

Forest-Based Woody Biomass Supplies in New York: Opportunity and Challenges



**NYSAEMC and NYSACC Conference on the Environment
October 18, 2008**



North Country Wood Biomass Alternative Energy Feasibility Project for Municipal and Institutional Facilities



The Opportunity: The Department of Environmental Conservation (DEC) and a coalition of organizations known as the Adirondack Energy Smart Park Initiative (ESPI) are administering a grant program for municipal and institutional facilities that are interested in exploring the feasibility of using locally produced wood to reduce annual heating costs. It is expected that colleges, prisons, schools, municipal buildings, and many other small- to medium-scale energy facilities will benefit most from this program because they are large consumers of fossil fuels and the buildings involved often meet the unique requirements needed to utilize wood for fuel.

Potential Savings on Heating Costs by Using Local Wood: Every year, North Country building managers spend millions of dollars on fossil fuels to heat their buildings, many of which leak heated air throughout the harsh winter season. The DEC and ESPI have developed a program to study ways to convert some facilities to the use of locally abundant and sustainable woody biomass fuels for heat, while also educating facility managers about opportunities to dramatically cut energy costs through energy conservation measures.

Program Activities Overview:

- DEC will provide 75 percent of the cost of a study to assess the feasibility of utilizing woody biomass for heat in qualifying facilities. Each study will evaluate costs, savings and site specific engineering concerns.
- Two or three local conferences will be scheduled in early 2008 to discuss woody biomass heat energy opportunities in-depth. **Topics will include:**
 - available boiler technology options (e.g.-wood chip systems, pellet systems)
 - operations and maintenance requirements
 - fuel availability
 - public relations issues
 - case studies of facilities in the northeast using wood for heat
 - emissions control issues
 - linking wood energy with other conservation opportunities
- Field trip(s) to facilities currently utilizing wood for heating will also be scheduled in 2008.

Renewable, Sustainable Energy: Woody biomass for heating is a locally produced product from on-going timber harvests and sawmill/forest products manufacturing operations. It is a "renewable" and "carbon neutral" source of heating energy because, unlike fossil fuels, the carbon released from burning wood is recaptured by the growth of new trees. Also, many sources of wood harvested in the North Country are certified as environmentally "green," or sustainable, as a result of enrollment in various recognized forest certification programs. Woody biomass costs less than fossil fuels on a Btu basis and is a viable alternative for many buildings in New York's North Country.

Local Wood Energy

*Offering the potential for
facility energy cost savings
and improved forest
management and timber
product utilization in the
North Country*

For More Information Contact:

NYS DEC Forest Utilization Program
518-402-9415
www.dec.ny.gov/lands/4963.html

The Adirondack Energy Smart Park Initiative
1-866-260-4837
www.energysmartpark.org

Wood Heated Schools in Vermont

- 30 Schools in VT
- 20% of Students
- 14 more are planned

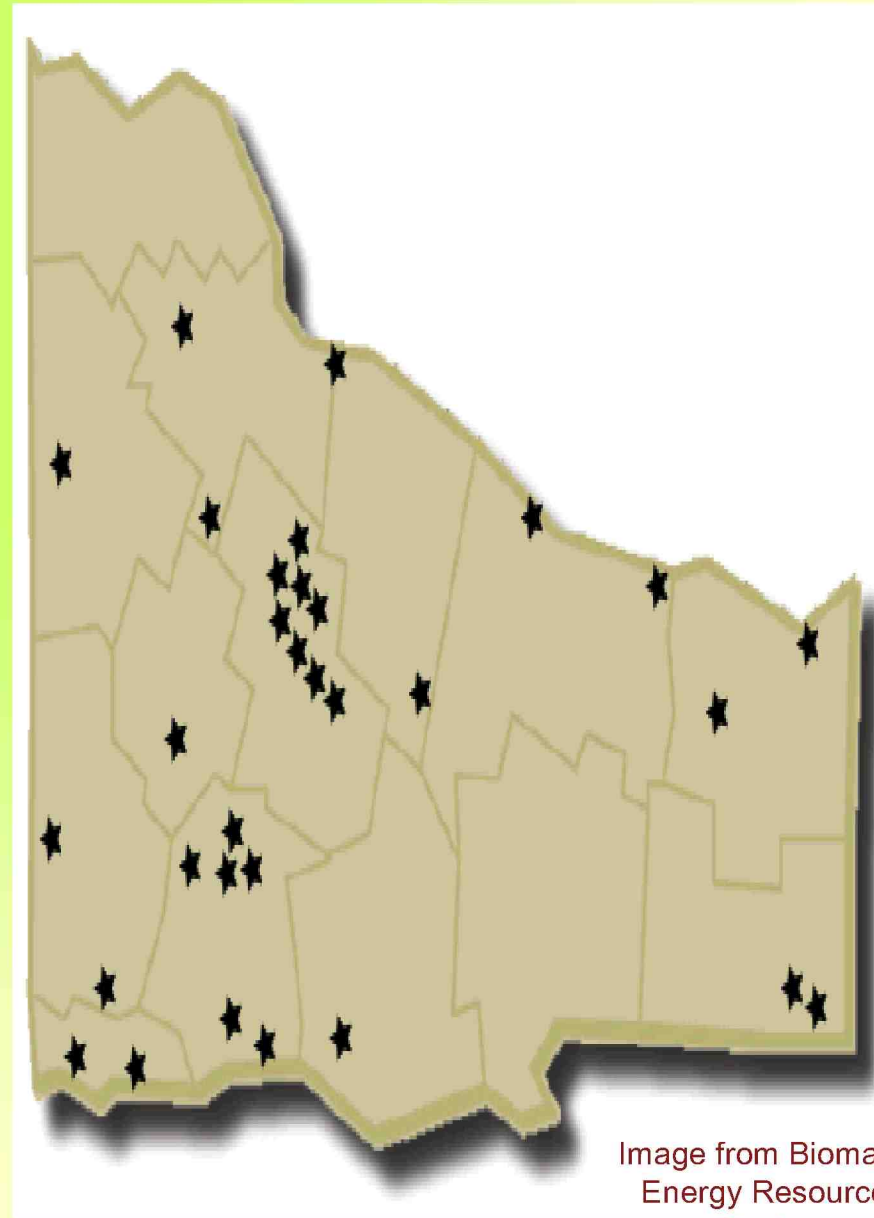
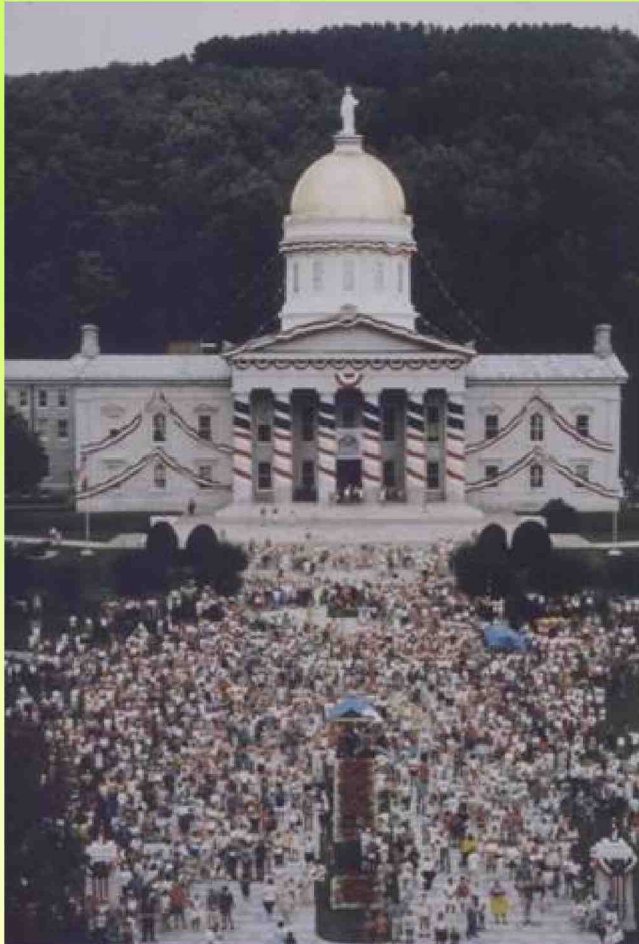


Image from Biomass
Energy Resource
Center

Vermont's Most Famous Wood Heated Building



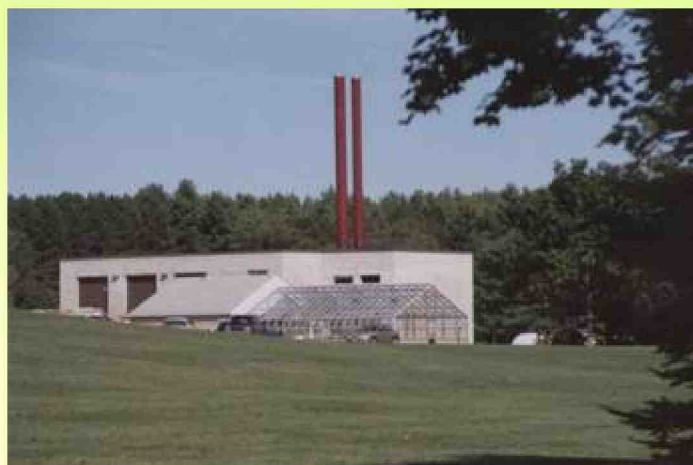
**Vermont Statehouse
Montpelier, Vermont**

Multi-Building Heating-District Heating



**Mt. Wachusett
Community College
Gardner, MA**

Approx. 10 MMBTU



Public Buildings: Correctional Facilities

Half of Vermont's 10 correctional facilities are heated with wood



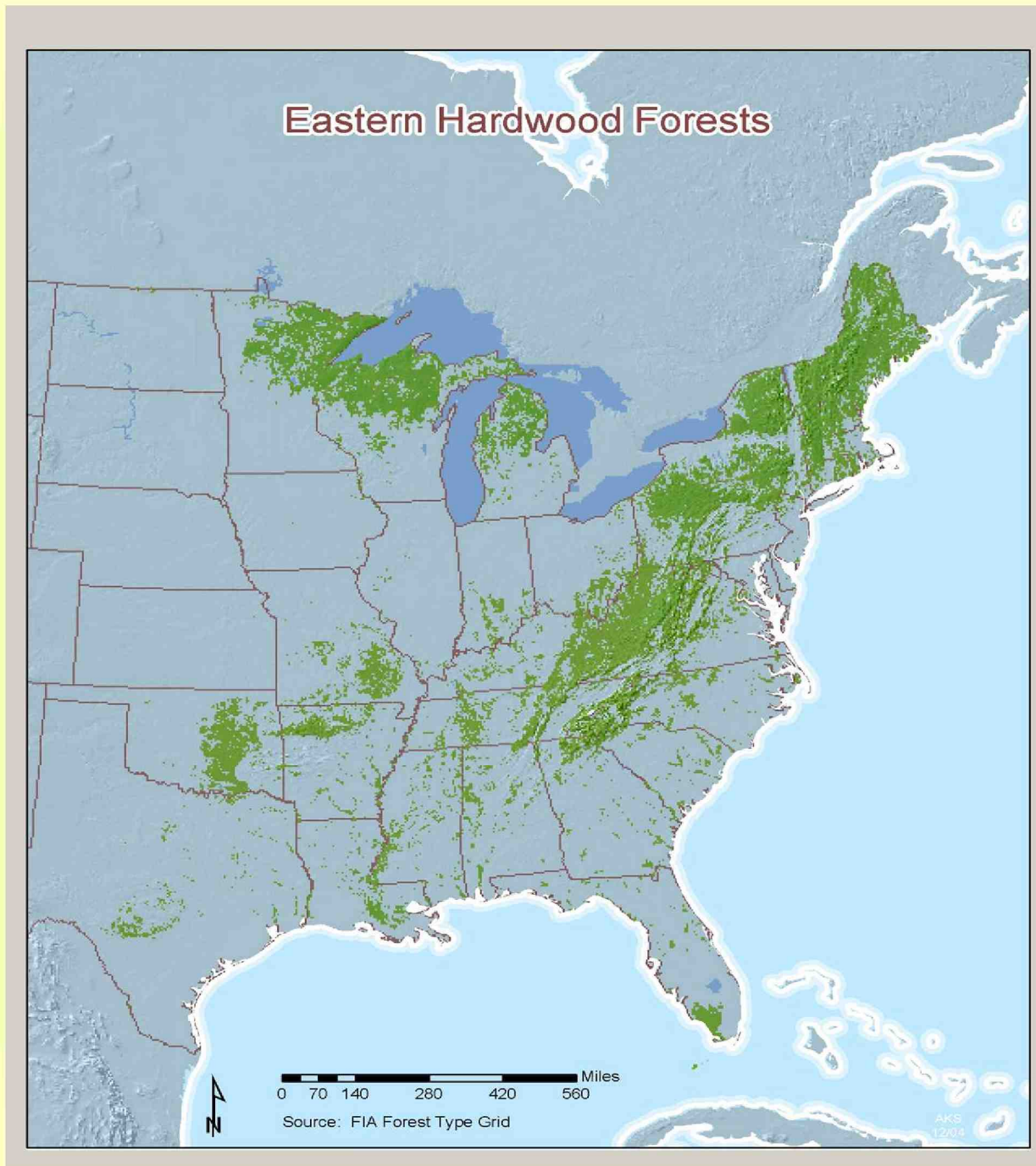
Newport



St. Johnsbury

Ten Facilities Awarded Pre-Feasibility Funding

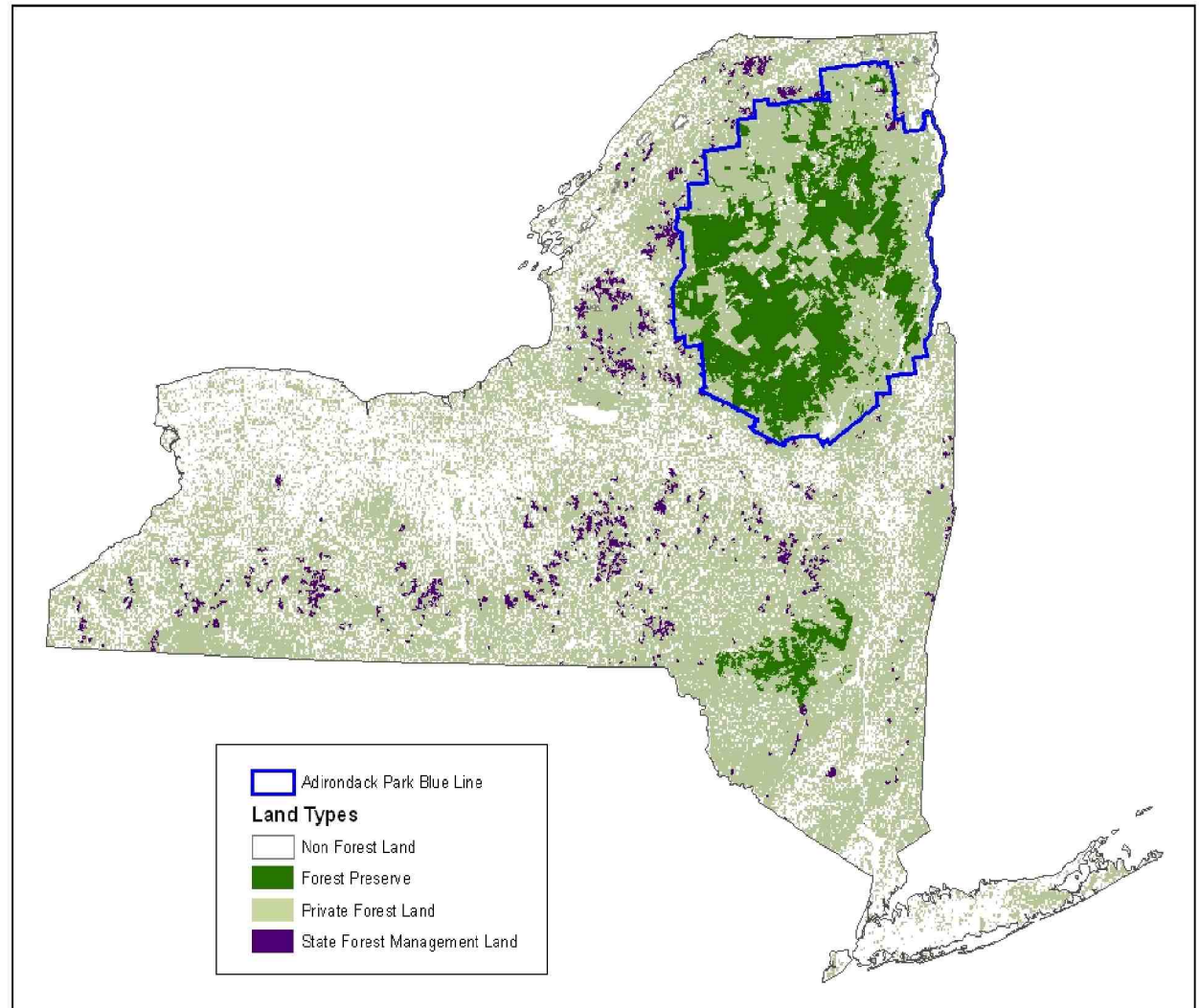
- **Paul Smith's College**
- **Pleasant Valley Nursing Home (Washington Co.)**
- **Dept. of Governmental Services (St. Lawrence Co.)**
- **State Office Complex (Ray Brook)**
- **Saranac Lake Central School**
- **Adirondack Central School District**
- **Camden Central School District**
- **Clifton-Fine Central School**
- **Chateaugay Central School**
- **Indian Lake Central School**



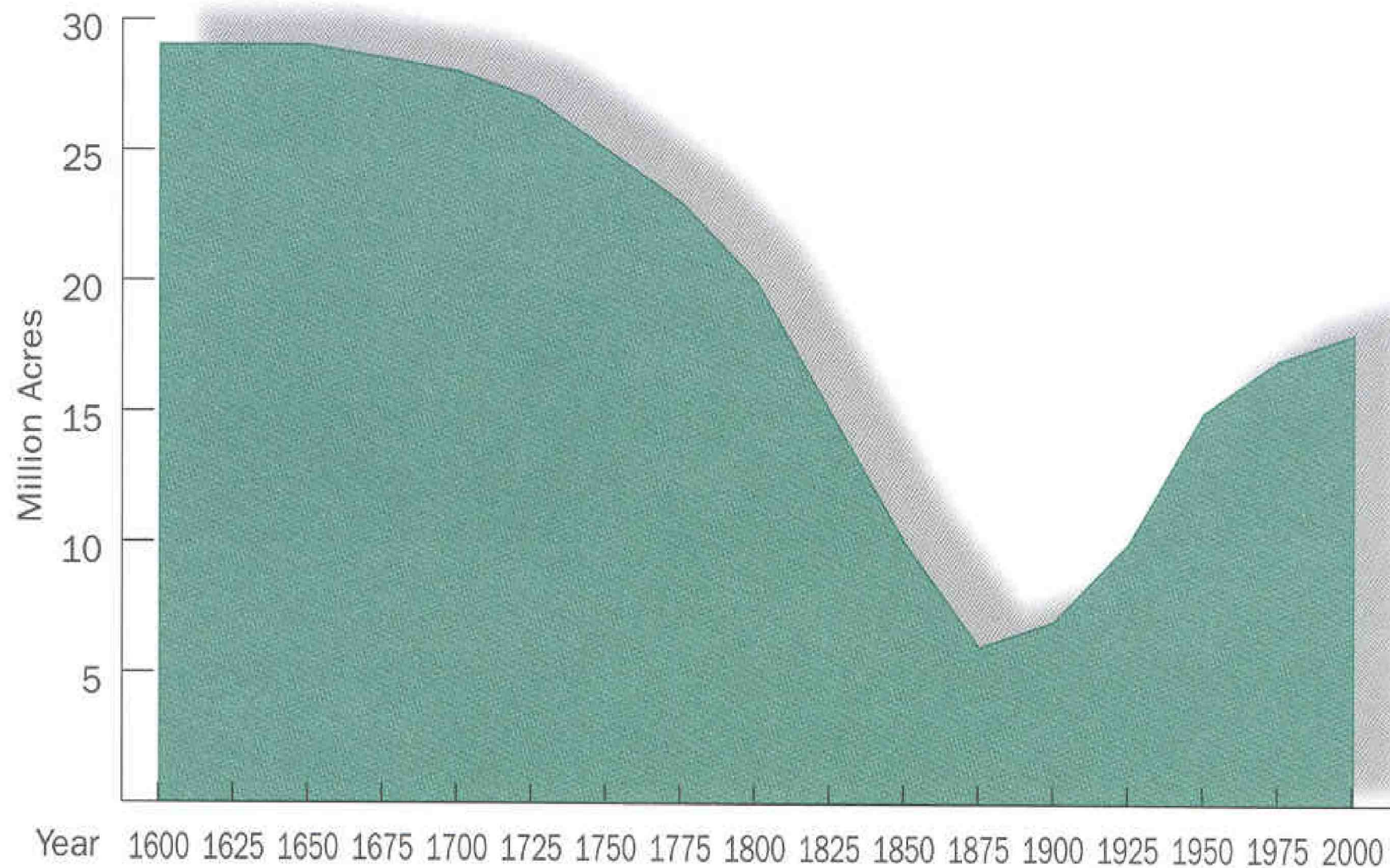
New York Forest Land Cover & Ownership

18.8 Million Acres Forestland

- 15.9 Million Acres Mostly Private Forestland
- 750 Thousand Acres State Management Land--(*FSC and SFI Certified*)
- 3 Million Acres Forest Preserve
- 680,000+ Forestland Owners



Changes in New York's Forest Land Area





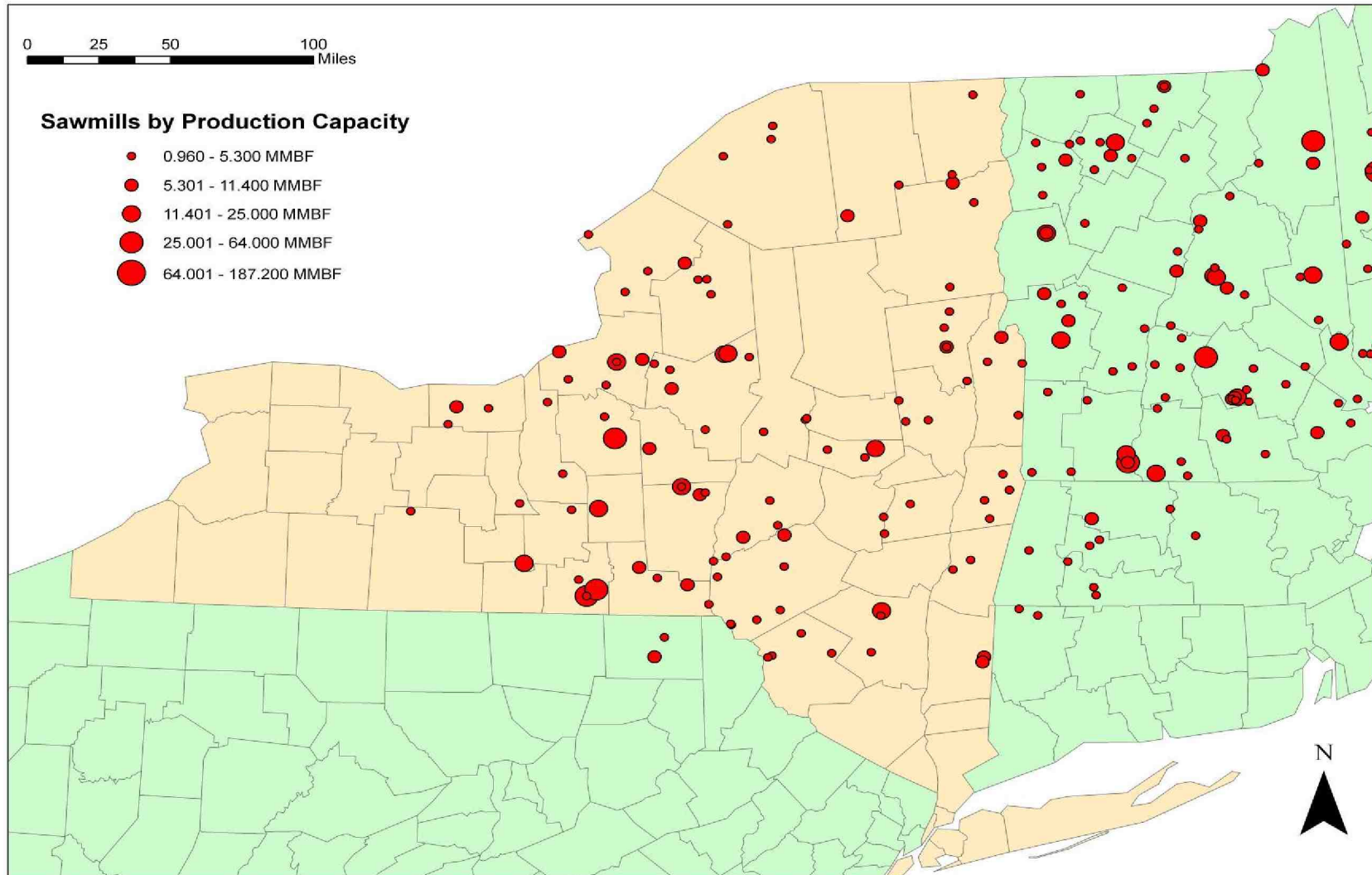


Forest Based Fuel Sources for Wood Systems

Sawmill Residues

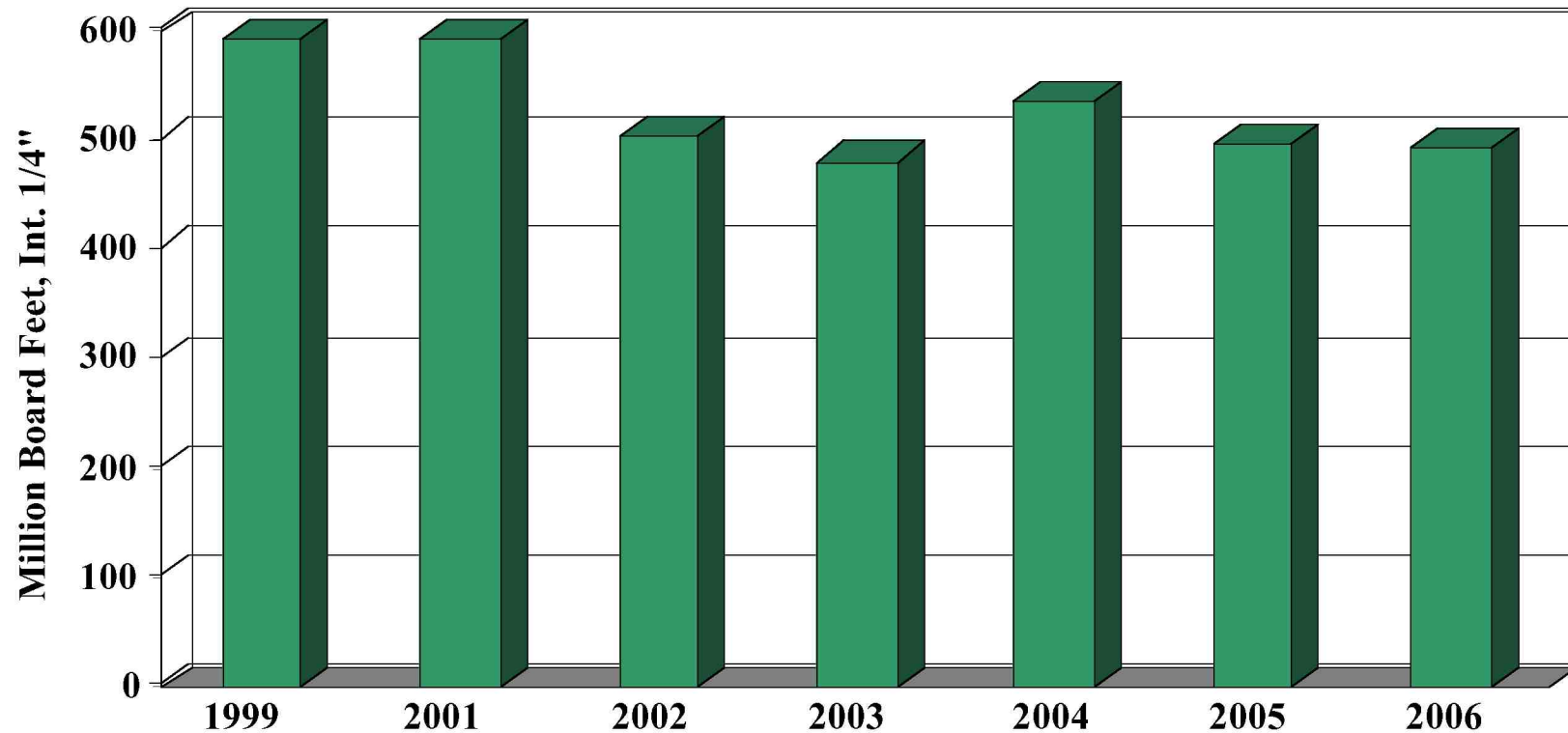


New York/New England Sawmills >1MMbf Capacity 2005



Decreasing Residue Production

Log Consumption by New York Sawmills 1999-2006



Other Factors Affecting Residue Availability

- Primary Log Breakdown (band head rigs and resaws)
- Portable Mills Displacing Fixed Mills
- Product Shifts (e.g.—Cants and low-grade to Ties)
- New or Expanded Markets (wood pellets, landscaping, composting, animal bedding)
- Additional On-Site Consumption for Fuel

Forest Based Fuel Sources for Wood Systems

Low-Grade/Underutilized Timber Products



Cooperative Forest Monitoring Efforts USFS FIA and NYS Timber Harvest Production Report..... Providing Reliable Forest Statistics



United States
Department of Agriculture

Forest Service

Northeastern Forest
Experiment Station

NE-INF-126-95



The Empire State's Forests— Trends in a Robust Resource



Provided by:
New York State
Department of Environmental Conservation
Bureau of Forest Resources

New York Statewide Forest Inventory

Provided by US Forest Service FIA Program

Four Previous Inventories

-1952

-1968

-1980

-1993

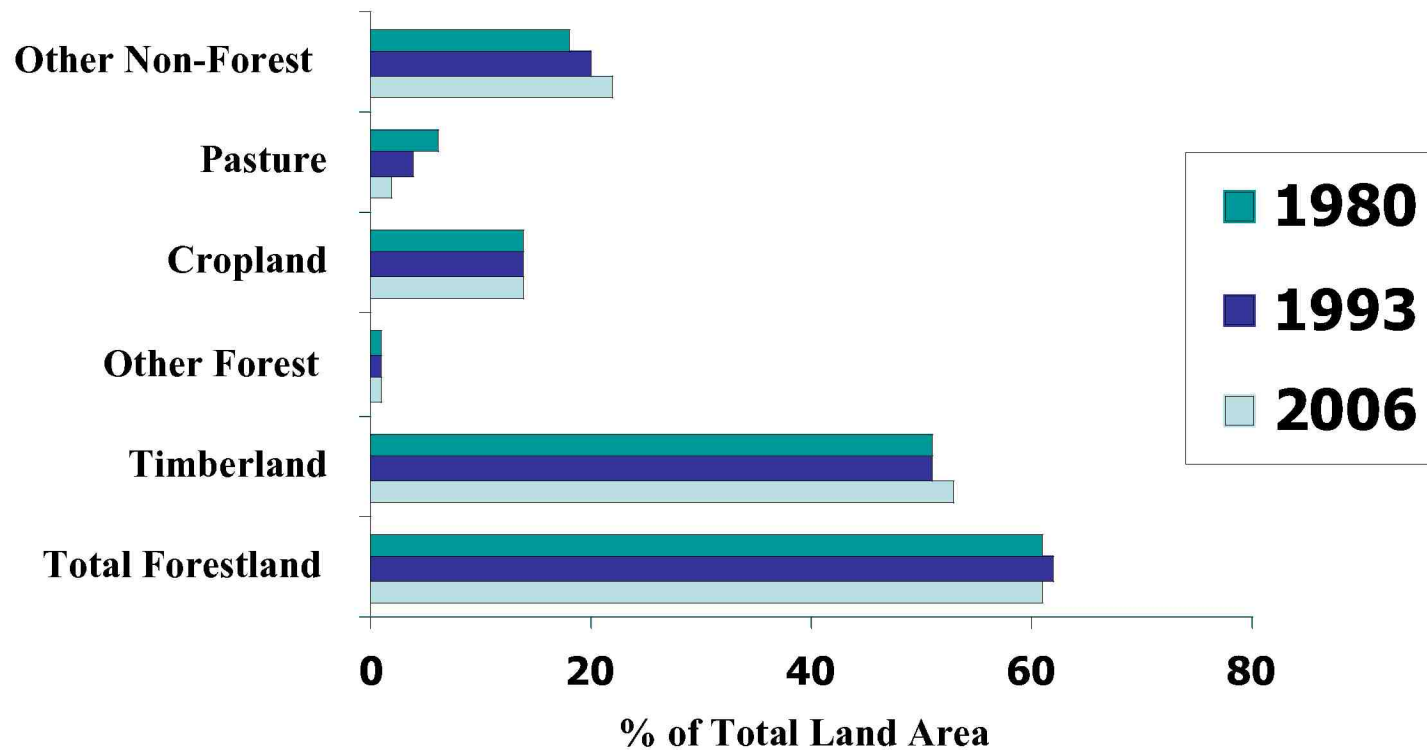
Data Collection-- State Wide
Mostly Timber Variables

Reporting-- State, Regional,
County

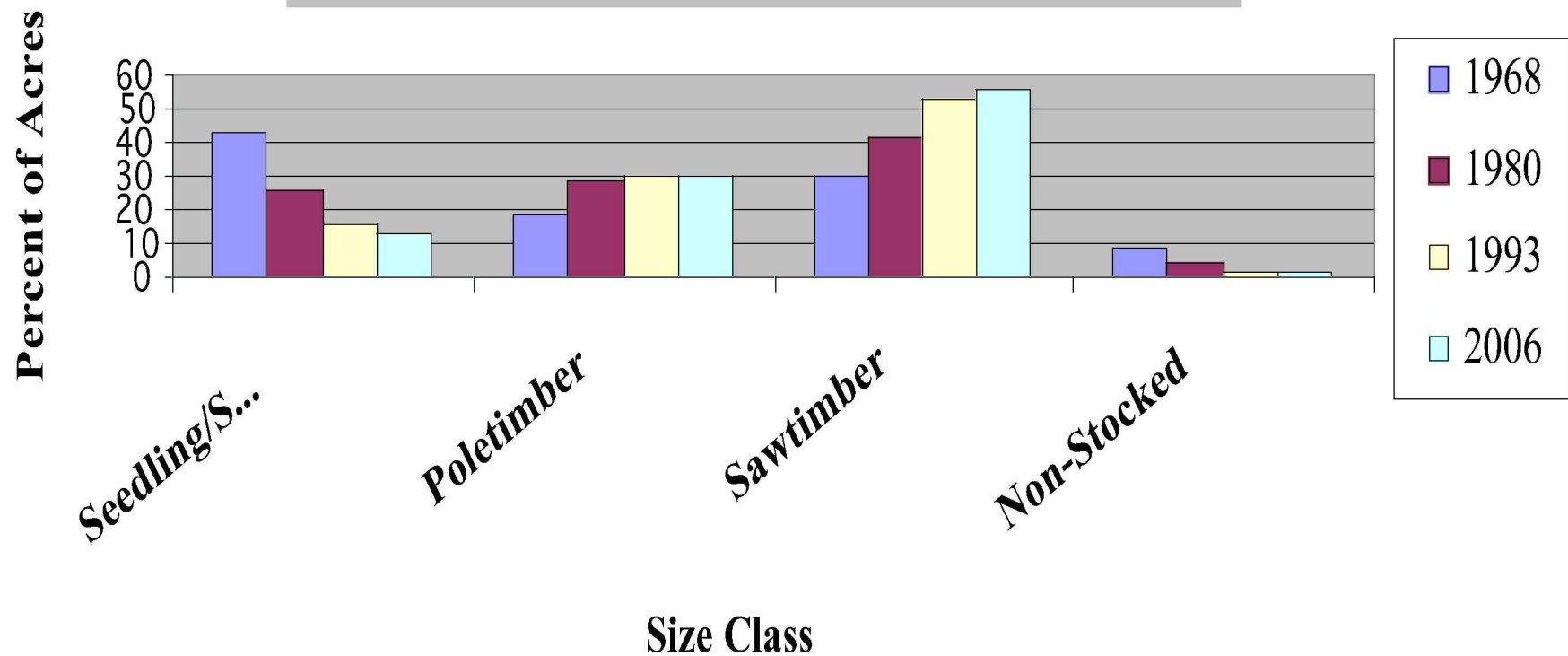
Growth vs. Removals

Forestland Acres Stabilized

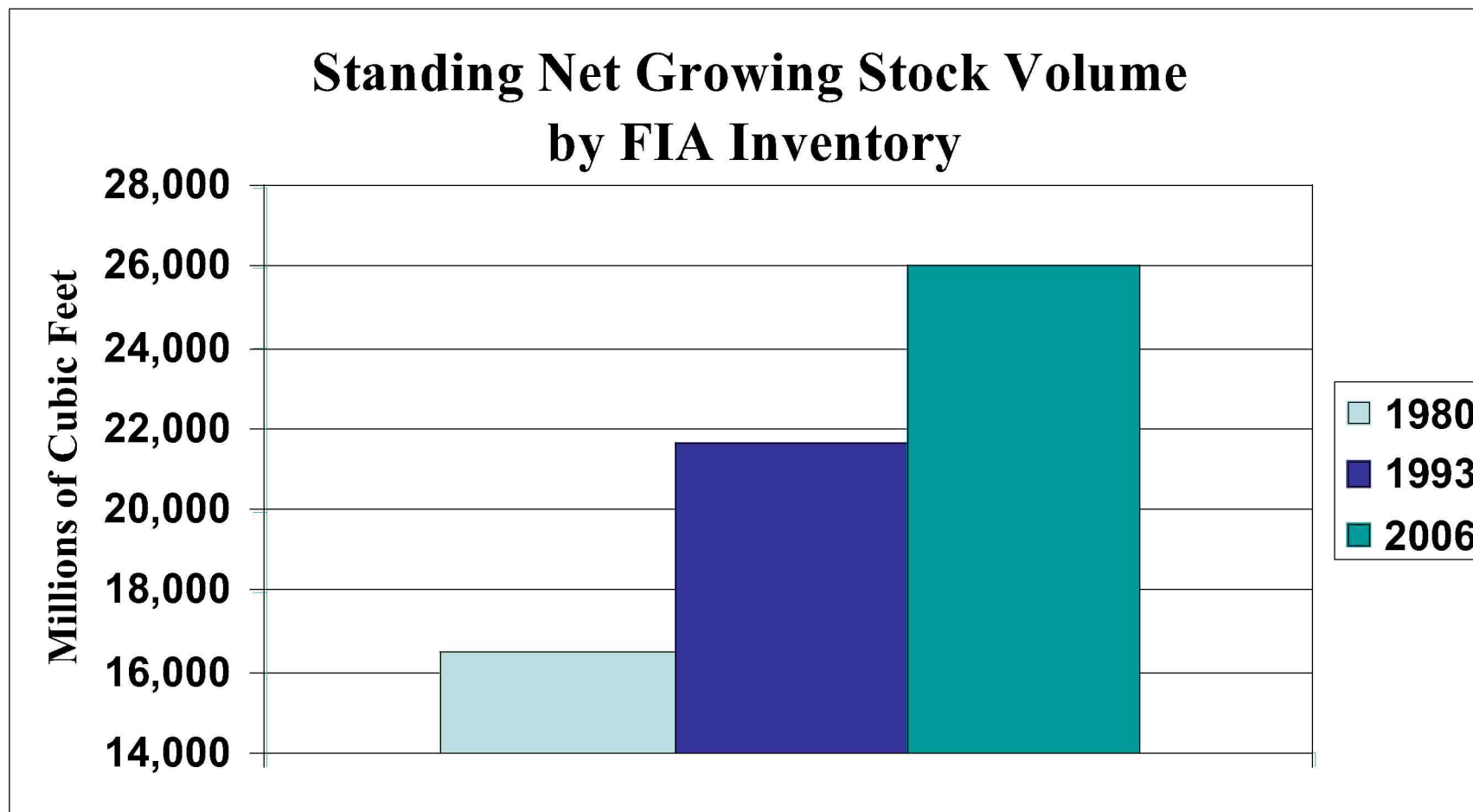
Area by Land Class, New York 1980-2006



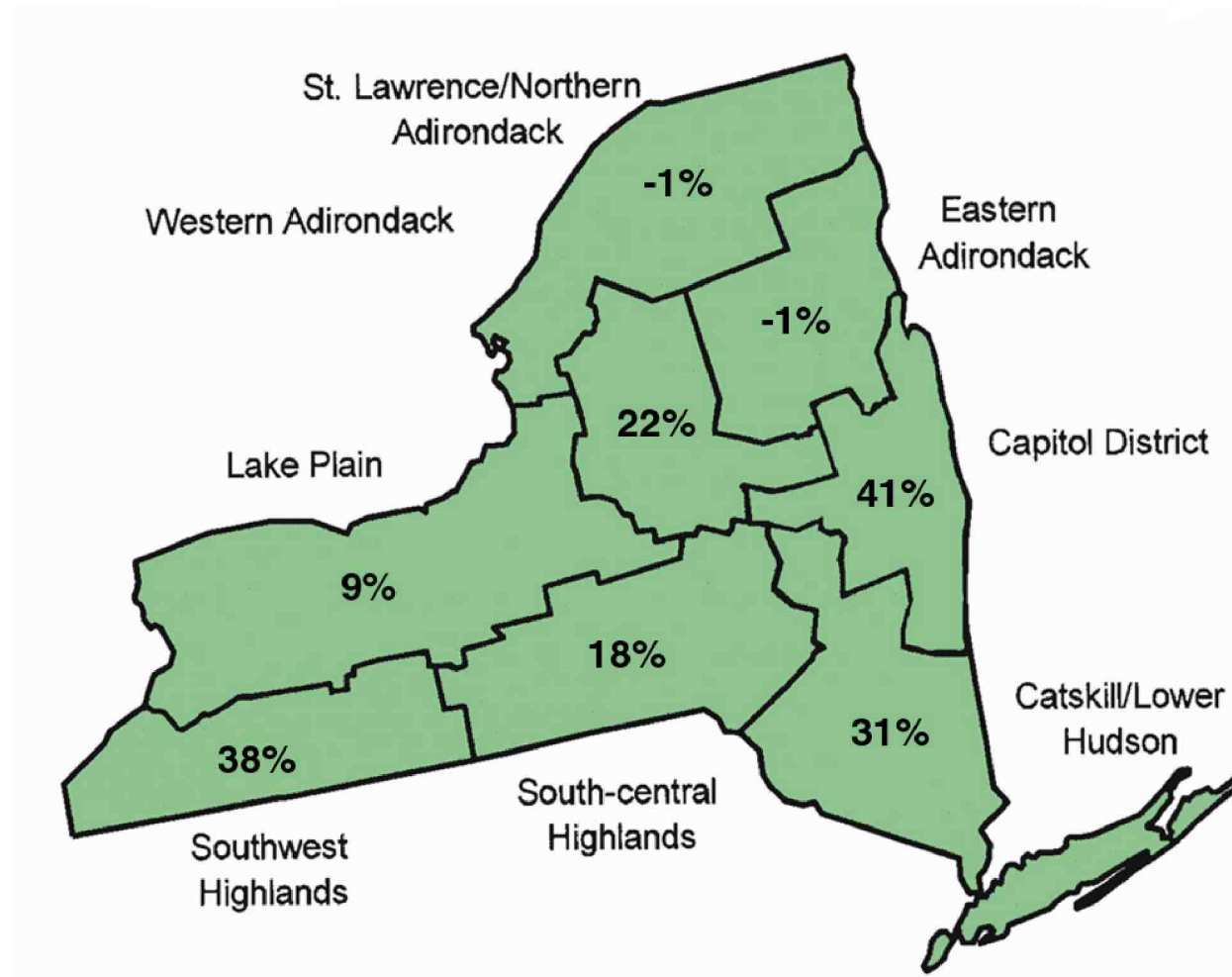
Changing Structure of New York's Forests



Continued Building of Fiber Stock

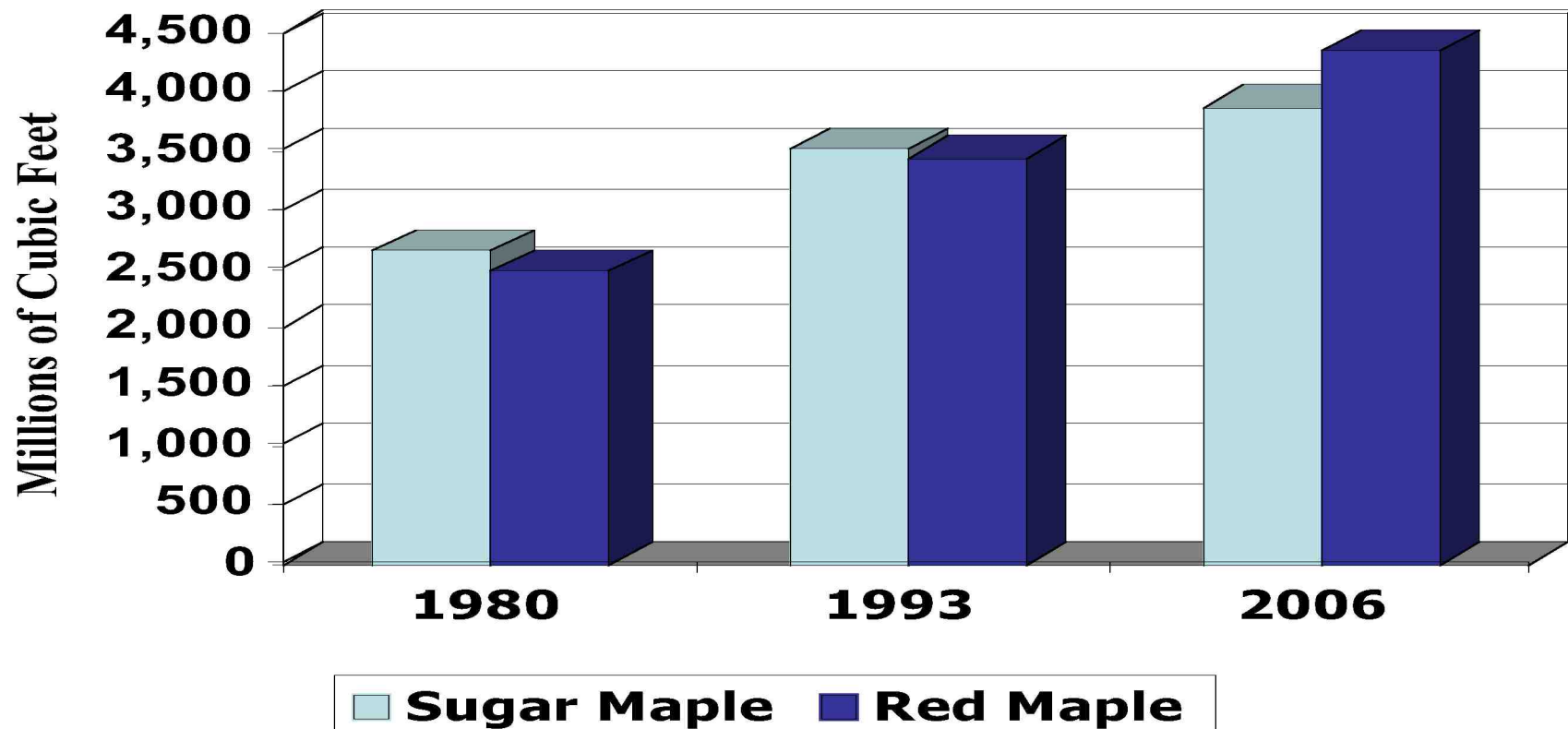


Growing Stock Volume Percent Increase by Region 1993-2006



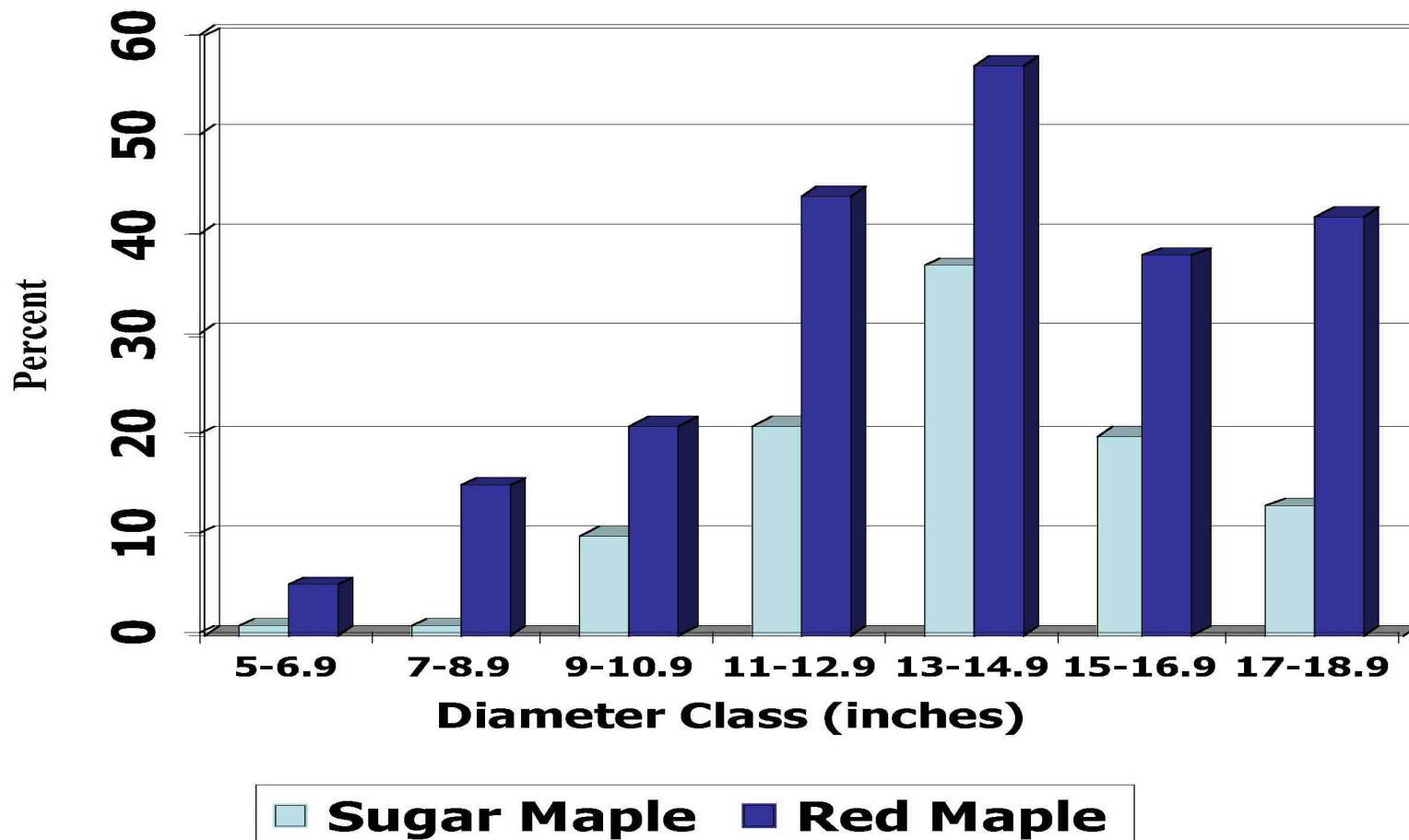
Important Species Shift

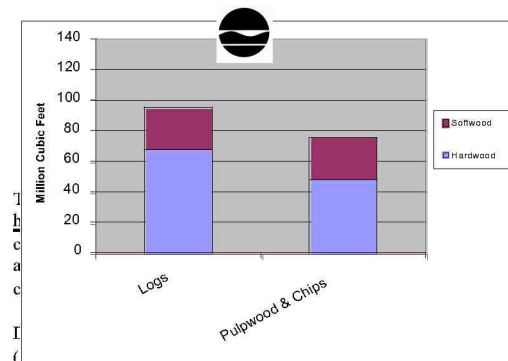
Net Volume of Growing-Stock Trees-- Sugar Maple Vs. Red Maple



Species Shift (cont.)

Rate of Volume Increase in Small Pole Class





mill capacities. Estimates reported for logs are conservative due to difficulties associated with collecting or estimating relatively small volumes of certain in-state and out of state/country consumption of wood harvested in New York.

Definitions

Industrial Harvest Products: Wood utilized by sawmills (fixed and portable), pulp mills, wood energy plants and other primary processors. Fuelwood for residential purposes and posts, poles and other miscellaneous products used locally are not included.

Logs: All types (e.g. –saw, veneer, bolter, pallet, scrag, poles, etc.).

Pulpwood & Chips: Roundwood and roundwood or whole tree derived fuel, pulp, and panel chips.

Log Scale: International 1/4 inch

Production

Total Production by Product and HW/SW, 2006

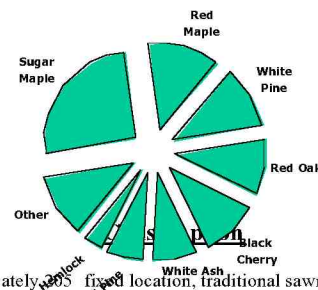
Total timber harvest production level was 171 million cubic feet, composed of the following product breakdown:

Log production -- 720 million board feet (MMbf)

Pulpwood & Chips production -- 2.1 million green tons (52% roundwood/48 % chips).

Returned surveys (accounting for 57% of total estimated log production) indicate that 71 % of New York's log harvest was comprised of five species: sugar maple, red oak, red maple, black cherry and white pine. Sugar maple alone accounted for 26 % of total log production. On a volume basis, 63 % of pulpwood & chip production was mixed hardwoods, while 37% was softwood. Softwood pulpwood & chip species included mostly white pine, hemlock, and spruce.

Species Breakdown -Survey Reported Log Production, 2006



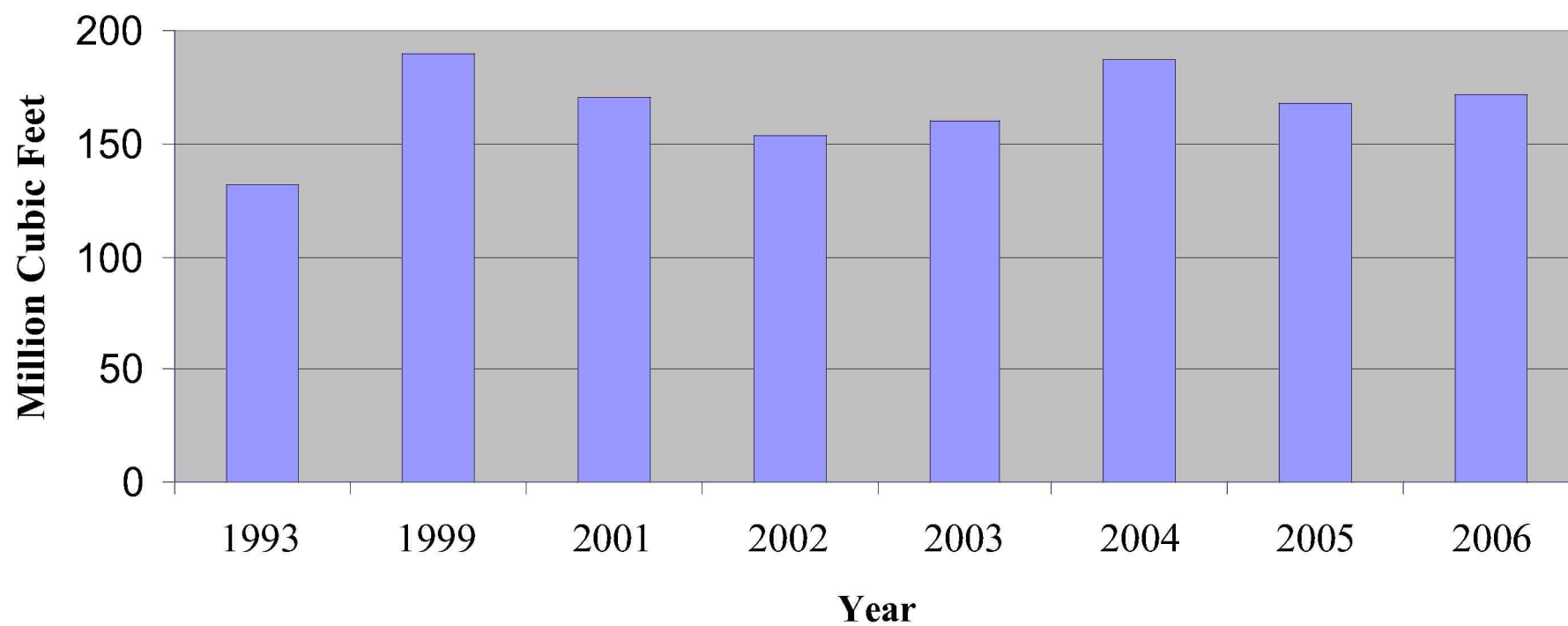
Approximately 205 fixed location, traditional sawmills were known to operate in New York during 2006. An additional 25 mills reported receiving no wood for the year. About one-half of all mills have a capacity of 1MMbf or greater.

Combined (reported volumes and estimates), these operating mills consumed **493 million board feet** of logs, of which around 92 % was from New York State harvest production. In addition, it is estimated that 1,800 portable and various other very small capacity fixed location sawmills operated to some extent in 2006. It is estimated that these operations consumed about **60 million board feet**, with almost all log receipts likely coming from New York production.

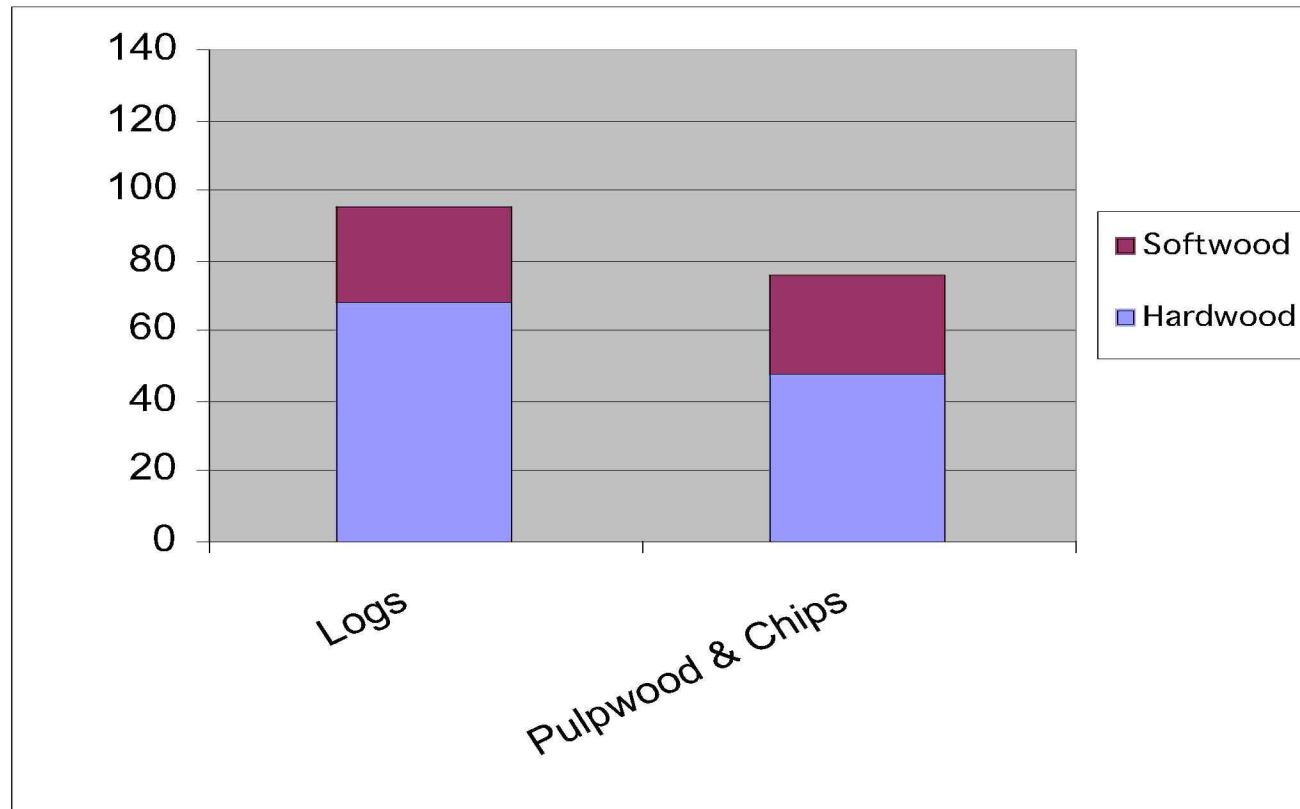
New York facilities consumed about **1.5 million green tons** of pulpwood & chip products harvested from New York's forests (71% of total pulpwood & chip product harvest).

(over)

New York State Industrial Wood Harvest Level



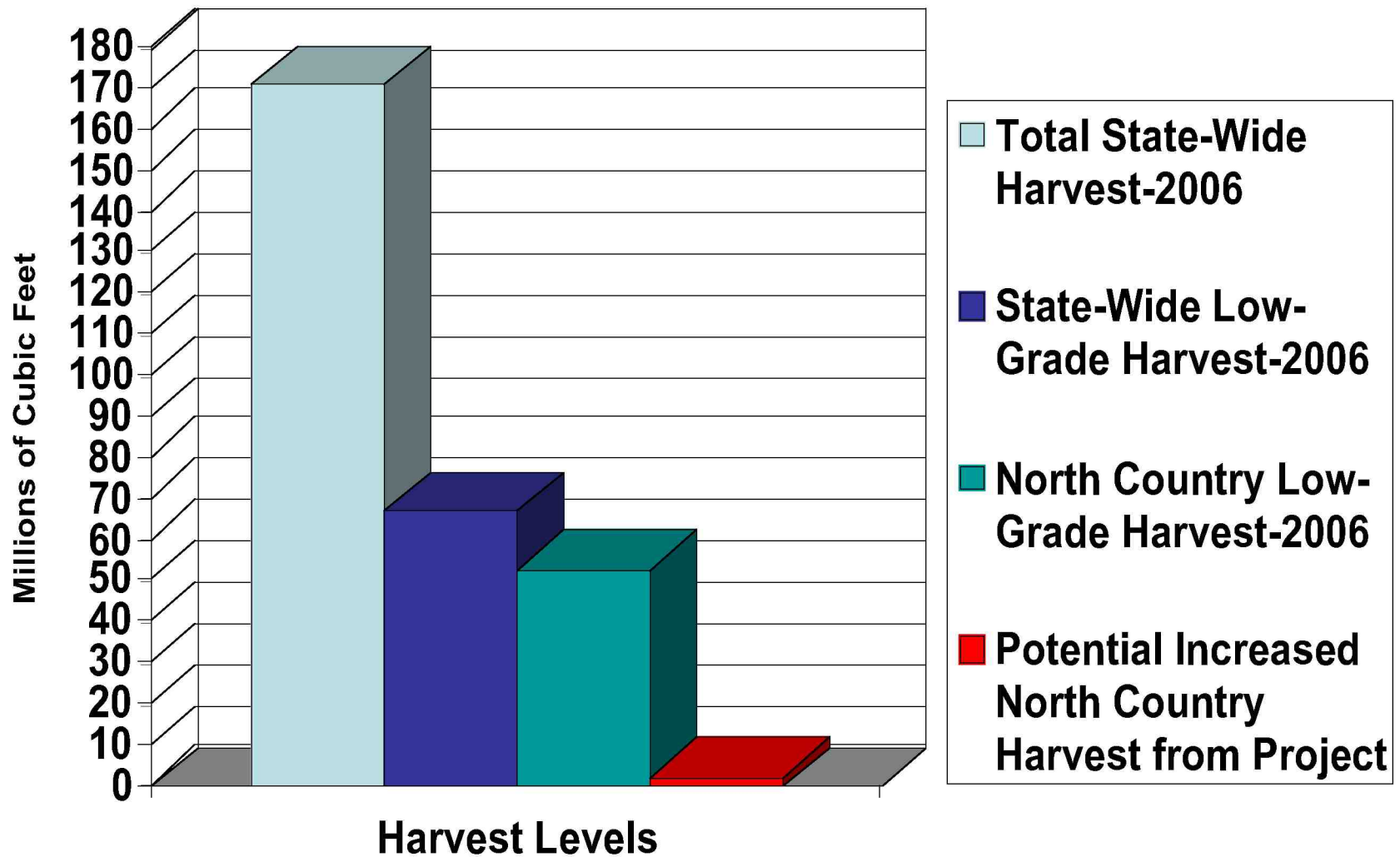
2006 Total Industrial Timber Harvest Production by Broad Species Group and Product Type



720 MM Bd.Ft.

2.1 MM Green Tons

Statewide and North Country Current and Potential Harvest Levels



**Traditional Low-Grade/Underutilized Timber
Product Markets for New York—2007
(e.g.—Pulp & Paper, Power, Panels)**

16 Total

New York: 6

Canada: 4

Pennsylvania: 4

Vermont: 1

Maryland: 1

Consuming 2.1 Green Tons of New York Harvest

**Theoretical annual availability of underutilized timber products suitable for biomass fuel in New York
2006**

in:

Cubic Feet (millions of cubic feet) and Green Tons

Class of Timber Product and Broad Species Group	Unit of Measure	Current Standing Volume (growing stock and rough cull)	Annual Net Growth* (growing stock and rough cull)	Poor Stocking/Site and Physical Factors Adjustment	Parcel Size and Owner Attitude Adjustment	Volume Not Avail. for Fuel Market	Annual Harvest	Annual Available Excess Growth
Non-Sawtimber (All Pole Trees and Stem Portion above Sawtimber (including Cull))								
Hardwood	Cubic Feet	10,314	309	minus 13%	minus 9%	N/A	118	123
	Tons	315,488,000	9,452,000	minus 13%	minus 9%	N/A	3,609,000	3,762,000
Softwood	Cubic Feet	1,845	55	minus 13%	minus 9%	N/A	28	15
	Tons	41,241,000	1,229,000	minus 13%	minus 9%	N/A	625,900	335,300
Sawtimber								
Hardwood	Cubic Feet	10,918	328	minus 13%	minus 9%	minus 32%	100	106
	Tons	333,962,000	10,033,000	minus 13%	minus 9%	minus 32%	3,059,000	3,242,000
Softwood	Cubic Feet	4,685	141	minus 13%	minus 9%	minus 68%	27	27
	Tons	104,724,000	3,152,000	minus 13%	minus 9%	minus 68%	603,500	603,500
Tops (Limbs, Branches, Twigs above 4" top diameter or merchantability)								
Hardwood	Cubic Feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tons	139,713,000	N/A	N/A	N/A	N/A	795,300	1,488,500
Softwood	Cubic Feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tons	38,396,000	N/A	N/A	N/A	N/A	N/A	N/A
							Total Green Tons: 9,431,300	

* accretion + ingrowth-mortality

Total Green Tons: 9,431,300

Theoretical Annual Statewide Biomass Availability Summary

Timber Product	Volume (Green Tons)
Non-Sawtimber	4.1 million
Sawtimber	3.8 million
Tops	1.5 million

Some Limiting Factors to Increased Harvest of Low-Grade/Underutilized Woody Biomass for Energy

- Sawlog/Veneer Log Markets
- Delivered Prices not able to Cover “Biomass Only” Harvests
- Number of Forestland Owners and their Goals/Objectives
- Site Preparation
- Harvesting Infrastructure
- Cutting Practices and Ecological Concerns

17. Appendix II – Summary Table of Biomass Guidelines

	ME	MN	MO	PA	WI	FSC
Dead Wood						
Coarse woody material	√	√	√	√	√	√
Fine woody material	√	√	√	√	√	√
Snags	√	√	√	√	√	√
Wildlife and Biodiversity				√		
Wildlife	√	√	√	√	√	√
Sensitive wildlife species	√	√	√	√	√	√
Biodiversity	√	√	√	√	√	√
Plants of special concern	√	√	√	√	√	√
Sensitive areas	√	√	√	√	√	√
Water Quality and Riparian Zones						
Water quality	√	√	√	√	√	√
Riparian zones	√	√	√	√	√	√
Non-point source pollution	√	√	√		√	√
Erosion	√	√	√	√	√	√
Wetlands	√	√	√	√	√	√
Soil Productivity						
Chemical (Nutrients)	√	√	√	√	√	√
Physical (Compaction)	√	√	√	√	√	√
Biological (Removal of litter)	√	√		√	√	
Silviculture						
Planning	√	√	√	√		√
Regeneration		√		√	√	√
Residual stands	√	√	√	√	√	√
Aesthetics			√	√	√	√
Post operations	√	√	√	√	√	
Re-entry		√	√	√		
Roads and skid trail layout	√	√	√	√	√	√
Disturbance						
Insects		√	√	√	√	√
Disease			√	√	√	√
Fire		√	√	√		√
Fuel reduction		√		√		√
Pesticides		√	√			
Invasives		√	√	√		
Conversion from forest			√	√		√

For more information see <http://www.forestguild.org/biomass.html>

NYSERDA---Renewable Fuel Roadmap and Sustainable Biomass Feedstock Study for New York

Objective is to explore:

- Life cycle environmental and public health consequences
- Development of “Best Practices” and sustainability criteria for supplying feedstocks
- Scale and time frames for implementation
- Affect on markets for competing uses of biomass feedstocks
- Highest value use of biomass....Is the use of biomass for alternative energy the most efficient use of biomass and the most effective pathway for reducing fossil fuel use and greenhouse gases?

Thank You!

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(518) 402-9415

www.dec.ny.gov/lands/4963.html