

Oceanfloor network system and real-time tsunami prediction system

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Very severe damages were brought by huge tsunami accompanied with the 2011 off Tohoku earthquake. It is important to take measures for tsunami to reduce the damages using real disaster scenarios. To use their scenarios on actual implementation, it is indispensable to detect tsunami, and to understand the situation from propagation of tsunami to its inundation.

Around the Nankai Trough area, which is concerned about future large earthquake, the dense ocean-floor network system for earthquakes and tsunamis (DONET) was constructed and implemented. A real-time tsunami prediction system using DONET was developed by JAMSTEC and is revised in collaboration among NIED, JAMSTEC and NTT data CCS to introduce DONET2 data in the Nankai area. The system predicts tsunami arrival time and the height with an inundation map based on amplification of the tsunami during the propagation using the database with fault models of over 1500 cases. In other words, it uses correlation between maximum average values of absolute pressure gauge data and maximum tsunami height of the predicted points. To develop it to improve the prediction, fault models to be used for the prediction are sorted out using differences of trigger times for the earthquake and tsunami between DONET observatories. In addition, the used DONET observatories are also sorted out based on the direction of the tsunami propagation for each predicted point. The system using DONET1 data in the Tonankai area is already implemented by prefectures of Wakayama and Mie, Chubu electric power, and Owase city, and the new version is under verification. This system does not determine one best fault model, and selects some worse cases to be satisfied some conditions for the predicted point. Therefore, it reflects heterogeneous slip distribution and local effects like landslide on the sea bottom.

It is indispensable for the implementation to evaluate the quality of the input data. Knowing the data quality and considering the implementation by local governments, the system should have flexibility to be able to prevent issues like lack of data and comprehensibility for the implementation. The visualization and prediction method depend on the purposes and the locality of the target. I point hybrid system adopting some prediction method and the visualization considering user's confusion by multiple prediction data.

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