

PRELIMINARY ASSESSMENT FOR MAINTENANCE
DREDGING SEARSPORT HARBOR FEDERAL
NAVIGATION PROJECT - SEARSPORT, MAINE

APPENDIX E
CHANNEL UTILIZATION ASSESSMENT

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SEARSPORT FNP UTILIZATION ANALYSIS

July 2022

Introduction

The purpose of this report is to determine whether maintenance dredging of the authorized Federal Navigation Project (FNP) in Searsport Harbor is economically warranted, and whether existing usage of the harbor supports maintenance of the project to authorized depths. Pursuant to ER 1105-2-100, the analysis is based on past and present use of the navigation channel, total cargo movements, vessel trips and cargo volumes by incremental foot of sailing draft, and a channel section utilization analysis. The channel utilization analysis shows the use of the channel by increment of channel depth over the most recent five years for which detailed vessel data was available and examines the use of each foot of channel depth.

Data Sources

Detailed data for vessels calling Searsport Harbor was collected from the Corps of Engineers Waterborne Commerce Statistics Center (WCSC). Detailed data regarding vessel cargo and vessel trips by sailing draft were obtained for the years 2016 through 2020, the most recent five years for which detailed data was available in the Channel Portfolio Tool. Additional information regarding harbor usage was obtained from city officials including the Searsport Harbormaster, the Searsport Port Authority, and the Searsport Department of Planning and Economic Development, as well as from terminal operators.

Federal Project

Searsport is located in Waldo County and is about 27 miles south of Bangor and 91 miles northeast of Portland, Maine. Searsport is located mid-way along the coast of Maine on Penobscot Bay. The deep draft port at Searsport Harbor is known as Mack Point. The existing Searsport FNP at Mack Point, authorized by Congress in 1962, includes a channel that is 35 feet deep (mean lower low water) and 500 feet wide. The channel extends from deep water in Penobscot Bay to Mack Point, for a total length of 3,500 feet, and widens to 1,500 feet off the terminals to provide a turning basin, where there are two piers. Figure 1 below shows the project area and features.

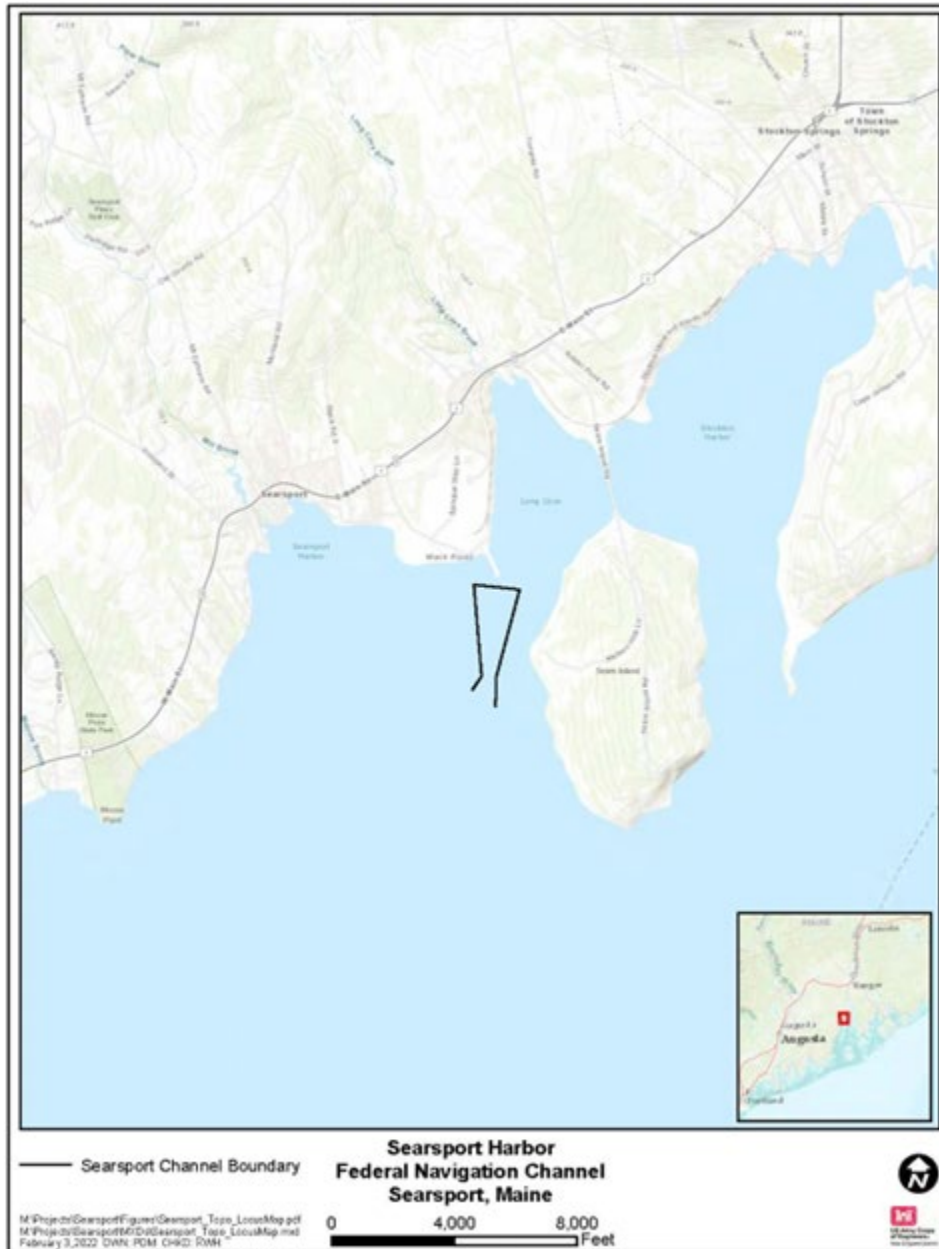


Figure 1: Searsport Harbor Federal Navigation Project

Description of Study Area

Searsport Harbor contains two piers; the State of Maine’s public general purpose cargo pier and the Sprague Energy liquid pier, both of which contain two berths, used by Sprague Energy and Irving Oil Company. Searsport Harbor is used primarily for the receipt of petroleum products, salt, and the export of lumber, paper, metals, and potatoes. Oil and gasoline are significant imports at the port, generally making up nearly 60 percent of the total tonnages. Of the bulk and break-bulk commodities, the most common imports are road salt, wood pulp, clay, chemicals, and gypsum. Commercial activity at Searsport Terminal currently contributes more than \$50 million in direct economic benefit to the mid-coast region annually. The railroad which

terminates in Searsport was recently purchased by the Canadian Pacific Railroad, a Class 1 rail service provider with coast-to-coast service in North America. This acquisition marks the first time in the history of Port of Searsport that it has been directly connected with a nation-wide carrier with single-carrier access to the Midwest and west coast. As fuel costs rise and efforts to reduce transportation emissions gain greater importance, the benefits of rail to sea shipping are becoming more apparent. Canadian Pacific has made Searsport part of its Atlantic Gateway initiative. Dredging Searsport's Federal Navigation Channel is necessary to maintain its role in Maine's marine and rail transportation infrastructure.

Current Harbor Conditions

The northwest corner of the Searsport FNP channel has shoaled to depths of less than approximately -32 feet MLLW and maintenance dredging is needed to restore the channel to the authorized -35 feet MLLW depth. The tide range of ~10 feet (mean high water to mean low water), combined with berths dredged significantly deeper than the channel, allow larger vessels to use the port than would normally be possible. Larger vessels are able to enter the harbor at mid to high tide, unload their cargo, and lay over at low tide at the deepened berths. Currently larger vessels experience tidal delays, as they wait until mid-tide or higher to enter or exit the harbor. This results in transportation inefficiencies and shippers are less likely to take advantage of the lower per ton transportation cost of the deeper draft vessels. Shoaled conditions in the harbor have decreased the efficiency of harbor operations, and continued shoaling and lack of maintenance will impact the level of commerce in the harbor.

The harbor has not been dredged since the initial improvement dredging in 1964. Efforts to initiate maintenance dredging began in recent years after efforts to initiate improvement dredging in the mid-2000s, and again in 2015, were abandoned due to significant opposition from local special interest groups.

Waterborne Commerce

Total volumes have remained steady in Searsport Harbor in recent years. Shipments of Manufactured Machinery at Searsport have declined in recent years. However, shipments of oil, gasoline, petroleum pitch and asphalt, other chemical products have either increased or stayed largely constant. Table 2 below shows the total commodity tonnage through Searsport Harbor from 2003 to 2020, the most recent years for which data is available.

Table 1 Searsport Harbor Total Waterborne Commerce 2003-2019 (short tons)

	Total Commodity Volume (short tons)
2003	1,300,000
2004	1,800,000
2005	2,000,000
2006	2,000,000
2007	1,800,000
2008	1,900,000
2009	1,500,000
2010	2,000,000
2011	1,700,000
2012	1,700,000
2013	1,500,000
2014	1,800,000
2015	1,600,000
2016	1,400,000
2017	1,400,000
2018	1,600,000
2019	1,400,000
2020	1,700,000

Source: Waterborne Commerce Statistics Center, USACE, 2021

Table 3 below displays a breakdown of Searsport tonnage by commodity for the years 2015-2019 (Latest available data from the Waterborne Commerce Statistics Center).

Table 2 Searsport Harbor Commodity Composition, 2015 - 2019

Year	Commodity Volume (Short Tons)					
	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	Gasoline, Jet Fuel, Kerosine	Distillate, Residual and Other Fuel Oils; Lube Oil and Greases	Sulphur (Dry), Clay & Salt	Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	Other
2015	-	308,199	554,259	105,338	114,195	465,524
2016	48,436	322,115	307,416	281,895	54,502	320,627
2017	-	320,244	422,408	449,199	77,234	172,270
2018	55,899	352,197	478,886	416,768	101,125	125,391
2019	-	317,307	428,944	391,600	77,015	214,719
Total	104,335	1,620,062	2,191,913	1,644,800	424,071	1,298,531

Source: Waterborne Commerce Statistics Center, USACE, 2021

Figure 2 below displays the volume of tonnage moved through the Searsport Harbor system from 2016-2020, by vessel draft in feet. It is important to note that Slag shipments have only occurred in 2020. Based on the shoaling that currently occurs in the Searsport Main Channel, most tonnage arrives at 41 feet or less.

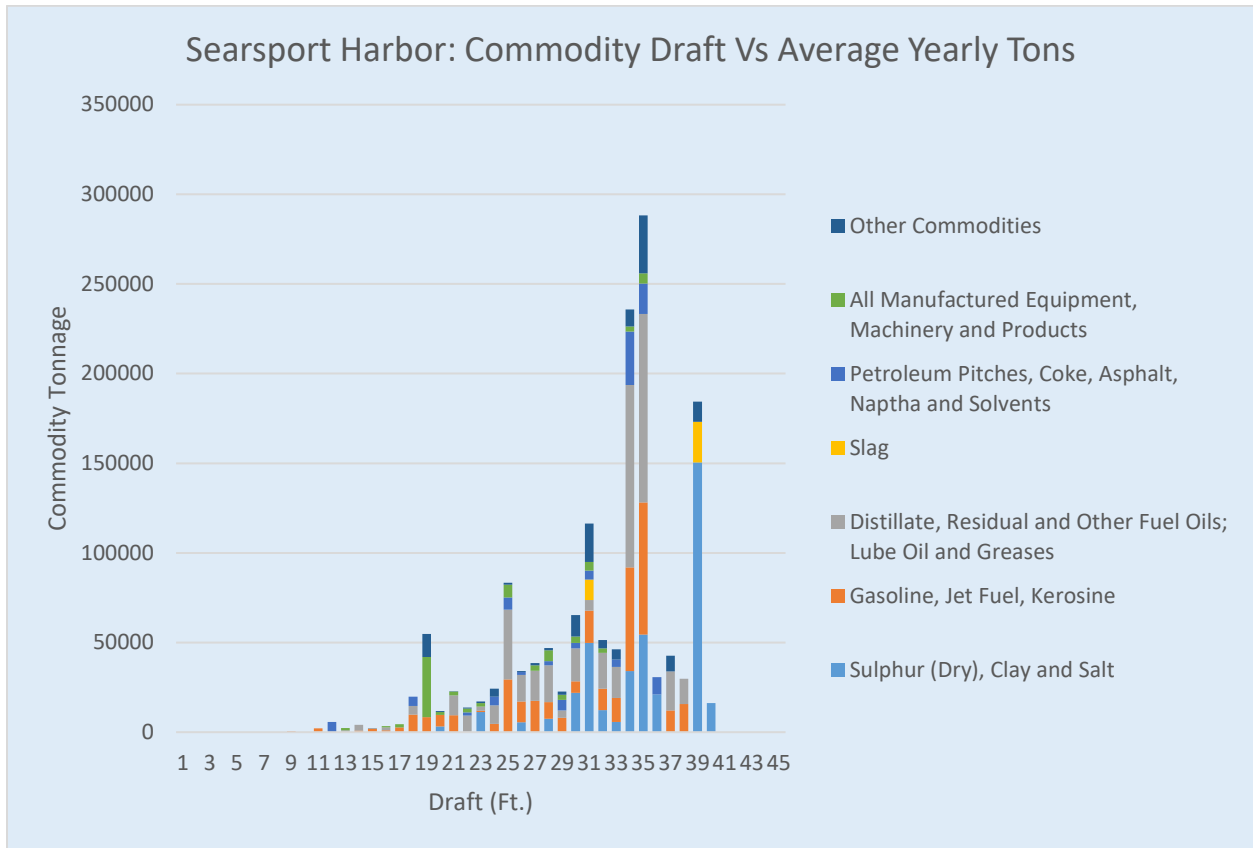


Figure 2: Searsport Harbor, all Reaches, Commodity Tonnage by Draft, 2016-2020

Figure Source: USACE Channel Portfolio Tool, data only available through 2020

Channel Utilization Analysis

The purpose of the channel utilization analysis is to provide an assessment of the extent to which the navigations channels in Searsport Harbor are used for commercial shipping. Because the main criterion for continued dredging is channel usage and the extent to which each foot of depth is being used to ship cargo, the analysis can be used to assess whether maintenance dredging to a certain depth is warranted.

The data described previously in this report form the basis for the channel utilization analysis. The analysis period consists of the years 2016 – 2020, the most recent years for which data were available. The utilization analysis is performed for each separable reach of channel in the harbor and displays the type and volume of tonnage moved at each increment of sailing draft. Searsport Harbor consists of only one reach.

The data shown in the channel utilization graphs show the extent and efficiency of channel utilization for each channel reach. If a channel has higher tonnage values at deeper drafts, then the channel is being used more intensively, and therefore more efficiently, at deeper depths.

The channel utilization analysis for the Searsport Channel is shown in Figure 3 below. The data show significant utilization of the channel to 40 feet of channel depth. The analysis also shows the increasing efficiency of cargo movements at deeper channel depths, as the cargo tons increase past 18 feet of draft. Considering underkeel clearance requirements which are typically 10% of vessel draft, the data show that maintenance dredging to its authorized depth of 35 feet is economically warranted.

The economics of waterborne freight transportation show that shippers can achieve economies of scale by loading existing vessels more efficiently, which can bring more freight with fewer vessel trips. The channel utilization analysis, showing significant usage of the channels to 40 feet, and adding underkeel clearance, supports dredging to 44 feet. This is deeper than the authorized channel depth of 35 feet, so dredging to the full authorized depth of 35 feet would allow for less restricted access based on the current fleet of vessels. Currently, vessels requiring 40-foot depths use the tide and the berth basins, which is dredged to 40 feet, to utilize the channel past its authorized depth of 35 feet.

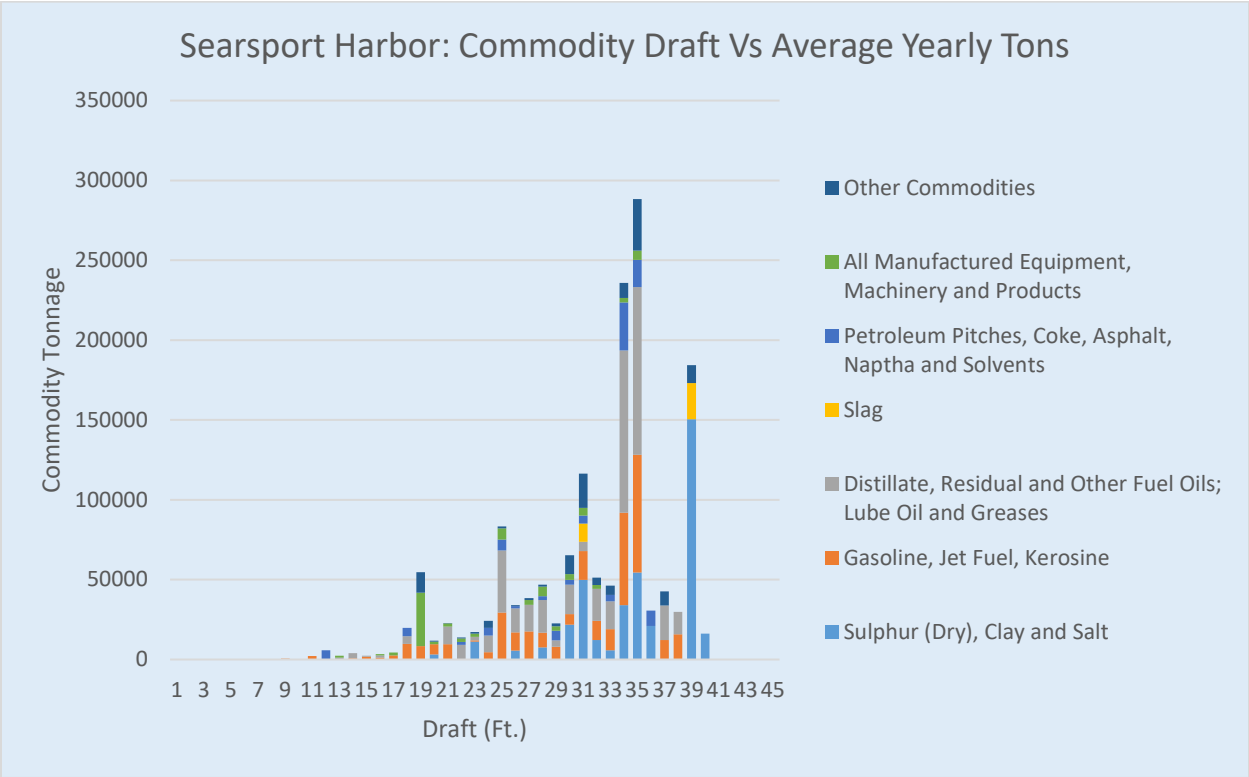


Figure 3: Searsport Harbor Reach, Commodity Tonnage by Draft

Source: USACE Channel Portfolio Tool, data available through 2020