

NATIONAL COOPERATIVE SOIL SURVEY

Southern Regional Conference Proceedings

Clemson, South Carolina

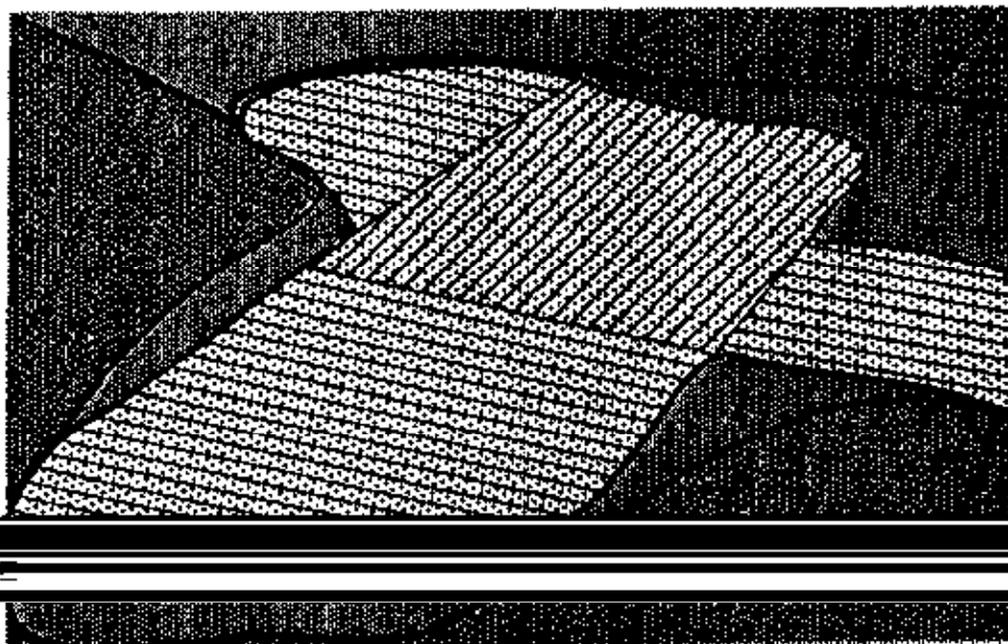
July 9-11, 1968

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Roy Daniels

Proceedings of

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE OF THE COOPERATIVE SOIL SURVEY



CLEMSON UNIVERSITY - CLEMSON, SOUTH CAROLINA - JULY 9-11, 1968

AGENDA
1968 SOUTHERN STATES SOIL SURVEY WORK PLANNING CONFERENCE
Clemson University, Clemson, South Carolina
July 9, 10 and 11, 1968

Meeting Place: Clemson House

Tuesday, July 9

C. N. Ellerbe, Presiding

6: 30	Remarks	Dr. Victor Hurst
8: 45		Vice-President for Academic Affairs and Dean, Clemson University
8: 45	Future of Soil Survey in South Carolina	A. T. Chalk
9: 05		State Conservationist Soil Conservation Service Columbia, South Carolina
9: 05	Announcement	Conference Committees
9: 10		
9: 10	The Cooperative Soil Survey of the Future	Dr. Charles E. Kellogg
10: 00		Deputy Administrator for Soil Survey Soil Conservation Service Washington, DC
10: 00	Break	
10: 15		
10: 15	Panel Discussion: Soils Information Used and Needed for Woodland Production	Carrow T. Prout, Jr.
11: 45		Head Forester Plant Science Division Soil Conservation Service Washington, DC
	George E. Smith, SCS - <u>Soil-Site Relationships.</u>	
	Dr. R. A. Klawitter, USFS - <u>Research Findings.</u>	
	Dr. Jack May, University of Georgia - <u>Requirements by Industry.</u>	
11: 45	Dinner	
1: 30		
1: 30	Announcement and Committee Meetings	
5: 30		
7: 30 PM	Ad Hoc Committee on Soil Survey Procedures. Charge: Outline orderly procedures for making changes in the New Classification System.	

Chairman - Dr. M. E. Springer
Associate Professor
of Agronomy
Department of Agronomy
University of Tennessee
Knoxville, Tennessee

(OVER)

/

Wednesday, July 10

8:00 Review Lawrence Chapel **Division Soil** Survey
11:45 Soil-Site Relationship for Woodland Uses

1:30 Committee Sessions Continued
5:30

Thursday, July 11

8:00 Committee Reports - **I-IX**
11:45

1:30 Special **Reports** and **Business** Meeting
3:00 Clemson. Room

3:00 Break
3:15

3:15 Regional Map Project Work Session
5:30 (Experiment Station **Representatives** and State Soil Scientists)

Friday, July 17.

8:00 Continue Regional Map Project (If needed)
11:30

Southern Regional Technical Work-Planning Conference
of the Cooperative Soil Survey
Clemson University, Clemson, S. C.
July 9-11, 1968

Minutes of the Business Meeting, July 11, 1968

G. R. Craddock, Presiding

A motion was made and passed that a Land Use Specialist, Soils and Fertilizer Research Branch of the Tennessee Valley Authority be granted a one vote membership in the conference. Currently Mr. John M. Soileau represents the T. V. A. group.

Dr. Curtis Godfrey presented a written report on the proposed "Field Workshop in Puerto Rico on Tropical Soils". As reports had been previously distributed the report is not included in the minutes.

Soil study trips will include side study trips to the Virgin Islands in addition to Puerto Rico. Some emphasis will be placed on soils suitable for houses and industry.

Some twenty-five members were reasonably sure of attending the conference August 5-14, 1969. Because of doubt in funding firm commitments could not be given for the majority. The decision was made to proceed with the Tropical Soils Workshop as being planned.

Dr. M. E. Springer reported for the ad hoc Committee consisting of Dr. R. J. McCracken, Mr. David **Slusher**, Dr. L. J. Bartelli, Mr. Henry Otsuki and Dr. Friedrich Beinroth with Dr. Eric Winters as advisor to the Committee. (See report by Dr. Springer.)

Attention was called to the fact that the constitution (Purpose, Policies and Procedures) of the Southern Regional Soil Survey Technical Work-Planning Conference is published in the 1966 Proceedings of the conference.

Dr. S. A. Lytle extended an invitation for the group to meet on the L.S.U. campus at Baton Rouge, Louisiana in 1970. Dr. **Cadwell** moved that the group accept Dr. Lytle's invitation and hold the meeting at L.S.U. The motion was seconded by Dr. **Obenshain** and then passed. The group expressed a desire for a June meeting if possible. In line with the constitution of the group the Experiment Station Representative of Louisiana would be chairman of the 1968 conference,

Dr. M. E. Springer expressed thanks to the South Carolina group on behalf of the entire workgroup for a successful conference.

Being no further Conference business the official Work Conference was adjourned. All State Experimentation Station Representatives, all State Soil Scientists and all persons in attendance interested in a Regional Soils Map Project were asked to remain and work on the organization of the map project.

Dr. S. W. Buol, chairman of the Regional Project committee discussed the proposal of a Regional Map as a project for workers of the Southern Soil Survey Work Group. **Dr. Buol** explained the initial project idea originated within the Experiment Station Group and the Southern Soil Research Committee gave approval for work on the project. The initial committee consisted of S. W. Buol, chairman; G. R. Craddock, C. R. Godfrey, and H. H. Bailey. This committee suggested that the State Soil Scientists, Regional SCS office and other interested persons become involved. After some discussion the following recommendations were made:

I. That the Soil Survey Work Group recommend that the State Experiment Station Representatives, the State Soil Scientists (**SCS**), the Regional SCS technical office representatives and other interested personnel proceed with the Southern Regional Map Project.

Recommendation approved.

II. That the State Experiment Station Representatives, the State Soil Scientists and Regional Technical Service Center (**SCS**) representatives present elect a chairman who will in turn select a Steering Committee from the group to proceed with the Southern Regional Map Project.

Recommendation approved.

This action in effect ended the work of the Regional Project Committee.

Mr. **Slusher** nominated Dr. S. W. Buol as chairman of the Southern Regional Map Project and that Dr. Buol select his committee. A motion was made and seconded that nominations be closed. The motion was seconded and passed.

The minutes of the Southern Regional Map Project Work Session will be circulated to states through State Experiment Station Representatives and State Soil Scientists.

Mr. Chairmen, Soil Scientists, fellow Conservationists, friends all, I welcome you to the fine State of South Carolina. I am a transplant as many of you are, and I have found that one advantage in being such is that some scales are lifted from one's eyes. A cleaner, clearer vision results. This has allowed me to see the advantages pertaining to living and working here, and while I am not so naive as to say there are no disadvantages, I have found them to be sharply outweighed.

I hope that your working visit here will permit you to see and learn of some of these advantages. I hope you can look around at our fine Land Grant university. I especially want you to see Death Valley, although it is somewhat removed from the academic fields of endeavor. Ask any grad what "Death Valley" is.

The preparers of this program did me no favor, although I appreciate the honor. I have never found it easy to peer into the future. It is an even more formidable task to try to forecast when a quick view is taken of what has happened in the recent past - and I call the recent past the last twenty-five years.

In this quarter century we have developed more things faster than in the previous 2,500 years. We have more scientists at work now than at any time in history and they are developing knowledge at such a prodigious rate that no one mortal man can absorb it all. The "knowledge explosion" is greater than in all previous recorded history, and is increasing.

We have developed television; I remember my first radio; we have boats which can stay submerged for months; we have begun travel in space; we have orbited the earth and photographed it with instruments hundreds of miles above the atmosphere with astonishing clarity. We have sent objects spinning around the sun; it is almost commonplace to send hardware up to relate in some way to the moon - soon we will place a human on that planet. All of this has been made possible by astounding progress in mathematics, physics, cryogenics and dozens, of other disciplines.

Only recently we have learned, rudimentarily to be sure, how to synthesize the structure of life itself in a test tube. We can create a virus that seems to be a living organism because it can reproduce itself.

Therefore a look at the past leaves small wonder that to guess at what is to come is dangerous. As Josh Billings says, "Don't never prophecy, for if you prophecy wrong nobody will ever forget it, and if you prophecy right nobody will ever remember it."

But despite our progress we remain firmly rooted and dependent still on natural resources - soil and water in particular. It is trite but true to remind you that though we can transplant a heart from one body to another we still need three meals per day; that though we can fly at twice

1/ Talk by A. T. Chalk, State Conservationist, SCS, Columbia, SC at Southern States Soil Survey Work Planning Conference, Clemson, SC, July 9-11, 1968.

the speed of a bullet we need clean water to drink; that in fact, the first task **given** to the Surveyor Moon device was to dig into the moon's surface to **see** what kind of **soil** there was on it.

Therefore despite the Buck Rogers fantasies that are so **commonplace** that we scarcely **turn our** heads for them any more, we are earthbound: the **most** of us, and will be for the indefinite future so far as food to eat, water to drink, cloth for clothing and fiber for shelter.

But before looking **ahead** let's see where we are in South **Carolina**.

It's usually good to learn where you are in plotting a course. That elemental fact I gathered in my first Boy Scout map reading course. Where are we then in South Carolina in soil survey?

We are right proud of our progress, though not satisfied. I know each of you State Soil **Scientists** will immediately compare our progress with yours. **and ours** will inevitably pale by comparison, but **I'll** move ahead, knowing that the first speaker never has a chance.

South Carolina has 46 counties -- 11, or **24%, of** these are published in what is considered the modern type of soil survey. **One** county is scheduled for publication in each of **the** next three years, so three are in the publication pipeline. **This** will total 14, **or** 30%.

Next, we have three more on which field work is complete. **These** are in that large body of reports awaiting funds for publication. So, counting the 11 published and 6 on which field work is done, we have 35% of South Carolina wrapped up - without regard for the large acreage of standard surveys in the other counties which are **not** complete. To do this job we are spending about 15% of our State's budgetary allocation based on the latest year of record.

An outstanding reason for this field **progress** is State aid. South Carolina appropriates \$50,000 each year to aid in paying scientists to produce surveys, and to speed laboratory analysis which is done here at Clemson for us. Also, I give recognition to the U. S. Forest Service for their aid in the last three years; this has **totalled** 5 man-years of survey time.

Parenthetically, please know that I also know that this "complete" job of **which** I speak **when** I mention "completed" **counties is** in fact not so - we only have down on maps what we now know about soils. Despite all the **fun-**poking directed at you men about re-mapping what you have already remapped, it is as unreasonable to expect soil scientists to **know now** all there is ever to be known about soils as for foresters to **know now** everything that will ever be known about trees, or doctors to be aware of all the secrets of the human **body today**. We keep learning things, and while this is occasionally disconcerting, it is overall good.

What is the future in South Carolina of the Soil Survey? Gentlemen, I state categorically that I think the soil survey is the brightest star in the conservation crown, with the possible exception of watershed work. I **believe** this: Why?

Conservation drill begins with soil, water, plants and animals. They are the base. But no, one I know believes that the problems of conservation are exactly the same as they were when we started, or that the solutions are the same, or that farming has not changed, or that the patterns of our society are the same that they were, either in South Carolina, or the United States.

A rural and limited soil conservation concept no longer suffices in a society that now is highly urban and is daily becoming more so, a society in which the users of resources have come to exceed those of the owners of the resources.

Conservation today encompasses the full sweep of interrelated natural resources and their management and use. However, use, restoration and preservation are compatible aims.

Emerging now is the special need to fit the activities and needs of man harmoniously into his total environment. This concept of full use conservation says that as populations grow and people live in greater and greater concentrations, we must consider the total environment.

And if this be so, as I firmly believe it is, is there a better tool to the conservationist or planner than a soil survey? I know of none.

Consider now how this tool is being sharpened and reshaped to fit what once were exotic demands in South Carolina:

1. A soil survey with urban interpretations covering James Island, a Charleston suburb, was an early effort of ours.
2. A soil productivity study in Richland Soil and Water Conservation District river swamps to assist in tax assessment has been made by one of our soil scientists.
3. Aid to U. S. Steel Corporation on soil acidity to determine the types of galvanizing needed over the state for steel culverts was useful to the company, it said.
4. Special urban interpretations for the standard soil survey in an area of rapid urbanization between Aiken, S. C. and Augusta, Ga. as a guide to the County Planning Board are now being made.
5. Surveys for four Air Force, one Naval base and one Marine installation to aid in best location of facilities have resulted from requests.
6. Aid to industrial developers in several places, one of the most unusual of which resulted in location of Campbell Soup at Sumter. The firm wanted an area of deep porous soil on which to spray partially purified and strained plant wastes emanating from their production there of Swanson TV dinners. The water percolating through the soil is purified and returned to the stream pure and fit for use.

7. A soil survey of a state wildlife refuge to help find the firmer marsh areas upon which to locate dikes. In so doing, annual sinkage and maintenance is diminished.
8. Several surveys in cooperation with the State Geologist and/or local Development Boards, to critically evaluate areas for potential development.
9. A high intensity survey of a portion of the wooded area under the control of the Forestry Department of Clemson -- for research purposes. You are to see this in your field tour, I understand.

These examples, and that's all they are -- not a complete listing -- do illustrate a breadth that would have astounded us only a few years ago - yet I dare say each of you could top this list.

1. So, without question in my mind, I list as the first need for soil surveys in the future is a way or ways to wake and interpret them for more urban and varied uses. To actively ferret out what and where we must work to help to the greatest degree the urban, suburban, industrial or megalopolis types with their soil problems. Never can we think that the 20% of the population which may be classified as rural in 1980 is our only clientele. This would be a devastating error, nor are they to be abandoned, I hasten to add.
2. Closely connected, allied, in fact, but not the same, is to make a soil survey more intelligible to the layman who is to use it. This we must do - don't ask me now just how; I look to our fine soil scientists headed by Clarence Ellerbe and Clemson's headed by Dr. Craddock, to provide this answer.

But I say that if the user had to understand the workings of TV as a prerequisite to use, not one thousandth as many kids would get crosseyed, and their parents cross, from watching TV. TV would exist only for a few.

A parallel case in point is an auto. How many of us would use a car if we had to know how it was waded? Few.

We must make a soil map a tool that the average person can use as readily as any other tool which he needs. This is a large order.

3. Next there is a crying need for a better knowledge of soil, in all of its almost infinite characteristics, by the population. Not how to use it necessarily, as in the preceding point, nor by all of the population, though that would be best.

Isn't it ironic, no, tragic, that the God-given sustainer of our very Life be looked on, if seen at all, as a place to build a

other important problems -- true -- but pray tell, is **not the soil the base of each and every facet of the resource diamond?**

If this be so, and it is, people desperately need to know of it. We need to tell them, not with success stories on conservation farming, but by sophisticated preparation and modern means.

We are trying to do this' here' to some extent with our Conservation Education Council for school children. It has caused to be produced a series of teachers' guides which Doubleday and Company is printing, and the soil is the subject of many of the lesson plans. Our Soil Scientists have had a place in this work, they need to have a greater place in the future.

4. **Finally,** and I know as well as you that **I've** only skimmed about in the few minutes I have, the future of the soil survey in South Carolina is tied up with the availability of **manpower to accomplish** the task.

Not long ago three of us presented a panel program to the South Carolina Agricultural Council on the agricultural career opportunities and the need for **manpower**. A **spokesman** for Clemson pointed out that in 15 years the **candidates** for agronomy degree have had decreased by 41. That's three per year, **about**. Clemson is the only institution granting degrees in **agronomy in South Carolina. Our pool is drying up and it wasn't big in the first place.**

What good to draw up **blueprints of action, to recognize and state needs, to develop policies, if the manpower to carry out** these desirable things is lacking?

The trained people to carry out the job are crucially short. It does us no good to point out that this scarcity prevails in other agricultural fields -- that few students feel the attraction for agricultural professions that we did and thus the academic halls of the **ag** schools are relatively bare.

There must be a concerted effort to interest good men in **ag** careers. Without manpower the technology which is bursting forth into the rapid growth I spoke of will be as useless as a jet plane without a pilot.

To **summarize**, I have **named four problems** and this could be considered a deviation from my assigned topic. However, I don't think so for they are bound together to affect the future.

Also, I have not exhaustively **canvassed** either our problems, or our opportunities, but have tried to select those I felt most important to our future.

I am **going to repeat them and stop. They are:**

1. **In the future** there will be more and varied use of soil **surveys** than at present, with a **higher percent of non-agricultural demands.**

- 2 . In the future we must make the soil survey an even easier tool to use, for the layman. Great progress has been made - more must be.
3. In the future we need an increased knowledge of soil by the bulk of the population. Not simply an awareness, nor only an appreciation. though these are better than nothing. A knowledge of sorts is needed.
4. And the last of my points is that in the future we need to get more of our youths into agricultural professions, and in soils work specifically.

If we can accomplish these four things the future of soil surveys in South Carolina is bright.

Thank you.

SOIL - SITE RELATIONSHIPS 1/

SLIDE # 1 - **Man** and his environment are affectionately joined **together**. We must understand environment to use it prudently and not destroy it, or possibly ourselves. **With** the rapid advances in technologies and **abilities**, **man's** relationships with environment **become** more significant. Soil **is** a part of our environment: a tree **is** a part. There are many other **components**.

SLIDE # 2 - Soil supports plants: it has characteristics which result from **the** effects of climate and living matter (including trees) **acting** upon parent **material**.

Site represents a combination of biotic, climatic, and soil conditions. The ecological factors are considered with reference to capacity to produce trees or other vegetation.

Obviously, trees are products of soils and **soils are products** of trees, to **some** degree. **Both** result from **numerous** actions and interactions.

SLIDE # 3 **For** example - **Man** manipulates both soils and trees, **sometimes** to improve - sometimes to degrade. **Man is** an integral part of the universe. **Much** progress has been **made** in soil-site relationships. But it **is** difficult to distinguish between soil and site in evaluating potentials for **woodcrop** production?

SLIDE # 4 Some **investigators** have developed highly refined criteria to evaluate soil suitability and **productivity** (3), (6), (7), (12), (13), (23), (34).

SLIDE # 5 Criteria include depth of horizons, consistency, texture, depth to pan, depth to mottling, organic **matter** content, moisture **equivalent**, surface drainage and a **number** of other soil characteristics. Such are well suited to research. ...

1/ Talk by George E. Smith, Jr., **Woodland Conservationist**, SCS, Columbia, S. C. at Southern Soil Survey Planning Workshop-Clemson University, 9 July 68.

SLIDE # 6

. or very intensively managed small forest areas. But mapping surface soil depth and subsoil texture with the Precision required by the "best" criteria is very time consuming and expensive. And in many instances such criteria must be adjusted due to climatic or topographic influences (11), (30).

SLIDE # 7

Ecological and total-site investigations should be expanded. It is the combinations of characteristics as influenced by time, climate, plant and animal influences, and manipulations that determine site, both qualitative and quantitative.

SLIDE # 8

The Soil Survey is a basic tool to facilitate conservation. Woodland suitability determinations and interpretations have been strongly influenced by the wide variety of criteria developed through research and field studies. Soil surveys and interpretations have not been adequate in some instances however.

Let us review the interpretations being made currently for mapping units:

SLIDE # 9

(a) Potential Productivity -- expressed as site index. Standard deviation is included if computed and tk range in site indexes is indicated.

The actual site index of this site for slash pine is zero due to excess water; but the potential site index at 50 years is above 90.

SLIDE # 10

Water management and tree planting of this Carolina-bay, permitted use of the productivity potentials of this site. Present timber value exceeds \$300/acre. Broadfoot (9) demonstrated benefits of water management in woodlands. Flooding, with control of water levels, from January to July increased annual diameter growth as much as 50 percent. Wildlife values (particularly ducks) were improved simultaneously. Klawitter (20), (21) suggests water management and control in wetland forests is a reality though all the relationships are not understood. Moehring and Ralston (26) relate diameter growth to available soil moisture and rate of soil moisture loss.

- SLIDE # 11 Here are weed trees as far as you can see. Turkey-oak is suited to the Sandhills but productivity is very low and turkey oak is not a profitable woodcrop.
-
- SLIDE # 12 This is the same area 5 years later. The turkey oaks have been controlled (by using heavy equipment to clear: then growing a crop of watermelons) and slash pine has been planted. What is the productivity of these soils for slash Pine? Will productivity justify the costs at current interest rates? Cost-return estimates indicate some soils will not produce woodcrops economically.
-
- SLIDE # 13 Potential productivity must be defined for each species preferred for particular woodcrops. As an example longleaf Pine may be preferred for pole8 and piling.
-
- SLIDE # 14 Cottonwood may be preferred for pulp used to manufacture a special grade of paper.
-
- SLIDE # 15 Arizona cypress may be preferred for Xmas trees. Insufficient data does not permit a complete evaluation of species suitability and productivity currently. Broadfoot (8) summarized soil suitability for hardwoods for 5 soil areas in the mid-south.
- Doolittle (14) and others (27) have prepared site index comparison charts; by using the known site index of an indicator species, site indexes of other species can be estimated, within certain limits of accuracy and within restricted localities. Has such information been utilized fully?
-
- SLIDE # 16 (b) Erosion hazard - The susceptibility of Soils to erosion from site manipulations and management of woodcrops is evaluated as slight, moderate, or severe depending upon characteristic8 such as texture of surface, rooting depth, and slope gradient. Site preparation, water management installation8 (culverts, ditches & outlet8 in Piedmont & mts), harvesting, firebreak construction, access road construction and use can contribute to erosion and site deterioration.
-

SLIDE # 17 **Water** disposal systems and vegetative **treatments** (such as planting sericea, etc. in logging roads) may be needed.

SLIDE # 18 Soil movement in the Sandhills can be severe and creates problems to the forester and logger.

SLIDE # 19 Soil **blowing** is a severe problem in the Coastal Plains. Wind erosion interpretations are provided for susceptible soils which include Class I soils and subclass "**s**" soils.

The effects of erosion vary according to soil and site conditions. Erosion of Cecil sandy loam generally does not decrease productivity for woodcrops as severely as erosion of **gataula** sandy loam, a soil with a very dense subsoil. Accumulation of soil (such as benched terrace areas) may **result** in improved productivity. **Allurail** areas frequently have very high productivity. **Excellent** examples of these conditions will be observed during the field trip to the Clemson Forest.

SLIDE # 20 (c) Equipment restrictions -Access and operation of equipment can be restricted by topography, rock outcrops or stoniness, wetness, etc. **Water** management may be a prerequisite.

SLIDE # 21 The trend is towards mechanization of operations. **Current** interpretations may not be adequate for different kinds of machinery.

SLIDE # 22 The tree combine can travel over a wider range of soil conditions.

SLIDE # 24 (d) SEEDLING MORTALITY

Site quality **must** be evaluated in terms of seed germination & seedling **survival**.

SLIDE # 25 Inundation for **3** days during spring floods **may** kill yellow poplar seedlings.

SLIDE # 26 Surface soil temperatures may prevent germination, or kill the young seedling. **Lack** of protective covet and moisture may destroy **the** crop. Chances for successful germination and early growth of cottonwood are reported to be optimum within a temperature range of **27° - 32° C** and at less than 5 atm moisture stress **(18)**

SLIDE 27 Seedling mortality is an interpretation which is **important** to natural seeding, direct seeding, tree planting and establishment using cuttings from limbs.

SLIDE 28 65 **years** ago **longleaf** pine **seed** were scraped up from a sand road by a small boy & his father. They planted them in hills **3' x 10'** and later thinned the seedlings to **one** per hill. **This** excellent stand resulted from excellent seedling survival.

SLIDE # 29 (e) Species to plant:

The littleleaf disease severely affects shortleaf pine in the Carolina Piedmont. It is associated with a root rot fungus. The effects are also more severe on soils with poor internal drainage and aeration **(10)**. In littleleaf areas, loblolly pine is favored when planting seedlings (though not **immune**, loblolly pine is affected less severely).

SLIDE # 30 This site supports a well-stocked stand of high quality **yellow** poplar and upland oaks. On similar sites, yellow **poplar** would be a preferred species to plant where the objective **is** to produce veneer and furniture stock.

SLIDE # 31 (f) SPECIAL INTERPRETATIONS

Chemical **characteristics** of soils influence **woodcrop**
production (4),(5),

- 2 - Since soil surveys are made by numerous soil scientists, there are variations in concepts of soil characteristics and soil identification by individuals, This is expected but does create problems.
-

SLIDE # 36

This slide illustrates **Crevassee** soils as correlated and mapped in South Carolina. In this photograph the Crevassee **soil** is the "ridge" **of** the ridge-trough topography **of** the

5. A soil **survey** is no better than its accuracy. Large wooded areas with limited access are difficult to **map**. Transects are improvements but can be expensive.

Some informed foresters prefer the expanded use of complexes **or** associations, adequately described, to a "pure" mapping unit which does not **reflect** soil conditions accurately.

Can **photo-interpretation** be improved and utilized more **accurately** and economically with more limited field work? **Infra-**red or **Infra-color** photography have been used for vegetation delineations (1) and accuracy of interpretations has been improved approximately 25%.

Have **vegetative** indicators been utilized as advantageously **as possible**? Such are not totally reliable, yet frequently can provide information of value to experienced scientists. This technique needs additional **study** and energies. Helicopter mapping has been advantageous in South Carolina.

6. The **ma** jority of soil-site data has been collected in natural stands. A few studies have been completed in plantations. The trend to artificial establishment demands interpretations for **such** woodlands. Also, the need for information on broad-leaf **species** -- soil **relationships becomes** more critical daily. Progress in this direction is too slow.
 7. Some of the more adverse sites have not been properly **eval-**
uated because it is difficult to find trees to measure on such sites. **Also,**
-
-
-

SLIDE # 39

Trees for streets, parks, recreation areas **and lawns** provide shade, conspicuous flowers and fruits, color in autumn foliage for recreation, rest, and respite from our labors. Such are useful for **scientific** study and for wildlife food shelter and cover.

What a magnificent environment when we interpret it properly.

The opportunity to discuss soil-site **relationships** is **appreciated**.

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SOILS INFORMATION USED AND NEEDED FOR WOODLAND PRODUCTION:

RESEARCH FINDINGS--ORGANIC SOILS^{1/}

By

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We have heard that by the year 2000 every woodland acre will have to produce its fair share of timber if cut is not to exceed growth in the South (9). Not only in the South but in other areas too, woodland owners are looking more closely at organic soils to determine how they can bring them into greater production. For example, more than 4 million acres of peatlands and other soils have been drained in northern Europe to improve woodland productivity (24). In these European efforts, selection of the site has been the key to success in drainage because some sites produce an excellent response, whereae others show little at all. We can see, consequently, why it is so important that woodland owners have as much soils information as possible to guide their water management and site improvement efforts. A lack of organic soils information can lead to improper site selection and much wasted effort. Here in the South, published information on woodland management of organic soils is scanty. Nevertheless, by bringing together what is known from our Region with that from other places, we can draw some general conclusions about the kinds of information on organic soils which should be included in soil surveys in the future. The question we are asking ourselves then is, "What soil survey information does the woodland owner need to aid him in improving the productivity of his organic soils?"

The Extent of the Problem

An estimated 80 million acres of peat and muck soils are found in the United States, with the largest share--60 million acres--located in the north and northeast (22). About one-fourth of the 60 million acres, or 15 million acres, occur in the northern Lakes States, mostly as forest land (2).

In the South, Florida is a leader in peat and muck soils with approximately 11 million acres (22). The Everglades alone contain more than two million acres in the largest known tract in the world. North Carolina offers another example of the importance of organic soils in the South. Muck and peat deposits in this State are estimated to cover about one and one-half million acres, mainly in forest land (17). When one considers the amount of woodland in and around such areas as the Dismal Swamp in Virginia, the Okefenokee Swsmp in Georgia, and the multitude of other swamps and bays elsewhere, the acreage of organic soils assumes gigantic proportions. Thus, the problem of guiding woodland owners in the selection of their organic soils for improvement is a matter of real and pressing concern to soil scientists.

^{1/} For presentation at the 1968 Southern Soil Survey Work Planning Conference, Clemson University, Clemson, S. C., July 9-11, 1968.

Coverage in Soil Surveys

A check of some of the more recent soil surveys for coastal plain counties in the southeast indicate that definitive information on organic soils is lacking in many cases. For example, organic soils of the Dismal Swamp in Virginia were included in mapping units identified as mucky peat, mucky peat-shallow over loams, and mucky peat-shallow over sands (29). These soils were not surveyed in detail, however, because of their inaccessibility. In two counties in North Carolina, organic soils were identified in two mapping units in the Pamlico series or simply as mucky peat (25,28). Those in South Carolina and Georgia are listed under swamp soils (30,31, 33, 34). Florida soil scientists, on the other hand, recognize an impressive list of organic soil types in addition to the general units of peat and swamp (26,27, 32).

It is now evident, however, that soil scientists are no longer satisfied to lump organic soils into large, ill-defined mapping units. Tentative soil series, such as the Dorovan and Ponzer, have been approved within the last year, and a number of others are proposed; i. e., Atlantic, Belhaven, Mattamuskeet, Pungo, and Dare. No doubt more will follow as soil scientists become better acquainted with the range of organic soil conditions in the coastal plain and those soil factors which affect woodland water management and timber production significantly.

Some Factors Related to Water Movement

Two criteria that can be defined quantitatively have been suggested as guides to the drainability of land: hydraulic conductivity of the saturated zone and the depth to strata which impede the removal of groundwater (8). Drainage to change the hydrology of the site is one of the first requirements to improve organic soil for pine tree production (22). Excessive wetness favors organic accumulation but hampers the development of the tree root system. Lake State studies show that the rate of water movement through an organic soil depends upon the kind of peat material that forms the soil (1,3, 4). Water will flow at a rate as high as 118 feet per day through undecomposed peat and as slow as 0.016 feet per day through decomposed peat. Humification tends to increase density and thus enables the peat material to retain more water against the suction forces produced in drainage. In addition, the potential for water management varies considerably with the peat type. For example, the water content of moss peat is less than herbaceous peat at a given suction pressure (5, 6).

The pattern of water movement and the water source also

low concentrations of nutrient6 from the main expanse of the bay ^{OK} swamp. In such cases, more productive organic soils may be associated with inclined groundwater tables and peats of higher hydraulic conductivity.

Some Factors Related to Tree Growth

Pine tree survival and growth on organic soils is more complex than rates and volumes of water movement. In dealing with trees, we are faced not only with hydrologic problems but with biochemical and physiological problems as well, many of which are only poorly understood (16). Con-
sequently, European foresters go into great detail in classifying their

mentions earlier, decomposition tends to reduce permeability. The reduction is much less, however, for woody peats which still retain a high level of permeability because of their loose, granular, and blocky structure (22).

A great deal of European effort has been devoted to the classification of peatlands on the basis of the natural vegetation. The thinking is that natural vegetation reflects the hydrologic, physical, and chemical factors of the site and can be used to predict suitability for woodland drainage (10). One Finnish report states that peat soils with a cover of mosses, sedges, and herbaceous plants rich in nutrients can be transformed into highly productive woodlands by drainage (13). Drainage of other kinds of peatlands, however, is ineffective without supplemental fertilization.

A recent account of a woodland drainage project in central Florida brings out the problem of distinguishing between organic soil sites with different natural vegetation, peat types, and degrees of decomposition (15). One peat has a cover of red, root (Gyrotheca tinctoria [Walt.] Solisb.). It is on a mucky, highly decomposed soil which allows ready water movement through it. This characteristic contrasts with the usual rate of water movement through most decomposed organic soils, possibly because of the inclusion of mineral soil. Pine tree growth on this soil is above average; The other peat is described as a "relatively undecomposed" and "practically impermeable" material found in bracken fern (Pteris aquilina L.) and sphagnum sites. The pine growing potential of this site is less than that of the other.

Kinds of Information Needed

What kind of soil information does the woodland owner need to aid him in managing organic soils? He needs to know the botanical origin and stratigraphy of the peat, as well as its thickness, degree of decomposition, wood content, acidity, and water sources and conductivity. The kind of subsoil material, amount of mineral soil mixed into the peat, and natural vegetation and fertility are all information that will be put to use in selecting peatlands for woodland drainage and planting. Detailed knowledge of the kind of organic soils and their location will be used not only in timber production, but in wildlife habitat improvement, in forage production, in water management; and by the engineer in road and other construction as well (20).

Without detailed knowledge of organic soils, improvement of woodland productivity on wetlands in the South will proceed very slowly through trial and error, a costly process at, best. In addition, the researcher's task will be much more difficult because he will have less knowledge of the range of soil conditions he has to work with and where the various kinds of organic soils are located;

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**Soil6 Information Used and Needed
for Woodland Production: Requirements by Industry**

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The

- B. Physical factors of soils: (1) depth of the **solum**, (2) depth to impermeable horizons. (3) depth to mottling. (4) internal drainage (permeability), (5) Porosity. (6) texture of soil horizons, (7) plasticity, etc.
- C. **Chemical properties** of soils: (1) **soil** reaction, (2) organic, **matter**, (3) exchange capacity, (4) **levels of available** nutrients, (5) **levels of nutrient** reserves, (6) ratio of nutrients, (7) **chemical** fixation,, (8) biological fixation, (9) toxicity of **some chemicals**, etc..
- D. Biotic characteristics of soils: (1) presence of **soil organisms**, both macro- and micro- **fauna** and flora,, and (2) **the** extent to which some micro-organisms are parasitic to trees.

Empirical equations for estimating site quality **from** various **functions** of soil and physiographic variables were developed by multiple **regression analysis** of paired observations of tree and soil **data**. The procedures required for applying these types of soil evaluation techniques to management problems require the compilation, analysis and interpretation of data from intensive sample surveys.

Site classification based on identification and delineation on soil **maps of** natural soil bodies by families, series, types and phases has been discussed by Byrd, Sands and May (1963), McClurkin and Covell (1965) and others.

This system has been rejected and/or **criticized** by many land managers' because of some very definite weaknesses: namely, (1) mapping of soil **units in** some areas has not always been accurate, (2) wide **differences in** site index values are reported for a single species and a single mapping unit (3) data collection has not always been based on representative samples, and (4) the **work has** not **always** been coordinated.

The accuracy of **soil mapping is the responsibility** of the State Soil Scientists, and **strict controls should be in** effect at all times.

Determination of reliable site index data for soil mapping units within specified **physiographic and climatic zones**

Drainage will be an operational necessity **for many** mineral soils. **Some unanswered questions** are: **How much? What size** canals? How far apart? At what **levels should** water be maintained **in** canals during dry periods?

Potential Responae of Soils to **Fertilization**

There is a **voluminous literature** on forest fertilization studies, in, **Europe** and the United States.

Indicator Plants

Herbaceous plants are sometimes used as indicators of soil moisture, soil fertility and site index. Could plants that are indigenous to **specific** soil families on sites be listed in the survey?

Conclusions

Much of the usable information on forest **soils has** been published within the past ten years. Forest land managers are not soil scientists and they are not acquainted with much of the data included in soil surveys,

A recurrent need **is** for **short** courses that will assist the land manager in interpreting available information.

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REPORT OF DISCUSSIONS, **COMMITTEES** THROUGH IX,
1968 SOUTHERN REGIONAL SOIL SURVEY WORK PLANNING CONFERENCE
Clemson University, Clemson, South Carolina
July 9-11, 1968

Discussion for Committee I - Criteria for **families**, series and phases.

Buol - Suggest that 25 copies of the report be forwarded *to* the Chairman (Dr. Brown) of the **S&C** group for **comments** and help from that group in use and **interpretation** of mineralogy data and additional kinds of data **needed**.

Discussion for Committee II - Classes and phases of stoniness and rockiness.

James - In **early** stages of progressive surveys progress reviews should critically examine the use of special symbols to see if these symbols can be eliminated from maps by use of phases.

No discussion for Committee II - Classes and phases of stoniness and rockiness.

Discussion for Committee III - Application of the New Classification System.

DeMent - Question the use of the word "old" after a series name, **i.e., Troup** (old **Lakeland**).

Kellogg - There is merit in relating soils at the higher categorical levels for example, the Great Soil Group. One might use "**formerly**."

No discussion for Committee IV - Interpretation of groups and categories higher than series.

Discussion for Committee V - Soil **moisture** and temperature.

DeMent

Discussion for Committee V - Soil moisture and temperature (contd)

- Bailey - 'Mesic, thermic' areas are being investigated in Kentucky. Some 16 stations have temperatures being measured at 4" and 20" depths.
- Kellogg - Interpretations of extreme conditions are important. More information is needed on capillary movement of water for well-graded and poorly graded materials.

Discussion for Committee VI - General soil maps.

- Kellogg - Three quadrangle sheets of map size 1:1,000,000 (16 miles to the inch) are being studied for the kinds of interpretations that can be made.

No discussion for Committee VII - Urban interpretations.

Discussion for Committee VIII - Soil survey forest committee.

- James - Narrow delineation along streams and drainageways are commonly exaggerated during map compilation.

No discussion for Committee IX - Priority of problems that need soil laboratory study and realistic estimates of work required for each of these studies.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Southern Regional Technical Work Planning Conference
of the Cooperative Soil Survey

Clemson, South Carolina
July 9-11, 1963

Report of the Committee on Criteria for Families, Series and Phases.

The charges to the committee were:

1. Summarize the criteria used in distinguishing soil series and phases within families. Study a few families in 2 or 3 representative Typic subgroups in each order. The families should include series from more than one state and more than one region. The Principal Soil Correlator should be requested to select the families. About 5 or 6 families in this **region** with about 10 soil series each **will** be sufficient for this study. Record data on form developed by Northeastern Committee.
2. Prepare a guideline statement for use in official soil series descriptions that will indicate the sources of data or of the estimates pertinent to the classification of the soil series.
3. Establish criteria for the ranges in characteristics of soil series.
4. Explore possible ways to improve limits for mineralogy classes. Refer to items 4 and 5, page 125 of 1967 National Proceedings and respond to recommendation 8, page 129.

Subcommittees on mineralogy, series criteria, and guideline statements for sources of data in series description did preliminary work on the charges to the committee. The reports of the **subcommittee** served as a basis for discussion.

The committee supports Dr. Grossman's suggestion of the National Technical Work Planning Conference of 1967. This committee recommends further study and action to extend the mineralogy of the clay fraction to at least include fine loamy and fine silty families. Classification based on minerals such as quartz has little advantage over plain textural classification, since such minerals are more or less inert when compared to clay minerals. From the standpoint of plant growth there is little advantage in distinguishing between feldspar and quartz in particles of silt size, or larger. It seems, therefore, that the determinant particle size, as well as mineral contents for textures other than clayey, should be carefully examined.

Dr. Grossman's proposal for modification of the **control** section used for mineralogy classes **was not considered.**

On page 127, item 7, of the 1967 **Proceedings of National Technical Work Planning Conference**, a recommendation was **ade** that a chloritic mineralogy class may be needed. The **committee** was unable to formulate a recommendation at this time, although the recommendation was briefly studied. Soils that usually contain significant amounts of chloritic minerals have coarse-loamy, or fine-loamy textures. The usual soil **chlorites** are expansible layer silicates, montmorillonite or vermiculite, whose interlayer spaces have been filled or partially filled by **hydroxyl** alumina, and their physical behavior after **chloritization** resembles kaolinite or mica. Soils containing much chlorite would probably best be **classed** as having mixed mineralogy.

At the present time information available on soil chlorites is insufficient to **clearly** define the nature of these minerals. Apparently the composition of chlorite **interlayers** is quite variable, with only small **islands of** aluminous material in **interlayer** spaces of **montmorillonites** and vermiculites in some cases, to complete hydroxy aluminum **interlayers** in others. Action on a chloritic mineral class should be deferred until soil chlorites are better defined, **although** the **investigation** of this mineral class should be continued.

The committee recommends that the definition of the fine carbonatic **mineralogy** class be revised to read: "Contains more than one-third (by weight) of carbonates in the less than 0.002 mm fraction as determined by a **calcium** carbonate **equivalent** greater than 33%." This revision would provide uniformity of the method of **determining** the carbonate content.

The definition of the **oxidic mineralogy** class should be extended to cover resistant minerals other than quartz. **For** example, is it permissible that **inert** or resistant minerals such as **rutile**, zircon, and other **extremely** resistant or inert minerals be considered on the same level as **quartz**, and included with the quartz analysis? Some soils contain appreciable amounts of the latter minerals, **along** with **iron-manganese** concretions. Considerable confusion has resulted as to what the mineral class should be in certain soils because of **un-**certainty **regarding** non-neatherable minerals other than quartz.

In the **ashy mineralogy** class it **was** not clear to the committee as to the exact meaning of the phrase: "**dominantly** smaller than 2 mm." A minimum **limit (percentage)** for less than 2 mm-size material should be specified. **Unless** the word **dominant** is used with reference to control, it should be deleted from the definition of this class and replaced by a word such as abundance.

In the **cindery mineralogy** class, as in the **ashy** class, the **subcom-**mittee **suggests** that the word **dominantly** be changed for a more suitable word and that quantitative **limits** be **clearly** defined.

The committee suggests that the siliceous mineralogy class be further studied and perhaps modified to include tridymite and **cris-tobolite** as well as opal, chalcedony, and quartz. The Lauderdale soils in Mississippi are high in both tridymite and cristobolite.

In determining siliceous **classes** some question always arises as to whether or not non-weatherable minerals should be considered as part of the 30% **siliceous** components of the soil. These minerals do not have a **hardness** of 7, or greater; as presently specified. In fact, there are very few minerals with a hardness of 7 or greater. Ilmenite has a hardness of 6; hematite has a hardness of **5.5-6.5**; magnetite has a hardness of **5.5-6.5**; **rutile** has a hardness of 5.5-6.5; pyrolusite has a **hardness** of 2-2.5; goethite has a hardness of 5-5.5; and limonite has the same hardness as goethite.

It appears that the 50% limit (weight of montmorillonite and **non-tronite**) is too high for the montmorillonite class. A value in the **range** of 30% may be more reasonable. **Where** montmorillonite is common it may be desirable to arrive at the mineral classification on the basis of a minimum C.E.C. to percent clay ratio, Surface area measurements, plastic limits, or shrink-swell behavior. The same reasoning applied to the montmorillonite class should be applied to the vermiculite mineralogy class. That is, a minimum value below 50% by weight should be considered.

The committee recommends restudy of the percentage **K₂O** presently used to determine the abundance of illite in the **illitic** mineralogy class. According to best information, half by weight of illite should be equivalent to 4% **K₂O** rather than 3% **K₂O**. Illite clays with reduced **K₂O** content are mixtures, or interstratified mixtures, of illite and vermiculite or montmorillonite. Some question presently exists on the use of the term illite in the Soil Science Society of America. This has not as yet been resolved, and the final definition may have considerable influence on the definition of the illite mineral class. Illite should be considered as the 10 **A** mineral component of the soil clays with an average **K₂O** complement of 10%. The 3% **K₂O** used to represent 50% illite **suggests** that this mineral contains only 6% **K₂O** when pure.

If the behavior of halloysite is carefully evaluated in terms of the properties it imparts to a soil, the 50% limit of the halloysitic class should probably be reduced considerably, as suggested for montmorillonite and vermiculite. Also, it may be desirable to restudy the limit placed on the amount of allophane that is permissible in halloysitic or kaolinitic mineral classes. As much as 25% allophane normally obscures the behavior of all other minerals present in a mineral mixture.

This committee recommends that a new **committee** of qualified mineralogists be added to the Southern Regional **Work** Planning Conference to which questions concerning mineralogy could be referred for study and recommendations.

The committee recommends a subdivision entitled "Source of Data" be added to each new official series description (blue copy) immediately after the subdivision "Series Proposed". The first sentence will contain a statement that characterization data is, or is not, available to support the classification of the series.

Reference will be made to the most pertinent laboratory investigations, when available, such as "The classification of this series is based in part on characterization data reported in Soil Survey Investigation Report No. 13; or in Soil Science Society of America Proceedings (Volume and Page) or unpublished data of the Lincoln Soil Survey Laboratory for pedon LSL X31-37, etc." Unpublished data will be listed by sufficient laboratory and pedon numbers so that it can be located by those most concerned.

Reference will also be made to the most pertinent studies, other than laboratory work, when appropriate. A summary statement of the results will be given. These studies could include such as soil moisture budgets, soil temperature studies, water table studies and the like.

Review drafts, blue line masters, and yellow copies should contain as a minimum the same requirements as for an official series description. Additional information, data, or references may be listed under remarks heading.

It was the feeling of the committee that the state originating the series description would select the one most pertinent reference for listing under "Source of Data". Other data or reference as appropriate would be listed under the "Remarks" section on review drafts and on yellow copies but would be dropped on blue copies.

It was also thought by the committee that the reporting stations for climatic data be identified along with climatic data under the heading "Setting".

The committee summarized criteria used to distinguish soil series in the following families:

- Chromudic Pellustorts, fine, mixed, isohyperthermic (4 series)
- Typic Argiudolls, fine silty, mixed, thermic (4 series)
- Typic Hapludults, clayey, kaolinitic, thermic (10 series)
- Typic Palcudults, clayey, kaolinitic, thermic (3 series)
- Typic Hapludults, clayey, mixed, thermic (10 series)

The distinguishing characteristics were recorded on forms suggested by the Northeastern Committee and were forwarded to the National Technical Work Planning Conference.

In the five foregoing families, 30 criteria were used as a basis for distinguishing series within the families. One criteria, soil color, was used in all families. Consistence, horizon sequence, and solum thickness were each used in two families. The other 26 criteria were used only within single families. A summary of the criteria used is attached to this report.

The committee discussed at length the establishment of criteria for ranges in characteristics of soil series in light of the foregoing summary. Some members felt that series criteria could be stated in only general terms. Other members felt that within some classes specific limits could be placed on ranges of color, thickness of Dt horizons, or thickness of solon, for example, but pointed out the problem of reaching agreement on what the limits should be.

An analysis of separation values developed for some families showed promise in evaluating the distinguishing criteria used. It is pointed out that the usefulness of separation values depended on the order of the criteria and the numerical weight assigned. Further testing of separation values may be worthwhile.

The committee makes no recommendation in regard to ranges of series criteria at this time.

The committee

SOUTHERN REGIONAL TECHNICAL
WORK-PLANNING CONFERENCE
Clemson, South Carolina
July 9, 10 & 11, 1968

REPORT OF COMMITTEE II
CLASSES AND PHASES OF STONINESS AND ROCKINESS

- I. Charges of the committee
- A. Test criteria for stoniness classes and phases on different size and shape of stones.
 - B. Study problems of rockiness with special attention to size of rock, spacing between rock and percent of surface covered by rocks.
 - C. Make recommendations for classes and nomenclatures for the classes of rockiness.
 - D. Suggest ways and means for broader phases in addition to the narrow phase names proposed.
- II. Committee actions
- A. The Chairman, T. W. Green, requested recommendations in a memo to members on January 16, 1968.
 - B. Based on responses from committee members, R. E. Daniell, Vice Chairman, summarized their suggestions. In this, several proposals were offered including a difference in phase names based on intensity of use. This was the basis for committee discussions.
 - C. The committee explored the possibility of intensive versus extensive use in classing stoniness and rockiness. For example, woodland or pasture land are extensive uses--crop-land intensive. The committee stated that this was not needed for the Southern Region.
 - D. The committee agreed that percent surface coverage was satisfactory and preferred in this region rather than spacing between stones and rocks. The distance between stones is so variable that percent coverage is more reliably estimated by field soil scientists.
 - E. The following classes and suggested phase names for stoniness are recommended by this committee:

Class	Surface Covered (Percent)	Suggested Phase Name
0	<2	None
1	2-10	Slightly stony
2	10-50	stony
3	50-90	Very stony
4	90+	Rubble land

- F. The following classes and suggested phase names for rockiness are recommended:

Class	Surface Covered (Percent)	Suggested Phase Name
0	<2	None
1	2-10	Rocky
2	10-25	Very rocky
3	25-53	Series - Rock outcrop complex
4	50-90	Rook outcrop - series complex
5	90+	Rook outcrop

An alternative for the Rock outcrop - series combination is Rock land if the soil is too variable for a series name.

- III. The reports of "Classes of Stoniness and Rockiness" Committees of 1966 and 1968 were compared. They are similar. It was recommended that the committee be discontinued.
- IV. Recommendations from conference

Discussion by members of the conference during the committee report resulted in the following:

The above report is amended to include "Spot symbols such as "s tone, "gravel" or "rock outcrop" should not be used in delineations where the mapping unit name includes like phase names. For example, rock outcrop symbols should not be used in delineated areas having rock outcrop (or rock land) in the name. Such use of spot symbols is redundant and increases the cost of map compilation. If during the process of correlation, map units are combined which will result in a rocky phase with "rock outcrop" symbols, there should be a note made to the cartographer that the "rock outcrop" symbols will not be shown in the delineations of this unit."

Committee Members Present:

R. E. Daniell, Vice Chairman
P. E. Avers
H. C. Dean
F. T. Ritchie
J. A. Cotton
C. B. Breinig
T. C. Mathews

Committee Members Absent:

T. W. Green, Chairman
M. E. Horn
Earl Nance

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE
OF THE COOPERATIVE SOIL SURVEY

Clemson, South Carolina

July 8 - 12, 1968

Report of Committee III - Application
of the New Classification System

The specific charge to Committee III was "Test Soils Memorandum 66, **issued** October 9, 1967." The first item for consideration and discussion by the Committee was Alternative 1 on Page 12 of Memo 66. The **Committee** recommends that sentence 5 in Alternative 1, which presently reads "Each of the inclusions of soils of closely similar series may constitute as much as 25 percent of the **mapping** unit but their aggregate proportion must not exceed 50 percent," be changed to read, "Each of the inclusions of soils of closely similar series **may** constitute as much as 49 percent of the mapping unit but none may be more extensive than the taxonomic unit giving the name to the mapping unit."

Committee consideration was given to item (b) on Page 10. The Committee believes the statement "Families are closely similar if they are

The Committee recognized the problems encountered in the **numerous** changes of names of **taxonomic** units, especially at a Great Group and Soil Series level. It is suggested that whenever feasible a **communication** link with old classification categories be maintained. It **is** recommended that this Committee remain active and continue work on application of The New Classification System.

Members of Committee Present.

S. W. Buol, Chairman (NCSU)	R. E. Caldwell
J. A. DeMent	E. A. Perry
R. G. Leighty	B. T. Birdwell
O. R. Carter	J. W. Kingsbury
J. M. Soileau	L. H. Rivers
Keith Young	J. B. Watts
H. T. Otsuki	L. E.

Committee IV Interpretations of groups and categories higher
than the series

Chairman: Olin C. Lewis, SCS, Florida
Vice Chairman: Curtis L. Godfrey, Texas **A&M** University

This is a new and relatively small Committee, charged with responsibility for working out guidelines for making interpretations of soils at categories above the series level.

I am greatly indebted to the Committee members and visitors. It was our pleasure to meet and consider possible courses of action.

Our work has been restricted essentially to methodology. The primary objective has been to determine a simple procedure for making meaningful interpretive groupings of soil series. We discussed results of the Regional study on procedure for determining land capability, initiated by Dr. Bartelli in 1965. Some of the information from that study has been applied directly in the work of this Committee.

It seems apparent to us that the art and science of survey interpretation has not received the **attention it deserves**, while we pressed for perfection in the soil classification system - **that we** need to go ahead now and stress progress in **standardiza-**tion of procedures and criteria for the widest possible range of interpretations.

The **time has** come when we should develop State and Regional literature on the occurrence and distribution **of** soils, and their interpretation **for use** and development. We should be able to pull meaningful groupings of soils out of the classification system, provide basic interpretations by scientific standards, and then show on small-scale maps where these conditions prevail. Our studies so far indicate that such an objective is justifiable, and that we should move in that direction.

We have attempted to outline simple procedures for identifying compatible interpretive groupings of soil series. This

criteria.

2. That work on the 1965 Regional Committee on land capability interpretations at the Family level be completed and incorporated into this project.
3. That the Committee be continued another term.

Towards this end, we offer our s&vices. Specifically, the Vice Chairman and I volunteer to help continue the project in whatever capacity you **may** determine.



Olin C. Lewis
Chairman

Curtis L. Godfrey (Tex.)
Lester L. Loftin (La.)
E. N. Miller (S. C.)
Morris E. Shaffer (Ga.)
L. H. Burgess (Ala.)
W. M. Parker (Miss.)
H. L. Dean (RTSC-Ft. Worth)

SOUTHERN REGIONAL TECHNICAL
WORK-PLANNING CONFERENCE
OF THE COOPERATIVE SOIL SURVEY
Clemson, South Carolina
July 9-11, 1968

Report of the Soil Moisture and Temperature Committee
committee v

The 1967 National Committee recommended that "the principal activity over the next two years should be the **formulation** of descriptive statements of the water table regime in terms of kind of water table, depth of occurrence, duration, and season of the year, which would replace drainage classes of the Soil Survey Manual and be used in the new classification system in place of morphological features in framing definitions." The committee spent most of its time working on this recommendation. Data in tables 1, 2 and figure 1, together with data and suggested class limits furnished by Carter Steers from Alabama were used in an attempt to formulate water table depth and duration classes that might be used to replace drainage classes. Any depth-duration class we **can** establish with our present information overlaps classification units; **i.e.**, it does not separate, for example, Aquults and Udults.

It was suggested that present data be tested statistically to determine (A) whether the overlap between classification **units** is real or only apparent, and (B) how long must **water** table and rainfall data be collected to give good prediction values under varying **rainfall**. The data on hand may be sufficient for the tests. The present **committee** chairman will investigate these possibilities with the assistance of statisticians at North Carolina State University. It is recommended that individual states collect additional water table data to help refine present definitions.

There was considerable discussion on the meaning of "**perched** water table? It is recommended that "water table" be used to indicate continuous saturation below the measured level; "perched water table" should be clearly indicated and separated.

North Carolina data (tables 1 and 2) indicate that in Aquults water tables are in or within 6 inches of the A1 for periods exceeding 1/2 month per year. Udults have water tables in or within 6 inches of the A1 for periods of less than 1/2 month per year. We propose that saturation of the A1 horizon be tested further to **see** if it can be used in the definition of suborders - Aquults and Udults, Aqualfs and Udalfs, etc..

There was some discussion of soil temperature classes and it was recognized that the lines separating temperature zones need, further refinement. We recommend that collection of soil temperature be continued and soil temperature lines be reconsidered at the next meeting. Observations of temperatures of steeply sloping soils will include aspect.

This committee was not prepared to deal with the question of soil moisture definitions in arid and semi-arid regions. We recognize the problem but believe it **can** best be handled by the states involved, working with the western region.

The committee suggests that it be continued, and that additional **water** table and soil temperature data be collected.

Committee Members

visitors

* R. B. **Daniels**, Chairman

* F. Steele, Vice Chairman

R. C. Glenn

T. J. **Longwell**

J. D. Nichols

G. S. McKee

* D. F. **Slusher**

* C. A. Steers

* G. L. Bramlett

T. C. **Peele**

* V. W. Carlisle

* R. **E. Caldwell**

R. E. Phillips

* J. A. **DeMent**

C. T. **Haan**

H. Landers

* O. R. Carter

R. I. **Barnhisel**

C. A. Ellerbe

J. A. Cottdn

* Attended committee meetings at the Clemson Conference.

Table 1.--Months that Water Table is Above Stated Depth
Range in North Carolina Data

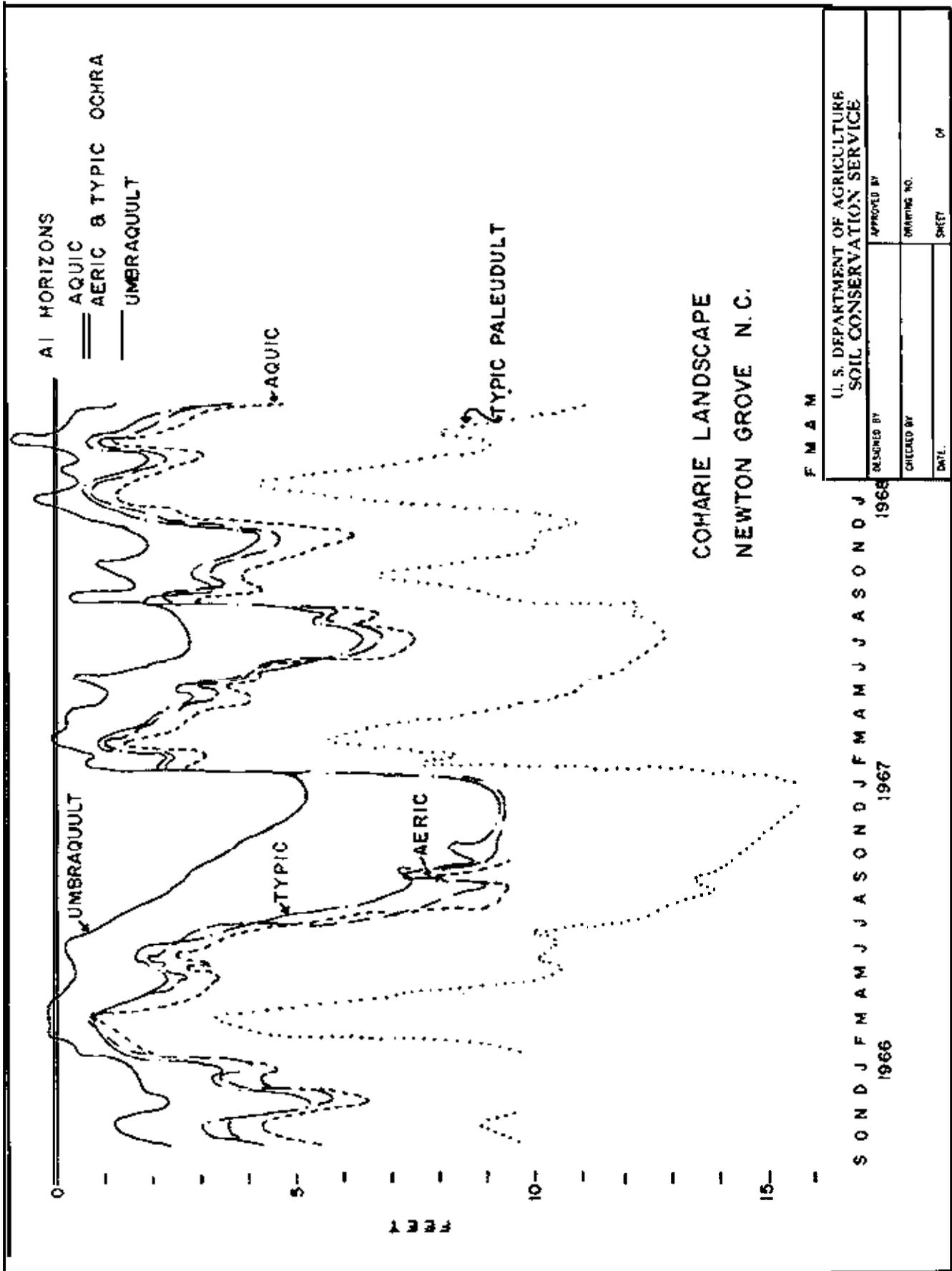
Depth (Inches)	Umbraquults			Typic Ochraquults			Aeric Ochraquults		
	1966	1967	1968	1966	1967	1968	1966	1967	1968
15	65 to 8½	6½	4+	1½ to 35	1 to 74	25 to 5+	1 to 2	0 to 4	½ to 3
30	7½ to 11½	9½	5+	3½ to 7½	2 to 9	4 to 5+	1 3/4 to 4½	1½ to 7 3/4	3 to 4 3/4
60	11 to 12	L2	5+	6 to 11½	8½ to 12	5+	5½ to LO	7½ to 95	5+
120				12	12	5+	12	12	5+
				Udults					
	Aquic Paleudults			Typic Paleudults					
	1966	1967	1968	1966	1967	1968			
15	0 to 1	0 to L	0 to 3	0 to ½	0 to ½	0			
30	1½ to 2½	1½ to 5½	2 to 45	0 to 3	0 to 2½	0 to 3			
60	5 to 9	6 to 11	45 to 5t	1½ to 5½	0 to 5 3/4	½ to 5+			
120		8½ to 12	5+	3 to 12	54 to 12	3½ to 5+			
				9 to 12	6 to 12	5+			

5
2

3

Table 2.--Months that Water Saturation in or Within 6" of A1 Horizon
Range in North Carolina Data.

Year	Umbragaquilt	Typic Ochraqquilt	Aeric Ochraqquilt	Aquic Paleudult	Typic Paleudult
1966	8 to 9	1½ to 4½	½ to 1½	0 to ½	None
1967	7 3/4	1 to 6½	0 to 3	None	None
1968	5+	1½ to 4½	0 to 1 3/4	0 to ½	None



SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE
Clemson, South Carolina

July 9, 10 and 11, 1968

Report of Committee VI
General Soil Maps

The Charge:

1. Consider soil interpretations at the higher categories of the current soil classification scheme. Explore the interpretations for farm and nonfarm uses that could be made from maps at the higher categories.
2. Examine the existing maps, both state and regional, that could be adapted or modified for the above purposes.
3. Select a county where a detailed soil and soil association map is available and is a part of a state or regional map and:
 - a. Describe the mapping units of a county soil association map in the nomenclature of the current classification system and prepare a legend.
 - b. Examine this new legend and determine for each of the mapping units, the most useful **categorical** level, suborder or great group, for making both farm and non-farm interpretations.
 - c. Determine what additional words, e.g., from the nomenclature used at the family or phase levels, would have to be added to the suborder or great group names in order to provide the information that in the committee's opinion, would be required for making the interpretations.
 - d. Prepare map using legend.
 - e. Consider what supporting tabular or text information would be required.

The charges and an assignment of charges to selected discussion leaders were made and sent out to all **committee** members on March 19, 1968. Each member of the committee was requested to develop in writing, his **recommendations** on each of the charges, sending a copy to the discussion leader and the chairman. Each discussion leader complied with the request and several members sent in their comments.

The chairman selected the General Soil Map of the Rolling Plains Area - Texas, at a scale of 1:250,000 and sent it out to each committee member for use in committee work. The General Soil Map from Fisher County, Texas, soil survey, scale 1:253,440, was selected and sent to the committee to represent a segment of the regional map to be used in the discussion of the charges.

The **committee** met at Clemson, South Carolina, and each discussion leader discussed his charge with **comments** from the committee members and visitors. Fourteen members and visitors were present.

Charge 1 -- The **committee** reviewed the soil interpretations possible at the higher categories of the soil classification system. It is possible to make a limited number of the interpretations at the order level. An increasing number of interpretations can be made at each category from the suborder to the family level.

Recommendation: The categorical level at which interpretations could be made will be dependent on the universe involved; county, multi-county; state or region; the scale of the map; and the needs of the expected users. The **committee** suggested that each state test the categorical level that would best **serve** the purpose for different size areas.

Charge 2 -- The General Soil Maps of the Rolling Plains - Texas, and Fisher County were examined and used in the discussion by the **committee** members.

Charges 3a and 3d -- The committee examined the map legend along with the General Soil Map of the Rolling Plains Resource Area and the Fisher County General Soil Map. A legend was prepared and accepted by the committee. See attachments 1 and 2.

Charge 3b -- In response to Charge **3b**, the committee agreed, of the two alternatives of suborder or great group presented in the charge, the great group is better for this map. More specific interpretations can be developed on the family level for the map at the scale of **1:250,000**.

Charge 3c -- The purpose of the additional words is to characterize the mapping unit in a general way for users who are not familiar with the classification system as well as for users who are familiar with it. The additional words should describe soil characteristics and landscape features that differentiate one mapping unit from another and are useful in making interpretations of the soil.

Some of the **more** common soil characteristics used in making interpretations are wetness - or watertable, flood hazard, slope, depth to hard rock, and productivity. These characteristics could be used where applicable along with descriptive landscape terms.

Charge 3e -- The committee reviewed the supporting descriptive legend prepared for the map of the Rolling Plains Area of Texas. In addition, examples of tabular interpretative material to support the legend were presented and discussed.

Recommendation: The legend for the general soil map should be prepared in enough detail, either in a descriptive legend or abbreviated form, to give the information on the soils to the users. Considering the needs of the users, interpretative information should be presented for the components of the associations. This can probably be best presented in tabular form. Attached are examples of the description of an association and a table with interpretations. See attachments 3 and 4.

General Recommendations:

1. The **committee** considered the problem of base maps for general soil maps. Some maps for completed soil surveys have been furnished to the Cartographic Unit on poor base maps with odd scales. It is suggested that the Cartographic Unit be consulted as to the best available base maps prior to the development of the general soil map. In addition, a memorandum may be needed to indicate scale of base maps suitable for general soil maps.
2. The **committee** recommends that more development and testing of general soil maps be done for larger areas on smaller scale maps to determine what categorical levels will best serve the needs.
3. It was recommended that this **committee** be continued.

The committee report was accepted.

Committee Members:

H. L. Dean, Chairman	Texas
H. F. Perkins	Georgia
W. B. Parker	Mississippi
R. C. Deen	Kentucky
Keith Young	Texas
E. A. Perry	Alabama
J. B. Dixon	Alabama
M. E. Shaffer	Georgia
R. G. Leighty	Florida
John Soileau	Alabama
Juan Juarez , Jr.	Puerto Rico
S. A. Lytle	Louisiana
J. B. Watts	North Carolina
J. W. Vandine	Virginia
C. A. McGrew	Arkansas
F. T. Ritchey	Georgia

Visitors:

Dr. Charles E. Kellogg	Washington, D. C.
Mel James	Spartanburg, S. C.
Joe Kingsbury	Washington, D. C.

LEGEND

GENERAL SOIL MAP OF ROLLING PLAINS - TEXAS
(Based on Fisher County portion only)

NEARLY LEVEL TO SLOPING, DOMINANTLY LOAMY SOILS (**Argiustolls**, Haplustalfs, Paleustalfs and Ustochrepts)

cw	Carey-Woodward association:	Soils that are loamy throughout.
MO	Miles-Wichita-Olton association:	Soils with loamy to clayey subsoils.
MC	Miles-Cobb association:	Cobb soils are moderately deep over sandstone.

MOSTLY DEEP, **GENTLY** SLOPING TO SLOPING SOILS WITH CLAYEY SUBSOILS (Paleustolls, Argiustolls, Calciustolls and Llstochopts)

TV	Tillman-Vernon association:	Tillman soils have a cracking clay subsoil. Vernon soils are moderately deep.
AR	Abilene-Rowena association:	Rowena soils have a cracking clay subsoil.

LOAMY SOILS OF RIDGES AND STRONGLY SLOPING TO STEEP AREAS (Ustochrepts, Calciustolls and Calciorthids)

WQ	Woodward-Quinlan association:	Woodward soils are moderately deep and Quinlan soils are shallow, both over silty redbeds.
MP	Mansker-Berda-Potter association:	Potter and Mansker soils are shallow and high in lime; Berda soils are deep and high in lime.

SOILS OF BOTTOM LANDS, SUBJECT TO FLOODING (**Ustifluvents**)

CM	Colorado-Mangum association:	Colorado soils are loamy; the clayey Mangum soils crack when dry.
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GENTLY UNDULATING, DEEP, SANDY SOILS (**Paleustalfs; Ustipsamments**)

BT	Brownfield-Tivoli association:	Brownfield soils have a loamy subsoil within depths of 40 inches. Tivoli soils are sandy throughout.
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KEY TO QUANTIES

GENERAL SOIL MAP FISHER COUNTY, TEXAS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TEMPLE, TEXAS



Base from General Highway Map, 1967 - Reproduction permission granted U. S. Department of Agriculture, Soil Conservation Service, Fort Worth, Texas
USDA SOIL CONSERVATION SERVICE, FORT WORTH, TEXAS

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AR Abilene - Rowena Association:

The soils of this association are deep, nearly level, clay loams and clays. The soils are slowly permeable and well drained. A few areas are gently sloping with slow surface runoff.

The Abilene soils have a thick surface layer of friable, neutral, very dark grayish brown clay loam. The subsoil is firm, dark grayish brown clay that is calcareous below 20 inches. Abilene soils comprise about 35 percent of this association.

The Rowena soils have a surface layer of thick, very dark grayish brown, calcareous heavy clay loam. Soft **caliche** occurs below depths of about 34 inches. Rowena soils comprise about 35 percent of this association.

Other soils within this association are Roscoe, Miles, Olton, and **Acuff**. Roscoe soils occur in depressions and are deep, dark colored, **poorly** drained clays. Miles soils are neutral, brown fine sandy loams with thick, friable, reddish sandy clay loam subsoils. Olton soils are neutral, brown loams with firm, alkaline, reddish clay loam or clay subsoils. **Acuff** soils have a neutral, dark brown sandy clay loam surface layer and friable, alkaline, reddish brown sandy clay loam subsoils.

The soils of this association are used mostly as **cropland** with cotton, small grain and sorghums as the main crops. The soils in this association have a high inherent fertility, moderately high available water capacity, and have a moderate potential for crop production. During years of below average rainfall these soils are droughty.

The soils of this association have moderate to high shrink-swell potential. They have severe limitations for highway subbases and home foundations. The slow permeability causes severe limitations for septic tank filter fields, but have only slight limitations for sewage lagoons.

TABLE - Interpretations of Engineering Properties for Rolling Plains Area Texas

Soil assn	components	%	<u>Selected soil characteristics</u>		<u>Soil limitations for selected non-farm uses</u>				<u>Soil features affecting farm use</u>	
			Depth to bedrock	Shrink-swell potential	septic tank filter fields	Foundations for 1 or 2 story buildings	Highway location	Intensive play areas	Irrigation	Terraces
TV	Vertic Argiustolls	60	5	High	Severe	Severe	Severe	Moderate	Very slow infiltration & permeability	High shrink-swell
	Typic Ustochrepts	20	3 to shaly clays	Moderate	Severe	Moderate	Moderate	Moderate to severe	Slope	None
AR	Pachic Arigustolls	35	5	Moderate	Severe	Moderate	Moderate	Moderate	None	None
	Vertic Calciustolls	35	5	High	Severe	Severe	Severe	Moderate	None	High shrink-swell
WQ	Typic Ustochrepts		3	LOW	Severe	Slight	Moderate to severe	Severe	Slopes-low water holding capacity	Strongly sloping to steep; shallow
MC	Typic Haplustalfs		5	LOW	Slight	Slight	Slight	Slight	Moderate water holding capacity	None
			4	LOW	Severe	Slight	Slight	Slight		

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SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE
of the Cooperative Soil Survey
Clemson University, Clemson, South Carolina
July 9-11, 1968
Report of Committee VII - Urban Interpretations

Charge:

1. Assemble comments and experiences in using the handbook for interpreting engineering uses of soils which was recently issued ("Guide for Interpreting Engineering Uses of Soils", For interim use.)
2. Facilitate the collecting of experiences and research in the broad field of "Correcting soil limitations in non-farm uses." For example, what changes are made in designs of concrete slab foundations when the soil limitations vary from slight to severe, or what physical soil manipulations are being made to overcome **soil** limitations.

To try and devise a way to best arrive at a procedure to allow all 23 committee members to have an opportunity to express their experiences, ideas and opinions, your Chairman, F. T. Ritchie, Jr., and Vice-Chairman, Dr. H. B. Vanderford, prepared a questionnaire. It was sent to each committee member. We received responses from 21 of the 23 members. **This** we consider excellent.

Below **is** the **summary** we **made** of the comments furnished by committee members.

1. Experiences and uses of "Guide for Interpreting Engineering Uses of **Soils**" was quite variable. Several stated they had not **seen** the guide. Others had made no use of the guide up to the present. Still others stated the guide was very useful, did a fine job in explaining the various engineering uses of soils and listing many important factors affecting their use, very helpful in rating the suitability of the soils for several potential uses, useful in placement of soils in AASHO and Unified system of classification, does a fine job of placing in one package much of the material needed to Interpret the engineering uses of soils.
2. The majority of replies stated that copies of the guide were in such short supply, even for interim use, that adequate use, review, and appraisal had not generally been satisfactory. There were a **few** exceptions to this in which they stated the document was thought to be plentiful. Several states reproduced the guide in its entirety, or parts for distribution to the field.
3. An effort was made to collect known knowledge and experiences where adjustments had been **made** in "Correcting **soil** limitation⁶ **in** non-farm uses." A few instances were cited. For example, where due to a high shrink-swell of soil, certain buildings and houses are **being** placed on a concrete slab instead of conventional **type**

pillars; another statement that FHA is now requiring soil tests for high shrink-swell soils; some changes made in septic tank requirements before approval; certain locations require homes to be placed on piling along coastal area, particularly if organic soils are present; **several buildings** and roads relocated, also some change in concrete design; some cities, counties and planning commissions are becoming more restrictive on the various **uses** of soils. However, in none of the replies received **was** there any specific example cited where changes in structure and design requirements were actually due to or changed as a result of soils information furnished by SCS.

It is the belief of your chairman that such changes are taking place daily and the committee members failed to cite specific examples and furnish documentary evidence.

In general, members discussed limitations, qualities and changes that should take place due to the soil conditions, rather than citing **examples** and properly documenting statements.

4. In requesting additional experiences, ideas, suggestions and exhibits, the comments **again were** quite variable. Several emphasized the need for presenting material in a more useful, effective and attractive manner to the potential users. The need for a better educational and publicity program was stressed and, if you please, a better selling job. Preparation of better and more **informative** interpretative engineering materials. For example, one soil series interpreted on one sheet. More additional laboratory data and Benchmark soils information are urgently needed.

There are several comments or items that need to be brought to the attention of all parties concerned. **They** have been listed below.

1. It **was** the consensus that all Interpretative criteria should be combined in one handbook. Examples, interpretative criteria for developing guides, such as: residential development, recreational **use, noncommercial** use, etc. **This** way the interpretative criteria would be more useful and accessible. It could be of a looseleaf nature, divided into sections and amended by sections or sheets as the need may arise. **Even** a State might like the authority to place slip sheets or additional instructions in these criteria handbooks. Criteria for interpretation⁵ should be removed from numbered memoranda, advisory notices and other locations.
2. When material or documents are distributed for review and comments, sufficient copies should be made available to allow for proper review, use and appraisal. The **consensus** is that this was not generally true of the "Guide For Interpreting Engineering Uses of Soils."
3. It was thought that we should develop uniform criteria for evaluating (**in** terms of suitability or limitations) the **uses** for

most of those listed in table 7, columns 4-14. If this were done, then we would have uniform interpretations in soil survey publications.

General:

1. There seems to be considerable overlapping in ~~some~~ of the committee assignments for this conference as they apply to interpretations. This particularly seems to be possible in ~~committee~~ VII and committee VI.
2. The charges to committee VII were quite limited in scope and presented a problem to your chairman and vice-chairman as to how far this committee work should be expanded.

Recommendation:

1. It is the recommendation of committee VII that consideration be given to combining all ~~committees~~ dealing with interpretation. This body should prepare for this region interpretative materials in one handbook. This may be accomplished best by having one large committee with several vice-chairmen that

**REPORT OF COMMITTEE VIII - SOIL SURVEY FOREST COMMITTEE, J. FRANK MILLER,
CHAIRMAN**

Committee VIII reports the following actions taken on charges given it Previously:

Charge I: Ask each state to hold at least one meeting with foresters... to determine the extent that their needs are being met, interpret present methods and explore or offer new approaches. Are data in a form they want and will use? What data, in what form do they want?

Action: Meetings of the nature specified have been held during the year in four states with two states (South Carolina and Georgia) anticipating meetings in the near future. Two additional states have held this type of meeting within the past two years.

The consensus of this committee in that meetings of this type are essential to inform foresters and others of the utility of soil surveys.

The results of these state meetings are attached to this report.

Three recommendations of Committee VIII resulting from a follow.

It is recommended that:

(1) Each State Soil Scientist review the need for revision of slope classifications for woodland uses and that interpretations be designed for the various types of equipment used in harvesting and site preparation. When soil scientists are developing or revising legends which will be used for woodlands, foresters should be consulted (See Charge II)

(2) Where soil complexes and associations, are included in a soil survey, complete description of the individual soil taxonomic units be included.

(3) Prior to mapping extensive areas of land, where the present and foreseeable primary land use is woodland, the ownership managers be consulted as to their needs. The Soil Survey should be designed to accurately meet these needs.

Charge II: Review current criteria used in interpretation of soils data into woodland suitability groups and explore the possibility of future woodland interpretation that may define which taxonomic units can be classified into groups for different management units.

Action: In consideration of Charge II the committee encountered ~~some~~

Competition and pine seedling mortality was referred to, and accepted by, the Southern Forest Environment Research Council. An extract of the minutes of the SFERC is attached as information.

Extract SFERC, report:

"Silker moved that an appropriate committee undertake problems a and b presented by Committee VIII of the Southern Region Soil Survey Work Planning Conference and that problem b be given priority. Kaufman second.

Miller amended: the Biotic Studies Committee be designated as the appropriate committee, Linnartz second.

Amendment approved and motion adopted,

Prank Miller, Chairman of Committee VIII, Soil Survey for Forestry Use, Southern Region Technical Work Planning Conference (a group of

the Southern Forest Soils Council was held on April 9, 1968. As a result, the following recommendation is made:

(1) That Committee VIII continue to urge the various states to hold the meetings stated in Charge I, and to accumulate the information on needs of foresters and other users of soil surveys. This information should be passed on to the Southern Forest Environment Research Council for study and possible action on some points, then transmitted to the Southern Regional Technical Work Planning Conference with the recommendations of the SPERC.

Additional Recommendations of Committee VIII.

Committee VIII recommends:

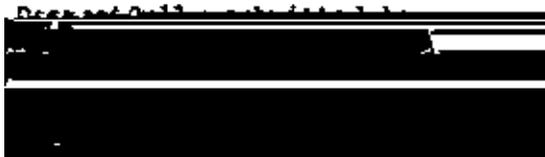
(1) That the committee be continued and instructed to explore new ways of increasing the utility of Soil Surveys for resource management.

(2) That in addition to other charges, Charge I of the 1966 minutes be continued in order to continue and improve communications between resource managers and soil scientists. The committee feels very strongly that potential users of soil surveys must be educated if utility is to be increased.

GENERAL INFORMATION re Committee meeting:

Presiding: W. Frank Miller, Chairman
Acting Secretary: George E. Smith, Jr.
Participant 8:

W. Frank Miller, Miss. State Univ., State College, Miss.
J. M. Case, Regional Forester, S. C. S. Port Worth, Texas
Peter Avers, Soil Scientist, U. S. Forest Service, Morehead, Ky,
Jack T. May, School of Forest Research, Fair



RATIONAL COOPERATIVE SOIL SURVEY SOUTHERN REGIONAL
WORK PUNNING CONFERENCE
Clemson, South Carolina
July 9-11, 1968

REPORT OF **COMMITTEE IX** - Priority of Problems That Need Laboratory Study and Realistic Estimates of Work Required for Each of These Studies.

This Committee was added to the **Work** Planning Conference by request of the Executive Committee after assignment for other committees was completed. It was designated as Committee IX.

Charge:

1. Collect list of projects in progress or contemplated in the future in each state.
2. Coordinate proposed research projects in soil genesis and classification proposed by each state.
3. Recommend regional or sub-regional projects.

The Chairman requested the following information from each state as specified in charge 1.

- 1a. The number of benchmark soils needing analysis over a ten-year period.
- 1b. The kind of investigational projects directed toward improvement in the soil classification system or knowledge of soil genesis needed over a ten-year period,
- 1c. Projects to **answer** specific problems of soil genesis or interpretation in number of samples and analysis per year. These have been called reference or "grab" samples.

Response to charge 1a - States indicated a general inactivity on benchmark soils in the past **several years**. After some discussion on the original concept of benchmark **soils** and their **uses**, it was suggested that the states should reevaluate their selection of benchmark soils. The Committee feels it would be helpful if the National Conference provided revised standards and/or guidelines for benchmark soils. The Committee recommends that selection and use of benchmark soils be continued and receive sufficient attention to remain active.

Response to charge 1b - Most states listed 5 to 10 investigational projects needed over the next 10 or so years for improvement in the soil classification system or knowledge of soil genesis. Copies of responses are available to the National Committee if requested by the Chairman. Copies were furnished to each State Soil Scientist of all projects proposed for SCS laboratories.

Response to charge 1c - The members of the planning conference indicated a need for ~~nearly 700~~ determinations per year from SCS laboratories with a range of zero to 150 per state per year. The wide variation in number is due to past volume of laboratory data and degree of assistance from experiment stations. **Tabulation** by states *has* been provided to laboratory representatives. A discussion of reference or 'grab' samples revealed these varied from relatively simple single determinations (e.g. texture) to those almost equal to investigational projects. Following the discussion on the usefulness of this type data, the Committee voted to recommend that adequate pedon descriptions be prepared at the time of sampling for all reference samples. One experiment station indicated a preference to sampling the entire pedon, when his laboratory was to do the work, rather than making determinations for one or only a few horizons. There was an expression of concern by the Committee of the large number of individual determination samples recently submitted for analysis, however, as the classification system **stabilizes**, the number will probably decrease to a more moderate level.

Response to charges 2 and 3 - After considerable discussion of charges 2 and 3, the Committee feels that direct coordination of projects is beyond the practical scope of this Committee. The Committee recommends that the future function of this Committee include a tabulation of immediate past, present **and** immediate future projects related to soil classification and genesis in each state. This information will be provided to all interested agencies. The report submitted by Alabama is considered desirable for present and proposed projects. A copy is attached to this report (Exhibit 1). At this time, the Committee feels that little can be done related to recommending projects, however, after charge 2 is developed as outlined above, the Committee will be in a position to make sound recommendations.

Additional Committee Considerations

1. In addition to the changes, the Committee recommended that if the procedures used in analyses agreed with SCS Soil Survey **Investigations** Report Mo. 1, the code number for the procedure would be reported for the data. In the event of minor deviations, footnoted explanations would be used. In the event of use or development of a new procedure, a distinctive code would be developed in conjunction with SCS laboratories.
2. An offer was made by the Soil Survey Laboratories to furnish a limited number of **Interlab** Comparison Samples to cooperating agencies if requested.
3. Considerable concern was expressed for the need of knowledge of projects and coordination **between agencies** involved in research affecting soil morphology and characterization. This involves the Agricultural Research Service, United States Forest Service and others carrying out research projects related to **soils**. The Committee was uncertain as to the administrative channels to **effect this** coordination and hopes that proper guidance will be provided by the National Conference. The Committee felt that those people with **common** interest in soils should attend each others' workshops.

The Committee recommends

1. The **Committee** be continued.
2. The name be Research Coordinating Committee.
3. Future charges of the Committee include the above recommendations.

The report was accepted as presented.

Members of Committee

J. D. Nichols, Chairman
 H. H. Bailey, Vice-Chairman
 Westal Fuchs, Recorder
 *B. L. Allen
 *L. J. Bartelli
 Glenn L. Bramlett
 S. W. Buol
 V. W. Carlisle
 G. R. Craddock
 *R. B. Daniels
 *Joe Dixon
 *Fenton Gray
 R. B. Grossman
 *C. J. Koch
 *W. M. Parker
 E. J. Pederson
 *Ted Silker
 *M. E. Springer
 Carter Steers
 R. D. Wells
 Keith Young

Other Participants

Louis E. Aull
 George J. Buntley
 H. S. Byrd
 Walter Keenan
 David Slusher
 J. B. Watts

*Unable to attend **Committee** meeting.

Attachment (Exhibit 1)

EXHIBIT 1

Laboratory Needs Submitted by the State Soil
Scientist of Alabama to Committee IX of the
National Cooperative Soil Survey Southern Regional

The kind of investigational projects directed toward improvement in the Soil Classification System or knowledge of soil genesis needed over a ten-year period. Submitted to Committee IX of the SRT Work Planning Conference.

2. Investigational projects for improvement in the classification system or knowledge of soil genesis needed in Alabama are as follows:
 - 2.1 - A reconnaissance type investigation to study the mineralogy of soil series over various geological regions and landscape positions.
 - 2.11 - A study comparing sand mineralogy for series from the upland Coastal Plains versus the series of the Alabama River terraces. Proposed series to be studied are the Aycock, Cahaba, **Kalmia**, Norfolk, Orangeburg, **Ruston** and **Wickham**. (14 samples)
 - 2.12 - A study comparing clay mineralogy for series from the upland Coastal Plains versus the series of the Alabama River terraces. Proposed series to be studied are the Angie, Craven, Greenville, Leaf, Magnolia, **McQueen**, and **Shubuta**. (14 samples)
 - 2.13 - A study comparing sand mineralogy for series from the upland Piedmont region versus series of the **Tallapoosa** River floodplains. Proposed series to be studied are as follows: Altavista, Augusta, Grover, **Masada**, **Congaree**, Chewacla, **Mantachie**, Wehadkee, and **Wickham**. (24 samples)
 - 2.14 - A study of clay mineralogy for series from the Piedmont region. Proposed series to be studied are: Hulett, Madison, **Tatum**, **Wedowee** and Armuchee (?). (10 samples)
 - 2.15 - Mineralogy is needed to check the classification of the following series: Decatur, Waynesboro, Hanceville, **Anniston**, Dewey, and Fullerton. (12 samples)
 - 2.2 - A geomorphology study comparing soil series morphology of the Alabama Blackland Prairie landscapes and similar classified series of other resource areas. Proposed series for characterization study are: Boswell, Capshaw, Colbert, Eutaw, Hollywood, Houston, **Iredell**, **Kipling**, Mecklenburg, Oktibbeha, Talbott, **Vaiden**, Watsonia, and Wilcox. (140 samples)

- 2.3 - Water table study needs expanding to include Geneva and Mobile Counties. Characterization **data will** be needed to **accompany** these studies. Work will deal mostly with soils of the **fragic** and plinthic subgroups. (150 samples)
- 2.4 - A study of silt content in the control section of selected similar soil series needs to be made **across** the state from **east** to west. Selected counties **are: Mobile, Dallas, Geneva, and Henry.**
- 2.5 - A base saturation study **of selected series from various** landscapes and geologic **areas in the state.** (35 samples)
- 2.6 - A characterization study of soils with **regolith** of transported materials from limestone, **sandstone, shale, and chert** as well as those of **mixed** origin. This **study** is needed primarily on the floodplain series for such soils previously **mapped as: Huntington, Lindside, Newark, Melvin, Ennis, Lobelville, Lee, Pope, Philo, Stendal** and Atkins. Also on **fragipan** soils series such as the Cane, Locust, **Leadvale, Landisburg, Csptina, Monongahela, and Tilsit.** (90 samples)
4. Alabama has a water well study on soils with plinthite in **Escambia** County and plans have **been** made to broaden this **study** into a Soil Geomorphology Study of the Lower **Coastal Plain Area** in this **same** county. Dr. R. B. Daniel's drilling rig is scheduled to be in **Alabama during November 1968.** Expected **characterization samples needed will probably be about 75.**

SOUTHERN REGIONAL TECHNICAL WORK PLANNING CONFERENCE
OF THE COOPERATIVE SOIL SURVEY
Clemson, South Carolina
July 9-11, 1968

Report of ad hoc committee on
Soil Survey Procedures

Charge: Outline an orderly procedure for making changes in the New Classification System

A. Open meeting on July 9 for general discussion of procedures.

1. The chairman summarized results of 37 questionnaires returned by the members of the conference,
2. Dr. Kellogg suggested that the new comprehensive classification might be published in two volumes.

There seemed to be a consensus that Volume I might contain a basic explanation of the system, including discussion of diagnostic horizons and information about Orders, Suborders and Great Groups; Volume II might carry information about subgroups, family and series and be issued in loose leaf or other form so that it could be easily revised annually or biennially by either replacement pages or additional pages. Battelli suggested that volume II might include a key from Orders to Subgroups so that an up-to-date outline of higher categories would be available.

It was suggested that this new publication carry a list of all soil series ever used with an indication of their revision or current inactivity. Battelli and others pointed out that such a procedure would present a great number of technical problems.

Dr. Winters suggested that state level committees be formed to funnel proposals for change or addition to the regional committee.

Grossman pointed out that time input by members of the regional committee would be large and that some special arrangement for time and funds may be desirable.

Ritchie suggested that on the regional level a permanent standing committee is needed, with representative from agencies involved in survey, classification, or soil formation work. Bartelli indicated that capability and interest should be primary criteria for membership on such a regional committee. Bailey suggested that personnel serve staggered terms so that there will be continuity.

Buol indicated that participation in this activity should be given status through clearance and approval by administrative personnel, including approval of time commitments and funding of travel to committee meetings. **Grossman** indicated that soil formation personnel in the **states** should be oriented closely to needs for research related to the new classification. Buntley suggested that proposals for change originating in the states should be documented and supported by research.

B. Committee meeting after open **discussion**.

1. Constructive, documented **suggestions** from any individual can be sent to a proposed regional committee.
2. Any proposals for revisions or **additions** to the new **classification** system must be documented with data or written **justification** to be considered by the regional committee.
3. **Echelons** or **levels** of **activity**.

3.1 State

- 3.11 A committee **is strongly** suggested but would not be required.
- 3.12 An individual, **institution** or agency may originate proposals at the state level, but it **is hoped that** they **will** be discussed with other individuals or agencies or a state committee before **transmission** to the proposed regional committee.

3.2 Region

- 3.21 A five-man committee is **suggested**
 - 3.211 The Regional Soil Survey Work Group (Experiment Station people) will prepare a list of individuals who are able and willing to **serve** on the regional committee and send it to the Southern Soil Research Committee (**SSRC**). From this list the SSRC will designate two **names** for transmission through the office of the Principal Correlator to the SCS Deputy Administrator for Soil Survey. These individuals will report annually to SSRC.
 - 3.212 It is proposed that the Principal Soil Correlator will prepare a list of individuals in SCS who are able and willing to **serve**. **Two** from this list shall be appointed to the Regional Committee by the Deputy Administrator for Soil Survey.

- 3.213 The Principal Correlator will invite the Regional Office of the US Forest Service to designate a qualified individual to serve on the committee.
- 3.214 The ~~terms~~ of office will be staggered. At the start, one individual appointed by SSRC and one ~~appointed~~ by SCS shall serve two year terms. All other terms are three years.
- 3.215 The committee may elect a chairman if desired.
- 3.22 The Principal Correlator shall be an ex officio member of the committee and can receive advice and ~~suggestions~~ from the committee,
4. This five-man ~~committee~~ shall be announced by the Deputy Administrator for Soil Survey ~~upon~~ completion of the appointment ~~process~~.
5. This committee shall be considered a ~~permanent standing~~ committee of the Southern Soil Survey Work Planning Conference and shall present reports and hold open ~~discussion~~ at every meeting of the W-P Conference.
6. This proposed regional committee may ask the Executive Committee of the ~~Southern~~ Soil Survey Work Planning Conference to appoint special committees or work ~~groups~~ for special needs such as revisions or changes involving soil mineralogy.
7. For each ~~propoeal~~ coming to it this regional committee will recommend either
- (a) forwarding the proposal to the appropriate ~~person~~ on the national SCS Soil Survey Staff or to a national (or international) committee.
 - (b) refer the proposal through the Principal Soil Correlator to a parallel regional committee (or committees) with similar problems.
 - (c) send the proposal back to the state for further testing or additional documentation and ~~justification~~.
 - (d) rejection.

Committee members

L. J. Bartelli
F. H. Beinroth
R. J. McCracken, recorder
Henry Otsuki
David Slusher
M. E. Springer, chairman
Eric Winters, ~~advisor~~

Registration 1968 SRTW-PC

NAME	ORGANIZATION
Allen, L. R.	Clemson Univ.
Aull, Louis E.	N. C. State Univ.
Avers, Peter E.	USFS-Ky.
Bailey, H. H.	Univ. of Ky.
Bartelli, Lindo J.	SCS-Texas
Beinroth, Friedrich H.	Puerto Rico Exper. Sta.
Birdwell, Bobby T.	SCS-Tenn.
Bremlett, Glenn L.	SCS-Ga.
Breinig, Clarence B.	SCS-Tenn.
Buntley, George J.	Univ. of Tenn.
Buol, S. W.	N. C. State Univ.
Burgess, Leland H.	SCS-Ala.
Byrd, Huger S.	SCS-S. c.
Caldwell, Robert E.	Univ. of Fla.
Carlisle, Victor W.	Univ. of Fla.
Carter, Oliver R.	SCS-Ark.
Carter, R. C.	SCS-Texas
Chalk, A. T.	SCS-State Conservationist-S. C.
Cotton, James A.	SCS-Ala.
Covell, R. R.	SCS-Miss.
Craddock, G. R.	Clemson Univ.
Daniell, Robert E.	SCS-Ky.
Daniels, Raymond B.	SCS-N. C.
Dean, Harold L.	SCS-Texas
Dean, Hartzell	SCS-Ark.
DeMent, James A.	SCS-Texas
Elder, Joe	SCS-Tenn.
Ellerbe, Clarence M.	scs-s. c.
Fuchs, Westal W.	SCS-Texas
Godfrey, Curtis	Texas A & M
Grossman, R. B.	SCS-Nebr.
Hurst, Victor	Clemson Univ.
James, Mel	SCS-Soil Scientist-S. C.
Jenkins, Van S.	SCS-N. C.
Jutras, M. W.	Clemson Univ.
Keenan, Walter E.	Miss. Agr. Exp. Sta.
Kellogg, Charles E.	SCS-Washington, D. C.
Kingsbury, Joe W.	Soil Survey Operations-Wash., D. C.
Klawitter, Ralph A.	USFS-S. c.

(OVER)

Registration 1968 SRTW-PC (contd.)

NAME	ORGANIZATION
Koch, Charles J.	SCS-Va.
Landers, Toby	State Climatologist-S. C.
Leighty , Ralph G.	Pla. Exp. Sta.
Lewis, Olin	SCS-Fla.
Loftin , Lester L.	SCS-La.
Lytle, S. A	L. S. U.
Mathews, T. C.	Univ. of Fla.
May, Jack T.	Univ. of Ga.
McCracken, Ralph J.	N. C. State Univ.
McKee, Gordon S.	SCS-Texas
Miller, E. N.	scs-s. c.
Miller, W. Frank	Miss. State Univ.
Nichols, Joe S	SCS-Okla.
Obenshain, S. S.	VP1
Otsuki, Henry T.	SCS-Okla.
Parker, W. B	SCS-Miss
Pedersen, Edwood J.	SCS-Md.
Peele , T. C.	Clemson Univ.
Perry, Ernest A.	SCS-Ala.
Prout, Carrow T.	SCS-Wash., D. C.
Ritchie, F. T.	SCS-Ga.
Rivera , Luis H.	SCS-Puerto Rico
Shaffer, Morris E.	SCS-Ga.
Slusher, David F.	SCS-La.
Smith, G. E.	scs-s. c.
Sofleau, John M.	TVA-Ala.
Springer, M. E.	Univ. of Tenn.
Steele, Forrest	SCS-N. C.
Steers, Carler A.	Auburn, Ala.
Vanderford. H. B.	Miss. Exp. Sta.
Watts, John B.	SCS-N. C.
Wells, R. D.	SCS-S. C.
Winters, Eric	Univ. of Tenn.
Young , Keith K.	SCS-Texas

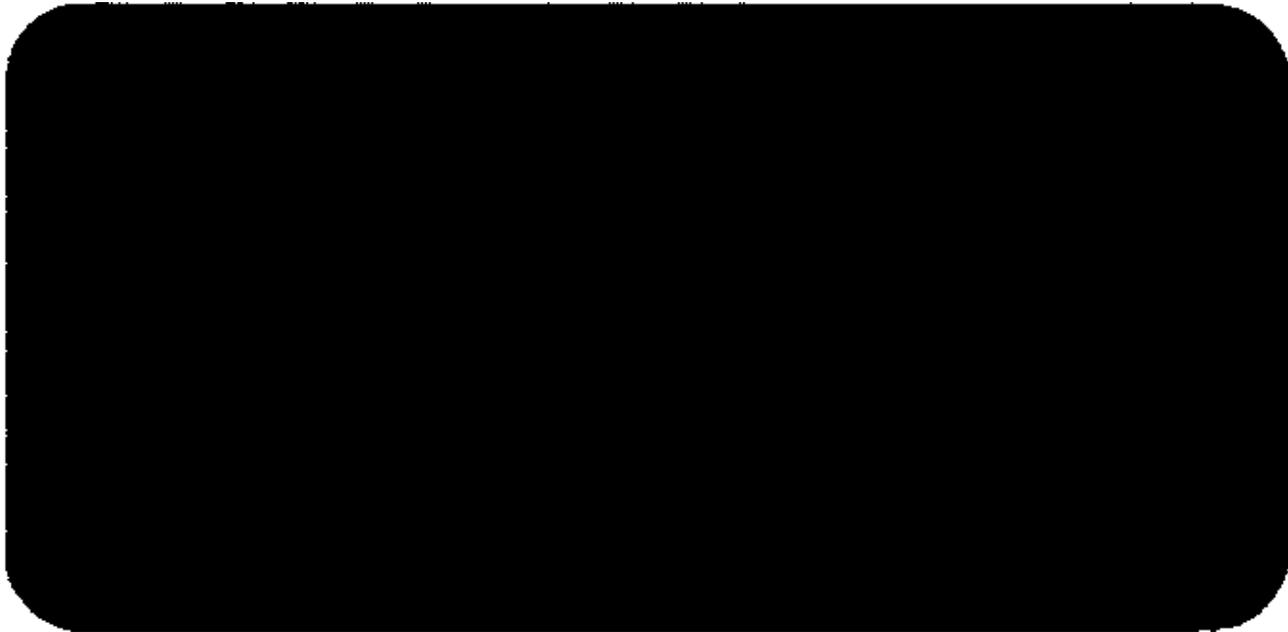
NATIONAL COOPERATIVE SOIL SURVEY
Southern Regional Conference Proceedings

Lexington, Kentucky
June 7-9, 1966

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Proceedings of

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING
CONFERENCE OF THE COOPERATIVE SOIL SURVEY



UNIVERSITY OF KENTUCKY • LEXINGTON . JUNE 7-9 1966

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING
CONFERENCE OF THE COOPERATIVE SOIL SURVEY

June 7, 8, 9, 1966

Agricultural Science Center
University of Kentucky
Lexington, Kentucky

TUESDAY, June 7, 1966

8:00-9:30 Registration. Foyer opposite Agricultural Library

Opening Session

Room N-12
Presiding: H. H. Bailey

9:30-9:50 **Welcome** - W. A. Seay
Dean and Director, Kentucky Agricultural
Experiment Station

9:50-10:30 Tobacco and Health Program - G. W. Stokes, Coordinator

10:30-11:00 Conservation Programs in Kentucky - H. A. Taff, State
Conservationist, SCS, Kentucky

11:00-11:30 The National Cooperative Soil Survey - G. D. Smith,
Soil Conservation Service, Washington

11:30- 1:15 Lunch

Afternoon Committee Meetings

1:15-1:20 Room N-12 Announcements

Problems of Soil Survey Publication - H. L. Dean

1:20-5:00	Committee	Room
	I Climate	N-8
	II Made soils	N-10
	III New Classification Scheme	N-11
	IV Stoniness and Rockiness	N-206
	V Organic Soils	N-120

WEDNESDAY, June 8, 1966

Morning

Committee meetings

8:15-11:30

Committee

Room

VI	Soil Survey for Forestry Uses	N-8
VII	Reports and Maps	N-10
VIII	Engineering Applications	N-11
IX	Fragipans	N-12

11:30- 1:15

Lunch

Afternoon

Work Group Meetings

1:15-1:20

Room N-12 Announcements

1:20-5:00

Soil Conservation Service Work Group Room N-10

Southern Regional Soil Survey Work Group Room N-120

Evening

Symposium on New Classification Scheme
as related to:

1) College teaching - B. L. Allen, D. D. Nehr, M. E.
Springer

2) Training a new soil surveyor - A. J. Baur, G. D. Smith

Moderator: R. E. Daniell

THURSDAY, June 9, 1966

Morning

Committee Reports Room N-12

8:00-9:50

Committees I, II, III, IV, v

9:50-10:10

Break

10:10-11:30

Committees VI, VII, VIII, IX

11:30- 1:15

Lunch

Afternoon

1:15- 2:30

Business, meeting Room N-12 Presiding: J. H. Winsor

2:30- 5:00

Field tour-University Farm

Soil: Maury silt loam, and adjacent weather station

Southern Regional Technical Work-Planning Conference
of the Cooperative Soil Survey
University of Kentucky, Lexington
June 7-9, 1966

Minutes of the Business Meeting, June 9, 1966

J. H. Winsor, Presiding

The chairman made the first order of business the report of the committee reviewing the "Policies, Purpose, and Procedures" of the conference. Following a brief review of the proposed changes to the draft, as circulated, the conference moved and adopted the revised "Purposes, Policies, and Procedures." A copy of the document is to be made a part of these minutes.

Following adoption of the "Purposes, Policies, and Procedures," the chairman briefly reviewed the constitution of the voting membership.

H. H. Bailey read a request from the Southern Forest Environment Research Council requesting a one vote membership in the Conference. Conference granted the request without dissent.

The chairman reviewed the membership of the Conference and pointed out that Virginia and Kentucky are still members of the Southern Regional Conference even though they are in a different region for soil classification purposes. Dr. L. J. Bartelli indicated that it is SCS policy for the states to remain in the "region" as corresponds to that of the Experiment Station Directors, thus Virginia and Kentucky would remain in the Southern Region.

Dr. H. H. Bailey read Letters of invitation to the conference from Puerto Rico for 1968 and South Carolina for 1968 or 1970. Following discussion the conference moved and accepted the invitation from Puerto Rico to hold the conference there in 1968, and further, moved and accepted the invitation from South Carolina for 1970.

Dr. Bartelli stated that within the next three months the SCS would check the conference decision of meeting in Puerto Rico with their administrator to determine the possibility of the SCS group going to Puerto Rico. If the administrator ruled against SCS travel to Puerto Rico the conference agreed to go to South Carolina in 1968 in order to keep the conference alive.

Conference **suggested** July 8-12, 1968 as a suitable time to visit **Puerto** Rico in order to avoid the tourist season. The third week of June 1968 was suggested as a suitable date if the conference must **move** its site to South Carolina.

In line with the adopted "policies" the 1968 Conference Chairman will be from the Soil Conservation Service and Vice-Chairman from the Experiment Station.

Mr. **Winsor** expressed thanks to all **speakers** at the conference (read **names**).

The chairman briefly reviewed the instructions to committee chairman as to completion and submission of their committee reports.

As a special item of business Dave **Slusher** reviewed the proposal submitted to National Conference by the North Central Conference **as** related to changes in **our** current procedures for making changes in the soil classification **system**. These proposed changes were read. (**See** par A5, **pages** 3, 4, and 5 of Report of the **Committee** on Soil Classification Procedures of the National Conference, Chicago, Illinois, January 25-29, 1965).

Winsor asked for discussion.

Representative from Texas asked if this organization would be **outside** of this workshop group. **Winsor**

Bartelli stated that we should think of things and ways of using **Regional** and National Work Planning Workshops in future revisions of the classifications system. **Need to tap the wealth** of these groups.

Dr. Winters stated that it might be desirable to state along with the rejection that the workshops are desirable groups for handling revisions.

Bartelli moved that the charge of organization of proper mechanism for changes of classification be included in **duties** of some permanent committee on **classification** in the Southern Regional Workshop with reference to steering committee for selection of **the** committee. Seconded and adopted.

Dr. **Baur pointed out** that such a committee would be necessary in other regions and at National level - need to meet more often than two years. **Bartelli** pointed out that procedures are such now that special **meetings** of committees can be called. Dr. Smith also discussed this in some detail.

Dr. H. B. **Vanderford** expressed appreciation to the chairman, University of Kentucky, College of Agriculture, and others for a successful conference.

There being no **further** business the conference was declared adjourned with the note of an optional field trip to the Kentucky Agricultural Experiment Station Farm to view a **Maury** soil site, and the Agronomy Department weather **instrumentation**.

SOUTHERN REGIONAL SOIL SURVEY TECHNICAL WORK-PLANNING CONFERENCE

PURPOSE, POLICIES AND PROCEDURES

1966

I. Purpose of Conference.

The purpose of the Southern Regional Soil Survey Technical Work-Planning Conference is to bring together Southern States representatives of the National Cooperative Soil Survey for discussion of technical and scientific developments. Through the actions of committees and conference discussions, experience is summarized and clarified for the benefit of all; new areas are explored; procedures are proposed; and ideas are exchanged and disseminated. The Conference also functions as a clearing house for recommendations and proposals received from individual members and State conferences for transmittal to the National Cooperative Soil Survey Technical Work-Planning Conference.

II. Membership,

A. Voting Membership.

Voting members of the Conference are the following:

The state soil scientist, or his representative, of each of the 13 States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia) and Puerto Rico.

The experiment station or university soil survey leader, or his representative, of each of the 13 States and Puerto Rico.

The principal soil **correlator** of the Southern States, or his representative.

One representative of the Soil Survey Laboratory serving the region.

One representative of the Cartographic Unit, SCS, serving the **region.**

One representative of the Forest Service regional office.

One representative of the Southern Forest Environment Research **Council**.

(Other organizations designated by the Conference).

B. Non-Voting Membership.

Special invitations may be given to a number of other individuals to participate in specific conferences. Any soil scientist or other **technical** specialist of any State or Federal agency or private enterprise whose participation would be helpful for particular objectives or projects of the Conference may be invited to attend. These extra participants do not vote on issues of Conference policy and procedure.

111. Officers.

A. Chairman and Vice-Chairman.

A chairman and vice-chairman of the Conference are elected to **serve** for two-year terms. Elections are held during the biennial business meeting. **Election** of officers follows the selection of a place for the next meeting, **because** officers must be from the State where that meeting is to be held. Officers rotate among agencies. That is, the chairman-elect must be of a different agency than the past chairman. Similarly, the vice-chairman must be of a different agency than the chairman.

Responsibilities of the chairman include the following (specific tasks may be delegated to the vice-chairman):

1. Planning and management of the biennial Conference.
2. Function as a member of the Steering Committee.
3. Issue announcements and invitations to the Conference.
4. Write the program and have copies prepared and distributed to the membership. Provide a recording secretary to take and prepare minutes of the business meetings of the Conference for inclusion in the proceedings of the Conference.
5. Make necessary arrangements for: food and lodging accommodations for Conference members; special food functions; meeting **rooms** (including committee rooms); and local transport on official functions.
6. Obtain official clearance for the Conference from SCS and Experiment station officials, and other organizations as required.
7. **Assemble** and distribute the Proceedings of the Conference.
8. Provide for appropriate **publicity** for the Conference.
9. Preside at the business meeting of the Conference.
10. Maintain Conference mailing list, clear membership with appropriate administration, and turn it **over** to incoming chairman.

Responsibilities of the vice-chairman include the following:

1. Function as a member of the Steering Committee.
2. Act for the chairman in the chairman's absence or disability.
3. Perform duties as assigned by the chairman.

B. Steering Committee.

A steering committee assists in the planning and management of the biennial meetings, including the formulation of committee memberships and selection of committee chairmen and vice-chairmen, organizing the program of the Conference, and selecting presiding chairmen for the various sessions. The Steering Committee consists of the following members, or their designated representatives:

The Conference chairman (Chairman)
The Conference vice-chairman
Principal Soil Correlator, Southern Region
The Conference past chairman and/or vice-chairman

1. Regular Meetings.

At least one meeting is held at each regional work-planning conference. Additional meetings may be scheduled at other times or places if the need arises.

2. Communications.

Most of the Committee's communications will be in writing. Copies of all correspondence between members of the Steering Committee shall be sent to each member of the Committee.

3. Participants.

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

4. Committee Charges.

The Steering Committee is responsible for the formulation and transmittal to Committee chairmen of charges to committees.

5. Conference Policies.

The Steering Committee is responsible for the formulation and statements of Conference policy. Final approval of such statements is by vote of the Conference.

6. Liaison.

The Steering Committee is responsible for maintaining liaison between the regional conference and (a) the Southern Regional Soil Survey Work Group, (b) the Southern experiment station directors, (c) the Southern state conservationists, (d) the national and state offices of the Soil Conservation Service, (e) regional and national offices of the Forest Service, (f) Southern Forest Environment Research Council, and (g) other cooperating and participating agencies.

C. Advisors.

Advisors to the Conference are the SCS State Conservationist and the Experiment Station Director from the state where the Conference is held. In addition other advisors may be selected by the Steering Committee or the Conference.

D. Committee Chairmen and ~~Vice-Chairmen~~.

Each Conference committee has a chairman and vice-chairman which are selected by the Steering Committee.

IV. Meetings.

A. Time of Meetings.

The Conference convenes every two years, in even-numbered years. Time of year to be determined by the Conference.

B. Place of Meetings.

The Conference may be held at any suitable location. 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 meeting places. Meeting sites should be determined two meetings in advance (eg. 1966 Conference should select place for 1968 and 1970 meetings, and then 1968 Conference select place for 1972, etc.)

C. Separate State and Federal Meetings.

Time is to be provided on the Conference program for separate state and federal meetings if requested by the Conference and scheduled by the Steering Committee.

V. Committees.

A. Most of the technical work of the Conference is accomplished by duly constituted **committees**.

R. Each committee has a chairman and vice-chairman. A secretary, or recorder, may be selected by the chairman. Committee chairmen and vice-chairmen are selected by the Steering Committee. It is the intent, where **possible**, for the vice-chairmen to succeed the chairmen at the succeeding conference.

C. The kinds of committees, officers of the committees, and their members, are determined by the Steering Committee. In selecting committee members, the Steering Committee considers expressions of interest filed by the Conference members, but at the **same** time provides for efficient continuity of work, and considers the technical proficiency of the members of the conference.

- D. Each committee shall make a verbal report at the designated time at each biennial Conference. Accepted committee reports shall be written and duplicated by the Committee Chairman as per instructions from the Steering Committee.

Note: Chairmen of Committees are **responsible** for submittal of committee reports promptly to the Chairman of the Conference. The Conference Chairman is responsible for distribution of committee reports to Conference members and others.

- E. Much of the work of committees will, of necessity, be conducted by correspondence between the times of biennial conferences. committee chairmen are charged with responsibility for initiating and carrying forward this work. They shall provide their committee members with the charges as directed by the Steering Committee, and whatever additional instructions they deem necessary for their committees to function properly. Chairmen should initiate committee work at the earliest possible date.

VI. Representation at the National Technical Work-Planning Conference.

At least one state and one federal voting member will represent this conference at the National Technical Work-Planning Conference. Selections are to be made subject to approval of the appropriate administrators. Representatives will report back to this conference, as well as to their respective state or federal group.

VII. Amendments.

Any part of this statement of purposes, policy, and procedures may be amended at any time by simple majority vote of the Conference voting membership.

Adopted by Southern Regional Soil Survey Technical Work-Planning Conference at Lexington, Kentucky on 9 June 1966.

MVB.

Registration 1966 SRTW-PC

NAME	ORGANIZATION
Allen, B. L.	Texas Tech.
Bailey, H. H.	Univ. of Ky.
Barnhisel, R. I.	Univ. of Ky
Bartelli, Lindo	SCS-Texas
Bender, William	SCS-Texas
Buol, S. W.	N. Carolina State Univ.
Burgess, Leland	SCS-Ala.
Baur, A. J.	SCS-Pa.
Byrne, James	USFS-Va.
Carlisle, Victor W	Univ. of Fla.
Carter, Oliver	SCS-Ark.
Carter, R. c.	SCS-Miss.
Cook, Doyle	Univ. of Ky.
Coover, James	SCS-Texas
Covell, R. R.	SCS-Miss.
Craddock, Garnet	Clemson Univ.
Culver, Jim	SCS-Okla.
Daniell, R. E.	SCS-Ky
Dean, Harold L.	SCS-Texas
Dean, Hartzell	SCS-Ark.
DeMent, James A.	SCS-Texas
Elam, A. B.	Univ. of Ky.
Elder, Joe A.	SCS-Tenn.
Ellerbe, Clarence	SCS-S. Carolina
Godfrey, Curtis	Texas A & M
Gray, Fenton	Okla. State Univ.
Horn, Merlin	Univ. of Ark.
Huffman, E. V	SCS- Ky
Juarez, Juan	Puerto Rico Exper. Sta.
Keenan, Walter E.	Miss. Exper. Sta.
Leighty, Ralph G	Univ. of Fla.
Lewis, Olin T.	SCS- Fla.
Linnartz, Norwin	School of Forestry-L.S.U.
May, Jack T.	Univ. of Ga.
Miller, Frank	Miss. State Univ.
Neher, David D	Texas A & I College
Obenshain, S. S.	VP1
Otsuki, Henry	SCS- Okla.
Perry, Ernest	SCS- Ala.
Pfeiffer, N. B.	scs- Va.

Ritchie, Frank
Rivera, Luis
Seay, W. A.
Shaffer, Morris E.
Silker, Ted

Sims, Raymond
Slusher, David
Smith, Guy D.
Soilean, John
Springer, M. E.

Steele, Forrest
Stokes, G. W.
Taff, Homer A.
Taylor, T. H.
Tcmplin, E. H.

Vanderford, H. B.
Webster, Lynn
Weems, Tracey
Winsor, Joe
Zimmerman, Wm.

Winters, Eric

SCS-Ga.
SCS- Puerto Rico
Univ. of Ky.
SCS-Ga.
Okla. Sta. Univ.

SCS-Ky
SCS-Louisiana
SCS-Washington, D.C.
TVA-Ala.
Univ. of Tenn.

SCS-N. Carolina
Univ. of Ky.
SCS-Ky.
Univ. of Ky.
SCS-Texas

Miss. Exper. Sta.
Univ. of Ky.
SCS-Louisiana
SCS-Ky.
SCS-Ky.

Univ. of Tenn.

Recommendations

The Southern Forest Environmental Research Council is studying **climate** as a function in forest environment in the coastal plain province. The results of these studies will be useful in **making** soil interpretations, and each state is encouraged to keep in touch with this group.

In some states the U. S. Weather Bureau has installed soil temperature recording instruments at selected weather stations in cooperation with the National Cooperative Soil Survey. This is encouraged for all states.

National Committee Report on Soil Moisture

The committee had few comments on the 1965 National Committee report on soil moisture. The committee agreed that depth to water table and duration classes are needed **and** useful in describing soils, but there was **general** feeling that they not be used as series criteria.

Collection of Soil Moisture and Soil Temperature Data

The 1965 National Committee report on climate points out that uniform methods be used in collecting data. The Principal Soil Correlator can help by reviewing proposed projects. The following states **are** making or **have** completed studies.

Soil Temperature

Puerto Rico
Kentucky
Texas
Virginia
Arkansas
Florida
South Carolina
Georgia
Tennessee

Soil Moisture

Virginia
Mississippi

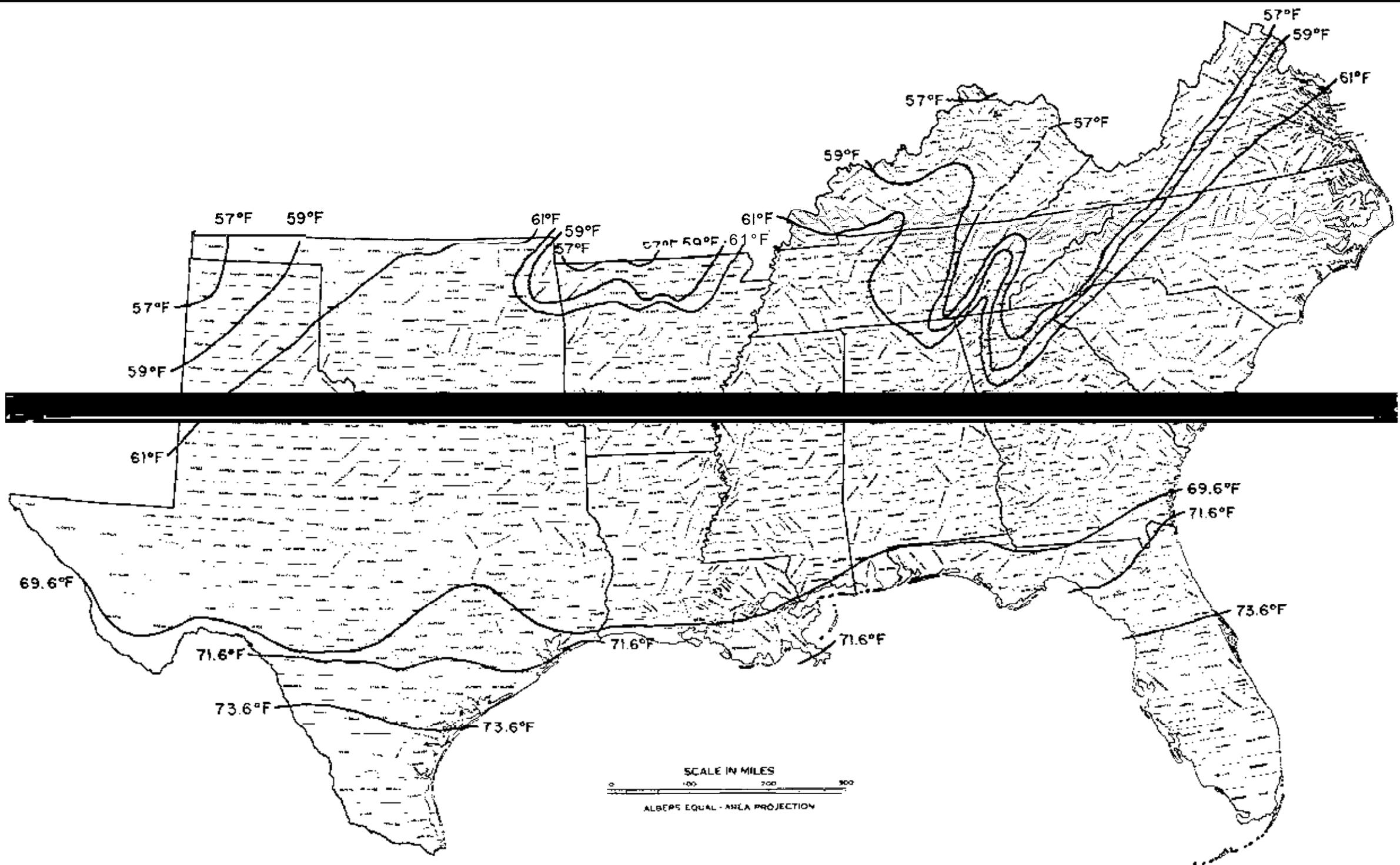
Participants in Committee Deliberations

Committee Members

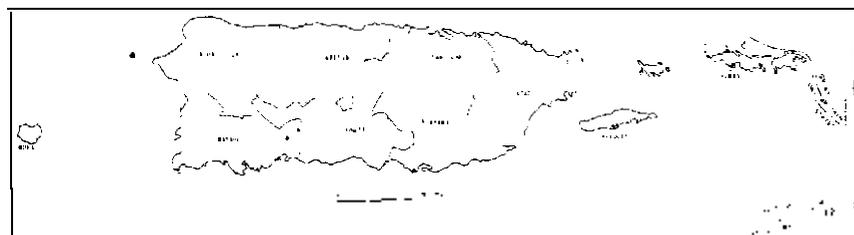
M. E. Springer, Tennessee-Vice Chairman
C. L. Godfrey, Texas
W. H. Bender, SRTSC, Texas
Tracey Weems, Louisiana
Richard I. Barnhisel, Kentucky
Jim Culver, Oklahoma
Luis H. Rivera, Puerto Rico
J. R. Coover, Texas - Chairman

Consultants

W. Frank Miller
N. E. Linnartz
A. B. Elam, Jr., Kentucky
Ted Silker, Okla.



ISOOTHERMS BASED ON AVERAGE ANNUAL AIR TEMPERATURE



AVERAGE ANNUAL SOIL TEMPERATURE ISOOTHERMS
SOUTHERN STATES
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FORT WORTH, TEXAS

Rev. 7-66 4-R-21, 939

NATIONAL COOPERATIVE SOIL SURVEY SOUTHERN REGIONAL
WORK PLANNING CONFERENCE
Lexington, Kentucky
June 7-9, 1966

REPORT OF COMMITTEE II - Criteria for the Classification and Nomenclature
of made soils.

Charge:

1. Review problems in classifying soils which have been altered by urban developments, spoils, deep plowing, land leveling, and the like.
2. React to **recommendation No. 3** of the 1964 **Regional Committee**.
3. React to National **Committee Reports of 1963 and 1965** on "**Classification and Nomenclature of Made Soils**".

All the recommendations, suggestions and comments from committee members was through correspondence.

Response to a request for two types of detailed descriptions for "**Made Soils**" were as follows:

South Carolina responded with four **semi-detailed** composite profile **descriptions** of made land from river dredging. They each describe the dominant color and texture by horizons or layers to a depth of 40 or 42 inches and each represented a separate mappable area. (See **Attachment 1**)

Virginia **responded** with a legend **in** which the type of fill or cut, texture, **wetness**, slope and erosion are used in classifying made land. (See Attachment 2)

Kentucky responded with a proposed **classification** of Strip mine land, using acidity, stoniness and slope groups as principal criteria. (See attachments 3 and 4). **Comments** from other states were of a **general** nature.

Response toward improvement of criteria, as proposed by the 1964 Southern Regional "**Made land**" Committee, was rather sketchy.

Structure, compaction of **fill** material, character of **substrata**, kind and amount of "**non-soil**" materials are additional criteria for consideration. Adjustment of **pH** ranges and use of color to indicate wetness were pointed out.

Actual experience during the past two years in using **the 1964** "Southern Regional **proposed** criteria to classify made land was not mentioned.

The proper nomenclature of made soils was requested. Most favored were names that had some descriptive meaning such as:

Hydraulic fill, sandy
Candy fill over Rutledge soil
Made lend, industrial wastes or made land, acid, silty, lithic

A **committee** visitor, R. R. Covell, gave an excellent report on land leveling in Mississippi. Transects were reviewed **showing change** in series names as well as percentage of unclassified soil areas (made soils with no diagnostic **horizons**).

There are no final committee recommendations because of the lack of a quorum at this committee meeting. This was due to conflicts in **committee** assignments as well as members absence from the conference.

There are several individual items that need **committee** discussion. Also, it would be desirable to have more detailed information on the characteristics of various made soil areas.

Under these circumstances, it seems best to continue this **committee** with similar charges trusting a sufficient committee attendance for at least a quorum-at the next meeting. Perhaps an additional charge needs to be added. This could be added as charge number 4.

- "4. Each state be requested to submit two or more transects across the dominant type of made soil in their state. These would be used as a basis for making more specific **recommendations** concerning naming and criteria for classifying made land."

Members of Committee

N. P. Pfeiffer
*J. W. Clay
*C. M. Ellerbe
*C. J. Finger
*T. C. Mathews
J. R. Moore
*Cordon McKee
D. D. Neher
E. A. Perry
*R. Leighty
s. L. Larson
C. J. Rich

Visitor - R. R. Covell

W. H. Zimmerman, Chairman

* Contributed comments by mail prior to conference. After the reading of the report, several **comments concerning** "made soils" were voiced from the group. This further indicated a need to continue this committee. The report was accepted.

ATTACHMENT
(South Carolina)

Most of the Naval Shipyard is made land. The soil materials, mostly clay or sand, came from river dredgings and some from other sources. Natural soils - deep drought gently sloping sandy soils - occur on the Naval Hospital and Officers Quarters Areas.

Borings, 42 inches deep, were made in fill areas where the growth of vegetation is or may be a problem. Color, texture, and thickness of the soil materials were recorded at 6-inch intervals in the soil profile. Any area having fairly similar soil profile characteristics was delineated on a blueprint plat to distinguish it from areas of dissimilar soils. Each area is briefly described. The site of each of the 89 borings was located and numbered on the plat. Soil descriptions of each boring site are included in this report. Loamy includes coarse and fine loamy. The particular texture of a layer is given in the soil profile description for each boring site. The soil description of an area is a composite of the colors, textures and thicknesses of the borings within that area.

Area A

0-12"	grayish brown sand
12-18"	yellow brown sandy loam
18-40"	dark olive gray plastic clay, containing marl

Area B

0-12"	brown sand
12-40"	sand, color may be gray to yellow brown

Area C

0-18"	dark brown sand
18-24"	brown to dark brown sand to sandy loam
24-30"	brown sand
30-42"	brown or gray sand and Clay lumps

Area D

0-6"	brown sandy clay loam to Clay
6-12"	brown clay
12-36"	dark brown to gray plastic clay
36-42"	dark brown to black plastic clay

ATTACHMENT 2
(Virginia)

The following legend is used:

- HF - Hydraulic fill (usually saline)
- F - Ordinary fill
- C - cut

Texture

- C - Sands
- L - Loamy sands
- M - Very fine sandy loam, loam, silt loam
- S - Sandy loams
- F - Clay loam
- H - Clays

Drainage (wetness)

- d1 - Well drained
- d2 - Moderately well drained
- d3 - Somewhat poorly drained
- d4 - Poorly drained

Slope

Conventional symbols

Erosion

- / - Fill (3 inches or more thick)
- 3 - Cut: to "B"3 horizon or deeper

Examples:

- HFsd4A/ - Hydraulic fill, sandy loams, poorly drained, nearly level, 8 inches or more thick.
- FFd3A/ - Ordinary fill, clay loams, somewhat poorly drained, nearly level, 8 inches or more thick.
- CFd2B3 - Cut to clay loams, moderately well drained, gently sloping, eroded (cut).

C-FS-Hd2A1 - cut - fill, sandy loams over moderately well drained plastic clay, nearly level, slight erosion (borrow area, surface soil replaced after borrow removed to considerable depth).

We are showing mines, pits and dumps with numerical symbol only. The word "dump" is printed on county dump areas and sanitary fills.

ATTACHMENT 3
(Kentucky)

Classification of Strip Mine Spoil

There are three main factors which determine mine spoil classification. They are (1) pH level, (2) slope, and (3) degree of stoniness. 1/ They are described in the following chart.

Strip Mine Spoil Classification

<u>ACIDITY GROUPS</u>	<u>Predominant pH*</u>
1. Alkaline	Over pH 7.0
2. Medium Acid	Between pH 5.5 and 7.0
3. Strongly Acid	Between pH 4.0 and 5.5
4. Toxic	Under pH 4

*Generally well over half of area delineated.

STONINESS GROUPS

1. Non-stony - no stones or not enough to make the growing of hay or pasture impractical.
2. stony - sufficient stones to make use of farm machinery impracticable.
3. Extremely stony - too stony for hand planting of trees; 90-100 percent stone cover.

SLOPE GROUPS

1. Gently sloping - 0-12 percent
2. Moderately sloping - 12-25 percent
3. Steep - 25-70 percent
4. Very steep - over 70 percent

OTHER FACTORS (Use only when significant to treatment)

Examples: S - for sand
 7 YR. - seven year old spoil
 Veg. - Vegetated
Symbol for spoil - Numbers above in order as 112, 323, 423,
 312S, etc.

1/ Stone is described as anything other than soil in addition to limestone and sandstone such as slate, shale and coal fragments.

Other criteria, such as texture, may be used.

ATTACHMENT 4

Three Transects from Kentucky Showing Some Important Characteristics
Of Strip Mine Areas

<u>Site</u>	<u>Textural Class</u>	<u>Coarse fragments (percent)</u>	<u>Reaction (pH)</u>	<u>Slope (percent)</u>
T1-S1	Fragmental	80	7.0	2 to 6
T1-S2	Loamy skeletal	50	4.5-7.0	10
T1-S3	Loamy skeletal	67	6.0	2 to 6
T1-S4	Loamy skeletal			
T1-S5	Loamy skeletal			

7.5
7.5

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

Southern Regional Technical Work Planning
Conference of the Cooperative Soil Survey
Lexington, Kentucky
June 7-9, 1966

Report of the Committee on Application
of the New Classification System

The committee met on June 7 to discuss the following subjects:

1. The draft statement of guidelines prepared at the request of the National Committee - "Application of the New Soil Classification System to Series Descriptions and to the Naming of Mapping Units".
2. Criteria for distinguishing series within families.
3. Soil family criteria - (a) skeletal classes, and (b) soil depth classes.
4. Procedures for making changes in the classification system.

1. The draft statement on 'Application of the New Soil Classification to Series Descriptions and to Naming of Mapping Units' was discussed at length. Committee discussion and recommendations are as follow:

A. The definitions of series concepts and the recording of such concepts in standard series descriptions were reviewed briefly. Although the feelings were not unanimous, the committee favored the recommendation of the National Committee and the draft statement that "The concepts of a series and the standard description of that series are to be developed so that the

B.

- c. Taxonomic inclusions - In a poll of *the* committee members by correspondence, all indicated they understood the meaning of taxonomic inclusions. However, comments received and committee discussions indicated divergent views in ~~what~~ constituted a taxonomic inclusion and ~~how~~ they were to be used. On the one hand, the mapping unit might be named as a phase of series when it is dominated by a taxonomic inclusion. On the other hand, a mapping unit may be named as a phase of a series when a major part of it falls within the range of the series and the remainder is considered as a taxonomic inclusion.

Recommendation: That the concept and use of the taxonomic inclusion as defined be applied in nomenclature of mapping units and the definition be revised for greater clarity.

Recognition of the fact that a mapping unit consists predominantly of taxonomic inclusions was considered important in publication of descriptions of correlated soils. An explanation by footnote was discussed as one alternative and addition of a term such as "deviant" to the mapping unit name was another.

Recommendation: That taxonomic inclusions be explained by footnote without recognition in the name by some special term such as deviant (similar to the use of variant).

- D. Mapping unit inclusions as defined in the draft statement are named series whereas unnamed but closely similar series are taxonomic inclusions. No provision is made for inclusions of minor areas of strongly contrasting but unnamed soils.

Recommendation: That mapping unit inclusions be redefined to provide for inclusion of minor areas of strongly contrasting soils worthy of mention.

- E. Nomenclature of mapping units - The committee felt that proposed conventions for nomenclature of mapping units were generally satisfactory. The proposed increase in allowable proportions of inclusions is preferable alternative to long and complex names of mapping units. One exception to the proposed conventions deals with nomenclature of map units for monotype series. Although only a few soils occur as monotype series in the southern region, the committee was opposed to nomenclature of mapping units as, for example, Houston series. One reason given is that the name Houston series would be applied to (1) the concept as defined in the standard series description, (2) the soils as described at the series level in soil survey reports, and (3) the soils as described in the mapping unit. The following alternatives were considered with the number favoring each:

8 members favor retention of the soil type as part of the name of the mapping unit of monotype series (ie, Houston clay)

3 favor no modifier whatever (ie, Houston)

1 favors some other term (**ie**, Houston _____)

A second exception to the proposed conventions for nomenclature of map units deals **with** soil associations. As **now** proposed mapping units of low intensity detailed surveys, as **well** as general soil maps of counties or states, may be named as soil associations. The committee felt that mapping units on such a variety of map scales would differ significantly in composition, **degree** of homogeneity of pattern, and use of

At the request of the National Committee, the following is a partial list of criteria used to differentiate series within families in the southern states:

- Proportions of particle size classes
- Color
- Coarse fragments
- Depth of plinthite
- Lithologic discontinuities
- Reaction
- Depth to carbonates
- Mineralogy
- Compactness or brittleness
- Depth to mottles

AS a result of recent observations, some committee members felt mottles having /3 chroma may be indicative of wetness and in some instances would be preferable criteria to /2 chroma mottles as now used.

Recommendation: That the National Committee summarize available data on soil water table in relation to chroma of mottles and reexamine the definition of classes where mottlings with chroma of 2 or less is used.

4. Soil Family Criteria

- A. The National Committee has **recommended** for testing a sliding scale of coarse **fragments** in skeletal classes as follows:

sandy skeletal:	20% coarse fragments
loamy skeletal:	40% coarse fragments
clayey skeletal:	60% coarse fragments

The argument for the sliding scale is that the **moisture-holding** capacities and other physical characteristics of soils would be more nearly equilibrated. On the basis of limited data, the lower limit of 40 percent coarse fragments in loamy skeletal and clayey skeletal classes is more nearly in line with past separations that have been considered satisfactory. Only one sandy skeletal soil is recognized in the southern region and no opinion on the proposal for sandy skeletal classes was expressed.

Recommendation: That the lower limit of coarse fragments in loamy skeletal and clayey skeletal classes be ~~40~~ percent.

- B. Soil depth (thickness) classes. The National Committee requested the depth (thickness) classes of Ultisols and Oxisols be reexamined. After discussion of alternative proposals, the committee concluded that soil depth classes used at the family level be set at less **than 20** inches,

20 to 40 inches, and more than 40 inches and applied in families of Entisols, Inceptisols, **Aridisols**, Spodosols, Alfisols, **and Ultisols when** soil depth is not already a part of the subgroup definition. No proposals for nomenclature are made.

5. The **committee** recommends that it be continued to study problems of application of the classification system.

Committee Members Present:

David **F. Slusher**, Chairman
G. R. Craddock, Recorder
S. I. Buol
L. H. Burgess
O. **R. Carter**
R.

Other Participants:

NATIONAL COOPERATIVE SOIL SURVEY SOUTHERN REGIONAL
WORK PLANNING CONFERENCE
Lexington, Kentucky
June 7-9, 1966

Report of Committee on **Classes** end Phases of
Stoniness and Rockiness

This new **committee** was added to the roster of the Southern Regional Conference **committees** to act on proposal⁸ contained in the 1965 report by the National Committee on stoniness and rockiness.

Initial regional **action on classes and** phases of stoniness **was** taken by the Northeastern States. A **committee** was formed following their conference in January 1964, with **the charge** of studying and testing criteria for **slasses and** phases and **making recommendations** to the Rational Committee prior to the **latter's** meeting held in January 1965. Although the Northeast confined **their study** and subsequent report to **stoniness**, the National

8.3, 17.2 and 19.3, respectively. On the two units with Bock land in the name there was a range from 23 percent to 75 percent per transect and totals of 43.5 percent and 35.3 percent, respectively. The three units without rocky in the name had totals of 6, 1.1 and 1.4. The data indicates quantitative underestimations on the part of the mapper in a few cases but does generally support the adequacy of the classes and phases of rockiness as defined in the Survey Manual.

The field study reported by Soil Scientist Byrne was on 36 plots in the McCreary-Whitley Counties portion of the Daniel Boone National Forest. The tests related to stoniness on 20 of the plots and rockiness on 16 plots. They tested several possible schemes including the one proposed by the National Committee. Particular attention was pointed at the comparison of estimated percentages of coverage with the measured quantities. The accuracy of estimations for seven different schemes of class limits ranged from accurate on 48 percent of the plots to 71 percent. There was a tendency to overestimate percent surface covered by rock outcrops and underestimate percent covered by stones and boulders.

The group voted in favor of adopting the same class limits for stoniness and rockiness.

A proposal to include all fragments larger than 2mm and base the kind of modification of the unit name on dominant size was rejected by the committee. Although the majority was receptive to the suggestion that consideration of the adequacy of the Manual's guidance on recognizing kinds and quantities of coarse fragments (10 inches and less) on and in the surface horizon be added to this committee's future work.

Also rejected was a suggestion that stones within the soil profile be included as a part of class criteria.

Two main objections to the National Committee's scheme were:

1. There are too many breakdowns of classes 0 through 1.3 to map adequately.
2. The use of like phase designations for stony classes 2.1 and 2.2 and the designation "rubbly" without a series name for stony class 3.1.

Of several schemes presented the committee voted in favor of the following,

Class	Class limits percent surface covered 1/	Phase designation	
		stoniness phase	rockiness phase
0	< 2	No modifier	No modifier
1	2 to 10	Stony	Rooky
2	10 to 25	very stony	Very rocky
3	25 to 50	Extremely stony	Extremely rocky
4	50 to 90	Stony land-series	Rock outcrop-series
5	90+	Rubble	Rock outcrop

1/ Percent surface covered is based on combined total of stones and rock outcrops where the **two occur** together. Determine phase designation according to **which** is dominant.

Two members of the group **were** strongly opinionated that classes 2 and 3 should be combined. **One** member was opposed to **using** a land type (stony land) as part of complex name.

It was generally agreed that spacing between the stones and between the rock outcrops should be defined for each class.

The conference adopted a suggestion **from** the floor that the National **Committee** on stoniness and **rockiness** provide for optional **use of** no modifier to the soil **name** up to 2 percent surface covered or a **more** detailed **breakdown below** 2 percent as needed in different section of the **country**.

It was **recommended** that the **committee be** continued.

The **report** was **accepted** by the conference.

COMMITTEE MEMBERS

T. W. Green, Chairman, USFS, Ca.
*E. v. Huffman, vice Chairman, Ky.
C. B. Breinig, Tenn.
H. T. Byrd, Ga.
J. R. Coover, Texas
*R. E. Daniell, Ky.
*J. C. Byrne, USFS, Ky.
John Elder, Va.
C. L. Hunt, N. Car.
R. E. Medesitt, Va.
*E. A. Perry, Miss.
*F. T. Ritchie, Ca.
E. C. Sease, Tenn.
*E. H. Templin, Texas

*Present at the committee meeting.

APPENDIX I

**Summary of Rock Outcrop Data Collected on Eight Mapping Units in Kentucky
Reported By R. E. Daniell, SCS**

Mapping Unit Name	Dominant Percent Slope	Land Use	Length of Transect feet	Percent Rock Outcrop
Corydon end Fredonia	10	Pasture	1000	5.5
very rocky silty clay loam, 6 to 12 percent slopes	10	Pasture	1500	10
	10	Pasture	1300	8.5

315 feet of rock outcrop in 3800 feet = 8.3 percent

Caneyville very rocky silty clay loam, to 20 percent slopes	13 12 19 19 19	Woodland Woodland Woodland Woodland Woodland	124 166 270 167 121	25 14 15 13 25
---	----------------------------	--	---------------------------------	----------------------------

146 feet of rock outcrop in 648 feet = 17.2 percent

Fredonia very rocky silty clay loam, 12 to 20 percent slopes	11 11 10 14 15	Pasture Pasture Pasture Pasture Pasture	154 279 280 204 165	14 18 16 20 25
--	----------------------------	---	---------------------------------	----------------------------

198.5 feet of rock outcrop in 1082 feet = 18.3 percent

Cynthiana- Rock land complex	22 15 18 17 15 20 25	Pasture Pasture Pasture Pasture Pasture Pasture Pasture Pasture	200 180 240 120 190 110 100	23 30 58 75 34 32 50 68
------------------------------	--	---	---	--

572.3 feet of rock outcrop in 1390 feet = 43.5 percent

APPENDIX I

<u>Mapping Unit Name</u>	<u>Dominant Percent Slope</u>	<u>Land Use</u>	<u>Length of Transect feet</u>	<u>Percent Rock Outcrop</u>
Rock land, limestone	18	Woodland	200	47
	17	Woodland	250	26

159 feet of rock outcrop in 450 feet = 35.3 percent

Caneyville silty clay loam,	9	Pasture	165	7
6 to 10 percent slopes	6	Pasture	261	2.5
1% percent slopes	11	Woodland	119	6
	12	Woodland	183	8

44 feet of Rock outcrop in 728 feet = 6.0 percent

Waynesboro silt loam: 12 to 20 percent eroded	16	Pasture	1000	1.1
---	----	---------	------	-----

Faywood silt loam, 12 to 20 percent	18	Cropland	120	4.3
6 to 12 percent	8	Pasture	480	1.4
6 to 12 percent	8	Pasture		1.2

15 feet of rock outcrop in 1030 feet = 1.5 percent

APPENDIX II

Report by James G. Byrne, Soil Scientist, USFS, on Classes and Phases of Stoniness and Rockiness

- Purpose:**
1. To develop and test guides for classes and phases of stoniness and rockiness.
 2. To react to National **Committee** on "Classes and Phases of Stoniness and **Rockiness**" (**Comm. 3**) suggested limits and phase designations,

- Definition:**
- Stones - Coarse fragments 10 to **24 inches** in size.
- Boulders - Coarse **fragments** over **24** inches.
- Rock - Bedrock exposure,
- Stoniness - Any combination of stones and boulders, but mainly stones,
- Rockiness** - Any combination of rocks and boulders, but mainly rock. These were combined because in limestone **areas the** two are closely associated, **difficult** to separate and limit use and management equally.

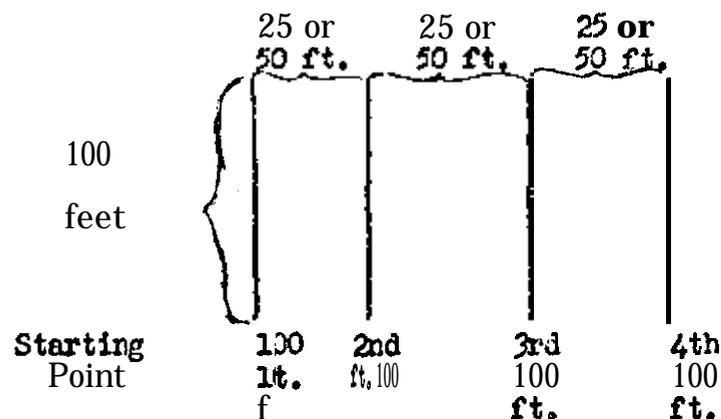
Summary:

1. Our biggest disagreement with the scheme suggested by the **National Committee** is in the first four or five classes. It **seems** that these **classes** will be difficult to separate and phase designations begin at too low percent coverage, **making** a soil with a two percent cover of stones very stony.
2. The separations of 1 to 5, 5 to 15 and 15 to 25 were: **(1)** easiest for us to estimate **accurately**, **(2)** near **natural groupings** on the landscape, and **(3)** seemed to have most use and management **significance**.
3. **When** selecting phase designations in the field, the soil scientist should estimate **management** limitations as well as percent surface coverage. This would serve as a cross check and give more meaning to the mapping units.

APPENDIX II

4. There should be upper and lower limits of percent coverage within each class with a choice of phase designations. This would make a more universal scheme, geographically as well as use and management wise.
5. We tested seven possible schemes, one of which was the National Committee scheme, as to our ability to estimate percent coverage in their classes. We were accurate 48 percent of the time using the National Scheme and had a high of 71 percent accuracy for the scheme we recommend.
6. We tended to overestimate the percent coverage on rockiness plots and underestimate 55 percent oniness (plot. One)Tj ET q 5855799.76 0 0 0855799.76413.57200438
- 7.

APPENDIX II



At each plot the following was recorded:

1. Estimation of **the** percent surface coverage of stones, boulders and rocks by each of two soil **scientists**.
2. The degree of limitation for **agronomic** and forestry practices created by the surface fragments. This was a relative or **qualitative rating**.
3. Soil profile **description**.

Data Evaluation:

Several class limits for stoniness and rockiness, including the scheme **suggested** by the National **Committee**, were tested **as** to the ability of a **soil** scientist to place e plot into the correct **class**. **Two breaks or percentage** limits were more accurately estimated than others. One was the 5 percent break. Seventy eight (78) percent of the time the soil **scientists** could determine **whether** a plot was **between** 1 and 5 percent, **They were** only accurate **50** percent of the **time** from 0 to 3 percent and only 17 percent **accurate** from 0 to 2 percent. The other was the 15 percent break. Sixty three (63) percent of the time they could estimate a plot to be between 5 and 15

APPENDIX II

In evaluating the data further, there seems to be a "natural" grouping of several plots between 1 and 5 percent stoniness and rockiness and between 5 and 15 percent. There also is a group of plots between 15 and 25 percent. We had few plots over 25 percent coverage and none below one percent coverage. Apparently, the 5, 15, and 25 percent breaks are close to the limits most often occurring on the landscape. In other words, 5, 15 and 25 may be near natural boundaries of the percent stones, boulders, and rocks in our area.

Upon studying the use and management evaluations made on each plot, the limitations were labeled moderate for agronomic uses and slight for forestry uses on those plots that were determined to be less than 5 percent stoniness or rockiness. Between 5 and 15 percent stoniness and rockiness, severe was used for agronomic uses, and slight to moderate for forestry uses. Between 15 and 25 percent, very severe was used for agronomic uses and moderate to severe for forestry uses. These adjectives are defined below.

Slight -Agronomic -very little difficulty (less than 1 percent coverage) in plowing or mowing with rubber wheeled equipment.

- Forestry - very few restrictions as to mobility of a crawler tractor (less than 5 percent).

Moderate - Agronomic - some restrictions in plowing and mowing with rubber wheeled equipment, such as plowing around areas and many stop and go situations (1-5 percent coverage).

- Forestry - crawler tractor would be restricted as to mobility, but could operate with care by going slower to avoid stony or rocky areas (5-15 percent coverage).

Severe - Agronomic - could not plow or mow with rubber wheeled tractor unless stones and rocks were removed (5-15 percent).

- Forestry - couldn't use crawler tractor in area without creating some hazards to machine and operator (15-U).

Very severe -Agronomic - impractical to plow, Use for limited pasture, perhaps (greater than 15 percent).

- Forestry - impractical for crawler tractor to operate (greater than 25 percent).

APPENDIX XI

Hence, the 1 to 5 end 5 to 15 and 15 to 25 percent classes seemed to be:

1. ~~Most accurately estimated~~ in the field by a soil scientist through observation.
2. Natural groupings on the ~~landscape~~.
3. ~~Logical use and management~~ classes.

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE OF THE COOPERATIVE
SOIL SURVEY
Lexington, Kentucky, June 7-9, 1966

Report of the Committee on Organic Soils

- I. Charges of the Committee - To continue work on the development and scheme of classification of organic soils in cooperation with the national committee.

The committee agreed to limit discussion to principals and criteria of the classification scheme. Subgroups needed in the south and the classification of specific series are considered operational instead of committee functions.

II. Discussion and Recommendations

A. Order level

There were no recommendations for changing the definition of Histosols from that given in the 7th Approximation.

B. Suborders

1. The term "Hemist" (Gr. hemi, half) is recommended in place of the term "Lenist" (used in an addendum report given limited circulation by Guy D. Smith, May 1963) or the term "Mixist" (suggested during discussion following the 1965 National Committee Report on Organic Soils). This recommendation also involves changing formative elements throughout the scheme from "Lenic" or "Mixic" to "Hemic".
2. A proposal to abolish the Leptists suborder and to include soils in this class with Thaptic subgroups in either Fibrists, Saprists, or Hemists was rejected for the following reasons (one member takes exception to the rejection):
 - a. The term Thaptic is being used at the subgroup level for Histosols having a buried mineral soil within the control section. By this definition, those Leptists lacking buried mineral soils (consisting only of various kinds of thin organic layers) would fail to qualify for Thaptic subgroups in either Fibrists, Saprists, or Hemists.
 - b. Because Leptists, under the present definition, lack diagnostic horizons it would be impossible to classify

such soils into an appropriate class because each of the other classes (Fibrists, Saprist, Hemist) are defined on the basis of having diagnostic horizons.

C. Great Groups

1. The 1965 national committee recommended that, in Leptists, the Dysic and Euc classes be moved to the family level and that, at the Great Group Level, the following classes be substituted:

Saproleptists
 Mixoleptists (Hemileptists)
 Fibroleptists

This committee recommends retaining Dysic and Euc classes in Leptists for the following reasons:

- a. A danger is recognized in using the same formative element (i.e. Saprist, Hemist, Fibrist) at different categories within the classification scheme. Confusing nomenclature is a possibility should the need arise at the subgroup level for intergrading from one class to another.
- b. In Leptists, moving Dysic and Euc classes to the family level would involve a need for family reaction classes to accommodate this group of soils. Family classes are rather complicated without this additional problem.

D. Subgroups

1. The committee recommends using the same format for defining subgroups in Histosols as is used in defining subgroups within the other orders. At present, each subgroup in Histosols is defined independently' in written text. This creates difficulty in cross-checking specific features when keying out an organic soil. It would be preferable to define a Typic subgroup and make exceptions to the Typic in defining other subgroups within the same class.
2. A proposal to abolish Interic subgroups (subgroups having 2 or more diagnostic horizons) in favor of modifying the subgroup name with the name of the second diagnostic horizon was rejected. Such a proposal would lengthen subgroup names without materially improving the system.
3. The committee rejected a proposal to establish saline subgroups for soils having high salinity. It was recommended that, as in mineral soils, salinity be recognized as a phase

instead of a part of the classification scheme.

4. Consideration was given to recognize a subgroup for organic soils having greater than normal subsidence rates. The committee recommended that this property be considered at the family level. Further study, however, may reveal a need for recognition at a higher category than families.

E. Families

1. Temperature - The committee recommended soil temperature classes in Histosols. It was further recommended that parameters for temperature classes parallel those of mineral soils. Data indicate that, although organic soils may respond more slowly to air temperature changes than mineral soils, mean annual temperatures of mineral and organic soils are closely related. In application, the data indicate that for Histosols, only the hyperthermic temperature class (71.6° F. mean annual soil temperature as presently defined) is needed in Florida and those states bordering the Gulf of Mexico.
2. Sulfurous families - The committee recommends further study to determine the upper pH limits of sulfurous families. Data from North Carolina indicate that pH 3.5 in 1NKCl as the upper limit may be somewhat high. These soils do not demonstrate limited plant growth but do fall below pH 3.5 in 1NKCl.
3. The committee realizes a need for further study concerning family criteria.

F. Series

Series criteria were not discussed. In the south, there is a need for updating most of the organic soils descriptions prior to classification. The format used by Farnham and Finney ^{1/} for describing series is recommended. This format adheres to current instructions and also considers features that apply specifically to organic soils.

^{1/} Farnham, R. S. and Finney, H. R. (1966). Some Ideas on the Classification of Histosols. Mimeograph Paper, Agron. Dept., Univ. of Minn. Some of the recommendations by this committee do not agree with parts of the cited paper. The committee recognizes, however, the merits of this paper particularly in the discussion of morphological features in organic soils and examples of formats given to describe organic soils.

G. Miscellaneous

1. Horizon Designation in Organic Soils - The committee considered several alternatives but recommends the system given by Farnham and Finney ^{1/} in which:

H - designates organic horizon of Histosols. The letter O was considered but this is used for organic horizons of mineral soils

f - designates fibric horizons

he - designates hemic horizons (cited paper uses mi for mixic horizons)

s - designates sapric horizons

Subtypes of fibric horizons (Sphagnum, Hypnales, etc.) are interpreted from botanical composition of fibers as indicated in the description. Horizons are numbered consecutively from the surface with Arabic numerals. Following is an example of 3 sequences of horizons:

H1 s p - a sapric plowed or disturbed horizon
 H2 he - a hemic horizon
 H3 he - a hemic horizon
 H4 f - a fibric horizon

Buried mineral horizons should be designated in conventional form Ab, Btb, etc.

2. Thin strata of contrasting materials within a diagnostic horizon - Farnham and Finney ^{1/} point out that cyclic changes in the peat-generating environment may create thin strata of contrasting organic material within a major horizon of uniform morphology. If a diagnostic horizon must be absolutely homogeneous, it could not contain even the thinnest stratum of contrasting material. The above authors suggest a maximum allowable thickness and contrast in fiber within major horizons as follows:

Degree of Contrast (Difference in percent of fiber between major and minor horizons after rubbing)	Maximum Allowable Thickness (inches)	
	Drained	Undrained
< 15	4	6
15 - 30	3	4
30 - 45	2	3
> 45	1	1.5

^{1/} Ibid

The committee recommends that the above qualification be added to the definition of the diagnostic horizons.

3. Illuvial humic horizons - Florida committee members question if humic horizons occur in organic soils. They have observed greasy, glossy, or shiny material on surfaces of soil particles in decomposed organic materials. Research is continuing on this problem. The committee had no constructive suggestions nor were specific suggestions given for classifying these soils.
4. A need for updated series descriptions - The committee

classification scheme. Criteria, where possible, should parallel those of the other orders.

3. Baur Why state that the hyperthermic class can be extended as far as suggested?

DeMent - The intention is to parallel the application used in mineral soils. If there is an established series in a thermic zone that has the morphology of a series within the boundary applied to hyperthermic soils, it could be used within the hyperthermic zone. That is, if within the 2° F. temperature range applied to boundaries of mineral soils.

Committee Members

V.W. Carlisle <u>1/</u>	E. H. Miller
James A. DeMent <u>1/</u> *	J. R. Moore
C. M. Ellerbe <u>1/</u>	James NeSmith
Juan Juarez <u>1/</u>	Forrest Steele <u>1/</u>
R. G. Leighty <u>1/</u>	B. P. Thomas
I. L. Loftin	Keith Young
S.A. Lytle	

Visitors

Guy D. Smith

1/ Those attending Lexington meeting

* Committee chairman

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE
Lexington, Kentucky

June 7, a, 9, 1966

Report of Committee VI
Soil Surveys for Forestry Uses

The Charge:

1. Review soil survey - a. taxonomic units and b. mapping **procedures** to determine if soil qualities significant to forest management are being recognized and mapped.
2. Formulate recommendations for mapping procedures in forest lands,
3. Formulate guide lines for differentiating taxonomic units in forest lands.
4. Explore ways of improving, coordinating and **standardizing** these procedures and programs.
5. Review recommendations that may be developed by the Forest Soils Conferences in the region.

The charges and request for ideas and comments were sent all members of the committee on September 8, 1965, by the chairman. Very few replies were received,

The committee met at Lexington and discussed the replies and each charge. Five committee members and their visitors were present,

Charge 1 -- Most of those present and replies indicated that the new classification system is adequate for delineating taxonomic units. Mapping procedures using the medium intensity soil survey appeared to be adequate for delineating most forest land. There were some who expressed the thought that there was no need to change taxonomic units just for forest uses, also that the same degree of accuracy is needed for forest and other agricultural lands.

There was some discussion of a member's view that series designation appears too inclusive as a map symbol - i.e., it does not help the resource manager interpret the several management classes possible within some of the common soils such as Boswell, Susquehanna, and Oktibbeha (profiles that may vary in A1 and A2 depth from 1 to 14+ inches, and thus vary in regeneration class, associate plant competition level, and productivity level). These factors affect evaluation of input-return and tax assessment base. Use of simple suffix symbols with the series symbol, to delineate certain woodland management classes could assist the resource manager when making his own evaluations, so he can first separate and then aggregate common management classes.

Charge 2 -- Most present seemed to feel that medium and low intensity surveys are adequate. All wanted the best map we can make. In determining the intensity of soil surveys to make, it was realized that economics was an important factor. Could we justify the extra time and money to make a detailed survey on all lands that are dedicated to woods in all the woodland areas. It was also expressed by a member using the new classification system, that some of the taxonomic units at series level can be combined, when grouping sites into common woodland management classes.

Charge 3 -- One expression stated that there should be no difference in differentiating taxonomic units in forest lands over lands used for other purposes. Another, "I believe the best way to standardize procedures is to have the SCS soil scientists and Forest Service soil scientists in complete agreement on mapping procedures for each state." Also, forested lands can and must be mapped accurately before land managers can be expected to use soil surveys. The mapping must separate segments of the landscape which have significance in planning forest management.

Charge 4 -- Guide lines rather well set out in the new classification system, coordinated by the Regional Technical Service Center staff and state staffs,

Charge 5 -- A brief report was given on the objectives, goals and items of interest discussed at the June 2-3, 1966 Southern Forest Environment Research Council Workshop at Clemson University. The group is organized under auspices of the Southern Agriculture Experiment Station Directors to provide inter-discipline cooperation among climatologists, geologists, soil scientists, foresters, etc. Excerpts from one of the papers follow: "This sampling of opinion took the form of a questionnaire sent to each of the major landholding companies in Tennessee, Alabama, Arkansas, Louisiana, and Mississippi,

"The questionnaire asked for information in the following areas:

1. amount of formal and information (Short course) soils training.
2. personal rating of practical soil-site knowledge and interest in soil-site information.
3. whether or not land under supervision has been soil-mapped, and by whom.
4. sources from which information is obtained to make decisions on selection of planting sites, rotation length, type of hardwood control measures, road location, equipment limitation, and site index determination.
5. way in which soil and/or site information is either lacking or could be made more useful.

"Returns were obtained from 27 sources representing 18 different companies with a total acreage under supervision of slightly over $9\frac{1}{2}$ million acres.

Table 1. Summary of information received

Number of companies responding	18
Number of individuals responding	27
Acreage represented	9,689,500 acres
% of acreage reporting land at least partially mapped	89%

Distribution of responding companies, by state:

<u>Alabama</u>	<u>Arkansas</u>	<u>Louisiana</u>	<u>Mississippi</u>	<u>Tennessee</u>
4	1	6	4	3

"I would like to state at this point that I was essentially correct in my early assumptions - the management, forester thinks mainly in terms of soil-yield, and for the most part, fails to see the potentially great utility of site classification. To substantiate this statement, I have extracted comments from some of the questionnaires as follows: "...need better yield data for managed stands by sites.", "...we need more local yield and growth information.", "We need a small booklet (like Zahner's) to get side Index.", "...a need for site index determination in the deep loess soils...". Only a few considered the need for more basic research leading to solution of practical problems - "...influence of summer rainfall patterns on site,...", and "...the effects of site preparation on yield...". A few indicated concern on a broader scale and felt that more management practices should be tied to soils information, and concern with the use of all available site information for a complete economic analysis based on site quality.

What level of knowledge, or what caliber of men are making these statements? Forty-one percent of the respondents had at least one soils course beyond the requirements for a Bachelor's degree plus attendance at one or more short courses, meetings, or symposiums dealing with soil-site information.

Table 2. Education, practical knowledge, and interest of respondents.

<u>College Soils Courses</u>	<u>Symposiums, etc.</u>	<u>No.</u>	<u>%</u>
0 or 1	none	3	11
0 or 1	1 or more	7	26
2 or more	none	6	22
2 or more	1 or more	11	41
		<u>27</u>	<u>100%</u>
<u>Professed Practical Soils Knowledge</u>	<u>Professed Interest</u>	<u>No.</u>	<u>%</u>
Poor	low	-	-
	med.	5	18
	high	3	11
Good	low	1	4
	med.	4	15
	high	13	48
Excellent	low		
	med.		
	high		
		<u>27</u>	<u>100%</u>

SOUTHERN REGIONAL TECHNICAL
WORK-PLANNING CONFERENCE
OF THE COOPERATIVE SOIL SURVEY
Lexington, Kentucky
June 7-9, 1966

Report of Committee VII - Soil Survey
Reports and Maps

Committees on Soil Survey Reports and Maps were active in the Southern Region in 1960 and 1962. The 1960 committee, under the chairmanship of Dr. C. L. Godfrey, and the 1962 committee, under the chairmanship of Mr. J. C. Powell, dealt with the form, content, and use of soil survey publications. There is no record that a Southern Region Committee on soil survey publications was active in 1961. There does not seem to have been any previous committee work on the charge of the 1966 committee.

The charge of Committee VII is;

1. To develop guidelines for incorporation of the comprehensive classification into soil survey publications, and
2. To respond to National Committee on Technical Soil Monographs as deemed appropriate by the chairman.

The committee thought it best to deal with the entire section on formation, classification, and morphology instead of trying to isolate the classification subsection. We gave much more attention and time to item number 1 of the charge than we did to item number 2.

The committee discussed by correspondence and in session five main topics in presenting the formation and classification of soils in soil survey publications. These are as follows:

1. The objective in presenting the classification system in soil survey publications. The main point here is our intended reading audience.
2. The sequence of topics to be discussed and the kind of text material under each topic.
3. The arrangement of the classification table.
4. The nomenclature of the classification
- 5.

1. The objective - the reading audience.

This topic was dealt with by correspondence prior to the meeting and again in session. There was quite a wide difference in opinions. The thinking of most members, however, is that this chapter or section is not especially for general reading, and that it is an educational tool for those who teach and those who are interested in learning about soil formation and classification. Most members thought that we would not likely have a great number of readers for this section, though the number would certainly vary from one survey area to another. Most committee members specified soil scientists, and other professional agricultural students, Vo-ag students and teachers; engineers, and some farmers, approximately in that order as the main users of this chapter.

The committee recognizes that this is a difficult audience to write for. It recommends that (1) the chapter be technically sound with enough technical material in it to satisfy soil scientists, (2) the material be written so that others can understand it, and (3) the authors strive for simplicity of language yet maintain technical soundness. If the last item can be successfully done, our reading audience will be enlarged.

2. The sequence of topics.

The committee dealt with the entire section on formation and classification in trying to develop a suggested outline and text material, under each topic,

The committee recommends the attached outlines (marked Exhibit 1) as a suitable sequence of topics in this chapter.

3. The arrangement of the classification table.

The committee members agreed that a classification table was essential in this chapter. Three different kinds of classification tables were sent to the committee members prior to the meeting. Table number 1 arranged the soils by higher categories, orders, suborders, etc. Table number 2 was arranged by series alphabetically; this table also gave the 1938 system of classification. Table number 3 was similar to table number 2 except that the 1938 system was not given.

About two-thirds of the committee members favored table number 2. They believed that most users would be looking up the classification of a particular series and the alphabetical arrangement made this much easier. An example of the table recommended by two-thirds of the members is attached (see Exhibit 2). It should be recognized that about one-third of the committee members did not favor a table such as Exhibit 2. They thought that a table arranged alphabetically by soil series was not a classification table, rather a listing of soil series.

4. Nomenclature.

The **committee** considered whether a subsection on nomenclature should be included in the classification section. Most of the members believed that we could not afford a detailed discussion of **nomenclature** in soil survey publications and that a brief discussion of it would be inadequate for the person interested in learning the Classification system in some detail. It would be better for such a user to refer to the text of the 7th approximation. The committee recommends that a separate subsection on nomenclature not be given in soil survey publications.

5. Detailed technical profile descriptions.

Before the conference, a poll of the committee members was taken to find out in which section they thought the detailed descriptions should be presented. Fifteen members **replied** to this question. Nine members favored the detailed descriptions in the Descriptions of Soils section. These **nine** members stated that the **profile** descriptions should be in one **place** in the publication and that the descriptions **should be** in the Descriptions of Soils section. Six members said that the detailed descriptions **should** be in **the** technical section in the **back part** of the publication or even in an appendix. These men further stated that the Descriptions of Soils section is for land users and that those users are not interested in and cannot comprehend detailed technical **profile** descriptions. One member pointed out that we would reduce the number of users by placing detailed descriptions in the **mapping** unit descriptions.

The **group** attending the session in Lexington could reach an agreement on this subject. They did agree that the answer could best be found by consulting the users. We recommend that a committee be continued **on** soil survey publications, and that this **committee** give attention to the technical **profile** descriptions with special emphasis on seeking the answer from users of soil surveys.

In **regard** to Technical Soil **Monographs**, most of the committee members stated that assignments would have to be made and adequate **time** allocated if we are to make **progress** in the preparation of monographs.

Committee Members:

* Joe A. Elder, **Chairman**
 * H. C. Dean, Acting **Vice-Chairman**
 C. A. McGrew, **Vice-Chairman**
 * B. L. Allen
 * L. H. Burgess
 * R. E. Caldwell
 C. C. Carter
 R. L. Carter
 J. W. Clay
 ** J. R. Culver
 * R. E. Daniell
 * H. L. Dean
 * C. L. Godfrey
 A. R. Hidlebaugh
 C. L. Hunt
 ** W. E. Keenan
 * O. C. Lewis
 J. F. Miller
 ** D. H. Nehr
 James Nesmith
 A. L. Newman
 ** J. D. Nichols
 D. P. Powell
 R. F. Rieske
 * L. H. Rivera
 F. B. Smith
 K. K. Young
 J. W. Vandine

Tennessee
 Arkansas
 Arkansas
 Texas
 Alabama
 Florida
Texas
Georgia
 Virginia
 Oklahoma
 Kentucky
 Texas
 Texas
Texas
 North Carolina
Mississippi
 Florida
 Texas
 Texas
 Florida
 Texas
 Oklahoma
 Florida
 Pennsylvania
 Puerto Rico
 Florida
Louisiana
 Virginia

* Participated in committee meetings at the Lexington Conference.

** Attended Lexington Conference but had a conflict between committees.

Several of the other members who were unable to attend, submitted their views in writing to the chairman before the conference.

Others attending the committee sessions:

A. 3. Baur
 E. V. Huffman
 R. G. Leighty
 H. T. Otsuki

Pennsylvania
 Kentucky
 Florida
 Oklahoma

Exhibit 1.

**SUGGESTED OUTLINE AND TEXT MATERIAL
FORMATION AND CLASSIFICATION CHAPTER**

- I. Introduction - some brief statements telling the reader what he can expect in the chapter.
11. Formation of soils - ~~Some~~ briefly stated facts telling how soils are formed and introducing the factors in soil formation.
 1. Parent material and rock weathering - a thorough discussion of the different kinds of parent materials and kinds of rocks in the survey area giving examples of the local soils which formed in the different materials. It is suggested that this factor be discussed first among the five factors.
 2. Relief - the discussion should point out the effects of relief on soil formation followed by a discussion of the relief in the survey area giving examples of the local soils which formed on the various slopes.
 3. Climate - a few brief statements about the effects of climate on soil formation. Do not overlook the effect of climate on all of the soils in the area, For example, soils in warm temperate climates that are leached and strongly acid. Reference the climate section instead of repeating a detailed discussion of the local climate under this heading.
 4. Living organisms - a few brief statements about the effects of living organisms, especially vegetation,

5.

III.

3. Great group = same sequence as suborder.
4. subgroup = same sequence as suborder.
5. Family = same sequence as suborder*
6. series = same sequence as suborder.

Table • Soil series classified according to new and old systems of classification.

Series	New Classification		1938 System of Classification			
	Family	Subgroup	Suborder	Order	Great Soil Group	Order
Baxter	Clayey Kaolinitic Mesic	Typic Paleudults	Udults	Ultisols	Red-yellow Podzolic	Zonal
Huntington	Fine-silty, Mixed, Mesic	Cumulic Hapludolls	Udolls	Mollisols	Alluvial	Azonal
Melvin	Fine-silty, Mixed, Non-acid, Thermic	Fluventic Haplaquepts	Aquepts	Inceptisols	Low-humic Gley	Intra- zonal

FORMATION, CLASSIFICATION, AND MORPHOLOGY OF SOILS

This section has two main parts. The first discusses the major factors of soil formation as they relate to the formation of soils in County. In the second part the system for classifying soils is described and the soils are placed in the system.

FORMATION OF SOILS

The characteristics of a soil at any given point are determined by the interaction of five factors of soil formation - climate, plants and other living organisms, parent material, relief, and time. Each of these factors affects the formation of every soil, and each modifies the effects of the other, four. The importance of the individual factors varies from place to place.

Climate

Plants generally have a greater effect on soil formation than other living organisms. In _____ County the native plants were dominantly hardwood trees. Chiefly oaks, hickory, beech, and yellow-poplar were on the well-drained sites. Sycamore, maple, and gum grew in the wet places. Because of the climate and the rapid decomposition of organic material from hardwoods, the soils generally are low in organic-matter content.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the limits of chemical and mineralogical composition for the soil. There is a wide variety of parent materials in _____ County - loess, alluvium, and residuum from several kinds of limestones and from sandstone and shale.

Nearly all of the western four-fifths of the country (the Highland Rim part) is underlain by limestone, some of which contains much chert. This limestone furnished the parent material for the Bodine, Barter, and Christian soils, all of which are on strongly sloping hillsides of the Highland Rim. These soils have cherty and clayey profiles of low base saturation and low fertility.

Alluvium is the parent material for many soils in the county, especially those along the eastern edge of the Highland Rim and those bordering the larger streams. This alluvium probably came from the Cumberland Mountains. It washed down the mountain slopes and was deposited, 3 to 15 feet deep, on the Highland Rim. The alluvium was a mixture of materials weathered from limestone, sandstone, and shale. In most places it was later reworked by water. The soils that developed in it range from yellowish brown, such as the Jefferson soils, to dark red and red, such as the Cumberland and Waynesboro soils. All of these soils have a strongly developed clay loam to clay B horizon, low base saturation, and low to medium fertility.

Loess was the parent material of the soils on the smoother parts of the Highland Rim. A mantle of loess, 1 to 3 feet thick, was deposited on the entire Highland Rim during the glacial ages. Since that time the material has been washed off the steeper slopes, but a layer 1 to 3 feet thick remains in the smoother areas. Soils that developed in loess are light colored, silty, and low in fertility and base saturation. In many places a fragipan formed along the area of contact between the loess and the under-lying red clay, which formed from limestone. The Mounview, Dickson, Lawrence, and Guthrie soils formed in loess, and the differences among them are due to differences in drainage.

The Cumberland Plateau and Mountains are underlain by sandstone that is interbedded with shale in some places. These rocks furnished the parent material for all the soils in this area - the Hartselle, Linker, and Ramsey soils. These soils have a loamy, light-colored subsoil and are very low in plant nutrients and in base saturation.

The soils on bottom land throughout the county formed in alluvium consisting of a mixture of material derived from the parent materials mentioned in this discussion.

Relief

Relief, or the shape of the landscape, affects soil **formation** through its influence on drainage, erosion, plant cover, and soil temperature. Slopes in _____ County range from nearly **level** to very **steep**.

The **Gutherie**, Lawrence, and other gray, **poorly** drained soils formed in nearly level and depressional areas where water stands or drains away slowly. In these places the soils are saturated for long periods and are poorly aerated, thus causing reduction and the formation of gray colors. In rolling areas that have good drainage, the soils generally are well aerated and have **colors** of **red**, yellow, or brown. On steep **slopes** in the Cumberland Mountains and similar areas, relief seems to be the dominant factor in **soil** formation. In these places the soil is removed by geologic and accelerated erosion nearly as fast as it forms. Consequently, a thick soil profile **never develops**. **Example** of shallow soils on steep slopes are the Ramsey soils. The differences between the **Ramsey** soils and the associated **Hartsells** soils, which are **3 1/2** to 6 feet deep, are caused by differences in **relief**.

Time

A long time generally is required for soil formation. The differences in length of time that parent materials have been in **place** therefore **are** commonly reflected in the character of the **soil**.

The soils in _____ County range from those that are very young and have little or **no profile** development to those that are very old and have a well-defined profile.

The **Staser**, Sequatchie, and **Waynesboro** soils are an **example** of a sequence of soils that owe their differences in characteristics to **differences in time**. The **Staser** soil is a young soil that lacks developed horizons because the materials have been in place only a short time. The Sequatchie soil lies a few feet **higher** than the Staser soil **and** has been in **place** long enough for weakly expressed horizons to develop. The **B** horizon in this soil has a slightly redder color and slightly more clay than the **A horizon**. Furthermore, the carbonates have leached out of this soil, and it is now strongly acid. The **Waynesboro** soil is an old, well-developed soil that has strongly contrasting **horizons**.

CLASSIFICATION OF SOILS

Soils **are** classified so that we may more easily remember their significant characteristics, assemble **knowledge** about them, see their relationships to one another and to the whole environment, and develop principles that **help** us understand their behavior and response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The system of classification used in this soil survey is that adopted as standard for all soil surveys in the United States, effective January 1, 1965 (9). It replaces the 1938 system, with revisions, of Baldwin, Kellogg, Thorp, and Smith (2,7). In table _____ the soils of _____ County are classified according to the new **and the old** systems,

The current system of classification defines classes in terms of observable or measurable properties of soils. The properties chosen are primarily those that permit grouping soils that are similar in genesis. Genesis, or mode of soil origin, does not appear in the definitions of the classes; it lies behind the classes. The classification, designed to accommodate all soils, has six categories, beginning with the most inclusive, the categories are the order, suborder, great group, subgroup, 'family,' and series. Following are brief descriptions of the first five categories in the system. The series is defined in the section "How This Soil Survey Was Made."

ORDER

Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in sol (Ent-i-sol),

As shown in table 8, there are four soil orders in _____ County: Entisols, Inceptisols, Mollisols, and Ultisols. Entisols are recent soils. They are without genetic horizons or have only the beginning of such horizons.

Inceptisols are soils that occur most commonly on young but not recent land surfaces. Their name is derived from the Latin Inception for beginning.

Mollisols are soils that have a dark-colored, thick surface layer and have high base saturation throughout the soil profile.

Ultisols are soils that are strongly weathered (strongly developed.) Tj 0.239 Tw-1786.1w-117.52

SUBORDER

groups have three or four syllables are made by adding a prefix to the name of the **suborder**. An example is **Normaquert** (Norm, meaning normal, aqu for wetness or water, and ept, from **Inceptisol**).

SUBGROUP

Great groups are subdivided into, subgroups, one representing the central (typic) segment of the group and others called **intergrades** that **have** properties of the group **and** also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil **properties intergrade** outside of the **range** of any other great group, **suborder**, or order. The **names** of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Normudult (a typical Normudult).

FAMILY

Families are **separated** within a subgroup **primarily** on the basis of **properties** important to the growth of plants **or on** the behavior of soils when used for **engineering**. Among the properties considered are texture, mineralogy, reaction!, soil temperature, **permeability**, **thickness of horizons**, and **consistence**. A family name consists of a series of adjectives **preceding** the subgroup name. The adjectives **are** the class names for texture, mineralogy, and so on, that are used as family **differentiae** (see table 8). An example is the **fine-silty, mixed, thermic** family of Typic **Paleudults**.

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

SOUTHERN REGIONAL TECHNICAL WORK-PLANNING CONFERENCE OF THE COOPERATIVE
SOIL SURVEY
Lexington, Kentucky, June 7-9, 1966

Report of the **Committee** on Engineering Application and Interpretation
of Soil Surveys with Special Reference to Urban Fringe
and Irrigated Areas and Highways

A. Objectives:

1. Continue the 1964 conference work of Committees VIII, VIIIA, and VIIIB. Review and prepare regional guides for the Engineering Application and Interpretation of Soil Surveys with Special Reference to Urban Fringe and Irrigated Areas and Highways.
2. Respond to 1965 national **committee** report (**Committee V**).

B. **Committee** actions:

1. Guidelines for nine different urban fringe land uses **were** prepared. **The** guide sheets are attached to this report.
2. Guides for engineering interpretations were not prepared because a national guide for preparing engineering interpretations for soil survey publications and soil handbooks is ready for printing and will be distributed soon.
3. The national **committee** chairman, Lindo J. **Bartelli**, said that the national committee needs assistance in preparing guides for urban fringe interpretations. The attached guides were prepared with this need in mind.
4. These guides are intended to reflect criteria and terminology of the **comprehensive** soil classification system. They will be the guidelines for making interpretations of phases of soil families in the near future.

These guides are not intended to replace the guides **that were** used for making interpretations for major land resource areas. They are for discussion and field testing only, **until they are** reviewed and reissued by the national committee.

5. It is recommended that this committee be continued.
6. Suggested future objectives:
 - a. This **committee** should exchange information and act as liaison between states.

- b. Continue to study and improve guidelines.
- c. Develop and expand guidelines to include fields not presently covered.
- d. Encourage research on soil properties as they relate to the engineering application and interpretation of soil surveys.

Committee members:

William H. Bender, **Chairman**
James R. Culver, Recorder
R. C. **Deen**
S. **S.** Obenshain
F. T. Hitchie, Jr., Vice Chairman
M. E. **Shaffer**
J. M. Soileau
M. E. Springer
Forrest Steele
W. H. Zimmerman

Visitors:

G. R. Craddock
C. M. Ellerbe
D. D. Neher

Soil Limitations for Sanitary Land Fill Areas

Definition: These areas are for underground burial of garbage and trash. The chief requirements are well-drained soils on sites that are free of **flooding**. The soil should be easy to excavate to a depth of 10 feet.

Items Affecting Use	Degree of Soil Limitation		
	None to Slight	Moderate	Severe
Slope	1 to 4 percent	Less than 1 percent 1/ and 4 to 8 percent	More than 8 percent
Depth to hard rock	Deeper than 120 inches	60 to 120 inches	Less than 60 inches
Seasonally high water table	Below 120 inches more than 9 months	72 to 120 inches more than 9 months	Above 72 inch- es more than 3 months
Texture of the area to be excavated (affecting sidewall caving and workability to the depth of the excavation).	Loam, silt loam, silty clay loam, sandy loam , clay loam, silt, sandy clay loam	Silty clay, sandy clay, well graded gravel	Sand, loamy sand, clay, organic soils, poorly graded gravel
Stoniness	Classes 0 and 1	class 2	Classes 3, 4, and 5
Rockiness	class 0	Class 1	Classes 2, 3, 4, and 5
Trafficability of soil in place	Loam, sandy loam, ssndy clay loam , sandy clay	Silt loam, clay loam, silty clay loam, silt , silty clay	Sand, loamy sand, clays, organic soils

1/ Assumes inadequate surface drainage on less than 1 percent slopes.

Soil Limitations for Shrubs and Trees

This guide applies to the **use** of the **undisturbed** soil for shrubs and trees in residential areas, around factories, apartment houses, school buildings, and intensively used **parks**.

Items Affecting Use	Degree of Soil Limitations		
	None to Slight	Moderate	Severe
Available moisture to 40 inches	More than 5.0 inches	2.5 to 5.0 inches	Less than 2.5 inches
Depth to root restricting layer including bedrock	More than 40 inches	20 to 40 inches	Less than 20 inches
Wetness	None to slightly wet	Moderately wet	Wet and very wet

Soil Limitations for Cemetery Sites

Definition: These are areas for underground burials. The chief requirements are a well-drained site free of flooding that is easy to excavate to a depth of five feet 1/ and is productive of plants commonly used in landscaping.

Degree of Soil Limitation

Items Affecting Use	None to Slight	Moderate	Severe
Slope	Less than 12 percent	12 to 25 percent	More than 25 percent
Depth to hard rock <u>1/</u>	Deeper than 72 inches	48 to 72 inches	Less than 48 inches
Seasonally high water table <u>1/</u>	Below 60 inches more than 9 months	Below 40 Inches more than 9 months	Above 40 inches more than 3 months
Productivity	Medium to high	Medium to low	Low
Rockiness	class 0	Class 0	Classes 1, 2, 3, 4, and 5
Stoniness	Classes 0 and 1	class 2	Classes 3, 4, and 5
Flooding hazard	None	Once in 5 to 20 years	More often than once in 5 years

1/ Adjust for excavation depths **commonly** used locally.

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6/66

Soil Limitations for Lawn6

This guide applies to the use of the undisturbed soil for lawns in residential areas, around factories, apartment houses, school buildings, and intensively used parks.

Degree of Soil Limitations

Items	None to Slight	Moderate	severe
Affecting use			
Available water capacity to 40 inches	More than 5.0 inches	2.5 to 5.0 inches	Less than 2.5 inches
Percent rock fragments 3 to 10 inches in size in surface 10 inches	0 to 1 percent	1 to 5 percent	More than 5 percent
Surface layer texture	Silt loam, loam, sandy loam, sandy clay loam, silt	Loamy sand, silty clay loam, clay loam	Silty clay, clay, sandy clay, loose sand, organic, gravelly
Wetness hazard	No wetness and slight wetness	Moderately wet	Wet and very wet
Depth to rock or other root restricting layer	> 40 inches	20-40 inches	< 20"
Percent slope	0-5 percent	5-15 percent	> 15 percent

Soil Limitations for Golf Fairways

Definition: The soils are not rated for the rough or for hazards because of the extremely wide variety of soils that are suited for these parts of the golf course. Neither are the soils rated for greens because most of them are man made. The rating reflects the suitability of the soil for the establishment and maintenance of grassed fairways and depends mainly on the ability of the soils to withstand foot and cart traffic without damage to the soil cover.

Degree of Soil Limitation

Items Affecting Use	None to Slight	Moderate	Severe
Slope	• Less than • 8 percent	• 8 to 15 percent •	• More than • 15+ percent
Stoniness or rockiness	• Class 0	• Class 1	• Classes 2, 3, • 4, and 5
Productivity	• High to medium	• Medium to low	• Low
Wetness hazard	• Slightly wet •	• Moderately wet	• Wet and • very wet
Flooding hazard and duration	• Once in 1 to 5 • years for 7 days • to 2 weeks	• Once or more • every year for • 2 to 7 days	• Once or more • every year for • 7 days to long- • er than 6 • months
Surface texture	• Silt loam, loam, • silty clay loam, • fine sandy loam, • sandy loam, clay. • loam, sandy clay. • loam, very fine • sandy loam, silt	• Silty clay, • clay, sandy • clay	• Sand, loose sand, • loamy sand, • gravelly and • organic

Guide for Depth to Hard Rock Classes

Definition: The depth of loose material to "rock which requires drilling and blasting for its **economical** removal." 1/

<u>Classes</u>	<u>Depth to Rock</u>
Very shallow	0-20 inches
Shallow	20-40 Inches
Moderately deep	40-72 inches
Deep	6-20 feet
Very deep	20 feet plus

1/ Glossary of Geology and Related Sciences, second edition, The American Geological Institute, Washington, D. C., ~~1960~~.

SRTWPC
6/66

Guide for Determining Flooding Hazard Classes

Definition: Water from river and stream overflow, from runoff or seepage, and water standing or flowing above the soil surface.

Class	Frequency ^{1/}	Duration	
None	No flooding	Very brief	1 to 2 days
Very infrequent	Once in 20 to 50 years	Brief	2 to 7 days
Infrequent	Once in 5 to 20 years	Moderate	7 days to 2 weeks
Frequent	Once in 1 to 5 years	Long	2 weeks to 6 months
Very frequent	Once or more every year	Very long	Longer than 6 months

^{1/} The time of year that the floods occur should be taken into consideration when rating soils for a particular use. Flooding occurring during the heavy-use period is more serious than in those periods.

Guide for Rating Water Table Characteristics

Definition: The upper surface of free water in a soil or underlying material. In some places an upper- or perched-water table is separated from a lower one by a dry zone.

	Depth <u>1/</u>	Duration*
Very shallow	0 to 10 inches . Continuous	12 months per year
	10 to 20 inches . Very long	6 to 12 months per year
Moderately shallow	20 to 40 inches . Long	2 to 6 months per year
Moderately deep	40 to 80 inches . Brief	1 to 2 months per year
Deep	80 to 240 inches . Very brief	Less than 1 month per year
Very deep	Below 240 inches .	

* Duration of seasonally high water table is most severe when it occurs during the heavy-use season. Duration may be more usefully expressed as a **percentage**

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
SOUTHERN REGIONAL TECHNICAL WORK PLANNING CONFERENCE
OF THE
COOPERATIVE SOIL SURVEY
Lexington, Kentucky

Report of Committee IX
FRAGIPANS

The Committee on Fragipans had the following charges:

1. Review adequacy of concepts and designations for fragipan soil conditions, especially for the Southern Region.
2. Develop guidelines for identification and designation of fragipans with emphasis on bi-sequum conditions.

Considerable interest was exhibited prior to the meeting via correspondence from many committee members and during the deliberation of the committee in Lexington.

The committee is indebted to Dr. M. E. Horn of the Arkansas Agricultural Experiment Station for his interest and assistance in developing and providing the Questionnaire-- "Identification and Evaluation of Fragipans in the Field", a copy of which is attached. This Questionnaire was circulated to all committee members prior to the meetings. It provided an excellent tool for stimulating interest and responses.

The majority opinion of those answering the Questionnaire agreed that:

1. The fragipan horizon is mottled generally with shades of gray, brown, and red.
2. A polygonal color pattern is observable.
3. Some fragipans exhibit bisequal characteristics and others do not.
4. Consistence is most always firm or greater where moist.
5. It displays brittleness when moist.
6. It is compact and appears to have a significantly greater bulk density than horizons above and below it.
7. Voids are usually present in most fragipans and are largely of the vesicular type.
8. Opinion was about equally divided that oriented clays were readily observed between a definite "yes" and indefinite "yes".

9. Textures listed were generally silt loam, very fine sandy loam, or loam. The (a) line dominated as textures observed in fragipans.
10. The question of structure was also about equally divided between angular blocky and subangular blocky.
11. The majority indicated most fragipans observed were between 12 and 28 inches (a), but could be between 28 and 36 inches or below 36 inches in some profiles.
12. Most agreed a perched water table was apparent.
13. Roots in the fragipan generally were confined to and followed down the gray streaks.
14. Most indicated the fragipans were most common on 0-3% slopes but could range up to 8-12% which was not very common.

The following items were discussed during the committee meeting:

1. The definition of a fragipan as defined in the 7th Approximation was discussed.

It was the opinion of most members who expressed their views that the definition covered the items looked for in the recognition of fragipans, but possibly might be strengthened if it could be made more definitive especially with respect as to what constitutes the minimum requirements for fragipan recognition.

No definite or concrete opinions or recommendations were offered as to how this could be accomplished.

2. Some soils with plinthite (more than 10% by volume that is non-indurated) have characteristics that are quite similar to those with fragipans.

At the present time, due to lack of knowledge and evidence, the committee agreed to exclude soils with plinthite from fragipan consideration. As additional information and knowledge are obtained, consideration should possibly be given to a review of this decision.

3. The classification of fragipan soils at the subgroup level was reviewed. Included for discussion purposes were the following subgroups :

Typic Fragiudalfs	Aqueptic Fragiudalfs
Ochreptic, Fragiudalfs	Typic Fragfaqualfs
Aquic Fragiudalfs	

The definition of Typic Fragiudalfs states:

"has a fragipan that has a brittle matrix in at least 90% of the cross section of the most strongly cemented subhorizon. "

Opinion was expressed that this 9% figure *is too* high, and that consideration be given to changing this figure to about 60 or 70 percent, which it is ~~thought would~~ more nearly represent the conditions with which we are dealing.

The committee was in agreement with definitions of the subgroups as presently defined, with the exception of the 9% brittleness, as being adequate for the needs in the Southern Region.

These subgroup definitions are applicable to the whole soils, expressing the total morphology rather than just to the fragipan horizons.

4. Considerable discussion centered around the degree of expression of fragipan horizons. The question was ~~raised--~~ "Could we recognize degrees of fragipan expression in the same subgroup?"--That is, for example, would it be possible to have in the Aqueptic Fragiudalfs a soil series having a strong expression and also one with a moderate expression? It was felt, that at least at the present time, we lack sufficient knowledge and guidelines to do this, but we should not rule out this possibility.

No action was taken by the committee relative to its continuance. The Conference likewise took no action. It is suggested that the 1960 Steering Committee take action on the continuance or discontinuance of this committee.

This concludes the committee report.

Attachment

Committee Members :

*E. A. Perry - Chairman - Ala.	R. C. Glenn - Miss.
C. B. Breinig - Vice Chairman - Tenn.	*H. E. Horn - Ark.
*R. I. Barnhisel - Ky.	*W. E. Keenan - Miss.
*O. R. Carter - Ark.	C. J. Koch - Va.
*R. C. Carter - Miss.	R. J. McCracken - N. C.
*J. R. Coover - Texas	*N. B. Pfeiffer - Va.
*J. A. DeMent - Texas	Grant Thomas - Texas
J. B. Dixon - Ala.	*H. B. Vanderford - Miss.
C. J. Finger - Ark.	J. B. Watts - N. C.
*Fenton Gray - Okla.	*Tracey Weems - La.

Visitors: L. J. Bartelli - Texas E. H. Templin - Texas
G. A. Buol - N. C. Eric Winters - Tenn.
G. D. Smith - Wash., D.C.

*Indicates members present at the conference.

Identification and Evaluation of Fragipans in the Field*

Introduction

The field soil scientist is frequently confronted with the problem of making decisions as to whether the soil he is inspecting or describing has (1) a **fragipan** or not?, and (2) if one is present, what is its degree of development or expression? In making these decisions chances are that the soil scientist goes through a **mental exercise** in which he, knowingly or unknowingly, asks himself a **series of** questions about the morphology and properties of the soil profile that he **is** observing.

Eventually his mental inquiry leads to a set of **answers upon which he bases his** decisions to the **main questions** posed above. If all soil scientists considered the same questions, had similar powers of observation and knowledge of soils, and reasoned similarly with the evidence on hand, presumably they would come up with the same decisions. If this were true, the problem of obtaining uniformity of fragipan identification and designation would largely be resolved. Obviously, this is not the case. However, if we assume that the majority of soil scientists possess similar powers of observation and a knowledge of soil morphology, the outcome of the mental inquiry would then **be** dependent on (1) *the* pertinence and scope of the questions asked, and (2) the interpretations of the **answers**.

It then seems possible that a list of pertinent questions and interpretations could be agreed upon that would lead to more consistent decisions regarding fragipan identification and designation of degree of expression and thus improve the classification of fragipan soils.

Because there seems to be little hope of finding a means of "measuring" fragipan properties in the field with any mechanical or chemical quick-test, it would appear that we must rely on some **judgement** method such as this in our routine mapping program.

Attached is a suggested checklist of questions with interpretations as I would make them. I am sure that there are weaknesses, however, **by pooling our experience in** mapping fragipan soils a list of questions and interpretations **could** well be prepared that would **guide** all of us in making **more** consistent evaluations of fragipans. Admittedly, there would still be a great deal of personal bias in answering the **questions**, but a conscientious **attempt to critically and objectively observe and answer questions such as these should improve upon the present situation**.

* Prepared by Dr. M. E. Horn, University of Arkansas **Agri.** Exp. Sta.

Check List of Questions for the Field Identification of Fragipans

Definite Yes Indefinite Yes Definite No

- | | | | |
|--|-------|-------|-------|
| 1. Is the horizon mottled
(a) predominately shades
of gray? or with
(b) grays, yellowish-brown,
and reds? | | | |
| 2. Is a polygonal color
pattern observable? | | | |
| 3. Does soil exhibit a
bisequal profile?, i.e., does
it have an Λ'_2 , and double
clay bulge? | _____ | _____ | _____ |
| 4. Is consistence firm or
greater when moist? | _____ | _____ | _____ |
| 5. Does it display brittle-
ness (non-plastic deformation)
when moist or dry? | _____ | _____ | _____ |
| 6. Is it compact? i.e., on
the basis of lack of many voids,
closeness of particles, does
it appear to have a significantly
greater bulk density than
horizons above or below? | _____ | _____ | _____ |
| 7. If voids are visibly present
are they largely of the vesicular
(discontinuous) type? | _____ | _____ | _____ |
| 8. Are oriented clays (clay
films on void walls and in
the matrix associated with
voids or "former" voids)
readily observed? | | _____ | _____ |
| 9. Is the texture
(a) sil, vfsl, 1, lt.sicl , or lt.cl?
(b) fal, hv.sicl , or hv.:l? | _____ | | _____ |
| 10. Is the structure
(a) massive, angular blocky , or
prismatic?
(b) subangular blocky: | _____ | _____ | _____ |

Definite Yes Indefinite Yea Definite No

11. At what depth below surface does the upper boundary of the questioned fragipan horizon occur?

(a) between 12 and 28 inches

(b) between 28 and 36 inches

(c) below 36 inches

12. Is a perched water table readily apparent?

13. Are any of the following features applicable? Roots confined to upper profile, roots follow gray streaks only, evidence of windthrowing.

14. What is the slope gradient

(a) 0% to 3%

(b) 3% to 8%

(c) 8% to 12%

**Interpretation of Checklist Results and Drawing
Conclusions to the Crucial Questions**

A. Is the horizon a fragipan, either minimal, medial, or maximal?

Affirmative if a definite yes is given to all of these questions: 1*, 4, 5, and 8. These seem to be the key properties of fragipans.

*The a or b answers to question 1 have no bearing on recognition of the fragipan but are related to the drainage class.

B. Is the fragipan of strong (maximal) expression?

Affirmative if a definite yes is given to questions 1, 2, 4, 5, 6, 7, 8, 9a, 10a, 11a, 12*, 13*, 14a or 14b.

*In many cases answers to questions 12 and 13 may not be obtainable depending on season, and vegetative cover. If they are answered a definite yes would be required in order to have a maximal fragipan.

Also note that a "yes" to question 3 is not considered a requirement of a fragipan of maximal expression. A bisequal condition (definite or indefinite) is generally associated with maximal fragipans in poorly and certain somewhat-poorly drained soils but is not associated with maximal pans in moderately well drained fragipan soils.

C. Is the fragipan of moderate (medial) expression?

Affirmative if a definite yes is given to questions 1, 4, 5, 6, 8, 9a or 9b, 10a or 10b*, 11a or 11b, and 14a, 14b, or 14c**; and an indefinite yes to questions 2, 3***, 7, and 12 and 13, if answered.

*There is some question as to whether one should permit subangular blocky structure in medial fragipans or not. This kind of structure is usually associated with good permeability; it may be that in some soils, individual peds are "fragipan-like" in themselves, perhaps representing a degraded fragipan zone (or the encroachment of the fragipan into the overlying B-horizon?). Nevertheless, if the entire layer, or a substantial part of it, does not show the slow permeability and other overall physical features normally associated with a fragipan horizon, it probably should not be included with the fragipan in designating horizons. If isolated fragipan material does exist it is unlikely that it could be accurately described within itself as subangular blocky.

**Fragipans in soils on slopes of 8 to 12% are generally weak. If it is generally true that moderate pans do not occur on these slopes, then a yes to 14c should be omitted.

***Comments regarding bisequal profiles made under

D. Is the fragipan of weak (minimal) expression?

Affirmative if the horizon qualifies as a fragipan by a definite yes to questions 1, 4, 5, and 8 (See (A) above) and does not qualify as strong or moderate as defined in (B) and (C) above.

An indefinite yes would be given to questions 2 and 7.

Minimal pans are more likely to be formed in fsl, **hv.sic1**, or hv.cl., *if* the latter contain **high** proportions of expanding clays it is unlikely that a fragipan would form at all. With lower clay contents, as in **sil**, vsl, 1, **lt.sic1**, or **lt.cl**, mineralogy does not seem to make appreciable difference in determining whether fragipan formation takes place or not. Apparently, at the lower clay contents there is either insufficient disruption by swelling and shrinking, or internal drainage is such that moisture contents are high and the expanding clays are in a static swelled condition, a factor that may actually play a vital role in fragipan formation in poorly drained soils.

Minimal pans are also more apt to be deep lying pans whose upper boundaries are below 28", and, more likely, below 36". The fragipans of **soils** on steeper slopes (**8-12%**) are also most likely to be minimal and usually begin at greater depth.

NATIONAL COOPERATIVE SOIL SURVEY

Southern Regional Conference Proceedings

Fort Worth, Texas
December 13-17, 1965

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REGIONAL SOIL **SCIENTIST** WORKSHOP
Worth Hotel, **Fort Worth**, Texas
December **13-17**, 1965

Monday A.M., December 13 - **Chairman:** E. A. Perry

9:00-9:15 a.m.. Objectives of workshop**H.** B. Martin

9:15-10:15 a.m. Plinthite - formation and
characteristics **L.** T. Alexander

10:15-10:30 a.m. Break

10:30-11:30 a.m. Continuation of plinthic discussion ... **L.** T. Alexander

Monday P.M., December 13

1:00-5:00 p.m. **Committee** workshop

Committee I - Classification of Sandy Soils - **Chairman:** J. A. **DeMent**

O. c. Lewis	Forrest Steele
H. J. Byrd	Joe Nichols
L. Ii. Rivera	E. C. Sease
H. C. Dean	L. H. Burgess
C. M. Ellerbe	J. R. Coover

Committee II - Classification of Soils with Plinthic Horizon -
Chairman: R. C. Carter

E. A. Perry	J. B. Watts
A. L. Newman	R. D. Well6
F. T. Ritchie	H. C. Dean
K. K. Young	

Committee III - Classification of Alents and Alentic Subgroups -
Chairman: E. H. Templin

H. T. Otsuki	G. S. McKee
D. F. Slusher	J. A. Elder
R. R. Covell	O. R. Carter
J. R. Moore	W. R. Elder
C. B. Breinig	

2--Regional Soil Scientist Workshop, December 13-17, 1965

Tuesday A.M., December 14 - Chairman: F. T. Ritchie

- 8:15-9:00 a.m. Report of Committee I
9:00-9:45 a.m. Report of **Committee** II
9:45-10:00 a.m. Break
10:00-11:30 a.m. Report of **Committee** III
11:30-12:00 N What the laboratory can do for you ... L. T. Alexander

Tuesday P.M., December 14 - Chairman: **Hartzell** C. Dean

- 1:15-3:00 p.m. Modifications in the soil classification
system L. J. Rartelli
3:00-3:15 p.m. Break
3:15-4:15 p.m. Interpretation guide of soils for
engineering Lester Lawhon
4:15-5:00 p.m. Review of soil survey manuscripts . . A. **R. Hidlebaugh**

Wednesday A.M., December 15 - Chairman: R. R. **Covell**

- 8:30-8:45 a.m. Land use capabilities based on soil
family phases W. H. Bender
8:45-10:00 a.m. Guide for **determining** basic capabilities . . O. C. Levis
10:00-10:15 a.m. Break
10:15-11:30 a.m. Guide for determining the capability class
of sloping phases of families J. R. Coover
11:30-12:00 N Procedure for testing capability
classification , W. H. Bender

Wednesday P.M., December 15 - Chairman: Forrest Steele

- 1:15-2:15 p.m. Review of series descriptions A. R. Hidlebaugh
2:15-2:45 p.m. Nomenclature of mapping units L. J. Bartelli
2:45-3:00 p.m. Break
3:00-4:45 p.m. Guides for the application of the soil
classification system L. J. Rartelli

3--Regional Soil Scientist Workshop, December 13-17, 1965

Thursday A.M., December 16 - Chairman: C. M. **Ellerbe**

8:15-9:00 a.m. **Ordinating** woodland suitability groups . . . W. Ii. Bender
9:00-10:00 a.m. Field reviews - testing the soil
 mapping units L. J. **Bartelli**
10:00-10:15 a.m. Break
10:15-12:00 N Progress **report on soil-geomorphology**
 study, Wilson County, North Carolina . . R. B. **Daniels**

Thursday P.M., December 16

1:15-5:00 p.m. Workshop to discuss placement of problem series
 by **MLRA's**

Committee A - **MLRA-136** - Chairman: Forrest Steele

Committee B - **MLRA's 133, 150, 153, 154, and 155** - Chairman: E. A. Perry

Committee C - **MLRA's 11.6, 122, 123, and 128** - Chairman: J. A. Elder

Committee D - **MLRA's 77, 78, 79, and 80** - Chairman: H. T. **Otsuki**

Committee E - **MLRA's 84, 85, 86, 87, and 135** - Chairman: Gordon **McKee**

Committee F - **MLRA's 117, 118, and 125** - Chainnan: O. R. Carter

Friday A.M., December 17 - Chairman: C. B. Breinig

8:15-10:00 a.m. Report of **Committees** A, B, C, D, and E
10:00-10:15 a.m. Break
10:15-10:30 a.m. Status of MLRA interpretations W. H. Bender
10:30-11:00 a.m. **Summary** of workshop L. J. Bartelli

10-12-65

Report of the Committee on Classification
of Sandy Soils (Committee I)

The discussion of this committee and its **recommendations** to the **workshop** are concerned with the classification of soils in (1) **Psamments**, (2) **Arenic** subgroups of **Ultisols**, and (3) **Arenic** subgroups of Alfisols. Recommendations are given for definitions of various subgroups. Series are listed **as** examples.

PSAMMENTS

The committee **recommends**:

1. The following criteria, to be used at the series level:
 - (1) For uncoated families - (a) soils having less than **4%** fines (silt plus clay) or (b) soils having **4-10%** fine and **67% or more** separates coarser than fine sand.
 - (2) For coated families - (a) soils having **4-10%** fines and less than **67% separates coarser** than fine sand or (b) soils having **10-25%** fines.
2. That, due to moisture limitations inherent in uncoated families under both irrigation and natural rainfall, uncoated families be included in all **Psamments**.
3. That Kershaw and **Lakeland** series be separated on the basis of Kershaw soils being defined as uncoated, **Lakeland** soils as coated.

1.X1 Aquipsamments

No changes are recommended. Discussion following presentation of the committee report, however, points out a need for better distinction between Aquipsamments and **Psamments** as well, as between Typic and **Aeric Aquipsamments** (see discussion following this report).

1.X2 Quartzipsamments

No changes are recommended.

1.X5 Torripsamments - In the South Region, these occur only in west Texas.

The following subgroups are recommended:

Typic Torripsamments. Torripsamments -

- a. having slopes of more than 25 percent, or with organic matter content that decrease6 regularly with depth.

Fluvic Torripsamments - Like the Typic except for a.

1.X6 Udipsamments

The committee recommends the following subgroups:

Typic Udipsamments. Udipsamments -

- a. **With** no mottles having **chromas** of 2 or less to a depth of 1 **meter** (40 inches).
- b. Having slopes **of** more than 25 percent or with organic matter that decreases regularly with depth.
- c. With no lithic contact within 50 cm. (20 inches) of the surface.

Aquic Udipsamments. Like the Typic except for a.

Fluvic Udipsamments. Like the Typic except for b.

Lithic Udipsamments. Like the Typic except for c.

1.X7 UstipsammentsTypic Ustipsamments. Ustipsamments -

- a. That are usually dry in some pert of the solum for **135-180** days (cumulative) **in most years.**
- b. Having slopes **of** more than 25 percent or with organic matter that decreases regularly with depth.
- c. With no lithic contact within 50 cm. (20 inches) of the surface.

Udic Ustipsamments. Like the Typic except for a and are usually **dry** in some part of the **solum** for **90-135 days** (cumulative) in **most years.**

Fluvic

Udifluvic Ustipsamments. Like the Typic except for a and b, and are usually dry in some part of the solum for 90-135 days (cumulative) in most years.

Lithic Ustipsamments. Like the Typic except for c.

Attachment No. 1 shows recommended placement of relevant **soils** into the above subgroups.

ARENIC ULTISOLB

1. The committee considered a proposed Great Group of **Paleudults**, defined as:

Other Udults with (1) epipedons with textures coarser than loamy very fine sands that are thicker than 50 cm. (20 inches); and (2) argillic horizons that are thicker than 1 meter (40 inches) and extend to 1.5 meters (60 inches) or more below the soil **surface** and have textures finer than **loamy** fine sands.

The following objections were registered to this proposal:

- (1) The proposal infers that, in Ultisols, only those soils having thick, coarse-textured epipedons are associated with old landscapes.
- (2) By its very name, the term "**Ultisol**" infers old soils, thus the "normal" soils of this order should occur on old surfaces. The definition of Normudults should include the old soils.
- (3) Thickness of the argillic horizon is considered significant at the Great Group level, thus Normudults should include those soils having argillic horizons with or without thick, coarse-textured epipedons and another Great **Group** should include soils having thin argillic horizons.

2. In lieu of the above, the committee recommends as follows:

(1) Redefine Normudults to read:

Other Udults with an argillic horizon that extends to depth greater than 1.5 meters (60 inches) below the soil surface and with an epipedon or an argillic horizon that has moist color values of 4 or more or dry values of 5 or more in some part.

3

4



5

6



Attachment No. 3 to this report shows a classification proposed by this committee.

Committee members:

L. H. Burgess
H. J. Byrd
J. R. Coover (Secretary)
Horace C. Dean
C. M. Ellerbee
c. L. **Hunt**

O. C. Lewis
J. D. Nichols
E. C. **Sease**
F. Steele
L. **H. Rivera**
J. A. C 1 s>w 0 Tr 1 0 0 1 326.88 ya5 p355 Tc 0 Tw 3 Tr 0.7826 0 0 1 3

Visitors:



PROPOSED CLASSIFICATION FOR
PSAMMENTS¹⁹

ATTACHMENT No. 1
SANDS 2011 COMMITTEE
SOUTH REGION

FAMILY AND COMMUNITY ADVISORY COMMITTEES ²⁰	ADVISORY COMMITTEES		QUARTERSAMMENTS				TERRITORYSAMMENTS		VILLAGE SAMMENTS				URBANSAMMENTS					
	TYPIC ²¹	ROCK ²²	TYPIC ²³	ROCK ²⁴	SPRING ²⁵	SHRUB ²⁶	TYPIC ²⁷	FLUWIL ²⁸	TYPIC ²⁹	ROCK ³⁰	SHRUB ³¹	LITRIL ³²	TYPIC ³³	URBIL ³⁴	FLUWIL ³⁵	URBANSAMMENTS ³⁶	LITRIL ³⁷	
1. Suburban Mt. ... (CA 10th ... 1-13 ... TRAIL ...)			* CAULISA (1997) SO. AUBIE(?)	* TYPICAL (1997)	* DODD (1997)													
2. Suburban, Rock, ... (CA 10th ... 1-13 ... TRAIL ...)			* ALISA (1997)	* CLAYTON (1997)														
3. Line Line 1, ...																		
4. Line Line 2, ...			* ARCHAIA (1997)	* ...				* ...										
5. ...																		

19- ...
20- ...
21- ...
22- ...
23- ...
24- ...
25- ...
26- ...
27- ...
28- ...
29- ...
30- ...
31- ...
32- ...
33- ...
34- ...
35- ...
36- ...
37- ...

PROPOSED CLASSIFICATION FOR
NORMUDULTS HAVING BACNIC EPICRONS

ATTACHMENT No. 2
SANDY SOILS COMMITTEE
SOUTH REGION

PROPOSED CLASSIFICATION FOR
ALFISOLS HAVING ARCTIC EPISODES

ATTACHMENT No. 3
SANDY SOILS COMMITTEE
SOUTH REGION

		USTALS								
		PALCUSTALS								
MIA FAMILY		ARENIC _U	ARVIC _U ARENIC _U	ADULTIC _U ARENIC _U	ARENIC _U VDULTIC _U	GROSS- ARENIC _U	ADULTIC GROSSARENIC _U	MALIC ARENIC _U	VDULTIC GROSSARENIC _U	HAPLOUSTALS
SII	Loamy Siliceous Thermic	Brownfield Nucleus Hobscot	NIMROD		DOUGHERTY STEPHAM	* SARITA LETT	* PATILO LETT	* COMITAS LETT	KENNEY	LETT
SI	FINE, Siliceous, Thermic	LEMINA		* DEMINA LETT	* HEATONIC LETT					

_U - PROPOSED SUBGROUPS

* - TENTATIVE SERIES

7.
Loamy, siliceous
thermic
> 4% fines in
the A horizon

*Alapaha

Plintharenic
Ochraqults

*Leefield
Series A

Plinthagic
Arenic
Normduits

~~Series A~~

~~Plinthagic
Grossarenic
Normduits~~

CLASSIFICATION OF SERIES SELECTED FOR GULF COAST PLATW

Lithology of Control Section	Typic Normu-dults	Paraquic Normu-dults	^{1/} Aquic Arenic Humic Normu-dults	Typic Glossa-qualfs	Typic Ochra-qualts	Typic Umbra-qualts	Plu Non dult
1. Fine loamy, siliceous thermic							Prof No.
1a.) >20 percent silt C.E.C. 30-50 m.e./100 grs. clay							Prof No.
1b. < 20 percent silt							Irvi *Gr *Dot Carr Tiff *Co
1c. <i>Silt not diagnostic</i>							
2. Coarse loamy, siliceous, thermic							
>20 percent silt C.E.C. 30-50 m.e./100 grs. clay	Profile No. 4	Profile No. 11					
3. Loamy, siliceous							
>15 percent silt			Profile No. 7				
4. Clayey, mixed, thermic							
4a.) >35 percent clay >70 percent silt					Profile No. 9 (Leaf)		
4b. ³⁰ <20 percent silt Mineralogy - Kaolinitic (?)							*Var Suns
5. Fine silty, mixed, thermic high Sand but <15 percent coarser than vfs C.E.C. >30 m.e./100 grs. clay				Profile No. 13 (Almo)		Profile No. 10 (Hyde)	
6. Coarse silty, mixed, thermic high sand but <15 percent coarser than vfs C.E.C. >30 m.e./100 clay							

13

*Tentative Series
^{1/} Provisional Subgroup
 U. S. D. A., SOIL CONSERVATION SERVICE, FORT WORTH, TEXAS
 W-104-803-1047-1-60774, TEL. 1-800

COMMITTEE II - Classification of Soils Having Horizons Containing
Plinthite

The Committee reviewed the draft report of Classification of Soils in the Gulf Coast Flatwoods of the Southern States, June 1965, and recommended that this report be released with the following suggested modifications:

1. Definitions of subgroups.
2. Changes in Classification Chart 2a, notes to be attached to chart.

Under Plintharenic Normudults we recommend series not be separated that have chroma 2 mottles in the 10- to 20-inch depth of the Bt from those that are free of chroma 2 mottles in the upper 20 inches of the Bt.

3. Series criteria.

- a. Soils 20 inches or less to horizons having 10 to 50 percent nonindurated plinthite.
- b. Soils 20 to 65 inches to horizons having 10 to 50 percent nonindurated plinthite.
- c. Soils 20 to 65 inches to horizons having 10 to 50 percent nonindurated plinthite, use percent silt as series criterion.

coarse or fine loamy < 20% or > 20% silt
clayey < 30% or > 30% silt

- d. Soils 20 inches or less to horizons having 10 to 50 percent nonindurated plinthite, percent silt is not a criterion in coarse loamy, fine loamy, or clayey families.
 - e. Soils with arenic epipedons (>4% fines).
Soils with arenic epipedons (<4% fines).
4. The Committee commends Dr. R. B. Daniels for his guidelines on Criteria for Plinthite. However, we would suggest that the title be altered to something such as Criteria for Nonindurated Plinthite, or to expend the paper to cover indurated plinthite, especially nodules.
 5. The Committee recommended that the grid system, as recommended by Dr. Daniels, be used in the field for determining the percentages of plinthite.
 6. The Committee recommended that all soils having horizons containing 10 to 50 percent nonindurated plinthite be included in this report.

R. C. Carter

COMMITTEE II - Classification of Soils with Plinthic Horizon

R. C. Carter, Chairman
E. A. Perry
A. L. Newman
F. T. Ritchie
K. K. Young
J. B. Watts
R. D. Wells
H. C. Dean

Alentia Sails

LTB

- * Anna. Miss. Alentia Aquio Entrochroptis Aquio Alentia
Coarse silty, mixed, thermic
- Arkabutla Miss. Alentia, Alentia Narmagupta
fine silty, mixed, acid, thermic
- Athens Ark. Alentia Narmagupta
Fouchamp. fine loamy, siliceous, acid, thermic
- Bibb. Miss. Alentia Narmagupta
Coarse loamy, siliceous, acid, thermic
- Baudre. Miss. Alentia Haploguella
fine, even loamy, mixed, thermic
- * Brien La. Alentia Aquio Entrochroptis
Coarse silty, mixed, thermic
- Bruno Ky. to be suspended or released
by mesic action

- ~~St. Louis No. 10. Alentia Haploguella
sandy, siliceous, thermic~~

- Citrus Ala. Atlantic Aquatic Haplodonta
fine, mixed, thermic
- Cascilla Miss. Atlantic Dytiscidae
fine silty, mixed, thermic
- Chaetrea Miss. Atlantic Nannozus
fine, mixed, acid, thermic
- Chesapeake N. Caro. Atlantic Aquatic Dytiscidae
fine loamy, mixed, thermic
- Callin Miss. Atlantic Aquatic Dytiscidae
coarse silty, mixed, thermic
- *Combs Ark. Atlantic Dytiscidae
loamy, skeletal, siliceous, thermic
- Commerce La. Aquatic Atlantic Nannozus
fine silty, mixed, nonacid,
thermic

Congaree S.C. Atlantic Diatomaceo-
fine loamy, siliceous, thin

*Pamlico La. Area Atlantic Humate-
Coarse silty, mixed loamy, thin

Crookston Miss. Atlantic Udiposament-
sandy, siliceous, thin

*Duckett La. Typic Udalents
fine loamy, siliceous, acid, thin

Egans. Tenn. Atlantic Aquic Cumulis Hyalodol-
~~fine silty, mixed, acid, massive~~

Elkins W. Va. Atlantic Humate-
fine silty, mixed, acid, massive

Ennis Tenn. Atlantic Diatomaceo-
fine loamy, siliceous, thin

- Falaya Miss. Aerie Alentic Normans-
 Coarse silty, mixed, acid, therm.
- * French Miss. Typic Alentic
 Coarse silty, mixed, nonacid, therm.
- ? French N.C. Alentic Aquic Dystrochlopt
 "fine loamy, mixed, therm.
- Podolian Terr. Alentic Aquic Cumulic Haplo
 fine, mixed, thermic
- x Humblen Terr. Alentic Aquic Dystrochlopt
 (dropped - proposed
 for reinstatement)
 "fine loamy, siliceous, acid, therm.
- Houlika Miss. Aerie Alentic Normans-
 fine, Montmorillonite, therm.
- Huntington W. Va. Alentic Cumulic Haplo
 fine silty, mixed, mesic

Juba - Miss. Alentic Agues *Dystrochaetes*
Coarse loamy, siliceous, thin

Jackson - N.C. Alentic *Hemoglyphis* -
(Probably *Cumilis*) Coarse loamy, siliceous, thin

*Piney Ala. Typic Adalentic.
Coarse loamy, siliceous, acid, thin

Landon. Tenn. Alentic *Cumilis* *Hoplagnathis*
fine silty, mixed, thin

Lee Tenn. Alentic *Hemoglyphis*
fine loamy, siliceous, acid, thin

Leeper. Miss. Aeric Alentic *Hemoglyphis*
fine, Montmorillonitic, nonacid, thin

Lindsides Ky. Alentic Agues *Dystrochaetes*
fine silty, mixed, thin

Rehoboth Tenn. Alentic Agnic Dignit. ~~Alentic~~
fine loamy, siliceous, thermic

Springfield Tenn. Alentic Agnic Cumul. ~~Alentic~~
fine loamy, mixed, thermic

Montachus Miss. Aeric Alentic Normaquept.
Coarse loamy, siliceous, acid, phos.

Marrett Miss. Alentic Agnic Eutrochrept.
fine loamy, mixed, thermic

Melvin & Mevies Ky. Alentic Normaquept.
fine loamy, mixed, nonacid, thermic

Mhoon La. Alentic Normaquept.
fine silty, mixed, nonacid, phos.

Newark Ky. Aeric Alentic Normaquept.
fine silty, mixed, nonacid, phos.

Newelltown La. Aeric Alentic Normaquept.
fine and loamy, mixed, nonacid, phos.

Callahan Ala. Atlantic B. ...
 .. Coarse loamy, siliceous, ...
 ... Ala. to the ...

... Ark. Atlantic ...
 fine silty, mixed, ...

Philo Ky Atlantic ...
 Coarse loamy, siliceous, ...

Pope Ark. Atlantic ...
 Coarse loamy, siliceous, ...

Robinsonville Miss. Atlantic ...
 Coarse loamy, mixed, ...

Rachel Tenn. Atlantic ...
 fine, mixed, ...

... Miss. Atlantic ...
 fine silty, mixed, ...

* Lab Con	Mexico	Aeris Alentis Normagoptes Coarsely, mites, mites, mites
sp. 1000	Texas	Aeris Alentis Normagoptes fine loamy, mites, mites
Standard	Ind.	Aeris Alentis Normagoptes Coarsely, mites, mites
Tenn. 1000	Mexico	Aeris Alentis Normagoptes fine loamy, mites, mites, mites
Tenn. 1000	Mexico	Aeris Alentis Normagoptes fine, mites, mites, mites, mites
Una	Mexico	Aeris Alentis Normagoptes fine, mites, mites, mites, mites
Uno -	Mexico	Aeris Alentis Normagoptes fine, mites, mites, mites, mites
Verona	Mexico	Aeris Alentis Normagoptes fine, mites, mites, mites, mites

Waverly Miss.

Typical Atlantic
Coarse silty, mixed, thin

Waco Tenn.

Atlantic Coastal Plain
fine loamy, mixed, thin

Waverly Miss.

Atlantic Non-marine type
Coarse silty, mixed, thin

Waverly Tenn.

Aerie Atlantic Non-marine type
fine loamy, mixed, calcareous

Wendover N.C.

Atlantic Non-marine type
fine loamy, silty, mixed, thin

Wintersburg Tenn.

Atlantic Aerie Coastal type
fine loamy, mixed, thin

Fort Worth, Texas December 14, 1965

WHAT THE LABORATORY CAN DO FOR YOU

by

L. T. Alexander

This morning I have been asked to tell you what the laboratory can do for you. In view of our shrinking laboratory staff and the increased need for laboratory work as a result of the adoption of the new classification system, I am tempted to ask what you can do for the laboratory.

At the present time, we have 28 professional employees in our three laboratories. A few years ago we had considerably more than this. On the basis of the 61 million acres of soil mapped in 1964, this amounts to somewhat less than one half year of professional laboratory time for each million acres of soil mapped. You can see that the butter is spread rather thin. Now I am not citing these figures in order to elicit your sympathy. Rather, I want to impress upon you the necessity for careful planning and study prior to any request for laboratory time.

Laboratory studies should not be undertaken for the purpose of solving problems that can be cleared up by field studies alone. Neither should you request complete characterization of soils when a simple test may give the answer you need. But most important of all, you should not ask for laboratory help on a problem unless

you have in mind some specific questions to answer or some hypotheses to test that require laboratory data for solution. We cannot afford to be shooting at ducks in the dark. We must put our time on work that will yield good returns on the average. I realize full well that at times we will fail to answer a question even when we have given careful thought. But we must come out well as a whole.

Now you may inquire as to how we expect you to fit soils into the new classification system without adequate laboratory data. And this is a good question indeed. But at the present time we do not have the resources to characterize one soil out of five that are being mapped. At present, I see no prospects that this situation will improve in the near future. Hence, the necessity for getting the most out of the work that we can do.

There are some things that you can do for yourselves. There is no need for the laboratories to determine your textures. You can do a

~~map which is the same. Your evaluation of the texture of~~

better than we could possibly give you from one or a few samples. For example, if you walk over a given field and determine texture by feel at a number of locations, you not only come out with the knowledge of the average texture for the field but at the same time you evaluate the range in texture. The two bits of knowledge together give far more useful information than the data obtained from a single sample or for that matter, more useful than a precise determination

of particle distribution on a composite sample taken from the field.

~~Some in evaluating a number of samples from this field would be~~

Perhaps you will say that this particular field has a texture near the border of a split in our triangular representation of textures in relation to particle size. But I say to you that there is no more necessity for precision here than if the texture was medium for a given class. A little thought will convince you, I think, that if you texture the field and find that the soil ranges from a heavy silt loam to a light silty clay loam, you have characterized it just as precisely as if you had found that it was a medium silt loam for example. If the soil truly falls astride a division line on the triangle, then the texture may just as well be thrown in one category as the other. All man-made divisions in functions that are continuous are subject to this same problem of what to do when values fall astride dividing lines. If one hangs up on these kinds of things, he runs the risk of becoming a slave to the system, rather than the system being a help to the slave. There are no natural breaks in percentages of clay, of degree of base saturation, or for that matter in such things as soil temperatures. One will always be faced with arbitrary decisions. The extent to which one can rise above the frustrations of such borderline cases determines how useful the soil texture triangle, or for that matter the whole of the new classification system can be to you and to the Soil Survey as a whole.

When one deals with the separation of soils on the basis of

~~of the soil's physical and chemical properties, it is not possible to~~
~~have a soil which is completely homogeneous in its composition.~~

bars if he whispers to himself the assurance that the separation that he has just made does not mean a thing in the world but was only an exercise in futility that he had to go through with in order to carry out his assigned task. In view of your assignments for the next few days, I may find myself persona non grata with your chairman.

If one knows that he will get data on only perhaps one fifth of his soils, he will or should select those to be characterized so that they are related in some systematic manner to soils not analyzed. It is poor strategy to have all of your analyses on closely related soils and to leave a large group of soils without data. From data on one well-chosen soil, one can reason information on a number of soils. Bear in mind that our present plans do not call for precise data on any of our soils. Only reliable information is required. Our efforts should be in areas where we have real gaps of knowledge rather than in trying to get precise information on the borderline cases.

Dr. Gady has stated that we now know enough about soil clay mineralogy to reason out the clay mineral composition of ^{all} most any soil in the United States for purposes of the classification.

This reasoning is done from a knowledge of the geological materials, the soil forming factors and the knowledge that we have already accumulated on many soils. Our clay mineralogy studies should be for the purpose of gaining a better understanding of processes, clay mineral syntheses, degradations and trends with degree of development rather than for the specific purpose of determining clay mineral percentages on specific soils. As a matter of fact, I might say that we cannot afford to analyze soils for the sole purpose of gaining information on that one soil. The soils must be so chosen that the data we get can be reasoned to other related soils.

Now the tough part of this is that it requires that considerable reasoning, the posing of questions, and the development of hypotheses prior to the selection of soils for sampling.

We now are to the stage in many states that we can gain much more by studying six profiles of soils composing some kind of a transect or sequence than we can by putting a similar amount of effort into three pairs of matched profiles from three mapping units. And here I should say that in transect studies all of the profiles studied need not, and perhaps frequently should not, constitute midpoints of mapping units. Some of them may well be transitional to other soils. The important thing is that we gain an understanding of the differences between the soils in the transect or sequence. This is the kind of knowledge that enables us to understand and assign values to those soils that we do not get data for.

One of the most common problems we face in getting soil samples is the selection of sites to sample. Frequently the fieldman wants to select a site that really fits the approved description for a given series. Now it may happen that he is working in a borderline area where in general the particular soil is not modal for the series as designated. Here again we must know why the laboratory work is being done. If the purpose is to characterize the series, then one should take the samples in another area where the soil is modal and this county is not the proper location. If the purpose is to characterize the soils as being mapped in that county the selected pedons should be modal for what is being mapped in that county or area and not modal for the series as described. Again if a local problem is being studied the soil should be typical of the problem. Thus we should never be faced with frustration because one cannot find the right sampling spot. Yet in getting matched profiles, we frequently find one that suits the selector fine but he never finds another one that quite fits. This should never be. If the soil to be studied is not easy to find then there is some mistake either in the mapping or the man is carrying one concept and mapping another.

A second problem that we frequently encounter is that the local people have not dug enough pits and really do not know what the lower horizons of the soil are like. This is particularly pertinent with soils that have horizontal patterns of structure and color that can be seen only in horizontal section. A typical case in

point is the polygonal patterns found in soils such as Tifton and some of the Zuber that I have seen. No valid picture of the soil can be gotten without examining a horizontal plane surface at the pertinent depth. It cannot be gotten from any numbers of augering nor can it be seen in a road bank. Yet we sometimes find areas

~~where the contour is not flat but is sloped and not horizontal~~

adequate size and depth has been dug and the soil described. In these cases the men simply do not know or understand the soils they are mapping. It is my feeling that the mapping is no better than their understanding of the soils being mapped.

If the men who are mapping are not allowed enough time to dig a hole to find out what the soil is like, then there is something wrong with the staff that has jurisdiction over them. You will recall

~~that the men who are mapping are not allowed enough time to dig a hole to find out what the soil is like, then there is something wrong with the staff that has jurisdiction over them. You will recall~~

fieldmen are not interested in seeing what shows in a pit then there is something wrong with them.

My purpose in giving you this talk is not to discourage you from requesting laboratory assistance. Just the opposite. It is our wish that the men in the field will submit to us through you well thought out problems that give them trouble. By committing these problems to writing, they will have to organize and set down their thinking and this will be beneficial in itself.

have been raised on the basis of information that you have from other areas or other soils. It may be that there are similar problems that you have that can be profitably combined to make a single project aimed at answering questions in more than one area. Another possibility is that the questions raised can best be answered by field studies. If so, this should be done by allocating the time necessary to do the work.

Regardless of whether you need more field work or more field work supported by laboratory data, our job is to help you if you need us. We would appreciate the opportunity of working with your fieldmen on problems prior to the submission of a formal request for laboratory assistance. If we do not think that laboratory work is needed in order to answer the questions raised, we will say so and not consider that the time with you was not well spent. In any such study preliminary to submission of a request for laboratory assistance, I am sure that both we and the fieldmen would learn something useful. And we might be able to come up with an answer that would save a great deal of laboratory time and expense.

If, as a result of such joint field studies, we decide that a laboratory study is needed we will be in a better position to prepare a request and to undertake the study with more understanding and background information than if our first contact with the problem is the morning we start to work in the area taking samples.

If you think that you need more technical help, both in solving field problems alone and in those requiring laboratory support, your best strategy, it seems to me, is to confront us with a stack of well-reasoned written requests for such help. Certainly such requests would have to be considered by Drs. Simonsen, Smith and by me. If we could not undertake to give the needed technical assistance because too many good requests were ahead of yours we would have to say so ~~to you~~ ~~that the request has not been considered~~ ~~on hand from the states that you represent.~~

Committee Report - Handling Proposed and New Soil Series Descriptions

The Committee considered statements made by Principal Soil **Correlators** from other regions on their procedure and recommended the following:

1. The procedure now in effect in **SRTSC** is satisfactory and is working. There appears to be no need for major changes or adjustments.
2. It is suggested six months after the new classification list of series is received, when a survey **area** comes up for correlation it be a requirement that **all** series in the area must have an updated series description before the correlation is completed.
(Note by Hitchie - It is possible this requirement should be placed into effect to a limited degree at **an**

RESUME

Introduction:

Conclusions reached were:

(b) MLRA Tables

Background:

At this point, it can be reasoned that the land capability system should be revised end perhaps simplified. This is evident from the fact that it preceded development of the comprehensive soil classification system. Careful study of land capability in light of today's needs, however, led to the committee's early decision to support the principles outlined in Soils Memorandum SCS-22 and concentrate on procedures for applying the interpretation. A high degree of co-ordination can be attained through methodology in application, within the normal flexibility of the system. The problem is primarily one of procedure in moving logically from a set of facts about the soil to a decision on capability.

criteria:

Determining land capability must begin with a well-defined soil, correctly fitted into the soil classification system. This permits use of information from all categories in the system, in addition to that normally shown in the description. It is then possible to evaluate each significant soil characteristic, soil quality, or other soil related feature separately. The degree to which these tend to reduce capability for agricultural use is a reliable indication of the capability class.

Many properties are considered in soil classification, and therein lies the key to better interpretation procedures. By working with specific parts of the whole soil, a decision on land Capability classification can be reached by synthesis or steps instead of a single conclusive jump, and the basis for the decision can be documented for review by all concerned. It is necessary, however, to organize the various kinds of soil properties and understand their relationships and how they can be evaluated under existing capability classification procedures. While there are some vague exceptions, a clear and useful distinction can be drawn among soil properties as follows:

1. Soil "Characteristics" that can be seen or measured. with limited interpretation, these include basic properties such as; particle size distribution or fractions, texture, reaction or pH, color, stoniness or rockiness, soil climate, percolation, compaction or bulk density, soluble salts, mineralogy, soil thickness or "depth", cation exchange Capacity, base saturation, structure, consistence, water table depth and duration, depth to rock, porosity, infiltration, permeability, and fines.
2. Soil "Qualities" that are acquired through the interaction of soil characteristics under a prescribed set of conditions. These can be illustrated by; tilth, fertility, available nutrient capacity, nutrient-supplying capacity, erodibility, available water Capacity, productivity, root zone, workability, trafficability, wetness, and response.
3. Soil related features or over-riding conditions that are soil-based but are not directly a part of the soil itself. These can be illustrated by; flooding, overflow, ponding, seeping, water table, soil loss, gullying, subsidence, salt intrusion, slumping, overwashing, climate, storm damage, windthrow, precipitation effectiveness, landscape, size and shape, and relief.

In principle, "suitability" of a soil for a particular use (for which the soil requirements can be determined) is based on a relatively few significant soil "qualities", and they in turn are based on a few basic soil "characteristics". Superimpose the influence of soil-related features and a semblance of usefulness begins to emerge.

Over-expression of one or a combination of the characteristics or qualities results in some measure of "limitation" or "restrictions" in use. Influence of soil related features can more appropriately be called "hazards". Hence the degree of limitation, restriction, or hazard can be used as capability class criteria.

By following this line of reasoning, it is possible to predict behavior of a soil for certain uses, or easier yet to start with the specific use and determine the soil requirements. This applies especially to the so-called "non-agricultural" uses and to purely soil "suitability" decisions for

Guides for Determining Capability Class - Erosion Hazards

What slope phases of families are significant with respect to capability classification?

How should eroded soils be interpreted?

Let's discuss the second question first. We propose that eroded soils be interpreted using Table 1 only. If the effects of **erosion are** significant at the capability class level, this will be reflected in Table 1.

In tackling this problem of the significance of soil slope in capability classification we worked under several assumptions. These are:

1. Significant slope phases of arable soils (those under cultivation or likely to be cultivated) are the slope phases that encompass **significant** ranges in rainfall-erosion hazard.

2. Significant slope phases for capability classification for non-arable soils are primarily those that reflect major differences in limitations in use - for example, 30 or 35 percent slope as break between classes VI and VII based on limitation in **use** for pasture on steeper slopes.

3. Significant slope breaks are not the same for different kinds of soils. Nor are they the same for the same soils **over** widely different rainfall zones.

4. Hundreds of observations and years of experience are involved in the background for the slope classes and slope phases now in use in this region. We assumed this experience offered the best basis for establishing which slope classes are significant. Although slope classes used in the region vary widely, there is a certain pattern which seems apparent. A few states seemed to be outside the pattern, and we assumed the majority were correct.

5. In determining the **significance** of the pattern of slope classes, we assumed the universal soil-loss equation to be the most useful tool.

6. Capability classes I through IV are defined in terms of increasing hazards from rainfall-erosion. Through the years the upper limit of the A slope class has been the upper limit of slope of soils having no significant erosion hazard. The B slope class was used for the moderate hazard, C slope severe, etc. To establish erosion-loss values for these **classes**, we used the equation. The values are shown in Table 2.

We can test the values shown in Table 2 as follows:

$$A = RKLSCP$$

U. S. D. A., SOIL CONSERVATION SERVICE, FORT WORTH, TEXAS

USDA SCS FORT WORTH TEX 1966

We assume that the conservation treatment for soils with T value of 5 should hold average soil losses to this value.

10	=	RKLS	when	C = 1	and	P = 1	for	average	loss	for	Class	I
10		x		(C = 0.5)	(P = 1)	=	5	tons				
35		x		(C = 0.3)	(P = 0.5)	=	5	tons				
75		x		(C = 0.13)	(P = 0.5)	=	5	tons				
150		x		(C = 0.07)	(P = 0.5)	=	5	tons				
200		x		(C = .025)		=	5	tons				

C of 0.5 is about equivalent to continuous corn, **fertilized, residues returned** - Class 1 treatment.

C of 0.3 and **P=0.5** is terraced or stripcropping, **contouring** with some close spaced crops in rotation - Class II.
etc.

Let us examine Table 2. You will note that the limitations of soils that determine T values are accounted for in this table. Footnote 1 gives an explanation of how to use Table 2.

In using Tables **2A-E**, read the **K = .15** column if the K value for the soil falls in the range **K = .10 to .20**, use the **K = .25** column for the range **K = .20-.30**, etc.

For example, assume a soil that is Class I using Table 1, with K value in the .20 to .30 range, **R = 250**, T value of 5. Using Tables 2 and 2A we see this soil is Class I on **0-2%** slopes, Class II on **2-5%** slopes, Class III on 5-9% slopes, etc.

As another example, consider a soil such as Wilson clay loam of the Blacklands of Texas which rates Class III on Table 1. This soil occurs in an area with R value of 350 (use Table **2C**), T value is 3, K value is **.43**. This soil has a basic rating of **III_s** from Table 1. Table 2 shows a significant erosion hazard exists when annual soil loss rate exceeds **12 tons/ac/yr.** Using Table **2C** we see this occurs if slopes exceed approximately **1/2** of 1 percent. The break between Class **III_e** and **IV_e** is at an annual soil loss rate of **60 tons/ac.**, which will occur at about a 3 percent slope. The break between **IV_e** and **VI_e** is at 120 tons, or at 5% slope. Thus, slope phases of **0 - 1/2%, 1/2 - 3%**, and **3 - 5** percent seem appropriate for this soil.

Table 2 - Guide for Determining Capability Class based on Rainfall-Erosion Hazard and Allowable Soil Loss

Capability Class	I	II	III	IV	V	VI	VII	VIII
Annual soil loss rate, tons/ac. ^{1/}								
When T value is 5	<20	20-50	50-100	100-200				
When T value is 4	<16	16-40	40-80	80-160			Erosion hazard not class determining.	
When T value is 3	<12	12-30	30-60	60-120				
When T value is 2	<8	8-20	20-40	40-80				
When T value is 1	<4	4-10	10-20	20-40				

^{1/} Use Tables 2A-2E to determine average annual soil loss rate. Select appropriate table based on R values shown on map pages 6 and 7 of Agriculture Handbook No. 282, Rainfall-Erosion Losses from Cropland East of the Rocky Mountains - May 1965. Values in Tables 2A-2E are derived using soil-loss equation and data given in Handbook 282.

Erosion classes as mapped are not used in determining capability class. Evaluate effects of erosion with respect to changes in soil properties significant in Tables 1 and 2.

Table 2 A • Guide for **Determining** Capability Class
 based on
 Rainfall-Erosion **Hazard and Allowable Soil Loss**

Rainfall Factor R = 250

<u>Gradient</u> %	<u>K-.15</u>	<u>K-.25</u>	<u>K-.35</u>	<u>K-.45</u>
1	6	9	13	17
2	12	18	26	34
3	18	27	39	51
4	23	37	53	68
5	29	47	66	86
6	35	58	81	105
7	44	72	102	131
8	53	87	122	157
9	62	103	145	187
10	73	120	170	218
11	8	4	140	197
12	97	161	226	
13	109	181		
14	124	205		
15	139	230		
16	154			
17	169			
18	186			
19	204			
20	223			

Table 2 B - Guide for Determining Capability Class
 based on
 Rainfall-Erosion Hazard and Allowable Soil Loss

Rainfall Factor R.300

<u>Gradient</u> %	<u>K-.15</u>	<u>K-.25</u>	K-.35	K-.45
1	7	11	16	20
2	14	23	32	41
3	20	34	47	61
4	27	45	63	81
5	34	57	80	103
6	42	70	98	126
7	52	107	122	156
8	63	105	147	189
9	75	125	174	224
10	87	145	204	
11	101	169	236	
12	116	194		
13	131	217		
14	149			
15	167			
16	184			
17	202			
18	223			
19				
20				

Table 2 C • Guide for **Determining** Capability Class
 based on
 Rainfall-Erosion Hazard and Allowable Soil **Loss**

Rainfall Factor R=350

<u>Gradient</u> %	<u>K-.15</u>	<u>K-.25</u>	<u>K-.35</u>	<u>K-.45</u>
1	8	13	18	24
2	16	26	37	47
3	24	39	55	71
4	32	53	74	95
5	40	67	93	119
6	49	81	114	146
7	61	101	142	182
8	74	123	172	220
9	87	145	203	
10	102	170		
11	118	197		
12	135	226		
13	152			
14	173			
15	194			
16	215			

Table 2 D - Guide for Determining Capability Class
 based on
Rainfall-Erosion Hazard and **Allowable** Soil Loss

<u>Gradient</u> %	<u>Rainfall Factor R=400</u>			
	<u>K-.15</u>	<u>K-.25</u>	K-. 35	K-.45
1	9	15	21	27
2	18	30	42	54
3	27	45	63	81
4	36	60	84	108
5	46	76	106	137
6	56	93	130	167
7	70	116	162	209
8	84	140	196	
9	100	166	232	
10	116	194		
11	135	225		
12	155			
13	174			
14	198			
15	222			
16				

Table 2 **E** - Guide for **Determining Capability** Class
 based on
 Rainfall-Erosion Hazard and Allowable Soil Lose

Rainfall Factor R=500

<u>Gradient</u> %	K-.15	K-.25	K-.35	K-.45
1	11	19	26	34
2	22	38	53	68
3	34	56	79	101
4	45	75	105	135
5	57	95	133	171
6	70	116	163	209
7	87	145	203	
8	105	175		
9	124	207		
10	146			
11	169			
12	194			
13	217			
14				
15				
16				

Table 3
Guide for Capability Class
based on
Wind Erosion Hazard - Dryland

Capability Class	I	II	III	IV	V,VI,VII,VIII
Wind Erodibility Groups when ^{1/} PE zone is					Wind Erosion hazard gener- ally not class determining
PE 64-44	3,4,5,6,7	2	1		
PE 44-36	4,5,6,7	3	2	1	
PE 36-31		4,5,6,7	3	2	1
PE 31-25			3,4,5,6,7	2	1
PE 25-19				3,4,5,6,7	1,2

Table 4
Guide for Capability Class
based on
Wind Erosion Hazard - Irrigated

Capability Class	I	II	III	IV	V,VI,VII,VIII
Wind Erodibility Groups when ^{1/} PE zone is					Erosion hazard generally not class deter- mining
PE 64-44	3,4,5,6,7	2	1		
PE 44-31	4,5,6,7	3	2	1	
< 31		3,4,5,6,7	2	1	

^{1/} Wind Erodibility Groups are listed on Table 1 of Interpretation Tables. Groups used in this table are the same as those used in the Southern Great Plains except fine sands with loamy argillic horizons at depths less than 20" are in group 2, and very fine sandy loams in group 4. PE zones generally are the same as the Wind Erosion Soil Moisture-Wind Velocity Factor Zones shown on Figure 2, page 10, ARS 22-69 A Universal Equation For Measuring Wind Erosion. June 1961

Workshop - Fort Worth
December 13-17, 1965

REPORT OF COMMITTEE A
MLRA's 136, 130

Committee A was concerned with the placement of problem series in MLRA's 136 and WO. A primary task was to make recommendations for separation of mesic and thermic soils. Also, at the meeting of Committee I, Classification of Sandy Soils, the need for dividing Normudults on the basis of thickness was presented. A great group of "Paleudults" was proposed for soils with arenic epipedons, and Committee A was asked to consider the effect of such a separation.

"Paleudults" or "Tenudults"

At the meeting of Committee I on sandy soils the proposal was made to modify the suggested "Paleudult" great group by defining soils with thick solums (more than 60"+) as the Normudults, and separating those with thinner solums as another great group. The thinner soils were thought to be on younger surfaces, and it was proposed to indicate this in the new great group name. In a joint meeting of Committees A and B, we agreed to this recommendation with the suggestion that the morpheme in the name should indicate thinner rather than younger. The name "Tenudult" was proposed (from the Latin tenuis, thin).

The Committee considered the soils in the Piedmont and Blue Ridge mountains, and concluded that nearly all of the soils classified as Normudults in these resource areas would fit the definition of the new group, "Tenudults." Exceptions are only a few on built-up surfaces, such as Braddock.

Soil Temperatures

The Committee considered available temperature data from eleven soils in the intermountain plateau, from watersheds in the Waynesville-Asheville, North Carolina area. Monthly records were available, from 24" depth over a 12 to 14 year period. (Unpublished data - to be published by North Carolina State University)

Recorded mean annual soil temperatures ranged from 51° F at a relatively high elevation (3500 feet approximately) to 62.7° F in a colluvial area at a lower elevation (1800-2000 feet). There was significant variation from year to year, as high as ten degrees. Our conclusion is that MLRA 130 in North and South Carolina is entirely within the mesic zone and that the line between mesic and thermic zones should be drawn on the resource area boundary. In

Georgia it should be drawn somewhat north of the resource area boundary. This line automatically corrects a number of placements which the Committee believes to be in error. It also separates such problem series as Cecil and Hayesville.

First Bottom Soils

A number of changes are suggested in the soils of the first bottom:

- 1) Congaree and **Chewacla series** should be classified as Dystrochrepts; they, with Wehadkee, to be considered fine loamy and used for fine loamy first bottom soils throughout the **thermic** zone of **MLRA's** 130 and 136, and also in the Coastal Plain.
- 2) Ochlockonee, **Iuka, Mantachie** and Bibb series will **be in** coarse loamy families and will be mapped in **MLRA 136 where coarse** loamy first bottom soils are found. Mantachie and Bibb mineralogy should be changed to siliceous.
- 3) We plan no further use **of** the Bermudian, Rowland and **Bowmansville** series, and release these names for the use of the Northeastern Region.
- 4) Color ranges for series of **Fluvents** and Fluventic soils should be broadened to include the colors allowed in subgroups. Color need not be diagnostic for series of **Fluvents**. (Note -- this recommendation was not endorsed unanimously by the entire workshop when the **Committee** reported. **Jim Coover** of Texas particularly objected.)
- 5) **Mesic** counterparts of first bottom soils are **needed**. We will look to the Northeastern Region for descriptions of these soils.

Slate Belt Soils

Soils derived from fine **grained** rocks in the Piedmont Plateau present a number of problems in classification, but as these soils are now under study by the Office of the Director for Classification and Correlation and by the Soil Survey Laboratory, no **recommendations** concerning them were made by this Committee. Included are the Georgeville, Herndon, Alamance, Orange, Neson and **Tatum** series, the silty members of the **Colfax** and Worsham series, and a number of proposed series for soils with fragipans.

Regional Conflicts

There are numerous conflicts in classification of **MLRA** 130 and 136 soils between the Southern and Northeastern Regions. The **Committee believes that**

inter-regional problems might be discussed profitably by representatives of the states concerned **before** the placement into families is issued.

Committee A

Forrest Steele, Chairman
F. T. Ritchie, Jr.
R. D. Wells
C. L. **Hunt**
E. H. Templin (part-time)

Committee B Report

Normudults. Udults without a fragipan in or below the argillic horizon; without nonindurated plinthite that forms a continuous phase or constitutes more than half of the volume of any horizon within the upper 165 cm. (65 inches); with mean summer and mean winter soil temperature at 20 inch depth or at a lithic contact, whichever is shallower, that differ by 9° F. or more; with an argillic horizon that extends to depths greater than 1.5 meters (60 inches) below the soil surface, **exclusive** of zones of partially weathered rock coated with **illuvial** clays, and with an epipedon or an argillic horizon that has moist color values of 4 or more or dry values of 5 or more in some part.

Leptudults. Other Udults, exclusive of **Fragiudults**, **Plinthudults**, **Tropudults**, **Rhodudults**, and Normudults.

The following subgroups and families are recommended for **MLRA 133**:

Typic Leptudults. Leptudults that--

- a. have no mottles with **chromas** of 2 or less in the upper 50 cm. (20 inches) of the argillic horizon;
- b. have textures finer than loamy sand in some part of the argillic horizon, and have an argillic horizon that, in at least its upper 25 cm. (10 inches), has no lamellae;
- c. have no interruptions of the argillic horizon by ledges of bedrock within each **pedon**;
- d. have a moist value of 4 or more in all parts of the argillic horizon;
- e. lack a lithic contact within 50 cm. (20 inches) of the surface of the mineral soil;
- f. have an argillic horizon thicker than 25 cm. (10 inches);
- g. lack an epipedon thicker than 50 cm. (20 inches) if coarser textured than loamy fine sand;
- h. have one of the following:
 - (1) a mean annual soil temperature of more than 59 degrees F. (15 degrees C.) and a **pH** that is less than 5.5 (1:1 dilution in water) throughout the argillic horizon and to at least 50 cm. (20 inches) below its base or to a lithic contact;

(2) a mean annual soil temperature of 59 degrees F. (15 degrees C.) or less and base saturation (by sum of cations) of less than 35 percent at depth of 125 cm. (50 inches) below the top of the argillic horizon, and base colors (a) with hues redder than 7.5 YR in some part of the matrix of the argillic horizon or (b) with **chromas** of 6 or more throughout the argillic horizon.

- j. have an Ap horizon with moist values of 4 or more, or an Al horizon thinner than 15 cm. (6 inches) if its moist value is darker than 4.

Clayey, kaolinitic, thermic.

Coarse loamy, siliceous, thermic.

B-Rumford

Fine loamy, siliceous, thermic (brittle?).

Gilead?

Fine loamy, siliceous, thermic.

Cahaba

Kalmia

Fine silty, mixed, thermic.

Silerton

Louisiana _____

Arenic Leptudults. Like the typic except for g.

Coarse loamy, siliceous, thermic.

Ex-Kenensville

Entic Leptudults. Like the Typic except for f.

Clayey, kaolinitic, thermic.

Ex-Cuthbert

Paraquic Leptudults. Like the Typic except for a, and having low chromas (2 or less) between 10 and 20 inches below the upper boundary of argillic horizon.

Clayey, mixed, thermic.

Ex-Flint

Fine loamy, siliceous, thermic.

B-Charleston

COMMITTEE B - MLRA 133

E. A. Perry, Chairman
Baxter Watts
William Koos
Al Newman
C. M. Ellerbe
Blake Parker
Keith Young, Secretary
D. F. Slusher
R. B. Daniels

Committee ^B report MLRA 133, Perry, Chm., Young, sec.

Series	Distribution	1964 Placement	Committee ^B recommendation	Distinguishing Characteristics
Acadia		Aeric Ochraqualfs - fine montmorillonitic, thermic	Change to mixed	Lo soil
Alto		N. C.		
Americus		Psamentic Rhodudults - sandy, siliceous, thermic, thick	OK	
Amite		Typic Rhodudults - fine loamy siliceous (mixed?) thermic	Typic Rhodudult - fine loamy, mixed, thermic siliceous	
Anacoco		N. C.		Fluic response ability
Altavista		Paraquic Normudult fine loamy, siliceous, thermic	Committee 136 should handle	
Angie		Aquic Normudult - clayey, mixed, thermic	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Augusta		Aquic Normadult - fine loamy, mixed, thermic	136 should handle placement	
Arredondo		Typic Quartzipsamment - siliceous-phosphatic, acid, thermic, coated	OK if practices are the same	
Barclay		N. C.	?	
Barth		N. C.	Aspects similar	
Beauregard		Aquic Normadult - fine silty, siliceous, thermic	Plinthic Normadult	
Bayboro		Typic Umbraquults - clayey kaolinitic, thermic	OK	
Bibb		Cumulic Normaquept - coarse loamy, mixed, acid, thermic	Plinthic Normaquept varied loamy, siliceous acid thermic	

Series	Distribution	1964 Placement	
Bertie		Aquatic Normadulfs - fine loamy, mixed, t h e r m i c	
Blakely		Dropped - TSC Ad. FW-15, 5-9-65 c/w Greenville	OK
Bienville		N. C.	Study with relationship of sites - to responsibility
Bladen			Series being circulated for Comment
Blanton			Assessment Committee responsibility OK (may be paraque) OK - Jepsen thinks may be plinthic

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Series	Distribution	1964 Placement	Committee Recommendation
Bradley		Typic Normudult - clayey, kaolinitic, thermic	<i>Typic Normudult clayey, kaolinitic thermic</i>
Bruno		Cumulic (Umeric?) Normipsamment - siliceous, thermic	<i>Normipsamment committee responsibility</i>
Bub		Lithic Haplorthent - clayey, kaolinitic, acid, thermic	<i>(Texas)</i>
Byars		Typic	<i>OK</i>
Caddo			<i>Typic Caddoquilt fine silty, siliceous, thermic</i>
Cahaba			<i>Typic Cahabaquilt, fine loamy, siliceous, thermic</i>
Carnegie			<i>OK</i>

Series	Distribution	Placement	Committee Recommendation	Distinguishing Characteristics
Caroline		Typic Normudult - clayey, kaolinitic, thermic	OK	
Chastain		Cumulic Normaquet - fine mixed, acid, thermic	<i>Cumulic Normaquet fine mixed, acid thermic</i>	
Chattahoochee		Typic Normudult - fine loamy, siliceous, thermic	<i>OK but prop to modify</i>	
Chesterfield		Typic Normudult - clayey, kaolinitic, thermic	<i>Typic Normudult may be fine loamy</i>	
Coxville		Typic Ochraqult - clayey, mixed, thermic	<i>OK</i>	
Cuthbert		Entic Normudult - clayey, kaolinitic, thermic, thin	<i>Typic Normudult may be kaol. thermic</i>	
Craven		Paraquic Normudult - clayey, kaolinitic, thermic	OK	

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Series	Distribution	1964 Placement	Remarks
Dobruce Debruce		Rquic Normudult - clayey, mixed, thermic	aquic Ferrudults clayey ^{thermic} kaolinitic
Dragston		Aquic Normudult - coarse loamy, siliceous, thermic	aquic Ferrudults, coarse loamy - siliceous thermic.
Dierks		Quic	Arts. considered _____
Dunbar			aquic Normudult, clayey kaolinitic thermic Low silt < 30%
Duplin			clayey, kaolinitic thermic
Esto (R)			
Elkton			?

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Eulonia		Paraquic Normudult - fine loamy over fine, mixed, thermic	<i>see committee narrative</i>	<i>high silt</i>
Eustis		Entic Normudult - Sandy, siliceous, thermic, thick	Psammentic Normudult - sandy, siliceous, ✓ thermic	
Faceville		Typic Normudult - Clayey, kaolinitic, thermic	OK	
Fallsington		Typic Ckhraquult - coarse loamy, siliceous, thermic	Typic OK	
Flint		Paraquic Normudult - clayey, mixed, thermic	<i>Paraquic Normudult clayey mixed thermic</i>	
Gainesville		Ultic Quarzipsamment - siliceous phosphatic, acid, thermic, coated	<i>Psamment committee</i>	
Galestown		Ultic Quarzipsamment - siliceous, acid, mesic, coated		

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Gilead		Typic Normudult - fine loamy, siliceous, thermic (brittle?)	<i>Typic Tenudalt, fine loamy siliceous thermic (See narrative)</i>	
Goldsboro		Paraquic Normudult - fine loamy, siliceous, thermic	OK	
Gore		Tqualfic Normudult - clayey, expanding, thermic	<i>see committee narrative</i>	
Grady		Typic Ochraqult - clayey, kaolinitic, thermic	OK	
Greenville		Typic Rhcdudult - clayey, kaolinitic, thermic	OK	
Guin		Typic Dystrochrept - sandy, skeletal, siliceous, thermic	OK	
Hannahatche		Cumulic Haplorthent - coarse loamy, siliceous, acid, thermic	<i>Typic Udofluvent</i> OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Character istics
Henderson		Typic Normudult - clayey, kaolinitic, thermic, thin	<i>Typic Normudult clayey, kaolinitic, thermic</i>	
Hoffman		Entic Normudult - clayey, kaolinitic, thermic, thin	<i>Entic Normudult clayey kaolinitic thermic</i>	
Hortman		Aqualfic Normudult - clayey, expanding, thermic	<i>see committee narrative</i>	
Iola		Typic Normudult - loamy skeletal, siliceous, thermic	↓	
Hyattsville			7	
Hyde		Typic Umbraquult	<i>fine silty, mixed thermic</i>	
Irvington		Kshreptic Plinthic Fragiudult - fine loamy, siliceous, thermic	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Immokalee		Arenic Normaquods - sandy, siliceous, thermic, coated	OK	
Iuka		Aquic Cumulic Haplor- thent - coarse loamy, siliceous, acid, thermic	Aquic Haplo- see fluvial committee	
Invershiel		N. C.		
Izagora		Paraquic Normudult - fine loamy over fine, mixed, thermic	see committee narrative	
Johnston		Typic Humaquept - coarse loamy, siliceous, acid, thermic	see fluvents	
Kalmia		Typic Normudult - fine loamy, siliceous, thermic	Typic Normudult, fine loamy siliceous thermic.	low silt
Kanapaha		Aquic Quarzipsamment - siliceous-phosphatic, acid, thermic, coated	see psamment committee	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Kirvin		Typic Normudults - clayey, mixed, thermic	<i>See below - appropriate</i>	
Kenansville		Arenic Normudult - coarse loamy, siliceous, thermic	<i>Arenic Normudults are a heavy siliceous series</i>	<i>7/2 27. 140</i>
Keyport		Parasquic Normudult - clayey, kaolinitic, thermic	<i>OK</i>	
Kleij		Aquic Quarzipsamment - siliceous, acid, thermic, coated	<i>See paragraph above</i>	<i>See above - silty from parent rock</i>
Kisatchie		M. C.	<i>Typic Normudults are a heavy siliceous series</i>	
Lakeford		Typic Quarzipsamment - siliceous, acid, thermic, coated	Ultic Quarzipsamment - siliceous, acid, thermic	<i>4 - 10% fines - silt and clay in control.</i>
Lakewood		Spodic Quarzipsamment - siliceous, acid; thermic, coated	<i>OK</i>	

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Lauderdale		Lithic Dystrochrept loamy skeletal, siliceous, thermic	OK	
Leaf		Typic Ochraqult - clayey, mixed; thermic	OK	over 30% silt
Lenoir		Aquic Normudult - clayey, mixed, thermic	-kaolinitic	
Leon		Aeric Normaqued - sandy, siliceous, thermic, non-cemented	OK	Fla soil
Luverne		Typic Normudult - clayey, kaolinitic , thermic	OK	
Lynchburg		Aquic Normudult - fine loamy, siliceous, thermic	OK	< 20% silt
Macon		Typic Normudult - fine loamy, siliceous, thermic (mixed?)	OK	

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	but	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Magnolia		Typic Normudult - clayey, kaolinitic, thermic	OK	
Mantachie		Aeric Cumulic Norma- quept - coarse loamy, mixed, acid, thermic	<i>Recessive as in the</i>	
Marlboro		Typic Normudult - clayey, kaolinitic, thermic	OK	
Mashulaville		Typic Fragiaquults - fine loamy, mixed, thermic	OK	> 20% silt
Matapeake		Aflic Normudult - fine silty, mixed, mesic	} both probably mesic	
Mattapex		Aflic Normudult - fine loamy, mixed, thermic		
Mayhew		Aquultic Mazaquert - montmorillonitic, thermic slowly permeable	<i>fine loamy typic Okhagquult</i>	

1964

Series	Distribution			
Molena			<p><i>Massachusetts Committee</i></p>	
McKamie			<p><i>Typic Normandy fine, mixed, thin</i></p>	
Morse clay			<p><i>see Vortic Committee</i></p>	
Mus kog ee			<p><i>Typic Normandy fine silt, or fine, mixed, thin</i></p>	
Myat t			<p><i>OK</i></p>	<p><i>high silt</i></p>
Nacogdoches			<p><i>OK not table family</i></p>	
Norfolk			<p><i>OK</i></p>	<p><i>low silt 420%</i></p>

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Series	UNSTRUDITION	1961 Placement	Committee Recommendation	Distinguishing Characteristics
Nevada		N. C.	?	<i>Order may change</i>
Mixonton		Aquic Dystrachrept - coarse silty, mixed, thermic	?	
Ochlockonee		Cumullic Haploorthent - coarse loamy, siliceous, acid, thermic	<i>see Fluventic committee</i>	
Okenee		Typic Umbraquult - fine loamy, siliceous, thermic	<i>OK</i>	
Ona		Aeric Normaquod - sandy siliceous, thermic, non-cemented	<i>see Fla.</i>	
Onslow		Udic Normorthods - sandy over fine loamy, siliceous, thermic	<i>↓</i>	
Ora		Typic Fragidult - fine loamy, mixed, thermic	<i>Fluventic could be placed</i>	

Series	Distribution	1964 Placement	Committee Recommendation	st gui ac ter
Orangeburg		Typic Normaquult - fine loamy, siliceous, thermic	OK	Low silt < 20%
Othello		Typic Ochraqault - fine loamy, siliceous, thermic	OK	
Paden		Ochreptic Fragindult - fine silty, mixed, thermic	Same	
Paraloma		Ochreptic Fragindult - loamy skeletal, siliceous, thermic	?	Och soil
Percilla		Typic Ochraqault - clayey, kaolinitic, thermic	?	Depos soil mapped in Landmark units Greenville
Parquetank		Typic Normaquept - coarse silty, mixed, acid, thermic	?	
Phosa		Aquaptic Fragindult - fine loamy, mixed thermic	fin silty	

		1964	Committee	Distinguishing
Pickwick		Typic Normudult - fine silty, mixed, thermic	OK	
Plummer (R)		Typic Haplaquoll - fine mixed, thermic	OK	
Pocomoke		Grossarenic Ochraqult - loamy, siliceous, thermic	OK	
Portsmouth		N. C.	?	
Prentiss (K)		Typic Umbraquult - fine loamy, siliceous, thermic	OK	
Prescott		Typic Fragidult - coarse loamy, siliceous, thermic	OK	
		M. C.	?	

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Rains		Typic Ochraquult - fine loamy, siliceous, thermic	OK	< 20% silt
Red Bay		Typic Rhodudult - fine loamy, siliceous, thermic	OK	low silt
Roanoke		Typic Ochraquult - clayey, mixed, thermic	see 134 committee	
Robertsdale		Aqueptic Plinthic Fragiudult - fine loamy, siliceous, thermic	see plinthic robust	
Rumford		Typic Normudult - coarse loamy, siliceous, thermic	Typic Normudult OK	> 20% silt
Ruston		Typic Normudult - fine loamy, mixed , thermic	Typic Normudult. fine loamy, siliceous, thermic	
Rattlege		Typic Humaquept - sandy, siliceous, acid, thermic	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Saffell		Typic Normudult - loamy skeletal, siliceous, thermic	OK	
Sassafras		Alfic Normudult - fine loamy, siliceous , mesic	✓ ✓	
Savannah		Typic Fragiudult - fine loamy, mixed, thermic	<i>siliceous</i>	<i>high silt > 20%</i>
Sawyer		Typic Normudult - clayey, mixed, thermic (Paraquic?)	<i>Paraquic normudult fine loamy over clayey siliceous thermic</i>	<i>Need revised series description OK</i>
Scranton		Aquipsammentic Haplum- brep - sandy, siliceous, thermic	-	
Shubuta		Typic Normudult - clayey, mixed, thermic	<i>normudult clayey mixed, thermic</i>	
Silerton		Typic Normudult - fine silty, mixed, thermic	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
St. Johns		Typic Normaquod - sandy, siliceous, thermic	OK	
St. Lucie		Typic Quarzipsamment - siliceous, acid, thermic, coated	<i>see p. 200 of report Committee</i>	
Stough		Aquic Fragiudult - coarse loamy, siliceous, thermic	OK	
Summerfield		Typic Ochraqult - clayey, mixed, thermic	<i>equiptic Normudult fine loamy over clayey mixed loamy</i>	
Sunsweet		Plinthic Normudult - clayey, kaolinitic, thermic	OK	
Susquehanna		Aquultic Mazaquert - montmorillonitic, thermic, slowly permeable	<i>aquic Normudult clayey, montmorillonitic thermic</i>	
Thomasville		I. c.	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Character istics
Tifton		linthic Normudult - fine loamy, siliceous, thermic	OK	
Tilden		ypic Fragiudult - fine loamy, mixed, thermic	siliceous	
Vaucluse		ypic Normudult - fine loamy, siliceous, thermic (brittle?)	ypic Normudult (see notes)	
Urbo		eric Cumulic Norma- quept - fine, mixed, acid, thermic	see Fluventic committee	
Wahee		ypic Normudult - clayey, mixed thermic	OK	
Wau gh		ractive - TSC Ad. FW-10, 5-3-65, c/w Altavista	OK	
Weeksville		ypic Humaquept - coarse silty, mixed, acid, thermic	OK	

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Wilcox		Aquultic Mazaquert - montmorillonitic, thermic	<i>typic Normudult, see Verity committee</i>	
Woodstown		Paraquic Normudult - fine loamy, siliceous, thermic	<i>Paraquic Normudult - OK</i>	
Wrightsville		Typic Albaqualf - fine montmorillonitic, thermic		
Weston		Typic Ochraqult - coarse loamy, siliceous, thermic	OK	

Series	Distribution	1964 Placement	committee recommendation	Distinguishing Characteristics
Alaga		Ultic Quarzipsamment - siliceous, acid, thermic	<i>OK as in yellow sheet</i>	10 - 25% fines - silt and clay in control.
Alapaha		Arenic Plinthic Ochraqult - loamy siliceous, thermic	↑ OK	
Albany		Aquic Arenic Normudults - fine loamy, siliceous, thermic		
Ardilla		Aquic Plinthic Normudult - fine loamy, siliceous, thermic	↓	
Cowarts		Plinthic Normudults - fine loamy, siliceous, thermic		
Dothan		Plinthic Normudults - fine loamy, siliceous, thermic		
Ducker		"Cumulic" Haplorthent - fine loamy, siliceous, acid, thermic		

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Series	Distribution	1964 Placéme
Piquay		Arenic Plinth Normadults siliceous,
Grangebourg		Paragultic Plin Normadult + loamy, silic thermic
Kershal		Ultic Quarzif siliceous, thermic
Kinsey		'Cumultic' Hap coarse loam siliceous, thermic
Leefield		Arenic Plinth Normadult + siliceous,
Lucy		Arenic Normadu loamy, silic thermic
McLaurin		Typic Normadu coarse loam siliceous,

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Ocilla		Arenic Aquic Normudult - fine loamy, siliceous, thermic	<i>loamy, siliceous - thermic</i>	
Osier		Typic Aquipsamments - siliceous, acid, thermic	<i>OK</i>	
Pansey		Plinthic Ochraqults - fine loamy, siliceous, thermic		
Pelham		Arenic Ochraqult - fine loamy, siliceous, thermic		
Quitman		Aquic Fragiudult - fine loamy, mixed, thermic		
Stilson		Arenic Paraquic Plinthic Normudult - loamy, siliceous, thermic		
Troup		Grossarenic Normudult - loamy, siliceous, thermic		

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Wicksburg		Arenic Normaduff - clayey, kaolinitic, thermic	CK	
<i>Wicksburg</i>		<i>Arenic Normaduff</i> <i>- clayey, siliceous</i> <i>thermic</i>	<i>→ CK</i>	

COMMITTEE C

Committee C was charged with the placement of problem soils in Resource Areas: Ozark Highlands, Central Basin, Highland Rim, and Great Valley. The recommendations of this committee are given on the attached chart.

Joe A. Elder, Chairman
H. C. Dean
Leland Burgess
Joe Nichols
E. C. Sease
A. H. Hidlebaugh
M. E. Shaffer

Committee C Report

by Joe Elder

Series	Distribution	1964 Placement	Committee C Recommendation	Distinguishing Characteristics
Alcoa	GV	Typic Rhodudults, fine loam oxidic, thermic	Same	
Allen	GV	Typic Normudults, clayey Kaolinitic, thermic	Typic Normudults, fine loamy, siliceous, mesic thermic	Argillic horizon redder than 7.5 YR in major part and ranges from 30-40 % in clay content. Nolichucky is thermic equivalent.
Apison	GV	Typic Normudults, fine silty, siliceous, thermic	<i>Leptudults</i> Typic Normudults, fine loamy, siliceous, thermic	Argillic horizon 7.5 YR and yellowish, and ranges from 25 to 35% in clay content. Paralitric contact at 3 to 4 feet. This series conflicts with Holston, one should be dropped.
Armour	CB	Humic Normudults, fine silty, mixed-phosphatic, thermic	<i>Normudults</i> Mollic Normudults, fine silty, mixed, thermic	Phosphatic
Armuchee	GV	Entic Normudults, clayey, mixed, mesic, thin	<i>Leptudults</i> Entic Normudults, clayey, mixed, thermic thin.	Thin argillic horizon. 2 to 8 inches, underlain by soft acid shale. Thermic equivalent of Litz.
Ashwood	CB	Typic Hapludolls, fine, illitic, thermic	Typic Argiudolls, fine Mont. thermic	Phosphatic
Baxter	HR, OH	Typic Normudults, clayey, Kaolinitic, thermic	Same <i>Alfic Normudult, Clayey, Kaolinitic, mesic</i>	Argillic horizon redder than 7.5 YR in major part and ranges from 35 to 45 percent. Clay content in control section. Less clay and

3
A

Series

Baxter
(Con't)

Beason

~~Bedline~~

Brandon

Braxton

Same

(Fluventic?) Typic
~~Typic~~ Udipsamments,
^{non-oxid}
siliceous, athermic
Typic Normudalts, fine,
~~Agonistic Normudalts,~~

Series	Distribution	Element	Committee Recommendation	Distinguishing Characteristics
Caylor	GV	Normadulfs, fine , mixed, thermic	Humic Normadulfs, fine loamy, siliceous, mesic	Argilllic in hues redder than 7.5 YR. mesic equivalent of Flowah. Base saturation less than 35% - about 15.
Christian	GV, HR, CB, OH	Normadulfs, clayey nitic, thermic	Humic Typic Lepidodulfs, clayey, Kalinitic, thermic	Argilllic in hues redder than 7.5 Yr. In major part and ranges from 45 to 65% in clay content. Base saturation below 35% - about 20 percent. Very few coarse fragments.
Claborne	GV	Normadulfs, fine , mixed thermic	Alfic Typic Normadulfs, fine loamy, siliceous, hard, mesic	Argilllic horizon in hues of 5 YR and redder in major part. Base saturation about 15 percent; low sand content; moderate amount of chert gravel; clay content of argilllic 25 to 37%. W R
Clarkville	GV, OH	Normadulfs, loamy cal, siliceous, lc	Alfic Typic Normadulfs, fine loamy, siliceous, thermic loamy skeletal, siliceous, mesic	
Colbert	GV, CB	Normadulfs, clayey ing, mesic, thin	Vertic Normadulfs, fine Alto-Normadulfs clayey, Mont, thermic	Argilllic in hues of 7.5 YR and yellower; about 60% clay content; PH above 5.5 in sub-horizon above limestone bedrock.

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Conasauga	GV	Alfic Normudults, clayey, expanding, mesic, thin;	Vertic Normudults, fine, Alfic Normudults, clayey, mixed, thermic	Argillic in hues of 7.5 YR and yellower; about 50 to 65% clay; PH above 5.5 in lower part of argillic above partly decomposed shale rock.
Crider	HR, OH	Alfic Normudults, fine silty, siliceous, thermic;	Same Alfic Normudults, fine silty, mixed, mesic	Upper 15 inches or more of argillic in hues yellower than 5 YR, value 4, Chroma 4. Lower part of argillic in hues redder than 7.5 YR. Base saturation about 35%.
Culleoka	CB	Alfic Normudults, fine silty, mixed, mesic	Alfic Normudults, fine loamy, mixed mesic-thermic	Phosphatic. Argillic 20 to 30 inches thick; hues of 7.5 YR and yellower.
Cumberland	GV, HR, CB, OH	Typic Rhodudults, clayey, Kaolinitic, thermic	Same Typic Rhodudults, clayey, Kaolinitic, mesic	In a completely satisfactory way has been found to separate this series from Decatur. Perhaps Cumberland should be dropped.
Dandridge	GV	Ruptic Alfic Lithic Eutrochrepts, clayey skeletal, mixed-calcareous, mesic	Same	Thin intermittent B horizon. Does not seem to conflict with other known series.
Decatur	GV, HR, CB, OH	Typic Rhodudults, clayey Kaolinitic, thermic	Same	Argillic in hues redder than 5 YR and values less than 4. Clay content of argillic 40 to 50%. Base-saturation generally less than 20 percent.

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Series	Distribution	1964 Placement	Committee Recommendation
Dekoven	GV, CB, HR, OH	Typic Haplaquolls, fine silty, mired mesic	Typic
Dellrose	CB	Humic Normudults, fine silty mixed, thermic	
Dewey	GV, HR, CB, OH	Typic Normudults, clayey, Kaolinitic, thermic	Same
Dickson	HR, OH	Ochreptic Fragiudults, fine silty, mixed thermic	
Donerail	CB	Humic paraquic Normudults, clayey mixed-phosphatic, mesic	
Dowellton	CB, HR, GV, OH	Typic Ochraqualfs, clayey, Mont. thermic	Same Vertic Ochraqualfs fine, Mont., thermic

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Dunmore	GV	Typic Normudults, clayey, Kaolinitic mesic	Same Typic Leptudults, clayey, Kaolinitic, mesic	Thick Argillic in hues of 5 YR and redder in major part; clay content 50 to 75%; base saturation below 35% - about 10 to 15.
Dunning	W	Typic Haplaquolls, fine, mixed, mesic (Mont.) (Vertic?)	Same	Mesic equivalent of Roellen.
Egan	GV, CB, HR, OH	Cumulic Hapludolls, fine silty, mixed thermic	Aquic Cumulic Fluventic Hapludolls, fine, mixed, thermic	Mollic epipedon has chroma of less than 2, in lower part; low chroma mottles within 6 inches of lower boundary of <input type="checkbox"/> ollic; clay content of control section averages about 42 percent.
Elk	W	Alfic Normudults, fine silty, mixed, mesic	Humic Alfic Normudults, fine loamy, mixed, mesic	Argillic horizon in hues of 7.5 YR and yellower; clay content of control section 25 to 35 percent; Minimum sand content for fine
Emory	GV, OH	Cumulic Dystrochrepts, fine silty siliceous, thermic	Umbric Dystrochrepts, fine loamy, mixed, thermic (Cumulic?)	Thick Cambic horizon in hues of 7.5 YR and redder; base saturation less than 35% - about 10-x); darker colored epipedon than Greendale.

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Series	Distribution	1964 Placement	Committee Recommendation
Enders	OH	Typic Normudults, clayey, kaolinitic, thermic	Same Typic Leptudults, Clayey, mixed, thermic
Ennis	GV, HR, OH	Cumulic	Fluventic Dystrochrept Typic Udalents acid, fine loamy. thermic
Etowah	GV, HR, OH, CB		Humic Normudults, thermic
Farragut	W		Humic Normudults, thermic
Frederick	W		Same Typic Normudults (Altic?), clayey, mixed mesic
Fullerton	GV, OH		Same

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Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Godwin	CB	Cumalic Hapludolls, fine silty, mixed thermic	Cumalic Haplaquolls, fine, mixed, thermic	Phosphatic; upper half of mollie has chromas of 2 and 3, lower half has chromas of less than 2; upper 10-15 inches of profile 1 _g recent overwash on a black poorly drained soil.
Orendale	OV, HR, OH	Cumalic Dyastrochrepts, fine silty, siliceous, thermic	<i>Fluventic</i> Alentive Dyastrochrepts, fine loamy, siliceous, thermic Mesic	Thick cambic horizon in hues of 7.5 YR and yellower; 20 to 30% clay content; base saturation below 35 - about 10-15%.
Oulu	HR, OH	Typic Dyastrochrepts, sandy skeletal, siliceous, thermic	Some Typic Dyastrochrepts, loamy skeletal, siliceous, thermic	Base saturation below 35%, ranges down to about 10%.
Outburle	HR, OH, OV	Typic Fraglaquolls, fine silty, mixed, thermic	Typic Fraglaquolls, fine silty, siliceous, thermic	
Hamblen	OV, OH, HR	Aquic Cumalic Haplorhents, fine silty, mixed, non-acid thermic	<i>Fluventic</i> Aquic Alentive Dyastrochrepts, fine loamy, siliceous, non-acid, thermic	Bottles with chromas of 2 or less within 20 inches of surface; pH ranges from 5.5 to 6.5.
Hampshire	CB	Typic Moxmudolls, fine illitic, thermic	Typic Moxmudolls <i>Leptudolls</i> Typic Moxmudolls, clayey, mixed, thermic	Argillie horizon 15 to 30 inches thick in hues of 7.5 YR and yellower; 40-55% clay content; base saturation below 35, between 15 and 34; phosphatic.

Series				Distinguishing
Hayter				2
				1
HR, GV, OH			humic normants <i>Leptoduits,</i> humic normants fine loamy,	2

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Series	Distributio	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Jefferson	W	Typic Normudolfs, fine loamy, mixed, mesic	Typic Normudults, fine loamy, <i>mesic</i> siliceous, thermic	Thick argillic horizon in hues of 7.5YR and yellower; lov base saturation, less than 20 percent; more than 25% sand content in control section.
Landisburg	W	ochreptic Fragiudults, fin silty, siliceous, mesic	<i>N.C.</i>	
Lanton	GV,HR, CB,OH	Typic Haplaquolls, fine silty, mixed thermic	<i>Fluventic</i> Umbric Haplaquolls, fine silty, mixed, thermic (<i>causatic?</i>)	Mollic epipedon 24 to 30 in. thick. <i>92</i>
Lawrence	W	Aqueptic Fragiudults, fine silty mixed, mesic	<i>N.C.</i>	
Lax	HR,OH	Typic Fragiudults, fine silty, mixed, thermic	Typic Fragiudults, fine silty over loamy skeletal, sili- ceous, thermic (<i>Ochreptic?</i>)	Needs study, may be ochreptic.
Leadvale	W	Ochreptic Fragiudults, fine silty, mixed, thensic	Ochreptic Fragiudults, fine silty, siliceous thermic	fragipan underlain by leache or calcareous shale.

Series	Distributor			
Lee	HR, OH			
Lehew	GV		Some <u>Typic Dystrochrepts</u> , coarse loamy, siliceous, mesic (thermic?)	
Lindsay	W		N.C.	
Litz	W		<u>Leptochrepts</u> Entic Horrochrepts , fine silty clayey, mixed, mesic, thin	
Lobelville	GV, HR, OH		Fluventic	
Maury	CB			

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Series	Distribution	1964 Placement	Committee Recommendation	
Melvin	GV, HR, OH, CB	Cumulic Normaquepts, fine silty, mixed, non-acid, thermic	Alentio <i>Fluventic</i> Alentio Normaquepts, fine silty, mixed, non-acid, thermic	Minerology and Melvin siliceous. <i>has higher percentage of sand.</i>
Mimosa	CB	Mollic Normudolfs, fine, illitic, thermic		
Minvale	GV, HR, OH	Typic Normudults, fine silty,		
Monogahela	GV			
Montevallo	GV			
Mountview	HR, OH			

Series	Distribution	1964 Placement	Committee Recommendation	Distinguishing Characteristics
Needmore	GV	Typic Normudults, clayey mixed, thermic	Alfic Normudults, clayey, mixed, mesic	Argillic horizon 15 to 30 ins. thick in hues 7.5 YR and yellower; underlain by calcareous shale. PH above 5.5 at 50 ins. below top of argillic.
Neubert	GV	Cumulic Dystrachrepts, fine loamy, mixed, thermic	<i>Typic Udipludents</i> Cambic udiments, fine loamy, siliceous, thermic	No diagnostic horizon except plow layer; hues of 7.5 YR and redder; PH 5.0-5.5.
Newark	GV, HR OH, CB	Aeric cumulic Normaquepts, fine silty, mixed, Non-acid, thermic	<i>Fluventic</i> Aeric Aleutic Normaquepts, fine silty, mixed, non-acid, thermic	PH 5.5 - 6.5. May conflict with Commerce.
Nixa	GV, HR, OH	Ochreptic Fragiudults, fine silty, siliceous, thermic	Ochreptic Fragiudults, fine loamy, siliceous, thermic loamy skeletal, siliceous, mesic	Bisequel profile; chert fragments or gravel qualifies the series for fine loamy.
Nolichucky	GV, HR, OH	Typic Fragiudults, fine loamy, mixed, mesic	<i>Normudults</i> Typic Fragiudults, fine loamy, mesic siliceous, thermic	Thick argillic in hues redder than 7.5 YR in major part; low base saturation. 5-15%; high sand content.
Ochlockonee	HR, ?	Cumulic Haplorthents, coarse loamy, siliceous, acid, thermic	<i>Fluventic Dystrachrepts, Coars</i> Typic udiments, fine loamy, siliceous, thermic	High sand content; PH 4.5-5.5; questionable whether Cambic is present.

5
7

Series	1964 Placement		
Pembroke			
Pickwick			
Saffell		Same	- -
Sango		<i>Fragindults</i> Aqueptic Fragindults, coarse silty, silicec	-----
		<i>Mollic Normudults</i> Humic Normudults,	
		<i>Entic Leptudults</i> Typic Normudults,	

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Series	Distribution	1964 Placement	Committee Recommendation
Staser	GV, HR, OH	Entic Hapludolls, fine silty, mixed, thermic	<i>Fluventic</i> Cumultic Hapludolls, fine loamy, mixed thermic (Cumultic <i>Fluventic</i>)
State	GV	Alfic Normudults, fine loamy siliceous, mesic	<i>N.C.</i>
Taft	GV, HR, OH, CB	Aqueptic Fragiudults, fine silty, mixed, thermic	
Talbott	GV, CB	Typic Normudults, clayey, mixed, thermic	<i>Typic Normudults, fine, mixed, thermic</i>
Tellico	GV	Typic Rhodudults, clayey, oxidic, thermic	
Waynesboro	GV, HR, OH, CB	Typic Normudults, Clayey, kaolinitic, thermic	
Whitwell	GV, HR, OH	Paraquic Nonuudults, fine Loamy, siliceous, thermic	

COMMITTEE D - Subgroups of Haplustalfs needed in Texas

Haplustalfs

Typic Haplustalfs. Haplustalfs that--

Statements b, c, d, e, and h from 1964 supplement, plus

- i. are usually moist, but are dry in some part of the upper 1.5 meters (60 inches) for more than 135 days (cumulative) in most years.
- j. have argillic horizons with less than 35 percent clay in the upper half and lack clear or abrupt textural changes between the A and B horizons.

Calcicustollic Haplustalfs. Haplustalfs like the Typic except for d and h.

Amarillo

Mollic Haplustalfs. Haplustalfs like the Typic except for d.

Cobb

Mollic Petrocalcic Haplustalfs. Haplustalfs like the Typic except for d and h with petrocalcic.

Arvana

Petrocalcic Haplustalfs. Haplustalfs like the Typic except for h with petrocalcic.

Delmita

Lithic Udic Haplustalfs. Haplustalfs like the Typic except for e and i.

Exray

Udolic Haplustalfs. Haplustalfs like the Typic except for d and i.

May or
Bastrop

Aquic Haplustalfs. Haplustalfs like the Typic except for c and i.

Vashti

Udultic Haplustalfs. Haplustalfs like the Typic except for b and i.

Bonti

Udollic Nimic Haplustalfs. Haplustalfs like the Typic except for d, i, and j.

Bexar or
Lindy

Mollic Nimic Haplustalfs. Haplustalfs like the Typic except for d and j.

Orelia

Udic Haplustalfs. Haplustalfs like the Typic except for i.

Moisture Breaks • Guides

1. Usually moist in some part of the upper 60 inches of the soil but are dry in some part for less than 90 days (cumulative) in most years.

8. This is east of P. E. 64 $\frac{1}{4}$.

b. All Udic great groups are east of P. E. 64 $\frac{1}{4}$.

(1) Udolls

(2) Udalfs

(3) Udifluvents

(4) Uderts

(5) Udipsanments

(6) Also Ultisols, Dystrochrepts, and Eutrochrepts.

c. This boundary also approximates the boundary between the Land Resource regions of M, Central Feed Grains and Livestock Region, N. East and Central General Farming and Forest Region; and P, South Atlantic and Gulf Slope Cash Crop, Forest, and Livestock Region, which are east of P. E. 64 $\frac{1}{4}$; and the H, Central Great Plains Winter Wheat and Range Region; and J, Southwestern Prairies, Cotton and Forage Region, which are west of P. E. 64 $\frac{1}{4}$.

2. All Udic subgroups of Ustic great groups are east of P. E. 44 $\frac{1}{4}$, excepting Fluvents and Fluvic or Fluventic soils, which are east of P. E. 33 $\frac{1}{4}$. Usually moist in some part of the upper 60 inches of the soil but are dry in some part for 90 to 135 days (cumulative) in most years.

a. Udic subgroups of Ustolls, Ustalfs, Uscerts, Ustipsanments, and also Ustrochrepts. P. E. 44 $\frac{1}{4}$ - 64 $\frac{1}{4}$.

b. Udic subgroups of Ustifluvents and Fluventic Udic or Fluvic Udic subgroups. P. E. 33

4. Torri. Usually dry.
5. Recommend that definitions of moisture statements for Udolls and Xeralfs be made consistent with Udalfs and Xerods, respectively. Udolls are defined as 60 consecutive days and Xeralfs as 90 days (cumulative).
6. Recommend that another name be selected to replace Pale that connotes thick rather than old. Pach was suggested.

H. T. Otsuki, Chairman
W. Fuchs
J. Culver
W. B. McKinzie

COMMITTEE E.

Gordon McKee, Chairman
H. C. **Dean**, Texas
R. C. Carter
D. F. **Slusher**
E. H. **Templin**
J. Nichols
Luis Rivera

We recommend that the following Vertic subgroups be recognized for use in the Southern States:

Rendollie Vertic Entrochrepts	(Dexter)
Fluventic Vertic Normaquepts	(Alligator)
Aeric Fluventic Vertic Normaquepts	(Houlka)
Aquic Fluventic Vertic Entrochrepts	(Hosbuck)
tbtollo Vertic Camborthids	(Hargus)
Neptic Vertic Calcicustolls	(Kilgus)
Petrocalcic Vertic Calcicustolls	(Valera)
Stagnic Vertic Camborthids	(Trinity)
	(Miller)
	(Maynes)
	(Denton)
	(Miller)
	(Ellis)

The definition of each proposed subgroup is based on the statement, "like the Typic except for" The following statement is added to each Typic subgroup:

() Lack in all horizons below the surface down to a lithic or paralithic contact or to a calcic horizon that must be deeper than 20 inches or to one meter whichever is shallower, more than 35 percent clay and more than 30 milliequivalents exchange capacity per 100 gms. of soil and one or more of the following characteristics:

1. Having at some season, if not irrigated, cracks 1 to 25 cm. wide that reach to a depth of 20," or
2. A coefficient of maximum potential extensibility of .08 or more (coefficient of swelling may be used when values have available).

In addition the Udic subgroup is proposed for Ustolls and Ustalfs where
(10 inches) for more than 90 consecutive days during most years."

Torreria (only one group is recognized).

Typic Torrerie. Torrerie that --

Dalby

- a. have moist chromas of 2.5 or more throughout the upper 30 cm. (12 inches);
- b. have surface color value that is more than 3.5 when moist, or the horizon that is darker than this is less than 30 cm. (12") thick;
- c. have less than 15 percent M saturation in all horizons throughout the profile to a depth of 75 cm. (30 inches).

Aquic Ferreris. Ferreris like the Type except g.

Matrix Ferreris. Ferreris like the Type except g.

Silverton

Utic Ferreris. Ferreris like the Type except h.

Verbalton

Utic.

Pelludertis.

Type Pelludertis. Pelludertis that --

Hollywood

- a. have to a depth of more than 75 cm. (30 inches) in ^{12"} more than 50 percent of the pedon moist values of 3.5 or less (5 when dry);
- b. have a matrix with chromas less than 1.5 throughout the upper 75 cm. (30 inches);
- c. have loose porous surface mulch and lack fragments of a platy or massive crust;

the upper 30 cm. (12 inches).

^{Chromic}
Acric Pelludertis. Pelludertis like the Type except for h.

Houston (of Alabama & Mississippi)

Neoraquollis Pelludertis. Pelludertis like the Type except for g.

Musquallis Pelludertis. Pelludertis like the Type except for g, e, and q, and have base saturation above 35 percent in some part of the control section.

Beaumont
Dumas

Utic Pelludertis. Pelludertis like the Type except for g.

~~Beaumont~~ ⁽¹¹¹¹⁷⁾

Chromidertis.

Type Chromidertis. Chromidertis that --

- a. have to a depth of more than 75 cm. (30 inches) in more than 50 percent of pedon moist values of 3.5 or less (5 when dry);

- b. lack distinct to prominent mottles within 40 cm. (20 inches) of the soil surface;
- c. have a loose porous surface muck and lack fragments of a platy or massive crust;
- d. have pH values (1:1 in water) of 5.5 or more throughout the upper 30 cm. (12 inches).

Typic Chromuderts. Chromuderts like the Typic except for g.

Mangrove Chromuderts. Chromuderts like the Typic except for g, h, i, and j and have base saturation greater than 35 percent in some part of the control section.

Chilbehn

Vertis.

Follisterts.

Typic Follisterts. Follisterts that --

- a. have color values of 3.5 or less when moist and 5 or less when dry to a depth of 30 cm. (12 inches);

- b. have a maximum of less than 1% throughout the control section;

- c. have a maximum of less than 1% throughout the control section;

disorder; lack a platy or massive surface crust contains

- d. have less than 15 percent saturation with sodium in all horizons to 75 cm. (30 inches);

- e. have cracks that remain open less than a total of 150 days per year.

Chromic

Typic Follisterts. Follisterts like Typic except for h.

Houston of Texas

Chromic

Typic Typic Follisterts. Follisterts like the Typic except for g and h.

Ferris

Typic Ferris Follisterts. Follisterts like the Typic except for g and h.

Lipan

Basic Fallusteris. Fallusteris like the Type except for g.

Burleson

Matrix Torris Fallusteris. Fallusteris like the Type except for g and g.

Victoria

Matrentis Torris Fallusteris. Fallusteris like the Type except for g, g, and g.

Montell

Torris Fallusteris. Fallusteris like the Type except for g.

Roscoe

Basic Matrix Torris Fallusteris. Fallusteris like the Type except for g, g, and g.

Banquete

Characteris.

Typic Characteris. Characteris that --

Tobosa

- a. have color values of 3.5 or less when moist and 5 or less when dry to a depth of 30 cm. (12 inches);
- b. have less than 15 percent saturation with sodium in all horizons to 75 cm. (30 inches);
- c. have a loose, porous surface which consisting of discrete, very hard aggregates dominantly less than 5 mm. in diameter; lack a platy or massive surface crust containing uncoated silt or sand grains that persists after drying; and lack fragments of a platy or massive crust in an Ap horizon;
- d. have cracks that remain open more than a total of 150 days per year.

Basic Characteris. Characteris like the Type except for g.

Marine Chromasters. Chromasters like the Type except for a and b.

Viboras

Udic Chromasters. Chromasters like the Type except for d and cracks remain open from 90 to 150 days.

Basic Intrastalfic Chromasters. Chromasters like the Type except for e and f.

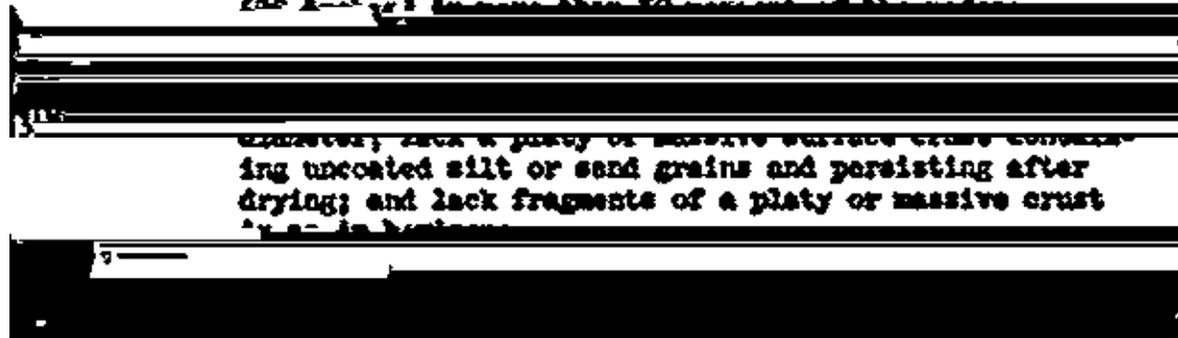
Fs' (of Puerto Rico)

Xererts.

Pellaxererts.

Type Pellaxererts. Pellaxererts that --

- a. have color values of 3.5 or less when moist and 5 or less when dry to a depth of 30 cm. (12 inches);
- b. have chromas of 1.5 or less throughout the upper 75 cm.



character; lack a platy or massive surface crust containing uncoated silt or sand grains and persisting after drying; and lack fragments of a platy or massive crust

Chromic

Aerie Pellaxererts. Pellaxererts like the Type except for b.

Ertic Pellaxererts. Pellaxererts like the Type except for a.

Chromoxererts.

Type Chromoxererts. Chromoxererts that --

- a. have color values of 3.5 or less when moist and 5 or less when dry to a depth of 30 cm. (12 inches);

- b. have less than 15 percent saturation with sodium in all horizons to 75 cm. (30 inches);
- c. have a loose, porous surface mulch consisting of discrete, very hard aggregates dominantly less than 5 mm. in diameter; lack a platy or massive surface crust containing uncoated silt or sand grains that persists after drying; and lack fragments of a platy or massive crust in an Ap horizon.

COMMITTEE F - Ultisols and Inceptisols

General Rules --

1. Divisions on depth to bedrock. The Lithic subgroups plus proposed separation of **Normudults** and Tenudults on **thickness of solum will** make the separations on depth to bedrock which we desire.
2. The report on classification of certain soils **from** sandstone and shale sets up limits for soils on depth to rock which straddles **certain** provisions of classification in the system. The Committee recommends this report be revised to bring it in **line** with the classification system.
4. The **Fluvic** soils were not considered as **Committee III** in making the placement recommendations, and **all** members of Committee F **are** on Committee III.

O. R. Carter, Chairman
C. B. Breinig
William H. Bender

Series	Comm. Dec Recommendation	35 Classification 10-1-69	Other Classifications (if different from 35)
Adler (Team)	Typic Normadell, fine loamy siliceous, mesic	Typic Normadell, clayey, kaolinitic, thermic	Team: fine loamy, siliceous, mesic NE: fine loamy, mixed, thermic
Opinion (Team)	Typic Humudult, fine silty siliceous, thermic	Typic Normadell, fine silty, siliceous, thermic	NE: fine silty, mixed, thermic
Peterson (ark)	reassign to Committee III	Entic Normadegult, fine silty, mixed, acid, mesic	NE: fine loamy, mixed, acid, thermic NE: fine loamy, mixed, acid, mesic
Blago (Ark)	not used if Samba approved	NC	NE: Typic Argudugults, fine, mixed, mesic NE: Typic Umbrogults, clayey, mixed, mesic
Paine (Ark)	close competitor with one series	Typic Argudugult, fine loamy, mixed, thermic	
Case (ark)	reassign to Casaville III	Entic Hapludult, fine loamy, siliceous, acid, thermic	
Blora (Ark)	reassign to Committee III	NC	Entic Hapludell, coarse loamy siliceous, thermic? (Proposed Okla. reactivation)
Conroy (ark)	Argic Normadull, fine silty, mixed, thermic	Argic Normadull, fine silty, mixed, thermic	
Casaville (Team)	Entic Argudugult, fine loamy, siliceous, mesic	Typic Argudugult, fine loamy, siliceous, st mesic	Team: entic Argudugults NE: Argic Normadull, coarse loamy, siliceous, mesic
* Haskoping (ark)	see proposal, if approved		Proposed: Typic Argudugult, fine silty, mixed, thermic
Easter (ark)	Typic Humudult, clayey, mixed, thermic	Typic Normadell, clayey, kaolinitic, thermic	NE: clayey, mixed, thermic

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Series	Reclassification	SS Classification	Other classifications
✓ Fayetteville (Ark)	under study, as proposed classic type typic Rhododactyls, fine loamy, micaceous, thermic	?	
Flannerville (Ola)	typic Rhododactyls, fine loamy, micaceous, thermic	typic Rhododactyls, fine loamy, micaceous, thermic	
Marshall (Ola)	typic sandshalt, fine loamy micaceous, thermic	typic Normandshalt, fine loamy, micaceous, thermic	
Hector (Ark)	shaly Dystrudshalt, loamy, siliceous, thermic	NC	Ark: shaly Dystrudshalt, loamy, siliceous, thermic
Heblia (Tenn)	typic sandshalt, fine loamy, siliceous, thermic	NC	Tenn: typic Normandshalt, fine loamy, siliceous, thermic NE: typic Normandshalt, fine silt, micaceous, thermic
Johnsburg (Ind)	NC or some NE classification	agentic fragindshalt, fine silt, micaceous, thermic	NE: typic fragindshalt, fine silt, micaceous, thermic
Jefferson (Ky)	typic sandshalt, coarse loamy, siliceous, mesic	typic Normandshalt, fine loamy, micaceous, mesic	Tenn: fine loamy, siliceous, mesic NE: thermic
Paducah (Tenn)	typic fragindshalt, fine silt, siliceous, thermic	agentic fragindshalt, fine silt, micaceous, thermic	Tenn: typic fragindshalt, fine silt, siliceous, thermic
Quincy (Ark)	typic sandshalt, fine loamy micaceous, thermic	typic Normandshalt, fine loamy, micaceous, thermic	
Quincy (Ola)	agentic fragindshalt, fine loamy, siliceous, thermic	agentic fragindshalt, fine loamy, siliceous, thermic	
Monongahela (W Va)	agentic fragindshalt, fine loamy, siliceous, thermic	agentic fragindshalt, fine loamy, siliceous, thermic	NE: typic fragindshalt, fine silt, micaceous, mesic
Monterey (Ola)	typic Dystrudshalt, loamy, shaly, siliceous, thermic	typic Dystrudshalt, loamy shaly, siliceous, thermic	MW: micaceous NE: shaly Dystrudshalt, loamy shaly, micaceous, thermic

Terms	Recommendation	SS Classification	Other Classification
* Interstitial (alk)	As proposed, if advice approved		Proposed: Allic Apatostaphylos leamy, silicious, thernic
* Phlox (alk)	As proposed, if advice approved		Proposed: Type Normalis, fine leamy, mixed, thernic
Phlox (Klg)	Reassign to Committee III	Alpic Simulic Apatostaphylos, fine leamy, silicious, acid, mevic	ME: mixed, acid, thernic NE: Same leamy, mixed, acid, mevic
Pop (alk)	Reassign to Committee III	Simulic Apatostaphylos, fine leamy, silicious, acid, thernic	ME: Same leamy, silicious, acid, thernic NE: Same leamy, silicious, acid, mevic
Pussy (alk)	Type Fragragulles, fine silly, mixed, mevic	NC	ME: Type Fragragulles, fine silly, mixed, mevic NE: Same
Ranunc (n. laro)	Allic Apatostaphylos, leamy, silicious, mevic	Allic Apatostaphylos, leamy, silicious, mevic	
Ranunc (Klg)	Type Simulic, clayey, mixed, mevic	Type Normalis, clayey, mixed, thernic	NE: mevic
* Ragwort (alk)	As proposed, if advice approved		Proposed: Wallie Normalis, fine leamy, mixed, thernic, mevic
* Sambac (alk)	As proposed, if advice approved		Proposed: Type Apatostaphylos, fine mixed, thernic
* Squatic (flam)	Thernic Normalis	Allic Normalis, fine leamy, silicious, thernic	Thernic: Allic thernic Normalis Same leamy, silicious, thernic
Stardal (n. l)	Reassign to Committee III	Alpic Simulic Normalis, fine leamy, silicious, acid, mevic	
Type (alk)	Not classified	NC	ME: Type Fragragulles, fine silly, mixed, mevic

Committer F.

Seeds

Marysville (Ann)

Wilder (Ohio)

Wheatville (Tram)

Seymour

Stelacta

Delaware

Mechanisms

Burke

Deholl

July