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Tsunami Prediction Using Electromagnetic Wave Sensor via. Tsunami Buoys

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Abstract: Our environment currently suffering from multiple issues due to change in nature like global warming, natural disasters like Tsunami, earthquake, floods, volcanic eruptions, etc. To predict before disaster is challenging task where scientist invent devices to get simultaneous data regarding environment changes with the help of sensors. In the study, we designed a device which senses waves in seas that manipulates via Tsunami buoys. Tsunami buoys are deployed in deep seas and high wave regions to get various surrounding data that helps to predict Tsunami. National geographic centers have the facility to collect the data from various Tsunami buoys, each data is been analyzed, manipulated, systemized into a centralized prediction mechanism. Electromagnetic wave sensors embedded in each Tsunami buoys that plot courses among others to simulate variation on waves. According to that Wide Range Angle Calculation (WRAC) methodology, arc kind of diplomatic solution is implemented to check and calculate the wave radius which is later then derived, predicting damage circles. By this device, circle radius of damage is identified and avoiding the damage percentage before it started to destroy surroundings as well as human beings.

Key words: Natural disaster, Tsunami prediction, Tsunami buoys, electromagnetic sensor, WRAC, systemized

INTRODUCTION

Tsunami raised by volcanic evolution under deep seas which increases the wave radius caused in tectonic plates under earth surface. When volcanic pressure raises under earth's surface causes natural disaster in terms of Tsunami where damage across environment is been severe (Rangachar and Sheenu, 2016). Whenever the term Tsunami comes, always in our mind is china, the country suffered more from it and stand over it. Lots of scientist gathered to implementing a solution for this big disaster to predict those eruptions via sensors to collect data from Tsunami buoys (Rangachar and Sheenu, 2015).

Tsunami buoys were the most advanced technology implemented to sense high raise waves in seas to measure and calculate the amount of damage as well as surrounding radius of wave. Every country has its own Tsunami buoys to acknowledge the movement of water waves which will be working under national geographic centers (Meinig *et al*., 2005). Sensors playing vital role to sensing environment changes simultaneously, this helps for analysis prediction of natural disasters on time without any damages for people. Providing such environment need lot of natural data to predict and analyze the amount of damage or the prevention before Tsunami (Borner *et al*., 2010).

Even India suffered from Tsunami once that increases awareness among several people what Tsunami can do. After several days, lots of people were lost their families, houses, children's, etc., to being a part of this environment to caring about human's life is important note (Wang and Li, 2008). Scientists are still trying to figure out a solution for every natural disaster.

MATERIALS AND METHODS

Proposed work: In our method, WRAC (Wide Range Angle Calculation) is implemented to measure wave radius simultaneously and forwarding those measurements back to national geographic centers wirelessly. WRAC is a mathematical derivation where collecting values from sensor it predicts the height of wave and distance of hit radius, status information of wave. Whether it going to hit surface within duration period or it will hold on longer. Volcanic pressures are a key to Tsunami disaster where the pressure hits tectonic plates to create eruptions under sea to increase wave speed and destroys surroundings in a short time. Managing these values under Tsunami buoys increased efficiency of data sense from one place to another to predict range and time of Tsunami before reaches surface.

In architecture, the electromagnetic sensors are embed with Tsunami buoys which is then deployed in high wave regions of sea to sense wave angle via. Wide Range Angle Calculation (WRAC) (Fig. 1). Each Tsunami buoys are connected to satellite which automatically transmits wave data simultaneously to NOAA centers. In between, this communication establishment is supportive to get data on time to predict analysis among them to find a solution for the natural disaster (tsunami). NOAA centers linked with other centers to collect various wave data from Tsunami buoys to finalize a solution based on prediction of simulative outcomes for those data's. Tsunami buoys embedded with electromagnetic sensors are high recommended which calculate the angle of wave according to our methodology WRAC which helps the

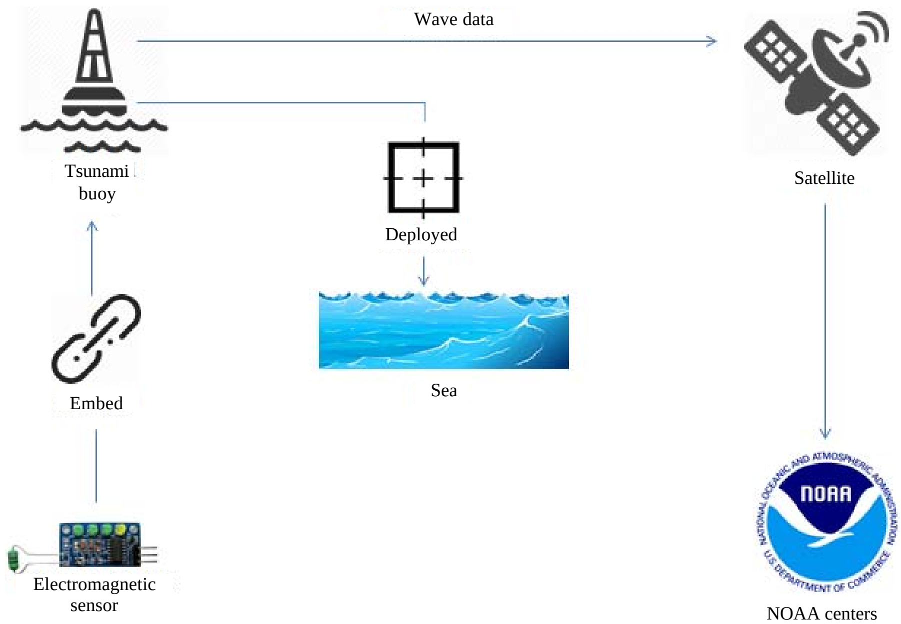

Fig. 1: Architecture

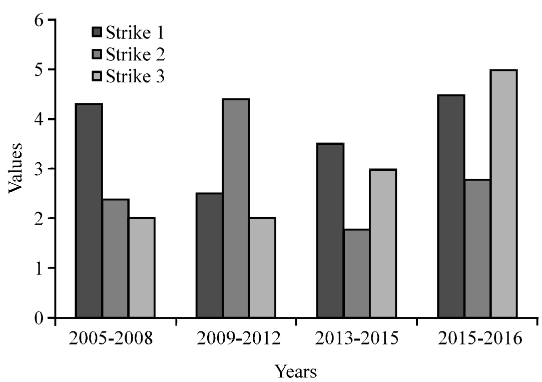

Fig. 2: Year comparison

way easier to forward calculated data to NOAA centers to predict on changes over environment day by day without any deviation.

RESULTS AND DISCUSSION

In Fig. 2, each year collected wave data from Tsunami buoys are compared one another with three types of strikes. Strike in the sense the amount of angle increased during hive wave data captured from buoys. In 2005-2012, strike 3 increased simultaneously from years where high end waves have been hit on Tsunami buoys. Recent years, implementing Tsunami buoys increased advantage among natural environment measures of environment changes.

CONCLUSION

Natural disaster evolved in our environment where global warming moved on day by day with severe damage on surfaces. WRAC concludes the calculation part of electromagnetic sensor data into wave data for further proceedings of environment changed prediction. Tsunami buoys guide those wave data helps to turn out eco-friendly nature with prediction analysis.

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