Maine's Forest Resources Past, Present, and Future

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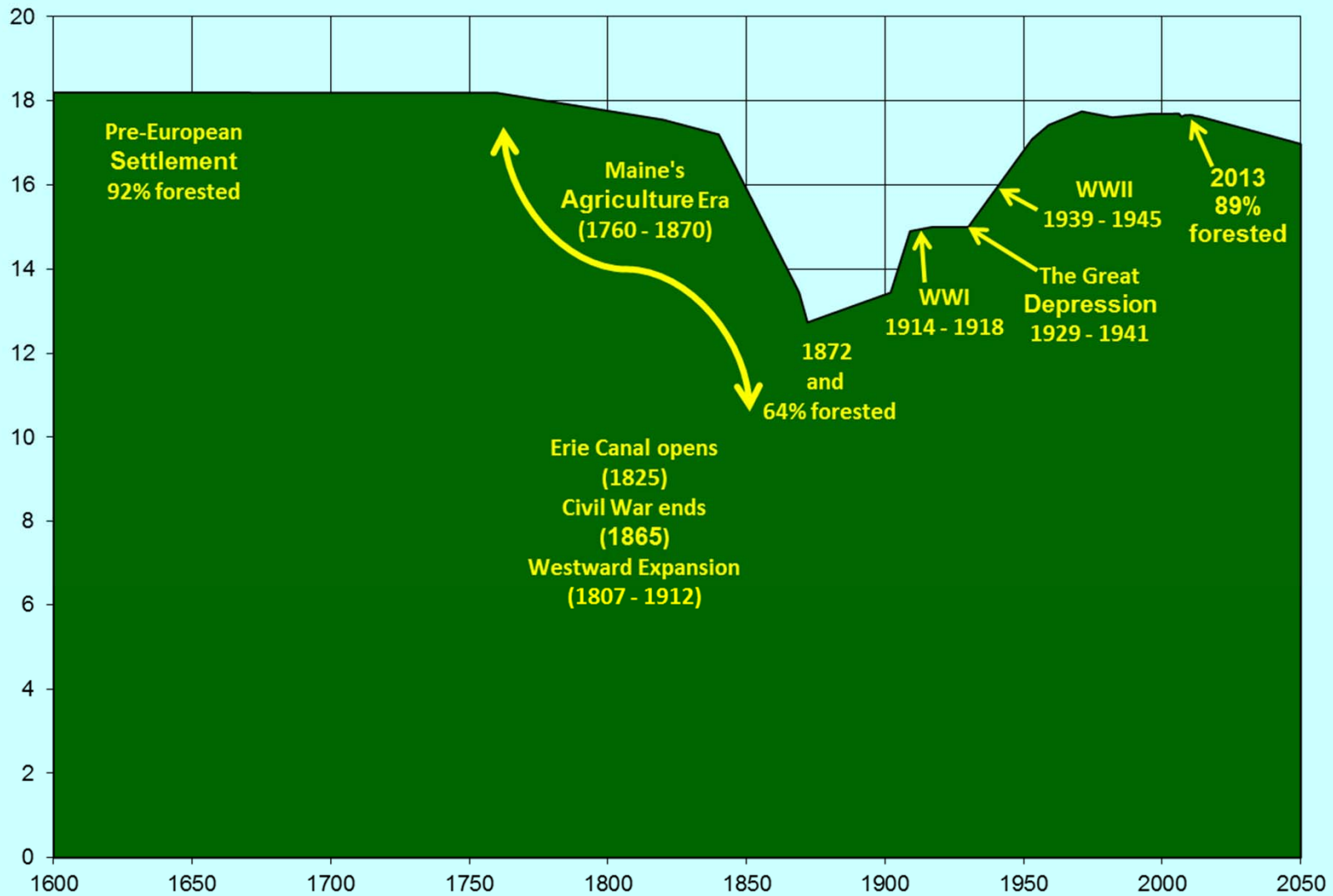
August 21, 2014
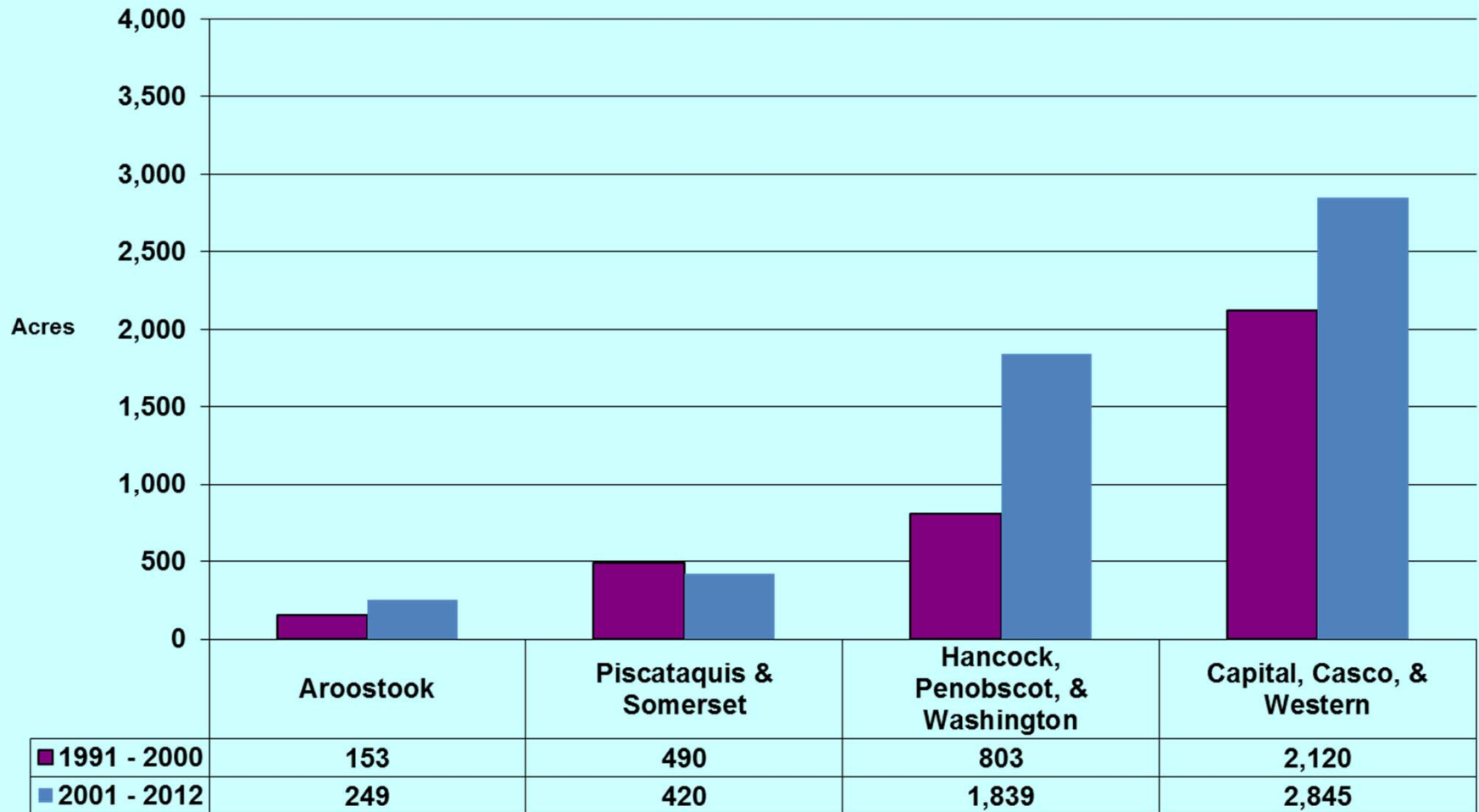
Forester's Institute - Emerald Ash Borer

Discussion topics

- Timberland and land use changes (1600 – 2013) and the future
- Current major forest types, stocking, stand size,
- Timberland ownership patterns (1959 – 2012)
- Standing inventory of sawtimber and pulpwood (1600 – 2013) and the future
- Harvest acreages and types (1982 – 2012)
- Harvest volumes (1839 – 2012) and the future
- Wood flows
- Ash – the risk and impacts

Estimates of Maine's forestland (past, current, and projected)
(million acres)

Pre-European Settlement 92% forested

Maine's Agriculture Era (1760 - 1870)

1872 and 64% forested

Erie Canal opens (1825)
Civil War ends (1865)
Westward Expansion (1807 - 1912)

WWI 1914 - 1918

The Great Depression 1929 - 1941

WWII 1939 - 1945

2013 89% forested

Average annual forestland conversion to other nonforested uses, as reported by landowners, by 4 areas of interest (MFS data sources)

	Aroostook	Piscataquis & Somerset	Hancock, Penobscot, & Washington	Capital, Casco, & Western
■ 1991 - 2000	153	490	803	2,120
■ 2001 - 2012	249	420	1,839	2,845

Forests on the Edge – 3 of top 15 are in Maine, including **#3, 8, and 13**

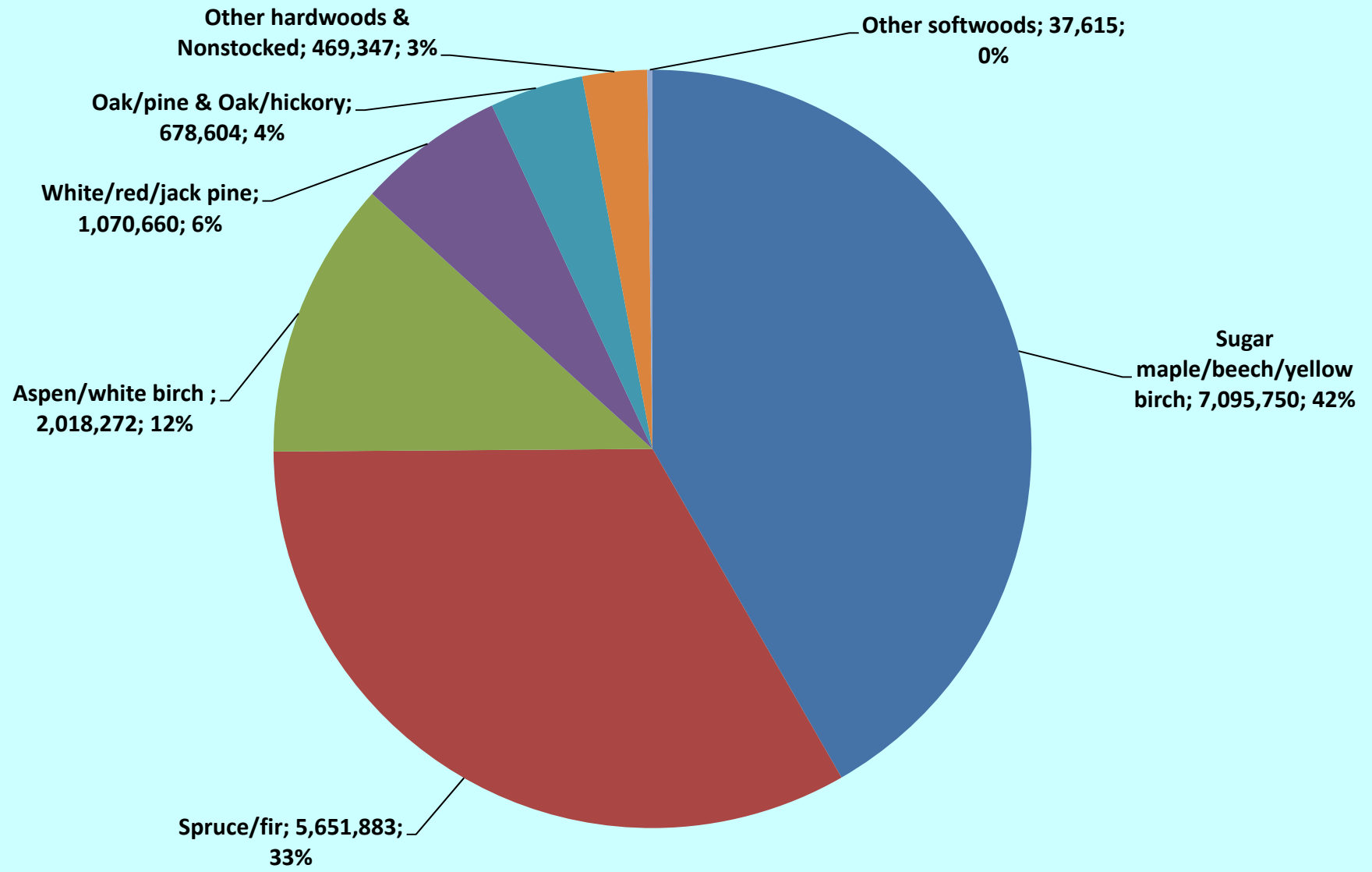|	Watershed	Acres	State(s)
1	Merrimack	416,192	Massachusetts, New Hampshire
2	Middle Chattahoochee–Lake Harding	346,163	Alabama, Georgia
3	Piscataqua–Salmon Falls	345,070	Maine, Massachusetts, New Hampshire
4	Etowah	330,625	Georgia
5	Upper Neuse	323,468	North Carolina
6	Upper Broad	320,688	North Carolina, South Carolina
7	Lower St. Johns	314,466	Florida
8	Lower Kennebec	308,017	Maine
9	Upper Ocmulgee	306,174	Georgia
10	Saluda	294,915	North Carolina, South Carolina
11	Upper Catawba	280,136	North Carolina, South Carolina
12	Upper Oconee	277,620	Georgia
13	Saco	259,896	Maine, New Hampshire
14	Middle Coosa	257,556	Alabama
15	Lower Kentucky	244,192	Kentucky

Figure 5—Top 15 watersheds in terms of total acreage of private forest projected to experience increased housing density. Note: Because of the use of updated data and analysis, the top 15 watersheds presented in this table are different than the top 15 watersheds shown in a similar table in Stein 2005.
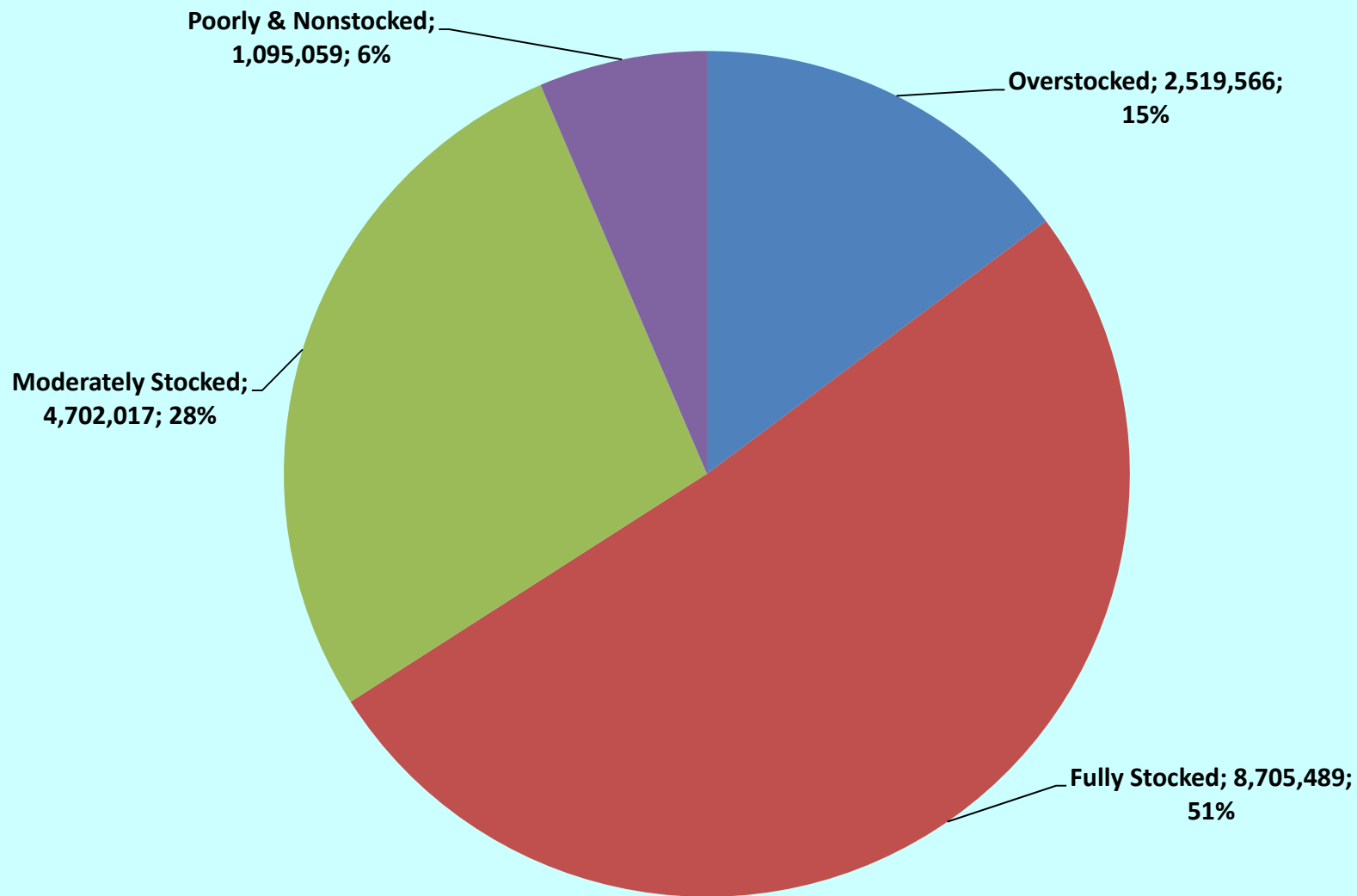
Assessment of timberland base and land use changes

- Maine remains the most heavily forested state, in 2003, it was 90% of it's land area, by 2013 reduced to 89%.
- In the last 22 years, there has been a substantial increase in land use changes, with forest conversions reducing individual county timberland from 0.12% in Aroostook to 2.55% in Cumberland.
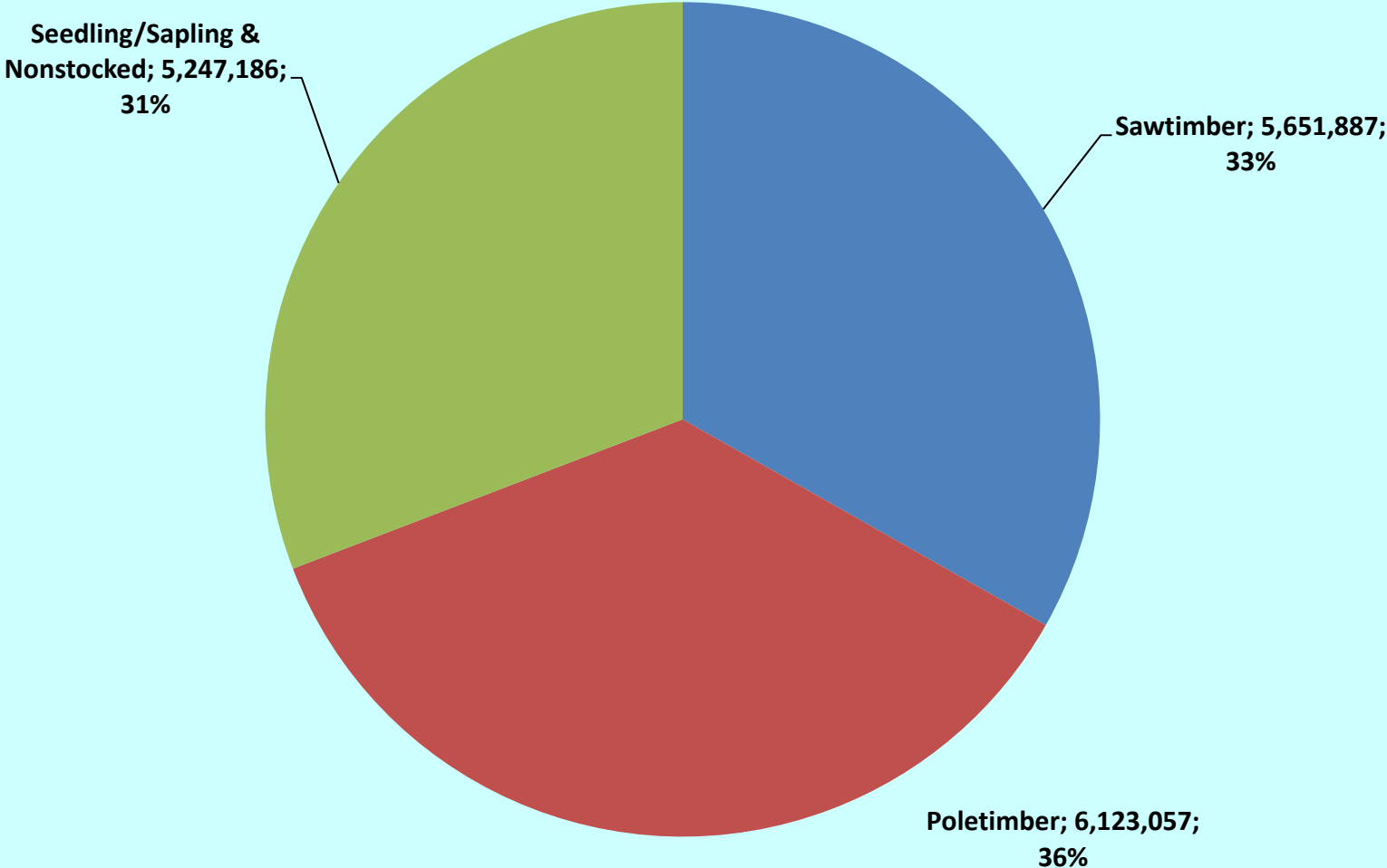- *Forests On The Edge* – predicts increased housing density on 913,000 acres in 3 watersheds by 2030.

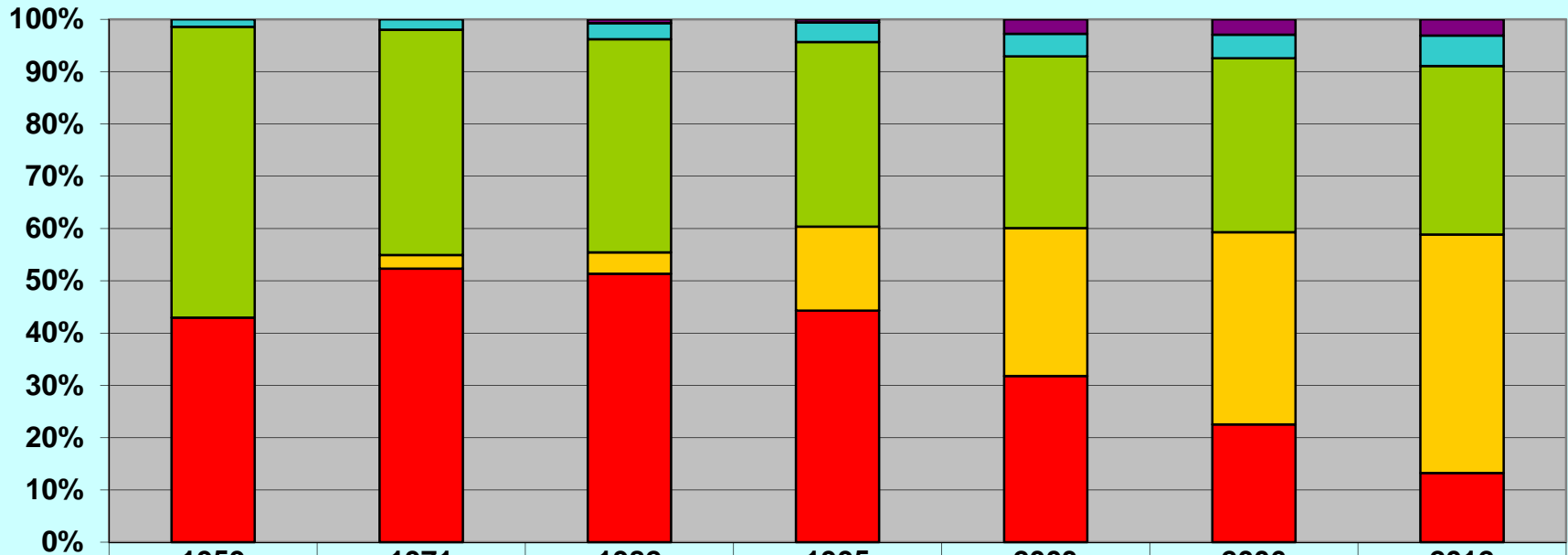**Maine's distribution of major forest types (type group; timberland acres; % of total), 2013**

Other hardwoods & Nonstocked; 469,347; 3%

Other softwoods; 37,615; 0%

Oak/pine & Oak/hickory; 678,604; 4%

White/red/jack pine; 1,070,660; 6%

Sugar maple/beech/yellow birch; 7,095,750; 42%

Aspen/white birch ; 2,018,272; 12%

Spruce/fir; 5,651,883; 33%

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Maine's distribution of timberland acres, by all live stocking class
(class; acres; % share), 2013

Poorly & Nonstocked; 1,095,059; 6%

Overstocked; 2,519,566; 15%

Moderately Stocked; 4,702,017; 28%

Fully Stocked; 8,705,489; 51%

Maine's distribution of timberland acres,
by stand size class (class; acres; 5 share), 2013

Seedling/Sapling &
Nonstocked; 5,247,186;
31%

Sawtimber; 5,651,887;
33%

Poletimber; 6,123,057;
36%

Timberland, by major owner group, percentage in chart and acres in table, by inventory year

	1959	1971	1982	1995	2003	2006	2012
■ Misc. Large Private	-	-	118,153	100,399	475,208	504,061	538,833
□ Public	216,000	311,500	495,746	627,957	743,542	771,236	1,011,877
■ Family Forests	8,440,000	6,797,200	6,579,406	5,935,261	5,648,088	5,705,685	5,590,691
□ Corporate Investor	-	408,500	656,756	2,702,735	4,865,170	6,302,971	7,908,723
■ Forest Industry	6,521,000	8,255,000	8,286,336	7,446,258	5,470,094	3,865,592	2,300,488

Sawtimber Inventory (million board feet) of
White Pine and Major Hardwood Species
(Red & Sugar Maple, Yellow & White Birch, Aspen, and N. Red Oak)
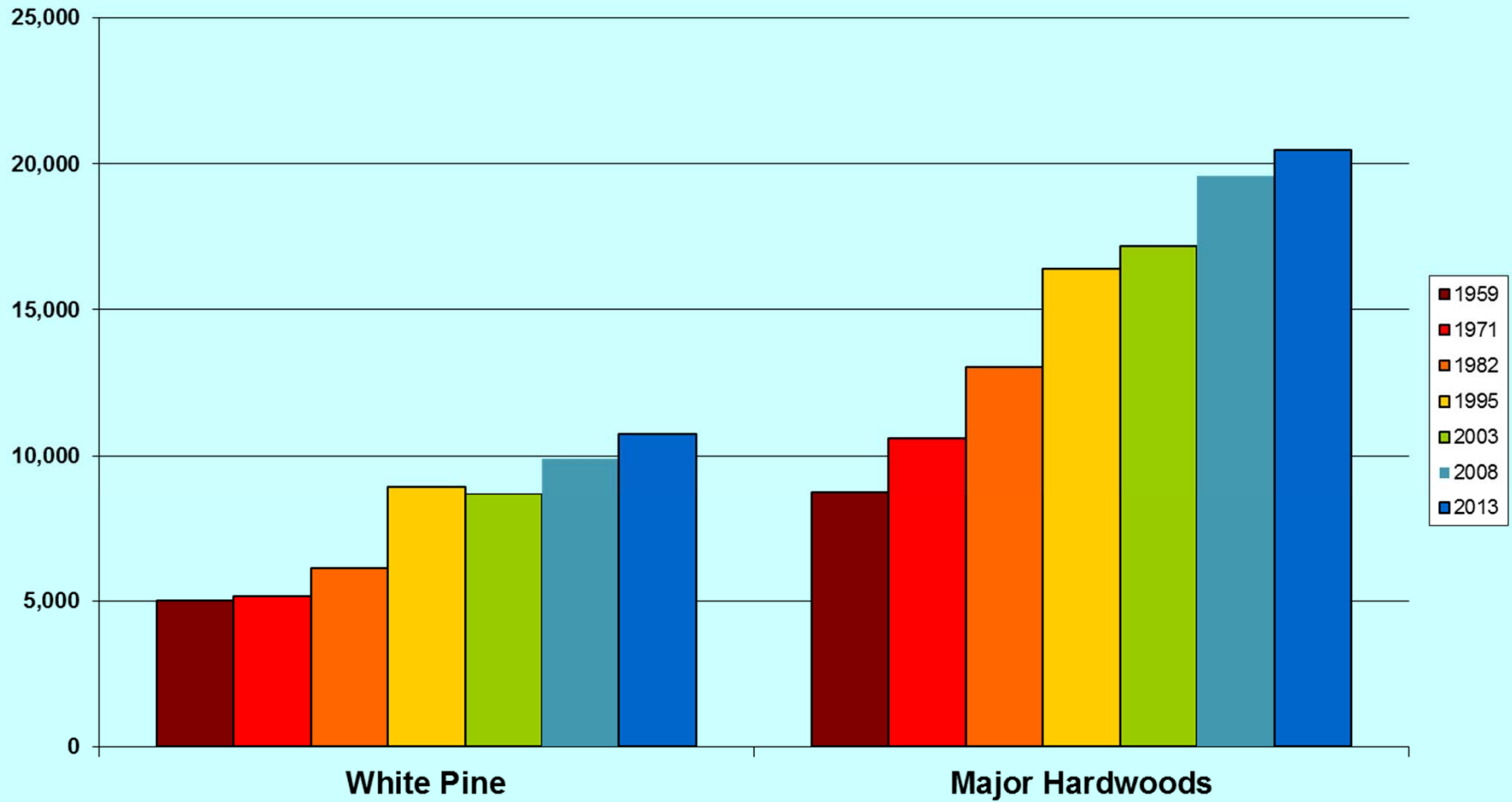
Historic estimates of Maine's merchantable volume
(5.0"+ DBH and at least pulpwood quality), million cords
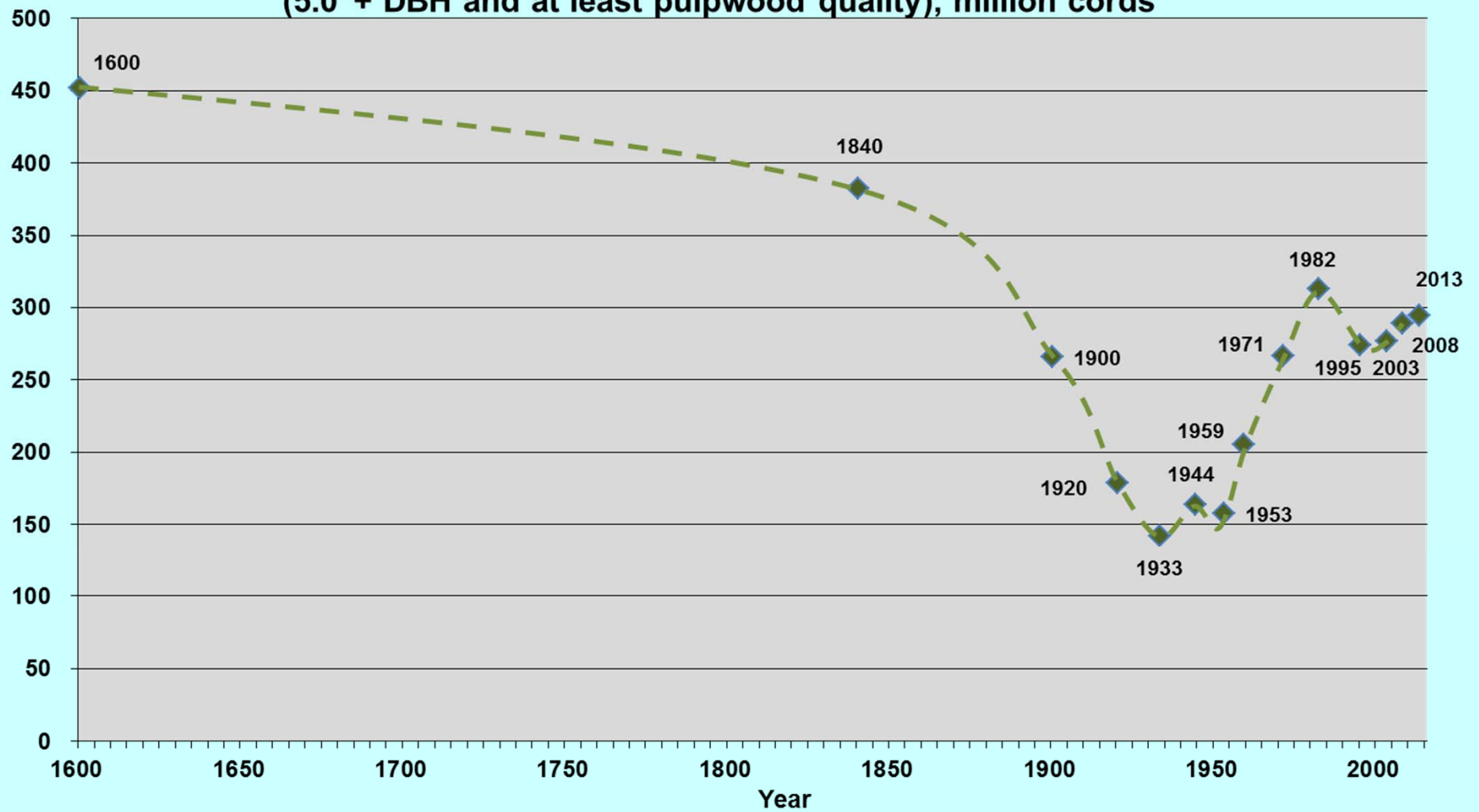
Assessment of the standing inventory of merchantable volume (1600 – 2013)

- The low point of forestland coverage (1872 @ ~64%) and the low point of merchantable inventory (1933 @ 142 million cords) are separated by 61 years.

- Current inventory levels (Species or product) are relatively stable.

Future Inventory Projections and Reality

- 1972 – USDA Forest Service predicted a 30-year projection of growing stock inventory to 2001

- 1995 – USDA Forest Service and Maine Forest Service modeled a 50-year projection to 2045

- 2000 – Northeastern State Foresters Association (NEFA) modeled a 50-year projection to 2050

Historic Pulpwood Inventory Estimates of All Species (Million Cubic Feet) and 3 Futuristic Projections of Wood Supply

Legend:
- Pulpwood
- 1972 USDA GS Projection
- 1995 TSO Report - Pulpwood
- 2000 NEFA - Merch. Volume
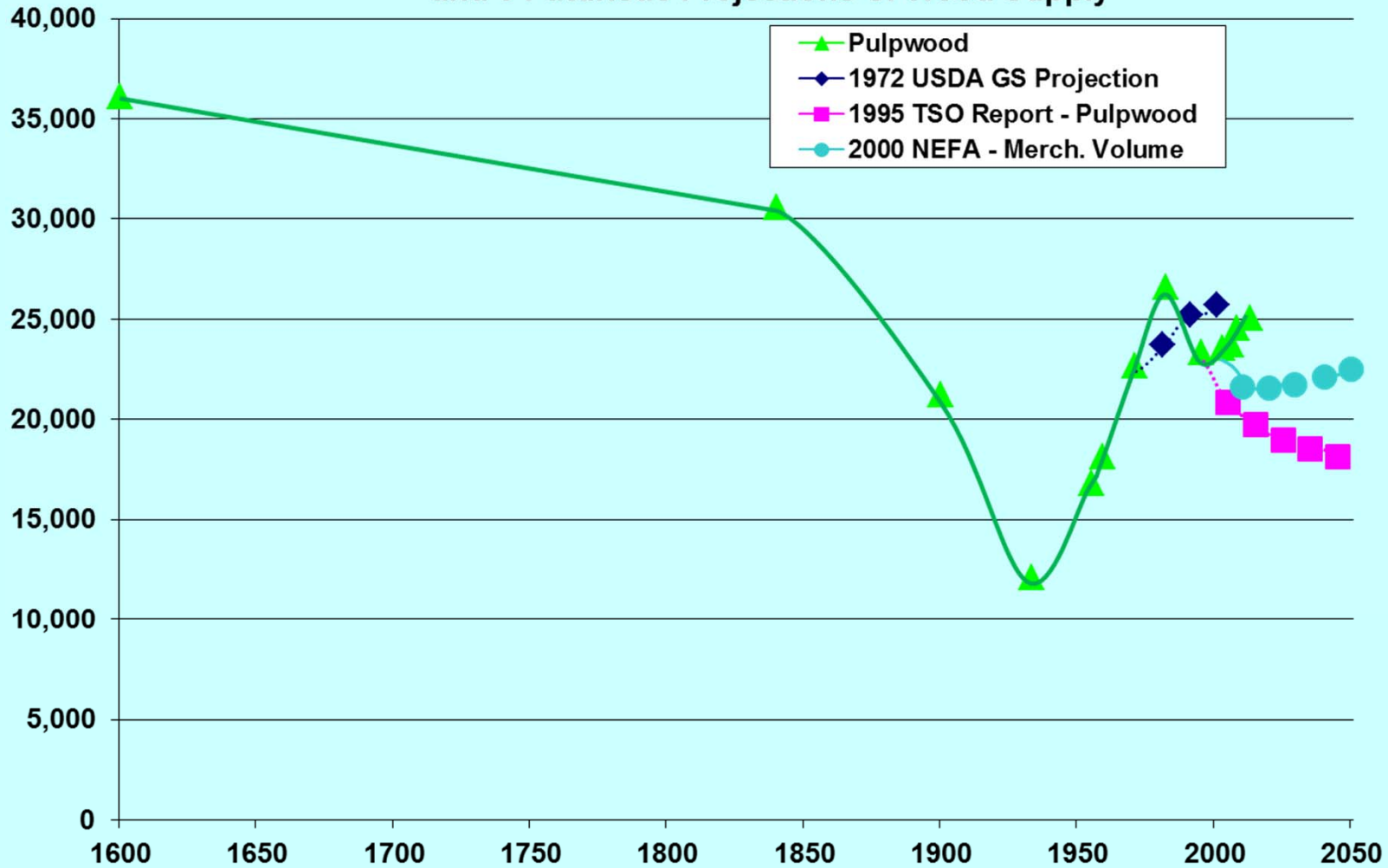
Assessment of Forest Modeling Efforts

- In terms of future projections, remember what George E. P. Box said,

  "All models are wrong, but some are useful!"

  Models are simplified abstractions of reality. Models provide information as to the potential effects that may occur. Therefore, even though we know these simulations cannot predict reality, they are useful for indicating patterns of likely outcomes and options for managers to alter effects.

- A new statewide wood supply/allowable cut modeling effort is in process, one that incorporates a additional basis for biomass estimation and other ecological services.

## Statewide average annualized acreage, by harvest type and period
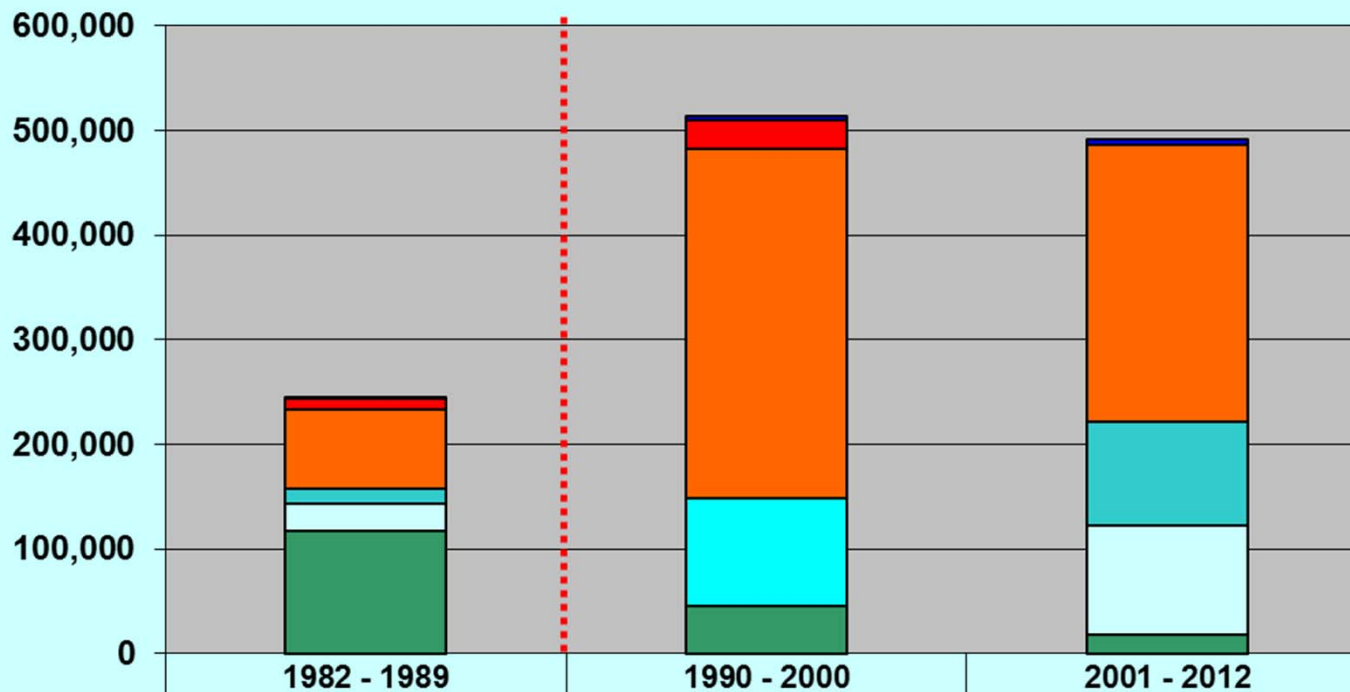
	1982 - 1989	1990 - 2000	2001 - 2012
■ Land Use Change	1,628	3,373	5,460
■ All Other	10,167	27,538	
■ Partial Harvesting	76,613	334,713	264,271
☐ Shelterwood	-	102,176	-
☐ Initial Shelterwood	13,642	-	99,447
☐ Final Shelterwood	26,642	-	104,095
■ Clearcut	116,832	45,832	18,083

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Elm Strm. W. Branch Penobscot

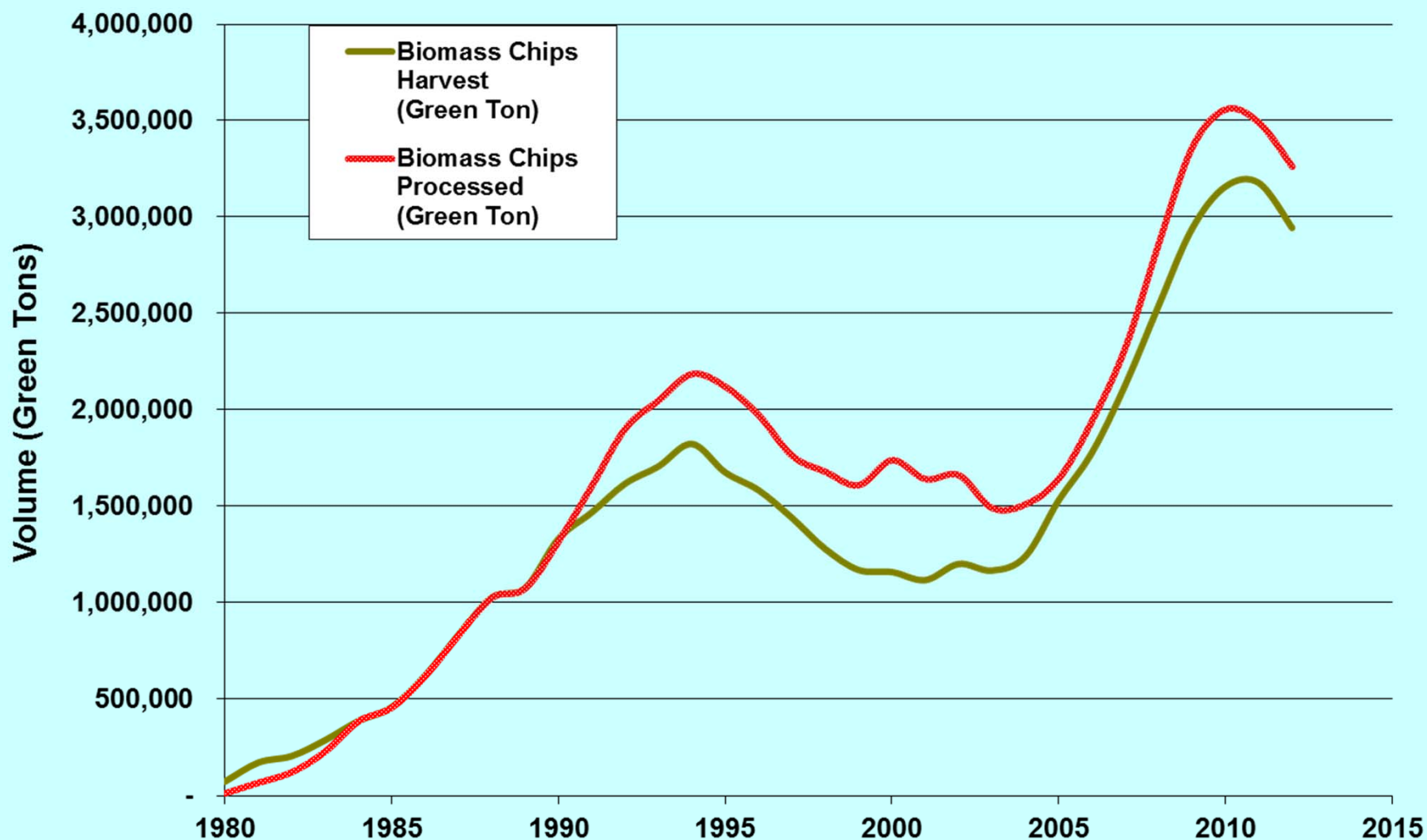1870 - 2012 sawlog harvest (MBF) by total, softwood, and hardwood (displayed as a 5-year trailing average)
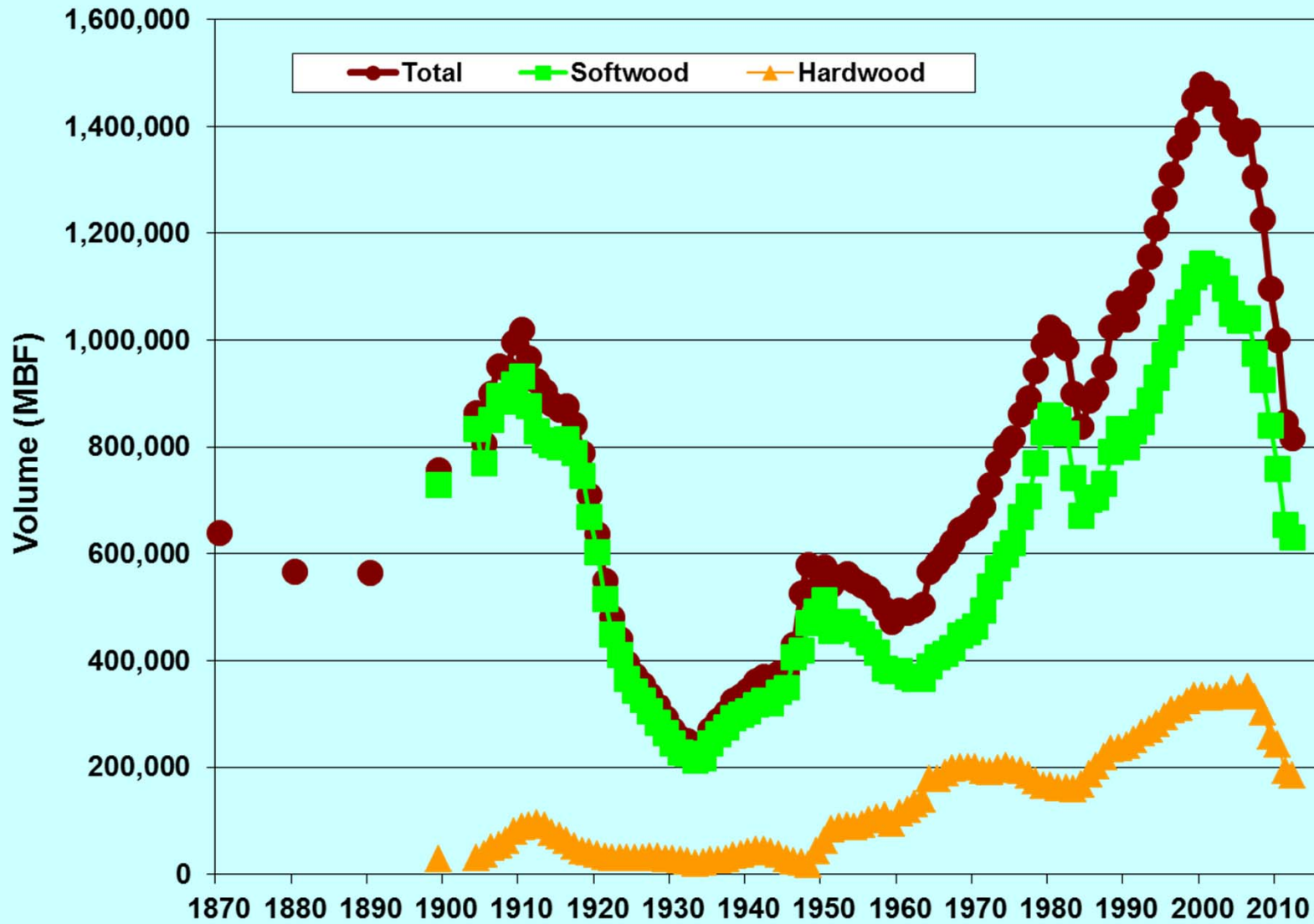
1899 - 2012 pulpwood harvest (Cords) for Total, softwood, and hardwood (displayed as a 5-year trailing average)
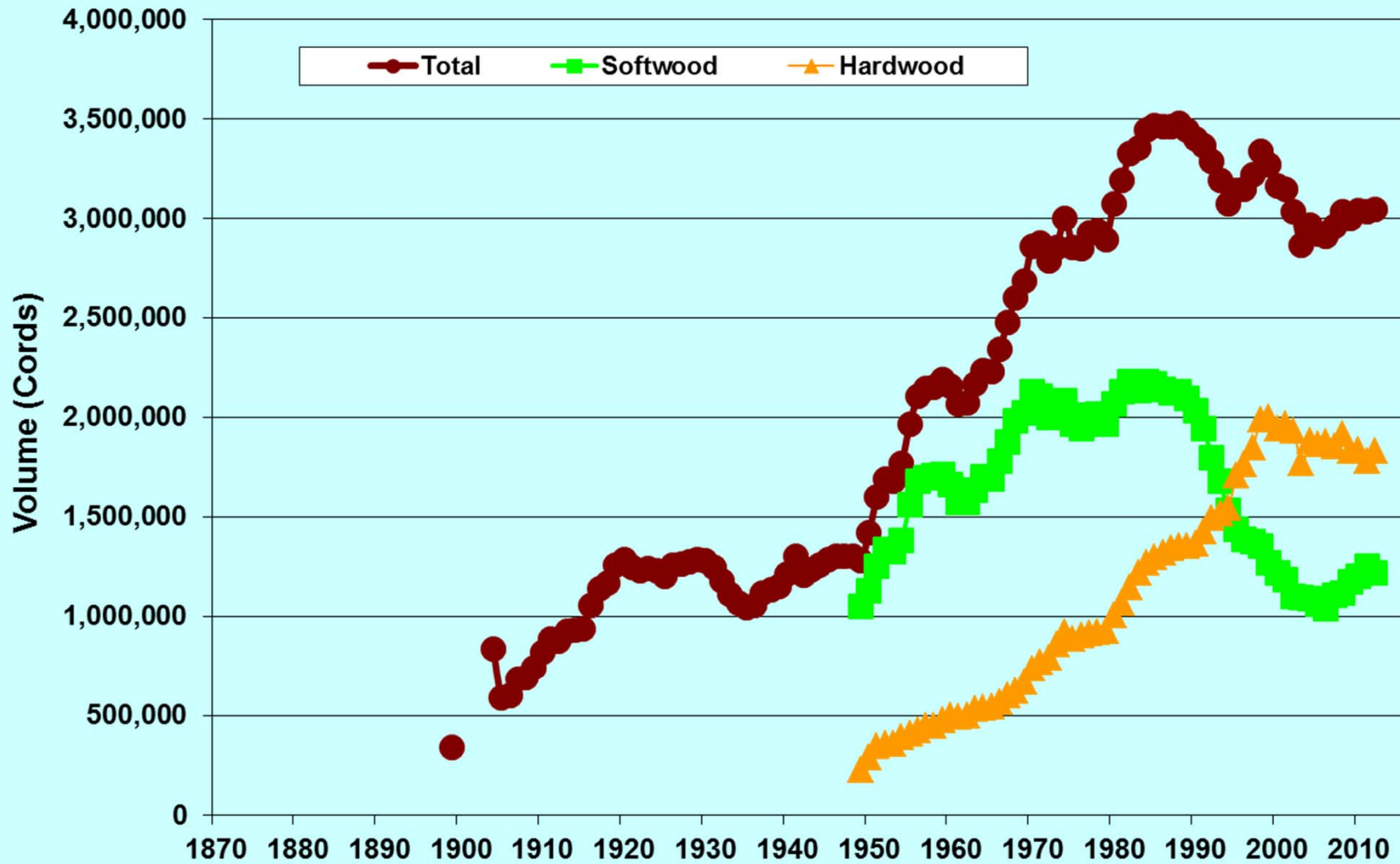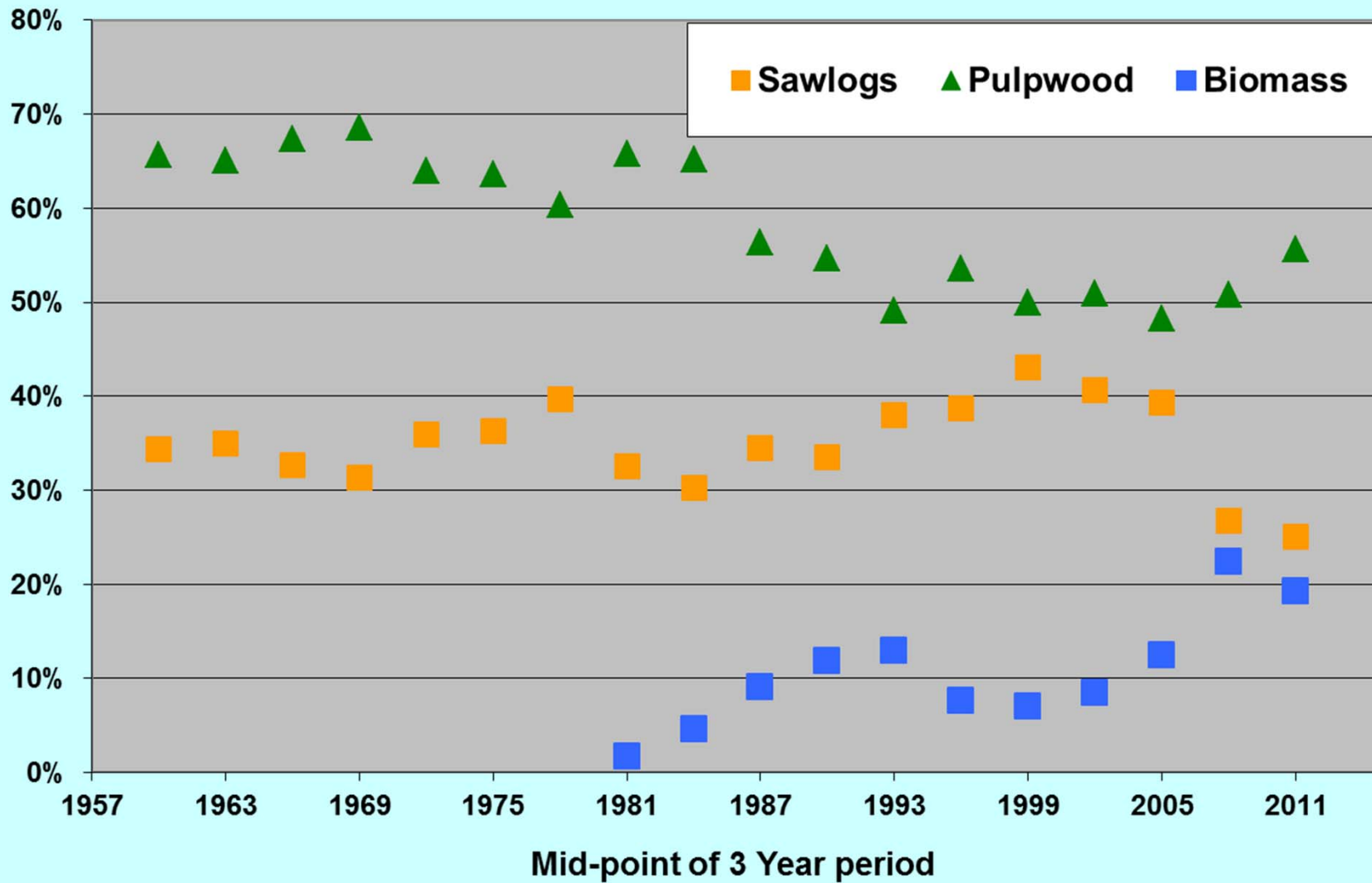
1980 - 2012 reported harvest and processing of biomass chips (Green Tons) (Displayed as a 5-year trailing average)

Harvest volume (green ton) distribution, by product, from 1904 - 2012 (5-Year Trailing Average)
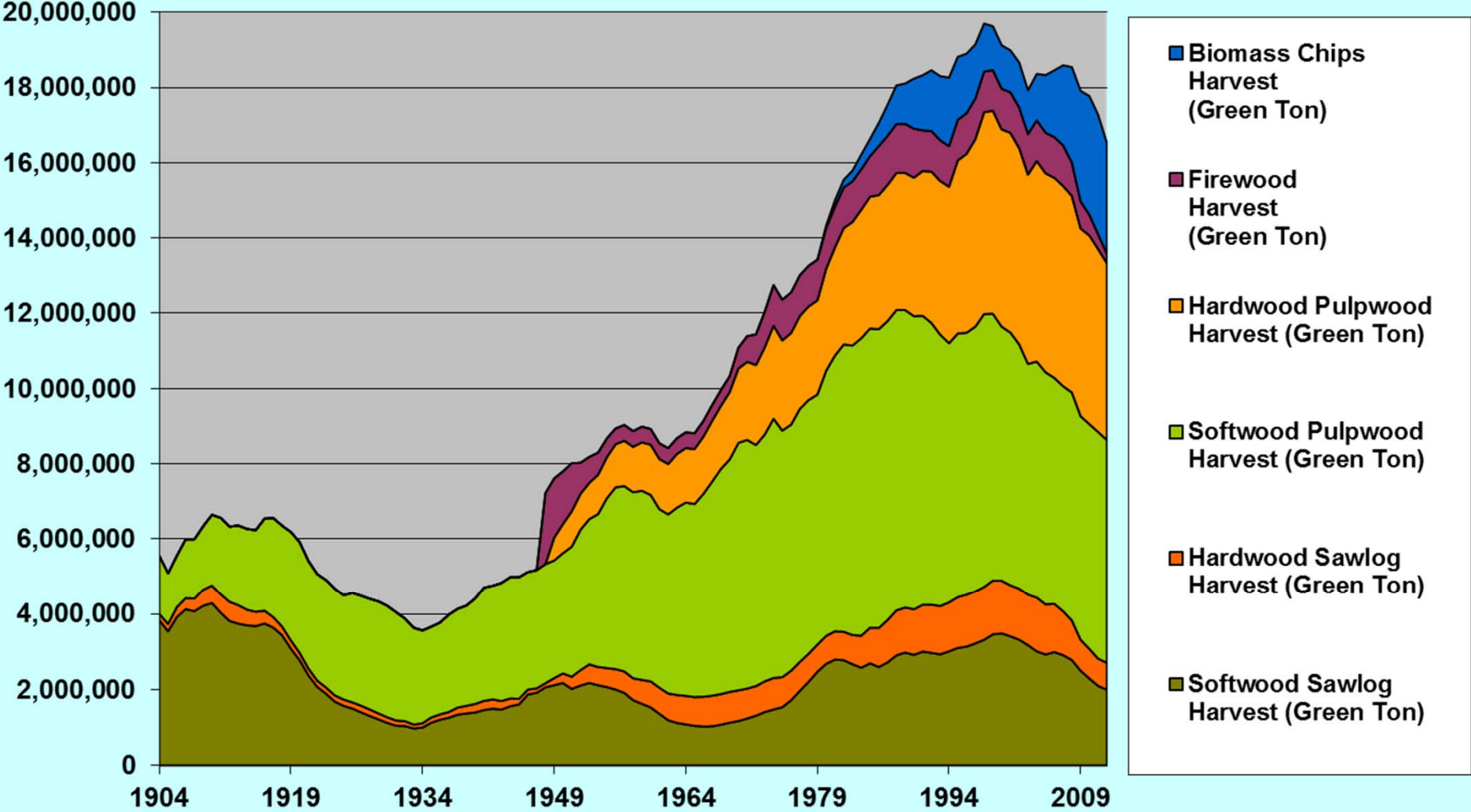
Average periodic (3 Year) contribution of 3 major forest products to the total harvest

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Potential increases in harvest volumes

■ **Spruce/Fir**

- ❑ MFS commissioned a study in 2011 to examine the current and forecast the status of the spruce/fir resource.

- ❑ Harvest can be increased 25% for next 10 years (2011–2020) without an adverse inventory impact.

- ❑ Harvest can then be increased again, for second 10-year period (2021–2031), while maintaining spruce/fir inventory.

- ❑ Overall a 23% increase over the 20-year period modeled.

■ **Hardwood**

- ❑ MFS commissioned an additional study in 2012 to examine the current and forecast the status of the hardwood resource.

- ❑ Harvest needs to decrease slightly (1%) within the 1st 10-year period (2012–2021) in order to maintain inventory.

- ❑ Then for the 2nd 10-year period (2022–2031), harvest can increase 29%, without impacting inventory.
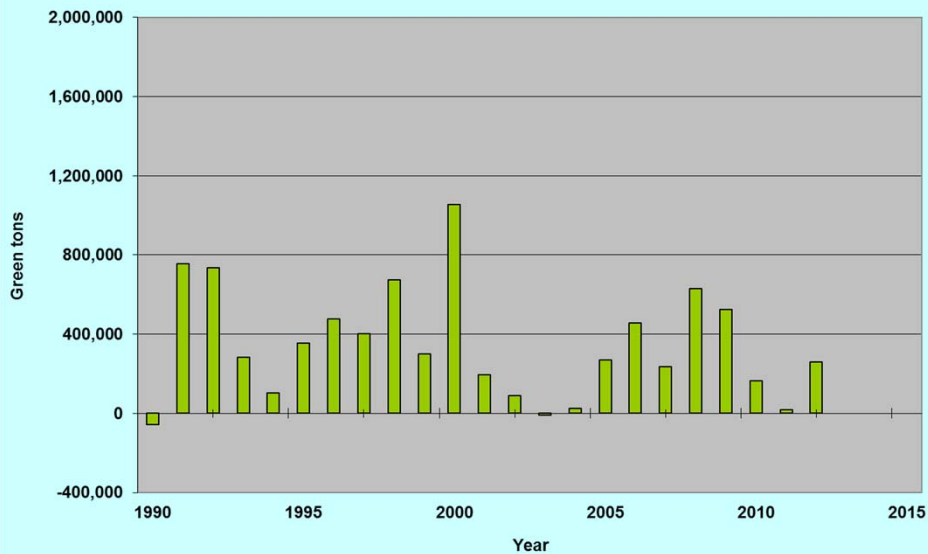
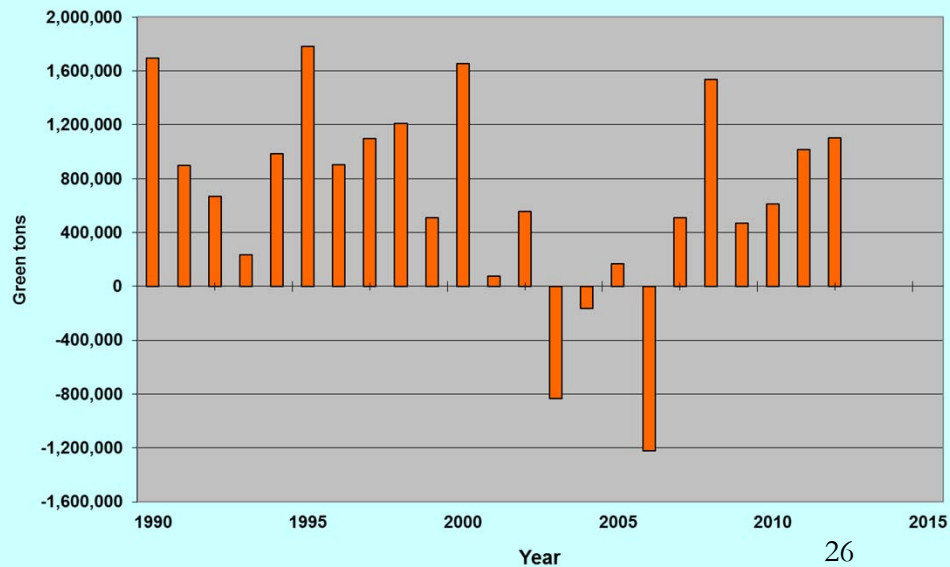Sawlog net imports (Total imports minus total exports)
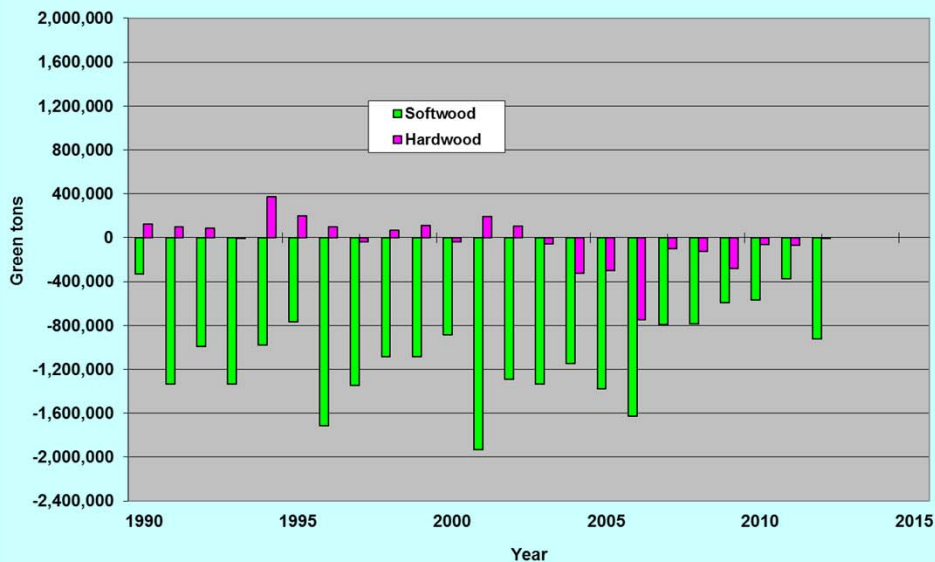
Pulpwood net imports (Total imports minus total exports)
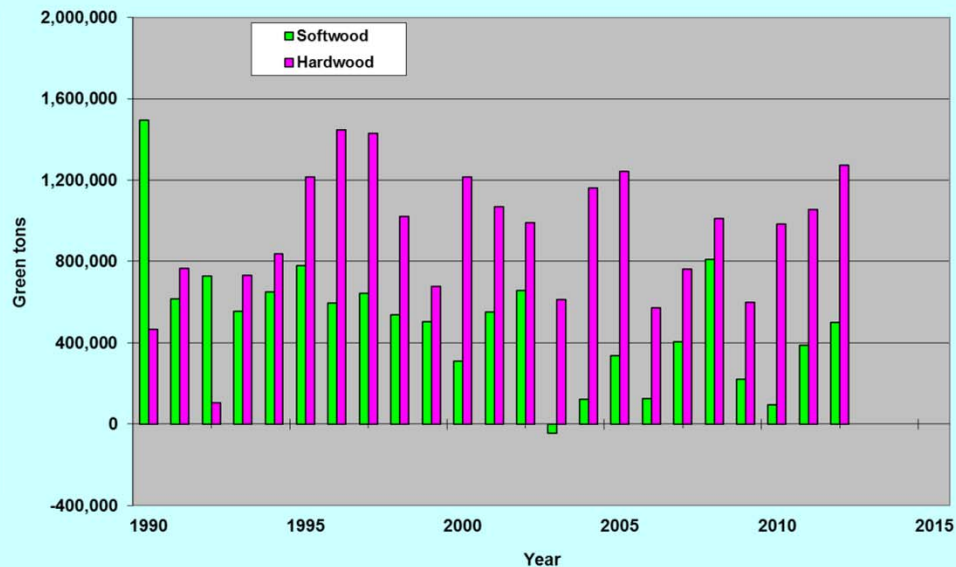
Biomass net imports (Total imports minus total exports)

Overall net import (Total imports minus total exports)

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Ash – the risk and impacts

- **Based on Maine's FIA data (2013)**
  - Includes white ash, black ash, and green ash; all of which are preferred by EAB
  - Is found in all major forest types, but 49% of all live ash trees (1.0"+ DBH) are in the Sugar maple/beech/yellow birch forest type
  - Is found in all Maine counties, and pretty evenly distributed across 4 equal areas – Aroostook (23%); Piscataquis/Somerset (26%); eastern ME (19%); and southern ME (31%)

Timberland Estimate of Ash Trees, by Species, by DBH Class/Product Grouping, Maine, 2013

Number of Trees by DBH Class Grouping

Species	Saplings 1.0 - 4.9" DBH	Poletimber 5.0 - 9.9" DBH	Sawtimber 11.0"+ DBH	Species Total (1.0"+ DBH)	Species Total (5.0"+ DBH)
White Ash	199,004,348	44,754,399	8,530,302	252,289,049	53,284,701
Black (Brown) Ash	161,527,202	14,502,202	417,089	176,446,493	14,919,291
Green Ash	3,275,234	1,205,465	291,193	4,771,892	1,496,658
All Ash Species	363,806,784	60,462,066	9,238,584	433,507,434	69,700,650
All Ash as a % of All Hardwood	4%	5%	4%	4%	5%
All Ash as a % of All Species	2%	3%	1%	2%	2%

Merchantable volume and stumpage value, Maine, 2013

Species	Sawtimber 11.0"+ DBH (MBF)	Pulpwood w/Potential 5.0 - 10.9"+ DBH (Cords)	Pulpwood ONLY 5.0"+ DBH (Cords)	Species Total (1.0"+ DBH) (Cords)
White Ash	1,009,800	2,921,475	736,492	5,677,566
Black (Brown) Ash	35,966	685,373	66,153	823,459
Green Ash	37,762	70,196	28,598	174,317
All Ash Species	1,083,528	3,677,043	831,242	6,675,342
2012 Statewide Stumpage Value	$ 173.00	$ 30.50	$ 22.50	
	$ 187,450,362	$ 112,149,823	$ 18,702,956	$ 318,303,140
Avg. stumpage value per tree (5.0"+ DBH)				$ 4.57

Questions/Comments

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