Sea-floor topography and surficial character in the study area vary at scales of several meters and less. For example, Inner and Outer Harbor are primarily composed of fine-grained sediments, such as fine sand or mud, which are occasionally disturbed by the introduction of low-relief mud mounds. These features are typically 1-5 m in height and can form as the result of local sedimentation processes or the movement of sediment by waves and currents. The acoustic backscatter intensity, which is a measure of the amount of energy reflected back to the sensor, is primarily based on the composition and texture of sediments, but can also be influenced by other factors such as the presence of biogenic structures or anthropogenic activities. Sonar images reveal the general distribution of the acoustic backscatter, which is often associated with the sediment composition and the presence of biogenic structures.

The bathymetry and sidescan-sonar data show natural features and sea floor modification from anthropogenic activities. Dredging and other activities are common in the Approaches to Boston Harbor, particularly in the areas near the outer Boston Harbor Islands and east of Nantasket Beach. The bathymetry and sidescan-sonar data reveal the presence of numerous deep channels, which are typically associated with the movement of ships and the dredging of the sea floor. Multibeam echosounder data reveal the presence of several large ledges that are bounded to the north by the Graves and to the south by Nantasket Roads. These ledges are approximately 15 km² in area, with 4-7 m of local relief. They are thought to be the result of the movement of sediment by waves and currents, which can create a range of features, including mounds, ridges, and depressions.

The sidescan sonar data were mosaicked using PCI Geomatics and exported as georeferenced TIFF image files. The single-beam echosounder data from survey H01991 were exported at a 5-meter grid interval. The multibeam surveys were performed using a General Submarine Echometer (GSSS) multibeam echosounder, which is capable of generating high-resolution bathymetric data. In general high backscatter corresponds to areas of smooth to detailed topography (sheet 2). The channels northeast of George's Island (multibeam echosounder) display smoothed topography due to wide-line spacing and interpolation. Multibeam echosounder data reveal the presence of numerous high backscatter targets in the Approaches, which are 4-6 m in length and less than a meter in height. These targets are thought to be the result of the movement of sediment by waves and currents, which can create a range of features, including mounds, ridges, and depressions.

The backscatter intensity and sample locations, sea floor slope, and an interpretive map of sea floor environments are displayed on sheets 3 and 4. The backscatter intensity is a relative measure of the amount of energy reflected back to the sensor, and is often associated with the sediment composition and the presence of biogenic structures. Bottom photos and video in these areas show the sea floor covered by gravel, cobbles and boulders, which are thought to be the result of the movement of sediment by waves and currents. The backscatter intensity is also a measure of the amount of energy reflected back to the sensor, and is often associated with the sediment composition and the presence of biogenic structures. Bottom photos and video in these areas show the sea floor covered by gravel, cobbles and boulders, which are thought to be the result of the movement of sediment by waves and currents. The backscatter intensity is also a measure of the amount of energy reflected back to the sensor, and is often associated with the sediment composition and the presence of biogenic structures. Bottom photos and video in these areas show the sea floor covered by gravel, cobbles and boulders, which are thought to be the result of the movement of sediment by waves and currents.

The bathymetry and surficial character of the sea floor within the Inner Harbor reflect a long history of dredging in the area. The bathymetry and surficial character of the sea floor within the Inner Harbor reflect a long history of dredging in the area. The bathymetry and surficial character of the sea floor within the Inner Harbor reflect a long history of dredging in the area.