



# Fact Sheet

US Army Corps of Engineers  
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## Periodic Inspections of Coastal Structures

**Purpose:** To periodically monitor selected coastal navigation structures to gain an understanding of the long-term structural response of unique structures to their environment.

**Background:** Many coastal navigation structures have been intensely monitored for a finite length of time under authority and funding of the Monitoring Completed Navigation Projects (MCNP) program of Headquarters, U.S. Army Corps of Engineers. After the completion of the MCNP work unit, most regimented monitoring efforts are abandoned. Continued periodic, low-level monitoring of these structures, and others having unique design features, on a periodic basis could add to the Corps' understanding of the long-term response of a particular structural design to its environment. These periodic data sets can be used to improve understanding in the design, construction, and maintenance of both existing and future structural projects, and will help avoid repeating past designs that have failed and/or resulted in high maintenance costs. Relatively low-cost remote sensing tools and techniques, with limited ground truthing surveys, are the primary inspection tools used in the periodic monitoring efforts. Most periodic inspections consist of capturing above-water conditions of the structure at periodic intervals using high-resolution aerial photography. Structural changes (primarily armor unit movement) are quantified through photogrammetric techniques.



**Facts:** As part of the MCNP program, periodic inspections have been conducted for many coastal navigation structures. Included are breakwaters at St. Paul Harbor, AK; Nawiliwili, Laupahoe, and Kahului, HI; Ofu Harbor, American Samoa; Crescent City Harbor, CA; Burns Harbor, IN; and Cleveland Harbor, OH; and jetties at Humboldt Bay, CA, and Manasquan Inlet, NJ. When a coastal structure is photographed at low tide, an accurate permanent record of all visible armor units is obtained. Through the use of stereoscopic, photogrammetric instruments in conjunction with photographs, details of structure geometry can be defined at a point in time. By direct comparison of photographs taken at different times, as well as the photogrammetric data resolved from each set of photographs, geometric changes (i.e., armor unit movement and/or breakage) on the structure can be defined as a function of time. Thus, periodic inspections of the structures capture permanent data that can be compared and analyzed to determine if structure changes are occurring that indicate possible failure modes and the need to monitor the structure(s) more closely. Normally, base conditions are established and documented in the initial effort, and the site is reinspected periodically to obtain long-term structural performance data.

**Points of Contact:** For additional information, please contact Mr. Robert Bottin at 601-634-3827 ([ray.r.bottin@erdc.usace.army.mil](mailto:ray.r.bottin@erdc.usace.army.mil)) or Mr. Dennis Markle at 601-634-3680 ([dennis.g.markle@erdc.usace.army.mil](mailto:dennis.g.markle@erdc.usace.army.mil)).