

GLOSSARY

Cargos Carried On The Great Lakes

Cement: a building material made by grinding limestone and clay to a fine powder that can be mixed with water and poured to set as a solid mass or used as an ingredient in making mortar or concrete.

The cement recorded in this report is produced in Michigan and Ontario and is carried by U.S.- and Canadian-Flag Lakers designed to discharge the powder-fine cargo. Cement generally moves in quantities of 8,000 – 15,000 net tons per trip and is often a split cargo (i.e., the cargo is discharged at two ports). The quantities reflect the storage capacity of receiving silos..

Coal: a black, combustible mineral. **Steam coal** is used primarily as fuel in steam-electric power generation. **Metallurgical coal** is used to make coke and is often referred to as **coking coal**. For purposes of this report, **eastern coal** is mined in Kentucky, Ohio, Pennsylvania and West Virginia. **Western coal** is mined in Colorado, Montana, Utah, Wyoming and Manitoba (Canada). Shipments of western coal have grown steadily on the Great Lakes since the mid-1970s, as its sulfur content is lower than that of eastern coal. However, as utilities have increased their reliance on cleaner-burning western coal, shipments of eastern coal have declined.

The coal recorded in this report is carried by U.S.- and Canadian-Flag Lakers. Individual cargos range from 9,000 net tons for customers located in confined harbors or rivers up to nearly 70,000 net tons for major riparian power plants. The top loads, all carried in U.S.-Flag 1,000-foot-long Lakers, represent enough coal to produce the electricity needed to power a metropolitan area the size of Greater Detroit for 1 day.

Grain: a small, hard seed or seedlike fruit; especially that of any cereal plant. Wheat, soybeans and corn are the primary grains moved on the Great Lakes. The vast majority of grain recorded in this report is destined for export to Europe. As no U.S.-Flag Laker is certificated for ocean service (plus many are too big to transit the St. Lawrence Seaway), participation in the trade is limited primarily to deliveries to a grain mill in Buffalo, New York. Canadian-Flag Lakers carry grain to transshipment facilities in the St. Lawrence River for reloading into ocean-going vessels too large to transit the Seaway. Seaway-sized ocean-going vessels also carry grain directly to Europe.

Iron ore: minerals from which metallic iron can be extracted. The iron itself is usually found in the form of magnetite or hematite. However, as much of the pure magnetite and hematite ore reserves have been depleted, modern iron mines rely on aggregate ores, such as taconite, which must be processed to remove non-iron-bearing components and pelletized prior to smelting. Most iron ore is used in the production of steel. Generally speaking, it takes 1.5 net tons of iron ore to make one ton of raw steel.

The iron ore recorded in this report is mined in Minnesota, Michigan and Quebec and moves in U.S.- and Canadian-Flag Lakers. The quantities depend on the location of the receiving steel mill or discharge port. Customers served by 1,000-foot-long U.S.-Flag Lakers receive as much as 70,000 net tons each trip when water levels permit loaded drafts of 28 feet or more. That cargo represents enough iron ore to keep a major steel mill in operation for nearly 5 days.

Limestone: a common sedimentary rock consisting mostly of calcium carbonate. Also referred to as **Aggregate** and **Fluxstone**. **Aggregate** is used as a building stone and in the manufacturing of

lime, carbon dioxide, and cement. **Fluxstone** is used as a purifying agent in the steelmaking process. Fluxstone is either added directly to the blast furnace or combined with iron ore during the pelletizing process to produce "fluxed pellets."

The limestone recorded in this report is quarried in Michigan, Ohio and Ontario. Limestone moves in U.S.- and Canadian-Flag Lakers in quantities that range from 5,000 to 35,000 net tons. Again, the location of the end user generally dictates the quantity. Modern life consumes vast quantities of limestone. For example, one mile of four-lane highway requires 85,000 net tons of aggregate as the base. The production of one ton of raw steel requires anywhere from 200 to 400 pounds of fluxstone.

Potash: any of several compounds containing potassium, used chiefly in fertilizers. The potash moving on the Great Lakes originates in the Canadian province of Saskatchewan, is loaded at Thunder Bay, Ontario, and moves almost exclusively in Canadian-Flag Lakers.

Salt: a white crystalline form of sodium chloride. The salt recorded in this report is mined in Michigan, Ohio and Ontario. Among salt's more than 14,000 known uses are deicing and seasoning and preserving food. Salt moves in both U.S.- and Canadian-Flag Lakers in quantities that range from 12,000 to 25,000 net tons. On average, a 12,000-ton salt cargo will deice approximately 20 miles of two-lane road.

Sand: a class of materials called granular matter. Sand is a naturally occurring, finely divided rock, comprising particles or granules ranging in size from 0.063 to 2 mm. Sand is a major ingredient of mortar, plaster, concrete, and asphalt. For proprietary reasons, LCA only tracks sand cargos moved by U.S.-Flag Lakers. The trade is limited in scope, averaging about 400,000 net tons a year.

Major End Products

Coke: a solid carbonaceous residue derived from low-sulfur coal from which the volatile constituents are driven off by baking in an oven at temperatures as high as 2,000 °F (1,000 °C) so the fixed carbon and residual ash are fused together. Coke is used as a fuel and as a reducing agent in smelting iron ore in a blast furnace. The production of one ton of raw steel requires nearly one ton of coke.

Concrete: a mixture of aggregates and cement. The cement and water bind the aggregate into a solid mass. Concrete is the world's most widely-used material and is the basic building block for basements, driveways, sidewalks....

Steel: an alloy of iron with small amounts of carbon, widely used in construction and armament. Mechanical properties can vary over a wide range.

Cargo Measurements

Bushel: a unit of volume measure used as dry measure of grains and produce. A bushel has a different weight, depending on the type of grain. For example, a bushel of wheat weighs 60 pounds, whereas a bushel of corn weighs 56 pounds.

Gross ton: 2,240 pounds of a given material. This measure is used mostly for iron ore by mining companies. Also referred to as a long ton. To convert a gross ton to a net ton (see next entry), multiply the gross ton total by 1.12.

Net ton: 2,000 pounds of a given material. Also referred to as a short ton. To convert a net ton to a gross ton (see previous entry), multiply the net ton by .89286.

Great Lakes Waterborne Commerce

Ice season: spans from December 16 to the following April 15. Used to illustrate the amount of cargo that moves on the Great Lakes during periods of ice cover.

Navigation season: period corresponding to the first sailing and final lay-up for dry-bulk cargo vessels, generally early March to late January. Formerly the basis for LCA's annual statistics. Since 2000, LCA has reported statistics based on a calendar year. The U.S. Army Corps of Engineers uses a March 25-January 15 navigation season for its statistics on cargo movement through the Soo Locks.

Soo Locks: Federally-built and -maintained locks at Sault Ste. Marie, Michigan that raise and lower vessels 21 feet to permit passage between Lake Superior and the lower four Great Lakes. The first lock at Sault Ste. Marie was built in 1855 and dramatically spurred the development of Great Lakes shipping. There are currently four locks at the Soo:

Lock	Year Opened	Dimensions (Length/width/depth)	Status
Poe	1969	1,200' x 110' x 32'	In operation
MacArthur	1943	800' x 80' x 31'	In operation
Davis	1918	1,350' x 80' x 23.1'	Used occasionally
Sabin	1914	1,350' x 80' x 23.1'	Inactive

Transshipment: a cargo that is delivered to one port for reloading into another vessel for delivery to its final destination. The most significant transshipment recorded in this report is iron ore in U.S.-Flag Lakers. The iron ore is initially delivered to Cleveland Bulk Terminals in Cleveland, Ohio, which is located on the city's lakefront. The iron ore is then reloaded into U.S.-Flag Lakers sized to navigate the Cuyahoga River in Cleveland, Ohio.