

29/3/ 2011 (Tue)

## Onagawa town

### Overall damage

Onagawa town locates about 50 km Northeastern from Sendai as a part of Oshika Peninsula.



Figure 1 Location of Onagawa town. Clock shows time when the peak tsunami arrive at 15:22, about 35 min after the earthquake.

Information (including from eyewitnesses):

- ❖ Tsunami warning worked just after the earthquake but the system stopped right after
- ❖ Tsunami first arrive within 15 min
- ❖ Second wave was bigger than the first wave
- ❖ Many residence had 1960 tsunami experience
- ❖ However, that causing insufficient evacuation in both inundation distance and time
- ❖ Inundation area was wider than the 1960 Chile tsunami
- ❖ Evacuees stay at town's library providing two meals a day
- ❖ They said that their houses were destroyed by the first receding wave
- ❖ They come back home at daytime, finding their remaining stuff
- ❖ Lifeline is still not recover, they use natural water from a nearby mountain
- ❖ Evacuees have no money and no plan...
- ❖ Hospital which is located on a hill was inundated at the first floor
- ❖ No cargo damage, mostly houses, cars, trains, boats and fishing tools
- ❖ Mainly lare buildings (at least 3 story RC building) survived
- ❖ Tsunami height was greater than 15 m



Figure 2 Survey area cover 0.5 km away from sea





Figure 3 Ground settlement causing submerged land by sea water



Figure 4 Damage in tsunami inundated area near the bay (Southern part)



Figure 5 Damage in tsunami inundated area near the bay (Southern part)



Figure 6 Damage in tsunami inundated area near the bay (Southern part)





Figure 7 Tsunami reached the 1<sup>st</sup> floor of the hospital where it is locating on a hill



Figure 8 Damage in tsunami inundated area in land (Northern part)



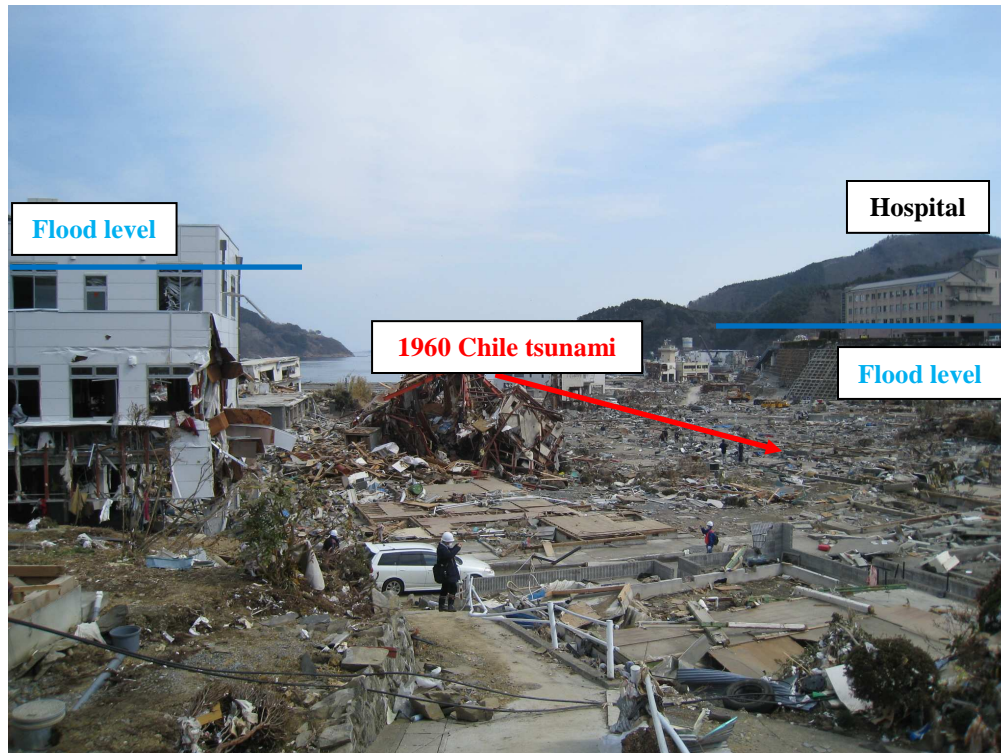


Figure 9 Damage in tsunami inundated area near the bay (Northern part)

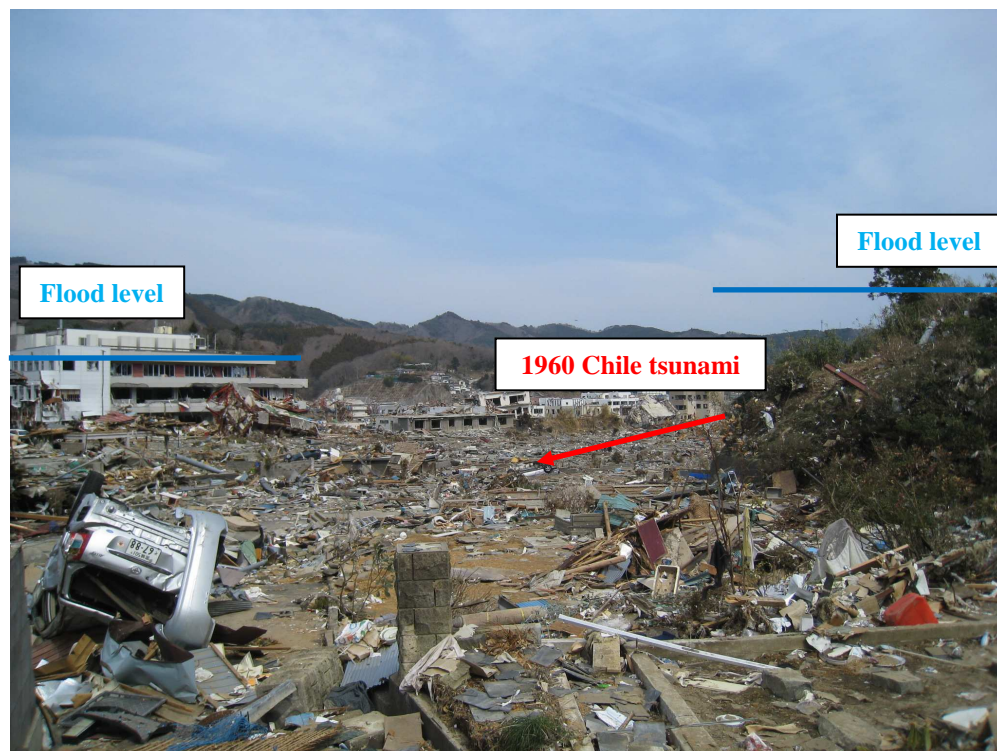


Figure 10 Damage in tsunami inundated area in land (Northern part)



## Estimation of tsunami height

Tsunami overtopped many high-rise buildings. From the survey, the maximum tsunami height is estimated greater than 15 m (higher than five-story building).



Figure 10 Damage found at the 4<sup>th</sup> floor, says more than 12 m tsunami height

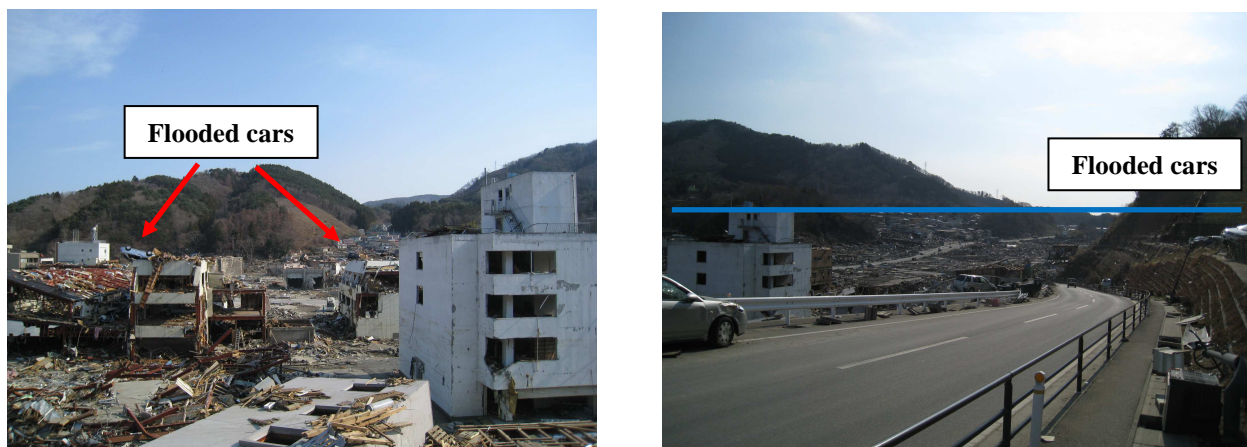


Figure 11 Cars were flooded onto the hill near hospital which is nearly equal 5<sup>th</sup> floor of building meaning that tsunami height was greater than 15m

## RC Building damage

The purpose of this survey is to investigate and measure the completely overturned RC buildings. Five buildings were inspected in this survey. Number of story vary from two to four story. Some buildings (Fig...and Fig..) are still unable to define the original location. At this stage, building's shape related information (i.e. height, length, width and opening) were measured.



Figure 12 Overturned buildings



Figure 13 Overturned buildings