総合理工学研究科 Graduate School of Science and Technology
建築・土木コース Structural Engineering

Let's prepare for global warming and huge tsunami！

地球温暖化と巨大津波に備えよう！

教授 山本 吉道

Prof.

Yoshimichi YAMAMOTO

Keyword ： 地球温暖化、巨大津波、高波、海岸侵食
Global warming, Huge tsunami, Big waves, and, Coastal erosion

日本は昔から毎年のように高波災害を被り，数十年毎に大津波に襲われています．特に近い将来，地球温暖化による時化の激化と南海トラフ発の巨大津波の来襲が懸念されています．

これらの甚大な災害は，発生を防げなくても，被害状況を正確に予測出来るようになれば，対策を立てて被害を十分に減じることが出来ます．

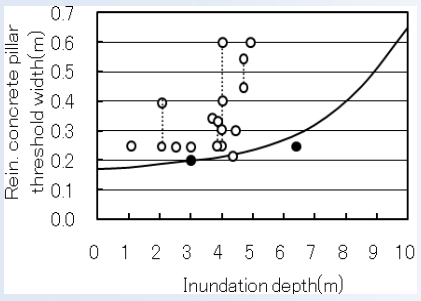
私の研究室では，津波による建物被害を広域で主要部材寸法を考慮して簡便に評価出来る手法，津波・高潮の浸水とそれらによる地形変化を精度良く計算負荷を抑えて予測出来る方法，さらに，高波による堤防・護岸の吸出し破壊予測法を開発しました．

新しい広域建物被害評価法と浸水予測法は，高い精度の津波被害予測を適度な作業負担で行えます．東日本大震災でも津波による洗掘が各所で生じましたが，この洗掘予測に対して開発した地形変化予測法は有効です．高波による吸出し破壊予測法も，役所の防災計画策定に大いに役立つでしょう．

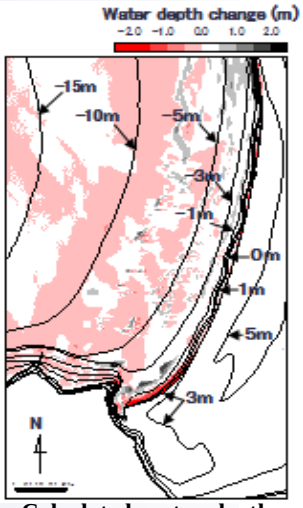
Many coasts in Japan have suffered damage by big waves every year and by tsunamis every some dozens of years. Especially, the typhoon intensification by global warming and the hit of the huge Nankai Trough tsunami of the near future are making us afflict. If their damage can be estimated beforehand, we can take counter-measures in order to prevent or mitigate their damage.

We proposed a method to handily evaluate the building damage of wide areas due to tsunamis by considering main member sizes, methods which predict the inundation and the topographical change due to a tsunami with light calculation loads, and a method for evaluating the suction destruction of dykes and seawalls by big waves.

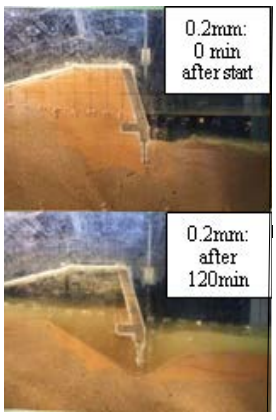
The new method for evaluating the building damage and the new inundation simulation method enable the damage prediction due to the tsunami with high accuracy under a moderate work burden. Heavy erosion and scour arose on many coasts in a lot of past big tsunamis. The new methods for predicting topographical change due to the tsunami are effective in evaluating such erosion and scour. The new method for evaluating the suction destruction by big waves is also useful in examining disaster prevention plans.



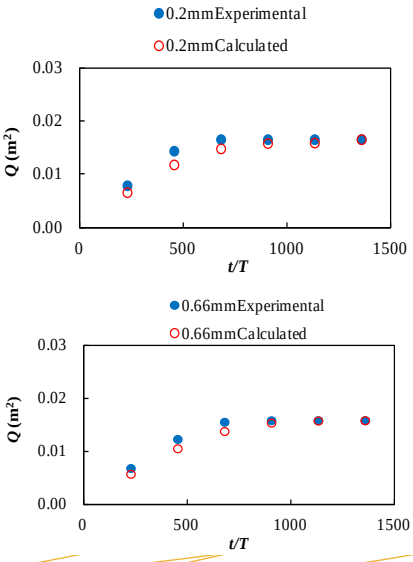
A sample of relation between inundation depths and threshold widths of a reinforced concrete pillar. (White circles are non-destructive cases, black circles are destructive cases. The Pillar height is 3m, the pillar interval is 5m. Double reinforcement section, Ratio of reinforcement section area to total section area is 0.0365.)



Calculated water depth change 90minutes after 2004-Tsunami hitting.



Experimental situation of scour and suction in the case of 0.2mm median diameter sand.



Relationship between calculated values using our prediction method and experimental values.

◆リンクページ(Link)：http://www.ev.u-tokai.ac.jp/top.html

◆電子メール（address）：yo-yamamo@tokai-u.jp

TOKAI UNIVERSITY