



2007 National Resources Inventory

Soil Erosion on Cropland

April 2010

About the Data

Estimates presented here are based upon the latest information from the National Resources Inventory (NRI). The NRI is a longitudinal sample survey based upon scientific statistical principles and procedures. It is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), in cooperation with Iowa State University's Center for Survey Statistics and Methodology.

These results are based upon the 2007 NRI, which provides nationally consistent data for the 25-year period 1982–2007. Current estimates cover the contiguous 48 States. Future estimates will also cover Hawaii, Alaska, and the Caribbean Area.

Release of NRI results is guided by NRCS policy and is in accordance with OMB and USDA Quality of Information Guidelines developed in 2001. NRCS is releasing NRI estimates only when they meet statistical standards and are scientifically credible in accordance with these policies; also, measures of statistical uncertainty are provided for all 2007 NRI estimates released to the public.

The National Resources Inventory (NRI) is a statistical survey of natural resource conditions and trends on non-Federal land in the United States. Non-Federal land includes privately owned lands, tribal and trust lands, and lands controlled by state and local governments.

The NRI provides nationally consistent statistical data on erosion resulting from water (sheet & rill) and wind processes on cropland for the period 1982–2007. To assess conservation issues this information must be analyzed in conjunction with other NRI data elements.

Soil erosion involves the breakdown, detachment, transport, and redistribution of soil particles by forces of water, wind, or gravity. Soil erosion on cropland is of particular interest because of its on-site impacts on soil quality and crop productivity, and its off-site impacts on water quantity and quality, air quality, and biological activity. Cropland includes cultivated and non-cultivated cropland.

The economic impact of mitigating soil erosion significantly burdens the agri-business sector and the Nation as a whole. Dust contributions to the atmosphere and delivery of sediment, nutrients, and chemicals to water resources are primary environmental concerns addressed by public policy makers and the stewards of our working lands. Understanding and managing these processes has important long term implications for cropland sustainability, natural resource condition and health, and environmental quality.

Key Findings

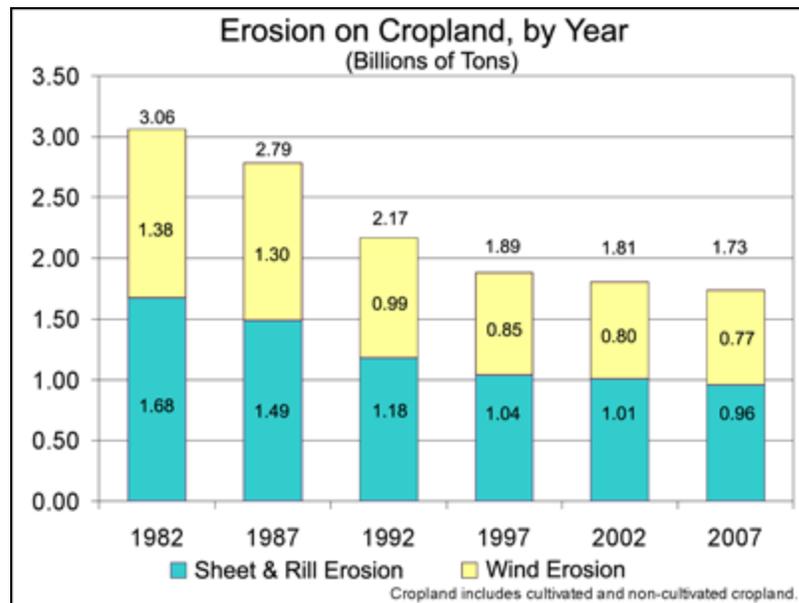
- Between 1982 and 2007, soil erosion on U.S. cropland decreased 43%. Water (sheet & rill) erosion on cropland in 2007 declined from 1.68 billion tons per year to 960 million tons per year, and erosion due to wind declined from 1.38 billion tons per year to 765 million tons per year. (Tables 18 and 19)

About the Data, Cont.

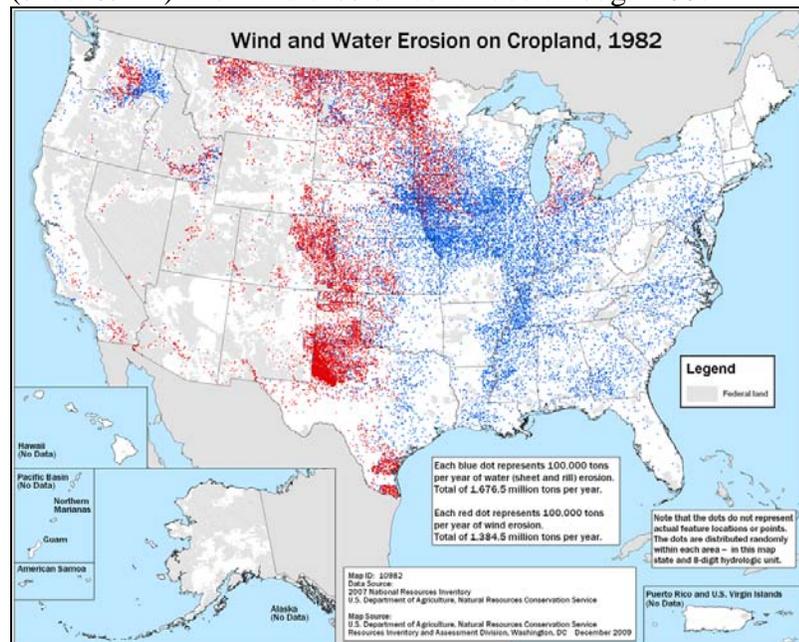
The findings presented here cover two types of erosion:

1. Water (sheet & rill) erosion - the removal of layers of soil from the land surface by the action of rainfall and runoff; it is the first stage in water erosion.
2. Wind erosion - the process of detachment, transport, and deposition of soil by wind.

Erosion rates computed from NRI data are estimates of average annual (or expected) rates based upon long-term climate data, inherent soil and site characteristics, and cropping and management practices. These estimates come from factors that are determined for the portion of a field associated with an NRI sample site. The factors are used in two erosion models: 1) the Universal Soil Loss Equation (USLE) and 2) the Wind Erosion Equation (WEQ). The factors for these erosion prediction equations are determined for each NRI sample site that is cropland, pastureland, or land enrolled in the Conservation Reserve Program.



- Erosion rates declined significantly between 1982 and 2007. Water (sheet & rill) erosion on cropland dropped from 4.0 tons per acre per year in 1982 to 2.7 tons per acre per year in 2007; wind erosion rates dropped from 3.3 to 2.1 tons per acre per year for the same time period. (Tables 18 and 19)
- Declines in soil erosion rates have moderated somewhat since 1997, but the general downward trend in both water (sheet & rill) and wind erosion continued through 2007.



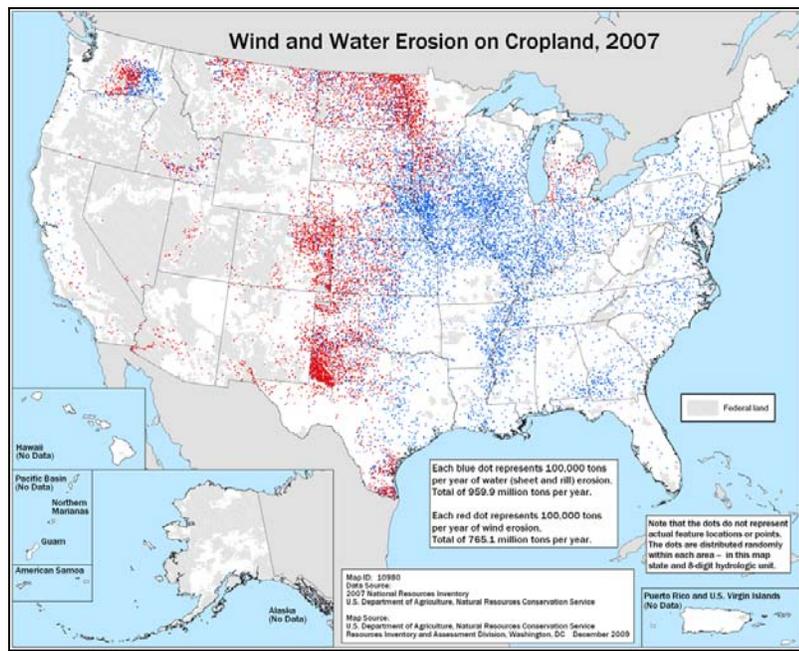
About the Data, Cont.

The erosion equation factors are also used to determine an Erodibility Index (EI) for these NRI sample sites. This index is a numerical expression of the potential of a soil to erode, considering climatic factors and the physical and chemical properties of the soil – the higher the index, the greater is the investment needed to maintain the sustainability of the soil resource base if intensively cropped. Highly Erodible Land (HEL) is defined to have an EI of at least 8.

The soil loss tolerance rate (T) is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given soil. Erosion is considered to be greater than T if either the water (sheet & rill) erosion or the wind erosion rate exceeds the soil loss tolerance rate.

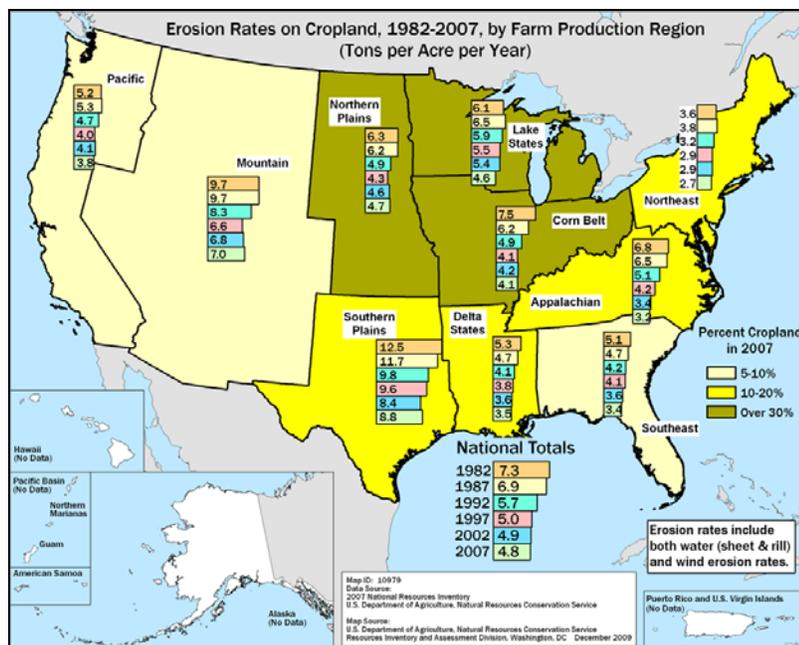
The NRI approach to conducting inventories facilitates examination of trends in erosion over time because –

- the same sample sites have been studied since 1982
- the same data have been collected since 1982 [definitions and protocols have remained the same]
- quality assurance and statistical procedures ensure that trend data are scientifically legitimate and unambiguous.



Due to climatic factors, soil characteristics, landscape features, and cropping practices, soil erosion is concentrated geographically.

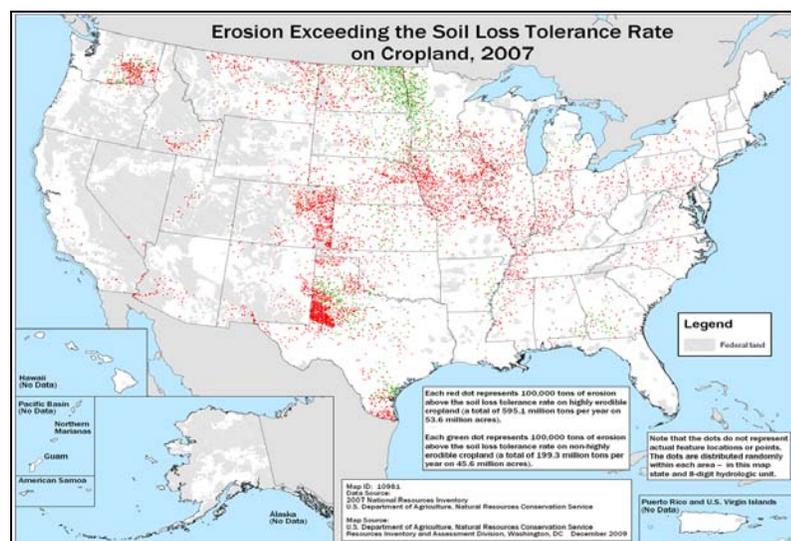
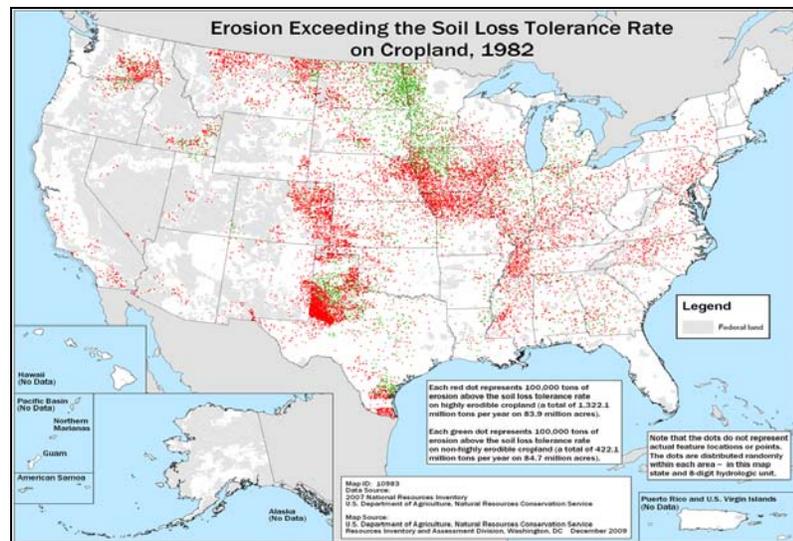
- Water (sheet & rill) erosion (2007)—54% occurred in just two of the 10 farm production regions—the Corn Belt and the Northern Plains. (Table 36)
- Wind erosion (2007)—93% occurred in four of the 10 farm production regions—the Northern Plains, Southern Plains, Mountain, and Lake States. (Table 37).



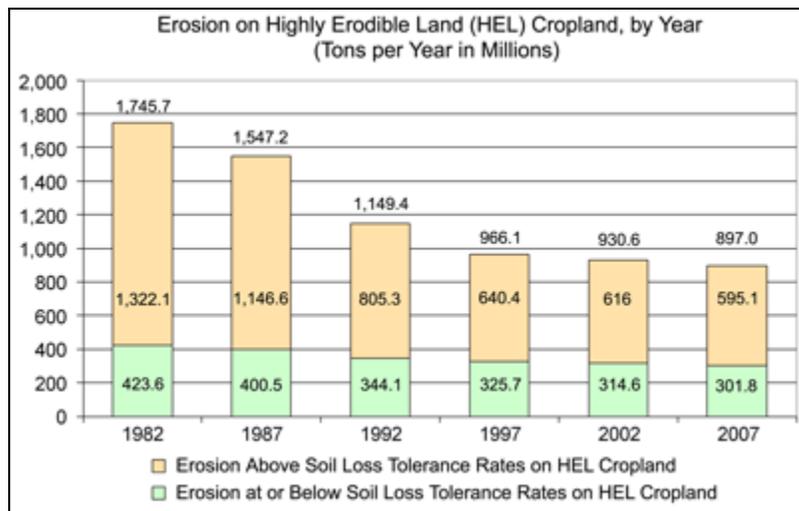
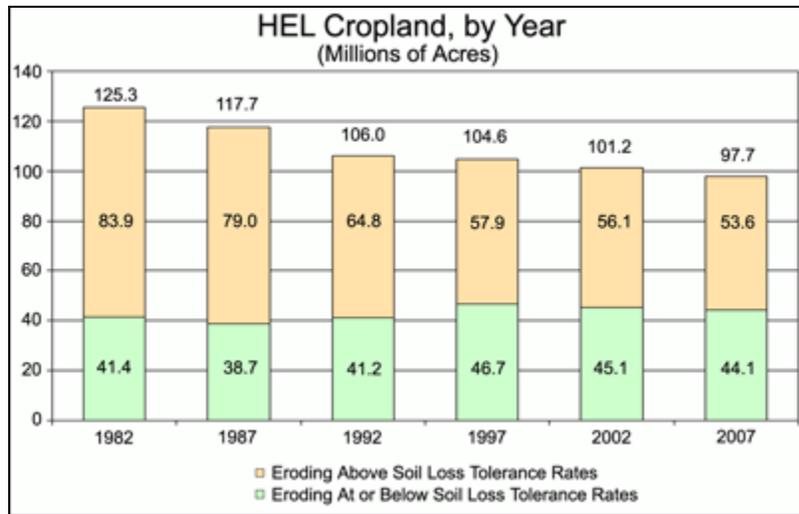
About the Data, Cont.

Irrespective of the scale of analysis, margins of error must be considered. Margins of error (at the 95 percent confidence level) are presented for all NRI estimates. Note that estimates of change between two points in time will be less precise (relatively) than estimates for a single inventory year because the changes will be occurring on a smaller fraction of the landscape.

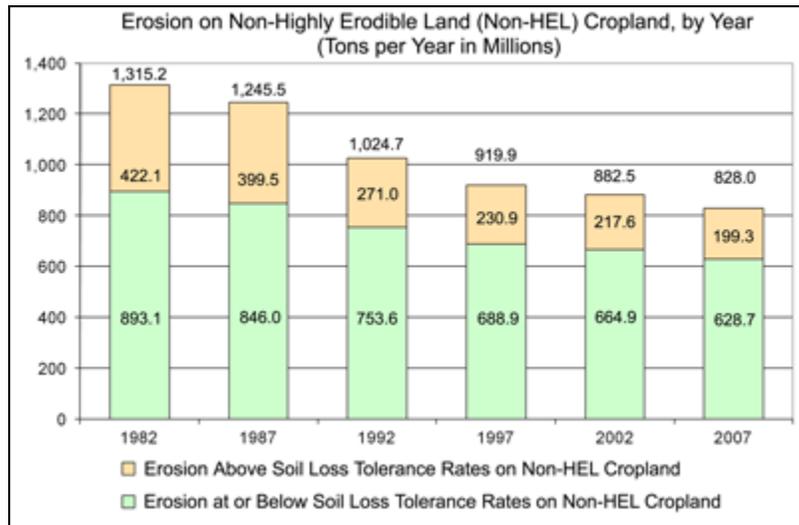
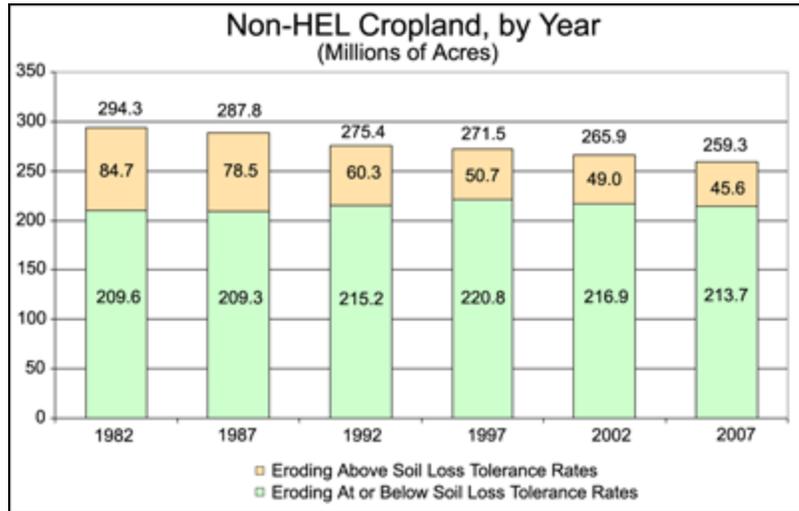
- The nationwide trend of declining soil erosion rates on cropland was mirrored in declining soil erosion in each of the 10 farm production regions. The Appalachian region experienced the greatest decline in water erosion rates, from 6.8 tons per acre per year in 1982 to 3.2 tons per acre per year in 2007—a 53% decline over the period. The Southern Plains region had the biggest decline in wind erosion rates, from 9.9 to 6.2 tons per acre per year—a 37% decline—over the same time period. (Table 36 and Table 37)
- Among all farm production regions, combined water and wind erosion in 2007 was lowest in the Northeast (2.7 tons per acre per year) and highest in the Southern Plains (8.8 tons per acre per year). (Table 36 and Table 37)



- In 2007, 99 million acres (28% of all cropland) were eroding above soil loss tolerance (T) rates. This compares to 169 million acres (40% of cropland) in 1982. (Table 20)
- The acreage of highly erodible cropland (HEL cropland) declined from 125 million acres to 98 million acres, or 22%, between 1982 and 2007. (Table 20)
- The acreage of HEL cropland that had erosion rates above T declined from 84 million acres to 54 million acres during the 1982–2007 period—a 36% decline. (Table 20)



- The acreage of non-HEL cropland declined from 294 million acres to 259 million acres over the same period, a decrease of 12%. (Table 20)
- The acreage of non-HEL cropland that had erosion rates above T declined from 85 million acres to 46 million acres during the 1982–2007 period—almost a 46% decline. (Table 20)



National Soil Erosion Results Tables

Estimates presented here are based upon the latest information from the National Resources Inventory (NRI). The NRI is a longitudinal sample survey based upon scientific statistical principles and procedures. It is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), in cooperation with Iowa State University's Center for Survey Statistics and Methodology. These results are based upon the 2007 NRI, which provides nationally consistent data for the 25-year period 1982–2007. Current estimates cover the contiguous 48 states. Future estimates will include Hawaii, Alaska, and the Caribbean.

Margins of error are reported for each NRI estimate and must be considered at all scales of analysis. The margin of error is used to construct the 95 percent confidence interval for the estimate. The lower bound of the interval is obtained by subtracting the margin of error from the estimate; the upper bound is obtained by adding the margin of error to the estimate. A 95 percent confidence interval means that in repeated samples from the same population, 95 percent of the time the true underlying population parameter will be contained within the lower and upper bounds of the interval. In the following tables, if there are instances where the margin of error is greater than or equal to the estimate, they are displayed in italics indicating that the confidence interval includes zero and the estimate should not be used.

Table 18. Water (Sheet & Rill) Erosion on Cropland, by Year, with Margins of Error

Year	Million Tons per Year	Tons per Acre per Year
1982	1,676.5 ±13.3	4.0 ±0.0
1987	1,488.2 ±10.6	3.7 ±0.0
1992	1,179.6 ±9.4	3.1 ±0.0
1997	1,039.5 ±7.2	2.8 ±0.0
2002	1,011.1 ±12.7	2.8 ±0.0
2007	959.9 ±14.9	2.7 ±0.0

Notes:

- Cropland includes cultivated and non-cultivated cropland.
- Estimated margins of error <.05 are shown as 0.0.

Table 19. Wind Erosion on Cropland, by Year, with Margins of Error

Year	Million Tons per Year	Tons per Acre per Year
1982	1,384.5 ±28.9	3.3 ±0.1
1987	1,304.5 ±25.1	3.2 ±0.1
1992	994.5 ±24.2	2.6 ±0.1
1997	846.4 ±19.2	2.3 ±0.0
2002	802.0 ±28.4	2.2 ±0.1
2007	765.1 ±37.8	2.1 ±0.1

Notes:

- Cropland includes cultivated and non-cultivated cropland.
- Estimated margins of error <.05 are shown as 0.0.

Table 20. Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Year, in Millions of Acres, with Margins of Error

Year	HEL Cropland Eroding At or Below Soil Loss Tolerance Rates	HEL Cropland Eroding Above Soil Loss Tolerance Rates	Total HEL Cropland	Non-HEL Cropland Eroding At or Below Soil Loss Tolerance Rates	Non-HEL Cropland Eroding Above Soil Loss Tolerance Rates	Total Non-HEL Cropland
1982	41.4 ±0.9	83.9 ±1.0	125.3 ±1.2	209.6 ±1.7	84.7 ±1.2	294.3 ±1.8
1987	38.7 ±0.9	79.0 ±0.9	117.7 ±1.2	209.3 ±1.5	78.5 ±1.0	287.8 ±1.8
1992	41.2 ±0.8	64.8 ±1.0	106.0 ±1.2	215.2 ±1.5	60.3 ±1.0	275.4 ±1.8
1997	46.7 ±1.0	57.9 ±0.8	104.6 ±1.2	220.8 ±1.5	50.7 ±0.8	271.5 ±1.8
2002	45.1 ±1.2	56.1 ±1.5	101.2 ±1.5	216.9 ±1.9	49.0 ±0.9	265.9 ±2.1
2007	44.1 ±1.3	53.6 ±1.4	97.8 ±1.7	213.7 ±2.4	45.6 ±1.5	259.3 ±2.6

Notes:

- Cropland includes cultivated and non-cultivated cropland.

Table 21. Erosion on Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Year, in Millions of Tons per Year, with Margins of Error

Year	Highly Erodible (HEL) Cropland				Non-Highly Erodible (Non-HEL) Cropland			
	Erosion on Land Eroding At or Below Soil Loss Tolerance Rates (T)	Erosion on Land Eroding Above Soil Loss Tolerance Rates (T)			Erosion on Land Eroding At or Below Soil Loss Tolerance Rates (T)	Erosion on Land Eroding Above Soil Loss Tolerance Rates (T)		
		Erosion at T	Erosion above T	Total Erosion		Erosion at T	Erosion above T	Total Erosion
1982	79.5	344.1	1,322.1	1,666.2	504.5	388.6	422.1	810.7
	±2.1	±4.4	±22.9	±24.6	±4.5	±5.7	±9.1	±14.1
1987	74.3	326.2	1,146.6	1,472.9	484.4	361.6	399.5	761.1
	±2.1	±4.0	±19.1	±21.1	±4.3	±4.8	±9.2	±13.2
1992	76.5	267.6	805.3	1,072.9	476.3	277.3	271.0	548.4
	±2.2	±4.5	±21.2	±23.1	±3.5	±4.9	±4.4	±8.5
1997	87.7	238.0	640.4	878.4	455.4	233.5	230.9	464.4
	±2.2	±3.7	±17.4	±19.4	±4.0	±3.9	±5.4	±8.4
2002	82.1	232.5	616.0	848.5	438.6	226.3	217.6	443.9
	±3.4	±6.2	±29.4	±33.4	±5.8	±4.3	±8.2	±11.5
2007	78.7	223.1	595.1	818.3	418.3	210.4	199.3	409.7
	±3.0	±6.7	±35.5	±39.7	±6.3	±6.9	±10.0	±16.3

Notes:

- Cropland includes cultivated and non-cultivated cropland.

Water (Sheet & Rill) Erosion on Cropland, by Farm Production Region and Year

Table 36. Water (Sheet & Rill) Erosion on Cropland, by Farm Production Region and Year, with Margins of Error

Region	Year	Million Tons per Year	Tons per Acre per Year
Appalachian	1982	154.4	6.8
		±5.7	±0.2
	1987	138.7	6.5
		±5.6	±0.2
	1992	99.5	5.1
		±3.4	±0.1
1997	79.6	4.2	
	±3.3	±0.2	
2002	64.9	3.4	
	±2.8	±0.2	
2007	58.0	3.2	
	±4.2	±0.2	
Corn Belt	1982	604.2	6.6
		±7.6	±0.1
	1987	496.6	5.5
		±7.6	±0.1
	1992	391.3	4.5
		±6.1	±0.1
1997	340.7	3.9	
	±5.0	±0.1	
2002	353.3	4.0	
	±8.4	±0.1	
2007	343.3	3.9	
	±10.0	±0.1	

Delta States	1982	116.0 ±4.6	5.3 ±0.1
	1987	98.2 ±3.5	4.7 ±0.1
	1992	78.5 ±2.9	4.1 ±0.1
	1997	70.4 ±2.4	3.8 ±0.1
	2002	64.3 ±3.4	3.6 ±0.1
	2007	60.4 ±7.3	3.5 ±0.4
Lake States	1982	123.3 ±3.4	2.8 ±0.1
	1987	118.1 ±3.5	2.8 ±0.1
	1992	99.5 ±2.7	2.4 ±0.1
	1997	90.5 ±2.2	2.2 ±0.0
	2002	92.5 ±3.5	2.3 ±0.1
	2007	89.3 ±5.1	2.3 ±0.1
Mountain	1982	82.9 ±4.0	1.9 ±0.1
	1987	75.5 ±4.8	1.9 ±0.1
	1992	59.1 ±3.5	1.6 ±0.1

	1997	54.3 ±3.5	1.5 ±0.1
	2002	48.2 ±3.8	1.4 ±0.1
	2007	44.4 ±4.3	1.3 ±0.1
Northeast	1982	60.8 ±2.3	3.6 ±0.1
	1987	61.3 ±2.2	3.8 ±0.1
	1992	50.1 ±2.0	3.2 ±0.1
	1997	44.2 ±1.8	2.9 ±0.1
	2002	41.0 ±2.1	2.9 ±0.1
	2007	36.6 ±2.4	2.7 ±0.2
Northern Plains	1982	257.3 ±6.5	2.8 ±0.1
	1987	240.6 ±5.2	2.6 ±0.0
	1992	190.4 ±5.0	2.2 ±0.0
	1997	170.4 ±3.7	1.9 ±0.0
	2002	176.4 ±7.3	2.0 ±0.1
	2007	170.7 ±5.9	2.0 ±0.1

Pacific	1982	68.5 ±4.5	3.0 ±0.2
	1987	71.0 ±5.4	3.3 ±0.3
	1992	48.0 ±3.7	2.3 ±0.2
	1997	38.4 ±2.6	1.9 ±0.1
	2002	35.8 ±3.8	1.8 ±0.2
	2007	35.1 ±5.8	1.8 ±0.3
Southeast	1982	92.8 ±3.2	5.1 ±0.2
	1987	77.2 ±2.6	4.7 ±0.2
	1992	60.1 ±3.0	4.2 ±0.2
	1997	53.2 ±2.3	4.1 ±0.2
	2002	44.4 ±2.7	3.6 ±0.2
	2007	38.0 ±3.9	3.4 ±0.3
Southern Plains	1982	116.3 ±3.4	2.6 ±0.1
	1987	111.0 ±3.2	2.6 ±0.1
	1992	103.0 ±3.3	2.7 ±0.1

	1997	97.7 ±3.2	2.6 ±0.1
	2002	90.4 ±4.3	2.6 ±0.1
	2007	84.1 ±4.2	2.6 ±0.1

Notes:

- Cropland includes cultivated and non-cultivated cropland.

Wind Erosion on Cropland, by Farm Production Region and Year

Table 37. Wind Erosion on Cropland, by Farm Production Region and Year, with Margins of Error

Region	Year	Million Tons per Year	Tons per Acre per Year
Corn Belt	1982	85.4	0.9
		±1.8	±0.0
	1987	68.0	0.7
		±1.3	±0.0
	1992	38.5	0.4
		±1.2	±0.0
1997	22.4	0.3	
	±0.9	±0.0	
Lake States	2002	16.5	0.2
		±1.4	±0.0
	2007	15.9	0.2
		±1.6	±0.0
	1982	145.4	3.3
		±4.5	±0.1
1987	162.4	3.8	
	±6.2	±0.1	
1992	143.3	3.5	
	±4.2	±0.1	
1997	130.3	3.2	
	±4.0	±0.1	
2002	120.9	3.1	
	±5.1	±0.1	
2007	87.3	2.3	
	±6.3	±0.2	
Mountain	1982	333.1	7.7
		±13.0	±0.2

	1987	316.1 ±15.1	7.9 ±0.3
	1992	250.0 ±15.1	6.7 ±0.3
	1997	189.5 ±10.2	5.1 ±0.3
	2002	189.4 ±15.5	5.4 ±0.4
	2007	189.9 ±19.7	5.7 ±0.5
Northern Plains	1982	327.4 ±6.1	3.5 ±0.1
	1987	333.9 ±5.4	3.6 ±0.1
	1992	236.6 ±4.9	2.7 ±0.1
	1997	206.1 ±4.6	2.4 ±0.0
	2002	225.3 ±9.7	2.6 ±0.1
	2007	229.3 ±9.3	2.7 ±0.1
Pacific	1982	47.4 ±8.3	2.1 ±0.4
	1987	42.0 ±5.9	2.0 ±0.3
	1992	48.9 ±8.1	2.4 ±0.4
	1997	41.2 ±6.9	2.1 ±0.3

Southern Plains	2002	45.8 ±9.3	2.3 ±0.5
	2007	39.3 ±12.8	2.0 ±0.6
	1982	445.7 ±23.1	9.9 ±0.4
	1987	382.2 ±15.6	9.0 ±0.3
	1992	277.2 ±13.8	7.2 ±0.3
	1997	257.0 ±13.7	7.0 ±0.3
	2002	204.1 ±15.0	5.8 ±0.4
	2007	203.5 ±19.3	6.2 ±0.6

Notes:

- Cropland includes cultivated and non-cultivated cropland.

Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Farm Production Region and Year

Table 38. Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Farm Production Region and Year, in Thousands of Acres, with Margins of Error

Region	Year	HEL Cropland Eroding At or Below Soil Loss Tolerance Rates	HEL Cropland Eroding Above Soil Loss Tolerance Rates	Total HEL Cropland	Non-HEL Cropland Eroding At or Below Soil Loss Tolerance Rates	Non-HEL Cropland Eroding Above Soil Loss Tolerance Rates	Total Non-HEL Cropland
Appalachian	1982	3,705.1	6,140.4	9,845.5	9,792.6	2,952.4	12,745.0
		±199.3	±228.1	±274.5	±204.4	±174.1	±233.1
	1987	3,583.9	5,484.4	9,068.3	9,352.4	2,767.7	12,120.1
		±168.1	±235.3	±286.4	±220.8	±143.6	±232.3
	1992	3,821.3	4,297.3	8,118.6	9,257.2	2,262.5	11,519.7
		±148.7	±182.9	±265.2	±255.0	±138.8	±263.9
1997	4,273.0	3,733.9	8,006.9	9,338.6	1,821.6	11,160.2	
	±156.9	±146.5	±204.9	±224.1	±125.3	±242.5	
2002	4,876.1	3,099.3	7,975.4	9,508.7	1,420.7	10,929.4	
	±316.4	±192.4	±345.9	±358.5	±151.8	±347.0	
2007	4,807.7	2,824.3	7,632.0	9,472.6	968.8	10,441.4	
	±490.8	±243.4	±512.5	±466.9	±160.3	±453.7	
Corn Belt	1982	4,233.8	18,363.5	22,597.3	47,840.2	21,798.7	69,638.9
		±215.5	±410.0	±475.6	±503.4	±456.2	±581.1
	1987	4,551.6	17,153.2	21,704.8	52,282.2	16,905.3	69,187.5
		±208.8	±387.2	±461.6	±509.1	±349.3	±567.7
	1992	5,196.3	14,764.4	19,960.7	56,686.8	11,063.4	67,750.2
±250.0		±364.2	±441.7	±479.5	±321.5	±570.9	
1997	6,206.8	14,149.2	20,356.0	59,807.4	7,787.2	67,594.6	
	±182.2	±361.6	±413.1	±494.6	±261.7	±554.4	
2002	6,006.2	14,469.6	20,475.8	59,726.3	7,501.3	67,227.6	
	±392.9	±458.5	±543.7	±705.9	±306.3	±690.0	

Delta States	2007	5,950.6 ±476.5	14,303.0 ±641.0	20,253.6 ±734.6	59,808.4 ±973.7	6,855.4 ±491.5	66,663.8 ±936.2
	1982	541.5 ±66.1	2,178.1 ±173.0	2,719.6 ±212.4	13,609.2 ±544.9	5,544.9 ±248.6	19,154.1 ±565.9
	1987	623.2 ±90.1	1,593.7 ±136.9	2,216.9 ±153.6	13,494.1 ±514.2	5,165.6 ±201.2	18,659.7 ±517.5
	1992	530.5 ±66.4	1,058.1 ±106.3	1,588.6 ±134.1	13,767.3 ±460.2	4,013.2 ±197.8	17,780.5 ±510.2
	1997	494.3 ±62.2	884.3 ±107.4	1,378.6 ±124.0	13,621.9 ±489.5	3,571.3 ±233.9	17,193.2 ±527.3
	2002	496.9 ±126.3	748.9 ±152.7	1,245.8 ±216.7	13,362.1 ±610.4	3,176.9 ±346.4	16,539.0 ±563.7
	2007	431.7 ±143.5	725.7 ±169.7	1,157.4 ±223.2	13,086.1 ±578.0	2,947.2 ±377.6	16,033.3 ±611.2
	1982	2,078.7 ±122.7	4,064.2 ±164.4	6,142.9 ±204.3	25,169.7 ±590.8	12,466.2 ±364.4	37,635.9 ±633.8
Lake States	1987	2,026.5 ±128.3	3,931.3 ±163.6	5,957.8 ±199.0	23,901.3 ±570.3	13,048.4 ±414.8	36,949.7 ±676.2
	1992	2,224.3 ±151.0	3,145.6 ±157.3	5,369.9 ±178.8	23,915.8 ±504.8	11,818.6 ±308.1	35,734.4 ±630.5
	1997	2,221.6 ±153.3	3,148.7 ±126.9	5,370.3 ±203.0	24,550.5 ±573.3	10,558.0 ±351.0	35,108.5 ±673.6
	2002	1,981.7 ±246.7	3,183.9 ±267.3	5,165.6 ±318.0	24,212.3 ±717.5	10,062.0 ±490.7	34,274.3 ±746.3
	2007	1,923.7 ±284.4	3,245.6 ±287.9	5,169.3 ±383.4	25,839.6 ±807.2	7,552.0 ±679.4	33,391.6 ±826.7
	1982	10,609.1 ±680.8	16,467.9 ±711.4	27,077.0 ±1,056.9	11,043.4 ±640.5	5,005.4 ±428.7	16,048.8 ±772.5
	1987	9,403.8 ±465.0	15,757.7 ±833.8	25,161.5 ±1,033.7	10,021.4 ±539.6	5,057.3 ±448.5	15,078.7 ±754.5
	Mountain						

Northeast	1992	9,938.9	13,482.0	23,420.9	10,256.3	3,735.4	13,991.7
		±602.6	±837.8	±1,072.7	±610.6	±311.8	±705.3
	1997	11,917.6	11,115.2	23,032.8	11,486.0	2,549.9	14,035.9
		±800.9	±629.3	±1,067.8	±588.6	±257.6	±684.7
	2002	10,886.2	10,519.1	21,405.3	11,287.1	2,122.4	13,409.5
		±761.9	±924.8	±1,050.6	±891.2	±267.2	±869.6
	2007	10,378.8	9,822.4	20,201.2	10,345.8	2,476.1	12,821.9
		±1,027.7	±1,031.0	±1,139.1	±855.3	±397.6	±1,002.4
	1982	3,613.9	3,397.3	7,011.2	8,327.3	1,398.3	9,725.6
		±158.3	±112.7	±191.0	±317.3	±82.2	±312.3
1987	3,144.0	3,581.1	6,725.1	8,278.3	1,237.5	9,515.8	
	±163.9	±134.7	±193.7	±318.7	±87.6	±317.2	
1992	3,273.7	3,217.5	6,491.2	8,079.9	1,134.9	9,214.8	
	±125.4	±133.7	±197.2	±303.2	±79.8	±309.2	
1997	3,333.2	2,959.9	6,293.1	7,899.7	948.8	8,848.5	
	±106.2	±142.3	±192.8	±339.8	±77.2	±329.7	
2002	3,254.7	2,641.5	5,896.2	7,463.6	972.5	8,436.1	
	±255.3	±211.1	±307.2	±408.9	±143.7	±416.4	
2007	3,271.3	2,383.4	5,654.7	7,314.9	738.0	8,052.9	
	±246.5	±244.1	±297.6	±419.6	±130.5	±448.1	
Northern Plains	1982	10,458.5	14,777.0	25,235.5	49,420.9	18,668.0	68,088.9
		±484.7	±409.9	±534.7	±677.1	±360.1	±732.7
	1987	9,762.9	14,852.9	24,615.8	49,493.8	18,913.3	68,407.1
		±423.4	±426.9	±554.4	±680.3	±394.9	±681.2
	1992	10,582.8	10,974.3	21,557.1	52,202.7	13,099.9	65,302.6
±436.7		±367.1	±517.6	±640.3	±377.9	±636.9	
1997	12,233.9	9,662.7	21,896.6	53,992.7	11,780.0	65,772.7	
	±459.8	±314.9	±550.5	±582.4	±260.2	±638.9	
2002	11,896.6	10,135.7	22,032.3	52,255.4	12,818.2	65,073.6	
	±675.2	±605.3	±832.3	±931.4	±587.8	±1,131.8	

Pacific	2007	12,044.0 ±859.2	9,502.1 ±674.1	21,546.1 ±990.7	50,763.4 ±1,277.1	13,568.3 ±717.0	64,331.7 ±1,322.7
	1982	1,138.4 ±173.7	4,109.1 ±326.3	5,247.5 ±410.6	14,799.8 ±770.6	2,491.2 ±235.2	17,291.0 ±816.0
	1987	1,258.0 ±194.2	3,567.8 ±306.6	4,825.8 ±377.1	14,072.3 ±753.5	2,461.5 ±284.0	16,533.8 ±850.5
	1992	1,191.2 ±196.9	3,306.0 ±262.7	4,497.2 ±350.7	13,842.9 ±747.4	2,238.6 ±282.0	16,081.5 ±847.9
	1997	1,242.7 ±206.8	3,007.0 ±256.2	4,249.7 ±361.1	13,667.6 ±752.1	2,129.1 ±289.2	15,796.7 ±858.5
	2002	1,210.3 ±200.2	2,968.1 ±321.3	4,178.4 ±375.2	13,594.5 ±808.3	2,029.0 ±345.0	15,623.5 ±996.4
	2007	1,468.4 ±287.9	2,718.9 ±372.8	4,187.3 ±568.8	13,544.0 ±1,032.0	1,825.0 ±391.8	15,369.0 ±1,184.4
Southeast	1982	618.2 ±70.4	2,433.4 ±132.1	3,051.6 ±151.8	10,833.1 ±371.8	4,344.4 ±135.2	15,177.5 ±409.6
	1987	677.7 ±92.5	1,956.1 ±120.4	2,633.8 ±144.6	10,169.1 ±407.0	3,661.6 ±153.8	13,830.7 ±430.7
	1992	573.7 ±92.8	1,379.9 ±128.5	1,953.6 ±156.7	9,284.7 ±392.1	3,123.7 ±138.8	12,408.4 ±417.6
	1997	591.0 ±57.3	1,093.1 ±102.5	1,684.1 ±119.0	8,404.2 ±402.0	2,977.1 ±132.8	11,381.3 ±440.2
	2002	672.6 ±112.3	830.1 ±126.9	1,502.7 ±145.3	8,241.2 ±508.1	2,530.9 ±236.8	10,772.1 ±537.9
	2007	670.0 ±152.2	630.0 ±162.8	1,300.0 ±240.3	7,979.1 ±629.9	2,048.3 ±266.3	10,027.4 ±691.7
	1982	4,410.7 ±331.6	11,923.3 ±491.4	16,334.0 ±578.4	18,736.4 ±470.0	10,042.7 ±481.4	28,779.1 ±566.5
Southern Plains	1987	3,684.9 ±268.8	11,112.7 ±429.7	14,797.6 ±512.4	18,267.3 ±469.2	9,287.6 ±367.3	27,554.9 ±573.4

1992	3,858.4	9,196.9	13,055.3	17,864.3	7,779.4	25,643.7
	±245.7	±457.7	±514.3	±459.5	±337.4	±621.5
1997	4,194.3	8,146.0	12,340.3	18,050.2	6,587.9	24,638.1
	±232.6	±366.3	±488.6	±472.5	±280.6	±607.2
2002	3,812.5	7,495.6	11,308.1	17,217.3	6,411.6	23,628.9
	±342.9	±437.7	±566.8	±624.6	±425.0	±630.2
2007	3,185.5	7,484.4	10,669.9	15,532.7	6,586.3	22,119.0
	±474.5	±726.1	±823.4	±727.9	±565.4	±783.1

Notes:

- Cropland includes cultivated and non-cultivated cropland.

Erosion on Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Farm Production Region and Year

Table 39. Erosion on Highly Erodible (HEL) Cropland and Non-Highly Erodible (Non-HEL) Cropland, by Farm Production Region and Year, in Millions of Tons per Year, with Margins of Error

Region	Year	Highly Erodible (HEL) Cropland				Non-Highly Erodible (Non-HEL) Cropland			
		Erosion on Land Eroding At or Below Soil Loss Tolerance Rates (T)	Erosion on Land Eroding Above Soil Loss Tolerance Rates (T)			Erosion on Land Eroding At or Below Soil Loss Tolerance Rates (T)	Erosion on Land Eroding Above Soil Loss Tolerance Rates (T)		
			Erosion at T	Erosion above T	Total Erosion		Erosion at T	Erosion above T	Total Erosion
Appalachian	1982	3.9	21.2	88.5	109.7	19.5	12.7	8.5	21.2
		±0.3	±0.8	±4.6	±5.1	±0.6	±0.7	±0.5	±1.2
	1987	3.4	19.1	78.5	97.6	18.2	12.1	7.4	19.5
		±0.3	±0.8	±4.8	±5.4	±0.6	±0.6	±0.4	±0.9
	1992	3.9	14.8	47.3	62.1	18.0	9.9	5.5	15.5
		±0.2	±0.6	±2.7	±3.2	±0.6	±0.6	±0.4	±1.0
	1997	4.9	12.8	33.4	46.2	16.7	8.1	3.7	11.8
		±0.2	±0.5	±2.7	±3.0	±0.5	±0.6	±0.4	±0.9
2002	5.6	10.5	25.0	35.5	14.4	6.3	3.1	9.4	
	±0.5	±0.6	±2.1	±2.5	±0.8	±0.7	±0.4	±1.0	
2007	5.6	9.5	22.9	32.4	13.2	4.3	2.4	6.8	
	±0.7	±0.8	±3.2	±3.7	±0.8	±0.7	±0.6	±1.3	
Corn Belt	1982	7.3	75.0	299.5	374.5	131.7	94.9	81.2	176.1
		±0.4	±1.7	±7.6	±8.8	±1.7	±2.0	±2.1	±3.9
	1987	8.0	70.4	231.5	301.9	127.8	72.9	54.0	126.9
		±0.4	±1.6	±7.2	±8.3	±1.6	±1.5	±1.6	±2.8
	1992	8.8	61.0	156.5	217.6	129.5	46.9	27.0	73.9
		±0.4	±1.6	±5.7	±6.9	±1.6	±1.4	±1.2	±2.4
	1997	10.0	58.8	123.3	182.1	122.3	32.9	15.8	48.7
		±0.4	±1.5	±4.1	±5.2	±1.5	±1.1	±0.9	±1.9

	2002	9.2 ±0.7	60.3 ±2.0	136.0 ±7.4	196.3 ±8.7	117.9 ±2.2	31.8 ±1.4	14.7 ±0.9	46.5 ±2.2
	2007	9.6 ±0.9	59.6 ±2.8	134.5 ±8.2	194.0 ±10.1	112.9 ±2.8	28.7 ±2.2	13.8 ±1.5	42.6 ±3.6
Delta States	1982	0.6 ±0.1	7.7 ±0.6	32.1 ±3.7	39.8 ±4.0	39.1 ±1.6	25.2 ±1.2	11.3 ±0.6	36.5 ±1.6
	1987	0.8 ±0.1	5.6 ±0.5	21.2 ±2.9	26.8 ±3.3	37.2 ±1.3	23.3 ±0.9	10.1 ±0.7	33.4 ±1.4
	1992	0.6 ±0.1	3.6 ±0.4	12.3 ±1.8	15.9 ±2.1	36.4 ±1.4	18.0 ±0.9	7.6 ±0.6	25.6 ±1.4
Lake States	1997	0.6 ±0.1	3.1 ±0.4	8.2 ±1.2	11.3 ±1.5	35.8 ±1.4	15.9 ±1.1	6.8 ±0.5	22.7 ±1.5
	2002	0.6 ±0.2	2.6 ±0.5	7.2 ±1.5	9.9 ±1.9	33.7 ±1.8	14.1 ±1.6	6.0 ±1.0	20.1 ±2.5
	2007	0.4 ±0.2	2.5 ±0.7	7.7 ±6.0	10.3 ±6.5	31.1 ±1.7	13.1 ±1.7	5.5 ±1.2	18.6 ±2.6
	1982	4.3 ±0.3	17.0 ±0.8	46.3 ±3.0	63.3 ±3.6	61.4 ±1.9	58.6 ±1.8	81.1 ±3.3	139.7 ±4.9
	1987	4.0 ±0.3	16.5 ±0.7	45.9 ±3.2	62.4 ±3.7	59.3 ±1.7	61.5 ±2.0	93.3 ±4.2	154.8 ±5.9
	1992	3.8 ±0.3	13.2 ±0.7	34.3 ±2.6	47.5 ±3.2	56.5 ±1.4	55.8 ±1.5	79.2 ±3.1	135.0 ±4.0
	1997	4.5 ±0.3	13.1 ±0.6	29.0 ±2.0	42.1 ±2.4	55.8 ±1.4	49.8 ±1.7	68.7 ±3.1	118.5 ±4.4
	2002	4.0 ±0.6	13.4 ±1.2	31.0 ±3.0	44.4 ±3.9	55.5 ±1.8	47.4 ±2.3	62.2 ±4.7	109.5 ±6.4
	2007	4.1 ±0.8	13.6 ±1.3	28.9 ±4.4	42.5 ±5.3	55.6 ±3.2	35.3 ±3.1	39.2 ±4.9	74.5 ±7.7
	Mountain	1982	22.3 ±1.9	70.9 ±3.3	241.9 ±10.9	312.8 ±13.0	20.5 ±1.6	24.3 ±2.1	36.1 ±4.3

	1987	19.2 ±1.4	68.0 ±4.0	225.7 ±14.5	293.7 ±17.3	17.3 ±1.0	24.7 ±2.2	36.7 ±4.3	61.3 ±6.2
	1992	19.7 ±1.9	58.3 ±3.9	173.1 ±14.3	231.4 ±16.9	18.4 ±1.3	18.3 ±1.6	21.3 ±2.2	39.6 ±3.5
	1997	24.1 ±2.3	47.2 ±3.0	126.1 ±9.6	173.3 ±11.8	20.1 ±1.3	12.4 ±1.3	13.9 ±1.8	26.3 ±2.9
	2002	22.7 ±2.5	45.5 ±4.2	128.8 ±14.3	174.3 ±16.8	17.8 ±1.5	10.4 ±1.3	12.5 ±1.9	22.8 ±3.0
	2007	19.8 ±2.8	42.4 ±4.6	130.2 ±18.4	172.6 ±21.9	14.5 ±2.0	12.1 ±1.9	15.2 ±4.2	27.3 ±5.8
Northeast	1982	3.1 ±0.2	10.9 ±0.3	30.7 ±2.0	41.6 ±2.2	8.2 ±0.3	4.9 ±0.3	3.1 ±0.2	8.0 ±0.5
	1987	2.7 ±0.2	11.4 ±0.4	31.9 ±1.9	43.3 ±2.2	8.3 ±0.3	4.3 ±0.3	2.7 ±0.3	7.0 ±0.6
	1992	2.8 ±0.2	10.3 ±0.4	22.8 ±1.5	33.1 ±1.8	8.1 ±0.3	3.9 ±0.3	2.2 ±0.2	6.1 ±0.5
	1997	3.1 ±0.2	9.5 ±0.5	18.6 ±1.3	28.1 ±1.7	8.1 ±0.3	3.3 ±0.3	1.7 ±0.2	4.9 ±0.4
	2002	3.1 ±0.3	8.4 ±0.7	17.2 ±1.5	25.7 ±2.0	7.1 ±0.5	3.4 ±0.5	1.8 ±0.4	5.2 ±0.9
	2007	3.4 ±0.4	7.5 ±0.8	15.5 ±1.8	23.0 ±2.5	6.3 ±0.5	2.5 ±0.4	1.4 ±0.2	3.8 ±0.6
Northern Plains	1982	26.1 ±1.3	65.1 ±1.9	163.8 ±6.3	228.9 ±7.8	142.0 ±2.4	88.2 ±1.7	99.5 ±2.8	187.7 ±4.2
	1987	25.3 ±1.1	65.8 ±2.0	152.3 ±4.9	218.1 ±6.5	138.4 ±2.0	89.6 ±1.8	103.1 ±3.3	192.7 ±4.7
	1992	26.1 ±1.2	48.6 ±1.8	97.8 ±4.3	146.4 ±5.6	135.8 ±2.2	62.0 ±1.8	56.7 ±2.1	118.7 ±3.6
	1997	27.5 ±1.2	42.7 ±1.5	74.2 ±3.2	117.0 ±4.4	125.2 ±1.9	55.8 ±1.2	51.0 ±2.0	106.8 ±2.8

Pacific	2002	26.1 ±2.1	44.4 ±2.7	85.9 ±8.5	130.3 ±10.6	125.7 ±3.0	60.7 ±2.8	58.8 ±3.7	119.5 ±6.1	
	2007	24.7 ±2.4	42.0 ±2.8	80.1 ±7.3	122.0 ±9.0	122.4 ±3.3	64.5 ±3.5	66.4 ±4.7	130.9 ±7.9	
	1982	1.4 ±0.2	14.7 ±1.4	62.2 ±8.7	76.9 ±9.6	14.6 ±1.5	10.3 ±1.1	12.8 ±1.7	23.1 ±2.6	
	1987	1.5 ±0.3	13.5 ±1.3	60.8 ±7.8	74.3 ±8.8	13.7 ±1.4	10.7 ±1.3	12.9 ±1.7	23.6 ±2.9	
	1992	1.2 ±0.2	12.6 ±1.1	49.5 ±9.5	62.0 ±10.1	12.6 ±1.3	9.8 ±1.3	11.3 ±2.0	21.1 ±3.2	
	1997	1.3 ±0.2	11.7 ±1.1	34.4 ±6.3	46.0 ±6.9	12.5 ±1.3	9.3 ±1.3	10.5 ±1.8	19.8 ±3.0	
	2002	1.1 ±0.2	11.7 ±1.5	38.9 ±9.2	50.6 ±9.6	11.0 ±1.5	9.0 ±1.5	9.8 ±2.1	18.8 ±3.5	
	2007	1.7 ±0.4	10.7 ±2.0	32.0 ±10.9	42.7 ±11.7	11.1 ±1.9	8.1 ±1.9	10.8 ±2.5	19.0 ±4.3	
	Southeast	1982	0.8 ±0.2	9.0 ±0.6	29.5 ±2.5	38.5 ±2.9	21.6 ±0.7	19.9 ±0.6	12.0 ±0.6	31.8 ±1.1
		1987	0.9 ±0.2	7.1 ±0.4	22.6 ±1.9	29.7 ±2.3	19.0 ±0.7	16.8 ±0.7	10.9 ±0.7	27.6 ±1.3
1992		0.6 ±0.2	5.0 ±0.5	14.8 ±1.8	19.8 ±2.2	16.4 ±0.7	14.3 ±0.6	9.0 ±0.6	23.3 ±1.1	
1997		0.6 ±0.1	3.9 ±0.4	11.4 ±1.4	15.4 ±1.8	14.5 ±0.6	13.6 ±0.6	9.1 ±0.6	22.7 ±1.2	
2002		0.6 ±0.2	3.0 ±0.5	8.3 ±1.5	11.3 ±1.9	13.4 ±0.9	11.7 ±1.2	7.4 ±0.9	19.1 ±1.9	
2007		0.6 ±0.2	2.3 ±0.6	6.7 ±3.0	9.0 ±3.5	11.7 ±1.2	9.4 ±1.3	7.3 ±1.0	16.7 ±2.1	
Southern Plains	1982	9.8 ±0.8	52.5 ±2.3	327.7 ±21.5	380.2 ±23.0	45.9 ±1.5	49.5 ±2.3	76.7 ±4.6	126.2 ±6.6	

	1987	8.5 ±0.7	48.9 ±2.1	276.3 ±13.4	325.2 ±15.0	45.3 ±1.3	45.7 ±1.8	68.5 ±3.5	114.2 ±5.0
	1992	8.9 ±0.6	40.3 ±2.3	196.9 ±13.1	237.1 ±14.9	44.6 ±1.2	38.3 ±1.6	51.2 ±2.4	89.5 ±3.7
	1997	11.0 ±0.6	35.2 ±1.9	181.8 ±12.9	217.0 ±14.4	44.5 ±1.3	32.4 ±1.4	49.7 ±2.5	82.1 ±3.5
	2002	9.2 ±1.0	32.6 ±2.0	137.7 ±14.6	170.3 ±16.0	42.2 ±2.4	31.6 ±2.1	41.2 ±4.4	72.8 ±6.1
	2007	8.8 ±1.4	33.1 ±3.5	136.6 ±19.3	169.7 ±21.0	39.4 ±2.4	32.5 ±2.7	37.2 ±3.6	69.7 ±5.9

Notes:

- Cropland includes cultivated and non-cultivated cropland.