

Hard maple

Sugar maple: *Acer saccharum*

Black maple: *Acer nigrum*

Hard maples are slow-growing, shade-tolerant species. Sugar maple is the most important species making up the maple-basswood forest type of northern Wisconsin. The **volume of hard maple has increased** by almost 60% since 1983 but hasn't changed since 1996.

Growth rates and **mortality** have remained statistically unchanged since 1996. Hard maple accounts for about 11% of all volume of trees in Wisconsin, but only 2.5% of total mortality.

Hard maple is **an important timber species**, accounting for 21% of roundwood production. Because of the high density of its wood and the large volume in the state, hard maple may be a valuable species for woody biomass production.

- [How has the hard maple resource changed?](#)

Volume and diameter class distribution:

- [Where does hard maple grow in Wisconsin?](#)

Growing stock volume by region with map

- [How fast is hard maple growing?](#)

Average annual net growth by region and year:

- [How healthy is hard maple in Wisconsin?](#)

Average annual mortality:

- [How much hard maple do we harvest?](#)

Roundwood production by product and year

- [How much is hard maple selling for?](#)

Prices for cordwood and sawtimber

- [How much hard maple biomass do we have?](#)

Aboveground carbon by region of the state



“How has the hard maple resource changed?”
Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of hard maple in 2013 was about 2.4 billion cubic feet or 11% of total volume in the state (Chart 1). This is an increase of 59% since 1983. Volume has increased slightly since 1996.

Hard maple growing stock has matured since 1983 with a greater increase in the volume of large sawtimber compared to smaller trees (Chart 2). Volume in large trees (over 13 inches dbh) has almost doubled in the last 30 years.

The numbers of [sawtimber](#) trees have increased over 20% since 1996 but the numbers of [saplings](#) and [poles](#) have decreased (Chart 3).

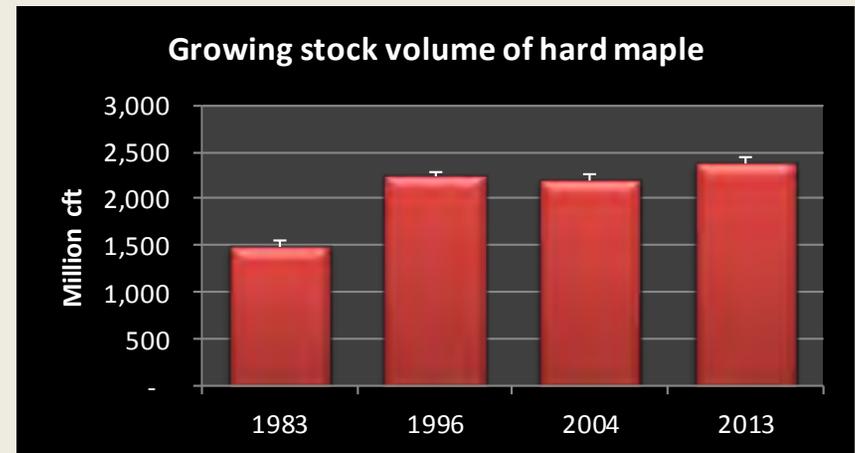


Chart 1. Growing stock volume (million cubic feet) by inventory year.
 Source: USDA Forest Inventory and Analysis data

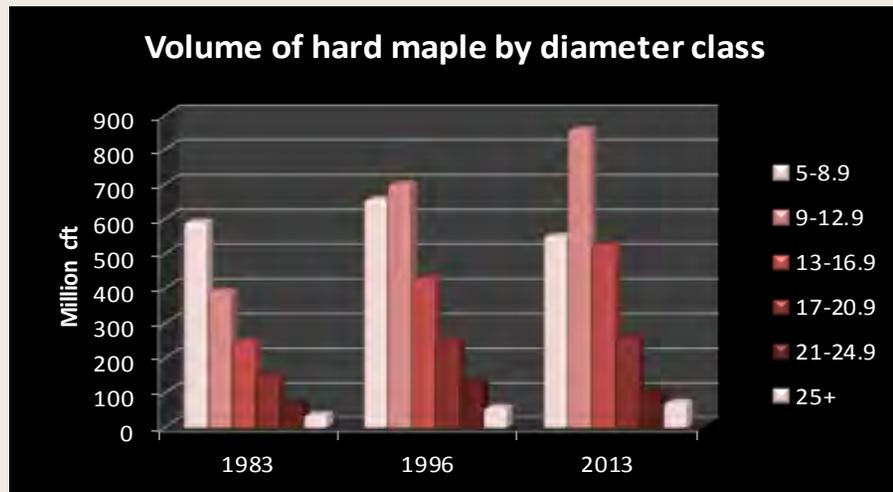


Chart 2. Growing stock volume (million cubic feet) by diameter class (inches).
 Source: USDA Forest Inventory and Analysis data

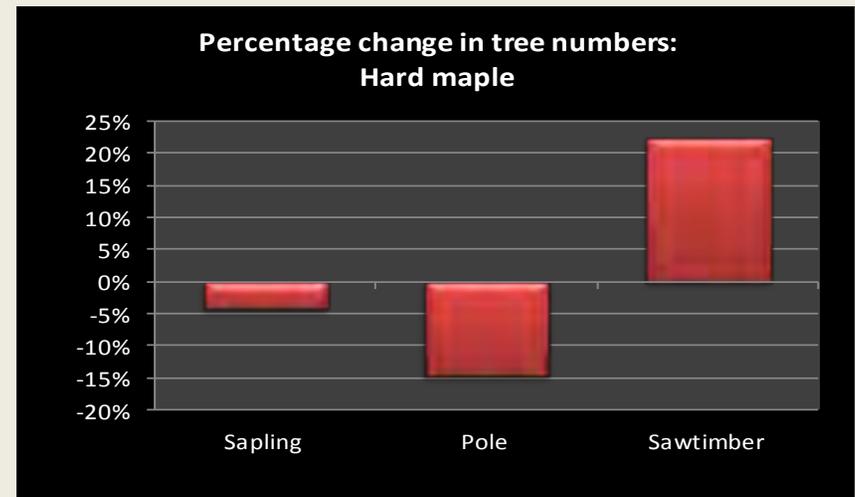
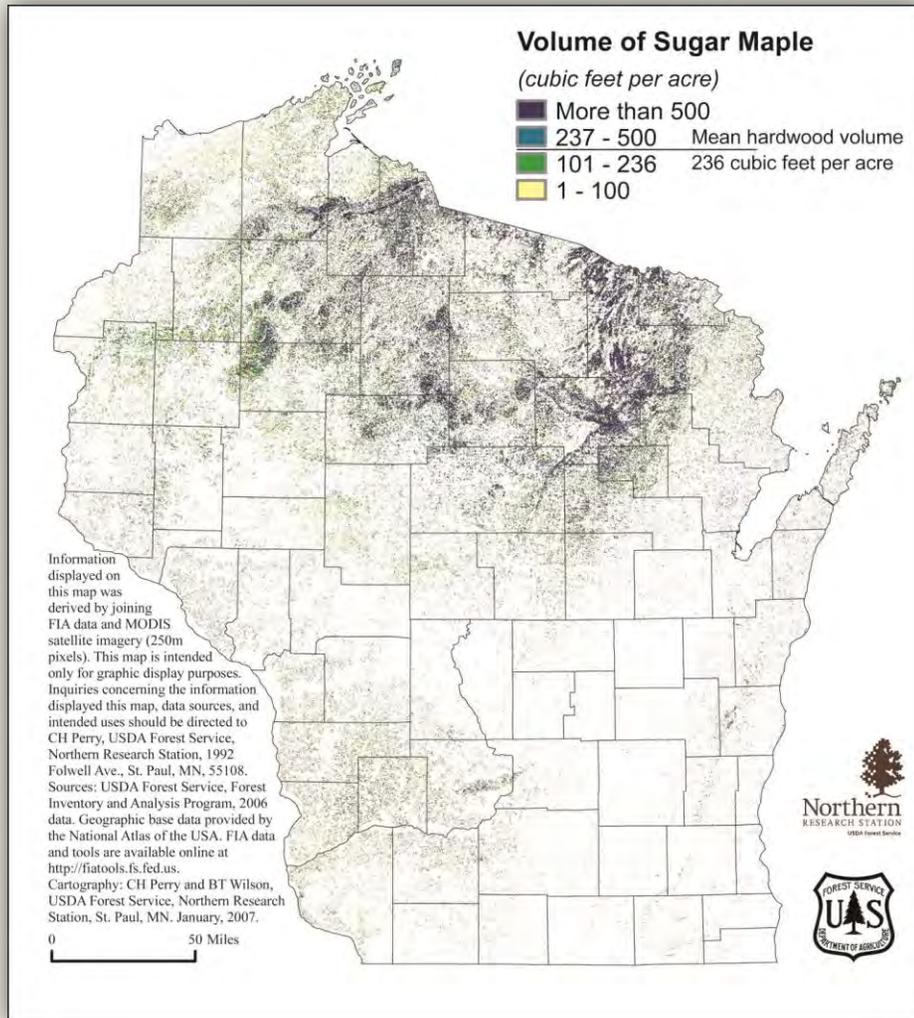


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2013.
 Source: USDA Forest Inventory and Analysis data 1996 and 2013.

“Where does hard maple grow in Wisconsin?”

Growing stock volume by region with map



About 80% of hard maple volume is located in northern Wisconsin with another 13% in the south (Table 1). It is a major component of the maple-basswood [forest type](#) and a minor component of oak-hickory and aspen-birch types.

Table 1. Growing stock volume (million cft) by species and region of the state.

Species	Central	North east	North west	South east	South west	Total
Sugar Maple	164	1,063	843	122	184	2,375
Percent of total	7%	45%	35%	5%	8%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2013 data

For a table on **Volume by County for 2013** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf>



“How fast is hard maple growing?”
Average annual net growth by region and year

The [average annual net growth rate](#) of hard maple was about 56.8 million cubic feet/year between 2009 and 2013, or 10.2% of total volume growth in the state (Chart 4). The rate of growth has increased 20% since 1983 but remained statistically unchanged since 1996.

Table 2. Average annual net growth (million cft/year) of growing stock and the ratio of growth to volume by region of the state.

Region	Net growth	Percent of Total	Ratio of growth to volume
Northeast	24.6	43%	2.3%
Northwest	17.5	31%	2.1%
Central	4.9	9%	3.0%
Southwest	6.1	11%	3.3%
Southeast	3.7	6%	3.0%
Statewide	56.8	100%	2.4%

Source: USDA Forest Inventory and Analysis 2013

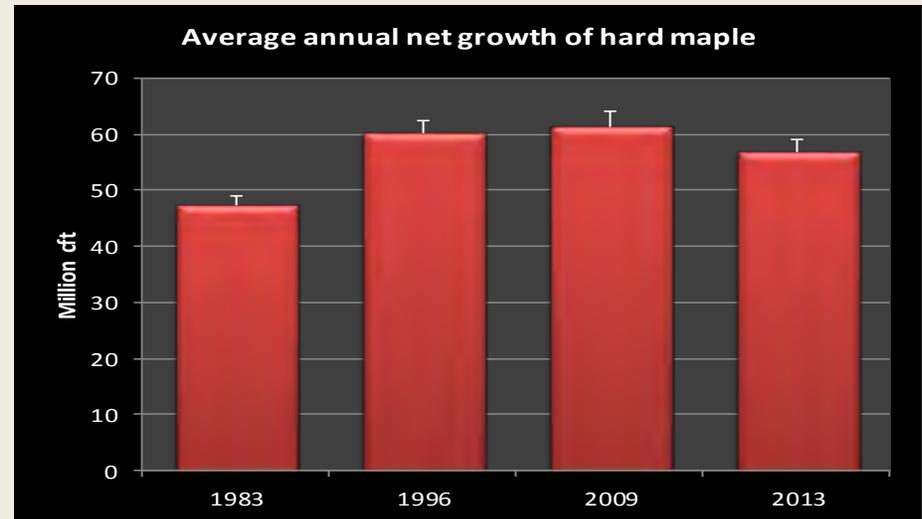


Chart 4. Average annual net growth (million cubic feet).
 Source: USDA Forest Inventory & Analysis data

Although northern Wisconsin has the highest percentage of volume growth in hard maple, the ratio of growth to volume is highest in the south (Table 2). The average statewide ratio for hard maple is 2.4%, slightly lower than the percentage for all species in the state, 2.6%. Sugar maple is a shade tolerant, slow-growing species.

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



“How healthy is hard maple in Wisconsin?”
Average annual mortality

Average annual mortality of hard maple, about 6 million cubic feet per year between 2009 and 2013, has increased almost 30% since 2009 (Chart 5).

The ratio of mortality to gross growth is only 9.6% for hard maple (Table 3). This is much lower than the statewide average of 29.6% and lower than any other species except red pine, eastern white pine and black walnut. Whereas sugar maple accounts for 11% of total growing stock volume in the state, it makes up only 2.5% of total mortality.

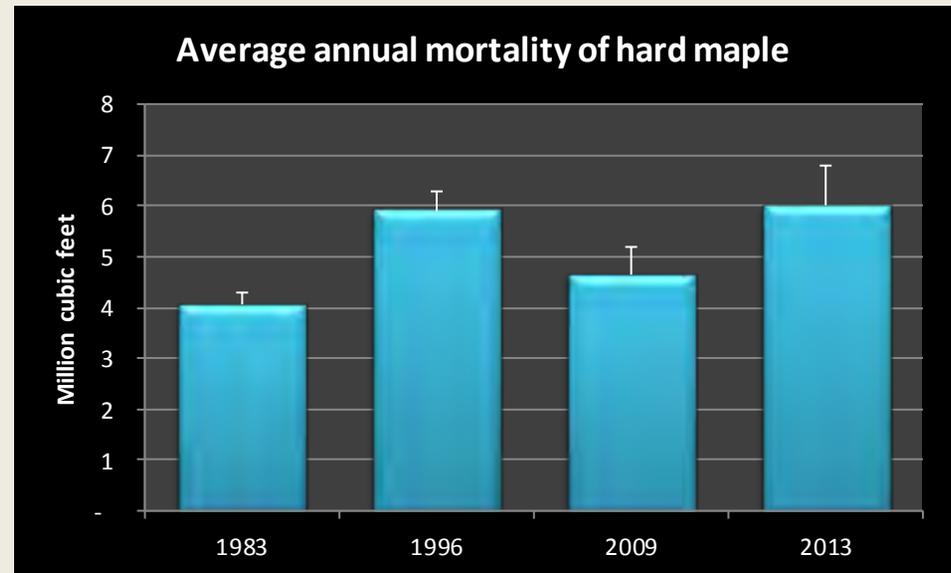


Chart 5. Average annual mortality (million cubic feet) by inventory year.
 Source: USDA Forest Inventory & Analysis data

Table 3. Mortality, gross growth, and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Sugar Maple	5,997,708	62,790,367	9.6%

Source: USDA Forest Inventory & Analysis data: 2013

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



“How much hard maple do we harvest?”
Roundwood production by product and year

Sugar maple is an important timber species in Wisconsin. In 2009, the state produced about 78.5 million cubic feet of hard maple or 28% of total [roundwood product](#) (Chart 6).

In 2009, 38% of hard maple roundwood was used for pulpwood, 19% for sawlogs and veneer and 43% for fuelwood. Sugar maple accounts for 21% of statewide roundwood production.



Chart 6. Volume of roundwood products. * Miscellaneous products include poles, posts, and pilings. Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

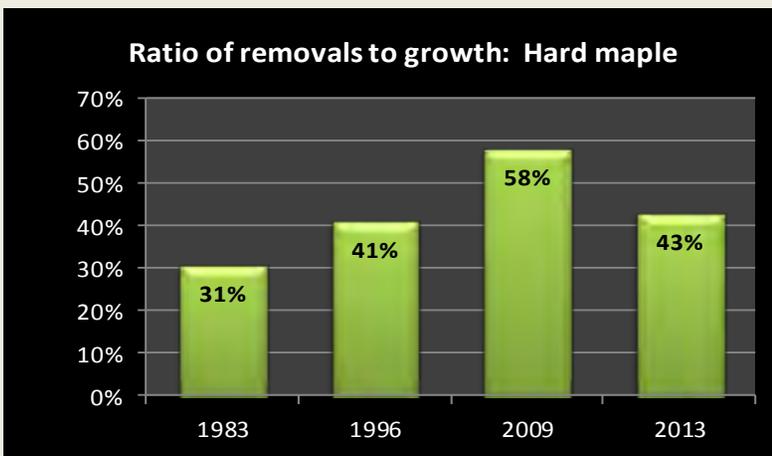


Chart 7. Ratio of volume harvested annually to net growth. Source: USDA Forest Inventory & Analysis data

Since 2004, sugar maple roundwood production has decreased for pulpwood and sawlogs but increased six fold for fuelwood.

The ratio of removals to growth for hard maple is 43%, lower than the statewide average of 56.3% for all species. We harvest 24.3 million cubic feet of hard maple annually.

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



“How much is hard maple selling for?”
Prices for cordwood and sawtimber

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and the [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR46.

Sawtimber prices, as reported in the Timber Mart North (Chart 8), had decreased steadily after 2004 but are beginning to increase in 2012.

Hard maple cordwood and sawlog prices, as reported in NR46 (Table 4), have decreased since 2005 but are beginning to pick up in 2012. Sawlog prices are substantially higher than the statewide average for all hardwood species.



Chart 8. Average prices for cordwood and sawtimber (2014 dollars).
 Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2014 dollars) by year for Wisconsin.

Product	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012	2013	Average for all hardwoods
Cordwood (per cord)	\$17	\$23	\$42	\$41	\$37	\$44	NA	\$25	\$25	\$22	NA	\$18
Logs (per MBF)	\$460	\$472	\$514	\$600	\$488	\$444	\$379	\$284	\$278	\$307	\$304	\$212

Source: Wisconsin Administrative Code Chapter NR46, 2002 to 2013. The stumpage values calculated each year are for the sole purpose of assessing MFL yield and FCL severance taxes, not for determining the price that should be received for timber.



“How much hard maple biomass do we have?”
Aboveground carbon by region of the state

There were 82.7 million short tons of aboveground biomass in live hard maple trees in 2013, a 40% increase since 1983. This is equivalent to approximately 41.4 million tons of carbon and represents 13.3% of all biomass statewide. As with volume, most hard maple is located in northern Wisconsin (Chart 9).

Hard maple has a much higher density than other commercial hardwood species in Wisconsin, with a ratio of biomass to volume of 40 oven-dry lbs. per cubic foot (ODP/cubic feet). The average for all hardwoods is about 37 ODP/cubic feet and for all species is 33 ODP/cubic feet. Approximately, 75% of all hard maple biomass is located in the main stem and 21% in branches.

The amount of hard maple as well as the high density of its wood may make it a valuable species for biomass production.

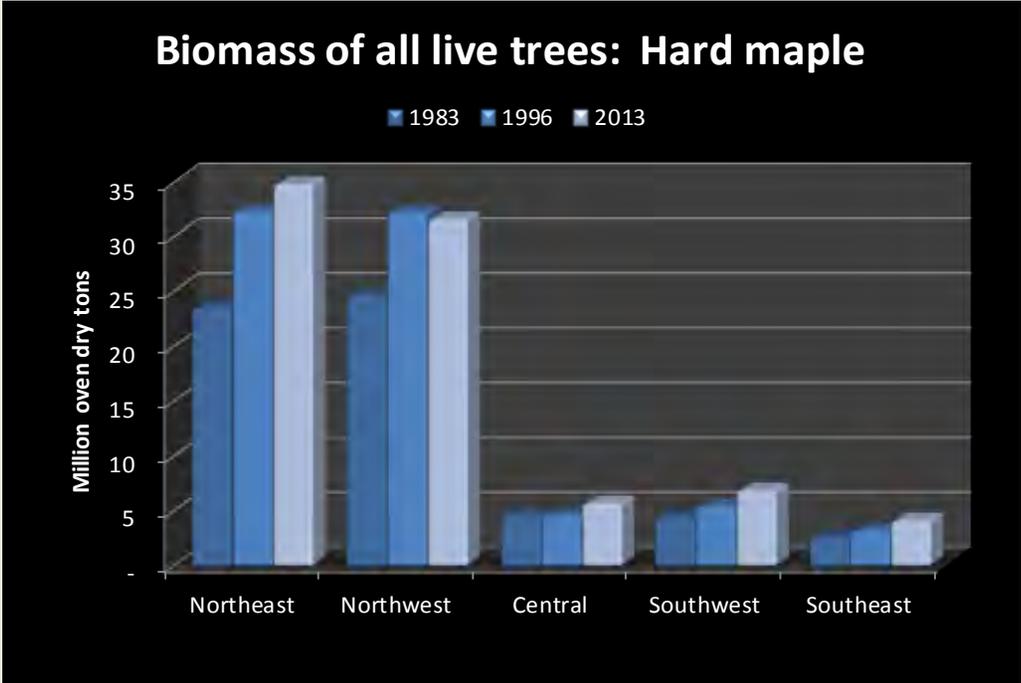


Chart 9. Biomass (million oven-dry tons) by year and region.
 Source: USDA Forest Inventory & Analysis data

For a table of **Biomass by County** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf>