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DEFINITIONS OF LAND CLASSES AND METHODS USED IN MAPPING

by

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The procedure I propose to follow in the few minutes allotted me will be: first, to present the definitions and assumptions underlying the research work in Economic Land Use Classification; second, to illustrate each of the class groups by slides; and third, to briefly describe the several steps followed in the preparation of land classification maps.

Several states, in addition to Washington, have been working on projects classifying farm lands on an economic productivity basis. A great many maps and research data, both describing and analyzing the economic principles involved, have been published by these different states. We obviously are not pioneering this field, though, I am sure, we have encountered some problems that are peculiar to our area as others, no doubt, have encountered problems that we have not.

To define generally this type of economic classification would be to say that it is the ascertaining, weighing, and correlating of physical land factors associated with variations in the economic productive level of farm units by areas over a period of time.

In the work with which we in Washington have been concerned so far (maps for eleven counties have been published and maps for eight additional counties are now in the process of being prepared for publication), we have found many important basic land factors associated with variations in the economic productivity of farms. These include soil texture, soil depth, soil waterholding capacity, topography, amount and distribution of rainfall, location, drainage, flooding, clearing, and to some extent climate. I mention the latter because climatic changes usually result in variations in types of farming rather than in changes in the economic level of productivity. In a few cases, however, similar soil and topographic features existed, but sharp changes in climate did occur within short distances. Consequently, farmers were compelled, because of comparative advantage, to follow a very similar type of farming, and changes in the economic productivity level were noted.

It is obvious, as you can see from this enumeration that we are emphasizing the importance of the association between physical land features and variations in economic levels of productivity. In reality this constitutes an inventory of our physical land resources in relation to the degree of economic use to which these resources are being put in the production field. Of course, other factors such as size of farm business, yields per acre, and the organization of enterprises within farms also were found associated. These factors at any one time, however, are reflectors of the basic land resources upon which they are found rather than causal factors.

The basic points in mapping in this classification work are:

1. A full-time farm is used as the basic unit of measurement for economic productivity. (Actually a better measure of this would

be the economic productivity per person; but, as yet, we have not devised means for measuring productivity in this manner.)

2. Typical or usual farm units within well-established farming areas reflect the kind of farming at that time best suited to that area.
3. Farms producing comparable levels of income over a period of time, irrespective of locations or type of farming, should be given the same Economic Land Use Classification rating.
4. Visible signs both in quantity and quality of invested capital on a farm, such as size and condition of buildings, kinds and condition of machinery, amount and condition of livestock, tith of land, kind of crops, and the like indicate the relative level of economic productivity of that farm unit.
5. Levels of economic productivity are determined by visible signs of invested capital on typical farm units, but the boundaries of economic areas are determined by changes in physical land features.
6. Once lands or combinations of the component parts of land, such as soils, topography, water relationships, and the like, within a type of farming area are assigned economic ratings; then these physical land features become the basis for final mapping.
7. Five different economic productivity levels of farm lands can be observed and mapped consistently. (It is my opinion on this point that with the experience we have gained it would be possible to map consistently twice this number of classes; the limiting factor that we are now encountering is the inadequacy of physical land data. Depth of soil types have not always been mapped, but when they are mapped, the generalization in groupings often are not broken at the proper depths. Topography has not always been mapped on a fine enough scale. Water relations data are very meager.)

It might be well at this point to reemphasize one of the above points which we think is very important in order to properly appreciate the scope of this study. Economic Land Use Class areas transcends type of farming areas. Specifically by this is meant that a typical farm in a Palouse Class 1 Wheat Area would return approximately the same level of earnings as would be returned by a typical farm in a Class 1 dairy and vegetable seed crop area of Skagit County located in western Washington or by typical farmers in any other Class 1 area. The level of earnings on typical farms in Class 5 areas in different types of farming likewise would be approximately equal. To further illustrate this point, size of farm businesses when measured by productive-man-work-units, man equivalent, or total capital per farm shows wide variations among the Economic Land Use Class groups within a type of farming area but is strikingly similar within the same land class group among different types of farming areas.

Definitions of Economic Land Use Class Areas

Economic Land Use Class areas were rated from 1 to 6. Class 1 are those areas where typical farms received the highest economic productivity ratings. Characteristics of farms in these areas are large amounts of visible capital

invested in the farm business, a high level of living, earlier than average retirement of the operator, fewer farm mortgage foreclosures, a larger number of children receiving college educations, and the like. Within a type of farming area this class is associated with the most productive soils and favorable topography; as a result, land use in this class is relatively more intensive than it is in the other classes.

Class 2 areas are better than average in income producing ability but measurably lower than Class 1. Within a type of farming area, this class is associated with soils of better than average productivity. Soils in this class, however, are less productive than those in Class 1. Some of the common restricting factors found in soils of those areas are more sloping topography, drainage difficulties, less desirable soil texture, more shallow soils, and other physical features which limit the size of fields and the efficiency of farm operators.

Soils and topography combinations in this class have pronounced restrictions in one or more of such factors as drainage, texture, depth, slope, and the like.

Class 3 areas may be characterized as the farm group with an average economic productivity level. Farms in this class provide modest levels of living. Farmers on typical full-time farms in this class experience difficulty in accumulating from the net farm earnings that he receives over his production life span enough capital to equal the total value of his farm business. Soils and topography combinations in this class have pronounced restrictions in one or more of such factors as drainage, texture, depth, slope, and the like.

Class 4 areas of farming usually provide incomes per farm that are below average but high enough to encourage farmers hopefully to remain. Farms in this class area should be characterized as marginal. Only under unusually favorable price or crop conditions can the operator expect to pay the purchase price of his farm from earnings. Soil and topography combinations have serious restrictions such as small size of soil body, very light or very heavy soil texture, considerable slope, shallow top soil, poor drainage, and the like. Off-farm employment for a considerable portion of the year is usually the best solution for farmers on this class of land.

Class 5 areas provide net incomes per farm that are very low. The level of production in Class 5 areas is submarginal. The level of living provided by farms in this class is usually inadequate. Sickness, drought, or similar casualties that are normally expected to occur are serious for families farming full-time in these areas. A high proportion of the soils in such areas are extremely droughty, are infertile, have steep topography, or are very poorly drained. If areas of fair soil are present, they are so limited in extent that they cannot be worked efficiently.

Class 6 are those areas of land not now being farmed.

Potential areas of Class 1, 2, or 3 have been indicated on the maps. These areas of land are undeveloped or partially developed at the present time but have similar physical land characteristics to those of other areas of land that are now developed and classified as Class 1, 2, or 3.

Procedure Followed in Making Maps

1. A party of two or more trained observers, usually accompanied by a soil technician and either the county agricultural extension agent or other well informed local people or both traveled the roads in each county and marked on maps a class rating (1 to 5) for each full-time and part-time farm unit. These ratings were determined on the basis of a judgment by the land class party concerning the amount of invested capital per farm as evidenced by size and condition of buildings and machinery, condition and number of livestock, kinds and condition of growing crops, and other factors reflecting income. In numerous cases interviews were conducted to ascertain why unusual land use characteristics were evident, or particular farm units appeared unusual in comparison to the general appearance of the surrounding farms.
2. Patterns of areas were drawn on the basis of ratings given farms throughout the county.
3. These area patterns were superimposed on maps depicting soils, topography, drainage, and other physical land features.
4. Economic ratings were assigned to each soil type, topographic change, drainage condition, and the like or combinations of these physical land data.
5. Areas were drawn on changes occurring in the physical land data found associated with the different levels of economic ratings.
6. A review of the maps to check the consistency of economic levels with the similar physical land features were made in each of the counties. Several counties were reviewed at the same time in order to check consistency in economic levels over broader geographic areas. Usually included in this review party were representatives from all of the agencies cooperating in the project.
7. Final maps were then drafted preparatory for publication.

Purposes of Maps

We feel that the results of this type of research information may give greater specific direction to means of attaining more effective agricultural production. Some of the purposes we have in mind are:

As a guide to settlement for prospective farmers;

As a guide to further land development;

As a guide in the extension of public and private services such as electricity, transportation facilities, credit service, and the like;

And as a means for grouping farms into more homogeneous segments in order to more effectively study farm organization, balance of enterprises, intensity of use and other internal farm relationships.