

Little Environments PLLC

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Subject: Ocean Dunes Temporary Near Shore Wave Telemetry Buoy Deployment (6 Pages)
rev2

To whom it may concern,

Please find here in the information of concern and description of activity for the deployment of a temporary wave monitoring buoy in proximity to the Ocean Dunes facility at the south end of Kure Beach. The Ocean Dunes HOA has engaged Little Environments PLLC to examine their coastline and make recommendations for better management, likely based on living shoreline principles. In order to be scientifically objective, I have recommended the deployment of Wave Droid Block III satellite enabled wave parameter monitoring buoy. Existing nearest buoy data in the remote vicinity of the area of Ocean Dunes are Station 41110(Masonboro Inlet ILM2) which is 12-15 miles to the North-Northeast and station 41159(Onslow Bay Outer) which is approximately 45 miles to the East-Northeast. The buoy placement location that is recommended is 1/2 mile N of the Ocean Dunes Location along the shore and 1500 to 2500 feet offshore in about 25-30' depth of water. The purpose of deploying this buoy in this location is to understand how the predominate (Anticipated mainly for the NE) and lesser predominate directional wave events carry over from these know monitored areas to this lesser monitored area. Understanding better how these waves impact manmade, man-managed, and natural structures and how currents predominate southward down Kure Beach will allow for better and quantitatively informed coastal decisions at the Ocean Dunes site. Information for the permit is provided as follows:

Cross Section of device in water Depths (Not to Scale)

Figure A below demonstrates how the buoy will be moored in 25-30' of water. In case of localized shoaling the base line will be reduced in length accordingly.

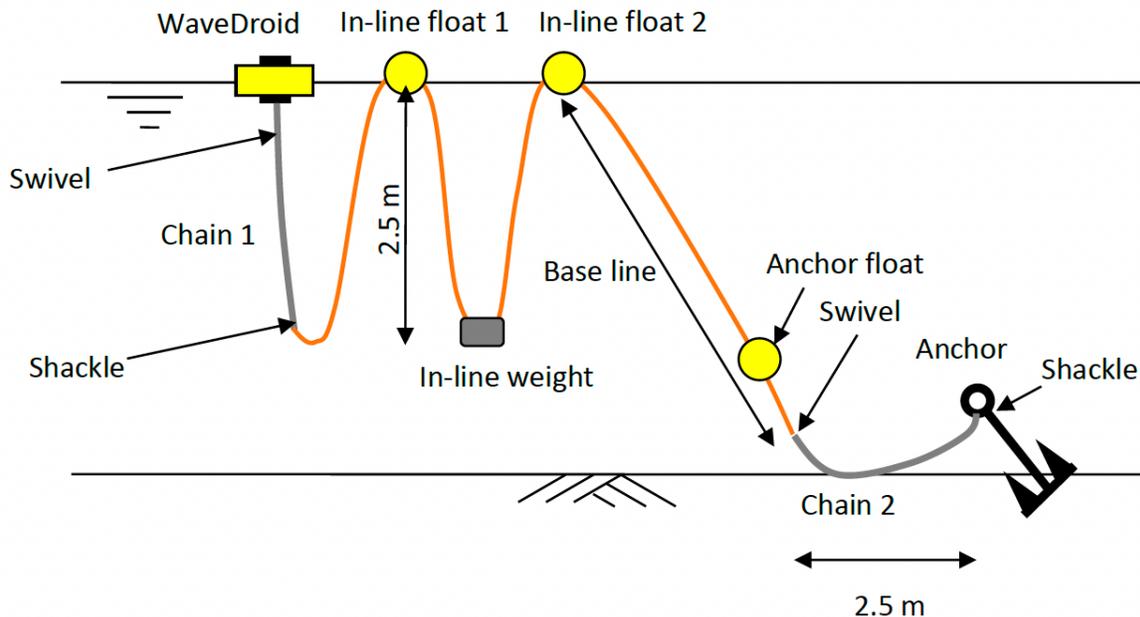


Figure A. Obscape Recommended and Little Environments Tested Mooring Method For application (From Obscape Buoy Block III Manual)

Location Relative to NHW/MHW

The buoy will float on the sure surface of the water. The buoy has a strobing intermittent white light at night.

Proposed Navigational Aids

The buoy color is bright yellow and has an intermittent strobing light on the top surface for visibility and identification at night. The buoy is similar in size to a crab pot float and the buoy is designed to take a vessel impact without damage to vessel.

No Impact of Activity to Coquina Rock

The buoy will be anchored with a 50'lb Danforth anchor on sandy bottom north of the coquina rock location by about ½ a mile. In extreme coastal events like hurricanes or aggressive nor-easters there is a chance the buoy could break loose. Due to its size and buoyancy the impact of the buoy to the coquina rock would have not more effect on the rock than the natural sand and water that already washes over and abrades/erodes it.

Deployment and Retrieval Methodology

Deployment will be carried out on a good weather day using a small craft vessel. Deployment includes attachment of the mooring to buoy, verification of telemetry setting and connection, accelerometer calibration at startup prior to leaving dock by a registered engineer. Deployment after reaching the location by boat and dual verifying both gps locations, is comprised of lowering the anchor, mooring, and buoy setup into the water by hand, ensuring 50lb anchor set. Back at the desk data will be monitored closely for the first two to three days for accuracy.

Retrieval is the reverse of the process in order. Note that the buoy has a GPS fence and real live to the second updates. Should the buoy rigging or anchor fail for some unforeseen reason and the buoy drift, anchored or uncoupled from anchor, outside the set GPS fence a notification will be sent to the managing engineer immediately to address/retrieve. The GPS monitor also provide real time tracking should the buoy break loose and float out to sea for retrieval.

Deployment Location

The target deployment location of the buoy will be at Lat 33deg. 59'13.56" N and Long 77deg. 54'8.67" west.

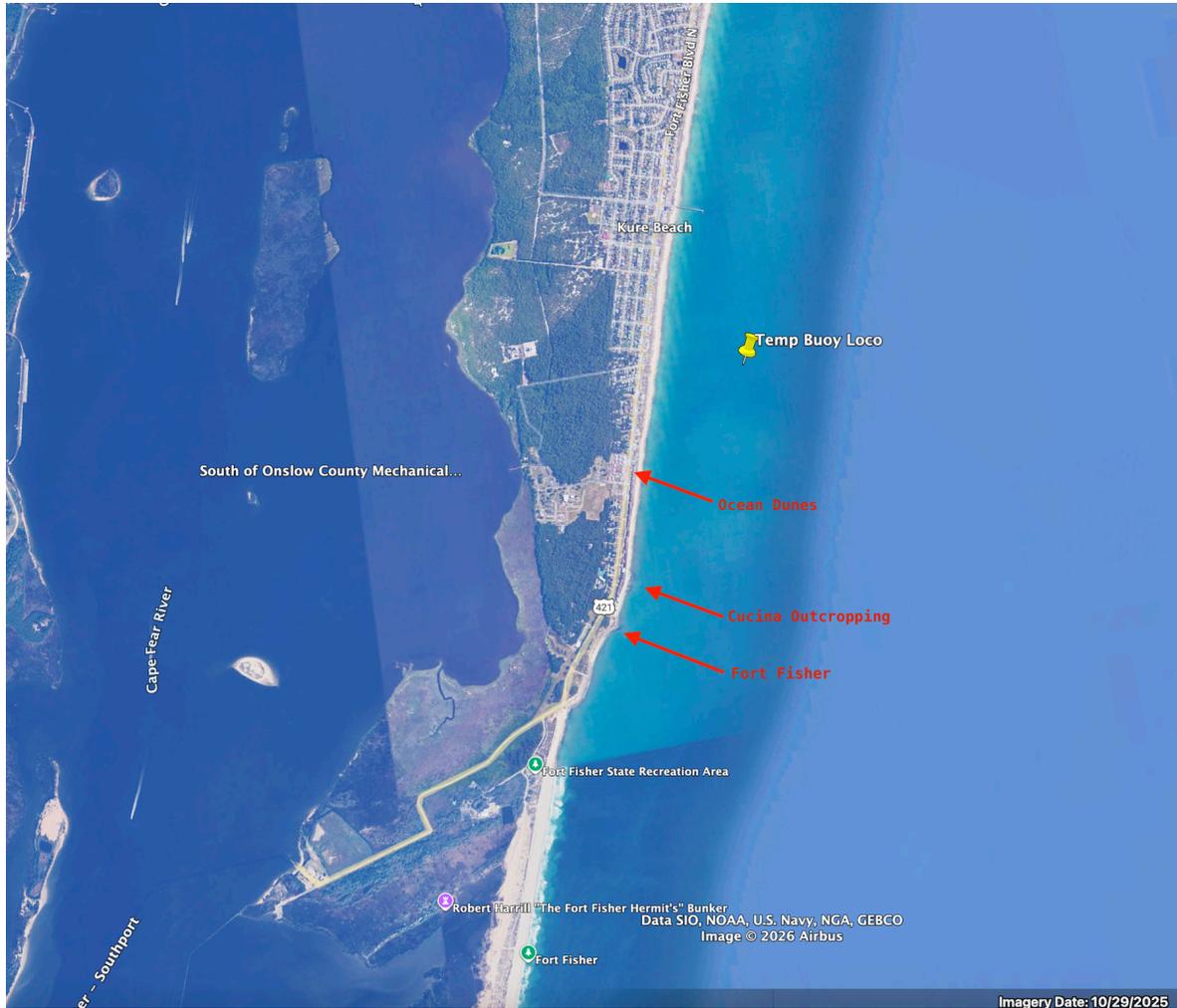


Figure B. Buoy Deployment Location Relative to Ocean Dunes/Kure Beach
(On top of Google Maps)

Timeline of Deployment

The timeline for deployment is between 1 month and 3 months ASAP this spring depending on wave and weather events. The objective is to have a few discernable wave events measured nearshore on the Wave Droid Buoy along with the existing offshore Masonboro and Onslow bay buoys such that we can understand the change in direction, speed and orientation from the offshore buoys to this near shore location and have at minimum a probabilistic correlation between the sets of data.

Stabilization Techniques to be Used by Buoy

The buoy is stabilized by its own geometry and center of gravity as designed and optimized by Obscape environmental monitoring.

Noteworthy Information for the product and monitoring/installation

Little Environments PLLC has worked with this product in the Caribbean atop rocky and sandy beaches and the insights the data it has provided to cost effectively attaining coastal solutions and being objective about coastal data to build trust in the community and on projects has been an asset. The Manual for the Buoy accompanies this document.



Figure C. WaveDroid Block III deployed by Little Environments PLLC on Recreational Beach

Deployment of the Buoy at this location is safe and needed. Notices of the deployment will be provided to the Town of Kure Beach, Lifeguards, and local police. Data will be openly shared. The wave droid manual accompanies this letter. Please do not hesitate to contact me with questions.

Best Regards,



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