United States General Accounting Office

GAO

Report to Congressional Requesters

May 1986

# GREAT LAKES SHIPPING

# U.S.-Flag Share of the U.S./Canada Trade on the Great Lakes



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GAO

**United States**
**General Accounting Office**
**Washington, D.C. 20548**

**Resources, Community, and**
**Economic Development Division**

B-222877

May 8, 1986

The Honorable Walter B. Jones
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives

The Honorable Robert W. Davis
The Honorable John D. Dingell
The Honorable Harris W. Fawell
The Honorable William D. Ford
The Honorable William O. Lipinski
The Honorable David O'B. Martin
The Honorable Mary Rose Oakar
The Honorable James L. Oberstar
The Honorable Gus Savage
House of Representatives

In response to your March 11, 1985, and March 19, 1985, requests, this report discusses waterborne commerce between the United States and Canada on the Great Lakes/St. Lawrence Seaway system and the reasons Canadian ships carry most of this trade.

As arranged with your offices, we are sending copies of this report to interested parties and will make copies available to others upon request.

J. Dexter Peach
Director

# Executive Summary

## Purpose

In 1984 about 40 million tons of cargo moved between the United States and Canada on the Great Lakes/St. Lawrence Seaway system. Of this total, about 6 percent was transported on U.S. ships. Canadian-flag vessels carried most of the remaining trade. (See p. 10.)

The Chairman, House Committee on Merchant Marine and Fisheries, and nine Representatives from states along the Great Lakes expressed concern about the effect of Canadian dominance on the Great Lakes shipping industry. At their request, GAO

- obtained historical data on trade between the two countries since the 1950's and
- gathered information on the factors that have influenced each country's participation in the trade. (See p. 10.)

## Background

The Great Lakes and the St. Lawrence River form a waterway that extends almost 2,400 miles from mid-North America to the Atlantic Ocean. To overcome differences in elevation, the waterway is connected by a network of locks that raise and lower vessels. On the St. Lawrence River between Montreal and Lake Ontario, a joint U.S. and Canadian seaway modernization program was undertaken in the 1950's and completed in 1959. Locks in the new system permitted a significant increase in the size of vessels entering or leaving the Great Lakes. (See p. 11.)

In 1984, the latest year for which complete data were available, about 22 percent of the waterborne commerce on the system consisted of traffic between U.S. and Canadian ports. This trade is the subject of congressional interest. Most of the remainder was domestic cargo moving between points within the United States or between points within Canada. (See p. 13.)

The U.S./Canada trade consists of cargoes transported between U.S. and Canadian Great Lakes ports or between U.S. Great Lakes ports and Canadian St. Lawrence River ports. Almost all of the trade is made up of dry bulk commodities such as coal, iron ore, and grain carried in dry bulk ships. (See p. 14.)

## Results in Brief

Canadian-flag ships have historically carried most of the waterborne trade that moves between the United States and Canada on the Great Lakes/St. Lawrence Seaway system. In the last three decades, the ships

have increased their share of the trade on the Great Lakes while capturing most of the new trade that resulted from the St. Lawrence Seaway opening. American-flag participation has been falling. (See p. 20.)

This trend is due to a number of factors, including higher American vessel operating and construction costs; modernization of the Canadian Great Lakes fleet that began with the Seaway opening; differences in Canadian and U.S. government assistance programs; factors such as geography, long-term contracts, and domestic trade policies that are advantageous to Canadian operators; and concentration of American fleet operators on domestic traffic. (See p. 32.)

## GAO's Analysis

### Historical Trade Data

Between 1953 and 1979, the U.S./Canada trade on the Great Lakes and through the St. Lawrence Seaway doubled from 25.1 million tons to 51.1 million tons. In the early 1980's, traffic declined due to depressed economic conditions. By 1983 traffic had fallen to 35.4 million tons but rebounded in 1984 to 40.1 million tons. (See p. 20.)

Between 1953 and 1979 trade between U.S. and Canadian Great Lakes ports grew 36 percent from 24.2 to 32.9 million tons. Seaway trade rose from 900,000 tons in 1953 to 18.2 million tons in 1979.

U.S.-flag participation in the total U.S./Canada trade has declined from 29.2 percent in 1953 to 6.4 percent in 1984. On the Great Lakes, the U.S.-flag share fell from 30.3 percent to 8.7 percent during the same period. American ships have never carried much of the Seaway trade. In most years, U.S.-flag participation was 5 percent or less—sometimes less than 1 percent. In 1983-84, very little of the Seaway traffic moved on American ships. (See p. 24.)

### Reasons for Low U.S.-Flag Participation

Vessel operating and construction costs. Canadian vessel operating and construction costs have historically been significantly lower than those in the United States, making it difficult for American vessel operators to compete in the U.S./Canada trade. Declines in the Canadian dollar relative to the U.S. dollar have also lowered Canadian costs relative to U.S. costs. (See p. 32.)

Modernization of the Canadian Great Lakes fleet. The opening of the Seaway resulted in increased vessel construction as Canadian operators upgraded their fleets to take advantage of new trading opportunities. Many ships were constructed to seaway maximum size and thus were able to carry the maximum tonnage possible. U.S. vessel operators did not build ships for the Seaway trade. Most vessels in the U.S. Great Lakes fleet are either too large to cross Seaway locks or too small to carry enough cargo to compete with Canada's ships. (See p. 35.)

Government financial assistance. In purchasing and financing new ships, Canadian vessel operators could take advantage of shipbuilding subsidies and tax incentives which became available after World War II. U.S. government support for the American fleet did not begin until 1970. By that time, the Canadian fleet was firmly established in the Seaway trade. (See p. 38.)

Other Canadian advantages. Canadian vessel operators have certain other advantages: the U.S./Canada Seaway trade parallels Canadian domestic traffic through the Seaway, thus they are more likely to carry a cargo in both directions; a significant share of the U.S./Canada trade is tied up in long-term contracts between Canadian vessel operators and Canadian buyers of the raw materials; and Canadian operators can purchase lower cost foreign built vessels for either domestic or U.S./Canada trade, while American operators do not have this flexibility. (See p. 44.)

U.S. flag vessels carry domestic cargo. U.S.-flag Great Lakes vessels carry mainly domestic cargo which is more than twice as great as U.S./Canada cargo. Historically, the American-flag fleet has been closely linked to the steel industry on the Great Lakes. Steel and mining company owners have been using their vessels to carry these raw materials, and most of this traffic has moved among U.S. ports. (See p. 46.)

## Recommendations

GAO is making no recommendations.

## Agency Comments

GAO did not obtain official comments. However, the information contained in the report was discussed with Canadian and American government officials and their views have been incorporated where appropriate.

# Contents

## Tables



## Figures

## Abbreviations

| | |
|---|---|
| CCF | capital construction fund |
| CDS | construction differential subsidy |
| CRF | construction reserve fund |
| GAO | General Accounting Office |
| MarAd | Maritime Administration |
| ODS | operating differential subsidy |
| RCED | Resources, Community, and Economic Development Division |

# Introduction

In 1983, the latest period for which national data are available, U.S. waterborne commerce totaled 1.5 billion tons of cargo, of which 671 million tons involved trade between the United States and foreign countries.[1] Of the total 1983 foreign waterborne commerce, trade with Canada on the Great Lakes or through the St. Lawrence Seaway represented about 35 million tons (40 million tons in 1984) or 5 percent of the foreign trade.

American-flag vessels carried slightly more than 6 percent of the 40 million tons traded with Canada on the Great Lakes/ Seaway system in 1984. As table 1.1 shows, this participation was confined almost completely to the Great Lakes. Almost all of the remaining U.S./Canada trade was transported on Canadian-flag ships.

**Table 1.1: U.S.-Flag Participation in the Waterborne Trade Between the United States and Canada on the Great Lakes and St. Lawrence Seaway, 1984**

| Trade area | Total tons | U.S. tons | U.S.-Flag percent of total |
|---|---|---|---|
| Great Lakes | 30,953,419 | 2,553,215 | 8.2 |
| St. Lawrence Seaway | 9,155,841 | 22,553 | 0.2 |
| **Total** | **40,109,260** | **2,575,768** | **6.4** |

Source: Maritime Administration.

The Chairman, House Committee on Merchant Marine and Fisheries, and nine Representatives from states along the Great Lakes expressed concern that Canadian-flag dominance of the U.S./Canada trade translated into lost business opportunities for American vessel operators and shipbuilders and lost work for American seamen. Further, they were concerned that such losses were multiplying throughout the many maritime support industries on the Great Lakes. Believing that the magnitude of the U.S./Canada trade situation warranted congressional consideration, the Chairman and the nine Representatives asked us to examine shipping activities on the Great Lakes/St. Lawrence Seaway system (the system). Specifically, we were asked to

- obtain historical trade and shipping data (aggregate tonnage, number of vessels, labor force employment) concerning the U.S./Canada trade before the St. Lawrence Seaway opened in 1959 to the most recent period for which data are available and

[1] Unless otherwise noted, all tonnage figures used in this report are in long tons of 2,240 pounds.

- gather information on the variables, such as government promotion programs, that have affected a national flag vessel presence in the trade between the two countries.

## Background on Shipping on the Great Lakes/St. Lawrence Seaway System

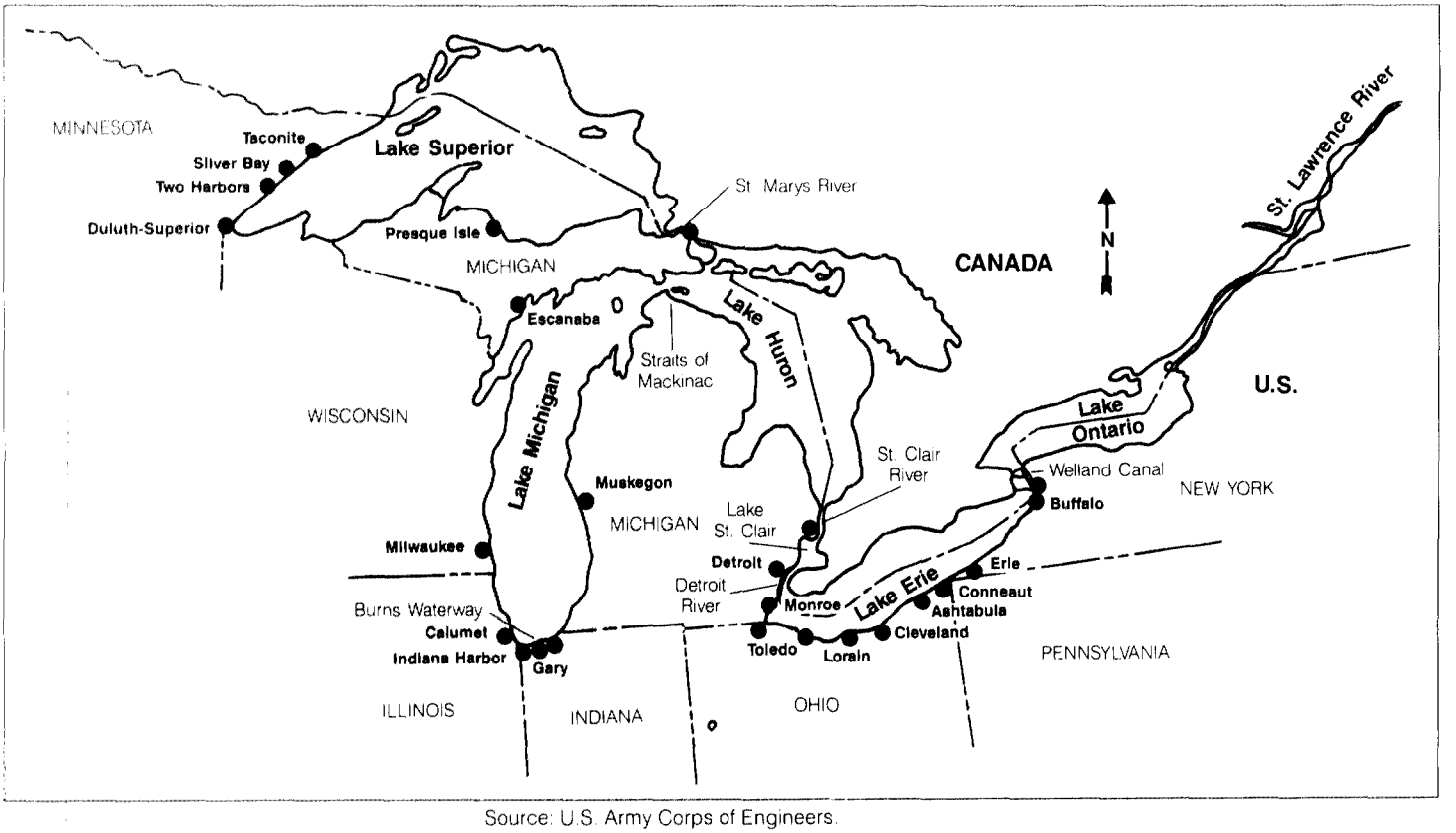
The Great Lakes/St. Lawrence Seaway is an international waterway extending almost 2,400 miles from the Atlantic Ocean through the St. Lawrence River to the western tip of Lake Superior (see fig. 1.1). To overcome differences in elevation, the waterway is connected by a network of locks that raise and lower vessels. These locks, however, place limitations on the size of vessels able to navigate the system. A series of seven locks on the St. Lawrence River between Montreal and Lake Ontario and eight locks on the Welland Canal, which bypasses Niagra Falls and allows vessel movement between Lakes Erie and Ontario, restrict vessel length to 730 feet and vessel width to 76 feet. A third series of parallel locks on the St. Marys River at Sault Ste. Marie provides access to Lake Superior. The largest lock in this section, the Poe Lock, can accommodate vessels of 1,000-foot length and 105-foot width.

The St. Lawrence River locks (St. Lawrence Seaway) are the result of a joint United States and Canadian seaway modernization program undertaken in the 1950's and completed in 1959. These locks replaced 18 smaller locks on the river and, as a result, enabled significantly larger vessels to enter and leave the Great Lakes.

## Trade Categories

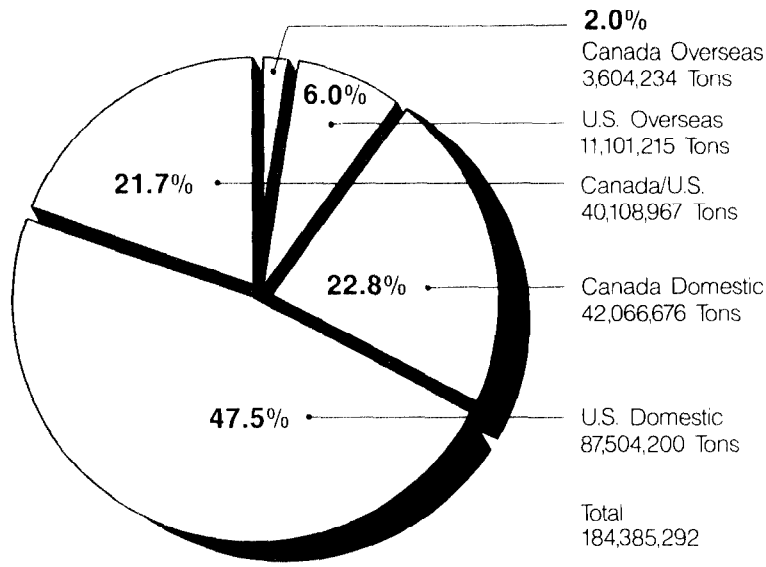
In 1984, the latest year for which complete data were available, waterborne commerce on the system totaled 184.4 million tons. Waterborne commerce on the system includes trade internal to the Great Lakes and between Great Lakes ports and other ports via the St. Lawrence Seaway. The trade is generally classified into three categories—domestic, overseas, and U.S./Canada. (See fig. 1.2.)

**Figure 1.1: Map of the Great Lakes/ St. Lawrence Seaway System**




Source: U.S. Army Corps of Engineers.

**Figure 1.2: Great Lakes/St. Lawrence Seaway Traffic, 1984**




Note: Data is the latest available.

Source: Prepared by GAO from data obtained from the U.S. Census Bureau, U.S. Army Corps of Engineers, St. Lawrence Seaway Development Corporation, and the Canadian Dominion Marine Association.

Domestic trade involves cargo moving between points within the United States on American vessels or between points in Canada on Canadian vessels. As figure 1.2 shows, domestic trade accounts for more than 70 percent of the 1984 total. Both the United States and Canada have what are commonly referred to as cabotage laws that restrict trade within their borders to domestic carriers. Therefore, most of the trade on the system is not available to foreign competition.

Overseas trade means trade moving to and from ports on the Great Lakes and overseas countries and is largely carried on foreign-flag (non-Canadian) oceangoing vessels. About 8 percent of the waterborne commerce on the system in 1984 involved direct overseas traffic moving to and from American or Canadian ports on the Great Lakes.

The U.S./Canada trade consists of cargoes transported between U.S. and Canadian Great Lakes ports or between U.S. Great Lakes and Canadian St. Lawrence River ports. These components of the U.S./Canada trade are referred to in this report as Great Lakes trade and Seaway trade. U.S./Canadian trade represented about 22 percent of the total waterborne commerce on the system in 1984.

## Cargo Types

Waterborne commerce moving on the system can also be classified by type of commodity—dry bulk, liquid bulk, and general cargo. Dry bulk commodities are items such as coal, grain, and iron ore that are carried in dry bulk ships. Dry bulk traffic is the predominant trade on the system. Liquid bulk cargoes such as petroleum are carried in tankers. General cargo consists of a wide variety of semifinished and manufactured products, such as steel, machinery, chemicals, farm equipment, and consumer products.

Most of the cargo moving on the system is transported on American and Canadian vessels that are specifically designed to carry dry bulk commodities. Most of these ships are not built for ocean travel. Further, many vessels in the American fleet cannot operate east of Lake Erie because the ships exceed the dimensions of the locks in the Welland Canal as well as those in the St. Lawrence Seaway. The American fleet operates mainly in bulk trade moving among U.S. ports on the Great Lakes. The Canadian fleet, which is not restricted to the Great Lakes, operates throughout the system, carrying mostly bulk commodities among Canadian ports and between Canadian and U.S. ports.

## Declining Traffic

Traffic on the system has declined in the last 5 years. According to the Department of Transportation's St. Lawrence Seaway Development Corporation statistics, for example, overall Seaway traffic fell from 73.1 million tons in 1979 to 53.6 million tons in 1982—a drop of almost 27 percent. Although traffic increased to 60.0 million tons in 1984, it was still below levels reached in the late 1970's. Data on the principal categories of dry bulk tonnage—iron ore, coal, grain—carried on the Great Lakes show a similar pattern, as table 1.2 illustrates.

**Table 1.2: Selected Great Lakes Dry Bulk Commerce, 1979-84**

Figures in Millions of Metric Tons

| Year | Iron ore | Coal | Grain | Total |
|---|---|---|---|---|
| 1979 | 92.9 | 41.6 | 26.3 | **160.8** |
| 1980 | 73.8 | 37.4 | 28.6 | **139.8** |
| 1981 | 76.3 | 34.3 | 22.9 | **133.4** |
| 1982 | 39.1 | 33.3 | 25.7 | **98.1** |
| 1983 | 52.9 | 33.2 | 26.4 | **112.5** |
| 1984 | 58.1 | 39.1 | 25.6 | **122.8** |

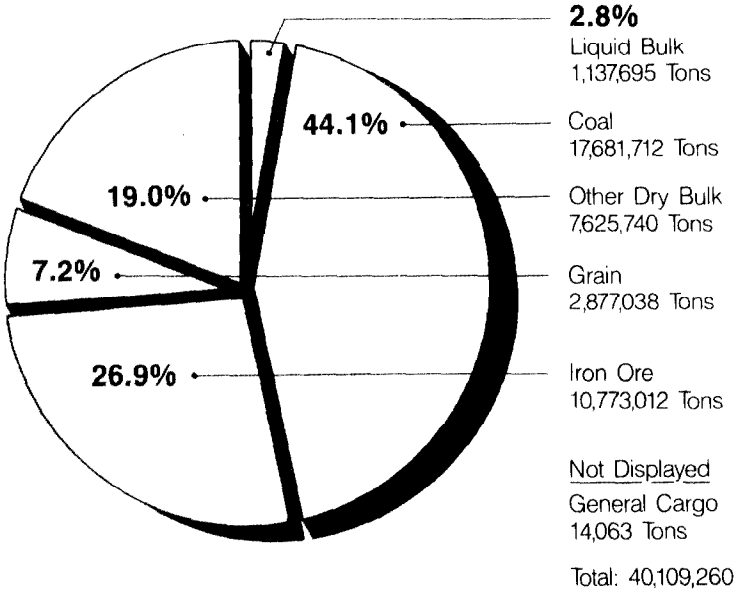
Note: A metric ton equals 2,204 pounds. Totals may not add due to rounding.

Source: Canadian Dominion Marine Association.

## The U.S./Canada Trade

The U.S./Canada trade, like the overall trade on the system, is primarily a dry bulk trade. Coal, iron ore, and grain are the major bulk commodities traded between the two countries on the system. Together, they comprised 78 percent of the trade in 1984 (see fig. 1.3). Most of the remaining 22 percent consists of a wide range of dry bulk commodities, such as stone, sand, gravel, crude minerals, and fertilizer.

**Figure 1.3: U.S./Canada Trade Commodity Shares, 1984**




Source: Prepared by GAO from Maritime Administration data.

## Commodity Flows

Current coal and iron ore movements are similar to what they were in the pre-Seaway era. In 1958, the year before the St. Lawrence Seaway opened, coal and iron ore represented 42.7 and 30.5 percent, respectively, of the total tonnage moved. The grain trade has grown from about 3 percent of the total in 1958 to 7.2 percent in 1984. Current coal, iron ore, and grain movements are described in the following sections.

### Coal

Coal, the largest commodity movement in the U.S./Canada trade, is an essential raw material for iron and steel and is also used by electric utility industries on the Great Lakes. Most coal moves from U.S. Lake Erie ports primarily to Canadian steelmaking centers and to Canadian electric power generating stations on Lakes Erie and Ontario. A large portion of this tonnage passes through the Welland Canal.

## Iron Ore

Iron ore is the second largest commodity moving between U.S. and Canadian ports on the system. The United States is both an importer and exporter of ore with Canada. Imported Canadian ore originates from mines in the Quebec-Labrador area. From the mines, iron ore is shipped by rail to ports on the St. Lawrence River. There, it is loaded on vessels and carried through the St. Lawrence Seaway and the Welland Canal to U.S. steelmaking centers on Lakes Erie and Michigan. U.S. ore exports originate from mines near Lake Superior and are shipped mostly to Canadian steel mills at Sault Ste. Marie, Port Colborne, Hamilton, and Nanticoke in Ontario.

## Grain

The grain trade with Canada is predominantly an export movement from American Great Lakes ports to Canadian St. Lawrence River ports. There, the grain is transferred to larger oceangoing vessels for overseas export. Grain is also transported from U.S. Great Lakes ports directly overseas on ocean vessels. This movement, however, is not part of the U.S./Canada trade.

U.S.-flag participation varies by commodity. As table 1.3 shows, American ships carry very little of the predominant commodities—coal, iron ore, and grain—involved in the trade. Although U.S.-flag vessels carried most of the liquid bulk cargoes in 1984, this trade represents less than 3 percent of the total tonnage moving between the two countries.

**Table 1.3: U.S.-Flag Share of the U.S./Canada Trade by Commodity, 1984**

| Commodity | Total tons | U.S. tons | Percent carried in U.S. vessels |
|---|---|---|---|
| Coal | 17,681,712 | 368,637 | 2.1 |
| Iron ore | 10,773,012 | 350,279 | 3.3 |
| Grain | 2,877,038 | 70,753 | 2.5 |
| Other dry bulk | 7,625,740 | 1,098,028 | 14.4 |
| Liquid bulk | 1,137,695 | 686,445 | 60.3 |
| General cargo | 14,063 | 1,626 | 11.6 |
| **Total** | **40,109,260** | **2,575,768** | **6.4** |

Note: Tons in long tons.

Source: Prepared by GAO from Maritime Administration data.

# Objectives, Scope, and Methodology

We conducted this review in response to requests by the Chairman, House Committee on Merchant Marine and Fisheries, and Representatives from states along the Great Lakes for information regarding the

waterborne trade between the United States and Canada on the Great Lakes/St. Lawrence Seaway system. The objectives of our review were to (1) provide data on trade, fleet, and employment concerning the U.S./Canada trade since the pre-Seaway era and (2) identify the variables that have affected the national flag vessel presence in the trade between the two countries.

Our overall approach was to obtain trade, fleet, and employment data, to the extent available, beginning with 1950. As agreed, we used 1950 as a starting point in order to obtain data on the St. Lawrence Seaway before it opened in 1959. However, we were able to obtain only fleet data back that far. Information on U.S./Canada cargo tonnage and the U.S.-flag share of that tonnage was available starting in 1953. Historical employment statistics for the U.S. Great Lakes fleet were available in 1960 (see app. I), while employment information for the Canadian fleet was not available. Fleet and employment information was obtained through 1985, while the most recent trade data available at the time of our review was for the 1984 shipping season.

We were unable to obtain data showing U.S.-flag participation for the 3-year period from 1964 to 1966, so we estimated the U.S. flag participation. To estimate the missing data, we used the Census Bureau's statistics on total U.S. port trade with Canadian Great Lakes and Atlantic ports and adjusted the statistics to exclude trade with U.S. ocean ports. Our estimates are based on an assumption that U.S. Great Lakes port trade with Canadian Great Lakes and Atlantic ports is directly related to total U.S. port trade with the same Canadian ports. Based on the average relationships between these trade figures over 22 years, we estimated trade data for 1964 to 1966. For example, U.S. Great Lakes port trade with Canadian Great Lakes ports over 22 years averaged 98.8 percent of total U.S. port trade with Canadian Great Lakes ports. Thus, for 1964 through 1966 we estimated U.S. Great Lakes port trade with Canadian Great Lakes ports to be 98.8 percent of all U.S. port trade with Canadian Great Lakes ports. We similarly estimated (1) U.S.-flag trade between U.S. Great Lakes ports and Canadian Great Lakes ports, (2) all trade between U.S. Great Lakes ports and Canadian St. Lawrence River ports, and (3) U.S.-flag trade between U.S. Great Lakes ports and Canadian St. Lawrence River ports. We estimated the total U.S./Canada trade by adding our estimated trade for the Great Lakes and St. Lawrence Seaway. Also, we estimated total U.S.-flag participation in the U.S./Canada trade by adding our estimated U.S.-flag share of the trade for each route.

We limited our analysis of historical fleet data to dry bulk vessels because these vessels account for the majority of ships in the United States and Canadian Great Lakes fleets and because almost all of the trade between the two countries on the system consists of dry bulk commodities (about 97 percent in 1984).

Because no single source for statistics on Great Lakes shipping exists, we obtained data from several U.S. government organizations, including the Department of Transportation's Maritime Administration and St. Lawrence Seaway Development Corporation, the U.S. Army Corps of Engineers, and the Department of Commerce's Census Bureau. We also obtained information compiled by various trade associations, such as the Lake Carriers Association in the United States and the Dominion Marine Association in Canada. Additionally, we used recognized industry sources like Greenwood's Guide to Great Lakes Shipping.

To address the factors that affect vessel choice and to discuss the trade data that we had obtained, we interviewed maritime-related government and industry officials of both countries. (See app. II for list of organizations contacted.) As agreed with the requesting congressional offices, we did not quantify the impact of the factors identified.

Among the organizations we visited were six American and three Canadian dry bulk vessel operators. The vessel operators were selected judgmentally to provide a cross-section of each country's Great Lakes dry bulk fleet. The American fleets we visited included small and large operators and private and independent fleets. Together these six firms accounted for 73 percent of the total vessels in the Great Lakes dry bulk fleet in 1985. The Canadian firms we visited included the two largest Canadian fleets operating on the Great Lakes. All three fleets we visited participate in the U.S./Canada trade and, together, operated 52 percent of the vessels in the 1985 Canadian dry bulk fleet. Our selection was limited to dry bulk vessel operators.

We also interviewed officials of two American labor unions that represented many of the licensed and unlicensed seamen on the Great Lakes.

We conducted literature searches to identify articles and studies concerning Great Lakes shipping and trade. The Maritime Administration (MarAd), the Canadian government, and other organizations we contacted provided additional studies and literature. We did not evaluate the analyses from any of the studies cited in our report. In developing information regarding the Canadian shipping laws, we did not use the

actual laws but relied on discussions with Canadian government officials and documents which they provided us.

In collecting statistical data for this report, we used many different data sources and systems. Similar data from different sources sometimes varied because of differences in reporting procedures or definitions of terms. Furthermore, some of the data spanned a period of 30 years or more. It was, therefore, impractical for us to verify the accuracy of the information obtained. As requested, we did not obtain official comments on the report. However, the information contained in the report was discussed with Canadian and American government officials and their views have been incorporated where appropriate. We performed our work between March and October 1985.

# Changes in the U.S./Canada Trade and the American and Canadian Great Lakes Fleets

We gathered information on the U.S./Canada trade and vessels on the Great Lakes/St. Lawrence Seaway system. This chapter provides information on changes since the pre-Seaway era in (1) United States- and Canadian-flag participation in the trade between the two countries and (2) United States and Canadian dry bulk fleet size and capacity.

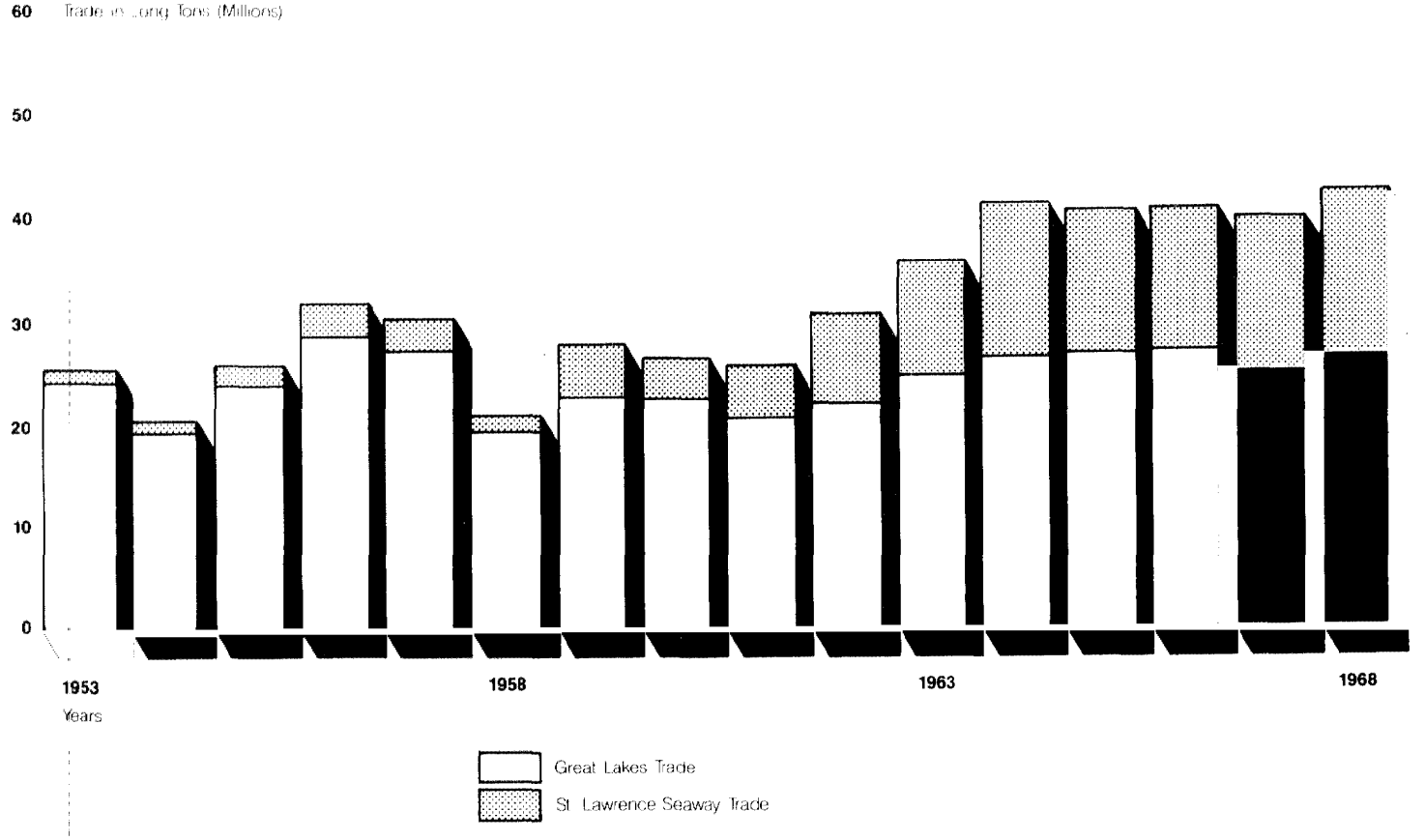
## Canadian Fleets Have Historically Dominated the U.S./Canada Trade

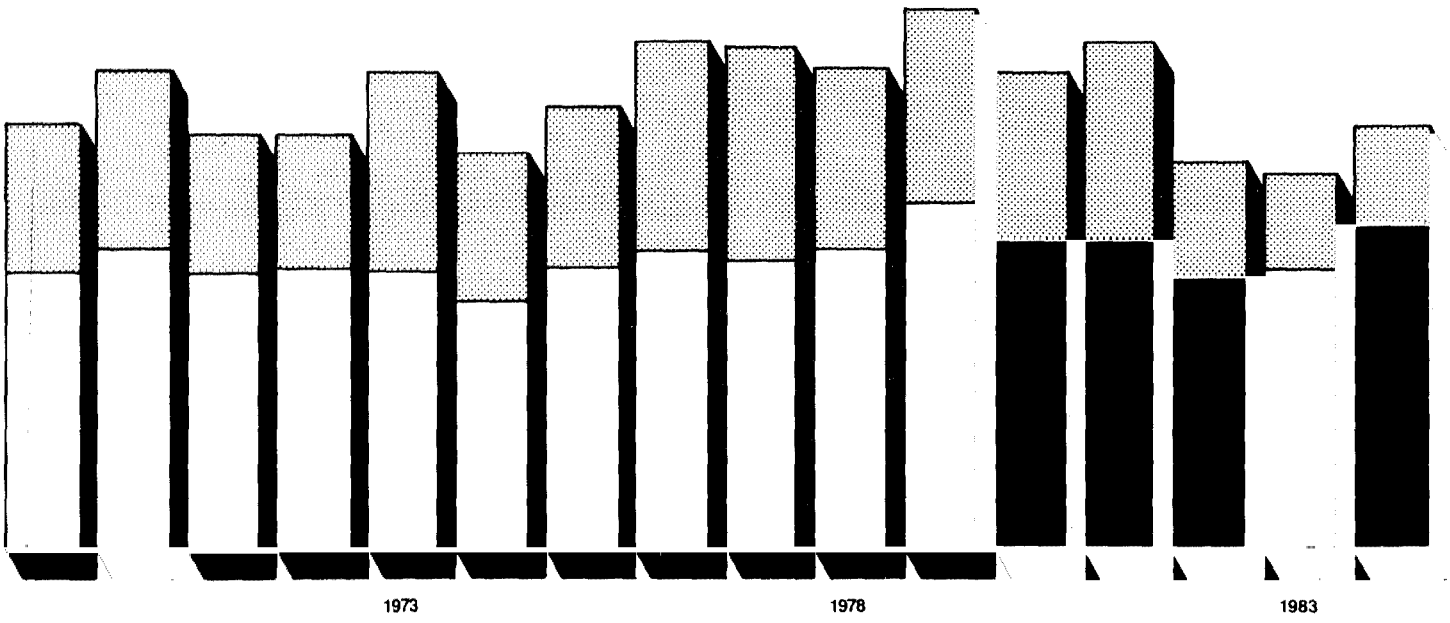
Canadian fleets transport most of the cargo that moves between the United States and Canada on the Great Lakes and through the St. Lawrence Seaway and have done so for many years. They carried most of the tonnage on the Great Lakes in the 1950's and most of the growth in new trade that developed after the St. Lawrence Seaway opened in 1959. American-flag participation has been steadily decreasing.

### Historical Development of the U.S./Canada Trade

Figure 2.1 shows the tonnage moving between the United States and Canada on the system from 1953 to 1984. In 1953 the trade totaled 25.1 million tons. In 1958, the year before the Seaway opened, it dropped to 21.8 million tons. With periodic fluctuations, traffic volume tended to move upwards, peaking at 51.1 million tons in 1979. In the early 1980's, traffic declined significantly due to depressed economic conditions. By 1983 traffic had fallen to 35.4 million tons but rebounded in 1984, reaching 40.1 million tons. (See appendix III for more complete statistics on cargo tonnage in the U.S./Canada trade.)

**Figure 2.1: Total U.S./Canada Tonnage on the Great Lakes/St. Lawrence Seaway System, 1953-84**






Source: Prepared by GAO from data obtained from the Census Bureau.

Most of the growth that occurred between 1953 and 1979 resulted from trade through the Seaway. During this period, trade between U.S. and Canadian Great Lakes ports grew 36 percent from 24.2 to 32.9 million tons. Seaway trade, however, rose from 900,000 tons in 1953 to 18.2 million tons in 1979—an increase of more than 1,900 percent. Further, the Seaway trade as a percent of the total increased from 3.6 to 35.6 percent during the period. In 1984 about 23 percent of the U.S./Canada trade moved via the St. Lawrence Seaway.

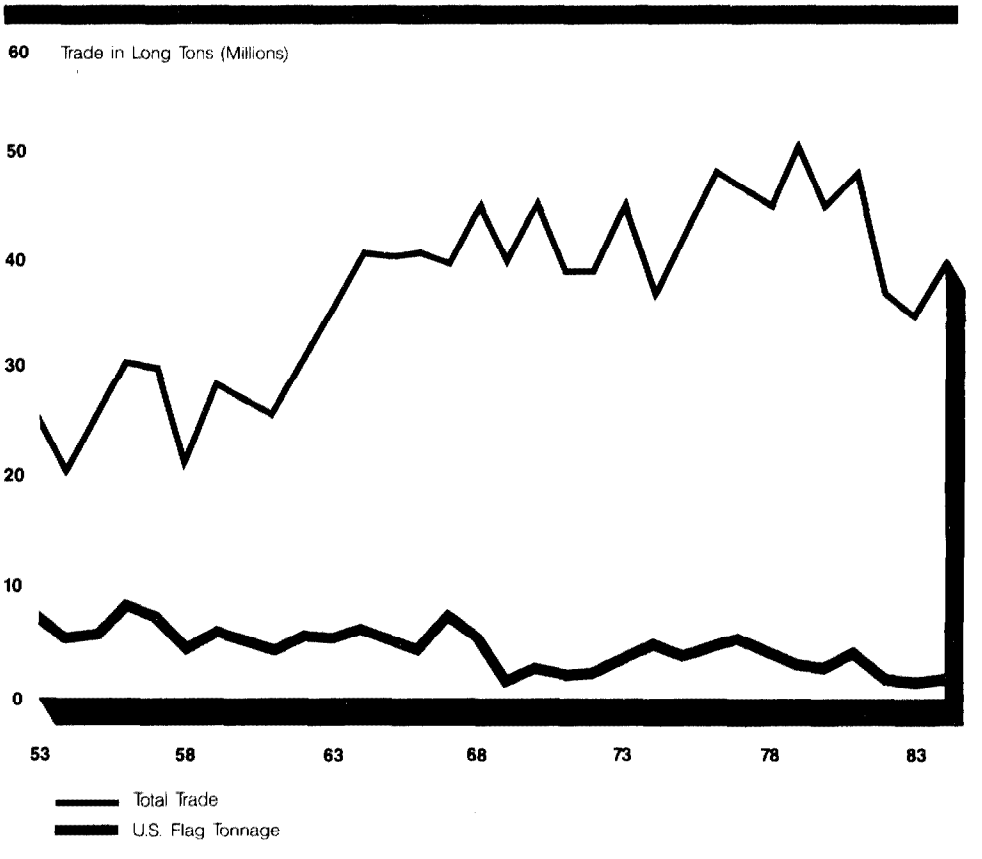
The growth in trade between U.S. Great Lakes ports and Canadian St. Lawrence River ports was largely due to a two-way trade that developed after the Seaway opened in 1959. The United States began to export grain eastbound through the Seaway. In the opposite direction,

iron ore from newly developed mines in eastern Quebec and Labrador began to move to American ports on the Great Lakes.

## U.S.-Flag Participation in the U.S./Canada Trade Has Declined

Over the 31-year period between 1953 and 1984, the U.S.-flag share of the U.S./Canada trade on the Great Lakes/Seaway system has steadily declined. Figure 2.2 shows that while tonnage generally increased during the period, the U.S. portion of the tonnage dropped. In 1953 U.S.-flag vessels carried 7.3 million tons while in 1984 they carried 2.6 million tons—a decline of more than 64 percent.

**Figure 2.2: U.S.-Flag Share of the Tonnage Moving Between the U.S. and Canada on the Great Lakes/Seaway System, 1953-84**

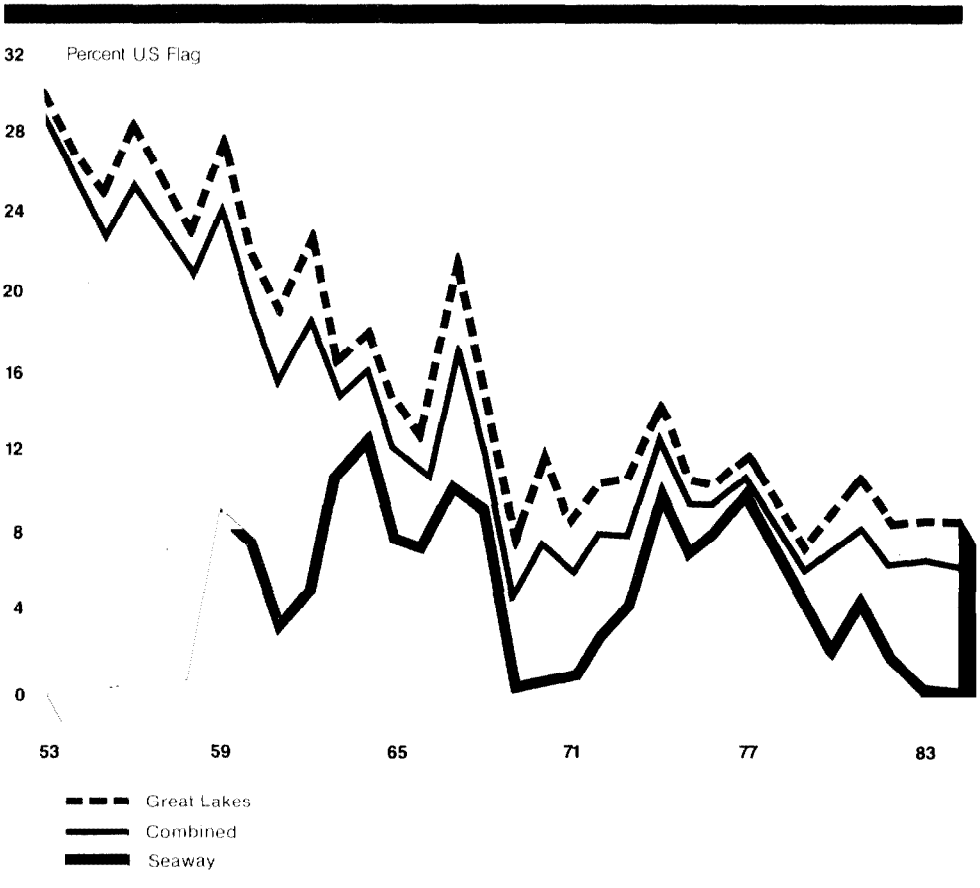



Source: Prepared by GAO from Census Bureau data.

Figure 2.3 shows the percentage of total U.S./Canada trade tonnage and the Great Lakes and Seaway components of the trade carried in U.S.-flag vessels. U.S.-flag participation in both the overall and Great Lakes portion of the trade has declined. The U.S.-flag share of the total trade dropped from 29.2 percent in 1953 to 6.4 percent in 1984. On the Great

Lakes, the percentage of the trade carried on American vessels fell from 30.3 to 8.7 percent during the same period. U.S.-flag vessels have never carried much of the Seaway trade and their participation has fluctuated. U.S. vessels transported very little of the cargo in the 1950's. In most years, U.S.-flag participation was 5 percent or less—sometimes less than 1 percent. In 1983-84, very little of the Seaway trade had moved on American-flag vessels.

**Figure 2.3: Percent U.S.-Flag Share of Trade Between the United States and Canada on the Great Lakes/Seaway System, 1953-84**




Source: Prepared by GAO from Census Bureau data.

The decline in U.S.-flag participation in the U.S./Canada trade apparently started much earlier. According to a study done by H.C. Downer and Associates for the Maritime Administration in 1957, the U.S.-flag share had been declining since the mid-1920's when it was 76 percent.[1]

[1]H.C. Downer and Associates, Inc., Engineering Study of the Effects of the Opening of the St. Lawrence Seaway on the Shipping Industry, Cleveland, Ohio, Feb. 25, 1957, p. 75.

The small and declining share of U.S.-flag participation in foreign waterborne commerce is not unique to the trade with Canada on the Great Lakes/St. Lawrence Seaway. MarAd data show that between 1956 and 1983 the U.S.-flag share of total waterborne foreign trade dropped from 20.7 to 5.8 percent.

## Canadian-Flag Vessels' Share of the Trade

Canadian-flag ships carry the majority of tonnage moving between the United States and Canada on the system. As U.S.-flag participation has decreased, Canadian-flag carriage increased. Few foreign-flag ships are involved in this trade. In 1955, according to the Royal Commission on Coasting Trade,[2] Canadian-flag vessels carried 74.3 percent of the waterborne trade between the United States and Canada within the Great Lakes and 88.4 percent through the St. Lawrence canal system. Most of the remainder was transported on U.S.-flag ships. Less than 1 percent of the total, according to the Commission, was carried by foreign-flag vessels.

MarAd statistics show that during the 11-year period from 1974 to 1984, Canadian-flag vessels increased their share of the trade between United States and Canada from 75.4 to 89.3 percent on the Great Lakes, and from 90.1 to 96.2 percent on the St. Lawrence Seaway. Overall, the percentage of cargo carried on Canadian ships grew from 80.3 to 90.8 percent during this period (see table 2.1).

**Table 2.1: Change in Share of the U.S./Canada Trade by Flag of Vessel Between 1974 and 1984**

| | Percent of Great Lakes trade | | Percent of Seaway trade | | Percent of total trade | |
|---|---|---|---|---|---|---|
| **Vessel flag** | **1974** | **1984** | **1974** | **1984** | **1974** | **1984** |
| Canada | 75.4 | 89.3 | 90.1 | 96.2 | 80.3 | 90.8 |
| United States | 16.1 | 8.2 | 7.8 | 0.2 | 13.3 | 6.4 |
| Unknown[a] | 7.3 | 2.1 | 1.9 | 2.8 | 5.5 | 2.3 |
| Foreign | 1.2 | 0.4 | 0.2 | 0.8 | 0.9 | 0.5 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

[a]Country where vessel registered not identified.

Note: Information was not available for earlier periods.

Source: Prepared by GAO from statistics provided by the Maritime Administration.

[2]Royal Commission on Coasting Trade, Report, Queen's Printer and Controller of Stationery, Ottawa, Dec. 9, 1957, p. 25.

## The United States and Canadian Lake Carrier Industry

At the start of the 1985 shipping season, the lake carrier industry consisted of 20 American and 18 Canadian companies operating a total of 269 commercial freight vessels with a combined carrying capacity of 5.9 million tons. (See table 2.2.) These companies own and operate a wide variety of dry bulk carriers,[3] tankers, and other vessels. Dry bulk vessels account for 94 percent of the total fleet capacity.

**Table 2.2: United States and Canadian Lake Carrier Industry, 1985**

| Vessel type | United States | | Canada | | Combined total | |
|---|---|---|---|---|---|---|
| | Number | Capacity | Number | Capacity | Number | Capacity |
| Dry bulk | 104 | 2,765 | 114 | 2,729 | 218 | 5,494 |
| Tankers | 9 | 45 | 28 | 221 | 37 | 266 |
| Other | 9 | 61 | 5 | 38 | 14 | 99 |
| **Total** | **122** | **2,871** | **147** | **2,988** | **269** | **5,859** |

Notes: Capacities are in thousands of long tons. Other vessels include cement carriers and package freighters. Vessels with carrying capacity of less than 220 tons are excluded.

Source: Prepared by GAO from Greenwood's Guide to Great Lakes Shipping, 1985.

The decline in business conditions on the Great Lakes has resulted in excess capacity in both the American and Canadian fleets. As table 2.3 shows, U.S. fleet activity has fallen since 1982. We were unable to obtain similar data on the Canadian fleet. An official of the Canadian Dominion Marine Association told us, however, that during July and August 1985 about 35 percent of the Canadian fleet was idle.[4]

[3]On the Great Lakes, dry bulk ships are usually subdivided into bulk carriers and self-unloaders. Bulk carriers depend on shore-based unloading equipment while the self-unloaders have self-contained unloading equipment.

[4]Canadian Government officials told us that their peak months in the Great Lakes shipping season occurred in the spring and fall.

**Table 2.3: Activity of the U.S. Great Lakes Bulk Fleet as of July 1, 1980 to 1985**

| Year | Number of vessels | | | Percent inactive |
|---|---|---|---|---|
| | Active | Inactive | Total | |
| 1980 | 91 | 56 | **147** | 38 |
| 1981 | 104 | 31 | **135** | 23 |
| 1982 | 55 | 79 | **134** | 59 |
| 1983 | 54 | 80 | **134** | 60 |
| 1984 | 63 | 67 | **130** | 52 |
| 1985 | 57 | 61 | **118** | 52 |

Notes: July was selected because it is a representative peak month in the shipping season. The 1985 fleet total differs slightly from table 2.2 because of differences in timing and reporting methods the two sources used.

Source: Chief, Ship Operations Office, Great Lakes, Region, Maritime Administration.

Recent studies indicate that the Canadian lake carrier industry is facing financial difficulties. An October 1984 profile of Canadian Great Lakes shipping by Touche Ross and Company covering the 1979 to 1983 period disclosed concern about the industry's ability to maintain an efficient and economical fleet. According to the study, new vessels cost more than two and one-half times average historical costs, yet the industry's profitability and borrowing ability were declining. The study also showed that the rate of return on investment from vessel operations was below the returns realized by other capital-intensive industries and that in 1983 the rate of return was below the yield available on low-risk Canada savings bonds.

A study by T. Norman Hall and Associates indicated that the Canadian self-unloader fleets were competing against bulk carrier operators for the declining trade. The older, less efficient bulk vessels had suffered the most. According to the study, those that were operating were at best breaking even and their cash flows were not sufficient to make a reasonable contribution towards future vessel replacement. The study noted that in the past few years some fleets had been sold or forced into bankruptcy. The study concluded that this attrition was likely to continue, unless ways were found to ensure that certain vessels remained economically viable.

## Changes in Dry Bulk Fleet Size and Capacity Since 1950

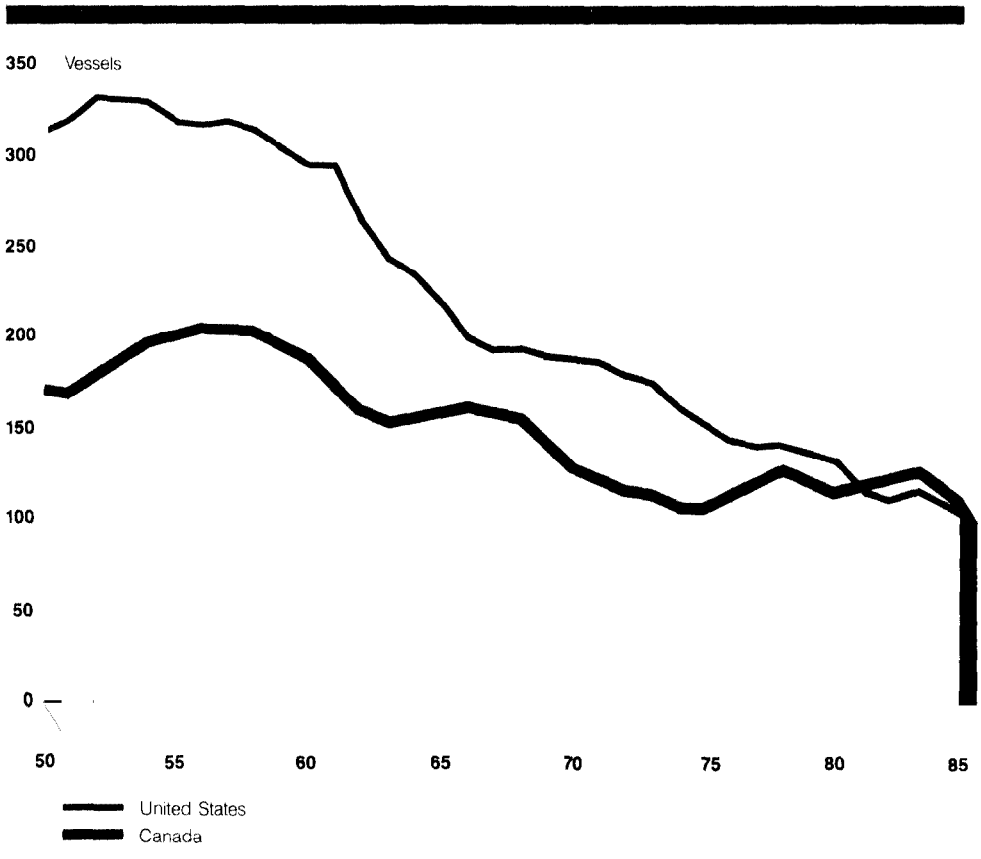
As discussed in chapter 1, most of the U.S./Canada trade is carried on dry bulk ships. The Canadian and American dry bulk fleets are relatively equal, both in terms of the number of ships and carrying capacity. The situation was much different in the pre-Seaway era. In 1950 the Canadian fleet had about one-half as many vessels and one-fourth the

carrying capacity of the U.S. fleet. Further, the average capacity per Canadian vessel was about one-half that of an American ship compared with about 90 percent now. Comparative changes in the number of ships and ship capacity since 1950 are illustrated in the graphs in figures 2.4 and 2.5. These figures show the trend in both fleets to operate fewer but larger capacity vessels.

## Number of Vessels

As figure 2.4 illustrates, the number of vessels in both the U.S. and Canadian dry bulk fleets have dropped significantly in the last 35 years. In 1950 the American dry bulk fleet totaled 317 ships. The fleet numbered 104 vessels in 1985—a decline of 213 ships or about 67 percent. The Canadian dry bulk fleet decreased by 60 vessels, from 174 to 114, or more than 34 percent, during the same period.

**Figure 2.4: Number of Vessels in the U.S. And Canadian Dry Bulk Fleets, 1950-85**

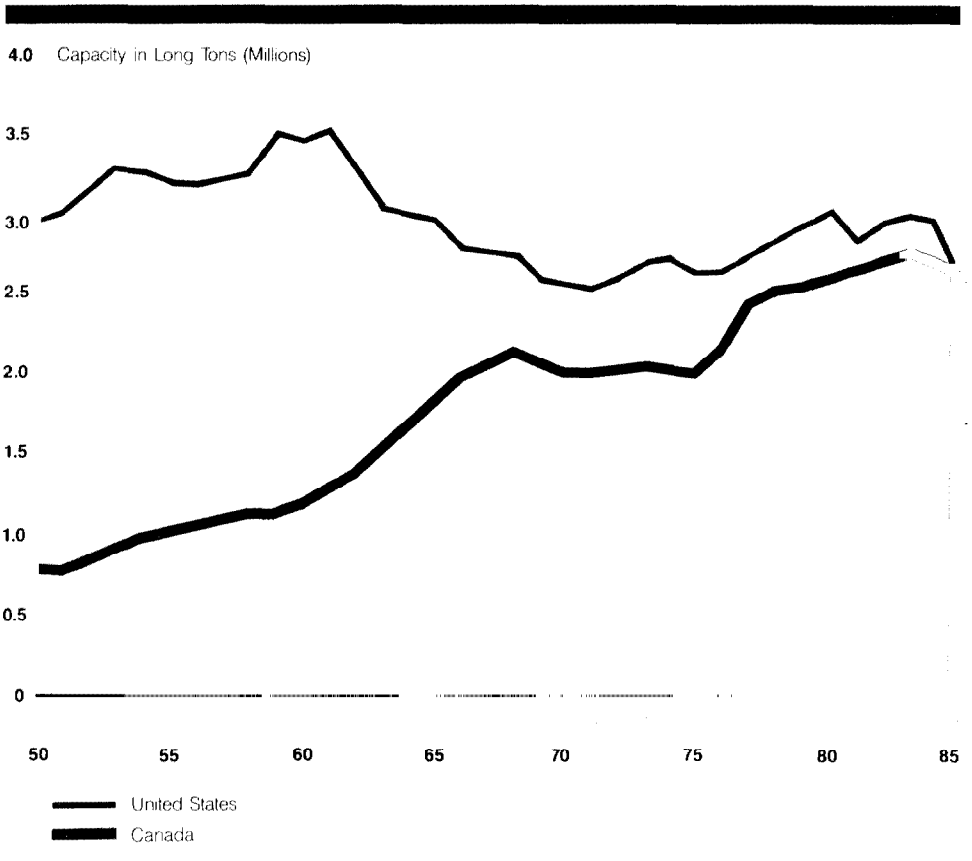



Source: Prepared by GAO from information obtained from the annual reports of the Lake Carriers Association, 1950 to 1960, and Greenwood's Guide to Great Lakes Shippping,1961 to 1985.

## Fleet Capacity

Figure 2.5 shows that while American dry bulk fleet capacity has declined since the 1950's, Canadian fleet capacity has grown dramatically. Between 1950 and 1961, the American fleet capacity grew from 3.0 to 3.6 million tons. Thereafter, it declined steadily, reaching a low of 2.6 million tons in 1971. Capacity grew again until 1980, but has declined since that time. Overall, the American fleet capacity has fallen by 203,000 tons, or 6.8 percent, since 1950. In contrast, the Canadian dry bulk fleet capacity has generally grown from 766,000 tons in 1950 to 2.7 million tons in 1985—an increase of more than 250 percent. According to Canadian government officials, the increase arose mainly from the opening of the Seaway in 1959 which spurred the growth of Canada's domestic shipments and the construction of new docks and grain elevators at lower St. Lawrence River ports.

**Figure 2.5: U.S. And Canadian Dry Bulk Fleet Capacity, 1950-85**




Source: Prepared by GAO from information obtained from the annual reports of the Lake Carriers Association 1950 to 1960, and Greenwood's Guide to Great Lakes Shipping, 1961 to 1985.

## Summary

Since the 1950's, most of the traffic moving between the United States and Canada on the Great Lakes/St. Lawrence Seaway system has been carried on Canadian ships. In the last three decades, Canadian ships' share of the trade has been increasing, the ships have carried most of the trade on the Great Lakes, and they acquired most of the growth in trade between U.S. Great Lakes ports and St. Lawrence River ports that developed after the St. Lawrence Seaway opened in 1959. American-flag participation in the trade has decreased steadily, from 29 percent in 1953 to slightly more than 6 percent in 1984.

The relative positions of the American and Canadian dry bulk fleets have changed significantly since the pre-Seaway era. Currently, the two fleets are almost equal in terms of the number of ships and carrying capacity. The 1950 Canadian dry bulk fleet had about one-half as many vessels and one-fourth the carrying capacity of the U.S. fleet. Although the number of ships in each fleet has declined significantly, average carrying capacity per ship has increased, reflecting the trend to operate fewer but larger capacity vessels.

# Reasons for the Low Level of U.S.-Flag Participation in the U.S./Canada Trade

Our research and discussions with American and Canadian maritime officials disclose that a variety of factors contribute to the low level of U.S.-flag participation in the U.S./Canada trade. These factors include

- higher American vessel operating and construction costs,
- modernization and expansion of the Canadian fleet to take advantage of the St. Lawrence Seaway,
- differences in the nature and timing of Canadian and U.S. financial assistance, and
- other factors such as geography, contractual arrangements, and cabotage policies that are advantageous to Canadian vessel operators.

In addition, the American lake carrier industry concentrated on domestic trade because it was dominated by steel and mining company-owned fleets moving raw material between U.S. ports and because it was more profitable than U.S./Canada trade.

## Vessel Operating and Construction Costs Have Been Higher in the United States

Canadian vessel operating and construction costs are lower than those in the United States. Various comparisons and studies indicate that gaps between the two countries have existed for many years. Further, declines in the Canadian dollar relative to the U.S. dollar have lowered Canadian costs relative to U.S. costs. These cost differences translate into lower freight rates for commodities carried on Canadian vessels.

As discussed in chapter 2, Canadian fleets captured most of the growth in trade that resulted from the St. Lawrence Seaway opening. A 1957 study done for MarAd before the Seaway opened predicted that situation would occur.[1] According to the study, American operators would not be able to compete for the Seaway trade because of the higher construction and operating costs of American-flag vessels. Consequently, although the Canadian fleet did not have the capacity to carry the predicted increased cargo in the Seaway trade, the study concluded that Canada would build up its fleet to meet the demand.

### Vessel Operating Costs

Vessel operating costs include such things as wages, fuel, maintenance, repairs, and insurance. The following comparisons, studies, and congressional testimony indicate that American vessel operators' operating costs have been higher than their Canadian competition.

[1]H.C. Downer and Associates, Inc., Engineering Study of the Effects of the Opening of the St. Lawrence Seaway on the Shipping Industry, Cleveland, Ohio, Feb. 25, 1957, p. 12, 13, 48, and 65.

- According to an analysis provided by the Lake Carriers Association, monthly wage costs during 1937 and 1938 on American Great Lakes cargo vessels ranged from 99 to 115 percent higher than those on Canadian vessels of similar size and type.
- In a 1949 study on Canada's shipping industry, the Canadian Maritime Commission reported that the daily operating costs of a Canadian ship were $810, compared with about $972 for an American vessel.
- Canadian wage costs were 45 percent of those of comparable U.S. vessels' wage costs according to MarAd's 1957 study.
- During hearings before the House Committee on Merchant Marine and Fisheries in 1963-1964, the Lake Carriers Association testified that the monthly operating costs for a 20,000- to 25,000-ton lake vessel was $53,840 in Canada and $77,394, or 43 percent higher, in the United States.
- In 1973 MarAd estimated the difference between Canadian and U.S. labor, maintenance and repair, and insurance costs at 43.7, 33.3, and 17.9 percent, respectively. MarAd compared U.S. and Canadian labor costs again in 1978 and concluded that the difference had increased to 53 percent, or $2,054 per day. MarAd attributed the increase to the decline in the Canadian dollar since 1973 and to the lower crew level of the Canadian vessel used for comparison.
- A 1982 comparison by CSR Consultants, Ltd., of U.S. and Canadian 25,000-ton bulk carriers showed that annual labor costs for the Canadian vessels were 54 percent of the U.S. labor costs.
- We obtained the annual labor costs of two similar Canadian and American vessels for 1983. The data showed that the labor costs on the American ship were $737,000 higher than on the Canadian vessel.
- Comparison of 1985 crew size data obtained from MarAd for the American fleet and a Canadian vessel operator for the Canadian fleet showed that U.S. dry bulk vessels averaged 2.5 more crewmen per ship than Canadian dry bulk vessels. The average crew on an American ship was 29.4 and 26.9 on a Canadian vessel.[2] Crew levels on individual ships, however, varied. Therefore, comparison of any two ships could show a Canadian crew larger than an American crew.

## Vessel Construction Costs

Construction costs have also historically been higher in the United States. According to the 1957 MarAd study, construction costs in Canada during 1957 were about 75 percent of those in the United States for ships of equal capacity. Testifying at hearings before the House

[2]Canadian crew size data is incomplete. We obtained the number of crew for 102 of the 114 dry bulk vessels in the 1985 Canadian fleet.

Merchant Marine and Fisheries Committee in 1963-64, the Lake Carriers Association provided information showing that the shipbuilding costs for a 25,000-ton vessel were $8.5 million in the United States and $6.5 million in Canada, or 76 percent of the U.S. cost.[3]

Current data on the relative costs of U.S. and Canadian vessels were not readily available. None of the organizations we contacted had made any comparisons. Although MarAd, for example, has compared U.S. shipbuilding costs with those in foreign countries, the comparisons do not include Canada because, according to one official, both countries' costs are high.

To obtain a comparison of the two countries' vessel construction costs, we asked an American and a Canadian vessel operator for cost information for two recently constructed ships. The operators provided cost figures for two ships built in 1980 which they believed were comparable. Both vessels were diesel powered, self-unloaders, 730 feet in length with similar carrying capacities. A major difference between the two ships was that the Canadian vessel's hull was designed for ocean service. After making adjustments for the Canadian vessels additional hull-strengthening costs and the difference in exchange rates, the cost differences between the two ships was relatively small. The American vessel cost $25.9 million while the Canadian vessel cost $24.6 million.[4]

Ship construction costs, however, are substantially higher now than they were in the 1960's when Canadian operators built many new vessels. Further, several officials with whom we spoke said that Great Lakes ships can last 50 years or more. Thus, if American vessel operators were to construct the type of vessels most useful for the U.S./Canada trade (discussed further in the next section), they would be at a disadvantage because these vessels would be competing against Canadian ships that cost less to construct.

## Exchange Rates

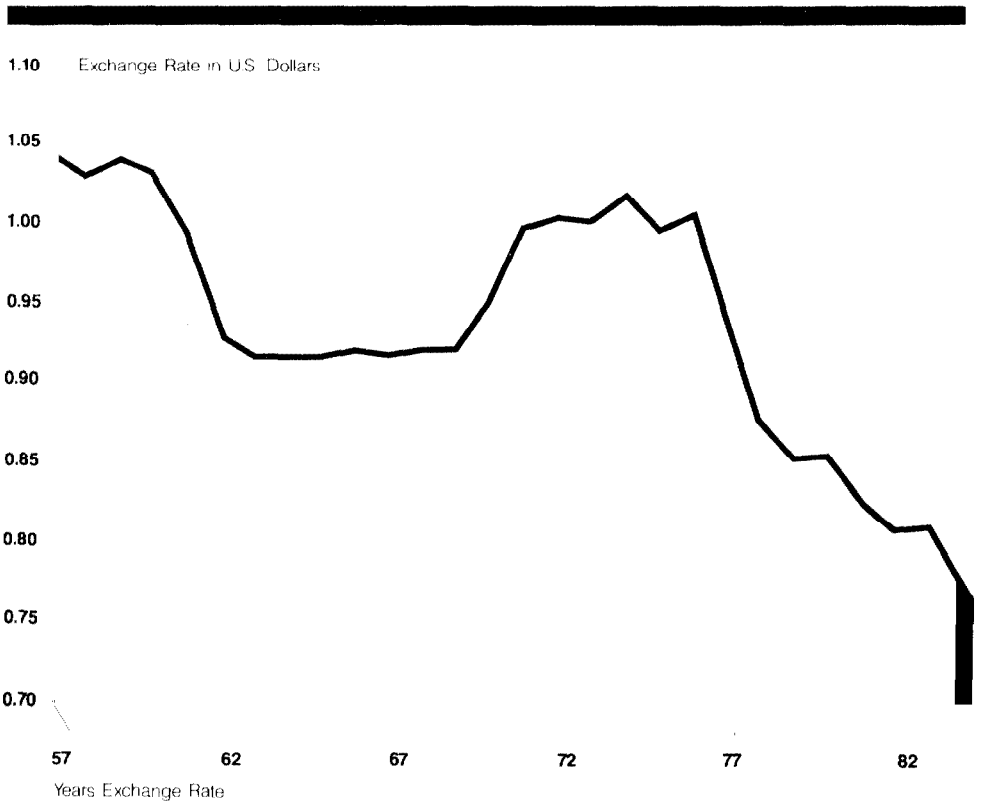
Figure 3.1 shows the changes in the U.S./Canadian exchange rate from 1957 to 1984. Since the late 1970's, the Canadian dollar has decreased in value, about 24 percent, relative to the U.S. dollar. Consequently, this

[3]A government shipbuilding subsidy further reduced Canadian vessel cost and, therefore, increased the competitive advantage of Canadian vessel operators over American operators. Subsidies are discussed later in this chapter.

[4]See footnote 3.

has reduced prices of Canadian goods and services, such as waterborne transportation, relative to prices of comparable U.S. goods and services.

**Figure 3.1: U.S. And Canadian Dollar Exchange Rates, 1957-84**




Note: U.S. Dollars Per Canadian Dollar.
Source: Standard and Poors, Statistical Service, Banking and Finance, 1985.

## With the Seaway's Opening, Canadian Operators Modernized Their Fleets

The Canadian operators modernized their fleets to take advantage of the St. Lawrence Seaway. The American operators, on the other hand, did not modernize their fleets after the Seaway opened. Because Canadian vessel operators built ships for the Seaway trade, they were able to increase their market share whereas American operators did not.

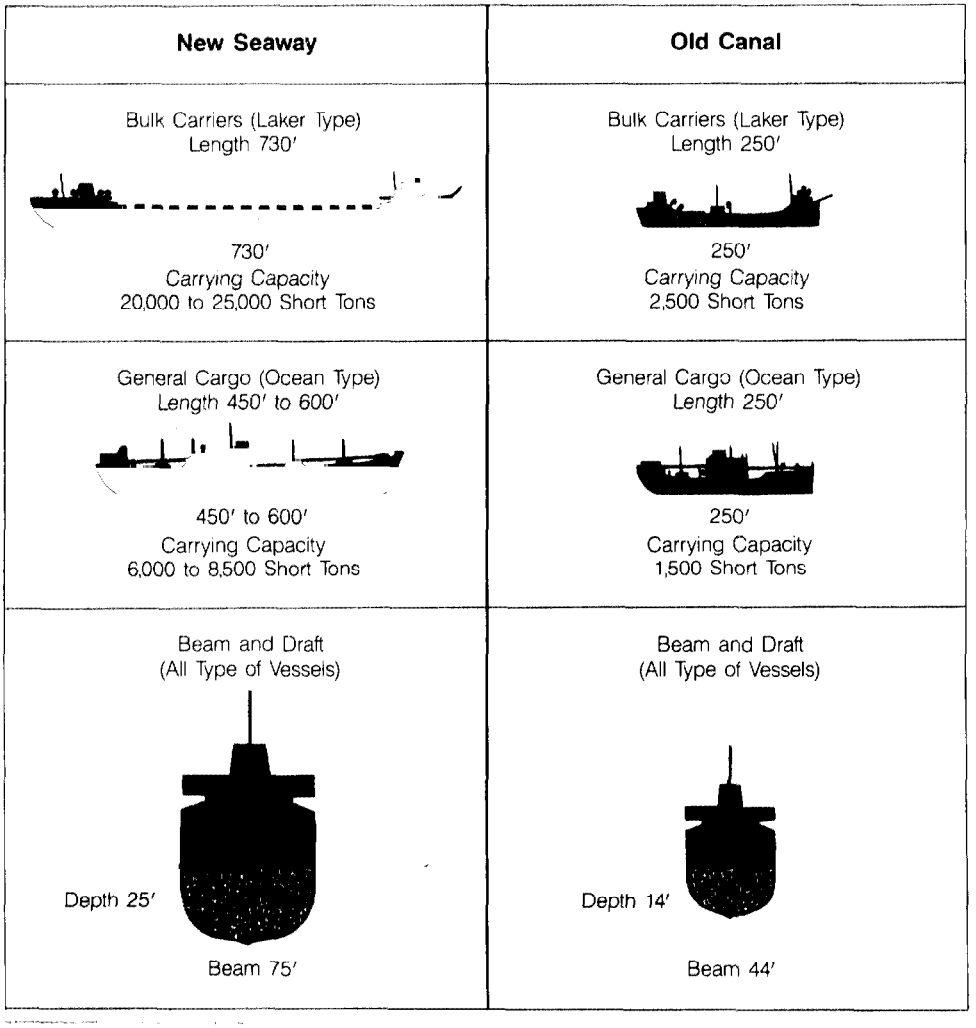
The Canadian dry bulk fleet remained smaller than its American counterpart in the pre-Seaway period because the old locks could not accommodate large vessels. Much of the fleet consisted of small vessels known as canallers carrying cargo between ports on the Great Lakes and on the lower St. Lawrence River. Canals on the St. Lawrence River limited the size of these vessels to 250 feet in length and 44 feet in width.

According to Canadian government officials, the opening of the St. Lawrence Seaway made the canallers economically obsolete and resulted in increased vessel construction as Canadian operators upgraded their fleets to take advantage of new trading opportunities, particularly domestic trade, made possible by the new seaway system. (See fig. 3.2.) New vessels were built and some existing vessels were lengthened. Of the 114 dry bulk vessels in the Canadian fleet at the start of 1985, 63 (55 percent) were built or lengthened between 1958 and 1970. Altogether, 96 vessels in the current Canadian fleet have been built or lengthened since 1958. Further, 67 of these 96 vessels were constructed to seaway maximum dimensions and thus are able to cross both the Welland Canal and the St. Lawrence Seaway, carrying the maximum tonnage possible.

The U.S. fleet, on the other hand, did not increase its carrying capacity when the Seaway opened. Few U.S. ships were built during the 1960's. Of the 104 vessels in the current fleet, 14 were constructed or lengthened between 1958 and 1970 of which 6 were built to seaway-size.[5] When shipbuilding picked up in the 1970's, the U.S. fleet operators concentrated on building vessels 800 to 1,000 feet in length which, because of their size, were confined to the Great Lakes west of the Welland Canal. The 1000-foot vessels were built to the maximum dimensions permitted by the Poe Lock at Sault Ste. Marie and have been used to transport coal and iron ore from Lake Superior to Midwestern utility companies and steel mills.

[5]Two of the seaway maximum vessels were later lengthened to more than 800 feet.

**Figure 3.2: Limitation on Vessel Sizes for the St. Lawrence Seaway Compared With the St. Lawrence Canal System**




Note: A short ton equals 2,000 pounds.

Source: St. Lawrence Seaway Development Corporation, Annual Report, 1959.

U.S. vessels that are small enough to transit Seaway locks, according to a study,[6] were designed and built primarily to carry iron ore. These vessels have interior cargo storage areas that are V-shaped to allow the ore to be concentrated for easy unloading. This design results in a relatively small cubic capacity. Canadian vessels, in contrast, were built to carry both grain and iron ore. The cargo storage areas have an almost flat bottom and rectangular cross-section. Therefore, the American vessels

[6]Shaw, G.C., and Cook, W.D., A Forecast of the Canadian Dry-Bulk Vessel Requirements on the Great Lakes in 1990, Research Report 83, Mar. 1982, pp. 150 and 151.

have a smaller grain-carrying capacity than Canadian ships of similar dimensions.

Vessels constructed to seaway maximum dimensions have an economic advantage over smaller ships because they can carry more cargo per trip through the seaway locks. As a result of the changes that have occurred since the Seaway opened, the U.S. dry bulk fleet is either too large to use the Welland Canal and the St. Lawrence Seaway or too small to carry enough cargo to compete effectively with Canada's seaway maximum ships. Table 3.1 illustrates the size of the U.S. and Canadian dry bulk fleet. Canadian operators have an advantage over their American counterparts because a significant share of the U.S./Canada trade—about 53 percent in 1984—moves through the Welland Canal and/or the St. Lawrence Seaway. As discussed in chapter 2, Canadian operators have translated this advantage into obtaining a larger share of the system trade.

**Table 3.1: U.S. And Canadian Dry Bulk Vessel Sizes for the 1985 Shipping Season**

| | Number of vessels | | |
|---|---|---|---|
| **Vessel size** | **U.S.** | **Canada** | **Total** |
| Above seaway maximum | 32 | 0 | 32 |
| Seaway maximum | 4 | 67 | 71 |
| Below seaway maximum | 68 | 47 | 115 |
| **Total** | **104** | **114** | **218** |

Note: Current seaway maximum dimensions are 730 feet in length and 76 feet in width.

Source: Prepared by GAO from information provided by the St. Lawrence Seaway Development Corporation and Greenwood's Guide to Great Lakes Shipping, 1985.

The U.S. and Canadian ships that are smaller than the seaway maximum vary in size. The smaller the ship the greater the economic disadvantage relative to seaway maximum size. Of the 68 U.S. vessels below seaway maximum size, 2 are over 700 feet long while 56, or about 83 percent, are 650 feet or less in length. In comparison 6 of Canada's 47 vessels which are below seaway maximum size are over 700 feet long.

## Differences in the Nature and Timing of Canadian and U.S. Government Assistance

The participation of American and Canadian fleets in the U.S./Canada trade has been affected by the maritime assistance programs offered by the United States and Canadian governments. Canadian government assistance began before the St. Lawrence Seaway opened, while U.S. support of its Great Lakes fleet was not available until 1970. By that time, the Canadian fleet was firmly established in the Seaway trade. According to Canadian government officials, this was similar to the

manner in which Canadians had dominated U.S./Canada trade prior to the Seaway opening. The following information about the Canadian maritime assistance programs is based on discussions with Canadian government officials and documents which they provided.

## Canadian Government Assistance Helped Encourage Vessel Construction at the Time the Seaway Opened

The modernization and expansion of the Canadian Great Lakes fleet was assisted by Canadian government fiscal and subsidy programs that became available following World War II. Vessel operators had been able to depreciate new ships on an accelerated basis since 1949. In the late 1950's and early 1960's, the main stimulus provided for was through tax incentives, according to Canadian government officials. In 1961, the Canadian government started to provide direct shipbuilding subsidies.

### Canadian Vessel Construction Assistance Act of 1949

The Canadian Vessel Construction Assistance Act of 1949 provided incentives to encourage the construction and conversion of vessels in Canadian shipyards. The act was intended to help develop Canada's shipping and shipbuilding industries by providing two basic incentives to shipowners: accelerated depreciation and tax exemptions. Under the act, beginning January 1, 1949, the owner of a vessel constructed by or for the owner and registered in Canada was allowed to depreciate the vessel for tax purposes over 3 years at a 33-1/3 percent rate. In addition, proceeds from the sale of a ship were not subject to income tax if the money was used to replace the ship by building it in a Canadian shipyard.

### The "Angel Plan"

The 1957 amendments to the 1949 act broadened the scope and made possible what became known informally within the industry as the "angel plan." Nonshipping corporations were able to utilize available tax incentives under the angel plan to enter the shipping industry. These companies became shipowners to take advantage of the act's accelerated depreciation provisions by offsetting the depreciation allowance against income from nonshipping activities. In practice, a company purchased a vessel, leased it to a Canadian vessel operator for 3 years, and wrote off the cost of the ship at 33-1/3 percent each year. When the vessel was fully depreciated, the company sold it to the vessel operator at a mutually beneficial price. Further, the company paid no income tax on the proceeds from the disposition as long as the money was reinvested in another ship. An analysis prepared by the Canadian government's Department of External Affairs estimated that under average corporate

tax circumstances, the angel plan method of vessel financing was equivalent to a 30 percent shipbuilding subsidy. According to Transport Canada ship registry information, between 1961 and 1966, 12 Canadian Great Lakes vessels were built for nonshipping corporations and ownership subsequently transferred to a ship operator within a 3-year period. The effect of the angel plan was to make additional funds available for ship construction.

The Canadian Vessel Construction Assistance Act of 1949 was repealed in 1967. However, the accelerated depreciation provisions of the act were retained and made part of Canada's Income Tax Act. Currently, new vessels constructed in a Canadian shipyard can be depreciated over a 4-year period—16.67 percent in the first and fourth years and 33.33 percent in the second and third years.[7]

## Ship Construction Subsidies

Ship construction subsidies designed to enhance the competitiveness of Canadian-built vessels were provided by the Canadian government under various programs between 1961 and 1985. The initial subsidy rate for commercial vessels was 40 percent; however, when the subsidy ended in June 1985, the rate was 9 percent. Initially, the subsidy was limited to new construction, but in 1976 was extended to conversions of existing vessels. Subsidized vessels were permitted to engage in either foreign or domestic trade.

The subsidy program permitted U.S. operators to build vessels in Canadian shipyards provided the vessels were operated under the Canadian flag. According to a 1969 study of the Great Lakes/St. Lawrence Seaway transportation system, few American operators exercised this option.[8]

Canadian government officials cited a major reason for instituting shipbuilding subsidies was to bridge the gap between the cost of a Canadian-flag ship built elsewhere in the British Commonwealth and that of a comparable vessel built in Canada. Without the subsidy, according to officials of one Canadian fleet, more vessels would have been purchased abroad.

[7]A representative of the Great Lakes Shipowners Association testified during 1963-1964 Senate hearings that, until the 1960's, U.S. Great Lakes operators were required to depreciate a vessel over 50 years in contrast to Canada's 3-year write-off. At the time of the hearings, the depreciation period was 18 years. In 1971, the period was further reduced to 14-1/2 years. Since 1981 vessel operators have been able to depreciate ships over 5 years, according to a shipping company official.

[8]Hazard, John L., The Great Lakes-St. Lawrence Transportation System: Problems and Potential, Upper Great Lakes Regional Commission, Dec. 1969, p. 53.

Canadian shipbuilding subsidies substantially reduced the cost of new vessels on the Great Lakes. According to Canadian Department of Regional and Industrial Expansion data, 59 seaway maximum vessels were constructed with the shipbuilding subsidy between 1961 and 1985. The subsidy totaled $199 million (in Canadian dollars), or about 22 percent, of the total $908 million cost of these vessels. Of these 59 ships, 38 (more than 64 percent) were constructed between 1961 and 1971.

## U.S. Government Assistance Not Available Until 1970

Although the United States has aided its merchant marine through subsidies and other forms of assistance at least since the Merchant Marine Act of 1936 was passed, the programs authorized by the act were generally unavailable to Great Lakes bulk fleet operators until the act was amended in 1970. By this time, the Canadian fleet had gained an edge in the Seaway trade and American operators had little incentive to build seaway maximum vessels. Consequently, subsidy programs designed to offset the competitive advantage enjoyed by foreign competition had little impact on U.S.-flag participation in the U.S./Canada trade. Other government assistance (nonsubsidy) programs were used by Great Lakes operators after 1970 to modernize their fleets for domestic trade.

### Background on U.S. Programs

The U.S. government through MarAd has offered a number of programs which provide direct financial assistance to American shipowners and shipbuilders. The operating differential subsidy (ODS) and the construction differential subsidy (CDS) programs are designed to help American vessel operators maintain a fleet capable of competing with foreign shipping lines. The ODS program provides parity between the operating costs incurred by a U.S.-flag operator and the operating cost incurred by a foreign-flag competitor. The CDS program covers the difference in costs between having a vessel constructed in a U.S. shipyard and having the same vessel constructed in a foreign shipyard up to a statutory limit.[9] The ODS and CDS programs were established by the Merchant Marine Act of 1936. Since inception, U.S. shipbuilders and owners have received ODS payments totalling almost $7.7 billion and CDS payments totalling $3.8 billion. Since fiscal year 1981, no new funds have been provided for either program. ODS payments, however, are still being made for prior agreements.

[9]Before 1970, the maximum CDS rate was 55 percent of vessel cost. The Congress reduced the maximum rate to 45 percent in 1971 and by a 2-percent annual reduction thereafter, until a CDS rate of 35 percent was reached in 1976. The Congress increased the maximum CDS rate to 50 percent in 1976.

In addition to direct subsidies, MarAd administers three other programs—federal ship financing (title XI), capital construction fund (CCF), and the construction reserve fund (CRF). These programs reduce vessel operators' cost of obtaining the capital they need to build new ships.

The federal ship financing program was established by Title XI of the Merchant Marine Act of 1936, as amended. Prior to 1972, title XI insured vessel construction loans or mortgage agreements against default. Because of limited acceptance of title XI obligations by the investment community, the Federal Ship Financing Act of 1972 was enacted to improve the program and attract more private debt capital. Under the act, rather than insuring a loan or agreement from an institutional investor, the U.S. directly guarantees the principal and interest on obligations which are issued to bond holders. This improved the marketability of title XI obligations. The guarantees are generally limited to 75 percent of vessel cost. The program enables owners to obtain long-term financing at lower interest rates. Prior to 1970, loan guarantees were generally used for oceangoing vessels. Of the $1.2 billion in loans guaranteed for the first 33 years of the program through fiscal year 1970, 97 percent were for oceangoing vessels.

The capital construction fund was established by the Merchant Marine Act of 1970. The act provides for the deferral of federal income taxes on eligible deposits placed into the fund. The fund, as well as earnings from the fund, may be used to construct, acquire, or rebuild vessels. Since the program began in 1971, fund holders have deposited $3.9 billion in the fund and have withdrawn $3 billion in the modernization and expansion of the U.S. merchant marine.

The 1936 act, as amended, established the construction reserve fund, like the CCF, encouraged the upgrading of the American-flag fleet. The fund is primarily used by vessel owners who operate along the coasts and inland waterways. Its benefits are not as broad as those of the CCF; at the end of fiscal year 1984, nine companies were participating in CRF, with deposits totalling $6.6 million.

## Subsidy Programs Not Used by the Great Lakes Bulk Fleet

The Merchant Marine Act of 1970 extended operating and construction subsidy programs to Great Lakes bulk vessel operators. Thus, the operators were eligible for the first time to obtain subsidies to help them compete in the U.S./Canada trade. Only one vessel operator, however, took advantage of the ODS program, and no Great Lakes vessels have been constructed with the CDS subsidy.

Canadian-flag dominance of the U.S./Canada trade at the time subsidies became available to U.S. operators discouraged the operators from using the subsidy programs. A 1978 MarAd study,[10] for example, characterized the assistance as "too little—too late" in comparison with past Canadian programs. According to the study, Canadian assistance programs had helped vessel operators design and build seaway maximum ships which permitted the operators to gain control of the iron ore and grain traffic moving through the St. Lawrence Seaway. These ships resulted in U.S. vessels, built before the Seaway opened, not being profitable in this trade. Faced with this competitive disadvantage, the study concluded, no U.S. operator would build a seaway maximum ship.

In addition, subsidized vessels under the CDS program cannot engage in domestic commerce. This, according to a 1979 analysis prepared by MarAd's Office of Ship Operating Costs, was the program's largest barrier on the Great Lakes. Given the dominance of Canadian-flag vessels in the U.S./Canada trade, the requirement that a subsidized vessel be used exclusively in foreign trade reduced the incentive to build a subsidized Great Lakes bulk carrier. In contrast, Canadian vessels built with a subsidy are allowed to operate in both the Canadian domestic or U.S./Canada trade.

ODS program benefits were able to attract one U.S.-flag operator to the U.S./Canada trade. In 1972 a Great Lakes vessel operator was awarded an ODS contract for the U.S./Canada trade. In a 1978 MarAd workshop, a company official said that during the 38 days the company's three subsidized vessels engaged in the U.S./Canada trade, the company earned a profit of $5,510. He added that the company would have earned $34,500 had those same vessels been employed in domestic cargo movements. Another vessel operator at the workshop said that his company had an ODS agreement in 1973 but did not use it because the program requirements were too stringent and costly to administer. Further, a third vessel operator told us that the ODS subsidy rates were not sufficient to eliminate the cost differential between U.S. and Canadian ships.

## American Operators Used Mortgage Guarantee and Tax Deferral Programs

The title XI and CCF programs stimulated significant new building and upgrading of ships after they became available to Great Lakes vessel operators. The first title XI contract was awarded in 1973. Since that

[10]U.S. Department of Commerce, Maritime Administration, Float Opportunities for U.S.-Flag Bulk Operators on the Fourth Seacoast, Great Lakes Region, 1978, pp. 3 and 4.

time, title XI has been used to help finance the construction or modification of 20 Great Lakes vessels. According to a MarAd official, guarantees outstanding at the end of fiscal year 1985 totaled $350.6 million. As of December 1984, the latest period for which MarAd information was available, the CCF program had been used by Great Lakes vessel operators to construct, rebuild, or modify 154 vessels, including 101 dry bulk ships. A 1979 MarAd analysis concluded that the majority of Great Lakes vessels participating in these two programs have operated almost exclusively in domestic trade. According to a MarAd official, the CRF program has not been used on the Great Lakes.

## Other Factors

Canadian operators have certain advantages in terms of traffic patterns, long-term contractual arrangements, and government cabotage policies which help them dominate the U.S./Canada trade.

### Geographic Advantages

The U.S./Canada cargo movements often parallel Canadian domestic traffic making it, as one operator told us, natural for them to have the business. Canadian operators carry both domestic and U.S./Canada cargoes through the St. Lawrence Seaway, American operators carry very little U.S. domestic cargo through this route because there are no American ports on the St. Lawrence River east of the Seaway. In 1984, 45.2 percent of the tonnage crossing the Seaway consisted of Canadian domestic cargo, but none of the traffic that year involved trade between U.S. Great Lake ports and other U.S. ports. This is an economic advantage because Canadian operators have flexibility to carry either domestic or U.S./Canada trade and, as a result, are more likely to carry cargo in both directions. U.S. vessel operators, on the other hand, may have to return empty.

### Long-Term Contracts

A significant part of the trade between the United States and Canada is tied up in long-term contracts between Canadian vessel operators and Canadian buyers of the raw materials. Consequently, it may be difficult for American operators to break into this trade. Coal, as noted in chapter 1, represents about 43 percent of the total trade between the two countries. Most of this coal is imported from the United States by three Canadian steel companies and Ontario Hydro, a provincial utility corporation. An official of one of the Canadian fleets we visited told us that all of the coal destined for Ontario Hydro is carried by Canadian vessel operators under contracts that run for up to 10 years. Further,

according to this official, each of the steel companies is linked to a Canadian vessel operator by a long-term contract. His company, for example, had a contract with one of the steel companies that ran for 25 years, and the contract was renewed for 10 more years when it expired. He said that the contract covered all raw materials purchased by the steel company regardless of whether the materials were bought in the United States or Canada.

## Less Restrictive Cabotage Requirements

Most nations have requirements, known as cabotage laws, to protect their domestic trade from foreign competition. In the United States, Section 27 of the Merchant Marine Act of 1920—commonly referred to as the Jones Act—requires that all cargo moving among U.S. ports be carried on vessels that are domestically registered, built, owned, and crewed by Americans. Canada's Shipping Act has similar restrictions for domestic trade but does not require that vessels be constructed in Canadian shipyards, however, they do have to meet Canadian construction standards. Foreign-built vessels are eligible to engage in Canadian domestic trade after paying duty of 25 percent of the vessel's fair market value.

As a result, Canadian Great Lakes operators have been able to purchase lower-cost foreign vessels and use them for both domestic and U.S./Canada trade. The U.S. fleet cannot do this because foreign-built vessels are not permitted to operate in the domestic trade. The 1985 Greenwood's Guide shows that 18 of the 114 vessels in the Canadian dry bulk fleet were built overseas while none of the vessels in the U.S. fleet were foreign built. Canadian officials told us that most of the overseas vessels were purchased second-hand and rebuilt in Canadian shipyards. According to one study,[11] these second-hand purchases helped Canadian vessel operators because they obtained ships at less cost and in less time than would be possible with new vessels.

[11] University of Toronto/York University Joint Program in Transportation, Marine Transportation Policy Project Final Report, Research Report 48, May 1978, p. 89.

## The American Lake Carrier Industry Has Historically Concentrated on Domestic Trade

As previously discussed, U.S.-flag vessels have had a low level of participation in the U.S./Canada trade. The volume of U.S. domestic trade carried on U.S.-flag vessels is more than twice the volume of U.S./Canada trade. Contributing to this volume of trade is the U.S.-flag vessels focusing their activities on transporting domestic raw materials and larger profits from domestic trade.

Historically, domestic traffic has accounted for the overwhelming volume of tonnage carried by the American Great Lakes fleet. Although, as noted in chapter 2, U.S.-flag vessels carried a greater share of the U.S./Canada trade in the 1950's than they do now, the percentage of U.S./Canada trade to total trade carried on U.S.-flag vessels has remained relatively unchanged. In 1953 of the total cargo carried on U.S.-flag vessels in the combined domestic and U.S./Canada trade, almost 96 percent consisted of domestic cargo moving among U.S. ports. In 1984 the percentage was 97 percent. (See table 3.2.)

**Table 3.2: Domestic Tonnage Compared With Total Tonnage Carried by the American Fleet on the Great Lakes/St. Lawrence Seaway System, 1953 and 1984**

| Fleet | Tonnage | | | Percent domestic |
|---|---|---|---|---|
| | Domestic | U.S./Canada | Total | |
| 1953 | 168.4 | 7.3 | **175.7** | 95.8 |
| 1984[a] | 87.5 | 2.6 | **90.1** | 97.1 |

[a]1984 domestic tonnage is estimated.

Note: Tons are in millions of long tons.

Source: Prepared by GAO from Census Bureau and Corps of Engineers data.

The U.S. fleet concentration on domestic traffic is related to its connection to steelmaking on the Great Lakes. In the late 19th century, iron ore was discovered in Minnesota and northern Michigan. This discovery, according to one study,[12] impacted on the U.S. lake carrier industry. Ore traffic soon dominated the industry and led to the majority of U.S. ships being in "captive" fleets owned by steel and ore companies. Vessels in these fleets were used to carry iron ore and other raw materials used in steelmaking for their steel and mining company owners, and most of the traffic moved between U.S. ports.[13]

[12]Darling, Howard J. and Shaw, Gordon C., The Canadian Lake Shipping Industry Today, University of Toronto/York University Joint Program in Transportation, Aug. 1975, p. 11.

[13]A 1980 MarAd analysis estimated that steelmaking activities generated 77 and 82 percent of the Great Lakes domestic dry bulk trade in 1977 and 1978, respectively.

MarAd's 1978 study on the U.S./Canada trade[14] reported that the American fleet was committed to domestic trade on the Great Lakes. According to the study, the American steel fleets were fully occupied by domestic cargo movements. Further, independent operators were few and their service often supplemented the iron ore carriage of the private fleets. Also, domestic trade was more profitable because there was no foreign flag competition which might drive freight rates down. The study concluded that the commitment of vessels to domestic traffic, among other things, resulted in a lack of interest by American operators in the U.S./Canada trade. The Lake Carriers Association told us that the recent downturn in domestic shipping on the Great Lakes had changed this attitude. Although interest in the U.S./Canada trade had increased, according to the Association, American operator's ability to compete for the trade had not improved.

## Summary

The Canadian Great Lakes fleet controls the U.S./Canada trade for a variety of reasons. For example, Canadian-flag ship costs have historically been lower than American-flag costs for both vessel acquisition and operation. In 1957 one study estimated Canadian wage costs to be 45 percent of those of comparable U.S. vessels while 25 years later, in 1982, another study estimated the disparity to be 54 percent. During the early 1960's when Canadian vessel operators began to modernize their fleets, construction costs in Canada were about 76 percent of those in the United States. These costs differences have enabled Canadian vessel operators to operate at lower costs when transporting commodities between the United States and Canada on the Great Lakes/St. Lawrence Seaway system.

Another reason relates to the type of vessels in the American and Canadian Great Lakes fleets. The majority of vessels in the Canadian fleet have been constructed to seaway maximum dimensions and, therefore, are able to use the Welland Canal and the St. Lawrence Seaway carrying the maximum tonnage possible. Most vessels in the American fleet, in contrast, are either too large to cross the Seaway or too small to carry enough cargo to compete effectively with Canadian seaway maximum ships. Thus, Canadians have an advantage because a significant amount of the U.S./Canada trade—53 percent in 1984—moves through the Welland Canal and/or the St. Lawrence Seaway. Canada's vessel advantage results from the expansion and modernization of the Canadian Great Lakes fleet that began when the Seaway opened.

[14]Maritime Administration, Great Lakes Region, 1978, pp. 7 to 9 and 17.

Differences in the nature and timing of American and Canadian government assistance programs also have had an impact on each country's participation in the trade. Canadian shipbuilding subsidies and fiscal incentives helped vessel operators to finance the expansion of their fleets after the St. Lawrence Seaway opened. By the time comparable U.S. programs became available, the Canadian fleet was firmly rooted in the Seaway trade. Consequently, subsidy programs designed to help U.S.-flag operators maintain a fleet capable of competing with foreign shipping lines did little to help American operators enter the U.S./Canada trade.

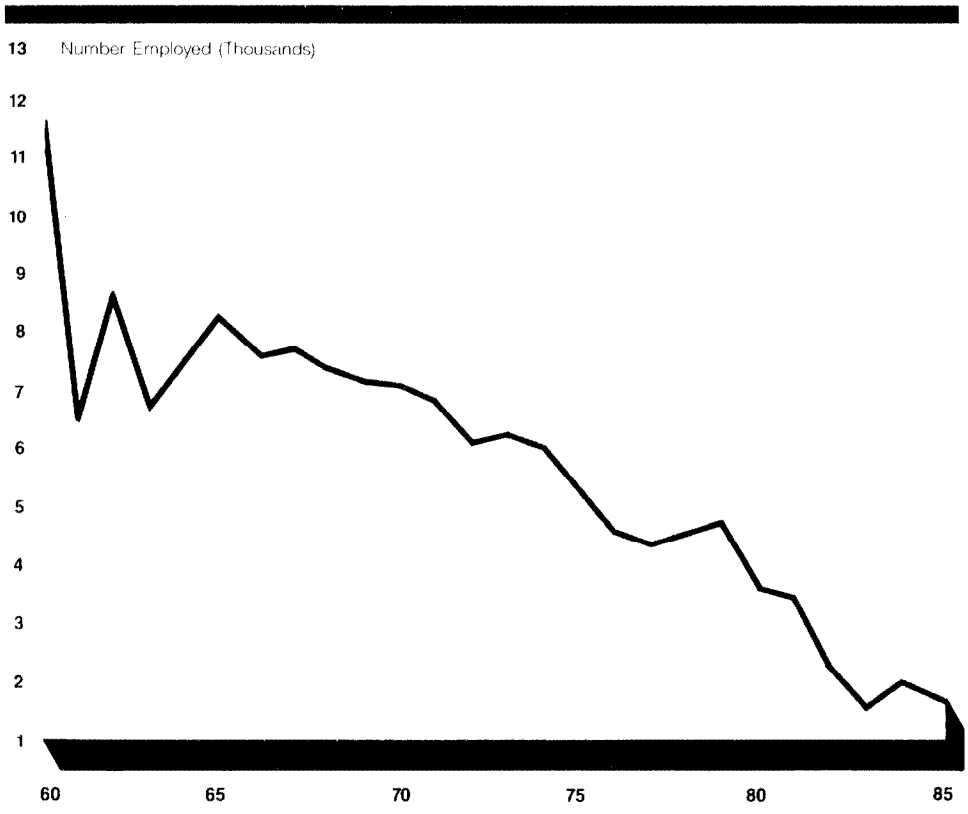
Certain characteristics of the U.S./Canada trade, contractual arrangements, and Canadian cabotage policies have also been beneficial to Canadian operators. Canadian operators are more likely to carry cargo in both directions through the system because they have ports on both sides of the system and thus have the flexibility to carry either domestic or U.S./Canada cargoes. Long-term contractual arrangements between Canadian vessel operators and Canadian purchasers of raw materials effectively preclude U.S.-flag involvement in certain U.S./Canada commodity movements. Finally, less restrictive Canadian cabotage policies allow Canadian operators to import foreign-built, lower cost vessels and use them for either domestic or U.S./Canada trade. However, American fleet operators do not have this flexibility.

U.S.-flag vessels operating on the Great Lakes carry mainly domestic cargo. The volume of this cargo, which is restricted by law to U.S.-flag vessels, is more than twice the volume of U.S./Canada cargo. Historically, the American fleet has been closely tied to the steel industry on the Great Lakes. Because both the origin and destination of raw materials used in steelmaking were on the U.S. side of the Great Lakes, a significant domestic trade developed.

# Information on Maritime Employment on the Great Lakes

Employment opportunities on U.S. ships have declined on the Great Lakes over the last 25 years. According to Maritime Administration statistics, in 1960 there were 11,858 jobs aboard Great Lakes vessels. In 1985 employment was 1,856—an 84-percent drop (see fig. I.1). Although data was not readily available for Canada, vessel operators told us that Canadian shipboard employment has also fallen.

**Figure I.1: U.S. Great Lakes Shipboard Employment, July 1960 to July 1985**




Note: July was selected because it is a representative peak month in the shipping season.
Source: Prepared by GAO from Maritime Administration data.

A number of interrelated factors, such as a decline in U.S. domestic trade, fewer ships on the Great Lakes, newer ships having greater cargo carrying capacity, and technological changes aboard ships, reduced labor requirements. We were not able to quantify the impact of these factors. Table I.1 compares domestic and U.S./Canada tonnages carried by the U.S. Great Lakes fleet for selected years between 1955 and 1984. As the table shows, domestic tonnage fell by 77.5 million tons between 1955 and 1984.

**Table I.1: Comparison of Domestic and U.S./Canada Tonnage Carried on U.S.-Flag Vessels on the Great Lakes/St. Lawrence Seaway, Selected Years, 1955-84.**

| Year | Domestic tons | U.S./Canada tons |
|---|---|---|
| 1955 | 165.0 | 6.1 |
| 1960 | 138.5 | 5.3 |
| 1970 | 140.2 | 3.6 |
| 1980 | 102.8 | 3.2 |
| 1983 | 74.5 | 2.3 |
| 1984 | 87.5 | 2.6 |

Note: Tons in millions of long tons.

Source: Compiled by GAO from Census Bureau and Corps of Engineers data.

As discussed in chapter 2, the number of ships in both the United States and Canadian Great Lakes fleets has declined significantly since 1950 which can impact on shipboard jobs. In February 1970 the President of the Lake Carriers Association testified before the House Merchant Marine and Fisheries Committee that more than 4,000 seamen's jobs were lost during the previous 10-year period because 122 vessels in the U.S. Great Lakes fleet had been scrapped or otherwise eliminated. In addition newer ships have the ability to carry more cargo than older vessels and may also do this without increasing crew size. An American vessel operator told us, for example, that one 1,000-foot vessel replacing smaller ships could result in the elimination of as many as 120 shipboard jobs. Since the early 1970's, 13 1,000-foot vessels have been added to the U.S. Great Lakes dry bulk fleet.

Innovations aboard ship have also reduce labor requirements, according to a study by the Bureau of Labor Statistics.[1] Centralized engine controls and the increased use of diesel engines, instead of steam powered, have lowered the need for engine room personnel. Further, the study reported that the steward's department on a modern ship has fewer people than in 1960 caused, in part, by changes in food preparation, storage, and handling techniques which have reduced the need for cooks and bakers. A Canadian vessel operator told us that similar innovations had occurred in the Canadian Great Lakes fleet, resulting in lost jobs for Canadian crews.

[1]U.S. Department of Labor, Bureau of Labor Statistics, The Impact of Technology on Labor in Five Industries, Washington, D.C., December 1982, pp. 18 to 20.

Technological changes also have reduced minimum crew sizes on newer vessels. A 1978 study of U.S. maritime labor on the Great Lakes[2] indicated that U.S. Coast Guard minimum crew sizes were smaller on new vessels. While not providing specific staffing requirements the study pointed out that the minimum crew requirements on a relatively old vessel might be 23 persons, but a newer, fully automated ship might only have a crew of 14. Total crew size, however, is usually larger because of management decisions and union labor agreements.[3]

[2]Schenker, Eric, Brockel, Harry C., and Wendling, Wayne R., Maritime Labor Organizations on the Great Lakes - St. Lawrence Seaway System, University of Wisconsin Sea Grant College Program, Technical Report 233, January 1978, pp. 63 and 66.

[3]Minimum manning levels are established by the Coast Guard on each ship. Therefore, the requirements cited in the maritime labor study are rules of thumb.

# Organizations GAO Contacted or Visited

## Canada

| | |
|---|---|
| Government | Department of External Affairs<br>Transport Canada<br>Canadian Transport Commission<br>Department of Finance<br>Department of Regional and Industrial Expansion<br>St. Lawrence Seaway Authority<br>Ports Canada |
| Associations | Dominion Marine Association<br>Great Lakes Waterway Development Association<br>Canadian Shipbuilding and Ship Repairing Association<br>Canadian Lake Carriers Association |
| Vessel Operators | Canada Steamship Lines, Inc.<br>Misener Shipping, Limited<br>ULS International, Inc. |
| Other | York University |

## United States

| | |
|---|---|
| Government | Maritime Administration<br>U.S. Coast Guard<br>St. Lawrence Seaway Development Corporation<br>Census Bureau<br>Bureau of Labor Statistics, Department of Labor<br>Corps of Engineers<br>Department of State |
| Associations | Great Lakes Commission<br>Lake Carriers Association<br>Transportation Institute |

| | |
|---|---|
| | U.S. Great Lakes Shipping Association<br>Shipbuilders Council of America |
| Vessel Operators | American Steamship Lines<br>Columbia Transportation Division, Oglebay Norton Company<br>Kinsman Lines, Inc.<br>M. A. Hanna Company/Nipigon Transport, Ltd./Carryore, Ltd.<br>Pickands Mather Company, Moore McCormack Resources<br>U.S. Steel Great Lakes Fleet,ted Steelworkers of America (Great Lakes Seamen) |
| Other | Fraser Shipyards, Inc.<br>Port of Chicago<br>Toledo-Lucas County Port Authority |

# U.S. Canada Trade and the U.S.-Flag-Share of the Trade on the Great Lakes/St. Lawrence Seaway System, 1953 to 1984.

| Year | Combined trade | | | Great Lakes | | | Seaway | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total tons | U.S.-flag tons | U.S.-flag percent | Total tons | U.S.-flag tons | U.S.-flag percent | Total tons | U.S.-flag tons | U.S.-flag percent |
| 1953 | 25,111 | 7,325 | 29.2 | 24,196 | 7,325 | 30.3 | 915 | • | • |
| 1954 | 20,671 | 5,443 | 26.3 | 19,624 | 5,443 | 27.7 | 1,047 | • | • |
| 1955 | 26,083 | 6,054 | 23.2 | 23,990 | 6,053 | 25.2 | 2,093 | 1 | 0.1 |
| 1956 | 31,170 | 8,056 | 25.8 | 28,214 | 8,041 | 28.5 | 2,956 | 14 | 0.5 |
| 1957 | 30,197 | 7,167 | 23.7 | 27,151 | 7,152 | 26.3 | 3,046 | 15 | 0.5 |
| 1958 | 21,832 | 4,639 | 21.3 | 19,805 | 4,632 | 23.4 | 2,027 | 8 | 0.4 |
| 1959 | 27,955 | 6,798 | 24.3 | 22,672 | 6,329 | 27.9 | 5,283 | 469 | 8.9 |
| 1960 | 26,831 | 5,267 | 19.6 | 22,320 | 4,922 | 22.1 | 4,511 | 345 | 7.6 |
| 1961 | 26,391 | 4,196 | 15.9 | 20,593 | 3,979 | 19.3 | 5,798 | 218 | 3.8 |
| 1962 | 30,959 | 5,729 | 18.5 | 22,569 | 5,283 | 23.4 | 8,390 | 446 | 5.3 |
| 1963 | 35,922 | 5,377 | 15.0 | 24,575 | 4,107 | 16.7 | 11,347 | 1,270 | 11.2 |
| 1964 | 41,467 | 6,738 | 16.2 | 26,514 | 4,872 | 18.4 | 14,952 | 1,866 | 12.5 |
| 1965 | 40,839 | 5,006 | 12.3 | 26,591 | 3,881 | 14.6 | 14,248 | 1,125 | 7.9 |
| 1966 | 41,224 | 4,645 | 11.3 | 26,819 | 3,535 | 13.2 | 14,405 | 1,110 | 7.7 |
| 1967 | 40,244 | 7,071 | 17.6 | 25,150 | 5,517 | 21.9 | 15,094 | 1,554 | 10.3 |
| 1968 | 44,718 | 5,616 | 12.6 | 26,930 | 3,975 | 14.8 | 17,788 | 1,642 | 9.2 |
| 1969 | 40,190 | 2,132 | 5.3 | 26,413 | 2,057 | 7.8 | 13,777 | 75 | 0.5 |
| 1970 | 45,491 | 3,569 | 7.9 | 28,570 | 3,450 | 12.1 | 16,921 | 120 | 0.7 |
| 1971 | 39,166 | 2,424 | 6.2 | 26,240 | 2,296 | 8.8 | 12,926 | 128 | 1.0 |
| 1972 | 39,386 | 3,216 | 8.2 | 26,800 | 2,821 | 10.5 | 12,586 | 395 | 3.1 |
| 1973 | 45,484 | 3,652 | 8.0 | 26,750 | 2,900 | 10.8 | 18,734 | 752 | 4.0 |
| 1974 | 37,589 | 5,018 | 13.4 | 23,658 | 3,622 | 15.3 | 13,931 | 1,396 | 10.0 |
| 1975 | 41,791 | 3,961 | 9.5 | 27,010 | 2,904 | 10.8 | 14,780 | 1,058 | 7.2 |
| 1976 | 48,040 | 4,540 | 9.5 | 28,430 | 2,892 | 10.2 | 19,610 | 1,648 | 8.4 |
| 1977 | 47,345 | 5,407 | 11.4 | 27,347 | 3,395 | 12.4 | 19,998 | 2,012 | 10.1 |
| 1978 | 45,383 | 4,029 | 8.9 | 28,449 | 2,725 | 9.6 | 16,934 | 1,303 | 7.7 |
| 1979 | 51,110 | 3,304 | 6.5 | 32,918 | 2,563 | 7.8 | 18,192 | 742 | 4.1 |
| 1980 | 45,077 | 3,193 | 7.1 | 29,795 | 2,850 | 9.6 | 15,282 | 343 | 2.2 |
| 1981 | 47,917 | 4,055 | 8.5 | 29,572 | 3,247 | 11.0 | 18,345 | 808 | 4.4 |
| 1982 | 36,643 | 2,386 | 6.5 | 25,974 | 2,209 | 8.5 | 10,669 | 177 | 1.7 |
| 1983 | 35,410 | 2,330 | 6.6 | 26,679 | 2,322 | 8.7 | 8,731 | 8 | 0.1 |
| 1984 | 40,109 | 2,576 | 6.4 | 30,953 | 2,553 | 8.3 | 9,156 | 23 | 0.3 |

Notes: Tons in thousands of long tons. Years 1964 to 1966 estimated by GAO. Welland Canal traffic included in Great Lakes statistics. Combined trade totals may not equal sum of Great Lakes and Seaway route figures due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Waterborne Foreign Trade, 1953 to 1963; U.S. Waterborne Exports and Imports, 1964 to 1984.

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