In order to calculate the significant wave height by means of a visual estimation, a theodolite was placed in the concrete breakwater located at the north side of the north beach (see Figure 1). From this point the waves were surveyed by looking at a point located in a detached concrete jetty, located further north (Figure 1). The distance between these 2 points was approximately 190 m.

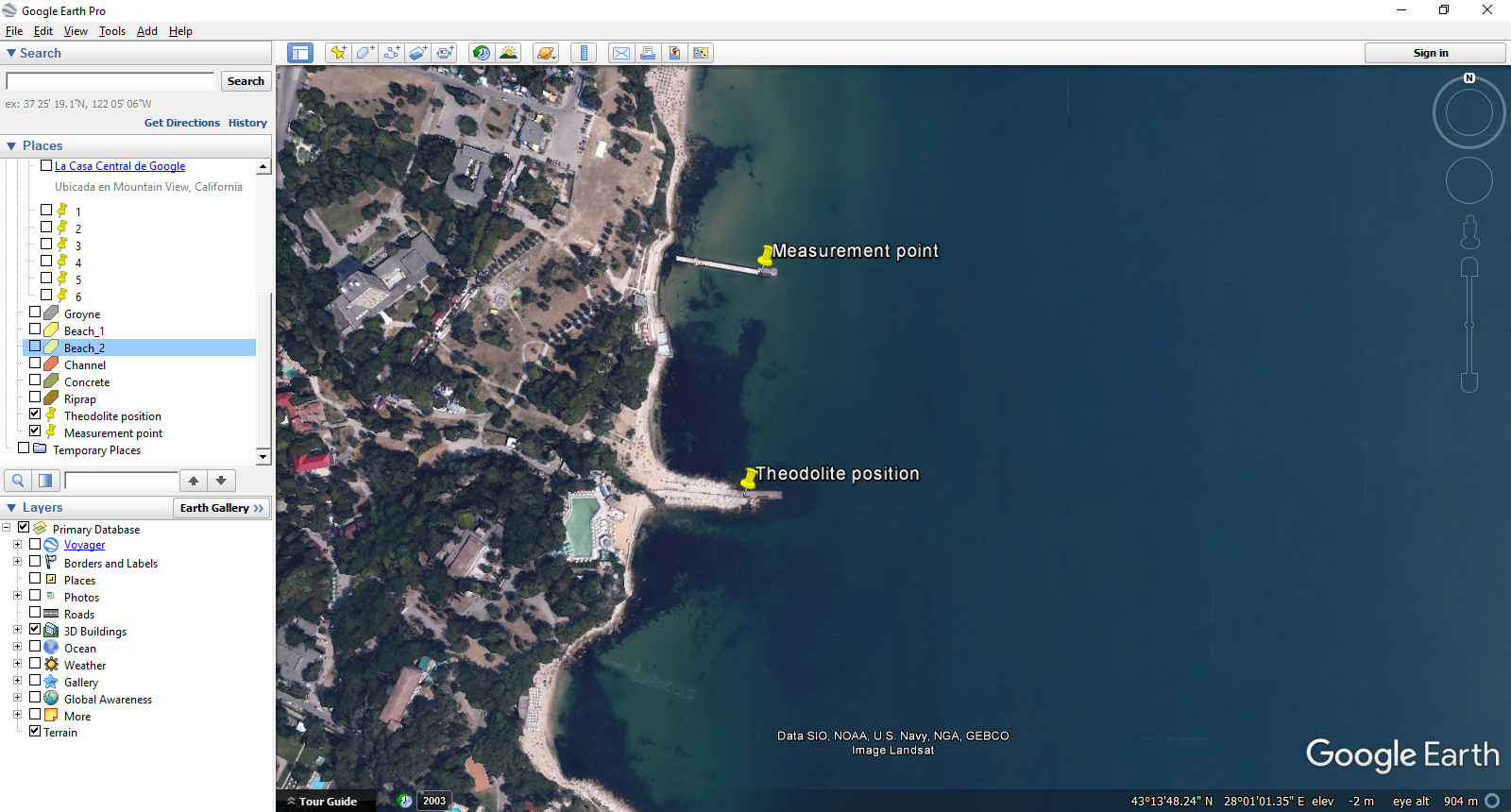


Figure 1: Significant wave height, visual estimation location.

The waves were measured for roughly 2 hours, and the wave height was defined as the distance between a crest and its following trough. This distance or height was defined in “*units”* (eg. 1 unit, or 0.7 units), being one unit the distance between a steel bolt and the bottom of the concrete slab of the jetty. This is sketched in Figure 2 (a picture was taken but due to the distance it was impossible to see the unit). To transform this *unit* into a real measurement, some scale was needed. For this purpose, a seagull was used, as was conveniently standing on top of the concrete slab. It was estimated that 1 unit equals approximately 4 seagulls, as depicted in Figure 2.

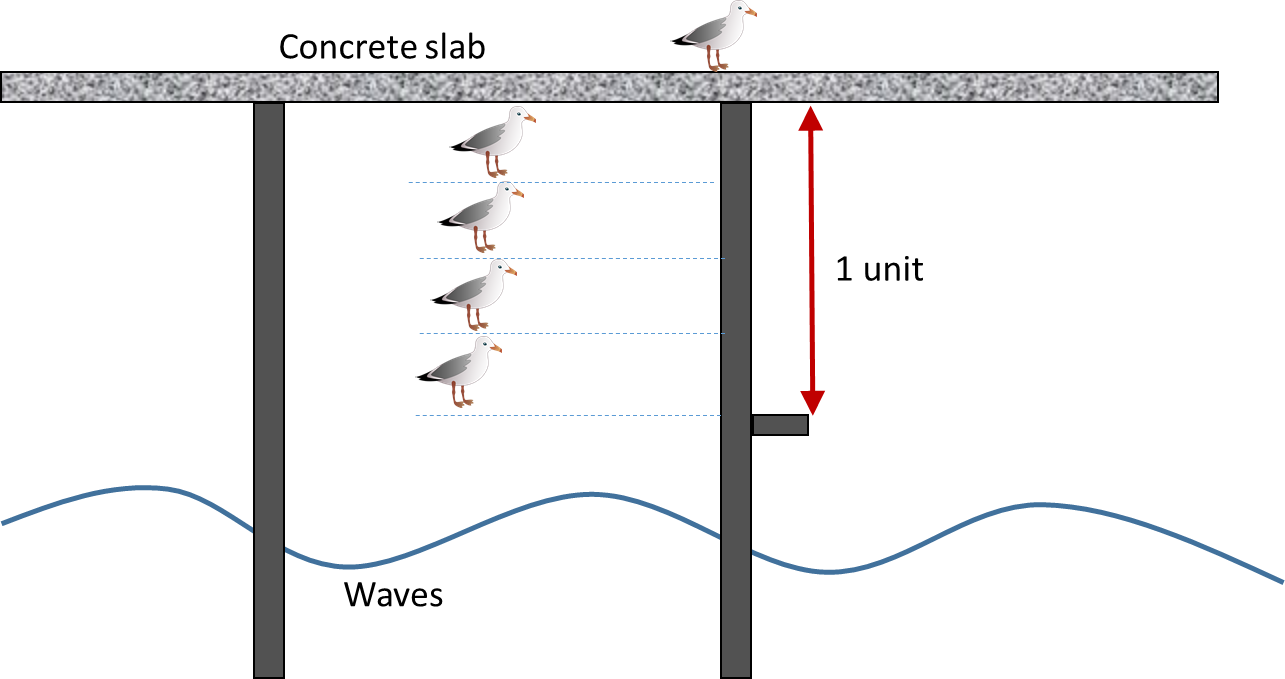


Figure 2: Unit definition and seagull for scale

By looking at some seagulls located nearby in the breakwater and the beach, it was estimated that the height of the seagull for scale was roughly 35 cm.

A total of 90 waves were measured. During this survey some problems were encountered, which are listed next:

* The surveyors were not experts in visual estimation, but quite the opposite, hence there might be an error in the estimation of the height of each wave. Also the estimation of the unit is subject to error.
* In some occasions the waves came from more than one direction, in which case it was complicated to determine which crest was linked to which trough.
* After measuring each wave, some short time was needed to write down the data; during this time some waves passed through, which means that the record was not continuous, as is the case with a pressure sensor.

Bearing that in mind, the accuracy of the visual estimation can be considered as questionable, nevertheless is still useful, as having some information is always better than having no information at all.

The results of the measurements are shown next.