Mapping Our Future... Together

Southern Regional Cooperative Soil Survey Conference

Baton Rouge Louisiana

June 21-26, 1998

Sunday, June 21, 1998..... Registration

2:00-5:00pm	Registration...	LSU & LA-NRCS

Monday, June 22, 1998..... Registration

9:00- 1:00	Registration.....	Judi Baker

Monday, June 22, 1998..... Optional Morning Session

Preparing For Careers In Natural Resources

Moderator — William (Bill) Puckett
Soil Scientist
NRCS Southeast Region
Atlanta, Georgia

9:00- 9:30 — Applying for Federal Employment
Barbara Smith
Personnel Management Specialist
Washington, D.C.

9:30- 10:15 — State Agency Employment

Jan Boyston
LA-DEQ
Baton Rouge, Louisiana

Ed Haywood
LA-DNR
Baton Rouge, Louisiana

Tony Duplechain
LA-DNR Natural Resources
Baton Rouge, Louisiana

10:15- 10:30 — Break

10:30- 11:30 — Private Sector Employment

Kevin Martin
National Association of Cunsulting Soil Scientists

Scott Nesbett
Nesbett Environmental
Baton Rouge, Louisiana

11:30- 12:00 — Student Perspectives

Karla Boley
Student Trainee
Southern University
Baton Rouge, Louisiana

???????
Student
Environmental Management
Louisiana State University
Baton Rouge, Louisiana

Monday, June 22, 1998..... Afternoon Session

Mapping Our Future

Moderator — Jerry Daigle
NRCS Assisstant State Conservationist for Soils and Resource Assessment
Alexandria, Louisiana

1:30- 1:45 — Welcome
William (Bill) Richardson
Chancellor
LSU Agricultural Center

Donald Gohmert
NRCS State Conservationist
Alexandria, Louisiana

1:45- 2:00	Purpose of the Conference Jerry Daigle NRCS State Soil Scientist, Alexandria, Louisiana
2:00- 2:30	Evolution of the NCSS Partnership Brian Carter Professor Oklahoma State University Stillwater, Oklahoma
2:30- 2:45	Discussion
2:45- 3:00	Break
3:00- 3:30	Revamping of curriculum Mary Collins Professor University of Florida Gainesville, Florida
3:30- 3:45	Discussion
3:45- 4:15	1890 Schools Richard Griffin Assistant Professor Prairieview A&M Prairieview, Texas
4:15- 4:30	Discussion
4:30- 5:00	National Association of Consulting Soil Scientists Kevin Martin
5:00- 5:15	Discussion

Monday, June 22, 1998..... Evening Social / Mixer

6:30- 8:00	Social Mixer Cash Bar & Hors D'oeuvres

Tuesday, June 23, 1998..... Morning Session

Mapping Our Future

Moderator	Alcorn State University
8:00- 8:20	Forest Service Perspective Jerry Ragus Regional Soil Scientist U.S. Forest Service Atlanta, Georgia
8:20- 8:30	Discussion
8:30- 8:50	National Soil Survey Center Horace Smith NRCS Director of Soils Washington, D. C.
8:50- 9:00	Discussion
9:00- 9:20	National Soil Survey Evaluation Bobby Ward Soil Scientist NRCS South Central Region Ft. Worth, Texas
9:20-10:00	Break
10:00-10:20	New Partnerships EPA
10:20-10:30	Discussion
10:30-10:50	New Partnerships Kerry St. Pe' Barataria-Terrebonne National Estuary Program Thibodaux, Louisiana
10:50-11:00	Discussion
11:00-11:20	National NRCS Perspective Horace Smith NRCS Director of Soils Washington, D.C.
11:20-11:30	Discussion
11:30-11:45	Break
11:45- 1:00	Lunch (In-House Catered) Keynote Speech (12:15-12:45) Maurice (Maury) Mausbach NRCS Deputy Chief for Soil Survey and Resource Assessment Discussion (12:45-1:00)

Tuesday, June 23, 1998..... Afternoon Session

Wet And Seasonally Wet Soils

Moderator	Moye Rutledge Professor University of Arkansas Fayetteville, Arkansas
1:30- 1:50	Sharkey Soil Committee Recommendations Mike Verpraskas Assistant Professor North Carolina State University Raleigh, North Carolina
1:50- 2:00	Discussion
2:00- 2:20	Playa Lake Study, Texas Gerald Crenwelge NRCS Soil Scientist Lubbock, Texas
2:20- 2:30	Discussion

2:30- 2:50	Vertisols Study, Brazos River, Texas Wes Miller NRCS Wet Soils Specialist Victoria, Texas
2:50- 3:00	Discussion
3:00- 3:30	Break
3:30- 3:50	Monitoring Wet Soils in Kentucky Tassos Karathanasis Professor University of Kentucky Lexington, Kentucky
3:50- 4:00	Discussion
4:00- 4:20	Wet Soils Monitoring in Mississippi David Pettry Professor Mississippi State University
4:20- 4:30	Discussion
4:30- 5:00	Magnetic Susceptibility Fred Rhoton USDA-ARS Soil Sedimentation Laboratory Oxford, Mississippi
5:00- 5:15	Discussion
5:15- 5:30	Overview of Field Trip Wayne Hudnall Professor Louisiana State University Baton Rouge, Louisiana

Tuesday, June 23, 1998..... Evening Activities

8:00- ???	Agency Meetings

Wednesday, June24, 1998..... Field Trip

Wet And Seasonally Wet Soils

7:30- 5:30	Field Trip Red River & Mississippi River Alluvial Toposequence

Thursday, June 25, 1998..... Morning Session

Mapping Our Future

Moderator:	Allan Tiarks Research Soil Scientist U.S. Forest Service Pineville, Louisiana
8:00- 8:20	Revisions in Soil Taxonomy Bob Engel NRCS Soil Scientist NSSC, Lincoln, Nebraska
8:20- 8:30	Discussion
8:30- 8:50	National Soil Survey Lab Data Access Ellis Benham Soil Scientist NSSC, Lincoln, Nebraska
8:50- 9:00	Discussion
9:00- 9:20	NASIS Interpretation Generator Bob Neilsen Soil Scientist NSSC, Lincoln, Nebraska
9:20- 9:30	Discussion
9:30- 9:50	Our Future Stan Buol Professor North Carolina State University Raleigh, North Carolina
9:50-10:00	Discussion
10:00-10:30	Break
10:30-12:00	Breakout Sessions

Action Item 1... Identify the process, with specific tasks and methods, required to “add value” for a MLRA soil survey . Identify partnership roles, responsibilities and contributions.

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Team Leader:	Tom Ammons Professor University of Tennessee Knoxville
Facilitator:	Dorlene Hicks Partnership Liaison NRCS South Central Region Ft. Worth, Texas
Recorder:	William H. Boyd Soil Survey Project Leader Rayville, Louisiana

Action Item 2... Identify additional uses of soil resource data to be tested in the Southern Region. Develop an action plan.

Team Leader:	Larry West Professor University of Georgia Athens, Georgia
Facilitator...	Ed Wright Partnership Liaison NRCS Southeast Region Atlanta, Georgia
Recorder...	Lawrence McGhee Soil Scientist Alexander City, Alabama

Action Item 3... Identify and develop strategies or methods to be used to increase the visibility of soil resources and the use of soil resource inventory products.

Team Leader: Bill Smith
Professor
Clemson University
Clemson, South Carolina

Facilitator... Curtiss Godfrey
Soil Scientist
Eunice, Louisiana

Recorder... John Gagnon
Resource Soil Scientist
Edenton, North Carolina

Action Item 4... Identify products to deliver soil resource information in the future? (hard copy in field? shrink wrap hard copy? SSURGO? CD-ROM? world wide web?)

Team Leader: Tom Hallmark
Professor
Taxas A&M University
College Station, Texas

Facilitator... Richard Brooks
Regional Soil Scientist
Raleigh, North Carolina

Recorder... Kirby Griffith
Resource Soil Scientist
Nacogdoches, Texas

12:00- 1:15 Lunch

Thursday, June 25, 1998..... Afternoon Session

Mapping Our Future

Moderator: Joey Shaw
Assisstent Professor
Auburn University
Auburn, Alabama

1:15- 1:45 Session 1 Report
1:45- 2:15 Session 2 Report
2:15- 2:30 Break
2:30- 3:00 Session 3 Report
3:00- 3:30 Session 4 Report
3:30- 3:45 Break

Moderator... Bobby Ward

3:45- 5:00 Business Meeting

Thursday, June 25, 1998..... Evening Activities

6:00- 7:00 Social
Burden Research Center)
(Possible Museum Tour)

7:00- 8:30 Cajun Dinner

Friday, June 26, 1998..... Morning Session

Research And Grant Opportunities

Moderator: Larry Wilding
Professor
Texas A&M University
College Station, Texas

8:00- 8:15 Technology Consortium Overview
Lee Herndon
NRCS Consortium Director
Washington. D.C.

8:15- 8:25 Discussion

8:25- 8:40 National Technical Committee for Hydric Soils
Wade Hurt
NRCS Soil Scientist
Florida

8:40- 8:50 Discussion

8:50- 9:05 Wetland Science Institute Report
Russ Pringle
Soil Scientist
Baton Rouge, Louisiana

9:05- 9:15 Discussion

9:15- 9:30 Soil Quality Institute Report
Lee Norfleet
Soil Scientist
Auburn, Alabama

9:30- 9:40 Discussion

9:40- 9:55 Research Opportunities
John Kimble
Soil Scientist
NSSC
Lincoln, Nebraska

9:55- 10:10 Break

10:10- 10:25 Dept of Energy Presentation

10:25- 10:35 Discussion

10:35- 10:50 NASA Presentation
Ramona Peltier

10:50- 11:00 Discussion

11:00- 11:20 Wrap-up
Jerry Daigle

11:20- 11:40 Wrap-up
Wayne Hudnall

12:00 Noon Adjourn

Conference Registration

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A New Perspective for the National Soil Survey Center[1]

By

Horace Smith
Director, Soil Survey Division
USDA, Natural Resources Conservation Service
Washington, DC

The National Soil Survey Center (NSSC) in Lincoln, Nebraska is a dynamic vital link in carrying out the Natural Resource Conservation Service (NRCS) Federal responsibility of the National Cooperative Soil Survey (NCSS). During the past 10 years or so, through the process of reorganization and redirection of responsibilities, the 79 staff members at the NSSC have emerged as the one largest single consolidated unit of soil scientists, research soil scientists, interdisciplinary staff, soil laboratory unit, and support personnel of the NRCS.

The NSSC can be viewed as the technical arm of the Soil Survey Division, which provides a critical technical role in conducting the soil survey program for the Agency and the NCSS.

The NSSC has been in existence for about 10 years. During this period of time the management styles at the Center have changed several times to meet the perceived needs of its customers, the Agency's strategic plan, and the needs of the NCSS.

The management of the NSSC for the past few years has been that of a Steering Team concept supervised by the Director of the Soil Survey Division, Dr. Dick Arnold. The Steering Team of three to four members supervised about an equal number of staff consisting of a cross section of all disciplines and work areas.

Our new Chief for the Agency, Mr. Pearlie Reed, has elevated the role and significance of soil survey in the agency to the level of a Deputy Chief for Soil Survey and Resource Assessment. Dr. Maurice Mausbach has been selected as Deputy Chief for this new deputy area. In keeping with the demand for new products, Government Performance Results Act (GPRA), fund accountability, and timely coordinated delivery of customer driven products and services, the Steering Team concept has been superseded by National Leaders responsible for their assigned subject or work area.

The new organizational plan includes a Laboratory Head and four National Leaders in the areas of 1) Soil Survey Laboratory, 2) Soil Survey Investigations, 3) Soil Survey Interpretations, 4) Soil Survey Technical Services, and 5) Soil Classification and Standards. The Laboratory Head and each National Leader will supervise all staff members in that specific discipline area. The Director of the Soil Survey Division will supervise the Laboratory Head and each National Leader.

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[1] Presented at the Southern Regional Cooperative Soil Survey Conference, June 23, 1998, Baton Rouge, Louisiana. Edited from National Soil Survey files.

A brief review of the major functional areas for the Laboratory and the National Leaders is as follows:

SOIL SURVEY LABORATORY

Provides national leadership for the Soil Survey Division's responsibilities in the following areas: soil characterization analyses in support of Agency missions using documented methods; research on methods development in support of NCSS; maintenance of in-house research facilities for in-house and field-based scientists; maintenance of the National Soil Survey Database and distribution of laboratory data and field pedon data; maintenance of the soil sample archive; standards laboratory for other cooperating laboratories; consultation for customers on an as-needed basis; and mutual interchange of scientific and soil survey information with professional colleagues in the USA and abroad. Works closely with soil survey investigations and members of the NCSS.

SOIL SURVEY INVESTIGATIONS

Provides leadership, coordination, and support for field investigations involving soil-geomorphic processes, soil genesis and Taxonomy, geospatial methods, soil moisture and temperature, use dependency, soil quality, heavy metals, carbon sequestration, biological processes, and many others. Works closely with the Soil Survey Laboratory, field soil scientists, university partners, and members of the NCSS.

SOIL SURVEY INTERPRETATIONS

Leads and coordinates the Soil Survey Division's efforts in developing philosophies, techniques, and applications for interpreting soil survey information. This includes updating and automating current interpretive procedures for use in the National Soil Information System (NASIS); developing new applications to meet the demands of the Agency in implementing its programs and of other customers; and identifying training needed by soil scientists in understanding the applications and the use of soil information to solve their particular resource concerns. Examples of interpretations and technologies include the fuzzy set theory, cluster analysis, neural network analysis, risk assessment, SRPG, Soil Potential Ratings and their derivations using NASIS, and the traditional sets of national soil survey interpretations and their local adaptations.

SOIL SURVEY TECHNICAL SERVICES

Coordinates all NSSC projects involving the application of soil survey information to specific needs and the integration of soil survey information with other resources and technology. This includes the derivation and application of soils information, including use of NASIS, to meet USDA and NRCS policy and program needs. Examples of projects include the adaptation of data for use in the Conservation Reserve Program (CRP), development of Soil Explorer technology for displaying soil information on new media, overseeing information technology development projects such as developing data sets for FOTG, STATSGO, and SSURGO.

Provides National leadership in all phases of soils training for soil scientists and other interdisciplinary staff at State and field levels.

SOIL CLASSIFICATION AND STANDARDS

The Soil Taxonomy and Standards Staff provides technical leadership for the maintenance, improvement and coordination of the standards for the NCSS. These standards include *Soil Taxonomy*, the *Soil Survey Manual*, the *National Soil Survey Handbook*, *Hydric Soil Indicators*, and others. They are recognized worldwide and are the foundation of the soil survey program in the U.S. The staff also provides training and technical assistance to MLRA Offices, State Offices, Federal and other agencies, universities, and soil scientists from foreign countries for the purpose of making and interpreting soil surveys.

The new perspective at the NSSC will give high priority to 1) management, 2) customer driven products and services, and 3) technical excellence.

MANAGEMENT

Management considerations in moving forward with the new perceptive at the NSSC will include the following:

- Accountability--The development and institutionalization of a system of accountability which will insure that each employee knows what is expected of him/her and that the products and services developed at the Center are in direct support of field office technical needs or consistent with our obligations as part of the NCSS. Linking all NSSC activities to Agency strategic objectives and goals.

- Stability--The installation of a stable operational structure that complements the activities of the Center and allows each employee to know where they fit in and how they contribute to the overall mission of the Agency and goals of the Center.

- Capacity Management--Emphasis on coordination and working with partners, such as universities, global climate projects, Federal agencies, and private industry. Learning to say 'no' when it is appropriate. Ensure we are a 'player' when individuals or groups are leveraging the Center's resources in support of their own projects.

- Capacity Building--Listening to our customers' needs and building capacity at the Center or building 'virtual' capacity with partners to meet those needs. Use the resources available and those acquired through capacity management to address emerging and critical Agency soil technology needs.

- Marketing--Be proactive in informing management and others of quality products and services by NSSC. Building a product and service line that will highlight our commitment to the NCSS and the Agency. Working directly with state conservationists and NCSS partners in building coalitions with partners so that when a soil technology issue confronts them they think of us.

Functional Assignments

The new management at the Center will give priority to the science of soil survey, maintaining many of our past commitments, increasing our capacity with new partners, and providing quality products and services in support of all Agency field staff as appropriate.

Functional assignments will include:

1. Provides national technical leadership for developing and implementing policy in the areas of collecting, interpreting and using soil information.

2. Develops national technical guidelines for the soil survey program.

3. Develops and assesses resource assessment criteria such as soil health indicators, prediction models, and tools involving resource conditions and tolerances.

4. Develops, tests, and improves soil databases; evaluates soils; and makes soil survey information available.

5. Provides technical support and assistance in the collection, interpretation and distribution of soil information for new agency initiatives in areas such as urban conservation, landscape analysis, and site-specific farming.

6. Provides technical leadership for identifying and conducting soil survey related research and technology development.

7. Manages and maintains the soil survey analytical laboratory to provide national and international soil analysis in support of field operations and agency programs, to set national and international standards, and assists other national and international laboratories to ensure data quality.

8. Provides leadership in development and direction in training employees in all aspects of soil survey activities. Trains other NRCS staff and other agencies and international users to use soil survey data and information.

9. Provides support for training in GIS use in soil survey in coordination with the soil survey staff at NCGS.

10. Provides technical support in developing and helping users of the three digitized data sets for the country: NATSGO, STATSGO, and SSURGO.

11. Participates in developing agency capabilities in managing and interpreting geo-spatial data.

Staff at the NSSC is involved in a large number of priority projects which are in keeping with the Agency and Soil Survey Division strategic issues. A summary of current NSSC priority activities is as follows:

SOIL SURVEY SUPPORT

The NSSC is the Agency source for soil survey support and knowledge. Soil survey publication accomplishments include 69 surveys to the printer for last fiscal year and 60 for this year. Estimations show the number of once-over surveys at about 400. The Center has been experimenting with "print-on-demand" and electronic versions of surveys for customers. The production phase of the digital soil data viewer (Soils Explorer) is scheduled for August 1998. This product will allow users to view soil interpretations, Digital Orthophoto Quad (DOQ) imagery, and reference data from the SSURGO database. The Center is supporting the data and interpretation development for this product. The NRCS Soils Hotline support is located at the Center. This hotline provides support to all NRCS State, MLRA, project, and field offices with the implementation and maintenance of NASIS. This support includes integration of local hardware and software with NASIS installation and configuration, and technical analyses support for the Soil Survey Scheduler. The Soil Survey Laboratory provides assistance to ongoing field activities. Thus far this fiscal year, 68 projects include more than 2000 soil horizons for laboratory characterization. The Center has distributed 77 projects to our customers so far in FY98. The Lab continues to develop new analytical methods and to modify existing methods to ensure that they are environmentally friendly. The Lab also provides logistical support for all field activities, including both routine characterization and research.

STANDARDS & GUIDELINES

The Center maintains the standards of the NCSS. These are *Soil Taxonomy*, the *Soil Survey Manual*, *Soil Survey Laboratory Methods Manual*, the *National Soil Survey Handbook*, and *Hydric Soil Indicators*. An 8th edition of the *"Keys to Soil Taxonomy*" will be published this summer. A second edition of *Soil Taxonomy* is nearly complete. The other standards have been recently updated and are available to our customers. Most of the standards have Internet access. A *"Field Guide for Describing Soils*" is ready for publication and currently can be accessed through our homepage. The NSSC provides leadership to the Federal Geographic Data Committee (FGDC) charged with developing standards for the distribution of soil data by federal agencies. The Laboratory is a depository for soil materials used in interlaboratory quality assurance standards and for research and development.

DATABASES

The NSSC provides NASIS technical analysis, implementation coordination, and soil science technical support to NRCS State, MLRA, and local field offices as well as technical consultation to the institutes and centers. Currently, NASIS 4.0 is being Beta tested and will be released for NRCS implementation in the field in June 1998. NASIS 5.0 analysis is underway with the MLRA and soil survey offices and will address field data collection needs. FGDC standards for soil survey data are maintained by the NSSC as a function of NASIS data dictionary maintenance and support activities. These activities include the development of protocols that

assist the field soil scientists with the derivation or estimation of soil properties that are not readily observable or measurable in the field.

TRAINING

The NSSC coordinates six formal training courses with the National Employee Development Center. They are Basic Soil Survey - Field and Lab, Soil Correlation, Soil Technology - Measurement and Data Evaluation, Soil Technology - Programs and Application, Soil Science Institute, and Advanced Hydric Soils for Soil Scientists. In FY97, 219 participants were enrolled. The Center has several informal training courses/workshops, which include four NASIS training courses. A total of 370 participants received training in one or more of the NASIS sessions in FY97. In addition, 7 MLRA Offices and 2 foreign countries received training in *Soil Taxonomy*. The NSSC provides assistance to the National Cartographic and Geospatial Center and to the Soil Quality Institute in designing and developing additional training courses in FY98. It is estimated that approximately 600 Agency employees will receive training from the NSSC in FY98. In addition to NRCS employees, the Center trains personnel from State Departments of Natural Resources, Conservation Districts, BIA, FS, NPS, BLM and Universities.

MARKETING/OUTREACH

The NSSC marketing plan focuses on products and services for the field. The Center works with partners and customers to increase minority and underserved farmers' participation in the soil survey program. These efforts include a project with underserved farmers in Arkansas and a proposed program submitted in cooperation with other Divisions/Centers in the Deputy area to work with 1890 universities to increase their participation in soil survey activities. The year 1999 marks the centennial year for soil survey. The Center schedules many activities in support of marketing soil survey and soil survey products. The Center's efforts will also include national meeting participation and a national celebration. Additionally, the NSSC supports and maintains the Soil Survey Division and NSSC homepages and associated sections and documents. The Soil Survey Division homepage contains an explanation of Soil Survey Programs, Business Plan, Soil Survey Centennial Celebration and links to the World Soil Resources and National Soil Survey Center. The NSSC homepage on-line contains public electronic access to the Center's Business Plan, Standards for Soil Survey technical support documents (*National Soil Survey Handbook*, *Soil Survey Manual*, *Field Book for Describing and Sampling Soils*, *Hydric Soil Indicators*, and *Keys to Taxonomy*), Soils Data access to Map Unit Interpretations Record data, SSURGO and STATSGO, National Soil Survey Lab data, NASIS, Hydric Soils, Published Soil Surveys, Research, and Training. (See NRCS Strategic Plan, Goal 1, Objective 1.2.)

RESEARCH & DEVELOPMENT

Domestic Activities - About 100 active research projects are underway, many of them cooperative studies with universities and other state and federal agencies. These projects are divided into nine areas: soil-geomorphic processes; soil genesis and taxonomy; field, laboratory, and geospatial methods; soil water and temperature; use dependency, soil quality, and heavy metals; carbon sequestration and biological processes; soil interpretations; facilitating activities;

and cooperative projects with universities and other groups. NSSC research findings are used in a variety of applications. Many of the research products are used directly in support of the Agency's soil survey activities. These products include development of new techniques, such as new mapping techniques and use of soil surveys in site-specific management, detailed soil characterization and behavior information, and models of relationships among soils, various individual soil parameters, climate, and vegetation. Customers outside of the Agency use our information for a wide variety of purposes including global-scale climate computer models, wildlife behavior, and engineering activities. Geospatial (GPR, EM) research and assistance has been effective in supporting field soil survey, waste management, and archeological evaluations.

International Activities - The Center maintains a leadership role in international soil science activities. The Soil Survey Laboratory provides leadership in methods development and standardization and is recognized as one of the premier soils laboratories in the world. The Center receives many visitors from around the world and requests for assistance weekly. Several international cooperative research projects are being conducted. An example is the Permafrost Soil Map done in conjunction with scientists in Canada, Russia, China, Germany, Denmark, and others in cooperation with the International Permafrost Association. This activity promotes common soil mapping procedures. Another project with Canada and Mexico produces a carbon map of North America. International activities provide information useful to the NRCS for the improvement of the *Soil Taxonomy* and at the same time promote the use of the *Soil Taxonomy* by other countries. The Center has developed and maintains the largest database of soils from around the world. Scientists from the NSSC are actively involved as invited participants in international meetings every year. The Soil Survey Laboratory has archived 93,000 soil samples from the U.S. and 80 foreign countries.

COOPERATIVE PROJECTS

The Center has technical interactions with all of the Agricultural Experiment Station representatives to the NCSS. Some Center staff are members of the Federal Geographic Data Committee and through it have interaction with 10 Federal agencies. The Center participates in the developmental effort by seven agencies to produce a handbook on stream corridor restoration. Analytical data and technical interaction are provided to ARS for the development of process models for wind and for water erosion (WEPS, WEPP), for the main general plant growth model (EPIC), and for erosion of rangelands. Staff are involved in development of RUSLE and the multi-agency effort to establish a common use interface for erosion models. GIS activities include cooperative work with EROS, Goddard Space Center, Standing Rock Sioux Tribe, FS, NPS, Canada, Mexico, and a multi-agency effort to develop the ecological units for the U.S. Laboratory analyses are done and technical advice is given on soil quality and with the Soil Quality Institute, the Northern Plains Soil Quality Team, ARS, and EPA. Field moisture and temperature for drought monitoring water supply and flood prediction measurements are conducted with the National Water and Climate Center and also involves the International Permafrost Association, the High Plains Regional Climate Center, NPS, National Biological Survey, the Smithsonian Institute, and 10-15 university people.

SOIL INTERPRETATIONS/AGENCY PROGRAM SUPPORT

The Center maintains a national perspective in support of soil interpretations for Agency programs. An interpretations module recently developed by the Center enables field and state offices to meet local soil interpretation needs. Interpretations developed by the Center provide standard interpretations for soils publications and national program initiatives. The Center interacts with scientists of other agencies to test erosion equations and other models. STATSGO, a national soils geospatial database that is maintained by the Center, provides a basis for interrelating many agro-ecological processes to other data layers. The diverse and interdisciplinary nature of the staff contributes technical support to many NRCS programs and activities. Programs in range, forestry, agronomy, soil quality, and stream corridors benefit from Center staff input to practice standards, manuals, training, and ecological linkages. Products arising from Center activities include soil quality information sheets, conservation buffer strip and agriculture waste interpretations, soil-based productivity ratings for CPR, soil conditioning index for conservation planning, site specific management, urban soil interpretations, global carbon studies, and hydric soils. Center staff also actively participate in Agency emphasis activities including the National Conservation Buffer Initiative and the Core 4 Conservation Technology Effort.

Linkages to Agency Strategic Objectives

The main activities of the National Soil Survey Center are summarized above. Center activities fit within Goal 1 of the NRCS strategic plan, "Individuals and their neighbors working together as effective and willing stewards of the natural resources on their property and in their communities." Within Goal 1 the Center's efforts support objective 1.3, "Private landowners and communities with the science-based information and technologies they need to conserve natural resources."

The Center's strategies for achieving this goal are aligned closely with the Agency's. The Center supports soil survey activities by providing the standards, laboratory analyses, database support, training, and research needed to conduct a national soil survey program. Soil survey is a fundamental tool required for conservation planning efforts. The Center is also in the process of making soil survey data more available to the public through the Internet.

The Center is working to strengthen and expand natural resource assessment through the many research and data acquisition projects associated with global climate change.

I personally see the NSSC staff in the future to be more focused on customer-driven assistance and products. The Center will be responsive to your needs and those of other cooperators and State and local partners. Collectively, we all need to be responsive and work cooperatively together in a productive atmosphere. I feel our combined soil survey work will enhance the marketing and visibility of the NCSS. Conferences such as the excellent one here in the Southern Region provide a common focus to move the soil survey program into the next century with high quality visibility.

Thank you for your attention.

National NRCS Perspective[1]

By

Horace Smith
Director, Soil Survey Division
USDA, Natural Resources Conservation Service
Washington, DC

Thank you for inviting me to be a part of this conference. It is good to be back in Louisiana and the South. It's been a year ago, but it seems like it was only yesterday that we convened here in this same room for the National Conference.

I'd like to quickly touch on a few items at the national level that may be of interest to you:

1. National Headquarters Reorganization

In March, Mr. Pearlie S. Reed took over as Chief of NRCS. During this period, the Agency was reorganized or realigned at NHQ. This new structure includes five deputy areas. These are: Strategic Planning and Accountability; Science and Technology; Programs; Soil Survey and Resource Assessment; and Management. The Soil Survey and Resource Assessment Deputy Area contains three Divisions -- Soil Survey, Resource Inventory, and Resource Assessment. This deputy area is led by Dr. Maury Mausbach, Deputy Chief. During this reorganization or realignment, Centers and Institutes were placed under the Divisions. Therefore, the National Soil Survey Center and the Soil Quality Institute are now a part of the Soil Survey Division. In my earlier presentation I gave you a very detailed overview of the reorganized National Soil Survey Center at Lincoln, Nebraska.

2. Budget

We are now in the middle of the 1999 budget process. It looks like the 1999 soil survey budget will be level. If there is an increase, it will be extremely small. We've asked for special allocations for benchmark initiatives in animal agriculture. We hope the 1999 budget will allow us to continue supporting RFPs and research initiatives that are beneficial to the Agency's and the NCSS' mission.

[1] Presented at the Southern Cooperative Soil Survey Conference, June 23, 1998, Baton Rouge, Louisiana

3. Mapping Status and Personnel

The following table gives an overview of mapping status:

NATIONAL SOIL SURVEY MAPPING STATUS
October, 1997 -- Water Acreage Excluded

Category	Total Acres Millions	Acres Mapped Millions	Percent Completed
Private	1521.6	1385.0	91
Indian	99.2	46.6	47
All Federal	649.2	299.3	46
Total	2270.0	1730.9	76

As you can see, we have mapped more than 90 percent of the private land in the US. We now have detailed maps on a little less than 1.4 billion acres of private land. We need to be very careful when we talk about the percent of the private land completed. This percentage is somewhat misleading, as a large portion of this acreage is outdated and in need of updating. This outdated acreage does not support many of the current interpretation for wetlands, highly erodible lands, wildlife, etc., that are essential to Farm Bill mandated applications. The numbers are not as favorable for Federal and Indian lands. The soils have been mapped on a little less than one-half of all Indian and Federal lands. We will have a special budget initiative in 1999 to accelerate soil mapping on Indian lands.

At the present, there are approximately 935 NRCS soil scientist supporting the NCSS. This is the lowest number in many years. A few days ago I was checking the personnel records and discovered that during the past two years we hired a little over 50 new soil scientists. That's not good enough. During 1999, the Agency has already committed to hire at least 50 new soil scientists. I need your assistance in helping us to locate qualified candidates to fill these 50 new positions. I especially need assistance from the Experiment Station Representatives.

4. Digital Map finishing

A little more than a year ago I commissioned a team to take an in-depth look at digital map finishing and make recommendations to me on how this technique can be used to produce high quality hard-copy maps for soil survey areas utilizing certified SSURGO data. The team came up with some excellent recommendations and we are in the process of evaluating them now. We are now in the process of testing software at several locations that would support digital map finishing in a production mode. We are also in the very early stages of trying to identify locations that have the interest and capability to

support digital map finishing centers. As we move further into a digital environment, you will be hearing more about digital map finishing. It is essential that we integrate this technology into our ongoing soil survey processes.

5. National Cooperative Soil Survey Advisory Committee

Shortly after I was named Director of the Soil Survey Division, I set up this committee. Its purpose is to serve as a sounding board for the Division and provide feedback and recommendations on emerging topics that affect the Division. The committee is composed of a representative from the four Agricultural Experiment Station Regions, the 1890 Universities, State Agencies, the soil survey leaders from the US Forest Service and Bureau of Land Management, the president of the National Society of Consulting Soil Scientists, and senior leaders from the Division. Dr. Mary Collins, University of Florida, represents the Southern Region on this committee. I've also included a few senior NCSS Cooperators on the committee -- those for whom I can always depend on to tell it like it is and put things in the proper perspective. My good friends Dr. Larry Wilding from Texas A&M and Dr. Stan Buol from North Carolina State fall into that category and are doing an outstanding job on the committee.

The committee held its first meeting August 20 - 22, 1997 in Raleigh, NC. The meeting was facilitated and 22 discussion items surfaced as being important to the group. A summary of the minutes from this meeting was sent to all state soil scientists and I assume these were shared with you. I won't attempt to list and discuss all 22 items, but I would like to emphasize a few:

- Quality control and associated responsibilities as related to MLRA operations;
- Consider a new definition for soil volume, greater than 2 meters;
- Communications;
- University department heads and deans need to be better informed on NCSS;
- Renew efforts to formalize connections to specific groups;
- Accessibility of databases to cooperators (NASIS, plants, etc.);
- Publications (formats; electronic versus hardcopy, etc.);
- Leadership/MLRA management operations (Steering Teams, etc.);
- MOUs for MLRAs need to be signed;
- RFPs need to be continued;
- Correlation tours; special field trips; and
- How do we perpetuate our science with new students?

At the meeting, we grouped the 22 discussion items and divided them among four breakout groups for discussion purposes. An action register has been developed to help us keep track of the status and progress made addressing the recommendations of the four breakout groups. We will issue periodic updates on the status of these recommendations.

I am very proud of the work of this committee and believe its recommendations will be extremely useful to me as I go about implementing the policies of the Agency and providing leadership for the Federal part of the NCSS.

At the national level, we are also placing special emphasis on the following initiatives:

- Data representing deep investigations below 2m will be included in updated soil survey information;
- Continue to support the Agency's global change and carbon sequestration efforts;
- Support standards for site-specific management as related to soil survey;
- Provide soil survey information to customers in several formats via hardcopy, CD ROM, and the Internet;
- Emphasize soil survey work in urban areas and on Tribal lands; and
- Establish super MLRA project offices that will include an interdisciplinary staff and cutting-edge technology.

Thank you again for allowing me to be a part of your conference. I'm sorry that I will not be able to be with you for the entire week. Have a great conference.

Southern Regional Cooperative Soil Survey Conference
Business Meeting
June 25, 1998
Minutes

The biannual business meeting of the Southern Regional Cooperative Soil Survey Conference was called to order at 3:45 PM on June 25, 1998. Bill Puckett chaired the meeting.

Minutes: Puckett read the minutes of the previous meeting. There were no comments or proposed changes. Bill Smith motioned, and Phil Tant seconded, the minutes be accepted as read. The motion passed.

University Committee Report: Wayne Hudnall explained the university group has a formal structure with a chair, vice chair, and secretary. These positions rotate up one level each two-year cycle. Tom Ammons is the new chair, Larry West is the Vice Chair, and Tom Hallmark is the new secretary.

Hudnall explained the group had voted to establish a Southern Regional Experiment Station Home Page. Larry West will spearhead this effort. If difficulties are encountered, Hudnall will house the information on the LSU Agronomy Home Page in the interim.

Hudnall stated a regional research team was discussed but no action was taken.

Craig Ditzler questioned the progress, if any, on the "Soils of the South Region" project. Larry West responded it would be done; he would do it. He implored everyone to volunteer his or her help when asked.

Government Agency Report: Bill Puckett reported the group had not been very formal in the past, nor for this meeting. He stated, however, there would be a conscientious attempt to be more formal in the future. Puckett stated, though the meeting was not formally structured, several timely and interesting discussions took place.

Puckett reported that Tommy Parham led a discussion on digital map finishing. Puckett also reported that Mike Kortum displayed a few examples of output products developed with digital map finishing techniques. A fairly in-depth discussion had ensued dealing mostly with getting some decisions made and procedures established so that the MLRA offices could proceed with the map finishing business at hand.

Puckett went on to report that Lee Norfleet gave a demonstration of the soil quality kit developed by the NRCS Soil Quality Institute. Norfleet had explained the kit was aimed primarily at NRCS field office staff.

Puckett stated that Wade Hurt reported on the "Advanced Hydric Soils" courses recently taught around the country. Hurt had stated there would be more of these courses offered. Anyone interested should be watching for information on when and where these courses would be held.

Puckett then reported that Larry Ward had presented an update on the phosphorus study current being conducted. Ward had also reported on the meeting, held in Texas, dealing with the phosphorus issue.

Larry Wilding expressed a concern that there was no agricultural experiment station representative in the federal agency meeting. Bill Puckett spoke for the agencies by stating "We will try for Conference 2000."

Action Teams: Wayne Hudnall explained the process in past conferences was to have issue papers that were worked on by committee members before the conference, brought to the conference, and discussed at the conference. He stated that for this meeting the objective was to discuss direction for the future and move forward with an action plan. Team leaders were directed to prepare summaries of each respective committee meeting. Hudnall said he would process the summaries into an action plan.

Bill Puckett asked if the group wanted to move forward with the standards committee suggested by one of the teams. Larry West stated he thought there was a national standards committee. Hudnall said we would process the other reports.

Puckett asked if the process used for this conference was a better way of addressing the issues. Larry West stated if follow-up is achieved, it will have been better.

Hudnall stated he would put the action register on the regional home page. Puckett stated he will be attending the Southern Experiment Station Conference and, hopefully, can present some of the concerns and action ideas voiced at this conference. Jerry Daigle explained that the conference chair and co-chair usually changes with the end of the biannual conference. He suggested the existing committee continue with the action plan until some time when leadership can be transferred in a timely fashion. Ed Wright asked, "What would the other folks outside of the steering committee do?" Hudnall said the committee would charge others with certain tasks.

Taxonomy Committee: It was pointed out that the existence of the Taxonomy Committee was spelled out in by-laws. Moye Rutledge questioned if others beside MO Leaders could be on the Taxonomy Committee. He was told the conference members could do whatever they desired by changing the by-laws. Hudnall read the Taxonomy Committee membership paragraph from the by-laws. Hudnall said he would post the by-laws on the LSU home page with the minutes of this business meeting. Puckett

questioned if the Taxonomy Committee had any current charges. Jim Ford asked if they had not been charged at the last conference to draft a letter to freeze revisions in taxonomy. Craig Ditzler stated the committee had no charges since the last meeting. Ben Stuckey commented on the procedure for revisions to soil taxonomy. Daigle stated it was a national standard spelled out in the National Soil Survey Handbook (NSSH).

Bob Engel stated that distribution of taxonomy review drafts was to all states and it was assumed the Regional Taxonomy Committee, because of their charge, would pick up on these and respond. Daigle motioned, and Rutledge seconded, the election of a co-chair to the Southern Regional Taxonomy Committee to pick up on these proposed revisions and process the responses. Hudnall recommended an NRCS regional soil scientist be this person. Ben Stuckey recommended it be a senior university person. Hudnall spoke against this because the university representatives served a three-year term. He went on to state that an NRCS co-chair could be permanent, if desired, and could better communicate with Bob Ahrens. Daigle motioned, and Norfleet seconded, that this person be an NRCS representative. Phil Tant motioned, and John Gagnon seconded, an amendment to Daigle's motion that this person be from the Auburn MO because it is the only MO entirely within the South Region. George Martin spoke against this motion since Cameron Leorch, the Auburn MO Leader, was not present at this business meeting. Ditzler suggested this co-chair rotate with the conference meetings. A vote on the amendment failed. A vote on the motion passed. Larry Wilding motioned, and George Martin second, the co-chair be decided by NRCS by friendly consensus. The motion passed. Ditzler issued a concern and admission that the taxonomy committee had not done its job during the past two years. He recommended that Bob Ahrens add a line on cover letters for taxonomy review alerting the taxonomy committee co-chair. Darwin Newton recommended review drafts go directly to agricultural experiment station members with a mailing list being developed for this purpose. July 15 was established as the deadline for NRCS to submit names of agricultural experiment station persons to be on this list. July 15 was also established as the deadline for NRCS MO Leaders to decide by friendly consensus who would be Taxonomy Committee Co-chair.

By-Laws: Jerry Daigle explained that Virginia had requested it be moved from the South Region to the East Region. A review of membership revealed that Virginia was never an official member of the South Region. Daigle motioned, and Wilding seconded, that Virginia be taken out of the by-laws as a member of the South Region. The motion passed

Conference 2000: Joey Shaw invited the conference membership to Alabama in the year 2000. He recommended a theme of "Animal Waste" or something along that line since that seemed to be one of the more important current issues. Hudnall motioned, and Hallmark seconded, the membership accepts Shaw's invitation to Alabama. The motion passed.

Other Business: Larry Wilding reported there is a U.S. Research Committee. He was pleased to announce that soil scientist had been appointed to this committee. These members are Mary Collins and Larry Wilding. Wilding was pleased to report that agriculture now has a vehicle at the national level to allow its science to interact with other sciences. He charged the group to "take advantage if you will."

Larry West reported the development of a Southern Regional Research Needs Committee formed by university members. He asked that NRCS appoint someone to be on this committee. Hudnall motioned, and Wilding seconded, the establishment of a Southern Regional Research Committee. The motion passed. It was decided the NRCS MO Leaders would decide on a research committee lead. Craig Ditzler volunteered for the first rotation.

Larry Wilding reported there is currently a National Committee on Research Needs. He also reported the steering committee recommended the composition of the national committee be expanded and that representatives from the Southern Region are needed. This committee would address critical research needs and technical excellence within NCSS. Wayne Hudnall reported he and Allen Tiarks are on the national committee. He said there is a need for NRCS membership. Daigle stated there are two NRCS administrative regions within the area represented by the Southern Regional Cooperative Soil Survey Conference. Darwin Newton motioned, and Ben Stuckey seconded, the NRCS Regional Soil Scientists be elected. The motion passed.

Bill Smith encouraged the conference membership to extend a hardy "Thanks" to Wayne Hudnall and Jerry Daigle for their hard work in preparing for and conducting the meeting.

Adjourn: Ben Stuckey motioned, and Bill Smith seconded, the business meeting be adjourned. The motion passed.

Reconvene: After Wade Hurt's presentation on Friday morning a motion to reopen the business session was made by Wayne Hudnall and seconded by Larry Wilding. The business session was reopened. Hurt had recommended that each region establish a Regional Technical Committee for Hydric Soils. Hudnall explained the proper parliamentary procedure was to amend the by-laws by, first, adding the Southern Regional Technical Committee for Hydric Soils and, second, deciding on the combination of membership. Bill Puckett motioned, and Larry Wilding seconded, that the committee be established. The motion passed.

Hudnall recommended the composition of the committee be one representative from the National Society of Consulting Soil Scientist (NSCSS), one representative from the U. S. Fish and Wildlife Service (FWS), one representative from the U. S. Army Corps of

Engineers (CORPS), one representative from the U. S. Environmental Protection Agency (EPA), one representative from the U. S. Forest Service (FS), three representatives from the university group, and three representatives from NRCS. Hudnall also questioned how this regional committee would report to the national committee. Wade Hurt stated he envisioned one member of the regional committee would attend the national meeting as a non-member. Hurt said the regional committee would give more thought and more input from the regional level, including input into NASIS. Wilding stated the regional committee could supply input on national standards or site selection on the regional level to test national standards. Warren Lynn asked what the power of the regional committee would be, if any, since the 1985 Farm Bill gave the national committee the charge and the authority. Hudnall asked how often the regional committee would meet and would they be funded. Hurt reported no funds would be available.

Stan Buol asked who from the Southern Regional Cooperative Soil Survey Conference membership is on the national committee. Hurt responded that Stave Faulkner, Buck Reed, and Russ Theriot are on the committee and Richard Griffin is coming on within the year. Wilding suggested most potential members would probably be attending the SSSA meetings and could meet on a holdover day. Hudnall stated that steering team members and others already stay over and this probably would not work. Wilding said they might piggyback on other meetings. Wilding stated that universities could probably function on NIEG-22 authority and funding. Hudnall suggested Bill Puckett issue a plea to the agricultural experiment station directors when he attends their meeting.

Hudnall suggested the universities and NRCS elect members in separate votes. He also suggested one member be elected for three years, one member for two years, and one member for one year. Separate votes were taken for university members and NRCS members. University nominees were Mike Vepraskas A. D. Karathanasis, Larry West, Wayne Hudnall, and David Pettry. David Pettry was elected for three years, Mike Vepraskas for two years, and Wayne Hudnall for one year. NRCS nominees were Jerry Daigle, Wes Miller, Ben Stuckey, Charles Fultz, John Gagnon, and Delaney Johnson. Jerry Daigle was elected for three years, John Gagnon for two years, and Ben Stuckey for one year.

The reconvened business meeting was closed.

Action Register

1. New officers of the university group:

Chair…	Tom Ammons
Vice-chair…	Larry West
Secretary…	Tom Hallmark

2. The university group voted to establish a Southern Regional Experiment Station Home Page. Larry West will take the lead to develop.
3. Larry West will pursue "Soils of the South Region Project".
4. The government agency group will include a university observer in future group meetings.
5. Hudnall will process breakout group reports into action items.
6. Hudnall will post the minutes, by-laws, and action register on the LSU Home Page.
7. Puckett will present concerns of the Southern Regional Cooperative Soil Survey Conference at the Southern Regional Agricultural Experiment Station Conference.
8. Committee members from the 1998 Conference will remain active until action registers are in place.
9. A Taxonomy Committee Co-Chair was established. This person will be an NRCS representative and will rotate with each biannual conference. This co-chair will be elected by friendly consensus. All NRCS members must submit their nomination to Jerry Daigle no later than July 15, 1998.
10. Virginia will be removed from the by-laws as a member of the Southern Region.
11. The year 2000 conference will be held in Alabama.
12. A Southern Regional Research Needs Committee was approved; expanding the research needs committee formed by the university group. The MO Leaders will decide the NRCS lead. Craig Ditzler volunteered for first rotation. Wayne Hudnall and Allen Tiarks and University representatives.
13. Bill Puckett and Bobby Ward were nominated to be on the National Committee on Research Needs.
14. A Southern Regional Technical Committee for Hydric Soils was approved

Universities (3):	David Pettry (3 Yr.)
	Mike Vepraskas (2 Yr.)
	Wayne Hudnall (1 Yr.)
	Larry West (3Yr. starting in 2000)
NRCS (3):	Jerry Daigle (3 Yr.)
	John Gagnon (2 Yr.)
	Ben Stuckey (1 Yr.)
	Wes Miller (3 Yr. starting in 2000)
CORPS (1):	TBD
USFWS (1):	TBD
EPA (1):	TBD
USFS (1)	TBD

Since NRCS is the permanent chair of the National Technical Committee for Hydric Soils, Jerry Daigle will act as chair of the regional committee until all members have been designated and the first meeting is conducted.

Southern Regional Cooperative Soil Survey Conference
1998 Business Meeting Participants

Name	Affiliation
Benedict, Paul	NRCS, Little Rock, AR
Buol, Stan	North Carolina State Univ., Raleigh, NC
Cortes, Milton	NRCS, Raleigh, NC
Craddock, Bill	NRCS, Lexington, KY
Crouch, Marc	NRCS, Raleigh, NC
Daigle, Jerry	NRCS, Alexandria, LA
Ditzler, Craig	NRCS, Raleigh, NC
Ealy, Edward	NRCS, Athens, GA
Engel, Bob	NRCS, Lincoln, NE
Fielder, Rick	NRCS, Little Rock, AR
Ford, Jim	NRCS, Stillwater, OK
Gagnon, John	NRCS, Edenton, NC
Griffith, Kirby	NRCS, Nacogdoches, TX
Hallmark, Tom	Texas A&M Univ., College Station, TX
Henderson, Warren	NRCS, Gainesville, FL
Hudnall, Wayne	Louisiana State Univ, Baton Rouge, LA
Hurt, Wade	NRCS, Univ. of Florida, Gainesville, FL
Jenkins, John	NRCS, Nashville, TN
Jones, David	NRCS, Jackson, MS
Kortum, Mike	NRCS, Ft. Worth, TX
Lynn, Warren	NRCS, Lincoln, NE
Martin, George	NRCS, Auburn, AL
McGhee, Lawrence	NRCS, Alexander City, AL
Newton, Darwin	NRCS, Nashville, TN
Nicholson, John	NRCS, Farmville, VA
Norfleet, Lee	NRCS, Auburn, AL
Pringle, Russ	NRCS, Baton Rouge, LA
Puckett, Bill	NRCS, Atlanta, GA
Ragus, Jerry	USFS, Atlanta, GA
Rutledge, Moye	Univ. of Arkansas, Little Rock, AR
Sample, Chuck	NRCS, Stillwater, OK
Shaw, Joey	Auburn Univ., Auburn, AL
Smith, Bill	Clemson Univ, Clemson, SC
Stuckey, Ben	NRCS, Columbia, SC
Tant, Phil	NRCS, Raleigh, NC
Ward, Larry	NRCS, Little Rock, AR
West, Larry	Univ. of Georgia, Athens, GA
Wright, Ed	NRCS, Ft. Worth, TX

Southern Regional Soil Survey Work Planning Conference
Steering Committee Meeting
November 5-6, 1998
Baton Rouge, Louisiana

Action Items:

1. **Southern Region Home Page Development:** Cameron Loerch will visit with Larry West concerning what is needed to get the project off-and-running.

2. **Soils of the Southern Region Project:** Cameron Loerch will visit with Larry West concerning what is needed to get the project off-and-running.

3. **Report to SRAES Conference:** Jerry Daigle will contact Bill Puckett to get a copy of the report for the Home Page.

4. **Taxonomy Co-chair:** Jerry Daigle will send out query to states for volunteers. Three-Year term is suggested.

5. **Southern Regional Research Needs Committee:** Jerry Daigle will include request with item 4 above.

6. **Research Needs Committees:** Wayne Hudnall will get clarification on the relationship between the U. S. Research Needs Committee and the National Committee on Research Needs.

7. **Follow-up from Breakout Group discussions from June 98 Conference:**

Group 1: Identify the process with specific tasks and methods required to "add value" for a MLRA soil survey. Identify partnership roles, responsibilities and contributions.

Cameron Loerch will coordinate a committee of MO Leaders. Goal will be to increase the technical knowledge base through enhanced communication, field visits, and interaction across state and county lines. The target audience is state conservationists, experiment station directors, and department heads.

Group 2: Identify additional uses of soil resource data to be tested in the southern region. Develop an action plan.

Phosphorus, precision agriculture, urban interpretations, water movement/permeability all surfaces as areas of need. Phosphorus, precision agriculture, and urban interpretation are being addresses at a national level. This topic will be carried over to the next conference.

Group 3: Identify and develop strategies or methods to be used to increase the visibility of soil resources and the use of soil resource inventory products.

Suggested options;

Option 1: Fund a co-op student in marketing to develop a marketing package. The Southern Regional Needs Committee would review proposals and make recommendations. This committee would also draft a research proposal.

Option 2: Contract with a media firm to develop an information campaign. Purdue University has a lot of stuff already. Texas has "Soils Talk" You have to subscribe to it.

Look to NACD for funding.

Group 4: Identify products to deliver soil resource information into the future… hard copy in the field, shrink wrap hard copy, SSURGO, CD-ROM, World Wide Web?

No follow-up.

Steering Committee Members (present)**:**

MO-14 (North Carolina)…	Deborah Anderson
MO-09 (Texas)	Mike Golden
MO-15 (Auburn)	Cameron Loerch
LSU (Louisiana)	Dr. Wayne Hudnall
Past Chair (Louisiana)	Jerry Daigle

BY-LAWS FOR THE SOUTHERN REGIONAL COOPERATIVE SOIL SURVEY CONFERENCE

ARTICLE I **NAME**

Section 1.0 The name of the Conference shall be the Southern Regional Cooperative Soil Survey Conference.

ARTICLE II **GEOGRAPHIC BOUNDARY**

Section 1.0 The Southern Region corresponds to the Agricultural Experiment Station Southern Region and includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and the Caribbean Area.

ARTICLE III **PURPOSE**

Section 1.0 The purpose of the Southern Regional Cooperative Soil Survey Conference is to bring together representatives of the National Cooperative Soil Survey in the southern states for discussion of technical, scientific, and other general questions and issues of importance to the Cooperative Soil Survey Program. Through the actions of committees and conference discussions, experience is summarized and clarified for the benefit of all; new areas are explored; procedures are synthesized; and ideas are exchanged and disseminated. The conference also functions as a clearinghouse for recommendations and proposals received from individual members and state conferences for transmittal to the National Cooperative Soil Survey Conference.

ARTICLE IV **PARTICIPANTS**

Section 1.0 Permanent participants of the conference are the following:

Section 1.1 The NRCS State Soil Scientist, Staff Soil Scientists, and the MLRA Office Soil Scientists responsible for each of the states and U.S. Territories assigned to the South Region.

Section 1.2 The Experiment Station or University's National Cooperative Soil Survey Leader(s) of each of the states and U.S. Territories assigned to the South Region.

Section 1.3 Representatives from the 1890 Land Grant Universities and Tuskegee University.

Section 1.4 Soil Scientists assigned to the NRCS Southeast and South Central Regional Offices.

Section 1.5 National Soil Survey Center Liaisons assigned to the MLRA Offices within the South Region.

Section 1.6 Representative from the National Cartography and Geospatial Center.

Section 1.7 Representative from the Information Technology Center at Ft. Collins, Colorado.

Section 1.8 Representatives from the regional soils staff of the USDA Forest Service.

Section 1.9 Soils discipline representative from the Tennessee Valley Authority.

Section 1.10 Representative from the National Society of Consulting Soil Scientists, Inc.

Section 2.0 On the recommendation of the Steering Committee, the Chair of the conference may extend invitations to other individuals to participate in committee work and in the conference. Any soil scientist or other technical specialists of any state or federal agency or private consultant whose participation is helpful for particular objectives or projects of the conference may be invited to attend.

ARTICLE V ORGANIZATION AND MANAGEMENT

Section 1.0 Steering Committee

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

Section 1.1 Steering Committee Membership

The Steering Committee consists of five members:

a. The conference chair.
b. The conference vice-chair.
c. Soil Scientist assigned to either the Southeast or South Central Regional Office of NRCS.
d. One MLRA Team Leader.
e. The past conference chair.

Appendix III contains a schedule that can be used to determine the appropriate rotations of assignments.

The Steering Committee is chaired by the Soil Scientist serving under item c above.

The Steering Committee may designate a conference chair and vice-chair if the persons designated in Section 2.0 are unable to fulfill their obligations.

Section 1.2 Meetings and Communications

A planning meeting will be held about 1 year prior to the conference. The chair may schedule additional meetings if the need arises.

Most of the steering committee's communications will be in writing. Copies of all correspondence between members of the committee shall be sent to all members of the steering committee.

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

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 Experiment Station Directors within the Southern Region.
2. The State Conservationists, NRCS, for the states within the Southern Region.
3. The Regional Conservationists for the Southeast and South Central NRCS regions.
4. Director, Soils Division, NRCS.
5. Regional and national offices of the U.S. Forest Service.
6. The National Cooperative Soil Survey Conference.
7. Southern Forest Soils Research Council.
8. Other cooperating and participating agencies and private individuals.

Section 1.4 Responsibilities of the Steering Committee Chair are:

Section 1.4.1 Call a planning meeting of the Steering Committee about 1 year in advance of the conference to plan the agenda, and if possible, at the scheduled location of the conference.

Section 1.4.2 Develop with the Steering Committee 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 a member of the conference steering committee and asked if they will serve prior to final assignments.

Section 1.4.4 Compile and maintain a conference mailing list (can be copies on mailing labels).

Section 2.0 Conference Chair and Vice-Chair

The conference chair and vice-chair are the State Soil Scientist and Experiment Station Soil Survey Leader from the state where the next conference is to be held. These officers serve a two-year term from close of conference to close of conference. The chair position, for each two-year period, alternates between the state soil scientist and experiment station representative. This sequence may be altered by the Steering Committee for special situations.

Section 2.1 Responsibilities of the conference chair:

Section 2.1.1 Functions as chair of the biennial conference.

Section 2.1.2 Planning and management of the biennial conference.

Section 2.1.3 Serve as a member of the Steering Committee.

Section 2.1.4 Send out a first announcement of the conference about 9 months prior to the conference.

Section 2.1.5 Send out 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 of the conference.

Section 2.1.11 Appoint a recording secretary to take minutes of the business meeting and prepare minutes for inclusion in the proceedings of the conference.

Section 2.2 Responsibilities of conference vice-chair:

Section 2.2.1 Serve 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. Time is to be provided on the conference agenda for separate state and federal meetings.

Section 2.2.5 Make the necessary arrangements for lodging accommodations for conference members, for food or social functions, for meeting rooms, including committee rooms, and for local transport for official functions. Notify all persons attending the conference 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. If these by-laws are amended, the proceedings shall contain a copy of the new by-laws.

Section 3.0 Past 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 4.0 Administrative Advisors

Administrative advisors to the conference consist of a NRCS State Conservationist (usually, but not necessarily, from the state where the conference is held) and an Experiment Station Director (usually, but not necessarily from the state where the conference is held). In addition, other advisors may be selected by the steering committee or the conference.

ARTICLE VI TIME AND PLACE OF CONFERENCE

Section 1.0 The conference convenes every two years, in even-numbered years. During the biennial business meeting, invitations from the various states are considered, discussed and voted upon. A simple majority vote decides the location of the next conference. Appendix I can be used as a guide for determining meeting locations. The date and specific location will be determined by the Steering Committee.

ARTICLE VII 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 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 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.

Section 5.0 Each committee shall make an official report at the designated time at each biennial conference. Chair of committees is responsible for submitting the required number of committee reports promptly to the vice-chair of the conference.

Section 5.1 Suggested distribution is:

Section 5.1.1 One copy to each participant on the mailing list.

Section 5.1.2 One copy to each State Conservationist, NRCS, and Experiment Station Director in the Southern Region

Section 5.1.3 Five copies to the Director of Soils, NRCS, for distribution to National Office staff.

Section 5.1.4 Ten copies to the National Soil Survey Center (NSSC) for distribution to staff in the Center.

Section 5.1.5 Three copies to the Soil Scientists representing the Southeast and South Central NRCS regions for distribution and circulation to both the NRCS and cooperators within their regions.

Section 5.1.6 Five copies to the Forest Service Regional Soil Scientist.

ARTICLE VIII REPRESENTATIVES TO THE NATIONAL AND REGIONAL SOIL SURVEY CONFERENCES

Section 1.0 At least one state and one federal member will represent this conference at the National Cooperative Soil Survey Conference. Selections are to be made by the appropriate administrators. Representatives will report back to their respective state or federal group.

Section 2.0 One member of the Steering Committee will represent the Southern Region at the Northeast, North Central 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 IX SOUTHERN REGIONAL SOIL TAXONOMY COMMITTEE

Section 1.0 Membership of the standing committee is as follows:

a. Lead Scientist, Soil Taxonomy (permanent chair).
b. MLRA Team Leaders representing MLRA Regions 9, 13, 14, 15, and 16 (permanent members).
c. Three experiment station representatives (rotating members).

Section 2.0 At their respective business meetings, the experiment station representatives will be elected to serve on this committee. The term of membership is three years, with two members elected at each biennial conference. One member's term will begin immediately and the other will begin one year later.

ARTICLE X SOUTHERN REGIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS

Section 1.0 Membership of the standing committee is as follows:

1. Three university members
2. Three USDA Natural Resources Conservation Service (NRCS) members
3. One U.S. Environmental Protection Agency (EPA) member
4. One U.S. Army Corps of Engineers (CORPS) member
5. One U.S. Fish and Wildlife Service (FWS) Member
6. One USDA Forest Service (FS) members
7. One member of the National Society of Consulting Soil Scientists, Inc. (NSCSS).

Section 2.0 At their respective business meetings during the biannual conference, the university and NRCS representatives will be elected to serve on this committee. The term of membership is three years, with two members elected at each biannual conference. One newly elected member's term will begin immediately and the other will begin one year later.

The method for placing members on the committee used by the other agencies will be determined by those agencies' regional or national leadership.

ARTICLE XI **AMENDMENTS**

Section 1.0 Any part of this statement of By-Laws may be amended any time by majority agreement of the conference participants.

By-Laws Adopted June 9, 1990
By-Laws Amended July 11, 1968
By-Laws Amended May 7, 1970
By-Laws Amended May 25, 1984
By-Laws Amended June 22, 1990
By-Laws Amended April 19, 1996
By-Laws Amended June 26, 1998

Appendix I: Southern Regional Soil Taxonomy Committee

NSSC Lead Soil Scientist Bob Ahrens (Permanent Chair)

NRCS MLRA Team Leaders (Permanent Members):
(Co-chair elected by NRCS friendly consensus)

MO-09	Michael L. Golden
MO-13	Stephen G. Carpenter
MO-14	Craig A. Ditzler
MO-15	Cameron J. Loerch
MO-16	Charles L. Fultz

University Members (Rotating Membership):

1998	1999	2000	2001	2002
A. D. Karanthanasis	Mike Vepraskas	Mike Vepraskas	Mike Vepraskas	
Richard Griffin	Richard Griffin	Larry West	Larry West	Larry West
Mary Collins	Mary Collins	Mary Collins		

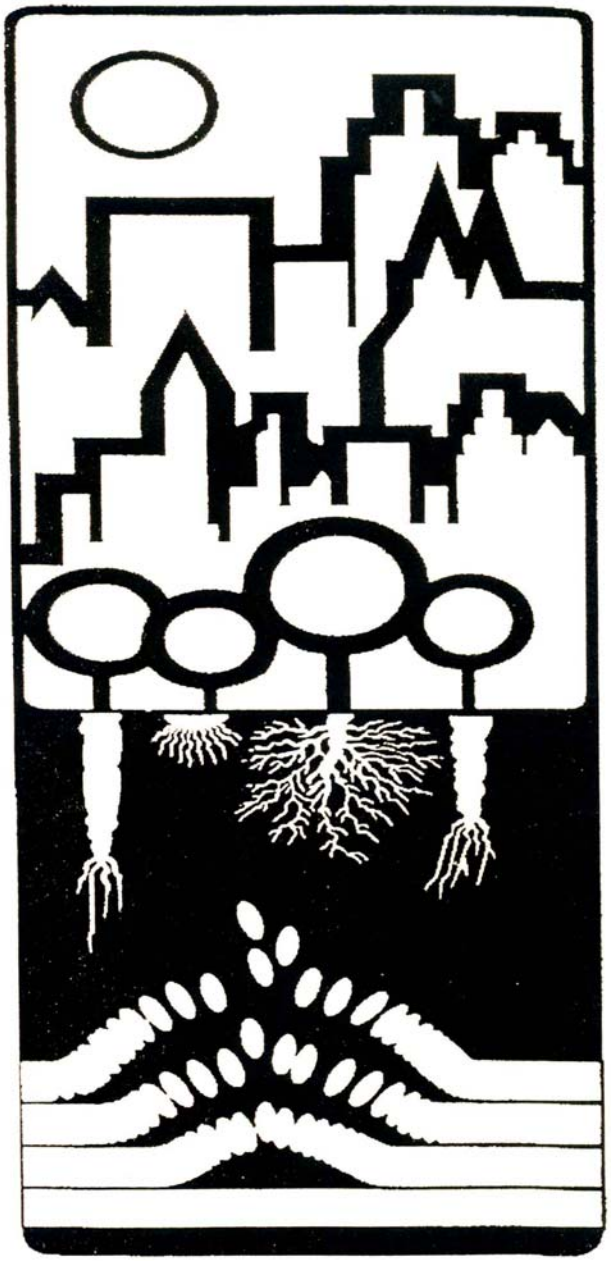
Appendix II: Southern Regional Technical Committee for Hydric Soils

Affiliation	1998	1999	2000	2001	2002
University	David Pettry	David Pettry	David Pettry	David Pettry	
University	Mike Vepraskas	Mike Vepraskas	Mike Vepraskas		
University	Wayne Hudnall	Wayne Hudnall	Larry West	Larry West	Larry West
NRCS	Jerry Daigle	Jerry Daigle	Jerry Daigle	Jerry Daigle	
NRCS	John Gagnon	John Gagnon	John Gagnon		
NRCS	Ben Stuckey	Ben Stuckey	Wes Miller	Wes Miller	Wes Miller
EPA					
CORPS					
FWS					
FS					
NSCSS					

APPENDIX III RECOMMENDATIONS FOR FUTURE CONFERENCE LOCATIONS; CONFERENCE CHAIR AND VICE CHAIR; STEERING COMMITTEE CHAIR; AND MLRA OFFICE REPRESENTATIVE TO STEERING COMMITTEE.

YEAR	HOST STATE	CONFERENCE CHAIR	CONFERENCE VICE CHAIR	STEERING CHAIR	STEERING MLRA REP.
1998	LA	SSS - LA	EXP STA - LA	SOUTH CENTRAL	RALEIGH
2000	AL	EXP STA - AL	SSS - AL	SOUTHEAST	TEMPLE
2002	MS	SSS - MS	EXP STA - MS	SOUTH CENTRAL	MORGANTOWN
2004	GA	EXP STA - GA	SSS - GA	SOUTHEAST	LITTLE ROCK
2006	OK	SSS - OK	EXP STA - OK	SOUTH CENTRAL	AUBURN
2008	FL	EXP STA - FL	SSS - FL	SOUTHEAST	TEMPLE
2010	TX	SSS - TX	EXP STA - TX	SOUTH CENTRAL	RALEIGH
2012	KY	EXP STA - KY	SSS - KY	SOUTHEAST	LITTLE ROCK
2014	TN	SSS - TN	EXP STA - TN	SOUTH CENTRAL	AUBURN
2016	PR	EXP STA - PR	SSS - PR	SOUTHEAST	TEMPLE
2018	NC	SSS - NC	EXP STA - NC	SOUTH CENTRAL	MORGANTOWN
2020	AR	EXP STA - AR	SSS - AR	SOUTHEAST	LITTLE ROCK
2022	SC	SSS - SC	EXP STA - SC	SOUTH CENTRAL	RALEIGH
2024	LA	EXP STA - LA	SSS - LA	SOUTHEAST	TEMPLE

In addition to the above, the past conference chair also serves on the steering committee.



Mapping Our Future… Together

Southern Soils Conference
Baton Rouge, Louisiana

Field Trip Guidebook

June 24, 1998

WELCOME TO LOUISIANA!

Guidebook for the Field Trip

prepared by

W.H. Hudnall, L.M. Boulton, L.M. West and J.J. Daigle

Agronomy Department
Louisiana Agricultural Experiment Station
Louisiana State University Agricultural Center

and

United States Department of Agriculture –
National Resources Conservation Service

WEST FELICIANA
EAST FELICIANA
ST. HELENA
TANGIPAHOA
EAST BATON ROUGE
WEST BATON ROUGE
LIVINGSTON
POINTE COUPEE
ST. LANDRY
IBERVILLE
ST. MARTIN
ASCENSION
ST JOHN THE BAPTIST
ST. JAMES
ASSUMPTION
ST. CHARLES
LAFAYETTE
IBERIA
VERMILION
ATCHAFALAYA BASIN
LAKE MAUREPAS
Baton Rouge
Lafayette
New Iberia
Opelousas
Kenner
Hammond
Ponchatoula
Plaquemine
Donaldsonville
Thibodaux
Abbeville
Franklin
Bunkie
Eunice
Gonzales
Denham Springs
New Roads
Port Allen
Breaux Bridge
St. Martinville
Woodville
Centreville
Liberty
Magnolia

LAGNIAPPE

Welcome to Louisiana, the edible state. No matter where you travel in Louisiana, from the pine covered hills in the north to the shady bayous down south you traverse a magical land of gourmet dining. These include jambalaya and crawfish pie, red beans and rice to blackeyed peas and cornbread.

Louisiana is home to some of the last of the true Southern Aristocrats. In our plantation homes, you can meet warm cultivated people who will show you the spot where the Yankee bullets hit their house. If you travel south and you say the word "Acadian" over and over in a French accent for about 200 years, you will end up sounding like "Cajun". Cajuns of southern Louisiana are the descendants of the Acadian French settlers who fled here in 1785 from what is now a Canadian province of Nova Scotia. They have been teaching us to cook, speak French, dance and have fun ever since.

Sporting life goes on year-around from fishing and hunting to horse racing. Louisiana lakes, streams and bayous are teeming with delicious bass, brim, catfish and "sac-au-lait" (that's Cajun for "Sack of milk", but you may know them as white perch or crappie). If you haul out something that fights like a crazy Cajun and has lots of teeth, it's a gar fish. If it succeeds in hauling you into the water instead, then it was an alligator. But don't worry; our alligators are really quite peaceful and spend most of their time sleeping. Take a swamp tour or walk down the Creole nature trail and see them right up close ... but not too close.

Louisiana is full of people who enjoy life, fun and music; who know a good thing when they hear it. You can kick up the dust with a "fais-do-do" to "Jolie Blonde" on the squeeze-box accordion or do a do-si-do to "Turkey in the Straw" on the fiddle. Stamp your feet to the beat of the birthplace of Dixieland Jazz or feel your heart race to the syncopated double-time rhythm of zydeco. Louisiana will keep your ears happy and your toes wiggling.

While you are here, we hope you adopt our state motto, "Union, Justice and Confidence". No, that's not our real one. Our real motto is "Laissez les bons temps rouler!" "Let the good times roll!".

Oh yes, welcome to the Southern Soils Conference in Baton Rouge and the field trip. You thought that you were coming to Louisiana for the primary purpose of this conference. But, in Louisiana, the tour is just "Lagniappe" (lan-yap), which means "something extra". So, just when you think you have seen it all, there is always something else to see or explore in Louisiana. When the day's activities are over and you are watching the sun set over the lazy Mississippi River, rice field, or sipping a cool one in your room, you will really know that your trip to Louisiana really was Lagniappe.

ORIENTATION AND SPACE RELATIONS

Louisiana orientation with respect to local features and distant location, it's physical and cultural setting are compared with other parts of the United States and the World. Louisiana has a position on the earth's surface that is easy to remember. New Orleans, the state's largest city, is located 90° West and 30° North. Ninety degrees West means that New Orleans is a quarter the way around the world from the meridian of 0° at Greenwich, England near London. Translated into time differences, Louisiana is six hours earlier than Greenwich. If it is noon at Greenwich, it is 6:00 a.m. Central time in New Orleans.

Due North on the 90th meridian from New Orleans are Memphis and St. Louis. This line passes west of Chicago, east of Duluth across Lake Superior, along the western side of Hudson Bay and on through the Arctic Islands. South of New Orleans, the due South course of the 90th meridian is surprising to most people. It cuts across the Gulf to Yucatan in Mexico, then across Guatemala into the open Pacific and through the Galapagos Islands that lie about 700 miles West of the mainland of South America. New Orleans has an advantage over most other major United States ports in shorter distance to Central America and the West Coast of South America.

At latitude of 30° North, New Orleans lies one-third of the way between the Equator and the North Pole. If we compare our latitude with that of other places, we can see how far south Louisiana is. In the Continental United States, only Florida and Texas extend farther South. If we follow the 30th parallel westward across North America, we see that it runs through Houston, Austin, the Big Bend of Texas and across Northern Mexico into the Pacific almost 200 miles South of the southern boundary of California. Eastward the 30th parallel cuts across Northern Florida into the Atlantic south of Jacksonville. Across Africa it lies everywhere south of the Mediterranean Sea and runs through Cairo, Egypt on the Nile River. Every point in Europe lies north of New Orleans.

Louisiana, approximately 48,000 square miles in area, ranks 31st in size among the states. Our neighbor to the west, Texas, with 266,000 square miles is over five-times larger than Louisiana. Regarding dimensions, we may say that Louisiana is broader than it is tall. From its eastern most to the western most, the state measures about 300 miles. Measured in the same way north and south, the distance is about 280 miles. These figures may suggest that Louisiana is square in shape. Actually, it is not, rather it resembles a great block "L".

We say that Louisiana climate is characterized by mild winters and warm summers. South Louisiana is regarded as semi-tropical, warm and humid in the summers and cool and mild in the winters. Humid means that there is abundant precipitation well distributed throughout the year. Subtropical implies warm summers and mild winters. The latter qualification is more important of the two. Louisiana summers are at least as hot as those in the tropics. Tropical winter seasons are those in which the temperature never gets low enough to halt plant growth. Normally, a January average temperature of 64.4°F and above means a tropical condition, or no winter. Louisiana cannot meet this figure for the state average. January temperature ranges between the humid subtropics of 64.4°F and 32°F. There is a period in which plant growth is inhibited but it does not produce severe freezing and frozen grounds. Our winters are open, which means they are marked by periods of relatively warm

temperatures in contrast to the closed or severe winters of the northern parts of the United States. Of all the states of the southeast United States grouped as humid tropical, Louisiana alone meets the qualifications perfectly. Figure 2 gives the average growing season. The growing season is defined as the number of days between the last killing frost in Spring and the first killing frost in Autumn. Figure 3 is the average annual precipitation for the State. Individual years may vary quite markedly from the averages shown.

Louisiana is one of the nation's largest producers of sugarcane, early Spring strawberries, sweet potatoes and cane syrup. Other important crops are rice, cotton, corn, potatoes, soybeans, citrus, truck crops, tobacco, pecans, and aquaculture. The state ranks high in lumber production with Kraft paper mills using large quantities of slash pine. The number of beef cattle is approximately 600,000. Louisiana also has an important dairy industry. In 1993 there were 678 dairy farms in the state. Only 2% of our population are directly involved in agriculture on 34% of Louisiana's land that is used to provide livelihood for more than 17,800 farm family workers assisted by 13,000 hired workers producing Louisiana farm products. Rice constitutes 8% of total farm products valued in the state and places Louisiana third in the nation in production of rice. In addition, Louisiana's agricultural output is composed of soybeans, 14%; cattle and calves, 12%; cotton, 13%; dairy products, 9%; sugarcane, 11%; broilers, 10%, and all other agricultural products, 23%. These products are valued at more than $3.8 billion annually.

Louisiana's approximately 4,200 manufacturing units employ approximately 164,000 wage and salary workers whose annual earnings are $6.3 billion. The state annually produces nearly $63 billion worth of products including petroleum, chemicals, plastic, clothing, wood products, industrial alcohol, wall board, cement, condiments, seafood, glass and drugs.

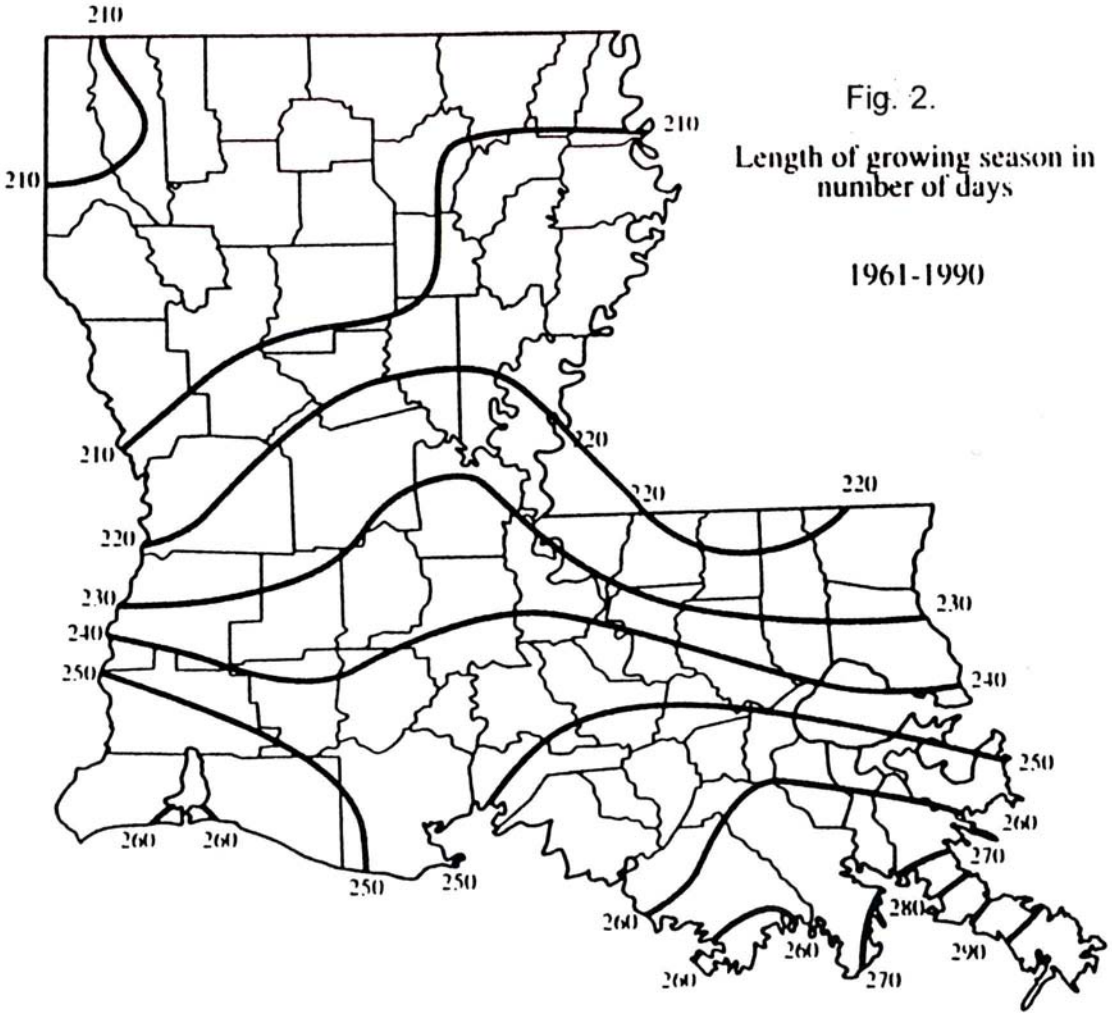


Fig. 2.

Length of growing season in number of days

1961-1990

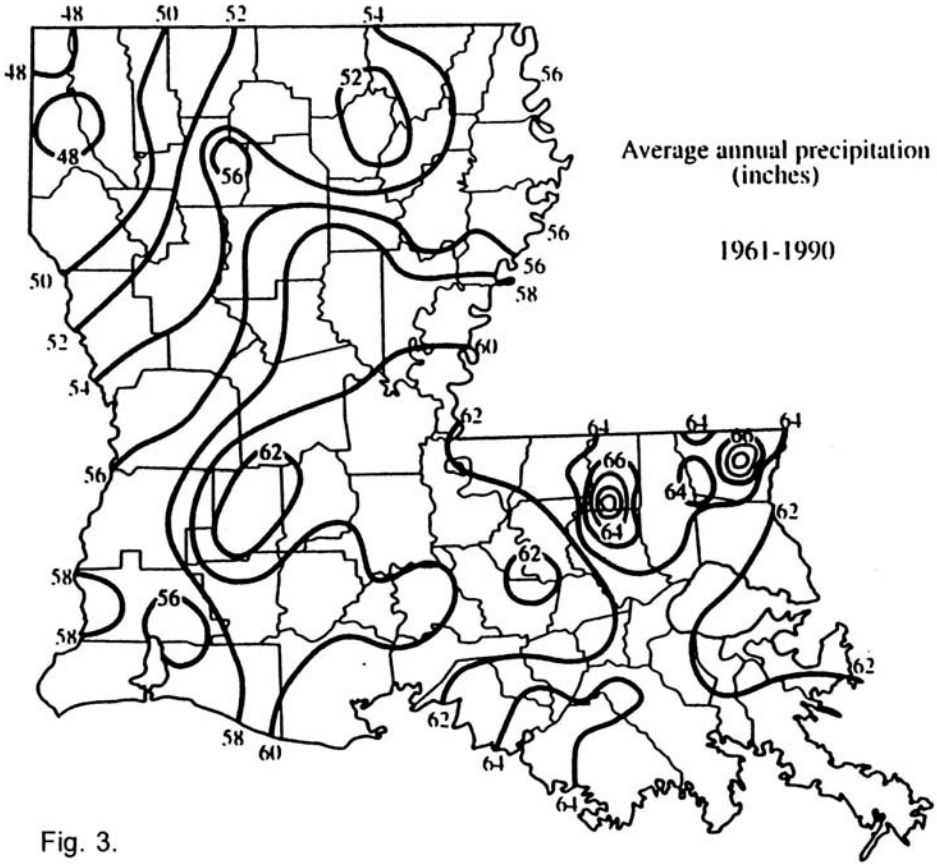


Fig. 3.

Climatic data provided by Louisiana Office of State Climatology. John M. Grymes III, State Climatologist.

FIELD TRIP OBJECTIVES

There are three objectives. The first 2 are technical and the 3rd is a combination of technical and cultural.

1. To observe a two from a toposequence of soils developed in Red River (Gallion and Lebeau,) and Mississippi River (Dundee and Sharkey) alluvium on the Thistlethwait Wildlife Management Area. This management area is located within the confluence of both rivers. The Mississippi River has been leveed and no longer floods this area. The Red River has been channeled into the Atchafalaya River Basin. The Atchafalaya basin is a road swamp running from the east to as far north as the Lower River. It is named for the Atchafalaya River, but contains streams of many names and a large number of lakes. In the lower part of the basin, the a splits into many streams and forms a braided pattern. This means the streams occupy an interlacing network of channels. Both the Red and Mississippi Rivers have occupied many of these channels and complicated layered soils have developed. Because of the difference in color, the source of the parent material is usually easily distinguished. However, in backswamps areas that are flooded or ponded for long duration undergo strong iron reducing conditions and the red color may be masked. Magnetic susceptibility (MS) is a technique that may be used to distinguish between the two parent materials. MS data will be presented for a Dundee, an Alfisol and Sharkey, which have developed from Mississippi river Alluvium; and a Gallion and Lebeau, which have developed from Red River alluvium.

2. To observe vertic properties of two very-fine Vertisols. The classification of the Sharkey soil has been proposed to be changed from an Inceptisol to a Vertisol The Lebeau is classified as a Vertisol. A trench will be opened across a micro-high and micro-low to examine the morphology of these two soils and to discuss the hydric characteristics of each. There are currently no field indicators that allow the Lebeau soil to be hydric. It is mapped within the same landscape position and has the same hydrology as the Sharkey.

3. The third objective is to show the participants some of the landscapes of south-central Louisiana and allow you to experience the sub-tropical climate of Louisiana during one of the driest, hottest summers.

THISTLETHWAITE WILDLIFE MANAGEMENT AREA

Thistlethwaite Wildlife Management Area is located in north central St. Landry Parish, immediately northeast of Washington off Louisiana Highway 10. Highway 10 connects two principle U.S. Highways, 71 and 167. Access by I-49 also, Lebeau exit. Seventeen miles of all-weather shell roads are maintained within the area, allowing convenient access to virtually the entire tract. Approximately eleven miles of woods trails are also maintained for the convenience of hunters.

Thistlethwaite is 11,000 acres in size and is owned by the Thistlethwaite heirs. The terrain is generally flat bottomland, with a gentle north to south slope.

Drainage is slow, with much standing water for considerable periods after heavy rains.

Forest cover is predominantly oak, most commonly water oak, willow oak, overcup oak, white oak, cherrybark oak, nuttall oak, cow oak and post oak. Other species are bitter pecan, sweet pecan, hickory, hackberry, sweetgum, ash, elm, and maple. The lower areas contain cypress and tupelo gum.

Selective timber cuttings has enhanced a natural understory of dogwood, redbud, spice bush, French mulberry, greenbriar, rattan, blackberry, and many others. Choice browse plants are dogwood and wild lettuce. Japanese honeysuckle grows profusely.

Game species are deer, squirrels, swamp rabbits, ducks, and woodcock. The deer herd is outstanding in quality, with many trophy bucks being taken. Bowhunting is allowed for deer and hogs. Trapping for furbearers is allowed and the species caught are raccoon, mink, bobcat and oppossum.

No camping is allowed by the landowner. Non-hunting activities include nature walks and nature studies by various civic organizations, schools and the general public.

MAGNETIC SUSCEPTIBILITY

The theory of MS was covered Tuesday afternoon. As mentioned, there are five different kinds of magnetic behavior. The first of these covers the most highly magnetic substances, like pure iron, and is termed ferromagnetism. These substances have very high magnetic susceptibility, but will not normally be found in the environment. The MS2D search loop can locate buried rusty cans and other items of metallic rubbish easily, and so it is as well to check that high values are from natural minerals. Unless, of course, you are interested in treasure-hunting - though beware, the MS2 is not set up to detect precious metals!

The most important category of magnetic behavior in natural materials is **ferrimagnetism**. This category includes magnetite and a few other iron minerals with high magnetic susceptibility values. Magnetite is a common mineral found in all igneous rocks, most sedimentary rocks and nearly all soils. Where these minerals are present they often dominate the magnetic susceptibility measurement.

Lower magnetic susceptibility values are obtained for **canted antiferromagnetic** iron minerals, such as haematite. There are only a few minerals in this category and haematite is probably the most common, occurring in many rocks and soils, and responsible for much of the natural red coloration in the environment.

Similar or weaker values are obtained for a group of minerals with the property of **paramagnetism**. There are a large number of these mineral which normally, but not always, contain iron, and are very common in rocks and soils. Examples are biotite and pyrite.

Finally, there is a category of magnetism referred to as **diamagnetism**, which gives weak and negative values of magnetic susceptibility. Materials which fall into this group include many minerals which do not contain iron, like quartz and calcium carbonate. Other non-mineral diamagnetic substances are organic matter and water. Therefore, the magnetic susceptibility of the environmental material is the sum of all

the magnetic susceptibilites of the ferrimagnetic, canted antiferromagnetic and paramagnetic minerals minus the diamagnetic susceptibility. Normally, the diamagnetic component is very weak relative to the sum of the other three and can be ignored. Exceptions to this are where the sample is almost all water, quartz or organic matter.

The type of magnetic behavior is detected when the material is placed in a **magnetic field**, as when a sample is placed between the pole pieces of a horseshoe magnet. Think of a magnetic field as lines of force shown by iron filings lying between the N and S poles of a magnet. When an unmagnetized sample is placed into the magnetic field the sample will become magnetized with its own lines of force and affect the total number of lines which were originally there. Different substances and environmental samples will affect the force lines in different ways.

Diamagnetic water, for instance, will become weakly magnetized in the opposite direction to the applied field and so reduce the total number of lines. Paramagnetic materials will become weakly magnetized in the same direction as the lines of the magnetic field and will increase the total number of force lines. A lump of basalt rock with many ferrimagnetic minerals will become highly magnetized in the same direction as the lines of the magnetic field and will greatly increase the total number of force lines per unit area. The total magnetic force in the material while it is in a magnetic field is called the magnetization.

HYDRIC SOILS

Field indicators of hydric soils should be used as a guide to identify and delineate hydric soils in the field. " Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register, July 13, 1994). Some key word that one has to interpretate are: formed under, conditions, saturation, long enough, growing season, anaerobic conditions in the upper part. Some of these term are defined, but other do not have universally accepted definitions. For example: when is a soil saturated, how long is long enough, what defines the growing season and when is a soil considered anaerobic? Soils that are on the extreme end of wetness do not present major problems. However seasonal wet soils and soils with Mollic epipedons and red soils are difficult to determine their hydric status even using the hydric indicators.

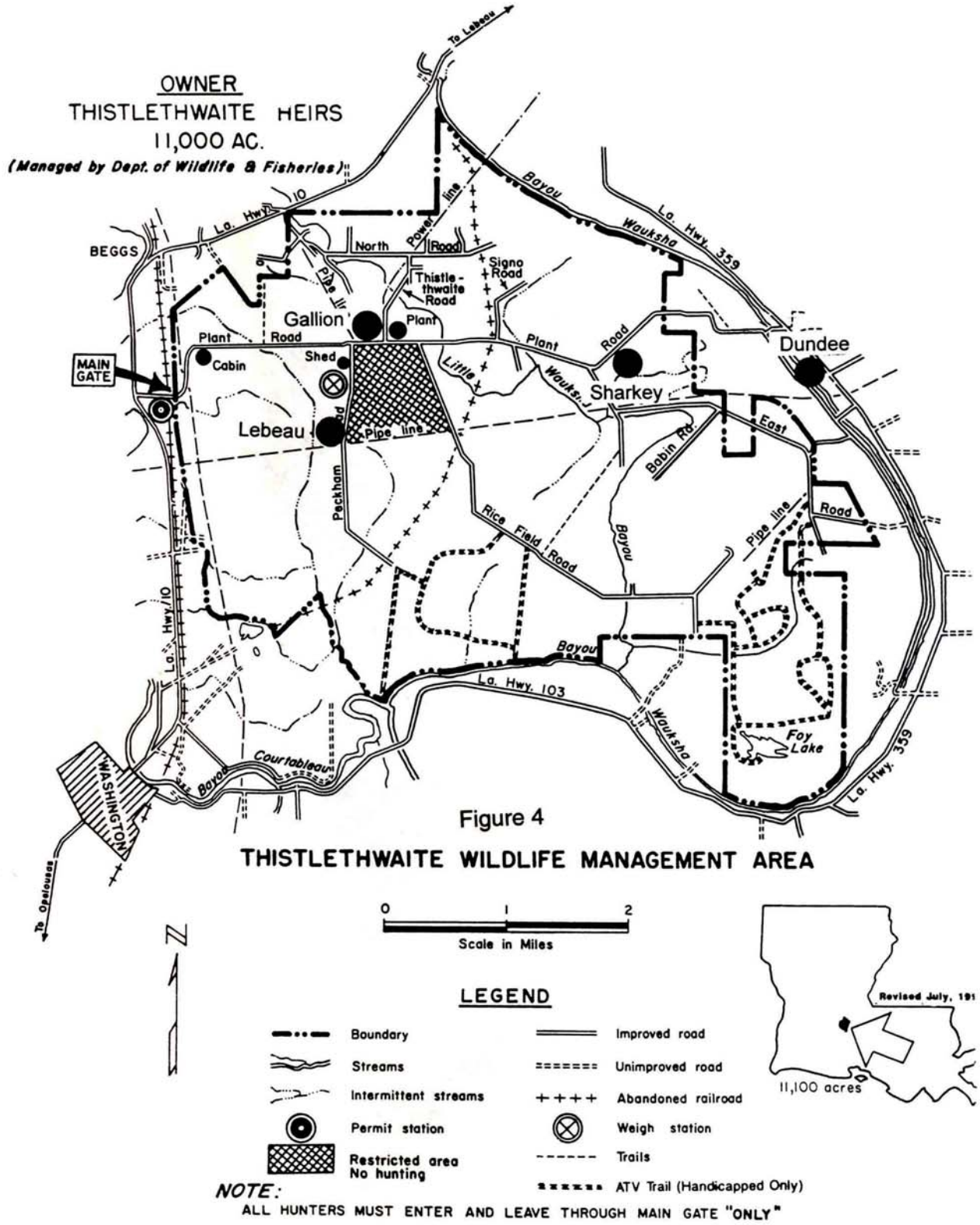


Figure 4

THISTLETHWAITE WILDLIFE MANAGEMENT AREA

NOTE:

ALL HUNTERS MUST ENTER AND LEAVE THROUGH MAIN GATE "ONLY"

SOILS

The location of the sites are shown in Figure 4.

DUNDEE

The Dundee Series consists of somewhat poorly drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are in the highest positions on the natural levees of former channels of the Mississippi River and its distributaries. Slopes range from 0 to 3 percent.

Soils of the Dundee series are fine-silty, mixed, thermic Aeric Ochraqualfs. The Dundee soils are commonly found near the Alligator, Baldwin, Loreauville, Tensas, and Sharkey soils. The poorly drained Alligator, Baldwin, and Sharkey soils are in lower positions than Dundee soils. The Loreauville and Tensas soils are in slightly lower positions than Dundee soils. The Alligator and Sharkey soils have a very-fine control section and the Baldwin and Tensas soils have a fine control section. The Loreauville soils are more alkaline in the subsoil than the Dundee soils.

Ap1--0 to 8 cm; brown (10YR 5/3), broken face; weak fine subangular blocky structure; friable; few fine roots throughout; few fine low continuity tubular pores; few fine irregular yellowish brown (10YR 5/4) soft masses of iron accumulation pedogenic throughout; clear wavy boundary.

Ap2--8 to 22 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; friable; few fine roots throughout; few fine low continuity tubular pores; common medium irregular yellowish brown (10YR 5/6) soft masses of iron accumulation pedogenic throughout; clear smooth boundary.

Bt1--22 to 34 cm; grayish brown (10YR 5/2), broken face, and brown (10YR 5/3), exterior; moderate medium subangular blocky structure; firm; few very fine roots throughout; few fine low continuity tubular pores and medium low continuity pores; few faint discontinuous dark grayish brown (10YR 4/2), moist, clay films on faces of peds; common medium irregular dark yellowish brown (10YR 4/4) soft masses of iron accumulation pedogenic throughout and common medium irregular dark yellowish brown (10YR 4/6) soft masses of iron accumulation pedogenic throughout and common fine rounded very hard iron-manganese concretions pedogenic throughout; gradual wavy boundary.

Bt2--34 to 58 cm; dark grayish brown (10YR 4/2), broken face; moderate medium subangular blocky structure; friable; few very fine roots throughout; few fine low continuity tubular pores and medium low continuity pores; many discontinuous dark grayish brown (10YR 4/2), moist, clayfilms on faces of peds; common medium irregular dark yellowish brown (10YR 4/4) soft masses of iron accumulation pedogenic throughout and few fine irregular black (10YR 2/1) hard pedogenic between peds; gradual wavy boundary.

Bt3--58 to 87 cm; grayish brown (10YR 5/2), broken face; moderatefine subangular blocky structure; very friable; few fine roots throughout and few very fine throughout; few medium low continuity tubular pores; few faint discontinuous dark grayish brown (10YR 4/2), moist, clay films on faces of peds; common medium irregular dark yellowish brown (10YR 4/6) soft masses of iron accumulation pedogenic throughout and few fine rounded very dark gray (10YR 3/1) slightly hard pedogenic throughout; gradual wavy boundary.

Bw1--87 to 109 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; very friable; few very fine roots throughout; few fine low continuity tubular pores; common medium irregular dark yellowish brown (10YR 4/4) soft masses of iron accumulation pedogenic throughout and common medium irregular yellowish brown (10YR 5/4) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary.

Bw2--109 to 123 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; very friable; few very fine roots throughout; few fine low continuity tubular pores; common medium irregular yellowish brown (10YR 5/6) soft masses of iron accumulation pedogenic throughout and common medium irregular yellowish brown (10YR 5/4) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary.

Bw3--123 to 147 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; very friable; few fine low continuity tubular pores; common fine irregular yellowish brown (10YR 5/4) soft masses of iron accumulation pedogenic throughout and common fine irregular yellowish brown (10YR 5/6) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary. 10YR 5/6 accumulations in pores.

Bw4--147 to 166 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; very friable; few very fine roots throughout; common medium irregular yellowish brown (10YR 5/4) soft masses of iron accumulation pedogenic throughout and common medium irregular yellowish brown (10YR 5/6) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary. 10YR 5/6 redox accumulations along pores.

Bw5--166 to 185 cm; grayish brown (2.5Y 5/2), broken face; weak fine subangular blocky structure; very friable; few very fine roots throughout; common medium irregular yellowish brown (10YR 5/6) soft masses of iron accumulation pedogenic throughout and few fine irregular strong brown (7.5YR 5/6) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary.

Bw6--185 to 208 cm; grayish brown (10YR 5/2), broken face; weak fine subangular blocky structure; very friable; common medium irregular strong brown (7.5YR 5/6) soft masses of iron accumulation pedogenic throughout; gradual wavy boundary.

Figure 5 - Dundee Temperature and Rainfall

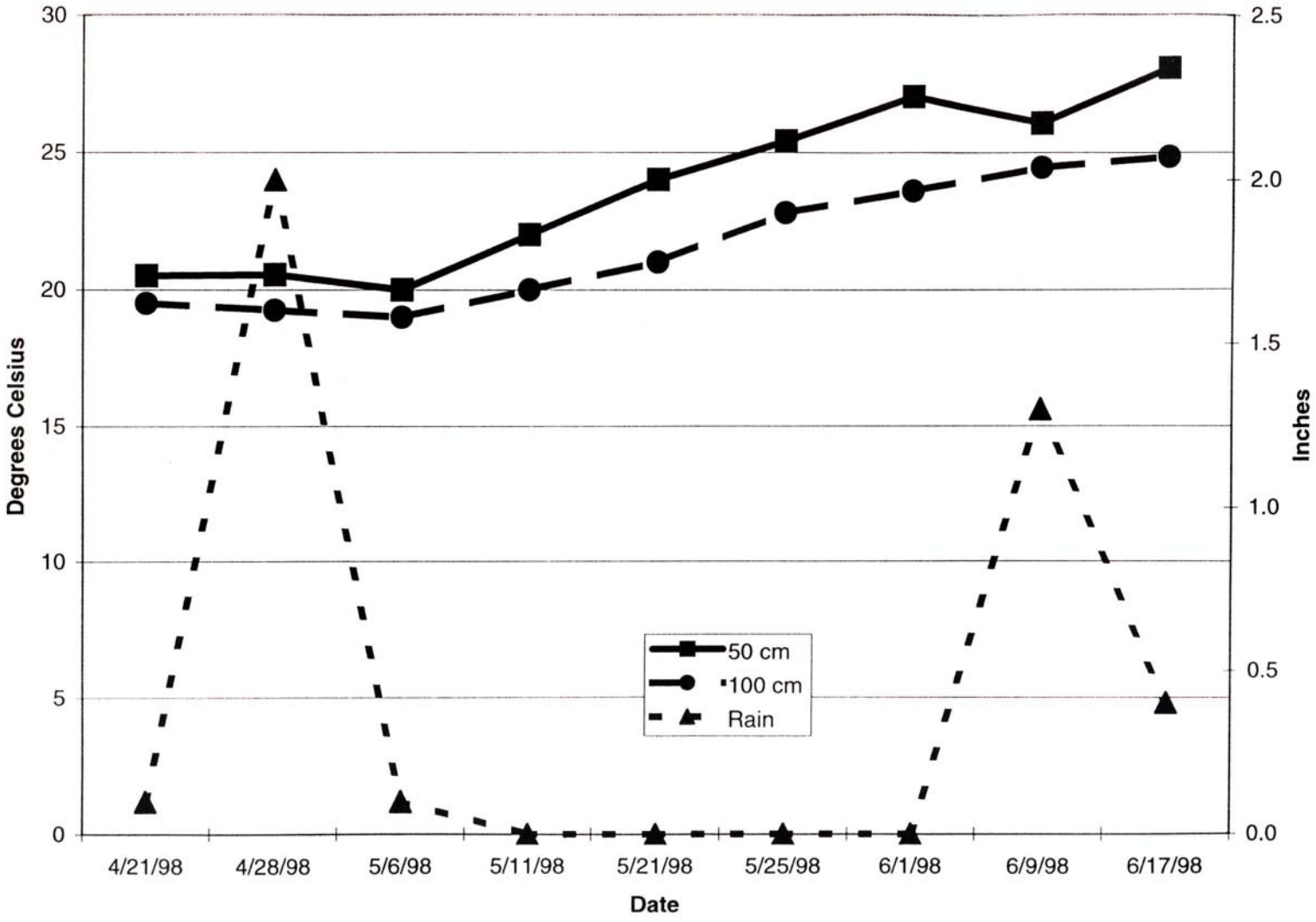


Figure 6 - Dundee Redox Potential 10 cm

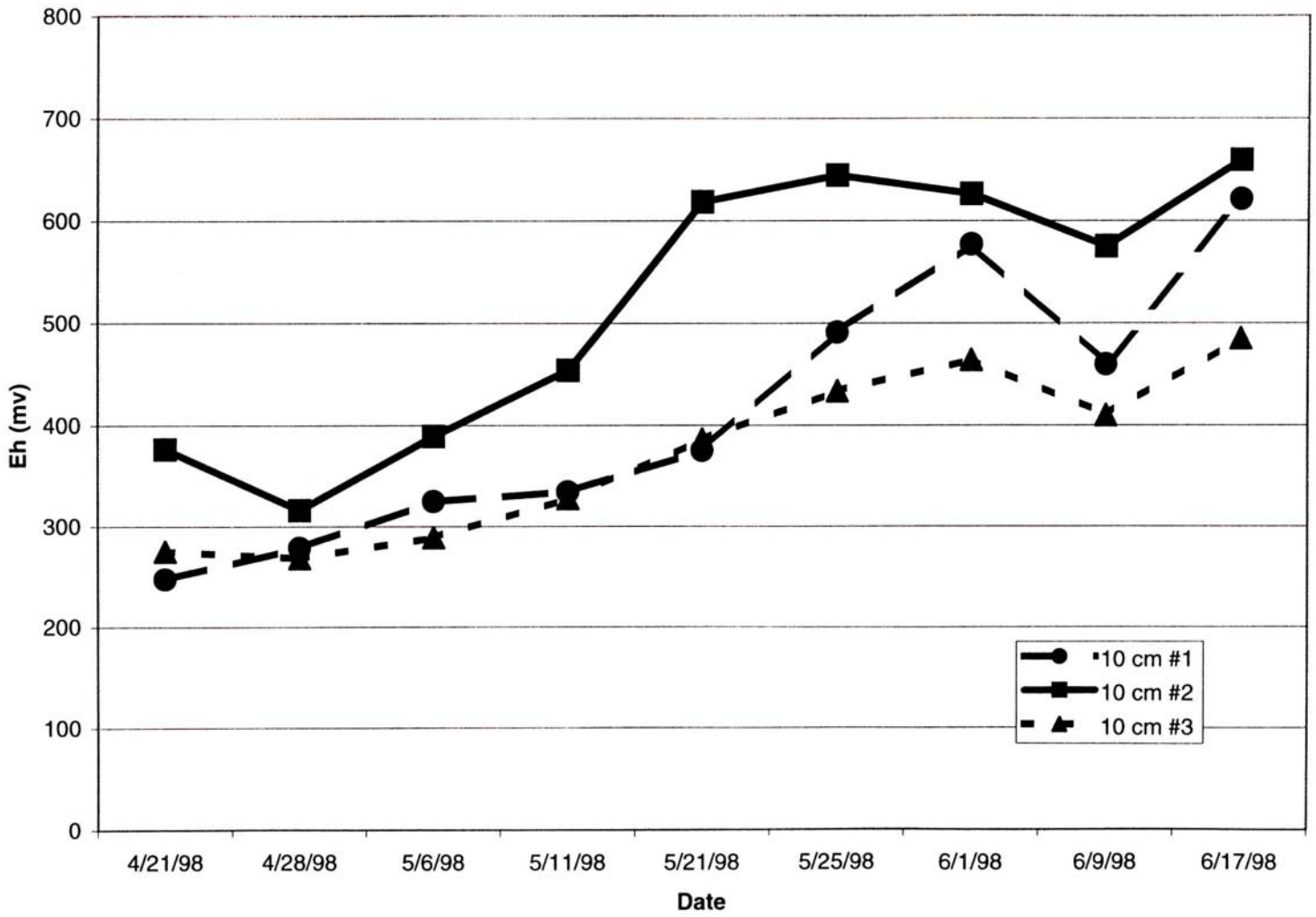


Figure 7 - Dundee Redox Potential 25 cm

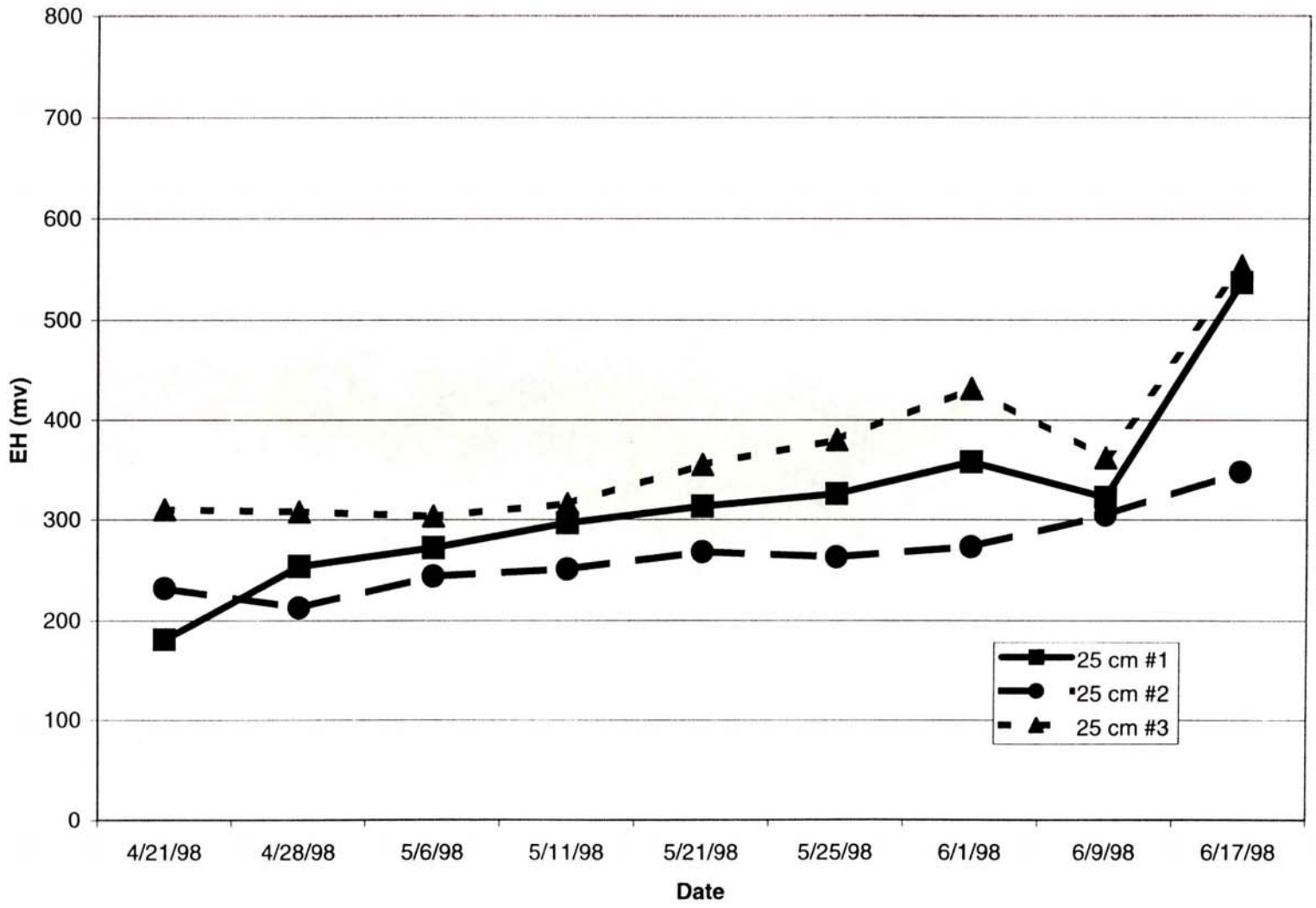


Figure 9 - Dundee Particle Size Distribution

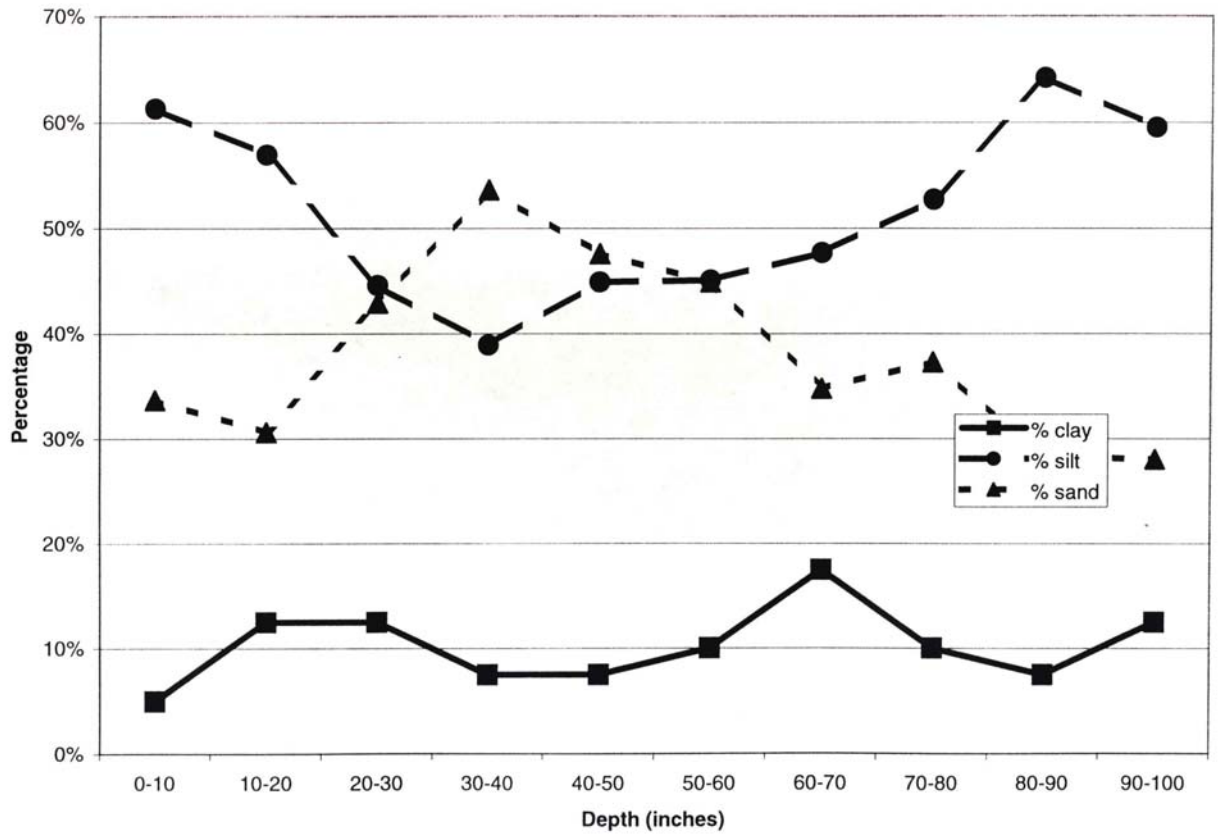


Table 1 - Particle Size Analysis

					Sand					
Sample	Depth (cm.)	%clay	%silt	%sand	vcs	cs	ms	fs	vfs	Class
Dundee	0-10	5.0%	61.3%	33.7%	0.36%	0.20%	0.25%	1.80%	31.09%	SiL
	10-20	12.5%	56.9%	30.6%	0.25%	0.37%	0.40%	4.74%	24.85%	SiL
	20-30	12.5%	44.6%	42.9%	0.03%	0.19%	0.25%	5.25%	37.18%	L
	30-40	7.5%	38.9%	53.6%	0.05%	0.02%	0.23%	6.66%	46.64%	SL
	40-50	7.5%	44.9%	47.6%	0.02%	0.07%	0.19%	4.97%	42.36%	L
	50-60	10.0%	45.1%	44.9%	0.01%	0.05%	0.20%	8.14%	36.50%	L
	60-70	17.5%	47.7%	34.8%	0.06%	0.08%	0.27%	2.57%	31.82%	L
	70-80	10.0%	52.7%	37.3%	0.06%	0.10%	0.24%	3.65%	33.25%	SiL
	80-90	7.5%	64.2%	28.3%	0.01%	0.14%	0.41%	1.65%	26.09%	SiL
	90-100	12.5%	59.5%	28.0%	0.05%	0.10%	0.24%	1.27%	26.33%	SiL

Figure 9 - Dundee Particle Size Distribution

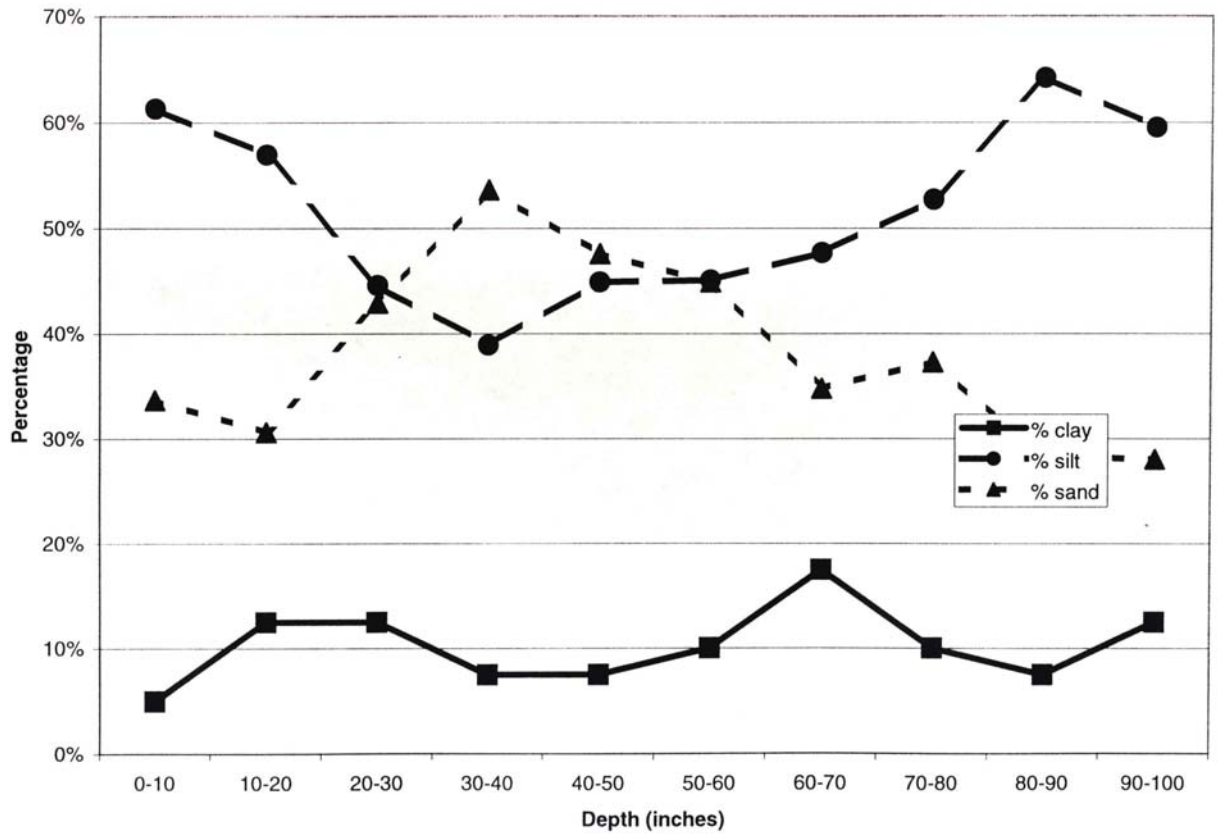


Table 2 - Fertility Profile

Soil	Depth	Horizon	pH	Organic matter (%)	P	Ca	Extractable cations (Meq/100g) Mg	K	Na	Al	H	Extractable Acidity	CEC	Base Sat.	Al Sat.	Na Sat.
Dundee	0-6	Ap	7.5	1.57	212	14.2	2.8	0.8	0.1	0.0	0.2	1.0	18.9	94.7	0.0	<1.0
	6-12	Bt1	5.4	0.59	92	8.1	3.7	0.5	0.2	0.7	0.3	8.6	21.1	59.2	5.2	<1.0
	12-19	Bt2	5.3	0.23	48	8.9	4.4	0.5	0.2	1.3	0.5	8.1	22.1	63.3	8.2	<1.0
	19-29	BC	5.4	0.25	88	7.8	3.8	0.4	0.2	1.0	0.3	7.6	19.8	61.6	7.4	1.0
	29-40	2C1	5.9	0.07	120	7.5	3.3	0.3	0.3	0.0	0.3	4.1	15.5	73.5	0.0	1.9
	40-60	2C2	6.6	0.04	198	7.3	3.2	0.6	0.6	0.0	0.2	2.6	13.9	81.3	0.0	4.3

Table 3 - Magenetic Susceptibility

Soil	Depth cm	Mass Specific LFMS $10^{-8}m^3kg^{-1}$	Dry color Hue	Dry color Value	Dry color Chroma	Wet color Hue	Wet color Value	Wet color Chroma	Organic Matter gkg^{-1}
Dundee	0-10	25.1	9.6YR	5.0	2.8	9.3YR	3.3	2.0	21.7
	10-20	23.9	9.3YR	5.4	3.1	9.0YR	3.6	2.4	9.7
	20-30	22.4	9.6YR	5.2	3.0	9.6YR	3.7	2.5	3.8
	30-40	23.9	9.6YR	5.3	3.0	9.4YR	3.8	2.4	2.9
	40-50	21.5	9.9YR	5.6	3.0	0.1Y	4.0	2.4	2.5
	50-60	20.2	0.1Y	5.5	2.8	9.6YR	4.1	2.5	2.3
	60-70	18.8	0.1Y	5.9	2.9	9.6YR	4.2	2.5	1.8
	70-80	21.9	0.1Y	5.4	2.8	0.1Y	3.8	2.3	2.4
	80-90	19.1	0.1Y	5.1	2.8	0.1Y	3.9	2.3	1.7
	90-100	21.5	0.1Y	5.5	2.8	0.1Y	4.1	2.4	1.6

SHARKEY

The Sharkey series consists of poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are on the lower parts of the natural levees and in back swamp areas on the Mississippi River alluvial plain. Slopes are less than 1 percent.

Soils of the Sharkey series are very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts.

The Sharkey soils commonly are near the Baldwin, Commerce, Dundee, Fausse, Iberia, and Tensas soils. The Baldwin soils have a fine textured control section and are in slightly higher positions than the Sharkey soils. The somewhat poorly drained Commerce and Dundee soils are fine-silty and are in higher positions than the Sharkey soils. The very poorly drained Fausse soils do not crack to a depth of 20 inches during most years. They are in lower positions than the Sharkey soils. The Iberia soils are in similar positions as the Sharkey soils and have a mollic epipedon. The Tensas soils have a fine textured control section and are in higher positions than the Sharkey soils.

Ap--0 to 6 inches; very dark grayish brown (10YR 3/2) clay; moderate fine angular blocky structure; firm; plastic; neutral; clear smooth boundary.

Bg1--6 to 18 inches; dark gray (5Y 4/1) clay; few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate medium angular blocky structure; firm; very plastic; common strong brown (7.5YR 5/6) root stains in root channels; shiny faces on peds; neutal; gradua; smooth boundary.

Bg2--18 to 28 inches; gray (10YR 5/1) clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium angular blocky structure; firm; very plastic; common slickensides; shiny faces on peds; neutral; gradual wavy boundary.

BCg--28 to 48 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red (5YR 4/6) mottles; weak medium angular blocky structure; firm; very plastic; many slickensides; neutral; gradual wavy boundary.

Cg-48 to 60 inches; gray (5Y 5/1) clay; common medium prominent yellowish brown (10YR 5/6) mottles; firm; massive; very plastic; moderately alkaline.

Thickness of the solum ranges from 36 to 60 inches.

The A or Ap horizon is 4 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. Reaction ranges from medium acid to moderately alkaline.

The Bg and BCg horizons have hue of 10YR or 5Y, value of 4 to 6, and chroma of 1. Reaction ranges from medium acid to moderately alkaline. Mottles in shades of brown, yellow, or red range from few to many.

The Cg horizon has the same range in colors as the Bg horizon. Texture is silty clay loam, silty clay, or clay. Reaction ranges from neutral to moderately alkaline.

Figure 10 - Sharkey Temperature and Rainfall

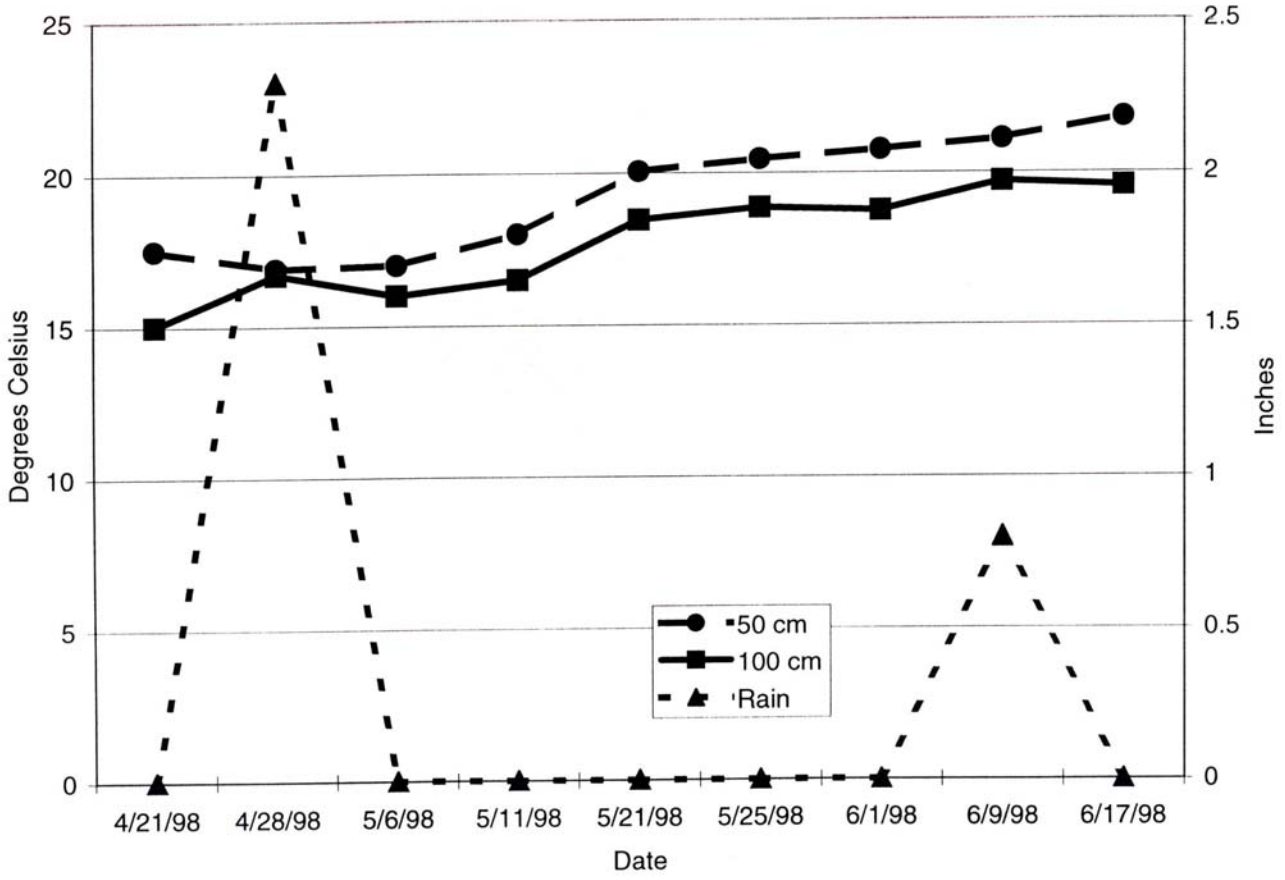


Figure 11 - Sharkey High Redox Potential 10 cm

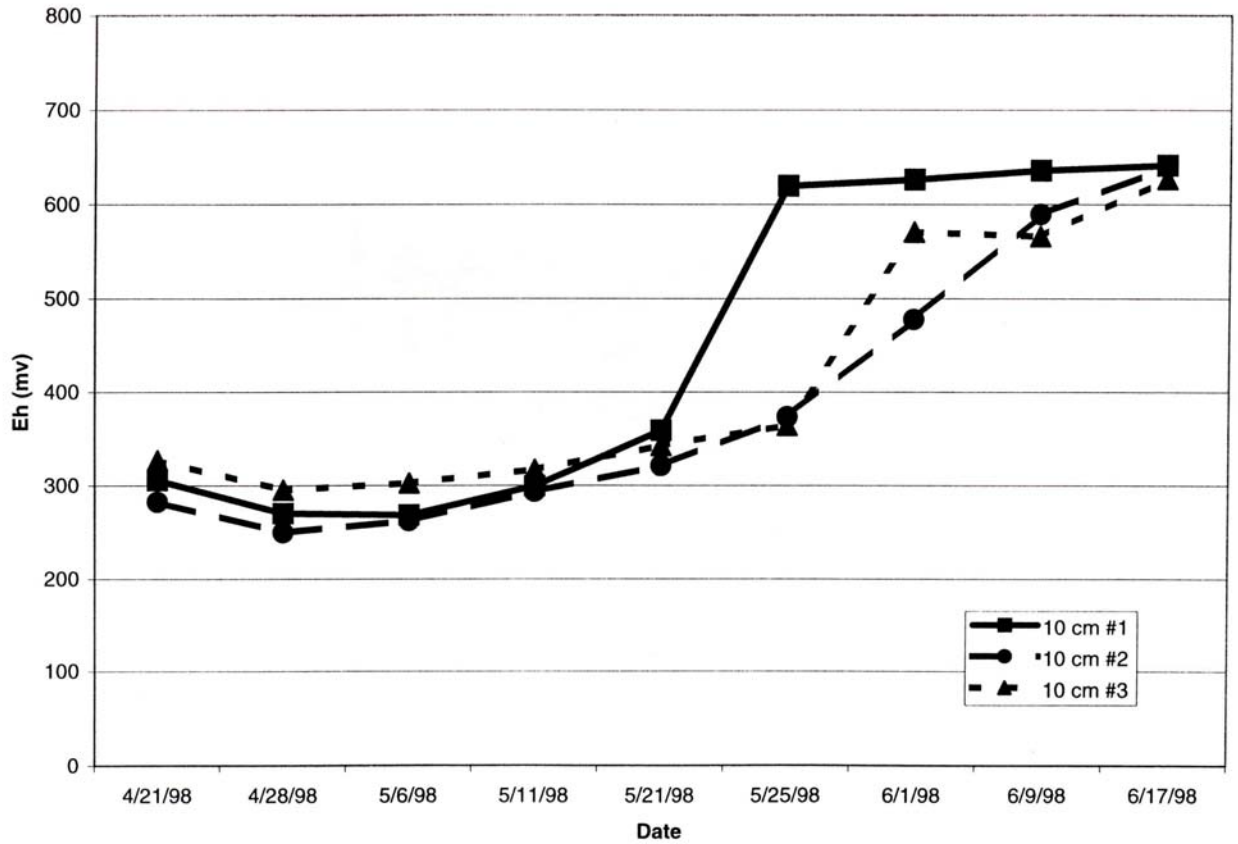


Figure 12 - Sharkey High Redox Potential 25 cm

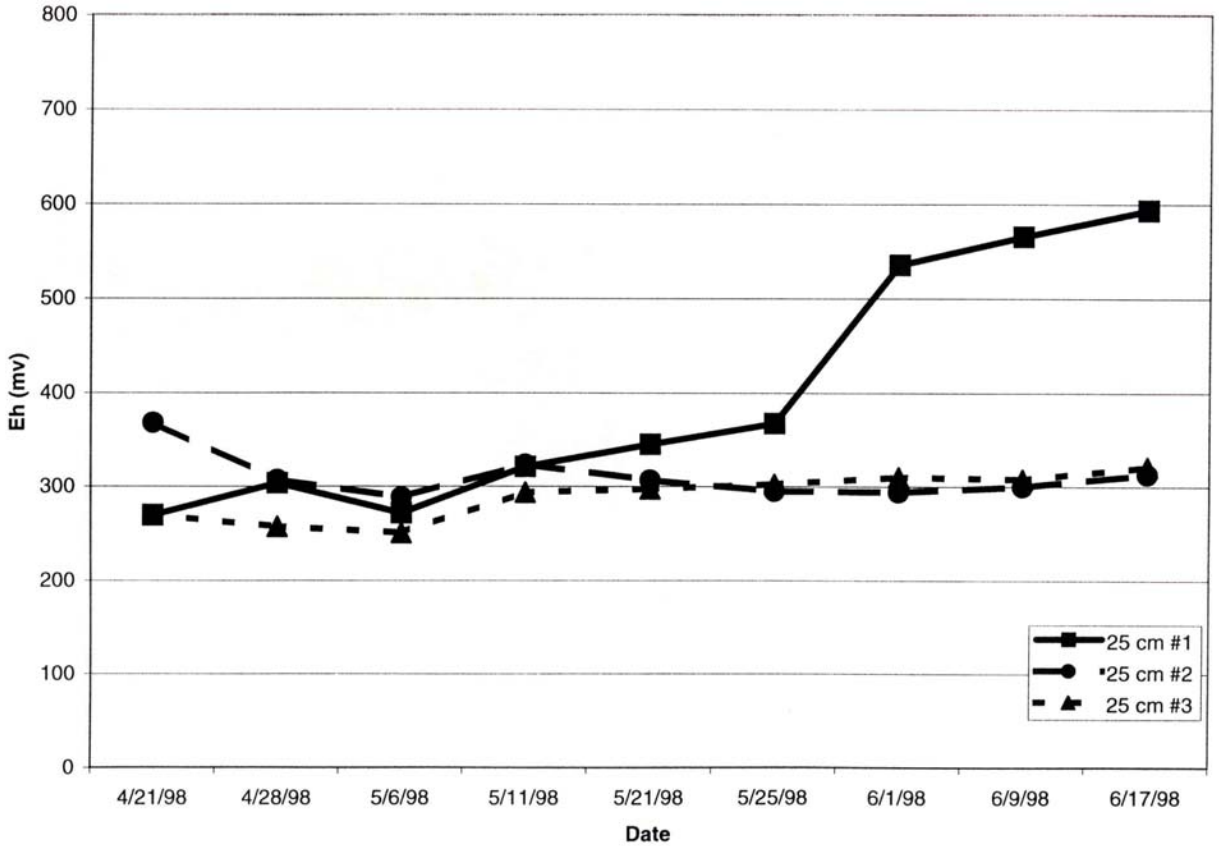


Figure 13 - Sharkey High Redox Potential 50 cm

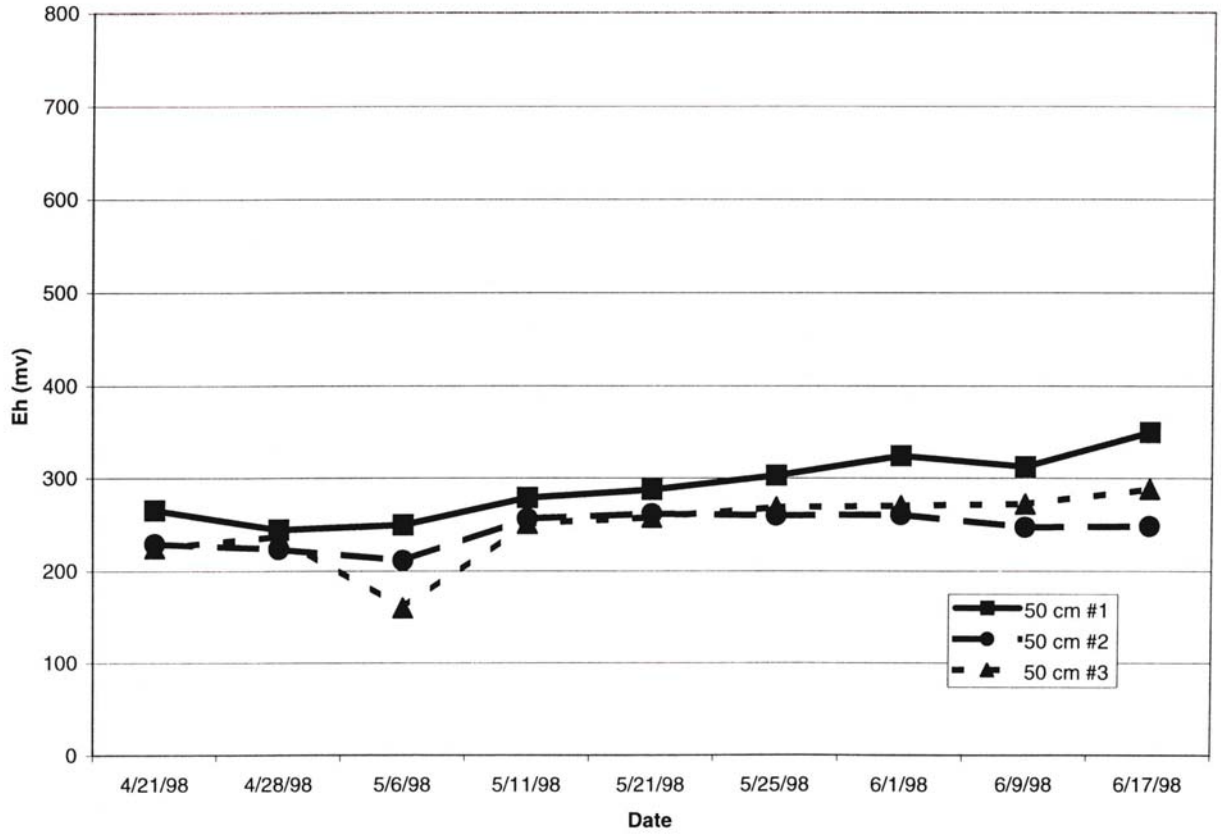


Figure 14 - Sharkey Low Redox Potential 10 cm

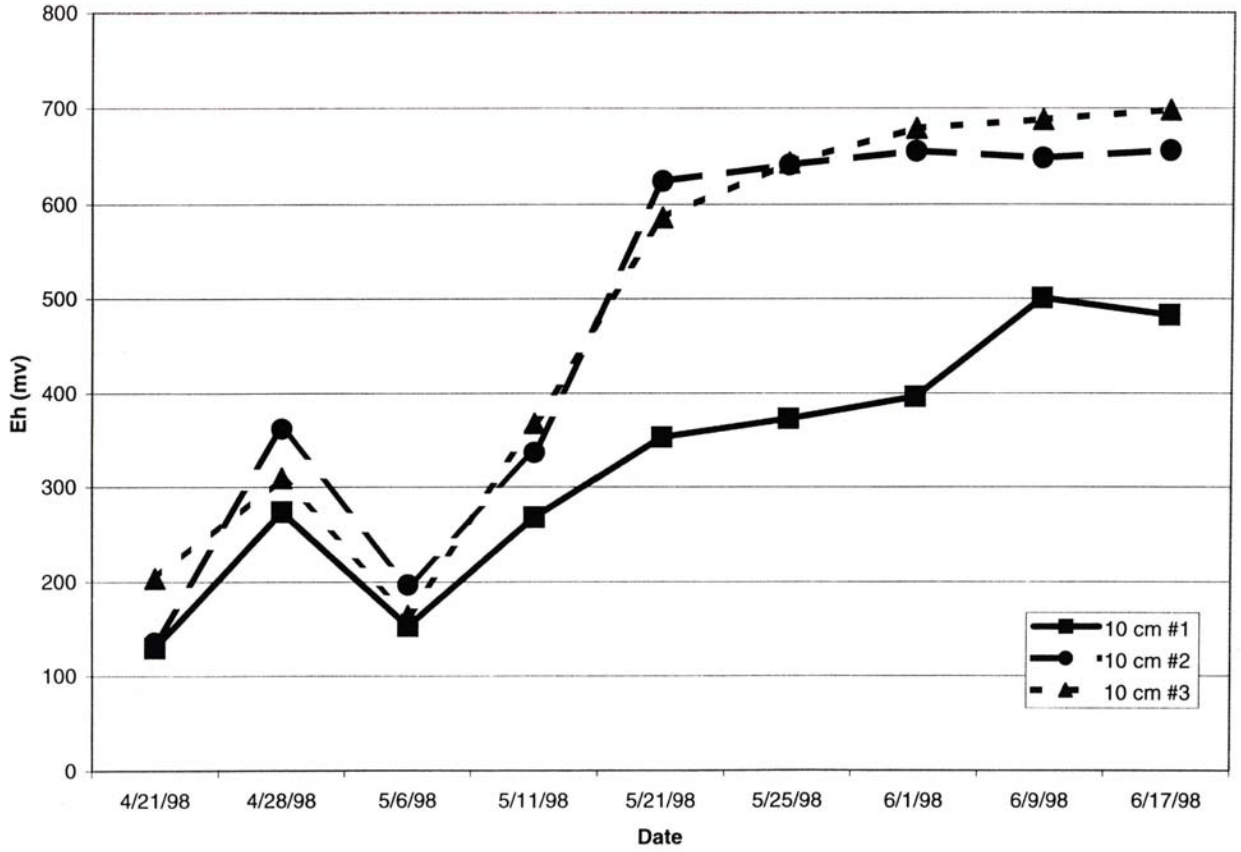


Figure 15 - Sharkey Low Redox Potential 25 cm

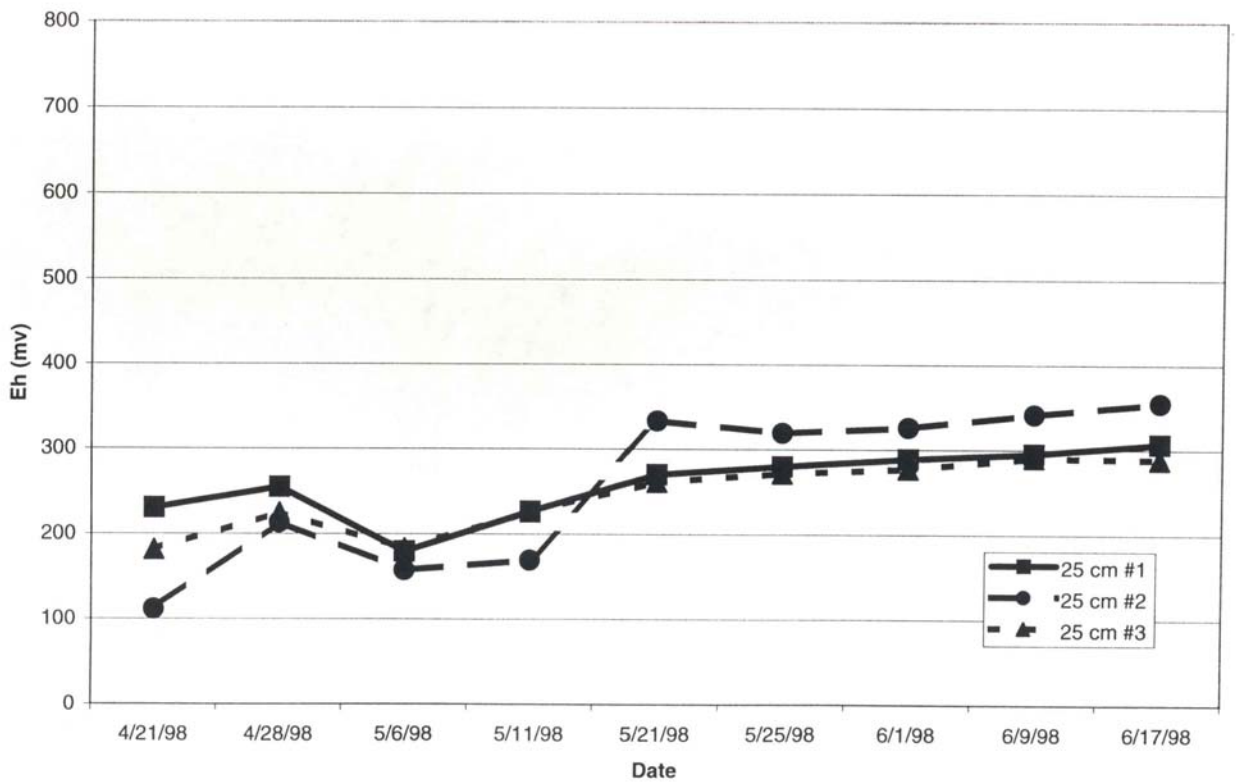


Figure 16 - Sharkey Low Redox Potential 50 cm

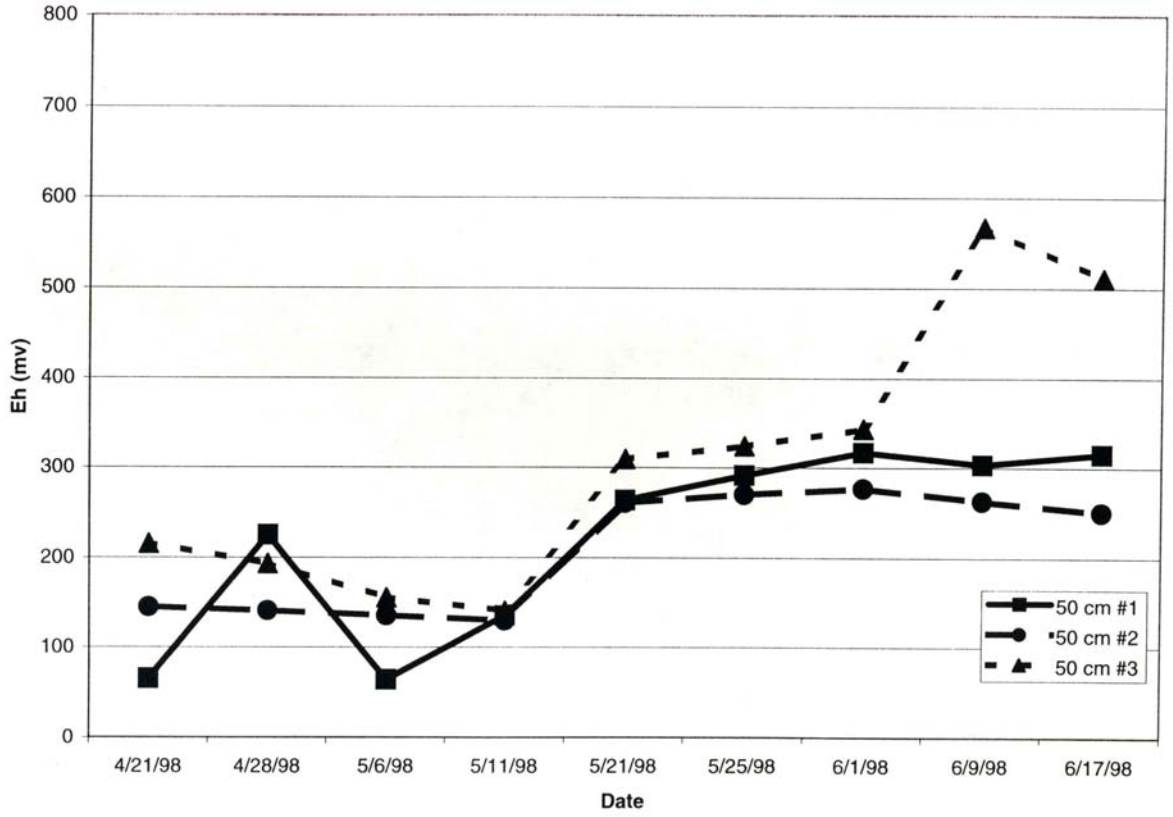


Table 4 - Fertility Profile

Soil	Depth	Horizon	pH	Organic matter (%)	P	Ca	Extractable cations (Meq/100g) Mg	K	Na	Al	H	Extractable Acidity	CEC	Base Sat.	Al Sat.	Na Sat.
Sharkey	0-6	Ap	6.6	1.38	68	27.4	10.6	1.1	0.4	0.0	0.2	9.7	49.2	80.3	0.0	<1.0
	6-18	Bg1	6.6	0.54	21	25.4	10.9	0.7	1.1	0.0	0.2	8.6	46.7	81.6	0.0	2.4
	18-28	Bg2	6.8	0.28	7	25.4	11.0	0.8	1.3	0.0	0.2	7.1	45.6	84.4	0.0	2.9
	28-48	BCg	7.3	0.28	31	25.8	11.0	0.9	1.2	0.0	0.2	8.2	47.1	82.6	0.0	2.5
	48-60	Cg	8.0	0.20	68	27	11.1	0.8	1.3	0.0	0.2	6.1	46.3	86.8	0.0	2.8

Table 5 - Magenetic Susceptibility

Soil	Depth cm	Mass Specific LFMS $10^{-8}m^3kg^{-1}$	Dry color Hue	Dry color Value	Dry color Chroma	Wet color Hue	Wet color Value	Wet color Chroma	Organic Matter gkg^{-1}
Sharkey high	0-10	9.2	0.1Y	4.3	1.8	0.1Y	3.3	1.5	40.5
	10-20	11.8	0.4Y	4.8	1.9	7.4YR	3.8	1.4	23.4
	20-35	12.1	0.1Y	5.0	2.4	8.2YR	4.0	2.0	17.3
	35-45	12.2	8.4YR	4.5	2.2	5.8YR	3.7	2.2	11.9
	45-55	11.3	0.1Y	5.1	1.7	7.7YR	3.9	1.7	11.0
	55-70	11.6	1.1Y	5.1	1.3	8.6YR	4.3	1.3	10.6
	70-85	10.8	9.7YR	5.2	1.8	7.9YR	4.3	1.7	7.5
	85-100	10.1	3.0Y	5.6	1.6	1.8Y	4.7	1.7	5.0
Sharkey low	0-8	9.3	9.6YR	4.4	1.6	2.7YR	2.9	1.4	99.8
	8-18	10.0	0.5Y	4.0	1.4	0.1Y	3.1	1.0	30.5
	18-25	9.8	1.5Y	4.4	1.1	7.4YR	3.3	0.9	30.2
	25-37	10.6	1.6Y	4.6	1.3	8.4YR	3.3	1.0	24.3
	37-47	9.8	1.0Y	4.6	1.1	3.5YR	3.1	1.0	26.0
	47-54	10.3	1.2Y	4.8	1.3	6.7YR	3.5	1.1	20.2
	54-64	10.8	1.4Y	4.8	1.7	8.6YR	3.7	1.7	15.2
	64-76	10.7	1.3Y	4.9	1.5	8.7YR	3.9	1.5	12.4
	76-91	10.6	2.0Y	5.2	1.4	9.8YR	4.1	1.4	11.2
	91-100	10.1	2.8Y	5.2	1.3	2.1Y	4.1	1.3	8.2

LUNCH

GALLION

The Gallion series consists of well drained, moderatley permeable soils that formed in reddish loamy alluvium. These soils are on natural levees of former channels of the Red River and its distributaries. Slopes range from 0 to 3 percent.

Soils of the Gallion series are fine-silty, mixed, thermic Typic Hapludalfs.

The Gallion soils are similar to the Memphis soils and are commonly near the Latanier, Lebeau, and Perry soils. The somewhat poorly drained Latanier soils and the poorly drained Lebeau and Perry soils are in lower positions than the Gallion soils. The Latanier soils have a clayey over loamy control section. The Lebeau and Perry soils have a very-fine control section. The Memphis soils are formed in loess. They have a browner subsoil than the Gallion soils.

Ap--0 to 8 inches; brown (7.5YR 4/4) silt loam; weak fine granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

Bt1--8 to 15 inches; yellowish red (5YR 4/6) silty clay loam; weak coarse subangular blocky structure; firm; few fine roots; common fine pores; distinct discontinuous clay films on surfaces of peds; neutral; gradual wavy boundary.

Bt2--15 to 27 inches; yellowish red (5YR 4/6) silty clay loam; weak medium subangular blocky structure; firm; few fine roots; many fine pores; distinct discontinuous clay films on surface of peds; neutral; abrupt smooth boundary.

BC--27 to 41 inches; yellowish red (5YR 4/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; many fine pores; thin patchy clay films in pores; neutral; clear wavy boundary.

C1--41 to 47 inches; reddish brown (5YR 4/4) silty clay loam; massive; firm; common fine pores; neutral; abrupt smooth boundary.

C2--47 to 60 inches; reddish brown (5YR 4/6) stratified silt loam and very fine sandy loam; massive; friable; mildly alkaline.

Thickness of the solum ranges from 40 to 60 inches.

The A horizon is 5 to 12 inches thick. It has hue of 10 YR of 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or silty clay loam. Reaction ranges from medium acid to neutral.

The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 3 to 6, or it has hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Reaction ranges from medium acid to mildly alkaline.

The BC horizon has the same colors as the Bt horizon. Texture is very fine sandy loam, silt loam, or silty clay loam. Reaction is neutral or mildly alkaline.

Figure 17 - Gallion Temperature and Rainfall

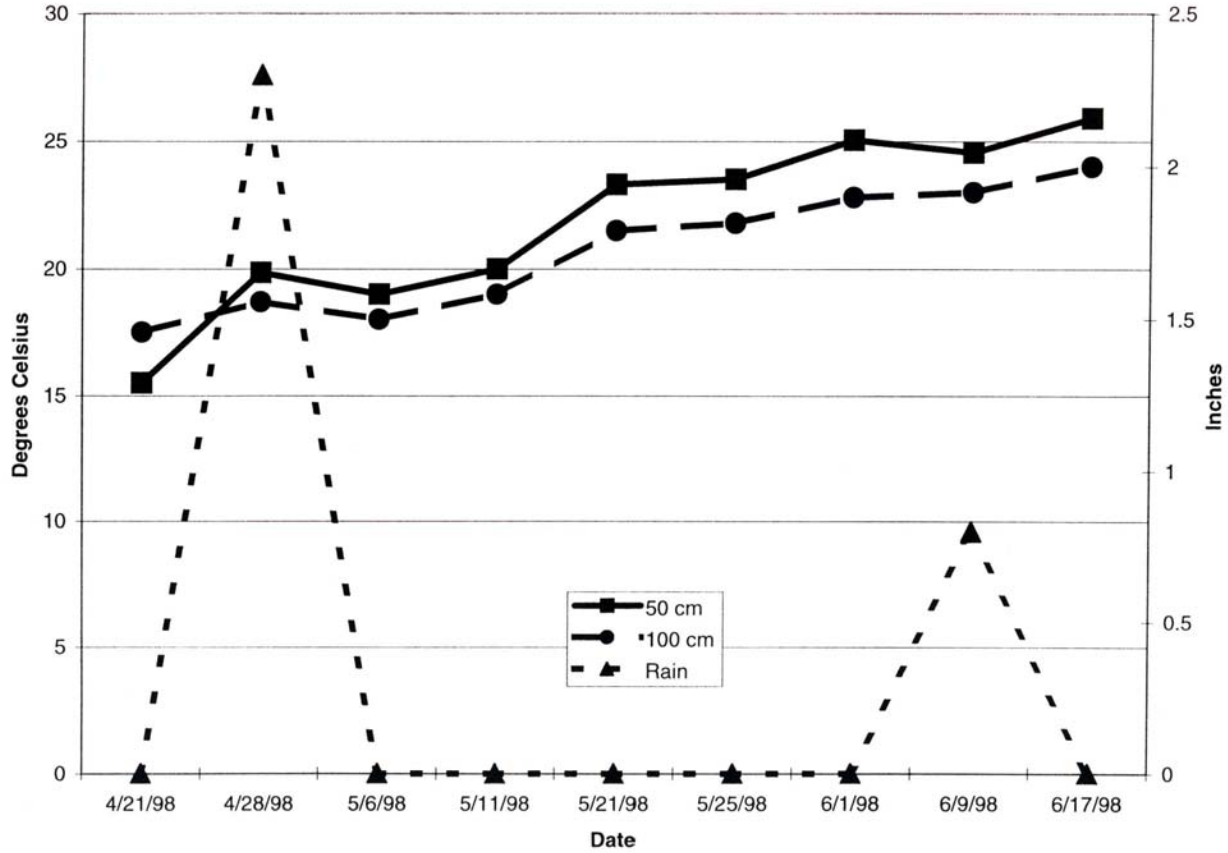


Figure 18 - Gallion Redox Potential 10 cm

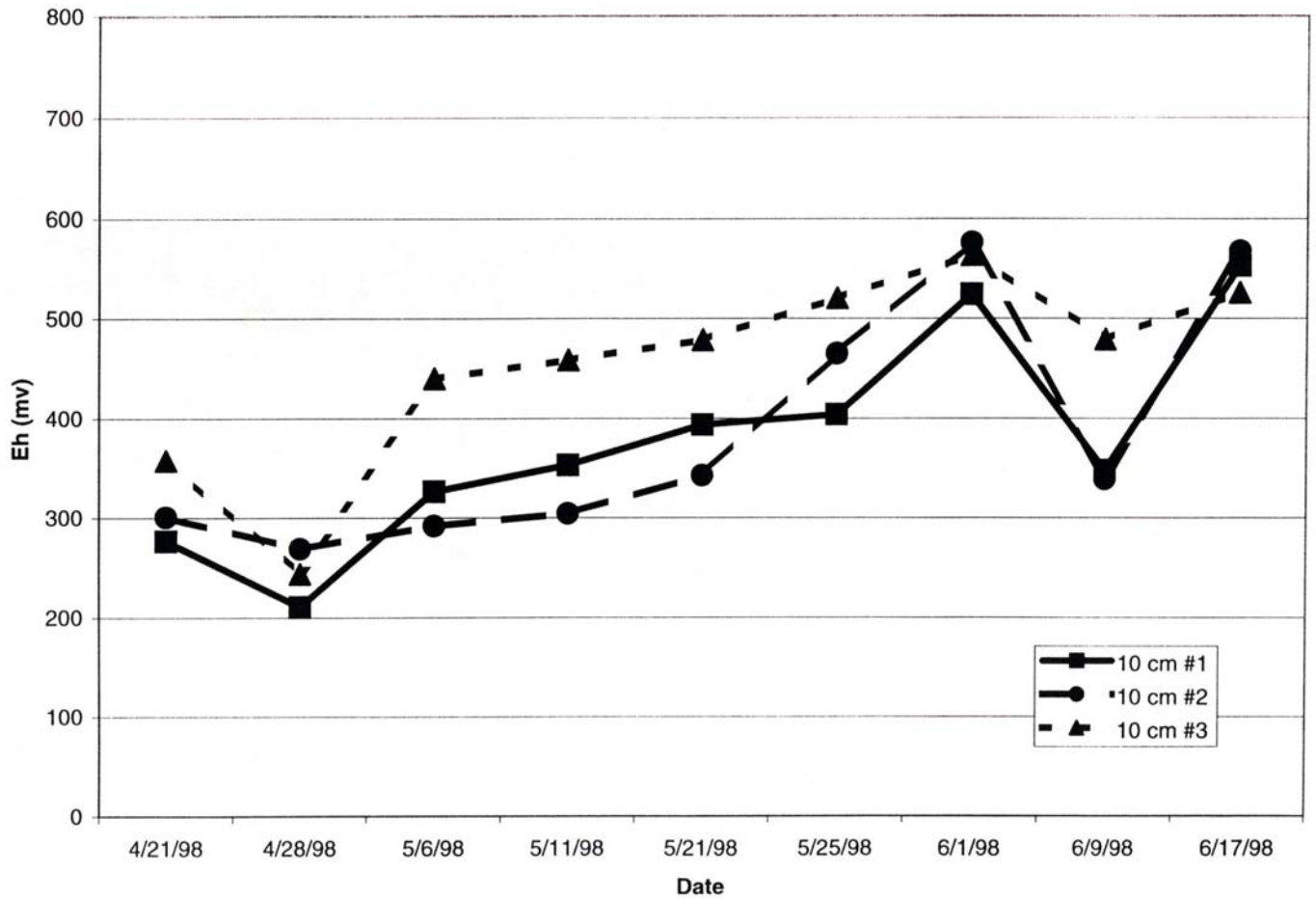


Figure 19 - Gallion Redox Potential 25 cm

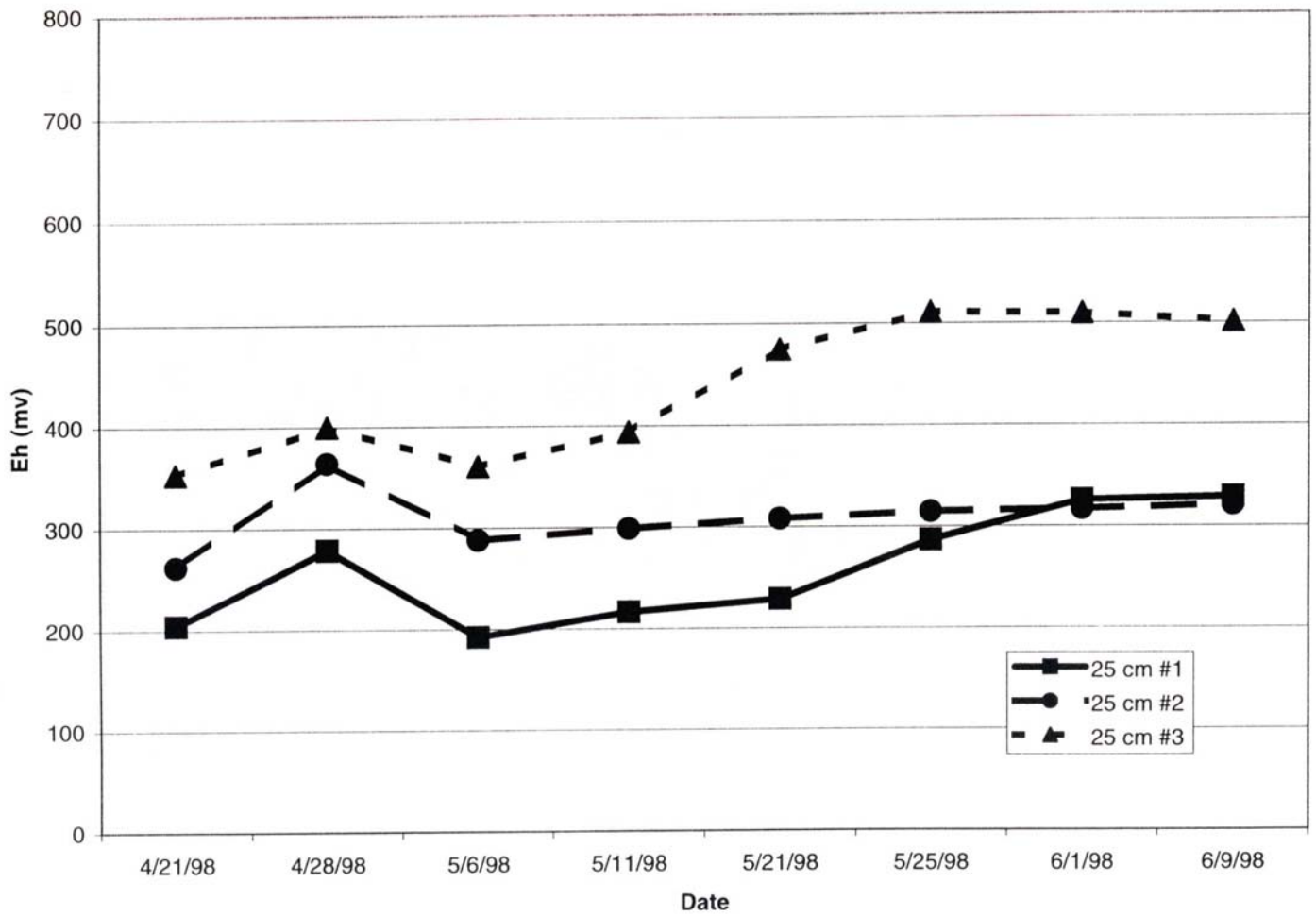


Figure 20 - Gallion Redox Potential 50 cm

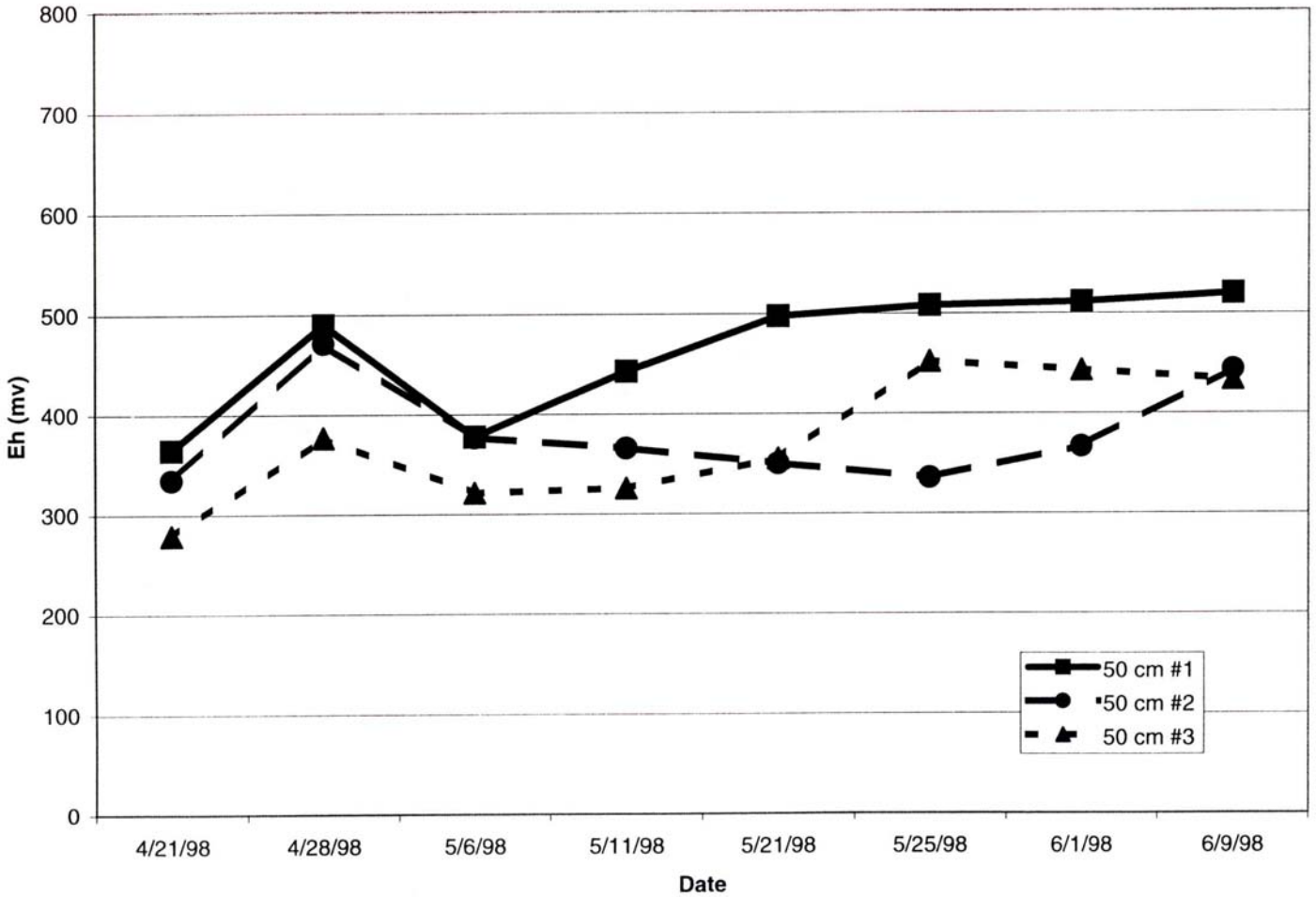


Table 6 - Particle Size Analysis

					Sand					
Sample	Depth (cm.)	%clay	%silt	%sand	vcs	cs	ms	fs	vfs	Class
Gallion	0-10	5.0%	46.6%	48.4%	2.84%	3.81%	6.52%	8.15%	27.08%	SL
	10-20	7.5%	48.3%	44.2%	0.32%	0.68%	1.19%	6.15%	35.87%	L
	20-30	7.5%	57.6%	34.9%	0.17%	0.20%	0.34%	2.53%	31.66%	SiL
	30-38	15.0%	45.5%	39.5%	0.05%	0.13%	0.25%	2.93%	36.15%	L
	38-50	15.0%	51.1%	33.9%	0.08%	0.16%	0.21%	2.63%	30.82%	SiL
	50-60	12.5%	49.0%	38.5%	0.00%	0.08%	0.13%	2.51%	35.78%	L
	60-75	10.0%	49.1%	40.9%	0.05%	0.05%	0.15%	4.00%	36.66%	L
	75-85	10.0%	48.2%	41.8%	0.03%	0.07%	0.16%	2.84%	38.71%	L
	85-95	12.5%	51.7%	35.8%	0.04%	0.09%	0.20%	4.63%	30.84%	SiL
	95-100	12.5%	53.3%	34.2%	0.10%	0.18%	0.19%	2.73%	31.00%	SiL

Figure 21 - Gallion Particle Size Distribution

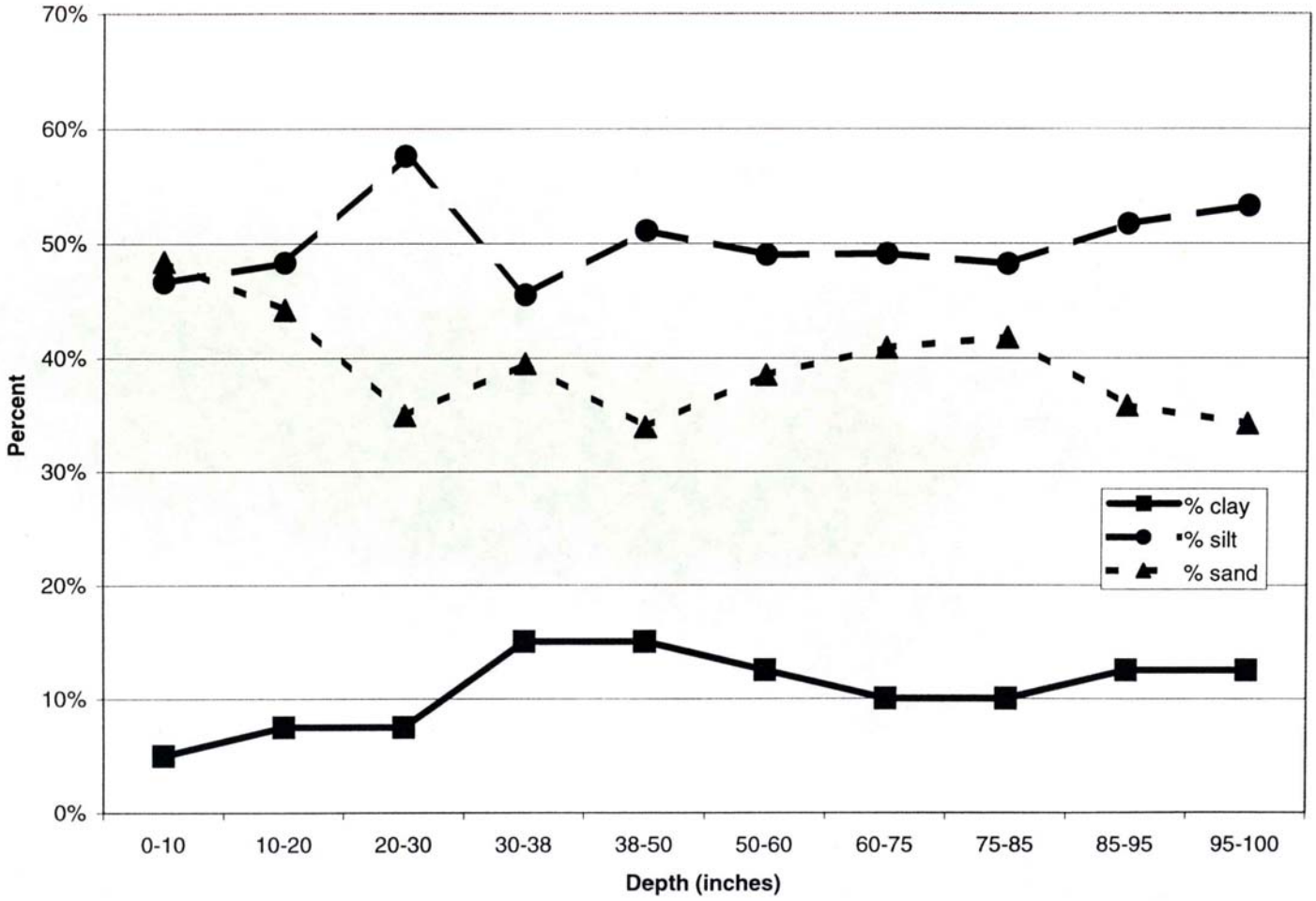


Table 7 - Fertility Profile

Soil	Depth	Horizon	pH	Organic matter (%)	P	Ca	Extractable cations (Meq/100g) Mg	K	Na	Al	H	Extractable Acidity	CEC	Base Sat.	Al Sat.	Na Sat.
Gallion	0-8	Ap	6.5	0.73	187	5.6	1.6	0.2	<0.1	0.0	0.2	1.0	8.4	88.1	0.0	<1.0
	8-15	Bt1	6.6	0.12	66	8.1	5.2	0.3	0.1	0.0	0.2	0.5	14.2	96.5	0.0	<1.0
	15-27	Bt2	6.6	0.07	124	7.4	5.6	0.3	0.1	0.0	0.2	3.1	16.5	81.2	0.0	<1.0
	27-41	BC	6.8	0.07	117	5.9	4.6	0.2	0.1	0.0	0.2	2.0	12.8	84.4	0.0	<1.0
	41-47	C1	7.0	0.07	138	7.9	6.1	0.3	0.2	0.0	0.2	1.0	15.5	93.5	0.0	1.3
	47-60	C2	7.4	0.02	127	5.9	3.8	0.2	0.1	0.0	0.2	1.5	11.5	87.0	0.0	<1.0

Table 8 - Magenetic Susceptibility

Soil	Depth cm	Mass Specific LFMS $10^{-8}m^3kg^{-1}$	Dry color Hue	Dry color Value	Dry color Chroma	Wet color Hue	Wet color Value	Wet color Chroma	Organic Matter gkg^{-1}
Gallion	0-10	9.6	9.0YR	3.9	2.3	9.0YR	2.9	1.1	39.5
	10-20	6.0	9.0YR	4.4	2.4	9.3YR	2.8	1.6	13.3
	20-30	4.9	9.3YR	4.7	2.3	9.3YR	3.1	1.7	9.2
	30-38	5.0	8.8YR	5.0	2.6	8.4YR	3.3	1.8	7.4
	38-50	5.9	7.3YR	4.1	3.7	6.7YR	3.4	3.1	4.7
	50-60	6.9	7.0YR	5.3	4.2	6.3YR	3.8	3.5	3.6
	60-75	7.3	7.5YR	5.2	3.8	6.8YR	3.8	3.4	2.9
	75-85	6.1	7.4YR	5.6	4.0	5.7YR	4.2	3.9	1.9
	85-95	5.5	7.2YR	5.6	4.2	6.5YR	4.0	3.6	1.1
	95-100	5.1	7.8YR	4.2	4.0	6.7YR	4.0	3.4	0.9

LEBEAU

The Lebeau series consists of poorly drained, very lowly permeable soils that are formed in reddish clayey alluvium. These soils are on the lower parts of natural levees of old distributary channels and in back swamps on the alluvial plain of the Red River. Slopes are less than 1 percent.

Soils of the Lebeau series are very-fine, montmorillonitic, thermic Aquentic Chromuderts.

The Lebeau soils commonly are near the Gallion, Latanier, and Perry soils. The well drained Gallioin soils have a fine-silty control section and are in higher positions " than the Lebeau soils. The somewhat poorly drained Latanier soils have a clayey over loamy control section and are in slightly higher positions than the Lebeau soils. The Perry soils do not have intersecting slickensides and are in lower positions than the Lebeau soils.

Site Identification #: 96LA097001 High

A--0 to 10 cm; brown (7.5YR 4/2); moderate medium subangular blocky structure; very firm, very sticky and very plastic; many fine and medium roots between peds; many fine pores; brown (7.5YR 4/4) calcite crystals throughout; clear smooth boundary.

Bw1--10 to 39 cm; dark reddish brown (5YR 3/3); moderate medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots; common fine pores; common distinct pressure faces; brown (7.5YR 4/2) calcite crystals at top of horizon and iron-manganese concretions; gradual wavy boundary.

Bw2--39 to 52 cm; dark reddish brown (5YR 3/3); moderate medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots and few medium; common fine pores; brown (7.5YR 4/2) nonmagnetic shot at top of horizon and gypsum crystals between peds; clear wavy boundary.

Bss--52 to 93 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure; very firm, very sticky and very plastic; few fine and medium roots in cracks; many intersecting slickensides; brown (7.5YR 4/2) calcite crystals at top of horizon and few fine light yellowish brown (10YR 6/4) masses of carbonate; gradual wavy boundary.

Bkssy1--93 to 112 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine and medium roots in cracks; many intersecting slickensides; dark gray (10YR 4/1) plinthite segregations at top of horizon and many gypsum crystals between peds and few fine light yellowish brown (10YR 6/4) masses of carbonate; strongly effervescent; clear wavy boundary.

Bkssy2--112 to 131 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky

and very plastic; few fine roots in cracks; many intersecting slickensides; dark gray (10YR 4/1) masses of lime at top of horizon and masses of iron-manganese accumulation between peds and many light brown (7.5YR 6/4) masses of carbonate; strongly effervescent; clear wavy boundary.

Bssg--131 to 155 cm; dark gray (2.5Y 4/1); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots in cracks; few fine pores; many intersecting slickensides; dark yellowish brown (10YR 4/4) nonmagnetic shot throughout and dark reddish brown (5YR 3/3) calcite crystals throughout and masses of gypsum between peds; clear wavy boundary.

Bss1--155 to 187 cm; reddish brown (5YR 4/4); strong medium subangular blocky structure; very firm, very sticky and very plastic; few fine roots in cracks; few fine pores; many intersecting slickensides; dark gray (10YR 4/1) masses of iron-manganese accumulation throughout and iron-manganese concretions and few fine masses of carbonate; gravel; clear wavy boundary. Few 7.5YR 5/6 iron accumulations in ped interior.

Bss2--187 to 214 cm; reddish brown (5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; few fine pores; many intersecting slickensides; dark gray (10YR 4/1) calcite crystals between peds and iron-manganese concretions; clear wavy boundary. Grooved.

Bss3--214 to 232 cm; reddish brown (2.5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; few fine pores; many intersecting slickensides; dark gray (10YR 4/1) masses of lime throughout and common iron-manganese concretions.

Site Identification #: 96LA097002 Low

A1--0 to 8 cm; dark grayish brown (10YR 4/2); weak medium subangular blocky structure; very firm, very sticky and very plastic; many fine and medium roots; many medium pores; common organic coats on faces of peds; brown (7.5YR 4/3) calcite crystals throughout; clear smooth boundary.

A2--8 to 14 cm; reddish brown (5YR 4/3) and weak red (2.5YR 4/2); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine and medium roots; common fine pores; reddish brown (5YR 4/4) nonmagnetic shot at top of horizon and few fine iron concretions and few fine iron-manganese concretions; clear smooth boundary.

Bw--14 to 37 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots and few medium; few very fine pores; few patchy pressure faces; dark reddish gray (5YR 4/2)

masses of lime at top of horizon; clear wavy boundary. Few fine 10YR 3/1, organic accumulations on ped faces.

Bssg--37 to 61 cm; dark gray (2.5Y 4/1); moderate medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots; few intersecting slickensides and common pressure faces; dark yellowish brown (10YR 4/4) nonmagnetic shot throughout and reddish brown (5YR 4/4) and few fine gypsum crystals; gradual wavy boundary.

Bss--61 to 107 cm; dark grayish brown (10YR 4/2); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots; few fine pores; common pressure faces and common intersecting slickensides; dark yellowish brown (10YR 4/4) nonmagnetic shot throughout and (7.5YR) and reddish brown (5YR 4/4) masses of iron accumulation at top of horizon and few fine gypsum crystals; clear wavy boundary.

Bkssy1--107 to 122 cm; dark reddish brown (5YR 3/3); moderate medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; few fine pores; many intersecting slickensides; brown (7.5YR 4/2) plinthite segregations at top of horizon and few carbonate concretions and many fine gypsum crystals and many threads masses of carbonate between peds; slightly effervescent; clear wavy boundary.

Bkssy2--122 to 142 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many intersecting slickensides and many pressure faces; dark gray (10YR 4/1) nonmagnetic shot at top of horizon and common gypsum crystals and _ few carbonate concretions; slightly effervescent; gradual wavy boundary. grooved; few organic pockets.

Bss1--142 to 162 cm; brown (7.5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; dark grayish brown (2.5Y 4/2) masses of iron-manganese accumulation at top _ of horizon and reddish brown (5YR 4/4) calcite crystals throughout and few fine carbonate concretions; slightly effervescent; gradual wavy boundary.

Bss2--162 to 186 cm; reddish brown (5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; few fine pores; many intersecting slickensides; dark grayish brown (2.5Y 4/2) masses of iron-manganese accumulation at top of horizon and common fine gypsum crystals; gradual wavy boundary. Grooved.

Bss3--186 to 210 cm; reddish brown (5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many intersecting slickensides; dark grayish brown (2.5Y 4/2) masses of iron-manganese accumulation throughout and few fine iron-manganese concretions. Grooved.

Site Identification #: 96LA097002A

A2--8 to 26 cm; reddish brown (5YR 4/3) and brown (7.5YR 4/2); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine and medium roots; common fine pores; reddish brown (5YR 4/4) nonmagnetic shot at top of horizon and few fine iron-manganese concretions.

Bw--26 to 43 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots and few medium; few very fine pores; few patchy pressure faces; dark reddish gray (5YR 4/2) masses of lime at top of horizon. Few fine 10YR 3/1 organic accumulations on ped faces.

Bssg--43 to 52 cm; dark reddish gray (2.5YR 4/1); moderate medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots; common pressure faces and common intersecting slickensides; (7.5YR/) nonmagnetic shot and reddish brown (5YR 4/4) masses of iron accumulation at top of horizon and few fine gypsum crystals.

Bss--53 to 83 cm; dark grayish brown (10YR 4/2); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots; few fine pores; common pressure faces and common intersecting slickensides; dark yellowish brown (10YR 4/4) nonmagnetic shot throughout and reddish brown (5YR 4/4) masses of iron accumulation at top of horizon and few fine gypsum crystals.

Bw--10 to 38 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure; very firm, very sticky and very plastic; few fine pores; common pressure faces; few fine gypsum crystals and dark grayish brown (10YR 4/2) masses of iron-manganese accumulation at top of horizon.

Bssg--67 to 100 cm; dark gray (2.5Y 4/1); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots and few medium; few intersecting slickensides; dark yellowish brown (10YR 4/4) nonmagnetic shot at top of horizon and reddish brown (5YR 4/4) calcite crystals throughout; clear wavy boundary.

Bkssy--78 to 109 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots in cracks; many intersecting slickensides; dark gray (10YR 4/1) plinthite segregations at top of horizon and common medium light yellowish brown (10YR 6/4) masses of carbonate and many gypsum crystals between peds.

Site Identification #: 96LA097002B High

A--0 to 8 cm; brown (7.5YR 4/2); moderate medium subangular blocky structure; very firm, very sticky and very plastic; many fine and medium roots between peds; many fine pores; brown (7.5YR 4/4) calcite crystals between peds and strong brown (7.5YR 4/6) masses of iron-manganese accumulation between peds; clear smooth boundary.

Bw1--8 to 33 cm; brown (7.5YR 4/2); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots; common fine pores; dark gray (10YR 4/1) masses of lime throughout; clear smooth boundary. 1 crawfish crotovina.

Bw2--33 to 58 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure; very firm, very sticky and very plastic; common fine roots; few medium pores; common pressure faces; dark gray (10YR 4/1) masses of lime throughout and few fine masses of carbonate between peds; clear wavy boundary. Slightly grooved

Bg--58 to 67 cm; gray (5Y 5/1); weak medium subangular blocky structure; friable, very sticky and very plastic; common fine roots; common pressure faces; brown (7.5YR 4/4) calcite crystals at top of horizon and dark yellowish brown (10YR 4/4) plinthite segregations in cracks; gradual wavy boundary. Common fine 5YR 3/3 iron accumulations on ped faces.

Bss--100 to 109 cm; reddish brown (5YR 4/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many intersecting slickensides; dark gray (10YR 4/1) masses of iron accumulation at top of horizon and common fine carbonate concretions; slightly effervescent; gradual wavy boundary.

Bkss1--109 to 116 cm; reddish brown (5YR 4/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many intersecting slickensides; dark gray (2.5Y 4/1) masses of iron-manganese accumulation at top of horizon and many fine carbonate concretions; slightly effervescent; clear wavy boundary.

Bkss2--116 to 145 cm; brown (7.5YR 4/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; gray (2.5Y 5/1) masses of iron-manganese accumulation at top of horizon and common fine dark yellowish brown (10YR 4/6) masses of iron accumulation throughout and common fine reddish brown (5YR 4/4) masses of iron accumulation throughout and few fine light brown (7.5YR 6/4) carbonate nodules; slightly effervescent; gradual wavy boundary.

Bss--145 to 200 cm; reddish brown (5YR 4/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many intersecting slickensides; dark gray (10YR 4/1) masses of iron-manganese accumulation throughout and few fine iron-manganese concretions and few fine masses of carbonate; slightly effervescent.

Bssg--52 to 72 cm; dark gray (10YR 4/1); weak and moderate medium subangular blocky structure parting to weak and moderate medium wedge-shaped aggregates; very sticky and very plastic; few fine roots; many prominent intersecting slickensides and many pressure faces; dark yellowish brown (10YR 4/4) masses of lime at top of horizon and brown (7.5YR 4/3) calcite crystals between peds. Few fine pockets of organic bodies; grooved.

Bss--52 to 73 cm; dark grayish brown (10YR 4/2); moderate medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; common fine roots; common intersecting slickensides and common pressure faces; few dark yellowish brown (10YR 4/4) nonmagnetic shot and few fine masses of gypsum and reddish brown (5YR 4/4) masses of iron accumulation at top of horizon.

Bkssy1--73 to 112 cm; dark reddish brown (5YR 3/3); moderate medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; few fine pores; few brown (7.5YR 4/2), moist, iron stains on faces of peds and many intersecting slickensides; many fine gypsum crystals and few carbonate nodules. Many soft filaments of calcium carbonate between peds.

Bkssy2--112 to 152 cm; dark reddish brown (5YR 3/3); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; many pressure faces and many intersecting slickensides; dark gray (10YR 4/1) nonmagnetic shot at top of horizon and common masses of gypsum and few carbonate nodules. Grooved; few organic pockets.

Bss1--152 to 166 cm; brown (7.5YR 4/4); strong medium subangular blocky structure parting to wedge-shaped aggregates; very firm, very sticky and very plastic; few fine roots; dark grayish brown (2.5Y 4/2) masses of iron-manganese accumulation at top of horizon and reddish brown (5YR 4/4) calcite crystals throughout and few fine carbonate nodules; slightly effervescent.

Figure 22 - Lebeau Temperature and Rainfall

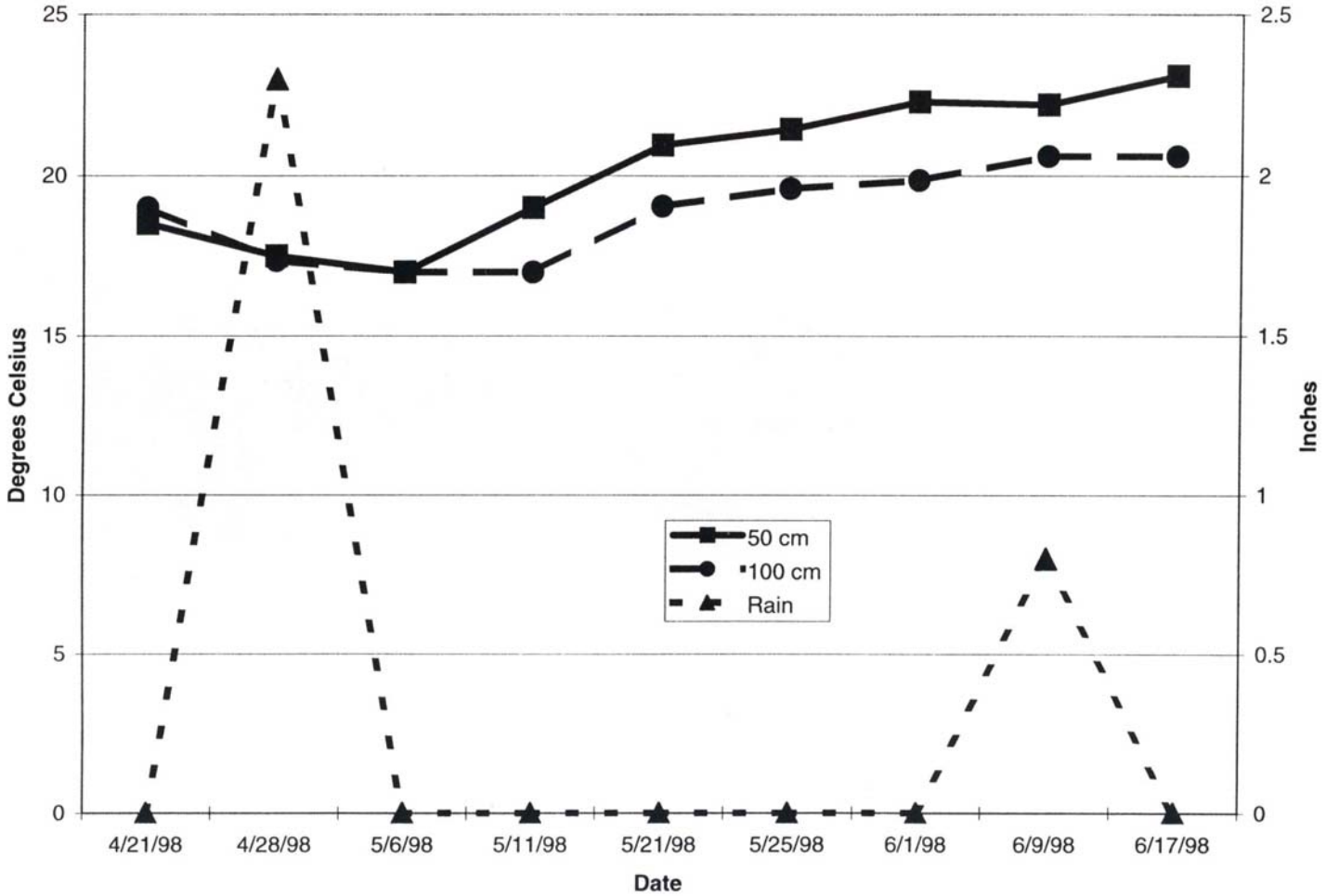


Figure 23 - Lebeau High Redox Potential 10 cm

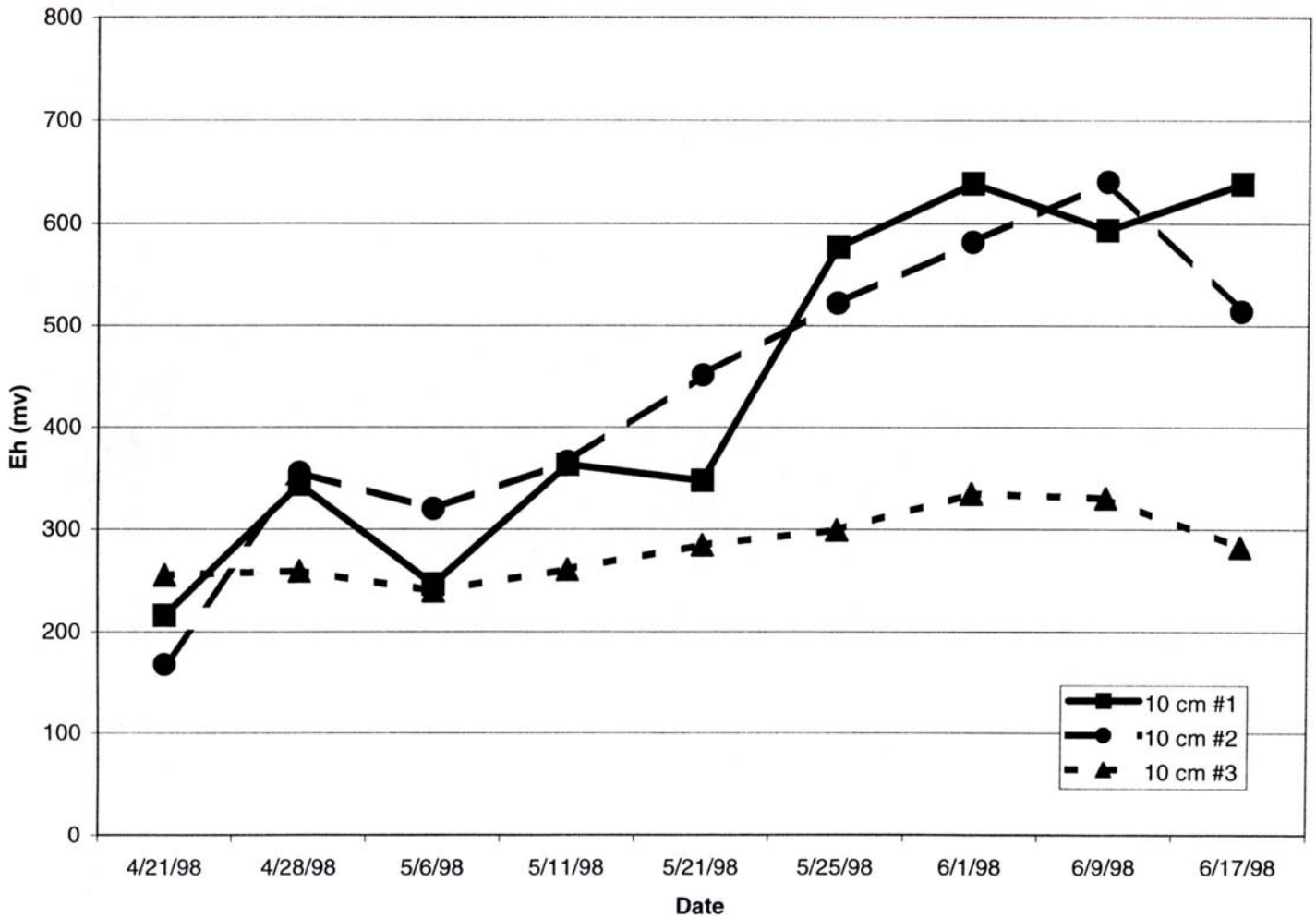


Figure 24 - Lebeau High Redox Potential 25 cm

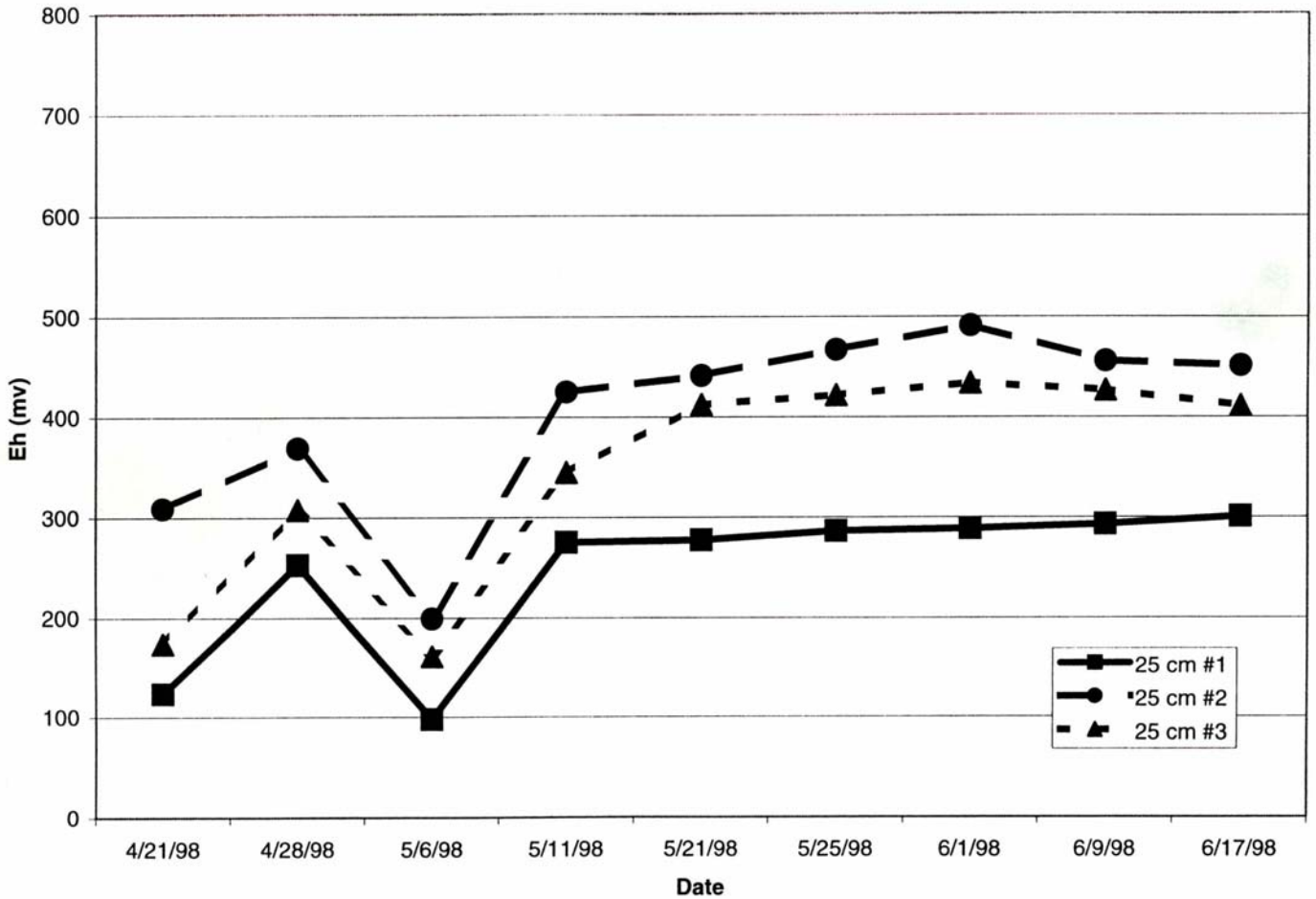


Figure 25 - Lebeau High Redox Potential 50 cm

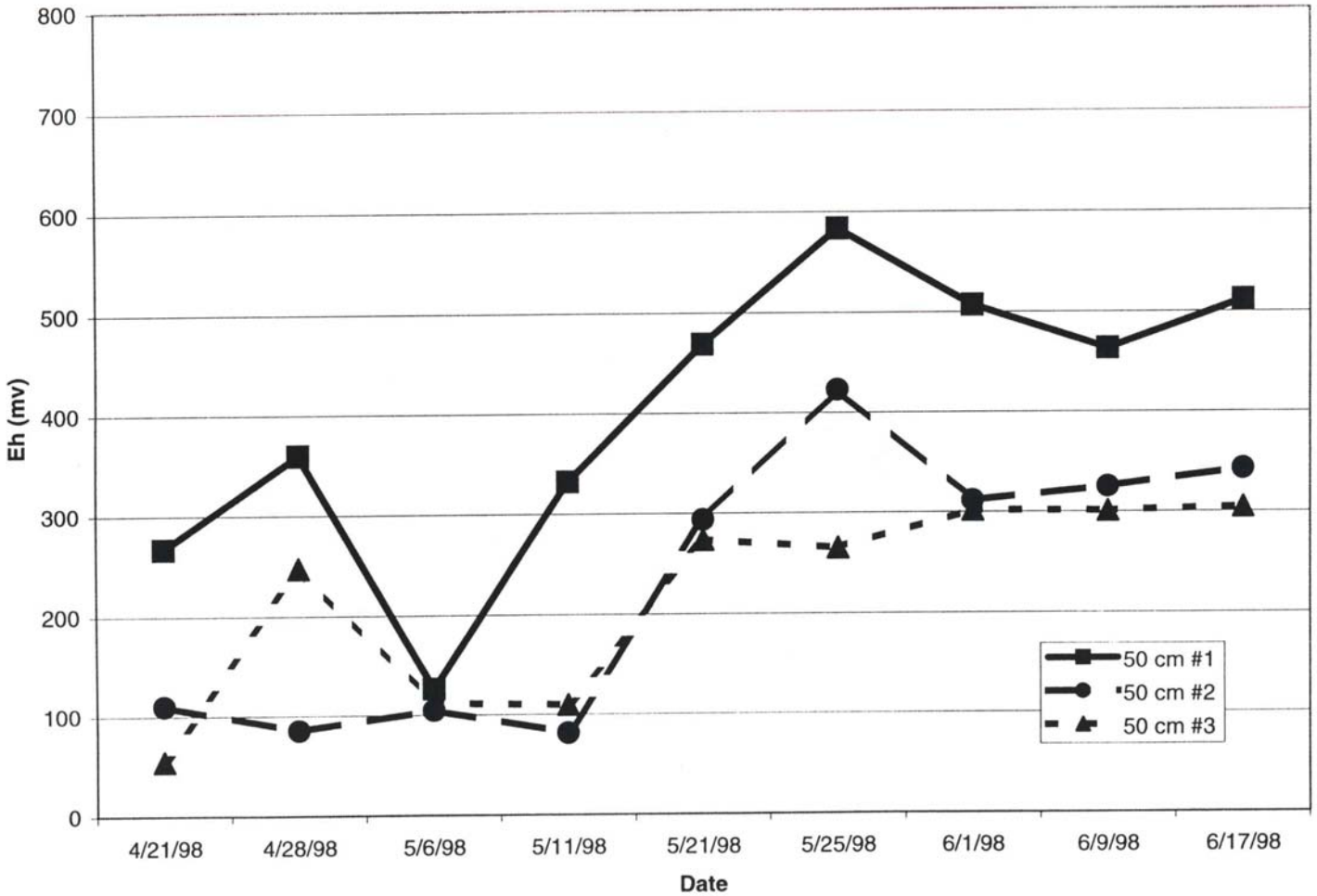


Figure 26 - Lebeau Low Redox Potential 10 cm

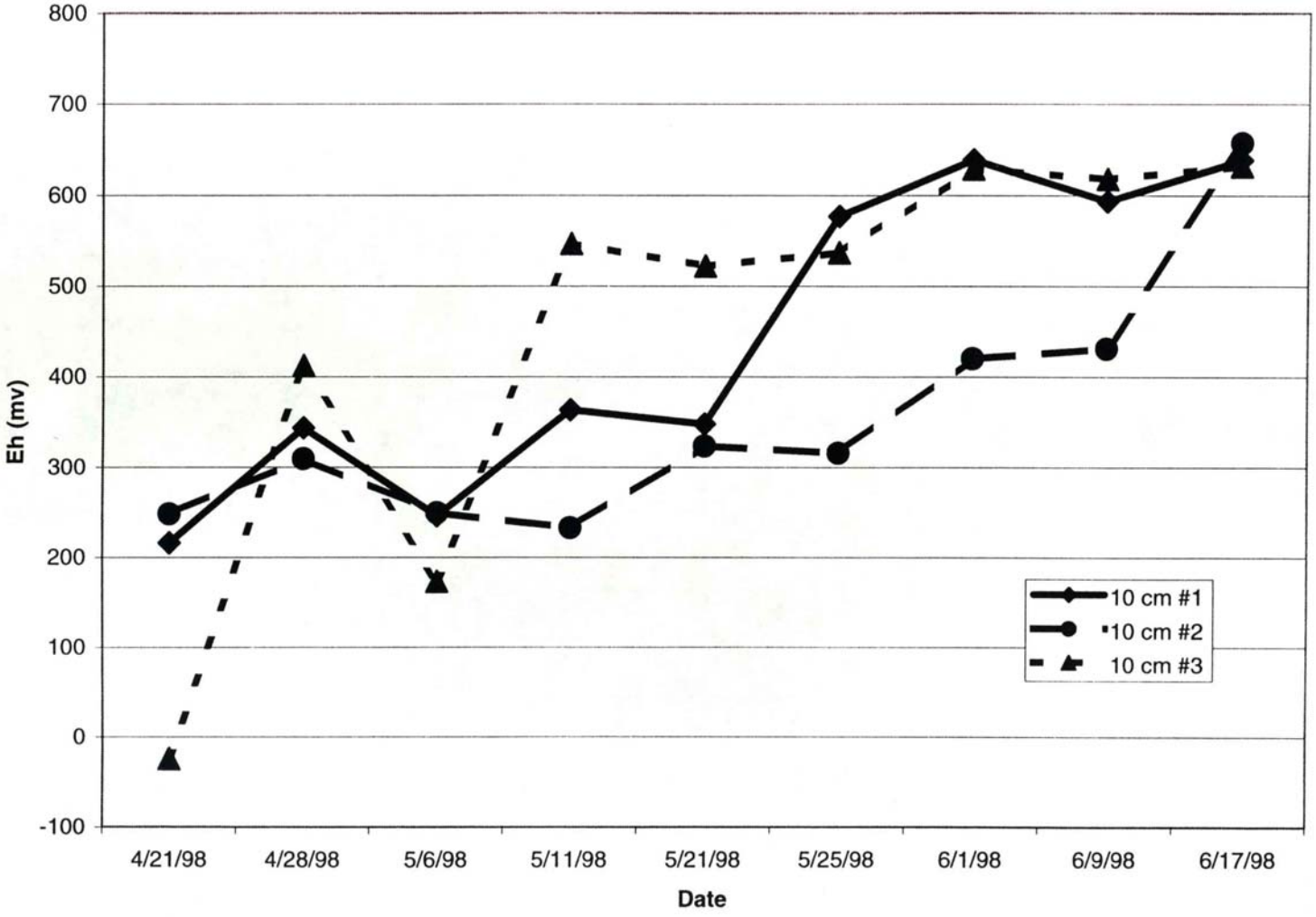


Figure 27 - Lebeau Low Redox Potential 25 cm

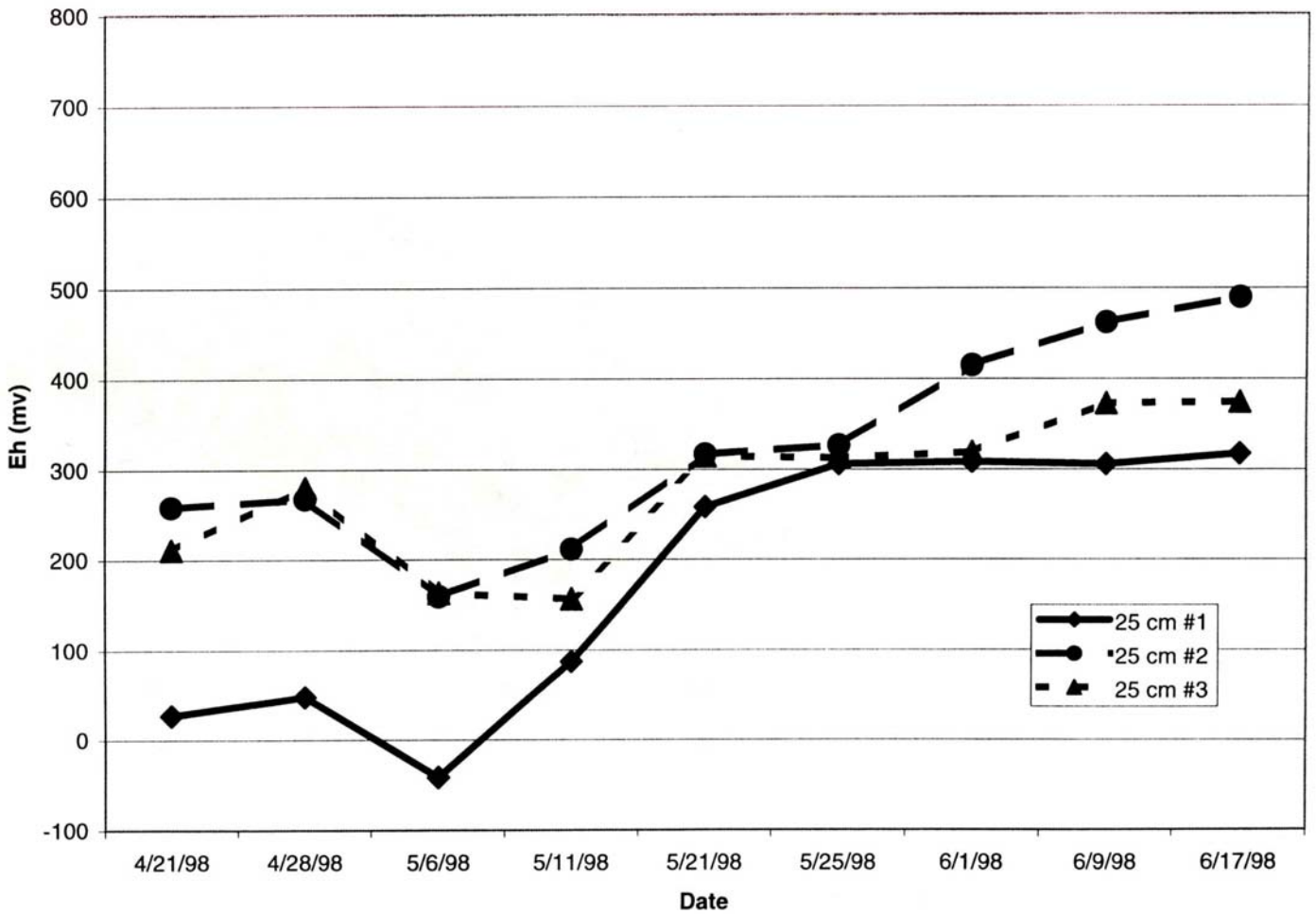


Figure 28 - Lebeau Low Redox Potential 50 cm

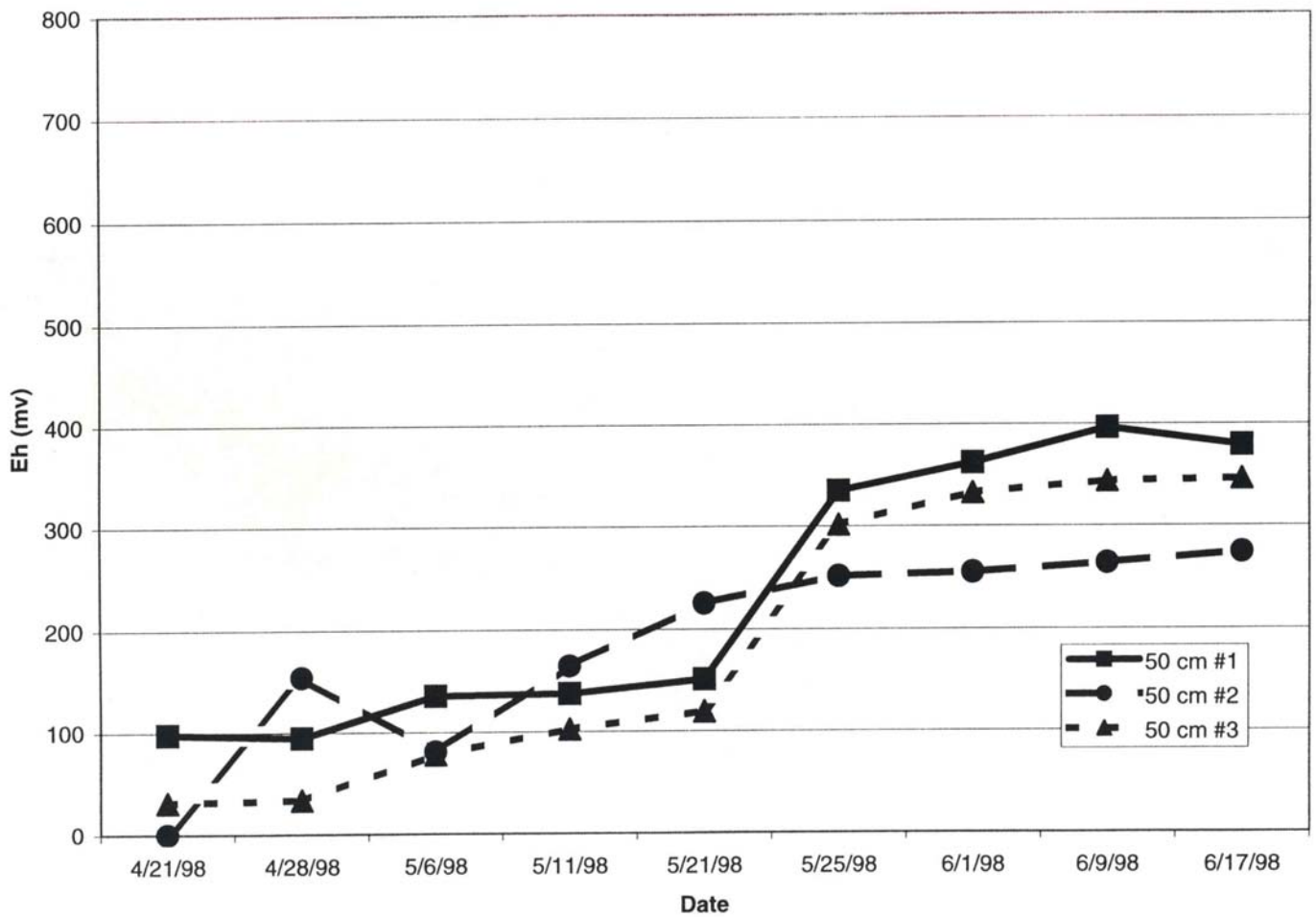


Table 8 - Magenetic Susceptibility

Soil	Depth cm	Mass Specific LFMS $10^{-8}m^3kg^{-1}$	Dry color Hue	Dry color Value	Dry color Chroma	Wet color Hue	Wet color Value	Wet color Chroma	Organic Matter gkg^{-1}
Lebeau high	0-7	9.8	9.4YR	4.2	1.7	2.2YR	2.8	1.7	88.0
	7-17	12.8	7.0YR	4.5	3.2	3.8YR	3.4	3.0	28.8
	17-30	12.7	5.6YR	4.3	3.4	4.4YR	3.2	2.8	14.3
	30-40	13.3	5.4YR	4.2	3.2	2.2YR	3.3	2.9	13.6
	40-50	13.3	6.3YR	4.5	3.2	3.0YR	3.3	3.0	11.7
	50-60	11.1	9.9YR	4.9	2.2	8.2YR	3.6	1.8	13.9
	60-70	10.8	0.1Y	4.9	2.4	9.1YR	3.5	1.9	13.0
	70-80	11.2	0.1Y	4.7	2.3	9.4YR	3.4	1.9	11.9
	80-90	11.5	9.8YR	5.2	2.7	8.5YR	3.8	2.1	7.9
	90-100	11.1	9.0YR	4.9	2.6	7.0YR	3.7	2.2	10.3
Lebeau low	0-10	10.5	8.8YR	4.4	2.4	5.0YR	3.3	2.0	63.1
	10-20	12.5	7.6YR	4.4	3.1	6.2YR	3.3	2.6	20.1
	20-30	13.3	5.4YR	4.3	3.4	3.8YR	3.3	2.9	12.8
	30-40	14.3	5.1YR	4.4	3.6	2.7YR	3.3	3.1	11.1
	40-50	12.5	5.2YR	3.6	2.9	4.1YR	3.0	2.7	9.3
	50-60	12.8	5.2YR	4.4	3.6	3.3YR	3.2	2.9	9.6
	60-70	10.7	9.5YR	5.1	2.1	7.1YR	3.9	2.0	11.7
	70-80	11.1	9.6YR	5.1	2.3	8.1YR	3.9	1.9	10.9
	80-90	10.9	9.7YR	4.8	2.1	7.9YR	3.5	1.6	11.1
	90-100	10.5	9.9YR	4.5	1.9	6.5YR	3.5	1.9	6.0

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