

Chapter 12

Land Classification Research: A Retrospective and Agenda

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ABSTRACT

Land classification is so central to geography that its use, and the use of its derivative and corresponding products, is seldom even questioned. Since its earliest implementations land classification has adapted to changes in geographic scale and in the nature of the categorical systematics upon which it is based. Land classification has changed in its techniques and in how it adapts to technological changes, particularly those related to remote sensing and geographic information systems. The adaptation of land classification to digital pixel-based classification spawned a wide range of land classification error analysis techniques. These techniques do not easily transfer to non-pixel based classification error analysis as recent research on rapid land assessment methodologies and land change error analysis has shown. This disparity suggests a need to reevaluate the very nature of land classification research. To begin such an evaluation, this lecture provides a retrospective on the roots of land classification research, examines some of the milestones of that research, and describes the divergent paths such research has taken. It examines the importance of land classification in these times of ever decreasing global resources, and reviews its potential legal, social, and economic implications. Based on this retrospective, this paper advances the need for geographic researchers to envision land classification not only as a set of techniques, but more generally to focus on systematic geography in all its facets as a research agenda in its own right.

INTRODUCTION

After nearly four decades of study as a geographer I have come to realize that land classification is fundamental to the geographer's craft in general and to GIS specifically. So much of what we do begins with classification and the choice of classification often dictates rather than just influences every model, every decision, and every thematic map we make. Given this integral nature of land classification, it is time to look at a bit of its background; to evaluate its current place in the discipline, and ultimately to discuss elevating it as a sub-discipline in its own right.

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A Brief History of Land Classification

While Carl Sauer was not the first to discuss the problem of land classification, nor was he the first to write about it, I believe his 1921 article (Sauer, 1921) provides a clear benchmark in the thinking of land classification within American geography. In his article, Sauer characterizes the classification of land from two perspectives – those of *existing* land uses, and I emphasize that word because of its implications for future discussion in this paper. Secondly he characterizes land classification in terms of what he calls “future utility.” Codified in this characterization is implied the full extent of the geographers’ craft from exploration, through description (the classification itself), to explanation (of the classified land), to prediction (future utility), and finally implying using this knowledge to plan for alternate futures. Sauer also pointed to the temporal dimension of the classification itself, which, considering his interest in land use as opposed to other forms of land classification seems a most reasonable thing to do as land uses change at a rate that is easily discernable by humans. Moreover he alluded to what current literature might characterize as high versus low entropy land uses.

Richard Hartshorne (1939a, 1939b, 1939c), a contemporary of Sauer’s, publishing some eighteen years after that original article investigated the more general question of land classification without the need to limit it to land use, but rather to include what the author calls the “...totality of all real phenomena” and suggested that areal sections of the earth can be considered as concrete objects that are “... individual unitary wholes, which have form, structure, and function, and hence position in a system.” Today’s terminology might variously categorize such land units as “biophysical units” or “landscape units.”

Hartshorne further expanded on the nature of classification as one that benefits from both the consideration of the systematics of physical factors such as climate, landforms, soils, etc. but also from a synthesis of human geographic systematics. There were, as Frances Harvey and Ute Wardenga (1998) suggest, significant differences between the ideas of Hettner and Hartshorne on ... “the relationship between systematic and regional geography, and the understanding of landscape.” These differences in philosophies still exist today and, I believe contribute much to the confusion of the role of classification in the literature. One reason for this, I believe, is that the topic is not the focal point of discussion but rather often a tangential and poorly articulated sidebars to other topics upon which the research is focused. There are many aspects of the problem of land classification that appear from often wildly varying research agendas. What I want to do for the next while is to examine some, certainly not all, but some of the more obvious of these. My purpose is not to be exhaustive, but rather to point out that there is a need to focus on the land classification as a topic --- even to the point of creating a new specialty group and/or a new journal.

Topical Aspects

Perhaps the most obvious of these research areas was that of the topical areas of land classification itself. Although there are many land classifications in the literature, this one by Anderson (1972, 1976) is not only arguably the best known; it is also our reason for the Anderson Distinguished Lecture itself. In my first remote sensing class at the University of North Dakota I wrote a paper that essentially defended and even praised the Anderson Land Use Land Cover Classification system both because of its utility and ability to adapt to changes in scale based on its built-in hierarchy. Still despite its many and significant positive aspects, it leads us back to Sauer’s 1921 work where we must ask about exactly what is being

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