze the future needs and uses of soil data in Pennsylvania and develop plans for obtaining the needed soil information, criteria, potentials and interpretations for the future. “Soil Type does matter in making sound land use decisions.”

Vermont NRCS Report

Soil Mapping Activities

Vermont has a staff of 6 full time and 1 part time soil scientists. They include the State Soil Scientist, GIS Specialist, Soil Resource Specialist, Soil Database Manager, 2 Soil Survey Project Leaders, and 1 Soil Scientist. Soil Mapping is on going in the 3 remaining soil surveys, Caledonia, Essex, and Orleans Counties in Vermont. Caledonia and Orleans Counties are project soil surveys and Essex County is currently a nonproject soil survey. With the current staff, the projected completion date of the Vermont Soil Survey is 2009.

A staff sharing arrangement with New Hampshire provides about ½ a staff year of mapping per field season. This agreement is renewed on an annual basis. The staff sharing arrange with NH will move the completion date of the Vermont Soil Survey up to 2007.

Digital Soil Surveys

Six of the 13 soil surveys in Vermont are SSURGO Certified. We are certifying one soil survey per year. The backlog of those completed soil surveys that are suitable for certification will be completed in 2 years assuming that funding is approved. Two out of date soil surveys are not suitable for SSURGO Certification.

Soil Names of American Indian Origin

This year we identified 68 soil names that are of American Indian Origin. The names of American Indian Villages, individuals and place names is fairly well documented. The definition of these words and spellings vary from source to source. The Mississquoi band of the Abenaki tribe were very helpful in identifying the correct definitions. We published a pamphlet on 20 soil names to help educate the public on the origin of our soil names and for out reach to the various tribes in New England.

Publishing Soil Surveys

Vermont has two backlogged soil surveys, Bennington and Washington Counties and one soil survey, Windsor County, which will be ready for review next year. Work on completed manuscripts has been backlogged by the need to complete the backlog of soil surveys requiring SSURGO certification.

The map finishing centers will help greatly in eliminating the backlog since both Bennington and Washington Counties are SSURGO Certified. A technical team will be assembled this winter to complete the review of both manuscripts.

In addition we will begin working with the map finishing centers to complete the map finishing of both soil surveys.

MLRA Soil Surveys

This year we will be setting up an MLRA Soil Scientist Position to coordinate the technical aspects of soil surveys on an MLRA basis within the state and to work with the MLRA Office in developing MLRA soil surveys throughout the region.

Technical Soil Services

We will be setting up a soil resource specialist position based in White River Junction to develop

The Virginia Tech Agricultural Experiment Station Report
Soil Survey, Characterization, and Interpretations

James C. Baker

Virginia Tech's participation in the National Cooperative Soil Survey still maintains the components of field mapping, laboratory characterization, and soil interpretations. Although not funded at levels enjoyed in the past, the program still serves a vital function as the transition in Virginia progresses from a period of mapping and data collection to one of utilization of data, information, and information management. The majority of funding is from the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation. Brief activity is reported for each category in addition a brief report on some research activities related to soils and land use.

Field Mapping

Virginia Tech maintains two active field soil surveys; one in central Virginia in Buckingham County and one in Sussex County in the Tidewater region. A total of 72,000 acres of order 2 level mapping was completed this past FY. In addition, some research effort is being directed toward establishing criteria and mapping standards for Mined Soils, under the direction of Dr. Lee Daniels in Southwest Virginia.

Laboratory Characterization

The characterization lab still provides soil analyses for all cooperators of the National Cooperative Soil Survey in Virginia. One full time laboratory manager/technician and several part time workers are funded. Chemical and physical analyses, including engineering properties are routinely run. Mineralogy analyses are limited due to under funding. MLRA correlations necessitate the need for expanding laboratory analysis across state boundary's although total numbers of sample analyses are limited as a result of level funding. There were 3,993 chemical analyses made, 898 particle-size analyses, and 637 other physical analyses, such as water retention and Atterberg limits conducted in support of soil survey activities.

Soil Interpretations

Virginia Tech has a contract with Chesterfield County, Virginia for 2/3 funding of a soil scientist working in the urban sector. We have an affiliation with Loudoun County, Virginia for a similar position although the soil scientist is a county employee. Virginia Tech has a contractual agreement with the Virginia Department of Health (VDH), whereby the VDH supplies salary and benefits for four (4) interpretative soil scientists. These individuals are in place to act a trainers, for the Environmental Health Specialists (sanitarians), to act as adjudicators in the permitting process where sites with disputed drain fields are brought to court, and they act in an advisory capacity to the VDH on soil science matters.

Research in the interpretations field, has focused on Dr. Pamela Thomas' work with defining criteria to best identify and quantify shrink swell soils. This past year, Dr. John Galbraith has joined the faculty and brings expertise in data base management and Geographic Information Systems (GIS) to our Department of Crop and Soil Environmental Sciences. This will improve our ability to further take advantage of the data sets accumulated throughout the course of the Virginia Tech involvement with the National Cooperative Soil Survey.

Other Soil Survey research and interpretation efforts at Virginia Tech include:

- Update/maintain the Virginia Agricultural Land Utilization and Evaluation System - J. C. Baker

- Wetlands mitigation - W.L. Daniels, J.M. Galbraith

- Reclamation of drastically disturbed soils - W.L. Daniels

- Designating alternate on-site waste water systems for marginal soils. P.J. Thomas, R.B. Reneau

- Refinement of SSURGO and NASIS data to better utilize actual soil properties in making interpretations rather than use soil ratings. P.J. Thomas, J. M. Galbraith

- Offering basic soils training to other state/public service, and private sector personnel. J.C. Baker and W. L. Daniels

VIRGINIA REPORT
NORTHEAST COOPERATIVE SOIL SURVEY WORK PLANNING CONFERENCE
JUNE 19-23, 2000
NEWPORT NEWS, VIRGINIA

Soil Survey

Virginia has completed approximately 92% or 24,000,000 acres of the States 26,090,600 acres during the initial soils survey mapping. Currently, progressive soil survey mapping continues in Bland, Brunswick, Buchanan, Buckingham, Floyd, Russell, Scott, and Sussex Counties. Update mapping continues in Culpeper, Loudoun and Fauquier Counties.

Recently soil mapping has been completed in Franklin and Bath Countiesi2 u

Last year they worked in Virginia, this year they are located out-of-state.

Soil Survey Digitizing

Virginia is a designated NRCS SSURGO Digitizing Unit (DU). Production began at the DU in FY-1996. A total of 149 Soil Survey Areas out of a total of 435 SSA in the nine state region of responsibility have been certified at the DU. In Virginia 46 SSA have been certified out of about 100 SSA. In FY-2000, 21 SSA have been certified in the DU region.

David M. Kriz
State Soil Scientist

Report of the
West Virginia Agricultural and Forestry Experiment Station

By

John C. Sencindiver

Abstracts of Current Research Projects Related to Soil Survey

1. Environmental Significance of Metals in West Virginia Soils – J. Sencindiver, D. Bhumbla, J. Skousen, L. McDonald, A. Slagle. Benchmark soils in each of the five Major Land Resource Areas represented in West Virginia are being evaluated for metal concentrations. One thesis and several abstracts have been published.

2. Effects of Fly Ash on Erodibility and Properties of Minesoils – J. Gorman, J. Sencindiver, D. Bhumbla. This study was initiated in 1989 to evaluate the long-term effects of fly ash on properties of minesoils developing on two reclaimed surface coal mines in Preston County, West Virginia. In general, minesoils with a fly ash cover that has not been incorporated will erode more for the first two years after revegetation than minesoils without a fly ash cover. However, erosion differences are not apparent after vegetation has become well established. Also, fly ash improves some of the minesoil properties. Several papers have been published, and sampling will continue for at least one more year.

3. Phosphorus Retention Capacity of Some West Virginia Benchmark Soils – D. Bhumbla, J. Sencindiver, S. Carpenter. Phosphorus pollution from land-application of poultry litter and other wastes is a concern along major waterways in West Virginia. This study was initiated in 1999 in cooperation with the Natural Resources Conservation Service to evaluate the phosphorus retention capacity of major soils along the South Branch of the Potomac River. These soils were described in detail, complete characterization analyses are being completed, and phosphorus studies are being conducted on each soil horizon. The first phase of this study will be completed by May 2001. Additional areas of the state are being added to the study in 2000 and 2001. In 2001 analyses of samples from Berkeley, Jefferson and Morgan Counties along the main part of the Potomac River will be analyzed. Also, soils from along the Ohio River will be sampled in 2000 and analyses will be initiated. Future studies in 2001will include the Greenbrier River watershed.

4. Genesis and Quality of Soils Developing on Reclaimed Mountaintop Removal Coal Mines in Southern West Virginia – K. Thomas, J. Sencindiver, J. Skousen, J. Gorman. Coal mining in general is controversial, but mountaintop removal mining is more controversial than most other mining methods. Future land use on these large mined areas is a concern. Hardwood forests cover most of the surrounding unmined soils. However, most of the mountaintop mines have been

revegetated with grasses and legumes. Although trees will eventually grow on the sites, there are concerns about the rate of tree establishment and the species diversity and quality of the new forests developing on the mines. Therefore, this study was initiated in 1999 to document soil development and quality of different aged minesoils on reclaimed mountaintop removal sites. In general, increased soil development with time has been documented. Also, the rate of increase of soil horizon thickness per year decreases over time. This decrease in soil horizon development also has been documented in other states for different mining methods. Kevin Thomas, a graduate student, is conducting this study for his thesis.

5. Characterization and Classification of Clayey Soils Forming on Chambersburg Limestone in Eastern Panhandle of West Virginia – B. Cooley, J. Sencindiver. Observations of soils developed on the Chambersburg limestone in Berkeley and Jefferson Counties, West Virginia have indicated shrink-swell characteristics, especially slickensides, that have often not been officially recorded in reports. Therefore, this study was initiated in cooperation with the Natural Resources Conservation Service to document the shrink-swell characteristics in these soils. Brian Cooley, a graduate student, is conducting this study for his thesis.

6. Characterization of Soils in the Ottercreek Wilderness Area – J. Schnably, J. Sencindiver, S. Carpenter. This is a cooperative effort of the U.S. Forest Service, the Natural Resources Conservation Service (NRCS) and the Experiment Station to map and characterize soils of the wilderness area. The Forest Service is providing funding, NRCS will do the mapping, and the experiment station will conduct the characterization studies. Jamie Schnably, a graduate student, will conduct the characterization studies for her thesis.

Publications 1998-2000

Journal Articles

1. Skousen, J. J. Sencindiver, K. Owens, and S. Hoover. 1998. Physical properties of minesoils in West Virginia and their influence on wastewater treatment. J. Environ. Qual. 27:633-639.

2. Gorman, J.M., J.C. Sencindiver, D.J. Horvath, R.N. Singh, and R.F. Keefer. 2000. Erodibility of fly ash used as a topsoil substitute in mineland reclamation. J. Environ. Qual. 29:805-810.

Proceedings Papers

1. Gorman, J.M., and J.C. Sencindiver. 1999. Changes in minesoil physical properties over a nine-year period. p. 245-253. *In* Proc. 16th Annual National Meeting of the American Society for Surface Mining and Reclamation. 13-19 August 1999. Scottsdale, AZ.

2. Sexstone, A.J., J.G. Skousen, J. Calabrese, D.K. Bhumbla, J. Cliff, J.C. Sencindiver, and G.K. Bissonnette. 1999. Iron removal from acid mine drainage by wetlands. p. 609-633. *In* Proc. 16th Annual National Meeting of the American Society for Surface Mining and Reclamation. 13-19 August 1999. Scottsdale, AZ.

Published Abstracts

1. Jenkins, A., S. Carpenter, and J. Sencindiver. 1998. Soil organic carbon stocks of major forest soils on the Allegheny plateau of West Virginia, USA. p. 633. *In* Summaries of Symposiums. Vol. I. 16th World Congress of Soil Science. 20-26 August 1998. Montpellier, France.

2. Jenkins, A.B., J.C. Sencindiver, and D.K. Bhumbla. 1998. Biogeochemical relationships of calcium and magnesium in high elevation forest soils of West Virginia. p. 296. *In* Agronomy Abstracts. ASA. Madison, WI.

3. Noll, W.J., and J.C. Sencindiver. 1998. Minesoil development in central West Virginia. p. 772. *In* Proc. 15th Annual National Meeting of the American Society for Surface Mining and Reclamation. 17-21 May 1998. St. Louis, MO.

4. Bhumbla, D.K., J.M. Gorman, and J.C. Sencindiver. 1999. Fly ash-sawdust mixtures for minesoil reclamation. *In* Proc. 1999 International Ash Utilization Symposium. CD-ROM. 18-20 October 1999. U.K. Center for Applied Energy Research. Lexington, KY.

5. Bhumbla, D.K., and J.C. Sencindiver. 1999. Phosphorus sorption capacity in some West Virginia soils. p. 318. *In* Annual Meetings Abstracts. ASA-CSSA-SSSA.

6. Jenkins, A.B., S.G. Carpenter, R.B. Grossman, and J.C. Sencindiver. 1999. Soil organic carbon stocks of major forest soils on the Allegheny plateau of West Virginia. p. 344. *In* Annual Meeting Abstracts. ASA-CSSA-SSSA.

7. Sencindiver, J.C., W.L. Daniels, and R.G. Darmody. 1999. Application of soil survey to surface mining and reclamation. p. 25. *In* Soil Resources: Their Inventory, Analysis, and Interpretation for Use in the 21st Century. 10-12 June 1999. Minneapolis, MN.

8. Stark, A., J. Skousen, D. Bhumbla, J. Sencindiver, and L. McDonald. 1999. Trace element concentrations in three soils of West Virginia. p. 35. *In* Annual Meeting Abstracts. ASA-CSSA-SSSA.

9. Sencindiver, J.C. 2000. Wetland soils in West Virginia. *In* Proc. of the West Virginia Academy of Science. Abstracts of the 75th Annual Session. 72(1):3.

Thesis

1. Slagle, A. 2000. Background Concentrations of Trace Elements in Three West Virginia Soils – MLRA-126. MS Thesis. West Virginia University.

NRCS Report on Soil Survey Activities in West Virginia

Stephen G. Carpenter, State Soil Scientist/MLRA Region 13 Staff Leader

The soil survey in West Virginia is rapidly approaching the threshold of completing the first generation of soil surveys. Only three projects remain to complete the "once over survey". One of the projects will be completed this summer with the two remaining projects at 50% completion. We will complete the state in 2002.

West Virginia has seven active soil survey projects that are balanced between update and once over surveys. We have one new update project to be started after July 1, 2000 that is an MLRA project office in MLRA 127 (our second).

The program is actively involved in better understanding forest soils and forest soil nutrient studies with the US Forest Service. We are also involved in a soil phosphorus study with the Agriculture Experiment Station.

West Virginia published their first fully digital soil survey this year: Berkeley County. This survey was to print within two years of mapping complete and incorporates new technology in typesetting and digital map finishing, all done at the MO-13 office in Morgantown. This survey is at Ft. Worth waiting for funds to print it.

For the first time, the West Virginia legislature funded the soil survey program in their budget for 2001. West Virginia is to commit $200,000 to the soil survey effort this next year.

We were able to bring in a new soil scientist this year with the graduation of Wendy J. Noll from graduate school. Wendy came up on the Student Educational Employment Program (SEEP) and reported to duty in May. We also were able to hire a new SEEP student for the summer. B.J. Shupe is working as a soil scientist trainee in the Monroe/Craig County, Va. update project. We find that the (SEEP) program is effective in replenishing our ranks.

West Virginia will complete full coverage of Digital Orthophotography in December of this year (if USGS keeps up with the contracts). We are very pleased with the flexibility this data gives us in updating and publishing soil surveys. We also completed all contracts for complete, leaf-off color infrared aerial photography for the entire state. Our field soil scientists love this imagery.

MO-12 REPORT
NORTHEAST AREA
JUNE 22, 2000

Because of the tight budget year, travel restrictions have prevented the MO-12 office from conducting many of the winter and spring scheduled functions. We have hoped to conduct steering team meetings with the active MLRA's and hold meetings relative to the draft of M.O.U.'s for the remaining MLRA's. Instead, we have been working on aspects of the following initiatives.

1. MLRA Line Placement – All states have been contacted about any proposed changes in line placement. Responses were received from Maine, Connecticut, New York, Pennsylvania, Ohio and New Jersey. Most line adjustments are minor except for the MLRA-139-140 line and the temperature adjustment between frigid and mesic for MA, CT & NY.

2. STATSGO – The MO-12 Soil Data Quality Specialists (SDQS) have reviewed all the taxonomic classifications used in the earlier publication. We are 95 to 98 percent completed with the update. The initial run of the 3SD to NASIS validation data has been received in the states and should be ready for review and correction.

3. SSURGO – There are about 15 projects currently being completed by the states and for digitizing units that will require soil business (correlation amendments). The SDQS have been reviewing the databases associated with the SSURGO projects and continue to find errors in coarse fragment entries, sieve analysis entries and liquid limit entries.

4. M.O.U.'s – Three M.O.U.'s and the associated work plans have been prepared for 139, 141 & 142. The states, Soil Survey Division, and the National Soil Survey Center have reviewed the drafts. The documents are out for signature at the state level.

Currently we have one update soil survey, six progressive surveys, nine progressive update surveys and four completed soil surveys awaiting correlation (one of which is an update). There are ten correlated soil surveys in the states that need technical reviews and two awaiting the state to make the necessary review changes. There are two soil surveys in the MO awaiting English edit, two soil surveys where the English edit is complete but awaiting general soil maps, etc., and one that is complete but not published at this time.

The states within the MO region have lost several field soil scientists to transfer and retirement during the first half of the year. This has caused postponement of several anticipated field reviews. Although travel is restricted, all scheduled reviews for the rest of the fiscal year will be scheduled and attended by one of the SDQS.

See attached maps.

Mid Atlantic MLRA Region Report
MO14

MO14 sent representatives to both the Northeast and South region conferences and will continue to support both regions.

Ag. Handbook 296 is in the process of revision. The changes in the Northeast involve the coastal plain of Maryland, Delaware, Virginia and New Jersey. The new MLRA 153D, Northern Tidewater, has been approved. There were also changes to the Northern Coastal Plain boundaries (MLRA 149A). In Virginia, the Eastern Shore has been changed to all 153B, Tidewater Area. Other changes to 153B involve the extension of the Tidewater Area across the Savannah River to northeastern Florida. The Southern Piedmont, MLRA 136 has been split into a mesic and thermic region. The proposal to create a subset of the Piedmont has been dropped. Cooperators need to give their input to the NRCS State Soil Scientist, especially on the narrative sections.

MO14 has a large workload in the Northeast Region in New Jersey, Maryland, Delaware, and Virginia. John Kelley and Marc Crouch are the primary Soil Data Quality specialists, with Debbie Anderson and Phil Tant covering parts of southern Virginia.

Maryland will be hosting the third Professional Development Workshop in Ocean City in October 2000. The first two workshops centered on correlation issues in the Southern Piedmont as well as documentation, data collection methods, and statistical analysis. MO14 training session include field activities that assist the local soil scientists gathering data. This provides exposure to people from different MLRAs and gives the local projects information they can use for correlating their surveys.

Since reorganization, many responsibilities that were assigned to the state offices fall on the shoulders of the field soil scientists. The correlation teams in the Northeast are active in developing new soil series and approving map units. The project leaders are the correlators with the MO providing quality assurance. As the field receives the necessary hardware and software, they will be managing their soil survey legends and maintaining the correlation notes in NASIS.

Northeast Cooperative Soil Survey Conference
Business Meeting
June 22, 2000

Maxine Levin, Soil Scientist, NRCS-USDA
NECSS Conference Steering Team Chair

<u>Old Business:</u>

1. Review and approve changes to bylaws of the NE Cooperative Soil Survey Conference (Discussion and recommendations will take place in NEC50 and NRCS Breakouts)—
   a. Article III- Participants Section 1.3
   b. Article III- Participants Section 1.4
   c. Article IV- Organization and Management Sec.1.1 Membership
   d. Article IV- Organization and Management Sec.1.3.4 Authority & Responsibilities - Liaison
   e. Article VII Representatives To the National & Regional Soil Survey Conferences Sec. 3
   f. Article VIII Northeast Cooperative Soil Survey Journal
   g. Article X Research Needs Committee Sec.2.0 Membership
   h. Article X Research Needs Committee Sec.4.0 Membership

   Proposed Changes in Bylaws were accepted. A proposal to suspend the NE Cooperative Soil Survey Journal (Article VIII)was accepted. A proposal to change wording in Article VII Representatives to the National and Regional Soil Survey Conferences Sec. 3 to say : “may attend” was accepted.
2. Future NCSS Conferences
   a. New York has agreed to host the 2002 NE Cooperative Soil Survey Conference
      Selection of Chair for 2002 Conference—Tyrone Goddard, NRCS Syracuse, NY
      Selection of Co-Chair for 2002 Conference—Ray Bryant, Cornell University, Ithaca NY
      Vice Chairs—David Kriz, USDA-NRCS, Richmond VA and Dr. Baker (or substitute), Professor, VA Tech, Blacksburg VA

   b. (Article VII-Sec 1&2) Representatives to attend National Cooperative Soil Survey Conference in 2001 are:
      NEC50 Representatives— Ray Bryant, Cornell University, Ithaca NY
      Laurie Osher University of ME, Orono, ME
      John Galbraith, VA Tech, Blacksburg, VA

      USDA-NRCS Representatives— Tyrone Goddard, NRCS, Syracuse NY
      David Kriz, NRCS, Richmond VA

   c. (Article VII-Sec. 3) Representatives to Attend South, Midwest, and West NCSS Conferences in 2002
      It was agreed that any representatives who attend other regional conferences as a NE representative will be selected and requested by the National Leaders. The National Leaders from NRCS will contact State Conservationists and Experiment Station supervisors with request for attendance by January 2002.

3. 1999-2000 Committee Reports
   Discussion and Recommendations; Follow-up Action
   a. Research Needs
   b. Soil Taxonomy
   c. SSURGO/Map Finishing
   d. Site Specific/Precision Farming
   e. Regional Hydric Soils Committees

Reports are accepted and committees recommended to continue through 2002. A summary report of recommendations and issues from the YR2000 NECSS Committees will be developed by representatives to the National NCSS Conference in Ft. Collins CO June 2001 for submittal at that conference

New Business:

Recommendations for Committees and Format for the next NE Cooperative Soil Survey Conference in FY2002—

1. Format will be continued in the next conference in YR2002
2. Change Committee SSURGO/Map Finishing to ***Information/Data Systems***

Recommendation for NE Conference Location in 2004:
Conference will wait until 2002 conference for status of Experiment Station participation in NJ or NH

Marty Rabenhorst, University of Maryland, College Park, was awarded the Silver Spade Award for 2000. Marty, with a group of past recipients will select the person receiving the award in 2002.

Northeast Cooperative Soil Survey Conference
NRCS Breakout Session
8:00 AM June 22, 2000
Maxine Levin, Soil Scientist, NRCS-USDA
Moderator

Old Business:

1. **Review and approve changes to bylaws of the NE Cooperative Soil Survey Conference**
   Discussion and recommendations—
   a. Article III- Participants Section 1.3
   b. Article III- Participants Section 1.4
   c. Article IV- Organization and Management Sec.1.1 Membership
   d. Article IV- Organization and Management Sec.1.3.4 Authority & Responsibilities - Liaison
   e. Article VII Representatives To the National & Regional Soil Survey Conferences Sec. 3
   f. Article VIII Northeast Cooperative Soil Survey Journal
   g. Article X Research Needs Committee Sec.2.0 Membership
   h. Article X Research Needs Committee Sec.4.0 Membership

   There was no discussion of the amendments to the Bylaws. Members agreed to defer to NEC-50 for any further changes. All changes were accepted as recommended to the NRCS Breakout group.

2. **Future NCSS Conferences**
   a. Nomination for 2004 Conference-

   Members voted to defer to the wished of the NEC-50 group. New Jersey and New Hampshire are willing to put on the conference but only if there is a full counterpart co-chair from the state agricultural experiment station. In the case of both New Hampshire and New Jersey, there is no one in that position in either state at this time.

   b. (Article VII-Sec 1&2) Representatives to attend National Cooperative Soil Survey Conference in 2001 are:
      Tyrone Goddard, State Soil Scientist, Syracuse NY
      David Kriz, State Soil Scientist, Richmond VA

   c. (Article VII-Sec. 3) Representatives to Attend South, Midwest, and West NCSS Conferences in 2002-

   Members agreed that it would be difficult to commit to attending another conference without a formal invitation from that conference steering chair. The NE Steering chair agreed to contact the steering team chairs of other conferences to formalize an invitation to other conferences for one member if the conferences are not held the same week as they were held this year.

3. **2002 Committee Membership Nominations**
   a. **Soil Taxonomy (NRCS Soil Taxonomy Lead Scientist is responsible for selection)**
      Ned Ellenberger – Bedford PA 1999-2001
      Dave Kingsbury – Morgantown WV 2000-2002
      Karen Dudley –Concord NH 2001-2003

Recommendation for 2002-2004: Scott Keenan, Hammonton NJ

b. **Research Needs**
NRCS State Soil Scientist (2YR term)—Steve Gourley, Winooski VT
NRCS Field Soil Scientist (2YR term)—Steve Carlisle, Seneca Falls, NY
MO Team Leader (4 Year Term)—Steve Carpenter, MO 13 Morgantown WV

<u>New Business:</u>

1. Discussion & Recommendations for Committees and Format for the next NE Cooperative Soil Survey Conference in FY2002—Recommend to keep same Committees for next regional meeting in NY in 2002.

2. Addition topics of Discussion –

a. **Proposal to make a list of future sites for regional meetings**. This proposal was not brought the floor for a vote because in discussion it was decided that without assurance of full participation from Ag Experiment Station, NRCS would not be able to host a meeting successfully. The preference is to select the next meeting place by volunteering sites, irrespective of how long ago the state hosted the meeting before.

Value of the Cooperative Soil Survey in Virginia

James C. Baker
Virginia Tech

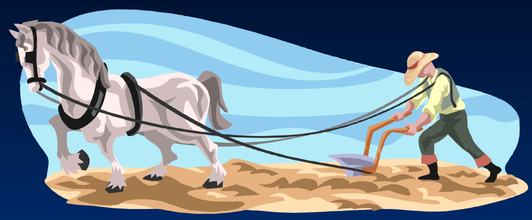
Ag Land Use

90% of Virginia’s population lives on <10% land area

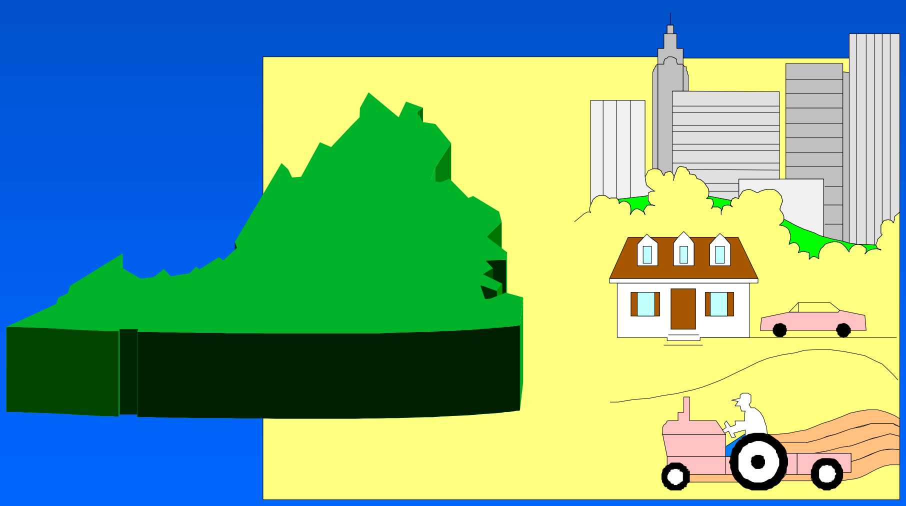
Early Emphasis on Agriculture

- Jefferson, Washington, Madison, Ruffin
  - All farmers
- Early yields did not change much until 1940’s
- Differences between “bottomlands” and “red piedmont clays” was apparent

Early Soil Surveys



- Agriculturally based
- Also useful for designating best soils for drainfields
- Urban soils program began in Virginia



Programs Using Soils Info

- Erosion and sediment control
- VALUES – nutrient management
- Waste disposal
  - Wastewater
  - Biosolids
- Other construction requirements
- Environmental Impacts
- Wetlands
- Reclamation and restoration of disturbed lands

Conservation Incentive Programs

- CRP
- CREP
- EQIP
- CFO
- WHIP
- PFW
- SIP
- RT
- BMPS

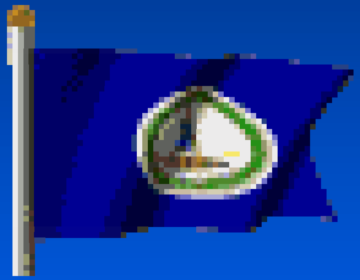
- BMPLP
- SBFA
- BMPTC
- NMETCP
- WP
- ECP
- EWP
- WRP

Environmental Programs

- SARA
- CERCLA
- CBO
- RPA
- etc

Resources

Virginia resources committed toward soil survey since 1978



$11 million

In 1978, Virginia had approximately

60 soil scientists

Changes Ahead

Expanded clientele groups

Fewer public sector soil scientists

More private sector soil scientists

The Soil Survey “Once Over” is not the end.

It is not the beginning of the end.

It is just the end of the beginning.

NRCS Virtual Urban Soils Workgroup (VUSWg)

FY 2000 Workplan

Joyce Scheyer
soil scientist
joyce.scheyer@usda.gov

Purpose of Workgroup

VUSWg Workplan for FY 2000

- Formed April 2000 by email using "technology needs assessment form"

- E-technology prototype for low cost and timely communication

- Increase efficiency and provide support for urban-related soil scientists

Membership and Format

VUSWg Workplan for FY 2000

- NRCS soil scientists at any level and location
- Voluntary participation with concurrence of supervisor
- Monthly teleconferences with info exchange by email and FAX
- Occasional workshops and field tours to review and finalize products

You are invited to join the NRCS “Virtual” Urban Soils Workgroup (VUSWg)

Return to: joyce.scheyer@usda.gov

1. Your name
   Full job title Address, Phone, Fax, email
   Geographic area of responsibility

2. Our teleconferences include discussion of the topics below (20 minutes each).
   Please rank these topics for order of discussion in our teleconferences
   a) ___ Compaction in Urban Areas
   b) ___ Urban Mapping Conventions
   c) ___ Educational Materials in Urban Soils
   d) ___ Working with Grassroots Groups on-site
   e) ___ Urban Soil Quality Assessment Kit
   f) ___ Soil Contamination and Relative Risk
   g) ___ Community Gardens
   h) ___ NRCS Urban Soils Homepage
   i) ___ Glossary for Urban Soil Taxonomy
   j) ___ Urban Interpretations for __________________
   k) ___ Urban Soils Research Needs for NCSS Work Planning Conferences.
   l) ___ _________________________________

3. I volunteer to present topics lettered ___, and ___. I will send a summary of the topic as I see it to participants before the teleconference and start off the discussion.

4. The regional/state/IRT urban soils coordinator for my area is:____________________

5. I recommend these additional group members:

Priority topics in urban soils

A. Urban Mapping Conventions
Glossary for Urban Soil Taxonomy
Compaction in Urban Areas
Soil Contamination and Relative Risk

B. Educational Materials in Urban Soils
Working with Grassroots Groups on-site
Urban Soil Quality Assessment Kit
Community Gardens
NRCS Urban Soils Homepage

C. Urban Interpretations for __________
Stormwater Management
Soil Slip Potential
Riparian Buffers

Committees

VUSWg Workplan for FY 2000

- Compaction and Hydrology (H. Chris Smith)
- Contamination and Safety (Luis Hernandez)
- Conventions for Mapping and Interpretations (Joyce Scheyer)
- Contacts and Communications (Scheyer)
    - Liaison to NRCS Divisions
    - Coordinate Formal Peer Reviews
    - Workgroup Email Distribution

NRCS Virtual Urban Soils Workgroup (VUSWg)

FY 2001 Workplan

(DRAFT)

Committees

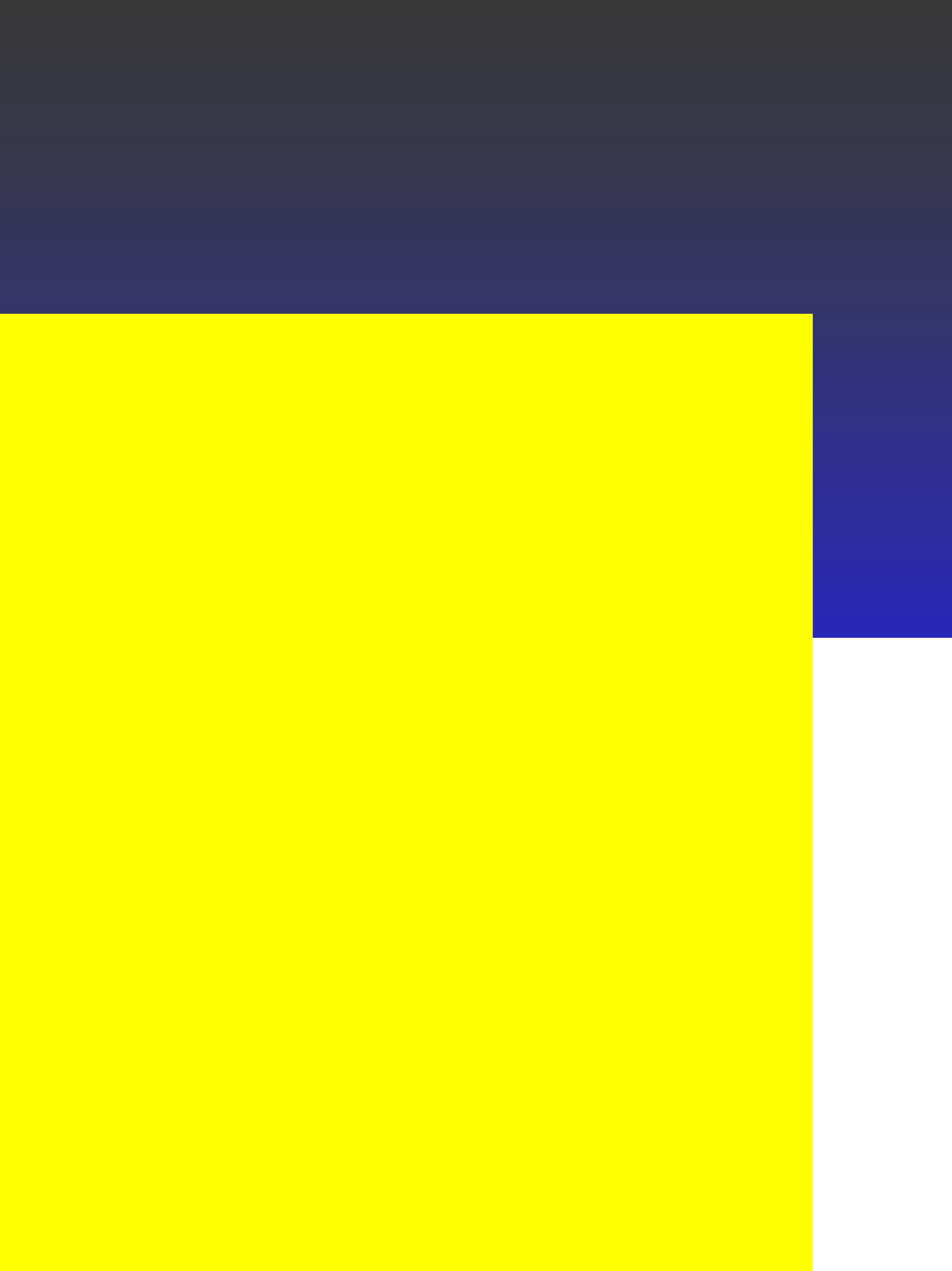
Preliminary VUSWg Workplan for FY 2001

- Add “Consumer Education and Marketing”
- Compaction
- Contamination
- Conventions
- Contacts

Products

Preliminary VUSWg Workplan for FY 2001

- Continue series of Urban Soil Technical Tips for newsletter
- Draft policy and procedure fact sheets on each committee subject
- Sponsor a workshop with field tour and peer review



Contact:

Joyce Mack Scheyer
soil scientist
National Soil Survey Center
Soil Survey Division, USDA-NRCS
joyce.scheyer@usda.gov

Your comments
are welcome

Thank You

Status of Subaqueous Soil Survey Projects in the Mid-Atlantic Region

Martin C. Rabenhorst
University of Maryland Dept. of Natural Resource Sciences & LA

Progress over the last 6 years on the development of concepts and protocols for mapping subaqueous soils has been largely accomplished by the late Dr. George P. Demas (USDA-NRCS). For his pioneering efforts, Dr. Demas was recognized both by the USDA who awarded him the Secretary's Honor Award for Scientific Research, and also by the Soil Science Society of America who presented him with the Emil Truog Award for outstanding contribution to Soil Science through the Ph.D. thesis. After demonstrating that horizon differentiation occurs in subaqueous sediments as a result of Simonson's generalized processes of soil genesis, a modification to the definition of soil was proposed and recently published in *Soil Taxonomy* which accommodates subaqueous soils in shallow water environments. Also in pilot studies in Sinepuxent Bay, Maryland, it was demonstrated that the distribution of subaqueous soils is associated with particular subaqueous landforms and thus can be described using the pedological paradigm of the soil-landscape model similar to that described by Hudson. By borrowing from and modifying Jenny's state factor equation for soil formation and Folger's concept of sediment genesis, and new state factor equation for subaqueous soil genesis has been formulated as: $\mathbf{Ss = \mathit{f}\,(C, O, B, F, P, T, W, CE)}$, where Ss is subaqueous soil; C is climatic

The protocol for conducting subaqueous soil survey first requires high quality bathymetric data which is obtained by integrating a research grade fathometer with a GPS providing real time latitude and longitude and then normalizing this data through use of a digital tide gauge. Once sufficient bathymetric data have been collected, a contouring software package such as SURFER can be used to generate both topographic maps and 3-D images of the subaqueous landscape. Other information such as IR photography can then be utilized in conjunction with the bathymetry to identify subaqueous landscape units.

Observations of subaqueous soils are made within landscape units using a bucket auger, a McCaulay sampler, or a vibracorer. Conceptual models can then begin to be formulated relating particular soils to landscape units. Based upon soil descriptions and accompanying characterization data, five soils series have been proposed to accommodate subaqueous soils in the coastal bays in the barrier island setting. These soil series have been used to name map units in the Sinpuxent Bay pilot project.

Initial work was performed in the southern end of Sinepuxent Bay, Maryland during Dr. Demas' doctoral work. At present, bathymetric data is being collected in Indian River Bay, DE to permit terrain analysis. The short term plan is to focus subaqueous soil survey efforts in the Delaware

Inland Bays (Indian River Bay d Rehoboth Bay) which includes approximately 7,500 Ha). Once work in Delaware has been completed, the focus will then be placed on the Maryland Inland Bays (Assawoman Bay, Isle of Wight Bay, Sinepuxent Bay, and Chincoteague Bay which includes approximately 30,000 Ha.). Beyond this, there is additional interest in pursuing subaqueous soils survey opportunities in Chesapeake Bay Pamlico Sound, and Narragansett Bay.

Deep Studies in the Soil-Regolith Column in Anne Arundel County, Maryland or Estimating Depth to Sulfide-Bearing Sediments in the Maryland Coastal Plain: A Pedogeomorphic Modeling Approach

Martin C. Rabenhorst
University of Maryland Dept. of Natural Resource Sciences & LA

Within the inner Coastal Plain of Maryland, microscopic sulfides (chiefly pyrite) are found associated with particular geological formations. Geological weathering has resulted in a boundary between the oxidized zone (lacking sulfides) and the unoxidized zone (containing sulfides) which may occur as shallow as two or three meters or as deep as 20 to 30 meters from the soil surface. The boundary between the oxidized and unoxidized zones can be easily identified by morphological features in the field. When the sulfide bearing materials are exposed through earth-moving activities, the sulfides begin to oxidize producing sulfuric acid and Fe laden drainage waters, much like acid mine drainage. These problems associated with acid sulfate weathering on the Maryland Coastal Plain have been previously documented. A collaborative effort was undertaken in conjunction with the update of the Anne Arundel Co. soil survey, to document the relation between geomorphology and the depth to sulfides. The effort was led by former UMD graduate student Terry Valladares, who made this the subject of his MS thesis. Terry, often working closely with NRCS soil scientists, made over 100 deep borings (ranging from 4 to >20 m in depth) and detailed morphological descriptions in dozens of landscapes of Anne Arundel county. Cross sectional diagrams show evident relationships between landform and the depth to sulfides and it was shown that the depth to sulfides could be related to the geomorphometric parameter known as Apoint relief.@ By utilizing a digital elevation model (DEM) in conjunction with mathematical models developed for particular geological formations, one could predict the depth at which sulfides would be expected to occur at any point on a landscape. This approach demonstrates the value of joining deeper investigations of the regolith with soil survey activities.

Calcium and Magnesium Stocks and Occurrence; and Aluminum/Acidity Considerations

for High Elevation Forest Soils of West Virginia

Steve Carpenter
USDA-NRCS
Morgantown, WV

100 Years…the end of the beginning

- In updating soil surveys in mostly forested MLRAs, clearly forested soils were not mapped as intensely as cropland
- Forest soils are beginning to emerge from obscurity
- This report is given on ongoing work in forest soil nutrient cycling and status

General Concerns:

- Forest productivity limitation from nutrient deficiency. Particularly Ca and Mg.
- Limitation from acidity/Aluminum interference.
- Streamwater acidification.

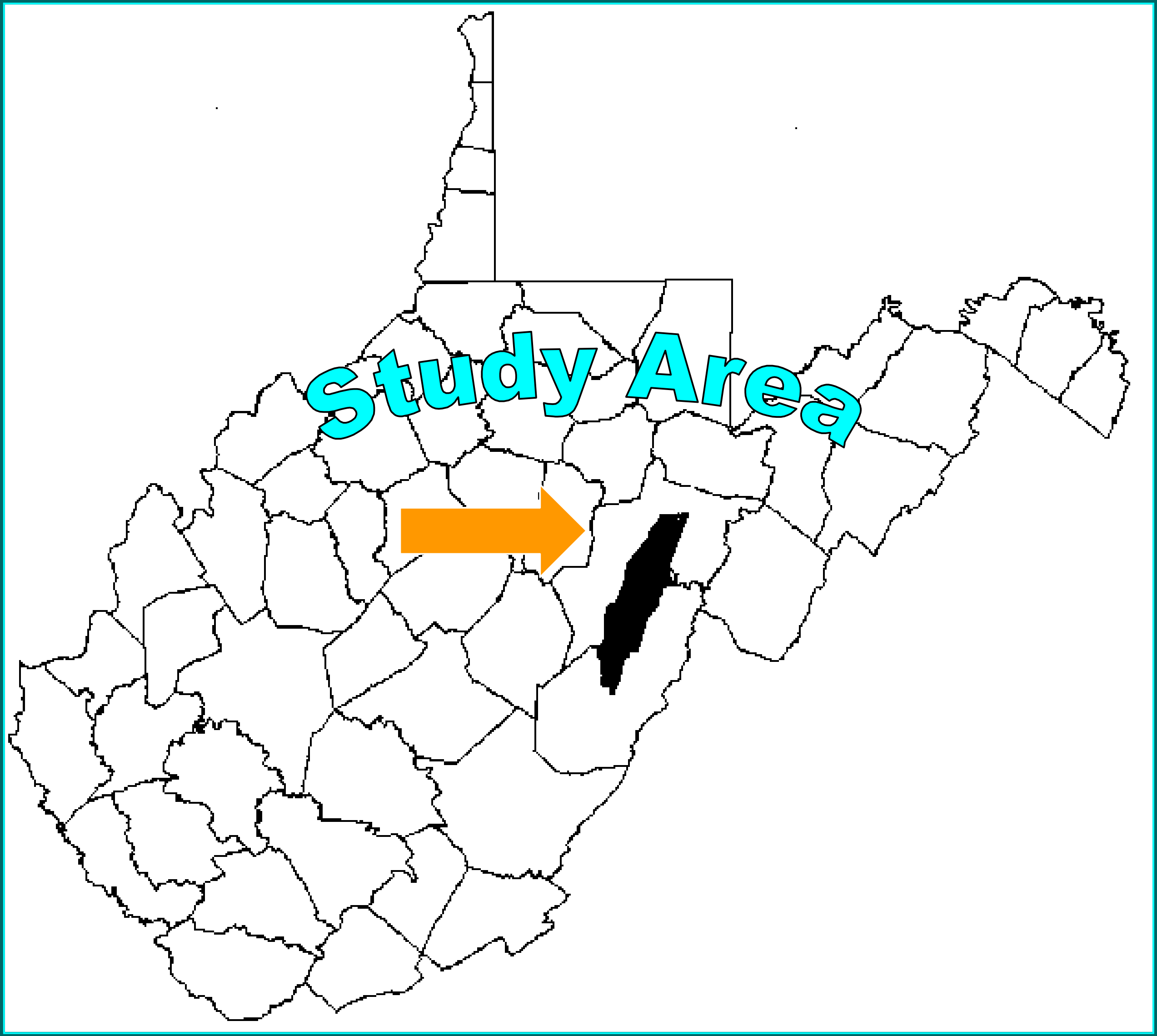
Objectives I:

- Document exchangeable and total nutrient stocks of Ca and Mg.
- Compare to published values from other eastern forest soils.
- Examine the biogeochemical occurrence of these nutrients in the soil.

Objectives II:

- Examine some factors of buffering status with regard to cation loss and Al saturation of soil exchange complex.
- Relate these soil characteristics to potential productivity and water chemistry effects.

West Virginia, USA



Focus on High-Elevation Soils of the Monongahela National Forest

- Frigid series formed from Pennsylvanian geological strata (acid sandstone and shale).
- Spruce and northern hardwood forest types.
- Correlated extent is about 90,000 ha, anticipated final extent is about 180,000 ha.

Study Sites:

- Four frigid soil series.
- Four typical, relatively undisturbed, forested sites of each.
- All above 3600 feet in elevation.
- All in MLRA 127 on same geologic formation.

Frigid Series

- **Mandy** - <40”, dystrochrept, Northern Hardwoods.
- **Snowdog** - >60”, dystrochrept, Mod. Well Drained, Northern Hardwoods.
- **Gauley** - <40”, spodosol, spruce.
- **“MWD Gauley”** - tentative series, Mod. Well Drained Gauley, spruce.

Sampling layout and procedures:

- Full pedon sampling to bedrock or 1.5 meters
- New techniques to characterize “forest floor” soil horizons (L, O, A) - especially for bulk density.
- NSSL/WVU chemical/physical characterization.

Study Area: Reasons for Concern

- Predominance of very acid soils, apparently poorly buffered (pH range 3.5-4.6).
- Annual precipitation > 1400mm yr^{-1}.
- Chronic inputs of acidity and nitrogen.
- Forest harvesting impacts on similar soils.

Results I

Exchangeable and Total Soil Calcium and Magnesium Stocks.

Exchangeable and Total Calcium Stocks of WV Frigid Soil Series.

Soil Series	Total Ca	Exch. Ca
	------------kg ha^{-1}--------	
Mandy	513	192
Snowdog	1095	350
Gauley	490	162
MWD Gauley	521	156

Exchangeable and Total Magnesium of WV Frigid Series

Series	Total Mg	Exch. Mg
	-------------kg ha-1-----------	
Mandy	3896	51
Snowdog	6662	126
Gauley	2046	28
MWD Gauley	1628	66

Comparison of Soil Calcium and Magnesium to other Forest Ecosystems in the Eastern U.S.

Total Soil Calcium and Magnesium for Some Eastern Forest Ecosystems

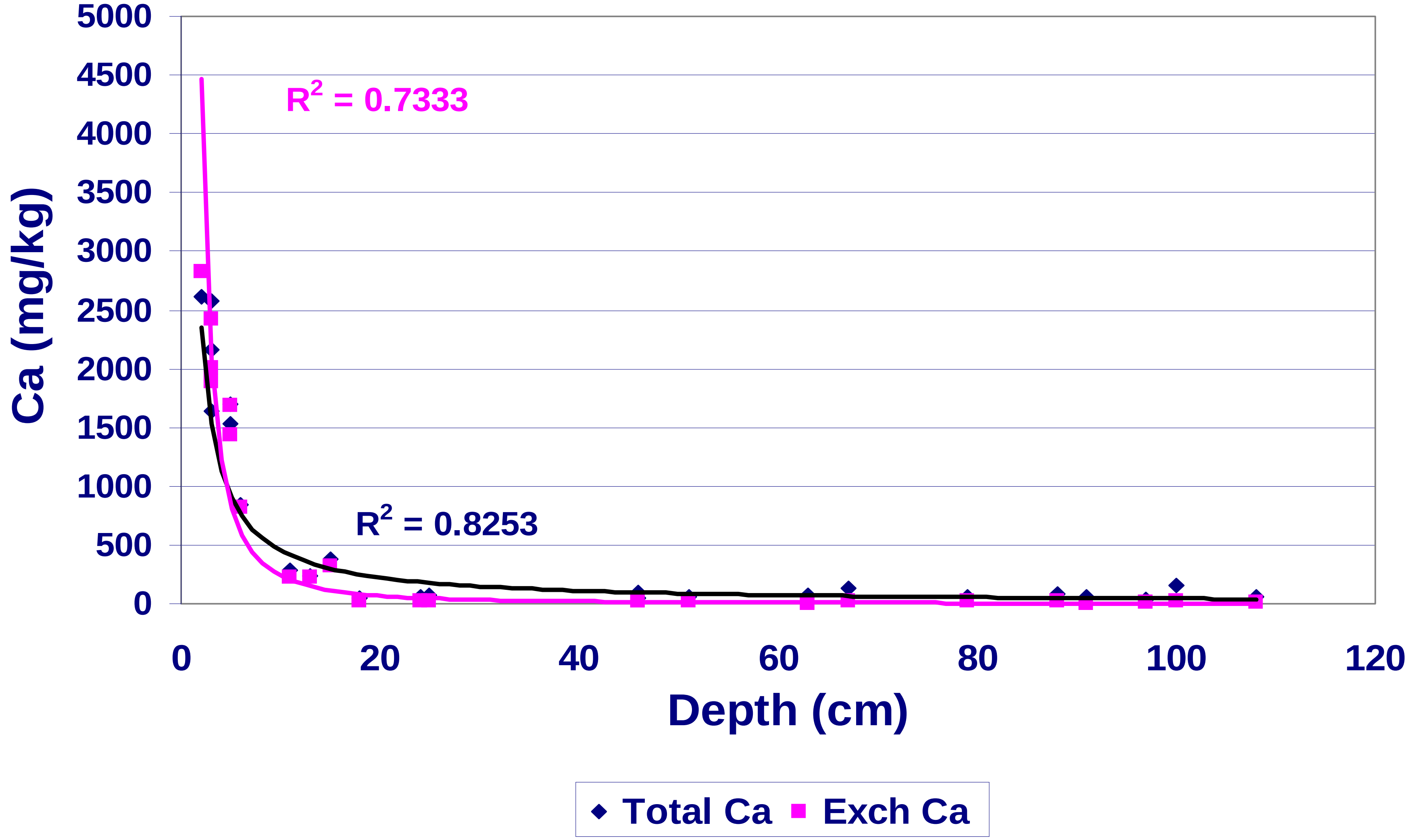
Site	Ca	Mg
	--------kg ha^{-1}------	
NH, N. Hardwood	8060	7790
NH, N. Hardwood	10270	7740
ME, Spruce	10710	36520
WV, N. Hardwood (Mandy)	513	3896
WV, N. Hardwood (Snowdog)	1095	6662
WV, Spruce (Gauley)	490	2046
WV, Spruce (MWD Gauley)	521	1628

Biogeochemical Characteristics:

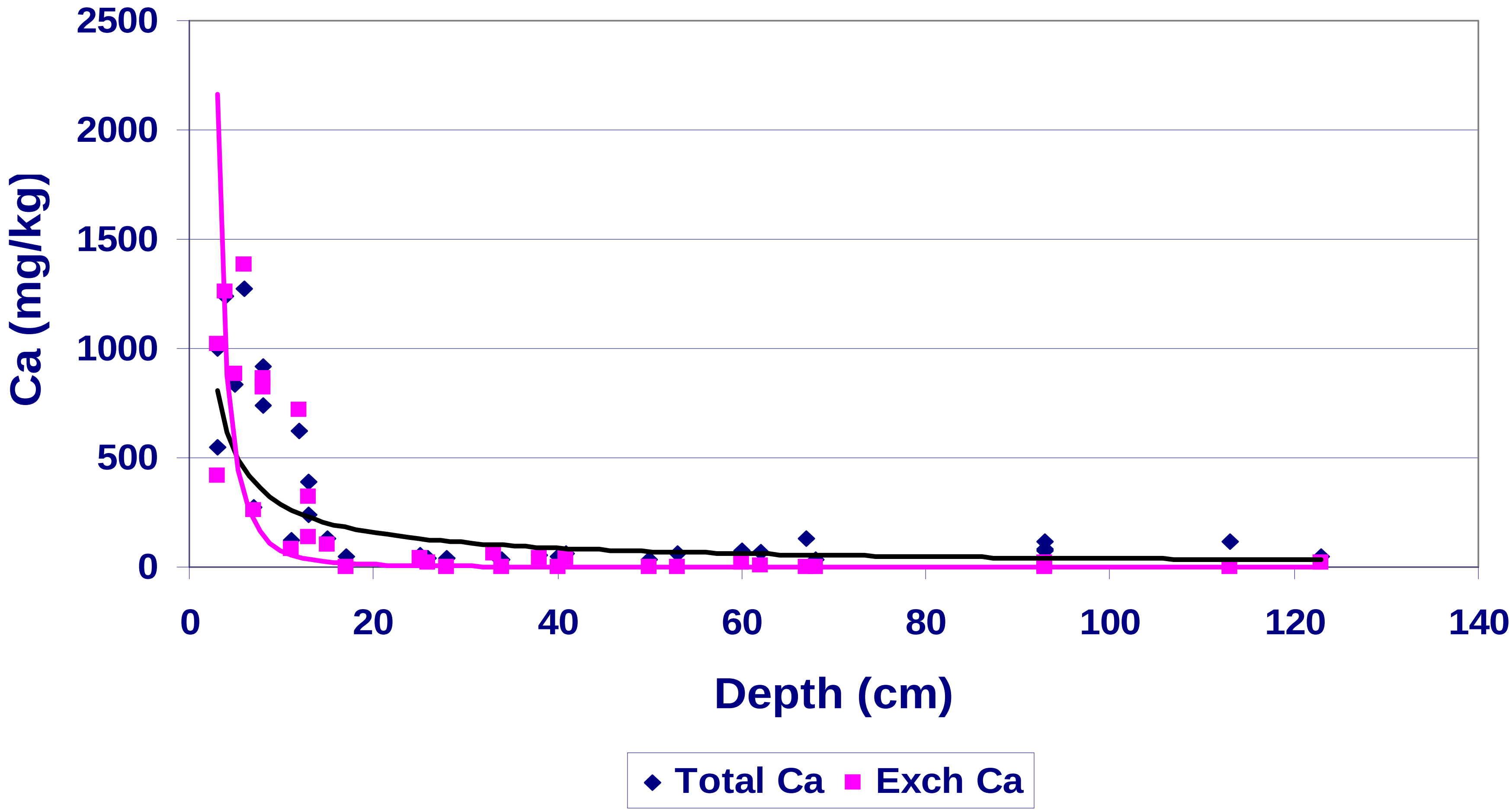
Comparisons

- Relationship to soil depth.
- Total vs. exchangeable values.
- Relationship to soil organic carbon

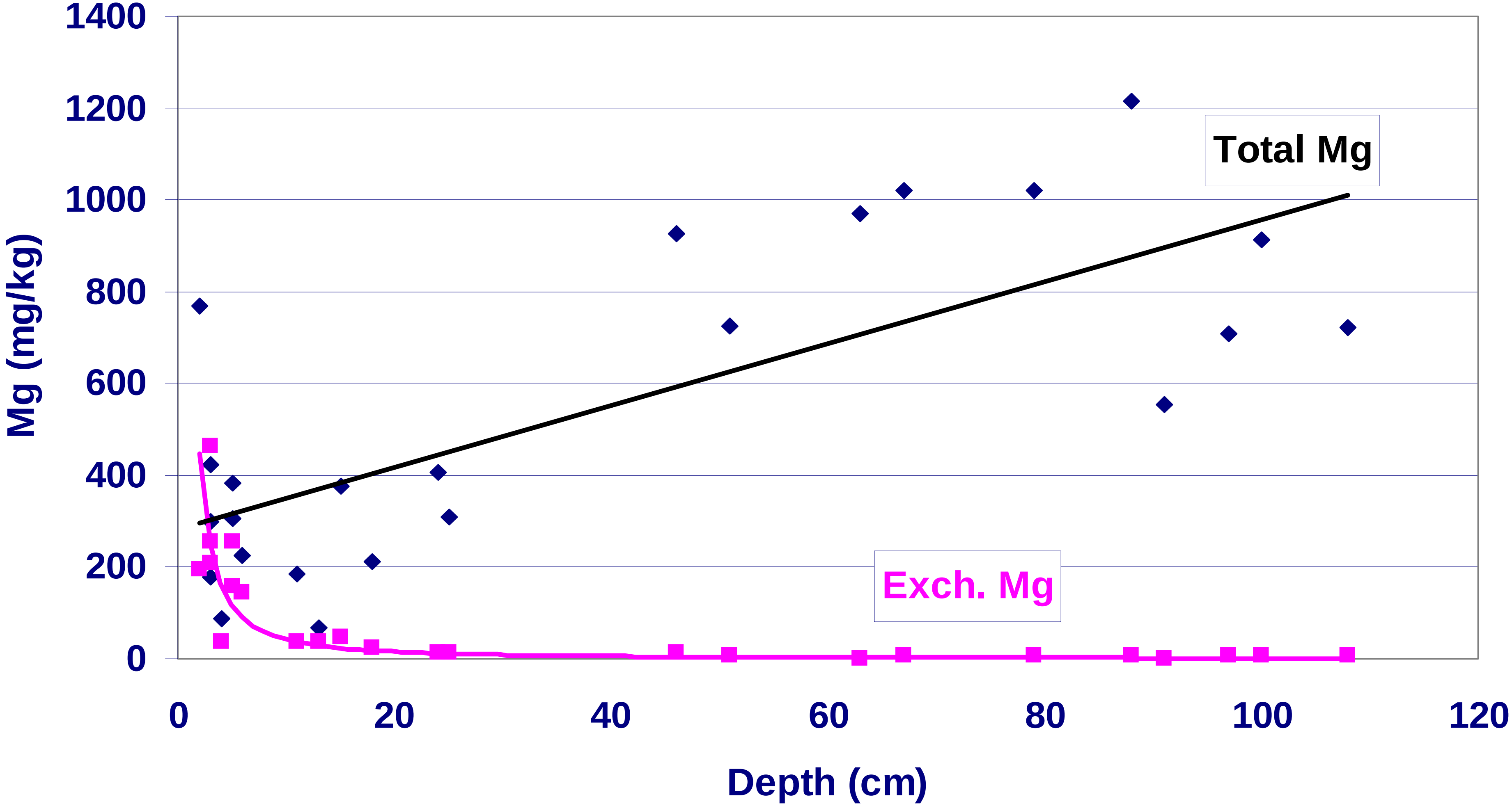
Relationship of Exchangeable and Total Calcium to Soil Depth for the Mandy Series.



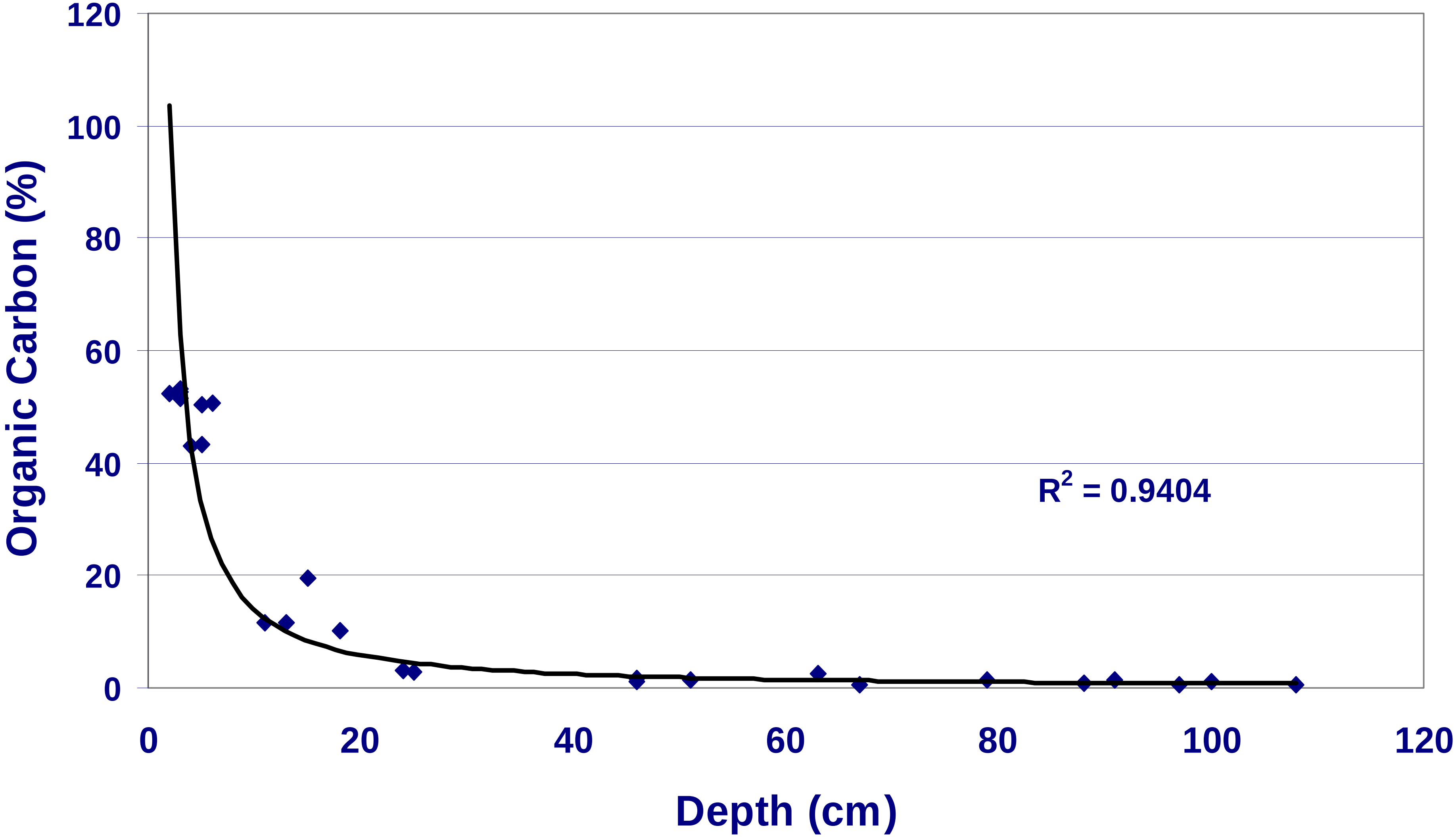
Relationship of Exchangeable and Total Calcium to Soil Depth for the Gauley Series.



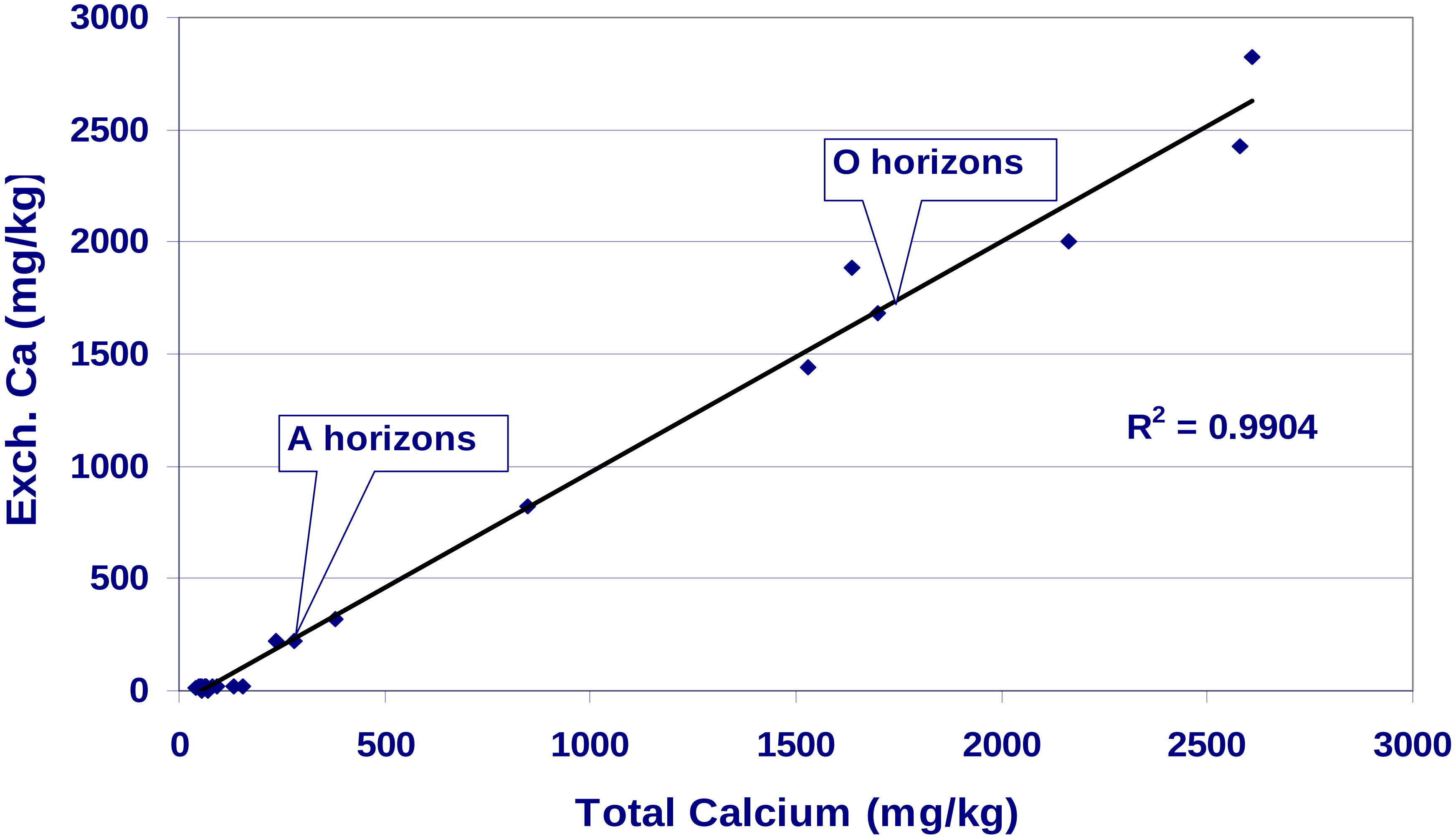
Relationship of Total and Exchangeable Magnesium to Soil Depth for the Mandy Series



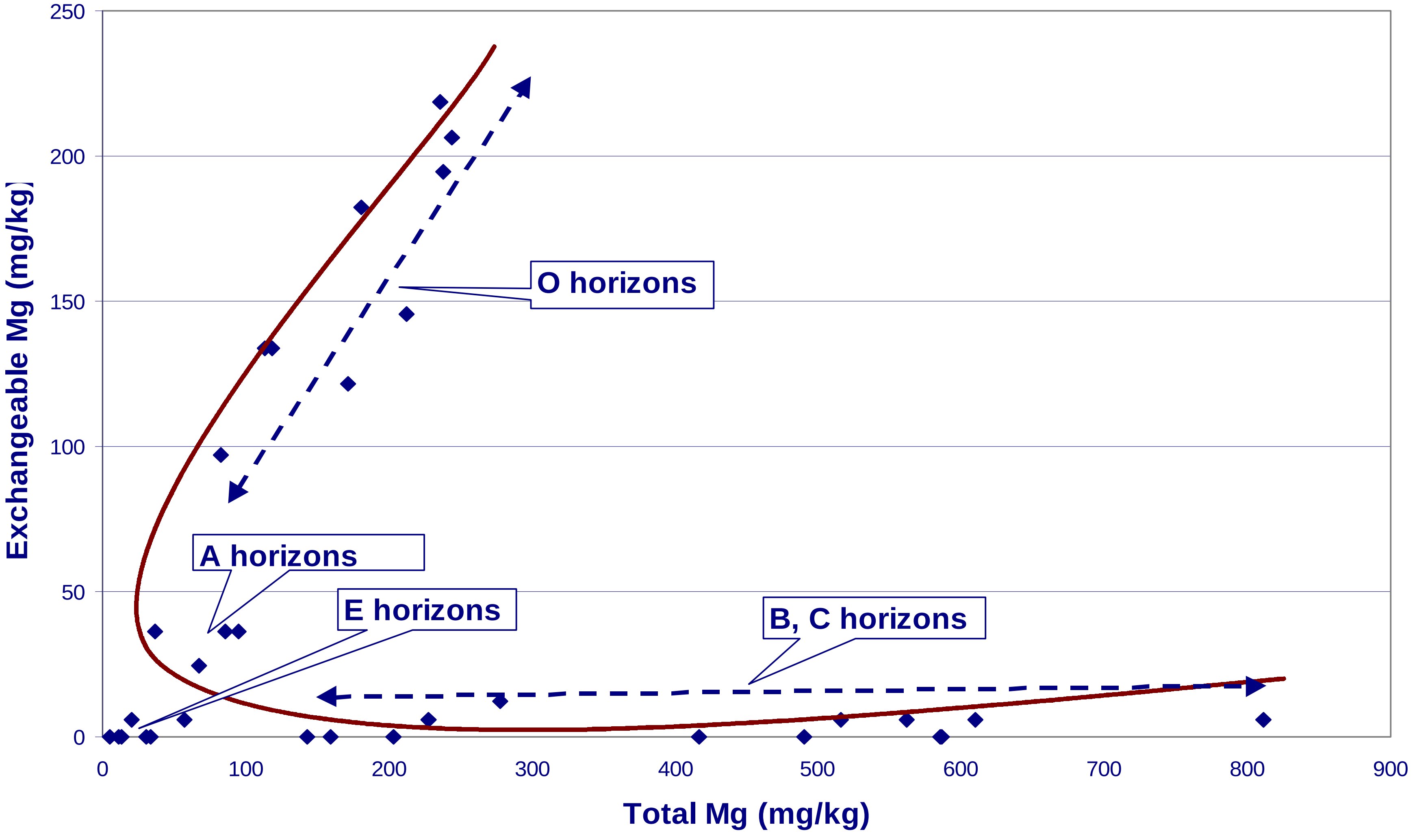
Relationship of Organic Carbon and Soil Depth for the Mandy Series.



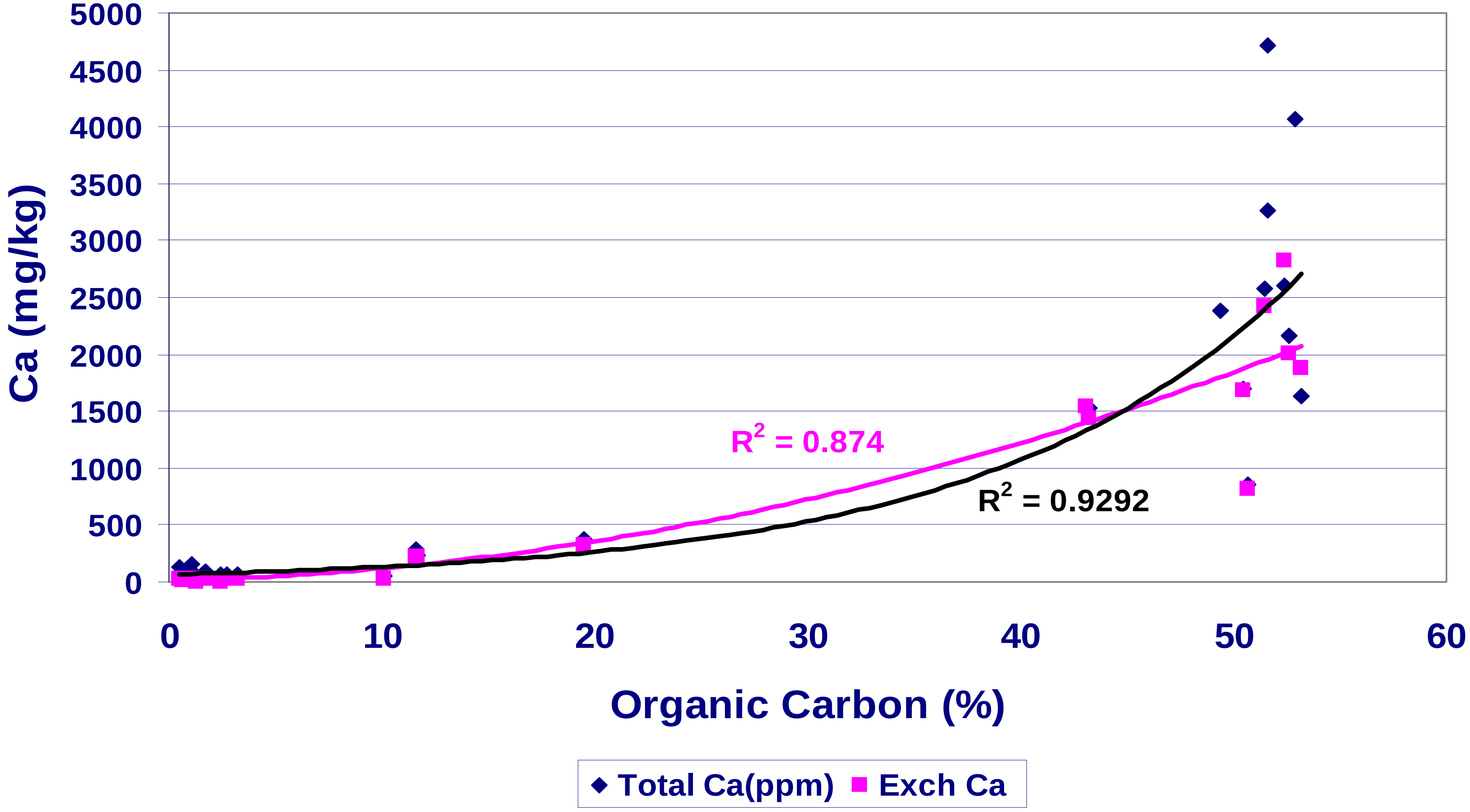
Total vs. Exchangeable Calcium for the Mandy Series



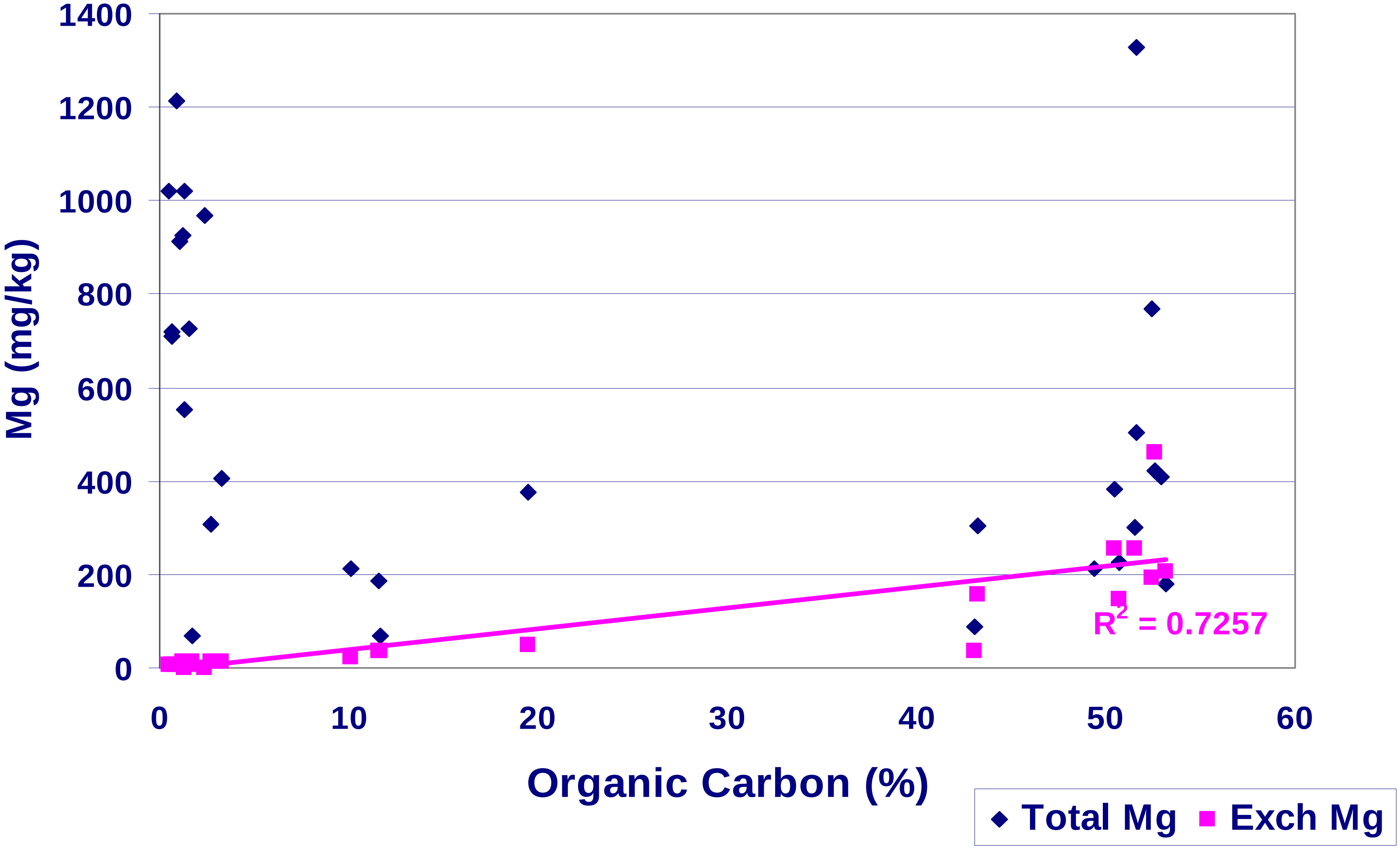
Total vs. Exchangeable Magnesium for the Gauley Series



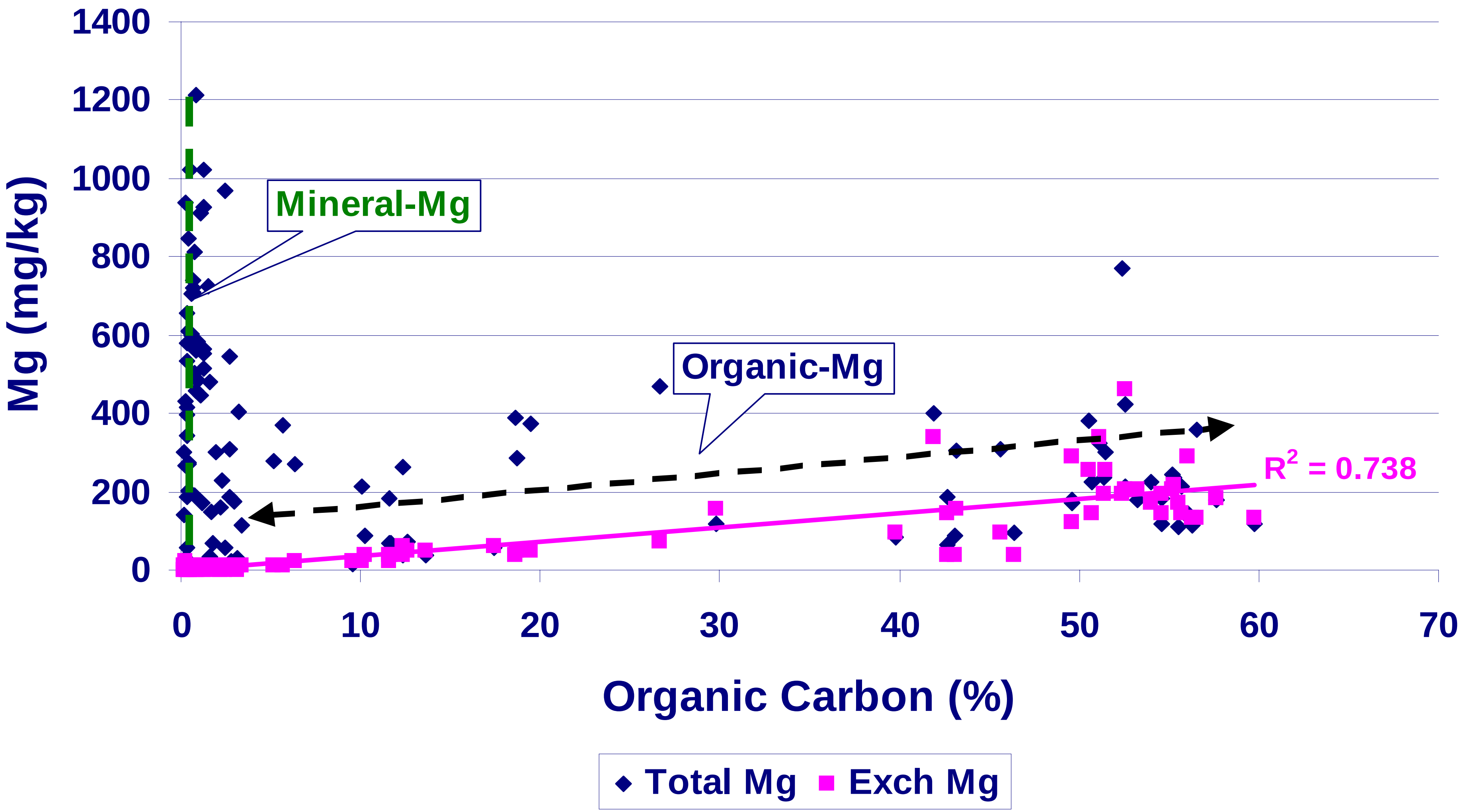
Relationship of Exchangeable and Total Calcium to Soil Organic Carbon for the Mandy Series.



Relationship of Exchangeable and Total Magnesium to Soil Organic Carbon for the Mandy Series.



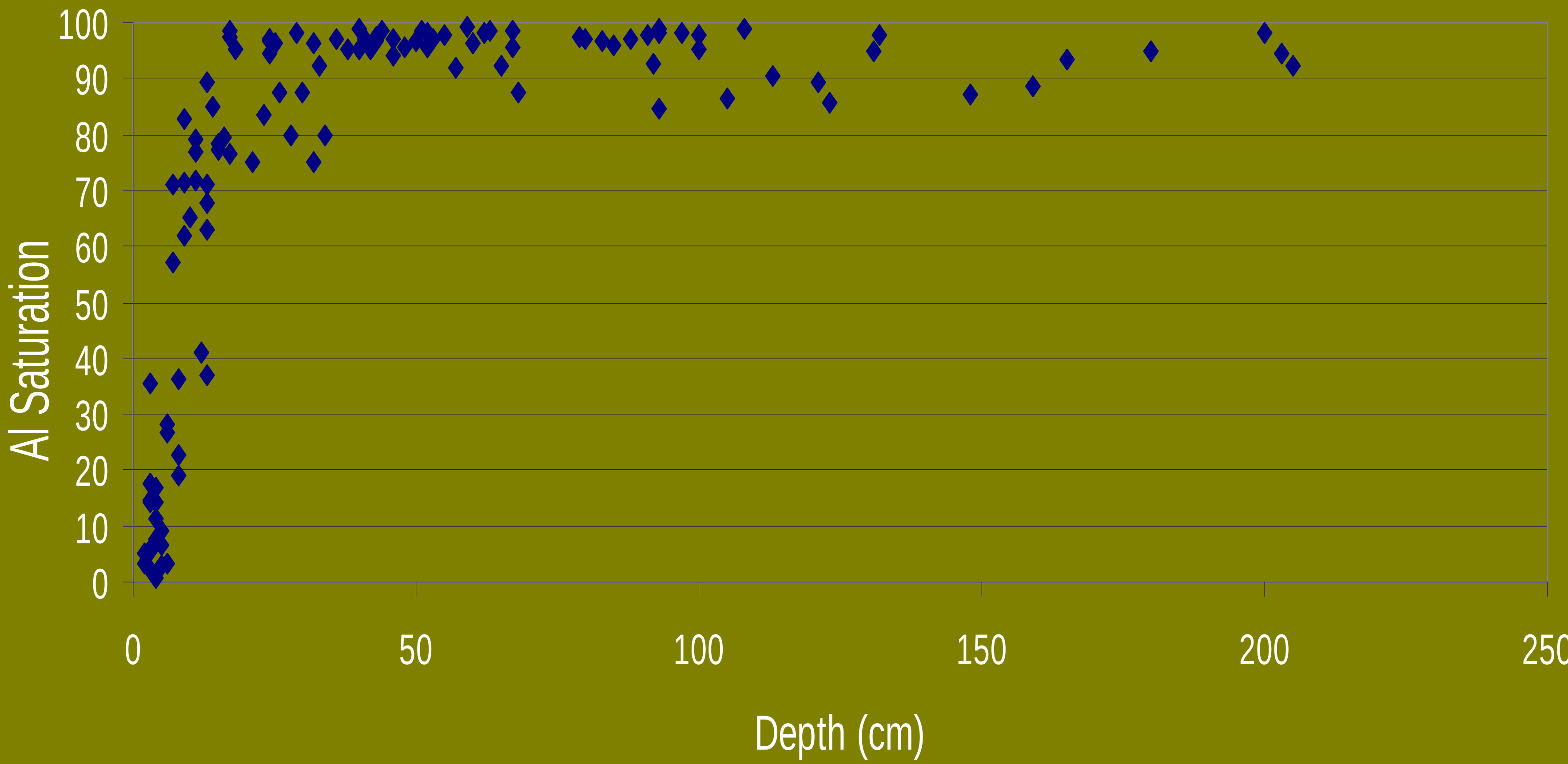
Relationship of Exchangeable and Total Magnesium to Soil Organic Carbon for All Series.



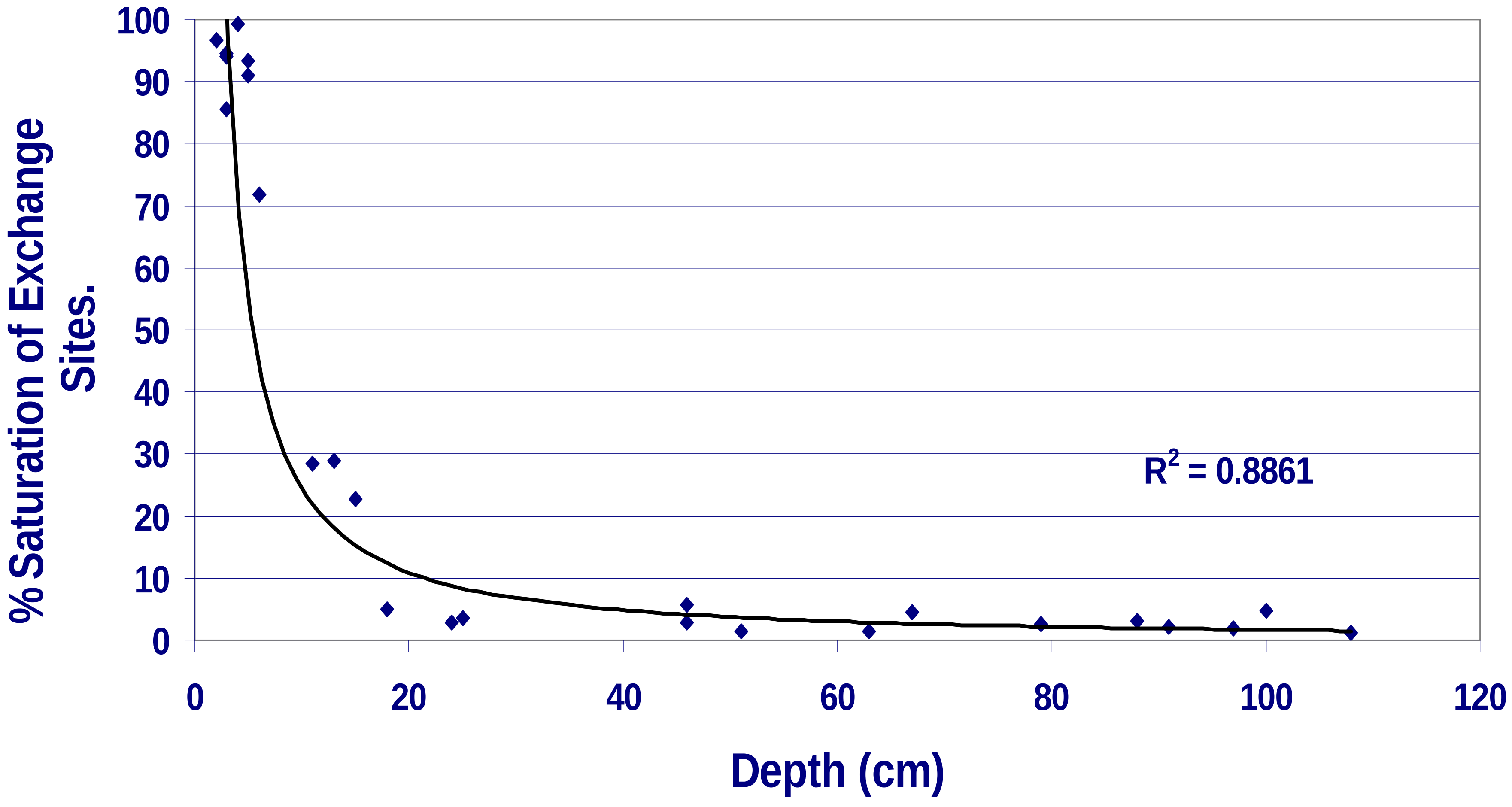
Results II

Aluminum and soil buffering status.

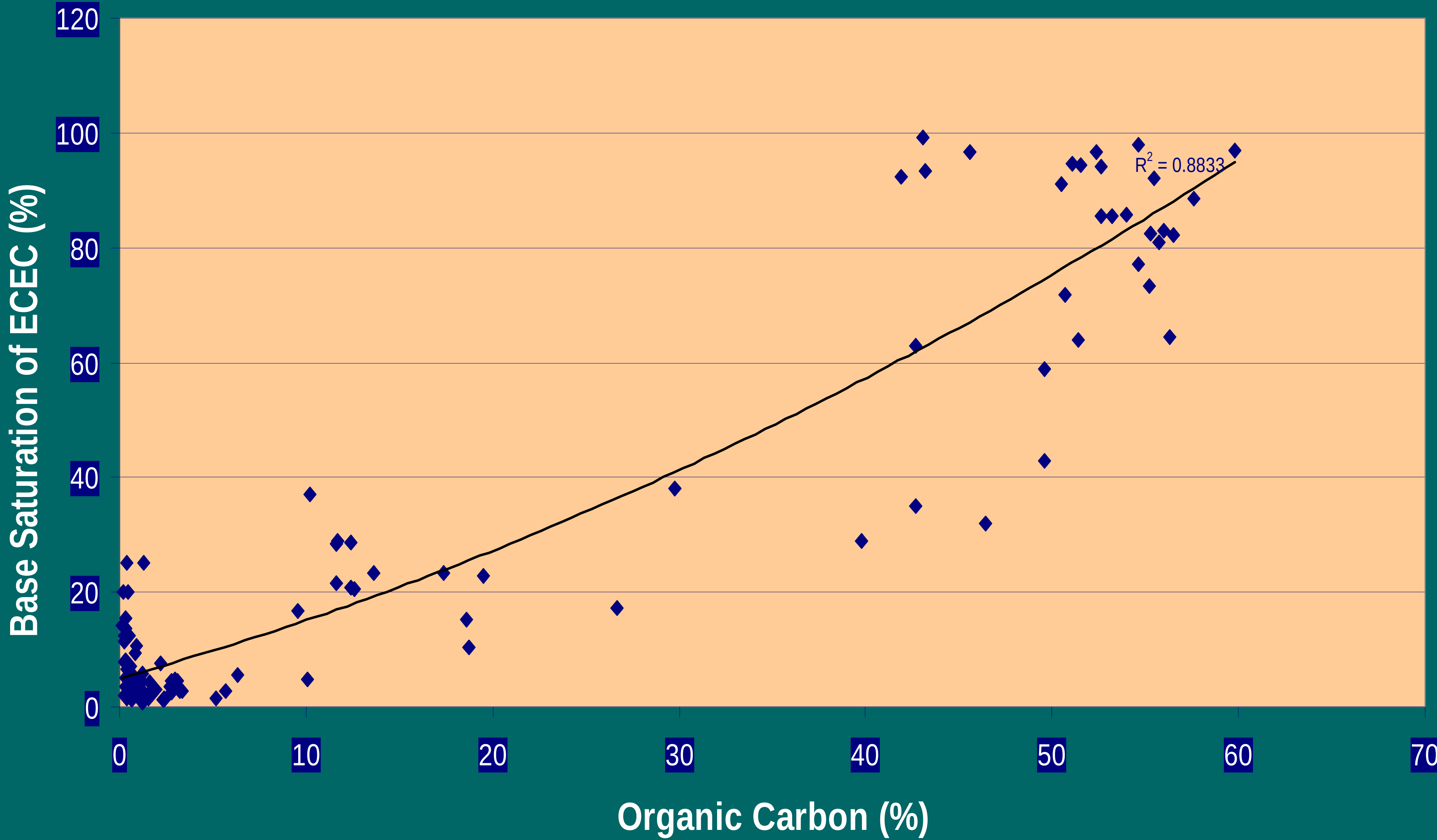
Al saturation of effective cation exchange capacity for all series.



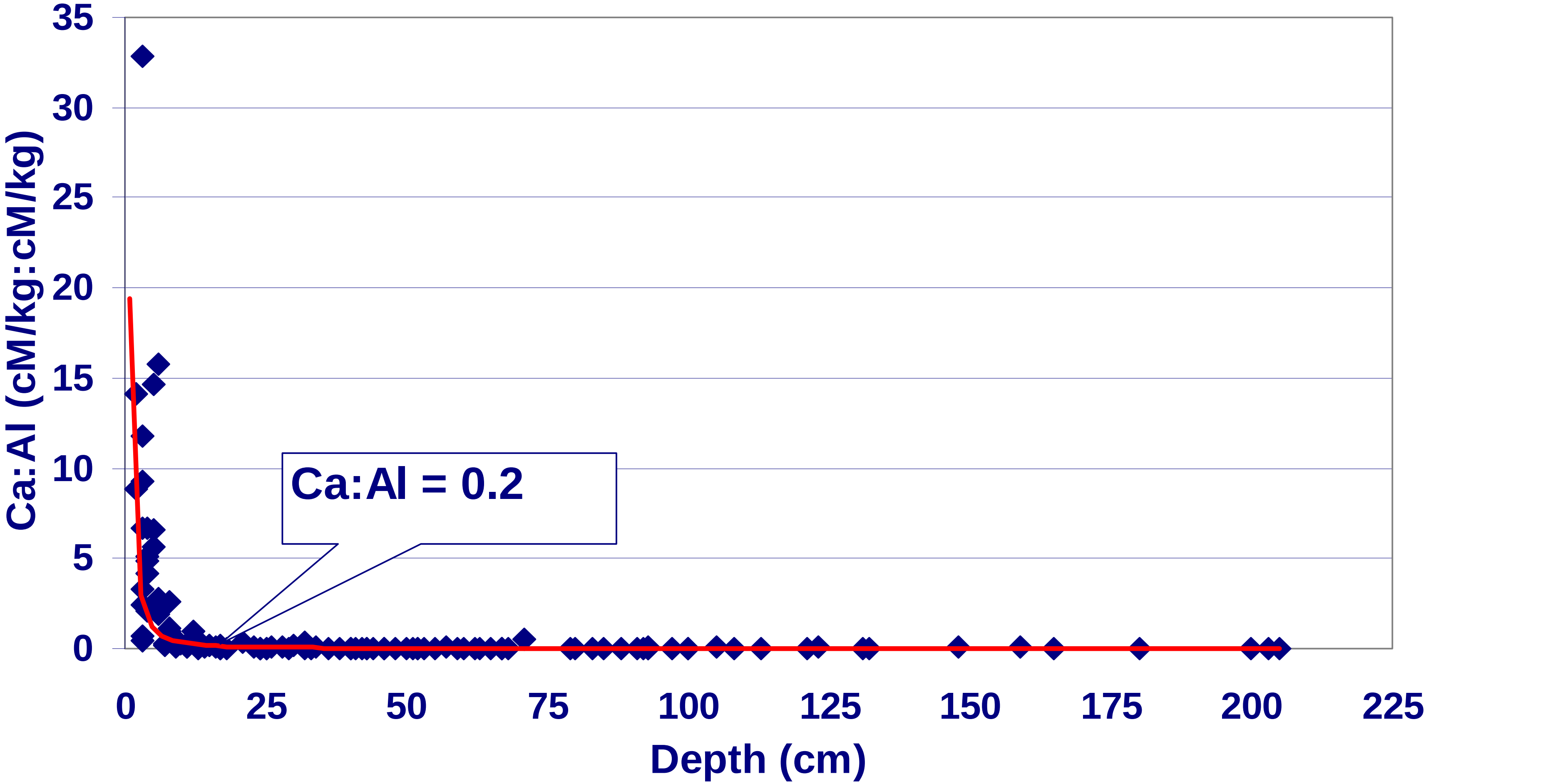
Base Saturation of Effective Cation Exchange Capacity for the Mandy Series.



Relationship of Base Saturation of ECEC to Soil Organic Carbon for All Series



Calcium: Aluminum Ratio as Related to Soil Depth for All Series.



Summary

- Stocks of Ca and Mg are very low compared to soils of similar forest types.
- The geochemical reserves of Ca are very low. Exchangeable:Total ratio > 0.3.
- The geochemical stocks of total Mg are more substantial, but relatively unavailable. Exchangeable:Total ratio < 0.05.

Summary (continued):

- Organic carbon is closely correlated to Ca stocks, and Mg availability.
- Organic matter appears to be the major reservoir of fertility, due to an apparently very tight Ca biocycle, and to buffering of acidity and Al interference with Ca and Mg availability.

Relationship of Fertility Parameters to Soil Organic Carbon.

	CEC	%Base Sat.	%Al Sat.
	-------------r^2----------		
			(neg.)
Frigid Series			
Mandy	.97	.78	.96
Snowdog	.96	.90	.96
Gauley	.98	.85	.94
MWD Gauley	.96	.75	.86

Sustainability

What does this mean to future generations (of trees)?

Published Harvest Removals Compared to Total Soil Calcium.

Forest Type	Sawtimber Clear-cut	Whole-tree	Total Soil Ca
	--------------------kg ha^{-2}	--------------------------------	
Spruce Fir (ME)	272	537	10710
Oak-Hickory (TN,NC,CT)	278	627	4600-5020
N. Hardwoods (NH)	162	370	8060-10270
West Virginia Frigid Soils (This work):		no data	490-1096

Conclusions:

- Calcium is a likely candidate as a limiting nutrient in these ecosystems. Near total depletion is conceivable.
- Magnesium may be limiting in some circumstances due to acid inhibition of availability and uptake.
- Aluminum solubility must be considered while interpreting these phenomena.
- Forest liming experiments are now yielding data which should be considered here.

Conclusions (cont’d):

- Management of upper soil horizons is of critical importance in acid forest soils.
- Manipulation of forest soil fertility should be explored on acid sites.
- Actual impacts on allometric and ecological phenomena should be researched.
- Working strategies for productivity maintenance should be developed.

SOIL SURVEY UPDATES

Danny Hatch

Soil Scientist, Fauquier County

Alex Blackburn

Soil Scientist, Loudoun County

Original Field Mapping

1940-1941	Culpeper County
1942-1944	Fauquier County
1947-1951	Loudoun County
1953-1955	Fairfax County

Base Information - Fauquier

- 1”=1760’ Published Soil Survey
- Enlarged to 1”=400’ Soils Maps (not rectified)
- 1”=400’ Aerial Photography
- 10’ & 20’ USGS Topo Maps

Base Information - Loudoun

- 1”= 1320’ Published Soil Survey
- 1”=200’ Scale Base Maps
- Aerial Photos at 1”=1000’ taken each year
- Planimetric detail including:
  - Roads, Buildings, Fences, Tree lines and Power Poles
- 5’ Contour Interval
- Property Map Based on Metes and Bounds

Fauquier County Soils Survey Update

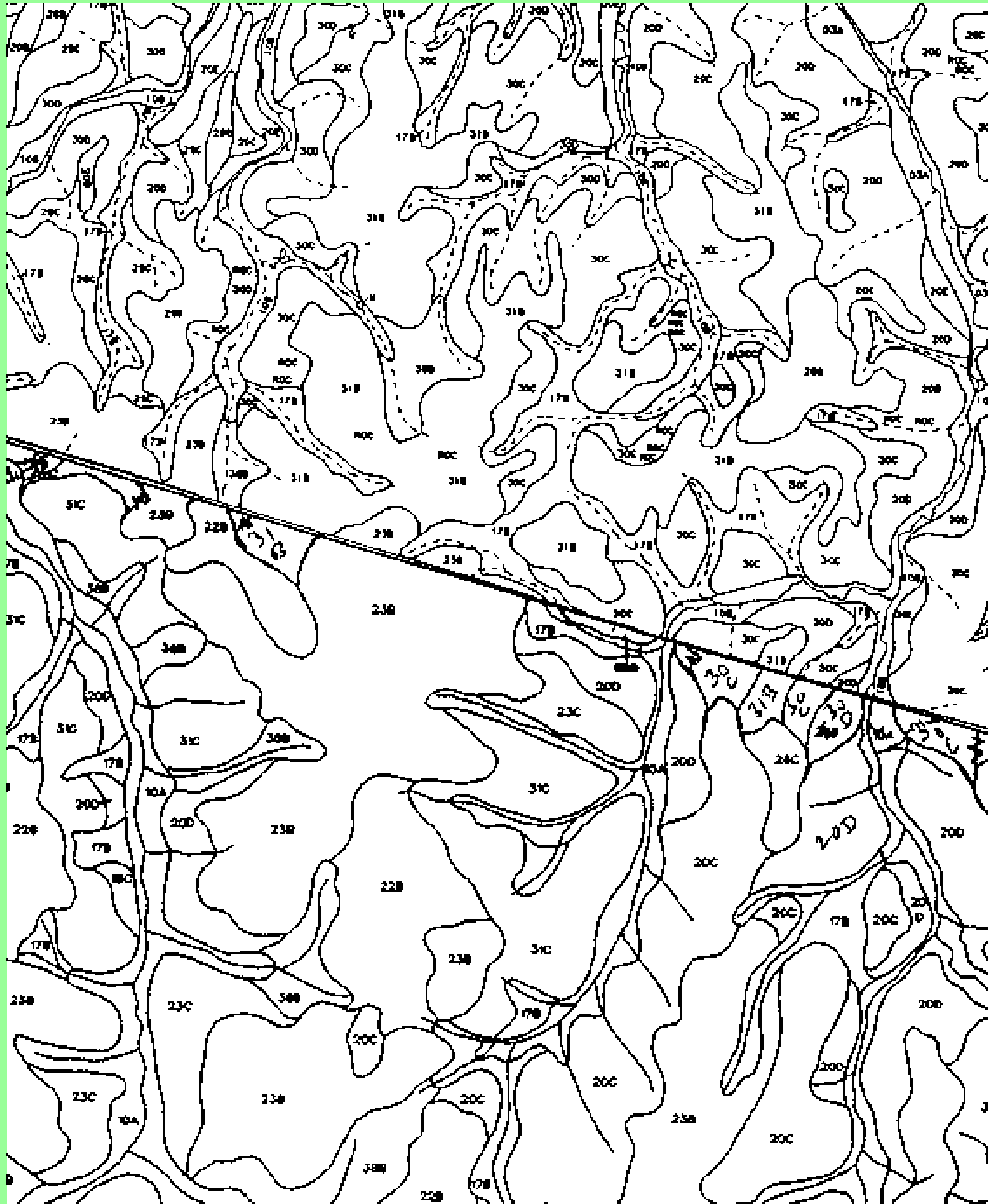
- Enlarge 1”=1760’ Published Soil Survey to 1”=400’ Tax Map
- Using Existing Base Information
  - Aerial Photography
  - 10’ & 20’ USGS Topo
- Redraft and Enlarge Soils Maps to Fit Landscapes
- Digitize onto County GIS

Loudoun County Soils Update

- Enlarge Field Sheets to Photo Negative at 1”=1000’
- Redraft Soils to 1”=1000’ Mylar Base Maps with 5’ Contours, etc. on Light Table
- Enlarge to 1”=200’
- Redraft Soils to 1”=200’ Scale 5’ Contour Base Maps
- Digitize into ARCInfo at 1”=200’Scale

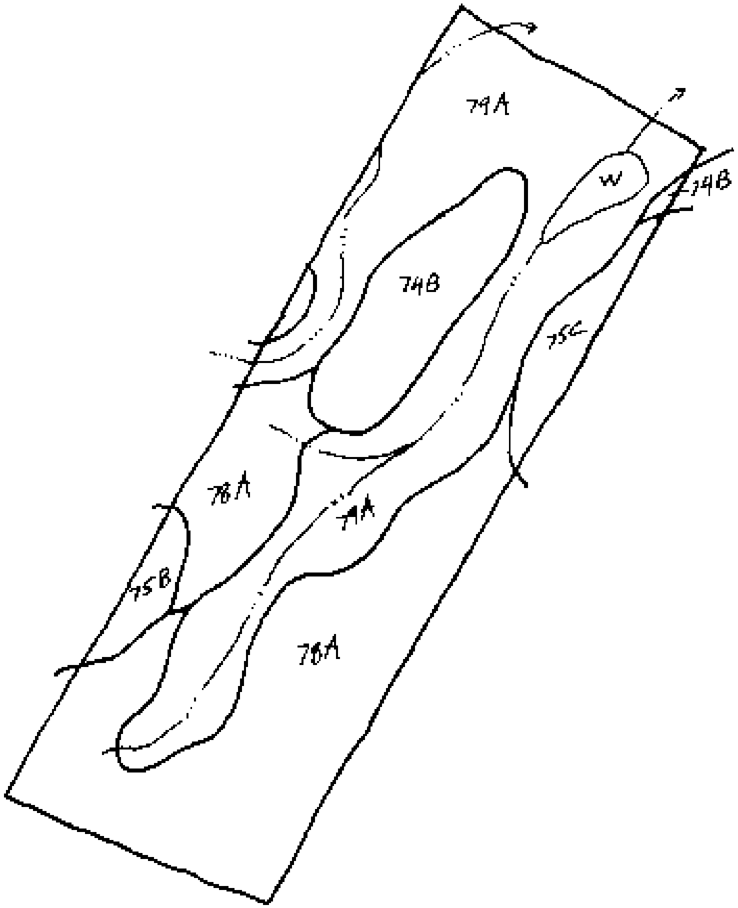
Loudoun County

Fauquier County



Scale 1”= 1000’

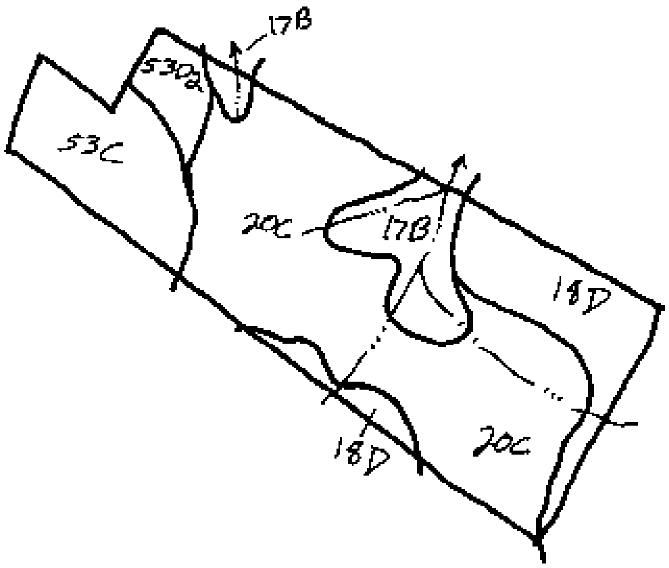
Triassic Basin Soils



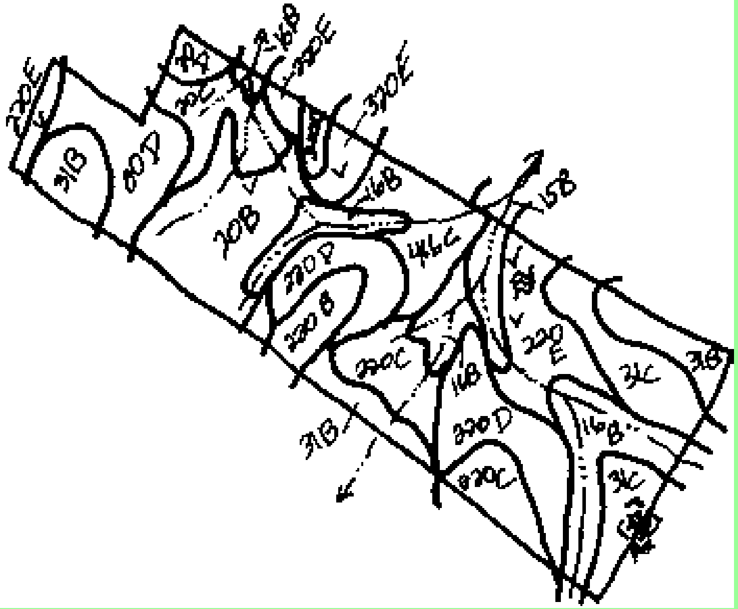
Updated Soil Survey

Type 1 Soil Map

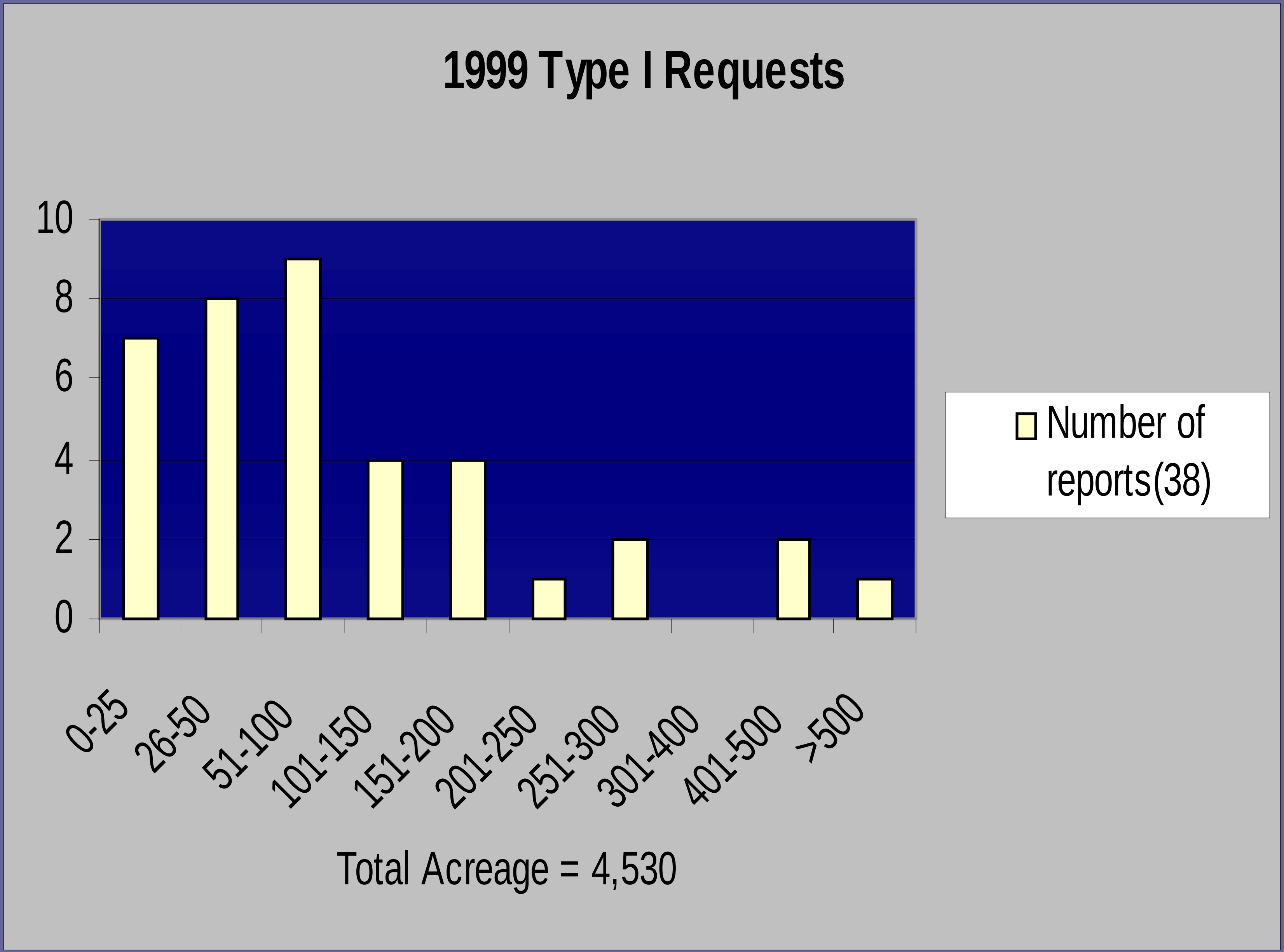
Blue Ridge Soils



Updated Soil Survey



Type 1 Soil Map



Fauquier County

Updating Soil Surveys

How will the soil information be used?

- **Urban**
- **Rural/Suburban**
- **Intensive agriculture**
- **Timber production**

Updating Soil Surveys

Establish a realistic and useful scale

- tax map scale
- local ordinances
- identify the most intensive proposed use
- may require more than one scale in a survey area (1 inch = 1000 feet and 1 inch = 200 feet)

Updating Soil Surveys

Base information available

- History of original field mapping
- Topographic maps (1foot or 20 feet contours)
- Aerial Photography (rectified?)
- Planimetrics
- GIS

Updating Soil Surveys

Loudoun County Approach

- Provide excellent base information up front in order to produce a planning tool that requires minor adjustment

Updating Soil Surveys

Fauquier County Approach

- Provide limited base information up front in order to produce a planning tool that requires major adjustment

Updating Soil Surveys

The Best Approach

- Understanding history
- Provide the best base information possible
- Update to an appropriate scale(s)
- Study and understand soil landscapes (tie old mapping unit concepts to new and useful interpretive units)
- NOT SIMPLY A RE-CORRALATION

TIME AND MONEY WILL BE SAVED IN THE LONG RUN

REMAP THE COUNTY

AND

DEVELOP LOCAL INTERPRETATIONS

Adding Value to Soil Surveys With a Dynamic Soil Properties Database

Cathy Seybold and Craig Ditzler
Soil Quality Institute

Increasingly, field soil scientists are being asked to do something new in soil survey. Rather than creating a soil map from scratch, soil scientists are given an existing map and are asked to update and modernize. Updating is a significant change and many soil scientists may be more comfortable doing what they have always done. To modernize, what does this mean? There are many worthy goals for an update soil survey project such as updating the soil classification, drawing new lines, conducting transects for map unit composition, updating yields, describing soils to two meters (some deeper), digitizing for SSURGO, and developing CD-Rom and web-based distributions. The key is to build on existing soil survey information so that modernized surveys are better and more useful than the old ones, not just different. If soil scientists remap, they spend all their time making a new survey that is not necessarily better than the old one, just another person's interpretation. The more we can accept the old work, the more time and resources we have for better documentation and development of new interpretations, etc.

There are two ways soil properties can be viewed; (1) as "inherent," where the soil property is general fixed and unlikely to change with use and management of the soil, and (2) as "dynamic," where the soil properties responds or change as a result of land use and management. Some examples of inherent properties are texture, mineralogy, depth, and color. Dynamic properties especially apply to the upper part of the soil profile where management can easily affect soil properties. Some examples of dynamic properties include organic matter content, bulk density, pH, aggregation, soil organisms, CEC, and permeability. Dynamic properties are not considered in Soil Taxonomy, because it's intended use was to achieve consistent taxonomic placement. Also, mapping the spatial distribution of dynamic soil properties is not a very effective use of dynamic property information. However, soil databases can be used most effectively to record dynamic soil property information. Some current examples include selected information for drained and undrained phases of map units. Also, some forest interpretations are stored for north and east aspect versus south and west.

An example data set was collected on the Memphis (Fine-silty, mixed, active Typic Hapludalf) silt loam soil located in Milan, TN. The soil quality test kit was used to compare effects of a higher residue no-till system with a lower residue conventionally tilled system on experiment station plots. Soil properties measured were soil respiration, earthworm numbers, infiltration rate, organic C content (not part of test kit), aggregate stability, and bulk density. The results are shown in Fig. 1 and 2. Results show that no-tillage has different soil surface properties that conventional tillage on the Memphis soil.

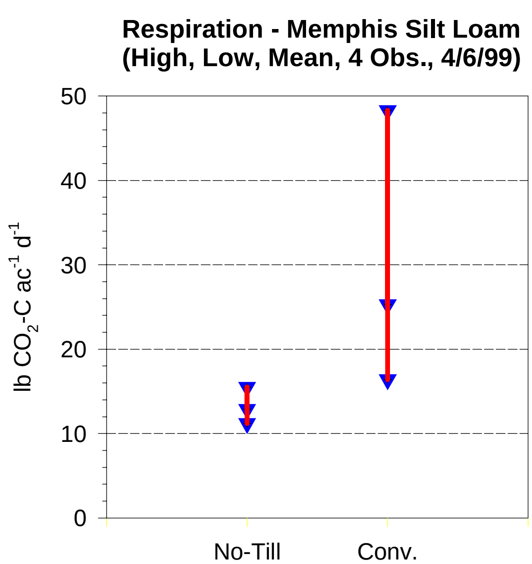
Another example data set was collected on the Aksarben (Fine, smectitic, mesic Typic Argiudoll) and Monona (Fine-silty, mixed, superactive, mesic Typic Hapludoll) soils comparing cropland and grassland uses. Soil properties measured were organic C content, aggregate stability, bulk density, hydraulic conductivity, and infiltration rate. The results are shown in Fig. 3 and 4. Results show that soil properties are different on cropland versus grassland on the

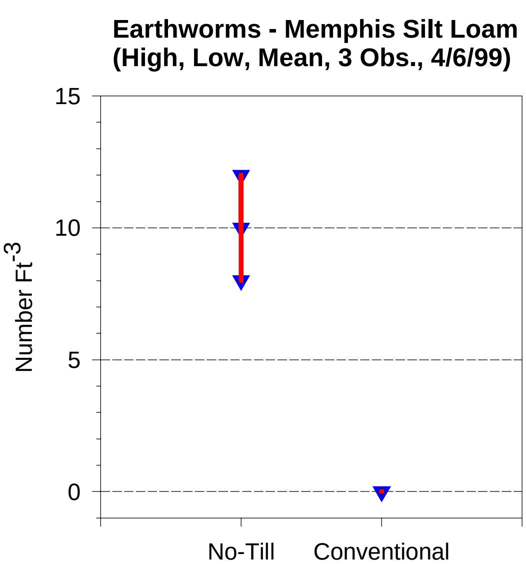
Aksarben and Monona soils.

Advantages of a dynamic properties data set includes greater flexibility in interpretations, improved derivative property information, greater utility at the field level, and greater utility at the regional and national levels for use in modeling. Table 1 shows an example of leaching potential and runoff change with land use for Aksarben soil along with results from the current database. Table 2 shows an example of how hydrologic group and K-factor change with land use along with current database information. Examples of improved value at the field level include being able to answer hypothetical questions like: (1) "If I change to no-till, will it affect the potential for pesticides to enter my farm pond?" and (2) "What is the potential for sequestering carbon in the soils on my farm?" The current database can not currently answer these questions very well at the field or farm scale. Some examples of improved watershed/regional assessment capabilities include being able to answer questions like: what are the current baseline carbon levels in the region? and, what effect would increasing no-till from 25% to 50% of the cropland in a watershed have on water quality and flooding?

Where do we go from here with developing a soil dynamic properties database? The goal is to select a few pilot projects with States and MO's to work with the NSSC and SQI in FY01. It is preferred to have survey updates with emphasis on data and interpretations. Key tasks would include:

- Identifying properties to be included;
- Obtaining equipment;
- Providing training;
- Sampling key soils under contrasting land use and management combinations;
- Extending information to similar soils;
- Incorporating data into NASIS; and
- Including information in soil survey reports.





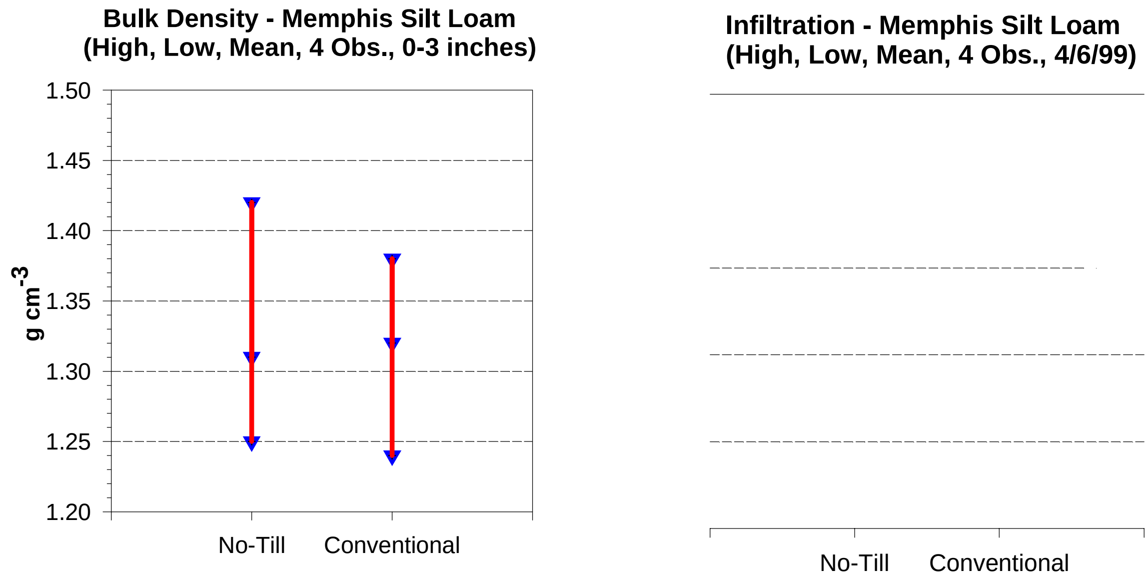
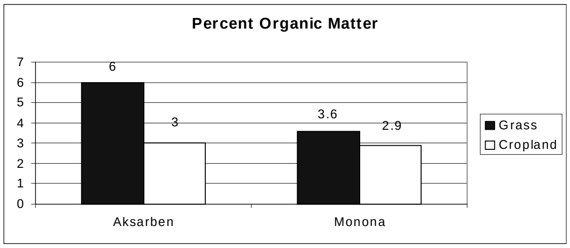
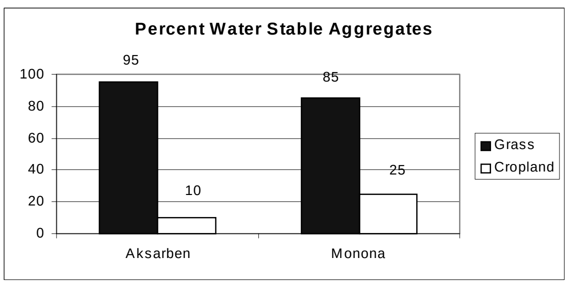


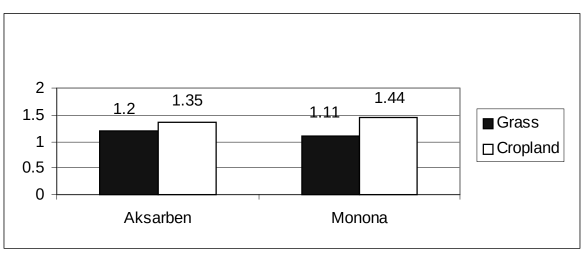
Figure 2. Infiltration rate, bulk density, percent organic carbon and aggregate stability on Memphis silt loam soil comparing no-till and conventional tillage systems.



Current Database
Aksarben 2-4
Monona 2-4



Not in current database.



Current Database
Aksarben 1.35-1.55
Monona 1.25-1.30

Figure 3. Percent organic carbon, aggregate stability, and bulk density for the Aksarben and Monona soils comparing cropland and grassland uses.

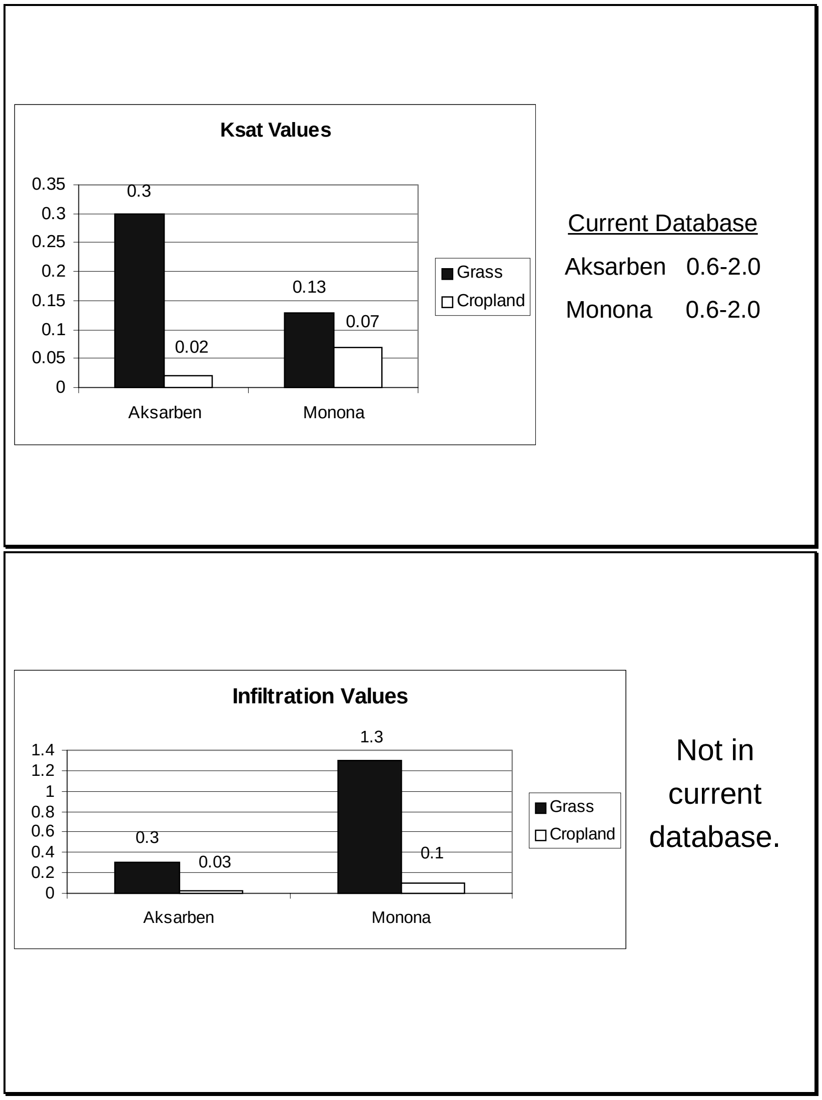


Figure 4. Hydraulic conductivity (Ksat) and infiltration rates for the Aksarben and Monona soil comparing cropland and grassland uses.

Table 1. Example interpretation for Aksarben soil for potential pesticide loss. Differences between land uses.

	Aksarben	
	Leaching	Runoff
Grass	Low	Int.
Cropland	V. Low	High
Database	Int.	Int.

Table 2. Improved derivation of information by land use.

Hydrologic Group

	Aksarben	Monona
Grass	B	B
Cropland	D	C
Database	B	B

K factor

	Aksarben	Monona
Grass	.32	.27
Cropland	.44	.43
Database	.32	.32

Soil Temperature Findings in Virginia from the Camden Farms Cropping System Study

By

Henry Mount

Soil Scientist - NSSC

Lincoln, Nebraska

Presented at NERSSWPC

Newport News, Virginia

Acknowledgments

- NRCS Global Change Initiative
- Soil Scientists from Virginia including -
  - John Nicholson
  - Marc Crouch
  - Bruce Dubee

Strip Information for the Soil Temperature Sites

Site (No.)	Strip (No.)	Treatment (No.)	Rep (No.)	Clay (%)	Sand (%)	Particle-Size (Class)
1	1	1 - Beans	1	12	58	Coarse-loamy
2	7	7 – Sorghum	1	16	61	Coarse-loamy
3	13	4 – Corn	2	38	19	Coarse-loamy
4	2	4 – Corn	1	3	95	Sandy
5	21	6 – Barley	3	7	83	Sandy
6	17	1 - Beans	3	5	88	Sandy

Air Temperature

Model Soil Temperature in Caroline County, Virginia

StowAway Configuration

23-cm PVC pipe with 2 StowAway sensors
1 for 25 cm and 1 for 50 cm

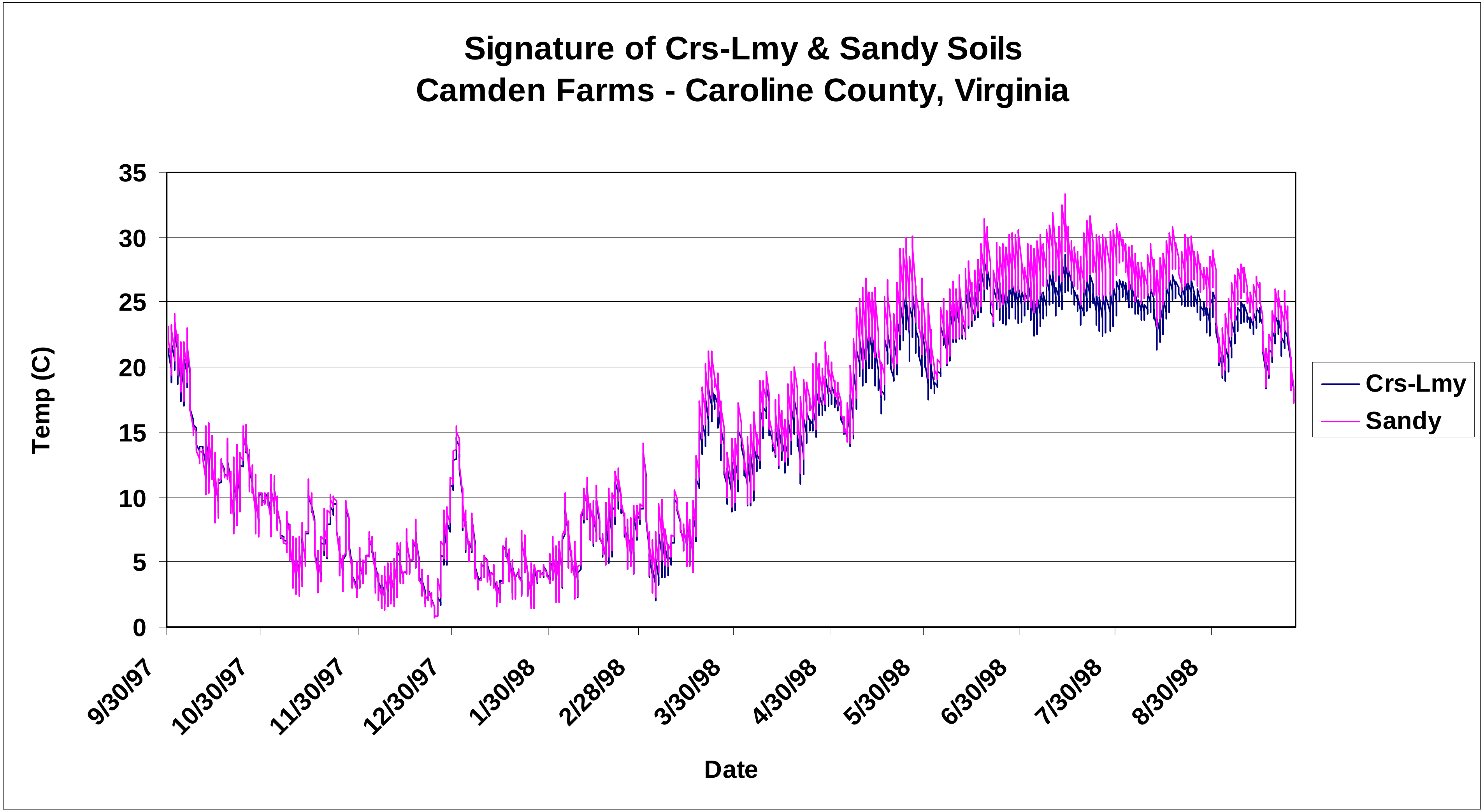
Electronic Data Download

Downloading Data

25-cm Soil Temperature

Anal.	Site 1 (°C)	Site 2 (°C)	Site 3 (°C)	Site 4 (°C)	Site5 (°C)	Site 6 (°C)	Mean Crs-Lmy (°C)	Mean Sandy (°C)
Jan	4.8	4.8	4.7	4.9	4.7	4.8	4.8	4.8
Feb	7.2	7.0	6.5	7.3	7.1	7.2	6.9	7.2
Mar	9.7	9.8	9.5	11.1	10.5	10.5	9.6	10.7
Apr	14.0	14.7	15.5	17.4	15.5	15.4	14.7	16.1
May	18.7	19.6	21.5	23.9	21.2	21.0	19.9	22.1
Jun	23.7	24.1	23.5	25.4	25.3	25.2	23.7	25.3
Jul	25.3	26.0	24.2	28.4	27.8	28.2	25.2	28.1
Aug	24.2	25.3	25.0	27.8	26.7	27.4	24.8	27.3
Sep	21.4	22.1	22.5	23.7	23.2	23.6	22.0	23.5
Oct	13.3	13.6	13.4	13.8	13.4	13.8	13.4	13.6
Nov	6.5	6.7	6.7	6.9	6.5	6.8	6.6	6.7
Dec	4.8	4.8	4.5	5.2	4.6	4.8	4.7	4.8
MAST	14.5	14.9	14.8	16.3	15.5	15.7	14.7	15.9
MST	24.4	25.1	24.2	27.2	26.6	26.9	24.6	26.9
MWT	5.6	5.5	5.2	5.8	5.4	5.6	5.5	5.6
MS-MW	18.8	19.6	19.0	21.4	21.2	21.3	19.1	21.3

25-cm Soil Temperature

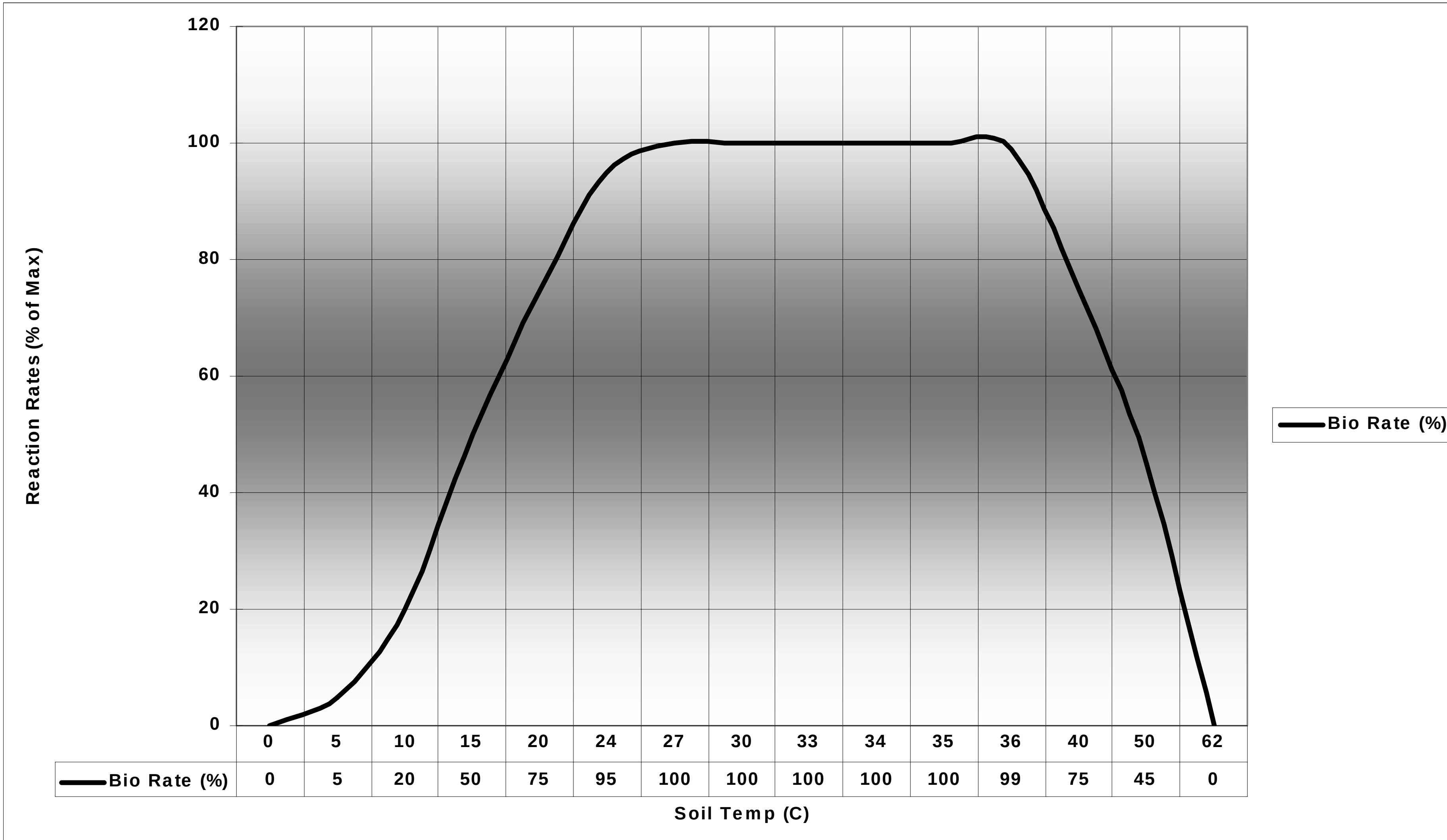


25-cm Soil Temperature

- The sandy sites average 1.2°C warmer on a mean annual basis than the coarse-loamy sites (15.9°C vs. 14.7°C).
- Warmer temperatures for sandy soils are most expressed during June, July, and August.

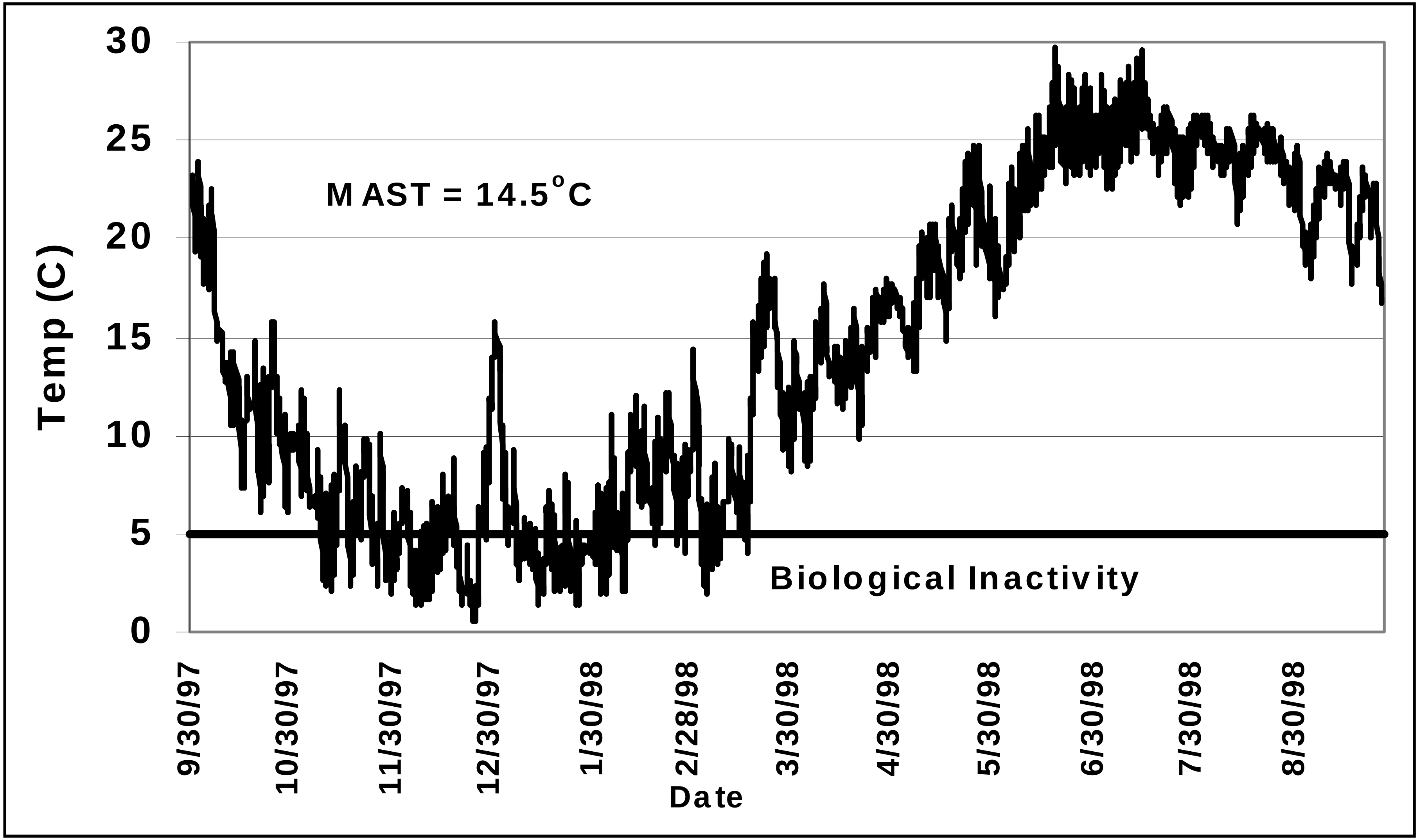
Biological Activity

(Paul, E.A. and F.E. Clark. 1989. *Soil Microbiology and Biochemistry*.)



Soil Temp (C)	0	5	10	15	20	24	27	30	33	34	35	36	40	50	62
Bio Rate (%)	0	5	20	50	75	95	100	100	100	100	100	99	75	45	0

Temperature Signature at 25 cm for Site 1 - Camden Farms



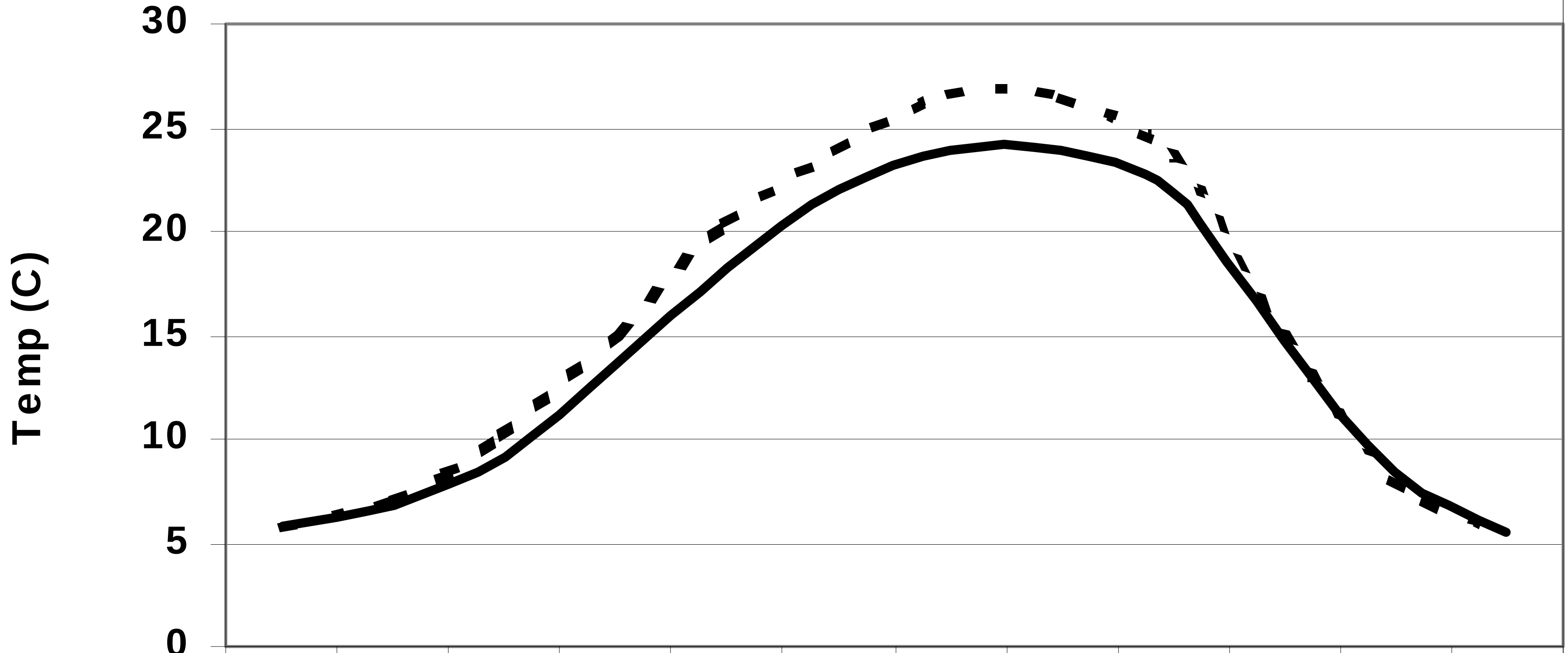
Biological Activity at 25-cm

- **The first occurrence of less than 5°C was at 1:37 a.m. on November 9, 1997 and the last occurrence was at 11:13 a.m. on March 17, 1998.**
- **The sandy soils at sites 4-6 showed the same relationship to reduced biological activity as the coarse-loamy soil at site 1.**

50-cm Soil Temperature

Anal.	Site 1 (°C)	Site 2 (°C)	Site 3 (°C)	Site 4 (°C)	Site 5 (°C)	Site 6 (°C)	Mean Crs-Lmy (°C)	Mean Sandy (°C)
Jan	6.1	5.8	5.6	6.1	5.5	5.8	5.8	5.8
Feb	7.1	6.9	6.2	7.2	7.0	7.3	6.7	7.2
Mar	9.2	9.3	8.7	10.3	10.0	10.3	9.1	10.2
Apr	13.0	13.8	14.0	16.1	14.7	14.7	13.6	15.1
May	17.1	18.1	19.7	21.8	19.8	19.6	18.3	20.4
Jun	21.5	22.4	22.3	24.0	23.9	23.7	22.1	23.9
Jul	23.7	24.7	23.2	26.6	26.6	26.9	23.9	26.7
Aug	23.3	24.5	24.0	26.9	26.1	26.7	23.9	26.5
Sep	21.3	22.0	22.4	24.1	23.2	23.7	21.9	23.7
Oct	14.9	14.7	14.9	15.1	14.4	15.1	14.8	14.9
Nov	8.4	8.2	8.4	8.4	7.7	8.3	8.4	8.1
Dec	5.8	5.6	5.4	6.0	5.1	5.6	5.6	5.6
MAST	14.3	14.7	14.6	16.1	15.3	15.6	14.5	15.7
MST	22.8	23.9	23.2	25.8	25.5	25.8	23.3	25.7
MWT	6.3	6.1	5.7	6.4	5.9	6.2	6.1	6.2
MS-MW	16.5	17.8	17.4	19.4	19.6	19.6	17.2	19.5

50 cm Temperature Averages



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crs-Lmy	5.8	6.7	9.1	13.6	18.3	22.1	23.9	23.9	21.9	14.8	8.4	5.6
Sandy	5.8	7.2	10.2	15.1	20.4	23.9	26.7	26.5	23.7	14.9	8.1	5.6

Sand vs. MAST

50-cm Soil Temperature

- **At the 50-cm soil depth the MAST difference between the sandy and coarse-loamy soils is also about 1.2°C (15.7°C versus 14.5°C).**
- **The mean winter soil temperatures at 50 cm average 0.6°C (1°F) warmer than for the 25-cm depth.**
- **The mean summer soil temperatures at 50 cm average more than 1.1°C (2°F) cooler than for the 25-cm depth.**
- **According to Soil Taxonomy, sites 1-3 are mesic and sites 4-6 are thermic (Soil Survey Staff, 1999).**

Summary

- **The variation of mean annual soil temperature in the study area was related more closely with soil properties than to cropping systems.**
- **The sandy soils are about 1.2°C warmer at both the 25-cm and 50-cm depths than the coarse-loamy textured soils.**
- **Increasing sand content in the soils of the study resulted in increasing MAST.**

Russian Premise

(**A.M. Shul'gin, 1965, *The temperature regime of soil)***

The vertical gradient of daily soil temperature decreases with depth mainly because the upper layers absorb most of the heat, so that the downward flow is reduced. However, in dry weather the increased gradient within the superficial soil layer may be due to decreased temperature conductivity of this layer, caused by lesser compactness and lower moisture content.

The annual course of soil temperature, at temperate latitudes, is usually characterized by one maximum in July or August and by one minimum in January or February. At temperate latitudes the amplitude of annual temperature oscillations at the surface of bare soil remains approximately the same, i.e., approximately 30ºC. Amplitudes of annual temperature oscillations in soil decrease with depth; the time of maximum and minimum temperatures in retarded.

Cooperation/Interaction

- The University’s role
  - Teach skills to students the skills needed to be hired as soil and environmental scientists
  - Provide advanced or refresher training to current professionals
  - Train students in use and understanding of conservation programs
  - Conduct research that supports soil genesis, survey, taxonomy, and interpretations
  - Provide feedback and consultation during technical reviews and field sampling

Challenges to those roles

- Most faculty are not rewarded for providing training or teaching beyond their job specifications, but by publications that come from research
- Faculty participation/roles at field reviews not as clear since the MLRA reorganization
- Funding seldom available for basic soil genesis research
- Conservation programs/training often not offered by NRCS to university partners except upon specific request

Can we start to?

- Renew hiring
- Share expensive equipment
- Share computer software licenses
- Purchase computer equipment at educational discount prices

Can we find?

- Funding for research projects
- Funding for electronic data sharing
- Renewed State funding of soil survey

Can we also?

- Jointly provide:
  - Soil interpretations training to all soil survey users
  - Urban soil survey, research, and interpretation
  - DSS (models) training
  - NASIS and SSURGO/GIS training

Wetland Science Institute

Leander Brown

Wetland Scientist

SCIENCE AND TECHNOLOGY CONSORTIUM

National

Resources

Conservation

Service

United States Department of Agriculture
Natural Resources Conservation Service

Snowden Hall, 11400 American Holly Dr. Laurel, Md. 20708-4014
voice: 301-497-5938, fax: 301-497-5911

Mission: Proactively develop, adapt, and disseminate science and technology needed to protect and restore wetlands

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Director

Plant Ecologist

Wetland Scientist

Biologist

Baton Rouge, LA

Soil Scientist

Oxford, MS

Wetland Hydrologist

Hadley, MA

Wetland Scientist

From Left to Right: Mike Whited, Paul Rodrigue, Russ Pringle, Leander Brown, Norman Melvin, Billy Teels

SECRETARY - LAUREL, MD

Administrative Support

Barbara Keywood

Tues. - Thurs.

Functions

Develop Techniques

Expert Consultation

Technical Guidance

Liaison with research
and technology centers

Training

Products

Provide the scientific basis for:

Wetland delineation

Wetland restoration, creation and enhancement

Wetland assessments

TRAINING

WETLAND DELINEATION (REG IV)

HYDRIC SOILS (BASIC)

HYDRIC SOILS (ADVANCED)

HYDROLOGY TOOLS

WETLAND PLANT IDENTIFICATION (BASIC)

WETLAND PLANT IDENTIFICATION (ADVANCED)

WETLAND RESTORATION, CREATION & ENHANCEMENT

CUSTOMIZED TRAINING (WETLAND ASSESSMENT)

Soil Survey Status and Priorities for the New Millennium[1]
by

Horace Smith
Director, Soil Survey Division
USDA Natural Resources Conservation Service
Washington, D.C.

making slow but steady progress in all major areas of the Soil Survey Program. I am particularly pleased with the progress we have made digitizing our soil surveys to Soil Survey Geographic Database (SSURGO) Standards. The following is a brief report on the status of several major areas of the Soil Survey Program:

Mapping

Total Area		2,313,207,929 acres
• Percent of private land mapped	91	
• Percent of public lands mapped		80
• Percent of Indian lands mapped		75
• Percent of total area mapped	90	
• Percent of total area updated	4	
• Percent of total area in need of updating	41	

Manuscripts

Soil Survey Areas		3,253
• Soil survey areas published	2,539	
• Soil survey areas being updated		597

Digitizing

Number of Surveys Tracked for SSURGO	1384
• Surveys digitized and SSURGO Certified	793
• Surveys certified during FY-99	366

Examples of Products Completed and Distributed in 1999

- Fifty Published Soil Survey Reports and 407 Digitized Soil Surveys (SSURGO) data sets—primary source of soils information for the nation on a county level. This information is distributed nationally to the public through NRCS field offices, libraries, universities and the internet;
- *Soil Taxonomy,* Agriculture Handbook 436--international standard for soil classification for making and interpreting soil surveys. It is used as a university textbook and in over 20 countries, and has become the *de facto* international soil classification system;
- *Revised Field Guide for Describing Soils* (Spanish version is also being finalized in cooperation with Argentina)--descriptive standard for describing soils in the field and is used nationally and internationally;
- Soil Quality Thunderbook and technical information products--soil quality information sheets and technical notes to increase knowledge of and integrate soil quality into conservation technical assistance;
- Soil Quality Card Design Guide and Soil Quality Test Kit Guide Book--tools for field staff to assist in measuring soil quality locally; and
- *Soil Biology Primer I*—The first in a series of educational materials dealing in soil biology directed to agency field staff and the public.

Personnel and Staffing

At the present time, there are approximately 1,100 soil scientists working in the production phase of the Soil Survey Program—930 employed by NRCS and 70 by other agencies. In a recent analysis of the NRCS workforce, it was determined that 675 of the soil scientists are 45 years old or older; 175 can retire within five years, and 70 can retire now.

As a result of a 1998 workforce planning exercise by NRCS and the goal of trying to maintain diversity, a limited soil science scholars program was established with five 1890 institutions, an Hispanic-serving institution and a Native American-serving institution. The 1890 institutions are Virginia State University, Alabama A&M University, Tennessee State University, Prairie View A&M University, and the University of Arkansas – Pine Bluff.

Staffing at the National Headquarters (NHQ) has not changed much. Dr. Sheryl H. Kunickis, the newest addition to the staff, reports July 5th as a soil scientist (landscape analyst). She will have national leadership for the development of new and innovative approaches to integrating natural resource data with soils information for landscape analysis and landscape modeling to meet the needs of field operations and clients. The National Soil Survey Center (NSSC) has been reorganized with Dr. Robert Ahrens being named director and the creation of five functional areas: 1) Soil Survey Laboratory (Dr. Dewayne Mays, Head); 2) Soil Survey Investigations (Dr. Carolyn Olson, National Leader); 3) Soil Survey Interpretations (Dr. Berman Hudson, National Leader); 4) Soil Survey Technical Services (James Culver, National Leader); and 5) Soil Classification and Standards, (vacant, National Leader). Dr. Craig Ditzler is the director of the Soil Quality Institute (SQI). Other personnel associated with the SQI have remained stable.

Budget

The amount budgeted for soil survey operations in FY-2000 is $78,323,000, the same as it has been for the last 3 years. About 18 percent of this budget supports agency-wide functions such as Global Climate Change research, management and support for the National Soil Information System (NASIS), support for the NSSC and the SQI, other national initiatives, and the procurement of national digital orthophotography and aerial photography. The remaining $63,464,700 is allocated to the 50 states and two territories for soil survey production mapping and services.

International Activities

The NCSS has major responsibility for making and interpreting soil surveys. Both of these activities require tools, both physical and conceptual, and a determination to ensure that the information is current, reliable, and designed to meet current and future needs of the NCSS and its customers in general. As leader of the NCSS, the NRCS has traditionally accepted the charge of being the repository for global soil resource information. The reason for this is that our linkages with sister organizations in other parts of the world have benefited our domestic Soil Survey Program tremendously. Soil survey standards developed by the NCSS such as *Soil Taxonomy, Soil Survey Manual, National Soil Survey Handbook,* etc., are used and continually tested by countries around the world. Our standards are used and referenced throughout the world and have been tested in all soil and climatic conditions, which strengthens our domestic program.

During the year, our budget that supports international travel was severely reduced due to the Agency's overall budget shortfall. This has frustrated some of our scientists, as they have been forced to cancel some important trips. Some individuals have gone as far as to question whether or not we are still committed to a strong international component within the NCSS. We are as committed as ever to maintaining and strengthening the international component of the NCSS. We continue to host visiting scientists and sabbaticals from foreign countries at the NSSC and the SQI. We will continue to be actively involved, within the limits of our budget, in global activities that support the objectives and priorities of the NCSS. To do otherwise would be foolish. Collaboration with the international community strengthens the overall Soil Survey Program; however, in an era of public scrutiny and accountability, all activities must be totally justified.

NASIS

NASIS is a comprehensive information system for collecting and managing soil data and distributing soils information. NASIS software is installed at all 17 MLRA Offices plus the NSSC. The system is providing services to about 950 soil scientists from NRCS USFS, BLM, Bureau of Indian Affairs (BIA), NPS, and several universities at a wide variety of locations—from soil survey project offices to NHQ. NASIS 5.0 is scheduled to be released November, 2000. The biggest change for this version is the implementation of a central server. Windows Pedon 1.0 is schedule to be released in August 2000 and will facilitate importing field descriptions to NASIS.

Special Projects and Investigations

During the past several years, we have made tremendous progress leveraging a few dollars in support of special initiatives of the NCSS, mainly monitoring projects relating to wet soils. Data from these projects are being used to update and refine several soil series; better understand the hydrology of some soil systems; and refine the hydric soil status of some soils. We are phasing out some of the wet soil monitoring projects that were started more than 10 years ago. We will continue to support some of those projects, especially those in areas where we still have severe data gaps relative to Hydric Soil Indicators.

Soil Science Institute

The Soil Science Institute is a very intense four-week training course for mid-career NCSS soil scientists who are mostly involved in production soil survey. The course updates participants in all phases of soil science and introduces them to new, innovative and cutting-edge topics. In previous years, the Institute has been held at Cornell University, Iowa State University, University of Florida, Texas A&M University, North Carolina State University, and University of California, Davis. This year the Institute was held at Alabama A&M University. Course evaluations and other feedback from participants indicate that it was a very successful session.

NCSS Soil Scientist Awards

During 1999--the Centennial Year of the Soil Survey Program--two awards were established by the NCSS to honor soil scientists who were making or had made unusual contributions in the production phase of the NCSS. These two awards are **NCSS Soil Scientist of the Year** and **NCSS Soil Scientist Achievement**. Recipients for the NCSS Soil Scientist of the Year and Soil Scientist Achievement awards in 1999 were Dr. Sam Indorante, Major Land Resource Areas (MLRA) Project Leader, NRCS, Carbondale, Illinois; and Dr. Ed Redmond, Resource Soil Scientist, NRCS, Mt. Vernon, Ohio, respectively. The 2000 recipients for these awards are Marcus Clark, Soil Survey Project Leader, NRCS, Palmer, Alaska and Bill Dollarhide, State Soil Scientist/MLRA Leader, NRCS, Reno, Nevada. I want to congratulate these scientists and commend them for the outstanding contributions they are making to the NCSS.

Priorities and Initiatives for the New Millennium

Implement Super MLRA Project Offices

I believe the keystone of the field portion of the Soil Survey Program of the future will be the “Super MLRA Project Offices”. I use the term “Super” for the lack of a better word. All I am talking about is fewer and better-equipped soil survey project offices. We can no longer afford to equip and maintain one- and two-person project offices. Illinois has taken the lead in implementing this concept. Several other States have also moved forward with the idea. I believe the Super Project Office will:

- Enhance a safer and more professional environment for soil scientists working in the field;
- Make it easier and more economical to install and maintain the latest computers, digitizing and GIS equipment, Global Positioning Systems, Digital Orthophotoquads, Digital Elevation Models, Satellite Imagery, etc;
- Provide an opportunity to locate on university campuses where possible—some could be small institutions or community colleges. The university’s internet could be utilized and students could be employed part time;
- Provide an excellent opportunity to utilize the MLRA concept by locating offices in areas without regard to State, county of other political boundaries; and
- Attract and maintain a highly qualified staffs and provide an opportunity to employ specialists other than soil scientists such as GIS experts, foresters, soil conservationists, etc.

Emphasis Areas for 2001 and the Near Term

- Hire diversified cadre of soil scientists;
- Develop a diversity of products that support NCSS priorities and meet customer expectations;
- Continue to accelerate NASIS and SSURGO development;
- Implement the Super MLRA Project Office concept;
- Implement digital map finishing;
- Develop use-dependent or dynamic soil properties database;
- Update Agriculture Handbook 296: *Land Resource Regions and Major Land Resource Areas of the United States* publication and STATSGO;
- Emphasize technical soil services and urban interpretations;
- Support the development and utilization of expert knowledge systems—ones that can make decisions—at the field level;
- Continue to employ Fuzzy Logic in generating soil survey interpretations and in other areas of the Soil Survey Program;
- Emphasis the application of GIS to landscape modeling, especially as it relates to the update process;
- During the update process and in the remaining once-over soil survey projects, emphasize making observations to depths >2m, or to whatever depths that are needed;

- Develop web-based applications for delivering soil survey data and products;
- Increase soil survey mapping on American Indian lands;
- Continue to emphasize and support the subaqueous soils research initiative that was initiated by the University of Maryland and NRCS in Maryland;
- Continue to play a major role in the National Soil Phosphorus Benchmark Study in cooperation with the Agricultural Research Service, Environmental Protection Agency, and others. This study has pilots in Virginia and Colorado and will involve some MLRA Soil Survey Offices in selected locations;

2002 Budget Initiative

The Agency is proposing a budget initiative of $18.55 million for 2002. The main purpose of this initiative is to start rebuilding the soil science infrastructure at the field level. The initiative will be used to:

- Add 150 new soil scientist positions;
- Accelerate mapping of private lands;
- Accelerate mapping in urban and urban-fringe areas and develop urban interpretations;
- Continue to accelerate the development of NASIS and the SSURGO initiative;
- Accelerate implementation of the MLRA concept field structure;
- Accelerate development of web-based applications to manage, achieve, and deliver soil survey data and products.

Thank you again for allowing me to be a part of your conference. I will be around until Friday morning.

FIELD TRIP GUIDEBOOK

SOILS, CROPPING SYSTEMS, HISTORY, and HOSPITALITY of TIDEWATER VIRGINIA

Northeast Cooperative Soil Survey Conference

June 21, 2000

NORTHEAST COOPERATIVE SOIL SURVEY CONFERENCE

FIELD TRIP AGENDA

June 21, 2000

7:45 A.M.	Depart Omni hotel.
9:00 A.M.	Arrive Tidewater Agricultural Research and Extension Center, Holland.
9:15 A.M.	Cotton. Dr. Ozzie Abaye, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg.
9:45 A.M.	Peanuts. Professor Walt Mozingo, Virginia Tech, Dept. Crop & Soil Env. Sci., Holland.
10:15 A.M.	Middle Coastal Plain soils. Suffolk and Roanoke Series. Mr. Jerry Quesenberry, Area Soil Resource Specialist, NRCS, Smithfield. Dr. Jim Baker, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg. Dr. Pam Thomas, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg.
11:30 A.M.	Depart Tidewater AREC.
12:30 P.M.	Arrive Chippokes Plantation State Park. Surry. LUNCH.
1:30 P.M.	Depart Chippokes.
2:30 P.M.	Arrive Shirley Plantation, Charles City.
2:45 P.M.	Tour sand and gravel mining reclamation. Dr. W. Lee Daniels, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg. Mr. Steve Nagle, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg.
3:30 P.M.	Pamunkey series. State Soil of Virginia. Mr. Bruce Dubee, Asst. State Soil Scientist, NRCS, Richmond. Dr. Lee Daniels, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg. Mr. Steve Nagle, Virginia Tech, Dept. Crop & Soil Env. Sci., Blacksburg.
4:30 P.M.	Refreshments.
5:00 P.M.	Depart Shirley.
6:00 P.M.	Arrive Newport News, Omni Hotel.

TABLE OF CONTENTS

Acknowledgments . . . . **iv**

Coastal Plain Geology **1**

Tidewater AREC **4**
Cotton 5
Peanuts 7
Soil map 10
Suffolk soil series 11
Roanoke soil series 13
Soil and landscape images 15

Chippokes Plantation State Park **16**
Soil map 17

Shirley Plantation **18**
Shirley land use plan 19
Soil map 21
Pamunkey soil series 22
THE VIRGINIA STATE SOIL 24
Soil and landscape images 25
James River Plantations 26

TOUR MAP

ACKNOWLEDGMENTS

Many individuals have contributed to planning this tour. We would like to thank the following:

Dr. Ozzie Abaye, Associate Professor and Extension Specialist, Alternative Crops, CSES, Virginia Tech.
Mr. Ronnie Alls, Research Specialist Senior, Mined Land Reclamation/Wetlands, CSES, Virginia Tech.
Mr. Charles Carter, Weanack Land Limited Partners, Shirley Plantation, Charles City, Virginia.
Dr. Lee Daniels, Professor, Soil Genesis and Mined Land Reclamation, CSES, Virginia Tech.
Dr. John Galbraith, Assistant Professor, Pedology and Soil Information Systems, CSES, Virginia Tech.
Ms. Danette McAdoo, Superintendent, Chippokes Plantation State Park, Surry, Virginia.
Prof. Walt Mozingo, Professor, Coordinator Peanut Variety and Quality Evaluation, Tidewater AREC.
Mr. Steve Nagle, Research Associate, Mined Land Reclamation/Wetlands, CSES, Virginia Tech.
Mr. Jerry Quesenberry, Area Resource Specialist, NRCS, Smithfield, Virginia.
Dr. Norris Powell, Associate Professor, Soil Physics, CSES, Tidewater AREC.
Dr. Fred Shokes, Professor, Plant Pathology, Director, Tidewater AREC.

Fred Shokes, Jerry Quesenberry, Norris Powell, Jim Baker

Walt Mozingo

Ozzie Abaye

Graham Daniels, Mike Brosius, Lee Daniels, John Galbraith, Steve Nagle, and dinner

This section was prepared by Dr. C.M. Bailey and Mr. Chad Roberts, Department of Geology, College of William and Mary, Williamsburg, Virginia.

The Coastal Plain extends from the Fall Zone eastward to the Atlantic Ocean. Through the Fall Zone, the larger streams cascade off the resistant igneous and metamorphic rocks of the Piedmont to sea level. Large tidal rivers, the Potomac, Rappahannock, York, and James, flow southeastward across the Coastal Plain to the Chesapeake Bay. The Bay, in turn, empties into the Atlantic Ocean.

The topography of the Coastal Plain is a terraced landscape that stair-steps down to the coast and to the major rivers. The risers (scarps) are former shorelines and the treads are emergent bay and river bottoms. The higher, older plains in the western part of the Coastal Plain are more dissected by stream erosion than the lower, younger terrace treads. This landscape was formed over the last few million years as sea level rose and fell in response to the repeated melting and growth of large continental glaciers and as the Coastal Plain slowly uplifted. During the glacial maxima, much of the continental shelf was emergent and the Susquehanna flowed through the Chesapeake lowland and across the exposed shelf to the sea 80 km or more to the east. The Chesapeake Bay was created about 5000 to 6000 years ago when the lower course of the Susquehanna River through the Chesapeake lowland was flooded as meltwater from the large Pleistocene continental glaciers raised sea level. Continuing sea level rise and shoreline erosion caused the bay to expand its aerial extent.

The Virginia Coastal Plain is underlain by a thick wedge of sediments that increases in thickness from a featheredge near the Fall Zone to more than 4,000 meters under the continental shelf. These sediments rest on an eroded surface of Precambrian to early Mesozoic rock. Two-thirds of this wedge is comprised of late Jurassic and Cretaceous clay, sand, and gravel; they were stripped from the Appalachian mountains, carried eastward by rivers and deposited in deltas in the newly formed Atlantic Ocean basin. A sequence of thin, fossiliferous marine sands of Tertiary age overlie the older strata. They were deposited in warm, shallow seas during repeated marine transgressions across the Coastal Plain. This pattern of deposition was interrupted about 35 million years ago by a large meteorite that plummeted into a shallow sea, and created a crater more than 90 km in diameter. It was subsequently buried under about 1.2 km of younger sediment. Latest Tertiary and Quaternary sand, silt, and clay, which cover much of the Coastal Plain, were deposited during interglacial high stands of the sea under conditions similar to those that exist in the modern Chesapeake Bay and its tidal tributaries.

COASTAL PLAIN PHYSIOGRAPHY

COASTAL PLAIN TIMELINE

CROSS SECTION AND STRATIGRAPHY

TIDEWATER AGRICULTURAL RESEARCH AND EXTENSION CENTER

The Tidewater Agricultural Research and Extension Center (Tidewater AREC) is an integral component of Virginia Polytechnic Institute and State University located at 6321 Holland Road in Suffolk, Virginia. Tidewater AREC is situated on 289 acres of land of which approximately 208 acres are devoted to research and demonstration plots in any given year. An additional 59 acres of land is leased from the adjacent Duke Farm. The main building complex occupies approximately 23 acres with 19 offices, laboratory, and shop buildings. There are two additional buildings on the Hare Road Research Farm. The swine facilities at the center occupy approximately 10 acres including six buildings and two waste management lagoons at the main center and two buildings and one lagoon at the Hare Road Swine Evaluation Center.

Research and extension projects at the Tidewater AREC involve work on corn, cotton, peanuts, small grains, soybeans, vegetables, and swine. The Cotton Specialist from the Southern Piedmont AREC at Blackstone conducts cotton experiments at the Center and scientists from the main campus at Blacksburg conduct experiments on cotton, small grains, and pesticide rinsate management. A scientist from Virginia State University conducts alternative crops research on canola and meadowfoam at the Tidewater AREC.

Center faculty represent the disciplines of agronomy, animal science, entomology, plant pathology, soil science, and weed science. Specialties within these disciplines include a swine reproductive physiologist, a swine nutritionist, a peanut-variety-quality-evaluation specialist, a peanut/cotton weed science/agronomy specialist, a soybean specialist, an entomology/IPM specialist, a cotton specialist, a row crops/turf pathologist, and an irrigation/vegetable production specialist. In addition to the research and demonstration work conducted at the Tidewater Center, similar trials are conducted at multiple locations in southeastern Virginia and northeastern North Carolina.

There are approximately 110,000 acres of cotton in Virginia and yields tend to be 35-100 lb/A greater than those of several other southern states. About 75,000 acres of peanuts are grown in Virginia. Approximately 95% of the cotton and peanut acreage is located in southeastern Virginia east of Interstate 95. Over 500,000 acres of soybeans, more than 450,000 acres of corn, and about 240,000 acres of small grains are produced all over the state. The total number of swine in Virginia remains at about 390,000. The swine industry is changing from many independent producers toward vertical integration with a few contract growers producing for large meat processors. However, the industry remains as both a vital producer and a consumer of other agricultural products such as small grains and soybean meal.

Applied technology that will allow growers to produce crops at lower per unit costs is needed in order to keep agriculture sustainable in Virginia. Our technology must fit within the constraints of greater regulation of the farm environment. The stewardship of land and water resources is essential if agricultural industries are to remain viable in Virginia. The watershed areas of the Chesapeake Bay and the Albermarle Sound estuaries are especially sensitive in this regard. The sustainability of agriculture must include both environmental and economic concerns.

On-going Cotton Experiments at the Tidewater AREC

Characterization of the Fruiting Growth Curve in COTMAN: A Regional Report

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The effect of production inputs such as nitrogen and mepiquat chloride on the crop target development curve is not clear. The objectives of this experiment which started in 1997 were to characterize the standard fruiting growth curve and determine the stability of the curve under different environments (locations) and management inputs (nitrogen and mepiquat chloride) on the nature of the fruiting curve. Field experiments were conducted at four locations (Virginia, Arkansas, Georgia and Louisiana). Treatments consisted of an untreated control (high N no MC), high N + MC at PHS and FF and low N (70% of the control) + no MC. COTMAN crop monitoring records of major phenological stages (PHS, FF and NAWF = 5) were recorded. To determine flower values, first position white flower at NAWF = 7, NAWF = 6, NAWF = 5, and NAWF = 4 were tagged by placing small tags on the main-stem branch. Tagged bolls were hand harvested at the end of the growing season. The development curve in Arkansas tracked the standard development curve (TDC) with slopes similar to the target curve. At first flower the apogee for the three treatments were 7.5, 8, and 7.5 for the check, low N and high N +PIX, respectively, which was lower than the TDC (9.3). At this location, for all treatments there was an increase in bolls required to produce one pound of seedcotton for NAWF = 5 or less. However, this increase in bolls/lb of seedcotton was even higher for the untreated control (high N no PIX). In Georgia the development curve showed slow development of squaring nodes followed by premature cutout for the low N No PIX treatment. At first flower the apogee for the three treatments were 8.3, 7.7, and 7.9 for the check, low N and high N + PIX, respectively, which was lower than the TDC (9.3). NAWF values declined to cutout at 70 DAP which was only 10 days from first flower for the low N no PIX treatment. The Louisiana development curve showed early initiation of flowering followed by premature cutout for all the treatments except the untreated control. At first flower the apogees for the three treatments were similar to the TDC (9.3) except the low N no PIX treatment which was 8.6. The NAWF values declined rapidly for the low N and high N + PIX treatments. For all treatments there was an increase in bolls required to produce one pound of seedcotton above NAWF = 4. Number of flowers required to produce one pound of seedcotton was lower for high N + PIX treatment compared with the check and low N treatments. Relative to the COTMAN TDC, the Virginia development curve showed slow development of squaring nodes, and a low apogee. For all treatments there was an increase in bolls required to produce one pound of seedcotton above NAWF = 5. However, this increase in bolls/lb of seed cotton was even higher for the low N + no PIX treatments. The standard fruiting growth curve varied slightly under different environments and management inputs. The variation in the fruiting growth pattern across location mainly were due to seasonal growing conditions (moisture and temperature). Production management inputs such as nitrogen and PIX effected flower values at some locations.

Compensation of Cotton to Square Removal with Different Varieties and Planting Dates

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Fruit shedding is a natural occurrence in cotton. Fruiting retention is very important since yields are highly correlated with number of bolls produced. There are many factors contributing to the shed of squares by cotton, including environmental conditions, heavy boll load, diseases, and insect feeding. An experiment was designed to evaluate the compensation capacity of cotton at various levels of square removal using two cotton varieties at two planting dates over two Virginia locations; the effect of mechanical square removal on cotton yield components and quality and to evaluate the use/effectiveness of COTMAN in tracking major phenological stages PHS, FF, Cutout) of cotton at varied rate of square removal. In 1999, two varieties (DPL 51 and DPL 5111), two planting dates (two weeks apart), and five levels of manual desquaring treatments (0%, 12-15%, 20-25%, and 30-40% of first position squares, and 10% of small bolls) were used. While in 1998, only DPL 51 at a single planting date was used. The physiological progress of the crop was monitored using the COTMAN cotton mapping system. season. In1998 yield and boll weight were not affected by any of the square removal levels .In 1999, the removal of squares at the 30-40% rate resulted in yield reduction for both DP51 and DP5111 for the 1 PD. Similar result was obtained for the 2 PD, although the square removal rate at which the yield reduction was occurred varied. No effect of 10% boll removal on yield.TDC showed slow development of squaring nodes, and low apogee. However, no effect of square removal on TDC was observed.

Influence of Nitrogen and Boron Interaction on the Production of Cotton

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Studies across the cotton (*Gossypium hirsutum*) growing regions of the country have shown boron and nitrogen to be essential nutrients for profitable cotton production. Four levels of nitrogen (N) (0, 30, 60 and 90 lbs/acre for 1996 and 0, 60, 90 and 120 lbs/acre for 1997) and four levels of boron (B) (0, 0.5, 1.0, and 2.0 lbs/acre) were used on DPL-50 in a split-plot design with B subplot treatments randomly assigned within N whole plot treatments. The experiment was replicated four times. Nitrogen as sodium nitrate, and ammonium nitrate for 1996 and 1997, respectively were side-dressed and boron as solubor foliar applied. Yield parameters were measured for each treatment. There was no significant N X B interaction thus, data were averaged over N and B rates, respectively. In both years increased N rate up to 90 lb N acre increased ($P < 0.01$) lint yield. The increase in lint yield was 86, 335 and 423 lbs/acre for 30, 60, and 90 lbs/acre N over the untreated control, respectively. In 1997, however the only significant yield increase was observed for the 90 lbs/acre N rate. Adding foliar boron at 2.0 lbs/acre, however decreased lint yield over the untreated control. Leaf blade tissue level increased with increasing B rates compared with the initial B level. Additional research is needed in order to fully understand the benefit of boron in N utilization.

PEANUT PRODUCTION

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Production Areas

Peanuts are produced in three major production areas in the United States: Virginia-Carolina, Southeast, and Southwest. Four market-type peanuts are grown in the United States. They are the virginia-type which has large pods with two large seeds per pod, runner-type which has smaller pods and seeds but still two seeds per pod, spanish-type which has smaller pods and seeds than runners but again two seeds per pod, and the valencia-type which has small pods but typically has three or four seeds per pod. The large-seeded virginia-type peanut is grown in the Virginia-Carolina (V-C) area consisting of Virginia and North Carolina with some production in South Carolina. The Southeast production area, consisting of Georgia, Florida, and Alabama, produces the runner-type. The Southwest production area is located in Texas, Oklahoma, and New Mexico where the runner-type is the main type grown with some spanish and virginia-type also grown. The valencia-type is grown in New Mexico for the in-shell trade.

Yield and Price

Typically peanut yields are dependent upon weather conditions. The large-seeded Virginia-type and runner-types have the highest yield potential, usually in the 3,000-4,000 lb/A range. However, yields above 6,000 lbs/A are recorded in good growing seasons on some farms. Spanish and valencia-types typically are not high yielding compared to virginias and runners. The average yield in the United States is usually in the 2,800 lb/A range in a typical growing season. Peanuts are under a quota system with the support price set by the USDA at $610 per ton based on grade.

Cultural Practices

Soils: Light, sandy soils (clayier subsoil at about 18 inches for water-holding capacity) with a pH of 5.9-6.2 is ideal for peanut production. The light, sandy soils of Virginia and North Carolina Coastal Plains are well suited for the production of large-seeded, virginia-type peanuts used for in-shell roasting and salting. These light-colored soils produce a bright-colored pod that is desired by the in-shell industry.

Varieties and Growth Habit: Many varieties are available for all market-types that have excellent yield potential. Some have pest resistance and others do not. Growers select varieties based on their needs and pest problems. All current runner market-types have runner growth habits. Most Virginia origin market-types also have runner growth habits, however some have an intermediate and/or bunch growth. Spanish and valencia market-type varieties are all currently bunch growth types.

Seeding: Normal planting pattern is a single row spaced 36 inches apart with a seeding rate of four seeds per foot of row. Some growers use a twin-row planting pattern with two rows spaced nine inches apart with the center of these two tow 36 inches apart. They usually increase the seeding rate about 10-15% over the single row pattern. Normal planting time is the last week in April to the third week in May depending upon weather conditions.

Fertilization: Since peanut is a legume, indirect fertilization is used on most of the acreage in the United States -- application of fertilizer to the crop preceding peanuts (usually cotton or corn). However, in some areas of west Texas they do apply nitrogen on peanuts through the irrigation water. Calcium is needed to prevent "pops," particularly with the large-seed types and application of gypsum, in the form of landplaster (calcium sulfate) is a normal production practice in the V-C area. Boron and manganese are also needed as micronutrients in peanut production in our area.

Insects: At planting, in-furrow application of a systemic insecticide is used to control thrips. During the growing season foliar feeders such as potato leafhoppers, corn earworms, and spider mites can be a problem. The southern corn rootworm larvae, which is the immature stage of the spotted cucumber beetle, feed on peanut pods during development and is a problem on medium to heavy soil types. Pesticides are used effectively to control these insects.

Diseases: A soil fumigant is used preplant to control Cylindrocladium black rot and also nematodes. Sclerotina blight seems to be the most severe disease for which adequate control is not available. It is a soil fungus that attacks the plant stems and pegs and may cause plant death. Foliar diseases also occur but can be effectively controlled with proper fungicide applications.

Harvest and Drying: Peanuts are dug with a digger-shaker-inverter. This machine lifts the peanut plant out of the soil, shakes out the dirt, and inverts the vines so that the peanut pods are facing upward toward the sun for drying (peanuts are approximately 45-50% moisture at digging). After three to five days of natural drying in this position and reducing the moisture to approximately 18 to 25%, peanut combines are used to separate the pods from the plant with the plant parts returned to the field and the peanut pods collect in a basket on the combine. The peanuts are dumped into large drying trailers where heated air is forced through the trailer to artificially dry the peanut kernels to approximately 10% moisture. They are then taken to a buying station for grading to determine the market price and sold to a peanut shelling company to begin the journey through shelling, processing, manufacturing, and delivery to the consumer.

PEANUT HISTORY

A Short Peanut History (www.aboutpeanuts.com)

The peanut plant probably originated in Brazil or Peru, although no fossil records exist to prove this. But for as long as people have been making pottery in South America (3,500 years or so) they have been making jars shaped like peanuts and decorated with peanuts. Graves of ancient Incas found along the dry western coast of South America often contain jars filled with peanuts and left with the dead to provide food in the afterlife.

Peanuts were grown as far north as Mexico by the time the Spanish began their exploration of the New World. The explorers took peanuts back to Spain, where they are still grown. From Spain, traders and explorers took peanuts to Africa and Asia. In Africa the plant became common in the western tropical region. The peanut was regarded by many Africans as one of several plants possessing a soul.

When Africans were brought to North America as slaves, peanuts came with them. Slaves planted peanuts throughout the southern United States (the word goober comes from the Congo name for peanuts - nguba). In the 1700's, peanuts, then called groundnuts or ground peas, were studied by botanists and regarded as an excellent food for pigs. Records show that peanuts were grown commercially in South Carolina around 1800 and used for oil, food and a substitute for cocoa. The first commercial peanut crop in Virginia was grown in Sussex County (near what is now Waverly) in the early to mid 1840's and the first ones in North Carolina were grown in the Wilmington area beginning around 1818. However, until 1900 peanuts were not extensively grown, partially because they were regarded as food for the poor, and because growing and harvesting were slow and difficult until labor-saving equipment was invented around the turn of the century.

The first notable increase in U.S. peanut consumption came in 1860 with the outbreak of the Civil War. Northern soldiers, as well as Southern, used the peanut as a food. During the last half of the 19th century, peanuts were eaten as a snack, sold freshly roasted by street vendors and at baseball games and circuses. While peanut production rose during this time, peanuts were harvested by hand which left stems and trash in the peanuts. Thus, poor quality and lack of uniformity kept down the demand for peanuts.

Around 1900, equipment was invented for planting, cultivating, harvesting and picking peanuts from the plants, and for shelling and cleaning the kernels. With these mechanical aids, peanuts rapidly came into demand for oil, roasted and salted nuts, peanut butter and candy. George Washington Carver began his research into peanuts in 1903 at Tuskeegee Institute. Research that would lead him to discover improvements in horticulture and the development of more than 300 uses for peanuts (including shoe polish and shaving cream). The talented botanist recognized the value of the peanut as a cash crop and proposed that peanuts be planted as a rotation crop in the Southeast cotton-growing areas where the boll weevil insect threatened the regions' agricultural base. Farmers listened and the face of southern farming was changed forever. For his work in promoting its cultivation and consumption, Carver is considered the father of the peanut industry.

Peanut production rose rapidly during and after World Wars I and II as a result of the peanut's popularity with Allied forces, and as a result of the post-war baby boom. Today, peanuts contribute over four billion dollars to the U.S. economy each year.

SUFFOLK

Setting: Soils of the Suffolk series are very deep and well drained. They have moderate permeability. They formed in loamy fluvial and marine sediments on Coastal Plain uplands. Slopes range from 0 to 50 percent. Mean annual temperature is about 59 degrees F, and mean annual precipitation is about 46 inches.
Taxonomic classification: Fine-loamy, siliceous, semiactive, thermic Typic Hapludults
Elevation (at site): 66 feet

Ap--0 to 8 inches; brown (10YR 5/3) loamy sand; weak fine granular structure; very friable, nonsticky, nonplastic; few fine roots; neutral; abrupt smooth boundary.

E--8 to 12 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable, slightly sticky, nonplastic; few fine roots; neutral; gradual smooth boundary.

Bt--12 to 32 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; few fine roots; very strongly acid; gradual smooth boundary.

BC--32 to 50 inches; strong brown (7.5YR 5/6) sandy loam; weak fine granular structure; very friable, slightly sticky, nonplastic; very strongly acid; gradual smooth boundary.

C--50 to 70 inches; yellowish brown (10YR 5/8) loamy sand; single grain; loose; very strongly acid.

Table 1. Particle size distributions.

Horizon	Depth	Sand†						Silt	Clay
		VC	C	M	F	VF	Total		
	inches	---------- % ----------							
Ap	0-8	0.3	9.3	39.2	29.7	3.4	81.9	12.8	5.2
E	8-12	0.7	8.9	35.8	27.9	3.1	76.4	18.6	5.1
Bt	12-32	1.4	10.9	32.6	23.9	2.3	71.1	8.4	20.5
BC	32-50	1.0	9.6	37.5	32.3	2.7	77.3	8.2	14.5
C	50-70	0.6	11.2	36.9	32.8	3.0	84.6	8.2	7.2

† VC = very coarse sand; C = coarse sand; M = medium sand; F = fine sand; VF = very fine sand; Total = total sand fraction

Table 2. Chemical properties.

Depth	pH	Exchangeable cations					CEC†	ECEC†	BS	EBS	Organic Matter
		Ca	Mg	K	H	Al					
inches		---------------------- *$cmol_c$ kg^{-1} of soil* ----------------------							-------------- % --------------		
0-8	6.70	1.14	0.29	0.10	0.78	0.10	2.31	1.63	66.23	93.87	0.9
8-12	6.78	0.65	0.29	0.08	0.98	0.10	2.00	1.12	51.00	91.07	0.7
12-32	4.80	1.55	0.68	0.23	2.34	0.53	4.80	2.99	51.25	82.27	0.6
32-50	4.85	1.26	0.58	0.12	1.56	0.10	3.52	2.06	55.68	95.15	0.6
50-70	5.04	0.88	0.28	0.06	1.17	0.10	2.39	1.32	51.05	92.42	0.6

CEC = Ca + Mg + K + H; ECEC = effective CEC = Ca + Mg + K + Al;
BS = base saturation = (Ca + Mg + K) / CEC x 100; EBS = effective BS = (Ca + Mg + K) / ECEC x 100.

Table 3. Sand Mineralogy.

Horizon	Depth	Qtz	Kspar	Plag	Musc	H.M.	Opaques
	inches	------------------------------------- *% of sand* -------------------------------------					
Bt	12-32	98	2	–	–	–	--

Qtz = quartz; Kspar = potassium feldspar; Plag = plagioclase feldspar; Musc = muscovite mica; H.M. = heavy minerals (rutile, ilmenite, zircon)

Table 4. Chemical properties.

Depth	Ca	Mg	K	P	Zn	Mn	Soluble Salts
inches	--- *ppm* ---						
0-8	228	38	34	14	0.5	3.9	1
8-12	108	21	36	3	0.2	1.6	1
12-32	240	69	67	3	0.3	1.0	102
32-50	216	65	45	7	0.1	0.8	166
50-70	144	32	22	3	0.2	1.3	64

ROANOKE

Setting: Soils of the Roanoke series are very deep and poorly drained. They have moderate permeability. They formed in clayey alluvial sediments on low Piedmont and Coastal Plain flood plains and terraces and in clayey marine and alluvial sediments on broad flats in the Coastal Plain. Slope ranges from 0 to 2 percent. Mean annual temperature is about 58 degrees F, and mean annual precipitation is about 46 inches.
Taxonomic classification: Fine, mixed, semiactive, thermic Typic Endoaquults
Elevation (at site): 63 feet.

Ag–0 to 5 inches; gray (10YR 5/1) loam; weak fine subangular blocky and moderate fine granular structure; friable, sticky, plastic; common fine roots; clear smooth boundary.

Btg1–5 to 25 inches; light gray (10YR 7/1) clay loam; common medium prominent yellowish brown (10YR 5/8) and light olive brown (2.5Y 5/6) soft masses of iron; weak coarse subangular blocky structure; firm, sticky, plastic; common fine roots; continuous prominent clay films on faces of peds; gradual smooth boundary.

Btg2–25 to 40 inches; dark gray (10YR 4/1) clay; common medium prominent yellowish brown (10YR 5/8) and light olive brown (2.5Y 5/6) soft masses of iron; weak coarse prismatic parting to strong coarse angular and subangular blocky structure; firm, sticky, plastic; common fine roots; continuous

Table 2. Chemical properties.

Depth	pH	Exchangeable cations					CEC†	ECEC†	BS	EBS	Organic Matter
		Ca	Mg	K	H	Al					
inches		---------------------- *$cmol_c$ kg^{-1} of soil* ----------------------							------------- % --------------		
0-5	4.92	1.65	0.61	0.35	19.10	4.05	21.71	6.66	12.02	39.19	6.8
5-25	4.78	0.04	0.86	0.08	14.13	8.85	15.11	9.83	6.47	9.97	0.2
25-40	5.02	0.03	1.44	0.10	17.51	9.85	19.08	11.42	8.23	13.75	0.1
40-55	5.22	0.03	1.49	0.09	11.94	8.05	13.55	9.66	11.88	16.67	0.1
55-70	5.38	0.04	1.05	0.05	4.78	3.60	5.92	4.74	19.26	24.05	0.1

CEC = Ca + Mg + K + H; ECEC = effective CEC = Ca + Mg + K + Al;
BS = base saturation = (Ca + Mg + K) / CEC x 100; EBS = effective BS = (Ca + Mg + K) / ECEC x 100.

Table 3. Clay Mineralogy.

Horizon	Depth	KAO	HIV	VER	MIC	SME	QTZ
	inches	--------------------------------------- *% of clay* ---------------------------------------					
Btg1	5-25	24	28	6	18	5	3

KAO = kaolinite, HIV = hydroxy interlayered vermiculite; VER = vermiculite; MIC = mica; SME = smectite; QTZ = quartz

Table 4. Chemical properties.

Depth	Ca	Mg	K	P	Zn	Mn	Soluble Salts
inches	-- *ppm* --						
0-5	120	29	2	40	1.1	16.1	1
5-25	24	78	0	9	0.7	0.7	8
25-40	12	119	0	8	1.5	0.2	22
40-55	24	113	0	6	1.9	0.4	24
55-70	12	81	0	6	1.5	0.2	5

SOIL AND LANDSCAPE PHOTOGRAPHS AND IMAGES

TIDEWATER AREC

7.5-minute topo of Hare Road Farm

Tidewater AREC, Hare Road Farm

SUFFOLK
fine-loamy, siliceous, semiactive thermic
Typic Hapludult

ROANOKE
fine, mixed, semiactive, thermic
Typic Endoaquult

CHIPPOKES PLANTATION STATE PARK

General Information: Chippokes Plantation State Park is one of the oldest working farms in the United States. Chippokes is a living historical exhibit located in a rural agricultural area along the James River in Surry County. In addition, the park has a wide variety of traditional park offerings, including a swimming complex, visitor center, picnic facilities, and hiking and biking trails. The plantation has kept its original boundaries since the 1600s and has a variety of cultivated gardens and native woodland. The formal gardens surrounding the Chippokes Mansion are accented by azaleas, crepe myrtle, boxwood and seasonal flowers. The plantation grounds are also home to the Chippokes Farm and Forestry Museum.

Chippokes Plantation State Park is operated by the Department of Conservation and Recreation in cooperation from the Chippokes Plantation Farm Foundation. The Virginia General Assembly created the foundation in 1977 to establish, administer and maintain the model farm. Funding for foundation efforts are from the General Assembly with matching private donations.

Park History: Captain William Powell, a prominent colonial gentleman, received a grant for 550 acres of river frontage on Chippokes Creek in 1619. This is the first record of ownership for this land. The plantation and the bordering creek were named for an Indian chief who befriended the early English settlers. Under the ownership of Colonel Henry Bishop in 1646, the plantation was expanded to its present boundaries encompassing 1,403 acres.

In 1854, Albert Carroll Jones built the present Chippokes Mansion, which overlooks the historic James River. This Italianate structure was built of brick, stuccoed and painted on its river facade. Chippokes was once the site of one of the few legal distilleries in the Commonwealth. Local legend has it that the mansion survived the Civil War because Albert Jones sold his brandies to both sides during the war. The plantation changed owners many times before it was bought by Thornton Jeffress of Rochester, New York and V.W. Stewart of Wilson, North Carolina in1918. Mr. and Mrs. Stewart moved to Chippokes and put much effort into restoring the property and compiling a detailed history of the plantation. Upon her husband's death, Mrs. Stewart, in order to preserve the plantation in its entirety, donated Chippokes Plantation to the Commonwealth as a memorial to her husband in 1967. Mrs. Stewart hoped that the plantation would be made into a park and preserved as a working farm to interpret day-to-day farm life through the centuries.

SHIRLEY PLANTATION

A VISIT TO SHIRLEY PLANTATION offers an intimate view of the Hills and Carters, a rare continuity of one family spanning nearly four centuries. Shirley was founded six years after the settlers arrived at Jamestown in 1607 to establish the first permanent English Colony in the New World. It was granted to Edward Hill I in 1660.

The present mansion was begun in 1723 when Elizabeth Hill, great-grand daughter of the first Hill, married John Carter, eldest son of Robert "King" Carter. It was completed in 1738 and is largely in its original state.

The home is recognized as an architectural treasure. The famous square-rigged, flying staircase rises three stories with no visible means of support and is the only one of its kind in America. A guided tour of the main floor reveals original 18th century hand carved woodwork, family portraits, silver, furniture and other decorative pieces. A 3 ½ foot wooden pineapple, gracing the Mansard roof, has signified hospitality for 250 years.

Since colonial times, Shirley has been a well-known center of hospitality. The Hills and Carters entertained the Harrisons, Byrds, Lees, Washingtons, Tylers, and other prominent Virginians. Visitors today see an 800- acre James River Plantation which remains home to the 10th and 11th generation of the Hill - Carter family.

During the Revolution, Shirley served as a supply center for the Continental Army. Twice, it was a listening post for both sides in the no-man’s land between the British at City Point, now Hopewell, and Lafayette’s army at Malvern Hill.

During the Civil War, Shirley survived both the Peninsula and Petersburg Campaigns, struggles for Richmond, capital of the Confederacy. Ann Hill Carter, mother of Robert E. Lee, was born and raised at Shirley. She married Governor Henry "Light-Horse Harry" Lee in the parlor. Their son, Robert was educated with his Carter cousins at the plantation. He formed a life long friendship with Hill Carter, who later inherited Shirley.

Four superb brick outbuildings form a Queen Anne forecourt, believed to be the only remaining example in America of this architectural style. These include a large two-story kitchen house and laundry house, and two L-shaped barns, one with the ice cellar beneath it. Other original structures include the stable, smokehouse, root cellar, and dovecote.

SHIRLEY PLANTATION
LAND USE PLANNING[1]

Introduction

In the summer of 1998 Virginia Tech's Community Design Assistance Center was asked by Weanack Corporation to develop a conceptual land use plan for Shirley Plantation. The 700 acre site is located in Charles City County, Virginia and is the oldest U.S. plantation owned by its original family.

The conceptual land use planning process undertaken by Virginia Tech addresses many of the short-term goals, economic needs, and biophysical interests of both the Weanack Corporation and Shirley Plantation personnel. A GIS was used to explore land use changes over time, to inventory existing conditions, and to model future conditions at the proposed gravel and sand mining area. GIS map provided baseline data for initial inventory, visualization and assessment, as well as setting the stage for more detailed site analysis necessary for development of a final master plan for Shirley Plantation.

Mining Reclamation

Mining at Shirley Plantation has been a process of excavating sand and gravel initiated in the early 1960's. The mining process entails the reshaping of landforms to comply with public safety, pollution control, erosion control, drainage regulations, and access needs. In the aftermath of the mining activity the landscape is left with overburden that blankets the disturbed landscape.

A multitude of problems can arise in the mining process is inappropriate engineering and poor land husbandry are practiced. Some post mining reclamation efforts reveal economic benefits and encourage further study of the following post-mine options:

- restoration of prime agricultural land to crop production
- mixed-use development (commercial, recreational, residential)
- wildlife habitat or natural areas
- environmental art (sculptures/earth art)
- mine sites as tourist areas

Conceptual Land Use Plan

The proposed land use plan revolves around the "working landscape" concept. The "working landscape" is the evolutionary process which encompasses historical, social, cultural, and economic aspects of Shirley Plantation, including the families and individuals who have lived and worked the land along this part of the James River. Key attributes of the land use plan are as follows:

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[1]Shirley Planation Land Use Planning Report. March 2000. Community Design Assistance Center, College of Architecture and Urban Studies, Virginia Tech.

- Prime agricultural land
- Restored farmland
- Historic preservation and restoration
- Port facilites
- Mining reclamation
- Wetland preservation and creation
- Forest and meadow creation
- Existing woodland

Pamunkey

Setting: Soils of the Pamunkey series are very deep and well drained. They formed in Piedmont and Coastal Plain sediments. They are on nearly level to sloping stream terraces. Slopes range from 0 to 15 percent. Mean annual precipitation is about 48 inches, and mean annual temperature is about 59 degrees F.
Taxonomic classification: Fine-loamy, mixed, semiactive, thermic Ultic Hapludalfs
Elevation (at site): 30 feet.

Ap–0 to 10 inches; dark brown (10YR 4/3) sandy loam; weak medium granular structure; friable, slightly sticky, nonplastic; common fine roots; common fine mica flakes; clear smooth boundary.

Bt–10 to 24 inches; strong brown (7.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; few fine roots; common distinct clay films on ped faces and bridges between sand grains; common fine mica flakes; gradual smooth boundary.

BC–24 to 59 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, sticky, plastic; few fine roots; few distinct clay films on ped faces and bridges between sand grains; common fine mica flakes; clear smooth boundary.

C–59 to 70 inches; strong brown (7.5YR 5/6) sandy loam; massive; friable, sticky, plastic; common fine and medium mica flakes.

Table 1. Particle size distributions.

Horizon	Depth	Sand†						Silt	Clay
		VC	C	M	F	VF	Total		
	inches	-- % --							
Ap	0-10	3.3	20.6	26.7	18.0	4.4	73.0	20.3	6.7
Bt	10-24	6.2	18.8	21.6	11.2	2.7	60.5	12.4	27.1
BC	24-59	10.5	19.5	24.8	12.1	2.0	68.8	7.9	23.3
C	59-70	8.4	22.7	28.4	12.2	1.8	73.6	6.6	19.8

† VC = very coarse sand; C = coarse sand; M = medium sand; F = fine sand; VF = very fine sand; Total = total sand fraction

Table 2. Chemical properties.

Depth	pH	Exchangeable cations					CEC†	ECEC†	BS	EBS	Organic Matter
		Ca	Mg	K	H	Al					
inches		---------------------- *cmol$_c$ kg^{-1} of soil* ----------------------							-------------- % --------------		
0-10	6.32	1.49	0.23	0.21	1.60	0.10	3.53	2.03	54.67	95.07	0.9
10-24	6.08	2.65	0.52	0.33	1.20	0.05	4.70	3.55	74.47	98.59	0.7
24-59	6.24	2.80	0.50	0.11	2.20	0.10	5.61	3.51	60.78	97.15	0.5
59-70	6.33	2.81	0.49	0.11	2.10	0.05	5.51	3.46	61.89	98.55	0.4

CEC = Ca + Mg + K + H; ECEC = effective CEC = Ca + Mg + K + Al;
BS = base saturation = (Ca + Mg + K) / CEC x 100; EBS = effective BS = (Ca + Mg + K) / ECEC x 100.

Table 3. Sand Mineralogy.

Horizon	Depth	Qtz	Kspar	Plag	Musc	H.M.	Opaques
	inches	------------------------------------- *% of sand* -------------------------------------					
Bt2	24-47	78	10	2	4	6	--

Qtz = quartz; Kspar = potassium feldspar; Plag = plagioclase feldspar; Musc = muscovite mica; H.M. = heavy minerals (rutile, ilmenite, zircon)

Table 4. Chemical properties.

Depth	Ca	Mg	K	P	Zn	Mn	Soluble Salts
inches	--- *ppm* ---						
0-10	348	29	51	34	0.8	6.7	1
10-24	516	60	109	8	0.3	3.6	1
24-59	588	68	33	2	0.3	0.4	51
59-70	600	57	31	2	0.2	0.5	51

Virginia's State Soil
PAMUNKEY

The Natural Resource Conservation Service (NRCS) of the United States Department of Agriculture (USDA) has asked that each state adopt, through legislation, a "State Soil." NRCS asked the Virginia Association of Professional Soil Scientists (VAPSS) to select a soil for Virginia.

Why Adopt a State Soil

In recognition of the 100 years that the Soil Survey program has provided valuable information necessary for planning growth and for protection of our natural resources and environment, each state in the Nation is adopting a "State Soil." Soil is a basic resource that we rely on for most of our food, fiber and national economy.

In selecting a "State Soil" for Virginia, we were faced with dilemmas that many other states would not be faced with. Virginia covers some 450 miles along its southern boundary, five Physiographic Provinces and nine Major Land Resource Areas. With this kind of diversity in the state, it is hard to select a soil which represents the entire state.

Fortunately, Virginia is blessed with rivers whose watersheds cover each Physiographic. The James River crosses the entire Commonwealth of Virginia and brings sediments from each of the provinces it flows through. These sediments are deposited on flood plains and on deltas along its course, to later form Pamunkey soils on low stream terraces.

This soil, originally mapped as Wickham soil series, was first recognized in Hanover County. Chemical laboratory data revealed that the base saturation (natural fertility) was greater in these soils than is allowed in the Wickham series. The soil was named Pamunkey, the name chosen for a nearby river, which in turn was named for the Pamunkey Indian Nation that lives along the river.

The Pamunkey soils were first used to sustain the Pamunkey Indians, other tribes, and later to grow crops by the settlers at Jamestown. The high natural fertility and high crop yields associated with these soils may be one reason that the Jamestown settlement survived. Pamunkey soils are prime agriculture soils in Virginia. Extensive areas of Pamunkey soils have been mapped in Hanover, Chesterfield, New Kent, Charles City, Surry, Henrico, James City, York, and other Tidewater counties.

Facts about Pamunkey Soil

- Pamunkey soil is formed from sediments which originated in every physiographic province in the Commonwealth and therefore represents the WHOLE state better than most other soils.
- The farm where the representative profile of Pamunkey soil was excavated, near Jamestown, is the oldest continuously worked farm in the United States. In spite of encroaching development, this historic farm has been put into a conservancy program for the use of agriculture by the County of James City.
- In 1999 the Pamunkey soil, on the oldest working farm in America, produced the second highest corn yield (224 bushels to the acre) in the nation.
- The first settlers at Jamestown grew their crops on Pamunkey soil which may be the very reason they survived. Prior to Jamestown being settled the River Indian Tribes, including the Pamunkey Tribe, recognized the high natural fertility of this soil. Its very likely Pocahontas saved Capt. John Smith's life on this soil.

SOIL AND LANDSCAPE PHOTOGRAPHS AND IMAGES

SHIRLEY PLANTATION

7.5-minute topo of Shirley Plantation area

overview of Shirley Plantation

undisturbed Pamunkey landscape

mined site amended with biosolids

PAMUNKEY
fine-loamy, mixed, semiactive, thermic
Ultic Hapludalfs

JAMES RIVER PLANTATIONS

EDGEWOOD

Edgewood Plantation -- its rich, fascinating history creates images of romance, intrigue and antebellum splendor. An exquisite 7,000 square foot example of Carpenter's Gothic architecture, Edgewood was once part of Berkeley Plantation, the ancestral home of U.S. President William Henry Harrison and Benjamin Harrison, a signer of the Declaration of Independence. Throughout its dramatic history, it has served as a church, post office, the first telephone exchange, restaurant and nursing home.

Nestled along the oldest highway in the U.S., Edgewood's third floor was used as a lookout to spy on McClellan's troops when they were camped at nearby Berkeley Plantation. The estate also includes the 1725 Benjamin Harris Grist Mill, which ground corn for both the Union and Confederate armies.

On June 15, 1862, Confederate General Jeb Stuart stopped at Edgewood for coffee on his way to Richmond to warn General Robert E. Lee of the Union Army's strength.

The tragic legacy of the civil war is literally written into one of Edgewood's window panes. Your heart will be touched for Elizabeth "Lizzie" Rowland, who etched her name on an upstairs bedroom window. She died of a broken heart after waiting in vain for her lover to return from the war. Legend has it, and many people believe, that she waits for him today, still watching from her upstairs window.

BERKELEY

Berkeley, on the James River between Williamsburg and Richmond, is the birthplace of a signer of the Declaration of Independence and a U.S. President. Benjamin Harrison, son of the builder of Berkeley and the plantation's second owner, was a signer of the Declaration of Independence and three-time Governor of Virginia. William Henry Harrison, Benjamin's third son, born at Berkeley, was the famous Indian fighter known as "Tippecanoe," who later became the ninth President of the United States, in 1841. His grandson, Benjamin Harrison, was the 23rd President.

On December 4, 1619, early settlers from England came ashore at Berkeley and observed the first official Thanksgiving in America.

At Berkeley the date of the building, 1726, and the initials of the owners, Benjamin Harrison IV and his wife, Anne, appear in a datestone over a side door. The early Georgian mansion is said to be the oldest 3-story brick house in Virginia that can prove its date and the first with a pediment roof. The original mansion, built in 1726 of brick fired on the plantation, occupies a beautifully landscaped hilltop site overlooking the historic James River.

The handsome Adam woodwork and the double arches of the "Great Rooms" in the mansion were installed by Benjamin Harrison VI in 1790at the direction of Thomas Jefferson. The rooms in Berkeley are furnished with a magnificent collection of eighteenth century antiques.

Berkeley's ten acres of formal terraced boxwood gardens and lawn extend a quarter-mile from the front door to the James River. In the basement, the original hand-hewn floor joists are visible. The basement also displays models of early plantation buildings.

George Washington, and later the succeeding nine Presidents of the United States, all enjoyed the famous hospitality of Berkeley in this dining room with its view of the James River.

WESTOVER

Westover was built circa 1730 by William Byrd II, the founder of Richmond. It is noteworthy for its secret passages, magnificent gardens, and architectural details.

Westover was named for Henry West, fourth Lord Delaware and son of Thomas West, Governor of Virginia. The shady tulip poplars framing the building are more than 150 years old. "Ancient" is the best word to describe the boxwood hedges which enclose the lawn.

The house is considered one of the most outstanding examples of Georgian architecture in America. Of special notice is the unusual steepness of the roof, the tall chimneys in pairs at both ends. Another special touch is the elaborate doorway, which continues to be recognized as "the Westover doorway" despite its adaptation to many other buildings.

EVELYTON

Evelynton was originally part of William Byrd's expansive Westover Plantation. Named for Byrd's daughter, Evelyn, this site has been home to the Ruffin family since 1847.

The family patriarch, **Edmund Ruffin**, fired the first shot of the Civil War at Fort Sumter. His later agricultural contributions--from scientific soil testing to the publication of The Farmer's Register--rescued l9th-century Virginia from a declining agricultural economy, and earned him the title "father of American agronomy."

Evelynton was the site of fierce Civil War skirmishes in 1862, when General George McClellan waged his destructive Peninsula Campaign; J.E.B. Stuart, Stonewall Jackson and John Pelham bravely led the Southern offensive in the Battle of Evelynton Heights.

The original house and outbuildings were burned during that conflict, and the current residence was erected two generations later by Edmund Ruffin's great grandson, John Augustine Ruffin, Jr. and his wife Mary Ball Saunders.

BELLE AIR

This 17th-century plantation home, a rare architectural monument built circa 1670, miraculously survives today.

Belle Air is known for its original massive heartpine timbers, which form not only the structure but also provide the interior decorative trim. The home also includes what is considered to be America's finest Jacobean stairway. The landscaped grounds overlook extensive rolling farmland. Belle Air has been open to the public since 1957 and has been featured in the magazine "Antiques."

PINEY GROVE

Piney Grove at Southall's Plantation is the only Williamsburg area historic landmark bed and breakfast inspected, approved and rated by America's premier travel association.

Over four centuries ago, the Chickahominy Indians resided at the very spot that Furnea Southall would establish his prosperous 300-acre plantation. The original log portion of Piney Grove was built In 1800 and today survives as a rare example of Early Tidewater Log Architecture. The grounds also include Ladysmith (built in 1857), Ashland (built in 1835), The Quarter (built in 1860) and Duck Church (built in 1900), as well as gardens and plantation outbuildings.

NORTH BEND

North Bend, a National Registry property and a bed and breakfast, features original antiques, rare books, old dolls and a rich Civil War history. It is considered the finest example of Greek Revival Federal Period architecture in Charles City County.

North Bend was built in 1819 by John Minge for his wife, Sarah Harrison, the sister of William Henry Harrison, the ninth president of the United States. It remained in the Harrison family until 1843, when it was purchased by Thomas Wilcox. He doubled the home's size in a 1853 renovation based on the designs of noted architect Asher Benjamin.

In 1864, 30,000 Federal troops camped in the area, and Mr. Wilcox left North Bend never to return. Federal general Phillip Sheridan headquartered at North Bend while his troops built a pontoon bridge across the James, and the desk used by the general remains at North Bend today.

The current owners of North Bend are George and Ridgely Copland. Mr. Copland is the great grand nephew of Sarah and William Henry Harrison. His mother was Mary Harrison Ruffin Copland of Evelynton Plantation and his maternal grandmother was Jane Cary Harrison of Berkeley. He is also the great, great grandson of Edmund Ruffin, the man who fired the first shot of the Civil War.

In terms of Civil War history, on the eastern edge of the property Civil War breastworks remain. Among the rare books on the premises are a "Harpers Illustrated Pictoral History of the Civil War," which dates from 1869, and a copy of "The Official Records of the War Between the States."

SHERWOOD FOREST

Sherwood Forest is the home of President John Tyler, the first Vice President to ascend to the presidency. Following the "Tippecanoe and Tyler, too" campaign of 1840, William Henry Harrison died just 30 days after his inaugural address. Tyler succeeded him and his 1841-1845 presidential term was the pinnacle of an active political and legal career.

Tyler was twice Governor of Virginia, a U.S. Senator, a member of the U.S. House of Representatives, a Virginia state senator and member of the Virginia House of Delegates. A graduate of The College of William and Mary, he later became Chancellor of that institution. As a supporter of state's rights, he re-entered public service in 1861 as an elected member of the Confederate Congress.

Sherwood Forest, contained in a 1616 land grant, was known originally as Smith's Hundred. Sherwood Forest has the distinction of being owned by two US. Presidents; William Henry Harrison, 9th President, inherited the plantation in the late 18th century. The plantation had several other owners until President John Tyler purchased it and its 1600 acres in 1842. Since then, it has been continuously owned by his direct descendants. In the mid-1970s, the residence was restored by President Tyler's grandson and his wife, the current owners.

The House, circa l730, is Virginia Tidewater in architectural design, and is the longest frame dwelling in America. It was expanded to its present length, 300 feet, by President Tyler in 1845, when he added the 68-foot ballroom designed for dancing the Virginia Reel.

Sherwood Forest survived the Civil War in 1864 when Union soldiers damaged the house and its furnishings, as testified by marks on woodwork and doors, and scars on a French Empire table used by President Tyler in the White House. Also unique to the house is the legend of a ghost, known as the Gray Lady, who has been heard rocking in the Gray Room for more than 200 years.

HOPE YA'LL HAD A GREAT DAY!

Your Field Trip Guidebook Authors

P.J. THOMAS
1983 Southeast Soil Judging Contest

J.C. BAKER
and fallen comrades
Nags Head, NC 1987

NOTES

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	Spencer	Cheryl		University of Maine	1 Deering Hall	Orono	04469-				
MI											
	Jordine	James	Soil Scientist	Ottawa National Forest	E 6248 U.S. Highway 2	Bessemer	49911-				Cooperator
NC											
	Anderson	Debra	Data Quality	USDA-NRCS	4405 Bland Road Suite 205	Raleigh	27609-	(919) 873-2135	(919)873-2181	debbie.anderson@nc.usda.gov	SSURGO/Map Finishing
	Kelly	John	Data Quality	USDA-NRCS	4405 Bland Road Suite 205	Raleigh	27609-	(919) 873-2137			Cooperator
	Tant	Phil	Data Quality	USDA-NRCS	4405 Bland Rd	Raleigh	27609-	(919) 873-2138		phil.tant@nc.usda.gov	
	Vick	Roy	MLRA Leader	USDA-NRCS	4405 Bland Road Suite 205	Raleigh	27609-	(919) 873-2141	(919)873-2181	roy.vick@nc.usda.gov	Soil Taxonomy
NE											

State	Last	First	Title	Organiza	Address	City	Postal	Work	FAX	Email	Committee
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	Bigler	Rick	Soil Scientist	NSSC-USDA-NRCS	Federal Building, Rm 152 100 Centennial Mall N.	Lincoln	68508-	(402) 437-5879			NRCS
	Engel	Bob	Soil Scientist	USDA-NRCS	Nation Soil Survey Center, Rm 152 100 Centennial Mall, North	Lincoln	68508-	(402) 437-5323	(402)437-5336	bob.engel@usda.gov	Soil Taxonomy
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	Mount	Henry	Soil Scientist	USDA-NRCS	Nation Soil Survey, Rm 152 100 Centennial Mall, North	Lincoln	68508-	(402) 437-5384	(402)437-5336	henry.mount@usda.gov	Site Specific/High Intensity
	Scheyer	Joyce	Soil Scientist	USDA - NRCS - NSSC	Federal Bldg., Room 152 Mail Stop 33 100 Centennial Mall North	Lincoln	68508-3866	(402) 437-5698	(402)437-5336	joyce.scheyer@nssc.nrcs.usda.gov	Research Needs-Chair
New											
	Reese	Herb	Soils Specialist	Potato Research Center	Agriculture & Agricultural Canada P.O. Box 20280, 850 Lincoln Rd.	Fredericton					Liaison
New											

State	Last	First	Title	Organiza	Address	City	Postal	Work	FAX	Email	Committee
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	Anderson	Mary	Soils Consultant		16 Parker Road	Brooklin	03033-				
	Babcock	Richard	State Conservati	USDA-NRCS	Federal Building 2 Madbury Road	Durham	03824-1499	(603) 433-0505			Liaison
	Balcius	Cindy	Consultant	Gove Environmental Services	P.O. Vox 118 Long Black Building	Exeter	03833-				Cooperator
	Brissette	John	Soil Scientist	US Forest Serviice	N.E. Experiment Station P.O. Box 640	Durham	03824-0640				Cooperator
	Carpenter	Constance	Soil Scientist	US Forest Service	N.E. Experiment Station P.O. Box 640	Durham	03824-	(603) 868-7698			
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State	Last	First	Title	Organiza	Address	City	Postal	Work	FAX	Email	Committee
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	Lobdell	Raymond	Soils Consultant		88 Gale Chandler Road	Landaff	03585-				Cooperator
	Long	James	Soils Consultant		177 Ledgewood Drive	Strafford	03884-				Cooperator
	Mariano	Mike	Soils Consultant		75 Prospect Street	Somersworth	03878-				Cooperator
	Safford	Larry	Soil Scientist	USDA-USFS	N.E. Experiment Station P.O. Box 640	Durham					Cooperator
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NJ											
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	Heckman	Joe	Cooperative	Rutgers the State University	Cooperative Extension	New Brunswick		(732) 932-9452	(732)932-9441		Cooperator
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	Race	Sam	Director	NASCA	Northeast P.O. Box 330	Trenton	08625-				Liaison
	Sadley	Jim		NASCA	Northeast P.O. Box 330	Trenton	08625-				Cooperator
	Shaw	Richard	Project Leader	USDA-NRCS	North Jersey Field Support, Box Suite 21, 1322 Rd 31 N.	Annandale	08801-	(908) 735-0733	(908)735-0744	rshaw@nj.nrcs.usda.gov	Research Needs

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NM											
	Tugel	Arlene	Soil Scientist	USDA-NRCS, Soil Quality Institute	Agronomy & Horticulture Dept. Box 30003, Dept. 3Q	Las Cruces	88003-8003				
NY											
	Alpern	Robert	Liaison	Dept.of Environmental Protection	5917 Junction Blvd.	Corona	11368-	(718) 595-6569			
	Biggs	Russell	MAPSS	SUNY	College of Environmental Sciences 1 Forestry Drive	Syracuse	13210-	(315) 470-6989			Cooperator
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	Craul	Paul	Professor	School of Forestry	College of Environmental Science SUNY	Syracuse	13210-				

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	Grisi	Brian		Adirondack Park Agency	P.O. Box 99	Ray Brook	12977-	(518) 891-4050			Cooperator
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	Somers	Robert		NYS	Dept. of Agric. & Markets 1 Winners Circle, Capital Plaza	Albany	12235-				Cooperator
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	Tenacredit	John		Gateway National Rec. Area	Headquarters Bldg., 69 Floyd Bennett Field	Brooklyn	11234-				Cooperator
	Watson	Phillip		NYS	Dept. of Transportation Bldg. 7, Rm. 104 1220 Washington Ave.	Albany	12232-				Cooperator
	White	Edwin	Professor	SUNY	College of Environmental Science 346 Lilick Hall	Syracuse	13210-				Cooperator
OH											
	Strain	Mitchel			1026 Hartbridge Ct.	Westerveille	43081-				
OR											
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	Day	Rick	Professor	Pennsylvania State University	University Park Circle 116 ASI Building	University Park	16802-	(814) 863-1615			
	Doolittle	James	Soil Scientist	USDA Forest Service	11 Campus Blvd., Suite 200	Newton Square	19073-	(610) 557-4233		jdoolitt/na@fs.fed.us	Site Specific/High Intensity
	Ellenburger	Ned	Project Leader	NRCS-USDA	702 W. Pitt St	Bedford	15522-	(814) 623-9616			Soil Taxonomy
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	Rivers	Panola	State Database	USDA-NRCS	1 Credit Union Place Suite 340	Harrisburg	17110-				
	White	Edgar	State Soil Scientist	USDA-NRCS	Suite 340 1 Credit Union Place	Harrisburg	17110-	(717) 237-2207	(717)237-2238	ewhite@pa.nrcs.usda.gov	
Prince											
	Carter	Martin	Research Soil	Agriculture &Agri-Food Canada	Crops and Livestock Research Centre, PO Box 1210, 440 University Ave	Charlottetown		(902) 566-6869	(902)566-6821	caterm@em.agr.ca	Cooperator
RI											
	DelVecchio	Joseph R.	State Conservati	USDA-NRCS	60 Quaker Lane, Suite 46	Warwick	02886-0111	(401) 828-1300			Liaison
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TX											
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VA											
	Atalay	Asmara	Professor	Virginia State University	Center for Excellence for Plants & Water P.O. Box 9005	Petersburg	23806-	(804) 524-5590			Cooperator
	Bailey	Thomas	Soil Scientist	USFS	George Washington and Jefferson NFS 5162 Valleypoint Parkway	Roanoke	24019-6065	(540) 265-6065			Cooperator

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	Crouch	Mark	Data Quality	USDA_NRCS	Culpepper Bldg 209, 1606 Santa Rosa Rd.	Richmond	23229-	(804) 287-1645	(804)287-1735	mcrouch@vaso.va.nrcs.usda.gov	Site Specific/High Intensity
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	Peacock	Carl	Soil Scientist	VA Technical University	508 Aylesbury Dr.	Chesapeake	23322-	(757) 363-3878		cpeacock@bdh.state.va.us	

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	Zelazny	Lucian	Professor	VPI & SU	Dept of Crop & Soil Environ Sciences 263 Smyth Hall	Blacksburg	24061-				Cooperator
VT											
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	Motyka	Connie	Soil Scientist	Dept. of Forests	Agency of Natural Resources 103 S. Main Street, 10 South	Waterbury	05676-				Cooperator
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WV											
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	Kingsbury	David	Data Quality	USDA-NRCS	75 High Street Room 301	Morgantown	26505-	(304) 284-7589	(304)284-4839	david.kingsbury@wv.usda.gov	Soil Taxonomy
	Palone	Roxanne	Soil Scientist	USDA-USFS	180 Canfield Street	Morgantown	26505-				Cooperator
	Prescott	Tim	NRI/GIS	USDA-NRCS	75 High Street, Room 301	Morgantown	26505-	(304) 284-7590	(304)284-4839	timothy.precottk@wv.usda.gov	SSURGO/Map Finishing

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	Teets	Jason	Soil Scientist	USDA-NRCS	410 E. Main St.	White Sulfur Springs	24986-				
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	Wright	Linton	Soil Scientist	USDA-USFS	200 Sycamore Street	Elkins	26241-				

BY-LAWS OF THE NORTHEAST COOPERATIVE SOIL SURVEY CONFERENCE

ARTICLE I – NAME

Section 1.0

The name of the Conference shall be the Northeast Cooperative Soil Survey Conference.

ARTICLE II - PURPOSE

Section 1.0

The purpose of the Northeast Cooperative Soil Survey Conference is to bring together representatives of the National Cooperative Soil Survey in the northeastern states for discussion of technical and scientific questions. Through

NRCS ~~East Region Soil Scientist~~National Leader assigned by the NRCS Director of the Soil Survey Division

Section 1.4

NRCS, MLRA Office (MO) 12, ~~and~~ 13, and 14 Team Leaders

Section 1.5

National Soil Survey Center Liaison to the Northeast

Section 1.6

Cartographic Staff Liaison to the Northeast

Section 1.7

Three representatives from the soils staff of the USDA Forest Service as follows:

1. One from the Eastern Region, National Forest System
2. One from the Southern Region, National Forest System
3. One from the Northeastern Area, State and Private Forestry

Section 2.0

On the recommendation of the Steering Committee, the Chair of the Conference may extend invitations to a number of other individuals to participate in committee work and in the conference. Any soil scientist or other technical specialist whose participation is helpful for particular objectives or projects of the conference may be invited to attend.

ARTICLE IV – ORGANIZATION AND MANAGEMENT

Section 1.0 Steering Committee

A Steering Committee assists in the planning and management of biennial meetings, including the formulation of committee memberships and selection of the committee chair and vice-chair.

Section 1.1 Membership

The Steering Committee consists of the following four members:

1. NRCS ~~East Region Soil Scientist~~National Leader in Soil Survey assigned by the NRCS Director of the Soil Survey Division (Steering Committee chair)
2. The conference chair
3. The conference vice-chair
4. The past conference chair

The Steering Committee may designate a conference chair and vice-chair if the persons are unable to fulfill their obligations.

Section 1.2 Meetings and Communications

A planning meeting is to be held about one year prior to the conference. Additional meetings may be scheduled by the chair if the need arises. Most of the committee's communications will be in writing. Copies of all correspondence between members of the committee shall be sent to the chair.

Section 1.3 Authority and Responsibilities

Section 1.3 .1 Conference Participants

The Steering Committee formulates policy on conference participants, but final approval or disapproval of changes in policy is by consensus of the participants.

The Steering Committee makes recommendations to the conference for extra and special participants in specific conferences.

Section 1.3.2 Conference committees and Committee Chair

The Steering Committee formulates the conference committee membership and selects the committee chair and vice-chair.

The Steering Committee is responsible for the formulation of committee charges.

Section 1.3.3 Conference Policies

The Steering Committee is responsible for the formulation of statements of conference policy. Final approval of such statements is by consensus of the conference participants.

Section 1.3.4 Liaison

The Steering Committee is responsible for maintaining liaison between the regional conference and

1. The Northeastern Experiment Station Directors.
2. The East Region State Conservationists, NRCS, and Virginia State Conservationist, NRCS.
3. Director, Soil Survey Division of the Natural Resources Conservation Service.
4. Regional and national offices of the U.S. Forest Service and other Cooperating and participating agencies, and
5. The National Cooperative Soil Survey Conference.

Section 1.4

Responsibilities of the Steering Committee Chair are:

Section 1.41

Call a planning meeting of the Steering Committee about one year in advance of, and if possible, at the place of the conference to plan the agenda.

Section 1.4.2

Develop with the Steering Committee the first and final drafts of the conference's committees and their charges.

Section 1.4.3

Send committee assignments to committee members. The committee assignments will be determined by the Steering Committee at the planning meeting. The proposed chair and vice-chair of each committee will be contacted personally by the conference chair or vice-chair and asked if they will serve prior to final assignments. NRCS people will be contacted by an NRCS person and experiment station people will be contacted by an experiment station person.

Section 1.4.4

Compile and maintain a conference mailing list that can be copied on mailing labels.

Section 1.4.5

Serve as a member of the editorial board of the Northeast Cooperative Soil Survey Journal.

Section 2.0 Conference Chair and Vice-Chair

An experiment station representative and an NRCS state soil scientist alternate as conference chair and vice-chair. This sequence may be altered by the steering committee for special situations. The conference chair and vice-chair will serve a two-year term. The conference chair and vice-chair are chosen following the selection of a place for the next meeting and are from the state where the meeting is to be held.

Section 2.1

Responsibilities of the conference chair include the following:

Section 2.1.1

Function as chair of the biennial conference.

Section 2.1.2

Planning and management of the biennial conference.

Section 2.1.3.

Function as a member of the Steering Committee

Section 2.1.4

Send out a first announcement of the conference about ¾ year prior to the conference.

Section 2.1.5

Send written invitations to all speakers or panel members and representatives from other regions. These people will be contacted beforehand by phone or in-person by various members of the Steering Committee.

Section 2.1.6

Send out written requests to experiment station representatives to find out if they will be presenting a report at the conference.

Section 2.1.7

Notify all speakers, panel members, and experiment station representatives in writing that a brief written summary of their presentation will be requested after the conference is over. This material will be included in the conference's proceedings.

Section 2.1.8

Preside over the conference

Section 2.1.9

Provide for appropriate publicity for the conference

Section 2.1.10

Preside at the business meeting at the conference.

Section 2.1.11

Serve as a member of the editorial board of the Northeast Cooperative Soil Survey Journal

Section 2.2

Responsibilities of the conference vice-chair include the following:

Section 2.2.1

Function as Program Chair of the biennial conference.

Section 2.2.2

Serve as a member of the Steering Committee

Section 2.2.3

Act for the chair in the chair's absence or disability

Section 2.2.4

Develop the program agenda of the conference.

Section 2.2.5

Make necessary arrangements for lodging accommodations for conference members, for food functions, for meeting rooms, including committee loans, and for local transport on official functions. Notify all persons attending the meeting of the arrangement for the conference (rooms, etc.) Included in the last mailing will be a copy of the agenda.

Section 2.2.6

Compile and distribute the proceedings of the conference.

Section 2.2.7

Serve as a member of the editorial board of the Northeast Cooperative Soil Survey Journal.

Section 3.0 Post Conference Chair

The primary responsibility of the past conference chair is to provide continuity from conference to conference. Additional responsibilities include the following:

Section 3.1

Serve as a member of the Steering Committee

Section 3.2

Assist in planning the conference

Section 3.3

Serve as the editor of the Northeast Cooperative Soil Survey Journal. This responsibility encompasses gathering information with the other editorial board members, printing the Journal, and distributing it.

Section 4.0 Administrative Advisors

Administrative advisors to the conference consist of the NRCS Regional Conservationist, East Region, Director of the NSSC, and the chair of the NE Agricultural Experiment Station Directors or their designated representatives.

ARTICLE V – TIME AND PLACE OF MEETINGS

Section 1.0

The conference convenes every two years, in even numbered years. The date and Location will be determined by the Steering Committee

ARTICLE VI – CONFERENCE COMMITTEES

Section 1.0

Most of the work of the conference is accomplished by duly constituted committees.

Section 2.0

Each committee has a chair and a vice-chair. A secretary or recorder may be selected by the chair, if necessary. The committee chair and vice-chair are selected by the Steering Committee.

Section 3.0

The kinds of committees and their members are determined by the Steering Committee. In making their selections, the Steering Committee makes use of expressions of interest filed by the conference participants.

Section 4.0

Each committee shall make an official report of the designated time at each biennial conference. Chair of committees are responsible for submitting the required number of committee reports promptly to the vice-chair of the conference. The conference vice-chair is responsible for assembling and distributing the conference proceedings. Suggested distribution is:

Section 4.1

One copy to each participant on the mailing list.

Section 4.2

One copy to each State Conservationist, NRCS, and Experiment Station Director of the Northeast.

Section 4.3

Five copies to the Director of Soil Survey, NRCS, for distribution to National Office staff.

Section 4.4

Ten copies to the National Soil Survey Center (NSSC) for distribution to staff in the center.

Section 4.5

Two copies to the NRCS East Region.

Section 4.6

One copy to each MO 12, 13, and 14 office.

Section 4.7

Two copies to the Region 8 and 9 Forest Service Regional Directors.

Section 4.8

One copy to Agriculture, and Ag Food Canada office.

Section 4.9

Much of the work of committees will of necessity be conducted by correspondence between the times of biennial conferences. Committee chairs are charged with the responsibility for initiating and carrying forward this work.

ARTICLE VII – REPRESENTATIVES TO THE NATIONAL AND REGIONAL SOIL SURVEY CONFERENCES

Section 1.0

The Experiment Station chair or vice-chair will attend the national conference the year prior to the regional conference for which they were selected. A second Experiment Station representative also will attend the conference. The second representative is to be selected by the Experiment Station representatives at the regional conference.

Section 2.0

One NRCS lead soil scientist from the East Region will be designated to attend the National Conference in addition to the NRCS member of the National Conference Steering Team.

Section 3.0

One member of the Steering Committee may represent the Northeast Region at the South, Midwest, and West Regional Soil Survey Conference. If none of the members of the Steering Committee can attend a particular conference, a member of the conference will be selected by the Steering Committee for this duty.

ARTICLE VIII – NORTHEAST COOPERATIVE SOIL SURVEY JOURNAL

Section 1.0 Suspended until further notice.

The Northeast Cooperative Soil Survey Conference will publish a journal on soil Survey and related topics at least once between conferences. The journal will be governed by an editorial board made of the Steering Committee for the Northeast Conference. The editor of the journal will be the past conference chair. Their responsibility will be to assist in gathering information for the journal as well as printing and distributing the journal.

ARTICLE IX – NORTHEAST SOIL TAXONOMY COMMITTEE

Section 1.0

Membership of the standing committee is as follows:

1. Lead Scientist, Soil Taxonomy (permanent chair)
2. Three federal representatives
3. Three state representatives

Section 2.0

The term of membership is three years, with one third replaced each year. The Experiment Station conference chair or vice-chair is responsible for overseeing the selection of state representatives. The lead scientist, soil taxonomy in NRCS is responsible for the selection of federal representatives.

ARTICLE X—NORTHEAST RESEARCH NEEDS COMMITTEE

Section 1.0

This is a standing committee, the purpose of which is to maintain a formal mechanism within the Northeast Region to identify, document, prioritize and address the critical research and development issues related to soil survey.

Section 2.0

Membership of this standing committee is as follows:

2.1 The National Soil Survey Center Liaison ~~NRCS East Region Soil Scientist~~ (permanent chair)
2.2 One MO Team Leader (four-year term)
2.3 One NRCS State Soil Scientist (two-year term)

2.4 Two experiment station/university representatives (two-year term)
2.5 One NRCS field soil scientist (two-year term)
~~2.6The National Soil Survey Center Liaison (permanent)~~
~~2.7~~2.6 U.S. Forest Service Representative (permanent)

Section 3.0

The state soil scientist and field soil scientist will be selected from a different state every two years alternating between each MO. The state soil scientist and field soil scientist will be from different states and different MOs.

Section 4.0

The ~~regional soil scientist~~USDA-NRCS Conference Steering Team chair will be responsible for ~~selecting~~ overseeing the selection of the state soil scientist and NRCS field soil scientist.

Section 5.0

The Experiment Station Conference chair, or vice-chair is responsible for overseeing the selection of the experiment station/university representatives as described in Section 2.4 above.

Section 6.0

The Northeast Forest Service Experiment Station Research Director will select the appropriate U.S. Forest Service representative

ARTICLE XII - AMENDMENTS

Section 1.0

Any part of this statement for purposes, policy and procedures may be amended any time by majority agreement of the conference participants.

By-Laws Adopted January 16, 1976
By-Laws Amended June 25, 1982
By-Laws, Amended June 15, 1984
By-Laws, Amended June 20, 1986
By-Laws, Amended June 17, 1988
By-Laws, Amended June 10, 1994
By-Laws, Amended June 13, 1996
By-Laws, Amended June 22, 2000