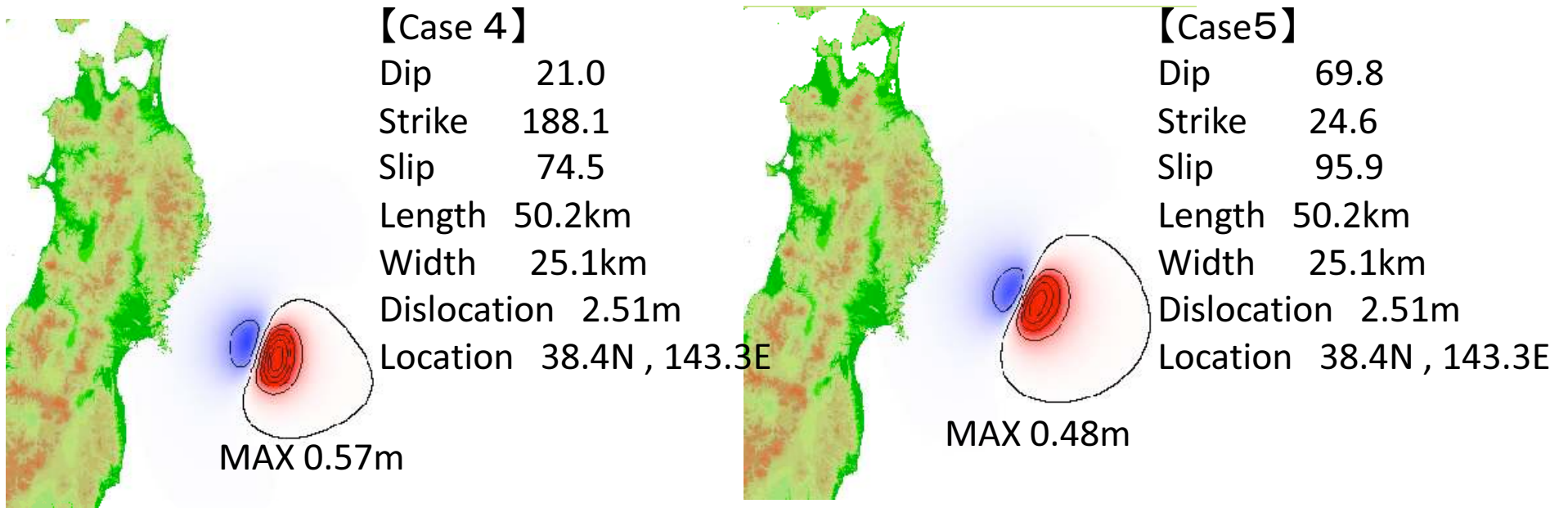# Tsunami numerical simulation of the 2011/3/9 M7.3 Sanriku Earthquake

9 March 2011

Tsunami Engineering Laboratory, Graduate School of Engineering, Tohoku University
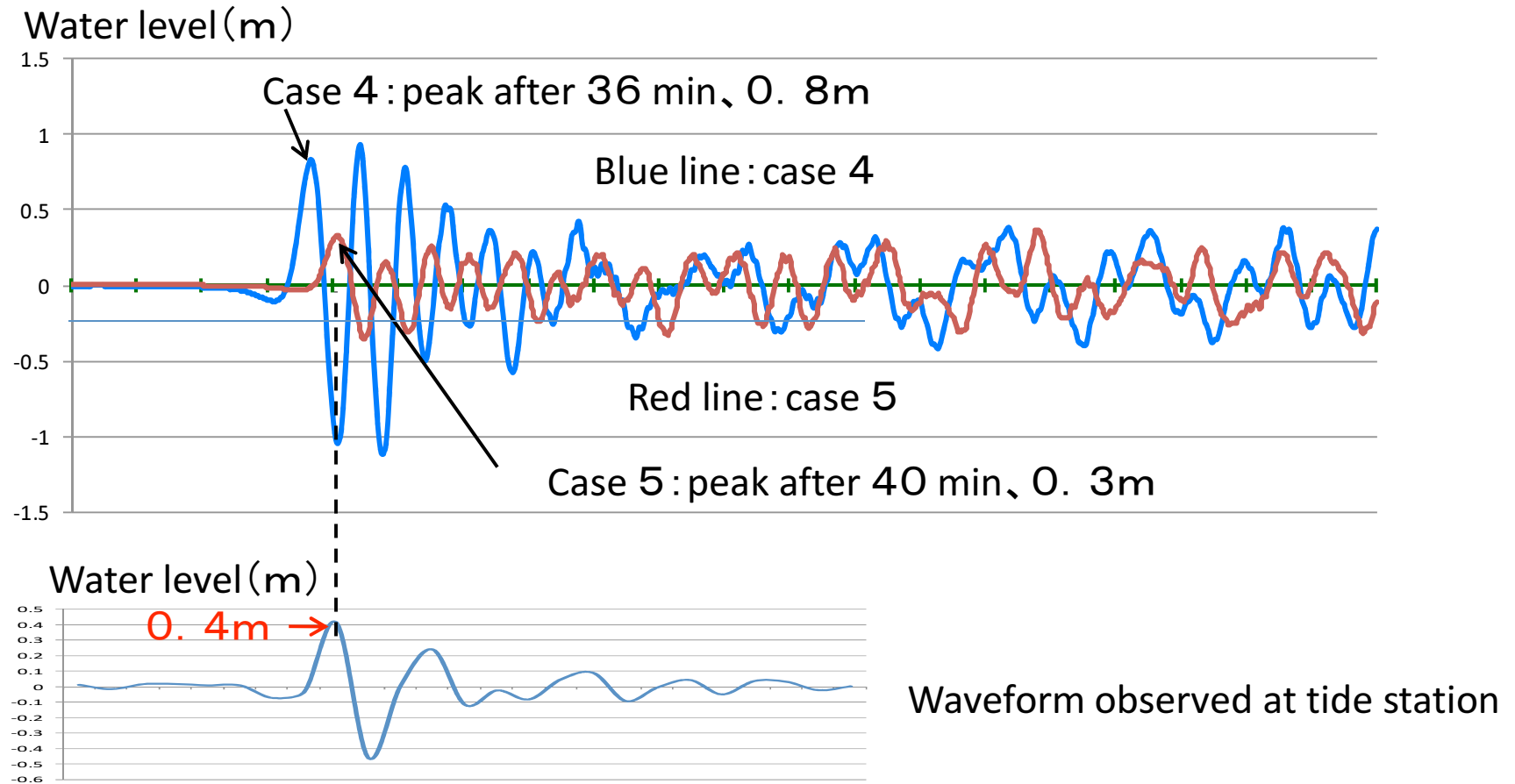
Dr. Ikuo Abe

■Distribution of initial water level

【Case 4】
Dip   21.0
Strike   188.1
Slip   74.5
Length   50.2km
Width   25.1km
Dislocation   2.51m
Location   38.4N , 143.3E

MAX 0.57m

【Case5】
Dip   69.8
Strike   24.6
Slip   95.9
Length   50.2km
Width   25.1km
Dislocation   2.51m
Location   38.4N , 143.3E

MAX 0.48m

Computational condition： Minimum 150 m resolution
Including breakwater
Using non-linear theory only in the 150 m mesh

■Tsunami waveform @ Ayukawa

Water level（m）

Case 4：peak after 36 min、0. 8m

Blue line：case 4

Red line：case 5

Case 5：peak after 40 min、0. 3m

Water level（m）

0. 4m →

Waveform observed at tide station
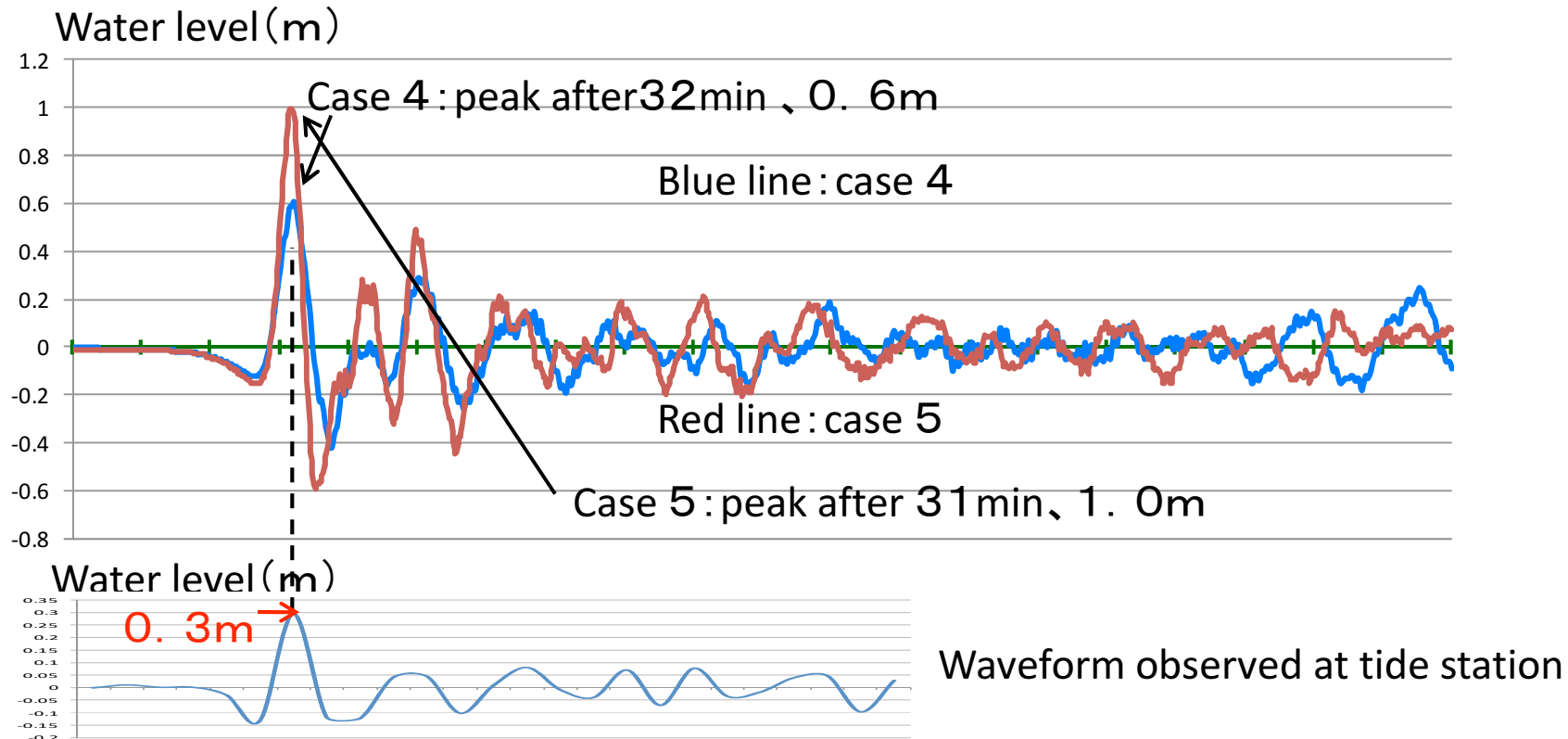
Case 5 can produce better good result in Ayukawa.
Observed data has longer wave period. Maybe this is because of summation of small other wave components?
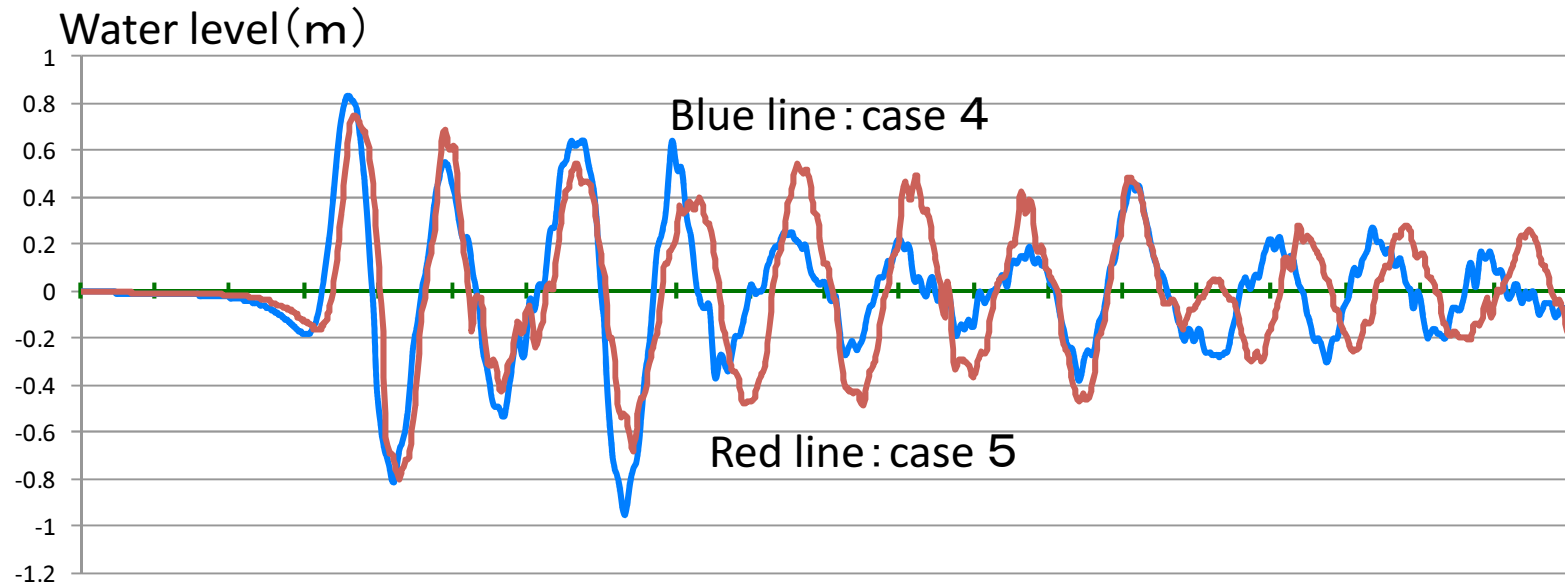
■Tsunami waveform @ Ofunato

Water level（m）

Case 4：peak after32min、0. 6m

Blue line：case 4

Red line：case 5

Case 5：peak after 31min、1. 0m

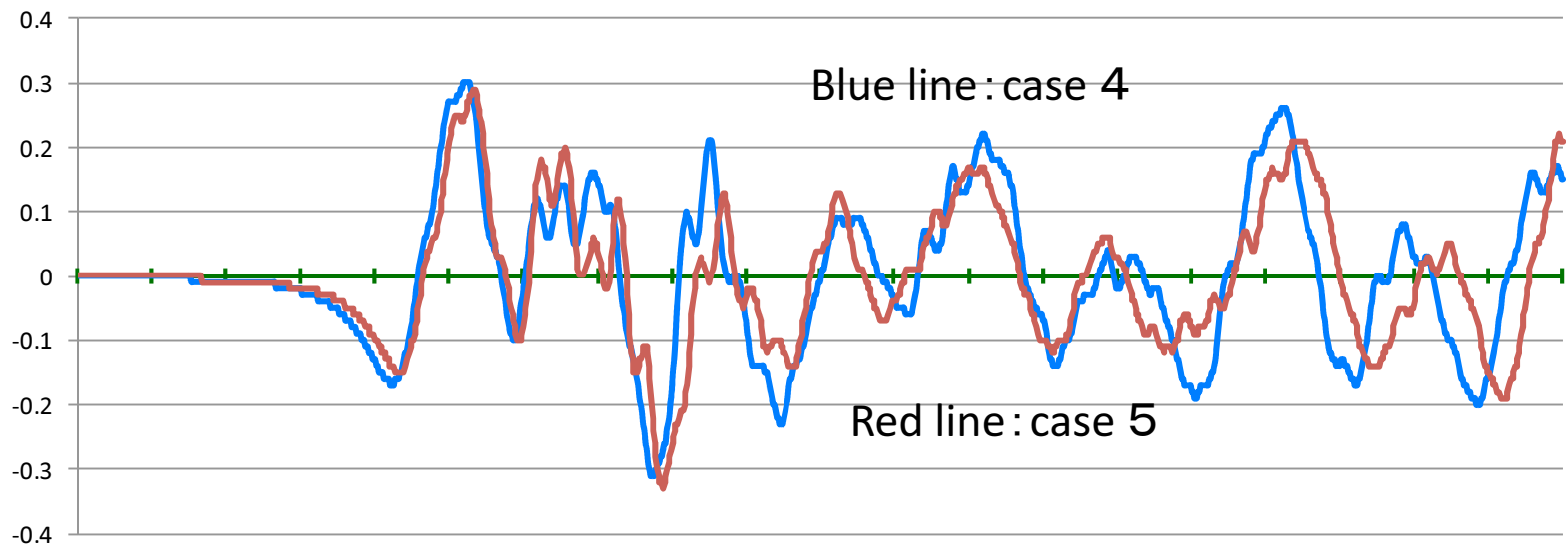Water level（m）

0. 3m

Waveform observed at tide station

Good results in tsunami arrival time at Ofunato.
Different in wave height is may be because the output for waveform is located outside the breakwater?(need confirmation)

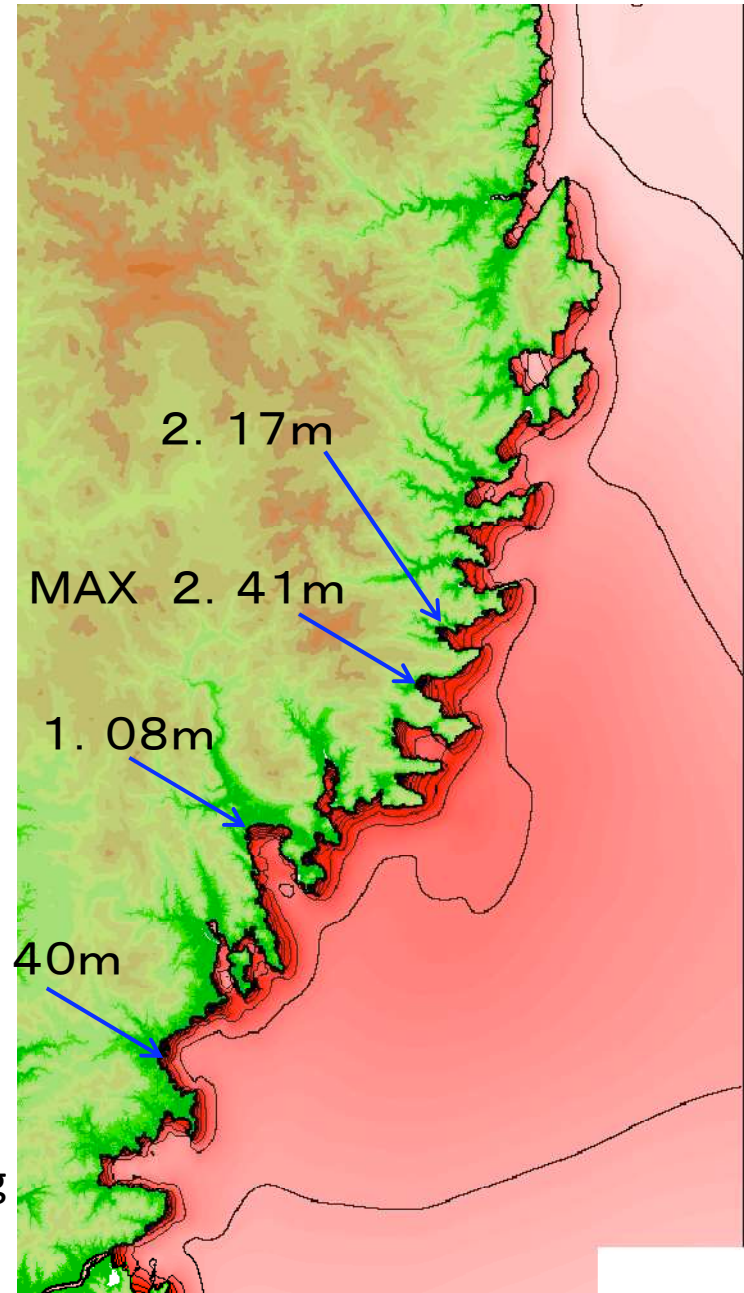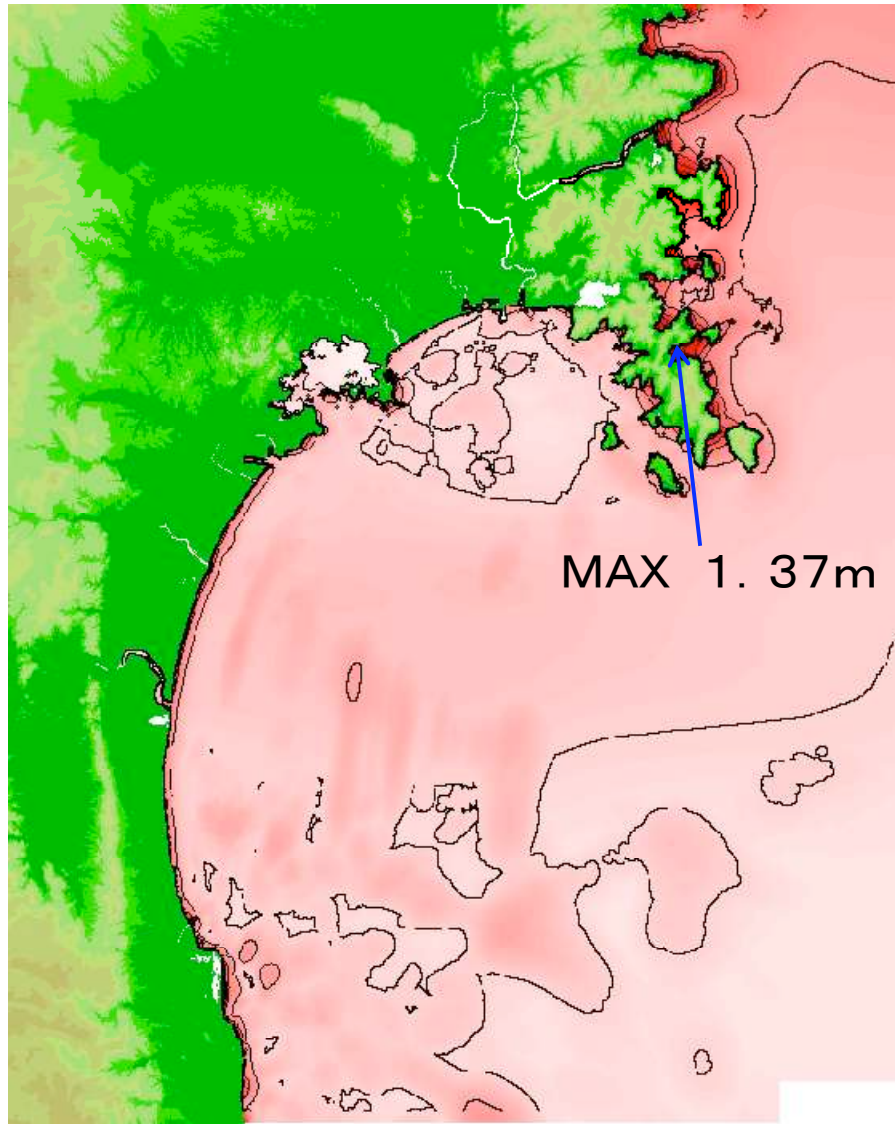## ■Tsunami waveform @ Kesennuma（Suginoshita）

Water level（m）

Blue line：case 4

Red line：case 5

■Tsunami waveform @ Kesennuma（Shinmeizaki）

Blue line：case 4

Red line：case 5

There are no notable different between case 4 and 5 in Kesennuma

■Maximum tsunami height distribution（Case 5、tsunami simulation for 6 hours）

MAX 1．37m

2．17m

MAX 2．41m

1．08m

1．40m

Based on the simulation results, about 1 – 2 m along shoreline of Iwate province.