



## **Test of TEDA (Tsunami Early Detection Algorithm) on the 11 March 2011 Tohoku tsunami marigrams**

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The records of the 11 March 2011 Tohoku tsunami have been used to test TEDA, a Tsunami Early Detection Algorithm (Bressan and Tinti, 2011) that aims to detect tsunamis and potentially dangerous long period oscillations on sea level data. TEDA is composed of two parallel detection algorithms: the tsunami detection algorithm is built on the detected slope of the sea-level signal and it triggers a detection based on a dynamic threshold that varies according to the level of the previous background signal, while the secure detection activates an alert according to a filtered sea-level amplitude threshold. Both modules are designed to work at a station level after being calibrated for the station's site, i.e. their performance should be optimized to the local typical background by carefully setting the temporal parameters that define TEDA functions and the thresholds that define the detection.

In this work the performance of TEDA has first been evaluated by testing TEDA with the calibration found best for Adak, USA, on 123 tsunami records from the 11 March 2011 Tohoku event located along the coasts around the Pacific Ocean, characterized by different background oscillations and tsunami response. The main goal was to evaluate the efficiency of TEDA and to assess whether a particular calibration could have a general validity for different situations. To further check the sensitivity of TEDA, additional tests have been performed by slightly increasing and decreasing the threshold for detection. The results are positive and show that TEDA is able to detect the majority of the tsunami signals in a robust way and therefore it could be used within a Tsunami Warning System.

### References

Bressan, L. and Tinti, S. (2011), Structure and performance of a real-time algorithm to detect tsunami or tsunami-like alert conditions based on sea-level records analysis, *Nat. Hazards Earth Syst. Sci.*, 11, 1499-1521, doi:10.5194/nhess-11-1499-2011.