

**Report to NEFA, Inc.**

**Wood Flows in New York,  
Vermont, New Hampshire, and  
Maine, 1997**

**with Recommended Monitoring System**

By

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## HIGHLIGHTS

This project was commissioned by NEFA to develop a working estimate of the four-state region's woodflow balance and to develop recommendations for ongoing tracking of woodflows. This woodflow balance covers primary products cut from the forest and not items such as sawmill chips, woodwastes, or market pulp. In this report, data for softwood and hardwood are provided, but individual species are not considered.

This study involved compiling different sources of government and private data on primary wood production, interstate wood movements, and international trade flows. These sources have various limitations that are described. Certain sources may have limited use for adding up a quantitative wood balance, but may still be very useful for monitoring market conditions and trends. Considerable judgment was used in fitting together the regional balance.

A preliminary working estimate of woodflow for primary products was assembled for the four-state region, supplemented by analysis of trade data in dollars. The region has a wood trade surplus with Canada and offshore nations of \$250 million per year in the primary products covered in this report. Additionally, flows to and from Canada and between states are important to individual mills and entire regions.

### OBSERVATIONS ON THE WOODFLOW BALANCE

1. An ongoing program of tracking consumption of wood from the forest is an essential element in a sound long-term forest management program. This is true for an individual as well as for a state. In order to respond to public issues, develop effective policy, and guide management programs, the amount of wood harvested needs to be monitored. In some areas, this may not be needed annually, and may not be needed in great detail.

2. In the four NEFA states, roughly 14 million cords of wood were harvested in 1997. While exports exceed imports, the difference is not large in volume terms. Because of the values of products shipped, however, the region has \$250 million in net exports (exports minus imports) of the primary products covered in this study.

3. For individual states and products, the differences in volumes and total dollar values between exports and imports can be quite significant. In Maine, for example, large amounts of high-value softwood logs are exported. The state imports large volumes of pulpwood and biomass fuel.

4. Movements of wood between NEFA states are important to each state's economy and to individual mills. Of all the wood cut in the region, 22% crosses a state line or international boundary before it is used.

5. Exports outside the region account for two million cords of wood. Canada is the destination for 90% of this amount, with most of the rest going to Pennsylvania and southern New England. It is known that a portion of this is re-exported, with or without further processing, but data do not exist to measure this. Offshore exports are very small, and have been declining in the 1990's -- from 543 Mbf in 1990 to only 35 Mbf in 1997.

6. Hardwoods provide 59% of the region's harvest, and softwoods the balance. By products, hardwood provides 60% of the pulpwood, and 36% of the sawlogs. For lack of data it is assumed that 100% of the fuelwood is hardwood.

7. Of the region's 14 million cords of annual consumption, the largest uses were sawlogs and pulpwood.

8. The most important timber producing states are Maine and New York. Their rank is influenced not only by forest area but by intensity of demand for wood.

#### **OBSERVATIONS ON THE DATA**

1. Existing data, compiled periodically by state and federal agencies, do not permit the ready development of a regional fiber balance at a reasonable cost and level of accuracy. Key components of such a fiber balance, such as wood usage in biomass power plants, are not regularly monitored. A proposed USDA Forest Service regional consumption survey could remedy this situation.

2. Production and receipts of some wood products are estimated annually by a number of agencies and groups. Weaknesses in some of these sources prevent their use, without significant adjustment and local judgment, as a basis for estimating woodflows.

3. Available data on international trade are difficult to use and subject to many weaknesses. Those sources were not designed to track foreign trade in great degree of product detail on a state by state basis. Users must be conscious of their limitations.

4. While it is recognized that exports of veneer logs from the region are likely to be significant, no existing statistical system tracks trade in veneer logs. Instead, they are treated together with sawlogs. One reason for this is the extreme variability in the specifications for "veneer" logs in the marketplace, which makes using a standard definition problematic. Another is the large number of dealers and woodyards involved in the trade, making surveys difficult.

5. Paper grade chips and market pulp are important elements in the wood mix of many papermills. State-level data on these items and their interstate and international movements are not being regularly maintained.

6. For this project, a spreadsheet, WoodMan, was developed allowing users to enter updated data, estimates, and conversion factors to update the woodflow balance for any state or

the region easily. The spreadsheet can readily be expanded to cover additional categories of products if desired.

## TABLE OF CONTENTS

	<u>Page</u>
<b>INTRODUCTION</b>	1
<b>ISSUES IN DEVELOPING REGIONAL FIBER BALANCES</b>	3
<b>METHODS FOR DEVELOPING REGIONAL ESTIMATED WOODFLOW FOR 1997</b>	10
PRODUCTS COVERED	10
ADJUSTMENT PROCEDURE FOR DATA: PRODUCTION	10
ADJUSTMENT FOR CROSSBORDER MOVEMENTS	11
ANALYSIS	12
PLACE OF PRIMARY WOOD PRODUCTS IN THE WOOD PRODUCTS TRADE	14
<b>SUMMARY ESTIMATES -- STATES AND REGION</b>	15
NEW HAMPSHIRE	16
NEW YORK	18
MAINE	20
VERMONT	23
REGIONAL FIBER BALANCE	25
<b>RECOMMENDATIONS</b>	31
<b>REFERENCES</b>	35
<b>APPENDIX</b>	37
<b>APPENDIX 1. DATA SOURCES</b>	38
PERIODIC SURVEYS OF PRIMARY PRODUCTION AND RECEIPTS	38
ANNUAL DATA ON PRIMARY PRODUCT PRODUCTION AND RECEIPTS	39
SELECTED COMPARISONS OF DATA SOURCES	54
TOTAL REGIONAL PRODUCTION	57
<b>APPENDIX 2. EXTRACTS FROM TRADE DATA</b>	58
U.S. TRADE ESTIMATES--QUANTITIES	58
U.S. TRADE ESTIMATES -- DOLLAR VALUES	61
<b>APPENDIX 3: CONTACT LISTING</b>	75

**APPENDIX 4: PORTS -- SOURCES OF INFORMATION**

77

## INTRODUCTION

The objectives of this project are as specified in the RFP issued by NEFA (box)

### **A. Study Goals**

1. Quantify the movement of unprocessed logs, pulpwood and wood chips from and between the NEFA states and their state neighbors immediately to the west and south and Canada to the north for a given year (1997).
2. Display results of study in tabular and map form.
3. Determine if an ongoing, efficient method can be developed to annually collect and display this data.

### **B. General Approach**

To accomplish these goals, NEFA proposes to carry out a study of the four states of Maine, New Hampshire, New York and Vermont to quantify the:

- \* Amount of raw logs, pulpwood and wood chips (displayed by hardwood and softwood categories) harvested from the forests (public and private) of the four states in 1997, breaking out the data by landowner categories where available;
- \* Flow of these harvested resources among the four states, and to Ohio, Pennsylvania, New Jersey, Connecticut, Massachusetts, Rhode Island, eastern Canada and out of country through ports. The emphasis should be on the four-state NEFA region, however.
- \* Display the results of this quantification on a map of the region and in tabular form.
- \* Identify where the data is lacking state by state and for the region and recommend a method for collecting this data on an annual basis.

There are several purposes for which the NEFA states would want a more thorough and up-to-date accounting of wood production and flows.

- To analyze trends within the wood sector, such as growth or decline in specific industries.



- To assess growth/cut balances for the forest resource.
- To supply a basis for assessing significance of wood movements and related policy issues.

For each of these purposes, the data requirements will be different. In most instances, the statistical agencies use information collected by other agencies for particular purposes. That information may or may not precisely match the information the states need.

A key objective of this report is to inventory all existing sources of periodic and annual information for the region on primary wood production and movements, and on the principal wood products produced in the region. Details are in the Appendix. The various sources are compared as to their reliability, currency, and cost, and where possible differences between their estimates will be noted. In the interest of a complete presentation, we at times discuss sources that at first blush may look promising, but that on closer inspection do not meet the states' needs. This is done in the hope of saving analysts time in the future. Based on all of this information, a wood production and flow estimate for the region for 1997 is provided with recommendations for NEFA consideration for means of benchmarking and tracking woodflow in the future.

The RFP requested estimates by landowner. The best information on this is in the periodic FIA reports for the states, and the current (1996) TPO estimates attempt to update these. Within the time and budget for this project, it was impossible to consider new estimates of harvest by landowner.

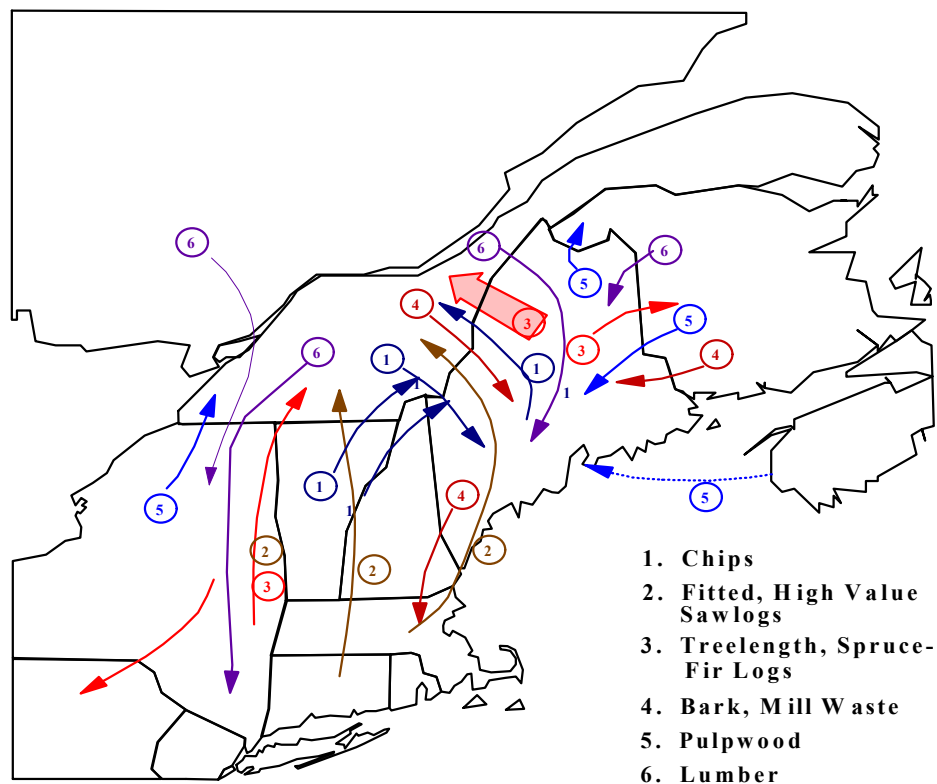
During the work, several rounds of reviews were conducted to check data with informed individuals and to seek comments on conclusions, methods, and presentation. These reviews were very helpful. NEFA and the author gratefully acknowledge reviews by Bob DeGues, Pete Lammert, Greg Lord, Todd Caldwell, Jim Blanck, Sarah Smith, Sloane Crawford, Spencer Phillips, Dave Field, Rich Widmann, Bill Luppold, Dave Emanuel, Brian Dunkiel, Hugh Canham, and Sylvain Martel. Assistance from Christine Petersen and Charles Levesque during these reviews was also valuable.

## ISSUES IN DEVELOPING REGIONAL FIBER BALANCES

The wood fiber balance of a state represents a snapshot in space and time of a complex, shifting market (Irland, 1998; Field, 1986; and Maranda, 1986). The market for logs, chips, and related products in the Northeast is a complex one, linked to mills in nearby Canada, markets and wood sources in Pennsylvania and Southern New England, and offshore markets as well (Fig. 1). A single map can only begin to describe the complexity involved. This section defines the concept of woodflow balance and illustrates the complexity of measurement. The next section discusses the data sources and what we can learn from them, their strengths and weaknesses. In a later section, the summary information is provided in graphic form.

The Appendix provided details on the data used.

**Figure 1**  
**FIBER FLOWS OF A**  
**BORDERLAND INDUSTRY**



An estimated wood fiber balance is a snapshot of this flow of production and trade, from the accounting position of a single state or region. Several concepts need to be defined and measured (Table 1). Once defined, these need to be measured by a process of sampling or enumeration. In practice, states and other agencies have adopted practices that seek a complete enumeration but may employ estimates to fill in missing reports. As an example, the woodfiber balance for Maine in 1997 as estimated by the Maine Forest Service shows the approach.

**Table 1**  
**Wood Fiber Balance: An Illustration**  
**Maine, All Products and Species, 1997**

	<u>1,000 cds.</u>	
1. Wood cut in state	6,991.9	
2. Logs imported to state	1,591.3	
3. Logs exported from state	1,219.6	
4. Consumption in state	7,363.6	
5. Maine wood processed in state	5,772.3	
 <u>ANALYSIS:</u>		
Net exports	- 371.7	<u>Source</u> Rows 3 - 2
Export share of cut	.17	Rows 3 / 1
Import dependence	.22	Rows 2 / 4
Exports/import ratio	.7664	Rows 3 / 2

Source: Maine Forest Service, 1997 Wood Processor Report

The accounting identity is:

$$(\text{wood cut} - \text{wood processed}) = (\text{exports} - \text{imports}) = \text{net exports}$$

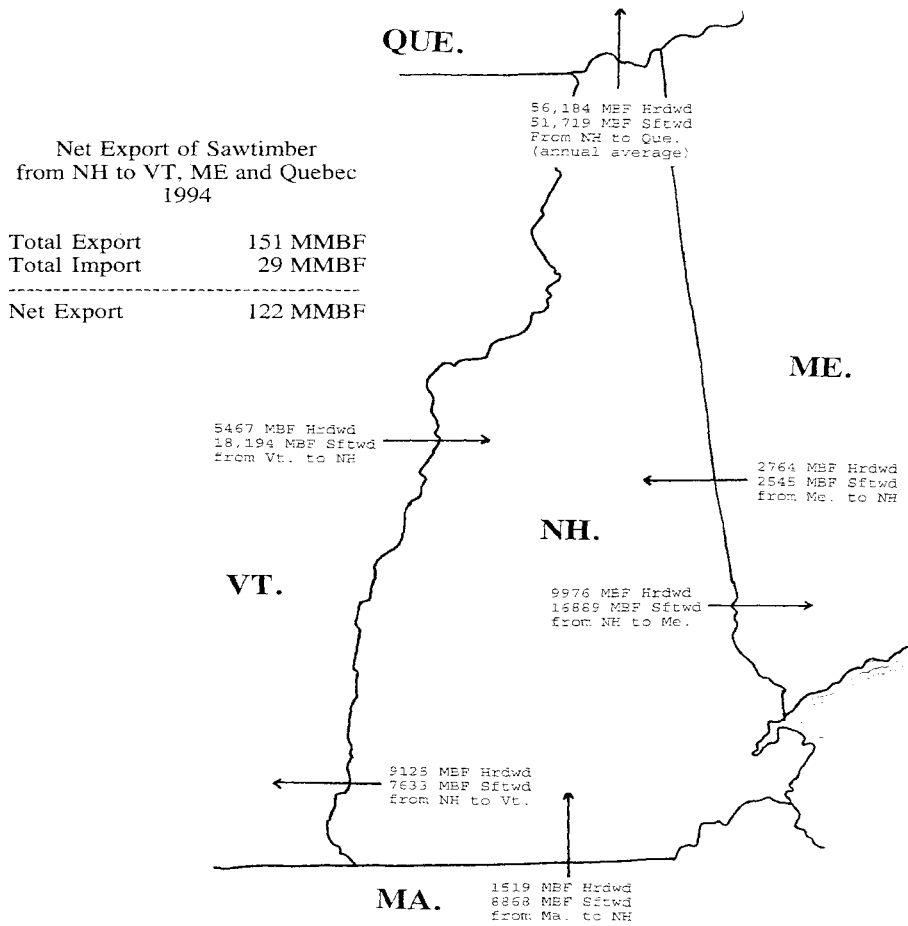
or,

$$(\text{wood cut} - \text{wood processed}) - (\text{exports} - \text{imports}) = 0$$

In words, this is the same as saying that the difference between the state's wood cut and consumption (or processing) is equal to the state's net exports.

As another example, the 1994 estimates prepared for New Hampshire were presented in map form:

**Figure 2**  
**New Hampshire Sawtimber Export and Import, 1994**



Source: N.H. Forest Inventory Project, 1995.

The number of pathways by which wood moves to mills is baffling (Fig. 3). The number of participants in the market is very large. For example, a recent survey elicited rough estimates of the number of logging operations in the NEFA states:

Maine	8,000
New Hampshire	5,000
Vermont	2,000
New York	<u>6,000</u>
	21,000

Source: Irland Group, NCASI Report.

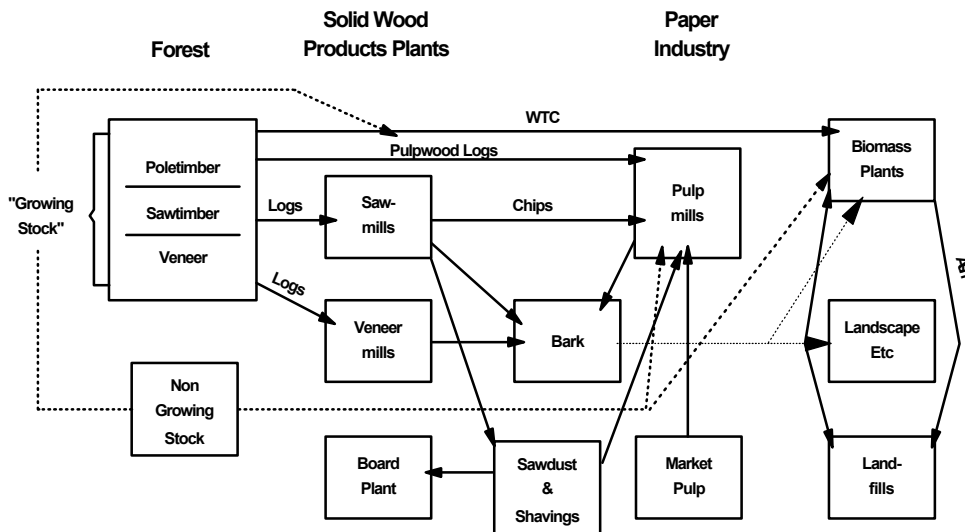
State agencies report the following numbers of mills surveyed in their efforts:

Maine	625
Vermont	182
New York	Hundreds
New Hampshire	500

Further, there are many woodyards serving both domestic and export customers for logs and related products. It is easily seen that developing complete and accurate lists of all of these market participants is a difficult task, one that is never finished. Brief upswings in demand may bring in a wave of new buyers from elsewhere in the U.S. or from export buyers. Given the difficulties in obtaining a complete list, there will always be questions about any effort to obtain valid estimates by sampling procedures. As a result, complete enumerations are usually attempted.

Reviewing these complexities gives an analyst an appreciation of the difficulties faced by the state forestry agencies conducting annual woodflow surveys.

**Figure 3**  
**Illustrative Materials Flow: A Single Timber Sale**



Trade across state and national borders occurs at each of these points, and usually in both directions. For important flows in this chart, no data at all is being collected.

Conducting surveys of mills, logyards, and market participants to enumerate woodflows encounters a number of challenges --

First, a complete listing of market participants must be developed. In some areas and markets, companies may enter or leave the industry, be acquired, relocate, or temporarily cease operations. Second, those participants must be contacted with a suitable survey instrument or direct contact.

Third, they must respond fully and accurately.

Fourth, sources of double counting or other inaccuracy must be accounted for.

Considering the thousands of small mills and logging operations, the swings in the markets, the numerous intermediaries, and the many firms in nearby areas doing business within the NEFA states, the task of accomplishing a complete enumeration is clearly enormous.

Once firms are contacted and data responses are received, further difficulties must be confronted. One is the variations in utilization standards that can be found even within a state. For example, in northern Maine, tree length wood down to five inch butt diameters is hauled to

sawmills where tops and slabs are converted to papermill chips. In other parts of the Northeast, trees of the same size would be converted to four foot wood with larger minimum top diameters, and considered pulpwood. In areas of strong wood markets, a category of “pallet log” may emerge in the market, whereas elsewhere it may not. In local areas, individual mills may buy boltwood or veneer that would have to be sold as woodrun logs in other areas. All of this poses serious challenges for efforts to develop a consistent reckoning of woodflows over a large and diverse region. The problem may not be easily solved by asking respondents to report in common units, say, tons, cubic feet, or cubic meters.

Wood is measured in different units within individual states and across the border (see Box). These differences introduce complications and potential for error in converting to a common set of units for trade reporting or estimation of wood flows. As an example, it is possible for a single forestry consultant in New York to use up to six different log rules in an individual consulting practice; in Quebec, for a conversion factor survey of four mills, there were six different log rules in use. Factors used by government statisticians may not reflect current log sizes and utilization practices, or differences in species mixes. Correcting for these problems may be next to impossible. Sources of conversion factors include Delcourt and Wilson (1998, p. S13); Evans (1990, p. 107ff); Canadian Woodlands Forum (NR-20, n.p.).

#### **Conversion Factor Issues**

Canadian mills buy wood by cubic metre or ton.

U.S. spruce-fir T/L sawlogs sold by 1,000 lbs. or ton; weights/Mbf differ by species and by area within species.

“Fitted” logs sold by Mbf (6 logs rules @ 4 mills).

Some papermills buy wood by:

cord  
ton  
cunit

Quebec mills buy chips in dry metric tons.

U.S. mills buy chips in green U.S. tons.

U.S. ton = metric ton.

**Table 2**  
**Standard Conversion Factors**

$4.5 \text{ m}^3 = 1 \text{ Mbf logs}$

Hardwood -  $5,000 \text{ lbs} = 1 \text{ cord} = 2.5 \text{ tons (green)}$

Softwood -  $4,000 \text{ lbs} = 1 \text{ cord} = 2.25 \text{ ton}$

$\text{Cord} = 85 \text{ cu. ft.} = 2.4 \text{ m}^3$

$\text{Mbf} = 2 \text{ cords}$

$= 170 \text{ cu. ft.}$

NOTE: These conversions to MCF yield somewhat higher estimates than factors used in U.S. Forest Service TPO studies.



## **METHODS FOR DEVELOPING REGIONAL ESTIMATED WOODFLOW FOR 1997**

This section describes generally how the 1997 estimates were developed. Additional details are in the spreadsheet (WoodMan) footnotes, provided separately from this report.

### **PRODUCTS COVERED**

For some states, fairly extensive product detail can be obtained, while for others, detail is limited. Considering the overall goal of this project, it seemed best to concentrate on developing the best regional woodflow we can for sawlogs, pulpwood, fuelwood, and biomass. This would be preferable to building a wood balance that contained many missing cells. As is explained below, veneer logs are included in sawlogs in most publicly reported data but separate, and very rough estimates are offered in the spreadsheet. Important quantities of chips and market pulp cannot be accounted for at all.

### **ADJUSTMENT PROCEDURE FOR DATA: PRODUCTION**

The starting point for the estimates was the existing published data: For Maine and Vermont, we used the 1997 timber cut estimates by their state forestry agencies, which also provide the best breakdowns on crossborder movements. A New Hampshire survey for 1994 supplied initial estimates for that state. We consulted the U.S. Forest Service preliminary TPO estimates for 1996 as well, and started with them for some items. We consulted the latest published U.S. Forest Service Resource Bulletins for details on crossborder movements. Draft 1997 pulpwood production figures from Widman (1998) were generally used for pulpwood. These figures were replaced whenever a more specialized survey existed, or consultations with state forestry agencies and judgment indicated. We updated sawlogs using changes in Census lumber data (Tables 3 and 4). These tables are not adjusted according to Luppold and Dempsey due to different years and regional definitions. The Census data do not provide a very good source for estimating log output, being a severe undercount (Luppold and Dempsey, 1994). We reviewed firewood usage surveys and updated these based on judgment and consultation with state agencies. The entry for fuelwood includes WTC from roundwood to the extent that these amounts can be estimated. For veneer, we included production estimates and assumed production = consumption since no reliable wood movement information was available.

**Table 3**  
**Softwood Lumber Production, U.S. and Northeastern States**  
(MMbf)

	<u>1993</u>	<u>94</u>	<u>95</u>	<u>96</u>	<u>97</u>
Maine	831	898	894	939	931
New Hampshire	212	232	235	244	262
Vermont	145	135	137	124	162
New York	140	98	87	91	99

Source: U.S. Bureau of Census, Current Industrial Reports, Lumber Production and Mill Stocks, Annual Report.

**Table 4**  
**Hardwood Lumber Production, U.S. and Northeastern States**  
(MMbf)

	<u>1993</u>	<u>94</u>	<u>95</u>	<u>96</u>	<u>97</u>
Maine	77	144	138	130	151
New Hampshire	33	41	40	31	32
Vermont	91	97	106	104	115
New York	262	406	431	443	466

Source: U.S. Bureau of Census, Current Industrial Reports, Lumber Production and Mill Stocks, Annual Report.

### **ADJUSTMENT FOR CROSSBORDER MOVEMENTS**

Based on existing TPO surveys, our own interviews, the U.S. Dept. of Commerce trade data, and Quebec Ministry of Natural Resources data, we estimated crossborder movements of wood between the states, Canada, and offshore. Though far smaller in volume, attention was given to imports as well in order to provide a complete picture. Given the wide variations in coverage and definitions in trade data, it was necessary to employ a considerable amount of judgment. In a few instances, the export data suggested increasing production estimates for a state. Crossborder movements of fuelwood and biomass are ignored, though unpublished summaries can be obtained for Maine.

## ANALYSIS

The basic information was recorded in a spreadsheet, which shows product-by-product woodflows for each state in cubic foot units for an overall regional picture. This spreadsheet shows the assumptions used in adjusting the basic data to an updated 1997 basis. This analysis shows export share of production, and dependence of states on imported wood. A regional account canceling out movements within states, was also developed by addition.

### Firewood

Each state periodically conducts firewood usage surveys. The results are shown in Table 5, with adjusted estimates for 1997 based on author judgment. Data on firewood trade are tallied by U.S. Forest Service (RPA TPO Data), but we did not use them in our summary tables (Table 6). They are shown for comparison. Recognizing the artificiality of this assumption, all residential firewood is assumed to be hardwood. This will not affect regional "all species" totals.

**Table 5**  
**Firewood Usage**

	<u>Fuelwood</u> <u>Surveys</u>	<u>Usage/</u> <u>Prim. HH</u>	<u>Thous.</u> <u>Cords</u>	<u>Est.</u> <u>1997</u>
New York	1994-95	4.75 (1)	890	850
New Hampshire	1996-97	4.30	285	280
Vermont	1993-94	5.20 (3)	335	300
Maine	1995 (4)	n/a	393	350
Total		14.25	1,903	1,780

Prim HH = Household and heating primarily with wood.

(1) Canham and Martin, 1996; refer to N. New York average.

(2) Hearth and Home, Apr. 1998, p. 20 ff.

(3) VT DPS, Energy Eff. Div.

(4) J. Connors, Maine SPO, pers. comm.

**Table 6**  
**Fuelwood, 1996 FIA TPO Estimates**  
**(thousand cords)**

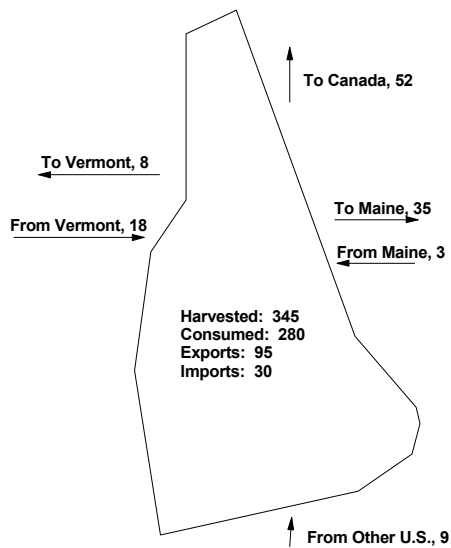
	<u>Non Growing</u> <u>Stock</u>	<u>Growing</u> <u>Stock</u>	<u>Total</u>	<u>Percent GS</u>
Maine	387.7	55.6	443.3	14.34%
New Hampshire	218.6	66.4	285.0	30.38%
Vermont	219.4	65.9	285.2	30.04%
New York	814.2	74.8	889.0	9.19%
Total	1,640.0	261.0	1,902.5	15.91%

Source: USFS RPA Website.

While the USDC data may not be free of coding problems, for particular products and customs districts they may yield clues as to wood movements, that may be small from a state

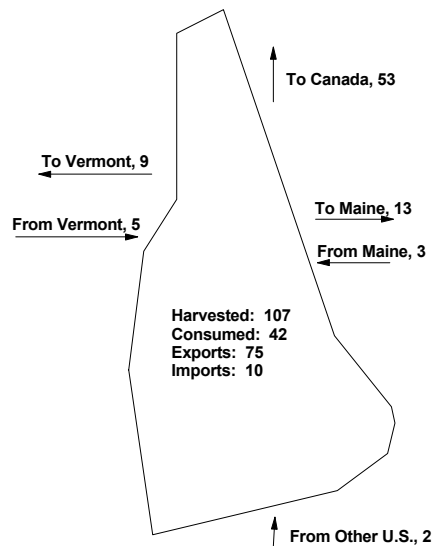
**NEW HAMPSHIRE WOOD**  
**FLOW ESTIMATES, 1997**

**Soft Sawlogs MMBf**



**NEW HAMPSHIRE WOOD**  
**FLOW ESTIMATES, 1997**

**Hard Sawlogs MMBf**

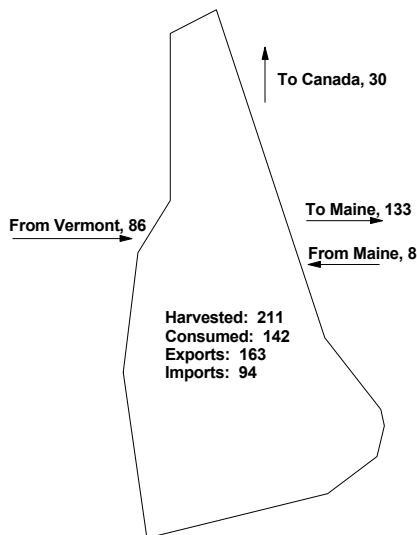


viewpoint but locally signification (Table 7).

**Table 7**

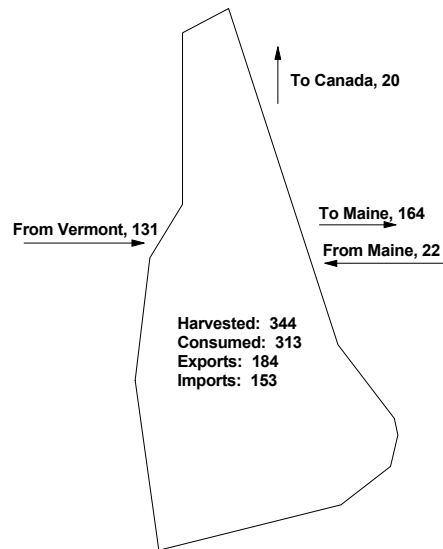
**NEW HAMPSHIRE WOOD  
FLOW ESTIMATES, 1997**

**Soft Pulpwood M cds**



**NEW HAMPSHIRE WOOD  
FLOW ESTIMATES, 1997**

**Hard Pulpwood M cds**



**USDC Data: Fuelwood Trade Balances, by  
Customs Districts, 1997**  
(\$1,000)

<u>District</u>	<u>Exports</u>	<u>Imports</u>	<u>Balance</u>
Buffalo		9.9 (1)	981.0 (6) (971.1)
New York City	703.2 (2)	11.7 (7)	691.5
Ogdensburg	0.0	515.0	(515.0)
Subtotal New York	713.1 (3)	1,507.7	(794.6)
St. Albans		21.8 (4)	127.4 (8) (105.6)
Portland	3,425.6 (5)	11.9 (9)	3,413.7
<b>TOTAL REGION</b>	<b>4,160.5</b>	<b>1,647.0</b>	<b>2,513.5</b>

- (1) High of \$44,000 in 1993.
- (2) Mostly to Japan; So. Korea for first time in 1997. Large jump from 227,000 in 1996.
- (3) \$26,000 in 1996.
- (4) First occurrence of export.
- (5) Steady increase from \$102,000 in 1990.
- (6) Down from \$9.0 million in 1994.
- (7) Down from \$218,000 in 1994.
- (8) Down from \$193,000 in 1996.
- (9) Data show zero in some years.

Source: USDC Dataset per U.S. Forest Service.

**Biomass Fuel From Roundwood**

Several states do not survey biomass fuel users, or do not make available detailed results.

In our estimates, we rely on available state estimates and our own interviews in some instances. We assume all biomass is hardwood, since there is no information available to separate the species groups. This will not affect the regional “all species” totals. The estimates used here are based on consultation with State sources supplemented by several direct plant contacts:

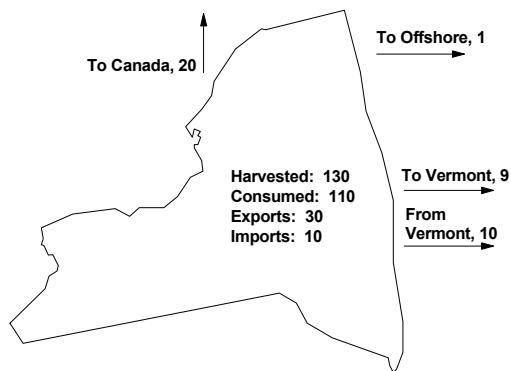
	<u>1997 Consumption, Thousand Green Tons</u>
New York	350
Vermont	137
New Hampshire	922
Maine	<u>1,345</u>
Region	2,754

This amount is equivalent to approximately 1.1 million cords of roundwood. Mill wastes or other residuals are not included here.

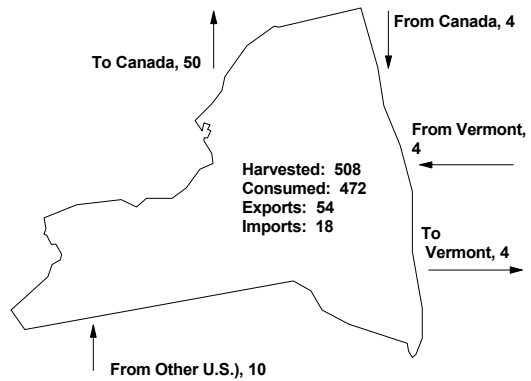
**Mill Residuals**

We do not consider mill residuals as they are not a direct drain on the forest. Also, only limited information on production and movement is available.

**NEW YORK WOOD FLOW  
ESTIMATES, 1997  
Soft Sawlogs MMBf**



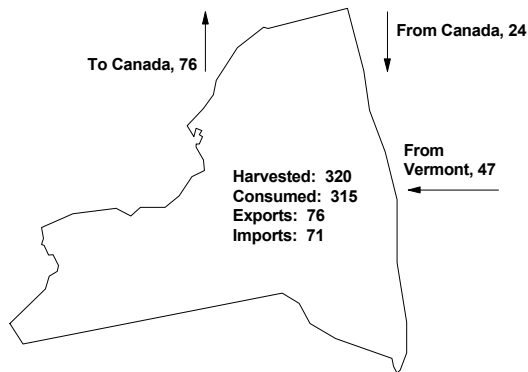
**NEW YORK WOOD FLOW  
ESTIMATES, 1997  
Hard Sawlogs MMBf**



Shipments to PA are likely; offshore movement of veneer is occurring, estimates unavailable.

**NEW YORK WOOD FLOW  
ESTIMATES, 1997**

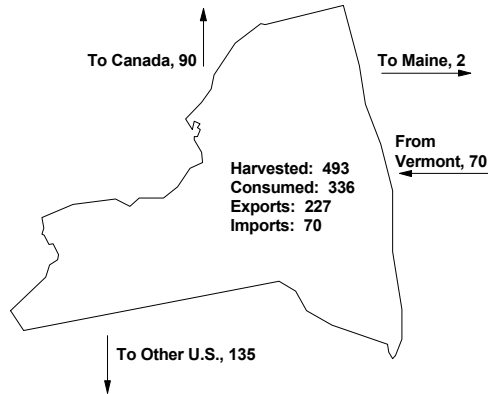
**Soft Pulpwood M cds**



Some movement to PA likely; no estimate available.

**NEW YORK WOOD FLOW  
ESTIMATES, 1997**

**Hard Pulpwood M cds**



**PLACE OF PRIMARY WOOD PRODUCTS IN THE WOOD PRODUCTS TRADE**

A compilation of export values in 1997 shows that primary products are only one element in the region's wood trade (See Appendix Tables A-8 to A-12). In this tabulation, a large volume of secondary products exports moves to Canada (and perhaps beyond) through these ports of entry. The primary products are only one small component. Very likely, the origin of much of this material is outside the NEFA states. If the imports were considered, and if the locations of processing could be tracked, a picture of impressive complexity would emerge. Conclusions using only data on primary products may not at all represent the entire wood products sector. These tables were prepared for us by the MISER office at the University of Massachusetts.

The percentages of logs relative to total dollar volumes of exports in 1997 were:

	<u>Percent</u>
Buffalo, NY	9%
New York City, NY	5%
Ogdensburg, NY	11%
St. Albans, VT	17%
Portland, ME	41%

**SUMMARY ESTIMATES -- STATES AND REGION**

This section presents a set of maps to a common format illustrating estimated woodflows for the states and the region (Figures 4-8).

The data in these maps were developed on the basis of sources and assumptions described later in this report, and embodied in a spreadsheet, "WoodMan" provided separately.

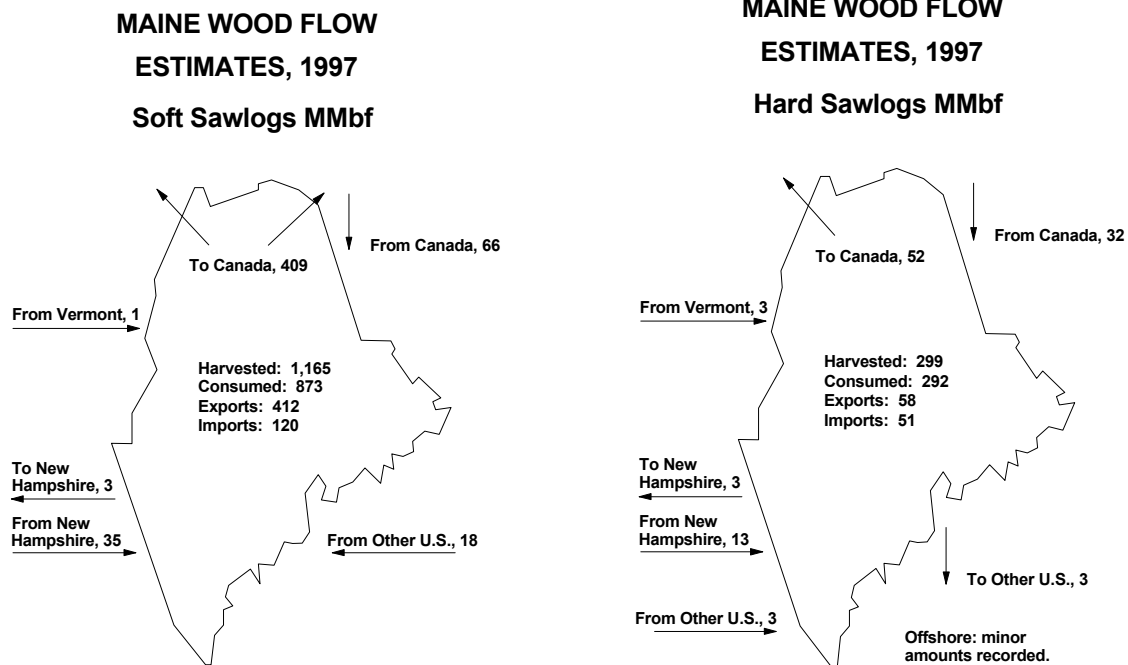
Limitations on the data in these maps, due to inadequate available information include:

- No separation between sawlogs and veneer logs.
- No interstate trade data on veneer logs
- No interstate movement information on firewood, chips, or other mill residuals.
- Fuel tonnages all allocated to hardwood.



## NEW HAMPSHIRE

The New Hampshire fiber balance is shaped by a forest continuing to gain inventory volume, with a fairly active level of harvesting. The state's wood use pattern is shaped by a



number of major factors:

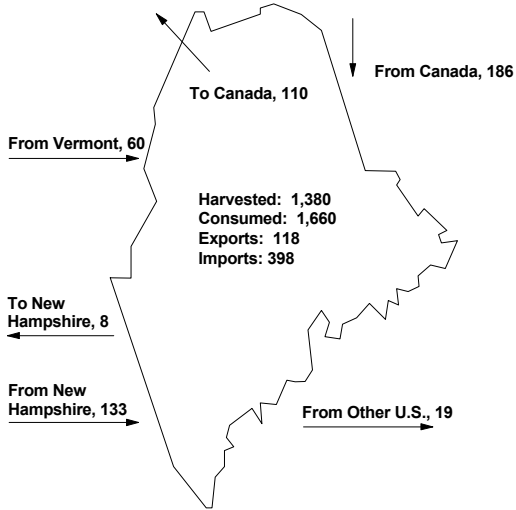
- a large, though currently shrinking, biomass powerplant sector;
- the nation's second largest white pine lumber industry;
- its largest in-state pulpwood market north of the Notches, at Berlin; and
- proximity to Quebec sawmills.

These factors lead to significant log trade to the north, and an apparent lack of significant imports of logs from Quebec. Exports are especially important as a portion of the hardwood log harvest. According to these estimates, movements of pulpwood to Maine are even larger in volume terms than the flow of sawlogs to Canada.

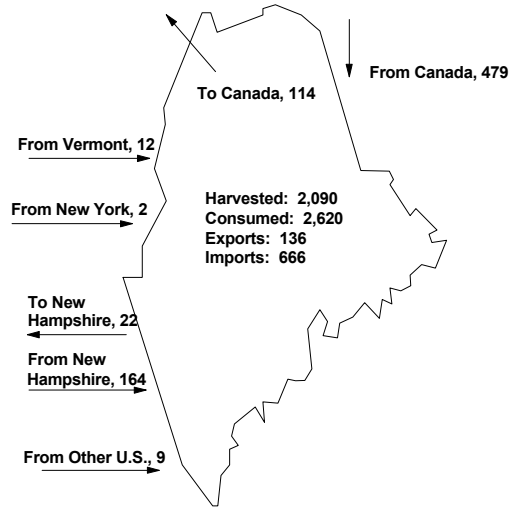
Current data on which to rely for these estimates are limited and uncertain. The degree of confidence in this estimate of New Hampshire's fiber balance is low.

**Figure 4**

**MAINE WOOD FLOW ESTIMATES, 1997**  
**Soft Pulpwood M cds**

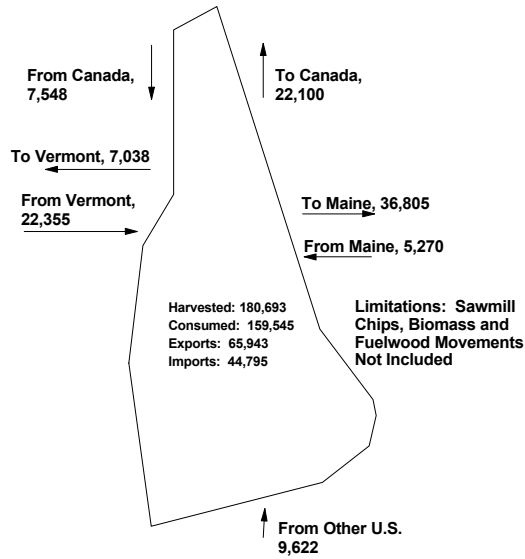


**MAINE WOOD FLOW ESTIMATES, 1997**  
**Hard Pulpwood M cds**



**NEW HAMPSHIRE WOOD FLOW ESTIMATES, 1997**

**All Products M cf**



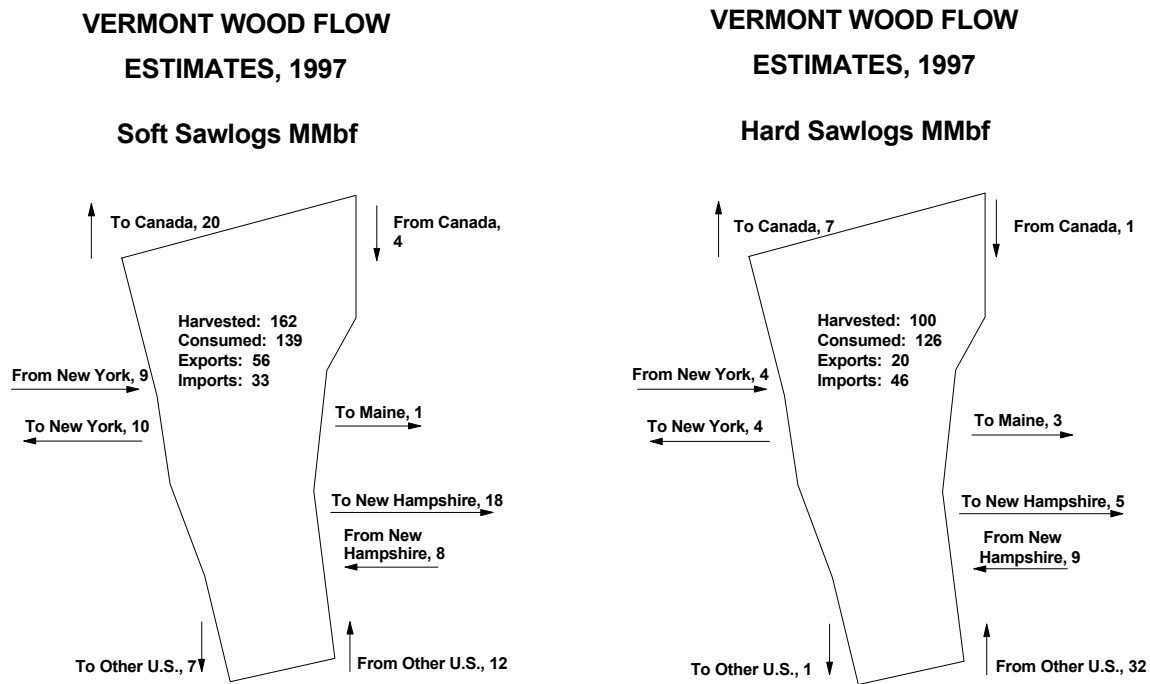
**NEW YORK**

New York has the second largest wood production of the four NEFA states. Its wood economy is shaped by a number of factors:

- Fairly large usage of residential firewood.
- A paper industry of significant size, but which is concentrated in northerly areas. This leads to movements of pulpwood from the Southern tier to Pennsylvania mills. The state's paper industry is a major market for pulpwood produced in Vermont.
- The state is the region's largest producer of hardwood lumber .
- Significant log exports move to Quebec; others, not documented for this study, probably go out via Baltimore.

A large secondary wood products industry exists in New York City and other urban areas, and this accounts for a portion of the imports of wood products through the Port of New York and New Jersey. Having three Ports of Entry, and proximity to Baltimore and Montreal gives this state a particularly active role in commerce with Canada and offshore ports. A significant part of that commerce involves origins and destinations in other states.

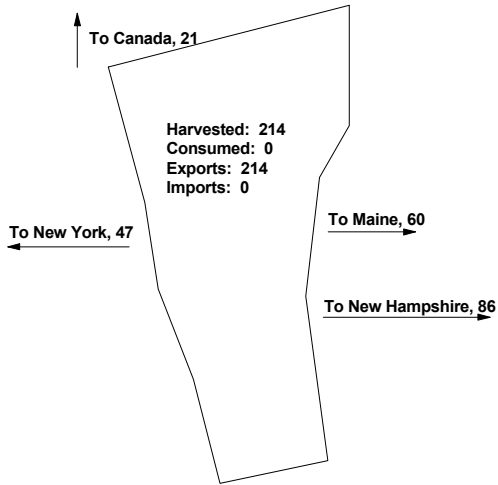
Current data on which to rely for these estimates are limited and uncertain. The degree of confidence in this estimate of New York's fiber balance is low.



**Figure 5**

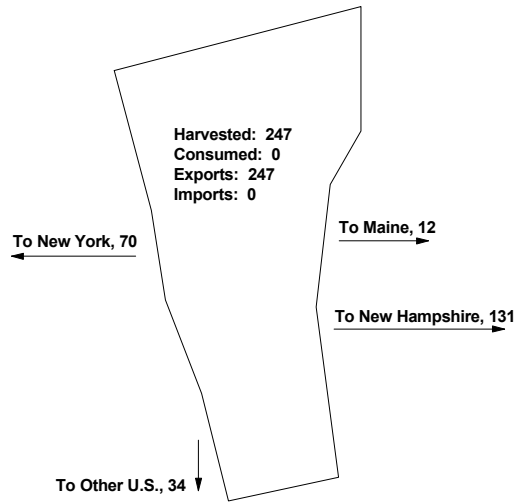
**VERMONT WOOD FLOW  
ESTIMATES, 1997**

**Soft Pulpwood M cds**



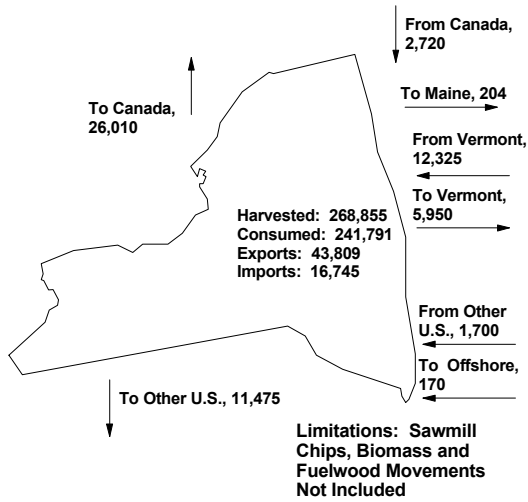
**VERMONT WOOD FLOW  
ESTIMATES, 1997**

**Hard Pulpwood M cds**



**NEW YORK WOOD FLOW  
ESTIMATES, 1997**

**All Products Mcf**



## **MAINE**

Maine is the major timber producer, accounting for roughly half of all of the region's wood production. The state has long had a degree of Canadian ownership of forest land which has been one factor in shaping woodflows; in the past year this ownership has increased.

- Maine has a large paper industry that draws fiber over long distances, which has shifted strongly to hardwoods in the past decade, boosting markets for hardwood pulpwood significantly.
- The proximity of a large sawmill industry on the Quebec border shapes the state's woodflow patterns. A very large proportion of the total softwood log production in northern Maine is shipped to sawmills in Quebec and New Brunswick. A significant part of the chips produced from those logs is brought back to Maine pulp mills. Those chip flows are not tracked by anyone, and have not been estimated for this project.
- Maine has a large softwood sawmill industry, but only a small hardwood lumber industry, due to the small tree sizes and modest quality of its hardwood resource.
- Since the collapse of oil prices in the 1990's the state's large biomass generating plant sector has been shrinking, with surviving plants running at low operating rates.
- Residential fuelwood remains a significant use factor.

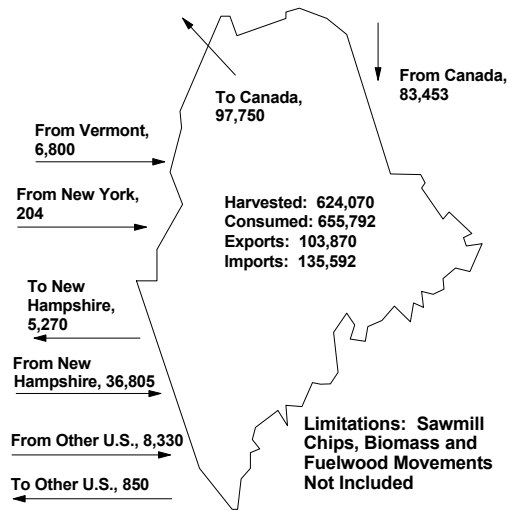
Despite the large softwood log exports, its imports of wood from nearby areas makes Maine a net importer of fiber on a volume basis through the 1990's.

(With the shutdown of the pulp end at Sappi's Westbrook mill, and the further shrinkage in usage of biomass in the powerplants, this could change by the end of the decade.)

Because these estimates rely on a state survey with a long history, our confidence in this estimate of the fiber balance is high.

**Figure 6**

**MAINE WOOD FLOW  
ESTIMATES, 1997  
All Products Mcf**



## **VERMONT**

Vermont's wood balance is shaped by a number of key factors:

- The state contains no wood pulp mills or board plants, so its pulpwood production is shipped to nearby states, as are its sawmill chips. Gilman Paper at times brings in biomass fuel for its boilers.
- A significant biomass electric generating capability leads to movements of biomass chips and residuals across state borders to support these plants. At the same time, such products move to New Hampshire biomass plants as well.
- An active, diversified primary and secondary wood processing industry provides good markets for Vermont wood and, because of the state's small size, results in extensive wood movements with nearby states.
- Vermont has several of the few large veneer mills in the region, which bring logs from considerable distances. The details are included in the estimates for sawlogs, however.

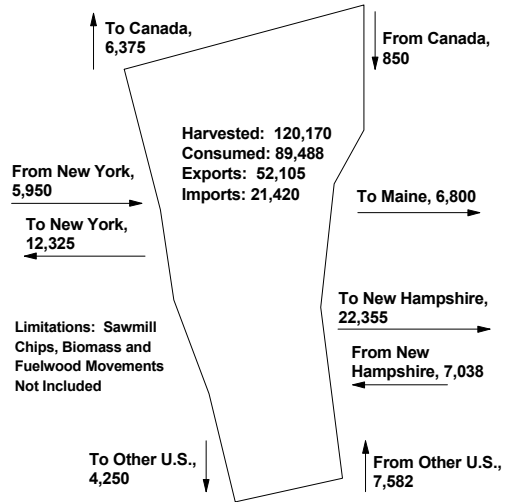
Because these estimates rely on a state survey with a long history, our confidence in this estimate of the fiber balance is high.

### **Figure 7**



### VERMONT WOOD FLOW ESTIMATES, 1997

#### All Products Mcf



## REGIONAL FIBER BALANCE

The NEFA states produced roughly 14 million cords of wood products in 1997. This includes growing stock and nongrowing stock sources. (Fig. 8). The principal product categories were pulpwood and sawlogs, but use of wood for fuel remains important despite the reduction in use of residential fuelwood and in consumption of wood for electricity generation. Hardwoods dominated the region's wood production, accounting for 59% of the total harvested. In terms of woodflows outside the region, those are estimated as the sum of the trade of individual states with Canada, other US states, and offshore areas. (Fig. 8).

Wood movements with other states are a small part of the region's fiber balance.

Wood trade with Canada is very significant in Maine, where log exports account for a very high proportion of the softwood sawlog harvest, and where significant imports of wood from New Brunswick are important.

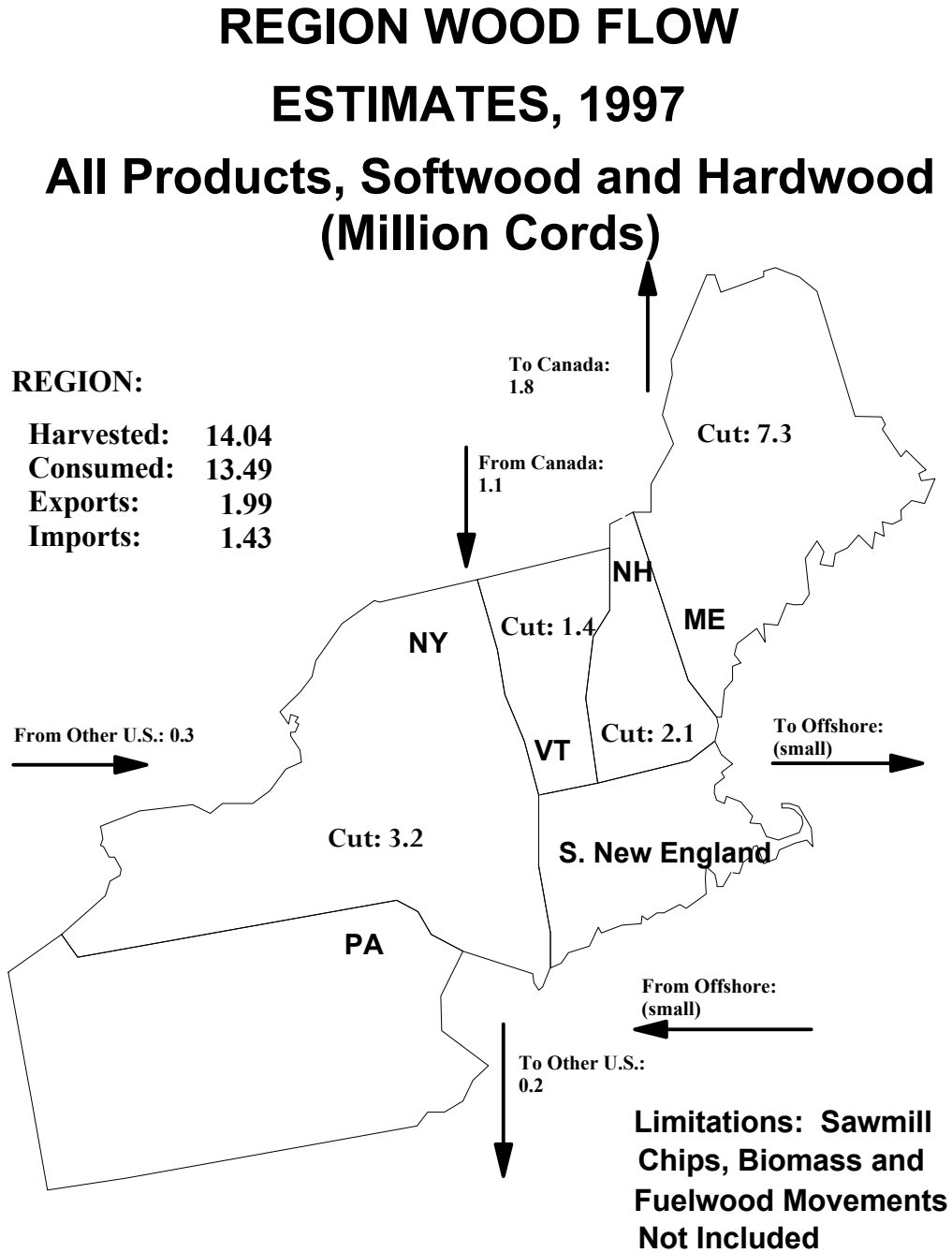
Offshore movements of primary products are essentially negligible. The export of veneer logs, which is an unknown amount, is an important unknown in this balance, however. Because of their scarcity (probably not more than 5% of the combined log-veneer harvest) and high unit value, their export has been controversial in the past. Part of the wood moving to Canada is re-exported, at times with some amount of processing, but there is no information to estimate the amounts and values moving in this manner.

The region also conducts a busy trade in a variety of processed wood products not included in the primary products covered for this report. The export data include considerable amounts of wood products originating in other regions, but nonetheless it is clear that exports of processed products are important to many of the region's firms. Total exports of wood products from the region's 5 Customs Districts in 1997 were \$1.1 billion, of which only a portion consisted of primary products (Appendix Tables A-8 to A-12).

Summaries of percent hardwood, wood cut by state, wood cut and consumed by product, are shown in Figures 9-12.

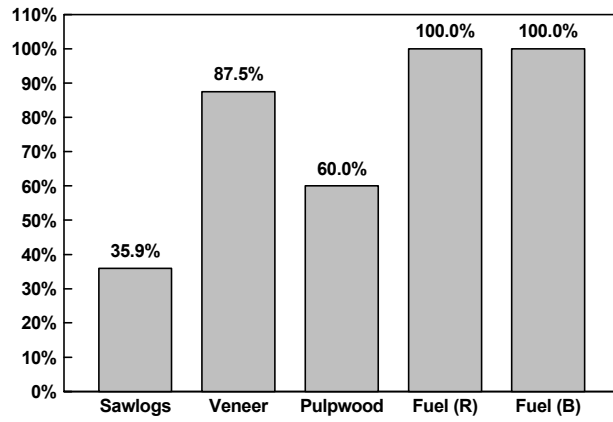
Conversions of summary totals to Mcords are provided in Tables 8 and 9.

Figure 8



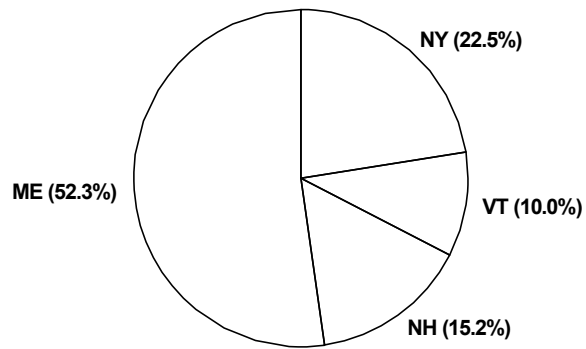
**Figure 9**

**Estimated Regional Percentage Hardwood  
by Product, 1997**



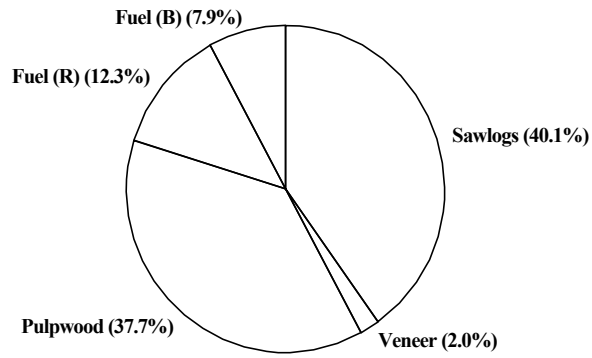
**Figure 10**

**Total Estimated Regional Timber Cut  
by State, 1997**



**Figure 11**

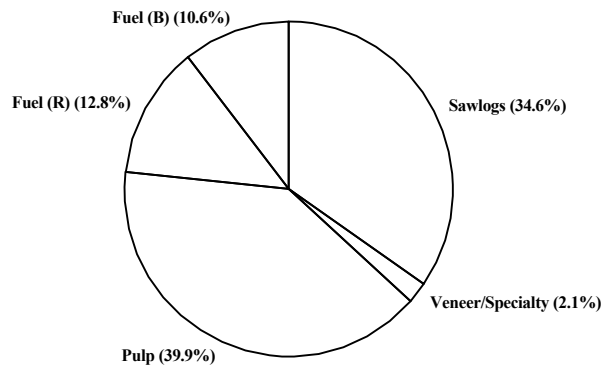
**Estimated Regional Production  
by Product, 1997**



**Figure 12**

**Estimated Regional Consumption  
by Product, 1997**

Total: 1,146.6



**Table 8**  
**Excerpts from WoodMan**

**Composition of Cut by State -- All species**

	New York		Vermont		New Hampshire		Maine		Region	
	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>
Sawlogs	108,460	1,276	44,540	524	76,840	904	248,880	2,928	478,720	5,632
Veneer/Spec.	11,390	134	6,290	74	1,530	18	4,760	56	23,970	282
Pulp	69,105	813	39,185	461	47,175	555	294,950	3,470	450,415	5,299
Fuel(R)	68,000	800	25,500	300	23,800	280	29,750	350	147,050	1,730
Fuel(B)	11,900	140	4,658	55	31,348	369	45,730	538	93,636	1,102
Total	268,855	3,163	120,173	1,414	180,693	2,126	624,070	7,342	1,193,791	14,045

**Fiber Balance by State -- All species**

	New York		Vermont		New Hampshire		Maine		Region	
	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>	<u>Mcf</u>	<u>Cords</u>
Harvested	268,855	3,163	120,173	1,414	180,693	2,126	624,070	7,342	1,193,791	14,045
Consumed	241,791	2,845	89,488	1,053	159,545	1,877	655,792	7,715	1,146,616	13,490
Exported	43,809	515	52,105	613	65,943	776	103,870	1,222	265,727	3,126
Imported	16,745	197	21,420	252	44,795	527	135,592	1,595	218,552	2,571
Harv-Cons	27,064	318	30,685	361	21,148	249	(31,722)	(373)	47,175	555
Exp-Imp	27,064	318	30,685	361	21,148	249	(31,722)	(373)	47,175	555

Source: WoodMan Spreadsheet, June 1999.

**Table 9**  
**WoodMan Regional Balance**

**NEFA Region, MMcf, Cut & Consumption**

	<u>Cut</u>	<u>Consumption</u>	<u>Cut- Consumption</u>	<u>Cut MM Cords</u>	<u>Consumption MM Cords</u>
Sawlogs	478.7	396.8	81.9	5.63	4.67
Veneer/Spec.	24.0	24.0	0.0	0.28	0.28
Pulp	450.4	457.8	(7.4)	5.30	5.39
Fuel (R)	147.0	147.0	0.0	1.73	1.73
Fuel (B)	93.6	121.0	(27.4)	1.10	1.42
<b>TOTAL</b>	<b>1,193.8</b>	<b>1,146.6</b>	<b>47.2</b>	<b>14.04</b>	<b>13.49</b>

From WoodMan, p. 45

**Region's Trade with "Rest of World"**

MMcf

**Data Checks**

	<u>Imports</u>	<u>Exports</u>	<u>Net Export</u>
Canada	94.6	152.2	57.6
Offshore	0	0.2	0.2
Other U.S.	27.2	16.6	-10.6
<b>TOTAL</b>	<b>121.8</b>	<b>169</b>	<b>47.2</b>

Import fr. WoodMan, p. 30.

Exports fr. WoodMan, p. 15.

**Region Balance, All Species**

	<u>MMcf</u>	<u>Cords</u>
Cut	1,193.8	14.04
Consumed	1,146.6	13.49
Imported	121.8	1.43
Exported	169.0	1.99

## **RECOMMENDATIONS**

These recommendations are based on the research performed for this project, on past experience, and on our judgment on how best to develop a full understanding of the region's woodflow balances. Order of listing does not imply priority. It is recognized that additional staff and funds would be required for implementation.

### **1. REVIEW AND SET PRIORITIES**

States and the U.S. Forest Service FIA unit should review this report and its recommendations with interested groups and develop their own view of the priority issues, knowledge gaps, and steps to be taken to deal with them.

### **2. WORKPLAN**

States and the Northeast Forest Experiment Station FIA Unit should agree on a division of effort and workplan that will result in filling the priority knowledge gaps identified in this report, and possibly additional ones identified by discussions within the individual states.

### **3. WOOD ENERGY USAGE**

The states ought to take the lead in developing detailed, accurate, and promptly reported estimates of the consumption of wood for energy. This would entail continuation of previous surveys of residential firewood usage on appropriate intervals, and a census of major utility, non-utility electric generators and institutional and commercial units using roundwood, chips, or residues. Information on this topic is important for a variety of information and policy needs.

### **4. POLES, POSTS, PILING AND TREATING**

A periodic assessment of poles, posts and piling production and usage, and of the region's wood treating business, would be desirable. Initial materials may be found in the USDC Trade Data, in statistics compiled by the American Wood Preservers Institute, and various state and other industrial directories. Production of poles and piling in the region is limited, but because of the high unit values, a better information base on this product class would be useful.



## **5. ANNUAL REGIONAL WOODFLOW ESTIMATE**

NEFA states should build on the spreadsheet format submitted with this report, or a suitable modification, to generate annual or periodic woodflow summaries according to consistent state and regional formats. By using independent estimates of production, such as U.S. Forest Service pulpwood surveys or Census lumber production estimates, even states that do not perform their own statewide surveys could develop working estimates of their woodflows annually.

This annual update should cost no more than \$4,000-6,000 if contracted out. The cost could be lower if Recommendation 11 is followed.

## **6. VALIDATE USDC TRADE DATA**

A joint group including the FIA, the states, and possibly the Universities should conduct a systematic validation of the USDC Trade Dataset to determine the practical impact of the uncertainties discussed in the body of this report. In this validation, there would be no substitute for direct, personal contact with a selected number of companies filing the forms, customs officials checking loads, and all of the practical details involved. Any results of such a validation would be most useful to the states and the U.S. Forest Service in ongoing tracking of woodflows. In this validation, consideration should be given to the dataset developed annually by the Quebec Ministry of Natural Resources and information planned to be produced in the future by the New Brunswick Dept. of Natural Resources. This effort should take full advantage of expertise that has been developed on this dataset at the U.S. Forest Service project in Princeton, West Virginia.

## **7. RECONCILE INDEPENDENT DATA SOURCES**

Further, the various independent sources of information on important values, such as the annual U.S. Forest Service Pulpwood Report, the American Pulpwood Association Receipts Report, the USDC Trade Data, the Census lumber production estimates, and the state surveys should be periodically reviewed and reconciled.

## **8. REGIONAL TPO SURVEY**

We understand that an effort is underway by the U.S. Forest Service FIA Unit in Radnor, Pennsylvania to pilot test a regional sample survey of timber products output. If such a survey could be conducted to a high standard of statistical accuracy and precision even every three years, it would represent a major advance. Surveys of this sort (I believe by enumeration) have been conducted at times in the past in the Pacific Northwest. Major attention needs to be paid to

the question of statistical confidence limits on the results for smaller states. (For the process in the Lake States, see May (1998)).

This is a commendable initiative that deserves the support of the State Foresters. It may not fully resolve all of the issues, so until its funding and feasibility have been demonstrated, it should not be considered a reason to defer action on other recommendations of this report. One reviewer of this report noted that existing TPO survey instruments need improvement.

#### **9. U.S. FOREST SERVICE VENEER LOG SURVEY**

Consideration should be given to re-instating the U.S. Forest Service Veneer Log Surveys, perhaps with a somewhat shorter interval than five years. In designing the survey, due attention should be given to the issues identified in this report, and to close cooperation with the states. (Full implementation of Recommendation 8 would render this unnecessary.)

#### **10. PRIVATE TRADE DATA**

The NEFA states should consider purchasing a year's run of data from one of the commercial services that provides detailed shipment-by-shipment information. Such a data source, obtained periodically, might yield valuable information on trends in the wood trade and its participants.

#### **11. STATE SURVEYS**

New York and New Hampshire, not now conducting annual surveys of their own, should be encouraged to do so. If such surveys were available, a rich source of regional data would exist, and for state-to-state movements, estimates of flows from both sources and destinations would be available. Such mutually reinforcing data checks would permit the detection of errors of nonresponses, and would increase confidence in the results. In New Hampshire, severance tax data has been used in the past; experience in Alabama with a similar database may be useful (Zhou and Teeter, 1999). State forestry agencies may experience better cooperation and response rates than federal surveys.

#### **12. CHIPS AND PULP**

The fiber balance of the region's paper industry hinges on movements of chips and pulp. These should be periodically surveyed.

### **13. FULL CONSUMER AND INDUSTRIAL WOOD PRODUCTS/PAPER FLOW BALANCES**

As noted above, primary products are only part of the picture for the region's wood economy. In order to understand the economy and the policy implications of wood flows, it would be desirable to understand the full regional balance of production, consumption, and trade of all wood-based consumer and industrial products. Developing such a balance would be a suitable task for the U.S. Forest Service and the Universities. Consumption data for end products do not exist, but working estimates could be obtained using average use factors and per capita values.

### **14. VALIDATE NONGROWING STOCK PERCENTAGES**

To understand the impact of a given cut level on the forest, it is necessary to measure the proportion of wood by product class coming from growing stock and non-growing stock sources. At present, this is not well documented. An effort should be made to update these factors as soon as possible.

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**APPENDIX**

## APPENDIX 1. DATA SOURCES

### PERIODIC SURVEYS OF PRIMARY PRODUCTION AND RECEIPTS

The best-known periodic surveys are the “TPO” (Timber Products Output) surveys conducted by USFS - FIA in conjunction with periodic Forest Surveys of the individual states (Table A-1). These surveys are exhaustive. Their primary purpose is to measure drain on the forest as a basis for determining growth/drain status of the forest in the periodic Forest Surveys. As additional benefit, the TPO surveys provide detail by product, species and species group, and indicate wood movements across state boundaries in some detail. It may require more than a year after the data year to complete publication of the TPO surveys. They form a valuable baseline for understanding wood usage.

<u>Item/Area</u>	<u>Source</u>	<u>Frequency</u>	<u>Pub. Lag</u>	<u>State/Province Movements</u>
All Products	USFS '96 TPO	5 years	2 yrs.	N
	& State TPO Bulls.	10 or more		Y
Pulpwood Prod-Cons.	USFS, NEFES	Annual	2 yrs.	Y
Pulpwood Receipts	APA	Annual	6 - 8 mos.	N
All Products -- Maine	MFS Woodflow Rept	Annual	1 - 1.5 yrs.	Y
All Products -- Vermont	VT For. & Parks Rept.	Annual	1 - 1.5 yrs	Y

Every five years, the Forest Service adjusts state level FIA reports, including summarized TPO data, for its periodic RPA Assessment. These reports were done in 1987, 1993, and for 1996 (Powell, et al., 1993). The 1996 data are preliminary for the Northeast and are available on the FIA Website. Hard copy publication is likely next year.

For this project, we obtained the 1996 preliminary TPO data from the RPA website and sought review of the estimates from the NEFA member U&M staffs. In a number of instances, differences were found between TPO estimates and other sources.

At one time, the FIA units conducted veneer log surveys every five years. Due to staff and funding limitations, these are no longer done.

The Radnor, Pennsylvania FIA Unit is conducting a study to assess feasibility of a periodic regionwide TPO assessment using a sampling scheme. Results of this analysis and a decision are expected in due course. Preparations for the work are underway.

## **ANNUAL DATA ON PRIMARY PRODUCT PRODUCTION AND RECEIPTS**

### **USDA Forest Service Pulpwood Survey**

As part of the regional FIA (Forest Inventory and Analysis) program, the U.S. Forest Service FIA unit at Radnor, Pennsylvania has conducted annual surveys of pulpwood production and usage in the Northeast since the 1970's. These surveys include considerable detail by species, product form, and movements between states. Mill residues are treated separately.

Preliminary data are often available within one year from the end of the reporting year, but delays in responses can delay production of the reports.

Reporting is voluntary and results at times differ from what is reported by states.

### **American Pulpwood Association**

The American Pulpwood Association, as a member service, conducts an annual survey of pulpwood receipts by mills. In recent years they have obtained a 100% response rate in the Northeast.

Detail is given by roundwood vs. chips, and softwood and hardwoods.

### **State Surveys**

Two states conduct regular surveys of wood harvests and movements: Maine and Vermont.

#### Maine

The State of Maine has conducted annual surveys of wood harvests and usage since the 1960's. These surveys were conducted under the Maine Forest Service's (MFS) general authority (12 MRSA, 8884) for many years, until a formal reporting requirement for landowners was introduced as part of the 1988 Forest Practices Act.

Reporting from landowners has been found unsatisfactory as a method of obtaining a full picture on consumption. Reporting on common and undivided ownerships and other problems



have prevented establishing a consistent report. Further, landowner reports have not been a useful way of obtaining information on exports and imports of wood.

As a result, the state has relied on reports from mills for its production and woodflow estimates. In the past, it was recognized that reporting on exports was incomplete (see, e.g. Maranda, 1986). In recent years, the gypsy moth quarantine reporting requirements and improved follow-up have enabled the MFS to improve its coverage of log exports.

Information is provided in annual reports that generally take a year to produce. The MFS is hopeful that with improved procedures and staffing they will be able to materially reduce this publication time.

### Vermont

For years, the Vermont Department of Forests and Parks, Forest Utilization and Marketing Section has compiled data on log usage and movements (authority is Title 10, ch. 83, sec. 2623). The work is done by mail with telephone follow-up. The survey is conducted under legal authorization, but response is voluntary. Staff involved report that the coverage within the state is fairly high, based on good knowledge of mills, high responses from larger ones, and personal contacts with smaller ones. Responses from out-of-state wood users are more problematic, with Quebec rating high for thoroughness of response, followed by Maine and New Hampshire and New York, with lowest responses from southern New England.

### New Hampshire

The state keeps files of severance tax data which are not compiled, but were used as a basis for 1995 data cited in this report. There is also a requirement for sawmills to register annually, which could provide the basis for asking for log consumption data on that form.

### **Existing Data Sources on Intrastate Movements**

One source that is often noted is the U.S. Census of Transportation. While useful for certain broad national and regional purposes, this information is aggregated at too high a regional and product level to be useful to the NEFA states for analyzing woodflows in any detail.

### **Available Information on Trade Movements**

There are both government and private sources of data on trade movements (Appendix Table A-2). The sources are briefly reviewed here.

**Table A-2  
International Trade Data Sources**

Data Source	Mode of Transport	Flow Given	Shipper/Consignee ID?	State of O.r.D?	Volume	Values	Commodity Codes	GEOGRAPHIC DETAIL				Customs District
								National	Province	State	Port	
Trade Inc.	All	I, E	Y	N	Y			X	X		X	
Piers	Water	I, E	Y	N	Y	N	HS	X	X		X	
USDC Customs Data (1)m	All	I, E	N	N	X	X	HS	X				X
Corps. of Engineers	Waterways	Movements	N	N	X					X	X	
Statistics Canada	All	I, E		Y				X	X			
Quebec MNR	All	I, E		Y				X	X			
New Brunswick DNR	All	I, E		Y	Y		Some	X	X			
Vermont	All	I, E		Y	Y		"			X		
Maine	All	I, E		Y	Y		"			X		

**I = Import**  
**E = Export**  
**HS = Harmonized System**  
**O = Origin**  
**D = Destination**

**(1) Available via USFS, MISER, and USDC Website**  
**(2) Corps used its own coding system.**

### Government Data

Both the U.S. and Canadian governments maintain statistical programs that summarize data developed from trade documentation generated by enforcement of quota and other regulations on trade. Essentially, the information content developed is a byproduct of the administrative and legal purposes that give rise to the original documentation. The trade data was not designed to enable users to track logs moving from particular states to particular overseas destinations. The primary documentation is a form called an export declaration, or "Export Dec," prepared by exporters and submitted to Customs for every individual shipment. A comparable form exists for imports, and is filed by the shipper of record. Most nations keep better track of their imports than their exports, because of the tariff revenues involved, the potential for illicit movements of both legal and "black" goods, and the need for enforcement operations on these matters. As a result, the U.S. simply adopts the Canadian import data in place of its own export information, at least for wood products.

Data on the products are classified according to the Harmonized System, which provides a standard set of codes and definitions that are identical for both imports and exports. Prior to adoption of the HS, it was clear that U.S. government trade data for logs in the Northeast was essentially worthless, as it provided fluctuating coverage of the actual flow from year to year. Analyses during the 1980's uncovered many weaknesses in the trade data (Durst, Ingram, and Laarman, 1986; Ryten, 1988; Puzilla and Walter, 1988; US GAO, 1989; Luppold, 1995; Luppold and Thomas, 1991). More recent work suggests that difficulties still remain (Hansen, 1998). The government recognized this in its decision to rely on Canadian information for export data (Foreign Trade Div., 1997).

A copy of the HS codes and definitions for primary wood products is attached in the Annex.

### *U.S. Department of Commerce Trade Data*

There are several ways to obtain the datasets produced by the U.S. Department of Commerce. These sources all rely on a primary dataset that suffers from several difficulties. First, the information is difficult to use because it must be obtained for a number of different HS codes and then added together to reach meaningful general results for wood flow analysis. The degree of detail goes so far as to separate treated from untreated posts, but unfortunately does not make distinctions that would be much more useful for our purposes, e.g. between sawlogs and veneer logs. As a result, the HS System creates serious difficulties for analysts of local product movements.

As an example of coding difficulties, the softwood log exports from Buffalo to Canada may be considered (Table A-3). In some years, items coded as "southern yellow pine" or "ponderosa pine" are large relative to the totals. "Logs, timber, in the rough, NESOI" often accounts for a large amount, and it is impossible to determine the species in this total. There seem to be no way to parse out numbers reflecting only locally harvested species.

**Table A-3**  
**1990-97 Softwood Log Exports, Buffalo Customs District**

DISTRICTS	TYPE	COUNTRY	HS-CODE	COMMODITY	UNITS	1990	1991	1992	1993	1994	1995	1996	1997
Buffalo, New York	Dom_FAS	Canada		TOTAL SELECTED COMMODITIES	\$	1,736,511	362,806	198,760	30,402	626,366	651,402	657,156	718,535
Buffalo, New York	Dom_FAS	Canada	4403200020	SOUTHERN YELLOW/PITCH ETC PINE LOG/TMBR NT TRT, RG	\$	8,949	84,202	0	0	15,903	0	0	0
Buffalo, New York	Dom_FAS	Canada	4403200020	SOUTHERN YELLOW/PITCH ETC PINE LOG/TMBR NT TRT, RG	\$	0	0	0	0	0	0	29,178	0
Buffalo, New York	Dom_FAS	Canada	4403200025	PONDEROSA PINE LOGS & TIMBER IN THE ROUGH, NT TRT	\$	11,761	22,278	0	0	109,484	121,031	0	0
Buffalo, New York	Dom_FAS	Canada	4403200025	PONDEROSA PINE LOGS & TIMBER IN THE ROUGH, NT TRT	\$	0	0	0	0	0	0	0	5,084
Buffalo, New York	Dom_FAS	Canada	4403200030	PINE, NESOI, LOGS AND TIMBER, IN THE ROUGH, NT TRT	\$	322,025	58,773	13,057	25,016	116,145	320,691	0	0
Buffalo, New York	Dom_FAS	Canada	4403200030	PINE, NESOI, LOGS AND TIMBER, IN THE ROUGH, NT TRT	\$	0	0	0	0	0	0	352,533	208,744
Buffalo, New York	Dom_FAS	Canada	4403200035	SPRUCE LOGS & TIMBER IN THE ROUGH, NT TREATD	\$	0	0	70,969	0	23,398	0	0	0
Buffalo, New York	Dom_FAS	Canada	4403200035	SPRUCE LOGS & TIMBER IN THE ROUGH, NT TREATD	\$	0	0	0	0	0	0	144,326	235,541
Buffalo, New York	Dom_FAS	Canada	4403200040	DOUGLAS FIR LOGS AND TIMBER IN THE ROUGH NT TREATD	\$	23,316	68,371	97,540	0	32,561	14,294	0	0
Buffalo, New York	Dom_FAS	Canada	4403200055	WESTERN RED CEDAR LOGS/TIMBER IN THE ROUGH NT TRT	\$	0	0	0	0	0	0	12,229	0
Buffalo, New York	Dom_FAS	Canada	4403200060	LOGS/TIMBER IN THE ROUGH, CONIFEROUS, NESOI NOT TR	\$	1,370,460	129,182	17,194	5,386	328,875	195,386	0	0
Buffalo, New York	Dom_FAS	Canada	4403200060	LOGS/TIMBER IN THE ROUGH, CONIFEROUS, NESOI NOT TR	\$	0	0	0	0	0	0	118,890	269,166

Second, there are concerns about completeness of coverage. Customs personnel have noted that there is no way to be certain if paperwork is filed during hours when remote border posts are not occupied by Customs personnel. Efforts have been made to improve coverage. This may be the cause of some abrupt jumps in the data that do not seem to be caused by actual changes in log movements.

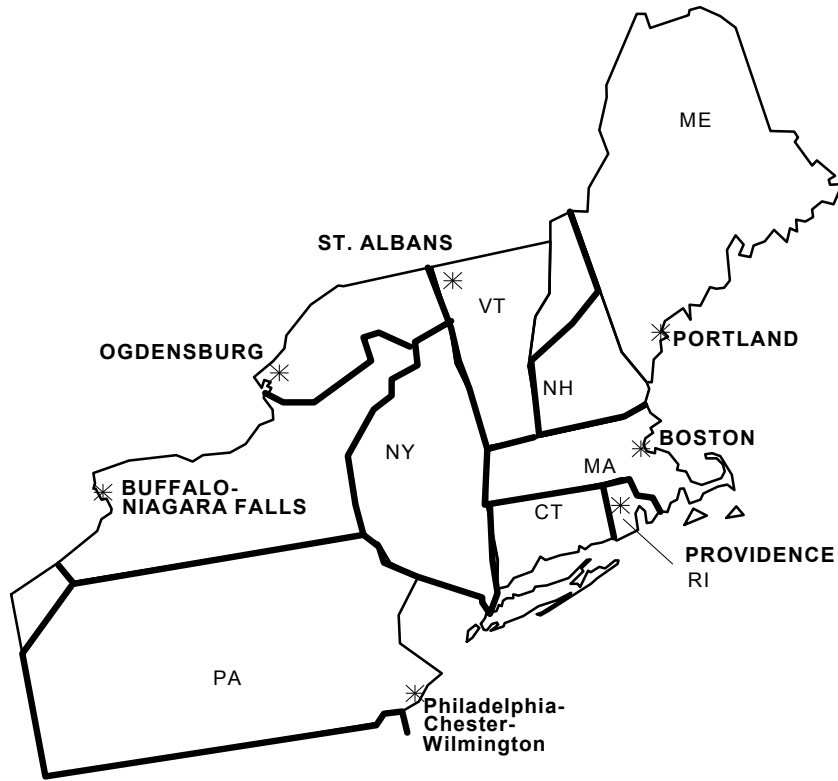
Third, there may be questions and uncertainties as to the accuracy of coding on the Export Declaration ("Export Dec") forms. The Export Dec form is often filled out in an office at the last minute by rushed clerical staff who may be impatient with the details of the coding system. It is not clear that there is effective verification of classifications, and shippers may believe they have incentives to deliberately misclassify products, say to record sawlogs and pulp, pulp as firewood, or veneer as sawlogs.

Also, the HS uses metric units. It is possible that busy sawmill or log yard staff are not conversant with conversion factors for converting from tons to cords to cubic meters and may employ rough "arithmetic in the head" when filling out the forms. Published conversion factors cover a range of values, and actual factors may vary by season, by product, and by region. It is virtually impossible to know to what extent the data may be affected by these factors.

Further, the trade data are organized by Customs Districts (Fig. A-1) where the shipments cross the U.S. border. This means that actual origins of the shipments are not clear, even in instances where states of origin are indicated, they may refer to the woodyard or company office and not the state where wood was cut (Fig. A-2). Also, the ultimate destination of logs entering Canada may not be identifiable.

It is often stated that we can have more confidence on the dollar volumes in these data sets than in the physical quantities. This makes sense up to a point, but does not resolve the other concerns. Our conclusion is that the Trade Data, being readily available, give us one source of information on trade movements. It is best if the results are checked against independent sources, if at all possible. A regional effort to validate the data and determine whether the concerns noted above materially affect the value of the data should be conducted.

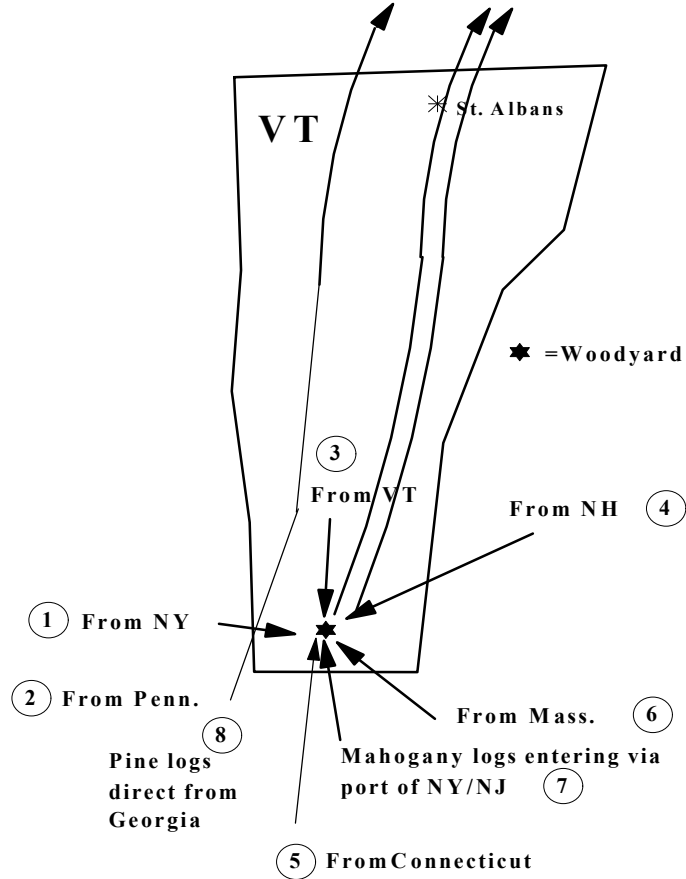
# Figure A-1 CUSTOMS DISTRICTS AND PORTS OF ENTRY



Source: U.S. Customs Service Map. 1989.

**Figure A-2**  
**Example: Ambiguity of Log Origins**  
**in U.S. Trade Data**

**Logs from all 8 origins are shown as exports from St. Albans District.**





### *USA*

The U.S. data are collected first by the Customs Service, and then captured and formatted into a trade dataset by the U.S. Department of Commerce. The information is published at the national level in the periodical *Wood Products: International Trade and Foreign Markets*, issued by the Foreign Agricultural Service's Forest and Fishery Products Division. Staff at that organization can be very helpful in answering questions.

Also, the American Forest and Paper Association reports national trade data, by species, for lumber in monthly publications.

The USDC data can be obtained through the USDA Forest Service's Marketing project at Princeton, West Virginia. Data on a monthly, quarterly, and annual basis will be provided to State Foresters' offices free of charge.

The Department of Commerce maintains a website from which this information can be obtained. Also, an organization called MISER (Massachusetts Institute for Social and Economic Research, at the University of Massachusetts) makes available custom tabulations from this dataset at a very modest charge. This may be the most cost-effective means of obtaining this information.

### *Canada*

Revenue Canada collects information on trade activity in much the same manner, and the information is managed for analysis and distribution through Statistics Canada. Detailed information on Canadian wood product imports and exports can be obtained in hard copy from Statistics Canada, and also from the agency's website.

On the Stats Canada Website, the information is shown in general categories, but does indicate state of origin for imports to Canada. Data in nominal U.S. or Canadian dollars can be printed directly or downloaded from the site. This site offers U.S. shipments to Canada by state of origin. This information probably shares some of the problems identified for U.S. trade data. As an example of coding difficulties, the trade data shows that a certain amount of "douglas fir logs" were exported from Canada into Maine in 1997. We cannot say that this is entirely impossible but it does not seem likely. In any case, what are we to do with this number?

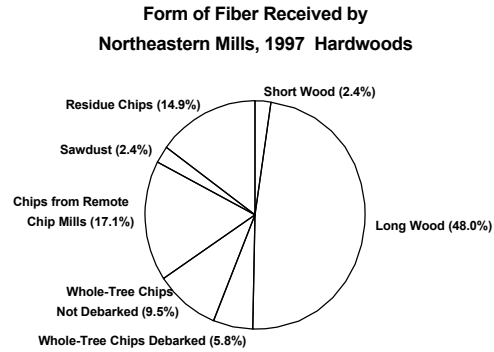
Examples of such queries are included in the Annex.

More detailed queries, with data by species, can be handled directly from the website and paid for by MasterCard. An example of this query is included in the Annex.

Quebec

The Quebec Ministry of Natural Resources has a legal mandate to track sources of wood used by the Province's industry. Each mill must have a permit to operate, and a condition of the permit is to produce information on the amount and source of wood used. Quebec MNR staff report that among the larger mills compliance is fairly good with this requirement. This information is summarized for major wood types and identifies sources of wood by state. The dataset we have obtained is charted below (Figs. A-3 to A-5).

Figure A-7



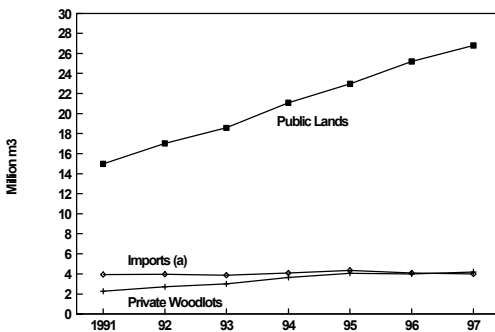
Green Tons

Short Wood	261,690
Long Wood	5,302,215
Whole-Tree Chips Debarked	641,494
Whole-Tree Chips Not Debarked	1,045,363
Chips from Remote Chip Mills	1,891,813
Sawdust	267,284
Residue Chips	1,644,580
<b>TOTAL</b>	<b>11,054,439</b>

Source: APA, 1998.

Figure A-3

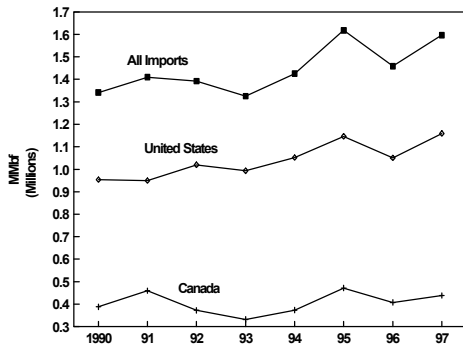
Origin of Timber Supply, Softwood and Hardwood



Source: QLMA from QMNR estimates.

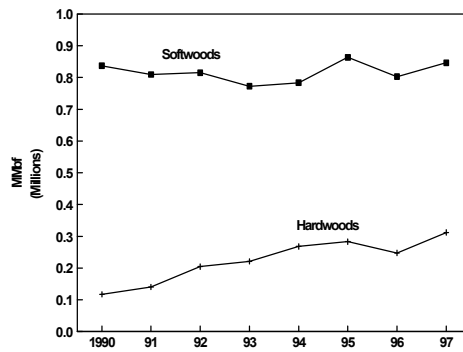
(a) = Estimated by the Ministry of Natural Resources.

**Figure A-4**  
**Quebec Log Imports, 1990-1997**  
**All Sources, U.S. and Canada**



Source: Quebec Ministry of Natural Resources.

**Figure A-5**  
**Quebec Log Imports from U.S.,**  
**by Softwoods and Hardwoods, 1990-1997**



Source: Quebec Ministry of Natural Resources.

### Private Data Sources

We know of two companies that obtain various kinds of trade data from individual shippers and repackage those in a variety of custom formats for customers. While these can be costly, they offer the advantage that they offer monthly summaries and may be able to specifically identify shippers. This could be useful in aiding an agency in tracking rapidly developing trade flows into or out of their state. Data can be obtained in a variety of formats. Details are given in the Annex.

#### *Trade Data, Inc.*

Working from available information, Trade Reporting and Data Exchange, Inc. (TRADE) offers customized printouts of data on trade shipments. The information includes origin, destination, weight and value and is identified by detailed commodity codes. This data has been considered reliable enough to be published in trade journals (e.g. Ferguson, 1993).

The company makes available annual summaries as well as monthly ones.

A query of annual data for a single commodity would cost \$500, with an additional \$100 for five more commodity codes.

#### *PIERS*

The PIERS service is made available by the publishers of the Journal of Commerce, a respected daily newspaper covering foreign trade and shipping. Working from Customs tapes of import and export documentation, the PIERS data analysts sort the data into fields by shipper, consignee, product, and product details. Monthly reports of this information can be obtained for specified areas and commodity codes for \$475 per month. Annual summaries can only be obtained by buying the data each month, meaning that a year's data would cost \$57,000

#### *Port Authorities*

The individual port authorities maintain data on movements of cargo through their facilities. Port revenue is usually based on tonnage or volume fees for the various port services. The information is used to track usage and for marketing purposes. Generally, wood products data is not maintained in extensive detail by products or destinations by the port authorities. But for a tracking activity in local areas, contacts with port authority officials can be most useful. A listing is provided in the Annex.

*Waterways Movements*

As the nation's principal agency charged with maintenance and operation of federal navigation projects such as harbor dredging and locks and dams, the Army Corps of Engineers maintains detailed records on the usage of its projects. This information is summarized by the Corps' Navigation Data Center, based at its New Orleans District. The information is consistently collected and available over long time periods. Unfortunately, it is often provided according to highly aggregated product classifications, and small individual shipments can be lost in totals for larger categories.

On its website, a user can order a CD-ROM containing detailed data, but we find that an agency would need a high level of database software and expertise to be able to make effective use of this CD-ROM product. The Corps responds well to individual inquiries at its New Orleans office, however.

Existing Annual Data on Wood Product Production

One way to estimate primary wood product consumption by state is to estimate "backward" from data on wood product production. The principal products that could be estimated in this manner would be sawlogs and pulpwood. Production of veneer logs in the region is small, though of very high unit values. But there has been no regularly available data on plywood and veneer production in the region since the Census Bureau ceased publication of its reports on softwood and hardwood veneer and plywood. For pulp, no data are available, and paper and board data are slow to be issued and lack detail for some states due to disclosure problems.

The information used would consist of three sources, on lumber, pulp and paper, and OSB (Table A-3).

<u>Product</u>	<u>Report</u>	<u>Periodical</u>	<u>Currency</u>	<u>Cost</u>
Lumber	U.S. Census	Annual	12-18 mos.	Free
Pulp & Paper	American Forest & Paper Assn.	Annual	18 mo. - 30 mo.	\$300+
OSB	APA--The Engineered Wood Association	Annual	4-6 mos.	Free

While these sources of data may have weaknesses for estimating primary timber harvesting within a state, they may serve as a “double-check” on other estimates and could be used with care to update any benchmark surveys that may be available, as those done by the U.S. Forest Service FIA unit.

### **Veneer Log Production and Trade**

Veneer logs are the forest products with the highest unit values, and a large veneer mill can be a considerable employer in a community. It is widely accepted that the best veneer logs often leave the state where they are produced, and are frequently exported to offshore markets. But there no data are being collected on the production and movement of this important product class. The region has long since ceased to be competitive in commodity hardwood plywood production, and most of its veneer mills serve specialty markets or produce material for products other than plywood.

Federal HS trade codes lump sawlogs together with veneer logs. Also, the surveys done by Vermont and Maine treat sawlogs and veneer logs together (though Vermont does identify usage by veneer mills). For this project, we conducted a brief interview survey of veneer mills and industry observers to attempt to develop our own estimates. Respondents were most helpful, and helped us learn a number of important lessons:

1. "Veneer log" is no longer a self-evident and clear product class. Several mills in the region are making veneers out of high grade sawlogs. Essentially the industry can no longer outbid export buyers for the traditional large, straight, veneer log of premium species. Veneer logs can travel six hundred miles or more to mills, and are exported to the ends of the earth. It is generally believed than many veneer logs moving to Canada are actually bound for offshore destinations.

2. The product class of boltwood includes a few species, is usually prepared to short lengths, and produces log prices almost as high as traditional veneer logs. In the basis of looking at a log on a landing, it may be impossible to tell if it will go to a sawmill, will be bucked to boltwood for a local dowel plant, or will go for veneer to a veneer mill. Published state woodflow surveys don't distinguish boltwood as a product class.

3. Veneer logs are marketed in a number of ways, directly from landings in the woods; at mill yards, and at special woodyards operated by intermediaries. The price premiums are so large that progressive sawmills conduct careful inspections to detect, for example, birdseye maple. One mill we know gives the scaler who finds one a piece of the profits. We believe that a large portion of the veneer logs that are exported are sold by experienced log brokers

specializing in this trade, often operating log yards at multiple points in the region. Alternatively, they often buy from other independent log yards who are kept aware of their needs. Few states even have good lists of the locations and identities of these log yards or the agents and brokers who may buy from them, who may be headquartered in other states. In addition, many of these firms keep a very low profile because of competitive reasons and because of the politically controversial nature of their activities.

Because of the complexity of the marketing system for logs shipped outside of the region to U.S. or Canadian mills and to offshore markets, any effort to fully census veneer log production, consumption, and movements would be a daunting task. Still, we think the states and the U.S. Forest Service ought to take steps to at least periodically take the pulse of this activity. We have been told that veneer log output from one major landownership is about 4% of their log volume. We would guess that few operations around the region would exceed this. A survey of owners and log yards to obtain indications of this percentage could provide a useful initial basis for at least an estimate of likely production volumes.

#### **Paper Grade Chips and Other Fiber**

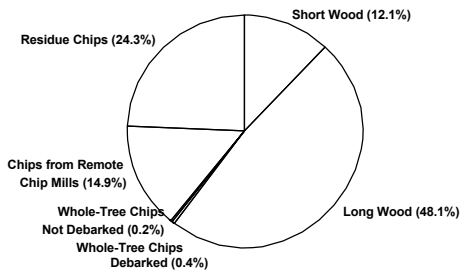
Paper mills buy one or more of several classes of chips (Figs. A-6 and A-7):

- sawmill residue chips from debarked slabs, edgings, and other mill byproducts;
- some mills buy "whole bole" chips produced in the woods from stems that are not debarked;
- hog fuel and other chipped or hogged landclearing and urban demolition waste, WTC, or secondary processing plant byproducts;
- sawdust or planer shavings.

Regionally, such "residuals" are very important to the industry.

Existing state surveys do not cover all of these items, either as to production within the state or crossborder movements. The annual U.S. Forest Service Pulpwood Report includes valuable information on residues, but does not include all of the above categories and does not include fully broken down data on movements between states. Also, it does not include all of the region's particleboard plants. Speaking very roughly, a green ton of chips will be produced per Mbf of lumber sawn. Using existing production data and conversion ratios such as these could lead to rough working estimates of production volumes for some of these items.

**Figure A-6**  
**Form of Fiber Received by**  
**Northeastern Mills, 1997 Softwoods**



	<u>Green Tons</u>
Short Wood	807,898
Long Wood	3,221,932
Whole-Tree Chips Debarked	25,149
Whole-Tree Chips Not Debarked	16,669
Chips from Remote Chip Mills	994,447
Sawdust	--
Residue Chips	<u>1,626,680</u>
<b>TOTAL</b>	<b>6,692,775</b>

Source: APA, 1998.

## SELECTED COMPARISONS OF DATA SOURCES

### Lumber and Sawlogs

One way to update log production might be by using some ratio between known lumber output and log consumption. Comparing data sources on lumber and logs involves a number of differences in coverage, definitions, and conclusions. It is not clear which estimates are the most accurate (Table A-4). For the three states compared, patterns of differences vary, and point to no common relationship between the sources. This suggests that efforts to update one variable by relying on the change in one of the others is perilous. The reasons vary, including different levels of further processing at mills, different overran ratios, and the classification of veneer and specialty logs as sawlogs in the surveys. If log production is to be updated from changes in lumber output, it should be done with care and on a state-by-state basis.



**Table A-4  
Lumber and Log Estimates, 1996, 1997**

	<u>MMbf</u>	
	<u>Softwood</u>	<u>Hardwood</u>
Maine		
Census Lumber	931	151
State Log Consumption	834	318
Ratio, Lumber/Logs (1996 TPO)	112% (285)	47% (57)
Vermont		
Census Lumber	162	115
State Log Consumption	158	107
Ratio, Lumber/Logs (1996 TPO)	103% (167)	107% (103)
New Hampshire		
Census Lumber '94	232	41
State Log Consumption '94	280	42
Ratio, Lumber/Logs (1996 TPO)	83% (167)	98% (103)
New York		
Census Lumber	99	466
1993 TPO (NE-141) Logs	135	422
Ratio, Lumber/Logs	73%	110%

Note: Lumber production may be underestimated especially for hardwood, and has high S.E. for small states.

State log surveys include veneer, boltwood, and other wood no going to sawmills.

TPO data is wood produced in state, not consumed in mills.

### Pulpwood Production and Receipts

Comparing data for pulpwood encounters similar problems (Table A-5). The American Pulpwood Association's data on receipts are probably affected by offsite chip plants, which could cause an underestimate of mill receipts of roundwood. The number of plants to be canvassed is fairly small for estimating consumption. But extensive interstate movements of pulpwood, heavy usage of mill residue chips, and offsite chipping plants make it difficult to follow the woodflow to develop a full wood balance.

In addition, many mills bring in market pulp or internal pulp from other states. Current and complete data on this is no longer available. When last reported by the Census, about 20% of Maine's pulp consumption came from out of state.

**Table A-5**  
**1997 Round Pulpwood Production/Receipts Estimates, Hard and Soft**

	<u>USFS ESTIMATES</u>		<u>APA</u>	<u>STATES</u>	
	<u>Production</u>	<u>Receipts</u>	<u>Receipts</u>	<u>Production</u>	<u>Receipts</u>
Maine	3,488	4,260	2,257 *	3,460	4,280
Vermont	383	0	0	438	0
New Hampshire	556	455	**	n/a	n/a
New York	737	694	n/a	n/a	n/a
NY & NH	1,293	1,149	1,020	n/a	n/a
TOTAL	5,164	5,409	3,277	3,898	4,280

Sources:

USFS: Draft 1997 Pulpwood Report, R. Widman, USFS, Radnor

APA: Annual pulpwood stat. summ. rep. 1997, 98-A-8.

Maine: 1997 Wood Processor Report.

Vermont: Forest Resource Harvest Summary, 1997.

\* Based on APA's tonnages of roundwood converted at 2.5 ton/cd for hardwood;  
2.25 ton/cd for softwood

\*\* Incl. with New York for disclosure reasons.

## Log Exports

Softwood log exports from Maine are clearly the largest flow in the region in volume terms. In this instance, we have three estimates of the volume:

Maine Forest Service:	1,901,808 cu. meters (422,624 MMbf)
U.S. Dept. of Commerce:	1,158,846 cu. meters
Quebec MNR	2,170,659 cu. meters

The Maine State estimate is bracketed by the U.S. Dept. of Commerce estimate on the low end and the Quebec estimate on the high end. The similarity of the QMNR and Maine estimates is a hint, though not fully compelling, that those estimates may be in the ballpark. If so, the Commerce figures would be a dramatic underestimate.

Similar exercises could be done comparing different sources for each product and state. But these would contribute little to this regional overview and would tediously lengthen this report. For reference, selections from the Quebec MNR data are show below as Figs. 8 to 10.

Further, as the charts in the next section show, the USDC dataset indicates that exports of softwood pulpwood have exceeded those of log. This raises a question of coding accuracy, as other indications are that log volumes far exceed pulpwood.

## TOTAL REGIONAL PRODUCTION

The existing TPO data were used as a partial basis for the compilations in this report. It is reasonable to ask how closely the results compare. The completed regional balance prepared for this report shows a regional total of production of roughly 14 million cords, while the TPO data show production of about 10 million. A small part of the difference could be due to conversion factors. Part could also be due to the fact that TPO estimates are for 1996 and this report is for 1997. But the major difference is in Maine, where the TPO data shows production of about 10 million cords, while the state Woodflow Report (on which this NEFA report relies) shows 7 million. So the bulk of the difference is in the Maine totals.

The remaining difference of one million cords is spread over the other three states, and no detailed check as performed to isolate the sources of the difference. Errors and lack of coverage in the many data sources uses, and misjudgments in author estimates could easily account for a difference of this size. Given the many disparate data sources and the author judgments made to develop the NEFA estimates, there is no certainty that they are the correct numbers either, but they are believed to be useful as a general picture of state-level and regional conditions in 1997.

## APPENDIX 2. EXTRACTS FROM TRADE DATA

### U.S. TRADE ESTIMATES--QUANTITIES

This section provides a quick overview of trends and composition of trade as indicated by the U.S. Department of Commerce (USDC) dataset (Table A-6). This information was provided by the USDA Forest Service Forest Products Marketing Lab, Princeton, West Virginia (Dave Emanuel).

The estimates of quantities obtained for this report provide a rich source of information on movements and trends. While concerns have been raised as to the reliability of these estimates, it seems useful to present them here so that the NEFA state forestry agencies can more conveniently review the information. A complete copy of the dataset will be provided in an Annex at the close of the project. It has not been possible to search for explanations for the occasional large changes seen from year to year in some items (Figs. A-8-A11).

**Table A-6**  
**Total Wood Trade, 1990-97**  
**Northeastern Districts, Import and Export Quantity**

#### IMPORT QUANTITY

TYPE	1990	1991	1992	1993	1994	1995	1996	1997	UNIT
Hardwood Logs	12,840	9,165	14,648	14,519	21,928	22,959	31,055	45,440	CBM
Softwood Logs	6,965	4,870	6,658	19,496	16,954	16,598	176,974	194,684	CBM
Hardwood Chips	961	2,370	311	2,853	3,727	5,763	8,812	9,794	DRY TON
Softwood Chips	3,069	1,459	1,259	1,982	2,960	3,909	3,244	4,717	DRY TON

#### EXPORT QUANTITY

Hardwood Logs	264,739	302,597	345,986	420,394	490,015	554,759	522,967	703,876	CBM
Hardwood Pulpwood	136,747	235,688	310,696	390,302	269,680	263,428	119,874	236,612	CBM
Softwood Pulpwood	721,595	1,721,590	1,590,988	1,746,331	1,865,169	1,993,292	1,953,517	1,572,863	CBM
Softwood Logs	1,219,590	1,078,981	1,102,414	947,981	859,523	1,119,742	1,029,716	1,540,437	CBM
Sawdust & Wood Waste	0	0	0	11,507,259	4,271,902	6,408,367	4,618,793	5,840,356	KG
Hardwood Poles, etc.	3,835	5,707	164	0	4,889	12,449	4,782	1,870	NO.
Softwood Poles, etc.	99,017	76,726	135,859	81,735	153,687	54,094	39,957	85,594	NO.
Hardwood Chips	750,558	3,207,188	4,960,876	4,927,813	5,878,980	8,587,281	7,647,639	7,476,627	DRY TON
Softwood Chips	21,996	80,746	114,797	124,556	145,166	188,658	185,873	198,310	DRY TON

Source: U.S. Dept. of Commerce, per U.S. Forest Service, Princeton, West Virginia.

Figure A-8

**Total Wood Trade, 1990-97  
Northeastern – Imports Quantity  
by Species Group (units in legend)**

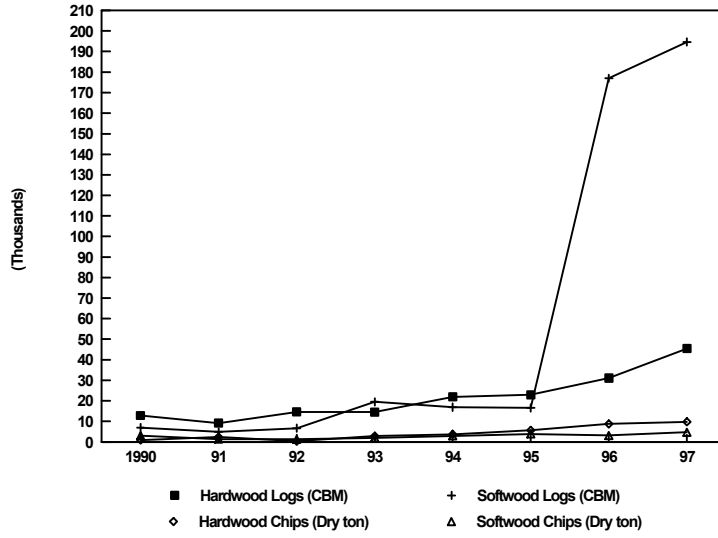


Figure A-9

**Total Wood Trade, 1990-97  
Northeastern Ports – Imports Quantity  
All Species Groups (units in legend)**

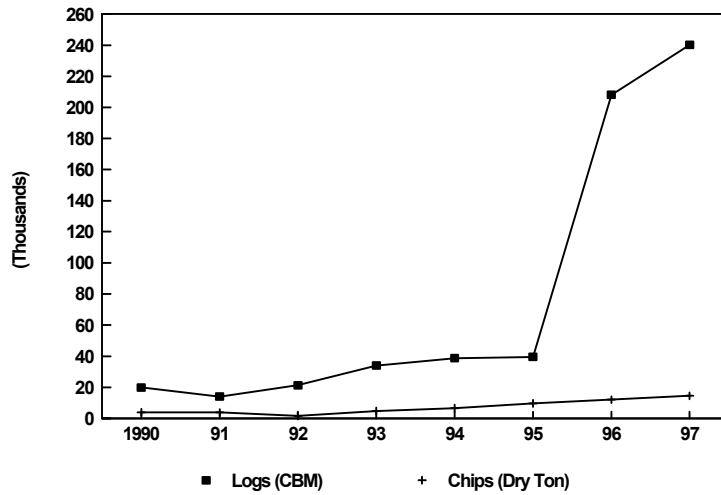


Figure A-10

**Total Wood Trade, 1990-97  
Northeastern Ports – Exports Quantity,  
by Species Group (units in legend)**

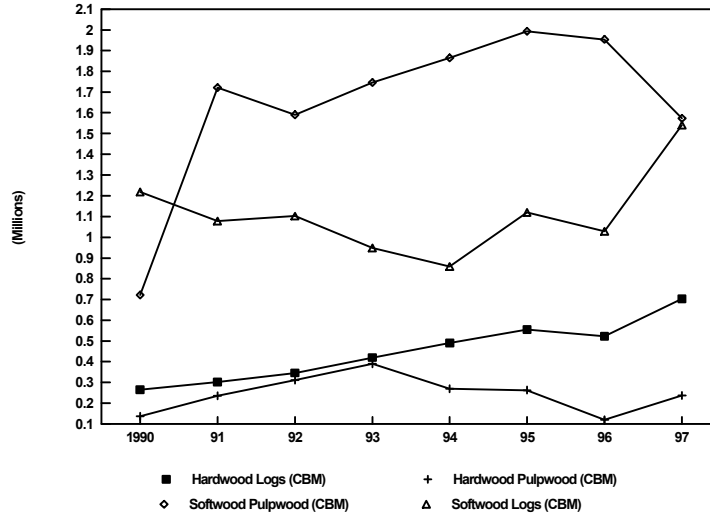
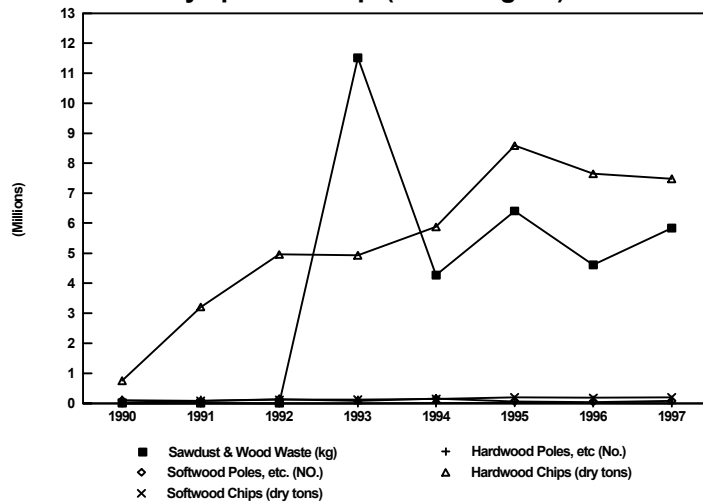


Figure A-11

**Total Wood Trade, 1990-97  
Northeastern Ports – Exports Quantity,  
by Species Group (units in legend)**



**U.S. TRADE ESTIMATES -- DOLLAR VALUES**

According to the USDC trade dataset, the region's primary wood products trade was dominated by exports, showing a surplus of about \$250 million in 1997:

Exports	\$272.7
Imports	<u>22.6</u>
Surplus	\$250.1

A portion of the reported export volume originates in states to the south of the NEFA area. Because of their high unit values, hardwood logs had the highest dollar value, \$40 million greater than softwood logs in 1997. According to these estimates, pulpwood amounts were quite high, which leads us to suspect classification errors here. Since dollars provide a useful means of comparison, the DOC data are charted in dollar terms by regional totals, and then by customs districts.

On the import side, some of the species imported are from offshore and are not found in the Northeast; these for the most part probably don't compete significantly with local species. Not surprisingly, the Portland district accounted for 54% of the total exports. The balance was divided among the other four districts, the largest being Ogdensburg (\$37.4 million). The charts showing the composition of exports illustrate the predominance of hardwood logs everywhere except Maine.

**Table A-7**  
**Total Wood Trade, 1990-97**  
**Northeastern Districts, Import and Export Dollars**

**IMPORT DOLLARS**

TYPE	1990	1991	1992	1993	1994	1995	1996	1997
Hardwood Logs	1,744,694	1,146,887	1,940,817	2,390,318	3,303,159	4,150,603	6,126,879	6,905,953
Softwood Logs	812,707	605,881	608,511	1,334,292	1,528,531	1,929,361	11,066,477	12,104,325
Fuelwood	3,343,139	3,500,800	3,984,088	6,852,465	9,776,961	3,386,441	3,210,092	1,647,058
Hardwood Chips	105,211	81,636	115,263	267,328	509,791	778,315	1,310,297	1,515,722
Softwood Chips	369,250	180,214	172,233	267,998	325,840	365,789	334,431	431,903

**EXPORT DOLLARS**

Hardwood Logs	45,263,079	45,991,138	51,630,615	59,754,415	74,671,226	83,620,712	74,724,401	106,148,872
Hardwood Pulpwood	3,777,549	6,997,675	6,678,507	9,133,840	6,893,009	6,687,081	3,502,483	5,509,505
Softwood Pulpwood	25,824,139	53,406,171	48,304,148	57,251,653	69,996,353	78,937,995	75,984,180	65,882,772
Softwood Logs	57,759,712	45,142,754	45,209,303	42,353,965	41,862,617	54,320,759	49,624,105	76,042,619
Fuel Wood	260,231	1,250,324	959,004	1,237,689	2,025,351	2,343,883	2,371,408	4,160,502
Sawdust & Wood Waste	943,993	1,030,386	3,123,157	1,790,574	1,367,693	1,875,450	1,494,075	1,876,812
Hardwood Poles, etc.	79,228	116,346	3,388	0	100,668	264,091	98,407	38,487
Softwood Poles, etc.	2,039,649	1,580,449	2,798,413	1,815,084	3,156,966	1,530,829	1,169,610	1,847,600
Hardwood Chips	750,558	3,207,188	4,960,876	4,927,813	5,878,980	8,587,281	7,647,639	7,476,627
Softwood Chips	3,841,174	5,056,696	9,176,542	6,569,926	3,705,220	5,596,516	5,310,294	3,761,685

**Figure A-12**

**Northeastern Custom Districts**  
**Total Import Dollars**

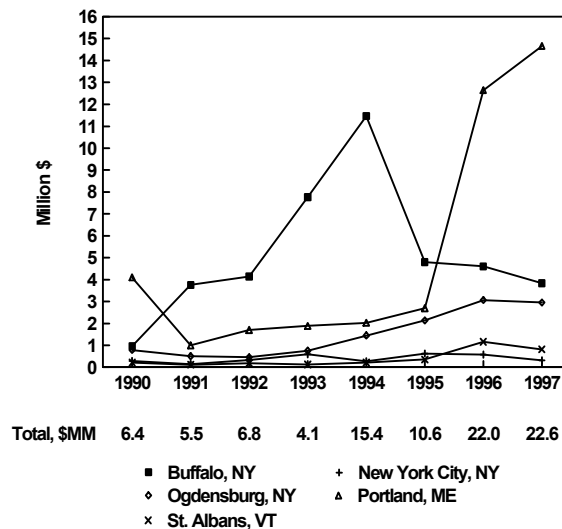




Figure A-13

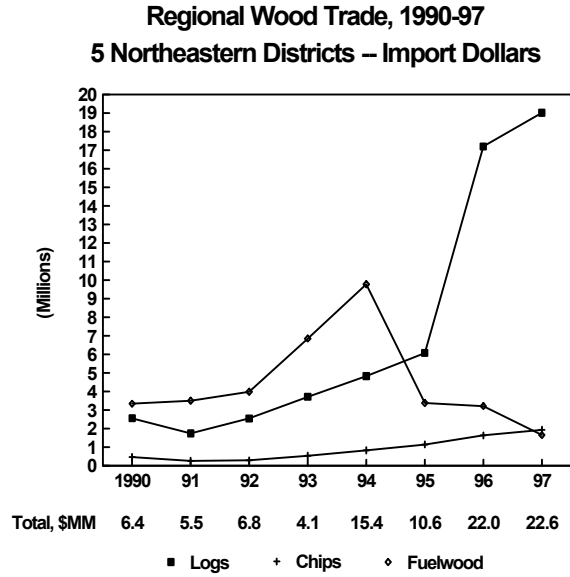
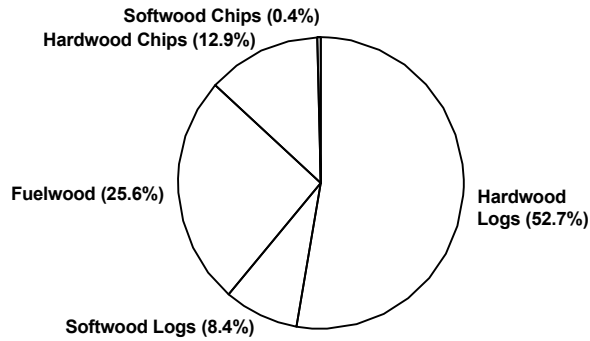


Figure A-14

**Imports, 1997**  
**Buffalo, New York**

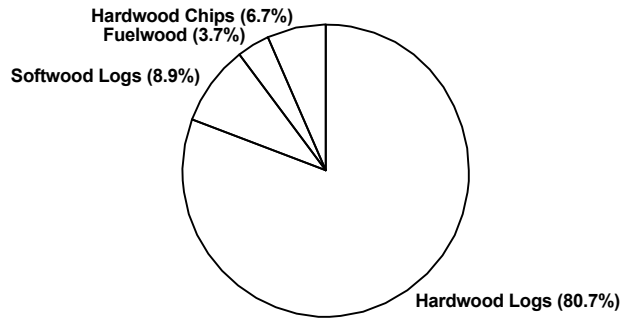


Total = \$964,758

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

**Figure A-15**

**Imports, 1997  
New York City, New York**

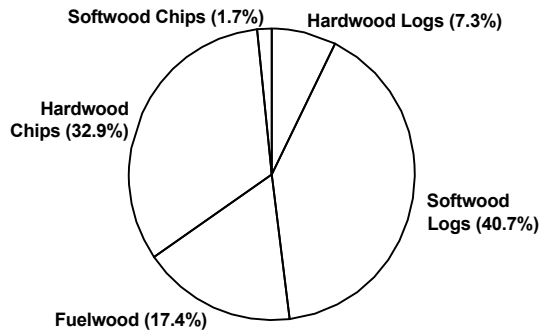


Total = \$288,816

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

**Figure A-16**

**Imports, 1997  
Ogdensburg, New York**

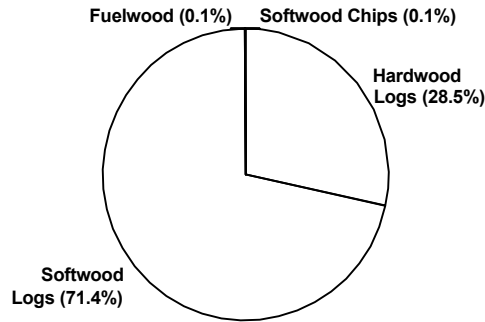


Total = \$793,202

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

**Figure A-17**

**Imports, 1997  
Portland, Maine**

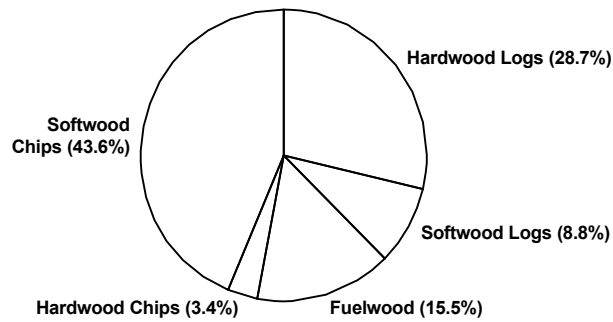


Total = \$4,106,083

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

**Figure A-18**

**Imports, 1997  
St. Albans, Vermont**



Total = \$222,142

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

Figure A-19

Northeastern Custom Districts  
Total Export Dollars

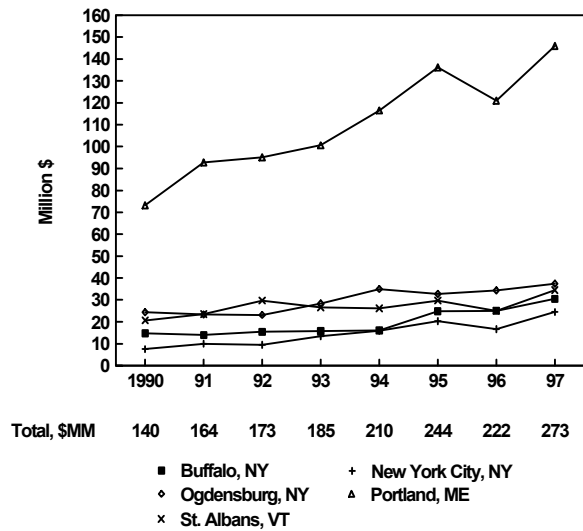


Figure A-20

Grand Total Wood Trade, 1990-97  
5 Northeastern Districts -- Export \$

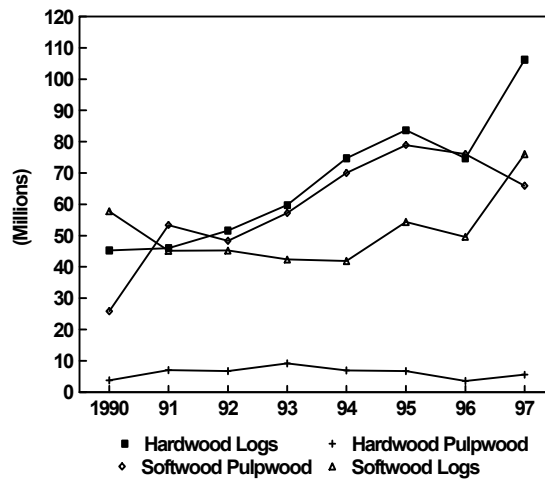


Figure A-21

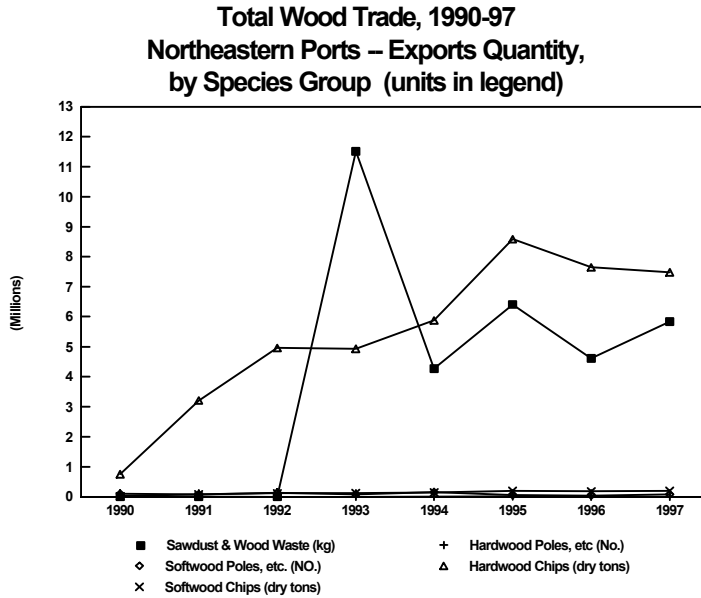
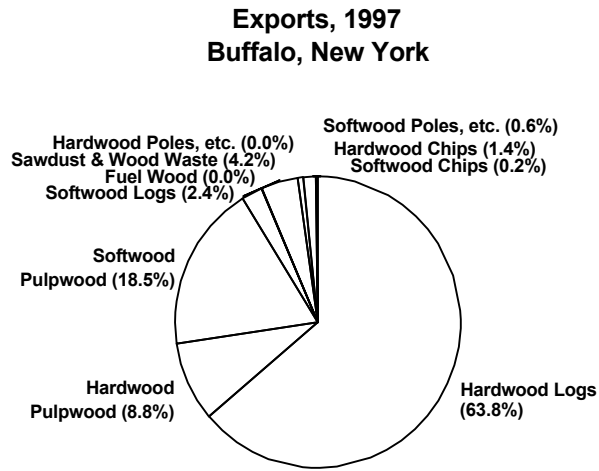


Figure A-22

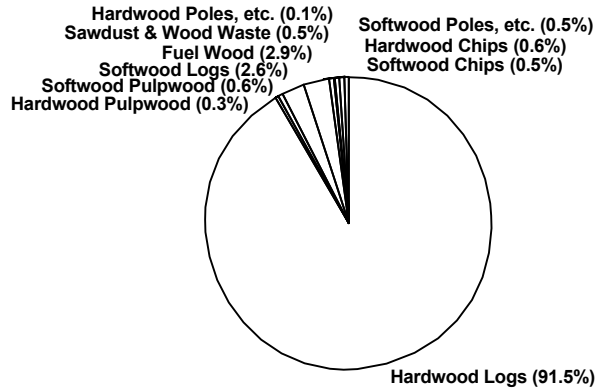


Total = \$14,770,442

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

Figure A-23

Exports, 1997  
New York City, New York

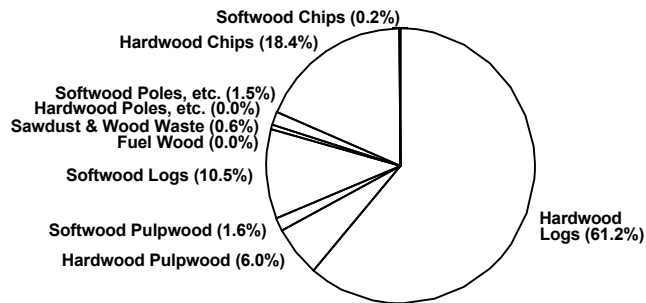


Total = \$7,557,673

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

Figure A-24

Exports, 1997  
Ogdensburg, New York

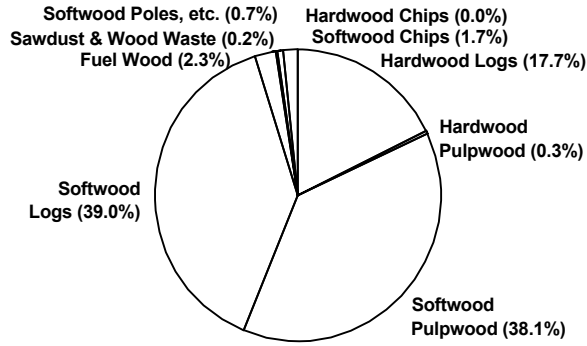


Total = \$24,415,769

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

Figure A-25

**Exports, 1997  
Portland, Maine**

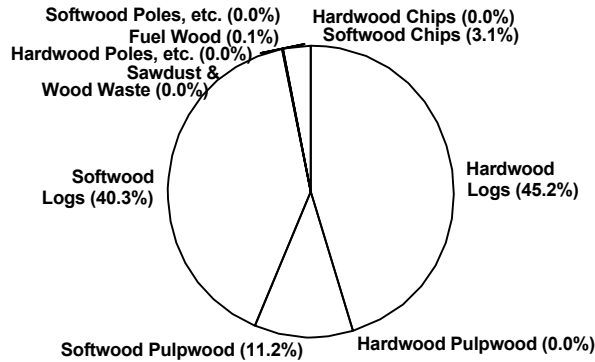


Total = \$73,109,450

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

Figure A-26

**Exports, 1997  
St. Albans, Vermont**



Total = \$20,685,978

Source: U.S. Dept. of Commerce, per USFS-Princeton, WV.

**Table A-8**  
**Buffalo, New York Customs District Exports --**  
**Wood and Articles of Wood, Wood Charcoal**  
**Total Value, 1997 (U.S. \$'s)**  
**(Primary in Bold)**

	1997 (U.S.\$)
Total All Commodities	284,581,835
Red oak wood sawn lengthwise, over 6MM, rough	39,709,522
Fiberboard ligneous over .8G/CM3 not mechanically worked	23,333,290
Hard maple wood sawn lengthwise over 6MM, rough	18,784,568
Articles of wood, NESOI	13,449,171
Nonconiferous wood NESOI sawn lengthwise over 6MM rough	13,443,286
Cherry wood sawn lengthwise over 6MM, rough	10,643,592
Red oak wood sawn lengthwise, over 6MM, NESOI	12,051,125
Cherry veneer/plywood sheet saw lengthwise not over 6MM not back	5,169,324
Wood flooring, nonconiferous	6,859,500
<b>Pulpwood, coniferous</b>	<b>5,651,667</b>
Fabricated structural wood members	7,131,069
<b>Maple wood, in the rough, not treated</b>	<b>6,462,998</b>
Nonconiferous NESOI veneer/plywood sheet lengthwise not over 6MM not back	6,173,589
Doors and their frames, thresholds, of wood, NESOI	3,495,534
Nonconiferous wood sawn lengthwise over 6MM NESOI	8,034,512
Sheet wood, sawn lengthwise, over 6MM, rough	5,437,985
<b>Red oak wood, in the rough, not treated</b>	<b>3,819,157</b>
<b>Cherry wood, in the rough, not treated</b>	<b>5,703,797</b>
Fiberboard wood/ligneous material density > .8G/CM3 NESOI	2,283,463
Maple wood NESOI sawn lengthwise, over 6MM, NESOI	5,602,682
Fiberboard ligneous over .5 not over .8G/CM3 not mechanical wk	4,651,055
Red oak veneer/plywood sheet saw lengthwise not over 6MM not back	2,045,399
Windows, French-windows and their frames, of wood	2,410,216
<b>Pulpwood, nonconiferous</b>	<b>2,688,593</b>
Plywood, veneer panels, laminated wood one particleboard NESOI	1,228,162
<b>Logs/timber in the rough, coniferous, NESOI not treated</b>	<b>269,166</b>
Board of wood NESOI	1,198,661
Oak wood except red sawn lengthwise over 6MM, rough	4,082,103
Wood moldings, coniferous	5,590,662
Irola/mahogany/imbuia/balsa wood sawn or chip, etc.	2,075,114
Pallets, box pallets and other load boards of wood	1,171,908
Railway/tramway sleepers (cross-ties), wood, NESOI	1,521,832
Wooden frames paintings, photographs, mirrors, etc.	2,229,538
Oak wood except red sawn lengthwise over 6MM, NESOI	2,786,377

Source: U.S. Census Bureau, Foreign Trade Division, from MISER inquiry.  
NESOI = Not elsewhere specified or included.



**Table A-9**  
**New York City, New York Customs District Exports --**  
**Wood and Articles of Wood, Wood Charcoal**  
**Total Value, 1997 (U.S. \$'s)**  
**(Primary in Bold)**

	1997 (U.S.\$)
Total All Commodities	368,531,713
Hard maple wood sawn lengthwise over 6MM, rough	37,691,567
Oak wood except red sawn lengthwise over 6MM, rough	26,706,452
Nonconiferous NESOI veneer/plywood sheet lengthwise not over 6MM not back	25,893,204
Red oak wood sawn lengthwise, over 6MM, rough	23,938,805
Red oak wood sawn lengthwise, over 6MM, NESOI	23,938,805
Fiberboard ligneous over .8G/CM3 not mechanically worked	11,297,955
Cherry wood sawn lengthwise over 6MM, rough	8,718,696
<b>Red oak wood, in the rough, not treated</b>	<b>8,572,361</b>
Articles of wood, NESOI	6,758,445
Nonconiferous wood NESOI sawn lengthwise over 6MM rough	4,834,824
<b>Cherry wood, in the rough, not treated</b>	<b>3,870,832</b>
Maple wood NESOI sawn lengthwise, over 6MM, NESOI	3,620,480
<b>Maple wood, in the rough, not treated</b>	<b>3,279,854</b>
Oak wood except red sawn lengthwise over 6MM, NESOI	2,993,906
Fiberboard wood/ligneous material density > .8G/CM3 NESOI	2,595,182
Doors and their frames, thresholds, of wood, NESOI	2,416,746
Virola/mahogany/imbuia/balsa wood sawn or chip, etc.	2,399,036
Cherry veneer/plywood sheet saw lengthwise not over 6MM not back	1,915,472
Red oak veneer/plywood sheet saw lengthwise not over 6MM not back	1,791,939
Nonconiferous wood sawn lengthwise over 6MM NESOI	1,588,953
<b>Logs/timber in the rough, coniferous, NESOI not treated</b>	<b>1,398,701</b>
Pallets, box pallets and other load boards of wood	1,039,514
Fabricated structural wood members	851,169
<b>Pulpwood, nonconiferous</b>	<b>830,204</b>
Wooden frames paintings, photographs, mirrors, etc.	589,231
Windows, French-windows and their frames, of wood	543,264
Wood flooring, nonconiferous	323,694
Railway/tramway sleepers (cross-ties), wood, NESOI	309,652
<b>Pulpwood, coniferous</b>	<b>165,186</b>
Fiberboard ligneous over .5 not over .8G/CM3 not mechanical wk	145,563
Board of wood NESOI	64,155
Wood moldings, coniferous	64,026
Plywood, veneer panels, laminated wood one particleboard NESOI	21,735

Source: U.S. Census Bureau, Foreign Trade Division, from MISER inquiry.  
NESOI = Not elsewhere specified or included.

**Table A-10**  
**Ogdensburg, New York Customs District Exports --**  
**Wood and Articles of Wood, Wood Charcoal**  
**Total Value, 1997 (U.S. \$'s)**  
**(Primary in Bold)**

	1997 (U.S.\$)
Total All Commodities	186,341,303
Hard maple wood sawn lengthwise over 6MM, rough	18,805,905
Red oak wood sawn lengthwise, over 6MM, rough	14,330,024
Cherry wood sawn lengthwise over 6MM, rough	10,341,309
Red oak veneer/plywood sheet saw lengthwise not over 6MM not back	7,725,100
<b>Cherry wood, in the rough, not treated</b>	<b>6,834,542</b>
Oak wood except red sawn lengthwise over 6MM, rough	6,752,672
<b>Red oak wood, in the rough, not treated</b>	<b>6,463,518</b>
Fabricated structural wood members	6,210,426
Nonconiferous wood NESOI sawn lengthwise over 6MM rough	5,893,580
<b>Maple wood, in the rough, not treated</b>	<b>4,065,885</b>
Nonconiferous NESOI veneer/plywood sheet lengthwise not over 6MM not back	3,623,744
Red oak wood sawn lengthwise, over 6MM, NESOI	3,495,781
Fiberboard ligneous over .5 not over .8G/CM3 not mechanical wk	3,185,569
Wood flooring, nonconiferous	3,116,812
Maple wood NESOI sawn lengthwise, over 6MM, NESOI	2,983,159
Cherry veneer/plywood sheet saw lengthwise not over 6MM not back	2,924,506
Nonconiferous wood sawn lengthwise over 6MM NESOI	2,730,249
Windows, French-windows and their frames, of wood	2,709,180
<b>Pulpwood, nonconiferous</b>	<b>2,233,905</b>
Virola/mahogany/imbuia/balsa wood sawn or chip, etc.	1,957,531
Board of wood NESOI	1,890,840
Oak wood except red sawn lengthwise over 6MM, NESOI	1,688,330
Articles of wood, NESOI	1,287,084
Fiberboard ligneous over .8G/CM3 not mechanically worked	1,190,227
Fiberboard wood/ligneous material density >.8G/CM3 NESOI	1,011,260
Pallets, box pallets and other load boards of wood	760,880
<b>Logs/timber in the rough, coniferous, NESOI not treated</b>	<b>720,376</b>
<b>Pulpwood, coniferous</b>	<b>590,194</b>
Wooden frames paintings, photographs, mirrors, etc.	527,585
Wood moldings, coniferous	364,227
Doors and their frames, thresholds, of wood, NESOI	268,850
Railway/tramway sleepers (cross-ties), wood, NESOI	206,843
Plywood, veneer panels, laminated wood one particleboard NESOI	0

Source: U.S. Census Bureau, Foreign Trade Division, from MISER inquiry.  
 NESOI = Not elsewhere specified or included.

**Table A-11**  
**St. Albans, Vermont Customs District Exports --**  
**Wood and Articles of Wood, Wood Charcoal**  
**Total Value, 1997 (U.S. \$'s)**  
**(Primary in Bold)**

	1997 (U.S.\$)
Total All Commodities	95,374,760
Red oak wood sawn lengthwise, over 6MM, rough	13,383,705
<b>Red oak wood, in the rough, not treated</b>	<b>7,522,367</b>
Hard maple wood sawn lengthwise over 6MM, rough	7,403,778
<b>Pulpwood, coniferous</b>	<b>3,854,941</b>
Red oak wood sawn lengthwise, over 6MM, NESOI	3,722,788
<b>Maple wood, in the rough, not treated</b>	<b>2,496,100</b>
<b>Logs/timber in the rough, coniferous, NESOI not treated</b>	<b>2,073,230</b>
Fiberboard ligneous over .8G/CM3 not mechanically worked	1,185,309
Maple wood NESOI sawn lengthwise, over 6MM, NESOI	965,705
Nonconiferous wood sawn lengthwise over 6MM NESOI	667,450
Cherry wood sawn lengthwise over 6MM, rough	623,436
Red oak veneer/plywood sheet saw lengthwise not over 6MM not back	444,879
Nonconiferous NESOI veneer/plywood sheet lengthwise not over 6MM not back	442,679
Nonconiferous wood NESOI sawn lengthwise over 6MM rough	400,688
Articles of wood, NESOI	314,259
Fiberboard wood/ligneous material density >.8G/CM3 NESOI	223,641
Cherry veneer/plywood sheet saw lengthwise not over 6MM not back	165,607
<b>Cherry wood, in the rough, not treated</b>	<b>146,854</b>
Wooden frames paintings, photographs, mirrors, etc.	125,430
Oak wood except red sawn lengthwise over 6MM, rough	123,593
Oak wood except red sawn lengthwise over 6MM, NESOI	123,593
Board of wood NESOI	118,250
Virola/mahogany/imbuia/balsa wood sawn or chip, etc.	92,606
Wood moldings, coniferous	81,720
Doors and their frames, thresholds, of wood, NESOI	80,337
Pallets, box pallets and other load boards of wood	71,389
Railway/tramway sleepers (cross-ties), wood, NESOI	31,589
Windows, French-windows and their frames, of wood	21,594
Wood flooring, nonconiferous	18,121
Fabricated structural wood members	13,196
Fiberboard ligneous over .5 not over .8G/CM3 not mechanical wk	12,068
<b>Pulpwood, nonconiferous</b>	<b>5,904</b>

Source: U.S. Census Bureau, Foreign Trade Division, from MISER inquiry.  
NESOI = Not elsewhere specified or included.

**Table A-12**  
**Portland, Maine Customs District Exports --**  
**Wood and Articles of Wood, Wood Charcoal**  
**Total Value, 1997 (U.S. \$'s)**  
**(Primary in Bold)**

	1997 (U.S.\$)
Total All Commodities	179,165,358
<b>Pulpwood, coniferous</b>	<b>55,650,784</b>
<b>Maple wood, in the rough, not treated</b>	<b>8,619,023</b>
Hard maple wood sawn lengthwise over 6MM, rough	5,169,052
<b>Red oak wood, in the rough, not treated</b>	<b>4,636,079</b>
<b>Logs/timber in the rough, coniferous, NESOI not treated</b>	<b>4,238,322</b>
Fabricated structural wood members	2,106,900
Maple wood NESOI sawn lengthwise, over 6MM, NESOI	1,646,502
Red oak wood sawn lengthwise, over 6MM, NESOI	940,317
Wood flooring, nonconiferous	801,453
Red oak wood sawn lengthwise, over 6MM, rough	763,091
<b>Pulpwood, nonconiferous</b>	<b>502,769</b>
Articles of wood, NESOI	462,470
Nonconiferous wood sawn lengthwise over 6MM NESOI	440,434
Railway/tramway sleepers (cross-ties), wood, NESOI	384,200
Board of wood NESOI	217,957
Nonconiferous wood NESOI sawn lengthwise over 6MM rough	214,335
Windows, French-windows and their frames, of wood	161,166
Nonconiferous NESOI veneer/plywood sheet lengthwise not over 6MM not back	122,114
Doors and their frames, thresholds, of wood, NESOI	113,163
Wood moldings, coniferous	106,299
Cherry wood sawn lengthwise over 6MM, rough	102,798
Fiberboard ligneous over .5 not over .8G/CM3 not mechanical wk	90,620
Pallets, box pallets and other load boards of wood	41,315
Wooden frames paintings, photographs, mirrors, etc.	35,951
Virola/mahogany/imbuia/balsa wood sawn or chip, etc.	31,248
Oak wood except red sawn lengthwise over 6MM, rough	30,207
Oak wood except red sawn lengthwise over 6MM, NESOI	27,760
Fiberboard ligneous over .8G/CM3 not mechanically worked	26,527
Fiberboard wood/ligneous material density >.8G/CM3 NESOI	14,790
<b>Cherry wood, in the rough, not treated</b>	<b>13,831</b>
Red oak veneer/plywood sheet saw lengthwise not over 6MM not back	0

Source: U.S. Census Bureau, Foreign Trade Division, from MISER inquiry.  
NESOI = Not elsewhere specified or included.

### APPENDIX 3. CONTACT LISTING

#### Port Authorities (forthcoming)

<u>Name</u>	<u>Contact</u>	<u>Phone</u>	<u>Other</u>
MISER, Mass. Institute for Social and Economic Research, University of Massachusetts, Amherst	Carla Miller	413-545-3460	www.umass.edu/miser
U.S. Forest Service, NEFES, Radnor	Rich Widman	610-975-4051	Pulpwood Surveys, Genl. Inq.
U.S. Forest Service, NEFES, Radnor	Eric Wharton		TPO Data
TPO Website			www.srs.fia.usfs.msstate.edu/ rpa/tpo

#### State Agencies

New Hampshire	J. B. Cullen	603-271-3457	
New York	Sloan Crawford	518-457-7370	
Vermont	Bob DeGeus	802-828-4037	
Maine	Pete Lammert	207-287-2791	
USFS, Princeton, WV	Bill Luppold	304-425-8106	
F. P. Market Laboratory	Dave Emanuel	304-431-2700	
U.S. Army Corps of Engineers Navigation Data Ctr, Alexandria, VA Waterborne Commerce Stats Ctr, New Orleans, LA		703-428-9061 504-862-1404	www.wrsc.usace.army.mil

#### Private Data Sources

Trade, Inc. 2756 Campus Dr. San Mateo, CA 94403	Kris Ta	650-513-0930	
PIERS, Journal of Commerce 2 World Trade Center, S#2750 New York, NY 10048	Denise Simms	800-952-3839	
U.S. Dept. of Commerce Trade Data			www.ita.doc.gov
Census -- Lumber Production Report		301-457-4673	www.census.gov/econ/www/ manumenu.html
American Pulpwood Association	Steve Jarvis	301-838-9385	



#### APPENDIX 4. PORTS -- SOURCES OF INFORMATION

Not all ports have statistics readily available; those that do often use unhelpful general categories such as "forest products." Nonetheless, staff at these ports can be useful sources of nonstatistical information on cargo volumes and trends. Because of the movements of regional wood products, ports outside NEFA states are included:

##### Canada

Port of Quebec	418-648-4956
Montreal Port Corp.	514-283-7011
St. John, NB	506-636-4869

##### USA

Portland, Maine	207-773-1613
Philadelphia, PA	215-928-9100
Erie, PA	814-455-7557
Baltimore, MD	410-385-4455
Port Authority, NY & NJ	212-435-8333
Albany, NY	518-463-8763
Massachusetts Port Authority	617-946-4445
New Hampshire Port Authority	603-436-8500