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## 2007 NATIONAL RESOURCES INVENTORY: CHANGES IN LAND COVER/USE

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### ABSTRACT

The National Resources Inventory (NRI) is the most comprehensive natural resource database in the United States tracking conditions and trends on non-federal land from 1982 to 2007. The NRI is conducted by the USDA Natural Resources Conservation Service (NRCS) in partnership with statistical researchers at Iowa State University. In addition to providing information about soil erosion, wetlands and conservation practices, the NRI is the best source for agricultural land conversion data. The 2007 NRI, dated December 2009, was released on April 27, 2010. This technical memo provides general information about the 2007 NRI and a more detailed discussion of changes in land cover/use.

### HIGHLIGHTS

The 2007 NRI data show that between 2002 and 2007 nearly 7.5 million acres of rural land were converted to developed uses. Of this amount, 4 million acres were agricultural land (crop, Conservation Reserve Program (CRP), pasture and range land). This translates to an average agricultural land conversion rate of more than 800,000 acres per year between 2002 and 2007—a 21 percent decline from the average annual rate reported for 1997 to 2002. Between 1982 and 2007, 23 million acres of agricultural land were converted to developed uses. This represents an area the size of Indiana.

### DESCRIPTION

The NRI is a statistically valid survey of the nation's non-federal lands. It documents natural resource conditions and trends, including the conversion of agricultural land to developed uses. Important data elements include, but are not limited to:

- Land cover and land use (e.g., developed areas, water areas, crop and forest land),
- Soil erosion,
- Selected conservation practices, and
- Wetlands.

The NRI was conducted every five years from 1977 to 1997 by the NRCS in cooperation with Iowa State University's statistical laboratory. Following the 1977 NRI, the NRCS expanded the scope of the inventory and significantly increased the sample size. The 1982 NRI became the baseline.

In 2000, the NRCS began collecting data from a subset of sample segments on an annual or continuous basis to help balance workloads and enable the agency to respond to emerging issues. The change took several years to implement. During this time, only selected national-level estimates were released as elements of annual NRIs. Now that the transition is complete, the NRCS intends to issue major releases of data—including state-level estimates—every five years. The 2007 NRI includes estimates for six different reporting periods spanning 25 years (1982 to 2007). Figures are statistically significant at the national and state levels.

### FUNCTIONS AND PURPOSE

The NRI was developed to fulfill NRCS reporting requirements and to help measure the effectiveness of conservation practices and programs. Resource inventory activities were authorized by the federal Rural Development Act of 1972. The act directed the U.S. secretary of agriculture to create a land inventory and monitoring program and to report on the conditions and trends of soil, water and related resources at regular intervals not to exceed five years. The Soil and Water Resources Conservation Act of 1977 and the Food Security Act of 1985 underlined the need for a periodic assessment of the nation's natural resources.

### DATA COLLECTION

The NRI sample contains about 300,000 sample segments and 800,000 specific sample points. Sample segments are blocks of land that range in size from 40 to 640 acres but are typically equivalent to 160-acre quarter-sections. Sample points are specific locations within sample segments. Now, staff examine nearly a quarter of sample segments each year.

For the 2007 NRI, NRCS staff primarily used geospatial technologies and other remote sensing techniques to monitor natural resource conditions and trends. They supplemented this information with on-site visits and ancillary materials, such as field office records and NRCS soil surveys.

Statistical researchers at Iowa State University expand data gathered from sample segments and sample points to develop national and state estimates. Information collected prior to 2007 was reviewed and adjusted during the most recent inventory to correct past reporting errors and update figures obtained from other sources. All figures, including those from earlier reporting periods, have changed. For these reasons, comparisons between two reporting periods *must* be based on the data released with the 2007 NRI.

### USES

The NRI is the most comprehensive natural resource database in the United States. In addition to providing information about soil erosion, wetlands and selected conservation practices, the NRI is the best source for agricultural land conversion data. The NRI reports on *all* land use changes over a given time period. In particular, the NRI documents the amount of crop, CRP, range and pasture land converted to developed uses over a given time period.

Many individuals use the Census of Agriculture to try to understand agricultural land conversion. However, the census only captures *net* changes in “land in farms” and does not explain what happened to land taken out of production or where additional acres came from. Decreases in “land in farms” do not necessarily equal the amount of farmland developed. The census supplies a wealth of information about agricultural production and operator characteristics, but it does not provide a complete picture of land use trends.

### LIMITATIONS

- NRI figures are estimates based on a statistically valid sample, not absolute values based on a census;
- Margins of error for some estimates may be relatively large; and
- County-level estimates are not available.

### AVAILABILITY

The 2007 NRI, dated December 2009, was released on April 27, 2010. Information about data collection, statistical reliability and national results is available at: <http://www.nrcs.usda.gov/technical/NRI>. The 2007 summary report contains background information about the NRI and a series of figures and tables that portray the data. Selected state data tables may be obtained by contacting NRCS state offices. Questions and requests for additional data can be submitted to the NRCS Help Desk at: [nri@wdc.usda.gov](mailto:nri@wdc.usda.gov).

### HOW TO READ THE TABLES

Tables 5, 6, 7, 8, 9 and 10 of the summary report depict changes in land cover/use for six different reporting periods. The numbers represent thousands of acres. Row headings refer to land cover/use at the beginning of the reporting period; column headings refer to the land cover/use at the end of the reporting period. Read the table horizontally to determine how a land use was distributed at the end of the reporting period. Read vertically to find out where land cover/use reported at the end of the reporting period came from. Instructions are provided at the bottom of each table.

For example, to determine how much agricultural land was developed between 2002 and 2007, read down the “Developed Land” column in Table 9 (attached). The table shows that 1,657,300 acres of crop; 500 acres of CRP; 1,310,200 of pasture and 1,112,300 acres of range land were converted to developed uses over five years.

To calculate the net change in land cover/use categories, subtract the total acres reported at the beginning of the reporting period (displayed in the last column of Tables 5, 6, 7, 8, 9 and 10) from the total acres reported at the end of the reporting period (displayed in the last row of Tables 5, 6, 7, 8, 9 and 10). For instance, between 2002 and 2007, developed land increased by 7,220,400 acres.

The state-level tables may break out data into additional land cover/use categories. Specifically, “Developed Land” may be reported in state tables as “Urban Built-Up” and “Rural Transportation”; “Cropland” may be expressed as “Cultivated Cropland” and “Non-Cultivated Cropland”; and “Water Areas and Federal Land” may be reported as “Small Water,” “Census Water” and “Federal.” These combinations are referenced in the glossary of terms included in the summary report.



## GLOSSARY OF SELECTED TERMS

**Developed Land:** A land cover/use category equal to the sum of urban and built-up areas and rural transportation land.

**Land Cover/Use:** General categories used to present NRI data that account for all the surface area of the United States. Land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of or human activity on the land.

**Other Rural Land:** A land cover/use category that includes farmsteads and ranch headquarters, other farm structures, field windbreaks, barren land and marshland.

**Rural Transportation Land:** A land cover/use category that includes highways, roads, railroads and associated

rights-of-way outside urban and built-up areas. This category includes private roads to farmsteads or ranch headquarters, logging roads and other private roads.

**Urban Built-Up Areas:** A land cover/use category that includes residential, industrial, commercial and institutional land, construction sites, public administrative sites, railroad yards, cemeteries, airports, golf courses, landfills, sewage treatment plants, dams and spillways, small parks within urban and built-up areas, and highways, railroads and other transportation facilities if they are surrounded by urban areas. Parcels less than 10 acres that are surrounded by urban built-up land also are included.

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**Table 9 - Changes in land cover/use between 2002 and 2007**

In thousands of acres, with margins of error

Land cover/use in 2002	Land cover/use in 2007								2002 total
	Cropland	CRP land	Pastureland	Rangeland	Forest land	Other rural land	Developed land	Water areas & Federal land	
<b>Cropland</b>	352,866.1 ±2,667.8	1,729.3 --	7,974.4 ±850.0	1,279.6 ±528.3	673.7 ±352.1	828.0 ±211.9	1,657.3 ±138.3	91.2 --	367,099.6 ±2,242.8
<b>CRP land</b>	365.9 --	31,008.7 --	347.5 --	77.5 --	182.1 --	4.7 --	0.5 --	3.4 --	31,990.3 --
<b>Pastureland</b>	2,975.4 ±558.5	110.4 --	109,574.8 ±2,079.6	1,508.4 ±708.9	1,865.0 ±504.4	367.6 ±138.0	1,310.2 ±182.9	71.2 --	117,783.0 ±1,770.8
<b>Rangeland</b>	449.4 ±297.4	0.9 --	69.4 ±45.2	405,891.3 ±3,805.1	307.2 ±374.6	326.3 ±191.6	1,112.3 ±176.5	52.4 --	408,209.2 ±3,713.4
<b>Forest land</b>	55.6 ±59.1	0.9 --	348.7 ±185.3	105.5 ±149.5	402,874.8 ±3,002.2	453.0 ±210.3	3,236.1 ±131.0	181.8 --	407,256.4 ±3,020.5
<b>Other rural land</b>	227.0 ±61.6	0.0 --	231.9 ±121.2	220.4 ±158.7	346.2 ±255.3	47,649.6 ±1,342.4	174.9 ±28.3	81.3 --	48,931.3 ±1,332.4
<b>Developed land</b>	58.7 ±12.0	0.0 --	54.6 ±9.0	31.1 ±7.6	124.9 ±15.5	8.1 ±11.8	103,753.0 ±1,261.9	0.4 --	104,030.8 ±1,269.0
<b>Water areas &amp; Federal land</b>	25.4 --	0.0 --	14.4 --	5.6 --	36.5 --	2.3 --	6.9 --	452,272.5 --	452,363.6 --
<b>2007 total</b>	357,023.5 ±2,688.7	32,850.2 --	118,615.7 ±2,347.0	409,119.4 ±3,992.9	406,410.4 ±3,065.4	49,639.6 ±1,359.1	111,251.2 ±1,499.4	452,754.2 --	1,937,664.2 ±163.8

**Notes:**

- Acreages for Conservation Reserve Program (CRP) Land and Water areas and Federal land are established through geospatial processes and administrative records; therefore, statistical margins of error are not applicable and shown as a dashed line (--). CRP was not implemented until 1985.
- Cropland includes cultivated and noncultivated cropland.
- When the estimate is 0.0, margins of error are not applicable and shown as a dashed line (--).
- Instances where the margin of error is greater than or equal to the estimate are displayed in italics indicating that the confidence interval includes zero and that the estimate should not be used.

2002 land cover/use totals are listed in the right hand vertical column, titled 2002 total. 2007 land cover/use totals are listed in the bottom horizontal row, titled 2007 total. The number at the intersection of rows and columns with the same land cover/use designation represents acres that did not change from 2002 to 2007. Reading to the right or left of this number are the acres that were lost to another cover/use by 2007. Reading up or down from this number are the acres that were gained from another cover/use by 2007.

