Ohio Pedologist Newsletter
Vol. 4, No. 3 - October 1978
George Hall - Editor

Attendance at the summer picnic at Fort Ancient indicates that the Association of Ohio Pedologists is alive and well. Large quantities of pop were drunk and everyone had a good fellowship period. Since there will be no Soil Scientist's Workshop this year, all of you should plan to attend the annual meeting in January held at noon following the SCSA meeting.

Executive Committee Meeting, July 22, 1978 - Bob Parkinson

Meetings called to order by Pres. Marvin Bureau at Ft. Ancient State Park. The minutes of the last meeting were read, and the treasurer's report was given showing a balance of $1,276.59.

Margaret Cashell's application for AOP student membership was accepted, and Dennis Halloran's application for a change from Affiliate to Pedologist status was accepted.

Jon Gerken has accepted to temporarily chair the Certification Committee whose task will be to identify pro-certification members of AOP to serve on this committee during calendar year 1979. Anyone interested in this committee should contact Jon.

Forty eight people attended the AOP Summer Picnic at Ft. Ancient.

I have moved from Columbus. My new address: B. Parkinson, 200 Coshocton Avenue, Mt. Vernon, Ohio 43050. Phone (614) 392-6455

News of Members, Former Members and Friends

Jim Bauder elected vice president and program chairman of the Northern Ohio Geological Society.

In mid-June, Randy Beeson accepted a new position with Williams Brothers Engineering Company, 6600 South Yale Avenue, Tulsa, Oklahoma.

After graduating from OSU in June, Jeff Bilkert accepted a position mapping in northern Minnesota. Excerpts from one of his letters:

"Itasca County is sure different than Ohio. It's 1.7 million acres in area and about 95% of that is forested. We use a lot of old logging trails for access into most areas and rely heavily on stereoscopes for line drawing. We also have two Cushman Tractstors, a dune buggy type thing that runs on a rubber track, and a beefed-up mini bike to help us go where the truck can't. Needless to say, those are a lot of fun. The scenery and lakes are also super.

Although I haven't come face-to-face with a bear, I've seen a few from the truck as well as many deer. If the mosquitoes don't carry me away, I fully expect to survive my stay in northern Minnesota. So far everything has been going great and I don't know if I'd ever want to map in farmland again. The woods are too much fun".

(This was written shortly after he started working).

News from SCS State Office

The Portage County Soil Survey was received in Ohio in August. Portage County is the 35th modern USDA Soil Survey published in Ohio. Information and distribution meetings are being planned.

Melanie Carrel (formerly Melanie Gates) reported to Perry County for work on August 14, 1978.

Ron Scherzinger - also newly married - reported to Wooster as a member of the Wayne County soil survey party on August 14, 1978.

The Madison County final field review and field correlation was held during the week of August 14. The Madison field party completed their work in September and moved to Logan County.

Joe Stieger made a presentation, "Soils of the Prairie in Ohio" during the poster session of the North Central Prairie Conference in Columbus, August 12-17, 1978.

The Auglaize County final field review and field correlation was held the week of September 11.

The Sandusky County initial field review was held the week of September 18. Rod Harner, from MTSC soil staff, participated in the review.

Norbert Lerch's wife, Louella, was injured in an accident at work on August Even though the injuries were many and serious, things could have been worse.

OSU Ivy Towers

Fall quarter is in full swing and class rooms are bursting at their seams. OSU has a little over 51,000 enrolled at the Columbus campus. The Agronomy Department has about 210 undergraduates and about 60 graduate students signed in for the Autumn.

Figures put out by the North Central Region for the calendar year 1977 show that there were 1,523 B. S. degrees in Plant and Soil Sciences (includes Horticul as well as Agronomy) awarded in the Region. Ohio produced 254 of these. This was surpassed only by Minnesota which awarded 275. Plant and Soil Sciences is the largest group of Agricultural graduates in the Region with 24% of ag graduates followed by Animal Science with 21%.

Nick Holowaychuk has been mapping soils with a group from the University of Alberta. The mapping is around fire towers in the Canadian Rockies. They are in a forested area with complex geology and slopes up to 70%. One week they lived in tents. He mentioned that he was pretty tired when he got in on the wee ends - wonder why!

Two new faculty appointments. Dr. Grant Jordan has joined the faculty in t weed science area. He is from Michigan State. Dr. Don Eckert, recent Ph.D. graduate with Dr. McLean, is working on a crop energy position in research and extension. Don is located at OARDC - Wooster.

Comments on "Soil Survey Under Pressure: The Maryland Experience - Jim Bauder

Comments relating to "Soil Survey under pressure: The Maryland experience" in "Journal of Soil & Water Conservation", May-June, 1978, by Dr. Fred P. Miller. The question proposed by Dr. Miller as to who is responsible for the "gray zone" between the column and underlying geologic strata is very important.

I feel the evaluation responsibility lies with a multi-disciplinary team. The team must have both pedologic (soils) and geologic expertise - - - whether the team is made up of several people or an individual. Conditions which might seem of limited importance to one discipline might be very important to another field of study.

The multi-disciplinary approach is necessary to allow each field of expertise to characterize the conditions present and to consider alternatives if needed. The summation of the diverse characterizations and potential alternatives enables the most careful evaluation for the client.

My experience in such evaluation procedures enables the different professionals to realize that they are all looking at the same materials, but with somewhat different interests and backgrounds. Once this condition is realized, improved communications, confidence and mutual respect will develop.

Correlation of Indian Artifacts to Soils - Bob Parkinson

While conducting routine soil mapping transects during my assignment in Crawford County, Ohio, random artifact finds were correlated to the soil series and soil map units in which they were found.

Acreage measurements for the respective soil maps were used to obtain the total number of acres mapped of given map units.

The Acre/Artifact ratio was calculated by dividing the total number of acres of the map unit by the total number of artifacts found while mapping that given map unit. This provided an index of the number of acres of a map unit that would be mapped before randomly finding an artifact. Assuming prehistoric land use is directly proportional to the amount of artifacts left on the land, this index may provide some inference about prehistoric land use.

After calculating this ratio for individual map units and then combining them into ratios for both drainage class and slope class, an inverse relationship of exponential porportions was noted between drainage class and slope class and the ratio.

Basically, the data indicate the chances for finding artifacts on well drained or sloping land is about 10 times greater than for finding them on poorly drained or depressional land. If the starting assumption holds any validity, the data could indicate and help quantify preferential use of some types of soil by prehistoric man (e.g. 7% of the total area mapped may have been "used" almost 10 times more intensively than was 21% of the area).

While not without its weaknesses or limitations, the acre/artifact index is an interesting and objective supplement to the generality that "Indians took to high ground". Like wildflowers, trees, prairie remnants and wildlife, the acre/artifact ratio can be an interesting side line to the soil surveyor - one that won't hurt your mapping rate if you keep the artifact finds random!

Table 1

Prehistoric Land Use As Inferred Through Random Artifact Finds on Till or Lacustrine Plains' Crawford County, Ohio

Map Unit	Series	# artifacts	acres	ac/art.	classification
AdB	Alexandria	1	147	147	Typic Hapludalf
AdC2	"	4	326	82	" "
BeC2	Belmore	1	73	73	" "
Bg	Bennington	2	2804	1402	Aeric Ochraqualf
BgB	"	12	4172	348	" "
Bo	Blount	3	1275	425	" "
BoB	"	3	1832	610	" "
CdB2	Cardington	7	3598	514	Aquic Hapludalf
CdC2	"	2	1271	635	" "
Co	Colwood	2	213	106	Typic Haplaquoll
De	Delrey	1	70	70	Aeric Ochraqualf
Dm	Digby	1	157	157	" "
LzB	Lykens	4	325	81	Aquic Hapludalf
MrB2	Glynwood	1	1157	1157	" "
Pm	Pewamo	1	5259	5259	Typic Argiaquoll
Tr	Tiro	1	1791	1791	Aeric Ochraqualf
TrB	"	4	578	144	" "
XaB	Tuscola - Cardington Complex	1	100	100	Aquic Hapludalf
		55	25,148		

' figures include end morainic, ground morainic and lake plain topography (preclude outwash terrace)

Table 2

Slope	Ac/Art.	% total area
1. depressional	1824	21
2. nearly level	762	25
3. gently sloping	361	47
4. mod. sloping	238	07

Publications

Here are a couple of publications some of you might be interested in knowing about. They are from the Pittsburgh Geological Society, P. O. Box 3432, Pittsburgh, Pa. 15230. Note that the Guidebook is relatively old.

"LOTS" OF DANGER - - Property Buyers Guide to land hazards of southwestern Pennsylvania. Edited by Jane L. Freedman.
Published in 1977. 85 pages. Illustrated----------$3.85
Written in nontechnical language, includes problems of mine subsidence, foundation performance, ground-water supply, floodplains and flooding, disposal of domestic wastes, landsliding, and earthquakes. Identifies sources of additional information, advice, and assistance

FIELD GUIDEBOOK OF APPALACHIAN GEOLOGY - - Pittsburgh to New York. Prepared under the general chairmanship of Norman K. Flint, in conjunction with the annual meeting of the American Association of Petroleum Geologists.
Published in 1955. 119 pages. Illustrated----------$3.00
A detailed 2-day geological itinerary with 11 stops along the general route Pittsburgh-Everett-Harrisburg-Hamburg-Easton (Pennsylvania) - Netcong-Paterson (New Jersey)-New York City.

CORRELATION OF RESULTS OF THREE TECHNIQUES FOR DELINEATING FLOOD PRONE AREAS

James R. Bauder and Randal J. Beeson

INTRODUCTION

Flood plain boundaries are usually delineated by civil engineering methods. While the accuracy of these methods is recognized, cost of the study may, in some cases, be prohibitive. Detailed soil maps have, at times, also been used for delineating flood boundaries, although it is generally conceded that the soil maps are not as accurate.

We have previously described a third methodology for use in those areas where engineering studies have not yet been done or where cost of such studies prohibitive (Soil Survey Horizons, Spring 1976). The interpretative method is based on soils, geology, hydrology, topography and vegetation.

As the National Flood Insurance Program is extended to more communities, the need to be more precise in delineating flood plain boundaries will increase. This paper represents an attempt to determine the accuracy of soil boundaries and the interpretative method in relation to the engineering method. We used published federal flooding reports for drainage systems in Stark County, Ohio to compare the three methods.

METHODOLOGY

Stark County, Ohio is located on the southern edge of the glaciated portion of the Appalachian Plateau region of Northeastern Ohio. A detailed soil survey for the county was completed during the period 1962-1964 with federal funding assistance. Since the mid 1960's, six engineering cross-sectional flood plain studies have been completed on the portions of the Nimishillen Creek and Tuscarawas River Basins within the County.

The purpose of this work was to assess the correlation between flood plain boundaries drawn using each of the methods. We assumed the flood plain boundaries delineated by the engineering cross-sectional method to be accurate and these boundaries were used as the standard of comparison. The six engineering studies available for the Nimishillen and Tuscarawas Basins were published by the Soil Conservation Service, Army Corps of Engineers and Ohio Department of Natural Resources.

Initially, the flood plain boundaries delineated with the engineering method were transferred to detailed two-foot contour interval topographic maps at a horizontal scale of 1"=200'. We used the cross-sectional elevations listed in each flood plain report to delineate the flood plain boundaries on the more detailed topographic maps. These boundaries were then transferred to the detailed soil surve maps with a horizontal scale of 1"=1,320'. In this transfer, we noted a couple of wooded areas where the soil boundaries did not closely correspond with the contour lines.

[1]Soils Office, Stark County Subdivision Engineering Department, Canton, Ohio 44

The flood plain boundaries of each waterway as identified using the soil boundaries and the interpretative method were then drawn on the detailed soil maps. The acreage of flood prone areas obtained using each method was then calculated with a planimeter. Percentages of difference between the engineering method and the soil lines and the interpretative method were then computed. Table I illustrates these results.

Using the alluvial soil boundaries for flood plain delineation was found to be quite accurate, depending on the amount of alteration within the basin. Overall, we found the accuracy of the soil maps to be approximately:

96% for rural basins.

93% for suburban basis.

45% - 98% for urbanized basins.

TABLE I

CORRELATION BETWEEN METHODOLOGIES

BASIN	AREA (SQ. MI.)	SOIL BOUNDARIES	INTERPRETATION METHOD
Upper Tuscarawas River	6.5	1.0% error	.5% error
Lower Tuscarawas River	300	15.5%	3.0%
Tributaries			
Plum Creek	3.9	3.7%	.5%
Fox Run	14.2	4.1%	.5%
Nimishillen Creek (West Branch)	49.2	3.1%	.0%
Nimishillen Creek (Middle Branch)	51.6	7.5%	.5%

Within the urbanized basins, channelization and filling of the floodplain accounted for the larger degree of error. However, as Table I indicates, the interpretative method based on pedologic - geomorphic relationships greatly reduced the apparent error between the soil boundaries method and engineering method. When drafting, transposing and comparing the boundaries derived by the three methodologies, we discovered:

(1) Textural characteristics of the terrace soils generally reflect the floodwaters which deposited these materials.
Flow rate: Rapid----------Moderate----------Slow
Texture: coarse skeletal-loamy-fine loamy-silty-fine silty

(2) In the case of rural areas with drainagesheds of less than 20 square miles, the soil boundaries were found to be 99+% accurate for delineating the areal extent of the 100 year frequency flood levels, when compared to the results of the engineering method.

(3) In several cases the soil maps were more accurate with regard to areal extent of flooding than the display maps contained in the engineering reports. We attribute this to the result of field observations recorded on the soil maps as compared with the more generalized USGS contour maps which acted as base sheets for the engineering displays.

(4) Designation of soil mapping units containing cumulic horizons would give greater meaning and value to the soil survey at a mimimal addition cost. Especially when compared with the cost of other methods of flood plain designation.

(5) The estimated minimum elevation of flooding could be obtained from a study based on the interpretative method.

(6) Alteration of a flood plain by channelization and/or filling tends to mask the natural features, resulting in decreased accuracy.

SUMMARY

This study verifies the feasibility of using the interpretative method for designation of areas that have been historically subjected to inundation principle areas of application of the interpretative method include:

-Small drainage basins where detailed engineering studies are not cost effective.
-As studies to enable basic information for areas of high concern prior to completion of a detailed engineering study.
-Designation of flood prone conditions not associated with drainageways, e.g. depressionary areas.