

Case Study : Brizo X

Testing at Halifax Harbour

When we needed a low-cost, plug-and-play way to turn any buoy into a precision wave sensor, we built the Brizo-X.

The Brizo is a GNSS (Global Navigation Satellite System) based wave height sensor meant to be installed on existing buoy infrastructure or added to a buoy as an extra sensor.

After the product was finalized and testing completed, it was time to test the Brizo against an industry standard model - TRIAXYS . The accelerometer-based platform had been deployed in the Halifax Harbour for some time and proven to work, so it was a good baseline to use for data comparison.

Xeos deployed 2 Brizo units for this test - one was co-located on the wave buoy (Brizo 1) and the other was deployed on a navigational buoy roughly 700m away (Brizo 2). The goal of the test was to prove the Brizo would gather accurate data when deployed on a navigational buoy, & could be installed on an existing platform.

Brizo 1 Testing

Brizo 1 was installed on the wave sensor platform that also housed TRIAXYS. This platform was a 3 metre disc buoy that was specifically designed for TRIAXYS. This was a good platform to test the Brizo, since we knew the data coming from TRIAXYS would be accurate, and a good baseline to compare our data to.

The purpose of deploying one of the Brizos on the same structure as an accelerometer-based sensor was to not only show relation in data, but also to compare robustness in design and ease of deployment. The direct comparison shows a large degree of agreement between the two sensors. This test confirms the validity of using GNSS-based wave height sensors agreeing with previous findings.

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Brizo 2 Testing

Brizo 2 was installed on a navigational buoy in the Halifax Harbour. This installation was meant to compare the performance of the Brizo between an oceanographic buoy and an existing navigation buoy. The goal was to prove that the Brizo is a viable option on either platform.

The findings of the field test were favourable for both Brizo units that were deployed. The graph below (Graph 1) shows the relationship in significant wave height measured between Brizo 1 and TRIAXYS. both data lines track very close together, which proves that the Brizo can work on an oceanographic buoy designed to measure wave statistics. The Brizo mimicked the TRIAXYS position as closely as possible, and the data was agreeable. There is a small window of data not used in the comparison; these data points were used for post-processing for another application.

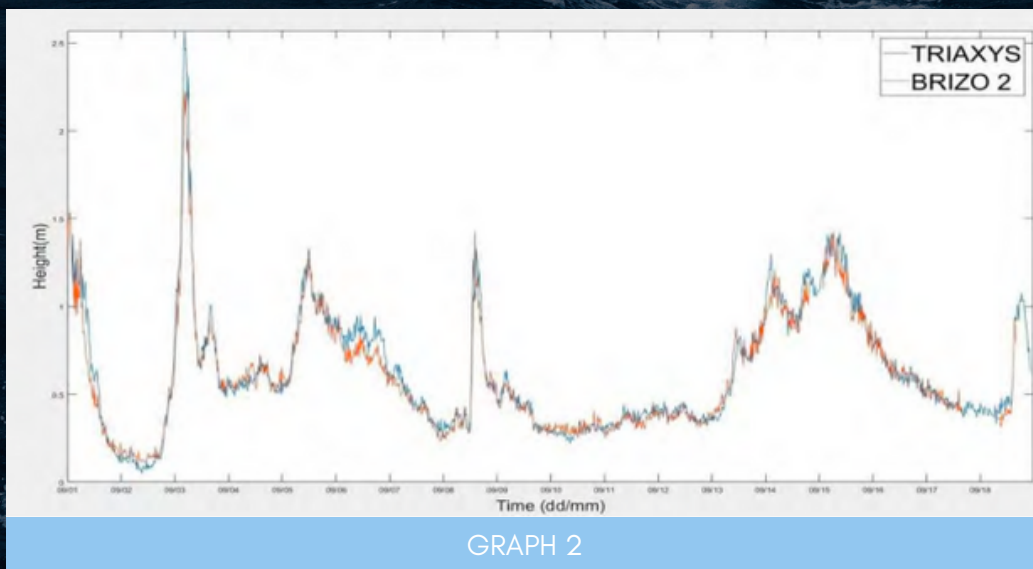


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The other test was compared the data from Brizo 2 to TRIAXYS. The second graph (Graph 2) provides a comparison of significant wave height data between Brizo 2 and TRIAXYS. Again, the data is agreeable and tracks closely together. There are some slight differences, which can be attributed to the change in wave field from 700m distance between them, buoy size & shape, and GNSS antenna offset. All of these things considered, Brizo 2 provided a successful field test of this theory.



Results

To conclude, it was determined that both Brizo sensors measured accurate data on both types of buoys. Xeos was very confident in the results of this field test and was able to bring the Brizo sensor to market with this data to rely on. Other tests have been conducted since, with different manufacturers' sensors on other platforms and similar trends have been found. There was an in-depth statistical analysis done on this data accompanied by a scientific paper that can be found here:

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