



JACST: Online Press Webinar

Prediction of damage by typhoon from 1,000 simulations

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With Thanks to

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TOUGOU program from MEXT (2017~2021)

Team Typhoon shot

Damage caused by typhoons in Japan

Windstorms and floods that resulted in large insurance payouts

	Natural Disasters	Date covered	Amount of Insurance Payment
1	Typhoon 21, 2018	Sep. 3-5, 2018	1,067.8 billion yen
2	Typhoon 19, 2019	Oct. 6-13, 2019	582.6 billion yen
3	Typhoon 19, 1991	Sep. 26-28, 1991	568 billion yen
4	Typhoon 15, 2019	Sep. 5-10, 2019	465.6 billion yen
5	Typhoon 18, 2004	Sep. 4-8, 2004	387.4 billion yen
6	Snow damage Feb., 2014	February, 2014	322.4 billion yen
7	Typhoon 18, 1999	Sep. 21-25, 1999	314.7 billion yen
8	Typhoon 24, 2018	Sep. 28- Oct. 1, 2018	306.1 billion yen
9	Rainstorm July, 2018	Jun. 28- Jul. 8, 2018	195.6 billion yen
10	Typhoon 15, 2015	Aug. 24-26, 2015	164.2 billion yen

Insurance payment is estimated amounts, according to the General Insurance Association of Japan (as of March 2020)

Topic 1

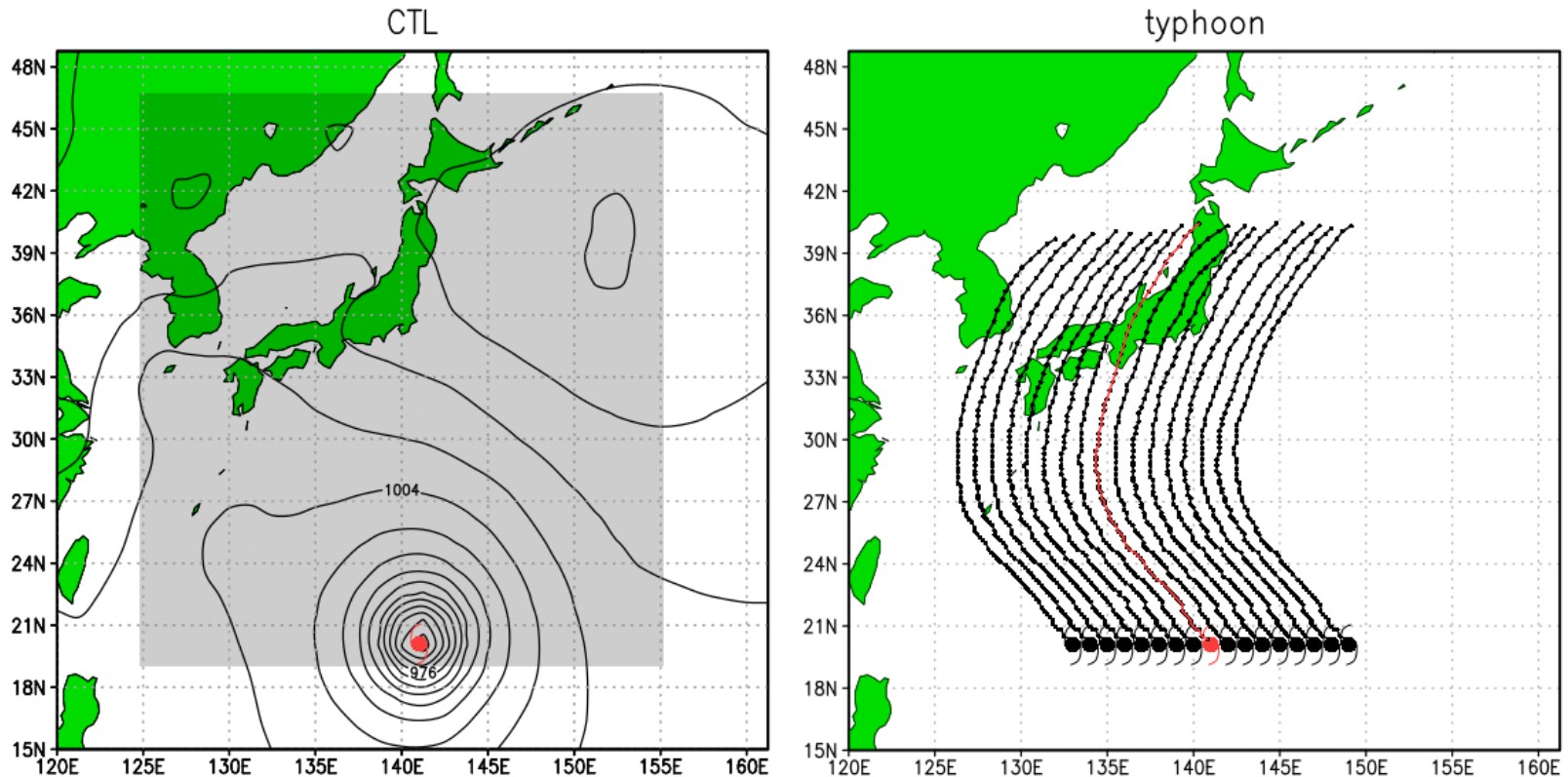
Development of typhoon hazard maps!

**Which regions are at
higher risk of typhoons?**



Moving the path of a typhoon in a simulation

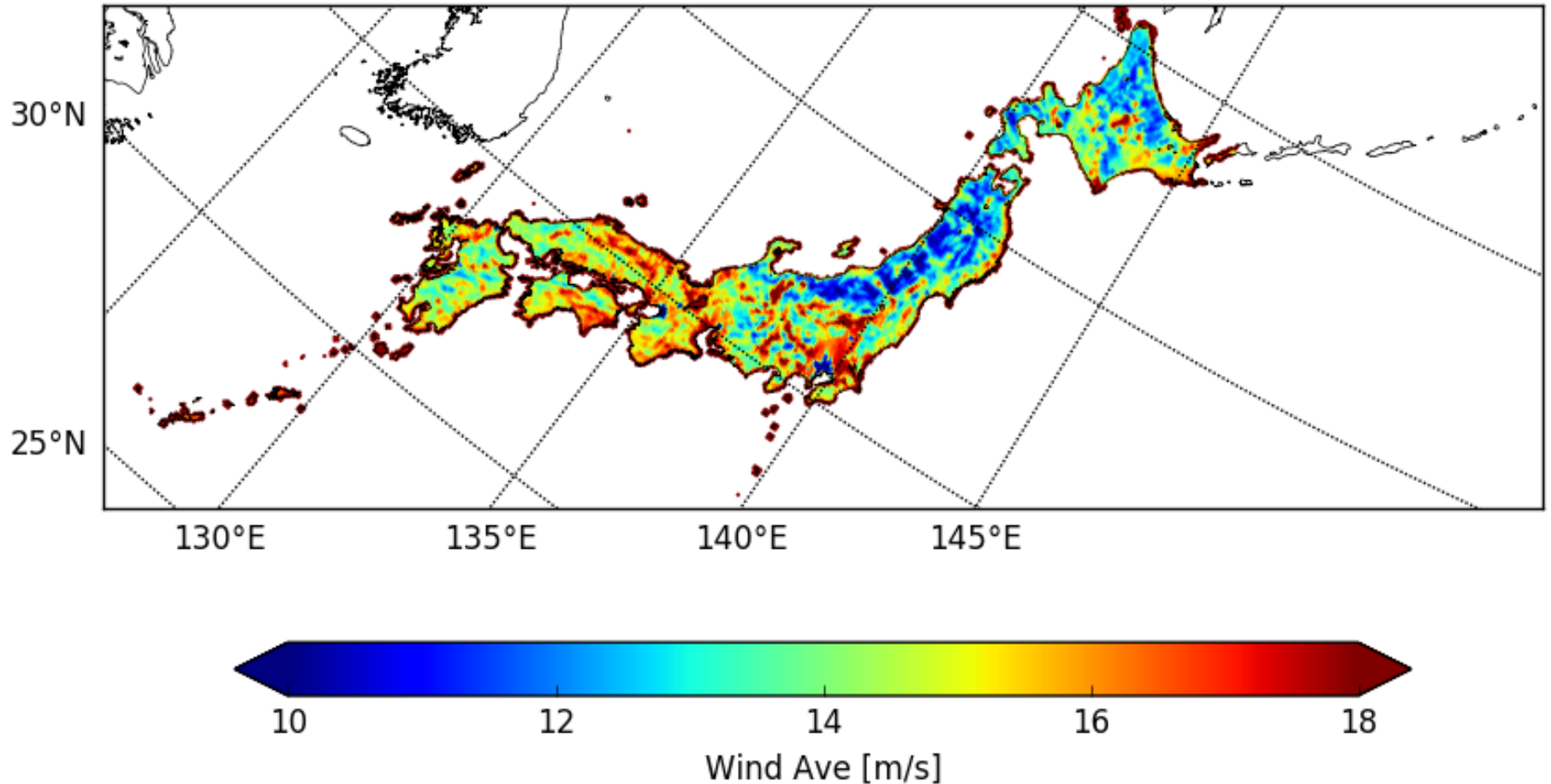
- **Simulations of typhoons landing on and cross all regions of Japan**



80 – 130 times of simulations for the past 13 cases of typhoons
= About 1,500 simulations in total

Typhoon Risk Maps for Wind Storm

Distribution of the average wind speed (m/s) when the typhoon enters within 300 km of each location.



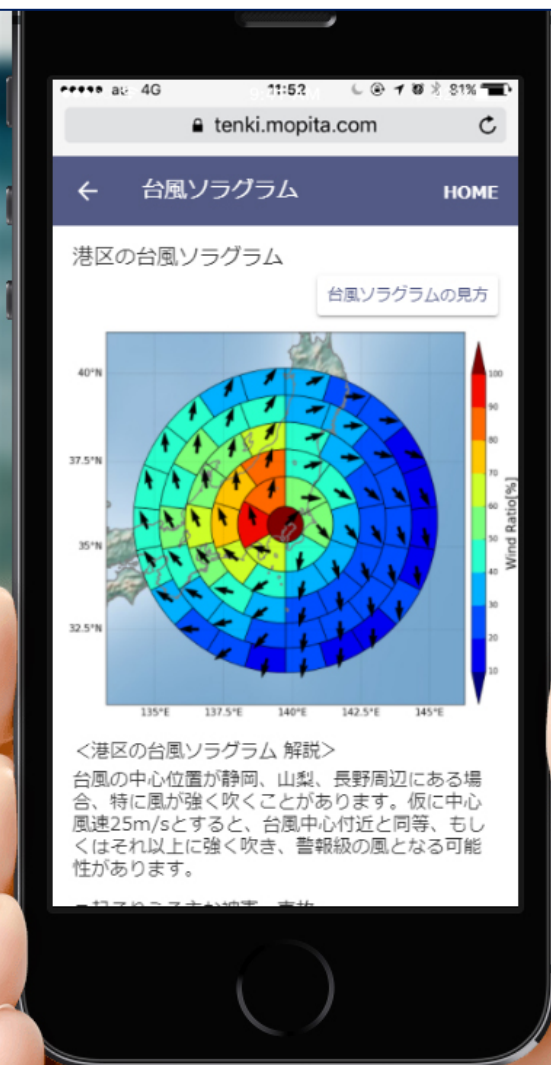
Collaboration with MTI Ltd. (since 2016)

Implementation of **Typhoon Nomogram** on the website for daily life, "Life Ranger"

Free distribution began in April 2017 !!

What is **the worst** typhoon course for your city?

Typhoon Sola-gram



1. Search for "Life Ranger" on your smartphone.
2. Access Life Ranger website, Menu > Disaster prevention > Typhoon Sola-gram

Topic 2
Development Real-time Damage
Prediction Website, **CMAP!**

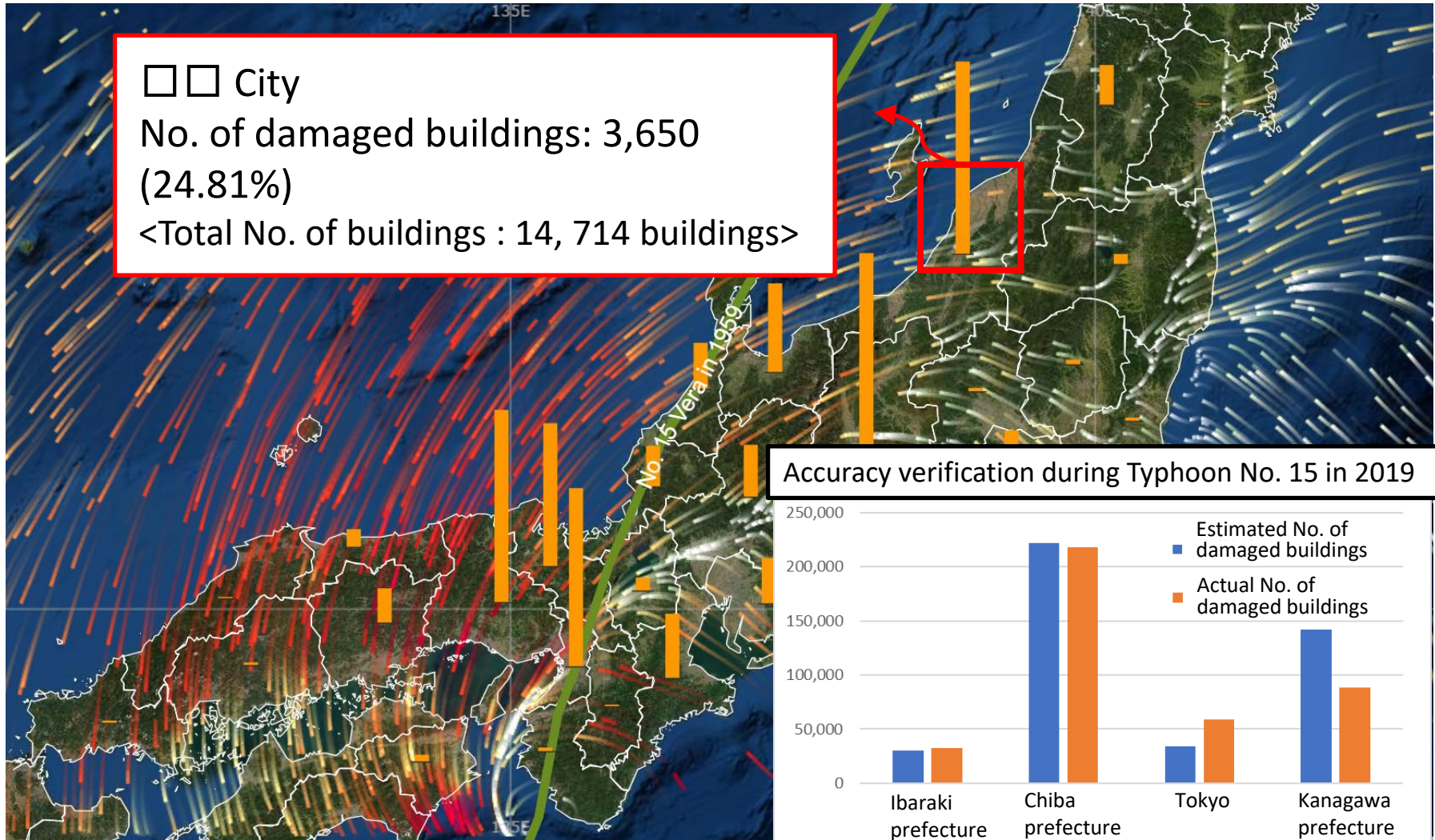
How many **buildings** are estimated
to be damaged?

(World First) Establishment of the website, cmap.dev, which predicts in real time the number of damaged buildings by natural disasters <Search "cmap" >

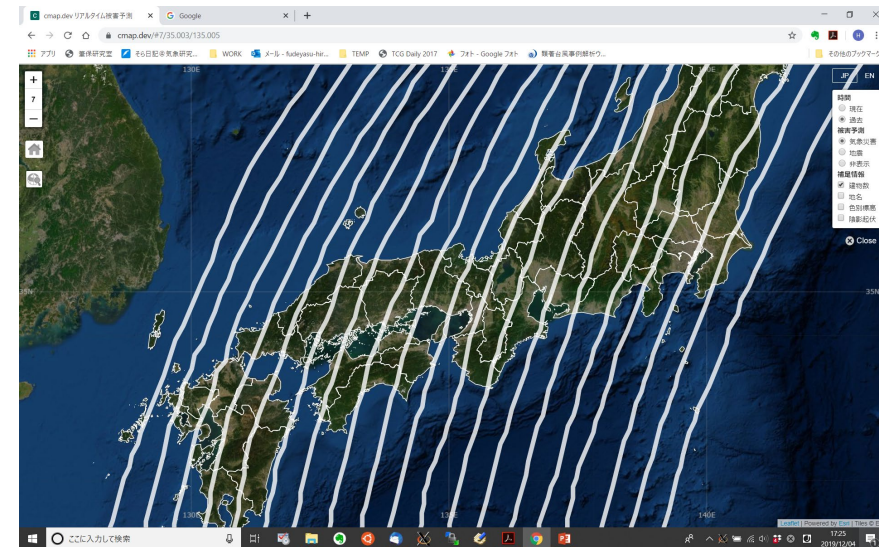
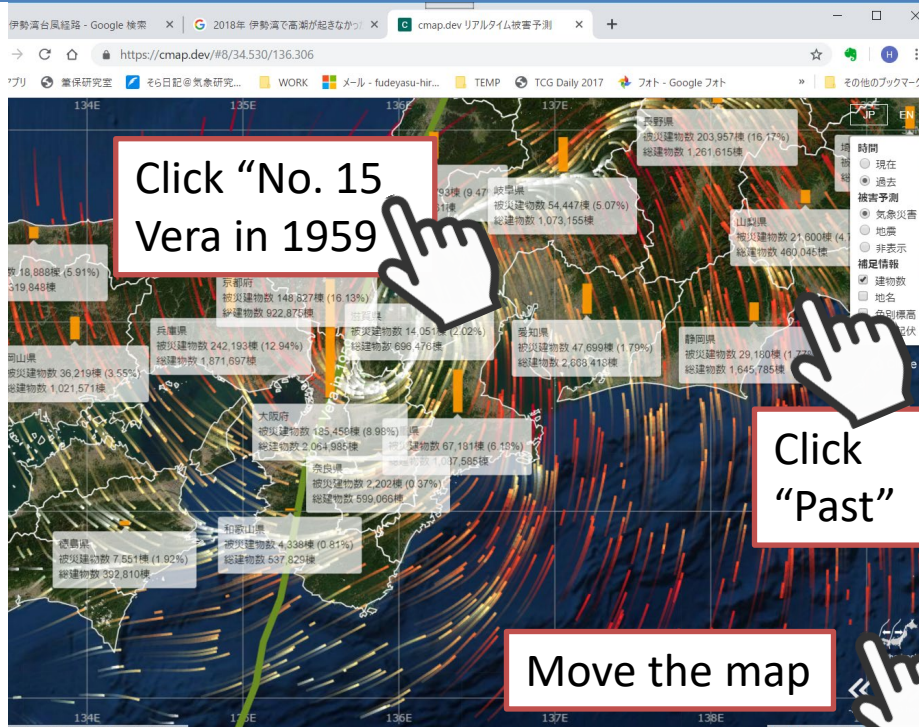
YNU
横浜国立大学

MS&AD
あいおいニッセイ同和損保

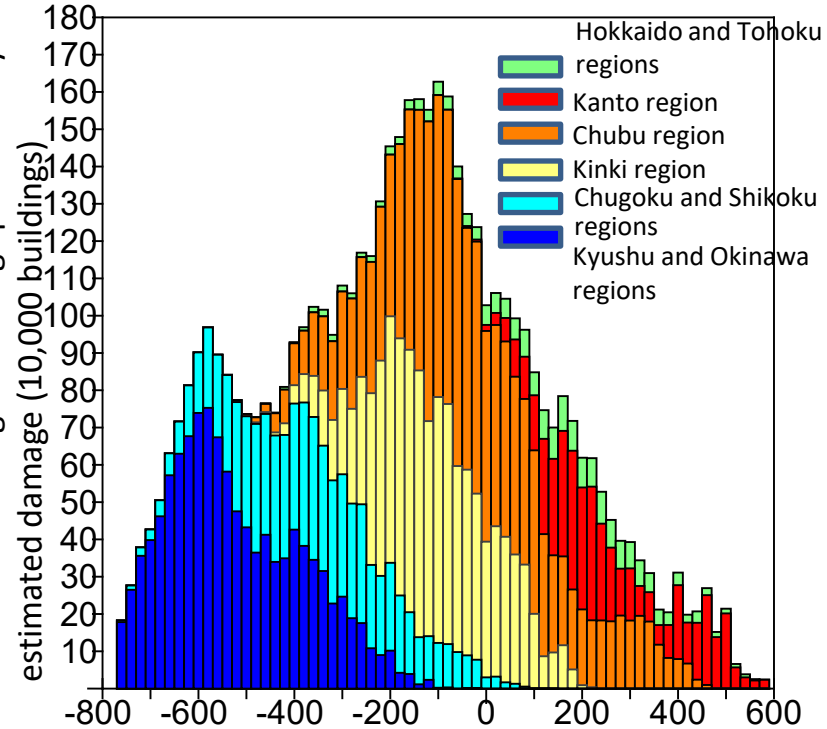
AON
Empower Results®



If Typhoon Vera would come to your city now,,



Number of damaged buildings predicted by the estimated damage (10,000 buildings)



Distance in the east-west direction from the actual course of Typhoon Vera (km)

Topic 3

Typhoon-Shot Project

Changing the perception of typhoon
from **natural disaster** to **source of
energy** by 2050!

Typhoon Shot proposal for the society of 2050

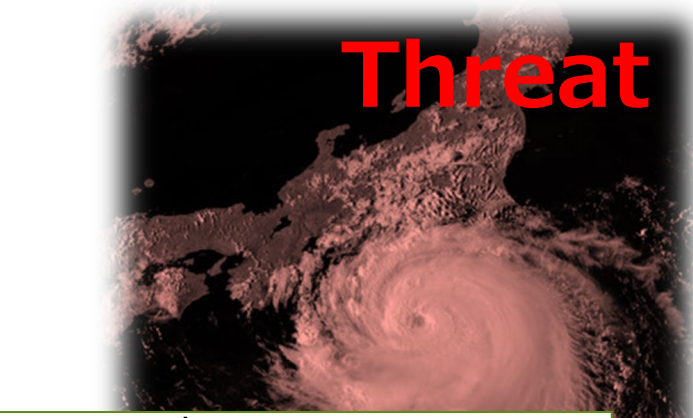
“Changing the perception of typhoon from **natural disaster** to **source of energy**”

When nothing is done,,,

Social vision for 2050

Threat

Benefit



Natural energy

Estimated insurance payments exceed 2 trillion yen
Largest ever for two consecutive years



Severer

Key technologies for realization

negative → zero → positive

1 Development of control method by unmanned aircraft

- Unmanned aircraft drop impact materials to reduce typhoon force

Current situation
Verification of typhoon reduction by computer simulation

2 Development of typhoon reduction and typhoon power generation by unmanned sailing ship

- Underwater propellers generate electricity while sailing against the strong winds of a typhoon

Current situation
Verified by small scale simulated experiments

Today's Summary

Topic 1

Development of **typhoon hazard maps** !

Which regions are at higher risk of typhoons?

Topic 2

Development Real-time Damage Prediction Website, **CMAF!**

How many buildings are estimated to be damaged?

Topic 3

Typhoon-Shot Project

Changing the perception of typhoon from natural disaster to **source of energy** by 2050!