



Saint Marys River Ice Islands Replacement Study

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

The Soo Project Office (Detroit District) requested support from CRREL related to the reconstruction of ice islands along the St. Marys River downstream of the Soo Locks (Figure 1). The 8 islands provide anchorage points for a string of ice booms and this system promotes the early growth of a stable ice cover to the north and east of the islands which limits the passage of ice into the navigation channel from that direction. The islands directly protect the Sugar Island Ferry passage which is immediately downstream. The presence of the islands and the ice booms also generally improves icebreaking and navigation conditions between Soo Harbor and Lake Nicolet. The existing ice islands have degraded since they were initially constructed in the late 1990s. In general, it appears that the islands have slumped towards the navigation channel based on the displaced angles of the H-pile anchor points.

On 13 June 2023, engineers from CRREL visited the St. Marys River and were escorted to the ice islands by District staff via boat. We discussed the operational procedures around setting the booms, the channel maintenance and modification activities that may have affected the islands and the ice behavior in the vicinity of the islands.

This visit allowed CRREL engineers to better understand current conditions and to provide input as to the key factors that should be considered in the design to reconstruct the islands.

Period of Performance:

The reconnaissance visit was conducted on 13 June 2023.

Benefits of the Response to the USACE Dredging/Navigation Program:

The existing ice islands and associated ice booms have helped protect the navigability of the St. Marys River between Soo Harbor and Lake Nicolet. Due to the importance of the ice islands in protecting the ferry passage and facilitating the maintenance of ice in the navigation channel, the Soo Project Office would like to ensure that similar protection from ice is maintained into the future. Due to the apparent displacement of the existing islands, their long-term reliability is uncertain and they will need to be replaced to ensure long-term protection. CRREL was able to provide subject matter expertise related to ice processes to help guide the District's approach to reconstructing the islands.

Deliverable:

The deliverable of this effort was a memorandum documenting the current conditions, potential alternatives for the reconstruction and the outline of the recommended approach for a study used to inform the eventual reconstruction of the islands.



Figure 1. Ice island with displaced H-pile anchor. Ice booms in the background.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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