

## Lessons from East Japan Earthquake and Tsunami

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- Introduction
- What happened?
- Learning from the Disaster
- Conclusions

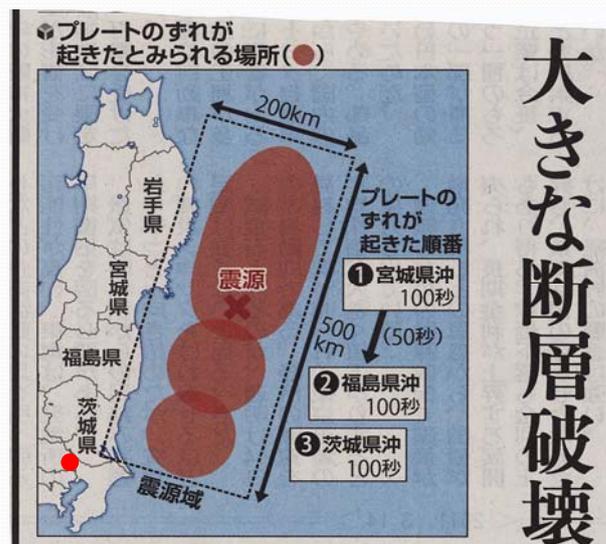
## Introduction

- About one year has passed since Great East Japan Earthquake and Tsunami, 2011.3.11
- Japan and Japanese people are tackling the rehabilitation from the catastrophic damages which gave us a lot of lessons
- It would be our duty and mission to record the facts and lessons to the rest of the world to reduce the disaster

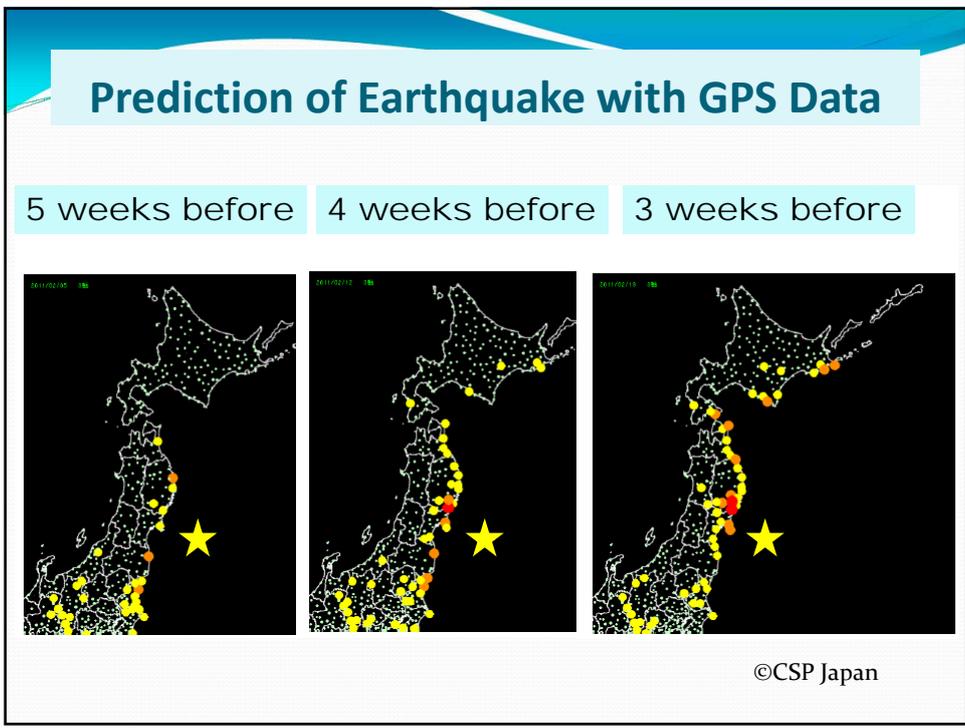
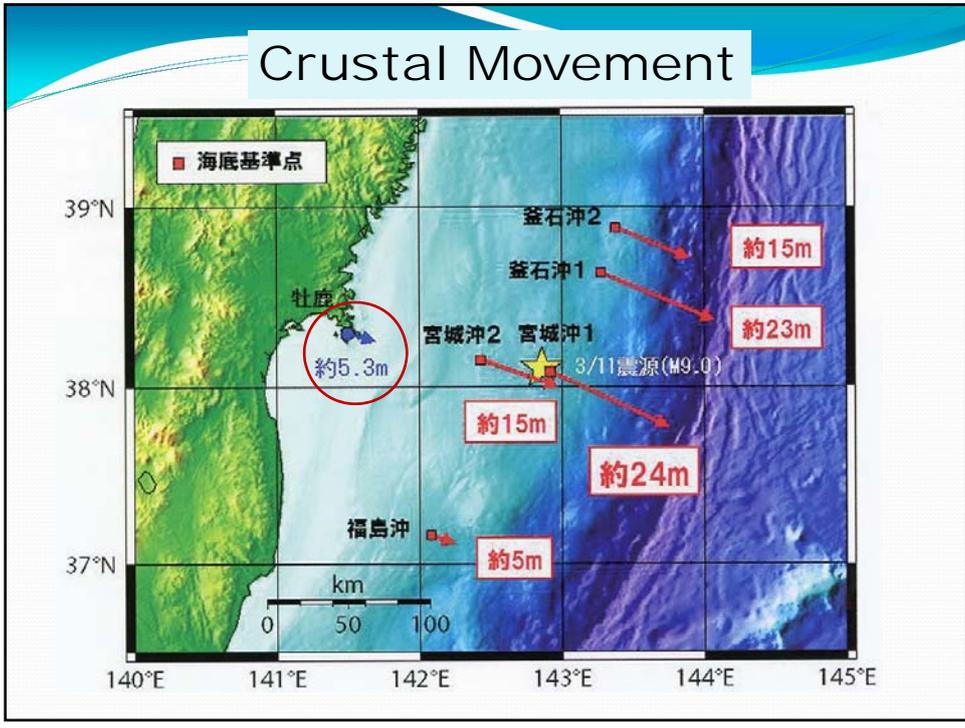
## What happened? ~statistics after a year

- Earthquake=M9.0, Tsunami=33m max.
- Inundated area: 561 Sq. KM
- Dead: 15,854+ Missing: 3,155=19,004
- Damaged houses: 1.168M
- Total Loss: 17,400 Billion Yen (~200B\$)
- Evacuated: 468,653 persons in max.
- Total volume of rubble: 22.53M ton
- Most of lifelines were stopped including electricity, water, gas, oil, railway, road

## Epicenter of the East Japan Earthquake



©Yomiuri Newspaper



## GPS Wave Height Recorder



## GPS Wave Height Recorder Recorded Seven Tsunami waves In Six Hours!

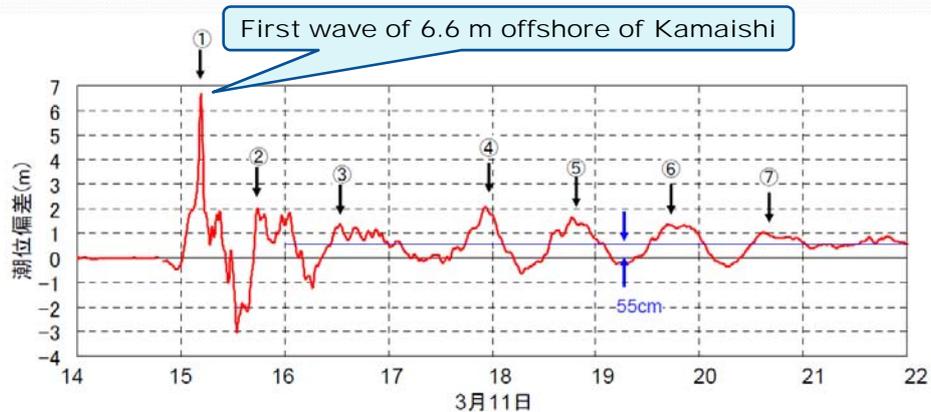
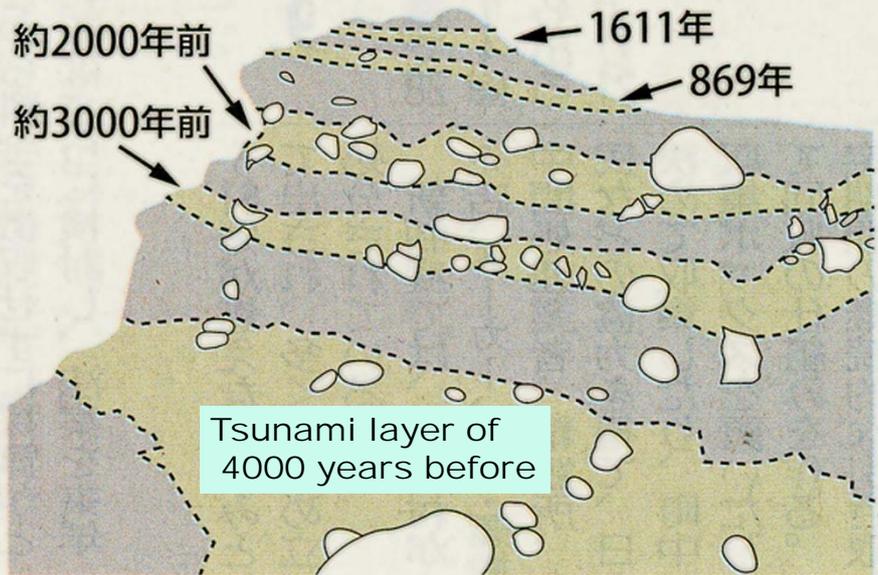


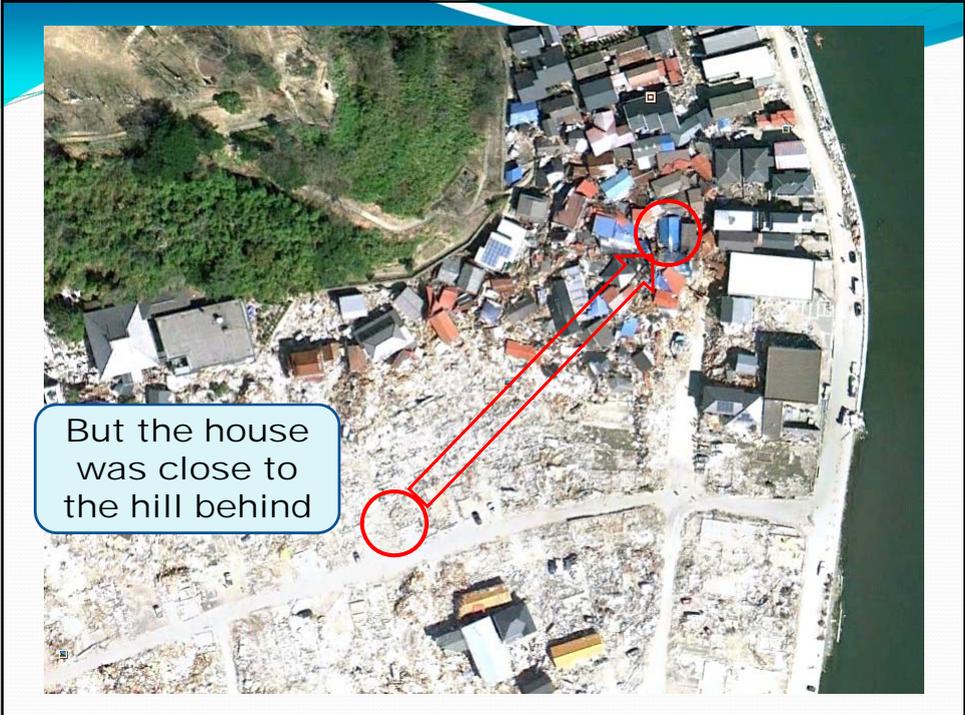
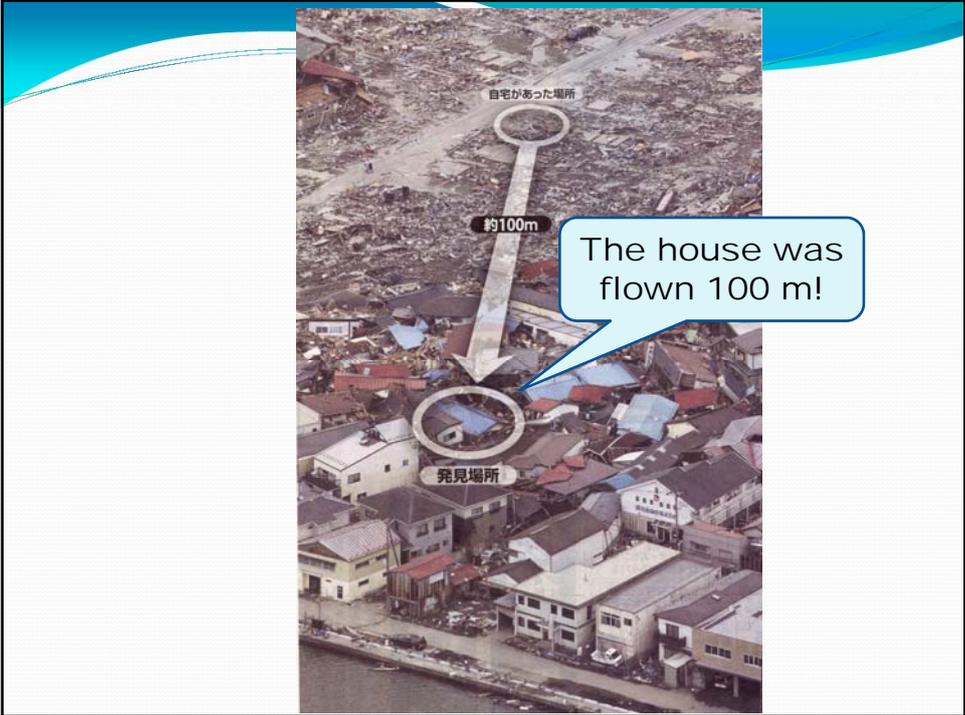
図-2 岩手南部沖GPS波浪計で捉えた津波の初期の波形

Geological layers showing the past Tsunami every 1,000 years interval



Grand Mam (80) & Grand Son (16) were rescued 9 days after

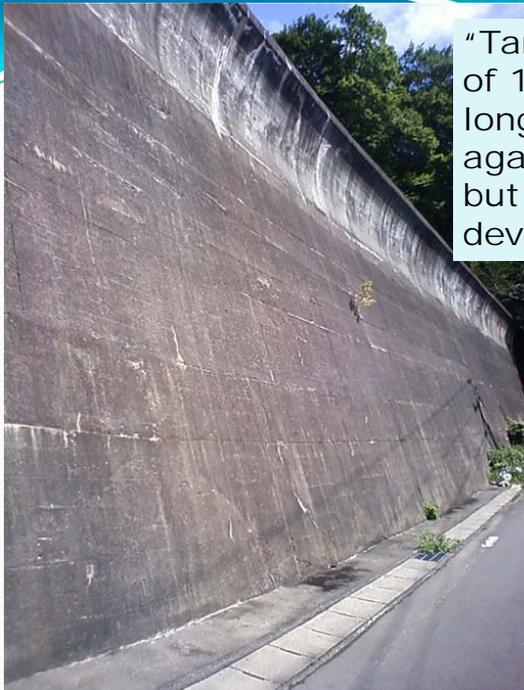




## Devastated "Taro" District



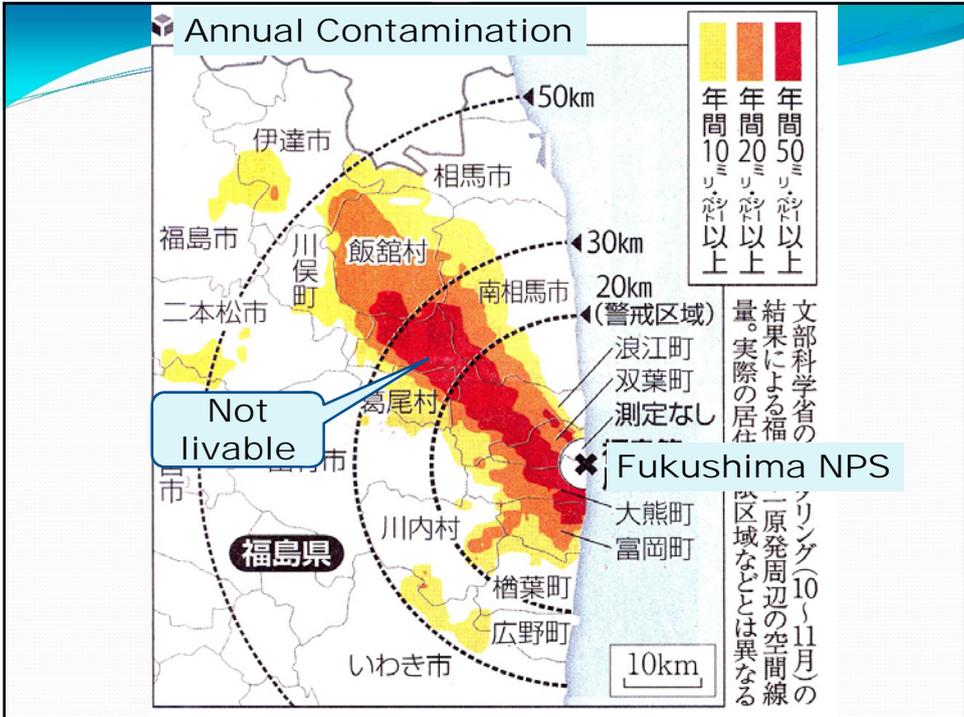
"Taro's Great Wall of 10m high and 2.4km long was constructed against Tsunami, but this wall was devastated by Tsunami





## What happened Fukushima?

- 3 reactors (No.1, 2 &3) were **melt down!**
- 3 reactors (No.1, 3 &4) were exploded with **Hydrogen gas!**
- Radio-active contamination **was equivalent to** 30 Hiroshima Atomic Bombs
- About **100,000** people lost their home!
- **30 km and more** are under risk of serious contamination
- Lesson: There is nothing which is **absolutely safe** as TEPCO and Government said before



## Conclusions

- We have experienced a lot of tragedies but **many lessons could be extracted** from such bad experience
- **Surveying and geo-spatial information technologies** were very useful for damage investigation and also reconstruction planning