Engineering Design Challenge: Beneficial Use of Dredged Material

Introduction

The U.S. Army Corps of Engineers (USACE) dredging program removes over 200 million cubic yards of dredged material annually from the bottom of federally-constructed and maintained navigation channels to maintain safe passage for vessels in navigation channels every year. Currently, most dredged materials are disposed of at permitted dredged material placement areas, either in-water, near-shore, or upland. A small amount of dredged material contains constituents at sufficient high concentrations to require disposal in a permitted solid or hazardous waste facility. Some dredged materials are repurposed through uses such as general construction, reclaiming lost farm land, and restoring a variety of aquatic habitats from degraded marshes to subsiding mud-flats. Since dredged materials are saturated, they contain a lot of water; the dredging process may add more. Consequently, dredged materials must be dewatered in many cases in order to be suitable for reuse. The USACE believes that the volume of dredged material that can be repurposed (avoiding disposal) can and should increase substantially from its current rate of 20 to 40% to 80 to 90%.

Design Challenge

How can Engineers use existing, new, and emerging technologies to increase the beneficial use for dredged materials? Students will use engineering design and analytical skills to design and evaluate innovative, productive, sustainable, and cost effective Beneficial Use of Dredged Material options. (improve or enhance existing solutions).

In this project, you will develop a conceptual design to use large volumes of dredged material using your engineering design skills. You will make a prediction for dredging and its beneficial uses for the next five years. You will present your proposed design to the leadership team of the USACE.