Los Angeles Breakwater Repair Project- Acoustic Signatures Generated due to Boulder Placement

Response Summary:

On 25Feb2019 a team of researchers from the U.S. Army Corps of Engineers Los Angeles District and Engineer Research and Development Center traveled to the Breakwater Repair Project at the Port of Long Beach, CA to collect representative sound files. The sound files were collected based on guidance documents set in NMFS 2011 a/b and NOAA OPR-55. The sound files were analyzed to determine whether the anthropogenic noise exceeded the thresholds for underwater acoustic activities set by the National Oceanic and Atmospheric Administration. 27Feb2019 ambient sound files were collected at San Luis Obispo, CA near the breakwater to be used as a baseline measurement for proposed repair work.

Underwater acoustics

The data files selected represented the most intense activities of the crane. The crane was "resetting" the rocks that were being placed by actively picking up individual rocks on the breakwater and quickly placing them back on the structure. This created a sound file with the largest signature due to the crane being fully throttled to lift the rocks in quick succession (<30 seconds). A 60 second sub-file was pulled from each recording device and used as the dataset. The recorded files were collected at the same time. The snap logger was deployed at 25% depth and the LS-1 logger was deployed at 75% depth from surface. Data were first filtered in Audacity to remove clicks/ distortion in the .wav file using high pass/ low pass filters. Data was then checked for clipping and anomalies that were not representative of the signal generated by the rock placement event. The data was then analyzed for individual events (impulse- i.e. rock placement) or broadband acoustic. The noise generated by the crane masked the sound of the rock placement therefore broadband event calculations were used. Broad band acoustic noise measurements were made using the equations set by OPR-55. All python script is available upon request.

Period of Performance:

25 Feb 2019- Ongoing

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

The recording of the crane and rock placement help project managers determine if their construction event will exceed the acoustic threshold limits set by OPR-55 & OPR-58.

Deliverable:

A monitoring report was sent to the Los Angeles District on 29 May 2019.

Alan Katzenmeyer
ERDC Environmental Laboratory • Alan.W.Katzenmeyer@usace.army.mil