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U.S. FARMLANDS: THE FALSE CRISIS

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INTRODUCTION

Beginning in the Carter Administration, but continuing through the Reagan Administration, a flood of scare stories has erupted in the newspapers, magazines, and television about the "loss" of cropland to urbanization. These scare stories have been based on egregiously false data about how much conversion is occurring. Though incorrect, these reports have fueled a variety of government programs, already enacted at the state and local level, that interfere with the free market in farmland with an eye to "saving" it.

For example, Senator Charles Mathias (R-MD) has just reintroduced a bill--cosponsored by Senators Paul Sarbanes (D-MD) and Mark Hatfield (R-OR)--intended to "encourage the preservation of farmland." That is, the bill is intended to keep farmers from selling their land for such uses as housing and industry.

This particular bill's device is a tax credit--no tax on capital gains up to $100,000--to farmers who sell easements to states under the various state farmland preservation programs. Currently, various states pay farmers for a legal promise that they and subsequent owners will never use the land for anything except farming. And with Senator Mathias's bill the federal government would sweeten the deal by making the state payments tax free. The regulations on farmland transfer enacted in various localities employ a variety of other legal devices. Underlying all of them, however, is the belief that conversion of cropland to functions the market considers more valuable than farming is a bad thing.

The misinformation about farmland urbanization and the resulting restrictive legislation has had destructive effects on both individuals and the economy. Bernard J. Frieden, in the Spring

1979 issue of The Public Interest, discussed the impact on people who want to build and buy new homes. But there also are ill effects on industrial development, farm planning, and the incentive to farm--all outcomes of restrictions on economic mobility in the name of saving "prime farmland."

The source of many or most of the recent news stories was the National Agricultural Lands Study (NALS). Secretary of Agriculture John Block is on record as agreeing with this product of the Carter Administration, saying that the loss of agricultural land is "a crisis in the making," similar to the energy situation ten years ago and that NALS "has built a strong case for protecting good agricultural land."[1] In a poll of the National Wildlife Federation members, "farmland preservation" was "ranked the number one concern and 95 percent of the 60,000 respondents felt that the federal government should act to stem conversion of cropland for urban use."[2]

The issue is clear: Should we be concerned about the amount of U.S. farmland, and of cropland in particular, that is currently being converted into urban uses? The answer must depend on how much of our cropland, present and potential, is being transformed into urban uses. The likely amount is only about one-third of the amount claimed by the National Agricultural Lands Study (NALS) in its national campaign to arouse concern about the issue. The current rate is probably no greater, but rather less than in the past, not three times the rate in the recent past as claimed by NALS. Such a true rate is not likely to worry persons knowledgeable about agricultural production.

To avoid confusion some terms must be defined. Farmland or agricultural land usually includes cropland, pastureland, forestland, and land in other agricultural uses. Cropland means land on which field crops such as corn and wheat are usually grown. The statistical and economic differences between farmland and cropland are enormous and have led to great confusion. For example, a recent estimate of conversions of pastureland and forestland to other uses (including wetlands alias swamps) "has been used frequently to suggest that the nation is losing annually almost 3 million acres of present and potential cropland to nonagricultural uses. Indeed, an unwary reader could easily infer this from the final report of the NALS,"[3] even though absolutely no one seriously claims that the amount of cropland being converted annually is greater than two-thirds of a million acres.

Harvest cropland for a given year excludes cropland left fallow that year. Prime farmland, as the term is used by the Soil Conservation Service, is most peculiar: it includes some land

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1 Champaign-Urbana News Gazette, February 11, 1981, p. A-3.
2 International Wildlife, September/October 1981, p. 28-30.
3 Crosson, 1981, p. 27.

that is now covered with water and some that has never been used for agriculture; it refers to potential cropland as well as land currently used for crops. (This is quite different from common usage and would make most farmers laugh. For example, in the farming advertisement section of the Wall Street Journal, "prime" invariably refers to land that is now highly productive of crops.)

Another important source of confusion is the NALS's extraordinary definition of agricultural land. It includes "all nonfederal land not actually in 'nonagricultural' uses--e.g., rural transportation rights-of-way, water impoundments, or other nonfarm uses."[4] That is, their definition of agricultural land included all wasteland--deserts, swamps, mountain ranges. The mixups caused by this NALS definition are monumental.

Many agricultural economists feel that, by all relevant economic measures, cropland is more available and less scarce than in earlier decades. Furthermore, the NALS-Soil Conservation Service assertions about the recent rate of farmland urbanization, which constitute the basis of the news stories and of proposed legislation, are three times the actual figures. Why, then, are Americans reading and hearing all this false bad news about the "loss of prime farmland?"

DOES THE U.S. SUFFER FROM FARMLAND LOSS?

The farmland preservation campaigners suggest that the U.S. is riding negative trends, that bad things have happened and are happening because of the conversion of land to built-up uses. This is not supported by the long-term trends related to the critical elements of the farmlands issue--quantities and prices of food, trees, and housing. After all, farmland by itself is only an instrument to provide food and fiber; it has no intrinsic value except to those who love it for its own sake.

1. The quantity of food. U.S. food production has been increasing by leaps and bounds. Take corn, for example (the story for other major crops is basically similar): Figure 1 shows that total corn production has been rising rapidly in recent decades. This means more to be consumed by Americans as vegetable and as meat and more to sell abroad. No grounds for concern there.

2. The price of food. Figure 2 shows the long-run price of food measured in the hours of labor that a given quantity of food costs; with each successive year, less and less work has been required to buy a bushel of corn. This means that a smaller proportion of Americans' income has been needed to buy farm output each year. Even compared to other products measured by the Consumer Price Index, the price of food has not been going up and probably has trended downward, as Figure 3 shows for the very long run and

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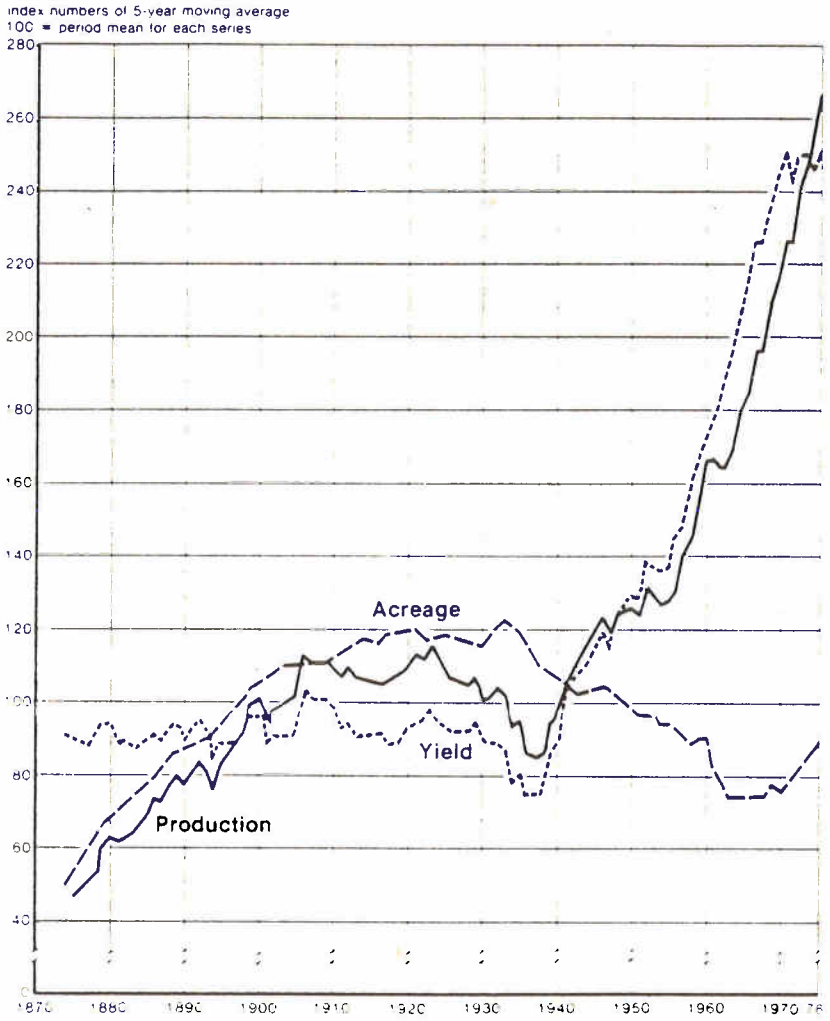
[4] Brewer and Boxley, 1981, p. 3.

Figure 1



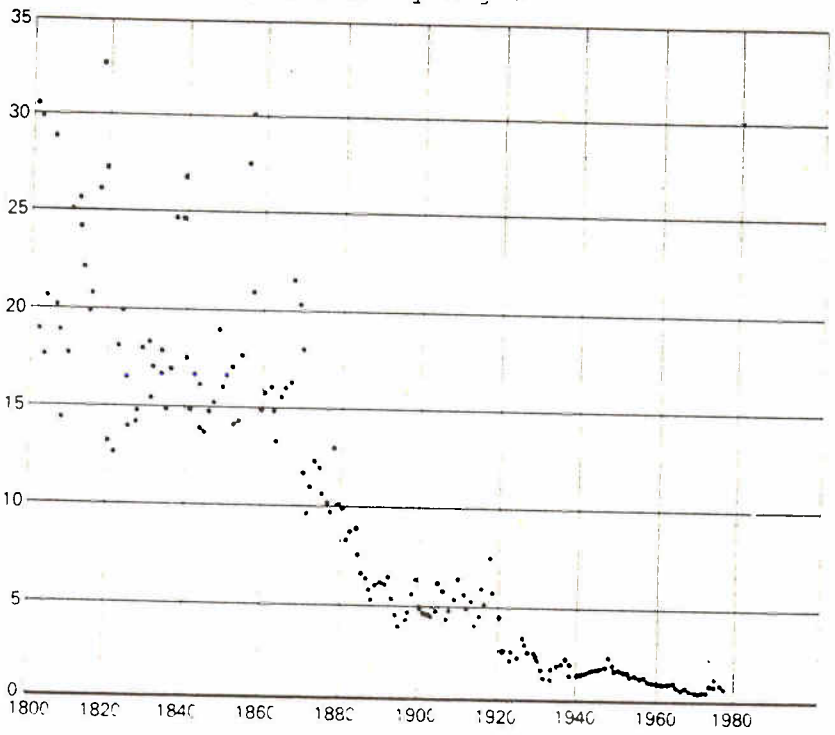
U.S. Acreage, Yield, and Production of Corn, 1870-1976

This graph shows that change in acreage is no longer the main influence upon change in food production. It suggests that concern about the competition between urbanization and agriculture is misplaced. Also interesting is that corn yield per acre was stable for many years even though output per worker rose greatly with the mechanization of agriculture.

Source: See Simon, 1981, p. 353.

Figure 2

Price of Wheat Deflated by Wages



Source: See Simon, 1981, p. 75.

Figure 4 shows for most of the 20th century. These trends would seem cheering, not depressing.

3. Trees. Figure 5 shows that the amount of wood being grown has been on the rise rather than on the decline in recent years; forest acreage has about stabilized. Wood prices have risen as the U.S. has made the transition to commercial tree growing from cutting wood to clear farmland; this upward trend therefore need not continue in the long-run future.

4. Recreation land has been on the rise. And visits to recreation areas have been increasing rapidly.

5. Housing. The U.S. has more housing than ever, as measured by the land related indicator of number of rooms per person, which has gone from 1.34 rooms per person in 1940 to 1.98 rooms per person in 1978.[5] It is probably also true that the space per single family home has increased with the years, though data on this could not be found.

6. Wetlands. Even wetlands--what used to be called swamp--are increasing, though environmentalists have been lamenting its decline. New wetlands are being created faster than the old ones are being drained; about 7 million new acres of wetlands were created between 1967 and 1976.[6] And the Soil Conservation Service says that "there is strong evidence that the total acreage of water and associated wetlands will increase rather than decrease in the future."[7]

7. Cropland. The most astonishing trend is in cropland. For some crops such as corn, the trend has been somewhat downward, as seen in Figure 1. But this is largely a response to increased yield and to the demand for other valuable crops, rather than encroachment by cities. Land in field crops taken altogether clearly has been increasing rather than decreasing. After a drop, harvested cropland rose from 1969 to 1974, and again from 1974 to 1978, according to the Censuses of Agriculture for 1969, 1974, and 1978.

These data show, as conclusively as such data can, that the Soil Conservation Service's claims about decreases in cropland are unfounded. This is evident in their erroneous finding, based on their 1967 survey and 1975 resurvey, that between 1967 and 1975 "cropland declined from 431 million to 400 million acres."[8] This finding is in direct contradiction to the far more reliable Census of Agriculture data presented earlier. And if the Soil Conservation

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5 1940 Census of Housing, V. 2, Pt. 1, Bureau of the Census, Department of Commerce, pp. 8, 26; U.S. Statistical Abstract, 1976, p. 744; 1977, p. 779; 1978, p. 790; 1979, p. 782; 1980, pp. 6, 790-91.

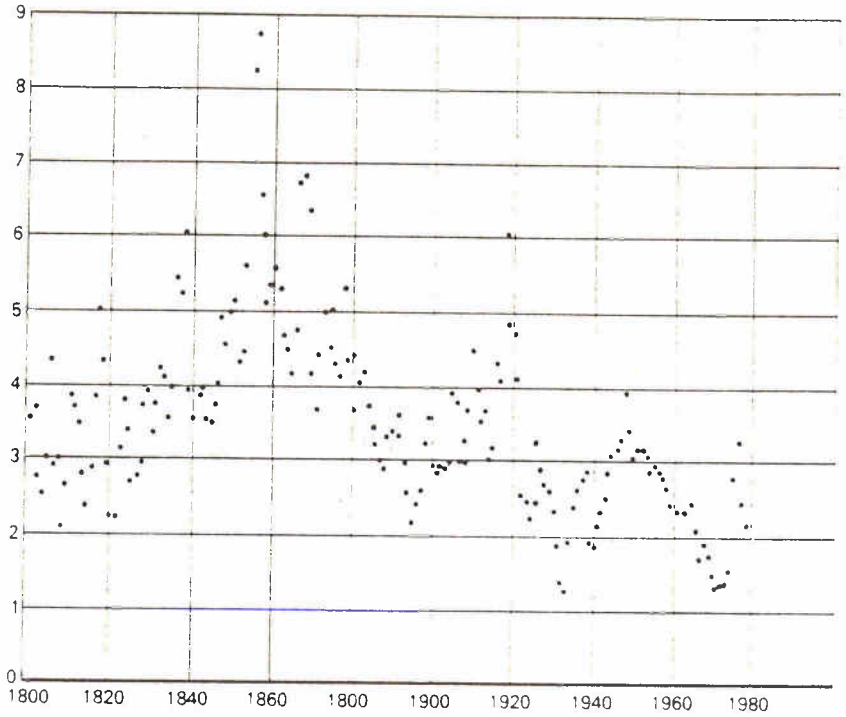
6 Dideriksen, et al., 1977, p. 3.

7 Ibid., p. 4

8 Ibid., "Highlights" page.

Figure 3

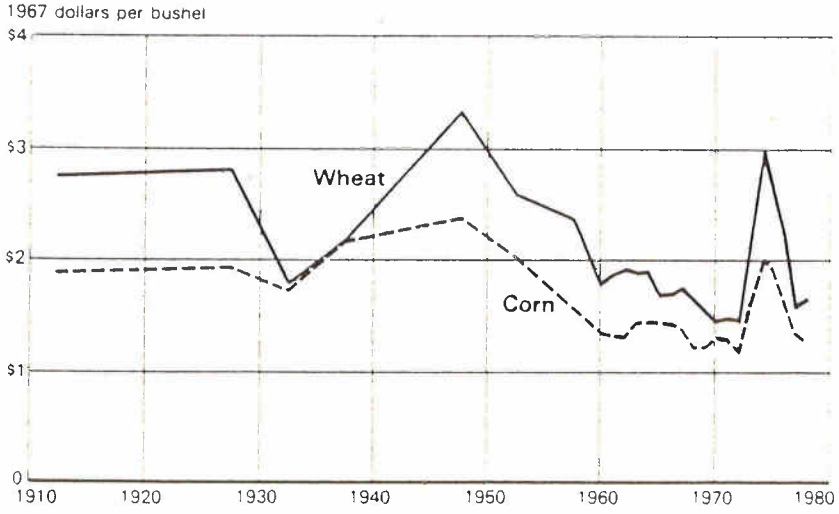
Price of Wheat Deflated by Consumer Price Index



Source: See Simon, 1981, p. 74.

Figure 4

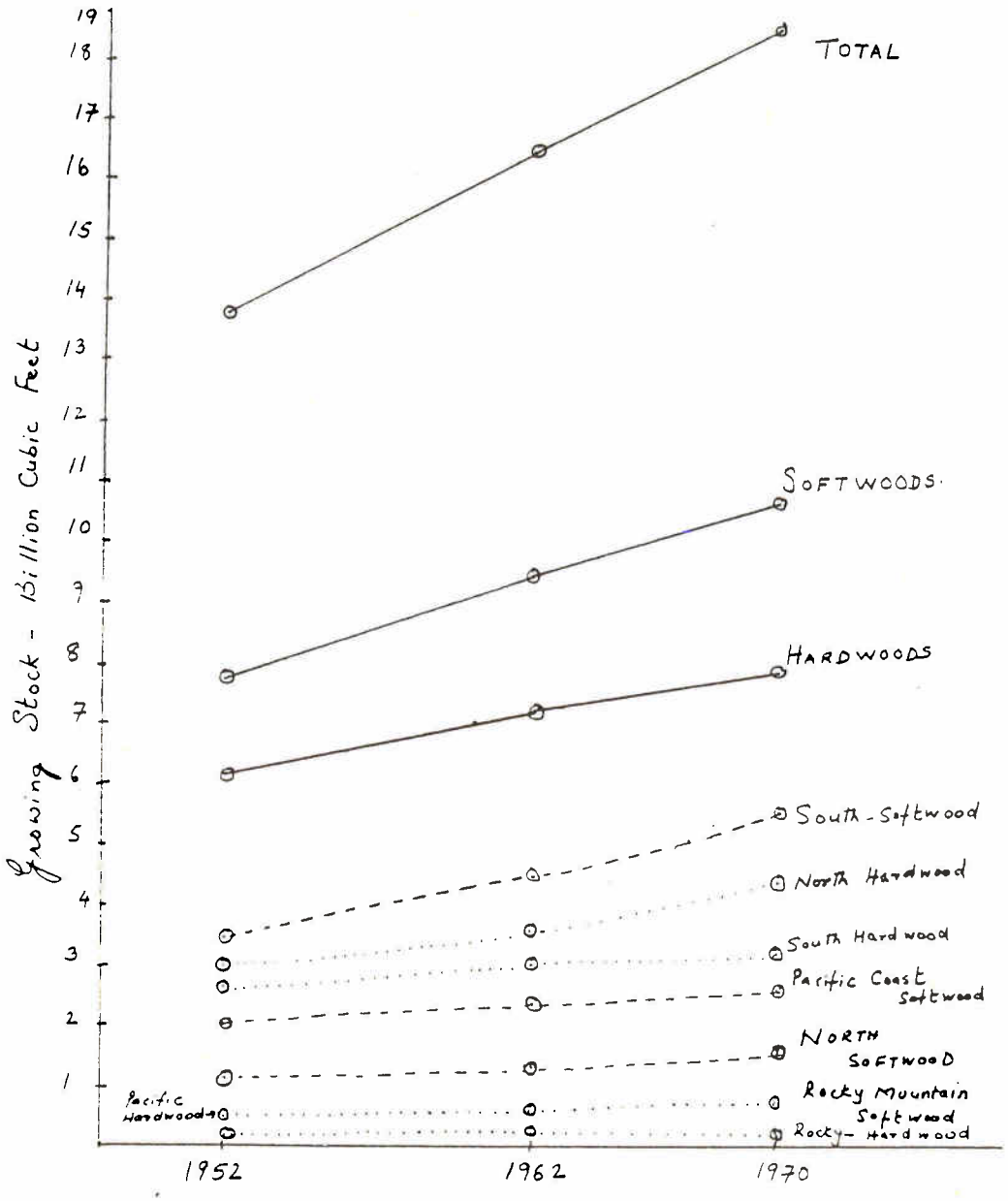
Export Prices of U.S. Wheat and Corn



Source: Johnson, 1980; see Simon, 1981, p. 74.

Figure 5

Net Annual Growth on Commercial Timberland



Source: U.S. Department of Agriculture, Perspectives on Prime Lands, p. 21.

Service and the National Agricultural Lands Survey are so wrong on this key figure, there is little reason to believe their other findings, which form the main source of data for all the recent stories in the media.

The mechanism enabling all these good things to happen at once is increased farm productivity, as seen in Figure 1. This increased productivity is relatively recent, starting in the late 1930s.

One may wonder whether some sort of subtle exploitation of existing capital is causing all these good things. Is all this happening at the expense of destroying prime land and lowering the quality of agricultural land? To the contrary, the quality of the cropland in use has been going up year by year. Notes the Soil Conservation Service:

> The quality of cropland has been improved by shifts in land use. In 1975, 86 percent (344 million acres) of America's cropland (400 million acres) was in capability classes I-III, compared with 83 percent in 1967 and 1958. In 1975 only 10 percent of the cropland was in capability class IV, compared with 11 percent in 1967 and 1958. Cropland in capability classes V-VIII also declined--in 1975 it was 4 percent, compared with 5 percent in 1967 and 6 percent in 1958.[9]

NALS-SCS NUMBERS DO NOT SQUARE WITH OTHER NUMBERS

What then is the basis of the widely publicized claims that the U.S. is losing farmland at a rate dangerous to future nutrition and economy? National Agricultural Land Survey and Soil Conservation Service staffers do not deny that the trends described above are correctly represented. They say, however, that there has recently been a major break with the past in the rate of urbanization of farmland, that recent history is fundamentally different than in earlier decades. More specifically, they say that the rate of conversion of farmland jumped around 1967 from less than 1 million acres a year to around 3 million acres a year. Upon examination, however, this evidence appears flawed.

1. SCS Conversion Data. SCS shows (see Table 1) the biggest loss of agricultural land in general, and of cropland in particular, in the South--12.0 out of 23.2 million total acres, and 2.5 out of 5.4 (given in one source as 4.8) million cropland acres respectively.[10] But the land story of the South in recent decades has been the massive abandonment of cropland to forest and to scrubland simply because it is no longer economical to farm cotton and similar crops.

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9 Ibid., p. 2.
10 Ibid., p. 15.

Table 1
Agricultural Land Converted to Urban, Built-up, Transportation and Water Uses by Selected Census Regions and Former Agricultural Uses From the NRI Data Series, 1967 to 1975

(Million Acres)

Census Region	Cropland	Pastureland and Rangeland	Forestland	Other Agricultural Uses	Total
West	0.7	1.3	0.5	0.5	3.0
North Central	1.6	0.8	0.7	2.1	5.2
South	2.5	2.1	3.9	3.5	12.0
North East	0.6	0.1	1.4	0.9	3.0
Total	5.4	4.3	6.5	7.0	23.2

Source: "Potential Cropland Study," USDA-SCS, 1977.

Note: In its text, the NALS talks about 24 million acres--17 million connected to urban and 7 to water. Therefore their usage has been adopted in the text, despite the 23.2 million acre total in this table.

That there is something wrong with the SCS land conversion data may be seen in an analysis of purported conversion of agricultural land to urban and water in the Southeast. The Southeast states alone--Florida, Georgia, North Carolina, and South Carolina account for 5.9 million acres, fully 25 percent of the 23.2 million total U.S. acres said to be converted to urban uses (the 1967-1977 NALS estimate is 29 million acres).[11] These states contain about 7.7 percent of total U.S. population. This seems implausible. Nor have these states accounted for such a huge preponderance of recent population increase.

Part of the explanation of these numbers for the Southeast is that much of it is conversion to water--3.3 million other acres of the total 5.9 million acres in the Southeast[12]--and this does not seem to signal an agricultural problem of any sort. This is probably mostly swamp;[13] because this quantity is much larger than the 2.6 million acres they estimate as having shifted into urban uses in the Southeast, it clearly does not represent reservoirs or other bodies of water for urban uses. (Chances are that much of the 3.3 million acre shift is simply due to reclassification

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11 Ibid., pp. 3, 5.
12 Ibid., p. 5.
13 Ibid., pp. 3-4.

of the Everglades.) Furthermore, the 2.6 million acres said to be urbanized in the Southeast is about 15 percent of the U.S. total of the 17 million acres. This suggests that some land that simply went out of cropland use probably became recorded as urban. Much of the South has done just that--either become forest or gone out of use entirely.

These conversions in the South are a substantial chunk of NALS's all-U.S. figures; removing them would lower the loss figures by about half. The same is true of the Northeast. In New Hampshire the tillable area was 2,367,000 acres in 1860; by 1974 it had declined to 172,000 acres,[14] though New Hampshire now has lots of forest. Would it make sense to worry about loss of farmland in places like New Hampshire? The land went out of cultivation because it was stony and hilly, and because crops grow cheaper in the Midwest, not because of encroaching cities.

2. Effects of Drainage. At last estimate, between 1.3 and 1.7 million acres a year of new cropland are being created by drainage of swamps, irrigation, and so on.[15] This was more than the million or so acres a year of cropland that was being urbanized up through 1970--and probably up to the present.

3. Population Growth's Impact. The best method for studying the rate of urbanization is aerial photography. No nationwide study has been done yet, but Zeimetz, et al. (1976) studied photographs of the 53 counties that grew fastest between 1960 and 1970, and Fischel (1981) reanalyzed their findings. These counties accounted for 20 percent of the total population increase for the U.S. during those years. But they required only 85,560 additional acres for urbanization. This increase represented only a 23 percent increase in urbanized area in these fastest growing counties. One would reasonably expect that the rate of increase in less rapidly growing counties would therefore be less than 23 percent. Yet the NALS figures imply a much higher rate for the U.S. as a whole, an increase of 47 percent for the entire country between 1967 and 1977, or a 26 percent increase for the shorter 8-year period from 1967 to 1975. It seems most implausible that the U.S. as a whole should have a much higher rate of urbanization than do the fastest growing counties.

If the rest of the U.S. were to require additional urban land at the same ratio of land per person as the fastest growing counties, the nationwide increase would have been 427,800 acres converted yearly to urban uses, according to Fischel. Compare this with the 2 million acres figure from the 1967-1975 Potential Cropland Study estimate, or the 2.9 million (or 3.3 million) acres estimate from the 1967-1977 National Resource Inventory comparisons.

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14 Barlow, 1978, p. 48.
15 Cotner, et al., 1975, p. 10.

4. Loss of Prime Farmland. SCS and NALS offer large amounts of data on the overall agricultural land base, which includes pastureland, rangeland, forest, etc. Yet such data tell virtually nothing about the subject of central interest--loss of prime farmland (or of any farmland) to urbanization. The vast shifts back and forth between farmland categories occur for a variety of farming decisions, as well as differences in classification decisions for the same land in the same use. This obscures shifts from farmland to urban uses when the urban category is treated as a residual--as is the case with some NALS-SCS estimates. For example, according to NALS, between 1967-1978, 74.2 million acres shifted out of cropland, but another 48.7 acres shifted into cropland.[16] These shifts dwarf urbanization shifts. Therefore, urbanization rates can be well estimated only from direct data on urbanized acres, and such data are not developed by the various SCS Inventories.

5. Disagreements with the USGS. The U.S. Geological Survey became worried because SCS data showed much more urbanized area than the Survey's. USGS therefore compared its very careful aerial photography method for selected counties, within four of the states in which its work was already done, against the SCS data collected by district conservationists from maps and other materials in a rather hit-or-miss manner. USGS found very large discrepancies due to SCS errors in three or four states, including a discrepancy of over 2 million acres in Florida. The discrepancies amount to 28 percent of the total of urbanized land estimated by SCS, a huge amount.

6. The Source of Measurement Error. The NALS case for large conversions of farmland to urban use is based entirely upon the 1975 Potential Cropland Study.[17] (Even NALS mostly rejects other SCS data comparisons as wildly inaccurate for this particular purpose.) But from all the information available, the amount of data collected in that PCS study is far too small to support the urbanization estimates NALS makes. It can be figured roughly as follows: in each of 506 counties in their sample, there were nine 160-acre plots selected.[18] Within each of the plots, there were nine observations, but they contain little more information than a single observation for this purpose. It can therefore be assumed there were about 4,554 observations.

From the tables in the Potential Cropland Study, it can be calculated that about 1/240 of U.S. land was converted to urban

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16 NALS Final Report, 1981, p. 12.

17 Ibid., p. 5.

18 Because the plots were within 506 of the counties rather than chosen more widely among the 3,000-plus counties of the U.S., they contain somewhat less information than they otherwise would.

areas from prime categories between 1967 and 1975. Multiplying this by 4,554 suggests that about 19 plots showed a change from prime to urban. Obviously 19 observations would be thoroughly inadequate information for the U.S. as a whole, let alone individual regions for which SCS also made estimates.

There are also important likely sources of measurement error and bias in the SCS survey procedures. Perhaps the most serious problem is that there was a progressive narrowing in the agricultural land sampling frame, which necessarily biases the estimates in the direction of showing more conversions than actually occurred. As soon as a plot is designated "urban," it is removed from the sampling frame and cannot subsequently be classified as "agricultural" even if the original designation was in error. And there is no possibility in the procedure for counterbalancing errors of previously classified urban land being classified as agricultural, because urban land was never reexamined after it was taken out of the agricultural inventory. This and other measurement errors are discussed in detail in Simon and Sudman, 1981, a paper that also systematically describes the SCS survey procedures.

DOES FARMLAND PRESERVATION MAKE SENSE ECONOMICALLY?

The preoccupation with the loss of prime land involves a fundamental misunderstanding of economic principles. Take the example of a new shopping mall, called Market Place, near Champaign-Urbana, Illinois. Wonderful though this Illinois land is for growing corn and soybeans, it has greater value to the economy as a shopping center, which is why the mall investors could pay the farmer enough to make it worthwhile for him to sell.

Suppose that the corn-and-soybeans farmer who owned the land sold it instead to the producer of an exotic new crop called, say, "whornseat," a hybrid of corn and wheat. The land would be more productive growing whornseat than corn, as shown by the higher profits the whornseat farmer would make as compared with the corn-and-soybeans farmer, and also by the higher price the whornseat farmer was willing to pay for the land. Under these conditions, no one would ever argue that the land should be required to remain in the production of corn and soybeans.

A shopping mall is similar to a whornseat farm. It seems different, however, because the mall does not use the land for agriculture. Yet economically there is no real difference between the mall and whornseat farming.

One may say: "Why not put the shopping mall on inferior wasteland that cannot be used for corn and soybeans?" The mall owners would be delighted to find and buy such land--so long as it were equally convenient for shoppers. But there is no such wasteland close to town. And wasteland far away from Champaign-Urbana is like land that is not fertile for whornseat--the latter will not produce whornseat and the former will not produce shoppers.

Some may argue that the U.S. should "keep the options open," because "paving is irreversible." In fact, paving is not irreversible. More important, keeping options open costs real resources. Stockpiling food in one's basement in case of possible calamity may be wise, but one loses the use of the money tied up in the food inventory. So it is with farmland: if it is kept from other uses, no other benefits are derived in the meantime. These benefits must be greater than can be obtained from farmland in agriculture, or investors would not be willing to convert the land from farmland to other uses.

WHY IS THIS HAPPENING?

Why are reporters writing and broadcasting scare stories about "the loss of prime farmland" that bear no relationship to the facts about land-use patterns or to economic understanding? Why do many well-intentioned persons conclude that the loss of farmland is indeed occurring? And who is responsible for creating the near religious enthusiasm that farmland should not be converted to other uses?

The complexity of the economic system's responses to people's needs for food and housing can easily cause misunderstanding that leads to calls for preservation of farmland. But saving cropland for agriculture is, for some, a front for other concerns. Pierre Crosson, a judicious editor of a recent conference volume on the general topic, notes two of these hidden agenda:

> (1) some of those ostensibly concerned with the adequacy of land as a factor of agricultural production are really concerned about it as a source of amenity values.... If much of the concern about the adequacy of agricultural land is really concern with preservation of amenity values rather than of productive capacity, why is the discussion typically cast in terms of [esthetic] issues and the capacity issues not treated separately, as they should be? One cannot be sure, but two reasons come to mind. One is muddled thinking, a simple failure to recognize that agricultural land provides both commodity values and amenity values, but not in fixed proportions. The other reason is that maintenance of capacity is more likely to enlist political support for preservation of agricultural land than maintenance of amenity values. This reason is likely to be particularly compelling if the objective is to shape national policies for agricultural land preservation. Threats to our ability to feed ourselves and meet our felt obligations to a hungry world are more likely to mobilize a political response to pressure agricultural land than threats to the pleasures of a Sunday afternoon drive through the countryside.[19]

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[19] Crosson, 1981, pp. 4-6.

(2) Some who argue for preservation of agricultural land to protect capacity do so to cloak purely private interests, e.g., some farmers in metropolitan areas who seek to have their land taxed at its value in agriculture rather than at its value in urban uses.[20]

The latter group has had particular success in achieving favorable zoning laws in such Eastern states as New York, where the farmers have obtained lower tax rates while the land is used for farming, but at the same time retain the right to sell the land for other uses.

Independent individuals and local environmental and farmers' organizations have been interested in the subject for some time and have campaigned successfully to obtain zoning changes and other farmland preservation laws in many places. But these scattered individuals and organizations have recently received a tremendous boost from the greatly increased interest in Washington. Congressman James M. Jeffords (R-VT) some years ago sponsored a bill to preserve farmland. An aide of his at the time was Robert Gray. The bill failed, but in 1979 the National Agricultural Lands Study was formed. It was a joint creature of the Council on Environmental Quality and the Department of Agriculture, with the participation of other government agencies including eight Departments, the Environmental Protection Agency, and the Water Resource Council. Toward the end of the Carter Administration, another organization called The American Farmland Trust--over the signature of Douglas Wheeler--began to solicit funds to preserve farmland, without saying how the money would be used. After the organization became more sophisticated, and after the Carter Administration was defeated, the same Robert Gray and Cecil Andrus appeared as important functionaries of the American Farmland Trust.

CONCLUSION

The vast majority of agricultural economists--and this issue surely lies in the domain of the agricultural economists--do not regard the loss of prime farmland as a national problem. For example, Marion Clawson of Resources for the Future, says "We're not very worried around here about the loss of prime farmland." Clifton B. Luttrell at the St. Louis Federal Reserve Bank finds that "there is no evidence that the quantity of cropland is shrinking or that shortages of food are imminent. Furthermore, even if the alleged problem did exist, there is no evidence that it could be solved more efficiently by social planning than by market participants."[21]

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20 Ibid., p. 31.
21 Luttrell, 1981, p. 11.

Philip Raup, an agricultural economist at the University of Minnesota, views the key competition as not between cropland and built-up land, but rather between cropland and forest. And he says, "The short-term prospect is for a substantial reduction in the pressure of urban demand on rural lands."[22] Pierre Crosson summed up a Resources for the Future Conference by saying that the consensus of the distinguished participants was that, "while one should not be complacent about the agricultural land issue neither is it a matter of pressing current national concern."[23]

Geographer John Fraser Hart ended his review of "Urban Encroachment on Rural Areas" with this question: "If urban encroachment on rural land is not a serious problem in the United States, then why has so much arrant nonsense been written and spoken on the subject?...," and then answers: "It is all too easy for the layman to generalize New York to the entirety of urban America or to believe that the unique agricultural situation in parts of California is typical of the entire nation. Some people seem to want to believe that the world is going to hell in a handbasket, and some simply do not know any better than to repeat what they have read or what someone else has told them."

In short, net agricultural land capacity is increasing, not decreasing. The claim that urbanization endangers our capacity to grow food is employed to justify calls for government policies to restrict free exchange and utilization of farmland. This is one of the package of unfounded pessimistic forecasts and calls for governmental interference from those who believe that physical limits increasingly constrain progress and growth. In fact, with every successive century and decade, physical elements are less and less of a constraint upon economic progress. The motivation of at least some of those involved in this movement is the desire to preserve the past--to avoid change. The obstacles to growth that arise from this motivation are a key impediment to progress that has no known physical limits.

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22 Raup, 1980, p. 50.
23 Crosson, 1981, p. 2.

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