

Report on the Environment

<https://www.epa.gov/report-environment>

Land Use

Land use is the purpose of human activity on the land. Unlike land cover, land use may not always be visible and may not be inferable from land cover. For example, a unit of land designated for use as timberland may appear identical in land cover to an adjacent unit of protected forestland or, if recently harvested, may appear not to be forest land cover at all. Land use is generally designated through zoning or regulation and is one of the most obvious effects of human habitation on the planet. It can affect both human health and ecological systems, for example by changing hydrologic responses in a watershed, contributing to potential erosion, changing the condition or contiguity of plant and animal habitat, and enhancing the spread of vector-borne diseases.

This indicator tracks trends in the acreage of major land uses over the 1977-2012 period using several data sources. These sources do not always cover the same time period, sample the same resource or geography, or use the same definitions, but each provides an important piece of the land use picture over time. See the [definitions page](#) for a detailed description of each land use category.

The National Resources Inventory (NRI) conducted by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) was used to track trends in “crop and pasture” land (row crop, orchard, and pasture uses) and “developed” land (residential, commercial, industrial, and transportation uses). The NRI developed estimates every 5 years on non-federal lands in the contiguous U.S. between 1977 and 1997, and annual estimates based on a smaller sample size beginning in 2001.

The Forest Inventory and Analysis (FIA) surveys conducted by the USDA Forest Service were used to track trends in forest and timberlands. The FIA surveys include both private and public land in all 50 states. The FIA previously assessed forest and timberland acreage every 10 years, but the data are now updated on a rolling basis using surveys that sample a different portion of FIA sites every year.

The USDA National Agricultural Statistics Service (NASS) Census of Agriculture was used to track trends in the extent of cropland, cropland used only for pasture, pastureland, and rangeland. NASS data are available for 1997, 2002, 2007, and 2012.

The USDA Economic Research Service (ERS) provides data on the extent of grassland, forested rangeland, and other land uses for 5-year intervals from 1982 through 2012 and for selected prior years.

What the Data Show

The acreage of land used for growing food and forage crops has declined since 1982, while developed land has increased and timberland has remained approximately constant (Exhibit 1). As of 2012, estimates from both the NRI and the NASS indicate that between 362 and 377 million acres were used for food crop production—approximately 16 percent of the 50-state U.S. land area.

Estimates of pasture or land used to support forage for livestock vary, depending on the data source and definitions (Exhibit 1). The NRI classifies 122 million acres as pasture, while the NASS, following a methodological change between 2002 and 2007, classifies about 13 million acres as

cropland used for pasture in 2012, which is a substantial decrease from 1997 (about 81 percent). The NASS classifies 415 million additional acres as pasture or rangeland for grazing. The broader ERS estimate of land available for grazing totals about 655 million acres, and includes grassland and other non-forested pasture and range. If forest lands used for grazing and cropland pasture are also included, the total estimate for grazing lands is 798 million acres for 2012, representing 35 percent of U.S. land area.

NRI cropland declined by 58 million acres (14 percent) between 1982 and 2012. NASS shows only a slight decrease in the extent of cropland (2 million acres) between 1997 and 2012.

According to the NRI, 5 percent (113.7 million acres) of U.S. land area was considered developed as of 2012 (Exhibit 1) (The land *use* classification for developed land uses NRI data and is considerably different from the land *cover* classification for developed land, which uses NLCD data. See the [Land Cover indicator](#) for more information.) This represents a gain of 58 percent (41.6 million acres) since 1982. While the amount of developed land is a small fraction of the total, its ecological impact can be disproportionately high relative to other land use types. Paving and the creation of other impervious surfaces can change local hydrology, climate, and carbon cycling, leading to increased surface runoff, pollution, and degradation of wetlands and riparian zones.

Forest lands are managed by a complex array of interests to meet multiple purposes, including providing habitat for a variety of species, recreation, and timber production. While forest is a land *cover* classification, timberland is a land use classification that reflects forest land capable of producing at least 20 cubic feet per acre per year of industrial wood and not withdrawn from timber utilization by statute or regulation. Approximately 521 million acres of U.S. forest land, or 23 percent of the total U.S. land area, qualified as timberland in 2012 (Exhibit 1). This total reflects a net gain of about 29 million acres (6 percent) between 1977 and 2012.

Land use varies widely by EPA Region (Exhibit 2). According to the most recent data for each land use type, Regions 6, 8, and 9 together have more than three-quarters of the nation's grazing land, while Region 4 has the largest portion of timberland (27 percent of total U.S. timberland).

Trends also vary widely among regions. About 83 percent of the cropland lost in the U.S. between 1982 and 2012 was in five EPA Regions (Regions 4, 5, 6, 7, and 8) (Exhibit 3). Increases in developed land are responsible for part of this decline; for example, developed land increased by 91 percent from 1982 to 2012 in Region 4 (Exhibit 3). Other factors include the federal Conservation Reserve Program, which has assisted private landowners in converting about 30 million acres of highly erodible cropland to vegetative cover since 1985 (as of 2012) (Bigelow and Borchers, 2017).

Limitations

- Estimates are derived from a variety of inventories and samples, conducted over different time periods and for different purposes. This limits the ability to integrate the data and track changes over time.
- The NRI does not report land use data for Alaska, which encompasses 365 million acres of the 2.3 billion acres nationwide. The NRI also does not provide data on federal lands (representing 20 percent of the contiguous U.S. land and one-third of Alaska). Because federal land is seldom used for agriculture or urban development, and there is relatively little developed or agricultural land in Alaska, the NRI data likely offer a reasonable approximation of national trends in these categories.
- NRI data use three subcategories of types of developed land: large built-up areas, small built-up areas, and rural transportation land. Because ecological effects from developed land

depend on the density of development and many other factors, the limited NRI categories are not discriminating enough to support detailed analyses of ecological effects of developed land.

- The FIA data are aggregated from state inventories in many cases, and dates of data collection for these inventories vary by state—for example, ranging from 2005 to 2011 for estimates reported in 2012.
- Some land uses may be administratively designated but not physically visible (e.g., lands that are reserved for parks or wilderness may appear similar to lands that are managed for natural resources).
- Land use designations are most frequently managed and monitored by local governments, each using different approaches and classifications. This makes national summaries difficult.
- The extent of lands used for energy production, resource extraction, or mining is not known and represents a data gap.
- Lands specifically protected for certain uses such as wilderness or parks have been periodically inventoried for the nation. These statistics are currently not reported in a form that allows comparison with other statistics.

Data Sources

Data were obtained from several original sources and compiled by EPA Region. ERS data were obtained from Bigelow and Borchers (2017). FIA data were obtained from Oswalt et al. (2014). NASS data were published by the USDA NASS (2014). NRI data were obtained from USDA NRCS (2018).

References

Bigelow, D.P., and A. Borchers. 2017. Major uses of land in the United States, 2012. U.S. Department of Agriculture, Economic Research Service.

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Oswalt, S.N., W.B. Smith, P.D. Miles, and S.A. Pugh. 2014. Forest resources of the United States, 2012. General Technical Report WO-91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. https://www.srs.fs.usda.gov/pubs/gtr/gtr_wo091.pdf (PDF) (228 pp, 14.3MB).

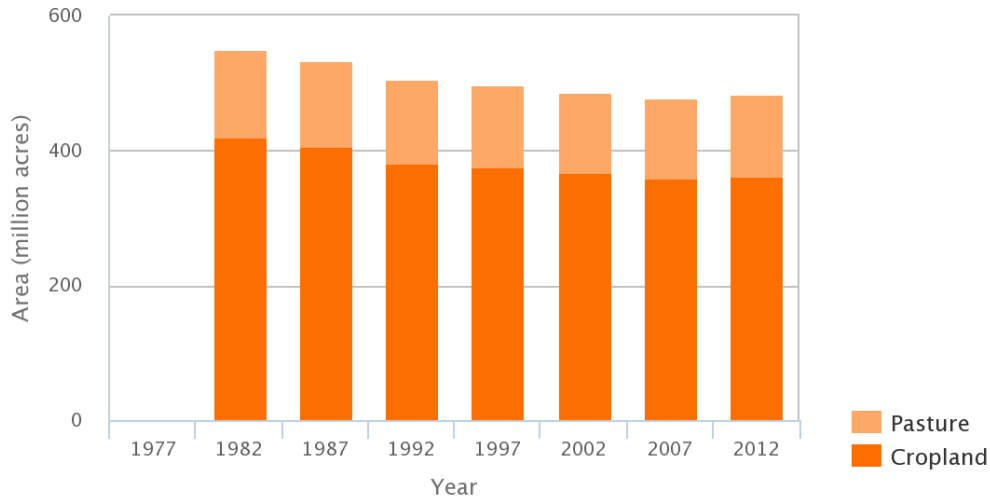
USDA NASS (United States Department of Agriculture, National Agricultural Statistics Service). 2014. 2012 Census of agriculture, United States summary and state data. Report AC-12-A-51. <https://www.nass.usda.gov/Publications/AgCensus/2012/>.

U.S. Department of Agriculture. 2018. Summary report: 2015 National Resources Inventory, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/nri/>.

Exhibit 1. Land use trends in the U.S., 1977–2012

NRI pasture and cropland



Coverage: Contiguous 48 states excluding federal land.

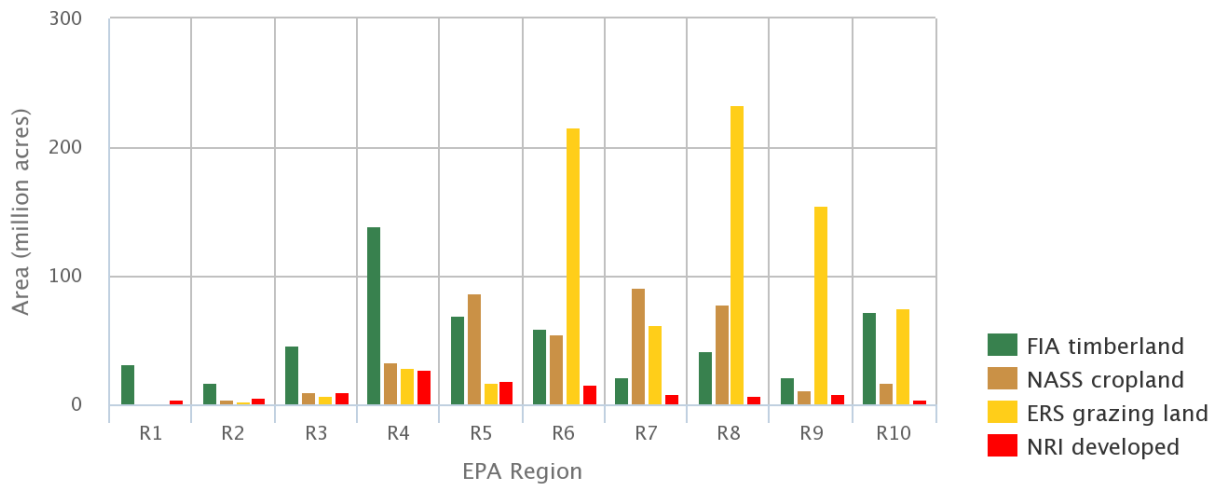
See text for definitions of land use categories.

Information on the statistical significance of the trends in this exhibit is not currently available. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: USDA NRCS, 2018

Visit <https://www.epa.gov/roe> to see the full exhibit.

Exhibit 2. Land use in the U.S. by EPA Region, 2012



Coverage: ERS: 50 states including the District of Columbia. FIA: 50 states excluding the District of Columbia. NASS: contiguous 48 states excluding the District of Columbia. NRI: contiguous 48 states excluding federal land.

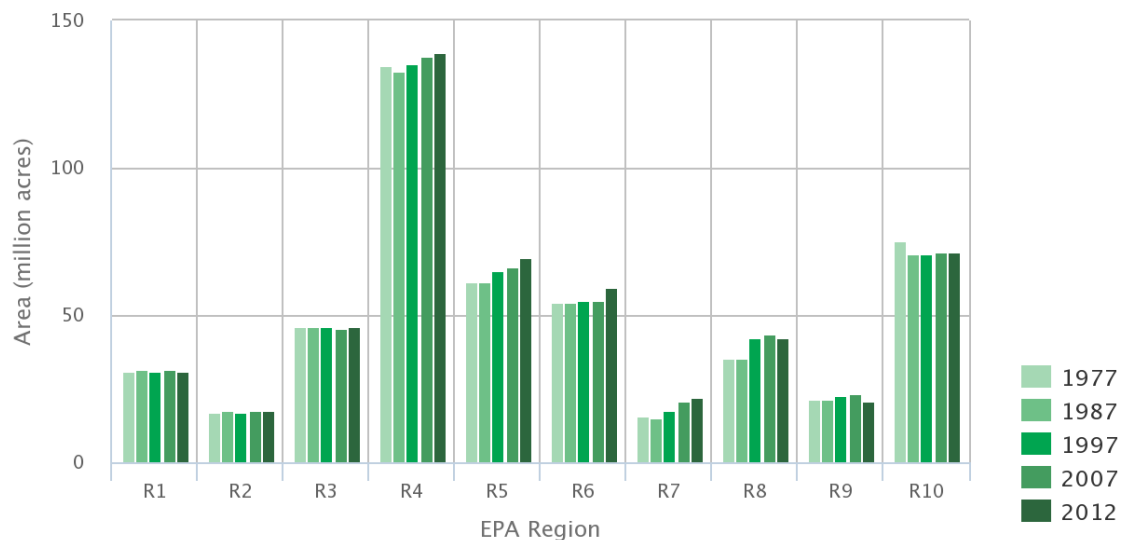
See text for definitions of land use categories.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: Bigelow and Borchers, 2017; Oswalt et al., 2014; USDA NASS, 2014; USDA NRCS, 2018

Exhibit 3. Changes in land use in the U.S. by EPA Region, 1977–2012

Timberland



Coverage: 50 states excluding the District of Columbia.

This graph shows timberland as defined by the FIA. See text for a detailed definition.

Information on the statistical significance of the trends in this exhibit is not currently available. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: Oswalt et al., 2014

Visit <https://www.epa.gov/roe> to see the full exhibit.