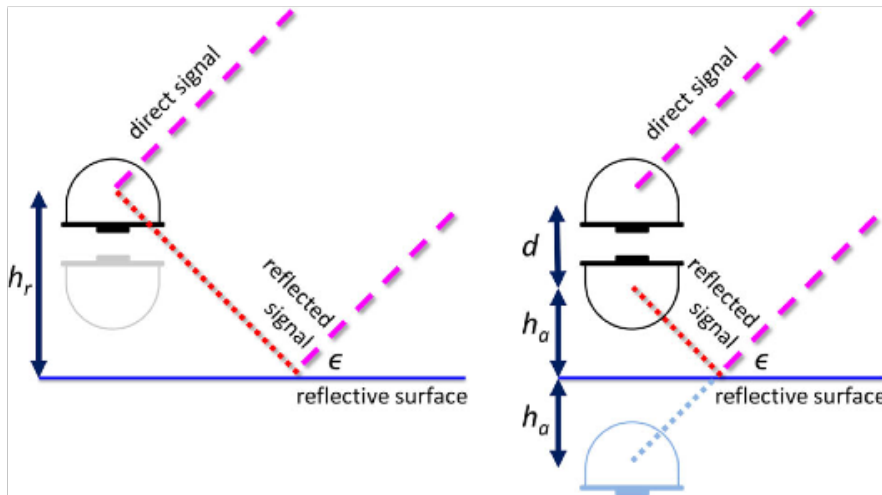


GNSS tsunami detection



This project is supported by an NSERC-CRD grant in collaboration with IBM. Here you have some information about the project objectives as stated in the proposal:

The current tsunami detection technology in the coast of British Columbia is mostly based on Bottom Pressure Recorders (BPRs) as part of the ONC observatories, Deep Ocean Assessment and Reporting of Tsunamis (DART) buoys from NOAA for far field tsunamis, tide gauges and seismometers. The inclusion of GNSS data was recommended in particular configurations for real-time detection of tsunamis in BC [10]. The real-time data available from Natural Resources Canada's GNSS network could allow for timely and accurate detection and measurement of tsunami waves for far- and near-field tsunamis. NRCan provides up to 1 Hz positional data for its continuous GNSS stations, with a latency of less than 10 seconds.

This project will assess the potential of coastal GNSS stations to provide accurate real-time measurements of tsunami amplitude and period, in order to provide early warning of far-field and regional tsunamis (e.g., from Alaska). Such data collected on the west coast of Vancouver Island could also be used to improve the accuracy of near-field tsunami inundation forecasts in advance of the first wave's arrival at more distant locations such as significant populations on southern and eastern Vancouver Island, and mainland British Columbia. This technique would build on recent studies that demonstrate the accuracy of coastal GNSS stations as "tide gauges" [11] [12]. This new system would be highly marketable if successful because of its relative low cost and ease of maintenance. Initially, one existing station and three others to be established in 2015 will be used to develop and assess methods of detecting and measuring tsunami wave parameters, via the measurement of changes in sea level. During this project, we will evaluate the suitability of various available software and hardware configurations (Fig. 1) for the accurate, timely, robust detection and measurement of tsunami wave amplitudes [11].

This objective will generate two outcomes: optimized Global Navigational Satellite Systems (GNSS) hardware and algorithm for nearshore tsunami wave detection based on a reliable, low-cost, easy to maintain system. The algorithm and hardware will be tested during the project by using historical datasets and modeling to ensure the capability of the system and the algorithm to detect tsunami waves.