

No. 331  
October 1996

**Analysis of Overseas Vessel Transits into the Great Lakes  
and Resultant Distribution of Ballast Water**

by

Rendall B. Farley



Department of Naval Architecture  
and Marine Engineering  
The University of Michigan  
Ann Arbor, Michigan 48109

The findings and opinions expressed in this paper are those of the author,  
and do not necessarily reflect those of the U.S. Coast Guard.

## ABSTRACT

The introduction of nonindigenous species into the Great Lakes has caused grave economic and ecological damages to the entire region. It is thought that a primary vector for release of threatening species arises from the ballast discharges of vessels originating from overseas ports, and to a lesser degree, vessels which originate from the North American seaboard. Of particular concern are those vessels entering fully loaded, with “no ballast on board” (NOBOB), which through normal operations mix and discharge Great Lakes freshwater with unpumpable residuals left in “empty” tanks. In this study, a model of vessel ballasting operations is applied to all overseas vessel transits of the 1995 shipping season in order to quantify the amount and location of ballast transfers taking place within the Great Lakes. Results for 1995 are also aggregated to overseas and domestic traffic data over the past several years. The model demonstrates that although a large portion of ballast discharges are made in the major grain ports, significant risks for foreign species introduction exist throughout the Great Lakes.

## TABLE OF CONTENTS

ABSTRACT .....	ii
LIST OF FIGURES .....	iv
LIST OF TABLES .....	v
NOMENCLATURE .....	vi
1. DATA COLLECTION .....	1
2. BALLAST DISTRIBUTION MODELING .....	1
3. CAPACITY ESTIMATION AND PARAMETRIC ANALYSIS .....	4
4. RESULTS .....	12
5. DISCUSSION .....	19
6. CONCLUSIONS .....	23
REFERENCES .....	24
APPENDIX A: Sample Customs Forms 1400 and 1401 .....	25
APPENDIX B: Transit Forecasts Calculations .....	32
APPENDIX C: Database Entered from Lloyd's Register and GLC Listings Data .....	35
APPENDIX D: GLC Listings .....	57

## LIST OF FIGURES

FIGURE	page
1. Comstock's Chart .....	5
2. Saunder's Chart .....	6
3. Watson and Gilfillan's Chart .....	7
4a. Total Deadweight vs. Overall Length .....	9
4b. Brake Horsepower vs. Total Deadweight .....	9
4c. Fuel Deadweight vs. Brakehorsepower .....	10
4d. Froude Number vs. Total Deadweight per BHP .....	10
4e. Beam vs. Total Deadweight per Overall Length .....	11
4f. Draft vs. Total Deadweight per Overall Length .....	11
5. Ballast Loaded into Overseas BOB and NOBOB Vessels, 1995 .....	15
6. Ballast Discharged from Overseas BOB and NOBOB Vessels, 1995 .....	15
7a. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Duluth-Superior, 1995 .....	16
7b. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Thunder Bay, 1995 .....	16
7c. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Chicago, 1995 ..	17
7d. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Detroit, 1995 ....	17
7e. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Toledo, 1995 ...	18
7f. Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Burns Harbor, 1995 .....	18
8. Annual Ballast Discharges for Domestic and Overseas Traffic, 1982-1997 .....	20
9. Overseas Vessel's Ballast Discharges, 1995-1997 .....	20

## LIST OF TABLES

TABLE	page
1. Transit Statistics for 1995 .....	2
2. Transfer of Ballast under a "Uniform Cargo Unloading" Assumption .....	3
3. Transfer of Ballast under a "Uniform Cargo Loading" Assumption .....	4
4. Missing Data Statistics .....	12
5. Total Port to Port Ballast Movement, 1995 .....	13
6. Total Lake to Lake Ballast Movement, 1995 .....	14
7. Ballast Capacity Comparisons .....	21
8. Summary of Uncertainty Factors .....	22

## NOMENCLATURE

$C_b$	=	Block Coefficient
$C_p$	=	Longitudinal Prismatic Coefficient
$C_{vp}$	=	Vertical Prismatic Coefficient
$C_{wp}$	=	Waterplane Coefficient
$C_x$	=	Midship Coefficient
$W_m$	=	Miscellaneous Weight = weight of lube oil + water + provisions + crew
$W_{fo}$	=	Weight of Fuel (sum of high and low viscosity)
$DWT_t$	=	Total Deadweight
$DWT_c$	=	Cargo Deadweight = $DWT_t - W_{fo} - W_m$
$\Delta_{fl}$	=	Displacement at Full Load Condition
$\Delta_{ball}$	=	Displacement at Ballast Condition (no load)
LS	=	Weight of Lightship = $\Delta_{fl} - DWT_t$
$W_{ball}$	=	Weight of Ballast
B	=	Moulded Breadth
T	=	Maximum Draft
$T_{ball}$	=	Draft at Ballast Condition (no load)
$T_{fl}$	=	Draft at Full Load Condition
L	=	Length between Perpendiculars (LPP)
$F_n$	=	Froude Number
$V_k/\sqrt{L_f}$	=	Speed to Length Ratio (knots/foot <sup>1/2</sup> )

## **1. DATA COLLECTION**

All collected data fell under two primary categories of transit and ship characteristics data, and was entered into a computer spreadsheet application, sorted alphabetically by vessel name. Transit data was based on several listings prepared by Dr. Albert G. Ballert of the Great Lakes Commission (GLC), generated by cross-referencing daily transit reports of various government agencies and port authorities throughout the Great Lakes. The listings provided the following information for all overseas vessels entering the Saint Lawrence Seaway for the 1995 season:

1. Vessel's name, flag of registry, and overall length.
2. Upbound and downbound dates of passage through the Eisenhower Lock, and type of cargo onboard at time of passage.
3. Total number of transits through the 1995 season.
4. For each transit, a sequential listing of port stops made, and respective dates.

Due to sensitivity concerns, Seaway and port authorities would not disclose types and quantities of cargo transfers, or ballasting operations made at or between ports of call.

The second main resource was Lloyd's Register of Ships (1995-1996), which was used to form a large database of ship's principal dimensions and characteristics. Of the 222 vessels listed by the GLC, 204 main entries were found in Lloyd's Register (91.9%), which accounted for 401 of the 437 total transits for the 1995 season (91.8%).

## **2. BALLAST DISTRIBUTION MODELING**

Although the average port stops per transit was only 2.3, some overseas vessels stopped in as many as 7 ports before returning to sea. Many transits involve partial loading and unloading of a variety of cargoes, in a variety of ports--and accordingly can be expected to ballast and deballast along the routing, depending on a variable loading condition. A reasonable estimation of the changing loading condition could not be directly obtained from the data, however, since specific quantities of cargo transfers at each port were unavailable. Therefore, a uniform model was needed for a vessel's ballasting and deballasting operations, as it traveled from port to port.



Development of the model was based on generalized trends observed in the transit data, with the primary goal of capturing a conservative, broad view of risk potential throughout the Great Lakes.

An overview of the GLC listings indicates that a large portion of the traffic operates in a NOBOB condition into its first port call, unloads most or all of its cargo, ballasts, and then proceeds to its second and last port call, where it deballasts and loads grain or another commodity for the return leg overseas. For vessels which stop in a larger number of ports, the distribution of the initial cargo is not easily determined, but the great majority also return to sea fully loaded from their last port. From these observations, it follows that the model should incorporate the dominant

**Table 1: Transit Statistics for 1995**

Transits by loading condition	Number	% of Total
Transits entering "in ballast"	68	15.6
Transits entering NOBOB, departing "in ballast"	41	9.4
Transits entering NOBOB, departing NOBOB	328	75.1
Total transits made for 1995	437	100

Transits by Ship Type	Number	% of Total
Bulk Carrier	316	72.3
Tanker	46	10.5
General Cargo	42	9.6
Heavy-Load Carrier	4	0.9
Ro-Ro Cargo	2	0.5
Unknown	36	8.2

Ship/Transit Characteristics	Average	Std. Deviation
No. of transits per vessel	1.98	1.25
No. of ports per transit	2.27	1.17
Overall Length (m)	165	31.5
Molded Breadth (m)	21.7	2.4
Maximum Draft (m)	9.5	1.4
Total Deadweight (tonnes)	22,062	9,066
BHP	8,706	2,936
Speed (knots)	14.6	1.4

trend of departing the Great Lakes in a fully loaded condition. Additionally, it should make logical simplifying assumptions for the distribution of the initial cargo and any intermediate cargos along the routing, since accurate estimation of these transfers on a case-by-case basis is at best highly subjective.

One way of handling the problem is to assume that the initial cargo is evenly unloaded among the port stops made throughout a particular routing. Under this assumption, shown in Table 2, a vessel ballasts proportionately at each port, until it arrives in the last port fully ballasted, where it then fully deballasts and loads cargo for the return trip overseas. Since the apparent trend of unloading a majority of the initial cargo in the first port is not followed, this model can be expected to underestimate the quantity of ballast taken on in typical arrival ports (such as Hamilton), overestimating the ballast discharged in typical departure ports (such as Duluth), and underestimating by far the amount of ballast discharged to other intermediate ports. Such results, although producing conservative, high-end estimates for discharges in the major grain ports, would effectively “hide” the risk associated with ballast discharges to other intermediate ports throughout the Great Lakes, which is undesirable.

**Table 2: Transfer of Ballast under a “Uniform Cargo Unloading” Assumption**

# ports for transit	% of ballast capacity	from port #	to port #
1	none	-	-
2	100%	1	2
3	50%	1	3
	50%	2	3
4	33%	1	4
	33%	2	4
	33%	3	4
			... etc.

Another possibility is to assume that each vessel unloads all its cargo in the first port stop, and then loads cargo proportionately along the routing, returning to sea in a fully loaded condition. Under this assumption, shown in Table 3, each vessel fully ballasts in its first port stop, and then

proportionately deballasts this water to the other ports along the routing, as it sequentially loads cargo. Although this model can be expected to overestimate ballasting in arrival ports and underestimate deballasting in departure ports, it captures a broader picture of risk throughout the Great Lakes, because it incorporates discharges to intermediate ports as well. By virtue of this aspect, the “uniform loading” model was selected for use.

Exceptions to the model were made for vessels that entered or departed the Great Lakes in a ballasted condition. Vessels arriving in ballast were assumed to discharge “foreign” ballast in their respective port stops, while vessels departing in ballast were assumed to unload cargo in all ports, therefore making no discharges at any port.

**Table 3: Transfer of Ballast under a “Uniform Cargo Loading” Assumption**

# ports for transit	% of ballast capacity	from port #	to port #
1	none		
2	100%	1	2
3	50%	1	2
	50%	1	3
4	33%	1	2
	33%	1	3
	33%	1	4 . . . etc.

### 3. CAPACITY ESTIMATION AND PARAMETRIC ANALYSIS

Use of the ballast distribution model requires a baseline of known values for each vessel’s weight of ballast in the no-load condition, which unfortunately is not included in the standard entries for Lloyd’s Register. In order to obtain a conservative estimate for this unknown quantity, we begin with draft criteria recommended by Ship Design and Construction, for cargo vessels in heavy weather or long runs:

$$\text{bow} \quad T_{\text{ball}} \geq 0.6T_{\text{fl}}$$

$$\text{stern} \quad T_{\text{ball}} \geq 0.8T_{\text{fl}}$$

Therefore, mean draft criteria should be  $T_{\text{ball}} \geq 0.7T_{\text{fl}}$ . Entering Comstock’s chart (Fig. 1) with 70% of full load draft shows that  $0.6\Delta_{\text{fl}} \leq \Delta_{\text{ball}} \leq 0.7\Delta_{\text{fl}}$ , for  $0.65 \leq C_{\text{vp}} \leq 1.0$ . If a small range

From: "Charts for Light-Draft Form Characteristics"  
 By John P. Comstock  
 Marine Engineering and Shipping Age  
 November 1926

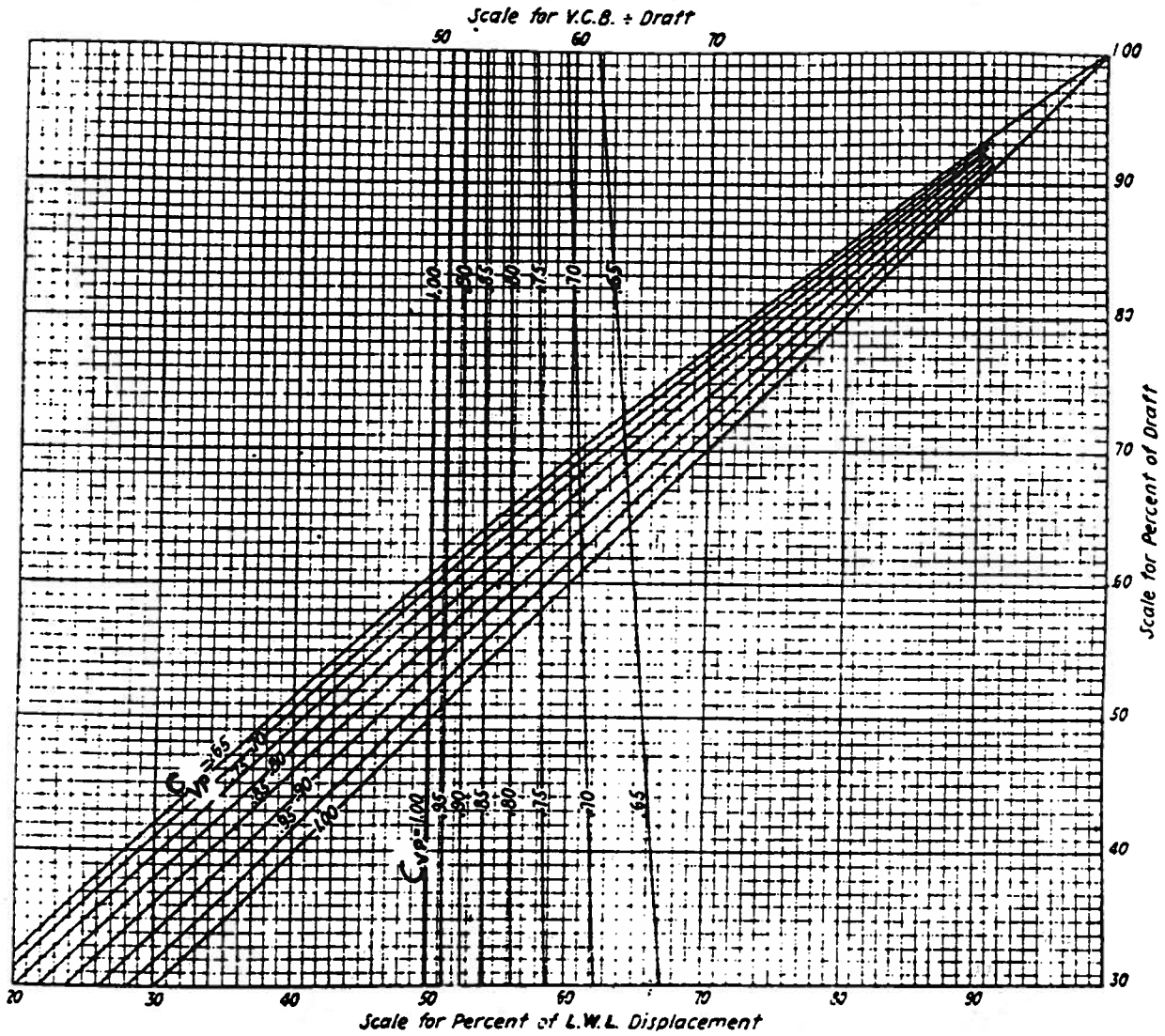
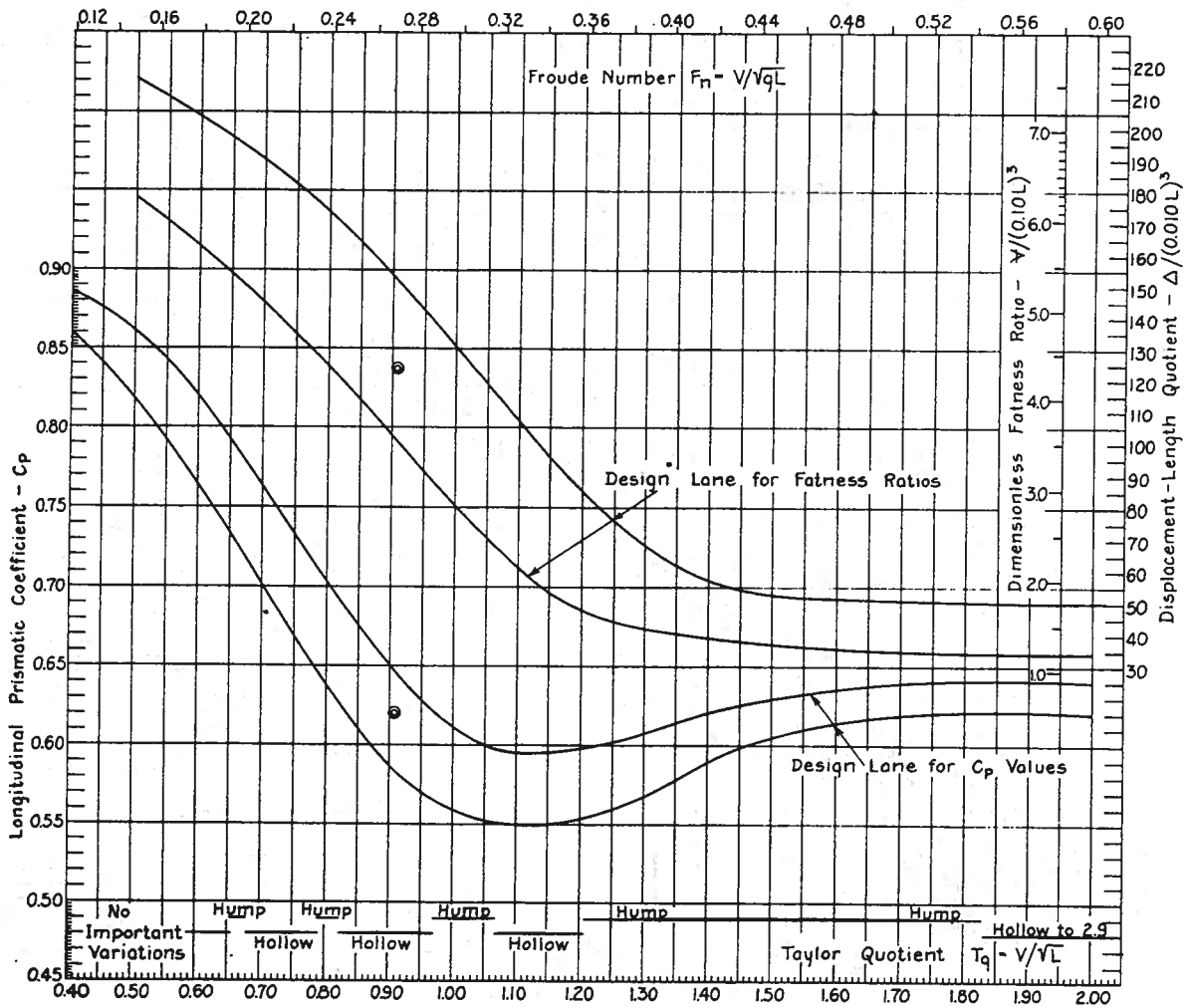


Chart showing displacement in terms of load waterline displacement, and V. C. B. in terms of draft, at light drafts

$$\text{Based on vertical prismatic coefficient} = \frac{C_{VP}}{VP} = \frac{\text{volume of displacement}}{\text{area L. W. L.} \times \text{draft}} = \frac{\text{block coefficient}}{\text{water plane coefficient}}$$

Figure 1: Comstock's Chart

of  $C_{vp}$  is determined, the respective percentage of full load displacement is narrowed as well, which may then be used to derive an estimate for the weight of ballast. Since by definition,  $C_{vp} = C_b / C_{wp}$ , reasonable values for block and waterplane coefficients are required. According to Watson and Gilfillan (Fig. 3),  $V_k / \sqrt{L_f} \approx 0.7$  for bulk carriers and cargo ships. Entering this speed to length ratio in Saunders' recommendation for  $C_p$  design lanes (Fig. 2), shows that



**FIG. 66.A DESIGN LANES OF PRISMATIC COEFFICIENT, DISPLACEMENT-LENGTH QUOTIENT, AND FATNESS RATIO**  
 The design lane for fatness ratios should have one or more upper branches for tugs, fishing vessels, patrol boats, and similar craft in the  $T_q$  range of about 1.00 and above. However, these lanes are not well defined and are not shown here. The design lanes of Fig. 66.H, and those of Fig. 66.J through 66.N, embody the prismatic coefficient  $C_p$  as one of the principal parameters. The  $C_p$  values on the referenced graphs apply generally to the region of  $T_q = 0.4$  through  $T_q = 1.20$  of the "Design Lane for  $C_p$  Values" of the present figure; in other words, to the left-hand branch only.

**Figure 2: Saunder's Chart (reprinted with permission)**

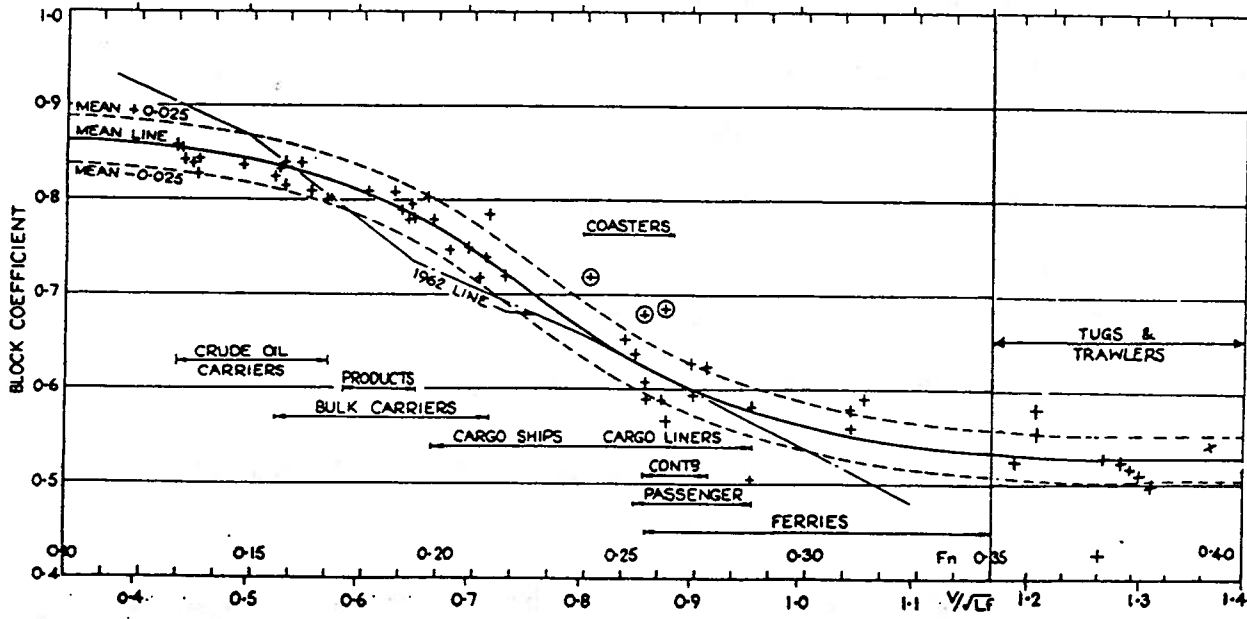


Fig. 32. Extension of Fig. 5(a) to include Small Trawlers and Tugs

Figure 3: Watson and Gilfillan's Chart (reprinted with permission)

$C_p \approx 0.75$ . For series 60 vessels,  $C_{wp} = 0.18 + 0.86 C_p$  (Parsons), which yields  $C_{wp} \approx 0.825$ .

By definition,  $C_x = C_p / C_b$ , ( $C_x \leq 1$ ), and therefore for consistency, we require that  $C_p \geq C_b$ .

Returning to Watson's chart with this constraint,  $C_b \approx 0.73$ , which therefore yields

$C_{vp} \approx 0.73 / 0.825 \approx 0.885$ . The vertical prismatic coefficient should remain fairly stationary over

a small range of block coefficients, which can be reasonably expected from the group of similar

cargo ships under study. Therefore, entering arguments of  $C_{vp} \approx 0.885$  and  $T_{ball} \geq 0.7T_{fl}$  in

Comstock's chart yields

$$\Delta_{ball} \approx 0.665 (\Delta_{fl}) \tag{1}$$

Derivation of ballast weight from (1) follows from basic definitions:

$$W_{ball} = \Delta_{ball} - W_{fo} - W_m - LS \tag{2}$$

$$\Delta_{fl} = DWT_t + LS = (DWT_c + W_{fo} + W_m) + LS \tag{3}$$

Substitution of (1) and (3) into (2) yields

$$W_{\text{ball}} = 0.665 (DWT_c) - 0.335 (W_{\text{fo}} + W_m + LS) \quad (4)$$

Since cargo and lightship weight are dependent quantities, use of (4) requires values for four unknowns: full-load displacement, total deadweight, weight of fuel, and miscellaneous weights.

Townsin provides a useful relation for Watson's mean line, which may then be used to obtain full-load displacement:

$$C_b = 0.70 + 0.125 \cdot \tan^{-1} \left( \frac{23 - 100 \cdot F_n}{4} \right), \quad (5)$$

$$\text{where } F_n = V / \sqrt{gL} = V_k / \sqrt{L_m} * (0.2976)$$

$$\begin{aligned} \Delta_{\text{fl}} &= LBT * (C_b) * (\text{Shell and Appendage Allowance}) * (\text{SW Density}) \\ &= LBT * (C_b) * (1.005) * (1.025) \end{aligned} \quad (6)$$

From basic design principles, miscellaneous weight may be adequately approximated as a linear relation to total deadweight (Parsons):

$$W_m = 0.0025 (DWT_t) + 125 \quad (7)$$

In order to use equations (4) - (7), values for length, beam, draft, Froude number, total deadweight, and weight of fuel must be known. Although the great majority of this information was obtained directly from the given data, almost 10% of all transits were carried out by vessels unlisted in Lloyd's Register. For these cases, only the vessel's length was known, as provided by the GLC listings. Additionally, some main entries in Lloyd's were incomplete--providing most, but not all of the required information. Where data was listed by Lloyd's Register, the actual values given were used in the calculations of (4) - (7). For cases of non-existent or incomplete entries, best fit regressions of the available body of data were used to obtain estimates. In each case, the best parametric relations were determined empirically through trial and error (Fig. 4). The use of the regressions allows for an estimate of ballast weight for all overseas transits made during the 1995 season, since length is known for 100% of the vessels (total deadweight is derived from length, brake horsepower is derived from total deadweight, fuel weight is derived from brake

### Total Deadweight vs Overall Length

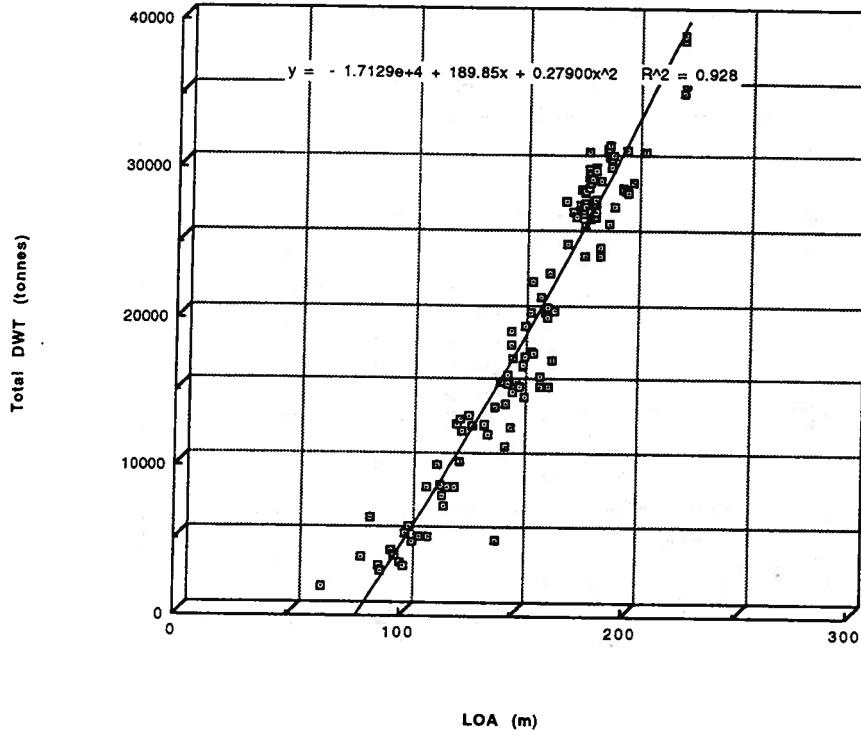


Figure 4a

### Brake Horsepower vs Total Deadweight

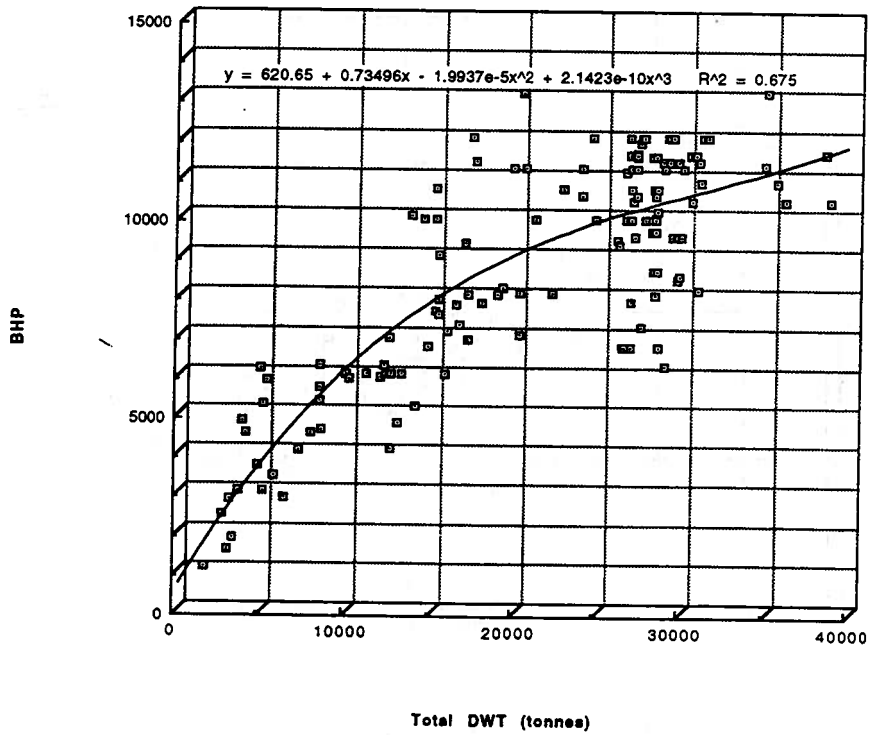


Figure 4b



Fuel Deadweight vs Brakehorsepower

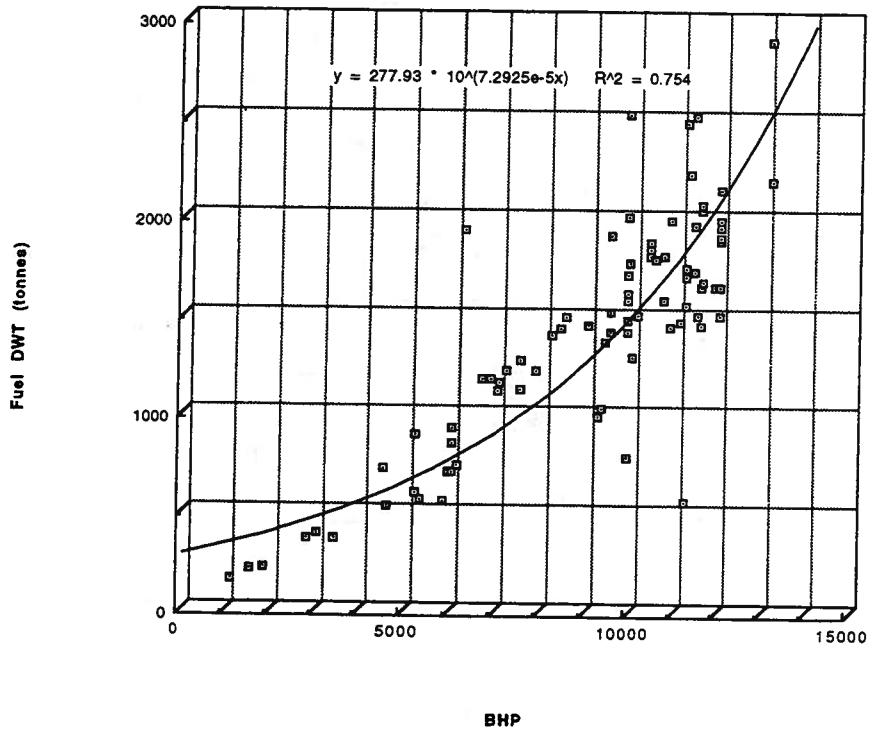


Figure 4c

Froude Number vs Total Deadweight per BHP

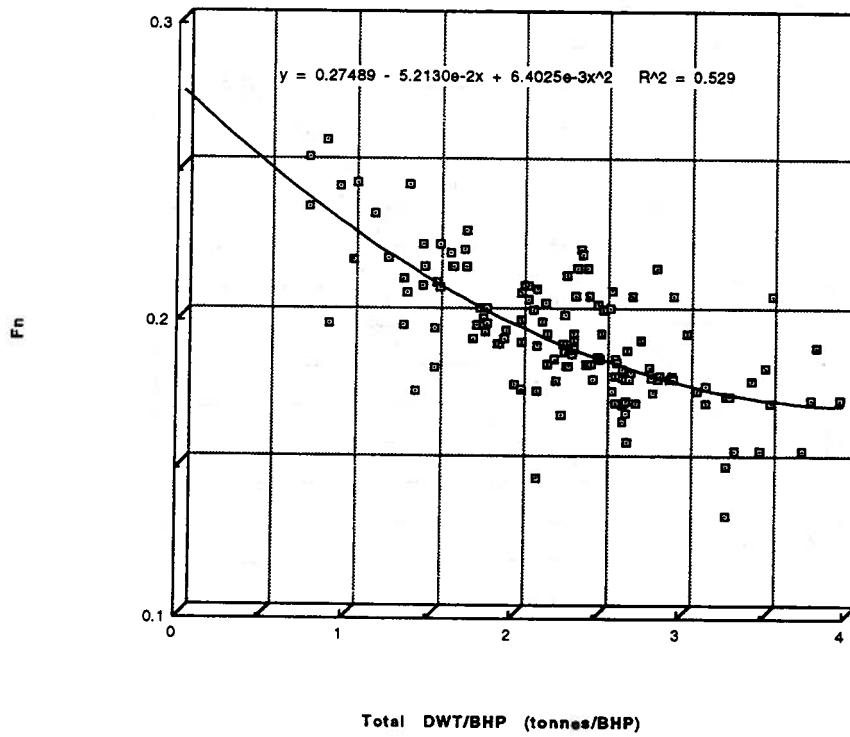


Figure 4d

Beam vs Total Deadweight per Overall Length

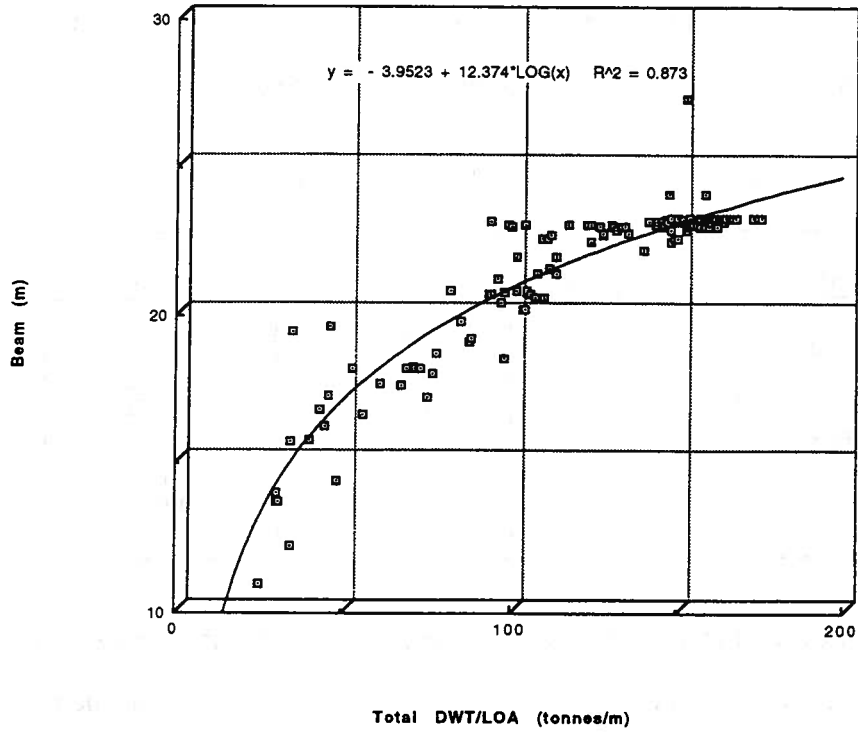


Figure 4e

Draft vs Total Deadweight per Overall Length

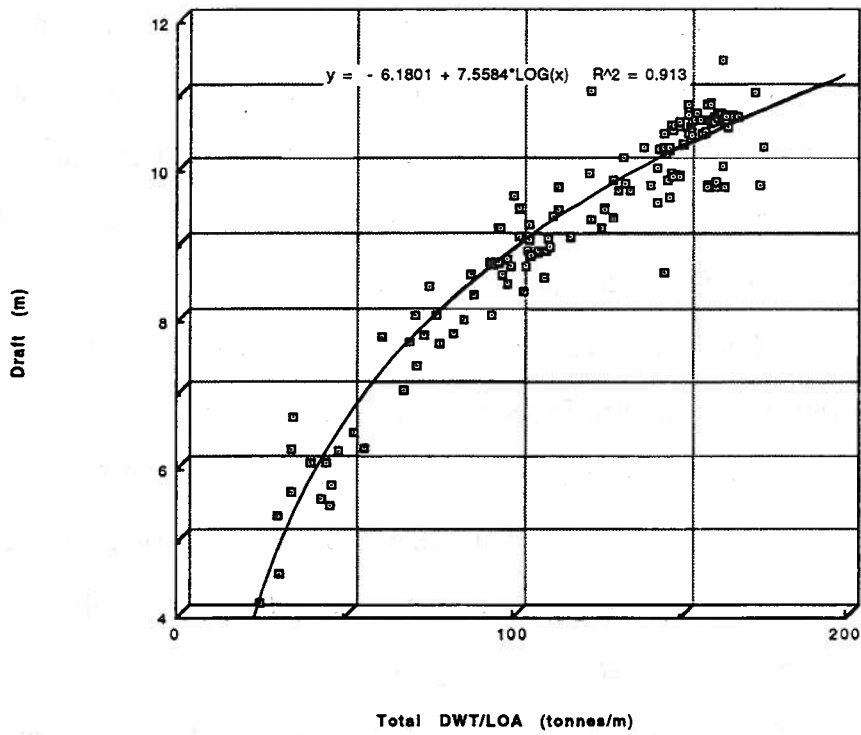


Figure 4f

horsepower, etc.). The following table gives an overview of the relevant missing data (out of 437 total transits), and the correlation coefficients for the relations used to approximate them:

**Table 4: Missing Data Statistics**

Data Element	# transits missing data	% missing from total	correlation coefficient
Total Deadweight	43	9.8	0.928
Brake Horsepower	40	9.2	0.675
Weight of Fuel	201	46.0	0.754
Froude Number	69	15.8	0.529
Beam	36	8.2	0.873
Draft	36	8.2	0.913

After results were obtained, an optimization procedure which minimized error revealed that  $W_{ball} = 0.49 * DWT_t$  most closely approximates the values given by the previous method.

#### 4. RESULTS

Results of the distribution model were placed in a port-to-port matrix format (Table 5), which shows the discrete quantities of ballast transferred for all possible port-to-port vectors. Classifying each port of this matrix by lake and taking summations forms the lake-to-lake matrix of Table 6. Note that for both tables, "foreign" denotes the discharge of water which originated outside the Great Lakes--presumably seawater--but potentially foreign freshwater as well, if the vessel failed to exchange ballast at sea in accordance with regulations. According to the model, nearly 45% of all ballast loading occurred in Hamilton and Cleveland (Fig. 5), while almost 41% of all deballasting occurred in Duluth-Superior and Thunder Bay (Fig. 6). Additionally, results indicate that of the 4.4 million tonnes of ballast discharged during 1995, vessels entering NOBOB accounted for nearly 3.7 million tonnes (84%). With the exception of Duluth-Superior and Thunder Bay, ballast from Hamilton and Cleveland accounted for well over half of all ballast discharged in each of the significant discharge ports (Fig. 7).

Data on transits made per month, and total annual transits made by overseas and domestic vessels over the last several years, were also provided by the GLC. Division of the total ballast

Table 5: Total Port to Port Ballast Movement, 1995

Ballast in tonnes	Port Receiving Ballast from Overseas BOB or NOBOB Vessel																		Totals	%								
	Ashabula	Burns Harbor	Chicago	Clarkson	Cleveland	Detroit	DuSuth-Superior	Erie, PA	Green Bay	Goderich	Hamilton	Ludington	Menominee	Milwaukee	Ogdensburg	Oshawa	Port Huron	Sarnia			Sault Ste. Marie	Thunder Bay	Toledo	Thorold	Toronto	Windsor		
foreign	13,444	2,991	894	0	0	34,263	195,183	0	25,546	66,705	6,913	0	0	14,040	23,485	27,363	0	31,867	5,803	195,441	66,539	0	0	4,784	0	716,462	16.26%	
Ashabula	0	38,109	0	0	0	20,995	34,022	0	0	0	0	2,658	0	14,311	7,088	0	0	0	0	71,995	0	0	0	0	0	190,778	4.33%	
Burns Harbor	0	0	20,887	0	13,064	20,232	79,773	0	0	4,412	0	0	0	61,871	0	0	0	0	9,441	15,376	0	1,086	0	0	0	239,295	5.43%	
Chicago	0	26,249	0	0	0	21,221	63,101	0	0	0	0	0	0	7,366	0	0	0	6,837	50,756	0	0	1,086	0	0	0	188,647	4.28%	
Clarkson	0	0	0	0	0	2,616	0	0	0	2,616	0	0	0	0	0	0	0	1,156	0	0	0	0	0	0	0	6,889	0.14%	
Cleveland	0	82,317	184,774	0	0	110,531	82,702	0	8,155	0	6,625	0	0	56,634	4,170	0	4,170	6,875	105,445	0	75,431	0	0	0	0	785,703	16.70%	
Detroit	0	15,386	102,795	0	648	284	104,540	0	0	1,867	6,236	0	0	17,407	2,592	9,762	2,592	0	14,821	95,764	54,735	0	0	0	5,755	435,276	9.88%	
DuSuth-Superior	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Erie, PA	0	0	2,485	0	0	2,485	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,970	0.11%	
Green Bay	0	0	4,361	0	0	1,744	5,014	0	0	4,361	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,479	0.35%	
Goderich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%	
Hamilton	0	79,549	132,707	1,156	80,657	132,029	191,465	0	3,212	9,648	5,010	0	0	68,369	0	0	0	45,544	226,660	0	101,704	3,243	0	36,705	12,215	1,175,291	26.67%	
Ludington	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Menominee	0	0	2,289	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,289	0.05%	
Milwaukee	0	0	19,478	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,489	0	0	0	0	1,900	0	0	21,378	0.49%	
Nankoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,489	0.24%	
Ogdensburg	0	0	0	0	0	5,273	5,273	0	0	5,493	1,699	0	0	0	0	0	1,699	0	0	0	5,273	0	0	0	0	0	26,805	0.61%
Oshawa	0	4,957	3,231	0	0	22,404	2,499	0	2,499	0	1,699	0	0	0	0	0	0	0	0	0	4,957	0	0	0	0	0	40,846	0.93%
Oswego	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Port Huron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Sarnia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Sault Ste. Marie	0	0	15,511	0	0	15,376	0	0	0	0	0	0	0	0	0	0	0	0	0	28,421	0	0	0	0	0	0	59,308	1.35%
Thunder Bay	0	4,255	4,970	0	18,862	19,699	3,662	0	0	2,970	0	0	0	0	0	0	0	0	0	2,801	4,255	0	0	0	0	0	60,875	1.36%
Toledo	0	0	1,867	0	0	15,992	64,513	0	10,179	0	0	0	0	0	0	0	0	0	0	1,667	13,673	0	0	0	0	0	118,306	2.68%
Thorold	2,361	21,758	9,710	0	17,933	18,295	54,492	0	5,645	40,994	0	0	0	5,348	0	0	0	0	0	61,478	31,083	13,220	0	0	8,215	296,832	6.78%	
Toronto	0	2,877	20,636	0	0	0	0	2,877	14,125	0	0	0	0	5,125	0	0	0	0	0	5,125	3,214	0	0	0	0	14,516	3.23%	
Windsor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53,980	1.23%	
Total	15,805	278,449	526,595	1,156	131,164	405,660	931,220	5,493	14,234	138,467	26,573	4,357	245,106	8,461	44,701	37,124	8,461	102,248	37,240	860,720	286,431	17,649	43,290	40,700	4,406,498	100.00%		
% of Total	0.36%	6.32%	11.95%	0.03%	2.98%	9.21%	21.13%	0.12%	0.32%	3.14%	0.60%	0.10%	5.56%	0.19%	1.01%	0.84%	0.19%	2.32%	0.85%	19.53%	8.77%	0.40%	0.98%	0.92%	100.00%	100.00%		

Table 6: Total Lake to Lake Ballast Movement, 1995

Ballast in tonnes from \ to	Lake Receiving Ballast from Overseas BOB or NOBOB Vessel							Total	% of Total
	Lake Erie	Lake Huron	Lake Michigan	Lake Ontario	Lake Superior	Total	% of Total		
overseas	113,946	56,913	26,839	122,337	396,426	716,462	16.3%		
Lake Erie	316,894	46,405	570,569	27,849	530,352	1,492,070	33.9%		
Lake Huron	-	-	-	-	-	-	0.0%		
Lake Michigan	82,129	6,837	135,135	19,125	223,863	467,089	10.6%		
Lake Ontario	472,284	103,998	347,260	113,176	634,851	1,671,568	37.9%		
Lake Superior	-	-	15,511	-	43,798	59,308	1.3%		
<b>Total</b>	<b>985,253</b>	<b>214,153</b>	<b>1,095,314</b>	<b>282,487</b>	<b>1,829,290</b>	<b>4,406,498</b>	<b>100.0%</b>		
<b>% of Total</b>	<b>22.4%</b>	<b>4.9%</b>	<b>24.9%</b>	<b>6.4%</b>	<b>41.5%</b>	<b>100.0%</b>			

Figure 5: Ballast Loaded into Overseas BOB and NOBOB Vessels, 1995

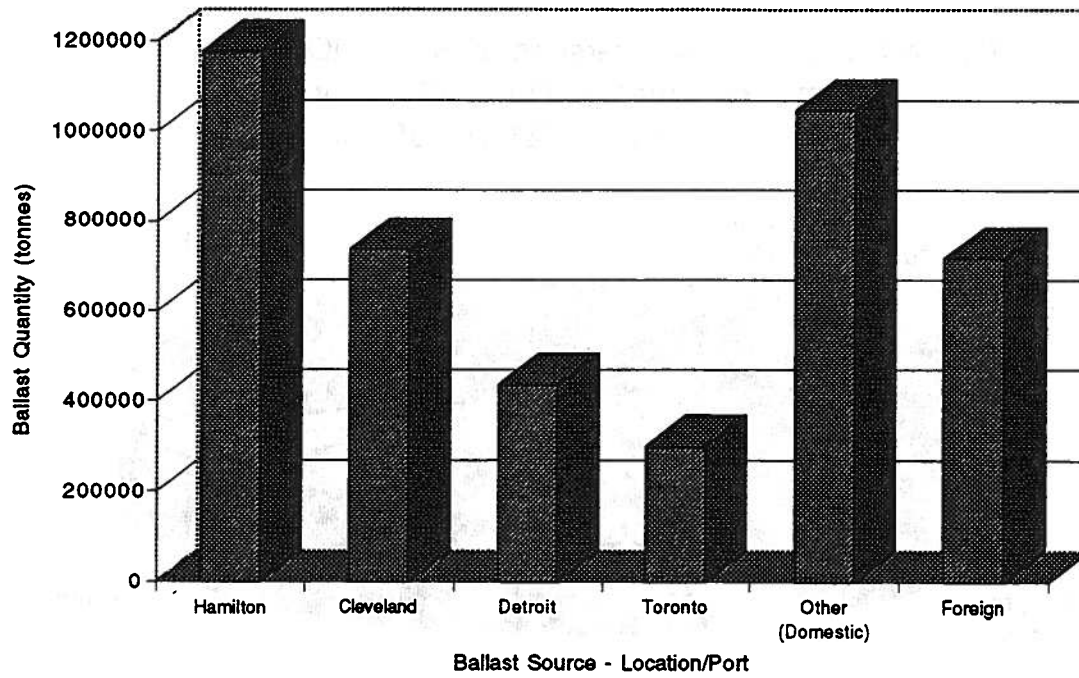
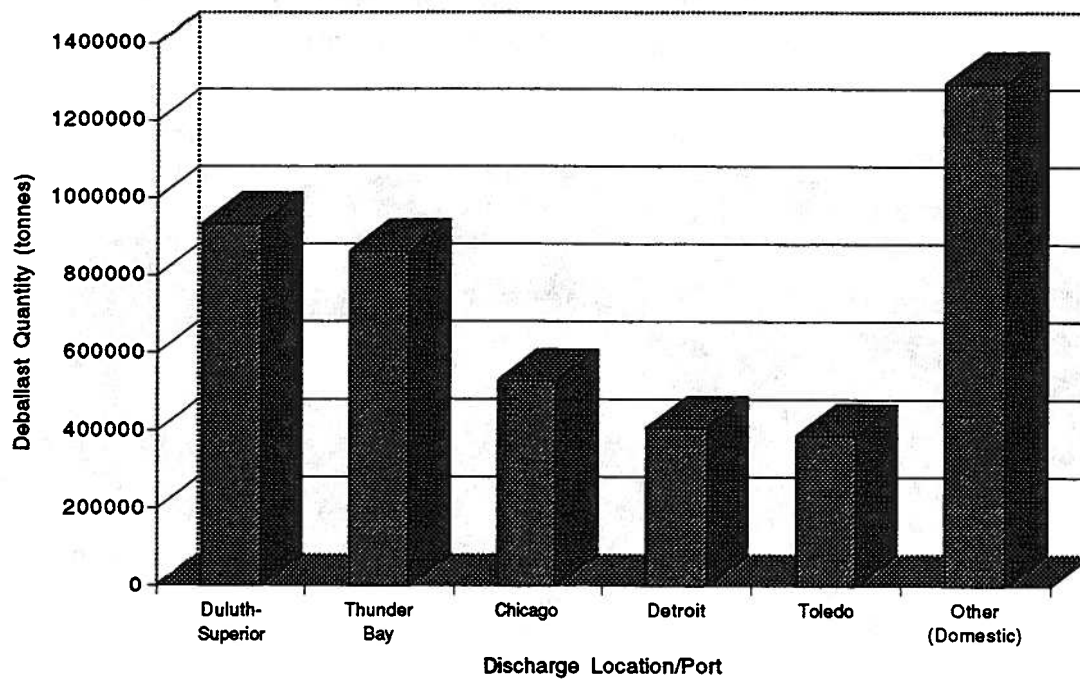
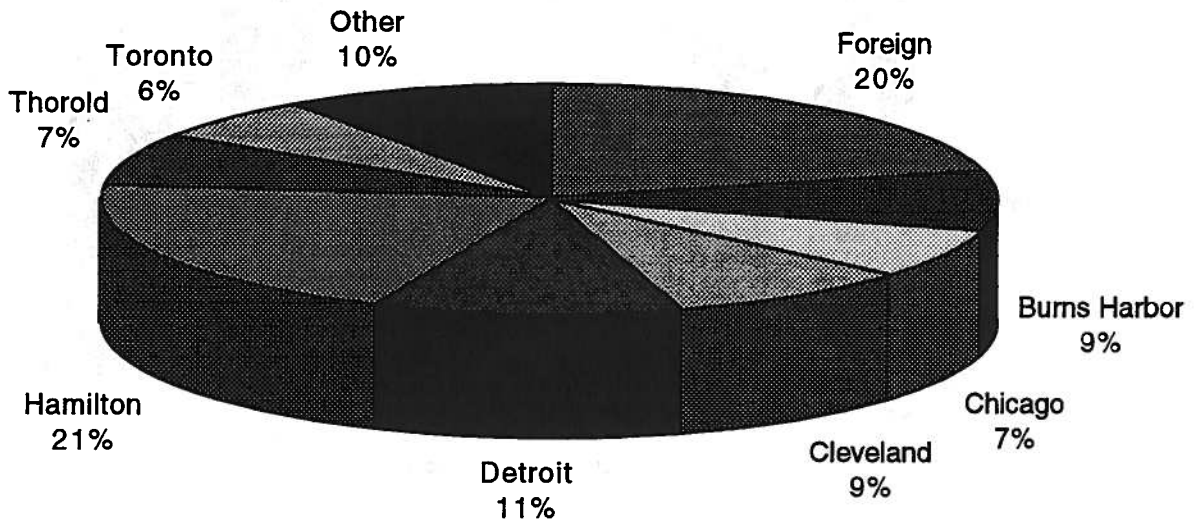


Figure 6: Ballast Discharged from Overseas BOB and NOBOB Vessels, 1995



**Figure 7a: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Duluth-Superior, 1995**  
 931,218 tonnes (21.1% of total)



**Figure 7b: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Thunder Bay, 1995**  
 860,730 tonnes (19.5% of total)

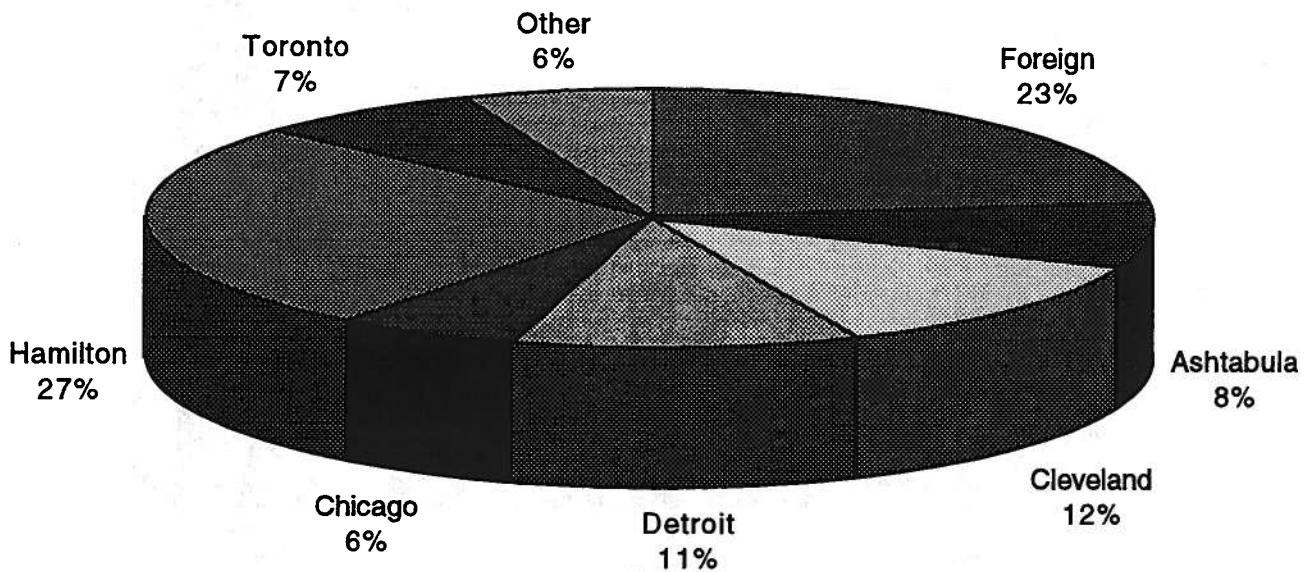


Figure 7c: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Chicago, 1995  
 526,595 tonnes (12.0% of total)

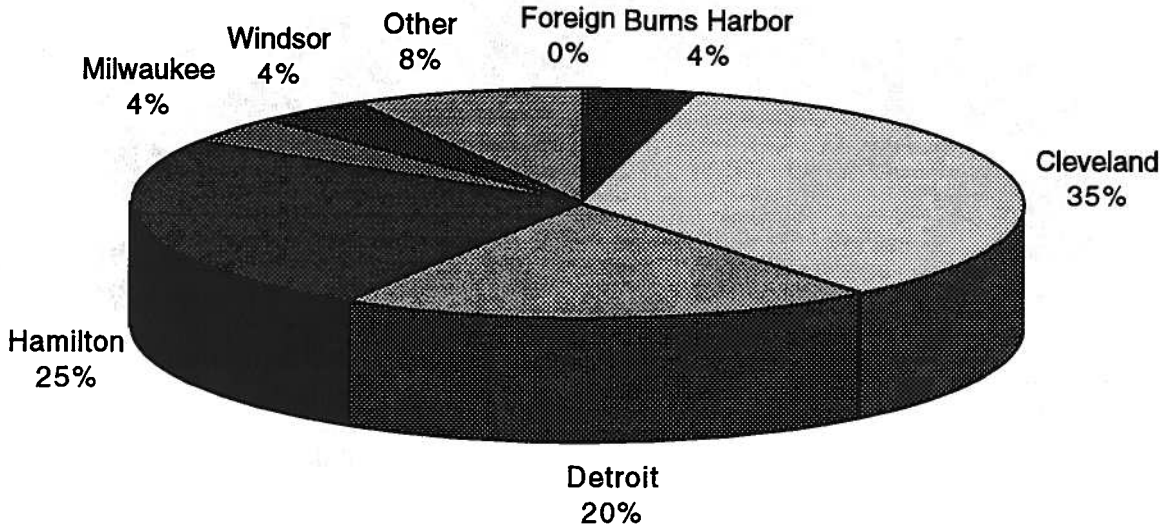


Figure 7d: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Detroit, 1995  
 405,660 tonnes (9.2% of total)

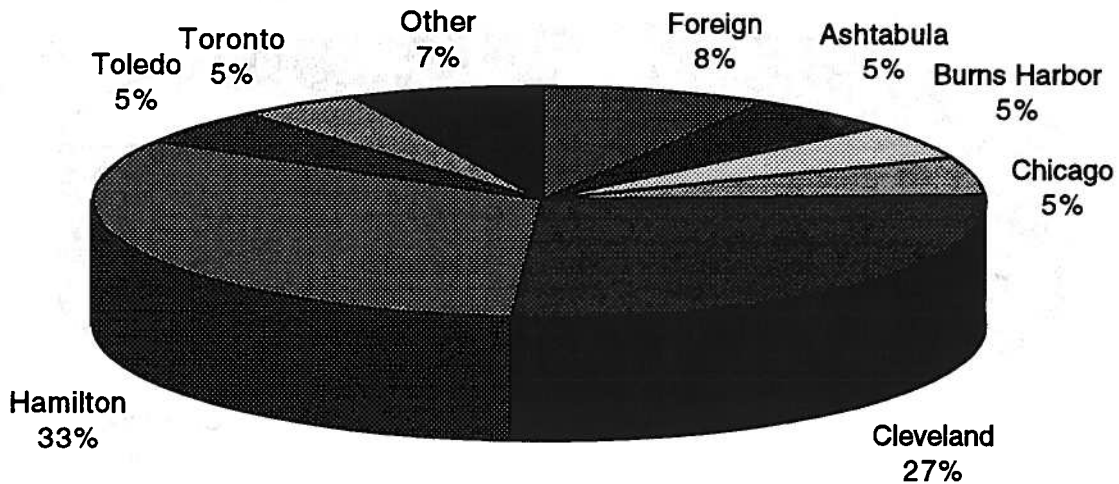




Figure 7e: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Toledo, 1995  
 386,431 tonnes (8.8% of total)

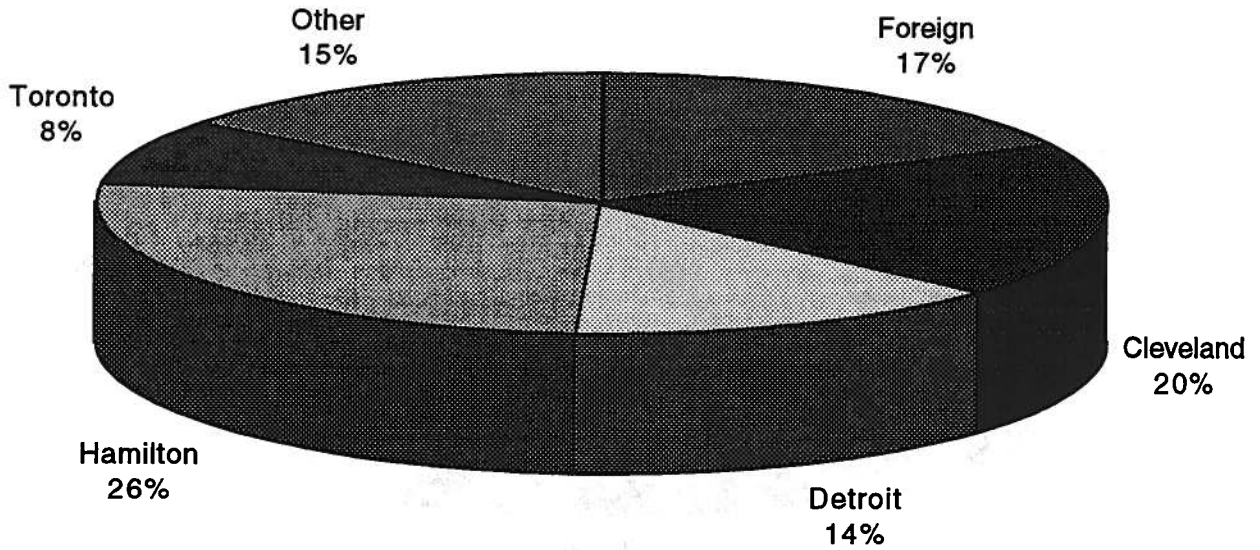
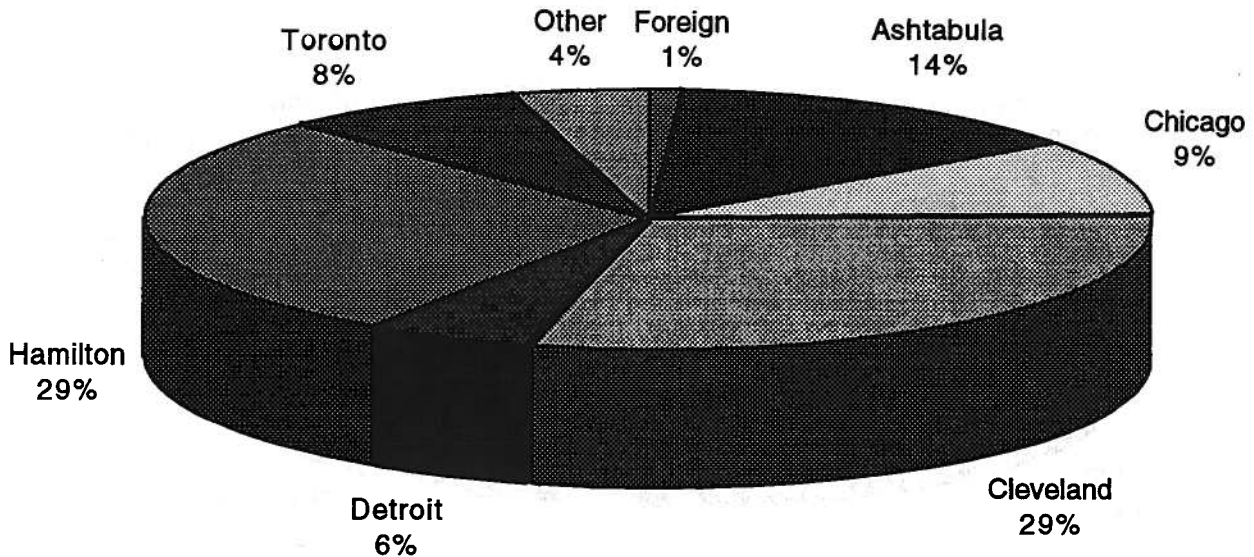


Figure 7f: Sources of Overseas BOB and NOBOB Vessel Ballast Discharged at Burns Harbor, 1995  
 278,449 tonnes (6.3% of total)



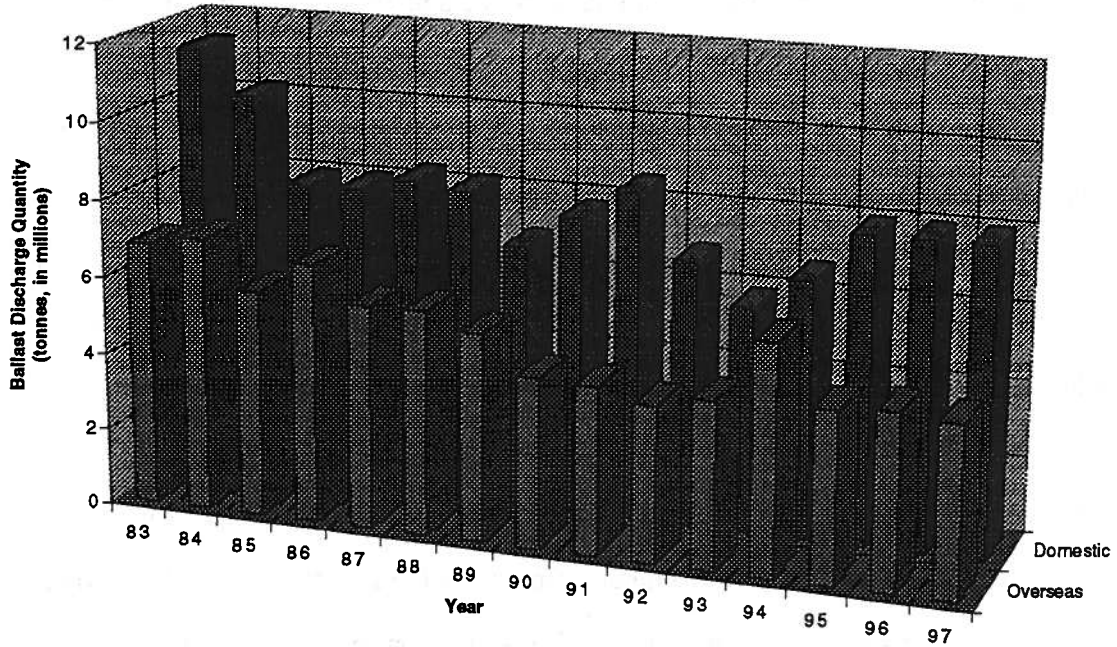
discharged by the total number of transits for 1995 yields an average total ballast discharge per transit of 10,083.5 tonnes. Application of this value to the aggregate transit data for previous years results in the rough estimates for ballast discharge quantities shown in Figures 8 and 9. The justification for application to “domestic” lakers--vessels which made transits that originated outside the Eisenhower Lock, but native to North America--is based on the knowledge that these vessels are typically of equal or greater size than the overseas vessels. Ballast transfers made by vessels which do not leave the Great Lakes are not included in the given quantities. Although these ships make significant cross-transfers of ballast from lake to lake, from the standpoint of risk prevention they are of lesser concern, since they make no contribution to the original introduction of foreign species. Figure 9 clearly shows the sharp rise in ballast discharges as the trading reaches it's peak in October through November, somewhere in the vicinity of 700,000 tonnes per month. Discharge levels shown for 1996 and 1997 are based on forecasting methods of double exponential smoothing, with trend factors in both cases, and a seasonality factor for the monthly discharges shown in Figure 9 (see Nahmias).

## 5. DISCUSSION

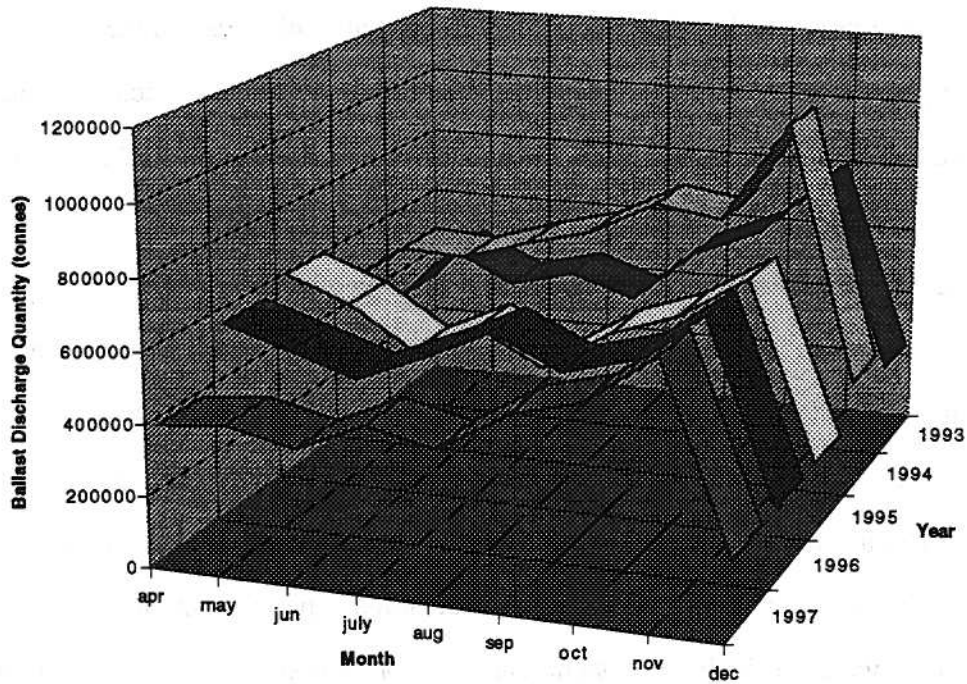
The quality of the results mainly depends on the full-capacity estimates and the assumptions made for ballasting operations. A small sample of listed ballast capacities for selected double-hulled overseas vessels was provided by the St. Lawrence Seaway Authority. As shown in Table 7, comparison of these values indicates that the model generally overestimates ballast capacity by roughly 20%. Realistically, the overestimation is further amplified by the assumption of universal ballasting for heavy-weather. By this measure, estimations of overseas vessel's total ballast discharges (4.4 million in 1995), should be viewed as conservative. The same can not necessarily be said for the discharges in individual ports, due to the effects of ballast distribution assumptions.

The absence of actual ballasting operations data makes it difficult to judge how well the ballasting assumptions represent the real world. However, some apparent disparities bear to be pointed out. To begin with, it's likely that a significant fraction of vessel traffic more closely approximates the “uniform unloading” model, rather than the “uniform loading” model used. That

**Figure 8: Annual Ballast Discharges for Domestic and Overseas Traffic, 1982-1997**



**Figure 9: Oversea Vessel's Ballast Discharges, 1995-1997**



is, a portion of the traffic distributes part of its initial cargo to “intermediate” ports, and/or makes transfers of intermediate cargoes from the arrival ports. The implication is that estimates for both ballasting in arrival ports and deballasting in intermediate ports are exaggerated, and that discharges to departure ports are low. This is somewhat mitigated, however, by the disparity between the mechanics of the model and common-sense ballasting practice. To illustrate, suppose that a vessel made three port stops on its transit. In this scenario, the model assumes that the vessel transfers all its initial cargo to the first arrival port, proceeds to the second port in a ballasted condition (at 70% full-load draft), where it then loads half of its full-cargo capacity and discharges half of its ballast. In this condition, the vessel travels to its third and final port, where it discharges the remaining ballast water and loads cargo to full capacity for the return voyage overseas. In contrast to the model, if half of the cargo were actually loaded, most ships would probably discharge more than 50% of the ballast water in the second port. Loading 50% of cargo

**Table 7: Ballast Capacity Comparisons**

Vessel	Listed Ballast Capacity (tonnes)	Model's Calculated Value
Alam United	7735	13705.95
Alidon	2158	2289.24
Altair	1300	832.74
Anna	8900	13376.63
APJ Anjli	9051	13528.46
Areito	2204	6556.23
Arma	5347	6685.43
Asia Trader	4744	11855.51
Aurora Topaz	10952	13236.86
Barbara E	1274	1453.45
Barbara H	13000	15200.24
Beluga	9800	10812.99
Federal Dora	14588	13336.92
Federal Fraser	19000	18977.32
Federal Inger	15620	14687.79
Fjordnes	7850	6913.39
Great Laker	9070	14124.58
Kapitonas Dubinin	5200	5603.91
Karen D	3000	3235.82
Lake Michigan	16700	21976.25

capacity alone brings the ship to about 50% of full-load draft, and therefore retaining half of the ballast water together with half of the cargo results in a draft deeper than 70% of full load. Since fuel efficiency generally increases with lighter drafts, it's likely that discharge of about 70% of the ballast would occur instead (assuming a 70% full-load draft is retained).

All things considered, ballasting in arrival ports and deballasting in intermediate ports should be viewed as conservative, although with a lesser degree of certainty for the intermediate ports. Although many of the effects listed in Table 8 indicate that deballasting in departure points are high as well, the data is dominated by transits of three ports or fewer per transit, which makes it seem likely that the "low" effect of (3) has considerable influence. Therefore, estimates for deballasting in typical departure ports may in fact be understated. Results for ballast discharges in arrival ports are most likely conservative, since we can expect vessels entering "in ballast" to dominate these discharges, which the model properly incorporates. Of lesser concern is the ballasting in intermediate and departure ports, since the action from intermediate ports indicates only a rough measure of cross-transferring (vice original introduction), and for the relatively rare instances of ballasting at departure ports, the water is carried out of the Great Lakes, presumably to be discharged overseas or during mid-ocean seawater exchange.

**Table 8: Summary of Uncertainty Factors**

Factor	<u>Implies results for ( ) are:</u>		
	ballasting in arrival ports	deballasting in intermed. ports	deballasting in departure ports
(1) Calculations overestimate ballast capacity	high	high	high
(2) Not always bad weather	high	high	high
(3) Some traffic approximates "uniform unloading" model	high	high	low
(4) Model mechanics vs. common-sense practice	-	low	high

Ports of origin for the overseas vessels were not listed by the GLC, but from personal knowledge, Dr. Ballert stated that approximately 70% of the overseas vessels utilize a triangular trading pattern between the Great Lakes, the Mediterranean, and the seas of Northern Europe. The bulk of these vessels deliver grain from the Great Lakes to various areas of the Mediterranean including Egypt, Morocco, Algeria, and Italy. From the Mediterranean, the vessels steam in ballast to the North Sea, the Baltic Sea, and to some degree the North Atlantic along the Spanish coast, where steel is loaded for delivery to the Great Lakes--principally Hamilton, Cleveland, Chicago, and Detroit. Therefore, the majority of NOBOB vessels enter the Great Lakes directly from Northern Europe, but contain tank residuals mainly from the ballasting operations throughout the Great Lakes and the Mediterranean. A more detailed survey of overseas port origins and departures could be undertaken through cross-referencing U.S. Customs forms 1400 and 1401 in major arrival and departure points in the Great Lakes.

## **6. CONCLUSIONS**

Since the distribution model assumes “uniform cargo loading” after the first port, ballast discharges found for major departure points such as Duluth and Thunder Bay are probably understated, and ballast loading for major arrival points such as Hamilton and Cleveland are most likely overstated. Although it’s possible that discharges found for intermediate ports are conservative as well, the lack of specific data to compare with the model’s ballast distribution assumptions makes these results less certain. Overall, at least a fair measure of risk for species introduction exists throughout the Great Lakes, but most prominently in the major grain ports of Duluth-Superior and Thunder Bay. In the final analysis, access to actual cargo or ballast transfer information appears to be necessary for results with a higher level of certainty.

## REFERENCES

1. Ballert, Albert G. Various reports for the Great Lakes Commission concerning overseas vessel traffic entering the Saint Lawrence Seaway and the Great Lakes. Compiled with cooperation from the St. Lawrence Seaway Development Corp., the St. Lawrence Seaway Authority, various port agencies, the U.S. Customs Service, and the U.S. Corps of Engineers.
2. Comstock, John P., "Charts for Light-Draft Form Characteristics," Marine Engineering and Shipping Age, Nov., 1926.
3. Lloyd's Register of Ships, 1995-1996, London (three volumes).
4. Nahmias, Steven, Production and Operations Analysis, 2nd Ed., Irwin, 1993.
5. Parsons, Michael G., "Informal Course Notes for NA 470 Ship Design," Department of Naval Architecture and Marine Engineering, University of Michigan, 1996.
6. Reeves, Eric and Weathers, Katharine, "The Defense of the Great Lakes against the Invasion of Nonindigenous Species in Ballast Water," Sept., 1995.
7. Saunders, Harold E. Hydrodynamics in Ship Design, Vol. II, The Society of Naval Architects and Marine Engineers, 1957.
8. Taggart, R. (ed.), Ship Design and Construction, The Society of Naval Architects and Marine Engineers, 1980.
9. Watson, D.G.M. and Gilfillan, A.W. "Some Ship Design Methods," Transactions RINA, 1976.

**Appendix A: Sample Customs Forms 1400 and 1401**



RECORD OF VESSELS ENGAGED IN FOREIGN TRADE—ENTERED OR ARRIVED UNDER PERMIT TO PROCEED

DEPARTMENT OF THE TREASURY

UNITED STATES CUSTOMS SERVICE

433 CR

(1) Date (Month)	(2) File or Manifest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE FROM (Port and Country)		(5) Natio- nality of Vessel (Flag) Trade & Net Tonnage	(6) Type of Cargo Transaction D. L. N. X. F. Y. (See Footnote 3)	(7) Dock	(8) Maximum Draft	(9) Number of Passen- gers Disem- barking
			(a) First Foreign Port and Country Entering Direct From	(b) All Other Foreign Ports and Countries					
JULY 19 96	01 254	M/V LAKE CHARLES #8418734 BRITISH STEEL SHIPPING	MILWAUKEE, WISCONSIN		MARS 5 9415	HALL D	ISLANDS IROQUOIS	5.86 M	C-20
	01 255	M/V ALGONORTH #341240 SEAWAY BULK CARRIERS	SEPT. ILES, QUEBEC		CANA 2 13083	DIAN D	INLAND-2 IND. HAR.	26/7	C-22
	02 256	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	GODERICH, ONTARIO		CANA 2 1114	DIAN D	NO. AMER. SALT	26/0	C-30
	03 257	S/S QUEBECOIS #319265 SEAWAY BULK CARRIERS	QUEBEC CITY, QUEBEC		CANA 2 12741	DIAN D	BETHLEHEM STEEL	26/8	C-25
	03 258	M/V BLUE MOON #1253 SHERIMAR MANAGEMENT	DETROIT, MICHIGAN		PANA 5 4360	MA D&L	FMT	23/0	C-24
	04 259	M/V MAPLEGLLEN #188395 P & H SHIPPING	QUEBEC CITY, QUEBEC		CANA 2 13138	DIAN D	BETHLEHEM STEEL	26/6	C-22
	05 260	M/V ZIEMIA GNIEZNIE #1625 POLISH STEAMSHIP CO	NSKA CLEVELAND, OHIO		POLI 5 9014	SH D	FMT	7.12 M	C-24
	05 261	M/V AGAWA CANYON #331081 SEAWAY SELF UNLOADERS	GODERICH, ONTARIO		CANA 2 1261	DIAN D&F	NO. AMER. SALT	26/0	C-31
	05 262	M/V GREAT LAKER #9195 CANADIAN FOREST NAV	DETROIT, MICHIGAN		MYAN 5 9293	MAR D	IROQUOIS	23/0	C-26
	05 263	M/V KAPITONAS KAMIN #239 BRODIN SHIPPING K/B	SKAS DETROIT, MICHIGAN		LITH 5 4903	UANIA D	CERES NORTH	7.50 M	C-20
	05 264	M/T TURID KNUITSEN #LAOH4 NESTE OY SHIPPING	SARNIA, ONTARIO		NORW 2 6238	EGIAN D	IROQUOIS ANCHOR	6.85 M	C-18
	06 265	M/V FEDERAL CALLIOPE #10270 FALLINE MONTREAL	MILWAUKEE, WISCONSIN		GREEK 5 10174	D	FMT	24/0	C-29
	06 266	M/V CANDIAN PROGRESS #328735 SEAWAY SELF UNLOADERS	CONTRECOEUR, QUEBEC		CANAD 2 16608	IAN D	LTV STEEL	26/6	C-30
	06 267	M/V FEDERAL AALESUND #N/A FEDNAV INTERNATIONAL	PRAIA MOLE, BRAZIL		NORWEGIAN 2 9816	D	LAKES & RIVERS	26/2	C-21
	08 268	M/V HERCEGOVINA #7413751 CANADIAN FOREST NAV	MONTREAL, QUEBEC		MALTA 2 12579	D	IROQUOIS	26/0	C-27
	08 269	M/V POLYDEFKIS #7400338 CANADIAN FOREST NAV	ROSTOCK, GERMANY		GREEK 2 11209	D	LAKES & RIVERS	26/0	C-26
	09 270	M/T STOLT ASPIRATIO #8610019 STOLT-NIELSEN INC.	N VALLEYFIELD, QUEBEC		LIBERIA 2 4080	D	STOLT TERMINAL	21/0	C-25
	09 271	B: CHIEF WAWATAM #805396 PURVIS MARINE LTD.	SAULT STE MARIE, ONTARIO		CANAD 2 2891	IAN D	RESERVE IRON	18/6	C-08

1—Note—Column (3) Indicate type of vessel code, e. g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tanker; SC for scows; and G for small gas vessels.  
 2—Indicate type of trade—Direct from Foreign Ports: Ballast—1; Bulk—2; General—3; Via other Domestic Ports: Ballast—4; Bulk—5; General—6.  
 3—Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D—Will discharge import cargo at this port (Import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry, to be filed); L—United States export or intratit export cargo to be laden at this port (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 to be filed); N—No United States export or intratit export cargo to be laden or import cargo unladen at this port; X—United States export or intratit export cargo on board upon arrival (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port); F—Foreign cargo aboard which is not to be discharged at this port; Y—Army and/or Navy cargo aboard for discharge at this port (Import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry are to be filed).

**RECORD OF VESSELS ENGAGED IN FOREIGN TRADE—ENTERED OR  
ARRIVED UNDER PERMIT TO PROCEED**

DEPARTMENT OF THE TREASURY

UNITED STATES CUSTOMS SERVICE

435 C.R.

(1) Date (Month) 19 <u>96</u>	(2) File or Manifest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE FROM (Port and Country)		(8) Nation- ality of Vessel (Flag) Trade & Net Tonnage	(5) Type of Cargo Trans- action D. L. N. X. F. Y. (See Footnote 3)	(7) Dock	(8) Maximum Draft	(9) Number of Passen- gers Disem- barking
			(a) First Foreign Port and Country Entering Direct From	(b) All Other Foreign Ports and Countries					
		T: AVENGER IV							
09	272	M/V WINDOC #383572 N.M. PATERSON & SONS	QUEBEC CITY, QUEBEC		CANA 2 12585	DIAN D	BETHLEHEM STEEL	26/8	C-23
10	273	M/V ALGOSTEEL #323016 SEAWAY SELF UNLOADERS	THUNDER BAY, ONTARIO		CANAD 2 13324	IAN D	KCBX	26/0	C-26
12	274	M/V LT ODYSSEY #1987 FEDNAV MONTREAL	KLAIPEDA, LITHUANIA		INDIAN 2 10419	D	BETA	24/6	C-41
12	275	M/V POMORZE ZACHODN #1628 POLISH STEAMSHIP CO	IE CLEVELAND, OHIO		POLISH 5 9015	D	LAKES & RIVERS	6.56 M	C-23
13	276	S/S CANADIAN VENTUR #323002 SEAWAY BULK CARRIERS	E SEPT. ILES, QUEBEC		CANADIAN 1 13074	D	INLAND-2	26/8	C-23
14	277	M/V ALGOWEST #372057 SEAWAY BULK CARRIERS	POINTE NOIRE, QUEBEC		CANADIAN 2 14591	D	ACME STEEL	27/0	C-22
15	278	M/V VERILY #8018912 BRODIN SHIPPING K/S	MILWAUKEE, WISCONSIN		CYPRUS 5 9576	D&F	IROQUOIS	23/0	C-25
17	279	M/V OCEAN LEADER #8005460 CANADIAN FOREST NAV	DETROIT, MICHIGAN		MALTA 5 9901	D	IROQUOIS	25/1	C-25
20	280	M/V PATERSON #800816 N.M. PATERSON & SONS	QUEBEC CITY, QUEBEC		CANADIAN 2 14534	D	BETHLEHEM STEEL	26/8	C-26
21	281	M/V LAKE MICHIGAN #MI-1088 BRITISH STEEL SHIPPING	MILWAUKEE, WISCONSIN		MARSH 5 13049	ALL D	ISLANDS IROQUOIS	6.65 M	C-22
22	282	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	GODERICH, ONTARIO		CANAD 2 11114	IAN D	NO. AMER. SALT	26/0	C-30
24	283	M/V FEDERAL BERGEN #N-00923 FALLINE MONTREAL	MILWAUKEE, WISCONSIN		NORWE 5 10888	GIAN D	FMT	23/6	C-24
24	284	M/V CONSENSUS MANITOU #LAEY4 TOKO KAIUN KAISHA	DETROIT, MICHIGAN		NORWA 5 10334	Y D	IROQUOIS	23/0	C-22
25	285	M/V AGAWA CANYON #331081 SEAWAY SELF UNLOADERS	BADGLEY ISLAND, ONTARIO		CANAD 2 11261	IAN D	IROQUOIS ANCHOR	26/0	C-29
26	286	M/V ALGOSOO #346839 SEAWAY SELF UNLOADERS	FERRYSBURG, MICHIGAN		CANAD 1 16093	IAN L	LAKES & RIVERS	22/0	C-28
27	287	M/V ALGONORTH #341240 SEAWAY BULK CARRIERS	POINTE NOIRE, QUEBEC		CANAD 2 13083	IAN D	ACME STEEL	26/8	C-23
29	288	M/V CARTIERDOC #383572 N.M. PATERSON & SONS	QUEBEC CITY, QUEBEC		CANAD 2 12617	IAN D	BETHLEHEM STEEL	24/6	C-24

1—Note—Column (3) Indicate type of vessel code, e. g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tanker; SC for scows; and G for small gas vessels.

2—Indicate type of trade—Direct from Foreign Ports: Ballast—1; Bulk—2; General—3; Via other Domestic Ports: Ballast—4; Bulk—5; General—6.

3—Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D—Will discharge import cargo at this port (import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry, to be filed); L—United States export or intransit export cargo to be laden at this port (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 to be filed); N—No United States export or intransit export cargo to be laden or import cargo unladen at this port; X—United States export or intransit export cargo on board upon arrival (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port); F—Foreign cargo aboard which is not to be discharged at this port; Y—Army and/or Navy cargo aboard for discharge at this port (import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry are to be filed).

RECORD OF VESSELS ENGAGED IN FOREIGN TRADE—ENTERED OR ARRIVED UNDER PERMIT TO PROCEED

DEPARTMENT OF THE TREASURY UNITED STATES CUSTOMS SERVICE

4.95 CR.

JULY

(1) Date (Month) 19 96	(2) File or Manifest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE FROM (Port and Country)		(5) Nation- ality of Vessel (Flag) Trade % & Net Tonnage	(6) Type of Cargo Trans- action D, L, N, X, F, Y, (See Footnote 3)	(7) Dock	(8) Maximum Draft	(9) Number of Passen- gers Disem- berking
			(a) First Foreign Port and Country Entering Direct From	(b) All Other Foreign Ports and Countries					
27	289	M/V ZIEMIA TARNOWSKI #ROS1634 POLISH STEAMSHIP CO	A CLEVELAND, OHIO		POLISH 5 9020	D	FMT	6.95 M	C-24
29	290	M/V TRIAS #10235 FALLINE MONTREAL	DETROIT, MICHIGAN		GREEK 5 13186	D	FMT	24/0	C-25
29	291	M/V ANTHONY #264 EAST COAST OVERSEAS	DETROIT, MICHIGAN		CYPRUS 5 6755	D	FMT	22/0	C-25
29	292	M/V ASLAN I #6441 ASIAN DENIZCILIK AS	CLEVELAND, OHIO		TURKISH 5 3342	D	IROQUOIS	5.81 M	C-21
28	293	B: A390 #642964 ANDRIE INC.  T: BARBARA ANDRIE	TORONTO, ONTARIO		USA 1 2346	L	AMOCO OIL	8/0	C-07
29	294	M/V BELUGA #9HMZ3 SHIPPING CORP OF MONROVIA	MONTREAL, QUEBEC		MALTE 2 10726	SE D	BETA	26/4	C-26
29	295	M/V WINDOC #383572 N.M. PATERSON & SONS	QUEBEC CITY, QUEBEC		CANAD 2 12585	IAN D	BETHLEHEM STEEL	26/6	C-23
30	296	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	MILWAUKEE, WISCONSIN		CANAD 5 11114	IAN D	NO. AMER. SALT	24/0	C-29
30	297	M/V CANADIAN RANGER #323030 SEAWAY BULK CARRIERS	QUEBEC CITY, QUEBEC		CANAD 2 13487	IAN D	BETHLEHEM STEEL	26/6	C-24
31	298	B: H2801 #290119 HANNAH MARINE CORP  T: DONALD C. HANNAH	SAULT STE MARIE, ONTARIO		USA 2 2210	D	KOPPERS	14/1	C-06
31	299	M/V CANADIAN TRADER #329351 SEAWAY BULK CARRIERS	SEPT. ILES, QUEBEC		CANA 2 13506	DIAN D	INLAND-2	26/6	C-22
31	300	M/V NORDOEN #7607170 PARTSHIP AB	DETROIT, MICHIGAN		SWED 5 2297	EN D	IROQUOIS	21/0	C-14

1—Note—Column (3) Indicate type of vessel code, e. g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tanker; SC for scows; and G for small gas vessels.  
 2—Indicate type of trade—Direct from Foreign Ports; Ballast—1; Bulk—2; General—3; Via other Domestic Ports; Ballast—4; Bulk—5; General—6.  
 3—Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D—Will discharge import cargo at this port (import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry, to be filed); L—United States export or intransit export cargo to be laden at this port (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 to be filed); N—No United States export or intransit export cargo to be laden or import cargo unladen at this port; X—United States export or intransit export cargo on board upon arrival (Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port); F—Foreign cargo aboard which is not to be discharged at this port; Y—Army and/or Navy cargo aboard for discharge at this port (import entries, Customs Forms 7501, 7502, and/or 7512 Transportation Entry are to be filed).

JULY 1996

**CHICAGO**                      **CHICAGO**                      **3901**                      **3901**  
Name of Customs District      Name of Port of Entry      Code number of Customs District      Code number of Port of Entry  
**DEPARTMENT OF THE TREASURY      UNITED STATES CUSTOMS SERVICE**  
**RECORD OF VESSELS ENGAGED IN FOREIGN TRADE — CLEARED OR**  
**GRANTED PERMIT TO PROCEED**

(1) DATE (Month) 19 96	(2) File or Manifest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE TO (Part and Country)		(5) National- ity of Vessel (Flag) Trade <sup>2</sup> & Net Tonnage	(6) Type of Cargo Trans- action D. L. N. X. F. Y. (See Footnote 1)	(7) Deck	(8) Maxi- mum Draft	(9) Number of Pass- engers Embark- ing
			(a) FIRST FOREIGN PORT TO WHICH VESSEL CLEARED DIRECT	(b) ALL OTHER FOREIGN PORTS AND COUNTRIES					
01	253	M/V ZIEMIA ZAMOJSKA #1616 POLISH STEAMSHIP CO	MILWAUKEE, WISCONSIN		POLISH 5 8911	N&F LAKES & RIVERS	6.25 M	C-23	
02	254	M/V LAKE CHARLES #8418734 FEDNAV LTD.	MONTREAL, QUEBEC		MARSHALL ISLANDS 2 9415	L&X KCBX	25/0	C-20	
02	255	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	BRUCE MINES, ONTARIO		CANADIAN 1 11114	N NO. AMER. SALT	23/0	C-30	
02	256	M/V SHIPKA #7729722 CANADIAN FOREST NAV	MONTREAL, QUEBEC		BULGARIA 1 8549	N LAKES & RIVERS	20/0	C-25	
02	257	M/V ALGONORTH #341240 SEAWAY BULK CARRIERS	THUNDER BAY, ONTARIO		CANADIAN 1 13083	N INLAND-2	22/0	C-22	
03	258	S/S QUEBECOIS #319265 SEAWAY BULK CARRIERS	THUNDER BAY, ONTARIO		CANADIAN 1 12741	N BETHLEHEM STEEL	22/0	C-25	
05	259	M/V AGAWA CANYON #331081 SEAWAY SELF UNLOADERS	ST. JOSEPH, MICHIGAN		CANADIAN 5 11261	N&F NO. AMER. SALT	23/6	C-31	
05	260	M/V MAPLEGLLEN #188395 P & H SHIPPING	THUNDER BAY, ONTARIO		CANADIAN 1 13138	N BETHLEHEM STEEL	22/0	C-22	
06	261	M/V GREAT LAKER #9195 CANADIAN FOREST NAV	DULUTH, MINNESOTA		MYANMAR 4 9293	N IROUOIS	20/0	C-26	
07	262	M/T TURID KNUITSEN #LAOH4 NESTE OY SHIPPING	CLARKSTON, ONTARIO		NORWEGIAN 1 6238	N IROUOIS ANCHOR	6.10 M	C-18	
08	263	M/V CANADIAN PROGRESS #328735 SEAWAY SELF UNLOADERS	BATH, ONTARIO		CANADIAN 2 16608	L&X KCBX	26/4	C-30	
08	264	M/V ZIEMIA GNIEZNIENSKA #1625 POLISH STEAMSHIP CO	THUNDER BAY, ONTARIO		POLISH 1 9014	N FMT	5.75 M	C-24	
09	265	M/V FEDERAL AALESUND #N/A FEDNAV INTERNATIONAL	DULUTH, MINNESOTA		NORWEGIAN 4 9816	N LAKES & RIVERS	22/0	C-21	
09	266	M/V FEDERAL CALLIOPE #10270 FALLINE MONTREAL	MONTREAL, QUEBEC		GREEK 1 10174	N FMT	23/0	C-25	
11	267	M/V HERCEGOVINA #7413751 CANADIAN FOREST NAV	MONTREAL, QUEBEC		MALTA 1 12579	N IROUOIS	20/0	C-27	
09	268	M/V POLYDEFKIS #7400338 CANADIAN FOREST NAV	DULUTH, MINNESOTA		GREEK 4 11209	N LAKES & RIVERS	20/0	C-26	
09	269	M/T STOLT ASPIRATION #8610019 STOLT-NIELSEN INC.	GREEN BAY, WISCONSIN		LIBERIA 4 4080	N STOLT TERMINAL	20/0	C-25	
10	270	M/V WINDOC #383572 N.M. PATERSON & SONS	THUNDER BAY, ONTARIO		CANADIAN 1 12585	N BETHLEHEM STEEL	22/0	C-23	

- NOTE. - Column (3) Indicate type of vessel code, e.g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tanker; SC for scows; and G for small gas vessels.  
- Indicate type of trade - Direct to Foreign Ports: Ballast - 1; Bulk - 2; General - 3; via other Domestic Ports: Ballast - 4; Bulk - 5; General - 6.  
- Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D - Discharged foreign cargo at this port (Import entries, Customs Forms 7501, 7502 and/or 7512 Transportation Entry to be filed); L - United States export or in transit export cargo was laden at this port (Shipper's Export Declarations, Commerce Forms 7525, and/or 7513 were filed or will be filed); N - No United States export or in transit export cargo laden at this port (United States export or in transit export cargo, laden at another port, on board Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port); F - Departed with residue foreign cargo aboard; Y - Departed with Army and/or Navy cargo laden at this port (which required no Shipper's Export Declarations, Commerce Forms 7525 and/or 7513).

CHICAGO                      CHICAGO                      3901                      3901  
 Name of Customs District      Name of Port of Entry      Code number of Customs District      Code number of Port of Entry  
**DEPARTMENT OF THE TREASURY      UNITED STATES CUSTOMS SERVICE**  
**RECORD OF VESSELS ENGAGED IN FOREIGN TRADE—CLEARED OR**  
**GRANTED PERMIT TO PROCEED**

JULY 1926

(1) DATE (Month)	(2) File or Mani- fest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE TO (Port and Country)		(5) Nation- ality of Vessel (Flag) Trade & Nec. Tonnage	(6) Type of Cargo Trans- action D. L. N. X. F. Y. (See Footnote 4)	(7) Dock	(8) Maxi- mum Draft	(9) Number of Pas- sen- gers Embar- king
			(a) FIRST FOREIGN PORT TO WHICH VESSEL CLEARED DIRECT	(b) ALL OTHER FOREIGN PORTS AND COUNTRIES					
11	271	M/V ALGOSTEEL #323016 SEAWAY SELF UNLOADERS	CALCITE, MICHIGAN		CANADIAN 4 13324	N	KCBX	22/0	C-26
11	272	B: CHIEF WAWATAM #805396 PURVIS MARINE LTD T: AVENGER IV	SAULT STE MARIE, ONTARIO		CANADIAN 1 2891	N	RESERVE IRON	15/6	C-08
11	273	B: ST. MARY CEMENT #D699114 MERCE TRANSPORTATION T: TRITON	BOWMANVILLE, ONTARIO		USA 1 5630	N	ST. MARYS CEMENT	16/9	C-06
11	274	M/V KAPITONAS KAMINS #239 BRODIN SHIPPING K/B	KAS PORT HURON, MICHIGAN		LITHUANIA 4 4903	N	CERES NORTH	5.50 M	C-20
11	275	M/V BLUE MOON #1253 SHERIMAR MANAGEMENT	SOREL, QUEBEC		PANAMA 2 4360	L&X	FMT	20/0	C-22
15	276	S/S CANADIAN VENTURE #323002 SEAWAY BULK CARRIERS	THUNDER BAY, ONTARIO		CANADIAN 1 13074	N	INLAND-2	22/0	C-23
15	277	M/V LT ODYSSEY #1987 FEDNAV MONTREAL	LUDINGTON, MICHIGAN		INDIAN 4 10419	N	BETA	23/0	C-41
15	278	M/V POMORZE ZACHODNI #1628 POLISH STEAMSHIP CO	DULUTH, MINNESOTA		POLISH 4 9015	N	LAKES & RIVERS	5.75 M	C-23
15	279	M/V ALGOWEST #372057 SEAWAY BULK CARRIERS	THUNDER BAY, ONTARIO		CANADIAN 1 14591	N	ACME STEEL	22/0	C-22
13	280	B: A390 #642964 ANDRIE INC. T: BARBARA ANDRIE	HAMILTON, ONTARIO		USA 2 2346	L&X	AMOCO OIL	15/0	C-07
16	281	M/V VERILY #8018912 BRODIN SHIPPING K/S	DULUTH, MINNESOTA		CYPRUS 5 9576	S N&F	IROQUOIS	20/0	C-25
18	282	M/V OCEAN LEADER #8005460 CANADIAN FOREST NAV	DULUTH, MINNESOTA		MALTA 4 9901	N	IROQUOIS	20/0	C-25
21	283	M/V PATERSON #800816 N.M. PATERSON & SONS	THUNDER BAY, ONTARIO		CANADIAN 1 14534	N	BETHLEHEM STEEL	22/0	C-26
23	284	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	PORT INLAND, MICHIGAN		CANADIAN 4 11114	N	NO. AMER. SALT	22/0	C-30
23	285	M/V LAKE MICHIGAN #MI-1088 BRITISH STEEL SHIPPING	MONTREAL, QUEBEC		MARSHALL ISLANDS 1 13049	N	IROQUOIS	5.00 M	C-22

1 — NOTE. — Column (3) Indicate type of vessel code, e.g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tankers; SC for scows; and G for small gas vessels.  
 2 — Indicate type of trade — Direct to Foreign Ports; Ballast — 1; Bulk — 2; General — 3; via other Domestic Ports; Ballast — 4; Bulk — 5; General — 6.  
 3 — Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D — Discharged foreign cargo at this port (import entries, Customs Forms 7501, 7502 and/or 7512 Transportation Entry to be filed); L — United States export or in transit export cargo was laden at this port (Shipper's Export Declarations, Commerce Forms 7525, and/or 7513 were filed or will be filed); N — No United States export or in transit export cargo laden or foreign cargo unladen at this port; X — United States export or in transit export cargo, laden at another port, on board Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port; F — Departed with residue foreign cargo aboard; Y — Departed with Army and/or Navy cargo laden at this port (which required no Shipper's Export Declarations, Commerce Forms 7525 and/or 7513).

CHICAGO

CHICAGO

3901

3901

Name of Customs District

Name of Port of Entry

Code number of Customs District

Code number of Port of Entry

DEPARTMENT OF THE TREASURY

UNITED STATES CUSTOMS SERVICE

# RECORD OF VESSELS ENGAGED IN FOREIGN TRADE — CLEARED OR GRANTED PERMIT TO PROCEED

(1) DATE (Month) 1996	(2) File or Manifest No.	(3) Name, official number & (1) type of vessel and name of operator or agent	(4) WHERE TO: Port and Country:		(5) National- ity of Vessel (Flag) Tonnage & Net Tonnage	(6) Type of Cargo Trans- action D, L, N, X, F, Y, /See Footnote 1)	(7) Dock	(8) Maxi- mum Draft	(9) Number of Passen- gers Embark- ing
			(a) FIRST FOREIGN PORT TO WHICH VESSEL CLEARED DIRECT	(b) ALL OTHER FOREIGN PORTS AND COUNTRIES					
25	286	M/V CONSENSUS MANITOU #LAEY4 TOKO KAIUN KAISHA	DETROIT, MICHIGAN		NORWAY 4 10334	N	IROQUOIS	20/0	C-22
26	287	M/V AGAWA CANYON #331081 SEAWAY SELF UNLOADERS	MELDRUM BAY, ONTARIO		CANADIAN 1 11261	N	IROQUOIS ANCHOR	22/0	C-29
26	288	M/V FEDERAL BERGEN #N-00923 FALLINE MONTREAL	MONTREAL, QUEBEC		NORWEGIAN 1 10888	N	FMT	23/0	C-24
27	289	M/V ALGOSOO #346839 SEAWAY SELF UNLOADERS	PORT CARTIER, QUEBEC		CANADIAN 2 16093	L&X	LAKES & RIVERS	26/4	C-28
28	290	M/V ALGONORTH #341240 SEAWAY BULK CARRIERS	THUNDER BAY, ONTARIO		CANADIAN 1 13083	N	ACME STEEL	22/0	C-23
30	291	M/V CARTIERDOC #383572 N.M. PATERSON & SONS	THUNDER BAY, ONTARIO		CANADIAN 1 12617	N	BETHLEHEM STEEL	22/0	C-24
26	292	B: WAI-0425/FRLN1049-1 #N/A FOREST LINES T: HAMILTON	1/CG-F63 NEW ORLEANS, LOUISIANA		USA 5 196	L	LEMONT STAGING AREA	9/0	C-04
29	293	M/V ASLAN I #6441 ASIAN DENIZCILIK AS	MONTREAL, QUEBEC		TURKI 1 3342	SH N	IROQUOIS	5.00 M	C-21
29	294	M/V ZIEMIA TARNOWSKA #R0S1634 POLISH STEAMSHIP CO	DULUTH, MINNESOTA		POLIS 4 9020	H N	FMT	5.50 M	C-24
31	295	M/V TRIAS #10235 FALLINE MONTREAL	DULUTH, MINNESOTA		GREEK 4 13186	N	FMT	23/6	C-25
29	296	M/V ANTHONY #264 EAST COAST OVERSEAS	MONTREAL, QUEBEC		CYPRUS 1 6755	N	FMT	19/0	C-25
30	297	M/V ALGORAIL #325747 SEAWAY SELF UNLOADERS	MELDRUM BAY, ONTARIO		CANADIAN 1 1114	N	NO. AMER. SALT	22/0	C-29

— NOTE. — Column (3) Indicate type of vessel code, e.g., MV for motor dry cargo vessels; SS for steam dry cargo vessels; TM for motor tanker vessels; TS for steam tanker vessels; S for sailing vessels; Y for yachts; TB for tanker barges; B for barges other than tanker; SC for scows; and G for small gas vessels.  
 — Indicate type of trade — Direct to Foreign Ports; Ballast — 1; Bulk — 2; General — 3; via other Domestic Ports; Ballast — 4; Bulk — 5; General — 6.  
 — Column (6) Indicate type of cargo transaction for each vessel, by entering one or more of the following symbols: D — Discharged foreign cargo at this port (Import entries, Customs Forms 7501, 7502 and/or 7512 Transportation Entry to be filed); L — United States export or in transit export cargo was laden at this port (Shipper's Export Declarations, Commerce Forms 7525, and/or 7513 were filed or will be filed); N — No United States export or in transit export cargo laden or foreign cargo unloaded at this port; X — United States export or in transit export cargo, laden at another port, on board Shipper's Export Declarations, Commerce Forms 7525 and/or 7513 filed at another United States port; F — Departed with residue foreign cargo aboard; Y — Departed with Army and/or Navy cargo laden at this port (which required no Shipper's Export Declarations, Commerce Forms 7525 and/or 7513).

## **Appendix B: Transit Forecasts Calculations**

Overseas vessel transit forecast for 1996-1997 based on annual transit data from 1982 through 1995  
(exponential smoothing using trend and no seasonality)

period	year	# transits	St	Tt	forecast	square diff	alpha	beta	
1	82	815	815	815	0		0.648195078	0.076546144	
2	83	679	726.8454695	-6.747889408	815	18496			
3	84	703	709.0150128	-7.596217197	720	292.3272433			
4	85	581	623.3639251	-13.57101658	701	14500.68634			
5	86	663	644.2814833	-10.93104915	610	2830.994588			
6	87	572	593.5833847	-13.97506345	633	3763.875769			
7	88	574	575.973035	-14.2533306	580	31.45326747			
8	89	533	543.1037334	-15.6783114	562	824.8214226			
9	90	437	468.8121086	-20.16493454	527	8176.756942			
10	91	429	435.9119725	-21.13976511	449	386.0114471			
11	92	399	404.5487402	-21.92233211	415	248.7625269			
12	93	427	411.3891519	-19.72065497	383	1969.015658			
13	94	588	518.9296108	-9.979307399	392	38546.05908			
14	95	437	462.3124709	-13.54925365	509	5176.84616			
15	96				449				
16	97				435				
						sum sq. diff	95243.61045		

Domestic vessel transit forecast for 1996-1997 based on annual transit data from 1983 through 1995  
exponential smoothing using trend and no seasonality

period	year	# transits	St	Tt	forecast	square diff	alpha	beta	
1	83	1122	1122	1122	0		1	0	
2	84	1008	1008	1008	0	1122	12996		
3	85	788	788	788	0	1008	48400		
4	86	791	791	791	0	788	9		
5	87	823	823	823	0	791	1024		
6	88	808	808	808	0	823	225		
7	89	680	680	680	0	808	16384		
8	90	766	766	766	0	680	7396		
9	91	843	843	843	0	766	5929		
10	92	681	681	681	0	843	26244		
11	93	578	578	578	0	681	10609		
12	94	661	661	661	0	578	6889		
13	95	787	787	787	0	661	15876		
14	96				787				
15	97				787				
						sum sq. diff	151981		

Overseas vessel transit forecast for 1996-1997 based on monthly transit data from Jan 1990 through July 1996  
(exponential smoothing with trend and seasonality factors)

period	year	month	# transits	St	Tt	It	Ft	square diff	alpha	beta	gamma
1	90	apr	55	55			1.132723112		0.289595895		0
2		may	56	56			1.153318078				
3		jun	49	49			1.009153318				
4		july	53	53			1.091533181				
5		aug	43	43			0.885583524				
6		sep	41	41			0.844393593				
7		oct	52	52			1.070938215				
8		nov	73	73			1.503432494				
9		dec	15	48.55555556		0	0.308924485				
10	91	apr	46	46.25458453		0	1.026057436	55	81		
11		may	60	47.92532841		0	1.229427504	53	44.27240873		
12		jun	50	48.39480878		0	1.027685236	48	2.676482309		
13		july	45	46.31887139		0	0.998927466	53	61.22341933		
14		aug	42	46.63959456		0	0.89711141	41	0.961911056		
15		sep	42	47.53741216		0	0.87458213	39	6.853008722		
16		oct	56	48.91391535		0	1.127987969	51	25.9118532		
17		nov	75	49.19538212		0	1.519715376	74	2.1351938		
18		dec	13	47.13522569		0	0.283365035	15	4.829701085		
19	92	apr	48	47.03264539		0	1.021821193	48	0.132095028		
20		may	47	44.48319669		0	1.096045334	58	117.1422603		
21		jun	47	44.84538007		0	1.043396658	46	1.651933083		
22		july	43	44.32433576		0	0.976698927	45	3.230222089		
23		aug	44	45.69179874		0	0.947935342	40	17.9448198		
24		sep	43	46.69801084		0	0.910254858	40	9.234119004		
25		oct	56	47.55171311		0	1.166322425	53	11.05699215		



26	nov	57	44.64281217	0	1.332265909	72	233.0223496
27	dec	14	46.02228036	0	0.299443123	13	1.821927535
28	93 apr	31	41.48017392	0	0.810016193	47	256.8500301
29	may	49	42.41441205	0	1.141745441	45	12.50222761
30	jun	40	41.23341661	0	0.986825782	44	18.10549972
31	july	45	42.63510328	0	1.037482874	40	22.34799172
32	aug	39	42.20272019	0	0.929550854	40	2.003134109
33	sep	55	47.47913368	0	1.101743759	38	275.0545604
34	oct	63	49.37216543	0	1.250974755	55	58.12570856
35	nov	80	52.46386433	0	1.480884245	66	202.2979154
36	dec	25	61.44841622	0	0.382322148	16	86.30515248
37	94 apr	46	60.09906499	0	0.77558948	50	14.24467731
38	may	59	57.65956754	0	1.050304047	69	92.50272022
39	jun	58	57.98239108	0	0.99722628	57	1.210114771
40	july	64	59.05545224	0	1.073168225	60	14.77835244
41	aug	69	63.44976455	0	1.051415751	55	198.9497256
42	sep	79	65.84030591	0	1.177467068	70	82.71207481
43	oct	76	64.36693436	0	1.196769353	82	40.50763061
44	nov	105	66.25992118	0	1.560971305	95	93.70280692
45	dec	32	71.31022086	0	0.43357752	25	44.45375079
46	95 apr	59	72.68897251	0	0.803437478	55	13.63487317
47	may	52	65.97628464	0	0.84801694	76	592.7044404
48	jun	40	58.48587892	0	0.75546174	66	685.2935457
49	july	49	54.77132464	0	0.93539468	63	189.4803697
50	aug	39	49.6517091	0	0.846194566	58	345.4926811
51	sep	51	47.81613568	0	1.091903159	58	55.70013539
52	oct	58	48.00369889	0	1.205621079	57	0.600802045
53	nov	70	47.08862647	0	1.503549224	75	24.32853527
54	dec	20	46.81039034	0	0.428699062	20	0.173530478
55	96 apr	55	53.07882824	0	0.98304919	38	302.4391605
56	may	49	54.44080826	0	0.888177085	45	15.90617394
57	jun	43	55.15843381	0	0.774067311	41	3.504579605
58	july	51	54.97425252	0	0.929462345	52	0.353912586
59	aug	60	59.58792815	0	0.970217948	47	181.7396868
60	sep					51	
61	oct					56	
62	nov					70	
63	dec					20	
64	97 apr					38	
65	may					40	
66	jun					35	
67	july					44	
68	aug					40	
69	sep					51	
70	oct					56	
71	nov					70	
72	dec					20	

sum of sq. diff

4533.107195

**Appendix C: Database Entered from Lloyd's Register and GLC Listings Data**

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Abilisk	ice strengthened	ca	7048	5043	4855	360	360	5.89	102.7	19.4	11.82	109	1	14800	13400	5199	15.5			
2	Alam Seering	bulk carrier	ma	17056	10329	28098	35.4	555	178.21	10.81	167.2	23.11	14.76	5	38514	33566	11520	14.5			
3	Alam United	bulk carrier	ma	17056	10329	28098	35.4	555	178.21	10.81	167.2	23.11	14.76	5	38514	33566	11520	14.5			
4	Allison	general cargo	cy	3792	3373	6110	275	83.7	74.81	17	10.14	17	10.14	1	52.8	7021	6811	2850	11		
5	Alpha	bulk carrier	cy	16772	10054	28193	560	176.79	10.818	108	22.86	14.81	5	25.58	37800	31848	9900	14.5			
6	Altair	ice strengthened	ab	2729	1102	2814	322	98.33	4.501	92.41	13.5	7.01	157	1	5380	5210	1485	11.5			
7	An Ze Jiang	general cargo	ch	11116	6250	14913	491	149.7	6.051	140	21.8	12.5	7	17.17	35504	32728	9899	14			
8	Anna	ice strengthened	cy	15923	10348	28702	35.2	600	183.04	10.472	170.9	22.7	14.36	6	38594	33651	9800	16.75			
9	Antilia	bulk carrier	cy	17084	10342	28082	35.4	555	178.21	10.81	167.2	23.11	14.76	5	38594	33651	9800	16.75			
10	APU Ajuli	bulk carrier	in	16712	9508	27192	577	178	10.415	166	23.11	14.61	6	25.16	32313	31731	11850	14.75			
11	Apimather	ice strengthened	cy	17677	10528	31200	619	188.75	10.656	181.3	23.11	14.51	6	22.57	36849	31731	11850	14.75			
12	Arctic	ice strengthened	ll	6385	2975	8130	397	121.01	7.922	114.8	18.01	10.01	289	1	75.2	10356	5299	14			
13	Arctic	ice strengthened	cu	10057	6045	15193	496	148.01	8.994	138	20.6	12.53	199	5	88.8	22181	19898	9000	16		
14	Argut	general cargo	ru	3466	1365	3800	312	95	8	87	15.6	7.8	1	4672	4572	4700	15				
15	Arma	ice strengthened	cy	9841	6234	15721	473	144.13	8.002	134	21.4	12.22	4	23.95	22181	20238	7050	13			
16	Arosa	ice strengthened	cy	17480	11346	30499	38.2	621	190.65	10.888	178	22.79	14.58	7	19.14	39980	11650	14			
17	Asha Trader	ice strengthened	pa	16995			591														
18	Ashen I	ice strengthened	tu	5306			396														
19	Astra Lift	ice strengthened	ba	3038	1333	3861	307	93.58	5.517	84.25	16.8	8.08	1		4900	4500	15.25				
20	Atlanta Forest	ice strengthened	ml	12582	5258	14931	522	159.19	9.151	151.6	21.01	12.8	370	3	27.6	17799	17773	9800	14		
21	Atlanta Spirit	ice strengthened	cy	11278	7481	19019	28.3	498	151.75	9.4	140.3	22.8	12.9	4	23148	21831	8201	14			
22	Aurora Topaz	ice strengthened	cy	18061	10891	28268	38.9	640	195	10.24	183	23	14.3	5	25.58	39750	10700	14.5			
23	Avdeevka	ice strengthened	cy	16578	9528	26398	35.2	571	174.02	19.45	166	22.86	14.51	5	25.64	34390	33766	9800	14.5		
24	Aynur Kalkanov	ice strengthened	tu	14147	9502	27299	34.6	683	177.95	10.688	172.5	22.89	13.84	6	24.9	32639	32268	12000	15.2		
25	Bahara E	ice strengthened	sp	4317	1730	4499	336	102.52	5.411	92.61	17.05	9.02	326	2	8486	8614	3971	13.5			
26	Bahara H.	ice strengthened	cy	16195	10227	30242	37.5	622	189.49	10.889	178	22.79	14.61	7	19.89	39981	34274	11650	16.2		
27	Baluga	ice strengthened	ml	16548	10726	23725	585	178.37	9.656	167.4	22.61	13.47	7		30384	28597	10600	13.5			
28	Bergon	ice strengthened	aw	3700	2118	5449	331	100.83	6.2	93.8	16.43	8	220	2	7803	7280	3400	13.5			
29	Bela Luck	ice strengthened	cy	15785	8815	24518	33.8	550	170.54	10.153	182	22.8	13.8	5	30413	28911	9900	14.75			
30	Blue Bell	ice strengthened	cy	16989			621														
31	Bontgucht	ice class 1A	du	1599	1052	3437	263	80.22	5.985	74.86	16.01	10.52	185	1	7172	7035	3000	12.75			
32	C. Manin	ice class 1A	ml	12929	5498	16711	32	538	183.96	8.651	155.4	22.86	11.82	4	23.45	18991	18558	9300	15.5		
33	Caribbean Merc-Hospital	Ad & Supply	pa				283														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
6.7	Calliroe Patroni	bulk carrier	strengthened, heavy car/gk		17870	10576	29809	37.8	600	182.81	10.854	174	23	14.81	108	6			39317	33359	8500	15	
6.8	Capaina Michail	bulk carrier	strengthened, heavy car/gk		18773	10823	28600	36.3	590	180.83	10.651	179.8	23.11	14.51		6	21.37		38824	33840	11400	16.5	
7.0	Chiefa Nares	bulk carrier	th		10541	7832	18688		479	146.08	9.897	137	22.88	12.6					23108	23278	8000	14.25	
7.1	Clevo	bulk carrier	pa		11037	8277	17726	27.3	479	146.01	9.27	138	22.31	12.45		4	25.26		22256	21399	7800	14	
7.2	Concarde		sv		2380				326														
7.3																							
7.4																							
7.5	Gvijala Zvezica	bulk carrier	strengthened, ore cargo/ru		15734	10368	27020	35.2	598	182.71	10.5	171.7	22.41	14.2		7	18.89		35704	31347	11550	17	
7.6	Dayra Kamaal	bulk carrier	strengthened, heavy car/fk		17770	10500	30910	38.8	617	188.17	10.659	181.3	23.11	14.51	542	6	21.95		36849	34827	12000	15	
7.7																							
7.8																							
7.9																							
8.0	Dmitriy Donatid	bulk carrier	ice strengthened	ru	13567	6927	19590	32.5	532	162.11	9.88	164.9	22.86	13.54		6	17.83		28228	22422	11200	15.25	
8.1	Dmitriy Peshard	bulk carrier	ice strengthened	ru	13567	6927	19590	32.5	532	162.11	9.88	164.9	22.86	13.54		6	17.83		28228	22422	11200	15.25	
8.2	Ducoguff	bulk carrier	strengthened, heavy car/ll		19495	10179	30689	41.4	674	205.52	10.275	196.2	23.02	14.51		7	22.4		26305	22432	11200	15.25	
8.3																				38837		11400	
8.4	Etda	general cargo	ice strengthened	ab	2729	1102	2812		323	98.33	4.408	92.41	13.5	7.01	137	1	89.3		5380	5210	1495	11.5	
8.5	Eemshom		di		2735				294														
8.6	El Kef	bulk carrier	ice strengthened	ll	17076	10495	29355		600	182.44	9.791	175	23.07	14.93		5			36988		11100	18.25	
8.7	Elkon	bulk carrier	ice strengthened, heavy car/ba		16676	10442	29234		590	177.4	10.524	168	22.88	13.52		5	27		37808	31924	10120	14.5	
8.8	Efikoua Wava	bulk carrier	strengthened, heavy car/ey		15933	10335	28858	35.2	601	183.02	10.520	171.6	22.41	14.23		7	18		35553	30283	9500	17.75	
8.9	Ermir	bulk carrier	strengthened, ore cargo/oy		16834	9644	29212	36.4	593	180.8	10.68	170	23.11	14.51		7	19		37713	33329		19	
9.0																							
9.1	Federal Alesaul	bulk carrier	ice strengthened	no	18011	9816	30674		590	179.81	10.975	170	23.11	15.52	112	5			37765		8160	14	
9.2	Federal Agno	bulk carrier	ice strengthened	ph	17821	10390	29843		600	182.8	10.559	174	23.1	14.8	104	5			34627	33331	9500	14.5	
9.4																							
9.5	Federal Bageh	bulk carrier	strengthened, heavy car/no		16983	10388	29159		591	180.08	10.651	170	23.11	14.51		6			38840	34018	9500	14.25	
9.6	Federal Calliop	bulk carrier	strengthened, heavy car/ll		19988	10174	30353	41	619	188.68	9.976	182.8	23.09	14.36		5	28		39159	35909	10400	15	
9.7																							
9.8																							
9.9	Federal Dora		gk		19988				619														
10.0																							
10.1																							
10.2	Federal Fraser	bulk carrier	strengthened, heavy car/ph		22388	11848	35315	47.2	730	222.54	9.772	216.9	23.08	14.64		7	27		47013	48386	10880	12	
10.3																							
10.4																							
10.5	Federal Fuji	bulk carrier	strengthened, heavy car/ll		17814	10390	29536		598	182.8	10.559	174	23.1	14.8	104	6			39319	33331	9500		
10.6																							
10.7	Federal Inger	bulk carrier	strengthened, heavy car/no		16827	9724	29212		593	180.83	10.681	170	23.11	14.51		6	23		38011	32217	12000	16	
10.8	Federal Mackel	bulk carrier	strengthened, heavy car/fk		22388	11848	35315	47.2	730	222.54	9.772	216.9	23.08	14.64		7	28		47013	48386	10880	12	
10.9																							
11.0																							
11.1																							
11.2																							
11.3	Federal Memlicu	bulk carrier	strengthened, heavy car/no		17068	10334	28192		585	178.21	10.61	167.2	23.11	14.76	453	5			38568	33812	8000	16.75	
11.4																							
11.5	Federal Metane	bulk carrier	strengthened, heavy car/no		18881	9254	28215		585	178.21	10.588	167.2	23.11	14.76		5			34794	33930	8640	14	
11.6																							
11.7																							
11.8	Federal Nord	bulk carrier	strengthened, heavy car/no		18890	10948	28002		591	179.81	10.651	170	23.11	14.51		6	21		38624	33840	11399	16.5	
11.9	Federal Oslo	bulk carrier	strengthened, heavy car/no		17730	9971	29462		601	183.01	10.611	172	23.11	14.91		5	27		37812	35540	8388	14	
12.0																							
12.1																							
12.2																							
12.3	Federal Potatis	bulk carrier	strengthened, heavy car/la		17815	10390	29536		600	182.8	10.559	174	23.1	14.8	104	6			39319	33331	9500		
12.4																							
12.5																							
12.6																							
12.7	Federal Vihoko	bulk carrier	strengthened, heavy car/no		17188	10488	30800	38.8	590	188.17	10.654	181.3	23.11	14.51		6	22		36849	34827	12000	15	
12.8																							
12.9	Federal Vigna	bulk carrier	ice strengthened	no	18011	9816	30686		590	179.81	10.975	170	23.11	15.52	112	5			37765		8160	14	
13.0																							
13.1	Flimfligher	general cargo	strengthened, ore cargo/ll		12582	5258	14831		522	159.16	9.152	151.6	21.01	12.63	370	3	27		17799	17779	9800	15	
13.2	Flinrasse	bulk carrier	strengthened, heavy car/pa		8967	4542	12358	23.6	441	134.52	8.688	125	20.5	11.51		4	20		15278	14631	6000	14.5	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
133	Firdaus			no	11542				490													
134	Freja Nordic	tanker	oil chemical	ba	6482	9947	11910	19.6	407	124.01	8.797	116	18.31	10.87		5			13542		6200	13
135	Friens	bulk carrier	strengthened, heavy car	pa	8987	4582	12388	21.8	441	134.52	3.888	125	20.5	11.51		4	20		15276	14631	6000	14.8
136	Fujian Meru	bulk carrier	strengthened, heavy car	th	9898	7204	16883	26.8	481	145.99	9.054	136	22.86	12.2		4			21944	20698	8000	14
137	Furunes	bulk carrier	strengthened, heavy car	pa	8960	4548	12274	22.9	441	134.52	8.886	125	20.5	11.51		4	23		15276	14631	6000	14.8
138	Gajah Beruas			na	6280				327													
139	General Cabal	bulk carrier	ice strengthened	ph	8341	4341	12100	23.9	477	145.5	7.924	135	19.59	10.85		3	33		15235		6000	14
140																						
141																						
142																						
143																						
144	George L	bulk carrier	oil chemical	pk	14788	9643	27434	34.6	597	182	10.805	182.9	27.13	15.12					32722	32418	12000	17.5
145	Golden Shield	tanker	oil chemical	pk	7102	6707	12985		417	127.01	8.854	119	20.01	11.21					14085		6000	14
146	Golden Sky	bulk carrier	strengthened, ore cargo	cy	18170	12207	30449	38.2	821	180.88	10.888	178	22.8	14.91		7	19		39082		11550	15
147																						
148																						
149																						
150	Great Laker	bulk carrier		ny	18344	9293	28358		591	180.02	10.651	170	23	14.81		5			35284	34228	6870	
151																						
152	Guney A	bulk carrier	strengthened, heavy car	lu	17182	10451	30800	38.8	817	188.17	10.854	181.3	23.11	14.51		6	22		36849	34827	12000	15
153																						
154																						
155																						
156	Haight	bulk carrier	strengthened, heavy car	ba	18008	10545	29779	35.2	581	177.04	10.502	187	22.92	14.51		5	24		37502	32590	10400	15
157	Hamby Laker	bulk carrier	strengthened, heavy car	ph	17086	10334	27915		585	178.21	10.81	167.6	23.11	14.76		5			38555	38812	11620	16.76
158																						
159	Hambathair	bulk carrier	strengthened, heavy car	fl	17877	10528	31200	50.8	619	188.76	10.866	181.3	23.11	14.51		6	23		36849	34827	12000	15
160																						
161																						
162	Hercegovina	bulk carrier	strengthened, heavy car	mt	18602	11823	30880	38.6	645	196.68	10.84	182.9	22.9	14.48		7	17		40292	39017	12000	14.5
163																						
164																						
165																						
166	Hilal II	bulk carrier	strengthened, heavy car	lu	15357	8874	25845		585	178.31	9.581	169	23	14		5	26		33064	32175	9380	
167	Holck Larsen	bulk carrier	strengthened, heavy car	h	18788	9932	27038	38.6	628	191.29	9.495	182.8	22.86	13.40		5	28		38415	32447	10500	
168																						
169	Hope I	bulk carrier	strengthened, heavy car	mt	17152	10451	30800	38.9	617	188.17	10.854	181.3	23.11	14.51		6	22		36849	34827	12000	15
170	Hydra	bulk carrier	strengthened, heavy car	ba	18278	11257	28715	34.4	588	173.03	10.8	164	22.79	14.76		5			37702		10700	15.5
171																						
172	Isapurna	bulk carrier	strengthened, heavy car	ba	17104	7365	25936		619	188.68	10.237	180	22	14.61		4			28892		9250	14.5
173																						
174	Ivan Selayang	bulk carrier	strengthened, heavy car	ei	15825	10718	29514		590	179.89	10.887	170	23.11	14.51		6	23		38624	38840	11400	15
175																						
176	Indian Express	general cargo		va	11504	7087	17279		599	185.23	9.7	145	21.2	13.21	381	4		5	24987	22861	11400	16
177	Island Gem	bulk carrier	strengthened, heavy car	pk	17085	10334	27915		585	178.21	10.81	167.6	23.11	14.76		5			38555	39612	9600	14.5
178																						
179	Island Stöpper	bulk carrier	strengthened, heavy car	pk	17085	10334	27915		585	178.21	10.81	167.6	23.11	14.76		5			38555	39612	9600	14.5
180																						
181																						
182																						
183	Ivi	bulk carrier	strengthened, heavy car	fl	18486	9960	28697	35.8	591	180.25	9.887	172	23.11	13.92		5	27		36622	32883	11200	18
184																						
185	Jeannie	bulk carrier	strengthened, heavy car	pk	15627	10255	27541	34.9	600	183.04	10.713	170.9	22.7	14.36		7	19		35304	32728	9900	15
186	Jing Hong Hai	bulk carrier	strengthened, heavy car	ch	16432	11352	29883		594	181.07	10.87	170	23.1	14.5		6	22		8001	35888	12000	15
187	Jo Hassel	tanker	ice strengthened	ev	5359	2319	8122		356	108.51	8	101	17.81	9.81		8		10	8139	6638	157	
188	Jo Palm	tanker	chemical	du	4988	2841	8224	19.9	378	115.2	7.72	108	18	9.5		10		14	9693	4568	127	
189	Kapitan Zamat	bulk carrier	ice strengthened	ru	10178	5780	14820	25.7	498	151.75	8.691	140	21.04	11.59		5			17070	16441	9900	15.75
190	Kapitanas A Lucia			lt	9965				480													
191																						
192																						
193	Kapitanas Dubai	bulk carrier	ice strengthened	lt	10145	4151	14650		479	146.21	9.421	134	20.85	12.91		6			18930	13730	6700	13.5
194																						
195																						
196	Kapitanas Guadi	bulk carrier	ice strengthened	lt	9965	4903	14650		480	146.21	9.424	134	20.85	12.91		6			18930	13730	6700	13.5
197																						
198	Kapitanas Izmit	bulk carrier	ice strengthened	lt	9965	4903	14650		480	146.21	9.424	134	20.85	12.91		6			18930	13730	6700	13.5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
199	Kapitonas Kam	bulk carrier	ice strengthened	lt	9065	4903	14650		480	146.21	9.424	134	20.85	12.91					18930	13730	6700	13.5
200	Kapitonas Mees	bulk carrier	ice strengthened	lt	9065	4903	14650		480	146.21	9.424	134	20.85	12.91					18930	13730	6700	13.5
201																						
202																						
203	Kapitonas Reed	bulk carrier	ice strengthened	lt	10145	4151	14650		479	146.21	9.421	134	20.85	12.91					18930	13730	6700	14.25
204																						
205																						
206																						
207																						
208	Kapitonas Stud	bulk carrier	ice strengthened	lt	9095	4903	14650		480	146.21	9.424	134	20.85	12.91					18930	13730	6700	13.5
209	Kapitonas Venti	bulk carrier	ice strengthened	lt	9065	4903	14650		480	146.21	9.424	134	20.85	12.91					18930	13730	6700	13.5
210	Kenan D	bulk carrier		cy	5306	2891	8186		386	117.61	7.301	110	18.01	9.02					10134	9928	6200	14
211	Kirby D	bulk carrier		cy	5306	2891	8186		386	117.61	7.301	110	18.01	9.02					10134	9928	6200	14
212	Kobulel	tanker	ice class IC	ml	10937	5884	18421		486	151.31	9.021	142.6	22.41	12.17					20092		7220	16
213	Konstantis F	bulk carrier		dk	8076	6016	15202		472	144	8.95	136	21.21	12.37					20448	10636	7900	14.25
214	L. Argosy	bulk carrier	strengthened, heavy car	tn	17825	10419	28791	37.8	607	184.99	10.435	176	23.11	14.66					39552	33917	8220	14.5
215																						
216																						
217	L. T. Odysey	bulk carrier	strengthened, heavy car	tn	17825	10419	28791	37.6	607	184.99	10.435	176	23.11	14.66					39552	33917	8220	14.5
218	Lake Carling	bulk carrier	ice strengthened	ml	17484	9395	26284	36.7	571	180.16	9.95	171.8	23.1	13.9					34920	34022	6662	1.4
219																						
220	Lake Challenge	bulk carrier	strengthened, heavy car	pa	18775	9254	28019		585	178.21	10.588	167.2	23.11	14.76					34704	33930	8640	1.4
221																						
222																						
223	Lake Champlain	bulk carrier	ice strengthened	ml	17484	9395	26284	36.7	571	180.16	9.95	171.8	23.1	13.9					34920	34022	6662	1.4
224																						
225																						
226																						
227																						
228	Lake Charles	bulk carrier	ice strengthened	ml	17427	9415	28209	36.7	591	180.17	9.865	171.8	23.0	13.88					34954	34022	6662	1.4
229																						
230																						
231	Lake Erie	bulk carrier		ml	22794				730													
232																						
233																						
234																						
235	Lake Michigan	bulk carrier	strengthened, heavy car	ml	22794	13049	38294	48.8	730	222.49	9.721	216.7	23.13	14.33					48871	46125	11800	1.4
236																						
237																						
238																						
239	Lake Ontario	bulk carrier	strengthened, heavy car	ml	22794	13049	38294	48.8	730	222.49	9.721	216.7	23.13	14.33					48871	46125	11800	1.4
240																						
241																						
242																						
243																						
244	Lake Superior	bulk carrier	strengthened, heavy car	ml	22794	13049	38294	48.8	730	222.49	9.721	216.7	23.13	14.33					48871	46125	11800	1.4
245																						
246	Lake Tahoe	bulk carrier	ice strengthened	ml	18119	3468	23720	34.8	608	185.12	9.802	172	22.81	14.15					30152	27718	11200	12
247	Lasaboom	bulk carrier	ice strengthened	ml	16205	10862	28637	35.3	600	182.86	10.543	171.8	22.31	14.2					34736	33930	8640	15.5
248	Liberty Stry	bulk carrier	strengthened, heavy car	pa	18775	9254	28019		585	178.21	10.588	167.2	23.11	14.76					34794	33930	8640	1.4
249	Lida	general cargo		cy	903	681	1448		214	92.8	4.115	59.99	10.72	4.91					1893	1857	1079	10
250	Luckyman	bulk carrier	strengthened, heavy car	cy	18224	10689	27000		585	178.21	10.572	167.2	23.11	14.76					38514	33566	11200	17.5
251																						
252																						
253																						
254	Luna Verda	bulk carrier		ph	16344	9293	26706		591	180.3	10.572	170	23	14.81					35284	34229	6670	
255																						
256	M. Hass	bulk carrier		ba	11488	7811	20335		532	182.28	9.427	150	22.5	12.5					25483	24705	11200	15.3
257																						
258	Melhi	general cargo	strengthened, heavy car	cu	10379	5680	15193		486	148.01	9.202	138	20.64	12.63	188				22181	19898	9000	16
259	Milkyavika	bulk carrier	strengthened, heavy car	cu	17889	10667	28136	38.6	644	196.45	10.235	183	23	14.9					32750		10700	14.5
260	Moilinta	bulk carrier	strengthened, heavy car	mt	23306	11292	34752	46.5	729	222.44	9.726	216.5	23.09	14.76					48555		13134	14.25
261																						
262																						
263	Margaret John	general cargo	strengthened, heavy car	ml	5004	2846	7583		379	115.5	6.979	109.5	17.4	8.69					10102	9634	4500	14.5
264																						

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
265	Mania S J		gk	16259				597														
266	Manita T		cy	17064	10342	28097	35.4	585	178.21	10.61	187.2	23.11	14.58		5			38584	33851	9800	16.76	
267	Marla L	strengthened, heavy car	gk	16224	8955	27818	34.9	597	182	10.669	187.8	22.88	14.71		6			32706	32395	12000	15	
268	Mitball Kuturoa	bulk carrier	ru	13572	7823	19590		532	182.31	9.88	154.9	22.86	13.54		442	6	17.5	26228	22422	11200	15.25	
269	Mulin Kamak	bulk carrier	ro	16168	8734	24285	3.6	408	185.2	10.1	172.8	22.8	14.15		7	17		32478		12000	14.5	
270	Miljet	bulk carrier	mt	17819	11195	29643	35.9	622	180.82	10.802	182	22.81	15.22		5			35793	11225			
271																						
272	Moubin Blosser	chemical	ba	11598	6963	19923	30.9	528	180.81	9.151	149.6	22.8	11.99		21			11132		7000		
273																						
274	Nes Doxa	strengthened, heavy car	gk	17882	10510	30320	39.4	617	188.17	10.661	181.3	23.1	14.5	542	6	21		36849	34827	10877		
275																						
276																						
277	Necat. A	bulk carrier	lu	18237	10900	28645	27.5	656	199.8	8.561	192.3	22.86	14		6	24		35777	35112	11200	17.0	
278																						
279	Nomadic Petris	general cargo	no	14013	4419	17180		512	155.99	9.314	148.4	22.51	13.97	380	3	28		17348	17212	12000	17	
280	Nordio Blosson	chemical	ll	11781	7942	19864	3.0	505	154	9.67	146	22.71	13.82		7			24200		8040	14	
281																						
282	Nyarza	general cargo	ba	11375	6674	16923		498	151.75	9.4	144.3	21.81	12.42		4	28		22815	21487	6841	15.25	
283	Oak	bulk carrier	ba	12806	8695	21951		509	155.23	9.86	145.7	22.86	13.59		5			30633	26593	8040	14.5	
284																						
285																						
286	Ocean PHB	bulk carrier	cy	15804	10929	27019		599	182.71	10.5	171.7	22.4	14.2		7	18		35750		11500	17.75	
287	Odrnesa	strengthened, heavy car	ba	9815	4798	13790	25.5	471	143.7	8.43	132.4	20.6	11.34		5			16659		5180	13	
288																						
289	Olympic Mento	bulk carrier	gk	17879	10576	29693	37.8	600	182.81	10.592	174	23.11	14.81	108	5		39317	33359	9500	14	3x440K	
290																						
291																						
292	Olympic Meatt	bulk carrier	gk	17879	10576	29693	37.8	600	182.81	10.592	174	23.11	14.81	108	5		39317	33359	9500	14	3x440K	
293	Olympic Mirack	bulk carrier	gk	17879	10576	29693	37.8	600	182.81	10.592	174	23.11	14.81	108	5		39317	33359	9500	14	3x440K	
294																						
295																						
296	Omisal	bulk carrier	mt	23306	11292	34752	49.2	729	222.21	9.7	216.5	23.9	14.76		7	24		48555				
297																						
298																						
299																						
300	Pantazia L	bulk carrier	gk	14790	9643	27434		591	182.02	10.67	187.8	22.64	14.71		6			39293	33339	12000	17.5	
301																						
302	Pankracht	general cargo	du	5998	3600	9656	19.1	349	113.14	8.692	106	19.92	11.31	474	1	73.5	1	12816	12110	6000	14	
303	Peehis	bulk carrier	ll	17949	10745	27995		648	197.42	10.202	183	23	14.3	452	5	30		39750		10700	14.5	
304																						
305	Pelisa	bulk carrier	mt	23271	10473	34685	49.9	729	222.13	9.702	216.5	23.99	14.76		7	23		45693		11284		
306																						
307																						
308																						
309	Phoenix H	bulk carrier	cy	16937	11440	28874	34.6	581	176.99	10.402	187	22.92	14.51		5	28		37302	32500	11550	15.5	
310	Poljefaris	bulk carrier	gk	17912	11063	30244	37.2	621	189.44	10.688	178	22.79	14.61		7	20		39982	34274	11550	15	
311																						
312	Pomorze Zach	bulk carrier	po	16697	9015	26696	36.8	592	180.25	9.848	172	23.11	13.92		5	28		34850	33563	7840	14.5	
313																						
314	Pontekalis		gk	14931				590														
315																						
316	Pontoporos		gk	16912				561														
317																						
318	Prantelis	bulk carrier	gk	17912	11063	30244	37.2	621	189.44	10.688	178	22.79	14.61		7	20		39982	34274	11550	15	
319																						
320	Prude of Donegal		ll	12811				518														
321	Project Eurapa	heavy load carrier	ru	9857	3693	13493		456	139.05	8.851	128.9	22.86	13.01	454	2			15587	15114	10000	17.5	
322	Proor Trader	tanker	no	1598	903	3124	9.5	318	96.83	6.184	88.68	12.03	7.29		16			2092		1800	11.5	
323	Punica	bulk carrier	ll	17949	10745	27995		648	197.42	10.202	183	23	14.3	452	5	30		39750		10700	14	
324																						
325																						
326	Ranum	tanker	cy	3370	1581	4886		346	105.47	6.152	97.47	14.22	8.82		4	24		6250		3000	13.5	
327	Reeboloi	general cargo	ro	11359	5848	15555		521	158.71	9.6	146.9	22.8	13.2	396	4	24		21192	18860	6000		
328	Ribes	bulk carrier	gk	16728	10610	28962		593	180.83	10.684	170	23.11	14.51		6	23		37845	33088	12000	15	
329																						
330																						

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
331	Riomer	bulk carrier	strengthened, heavy car/cy	7068	4759	11702	21.1	445	135.67	8275	125	19	10.93	566		3	31	14878	14495	5910	12.5	
332	Roma	oil, chemical	de	18282	8880	27350	36.9	568	170.91	11441	184	23.11	15.37		14			28421		7200	15	
333																						
334																						
335	Rong Jiang	general cargo	ch	9117	6354	15189		483	140.98	886	134.2	20.42	11.74			5	21	21416	19830	7500	15	
336	Rosa Islands	general cargo	pa	8968	6238	15176	24.3	472	144	848	137.5	20.43	11.76	120		5	22	21370	19536	7500	14.5	
337	Rubin Eagle		ph	11176				488														
338	Ruder Boskovik	bulk carrier	strengthened, ore cargo/yu	15704	10358	27020	35.2	599	182.71	10535	171.7	22.41	14.2			7	19	35752	31365	11650	17	
339																						
340	Sac Hainage	bulk carrier	strengthened, ore cargo/pa	17188	11340	30489	38	621	190.68	10688	178	22.8	14.58			7	19	39882		11650	16	
341																						
342	Sabathawren	bulk carrier	strengthened, heavy car/ba	22388	11648	35315	47.2	730	222.54	9702	218.9	23.08	14.64			7	23	47013	48388	10880	13.5	
343																						
344																						
345																						
346	Saendael	bulk carrier	strengthened, heavy car/pa	15911	10870	27000		581	177.04	10592	168	22.86	14.1			6	21	32338	31083	11800	15.26	
347	Saimonach	bulk carrier	strengthened, heavy car/mt	18025	9394	28251	38.6	640	196	10221	183	23	14.3			5	28	39403	33194	10700	14.5	
348																						
349	Saopont II	bulk carrier	strengthened, heavy car/mt	16136	9202	26641	35.2	581	177.02	10415	167	22.89	14.48			5		38840	32878	12000	15	
350	Silad Knutsen	tanker	oil, chemical	15808	6284	22825	35.1	593	182.52	9738	155.8	23	14.8			12		25888		10680	13.5	
351																						
352																						
353																						
354	Solta	bulk carrier	ice strengthened	19259	9495	29785		622	189.59	10818	182	22.8	15.10	570		5		35763		11235	15.75	
355																						
356	Soren Toubro	bulk carrier	strengthened, heavy car/h	16788	9002	27048	38.8	628	191.29	9494	182.8	22.86	13.49			5	27	38598	35477	10500		
357																						
358																						
359	South Islands	general cargo	cy	8986	6288	15175	24.3	472	144	848	137.5	20.43	11.76	120		6	22	21379	19536	7500	14.5	
360	Svalfang	bulk carrier	no	1688				251														
361																						
362	Steel Flower	bulk carrier	strengthened, heavy car/no	15611	10255	27540	34.9	600	185.04	10713	170.9	22.7	14.38			7	17	35504	32728	9000	15	
363																						
364																						
365	Stallmoro	heavy-load carrier	na	1488	889	2850		289	88.19	5601	74.02	15.51	7.52			1		4086		2800	12.5	
366	Stalinova	general cargo	ice strengthened	4697	2315	5076		327	98.8	64	91.01	18	9.76	192		1	51.8	7010	6847	5800	12	
367	Stegan Basin	bulk carrier	ru	19572	6723	19690		532	162.08	988	154.9	22.86	13.54	442		6	17	28223	22422	11200	15.26	
368	Stevensland	general cargo	ice strengthened	999	748	2510		290	88.5	5277	80.29	13.81	8.01	180		1	58.2	4847	4545	2400	14	
369	Stolt Alliance	tanker	oil, chemicals	4194	12874			404.4	123.3	8789	118	20.01	11.21			19		14014		4760	13.25	
370																						
371																						
372																						
373																						
374																						
375	Stolt Asphatol	tanker	oil, chemicals	7901	4080	12219	22.4	423	128.91	853	121	20.21	11			14		14357		6900	14	
376																						
377																						
378																						
379																						
380																						
381																						
382	Stolt Taurus	tanker	oil, chemicals	7145	4134	12749		495	123.3	8789	116	20.52	11.21			19		14189		4760		
383	Stormy Annie	general cargo	strengthened, heavy car/pa	12628	7829	20850		522	159.01	9754	148	22.8	13.52			5	22	29231	27529	9000	16	
384	Storn	bulk carrier	ice strengthened	7193	4715	10880	20.4	470	143.31	7585	134.7	18.5	10.16			3		18042	15205	6000	14.75	
385	Sunny Blossom	tanker	chemical	11588	6893	18993	30.9	528	180.81	9151	149.6	22.81	12.02			21		11132		7000		
386	Super Vision	general cargo	ph	7170	4381	12359		400	121.8	891	116	20.01	11.03	252		3		15052	14435	4100	13	
387	Thor I	general cargo	ice strengthened	15290	8221	20975		542	165.11	11	158	22.86	14.71	500		4		26405	24745	13100	17.5	
388																						
389																						
390																						
391	Thorscape	general cargo	ice strengthened	15290	8221	20975		542	165.11	11	158	22.86	14.71	500		4		26405	24745	13100	17.5	
392																						
393																						
394																						
395	Tim Buck	bulk carrier	ice strengthened	14009				532	182.11	9881	154.9	22.86	13.52	442		6	18	28216	22245	11200	15.25	
396	Then Stein	heavy-load carrier	ice strengthened	7581	3620	9864		405	123.35	773	113.2	20.64	10.3	444		1	79.8	12281	11570	5880	15	



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
327	Trens Arctic	oil, chemicals	no	4712	2151	8900	383	116.3	7.7	109.4	17.5	9.8			2		8	7563		4069	16	
328																						
329																						
400	Trisa	strengthened, heavy car, gk		22640	13186	38568	49.6	730	222.49	10.246	216.6	23.08	14.33		7	26		47038	43940	10400	14	
401																						
402																						
403	Tuifd Knibsen	oil, chemicals	no	15889	8238	14910	533	182.54	8	155.6	23	14.3								10880	13.5	
404																						
405																						
406																						
407																						
408																						
409	Turkey B	general cargo	tu	5194	3050	8153	387	117.91	7.99	110	18.04	9.02		3	26		10194	9828	6200	13		
410	Ulota	strengthened, heavy car, al		16887	10337	28128	595	178.21	10.61	167.2	23.11	14.78		5			38539	33807	10500	16.75		
411																						
412																						
413	Union	strengthened, heavy car, hk	ba	17066	10334	28166	35.4	685	178.21	10.61	167.2	23.11	14.78		5			38555	33807	9950	14.5	
414	Urtiken			17191			821															
415																						
416																						
417																						
418																						
419	Uzmedse	ice strengthened	mt	10948	5887	16231	498	151.3	8.502	142.6	22.41	12.15	16				20502		7751	15.1		
420	Verakka	strengthened, ore cargo, fl		12385	6435	14938	522	159.18	9.151	151.6	21.01	12.3		3	27	3	17799	17773	9900	16		
421	Verally Alusink	bulk carrier	ru	10179	5780	14200	25.7	498	151.75	8.691	149	21.04	11.59		5	19		17070	16200	9900	15.75	
422	Vehua	ice strengthened	mt	10948	5887	16231	498	151.3	8.502	142.6	22.41	12.15	16					20502		7751	15.1	
423																						
424																						
425	Viljandi	ice strengthened	ee	8645	2563	4600	19	468	139.63	6.82	127.4	19.23	13.11		1	64		11810		6100	17	
426																						
427	Vuolun	strengthened, ore cargo, cy		17187	10246	30489	38.2	826	190.66	10.688	178	22.79	14.58		7	18.5		36982		11550	14	
428																						
429																						
430	Wana Nares		th	16518			578															
431	Winter Star	ice strengthened	cy	16767	10918	28860	40.3	656	199.8	10.41	192.3	22.86	14		6	24		35777	35112	11200	15	
432																						
433																						
434	Yick Hua	strengthened, heavy car, Pa		17054	10342	28088		585	178.24	10.572	167.2	23.11	14.76		5			38555	33607	9900	14.5	
435	Ziemia Chelmin	bulk carrier	po	16899	9021	26700	36.8	591	180.25	9.851	172	23.11	13.92		5	27		34850	33563	7840	14.5	
436																						
437																						
438																						
439	Ziemia Gniezna	bulk carrier	po	16899	9021	26700	36.8	591	180.25	9.851	172	23.11	13.92		5	27		34850	33563	7840	14.5	
440																						
441																						
442																						
443	Ziemia Suwalski	bulk carrier	po	16899	9021	26700	36.8	591	180.25	9.851	172	23.11	13.92		5	27		34850	33563	7840	14.5	
444																						
445																						
446																						
447	Ziemia Tatnowa	bulk carrier	po	16899	9021	26700	36.8	591	180.25	9.851	172	23.11	13.92		5	27		34850	33563	7840	14.5	
448																						
449																						
450	Ziemia Zamojski	bulk carrier	po	16899	9021	26700	36.8	591	180.25	9.851	172	23.11	13.92		5	27		34850	33563	7840	14.5	
451																						
452																						
453			average	13598.127	7855.787	22082	35.1	535.9	185.02	9.50055	155.7	21.7176355	13.168816	325.037037	5.5257792	27.462	6942.17647	28672.91457	26118.9	8705.9	14.64	
454			avg. dev	4451.5252	2760.097	7924.7	5.58	86.3	25.107	1.05871	25.09	1.74589289	1.5812895	168.860219	1.7839393	7.6767	11428.4083	10455.93965	9361.43	2457.8	0.979	
455			stamd. d.	5983.9701	3207.69	9085.5	7.83	108.1	31.499	1.42414	31.68	2.38593015	2.0234207	194.140988	3.0862986	13.978	15447.8682	11892.86892	10650.7	2935.5	1.354	

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15	1x360KW, 2x360KW 380V					1	25-Mar in ballast		4-Apr cement plant		os	25-Mar								
16	3x440KW					3	7-May steel		28-May sunflower seed		ch	11-May ds		18-May						
17							4-Jul steel		21-Jul steel		ch	10-Jul dt		14-Jul						
18							1-Nov magnesite		16-Nov corn		dt	6-Nov								
19	3x440KW					1	15-Apr iron fines		30-Apr polish		dt	17-Apr lb		25-Apr						
20	3x144KW 380V 50HZ					1	2-Nov pulwood		21-Nov bentonite		ms	7-Nov ch		12-Nov						
21	3x450KW 450V 60HZ					3	4-May steel		19-May corn		cl	6-May ch		9-May td		13-May				
22						0	12-Sep steel		27-Sep wheat		cl	14-Sep td		15-Sep ch		18-Sep ds				
23							19-Nov steel		25-Nov wheat		ba	20-Nov								
24	2x158KW, 1x120KW 220V					43	21-Oct in ballast		12-Nov machinery		ds	26-Oct								
25	3x500KW 450V 60HZ					5	12-Sep steel		6-Oct pipes/fittings		ch	19-Sep								
26	3x370KW 220/440V 60HZ					561	10-Jun steel		19-Jun corn		ch	11-Jun td		15-Jun						
27	3x440KW					2	10-Nov steel		28-Nov peas		dt	12-Nov lu		15-Nov ch						
28	3x440KW					1	17-Nov in ballast		5-May soybeans		td	28-Apr								
29	3x200KW 450V 60HZ					142	31-May steel		18-Jun corn		cl	2-Jun ch		6-Jun mw						
30	3x450KW 440V 60HZ					142	4-May coke		22-May wheat/mid.pellet		dt	6-May ds		13-May lb						
31							5-Aug iron fines		18-Aug steel		dt	7-Aug								
32							1-Oct in ballast		18-Oct sands/mustard		dt	7-Oct								
33							20-Nov steel		8-Dec soybeans		cl	21-Nov dt								
34	4x247KW 450V 60HZ						22-Dec steel		22-Dec in ballast		cl	15-Dec								
35	3x300KW 450V 60HZ					18.5	17-Nov in ballast		20-Dec peas		lb	22-Nov								
36	3x300KW						1-Sep in ballast		11-Sep peas		ch	5-Sep								
37	3x244 450V 60HZ					18.5	30-Apr pulwood		8-May general cargo		to	30-Apr ha		6-May						
38							28-Sep aluminum		7-Oct steel		ha	29-Sep th		1-Oct ha						
39	3x420KW 440V 80HZ					1843	10-Nov steel		28-Nov steel		ch	14-Nov		7-Nov ch						
40							7-Sep sugar		20-Sep soybeans		to	8-Sep ds		14-Sep						
41							6-Sep in ballast		22-Nov flax/mustard		cl	7-Nov ch		11-Nov bh						
42							9-Dec steel		19-Sep steel		bh	10-Sep								
43							3-Aug in ballast		28-Dec screenings		cl	14-Dec lb		18-Dec						
44	1x460KW 380V						17-Oct general		11-Aug pres/patte		dt	5-Aug								
45							6-May steel		31-Oct generator/elec		dt	19-Oct bh		23-Oct cl						
46	2x640KW, 1x480KW 380V					230	15-Apr steel		11-May bentonite		cl	8-May td		10-May dt						
47	2x450KW 440V					201	21-May manganese		2-May sand/pass		td	18-Apr bh		19-Apr td						
48	3x440KW 450V 60HZ					174.5	22-Jul steel		1-Jun steel		td	23-May dt		27-May						
49							27-Sep manganese		26-Jul in ballast		ba	22-Jul								
50							7-Nov steel		8-Oct steel		dt	28-Sep								
51							29-Oct in ballast		21-Dec steel		bh	21-Nov ?		?						
52	3x550KW 445V 60HZ					359.5	23-Nov steel		16-Oct soybeans		gd	9-Oct								
53							29-Oct bauxite		6-Dec corn		bh	28-Nov mw		30-Nov						
54	3x440KW 450V 60HZ						1 28-Oct bauxite		22-Nov sunflower/soybe		lh	30-Oct ds		10-Nov						
55							30-Aug steel		18-Sep machinery/gener		cl	4-Sep dt		6-Sep						
56	1x304KW, 3x264KW 380V 60HZ					13.5	24-Aug misgradum		5-Sep steel		td	27-Aug cl		31-Aug						
57	3x420KW, 440V 60HZ					35.5	28-Oct in ballast		12-Nov sunflower seed		ch	28-Oct ds		6-Nov						
58							27-Jul zinc		7-Nov wheat		ds	30-Oct								
59	3x300KW					0	27-Sep in ballast		12-Aug steel		td	31-Jul ha		2-Aug						
60	2x172KW, 1x44KW 380V					13	7-Aug steel		28-Aug corn		dt	2-Oct		6-Aug ch						
61	3x500KW					35	2-Nov in ballast		11-Nov steel		ba	3-Nov dt		14-Aug						
62							12-May steel		24-Nov aluminum		bh	17-Nov th		5-Nov						
63							13-May steel		16-May in ballast		ha	14-May		22-Nov						
64	3x200, 1x132KW 445V 60HZ					58	12-May steel													
65	3x725KW 450V 60HZ					1024	12-May steel													
66							161.5 pulp, newsprint													

W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
67	3x40RW 450V 60Hz	140.5	21		2	11-Oct rutile		31-Oct canola	as		19-Oct lb		19-Oct						
68						7-Dec steel		18-Dec in ballast	dt		6-Aug		13-Dec						
69	3x50RW				1	2-Aug steel		13-Aug in ballast	bh		4-Sep								
70	2x340RW				1	3-Sep in ballast		7-Sep steel	ha		26-May								
71					1	25-May in ballast		7-Jun steel pipe	ha		6-Jul								
72					3	3-Jul coal tar		15-Jul coal tar	dt		16-Aug								
73						18-Aug coal tar		26-Aug coal tar	ha		24-Nov 60								
74					1	24-Nov coal tar		5-Dec coal tar	dt		9-Oct								
75	3x420RW 450V 60Hz				1	26-Sep in ballast		10-Oct wheat	ds		23-Apr								
76	3x40RW 440V 60Hz	282	37.5		4	23-Apr in ballast		27-Apr wheat	ds		4-Jun ch								
77						3-Jun steel		23-Jun wheat	ha		30-Jul td								
78						22-Jul steel		12-Aug in ballast	cl		24-Oct ds								
79					1	22-Oct rutile		6-Nov barley	as		7-May ch								
80	4x40RW 380V 60Hz	441	1257		1	5-May steel		14-May corn	dt		18-Apr dt								
81	4x40RW 380V 60Hz	441	1257		1	15-Apr steel		1-May peash	cl		28-Sep								
82	3x450RW 450V 60Hz	205.5	2301		2	24-Sep in ballast		7-Oct peas/rutile	lb		18-Nov								
83					1	17-May in ballast		27-Nov sunflower seed	ds		28-May								
84	2x185RW, 1x120RW 220V	43	162		5	27-May in ballast		2-Jun rail case	ha		11-May bh								
85					1	7-May steel		21-May bentonite	ch		15-Apr dt								
86	3x52RW 390V 60Hz	234	1228		28	22-Oct in ballast		2-Nov wheat	ds		15-Nov ds								
87	3x480RW 450V 60Hz	165	1942		1	14-Apr steel		1-May corn	ha		19-Nov dg								
88	3x480RW 440V 60Hz	190	1299.5		1	10-Nov rutile		20-May sunflower seed	as		1-May wl								
89	3x388RW 450V 60Hz	182.5	1970.5		2	30-Apr fertilizer		30-May sunflower seed	ha		11-Oct dt								
90					1	9-Oct rutile		20-Oct steel	as		22-Aug dt								
91	3x400RW 440V 60Hz				3	28-Apr steel		10-May soybeans	wl		30-Apr ch								
92	3x40RW					14-Jul steel		31-Jul steel	so		17-Jul ch								
93						9-Oct steel		6-Nov sunflower seed	ha		14-Oct cl								
94					1	31-Oct steel		18-Nov steel	dt		2-Nov so								
95	3x420RW 450V 60Hz	307	1598		3	22-Apr steel		20-May wheat/barley/soy	cl		24-Apr mw								
96	3x550RW 450V 60Hz	220	1813		3	16-Jul steel		1-Aug sunflower seed	ha		17-Jul ds								
97						30-Aug steel		8-Sep wheat	ha		31-Aug gd								
98					3	20-Jun sugar		30-Jun in ballast	to		21-Jun								
99						13-Aug steel		30-Aug peas	so		17-Aug lb								
100						19-Oct steel		30-Oct canola/peas	ha		11-Oct td								
101					3	27-Mar steel		15-Apr corn	ha		22-Mar dt								
102	3x525RW 440V 60Hz	124	1315		3	18-May in ballast		30-May mult grains	lb		18-Nov lb								
103					2	25-May steel		7-Dec mult grains	dt		27-May ds								
104	105 3x40RW 450V 60Hz					10-Oct steel		31-Oct wheat	dt		12-Oct ch								
105					1	29-Sep steel		9-Nov wheat	cl		26-Sep td								
106	107 3x40RW 450V 60Hz	156	1725		5	19-Apr steel		7-May flaxseed	dt		21-Apr ch								
107	3x525RW 440V 60Hz	124	1315.5		27	8-Jun steel		27-Jun wheat/flaxseed	ha		9-Jun dt								
108						11-Aug steel		11-Aug chamble	dt		1-Aug ds								
109						11-Oct steel		27-Oct flax/canola	dt		19-Oct lb								
110					2	3-Dec steel		25-Dec corn	mw		8-Dec ch								
111						8-Sep steel		6-May corn	ha		21-Apr mw								
112					3	28-Mar steel		19-Apr corn	to		10-Sep wl								
113						6-Jun steel		16-Jun steel	cl		7-Jun								
114					1	31-Oct sugar		22-Oct steel	to		11-Oct cl								
115					4	19-May steel		14-Aug steel	ha		3-Aug bh								
116					4	3-Aug steel		4-Jun sunflower seed	ha		20-May ds								
117					22	22-Sep steel		16-Aug steel	ha		9-Aug dt								
118					8	5-Nov steel		8-Oct canola	ha		23-Sep lb								
119					4	9-Apr steel		20-Apr canola	so		8-Nov lb								
120						15-Jul steel		18-Jul in ballast	ha		5-Apr ds								
121					28	28-Aug steel		11-Sep steel	ha		16-Jul								
122					2	9-Nov steel		16-Nov steel	ha		30-Aug ch								
123					2	2-Jul steel		30-Jul wheat/oats	og		4-Nov cl								
124					2	28-Oct in ballast		14-Nov steel	bh		5-Jul dt								
125					2	7-Jun in ballast		19-Jun flaxseed	lb		11-Nov dt								
126						17-Jul steel		1-Aug steel	ha		19-Jul cl								
127	1x40RW 380V 60Hz				1	18-Aug in ballast		20-Aug welds/bent	og		16-Aug								
128	1x80RW 440V 60Hz				1	8-Oct calcium		26-Oct wheat	dt		12-Oct ds								
129					1														
130																			
131	2x640, 1x40RW 380V 60Hz																		
132	2x640, 1x40RW 450V 60Hz	128	718																

W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP		
133																					
134	1x320, 2x240KW 440V 60Hz			17.4	1	18-Oct	in ballast	31-Oct	wheat	li	20-Oct	ds	28-Oct								
135	3x360KW 450V 60Hz	128	718		1	17-Sep	coconut oil	29-Sep	in straw	ha	18-Sep	dt	18-Sep	ha	27-Sep						
136	3x320KW				1	1-Dec	steel	23-Dec	in straw	oa	23-Dec	me	10-Dec	li	12-Dec	ph	15-Dec				
137	3x360KW 450V 60Hz	128	718		1	21-Oct	in ballast	18-May	corn	ha	18-Oct										
138					1	17-Apr	alum/woodpulp	18-May	corn	ow	21-Apr	pb	6-May	ds	11-May						
139	2x375, 1x280KW 380V 60Hz		21.5		5	2-Apr	steel	17-Dec	steam generator	to	9-Dec										
140					1	15-May	fertilizer	28-May	in straw	ha	3-Apr	wl	6-Apr								
141					4	20-Apr	sugar	7-May	in straw	to	17-May	tb	21-May								
142					1	2-Aug	sugar	17-Aug	in straw	to	2-Aug	tb	3-Aug	tb	10-Aug						
143					2	28-Nov	in ballast	2-Oct	wheat	ha	21-Sep	gd	25-Sep								
144	3x350KW				1	26-Aug	baucite	4-Jun	steel	th	23-May	dt	28-May								
145	3x400KW 450V 60Hz	108.5	817		1	18-May	coconut oil	23-May	in ballast	ha	20-May										
146	3x200KW 440V 60Hz	184.3			4	20-Apr	sugar	7-May	in straw	to	21-Apr	tb	28-Apr								
147					2	2-Aug	sugar	17-Aug	in straw	to	3-Aug	tb	10-Aug								
148					2	28-Nov	in ballast	2-Oct	wheat	ha	21-Sep	gd	25-Sep								
149					2	28-May	baucite	4-Jun	steel	th	23-May	dt	28-May								
150	3x328KW				2	28-May	baucite	4-Jun	steel	th	23-May	dt	28-May								
151					4	12-Apr	steel	29-Apr	canola/sunfl	ha	13-Apr	bh	18-Apr	tb	22-Apr						
152	3x400KW 440V 60Hz	185	1723		4	10-Jun	steel	1-Jul	sunflower seed	bh	14-Jun	ds	22-Jun								
153					1	20-Jul	steel	14-Aug	sunflower seed	ha	30-Jul	ds	6-Aug								
154					1	19-Oct	steel	31-Oct	steel	ha	14-Oct	cl	17-Oct	td	19-Oct	mw	21-Oct	bh	26-Oct		
155	3x320KW	115	1755		1	10-Oct	in ballast	19-Oct	steel	cl	12-Oct										
156					2	30-Apr	steel	14-May	corn	cl	2-May	dt	3-May	ch	8-May						
157	3x400KW				2	8-Oct	steel	19-Oct	soybeans	cl	8-Oct	dt	9-Oct	ch	11-Oct	td	15-Oct				
158					3	26-May	steel	18-Jun	corn	ha	27-May	cl	30-May	td	1-Jun	mw	5-Jun	ch	6-Jun		
159	3x450KW 440V 60Hz	162	1718		3	15-Aug	steel	15-Aug	soybeans/sunfl.	ha	25-Jul	ds	3-Aug								
160					4	18-Sep	steel	11-Oct	mdt, wheat	ha	20-Sep	dt	23-Sep	ch	28-Sep	tb	1-Oct				
161					4	15-Apr	skinning	8-May	sunflower seed	oa	16-Apr	td	25-Apr	ds	27-Apr	ds	1-May				
162					2	29-Jun	general	19-Jul	steel	ha	30-Jun	td	5-Jul	dt	6-Jul	bh	9-Jul				
163					1	7-Nov	in ballast	20-Sep	steel	ch	11-Sep										
164					1	18-Jul	steel	30-Jul	in ballast	cl	13-Nov	dt	18-Nov								
165	3x400KW 450V 60Hz	199	1210		1	18-Jul	steel	30-Jul	in ballast	cl	20-Jul	dt	21-Jul	ch	26-Jul						
166	3x400KW 450V 60Hz	209	1570		2	15-Apr	steel	1-May	wheat	cl	18-Apr	td	21-Apr	ds	24-Apr						
167					1	12-Dec	zinc	23-Dec	in ballast	td	16-Dec										
168	3x400KW 440V 60Hz	185	1723		1	18-Apr	coke	4-28	steel coils	dt	17-Apr										
169	3x380KW 450V 60Hz				2	18-Apr	steel	9-Sep	steel	ch	22-Aug	bh	24-Aug								
170	3x360KW	886.5			2	26-Apr	in ballast	9-Nov	wheat	ha	20-Oct	cl	23-Oct	bh	27-Oct	ds	3-Nov				
171	4x580KW 400V 50Hz				2	26-Jun	fat fuel	30-Jun	in ballast	ck	27-Apr										
172	3x440KW 440V 60Hz				2	2-Oct	in ballast	14-Oct	corn	td	28-Jun										
173					2	1-Dec	steel	16-Dec	corn	td	8-Oct										
174					1	2-Aug	in ballast	14-Aug	maize	tb	7-Aug										
175	3x520KW 440V 60Hz	240	1480		2	16-Sep	steel	2-Oct	wheat	ha	11-Sep	cl	12-Sep	td	13-Sep	td	14-Sep	mw	17-Sep		
176	3x400KW 450V 60Hz				2	25-Nov	steel	18-Dec	peas/canola	ha	28-Nov	cl	29-Nov	tb	4-Dec						
177					4	30-Mar	baucite	19-Apr	wheat	th	31-Mar	ds	8-Apr								
178	3x400KW 450V 60Hz				7-Jun	steel	steel	25-Jun	sunflower seed	cl	6-Jun	td	11-Jun	ch	19-Jun	ds	16-Jun				
179					5-Sep	steel	steel	13-Dec	peas	ha	22-Nov	td	23-Nov	td	26-Nov	dt	28-Nov	mw			
180					2	8-Jul	baucite	30-Jul	corn	th	9-Jul	td	17-Jul								
181					1	11-Nov	steel	23-Dec	in straw	ch	16-Nov	ds	19-Nov	ds	23-Nov						
182	3x400KW 450V 60Hz	256	2221		2	2-Dec	rutile	30-Dec	in straw	ch	4-Dec	tb	13-Dec								
183	3x370KW 440V 60Hz	246	1463		1	16-Nov	baucite	4-Dec	sunflower seed	th	18-Nov	ds	25-Nov								
184	2x310KW 450V 60Hz				1	6-May	run	8-May	in ballast	to	5-May										
185	4x322KW	54.15	475.34		1	26-May	clay/woodpulp	28-Oct	in ballast	to	24-Oct										
186	3x480				3	23-Aug	steel	23-May	wheat	dt	28-May	me	31-May	tb	3-Jun						
187	3x504KW 380V 60Hz				3	23-Aug	steel	6-Sep	corn/gluten feed	cl	24-Aug	td	26-Aug	dt	27-Aug	ch	30-Aug	ph	1-Sep		
188					5-Nov	steel	steel	28-Nov	baucite	oa	6-Nov	ch	16-Nov	ds	19-Nov	ds	23-Nov				
189					3	7-Aug	fat	17-Aug	potash	as	24-Jun	td	27-Jun	ch	1-Jul						
190					4-Nov	steel	steel	3-Dec	baucite	th	9-Aug	tb	12-Aug								
191					2	28-Apr	steel	11-May	in straw	dt	27-Apr	ch	3-May	ha	8-May						
192					1-Jul	steel	steel	17-Jul	in straw	th	1-Jul	td	6-Jul	ch	10-Jul	tb	12-Jul				
193					1	20-Apr	steel	4-May	soybeans	cl	22-Apr	td	26-Apr	ds	28-Apr						

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	
199						1	9-Nov	in ballast	14-Nov	wheat	da	8-Nov									
200						3	9-Jul	steel	28-Jul	pass	dt	11-Jul	ch	20-Jul	fb	24-Jul					
201							19-Sep	steel	29-Sep	bertoni/c	ch	21-Sep	td	26-Sep	td						
202						5	28-Nov	steel	20-Dec	potash	dt	1-Dec	td	14-Apr	fb	7-Dec					
203							10-Apr	steel	21-Apr	canola feed	dt	12-Apr	wl								
204							7-Jun	steel	10-Jun	in ballast	ba	8-Jun									
205							23-Jul	steel	15-Aug	bertoni/c	wl	25-Jul	th	31-Jul	gb	7-Aug					
206							4-Oct	damman	18-Oct	soybeans	cl	8-Oct	td	8-Oct							
207							28-Nov	steel	5-Dec	coal	cl	26-Nov	ph	28-Nov	og	4-Dec					
208						1	4-Oct	steel	23-Oct	canola/pass	td	6-Oct	dt	7-Oct	fb	12-Oct					
209						1	11-Jun	steel	17-Jun	in ballast	cl	12-Jun									
210	2x350KW 445V 60HZ			20		1	6-Sep	in ballast	21-May	barley	ba	7-Sep									
211	2x350KW 445V 60HZ			20		1	6-May	in ballast	21-May	barley	ba	7-Sep									
212	1x720, 2x560KW 380V 50HZ					1	17-Jun	in ballast	28-Jun	in ballast	ba	12-May									
213	3x248KW 440V					1	18-May	steel	3-Jun	bertoni/c	cl	20-May	tu	26-May		24-Jun					
214	3x540KW 450V 60HZ	190.5	1738	27.5		3	25-Mar	steel	19-Apr	wheat	cl	25-Mar	ds	1-Apr							
215							1-Jun	steel	17-Jun	wheat	ba	5-Jun	so	7-Jun	ds	11-Jun					
216							13-Nov	supr	28-Nov	steel	ba	14-Nov	th	20-Nov							
217	3x540KW 450V 60HZ	190.5	1738	27.5		1	30-Nov	steel	25-Dec	wheat	dt	2-Dec	ch	7-Dec	ds	15-Dec					
218	3x504KW 380V 50HZ	130	1044	24.5		2	12-Jul	steel	28-Jul	scrappings	dt	14-Jul	ch	18-Jul	fb	20-Jul					
219						3	31-Oct	steel	17-Nov	pass	ba	1-Nov	fb	8-Nov							
220	3x360KW					3	6-May	steel	22-May	soybeans	cl	8-May	td	10-May	dt	11-May	ch				
221							17-Jul	steel	5-Aug	wheat	ch	24-Jul	ds	30-Jul							
222							8-Oct	in ballast	18-Oct	wheat	da	12-Oct									
223	3x504KW 380V 50HZ	130	1044	24.5		5	18-May	steel	2-Jun	mult. grains	ba	18-May	tb	23-May							
224							9-Jul	steel	20-Jul	coke	dt	10-Jul	ch	10-Jul	ds	13-Jul					
225							17-Aug	steel	6-Sep	corn	cl	19-Aug	ch	25-Aug							
226							7-Oct	steel	22-Oct	steel	cl	10-Oct	ch	13-Oct							
227							2-Dec	steel	25-Dec	mult. grains	cl	4-Dec	tb	9-Dec							
228	3x504KW 380V 50HZ	130	1044	24.5		3	18-Jul	bauxite	7-Aug	soybeans	th	22-Jul	ds	28-Jul							
229							24-Sep	steel	9-Oct	canola	ba	25-Sep	tb	30-Sep							
230							14-Nov	steel	3-Dec	steel	ch	18-Nov	bb	18-Nov							
231						4	7-Apr	steel	26-Apr	wheat	dt	10-Apr	ds	16-Apr							
232							13-Jul	steel	20-Jul	flaxseed	ba	14-Jul	tb	20-Jul							
233							6-Sep	steel	17-Sep	corn	cl	7-Sep	dt	8-Sep	dt	12-Sep					
234							23-Oct	steel	13-Nov	mult. grains	ba	24-Oct	cl	27-Oct	td	30-Oct	tb				
235	3x558KW 440V 60HZ	250	1420			5	26-Apr	steel	10-May	soybeans	ba	26-Apr	th	30-Apr	dt	5-May					
236							17-Jun	steel	30-Jun	coal	ba	18-Jun	ds	24-Jun							
237							6-Sep	steel	20-Sep	coal	ba	7-Sep	dt	9-Sep	ch	11-Sep	ds				
238							17-Oct	in ballast	1-Nov	mult. grains	tb	21-Oct									
239							8-Dec	in ballast	26-Dec	wheat	da	17-Dec									
240	3x558KW 440V 60HZ	250	1420			4	25-Mar	steel	1-Apr	in ballast	ba	26-Mar									
241							12-May	steel	6-Jun	wheat	cl	14-May	dt	17-May	th	20-May	ds				
242							15-Aug	pig iron	30-Aug	corn	ba	22-Aug	mw	24-Aug							
243							11-Dec	in ballast	19-Dec	steel	ba	12-Dec									
244	3x558KW 440V 60HZ	250	1420			2	26-Mar	iron briquet	25-Apr	wheat	ba	30-Mar	ds	4-Apr							
245							13-Sep	in ballast	30-Sep	flax/canola/pass	th	17-Sep									
246	2x320, 1x200KW 400V 5	278	1466			1	22-Jul	bauxite	30-Jul	in ballast	th	25-Jul									
247	3x440KW 450V 60HZ	173	1275	3.7		1	13-Oct	in ballast	24-Oct	wheat	da	18-Oct									
248	3x380KW					1	17-Oct	in ballast	29-Oct	pass	tb	21-Oct									
249	2x32KW 220/380V 50HZ	153	0	4.5		1	22-Jun	in ballast	6-Jul	machinery	mw	26-Jun									
250	3x420					4	29-May	steel	15-Jun	corn	ba	2-Jun									
251							28-Jul	steel	19-Aug	steel	ba	29-Jul	td	2-Aug	ch	7-Aug	cl				
252							6-Oct	steel	17-Oct	steel	ba	7-Oct	ch	12-Oct							
253							18-Nov	steel	5-Dec	alfalfa/soybeans	ch	22-Nov	ds	28-Nov	tb	29-Nov					
254						2	2-May	steel	15-May	soybeans	cl	4-May	td	12-May							
255							26-Sep	steel	10-Oct	steel	cl	28-Sep	dt	29-Sep	ch	1-Oct					
256	2x300KW 450V 60HZ	113	442	27.5		2	16-Apr	bauxite	30-May	zinc	ba	27-May									
257							28-May	in ballast	22-Dec	pass	ba	9-Dec									
258	2x350, 1x300KW 450V 6	186	1265			1	28-Nov	in ballast	23-Nov	corn	ba	13-Nov	td	19-Nov	tb	8-May					
259	3x440KW 450V 60HZ	175.5	1399.5			1	12-Nov	steel	15-May	canola/flaxseed	ba	2-May	tb	9-Oct							
260	1x1080, 3x522KW 450V	209.5	1971.5			3	30-Apr	rubble	17-Oct	canola	to	1-Oct	tb	25-Nov	dt	26-Nov	bh				
261							30-Sep	stiger	10-Dec	steel	ba	22-Nov	dt	25-Nov	dt	26-Apr	in ballast				
262							21-Nov	steel	16-Jul	steel	ba	16-Jul	steel	16-Jul	steel						
263	3x200KW 445V 60HZ	93	619	1.4		2	4-Jul	steel	18-Jul	steel	wl	6-Jul	td	10-Jul							
264																					

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	
266	3x440kW					1	7-Jul steel		13-Jul in ballast	in		8-Jul									
267	3x350kW					1	24-Nov steel		4-Dec soybeans	cl		28-Nov dt		28-Nov td		30-Nov					
268	4x400kW 380V 60Hz		441			1	22-Apr steel		5-May corn	bl		26-Apr td		1-May							
269	3x600kW 400V 60Hz		300	1895		34	24-May steel		9-Jun peas	bl		30-May tb		9-Jun							
270						1	26-Nov bentonite		20-Dec alfalfa pellets	th		27-Nov gb		4-Dec							
271						2	6-May steel		20-May soybeans	ha		10-May gd		14-May							
272	3x400kW 445V 60Hz		113	1000		7 pumps, total	26-Sep sugar		12-Oct soybeans	to		27-Sep dt		4-Oct td		9-Oct					
273						2	2-Nov caustic soda		10-Nov rhomboids	sa		4-Nov									
274	3x520kW 440V 60Hz		282	1723		3	9-Dec caustic soda		19-Dec caustic soda	sa		14-Dec		27-May							
275							20-May steel		4-Jun canola	ha		21-May tb									
276							6-Jul steel		26-Jul steel	bl		10-Jul									
277	3x400kW 440V 60Hz		365	1196		2	16-Nov steel		8-Dec sunflower seed	to		18-Nov ds		28-Nov							
278							20-Jun rubber		12-Jul steel	sa		1-Jul bh		5-Jul							
279	1x750, 3x650kW 380V 60Hz		1500.6			16 pumps, total	27-Nov rubber		18-Dec mult grades	sa		29-Nov tg		26-Jun							
280						2	16-Jun steel		27-Jun zinc	ch		29-Jun tg									
281						2	3-Sep caustic soda		9-Sep in ballast	sa		5-Sep									
282	2x600, 1x200kW 440V 6		151.5	1025		1	13-Nov caustic soda		18-Nov in ballast	sa		15-Nov									
283	2x400kW					3	14-Oct newspaper		23-Oct calcium chloride	wl		19-Oct		3-Jul dr		11-Jul					
284							2-Jul fertilizer		20-Jul mill scale	og		2-Jul									
285						3	29-Aug in ballast		2-Sep steel	ha		30-Aug									
286	3x350kW 450V 60Hz		179	1318		1	15-Nov steel		4-Dec wheat	td		18-Nov dt		20-Nov cl		23-Nov ds					
287	3x400, 1x100kW 400V 5		87	824.6		2	6-Sep rubber		19-Sep corn	sa		8-Sep									
288						16.5	7-Jun manganese		20-Jun barley	ha		8-Jun dt		11-Jun ds		14-Jun					
289						3	12-Sep in ballast		23-Sep barley	ds		16-Sep									
290							7-Jul steel		23-Jul flaxseed/peas	bl		11-Jul tb		16-Jul							
291							28-Aug steel		13-Sep steel	bl		28-Aug bh		5-Sep							
292							30-Nov steel		23-Dec potato	wl		2-Dec mw		6-Dec ch		7-Dec					
293						1	9-Sep in ballast		18-Sep potato	tb		19-Sep									
294						3	13-Apr steel		30-Apr mult grades	ha		14-Apr tb		21-Apr							
295							7-Jun steel		24-Jun wheat	ao		10-Jun ds		9-Aug							
296	1x1080, 3x692kW 450V		208.5	1971.5		4	6-Aug steel		28-Aug wheat	ha		7-Aug cl		6-Aug td		11-Aug ch					16-Aug
297							27-Mar steel		18-Apr wheat	bl		28-Mar ds		8-Apr							
298							22-May steel		5-Jun canola/flax/peas	ha		22-May tb		26-May							
299							13-Jul steel		6-Aug corn	bl		14-Jul cl		16-Jul td		18-Jul dt					23-Jul
300	3x350					2	27-Nov steel		17-Dec wheat	dt		26-Nov ch		2-Dec ds		5-Dec					
301							25-Jun steel		14-May soybeans	to		30-Apr wl		3-May ds		8-May					
302	1x400, 3x200kW 445V 6		68	828		1	11-Jun steel		5-Jul coke	bl		15-Jun		30-Jun							
303	3x400kW 450V 60Hz		175	1399		34	18-May magnesite		9-Jun corn	bl		22-May mw		30-May							
304							11-Oct steel		27-Oct steel	bl		16-Oct cl		25-Oct							
305						4	1-Apr steel		19-Apr soybeans	bl		2-Apr td		7-Apr							
306							28-May gen cargo		21-Jun petroleum coke	to		28-May cl		30-May td							
307							10-Sep steel		25-Sep wheat	ha		11-Sep ds		17-Sep							
308	3x440kW					2032	16-Nov steel		18-Dec wheat/flaxseed	ha		20-Nov tb		28-Nov							
309	3x420kW 440V 60Hz		188.5	1895		2	2-Aug steel		26-Nov steel	dt		18-Nov									
310							20-Aug corn		20-Aug corn	ch		7-Aug dt		14-Aug td		14-Aug					
311							19-Oct iron/omag		1-Nov corn	ha		19-Oct dt		26-Oct td		27-Oct					
312	3x480kW 440V 60Hz		148	1070		28	17-May steel		3-Jun potato	cl		19-May bh		28-May tb		28-May					
313							2-Sep steel		20-Sep potato	cl		3-Sep ch		11-Sep tb		19-Sep					
314						2	26-Apr sugar		10-May wheat	to		27-Apr ds		2-May							
315							8-Nov sugar		8-Dec steel	to		10-Nov tn		14-Nov as		18-Nov sb					28-Nov
316						2	8-Jul steel		21-Jul steel	cl		8-Jul ch		13-Jul							
317	3x420kW 440V 60Hz		188.5	1895			10-Nov sugar		10-Dec wheat	to		24-Nov ds		4-Dec							
318						2	19-Sep steel		30-Sep bentonite	ha		11-Sep lu		16-Sep ds		21-Sep ch					
319							16-Nov steel		4-Dec canola	ha		17-Nov dt		19-Nov ch		22-Nov tb					
320							9-Dec steel		25-Dec machinery	th		10-Dec wl		14-Dec							
321	1x520, 4x252kW 230/400		119	1182		7 14 pumps, total	1-Nov in ballast		1-Nov plant equip.	so		21-Oct									
322	3x145kW 380V 60Hz		212.5	1399		28	8-Nov iron		11-Nov in ballast	to		9-Nov									
323	3x400kW 450V 60Hz		175	1399			26-Jun steel		12-Jul steel	bl		30-Jun									
324							16-Aug steel		4-Nov soybeans	gd		29-Oct		20-Aug bh		23-Aug ds					
325							24-Oct in ballast		27-Sep in ballast	ck		25-Sep									
326	3x150kW 380/220V 60Hz					3 pumps, total	7-Jul plywood		7-Jul general	ha		5-Jul									
327							24-May steel		17-Jun wheat	dt		28-May ch		30-May ds		11-Jun					
328	3x400kW 450V 60Hz		200	1700		38.5	16-Sep steel		1-Oct corn	os		18-Sep ds		24-Sep							
329							23-Nov steel		8-Dec wheat/peas	ha		24-Nov ds		30-Nov tb		2-Dec					
330																					

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
331	1x352, 3x320kW 380V 5	120.5	578			1	24-Sep	in ballast	6-Oct	whst	ds	28-Sep								
332	2x886, 2x740kW 450V 6	136	1082		14 pumps, total	3	18-Jul	jet fuel	18-Jul	in ballast	hs	18-Jul								
333							6-Aug	jet fuel	8-Aug	in ballast	hs	7-Aug								
334							12-Dec	in ballast	22-Dec	in ballast	sa	15-Dec								
335	3x350kW 440V 60Hz	125	1140	25		1	20-Nov	in ballast	20-Dec	machinery	dt	27-Nov								
336	3x350kW 440V 60Hz	130	889.5	24		1	26-Oct	in ballast	21-Nov	pass	tb	30-Oct								
337						2	15-Nov	steel	27-Nov	in ballast	cl	17-Nov	dt	10-Nov	ch					
338	3x420kW 450V 60Hz					1	23-Sep	in ballast	6-Oct	whst	ds	28-Sep								
339						2	18-Nov	in ballast	22-Nov	steel	sg	19-Nov	hs	20-Nov	hs					
340	3x420kW 440V 60Hz	43.5	1643			2	1-May	steel	21-Jun	barley	hs	1-Jun	dt	4-Jun	hb	6-Jun	ds	12-Jun		
341						4	14-Aug	in ballast	22-May	mult. grains	hs	18-Aug								
342	3x625kW 440V 60Hz	124	1315.5	27		4	27-Apr	steel	22-Jul	mult. grains	hs	28-Apr	to	1-May	to	2-May	dt	4-May	mw	8-May
343						2	19-Jun	steel	22-Jul	mult. grains	cl	1-Jul	dt	6-Jul	dt	7-Jul	mw	10-Jul	tb	12-Jul
344						25-Aug	steel	10-Sep	steel		hs	29-Aug								
345						9-Nov	steel	26-Nov	flaxseed		hs	4-Nov	dt	5-Nov	dt	7-Nov	ch	10-Nov	mw	19-Nov
346						1	19-May	steel	10-Jun	steel	sa	21-May	dt	22-May	hb	31-May				
347	3x440kW 450V 60Hz	174.5	1628	34		2	9-Aug	steel	29-Aug	pass	hs	10-Aug	cl	12-Aug	td	13-Aug	td	13-Aug	mw	16-Aug
348						1	17-Oct	steel	9-Nov	sunflower seed	cl	19-Oct	td	24-Oct	ch	28-Oct	ds	30-Oct		
349	3x400kW 440V 60Hz		2138			1	12-Apr	bauxite	2-May	soybeans	hs	14-Apr	ds	23-Apr						
350						4	19-Jun	in ballast	22-Jun	chemicals	sa	15-Jun								
351							9-Aug	gasoline	20-Aug	styrene	hs	10-Aug	sa	11-Aug						
352							1-Oct	gasoline	12-Oct	chemicals	sa	9-Oct								
353							15-Nov	jet fuel	24-Nov	isopropanol	hs	16-Nov	sa	20-Nov						
354	3x680kW 450V 60Hz					2	16-Sep	bauxite	5-Oct	mult. grains	to	17-Sep	th	20-Sep	tb	26-Sep				
355							9-Nov	steel	28-Nov	whst	ch	13-Nov	tb	21-Nov						
356	3x400kW 450V 60Hz	209	1579.5			3	26-Apr	steel	9-May	flaxseed	hs	27-Apr	tb	2-May						
357							12-Jun	steel	5-Jul	whst	hs	12-Jun	dt	15-Jun	dt	17-Jun	dt			21-Jun
358						1	11-Oct	steel	22-Oct	steel	cl	13-Oct	ch	16-Oct						
359	3x350kW 440V 60Hz	130	989.5	24		1	31-Oct	in ballast	4-Dec	pass	tb	5-Nov								
360						1	29-Jul	manganese	2-Aug	in ballast	er	30-Jul								
361	3x370kW 440V 60Hz	246	1483			3	7-Jun	coke	1-Jul	flax/pea/sunfl.	ds	23-Apr	ds	28-Apr						
362	3x650kW 450V 60Hz	220	1583				12-Aug	steel	30-Aug	coke	hs	9-Jun	tb	18-Jun	es	29-Jun				
363							2-Nov	steel	22-Nov	whst	hs	13-Aug	dt	17-Aug	ch	21-Aug				
364							14-May	machinery	20-May	in ballast	dt	16-May								
365	3x160kW 250V 50Hz	110	250	8.5		1	26-Apr	machinery	9-May	in ballast	dt	10-May	ph	3-May						
366	4x250kW 380V 50Hz	550	0	12.5		1	5-May	steel	25-May	canola meal/mal	ch	10-May	tb	16-May						
367	4x400kW 380V 50Hz	441	1257			1	17-Sep	steel	2-Oct	steel	mw	21-Sep	ch	25-Sep						
368	4x282kW					6	24-Apr	chemicals	28-Apr	tallow	to	25-Apr	hs	27-Apr						
369							2-Jun	jet fuel	9-Jun	tallow	hs	3-Jun	dt	6-Jun						
370							12-Jul	jet fuel	28-Jul	tallow	hs	19-Jul	ch	18-Jul	gb	21-Jul				
371							28-Aug	jet fuel	2-Sep	tallow	hs	29-Aug								
372							5-Oct	jet fuel	18-Oct	tallow	hs	6-Oct	ch	10-Oct	gb	12-Oct	dt	15-Oct		
373							28-Jan	chemicals	8-Dec	tallow	to	24-Nov	ch	27-Nov	gb	2-Dec	hs	6-Dec		
374	4x468 kW					7	6-Apr	chemicals	18-Apr	tallow	gb	9-Apr	ch	10-Apr	dt	15-Apr	hs	16-Apr		
375							14-May	chemicals	26-May	tallow	gb	16-May	ch	19-May	hs	24-May				
376							10-Aug	tallow	6-Jul	tallow/chemicals	to	24-Jun	gb	30-Jun	dt	3-Jul	hs	5-Jul		
377							18-Sep	chemicals	17-Aug	tallow	hs	11-Aug	dt	13-Aug						
378							30-Oct	in ballast	1-Oct	tallow	to	19-Sep	ch	22-Sep	gb	24-Sep				
379							3-Dec	paraffin	22-Dec	tallow	ok	4-Dec	hs	11-Dec	dt	15-Dec				
380						1	28-Nov	rain oil	6-Dec	lba oil	hs	28-Nov								
381	3x300kW 440V 60Hz	174	1298	37		1	26-Nov	fluor spar	26-Nov	in ballast	hs	27-Nov								
382	3x328kW 450V 60Hz					1	2-Jun	steel	16-Jun	steel	wl	4-Jun								
383	3x285kW 440V 60Hz	113	1000			1	7-May	caustic soda	14-May	chemicals	sa	9-May								
384	3x400kW 445V 60Hz					1	18-May	steel	10-Jun	whst	ch	23-May	ds	28-May						
385	3x178kW					4	16-Apr	general	20-Apr	general	hs	17-Apr	to	19-Apr						
386	3x720kW 440V 60Hz	304	2585.5	46			29-Jun	general	2-Jul	general	to	28-Jun	hs	30-Jun						
387							3-Sep	general	7-Sep	general	hs	4-Sep	to	7-Sep						
388							11-Nov	general	16-Nov	general	to	12-Nov	hs	13-Nov						
389	3x720kW 440V 60Hz	304	2585.5	46		4	10-May	general	14-May	general	hs	11-May	to	12-May						
390							15-Jul	general	19-Jul	general	hs	16-Jul	to	17-Jul						
391							27-Sep	general	30-Sep	general	hs	28-Sep	to	28-Sep						
392							1-Dec	general	6-Dec	general	to	2-Dec	hs	3-Dec						
393							31-Aug	in ballast	9-Sep	general	to	1-Sep	hs	5-Sep						
394	4x400kW 380V 50Hz	441	1257.5			1	31-Aug	in ballast	9-Sep	general	to	1-Sep	hs	5-Sep						
395																				
396																				

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	
3.97	2x668RW 440V 60Hz					3	8-May coil br	15-May in ballast	ha		ha	12-May									
3.98							12-Jun coil br	17-Jun in ballast	ha		ha	13-Jun	8-May								
3.99							17-Jul coil br	24-Jul in ballast	ha		ha	18-Jul	15-Jun								
4.00	3x550RW 450V 60Hz	220	1.643			3	17-Jul coil br	24-Jul in ballast	ha		ha	20-Jul	20-Jul								
4.01							1-Sep steel	17-Sep coke	dt		dt	5-Sep	17-Sep	mw	ch	11-Sep					
4.02						6	7-Apr gasoline	17-Apr chemicals	ha		ha	22-Oct	22-Oct								
4.03							13-Jul gasoline	26-Jul chemicals	ha		ha	20-May	11-Apr								
4.04							8-Sep gasoline	18-Sep xylene	ha		ha	14-Jul	17-Jul	ch							
4.05							22-Oct gasoline	8-Nov isopropanol	ha		ha	9-Sep	8-Sep	sa							
4.06						1	8-Dec lat fuel	23-Dec chemicals	ha		ha	23-Oct	8-Dec	sa							
4.07						3	13-Apr steel	6-May corn	cl		cl	28-Jun	18-Dec	sa							
4.08	3x440RW						29-Aug steel	11-Sep wheat	dt		dt	15-Apr	19-Apr	mw	ds	22-Apr	ch				
4.10	3x440RW 450V 60Hz	192	1.633	29.5		1	14-Jul steel	31-Oct iron fines	dt		dt	2-Nov	7-Nov								
4.11						5	14-Jul steel	31-Jul steel	ha		ha	18-Jul	16-Jul								
4.12							14-Apr sugar	1-May canola	to		to	15-Apr	24-Apr								
4.14							6-Jun steel	16-Jun steel	ha		ha	7-Jun	7-Jun								
4.15							15-Aug steel	19-Aug in ballast	ha		ha	16-Aug	16-Aug								
4.16							28-Sep steel	19-Oct canola	ha		ha	20-Sep	20-Sep	fb							
4.17							26-Jan steel	13-Dec corn	dt		dt	26-Nov	1-Dec	mw		4-Dec					
4.18	1x900, 2x700RW	16 pumps, total				1	18-Dec palm oil	24-Dec in ballast	ha		ha	19-Dec	19-Dec								
4.20	2x440, 1x800RW 380V 5	230	1.180	30		1	28-Oct in ballast	29-Oct stone	og		og	28-Oct	28-Oct								
4.21	3x40RW 380V 50Hz	2520		33.5		1	18-Jun in ballast	1-Jul bagged peas	ib		ib	22-Jun	22-Jun								
4.22	1x900, 2x700RW	16 pumps, total				3	14-Jun in ballast	21-Jun xylene	sa		sa	17-Jun	17-Jun								
4.23							31-Jul chemicals	10-Aug chemicals	ha		ha	1-Aug	5-Aug								
4.24							21-Sep lat fuel	3-Oct xylene	ha		ha	22-Sep	29-Sep	sa							
4.25						2	18-May combi/nd/gln	28-May machinery	to		to	18-May	22-May	mw							
4.26						728.5						18-May	22-May								
4.27	3x420RW 440V 60Hz					3	24-Jun general	30-Apr barley	mw		mw	27-Jun	3-Jul								
4.28							9-Jul steel	23-Jul corn	ha		ha	17-Apr	22-Apr								
4.29							16-Nov in ballast	27-Nov sunflower seed	ds		ds	10-Jul	18-Jul								
4.30	3x440RW 440V 60Hz	355	1.196	33.5		1	11-Jul steel	29-Jul wheat	cl		cl	13-Jul	14-Jul	ch							
4.31						3	14-May steel	31-May flaxseed/peas	ch		ch	19-May	26-May								
4.32							8-Dec steel	23-Dec in ballast	cl		cl	20-Oct	20-Oct	ch							
4.33							20-Nov steel	5-Nov lumber	cl		cl	19-Dec	19-Dec	dt							
4.34	3x440RW 450V 60Hz	146	1.070	28		1	26-May steel	6-Jun corn	ha		ha	24-May	30-May								
4.35	3x88RW 440V 60Hz	146	1.070	28		4	5-May steel	27-May flax/peas/canola	cl		cl	7-May	11-May	ch							
4.36							1-Jul steel	17-Jul corn	cl		cl	3-Jul	8-Jul								
4.37							14-Sep steel	4-Oct soybeans	cl		cl	16-Sep	27-Sep	sa							
4.38	3x488RW 440V 60Hz	146	1.070	28		4	20-Nov steel	13-Dec mult grains	cl		cl	22-Nov	27-Nov	mw							
4.39							30-Mar baculite	18-Apr canola	cl		cl	1-Apr	8-Apr	fb							
4.40							7-Jun steel	28-Jun flaxseed	cl		cl	9-Jun	9-Jun	mw							
4.41							4-Aug steel	20-Aug coke	cl		cl	10-Aug	14-Aug	so							
4.42							10-Nov steel	27-Nov wheat	cl		cl	12-Nov	16-Nov	fb							
4.43	3x488RW 440V 60Hz	146	1.070	28		4	4-Apr steel	24-Apr soybeans	cl		cl	8-Apr	11-Apr	fb							
4.44							8-Jul steel	23-Jul corn	cl		cl	10-Jul	13-Jul	mw							
4.45							28-Nov steel	19-Dec peas	cl		cl	4-Oct	4-Oct	mw							
4.46							22-Jul steel	15-May canola/peas	cl		cl	1-Dec	1-Dec	fb							
4.47	3x488RW 440V 60Hz	146	1.070	28		3	22-Jul steel	5-Aug corn	cl		cl	24-Apr	2-May	fb							
4.48							21-Oct steel	7-Nov mult grains	cl		cl	24-Jul	24-Jul	fb							
4.49							19-Apr steel	23-Jul sunflower seed	cl		cl	22-Oct	27-Oct	fb							
4.50	3x488RW 440V 60Hz	146	1.070	28		4	22-Jun steel	17-Sep soybeans	cl		cl	15-Apr	15-Apr	mw							
4.51							28-Aug steel	12-Nov mult grains	cl		cl	30-Aug	30-Aug	ch							
4.52							27-Oct steel	12-Nov mult grains	cl		cl	25-Oct	25-Oct	ch							
4.53						1.0774															
4.54						0.9906															
4.55						1.2484															
4.56						0															



	AQ	AR	AS	AT
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13	6th port	date	7th port	date
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				

	AQ	AR	AS	AT
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89				
90				
91				
92				
93				
94				
95				
96				
97				
98				
99				
100				
101				
102				
103				
104				
105				
106				
107				
108				
109				
110				
111				
112				
113				
114				
115				
116				
117				
118				
119				
120				
121				
122				
123				
124				
125				
126				
127				
128				
129				
130				
131				
132				

	AQ	AR	AS	AT
133				
134				
135				
136				
137				
138				
139				
140				
141				
142				
143				
144				
145				
146				
147				
148				
149				
150				
151				
152				
153				
154				
155				
156				
157				
158				
159				
160				
161				
162				
163				
164				
165				
166				
167				
168				
169				
170				
171				
172				
173				
174				
175				
176				
177	ch	18-Sep	ds	23-Sep
178				
179				
180				
181				
182	ch	1-Dec	fb	2-Dec
183				
184				
185				
186				
187				
188				
189				
190				
191	og	6-Sep		
192				
193				
194				
195				
196				
197				
198				

	AQ	AR	AS	AT
199				
200				
201				
202				
203				
204				
205				
206				
207				
208				
209				
210				
211				
212				
213				
214				
215				
216				
217				
218				
219				
220				
221				
222				
223				
224				
225				
226				
227				
228				
229				
230				
231				
232				
233				
234				
235				
236				
237				
238				
239				
240				
241				
242				
243				
244				
245				
246				
247				
248				
249				
250				
251				
252				
253				
254				
255				
256				
257				
258				
259				
260				
261				
262				
263				
264				

	AG	AR	AS	AT
265				
266				
267				
268				
269				
270				
271				
272				
273				
274				
275				
276				
277				
278				
279				
280				
281				
282				
283				
284				
285				
286				
287				
288				
289				
290				
291				
292				
293				
294				
295				
296				
297				
298 ch		24-Jul		
299				
300				
301				
302				
303				
304				
305				
306 th		19-Jun		
307				
308				
309				
310				
311				
312				
313				
314				
315 dt		1-Dec		
316				
317				
318				
319				
320				
321				
322				
323				
324				
325				
326				
327				
328				
329				
330				

	AQ	AR	AS	AT
331				
332				
333				
334				
335				
336				
337				
338				
339				
340				
341				
342	ch	10-May/1b		15-May
343				
344				
345	td	16-Nov		
346				
347				
348				
349				
350				
351				
352				
353				
354				
355				
356				
357	ds	25-Jun		
358				
359				
360				
361				
362				
363				
364				
365				
366				
367				
368				
369				
370				
371				
372				
373				
374				
375				
376				
377				
378				
379				
380				
381				
382				
383				
384				
385				
386				
387				
388				
389				
390				
391				
392				
393				
394				
395				
396				

	AQ	AR	AS	AT
397				
398				
399				
400				
401				
402				
403				
404				
405				
406				
407				
408				
410				
411				
412				
413				
414				
415				
416				
417				
418				
419				
420				
421				
422				
423				
424				
425				
426				
427				
428				
429				
430				
431				
432				
433				
434				
435				
436				
437				
438				
439				
440				
441				
442				
443				
444				
445				
446				
447				
448				
449				
450				
451				
452				
453				
454				
455				

## Appendix D: CLC Listings



OVERSEAS VESSELS TRANSITS INTO THE GREAT LAKES - MARCH-DECEMBER 1995

Note: Data are based on the listing of oversea cargo vessels in the daily transit reports for the U.S. Seaway locks and from supplemental port cargo data. The dates are for the up- and downbound passages through the Eisenhower Lock. LOA refers to overall length in feet. Following the vessel name: T refers to a tanker and a number indicates the trips into the lakes beyond the first one made by the ship.

36 Flags of Registry

AB	Antigua/Barbuda	HK	Hong Kong	Ph	Philippines
Ba	Bahamas	In	India	Po	Poland nia
Ca	Canada	It	Italy	Rq	Romania
Ch	China	Li	Liberia	Ru	Russia
Cr	Croatia	Lt	Lithuania	Si	Singapore
Cu	Cuba	Ma	Malaysia	Sp	Spain
Cy	Cyprus	MI	Marshall Islands	SV	St. Vincent and the Grenadines
De	Denmark	Ma	Malta	Sw	Sweden
Du	Netherlands	My	Myanmar (ex.Burma)	Th	Thailand
Es	Estonia	NA	Netherlands Antilles	Tu	Turkey
Fi	Finland	No	Norway	Va	Vanuatu
Gk	Greek	Pa	Panama	Yu	Yugoslava

1995 Monthly Upbound Transits

March-April 59, May 52, June 40, July 49, August 39,  
September 51, October 57, November 70, December 20

Upbound transits through December 1990 - 1995

1995 - 437, 1994 - 588, 1993 - 427, 1992 - 399, 1991 - 429, 1990 - 437

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
✓Aivik	3/25	Ca	340	in ballast	4/4	cement plant
✓L T Argosy	3/25	In	607	steel	4/13	wheat
✓Lake Ontario	3/25	Cy	730	steel	4/1	in ballast
✓Lake Superior	3/26	Cy	730	iron briquet	4/22	wheat
✓Federal Fraser	3/27	HK	730	steel	4/15	corn
✓Omisalj	3/27	Mt	729	steel	4/16	wheat
✓Federal Matane	3/28	No	585	steel	4/19	corn
✓Ziemia Gnieznienska	3/30	Po	591	steel	4/18	canola
✓Island Skipper	3/30	Gk	585	bauxite	4/19	wheat
✓Petka	4/1	Mt	729	steel	4/19	soybeans
✓General Cabal	4/2	Ph	477	steel	4/10	canola feed
✓Federal Polaris	4/3	Li	600	steel	4/20	wheat
Ziemia Suwalska	4/4	Po	591	steel	4/24	soybeans
✓Stolt Aspiration--T	4/5	Pa	423	chemicals	4/18	tallow
✓Lake Erie	4/7	MI	730	steel	4/26	wheat
✓Turid Knutsen--T	4/7	No	533	gasoline	4/17	chemicals
✓Kapitonas Reutov	4/10	Lt	480	steel	4/21	canola feed
✓Gunay A	4/12	Tu	617	steel	4/29	canola, sunfl.
✓Seapearl II	4/12	Mt	581	bauxite	5/2	soybeans
✓Vulcan	4/13	Cy	626	steel	4/30	barley

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Olympic Miracle	4/13	Gk	600	steel	4/30	multiple grains
Siemia Zamojska	4/13	Po	592	steel	5/1	multiple grains
Illoa	4/13	Si	590	steel	5/6	corn
Ilikon	4/14	Ba	580	steel	5/1	corn
Itviken	4/14	Ba	621	sugar	5/1	canola
Ilope I	4/14	Mt	617	coke	4/28	steel coils
Atlantis Spirit	4/15	Cy	498	steel	5/2	lentils, peas
Alam United	4/15	Ma	585	iron fines	4/30	potash
Polck Larsen	4/15	In	628	steel	5/1	wheat
Percegovina	4/15	Mt	645	aluminum	5/9	sunflower seed
Mitriy Pozharskiy	4/15	Ru	532	steel	5/1	potash
Thor I	4/16	Li	542	general	4/20	general cargo
Al Hass	4/16	Ba	532	bauxite	4/23	in ballast
Federal MacKenzie	4/19	HK	730	steel	5/7	flaxseed
Margaret John	4/19	Mt	379	steel	4/25	in ballast
Capitonas Izmiakov	4/20	Lt	480	steel	5/4	soybeans
Golden Sky	4/20	Cy	621	sugar	5/7	alfalfa pellets
Federal Manitou	4/20	No	585	steel	5/6	corn
Surunes	4/21	Pa	441	alum., woodpulp	5/16	corn
Staberg	4/21	No	600	rutile	5/8	sunflower seed
Larka L	4/22	Gk	597	steel	5/5	corn
Federal Calliope	4/22	Li	619	steel	5/20	wheat, barley, soy
Siemia Tarnowska	4/22	Po	591	steel	5/15	canola, peas
Marya Kamal	4/23	HK	617	in ballast	4/27	nickel
Stolt Alliance--T	4/24	Pa	405	chemicals	4/28	tallow
Capitonas Gudin	4/25	Lt	480	steel	5/11	magnetite
Antalina	4/25	Cy	585	in ballast	5/5	soybeans
Loren Toubro	4/26	In	628	steel	5/9	flax, mustard seed
Ontokratis	4/26	Gk	590	sugar	5/10	wheat
Cepurna --T	4/26	Ba	619	lube oil	5/2	in ballast
Maskatchewan Pioneer	4/27	Ba	730	steel	5/22	multiple grains
Federal Agno	4/28	Ph	600	steel	5/10	soybeans
Lake Michigan	4/28	Cy	730	steel	5/10	soybeans
Stellanova	4/29	NA	327	machinery	5/9	in ballast
Antazis L	4/29	Gk	591	steel	5/14	soybeans
Lrma	4/30	Mt	473	pulpwood	5/8	general cargo
Lvmar	4/30	Cy	593	fertilizer	5/20	sunflower seed
Malinska	4/30	Mt	729	rutile	5/15	canola, flaxseed
Landy Laker	4/30	Ph	585	steel	5/14	corn
Luna Verde	5/2	Ph	591	steel	5/15	soybeans
Lptmariner	5/4	Li	619	coke	5/22	wheat mid. pellets
Lpha	5/4	Li	580	steel	5/19	corn
Lo Hassel --T	5/5	SV	356	rum	5/8	in ballast
Siemia Chelminska	5/5	Po	591	steel	5/27	flax, peas, canola
Ltepan Razin	5/5	Ru	532	steel	5/25	canola meal, malt
Mitriy Donskoy	5/5	Ru	532	steel	5/19	corn
Ltanta Forest	5/6	Mt	522	steel	5/11	bentonite
Lake Challenger	5/6	Pa	585	steel	5/22	soybeans
Lemshorn	5/7	Du	294	steel	5/21	bentonite
Llan Senang	5/7	Ma	585	steel	5/28	sunflower seed
Lunny Blossom--T	5/7	Ba	528	caustic soda	5/14	chemicals
Lirby D	5/8	Cy	386	in ballast	5/21	barley
Lrans Arctic	5/8	No	383	coal tar	5/15	in ballast
Lljet	5/9	Mt	622	steel	5/20	soybeans

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Kapitonas A Lucka	5/9	Lt	480	steel	5/23	wheat
Thorscape	5/10	Li	542	gen.cargo	5/14	general cargo
Caribbean Mercy	5/11	Pa	263	(hospital aid and supply vessel)		
Lake Ontario--2	5/12	MI	730	steel	6/6	wheat
C Martin	5/13	Mt	538	steel	5/16	in ballast
Stolt Aspiration--T	5/14	Pa	423	chemicals	5/26	tallow
Stellamare	5/14	NA	289	machinery	5/20	in ballast
Winter Star	5/14	Cy	656	steel	5/31	flaxseed,peas
General Cabal	5/15	Ph	577	fertilizer	5/28	flaxseed
Pomorze Zachodnie	5/17	Po	592	steel	6/3	potash
Lake Champlain	5/18	MI	591	steel	6/2	multiple grains
Viljandi	5/18	Es	458	combines/gen.	5/28	machinery
Peonia	5/18	Li	648	magnesite	6/3	corn
Super Vision	5/18	Ph	400	steel	6/10	wheat
Federal Fraser	5/18	Ph	730	in ballast	5/30	multiple grains
Konstantis F	5/18	Gk	472	steel	6/3	bentonite
Federal Oslo	5/19	Pa	601	steel	6/4	sunflower seed
Turid Knutsen--T	5/19	No	533	gasoline	6/2	xylene
Sea Daniel	5/19	Pa	581	steel	6/10	steel
Golden Shield--T	5/19	Pa	417	coconut oil	5/23	in ballast
Yick Hua	5/20	Pa	585	steel	6/6	corn
Tim Buck	5/20	Ru	532	steel	6/4	in ballast
Nea Doxa	5/20	Gk	617	steel	6/4	canola
Aurora Topaz	5/21	Li	640	manganese	6/1	steel
Omisalj--2	5/22	Mt	729	steel	6/5	canola, flax, peas
Great Laker	5/22	My	591	bauxite	6/4	steel
Mikhail Kutuzov	5/24	Ru	532	steel	6/9	peas
Rhea	5/24	Gk	593	steel	6/17	wheat
Ciovo	5/25	Pa	479	in ballast	6/7	steel pipe
Federal Fuji	5/25	Ja	598	steel	6/7	soybeans
Kapitan Zamyatin	5/26	Ru	498	clay,woodpulp	6/11	peas, canola, sunfl.
Handymariner	5/26	Li	619	steel	6/18	corn
Hass--2	5/26	Ba	532	in ballast	5/30	zinc
Edda	5/27	AB	323	in ballast	6/2	rail cars
Petka--2	5/28	Mt	729	general cargo	6/21	petroleum coke
Luckyman	5/29	Cy	585	steel	6/12	corn
Sac Malaga	5/31	Pa	621	steel	6/21	barley
APJ Anjli	5/31	In	577	steel	6/18	corn
L T Argosy--2	6/1	In	607	steel	6/17	wheat
Storon	6/2	Sw	470	steel	6/15	steel
Stolt Alliance--2-T	6/2	Pa	405	jet fuel	6/9	tallow
Aivik--2	6/2	Ca	340	machinery (omit, back		in coastal trade)
Darya Kamal--2	6/3	In	617	steel	6/23	wheat
Federal Matane--2	6/6	No	585	steel	6/16	steel
Utviken--2	6/6	Ba	621	steel	6/16	steel
Olympic Miracle--2	6/7	Gk	600	steel	6/24	wheat
Kapitonas Reutov--2	6/7	Lt	480	steel	6/10	in ballast
Steel Flower	6/7	Pa	730	coke	7/1	flax, pea, sunfl.
Odranes	6/7	Ba	471	manganese	6/20	barley
Federal Vigra	6/7	No	590	in ballast	6/19	flaxseed
Ziemia Gnieznienska--2	6/7	Po	591	steel	6/28	flaxseed
Island Skipper--2	6/7	Gk	585	steel	6/25	sunflower seed
Federal MacKenzie--2	6/8	HK	730	steel	6/27	wheat, flaxseed
Gunay A--2	6/10	Tu	617	steel	7/1	sunflower seed

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
anna	6/10	Cy	600	steel	6/19	corn
Capitonas Vavilov	6/11	Lt	480	steel	6/17	in ballast
Parkgracht	6/11	Du	349	steel	6/19	in ballast
Soren Toubro	6/12	In	628	steel	7/5	wheat
Trans Arctic--2-T	6/12	No	383	coal tar	6/19	in ballast
Widsef Knutsen--T	6/13	No	533	in ballast	6/22	chemicals
Wekua--T	6/14	Mt	496	in ballast	6/21	xylene
Tomadic Patria	6/16	No	512	steel	6/27	zinc
Tobuleti--T	6/17	Mt	496	jet fuel	6/26	tallow
Lake Michigan--2	6/17	Cy	730	steel	6/30	coal
Vasilij Musinskiy	6/18	Ru	498	in ballast	7/1	bagged peas
Federal St. Laurent	6/20	Li	619	sugar	6/30	in ballast
(outbound as Federal Dora, Gk.)						
Siemia Zamojska--2	6/22	Po	592	steel	7/23	sunflower seed
Sida	6/22	Cy	214	in ballast	7/5	machinery
Capitonas Dubinin	6/22	Lt	470	steel	7/5	bauxite
Stolt Aspiration--2-T	6/23	Pa	423	chemicals	7/6	tallow, chemicals
Siljandi--2	6/24	Es	458	general	7/5	general
Pantazis L--2	6/25	Gk	591	steel	7/5	coke
Iceperna--T	6/25	Ba	619	jet fuel	6/30	in ballast
Tunica	6/26	Li	648	steel	7/12	steel
Turkay B	6/26	Tu	387	steel	7/19	beans
Saskatchewan Pioneer-2	6/29	Ba	730	steel	7/22	multiple grains
Thor I--2	6/29	Si	542	general	7/2	general
Percegovina--2	6/29	Mt	645	general	7/19	steel
Secat A	6/29	Tu	656	rutile	7/12	steel
Capitonas Gudini--2	7/1	Ru	480	steel	7/17	linmeal
Siemia Chelminska--2	7/1	Po	591	steel	7/17	corn
Kazboieni	7/2	Ro	521	pulpwood	7/7	general
Federal Vibeke	7/2	No	590	steel	7/30	wheat, oats
Lak	7/2	Ba	509	fertilizer	7/20	mill scale
Concorde--T	7/3	SV	320	coal tar	7/15	coal tar
Lake Champlain--2	7/3	MI	591	steel	7/20	coke
Margaret John--2	7/4	Mt	379	steel	7/16	steel
Slam Senang	7/4	Ma	585	steel	7/21	steel
Pontoporos	7/6	Gk	581	steel	7/21	steel
Sea Doxa--2	7/6	Gk	617	steel	7/26	steel
Olympic Mentor	7/7	Gk	600	steel	7/23	flaxseed, peas
Maria S J	7/7	Yu	622	steel	7/13	in ballast
Siemia Suwalska--2	7/8	Po	591	steel	7/23	corn
Vi	7/8	Li	591	bauxite	7/20	corn
Vulcan--2	7/9	Cy	626	steel	7/23	corn
Capitonas Mesceriakov	7/9	Lt	477	steel	7/29	peas
Lana Naree	7/11	Th	576	steel	7/29	wheat
Lake Carling	7/12	MI	571	steel	7/28	screenings
Stolt Alliance--2-T	7/12	Pa	405	jet fuel	7/28	tallow
Wurid Knutsen--3-T	7/13	No	533	gasoline	7/26	chemicals
Wmisalj--3	7/13	Mt	729	steel	8/5	corn
Lake Erie--2	7/13	MI	730	steel	7/29	flaxseed
Federal Agno--2	7/14	Ph	600	steel	7/31	steel
Wnion	7/14	HK	585	steel	7/31	steel
Federal Polaris--2	7/15	Ja	600	steel	7/19	in ballast
Worscape--2	7/15	Li	542	general	7/19	general
Womo Maersk--T	7/16	De	558	jet fuel	7/18	in ballast

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Federal Calliope--2	7/16	Li	619	steel	8/1	sunflower seed
Trans Arctic--2	7/17	No	383	coal tar	7/24	in ballast
Lake Challenger--2	7/17	Pa	585	steel	8/5	wheat
Trias	7/17	Gk	730	in ballast	7/24	corn, wheat
Federal Vigra--2	7/17	No	600	steel	8/1	steel
Hilal II	7/18	Tu	585	steel	7/30	in ballast
Lake Charles	7/18	MI	591	bauxite	8/7	soybeans
Aurora Topaz--2	7/22	Li	640	steel	7/26	in ballast
Lake Tahoe	7/22	MI	591	bauxite	7/30	in ballast
Ziemia Tarnowska--2	7/22	Po	591	steel	8/5	corn
Kapitonas Reutov--3	7/23	Lt	480	steel	8/15	bentonite
General Cabal--3	7/24	Ph	477	fertilizer	8/8	bentonite
Handymariner--2	7/24	Li	619	steel	8/15	soybeans, sunfl.
Bergon	7/27	Sw	331	zinc	8/12	steel
Darya Kamal--3	7/28	HK	617	steel	8/12	in ballast
Luckyman--2	7/28	Cy	585	steel	8/19	steel
Staalvang	7/29	No	251	manganese	8/2	in ballast
Gunay A--3	7/29	Tu	617	steel	8/14	sunflower seed
Federal MacKenzie--3	7/29	HK	730	steel	8/11	chemicals
Vekua--2-T	7/31	Mt	496	chemicals	8/10	chemicals
Federal Nord	7/31	No	591	rutile	8/14	steel
Polydefkis	8/2	Gk	621	steel	8/20	corn
Capetan Michalis	8/2	Gk	590	steel	8/13	in ballast
Indian Express	8/2	Va	509	in ballast	8/14	malt
Golden Sky--2	8/2	Cy	621	sugar	8/17	flax, sunfl. seed
Astra Lift	8/3	Ba	307	in ballast	8/11	press & parts
Federal Oslo--2	8/3	Pa	601	steel	8/16	steel
Ziema Gnieznienska	8/4	Po	591	steel	8/20	coke
Aptmariner--2	8/5	Li	619	iron fines	8/16	steel
Olympic Miracle--3	8/6	Gk	600	steel	8/28	wheat
Romo Maersk--2-T	8/6	De	558	jet fuel	8/8	in ballast
Blue Bill	8/7	Cy	621	steel	8/28	corn
Kapitonas Dubinin--2	8/7	Lt	479	talc	8/17	potash
Seamonarch	8/9	Mt	640	steel	8/29	peas
Sidsel Knutsen--2-T	8/9	No	533	gasoline	8/20	xylene
Stolt Aspiration--3-T	8/10	Pa	423	tallow	8/17	tallow
Steel Flower--2	8/12	Pa	730	steel	8/30	coke
Federal Dora--2	8/13	Gk	619	steel	8/30	peas
Sac Malaga--2	8/14	Pa	621	in ballast	8/24	corn
Utviken--3	8/15	Ba	621	steel	8/19	in ballast
Lake Ontario--3	8/15	MI	730	pig iron	8/30	corn
Punica--2	8/16	Li	648	steel	9/5	wheat
Lake Champlain--2	8/17	MI	591	steel	9/5	corn
Hydra	8/18	Ba	568	steel	9/3	steel
Finnfighter	8/18	Fi	522	in ballast	8/20	wollastonite
* Concorde --T	8/18	SV	321	coal tar	8/26	coal tar
Federal Aalesund	8/19	NO	590	steel	9/3	steel
Kapitonas A Lucka--2	8/23	Lt	480	steel	9/6	corn gluten feed
Barbara H	8/24	Cy	632	magnesium	9/5	steel
George L	8/26	Gk	597	bauxite	9/21	steel
Olympic Mentor--2	8/28	Gk	600	steel	9/13	steel
Ziemia Zamojska--3	8/28	Po	592	steel	9/17	soybeans
Saskatchewan Pioneer-3	8/28	Ba	730	steel	9/10	steel
Stolt Alliance--3-T	8/28	Pa	405	jet fuel	9/2	tallow

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Oak--2	8/29	Ba	509	in ballast	9/2	steel
Federal Polaris--3	8/29	Ja	600	steel	9/11	steel
Ulloa	8/29	Si	585	in ballast	9/11	wheat
Federal Calliope--3	8/30	Li	619	steel	9/8	wheat
Barbara E	8/30	Sp	336	steel	9/18	mach.& general
Titan Scan	8/31	NA	405	in ballast	9/9	general
Argut	9/1	Uk	312	in ballast	9/11	steel
Trias--2	9/1	Gk	730	steel	9/17	coke
Pomorze Zachodne--2	9/2	Po	592	steel	9/20	potash
Nordic Blossom--T	9/3	Li	505	caustic soda	9/9	in ballast
Chada Naree	9/3	Th	479	in ballast	9/7	steel
Thor I--3	9/3	Si	542	general	9/7	general
Lake Erie--3	9/5	MI	730	steel	9/17	corn
Island Skipper--3	9/5	Gk	585	steel	9/30	steel
Lake Michigan--3	9/6	Cy	730	steel	9/20	coal
Aslan 1	9/6	Tu	396	in ballast	9/19	steel
Hercegovina--3	9/6	Mt	645	steel	9/20	steel
Karen D	9/6	Cy	386	in ballast	9/9	steel
Ocean Priti	9/6	Pa	599	rutile	9/19	corn
Asia Trader	9/7	Pa	591	sugar	9/20	soybeans
Federal Manitou--2	9/8	No	585	steel	9/24	steel
Turid Knutsen--2-T	9/8	No	533	gasoline	9/18	xylene
Olympic Merit	9/9	Gk	600	in ballast	9/18	potash
Praxitelis	9/10	Gk	621	steel	9/30	bentonite
Island Gem	9/10	Gk	585	steel	10/2	wheat
Petka--3	9/10	Mt	729	steel	9/25	wheat
Alpha--2	9/12	Li	580	steel	9/27	wheat
Odranes--2	9/12	Ba	471	in ballast	9/23	barley
An Ze Jiang	9/12	Ch	491	steel	10/5	pipes & fittings
Nordic Blossom(ret.trip)	9/12			(1st trip upbd.9/3, dnbd.9/9)		
Lake Superior--2	9/13	Cy	730	in ballast	9/30	flax, canola, peas
Ziemia Chelminska--3	9/14	Po	591	steel	10/4	soybeans
General Cabal--4	9/16	Ph	477	steel	9/30	steel
Solta	9/16	Mt	622	bauxite	10/5	multiple grains
Kapitonas Mesceriakov-2	9/16	Lt	477	steel	9/29	bentonite
Rhea--2	9/16	Gk	593	steel	10/1	corn
Freja Nordic--T	9/17	Ba	407	coconut oil	9/29	tallow
Stevnsland	9/17	AB	209	steel	10/2	steel
Stolt Aspiration--4-T	9/18	Pa	423	chemicals	10/1	tallow
Handymariner--3	9/19	Li	619	steel	10/11	multiple grains
Golden Sky--3	9/20	Cy	621	steel	10/2	wheat
Vekua--3-T	9/21	Mt	496	jet fuel	10/3	xylene
Federal Oslo--3	9/22	Pa	601	steel	10/8	canola
Federal Inger	9/23	No	593	steel	11/3	wheat
Ruder Boskovic	9/23	Yu	599	in ballast	10/5	wheat
Lake Charles--2	9/24	MI	591	steel	10/8	canola
Rantum--T	9/24	Cy	346	gasoline	9/27	in ballast
Docegulf	9/24	Li	674	in ballast	10/7	peas, lentils
Riomar	9/24	Cy	445	in ballast	10/5	wheat
Luna Verde--2	9/26	Ph	591	steel	10/10	steel
Mljet--2	9/26	Mt	622	sugar	10/12	soybeans
Cvijeta Zuzoric	9/26	Yu	599	in ballast	10/10	wheat
Beta Luck	9/27	Gk	559	in ballast	10/14	steel
Aurora Topaz--3	9/27	Li	640	manganese	10/8	steel

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Thorscape--3	9/27	Li	542	general	9/30	general cargo
Arma--2	9/28	Gk	473	alumina	10/7	steel
Utviken--4	9/28	Ba	621	steel	10/19	canola
Malinska--2	9/30	Mt	729	sugar	10/17	peas, canola
Aptmariner--3	10/1	Li	619	in ballast	10/18	canola, mustard
Sidsel Knutsen--3-T	10/1	No	533	gasoline	10/12	chemicals
Ziemia Suwalska--3	10/2	Po	591	steel	10/20	peas
Ikan Selayang	10/2	Si	590	in ballast	10/14	corn
Kapitonas Stulpinas	10/4	Lt	480	steel	10/23	canola, peas
Kapitonas Reutov--4	10/4	Lt	389	aluminum	10/18	soybeans
Stolt Alliance--4-T	10/5	Pa	405	jet fuel	10/18	tallow
Handy Laker--2	10/6	Ph	585	steel	10/19	soybeans
Luckyman--3	10/6	Cy	585	steel	10/17	steel
Lake Champlain--3	10/7	MI	591	steel	10/22	steel
Avdeevka	10/7	Uk	571	in ballast	10/16	soybeans
Lake Challenger--3	10/8	Pa	585	in ballast	10/18	wheat
Finnsnes	10/8	Pa	441	calcium	10/25	wheat
Evmar--2	10/9	Cy	593	rutile	10/20	steel
Federal Agno--3	10/9	Ph	600	steel	11/6	sunflower seed
Federal Dora	10/10	Gk	619	steel	10/30	canola, peas
Federal Fuji--2	10/10	Li	600	steel	10/31	wheat
Haight	10/10	Ba	581	in ballast	10/19	steel
Federal Matane--3	10/11	No	585	sugar	10/22	steel
Federal MacKenzie--4	10/11	HK	730	steel	10/27	flax, canola
Soren Toubro--2	10/11	In	628	steel	10/22	steel
Calliroe Patronicola	10/11	Gk	600	rutile	10/31	canola
Peonia--2	10/11	Li	648	steel	10/27	steel
Gunay A--4	10/13	Tu	617	steel	10/31	steel
Laserbeam	10/13	Mt	600	in ballast	10/24	wheat
Nyanza	10/14	Ba	498	newsprint	10/23	calcium chloride
Fjordnes	10/15	No	490	in ballast	10/31	wheat
Seamonarch	10/17	Mt	640	steel	11/9	sunflower seed
Fujisan Maru	10/17	Th	481	in ballast	10/21	steel
Lake Michigan--4	10/17	Cy	730	in ballast	11/1	multiple grains
Liberty Sky	10/17	Pa	585	in ballast	10/29	peas
Astra Lift	10/17	Ba	307	general	10/31	generators, etc.
Winter Star	10/18	Cy	656	steel	11/5	linmeal
Trias--3	10/18	Gk	730	in ballast	10/30	wheat
Polydefkis--2	10/18	Gk	621	ferromang.	11/1	corn
Project Europa	10/19	NA	456	in ballast	11/1	plant equipment
Hydra--2	10/19	Ba	568	steel	11/9	wheat
Ziemia Tarnowska--3	10/21	Po	591	steel	11/7	multiple grains
Altair	10/21	AB	322	in ballast	11/12	machinery
El Kef	10/22	Li	600	in ballast	11/2	wheat
Darya Kamal--4	10/22	HK	617	rutile	11/6	barley
Turid Knutsen--5-T	10/22	No	533	gasoline	11/6	isopropanol
Lake Erie--4	10/23	MI	730	steel	11/13	multiple grains
Jo Palm--T	10/23	Du	378	rum	10/26	in ballast
Barbara H--2	10/23	Cy	622	steel	11/12	sunflower seed
Rose Island	10/26	Pa	472	in ballast	11/21	peas
Beluga	10/26	Mt	585	in ballast	11/7	wheat
Punica--3	10/26	Li	648	in ballast	11/4	soybeans

Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Ziemia Zamojska--4	10/27	Po	592	steel	11/12	multipl grains
Varjakka	10/28	Fi	522	in ballast	10/29	stone
Federal Vibeke--2	10/28	No	590	steel	11/14	steel
Aynur Kalkavan	10/29	Tu	583	bauxite	11/22	sunfl., soybeans
Stolt Aspiration--5-T	10/30	Pa	423	in ballast	11/2	tallow
Lake Carling--2	10/31	MI	591	steel	11/17	peas
Ulloa--3	10/31	Si	585	iron fines	11/14	steel
Federal Bergen	10/31	No	591	steel	11/18	steel
South Islands	10/31	Cy	472	in ballast	12/4	peas
Alam Senang--2	11/1	Ma	585	magnetite	11/16	corn
Mountain Blossom--T	11/2	Ba	528	caustic soda	11/10	chemicals
Blue Bill	11/2	Cy	621	in ballast	11/11	steel
Alidon	11/2	Cy	275	pulpwood	11/21	bentonite
Steel Flower--3	11/2	Pa	730	steel	11/22	wheat
Saskatchewan Pioneer--4	11/3	Ba	730	steel	11/26	flaxseed
Kapitonas Kaminskas	11/3	Lt	480	in ballast	11/14	wheat
Federal Polaris--4	11/3	Ja	600	steel	11/16	steel
Kapitonas Dubinin--3	11/4	Lt	479	steel	12/3	bentonite
Asia Trader--2	11/4	Pa	591	steel	11/22	flax, mustard
Federal Oslo--4	11/5	Pa	601	steel	11/20	canola
Kapitonas A Lucka--3	11/5	Lt	480	steel	11/28	bentonite
General Cabal--5	11/7	Ph	477	fertilizer	11/14	coke
Hercegovina--4	11/7	Mt	645	in ballast	11/20	corn
Pontokratis	11/8	Gk	590	sugar	12/8	steel
Proof Trader--T	11/8	No	318	rum	11/11	in ballast
Solta--2	11/9	Mt	622	steel	11/28	wheat
Anna--2	11/10	Cy	600	steel	11/28	peas
Arosa	11/10	Cy	621	steel	11/28	steel
Ziemia Gnieznienska--4	11/10	Po	591	steel	11/27	wheat
Erikousa Wave	11/10	Cy	601	rutile	11/30	wheat
Thor I--4	11/11	Si	542	gen. cargo	11/16	general cargo
Ivi--2	11/11	Li	591	steel	11/30	wheat
Makeyevka	11/12	Ru	649	steel	11/23	corn
Bontegracht	11/12	Du	263	steel	11/24	alumina
L T Argosy--3	11/13	In	607	sugar	11/26	steel
Docegulf--2	11/13	Li	674	in ballast	11/28	sunfl., soybeans
Nordic Blossom--2-T	11/13	Li	505	caustic soda	11/18	in ballast
Lake Charles--3	11/14	MI	591	steel	12/3	steel
Vulcan--3	11/15	Cy	621	in ballast	11/27	sunflower seed
Oak--3	11/15	Ba	509	steel	12/4	wheat
Rubin Eagle	11/15	Ph	486	steel	11/27	in ballast
Sidsel Knutsen--4-T	11/15	No	533	jet fuel	11/24	isopropanol
Praxitelis--2	11/16	Gk	621	steel	12/4	canola
Nea Doxa--3	11/16	Gk	618	steel	12/8	sunflower seed
Jing Hong Hai	11/16	Ch	594	bauxite	12/5	sunflower seed
Phoenix M	11/16	Cy	581	in ballast	11/29	steel
Federal Fraser--3	11/17	HK	730	steel	12/7	multiple grains
Areito	11/17	Cu	486	in ballast	12/20	peas
Aurora Topaz--4	11/17	Li	640	steel	12/21	steel
Luckyman--4	11/18	Cy	585	steel	12/5	alfalfa, soybeans
Ruder Boskovic--2	11/18	Yu	599	in ballast	11/22	steel
Alpha--3	11/19	Li	580	steel	11/25	wheat
Petka--4	11/19	Mt	729	steel	12/16	wheat, flaxseed
Aptmariner--4	11/20	Li	619	steel	12/6	soybeans



Vessel name	Date	Flag	LOA	Cargo In	Date Out	Cargo Out
Ziemia Chelminska--4	11/20	Po	591	steel	12/13	multiple grains
Rong Jiang	11/20	Ch	463	in ballast	12/20	machinery
Utviken--5	11/21	Ba	621	steel	12/13	corn
Malinska--3	11/21	Mt	729	steel	12/10	steel
Island Skipper	11/21	Gk	585	steel	12/13	peas
Stolt Alliance--6 T	11/23	Pa	405	chemicals	12/8	tallow
Rhea--3	11/23	Gk	593	steel	12/8	wheat, peas
Avdeevka--2	11/23	Uk	571	steel	12/6	corn
Pontoporos--2	11/23	Gk	581	sugar	12/10	wheat
Marilis T	11/24	Cy	585	steel	12/4	soybeans
Concorde--2-T	11/24	SV	320	coal tar	12/5	coal tar
Kapitonas Reutov--5	11/25	Lt	480	steel	12/5	corn
Island Gem--2	11/25	Gk	585	steel	12/18	peas, canola
Milin Kamak	11/26	Ro	608	bauxite	12/20	alfalfa pellets
Stormy Annie	11/26	Pa	522	fluorspar	11/29	in ballast
Necat A--2	11/27	Tu	656	rutile	12/18	multiple grains
Omisalj--4	11/27	Mt	729	steel	12/17	wheat
Golden Sky--4	11/28	Cy	621	in ballast	12/13	mustard seed
Maisi	11/28	Cu	486	in ballast	12/22	peas
Great Laker--2	11/28	My	591	steel	12/10	wheat
Stolt Taurus--T	11/28	Li	405	palm oil	12/6	lube oil
Kapitonas Mesceriakov 3	11/28	Lt	477	steel	12/20	potash
Ziemia Suwalska--4	11/29	Po	591	steel	12/19	peas, canola
Olympic Mentor--3	11/30	Gk	600	steel	12/23	potash
L T Odyssey	11/30	In	607	steel	12/25	wheat
Ikan Selayang--2	12/1	Si	590	steel	12/16	corn
Thorscape--4	12/1	Li	542	general	12/6	general cargo
Frines	12/1	Pa	441	steel	12/23	magnesium
Lake Champlain--5	12/2	MI	591	steel	12/25	multiple grains
Jeannie	12/2	Gk	600	rutile	12/23	lentils, peas
Stolt Aspiration--7-T	12/3	Pa	423	paraffin	12/22	tallow
Federal MacKenzie--5	12/3	HK	730	steel	12/25	corn
Calliroe Patronicola--2	12/7	Gk	600	steel	12/18	in ballast
Turid Knutsen--6-T	12/8	No	533	jet fuel	12/23	chemicals
Gajah Borneo	12/8	Ma	327	in ballast	12/17	steam generators
Lake Michigan--5	12/8	Cy	730	in ballast	12/26	wheat
Pride of Donegal	12/9	Li	518	steel	12/25	machinery
Winter Star--3	12/9	Cy	518	steel	12/23	in ballast
Mountain Blossom--2-T	12/9	Ba	528	caustic soda	12/19	caustic soda
Aslan 1--2	12/9	Tu	396	steel	12/26	screenings
Lake Ontario--4	12/11	MI	730	in ballast	12/19	steel
Aquarius	12/12	It	397	steel	12/22	in ballast
Holck Larsen--2	12/12	In	628	zinc	12/23	in ballast
Romo Maersk--3	12/12	De	558	in ballast	12/22	xylene
Uznadze--T	12/16	Mt	496	palm oil	12/24	in ballast

Note: In addition to the overseas ships listed, a coasting tug/barge Dixie Commander/DXE 1640 (120'x 469') made three trips into the Lakes from the Gulf coast: 5/22 urea inbd., 6/7 calcium chloride outbd.; 9/21 in ballast, 9/27 calcium chloride; 11/13 urea, 11/23 calcium chloride

Prepared by Albert G. Ballert  
Great Lakes Commission  
400 Fourth St., Ann Arbor, MI 48103

KE...  
4/1/95

95...  
F...

Ports of Call

OVERSEA VESSEL TRIPS INTO THE GREAT LAKES -- MARCH-DECEMBER 1995

Note: Data are based on the daily transit reports for the U.S. Seaway locks and from supplemental port cargo data. The dates are for the upbound passages through the Eisenhower Lock and for the arrival dates at the ports noted. LOA is overall length in feet, T indicates a tanker, and a number after a vessel name refers to its trip into the lakes during the season beyond the first.

Flags of Registry

AB	Antigua/Barbuda	HK	Hong Kong	Ph	Philippines
Ba	Bahamas	In	India	Po	Poland
Ca	Canada	It	Italy	Ro	Romania
Ch	China	Li	Liberia	Ru	Russia
Cr	Croatia	Lt	Lithuania	Si	Singapore
Cu	Cuba	Ma	Malaysia	Sp	Spain
Cy	Cyprus	MI	Marshall Islands	SV	St. Vincent and the Grenadines
De	Denmark	Mt	Malta	Sw	Sweden
Du	Netherlands	My	Myanmar(ex. Burma)	Th	Thailand
Es	Estonia	NA	Netherlands Antilles	Tu	Turkey
Fi	Finland	No	Norway	Va	Vanuatu
Gk	Greek	Pa	Panama	Yu	Yugoslavia

Transits through December: 1995 438<sup>1</sup>, 1994 588, 1993 427, 1992 399, 1991 429, 1990 437, 1989 533, 1988 574, 1987 572, 1986 663, 1985 581, 1984 703, 1983 679, 1982 815

Upbound transits:	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1995	59*	52	40	49	39	51	58 <sup>1</sup>	70	20
* 19 in March	1994	46	59	58	64	69	76	105	32
	1993	31	49	40	45	39	55	80	25
	1992	48	47	47	43	44	43	56	14
	1991	46	60	50	45	42	42	56	13
	1990	55	56	49	53	43	41	52	15

Great Lakes Ports of Call

As	Ashtabula, OH	Gd	Goderich, ON	PH	Port Huron, MI
BH	Burns Harbor, IN	Ha	Hamilton, ON	Sa	Sarnia, ON
Ch	Chicago, IL	Lu	Ludington, MI	So	Sault Ste. Marie, ON
Ck	Clarkson, ON	Me	Menominee, MI	TB	Thunder Bay, ON
Cl	Cleveland, OH	Mw	Milwaukee, WI	Td	Toledo, OH
Dt	Detroit, MI	Na	Nanticoke, ON	Th	Thorold, ON
DS	Duluth-Superior	Os	Oshawa, ON	To	Toronto, ON
Er	Erie, PA	Ow	Oswego, NY	Wi	Windsor, ON

Prepared by: Albert G. Ballert  
Great Lakes Commission  
400 Fourth St., Ann Arbor, MI 48103

Vessel name	Date	Flag	LOA	Ports of Call
Aivik	3/25	Ca	340	<sup>Os</sup> <del>Os</del> 3/25
L T Argosy	3/25	In	607	Ha3/25, DS4/1
Lake Ontario	3/25	Cy	730	Ha3/26
Lake Superior	3/26	Cy	730	BH3/30, DS4/4
Federal Fraser	3/27	HK	730	Ha3/28, Dt3/31, Mw4/3
Omisalj	3/27	Mt	729	Ha3/28, DS4/6
Federal Matane	3/28	No	585	Ha3/29, Mw4/8
Ziemia Gnieznienska	3/30	Po	591	Cl4/1, Ch4/8, TB4/11
Island Skipper	3/30	Gk	585	Th3/31, DS4/8
Petka	4/1	Mt	729	Dt4/3, Td4/7,
General Cabal	4/2	Ph	477	Ha4/3, Wi4/6
Federal Polaris	4/3	Li	600	Cl4/5, DS4/10
Ziemia Suwalska	4/4	Po	591	Cl4/6, Dt4/11, BH4/13, DS4/17,
Stolt Aspiration--T	4/5	Pa	423	GB4/9, Ch4/10, Dt4/13, Ha4/16
Lake Erie	4/7	MI	730	Dt4/10, DS4/16
Turid Knutsen--T	4/7	No	533	Ha4/8, Sa4/11
Kapitonas Reutov	4/10	Lt	480	Dt4/12, Wi4/14
Gunay A	4/12	Tu	617	Ha4/13, BH4/18, TB4/22
Seapearl II	4/12	Mt	581	Th4/14, DS4/23
Vulcan	4/13	Cy	626	BH4/17, DS4/22
<u>Olympic Miracle</u>	4/13	Gk	600	Ha4/14, TB4/21
Ziemia Zamojska	4/13	Po	592	Cl4/15, Mw4/21, Ch4/24, TD4/25
Ulloa	4/13	Si	590	Cl4/15, Mw4/19, DS4/22, Ch4/26
Elikon	4/14	Ba	580	Ha4/15, Dt4/18/, BH4/22, Td4/27
Utviken	4/14	Ba	621	To4/15, TD4/24
Hope I	4/14	Mt	617	Dt4/17
Atlantis Spirit	4/15	Cy	498	Td4/18, BH4/19, TD4/22
Alam United	4/15	Ma	585	Dt4/17, TB4/25
Holck Larsen	4/15	In	628	Cl4/18, Td4/21, DS4/24
Hercegovina	4/15	Mt	645	Os4/16, Td4/23, BH4/27, DS5/1
Dmitriy Pozharskiy	4/15	Ru	532	Cl4/18, Dt4/21, Ch4/24, TB4/27
Thor I	4/16	Li	542	Ha4/17, To4/19
M Hass	4/16	Ba	532	Th4/20
Federal MacKenzie	4/19	HK	730	Dt4/21, Ch4/26, TB5/1
Margaret John	4/19	Mt	379	Wi4/22
Kapitonas Izmiakov	4/20	Lt	480	Cl4/22, Td4/25, DS4/28
Golden Sky	4/20	Cy	621	To4/21, TB4/29
Federal Manitou	4/20	No	585	Ha4/21, Mw4/27
Furunes	4/21	Pa	441	Ow4/21, GB5/5, DS5/11
Staberg	4/21	No	600	As4/23, DS4/28
Marka L	4/22	Gk	597	BH4/26, Td5/1
Federal Calliope	4/22	Li	619	Cl4/24, Mw5/3, DS5/8
Ziemia Tarnowska	4/22	Po	591	Cl4/24, BH5/2, TB5/5
Darya Kamal	4/23	HK	617	Os4/23
Stolt Alliance--T	4/24	Pa	405	To4/25/Ha4/27
Kapitonas Gudin	4/25	Lt	480	Dt4/27, Ch5/1, Lu5/3, Ha5/8
Antalina	4/25	Cy	585	Td4/28
Soren Toubro	4/26	In	628	Ha4/27, TB5/2
Pontokratis	4/26	Gk	590	To4/27, DS5/2
x Icepurna--T	4/26	Ba	619	Ck4/27
Saskatchewan Pioneer	4/27	Ba	730	Ha4/28, Cl5/1, To5/2, Dt5/4, Mw5/8, Ch5/10, TB5/15
Federal Agno	4/28	Ph	600	Wi4/30, Ch5/5
Lake Michigan	4/28	Cy	730	To4/29, Ha4/30, Dt5/5, Td5/6

Vessel name	Date	Flag	LOA	Ports of Call
Stellanova	4/29	NA	327	Dt5/2, PH5/3
Pantazis L	4/29	Gk	591	To4/30, Wi5/3, DS5/8
Arma	4/30	Mt	473	To4/30, Ha 5/5
Evmar	4/30	Cy	593	Ha5/1, Wi5/6, DS5/10
Malinska	4/30	Mt	729	As5/2, TB5/8
Handy Laker	4/30	Ph	585	Cl5/2, Dt5/3, Ch5/8
Luna Verde	5/2	Ph	591	Dt5/4, Td5/12
Aptmariner	5/4	Li	619	Dt5/6, DS5/13, TB5/15
Alpha	5/4	Li	580	Dt5/6, Ch5/9, Td5/13
Jo Hassel	5/5	SV	356	To5/5
Ziemia Chelminska	5/5	Po	591	Cl5/7, Dt5/11, Ch5/15, TB5/17
Stepan Razin	5/5	Ru	532	Ch5/10, TB5/16
Dmitriy Donskoy	5/5	Ru	532	Dt5/7, Ch5/11, PH5/13, Og5/19
Atlanta Forest	5/6	Pa <sup>22</sup>	525	Cl5/8, Td5/10, Dt5/11, Ch5/15
Eemshorn	5/7	Ma <sup>24</sup>	585	Ch5/11, BH5/15, DS5/19
Sunny Blossom--T	5/7	Ba	528	Sa5/9
Kirby D	5/8	Cy	386	TB5/12
Trans Arctic	5/8	No	383	Ha5/8
Mljet	5/9	Mt	622	Ha5/10, Gd5/14
Kapitonas A Lucka	5/9	Lt	480	Dt5/11, DS5/17
Thorscape	5/10	Li	542	Ha5/11, To5/12
Caribbean Mercy	5/11	Pa	263	(hospital aid and supply vessel)
Lake Ontario--2	5/12	MI	730	Cl5/14, Dt5/17, BH5/20, DS5/24
C Martin	5/13	Mt	538	Ha5/14
Stolt Aspiration--T	5/14	Pa	423	GB5/16, Ch5/19, Ha5/24
Stellamare	5/14	NA	289	Dt5/16
Winter Star	5/14	Cy	656	Ch5/19, TB5/26
General Cabal	5/15	Ph	577	To5/17, TB5/21
Pomorze Zachodnie	5/17	Po	592	Cl5/19, BH5/26, TB5/28
Lake Champlain	5/18	MI	591	Ha5/18, TB5/23
Viljandi	5/18	Es	458	To5/18, Mw522
Peonia	5/18	Li	648	BH522, Mw5/30
Super Vision	5/18	Ph	400	Ch5/23, DS5/28
Federal Fraser	5/18	Ph	730	TB5/22
Konstantis F	5/18	Gk	472	Cl520, Lu5/26
Federal Oslo	5/19	Pa	601	Ha5/20, DS5/25
Turid Knutsen--T	5/19	No	533	Ha5/20, Sa5/23, Ch6/2
Seadaniel	5/19	Pa	581	As5/21, Dt5/22, BH5/31
Golden Shield--T	5/19	Pa	417	Ha5/20
Yick Hua	5/20	Pa	585	BH5/24, Mw5/30
Tim Buck	5/20	Ru	532	Ha5/21, Dt5/28
Nea Doxa	5/20	Gk	617	Ha5/21, TB5/27
Aurora Topaz	5/21	Li	640	Td5/23, Dt5/27
Omisalj--2	5/22	Mt	729	Ha5/22, TB5/29
Great Laker	5/22	My	591	Th5/23, Dt5/29
Mikhail Kutuzov	5/24	Ru	532	Ch5/30, TB6/3
Rhea	5/24	Gk	593	Dt5/26, Ch5/30, DS6/11
Ciovo	5/25	Pa	479	Ha5/26
Federal Fuji	5/25	Ja	598	Dt5/27, DS6/1
Kapitan Zamyatin	5/26	Ru	498	As5/28, Me5/31, TB6/3
Handymariner	5/26	Li	619	Ha5/27, Cl5/30, Td6/1, Mw6/5, Ch6/6
Hass--2	5/26	Ba	532	Os5/27
Edda	5/27	AB	323	Ha5/28

Lake Challenger 5/6 Pa 585 Cl5/6, Td5/10, Dt5/11, Ch5/5

Alam Senang 5/7 Ma 585 Ch5/11, DS5/19

Vessel name	Date	Flag	LOA	Ports of Call
Petka--2	5/28	Mt	729	To5/28, Cl5/30, Td6/3, Mw6/6, Ch6/7, Th6/19
Luckyman	5/29	Cy	585	BH6/2
Sac Malaga	5/31	Pa	621	Ha6/1, Dt6/4, BH6/6, DS6/12
APJ Anjli	5/31	In	577	Cl6/2, Ch6/6, Mw6/12
L T Argosy--2	6/1	In	607	BH6/5, So6/7, DS6/11
Storon	6/2	Sw	470	Wi6/4
Stolt Alliance--2-T	6/2	Pa	405	Ha6/3, Dt6/6
Darya Kamal--2	6/3	In	617	Ha6/4, Ch6/9, TB6/15
Federal Matane--2	6/6	No	585	Cl6/7
Utviken--2	6/6	Ba	621	Ha6/7
Olympic Miracle--2	6/7	Gk	600	So6/10, DS6/16
Kapitonas Reutov--2	6/7	Lt	480	Ha6/8
Steel Flower	6/7	Pa	730	Dt6/9, TB6/18, Os6/29
Odranes	6/7	Ba	471	Ha6/8, Dt6/11, DS6/14
Federal Vigra	6/7	No	590	TB6/11
Ziemia Gnieznienska--2	6/7	Po	591	Cl6/9, Mw6/16, Ch6/19, TB6/22
Island Skipper--2	6/7	Gk	585	Cl6/9, Td6/11, Ch6/13, DS6/16
Federal MacKenzie--2	6/8	HK	730	Ha6/9, Dt6/14, TB6/18
Gunay A--2	6/10	Tu	617	BH6/14, DS6/22
Anna	6/10	Cy	600	Ha6/11, Td6/15
Kapitonas Vavilov	6/11	Lt	480	Cl6/12
Parkgracht	6/11	Du	349	BH6/15
Soren Toubro	6/12	In	628	Ha6/12, Cl6/15, Td6/17, Dt6/17, Mw6/21, DS6/25
Trans Arctic--2-T	6/12	No	383	Ha6/13, Sa6/15
Sidsel Knutsen--T	6/13	No	533	Sa6/15
Vekua--T	6/14	Mt	496	Sa6/17
Nomadic Patria	6/16	No	512	Ch6/29, Og6/26
Kobuleti--T	6/17	Mt	496	Ha6/18, Dt6/21, Ha6/24
Lake Michigan--2	6/17	Cy	730	Ha6/18, DS6/24
Vasiliy Musinskiy	6/18	Ru	498	TB6/22
Federal St. Laurent	6/20	Li	619	To6/21
(outbound as Federal Dora, Gk.)				
Ziemia Zamojska--2	6/22	Po	592	Cl6/23, Dt7/4, BH7/10, DS7/13
Lida	6/22	Cy	214	Mw6/26
Kapitonas Dubinin	6/22	Lt	470	Cl6/24, Td6/27, Ch7/1
Stolt Aspiration--2-T	6/23	Pa	423	To6/24, GB6/30, Dt7/3, Ha7/5
Viljandi--2	6/24	Es	458	Mw6/27, To7/3
Pantazis L--2	6/25	Gk	591	BH6/29, Ch6/30
Icepurna--T	6/25	Ba	619	Ha6/26
Punica	6/26	Li	648	BH6/30
Turkay B	6/26	Tu	387	Cl6/28, Dt7/3, DS7/8
* Saskatchewan Pioneer-2	6/29	Ba	730	Cl7/1, Td7/6, Dt7/7, Mw7/10, TB7/12
Thor I--2	6/29	Si	542	To6/29, Ha6/30
Hercegovina--2	6/29	Mt	645	Ha6/30, Td7/5, Dt7/6, BH7/9
Necat A	6/29	Tu	656	As7/1, BH7/5
Kapitonas Gudini--2	7/1	Ru	480	Th7/2, Dt7/6, Ch7/10, TB7/12
Ziemia Chelminska--2	7/1	Po	591	Cl7/3, BH7/8
Razboieni	7/2	Ro	521	Ha7/5
Federal Vibeke	7/2	No	590	Og7/5, Dt7/7, Td7/12, DS7/22
Oak	7/2	Ba	509	Og7/2, Ha7/3, Er7/11
Concorde--T	7/3	SV	320	Dt7/5
Lake Champlain--2	7/3	MI	591	Dt7/10, Ch7/10, DS7/13
Margaret John--2	7/4	Mt	379	Wi7/6, Td7/10
Utman Senang--2	7/4	Ma	585	Ch7/10, Dt7/4

Vessel name	Date	Flag	LOA	Ports of Call
Pontoporos	7/6	Gk	581	C17/8, Ch7/13
Nea Doxa--2	7/6	Gk	617	BH7/10
Olympic Mentor	7/7	Gk	600	BH7/11, TB7/16
Maria S J	7/7	Yu	622	Ha7/8
Ziemia Suwalska--2	7/8	Po	591	C17/10, Dt7/13, Mw7/17
Ivi	7/8	Li	591	Th7/9, /Td7/17
Vulcan--2	7/9	Cy	626	Ha7/10, Ch7/18
Kapitonas Mesceriakov	7/9	Lt	477	Dt7/11, Ch7/20, TB7/24
Wana Naree	7/11	Th	576	C17/13, Dt7/14, Ch7/17, DS7/20
Lake Carling	7/12	MI	571	Dt7/14, Ch7/18, TB7/20
Stolt Alliance--2-T	7/12	Pa	405	Ha7/13, Ch7/18, GB7/21
Turid Knutsen--3-T	7/13	No	533	Ha7/14, Sa7/17, Ch7/21, Sa7/23
Omisalj--3	7/13	Mt	729	Ha7/14, C17/16, Td7/18, Dt7/19, Mw7/23, Ch7/24
Lake Erie--2	7/13	MI	730	Ha7/14, TB7/20
Federal Agno--2	7/14	Ph	600	So7/17, Ch7/21
Union	7/14	HK	585	BH7/18
Federal Polaris--2	7/15	Ja	600	Ha7/16
Thorscape--2	7/15	Li	542	Ha7/16, To7/17
Romo Maersk--T	7/16	De	558	Ha7/18
Federal Calliope--2	7/16	Li	619	Ha7/17, DS7/24
Trans Arctic--2	7/17	No	383	Ha7/18, Dt7/20
Lake Challenger--2	7/17	Pa	585	Ch7/24, DS7/30
Trias	7/17	Gk	730	Td7/20
Federal Vigra--2	7/17	No	600	Ha7/19, C17/21, Dt7/23, BH7/26
Hilal II	7/18	Tu	585	C17/20, Dt7/21, Ch7/25
Lake Charles	7/18	MI	591	Th7/22, DS7/28
Aurora Topaz--2	7/22	Li	640	Ha7/22
Lake Tahoe	7/22	MI	591	Th7/25
Ziemia Tarnowska--2	7/22	Po	591	C17/24, BH7/28, Mw7/31
Kapitonas Reutov--3	7/23	Lt	480	Wi7/25, BH7/31, GB8/7
General Cabal--3	7/24	Ph	477	Td7/26, Ch7/31
Handymariner--2	7/24	Li	619	Ha7/25, DS8/3
Bergon	7/27	Sw	331	Td7/31, Ha8/2
Darya Kamal--3	7/28	HK	617	C17/30, Td8/1, Mw8/4, Ch8/7
Luckyman--2	7/28	Cy	585	Ha7/29, Td8/2, Ch8/7, C18/14
Staalvang	7/29	No	251	Er7/30
Gunay A--3	7/29	Tu	617	Ha7/30, DS8/5
Federal MacKenzie--3	7/29	HK	730	Dt8/1, DS8/5
Vekua--2-T	7/31	Mt	496	Ha8/1, Sa8/5
Federal Nord	7/31	No	591	As8/3, BH8/7
Polydefkis	8/2	Gk	621	Ch8/7, Dt8/14, Td8/14
Capetan Michalis	8/2	Gk	590	BH8/6
Indian Express	8/2	Va	509	TB8/7
Golden Sky--2	8/2	Cy	621	To8/3, TB8/10
Astra Lift	8/3	Ba	307	Dt8/5
Federal Oslo--2	8/3	Pa	601	Ha8/3, Dt8/6, Ch8/10
Ziema Gnieznienska	8/4	Po	591	C18/10, Ch8/14, So8/16
Aptmariner--2	8/5	Li	619	Dt8/7
Olympic Miracle--3	8/6	Gk	600	Ha8/7, C18/9, Td8/11, Ch8/14, DS8/16
Romo Maersk--2-T	8/6	De	558	Ha8/7
Blue Bill	8/7	Cy	621	Dt8/9, Ch8/14
Kapitonas Dubinin--2	8/7	Lt	479	As8/9, TB8/12
Seamonarch	8/9	Mt	640	Ha8/10, C18/12, Td8/13, Dt8/13, Mw8/18, Ch8/21, TB8/23
Sidsel Knutsen--2-T	8/9	No	533	Na8/10, Sa8/11
Stolt Aspiration--3-T	8/10	Pa	423	Ha8/11, Dt8/13

Vessel name	Date	Flag	LOA	Ports of Call
Steel Flower--2	8/12	Pa	730	Ha8/13, Dt8/17, Ch8/21
Federal Dora--2	8/13	Gk	619	So8/17, TB8/24
Sac Malaga--2	8/14	Pa	621	Mw8/18
Utviken--3	8/15	Ba	621	Ha8/16
Lake Ontario--3	8/15	MI	730	BH8/22, Mw8/24
Punica--2	8/16	Li	648	Ha8/17, Dt8/20, BH8/23, DS8/31
Lake Champlain--2	8/17	MI	591	Cl8/19, Ch8/25
Hydra	8/18	Ba	568	Ch8/22, BH8/24
Finnfighter	8/18	Fi	522	Og8/19
Concorde	8/18	SV	321	Ha8/19
Federal Aalesund	8/19	NO	590	Cl8/21, Dt8/22, Ch8/25
Kapitonas A Lucka--2	8/23	Lt	480	Cl8/24, Td8/26, Dt8/27, Ch8/30, PH9/1, Og9/6
Barbara H	8/24	Cy	632	Td8/27, Cl8/31
George L	8/26	Gk	597	Ha8/27
Olympic Mentor--2	8/28	Gk	600	Ha8/29, BH9/3
Ziemia Zamojska--3	8/28	Po	592	Cl8/30, Ch9/5, DS9/10
Saskatchewan Pioneer-3	8/28	Ba	730	Ha8/29
Stolt Alliance--3-T	8/28	Pa	405	Ha8/29
Oak--2	8/29	Ba	509	Ha8/30
Federal Polaris--3	8/29	Ja	600	Ha8/30, Ch9/5
Ulloa	8/29	Si	585	DS9/4
× Federal Calliope--3	8/30	Li	619	Ha8/31, Gd9/1 2/
Barbara E	8/30	Sp	336	Cl9/4, Dt9/6
✓ Titan Scan	8/31	NA	405	To 2 3/1, Ha9/5
<hr/>				
Argut	9/1	Uk	312	Ch9/5
Trias--2	9/1	Gk	730	Dt9/5, Mw9/8, Ch9/11
Pomorze Zachodne--2	9/2	Po	592	Cl9/3, Ch9/11, TB9/13
Nordic Blossom--T	9/3	Li	505	Sa9/5
Chada Naree	9/3	Th	479	Ha9/4
Thor I--3	9/3	Si	542	Ha9/4, To9/7
Lake Erie--3	9/5	MI	730	Cl9/7, Td9/9, Dt9/12
Island Skipper--3	9/5	Gk	585	Ha9/6, BH9/19
Lake Michigan--3	9/6	Cy	730	Ha9/7, Dt9/9, Ch9/11, DS9/15
Aslan 1	9/6	Tu	396	BH9/10
Hercegovina--3	9/6	Mt	645	Ch9/11
Karen D	9/6	Cy	386	Ha9/7
Ocean Priti	9/6	Pa	599	As9/8, Mw9/14
Asia Trader	9/7	Pa	591	To9/8, DS9/14
Federal Manitou--2	9/8	No	585	To9/10, Wi9/13, BH9/18
Turid Knutsen--2-T	9/8	No	533	Ha9/9, Sa9/13
Olympic Merit	9/9	Gk	600	TB9/13
Praxitelis	9/10	Gk	621	Ha9/11, Lu9/16, DS9/21, Ch9/25
Island Gem	9/10	Gk	585	Ha9/11, Cl9/12, Td9/13, Dt9/14, Mw9/17,
↓ Petka--3	9/10	Mt	729	Ha9/11, DS9/17 Ch9/18, DS9/23
Alpha--2	9/12	Li	580	Cl9/14, Td9/15, Ch9/18, DS9/20
Odranes--2	9/12	Ba	471	DS9/16
An Ze Jiang	9/12	Ch	491	Ch9/19
Lake Superior--2	9/13	Cy	730	TB9/17
Ziemia Chelminska--3	9/14	Po	591	Cl9/16, BH9/25, Sa9/27
General Cabal--4	9/16	Ph	477	Er9/17, Dt9/19, Ch9/22
Solta	9/16	Mt	622	To9/17, Th9/20, TB9/26
Kapitonas Mesceriakov-2	9/16	Lt	477	Ch9/21, Td9/26
Rhea--2	9/16	Gk	593	Os9/18, DS9/24
Freja Nordic--T	9/17	Ba	407	Ha9/18, Dt9/23, Ha9/27

Vessel name	Date	Flag	LOA	Ports of Call
Stevnsland	9/17	AB	209	Mw9/21, Ch9/25
Stolt Aspiration--4-T	9/18	Pa	423	To9/19, Ch9/22, GB9/24
Handymariner--3	9/19	Li	619	Ha9/20, Dt9/23, Ch9/29, TB10/1
Golden Sky--3	9/20	Cy	621	Ha9/21, Gd9/25
Vekua--3-T	9/21	Mt	496	Ha9/22, Sa9/28
Federal Oslo--3	9/22	Pa	601	Ha9/23, TB9/28
Federal Inger	9/23	No	593	Cl9/25, Td9/29, Dt ? , DS10/29 - record
Ruder Boskovic	9/23	Yu	599	DS9/28
Lake Charles--2	9/24	MI	591	Ha9/25, TB9/30
Rantum--T	9/24	Cy	346	Ck 9/25
Docegulf	9/24	Li	674	TB9/28
Riomar	9/24	Cy	445	DS9/29
Luna Verde--2	9/26	Ph	591	Cl9/28, Dt9/29, Ch10/1
Aljet--2	9/26	Mt	622	To9/27, Dt10/4, Td10/9
Zvijeta Zuzoric	9/26	Yu	599	DS10/3
Beta Luck	9/27	Gk	559	DS10/2
Aurora Topaz--3	9/27	Li	640	Dt9/29
Thorscape--3	9/27	Li	542	Ha9/28, To9/28
Arma--2	9/28	Gk	473	Ha9/29, Th10/1, Ha10/4
Jtviken--4	9/28	Ba	621	Ha9/29, TB10/7
Malinska--2	9/30	Mt	729	To10/1, TB10/9
Aptmariner--3	10/1	Li	619	TB10/7
Sidsel Knutsen--3-T	10/1	No	533	Sa10/9
Niemia Suwalska--3	10/2	Po	591	Cl10/4, Mw10/8, Ch10/10, TB10/12
Kan Selayang	10/2	Si	590	Td10/8
Capitonas Stulpinas	10/4	Lt	480	Td10/6, Dt10/7, TB10/12
Capitonas Reutov--4	10/4	Lt	389	Cl10/6, Td10/8,
Stolt Alliance--4-T	10/5	Pa	405	Ha10/6, Ch10/10, GB10/12, Dt10/15
Handy Laker--2	10/6	Ph	585	Cl10/8, Dt10/9, Ch10/11, Td10/15
Luckyman--3	10/6	Cy	585	Ha10/7, Ch10/12
Rantum--2-T	10/6	Cy	346	
Lake Champlain--3	10/7	MI	591	Cl10/10, Ch10/13
Ardeevka	10/7	Uk	571	Gd10/9
Lake Challenger--3	10/8	Pa	585	DS10/12
Finnsnes	10/8	Pa	441	GB10/12, DS10/20
Riomar--2	10/9	Cy	593	As10/11, Dt10/13
Federal Agno--3	10/9	Ph	600	Ha10/14, Cl10/14, Ch10/18, DS10/25
Federal Dora	10/10	Gk	619	Ha10/11, TD10/21
Federal Fuji--2	10/10	Li	600	Dt10/12, Ch10/15, DS10/21
Wright	10/10	Ba	581	Dt10/12
Federal Matane--3	10/11	No	585	To10/11, Cl10/18
Federal MacKenzie--4	10/11	HK	730	Dt10/13, TB10/18
Loren Toubro--2	10/11	In	628	Cl10/13, Ch10/16
Calliroe Patronicola	10/11	Gk	600	As10/13, TB10/19
Leonia--2	10/11	Li	648	BH10/16, Cl10/25
Lunay A--4	10/13	Tu	617	Ha10/14, Cl10/17, Td10/19, Mw10/21, BH10/25
Laserbeam	10/13	Mt	600	DS10/18
Lyanza	10/14	Ba	498	Wi10/19
Ljordnes	10/15	No	490	LU10/20, DS10/26
Leamonarch	10/17	Mt	640	Cl10/19, Td10/24, Ch10/26, DS10/30
Lujisan Maru	10/17	Th	481	Ha10/18,
Lake Michigan--4	10/17	Cy	730	TB10/21
Liberty Sky	10/17	Pa	585	TB10/21
Lustra Lift	10/17	Ba	307	Dt10/19, BH10/23, Cl10/26



Vessel name	Date	Flag	LOA	Ports of Call
Winter Star	10/18	Cy	656	Cl10/20, Dt10/23, Ch10/26, TB10/29
Trias--3	10/18	Gk	730	DS10/22
Polydefkis--2	10/18	Gk	621	Ha10/19, Dt10/26, Td10/27
Project Europa	10/19	NA	456	So10/21
Hydra--2	10/19	Ba	568	Ha10/20, Cl10/23, BH10/27, DS11/3
Rantum (return trip)	10/20	Cy		(first trip - upbd. 10/6, dnbd. 10/10)
Ziemia Tarnowska--3	10/21	Po	591	Cl10/22, BH10/27, TB10/29
Altair	10/21	AB	322	DS10/25
El Kef	10/22	Li	600	DS10/27
Darya Kamal--4	10/22	HK	617	As10/24, DS10/28
Turid Knutsen--5-T	10/22	No	533	Ha10/23, Ck ?, Sa10/27, Ch10/30, Sa11/1
Lake Erie--4	10/23	MI	730	Ha10/24, Cl10/27, Td10/30, TB11/5
Jo Palm--T	10/23	Du	378	To10/24
Barbara H--2	10/23	Cy	622	Ch10/28, DS11/5
Rose Island	10/26	Pa	472	TB10/30
Beluga	10/26	Mt	585	DS10/30
Punica--3	10/26	Li	648	Gd10/29
Ziemia Zamojska--4	10/27	Po	592	Cl10/29, Ch11/3, TB11/6
Varjakka	10/28	Fi	522	Og10/28
Federal Vibeke--2	10/28	No	590	BH11/1, Dt11/5
Ayhur Kalkavan	10/29	Tu	583	Th10/30, DS11/10
Stolt Aspiration--5-T	10/30	Pa	423	Ha10/31
Lake Carling--2	10/31	MI	591	Ha11/1, TB11/8
Ulloa--3	10/31	Si	585	Dt11/2, BH11/7
Federal Bergen	10/31	No	591	Dt11/2, So11/6
South Islands	10/31	Cy	472	TB11/5
Alam Senang--2	11/1	Ma	585	Td11/5
Mountain Blossom--T	11/2	Ba	528	Sa11/4
Blue Bill	11/2	Cy	621	As11/3, Dt11/5
Alidon	11/2	Cy	275	Me11/7, Ch11/12
Steel Flower--3	11/2	Pa	730	BH11/9, DS11/15
Saskatchewan Pioneer--4	11/3	Ba	730	Ha11/4, Cl11/5, Td11/7, Ch11/10, Mw11/13, TD11/16
Kapitonas Kaminkas	11/3	Lt	480	DS11/8
Federal Polaris--4	11/3	Ja	600	Ha11/4, Cl11/9
Kapitonas Dubinin--3	11/4	Lt	479	BH11/10, SB11/18, Ch11/24
Asia Trader--2	11/4	Pa	591	Cl11/7, Ch11/11, BH11/13, TB11/15
Federal Oslo--4	11/5	Pa	601	So11/8, TB11/15
Kapitonas A Lucka--3	11/5	Lt	480	Os11/6, Ch11/16, DS11/23
General Cabal--5	11/7	Ph	477	Td11/9
Hercegovina--4	11/7	Mt	645	Td11/13, Dt11/16
Pontokratis	11/8	Gk	590	To11/10, Th11/14, As11/18, SB11/21,
Proof Trader--T	11/8	No	318	To11/9 Ch11/26, Dt12/1
Solta--2	11/9	Mt	622	Ch11/13, TB11/21
Anna--2	11/10	Cy	600	Dt11/12, Lu11/15, /Ch11/17, TB11/21
Arosa	11/10	Cy	621	Ch11/14
Ziemia Gnieznienska--4	11/10	Po	591	Cl11/12, BH11/16, TB11/20
Erikousa Wave	11/10	Cy	601	As11/13, DS11/19, Og11/29
Thor I--4	11/11	Si	542	To11/12, Ha11/13
Ivi--2	11/11	Li	591	Ch11/16, DS11/19, Sa11/23
Makejevka	11/12	Ru	649	Ha11/13, Td11/19
Bontegracht	11/12	Du	263	BH11/17, Th11/22
L T Argosy--3	11/13	In	607	To11/14, BH11/20
Docegulf--2	11/13	Li	674	DS11/18
Nordic Blossom--2-T	11/13	Li	505	Sa11/15
Lake Charles--3	11/14	MI	591	Ch11/18, BH11/18

Vessel name	Date	Flag	LOA	Ports of Call
Vulcan--3	11/15	Cy	621	DS11/19
Oak--3	11/15	Ba	509	Td11/18, Dt11/20, Cl11/23, DS11/28
Rubin Eagle	11/15	Ph	486	Cl11/17, Dt11/19, Ch11/22
Sidsel Knutsen--4-T	11/15	No	533	Ha11/16, Sa11/20
Praxitelis--2	11/16	Gk	621	Ha11/17, Dt11/19, Ch11/22, TB11/26
Nea Doxa--3	11/16	Gk	618	To11/16, DS11/26
Jing Hong Hai	11/16	Ch	594	Th11/18, DS11/25
Phoenix M	11/16	Cy	581	Dt11/18
Federal Fraser--3	11/17	HK	730	Dt11/19, TB11/23
Areito	11/17	Cu	486	TB11/22
Aurora Topaz--4	11/17	Li	640	BH11/21, ? Dt12/5, Ha12/13
Luckyman--4	11/18	Cy	585	Ch11/22, DS11/28, TB11/29
Ruder Boskovic--2	11/18	Yu	599	Og11/19, Ha11/20
Alpha--3	11/19	Li	580	Ha11/20
Petka--4	11/19	Mt	729	Ha11/20, TB11/28
Aptmariner--4	11/20	Li	619	Cl11/21, Dt11/29, Gd11/30
Ziemia Chelminska--4	11/20	Po	591	Cl11/22, Ch11/27, Mw11/29, TB12/1
Rong Jiang	11/20	Ch	463	Dt11/27
Utviken--5	11/21	Ba	621	Dt11/26, Ch12/1, Mw12/4
Malinska--3	11/21	Mt	729	Ha11/22, Dt11/25, BH11/29
Island Skipper	11/21	Gk	585	Ha11/22, Cl11/23, Td11/26, Dt11/26, Mw11/30, Ch12/1, TB12/2
Stolt Alliance--6 T	11/23	Pa	405	To11/24, Ch11/27, GB12/2, Ha12/6
Rhea--3	11/23	Gk	593	Ha11/24, DS11/30, TB12/2
Avdeevka--2	11/23	Uk	571	BH11/28, Mw11/30
Pontoporos--2	11/23	Gk	581	To11/24, DS12/4
Marilis T	11/24	Cy	585	Cl11/25, Dt11/26, Td11/30
Concorde--2-T	11/24	SV	320	Dt11/26, So11/28, Dt11/30
Kapitonas Reutov--5	11/25	Lt	480	Cl11/26, PH11/29, Og12/4
Island Gem--2	11/25	Gk	585	Ha11/26, Cl11/29, TB12/4
Milin Kamak	11/26	Ro	608	Th11/27, Gd12/4
Stormy Annie	11/26	Pa	522	Ha11/27
Necat A--2	11/27	Tu	656	As11/29, TB12/4
Omisalj--4	11/27	Mt	729	Dt11/29, Ch12/2, DS12/5
Golden Sky--4	11/28	Cy	621	TB12/2
Maisi	11/28	Cu	486	TB12/3
Great Laker--2	11/28	My	591	Wi11/30, Gd12/2
Stolt Taurus--T	11/28	Li	405	Ha11/29
Kapitonas Mesceriakov 3	11/28	Lt	477	Dt12/1, Td12/2, TB12/7
Ziemia Suwalska--4	11/29	Po	591	Cl12/1, BH12/5, TB12/8
Olympic Mentor--3	11/30	Gk	600	Wi12/2, Mw12/6, Ch12/7, TB12/13
L T Odyssey	11/30	In	607	Dt12/2, Ch12/7, DS12/15
Ikan Selayang--2	12/1	Si	590	Dt12/3, Td12/8
Phorscape--4	12/1	Li	542	To12/2, Ha12/3
Prines	12/1	Pa	441	Os12/2, Me12/10, Lu12/12, Ph12/15
Lake Champlain--5	12/2	MI	591	Cl12/4, TB12/9
Jeannie	12/2	Gk	600	As12/4, TB12/13
Stolt Aspiration--7-T	12/3	Pa	423	Ck12/4, Ha12/11, Dt12/15
Federal MacKenzie--5	12/3	HK	730	Mw12/8, Ch12/11
Calliroe Patronicola--2	12/7	Gk	600	Dt12/11, Td12/13
Furid Knutsen--6-T	12/8	No	533	Ha12/8, Sa12/16
Rajah Borneo	12/8	Ma	327	To12/9
Lake Michigan--5	12/8	Cy	730	DS12/17
Pride of Donegal	12/9	Li	518	Th12/10, Wi12/14
Winter Star--3	12/9	Cy	518	Cl12/13, Dt12/16
Mountain Blossom--2-T	12/9	Ba	528	Sa12/14

Aslan 1--2	12/9	Tu	396	Cl12/14, TB12/18
Lake Ontario--4	12/11	MI	730	Ha12/12
Aquarius	12/12	It	397	Cl12/15
Holck Larsen--2	12/12	In	628	Td12/15
Romo Maersk--3-T	12/12	De	558	Sa12/15
Uznadze--T	12/16	Mt	496	Ha12/18

Note: In addition to the overseas ships listed above, a coasting tug/barge Dixie Commander/DXE 1640 (120'/469') made three trips into the Lakes from the Gulf coast: 5/22 urea, 6/7 calcium chloride; 9/21 in ballast, 9/27 calcium chloride; 11/13 urea, 11/23 calcium chloride

Prepared by *Albert G. Ballert*  
Great Lakes Commission  
400 Fourth St., Ann Arbor, MI 48103

Listed below are name and/or registry changes for several overseas vessels serving the Great Lakes in 1994 and again this year.

<i>Present name and registry</i>		<i>Former name and/or registry</i>	
Lake Erie	Marshall Islands	Federal Ottawa	Luxembourg
Lake Michigan	Marshall Islands	Federal Maas	Cyprus
Lake Ontario	Marshall Islands	Federal Danube	Cyprus
Lake Superior	Marshall Islands	Federal Thames	Cyprus
Federal Calliope	Greek	Federal Saguenay	Liberia
Federal Dora	Greek	Federal St.Laurent	Liberia
Federal Fraser	Hong Kong		Philippines
Federal MacKenzie	Hong Kong		Philippines

OVERSEAS VESSELS TRANSITS INTO THE GREAT LAKES - MARCH-DECEMBER 1995

Note: Data are based on the listing of oversea cargo vessels in the daily transit reports for the U.S. Seaway locks and from supplemental port cargo data. The dates are for the upbound passages through the Eisenhower Lock. LOA refers to overall length in feet and (T) indicates a tanker.

36 Flags of Registry

AB	Antigua/Barbuda	HK	Hong Kong	Ph	Philippines
Ba	Bahamas	In	India	Po	Poland
Ca	Canada	It	Italy	Ro	Romania
Ch	China	Li	Liberia	Ru	Russia
Cr	Croatia	Lt	Lithuania	Si	Singapore
Cu	Cuba	Ma	Malaysia	Sp	Spain
Cy	Cyprus	MI	Marshall Islands	SV	St. Vincent and the Grenadines
De	Denmark	Mt	Malta	Sw	Sweden
Du	Netherlands	My	Myanmar (ex. Burma)	Th	Thailand
Es	Estonia	NA	Netherlands Antilles	Tu	Turkey
Fi	Finland		Norway	Va	Vanuatu
Gk	Greek		Pa Panama	Yu	Yugoslavia

1995 Monthly Upbound Transits

March-April 59, May 52, June 40, July 49, August 39, September 51, October 57, November 70, December 20

Upbound transits through December 1990 - 1995

1995 - 437, 1994 - 588, 1993 - 427, 1992 - 399, 1991 - 429, 1990 - 437

Vessel Name	Flag	LOA	1st	2nd	3rd	4th	5th	6th	7th
✓Aivik	Ca	340	3/24	6/2					
Alam Senang	Ma	585	5/7	7/4	11/1				
Alam United	Ma	585	4/15						
Alidon	Cy	275	11/2						
Alpha	Li	580	5/4	9/12	11/19				
Altair	AB	322	10/21						
An Ze Jiang	Ch	491	9/12						
Anna	Cy	600	6/10	11/10					
Antalina	Cy	585	4/25						
APJ Anjli	In	577	5/31						
Aptmariner	Li	619	5/4	8/5	10/1	11/20			
Aquarius	It	397	12/12						
Areito	Cu	486	11/17						
Argut	Uk	312	9/1						
Arma	Mt	473	4/30	9/28					
Arosa	Cy	621	11/10						
Asia Trader	Pa	591	9/7	11/4					
Aslan I	Tu	396	9/6	12/9					
Astra Lift	Ba	307	8/3	10/17					
Atlanta Forest	Mt	522	5/6						
Atlantis Spirit	Cy	498	4/15						
Aurora Topaz	Li	640	5/21	7/22	9/27	11/17			
Avdeevka	Uk	571	10/7	11/23					
Aynur Kalkavan	Tu	583	10/29						

Vessel Name	Flag	LOA	1st	2nd	3rd	4th	5th	6th	7th
Barbara E	Sp	336	8/30						
Barbara H	Cy	622	8/24	10/23					
Beluga	Mt	585	10/26						
Bergon	Sw	331	7/27						
Beta Luck	Gk	559	9/27						
Blue Bill	Cy	621	8/7	11/2					
Bontegracht	Du	263	11/12						
C Martin	Mt	538	5/13						
Calliroe Patronicola	Gk	600	10/11	12/7					
Capetan Michalis	Gk	590	8/2						
Chada Naree	Th	479	9/3						
Ciovo	Pa	479	5/25						
Concorde (T)	SV	320	7/3	8/18	11/24				
Cvijeta Zuzoric	Yu	599	9/26						
Darya Kamal	HK	617	4/23	6/3	7/28	10/22			
Dmitriy Donskoy	Ru	532	5/5						
Dmitriy Pozharskiy	Ru	532	4/15						
Docegulf	Li	674	9/24	11/13					
Edda	AB	323	5/27						
Eemshorn	Du	294	5/7						
El Kef	Li	600	10/22						
Elikon	Ba	580	4/14						
Erikousa Wave	Cy	601	11/10						
Evmar	Cy	593	4/30	10/9					
Federal Aalesund	No	590	8/19						
Federal Agno	Ph	600	4/28	7/14	10/9				
Federal Bergen	No	591	10/31						
Federal Calliope	Li	619	4/22	7/16	8/30				
Federal Dora	Gk	619	6/20	8/13	10/10				
✓Federal Fraser	Ph	730	3/27	5/18	11/17				
Federal Fuji	Li	598	5/25	10/10					
Federal Inger	No	593	9/23						
Federal MacKenzie	HK	730	4/19	6/8	7/29	10/11	12/3		
Federal Manitou	No	585	4/20	9/8					
✓Federal Matane	No	585	3/28	6/6	10/11				
Federal Nord	No	591	7/31						
Federal Oslo	No	601	5/19	8/3	9/22	11/5			
✓Federal Polaris	Ja	600	4/3	7/15	8/29	11/3			
Federal Vibeke	No	590	7/2	10/28					
Federal Vigra	No	590	6/7	7/17					
Finnfighter	Fi	522	8/18						
Finnsnes	Pa	441	10/8						
Fjordnes	No	490	10/15						
Freja Nordic (T)	Ba	407	9/17						
Frines	Pa	441	12/1						
Fujisan Maru	Th	481	10/17						
Furunnes	Pa	441	4/21						
Gajah Borneo	Ma	327	12/8						
✓General Cabal	Ph	477	4/2	5/15	7/24	9/16	11/7		
George L	Gk	597	8/26						
× Golden Shield (T)	Pa	417	5/19						
Golden Sky	Cy	621	4/20	8/2	9/20	11/28			
Great Laker	My	591	5/22	11/28					
Gunay A	Tu	617	4/12	6/10	7/29	10/13			
Haight	Ba	581	10/10						

Vessel Name	Flag	LOA	1st	2nd	3rd	4th	5th	6th	7th
Handy Laker	Ph	585	4/30	10/6					
Handymariner	Li	619	5/26	7/24	9/19				
Hercegovina	Mt	645	4/15	6/29	9/6	11/7			
Hilal II	Tu	585	7/18						
Holck Larsen	In	628	4/5	12/12					
Hope I	Mt	617	4/14						
Hydra	Ba	568	8/18	10/19					
Icepurna	Ba	619	4/26	6/25					
Ikan Selayang	Si	590	10/2	12/1					
Indian Express	Va	509	8/2						
Island Gem	Gk	585	9/10	11/25					
Island Skipper	Gk	585	3/30	6/7	9/5	11/21			
Ivi	Li	591	7/8	11/11					
Jeannie	Gk	600	12/2						
Jing Hong Hai	Ch	594	11/16						
Jo Hassel	SV	356	5/5						
Jo Palm	Du	378	10/23						
Kapitan Zamyatin	Ru	498	5/26						
Kapitonas A Lucka	Lt	480	5/9	8/23	11/5				
Kapitonas Dubinin	Lt	479	6/22	8/7	11/4				
Kapitonas Gudin	Lt	480	4/25	7/1					
Kapitonas Izmiakov	Lt	480	4/20						
Kapitonas Kaminskas	Lt	480	11/3						
Kapitonas Mesceriakov	Lt	477	7/9	9/16	11/28				
Kapitonas Reutov	Lt	480	4/10	6/7	7/23	10/4	11/25		
Kapitonas Stulpinas	Lt	480	10/4						
Kapitonas Vavilov	Lt	480	6/11						
Karen D	Cy	386	9/6						
Kirby D	Cy	386	5/8						
Kobuleti (T)	Mt	496	6/17						
Konstantis F	Gk	472	5/18						
L T Argosy	In	607	3/25	6/1	11/13				
L T Odyssey	In	607	11/30						
Lake Carling	MI	571	7/12	10/31					
Lake Challenger	Pa	585	5/6	7/17	10/8				
Lake Champlain	MI	591	5/18	7/3	8/17	10/7	12/2		
Lake Charles	MI	591	7/18	9/24	11/14				
Lake Erie	MI	730	4/7	7/13	9/5	10/23			
Lake Michigan	Cy	730	4/28	6/17	9/6	10/17	12/8		
Lake Ontario	MI	730	3/25	5/12	8/15	12/11			
Lake Superior	Cy	730	3/26	9/13					
Lake Tahoe	MI	608	7/22						
Laserbeam	Mt	600	10/13						
Liberty Sky	Pa	585	10/17						
Lida	Cy	214	6/22						
Luckyman	Cy	585	5/28	7/28	10/6	11/18			
Luna Verde	Ph	591	5/2	9/26					
M Hass	Ba	532	4/16	5/26					
Maisi	Cu	486	11/28						
Makeyevka	Ru	644	11/12						
Malinska	Mt	729	4/30	9/30	11/21				
Margaret John	Mt	379	4/19	7/4					
Maria S J	Gk	597	4/22						
Marilis T	Cy	585	11/24						

Vessel Name	Flag	LOA	1st	2nd	3rd	4th	5th	6th	7th
Marka L	Gk	597	4/22						
Mikhail Kutuzov	Ru	532	5/24						
Milin Kamak	Ro	608	11/26						
Mljet	Mt	622	5/9	9/26					
Mountain Blossom (T)	Ba	528	11/2	12/9					
Nea Doxa	Gk	617	5/20	7/6	11/16				
Necat A	Tu	656	6/29	11/27					
Nomadic Patria	No	512	6/16						
Nordic Blossom (T)	Li	505	9/3	11/13					
Nyanza	Ba	498	10/14						
Oak	Ba	509	7/2	8/29	11/15				
Ocean Priti	Pa	599	9/6						
Odranes	Ba	471	6/7	9/12					
Olympic Mentor	Gk	600	7/7	8/28	11/30				
Olympic Merit	Gk	600	9/9						
Olympic Miracle	Gk	600	4/13	6/7	8/6				
Omisalj	Mt	729	3/27	5/22	7/13	11/27			
Pantazis L	Gk	591	4/29	6/25					
Parkgracht	Du	349	6/11						
Peonia	Li	648	5/18	10/11					
Petka	Mt	729	4/1	5/28	9/10	11/19			
Phoenix M	Cy	581	11/16						
Polydefkis	Gk	621	8/2	10/18					
Pomorze Zachodnie	Po	592	5/17	9/2					
Pontokratis	Cy	590	4/26	11/2					
Pontoporos	Gk	581	7/6	11/23					
Praxitelis	Gk	621	9/10	11/16					
Pride of Donegal	Li	518	12/9						
Project Europa	NA	456	10/19						
Proof Trader (T)	No	318	11/8						
Punice	Li	648	6/26	8/16	10/26				
x Rantum (T)	Cy	346	9/24						
Razboieni	Ro	521	7/2						
Rhea	Gk	593	5/24	9/16	11/23				
Riomar	Cy	445	9/24						
Romo Maersk (T)	De	558	7/16	8/6	12/12				
Rong Jiang	Ch	463	11/20						
Rose Island	Pa	472	10/26						
Rubin Eagle	Ph	486	11/15						
Ruder Boskovic	Yu	599	9/23	11/18					
Sac Malaga	Pa	621	5/31	8/14					
Saskatchewan Pioneer	Ba	730	4/27	6/29	8/28	11/3			
Sea Daniel	Pa	581	5/19						
Seamonarch	Mt	640	8/9	10/17					
Seapearl II	Mt	581	4/12						
Sidsel Knutsen (T)	No	533	6/13	8/9	10/1	11/15			
Solta	Mt	622	9/16	11/9					
Soren Toubro	In	628	4/26	6/12	10/11				
South Islands	Cy	472	10/31						
Staalvang	No	251	7/29						
Staberg	No	600	4/21						
Steel Flower	Pa	730	6/7	8/12	11/2				
Stellamare	NA	289	5/14						
Stellanova	NA	327	4/29						

Vessel Name	Flag	LOA	1st	2nd	3rd	4th	5th	6th	7th
Stepan Razin	Ru	532	5/5						
Stevnsland	AB	290	9/17						
Stolt Alliance (T)	Pa	405	4/24	6/2	7/12	8/28	10/5	11/23	
Stolt Aspiration (T)	Pa	423	4/5	5/14	6/23	8/10	9/18	10/30	12/3
Stolt Taurus (T)	Li	405	11/28						
Stormy Annie	Pa	522	11/26						
Storon	Sw	470	6/2						
Sunny Blossom (T)	Ba	528	5/7						
Super Vision	Ph	400	5/18						
Thor I	Li	542	4/16	6/29	9/3	11/11			
Thorscape	Si	542	5/10	7/15	9/27	12/1			
Tim Buck	Ru	532	5/20						
Titan Scan	NA	405	8/31						
Trans Arctic (T)	No	383	5/8	6/12	7/17				
Trias	Gk	730	7/17	9/1	10/18				
Turid Knutsen (T)	No	533	4/7	5/19	7/13	9/8	10/22	12/8	
Turkay B	Tu	387	6/26						
Ulloa	Si	585	4/13	8/29	10/31				
Union	HK	585	7/14						
Utviken	Ba	621	4/14	6/6	8/15	9/28	11/21		
Uznadze (T)	Mt	496	12/16						
Varjakka	Fi	522	10/28						
Vasiliy Musinskiy	Ru	498	6/18						
Vekua (T)	Mt	496	6/14	7/31	9/21				
Viljandi	Es	458	5/18	6/24					
Vulcan	Cy	626	4/13	7/9	11/15				
Wana Naree	Th	576	7/11						
Winter Star	Cy	656	5/14	10/18	12/9				
Yick Hua	Pa	585	5/20						
Ziemia Chelminska	Po	591	5/5	7/1	9/14	11/20			
Ziemia Gnieznienska	Po	591	3/30	6/7	8/4	11/10			
Ziemia Suwalska	Po	591	4/4	7/8	10/2	11/28			
Ziemia Tarnowska	Po	591	4/22	7/22	10/21				
Ziemia Zamojska	Po	591	4/13	6/22	8/28	10/27			

Note: Name changes: Stellanova 4/29 became Gajah Borneo 12/8 and Kapitonas Gudín 4/25 and 7/1 became Kapitonas Kaminskis 11/3

In addition to the overseas cargo vessel trips listed, the Caribbean Mercy (Pa), a hospital aid and supply ship, entered the Lakes on 5/11 and made tour calls at a number of ports before departing about 9/20.

Prepared by: Albert G. Ballert  
Great Lakes Commission  
400 Fourth St. Ann Arbor, 48103



## SEAWAY COMMERCIAL VESSEL TRAFFIC 1983-1995

## Upbound/Westbound Vessel Traffic

Year	Total	Inland				Ocean			Other
		Total	Ore	In Ballast		Total	In Ballast	Steel	
1995	1228	787	428	218	48	437	69	234	3
1994	1252	661	430	72	38	588	17	421	3
1993	1005	578	382	62	43	427	19	236	0
1992	1083	681	346	172	40	399	82	143	3
1991	1275	843	331	307	92	429	142	126	3
1990	1207	766	455	90	77	437	90	178	4
1989	1215	680	446	70	61	533	125	191	2
1988	1394	808	422	190	57	574	62	269	12
1987	1408	823	373	251	51	572	94	237	13
1986	1468	791	314	296	74	663	161	243	14
1985	1381	788	342	263	101	581	129	227	12
1984	1712	1008	457	350	96	703	191	296	1
1983	1808	1122	421	473	127	679	263	204	5