Land Use History of North America

The Land Use History of North America (LUHNA) is no longer an active USGS research project.
This web site serves as an archive to maintain the visibility of the important work done by the LUHNA project team.

The LUHNA Book!

Our co-sponsor

Historical Interrelationships Between Population Settlement and Farmland in the Conterminous United States, 1790 to 1992

by

Margaret Maizel
National Center for Resource Innovations-Chesapeake, Inc.
1925 N. Lynn Street, Suite 1102, Rosslyn, Virginia 22209
703/524-4554
ncri@idt.net

R. Denis White
Oregon State University
Geosciences Department
Corvallis, Oregon 97331
503/754-4476
denis@mercury.cor.epa.gov

Ralph Root
U.S. Geological Survey
Center for Biological Informatics
P.O. Box 25046
Denver, Colorado 80225
303/202-4234
ralph_root@usgs.gov

Stuart Gage
Michigan State University
Department of Entomology
East Lansing, Michigan 48824
517/355-4561
gages@pilot.msu.edu

Susan Stitt
U.S. Geological Survey
Center for Biological Informatics
P.O. Box 25046
Denver, Colorado 80225
303/202-4232
susan_stitt@usgs.gov

Leon Osborne
Regional Weather Information Center
University of North Dakota
Grand Forks, North Dakota 58202
701/777-2479
leono@rwic.und.edu

George Muehlbach
GIS Coordinator
NCRI-Chesapeake, Inc.
1925 N. Lynn Street, Suite 1102
Rosslyn, Virginia 22209
703/524-4554
ncri@idt.net

Abstract. The historical interrelationships between farmland and population settlement patterns have long been the subject of conjecture. Simple overlays of counties with historical population and farmland data, together with national soils and topographic data layers, provide a useful way to describe this delicate relationship spatially, as well as temporally. As new farmlands (cropland and grasslands) were being created at the population frontier early in the period between 1760 and 1992, certain other areas were being bypassed to be farmed only later when drainage and/or irrigation was possible. Other areas characterized by poor climate, steep slopes, and soils unable to support either cropland, pastureland, or grassland uses were unsustainably farmed or never farmed at all. Knowledge of land quality is key to understanding the interrelationship between populations and farmland. Urban expansion is preferentially converting prime farmland to non-agricultural uses. By 1992, metropolitan areas had expanded to engulf 25% (33 million ha or 82 million ac) of the prime farmlands in the Nation. This percentage was up from 20% (27.8 million ha or 68.6 million ac) of the prime farmlands in 1982. Population densities associated with farmland loss vary across the country but are quite specific at the local scale. For areas east of the

Mississippi River, farmland decline historically occurred at an average population density of approximately one person per 9.3 ha (23 ac) of arable land. In the west, farmland decline began at average densities of one person per 35-486 ha (88-1,200 ac). This historical analysis provides helpful new insights into the capabilities of the Nation's natural resources to support competing land uses based on their performance over 230 years of population settlement.

Introduction: Reconstructing Patterns of Population and Agricultural Expansion

A close historical relationship between the geographical expansion of human population and progressive changes in rural land use can be demonstrated by examining databases derived from historical population and agricultural censuses. Understanding such trends may permit glimpses into the future of continuing changes in land-use patterns.

A number of questions are intertwined with population and agriculture interactions.

- What has been the relationship between the geographical spread of human populations and the simultaneous expansion of agriculture during the past 200 years?
- When, where, and why have certain areas been historically bypassed for agriculture?
- Has the phenomenal growth of large urban centers during the twentieth century been at the expense of some of our nation's best farmlands?
- Where are the remaining highest quality agricultural lands, and how can they be most effectively used/protected today and into the future for maximum, sustainable productivity?

We explored these questions by reconstructing historical patterns in the growth and expansion of human populations and agricultural activity across the United States over the past 230 years. Results of these analyses are presented in graphic format to illuminate the broad patterns and interrelationships. A series of maps and graphs depict changes in human population and agricultural activity across the continent. These images provide a visual introduction to large-scale temporal patterns in land-use history at the national scale.

Methods

Two historical databases--the Census of Population and Housing (starting in 1790) and the Agricultural Census (formally collected beginning in 1850)--provided a picture of the interrelationships between population and agriculture over time. Historical county-level data describing population and farming were collected from the Inter-university Consortium for Political and Social Research, University of Michigan, Ann Arbor. These data were processed at the Harvard Laboratory for Computer Graphics and Spatial Analysis to account for historical changes in county boundaries and the changing definition of farmland over time. Some adjustments to these data sets, acquired at various times and for different purposes, were necessary to permit the joint analysis and display of data at the resolution of counties.

Adjustments for Jurisdictional (County and State) Boundary Changes

Until 1910, new counties were often created, some were dropped, and new territories were acquired. In a few cases whole states seceded from other states or territories (West Virginia, for example, was created from part of Virginia in 1863 [U.S. Bureau of Census 1995]). For consistency, we used today's county boundaries and spatially allocated earlier data to them from earlier boundaries.

Census data were not available for some states until they joined the United States (e.g., those states involved in the Louisiana Purchase in 1803 and Florida, ceded by Spain in 1819 but not formally added to the conterminous United States until 1845). The late addition of Oklahoma is obvious in the images presented here, due to the lack of data for that state until after 1907. Consequently, there is some omission of early agricultural activity in the western states. Likewise, no spatial data exist for farming practices by Native Americans prior to European settlement. The reader should be aware of these data gaps when assessing the displays.

Changes in the Definition of "Farmland"

Until 1920, farmland in the censuses comprised both "improved" (tilled and in meadows) and "unimproved" (forests, woodlands, etc.) land. In 1920, farmland was defined by the U.S. Census as "land in farms as harvested crop-lands, idle croplands, pastureland, woodland not in pastureland, other farmland, and unimproved farmland." In 1930, "unimproved farmland" was redefined as "other farmlands." For data before 1920, only "improved" farmland was used as the definition of farmland. For census data describing farmland after 1920, the "land in farms" definition that also included "other farmlands" was used (U.S. Bureau of Census 1992, Appendix A:A2-A10). It is important to note that the definition of farmland used in this study is very broad and the study does not account for shifts of less- to more-intensive farmland uses, e.g., from rangeland into irrigated cropland uses such as has occurred in eastern Nebraska and western Kansas after 1970 (Gage and Maizel, unpublished data).

Cartographic displays of the data in maps presented here were developed further to allow us to spatially allocate population and farmland data to those areas within each county that would reasonably be expected to support these land uses (see historically non-farmed areas criteria below). County boundaries were thus intersected with the State Soils Geographic Data Base (STATSGO; Natural Resources Conservation Service 1991). These layers were then overlaid on a national 30-arc-second digital elevation model developed by the U.S. Geological Survey (USGS) of the U.S. Department of the Interior.

Because county size varies markedly across the United States, it would be misleading to compare counties based on the total number of acres under cultivation. Instead, the maps included here display agricultural activity as the percent of each county's land area that is farmland. Historical analyses of the county-level data showed that certain areas in the country were never or only transiently farmed. They were found to correspond to places where

- the topography has an average slope greater than 20%,
- soils are of the lowest agricultural quality for crop production as ranked by the NRCS Soils Capability Class system for cropland uses,
- soils have been classified by the NRCS as "barren," and
- less than 60% of the soils were rated as "good" for producing grasses as a rangeland wildlife habitat component.

In nearly every county, the maximum amount of farmland in production, as determined by the census, fell within the acreage declared "arable" by this method (data not shown). This result indicates that the criteria used to define nonarable land provide a reasonably accurate operational definition. Thus, farmland areas are shown within counties where soils and topography could reasonably be expected to support agriculture as cropland, pastureland, and/or rangeland. Because historically populated areas corresponded geographically to farmed areas, population data were allocated spatially to "arable" lands in the map displays. The graphics illustrating farmlands are superimposed on the USGS digital elevation model; thus the nonarable areas are rendered in grayscale illustrating elevation categories.

Certain figures generated for this project have been placed in the body of this report as they are discussed; however, an expanded understanding of temporal relationships can be derived if the entire series of graphics is examined in entirety. (See related site on the world wide web, http://biology.usgs.gov/luhna/ncri/images.html for graphics illustrating and animating the population by county for 1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960,1970, and 1990, and for graphics illustrating percent farmland by county for 1850, 1860, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1982, 1987, and 1992.)

Results and Discussion

Early Population Settlement and the Farmland Frontier (1790-1860)

In 1790, the U.S. population in the original 13 states was 3.82 million people (Fig. 2-1). By 1850, the population had increased nearly tenfold, to 23 million (Fig. 2-2), and by then, according to the U.S. Census of Agriculture, there were 118 million ha (292 million ac) of land in farms (Fig. 2-3). The average population density was approximately 1 person per 5 ha (13 ac) of farmland. Most of the population was concentrated in the cities of Charleston and Greenville, South Carolina; Augusta, Georgia; Fayetteville, North Carolina; Danville and Charlottesville, Virginia; Lancaster, Pennsylvania; Trenton, New Jersey; Albany and Rochester, New York; and Worcester, Massachusetts.

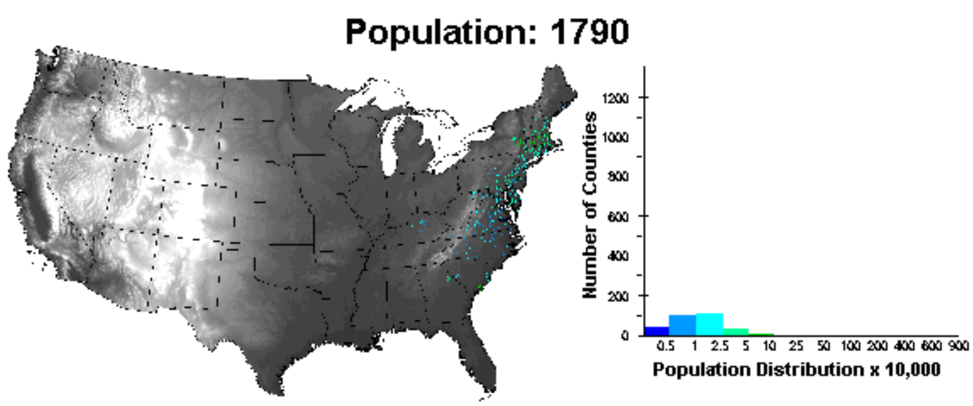

Fig. 2-1. Population, 1790.

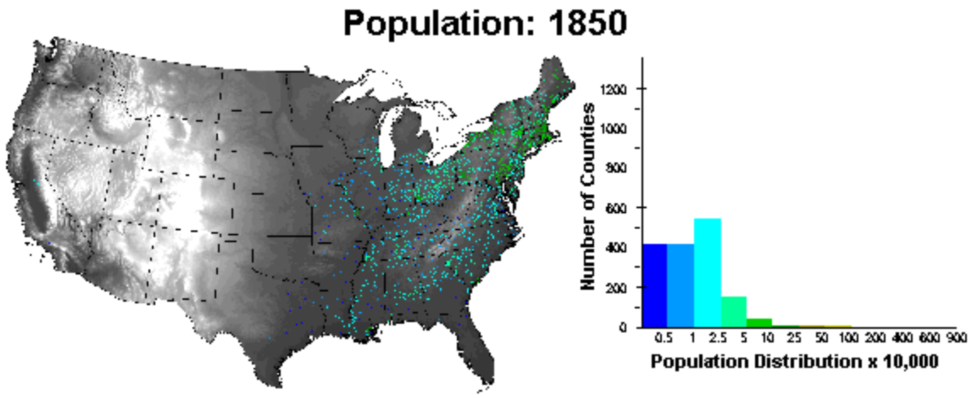

Fig. 2-2. Population, 1850.

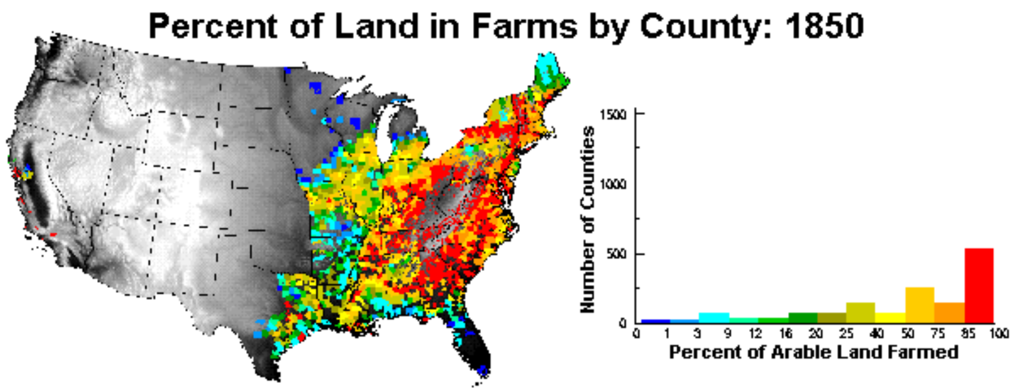

Fig. 2-3. Percent of land in farms by county, 1850.

By 1860, large agricultural regions averaging 202,000-324,000 ha (500,000-800,000 ac) per county developed around these urbanized areas, and more diffuse but significant population settlements averaging 5,000-25,000 people per county had already begun extending westward across Pennsylvania into Ohio, Indiana, Illinois, Iowa, and southern Wisconsin (Fig. 2-4). Smaller frontier populations averaging 2,000 people per county were also settling new farmlands averaging 8,000-20,000 ha (20,000-50,000 ac) per county in eastern Missouri and eastern Texas (Fig. 2-5).

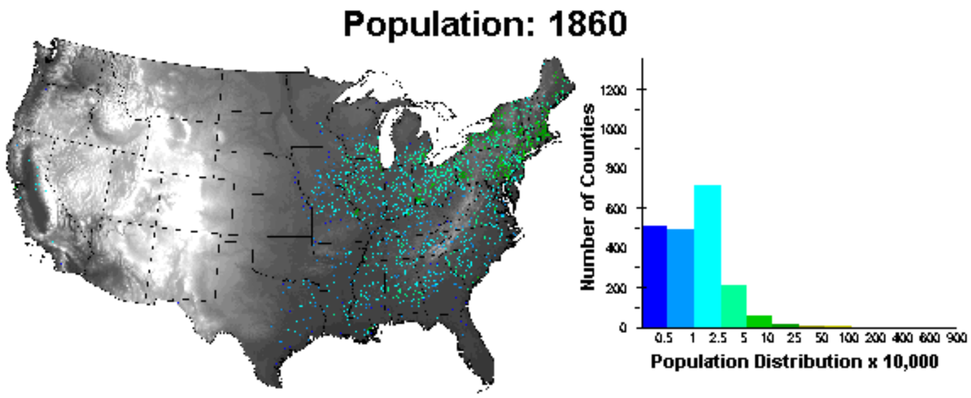

Fig. 2-4. Population, 1860.

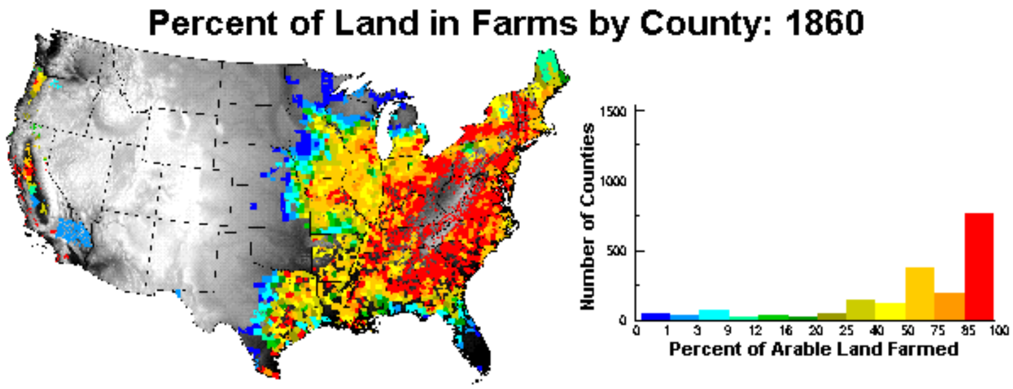

Fig. 2-5. Percent of land in farms by county, 1860.

As eastern cities continued to grow, Philadelphia became the largest city in the United States in 1860 when its population surpassed 500,000. By that time, the total U.S. population had increased to 31.1 million.

From 1850 to 1860, counties with the largest amounts of land in farms (0.2 million to 0.4 million ha or 0.5 million to 1.0 million acres) were still found mostly in eastern areas, especially in plantations in South Carolina and large farms in the Northeast. By that time, agriculture had already gained a foothold on the west coast in the Willamette Valley of Oregon.

In 1890, the census reported for the first time population and farmland expansions following the annexation of Texas in 1845 and the ceding of southern California to the United States by Mexico in 1848. Of course, expansion of farmland across the United States was not a uniform process. Although Tampa-St. Petersburg, Florida, was an established population center by 1900, only the northern part of the state had been settled (Fig. 2-6). Farmland development in the southern part of the state, with its extensive wetlands, awaited access via new roads and the drainage practices and irrigation technologies that arrived in the early 1930's (Fig. 2-7).

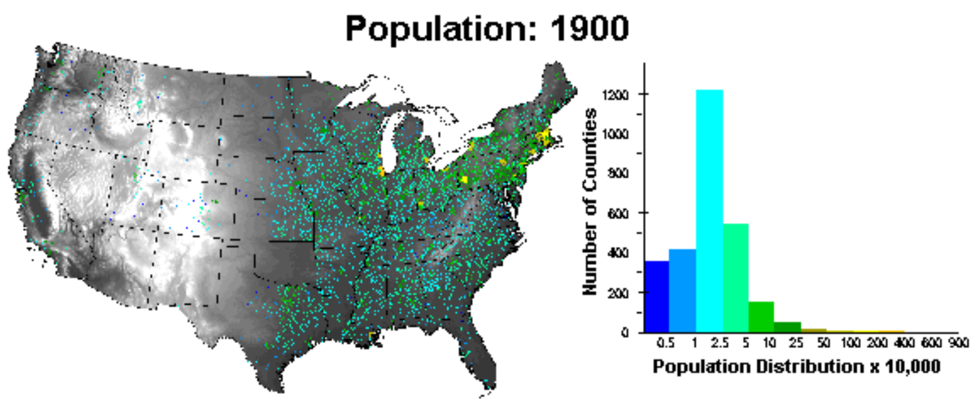

Fig. 2-6. Population, 1900.

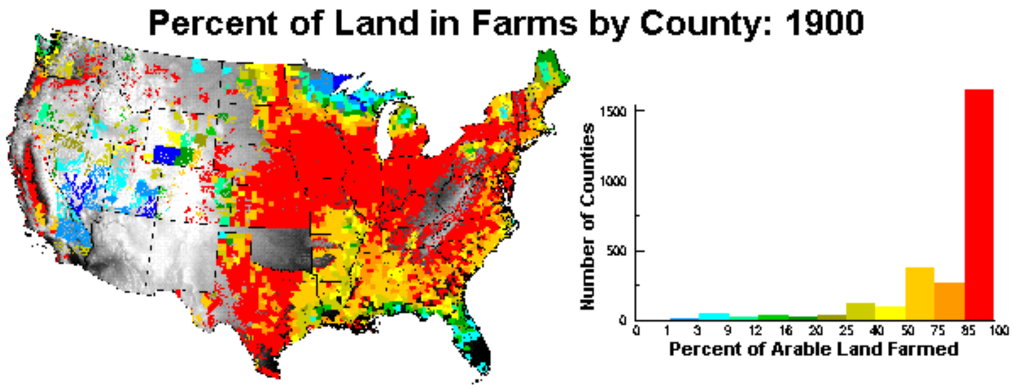

Fig. 2-7. Percent of land in farms by county, 1900.

Translocation of Large Farming Areas from East to West (1850-1950)

By 1900, coastal California farming had spread inland into the California Valley. New farming areas had become established in the coastal region of northwestern Washington, and large ranching areas were operating in Wyoming, Montana, and southwestern Washington. Large new farming and ranching areas were also being established in central Texas, Kansas, Nebraska, Illinois, and the Dakotas by 1900. By this time however, the largest early farm/plantation areas in South Carolina had begun to decline. In just 50 years, 15 major cities in the Northeast had reached populations of more than 500,000.

By 1950, a new wave of large frontier farms had rolled westward, past the Mississippi River and into eastern Colorado and southwestern Texas, and northward to the Dakotas, creating patterns that remain today (Figs. 2-8 and 2-9). These areas are now--as they were then--largely rangelands, with soils capable of supporting grasslands for livestock grazing. More recently, irrigation has resulted in significant cropland development in certain sections of these areas.

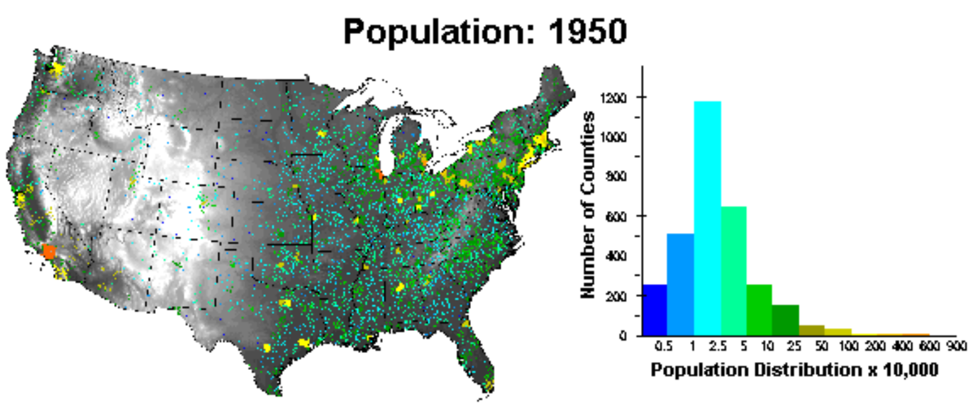

Fig. 2-8. Population, 1950.

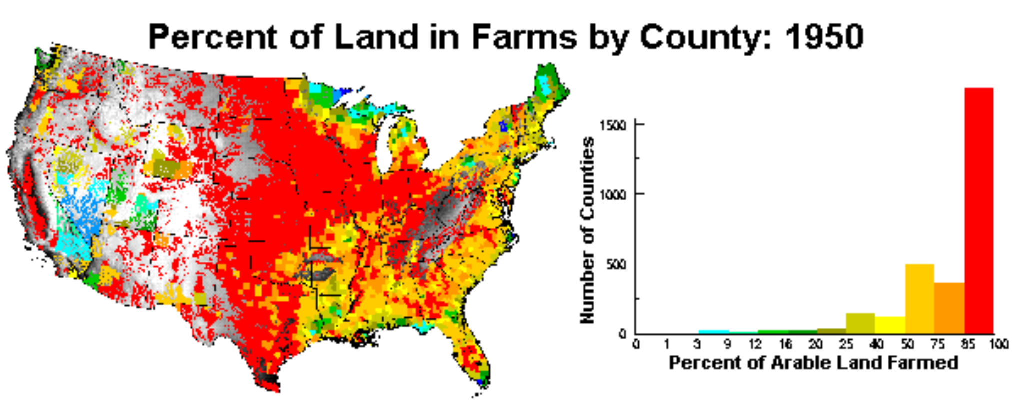

Fig. 2-9. Percent of land in farms by county, 1950.

Land Quality and Historical Farmland Patterns: Historically Unsustainably Farmed Areas

A review of the progression of percentage of land in cultivation from 1850 through 1992 reveals some notable regions where farming occurs only transiently, in small areas, or not at all. These areas are distinguished from those designated as nonarable, such as parts of southern Florida, which were put into production late in the period of population expansion. We dubbed these areas "historically unsustainably-farmed." These areas include, for example, parts of northern Michigan, Wisconsin, northern Minnesota, and western Nebraska. In these areas there were rarely more than 30,000 ha (75,000 ac) per county in production. Today these areas have approximately 800 ha (2,000 ac) or less per county in farmland. Modern soils data show that several soil- and water-related characteristics limit productivity over many of these unsustainably farmed areas, including the presence of wetlands, poor quality soils for agricultural production, steep slopes, sandy soils, lack of water, and poor climatic conditions.

In the case of the areas across northern Michigan, Wisconsin, and Minnesota, the poor quality of soils, presence of wetlands, and shorter growing season have all contributed to their being historically abandoned or altogether bypassed by farmers. In western Nebraska the widespread existence of deep, sandy soils, in combination with more arid conditions had already imposed a severe limitation on agricultural development.

In addition to the prohibitively arid regions of the desert West, many additional locations have been historically bypassed by agriculture for one or more of the above reasons. A careful review of the images of percent land in farms from 1850 through 1992 reveal 25 of these unfarmed or abandoned farming areas (Table 2-1).

Table 2-1. Large, historically non-farmed or unsustainably-farmed regions in the United States.

Hectares (millions)	Acres (millions)	State(s)	Forest [a] (percent)	Federal [b] (percent)	Principal Limitations [c]
0.57	1.40	NY	90	0	Class 6,7 soils
0.51	1.25	FL	0	10	Wetlands; class 7 soils
1.81	4.48	FL & GA	70	10	Wetlands; class 5,6 soils; restricted root zone
1.56	3.85	FL panhandle	30	30	Wetlands; class 8 soils; restricted root zone, low fertility soils
0.70	1.73	PA	40	50	Unknown
2.59	6.40	WV & KY	90	0	Class 7 soils
0.47	1.15	SC	60	0	Unknown
0.86	2.12	W/central GA	85	0	One-third area, 7%-15% wetlands
1.87	4.61	GA	85	10	One-fifth area, 7%-20% wetlands; low fertility soils
1.82	4.50	GA & SC	33-70	50	Class 7 soils
1.92	4.74	AL	90	5	Class 7 soils
0.96	2.37	MS	70	50	Common flooding
1.76	4.35	LA	50-60	0	Common flooding in the north
0.88	2.18	TX	90	5	Class 7 soils; one-tenth 20% wetlands; low fertility soils
1.42	3.52	AR & LA	90	0	Class 6 soils; low fertility in western part
1.24	3.07	MO & AR	0	10	Unknown
2.33	5.76	MI	80	20	One-third area 7%-30% wetlands; class 6,7 soils
6.731	6.64	WI, MN & MI	85	40	Class 6,7 soils; wetlands; low fertility
0.98	2.43	CO	0	60	Class 6 soils
0.43	1.09	CO	0	50	70% class 7 soils
3.62	8.96	ID	0	90	One-tenth area 10% wetlands
2.33	5.76	ID & MN	90	30	Class 7 soils

1.94	4.80	NV	0	20	70%-80% class 7 soils, 40% class 8 soils; barren land
0.78	1.92	CA	0	90	Class 7 soils
1.04	2.56	OR & CA	80	30	Class 7 soils
3.88	9.60	WA & OR	80	50	One-fifth area 7%-20% wetlands; class 6 soils
45.00	**111.24m**	**Total**			

Prime Farmland Under Urban Influence and the Urban/Agriculture Interface

As populations expanded rapidly between 1900 and 1950, some farming areas in the East showed early signs of decline, although farmland continued to increase in Florida. Between 1950 and 1992, even greater declines in farmland occurred in the East as the total U.S. population increased from 149.7 million in 1950 to 248.7 million in 1990. This trend is particularly noticeable in the images around the burgeoning cities of Boston, New York, Rochester, Buffalo, Philadelphia-Trenton, the Baltimore-Washington corridor, Richmond, and areas near Cleveland, Detroit, Chicago, and Cincinnati. Farmland in the west coast urban areas surrounding Los Angeles, San Francisco, Portland, and Seattle had also begun to decline (Fig. 2-10).

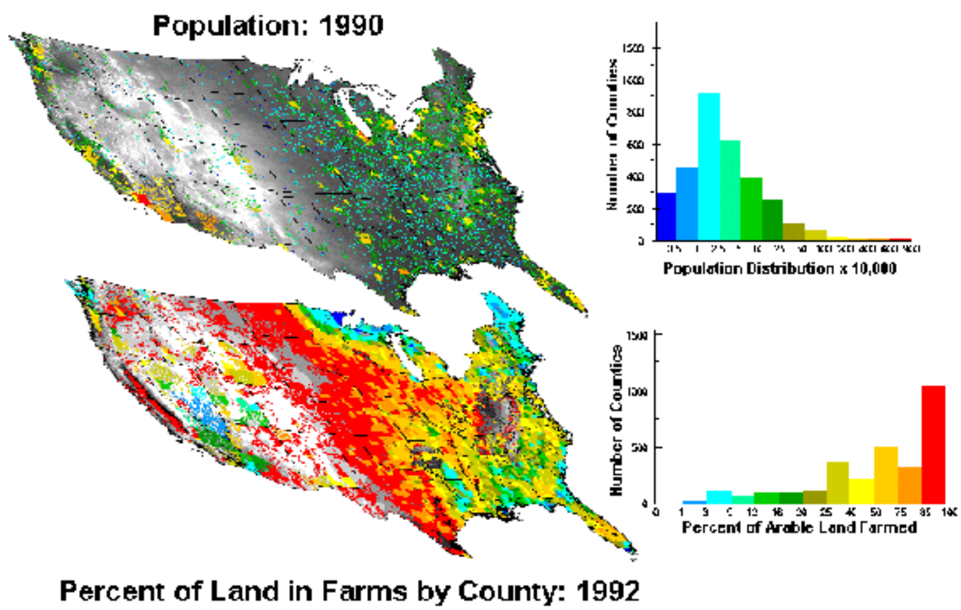

Fig. 2-10. Population, 1990, and percent of land in farms by county, 1992.

In 1952, 169 of the more than 3,000 counties in the conterminous United States had no farmland at all. In 1982, this number had increased to 177, and in 1992, to 185 counties. Of the remaining counties with farmland, 2,241 lost 10% or more of their farmland beginning at various times after 1950. This trend generally occurred when populations exceeded an average of one person per 9.3 ha (23 ac) in counties east of the 100th meridian and one person per 35-486 ha (88-1,200 ac) in those counties losing farmland west of the 100th meridian.

But the whole story is not told by numbers of hectares or acres alone. Of the 137 million ha (339 million ac) of prime farmland (for definition see the National Soil Survey Handbook [Soil Survey Staff, Natural Resources Conservation Service 1997]) in the United States in 1982, 27.8 million ha (68.6 million ac; approximately 20% of the total) were considered by the Census Bureau to be under urban influence--that is, inside Metropolitan Statistical Areas (MSA's; for definition see [U.S. Bureau of Census 1995]).

By 1992, MSA's had expanded to engulf 33 million ha (82 million ac) of prime farmland, while the total number of prime farmland hectares nationwide had declined from 137 million (340 million ac) in 1982 to 133 (330 million ac) in 1992 (Fig. 2-11).

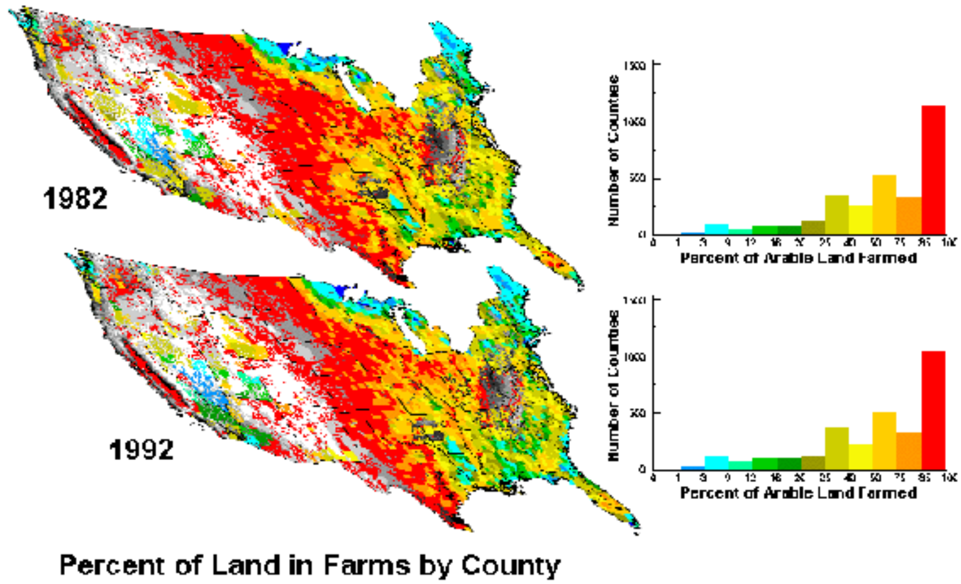

Fig. 2-11. Percent of land in farms by county, 1982 and 1992.

One can conclude from the evidence above that a significant portion of the Nation's prime farmlands has been lost to metropolitan development in the past 100 years. A more detailed look at this trend can be found in Imhoff et al. (Chapter 3, this volume), where nighttime satellite images of the earth are compared "spot for spot" on the ground with census data and soils maps. The results clearly show that "urban sprawl" has resulted in conversion of productive agricultural soils to nonagricultural use.

Conclusion

This study has illuminated answers to parts of the four questions posed in the Introduction. Spatial data sets, and new techniques for analyzing and visualizing these data, will permit a greater understanding of the past trends and therefore a better anticipation of future land use and landcover changes, such as those that are currently emerging from the tensions at the urban and agriculture interface. For instance, this study shows that issues surrounding population and farmland ratios related to farmland creation and decline are highly dependent upon the quality of the farmland and its ability to sustain food production needs. Until land quality (among other factors) is incorporated into the urban and agriculture interface issue as a widely accepted determinant, conjecture that differs by broad geographies (for instance, as eastern and western views) will only continue.

As Federal, State, and local land managers better understand the interaction of population growth, urbanization, and agricultural activity, they will be better able to make informed decisions regarding resource conservation, development, and land use. Among the key challenges will be the preservation of the nation's remaining productive agricultural areas.

[a]On non-federal lands in the region.

[b]Federal jurisdictions include National Parks, National Forests, National Wildlife Preserves, and other lands under Federal jurisdiction.

[c]Classes for soils are from the Soils Capability Classes (Soil Survey Staff, Natural Resources Conservation Service 1997). These are interpretations of the soils in terms of their ability to support cropland and certain pastureland uses. Lowest numbers (e.g., 1) have highest agricultural value, and highest numbers (e.g., 8) have lowest value.

Through integration of historical databases from many different sources and the continuing refinement of the resolution and accuracy of this diverse information, we hope to continue to improve our understanding of shifting patterns of land use and its relationship to human settlement and population growth. This integration and refinement should permit the untangling of the complex local interactions among a host of factors influencing agricultural activity. These factors include land quality, farm and human settlement patterns, farming types and economics, physical and biological constraints, and socioeconomic characteristics of farms and farmers in the specific context of their local communities. We anticipate that this new way of evaluating historic information will be used to better understand the impacts on farmland as a result of future growth planning, such as has been developed for the Washington, D.C., region (Maizel and Muehlbach 1998).

Acknowledgments

Some of the information in this chapter was assembled for a project developed at the American Farmland Trust: M. Maizel, J. Corson-Rikert, Kelly Chan and R. Denis White (1988), "Historical Land Use in the United States," as funded by a grant from the Laurel Foundation of Pennsylvania.

The project was inspired by a hologram depicting historical population growth and expansion in the United States as constructed by Geoff Dutton when he was at the Harvard Laboratory for Computer Graphics and Spatial Analysis in the late 1970s. In addition, special recognition is due to Jonathan Corson-Rikert for work in reconciling historical changes in county boundaries and farmland definitions.

Images for this chapter were contributed by the Biological Systems Under Stress and Change Consortium, a collaborative initiative among four of the authors (Maizel, White, Gage, and Osborne) to integrate information about biological and physical resources in spatially hierarchical information systems in order to better understand interrelationships between natural and human-managed systems.

The National Center for Resource Innovations-Chesapeake, Inc., is a founding member of the National Center for Resource Innovations, a consortium of seven project sites established in 1990 by Congressional appropriation through the U.S. Department of Agriculture's Cooperative State Research Education and Extension Service. NCRI's mission is to build geographic information system-based information systems for public policy and other decision makers. The National Center for Resource Innovations-Chesapeake specializes in integrating spatially hierarchical data from many public and private sources, "From the Nation to the Neighborhood," in order to build new information about interactions between human population and the status, use, and potential of the Nation's natural resources and farming systems.

Literature Cited

Maizel, M., and G. Muehlbach. 1998.
Green, more or less - a future growth scenario for the Washington D.C. Region in: R. K. Olson, and T. A. Lyson, editors. Under the blade: the conversion of agricultural landscapes. Westview Press, Boulder, Colo.

Natural Resources Conservation Service. 1991.
State Soils Geographic (STATSGO) Data Base, Data Use Information. National Soil Survey Center, Miscellaneous Publication Number 1492. Natural Resources Conservation Service, U.S. Department of Agriculture, Washington, D.C.

Soil Survey Staff, Natural Resources Conservation Service. 1997.
National soil survey handbook. Title 430-VI. U.S. Government Printing Office, Washington D.C. Sec 602.

U.S. Bureau of Census. 1992. 1992
Census of agriculture, geographic area series, state and county data. U.S. Department of Commerce, Bureau of Census, Washington D.C. Appendix A.

U.S. Bureau of Census. 1995.
Territorial Expansion of the United States and Acquisitions of Other Areas. In: Statistical Abstract of the United States, 1995: The National Book. U.S. Dept. of Commerce, Economics and Statistics Administration, Bureau of Census, Washington, D.C. Also found in: U.S. Bureau of Census, 1995. Major Acquisitions of Territory by the United States and Date of Admission. Sec 4. Plate 8. 1990 CPH-2-1. U.S. Department of Commerce, Bureau of Census, Washington, D.C.

Next Chapter:
Assessing the Impact of Urban Sprawl on Soil Resources in the United States Using Nighttime "City Lights" Satellite Images and Digital Soils Maps

Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
URL: http://landcover.usgs.gov/luhna/chap2.php
Page Contact Information: lci@usgs.gov
Page Last Modified: December 2012

The history of immigration to the United States details the movement of people to the United States starting with the first European settlements from around 1600. Beginning around this time, British and other Europeans settled primarily on the east coast. In 1619, Africans began being imported as slaves. The United States experienced successive waves of immigration, particularly from Europe. Immigrants sometimes paid the cost of transoceanic transportation by becoming indentured servants after their This paper investigates the link between population growth, energy resources and carrying capacity at a global level, to determine if there might be dependencies and if so, how they could be modelled. Different qualities of energy resources may interact differently with population growth. Finally the implications of a peak in energy resource availability on population growth are examined. Introduction. The Population Division of the United Nations predicts a global population of approximately 9 billion people in 2050[1]. That is over 2 billion more people than are alive today. This mantra â€“ 9 ...Â By 1865 coal had gained a 20% share of energy consumption in the United States. U.S. Population, 1790-2000: Always Growing. The population of the colonies that later became the United States increased steadily in the decades prior to, and including, the American revolution. The first decennial census, mandated in the U.S. Constitution, took place in 1790. Since that time, the natural increase, i.e. the excess of births over deaths, has been a constant contributor to population growth. The other factor, immigration, has ranged from negligible to large at various points in the nation`s history.Â Henry A. Wallace wrote in his book New Frontiers in 1934, that the end of population growth in the United States as in sight. "Today, immigration is mostly shut out. Our birthrate is decreasing.