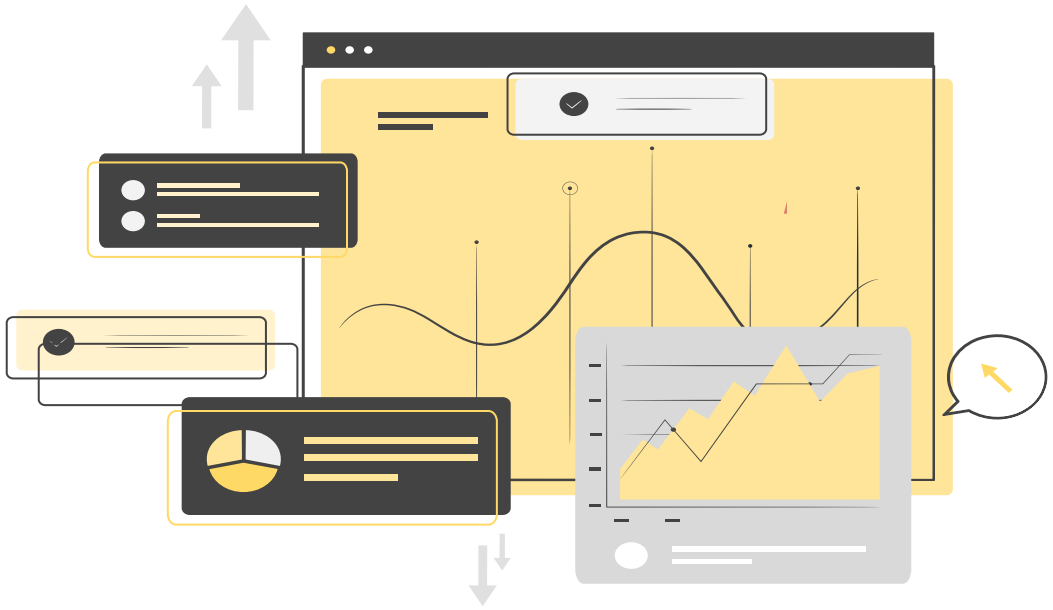
Data & Digital Government for DRR and Building Resilience

Kazushige Endo
Director of UNCRD, Japan



Overview of the Great East Japan Earthquake

(1) Scale

- Date: March 11, 2011 at 14:46 JST
- Epicenter: Bed of Pacific Ocean 100 Kilometers off the coast of theTohoku
- Scale: Magnitude 9.0, Maximum Seismic Intensity 7 (The largest earthquake ever recorded in Japan)

(2) Damage (as of April 10, 2014)

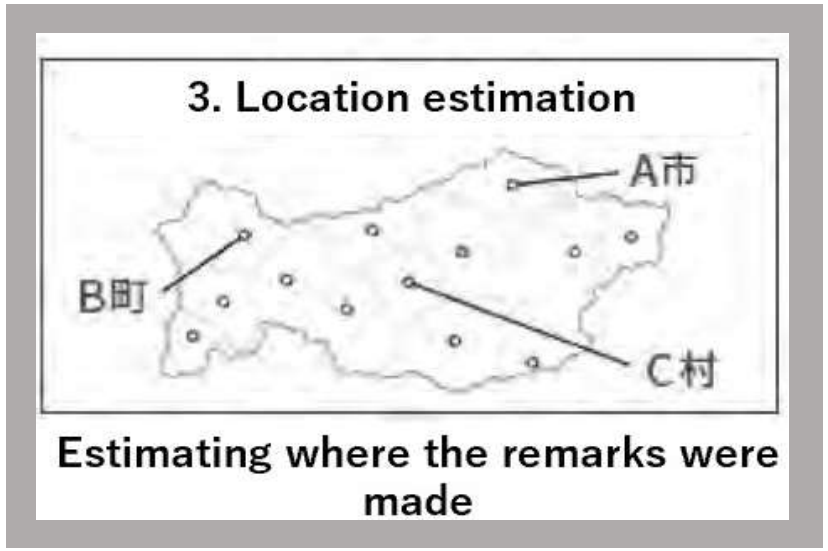
● No. of Human Casualties:	24,674
• Deceased	15,884
• Missing	2,640
• Injured	6,150
● No. of Damaged Buildings:	1,142,776
• Completely Destroyed	126,631
• Half Destroyed	272,653
• Partially Destroyed	743,492

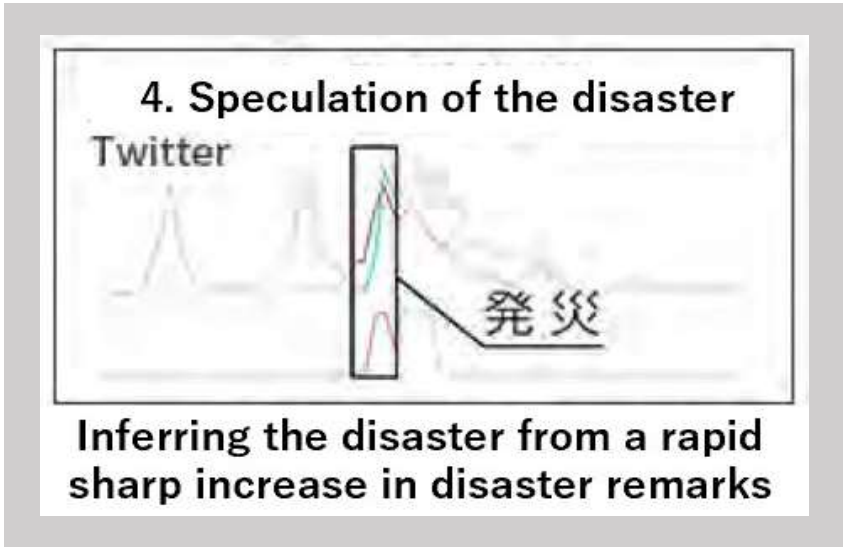
(3) Characteristics

- A wide-area and complex disaster due to the earthquake, tsunami and nuclear accident
- Majority of human casualties and damaged buildings were due to the tsunami

Source: UNCRD

Example 1: Utilization of SNS

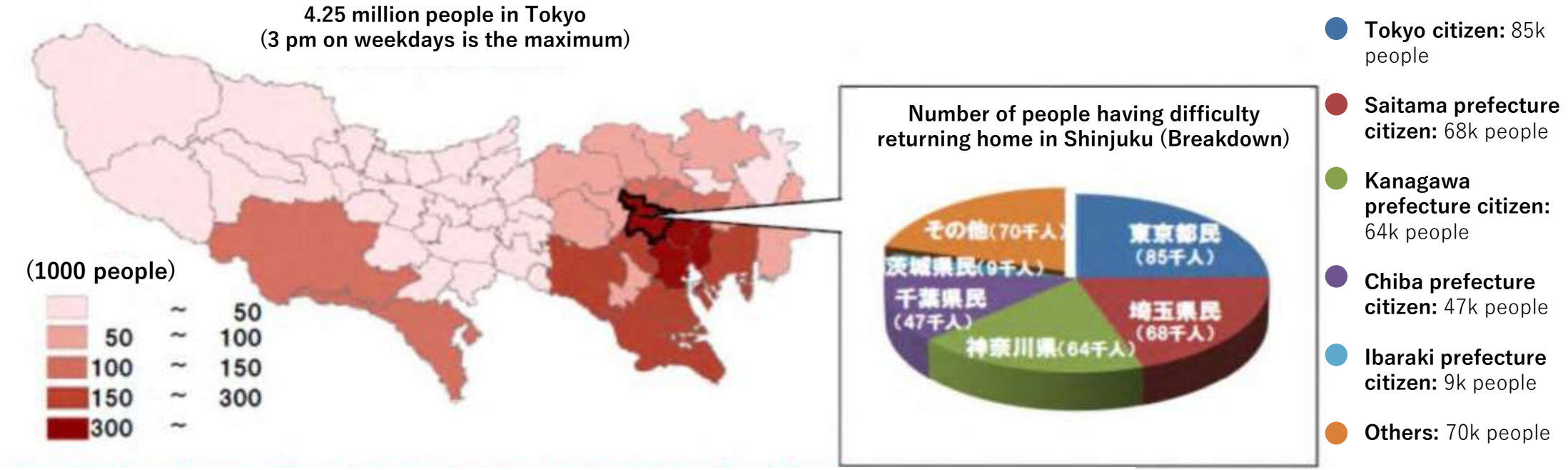




Source: FUJITSU JOURNAL, 『災害予測を迅速かつ正確に、防災を支援する「災害ビッグデータ分析技術」』, May 29, 2015
http://journal.jp.fujitsu.com/2015/05/29/02/

Example 2： Statistical use of mobile location information

Estimating the number of people who have difficulty returning home in each municipality of Tokyo Metropolitan

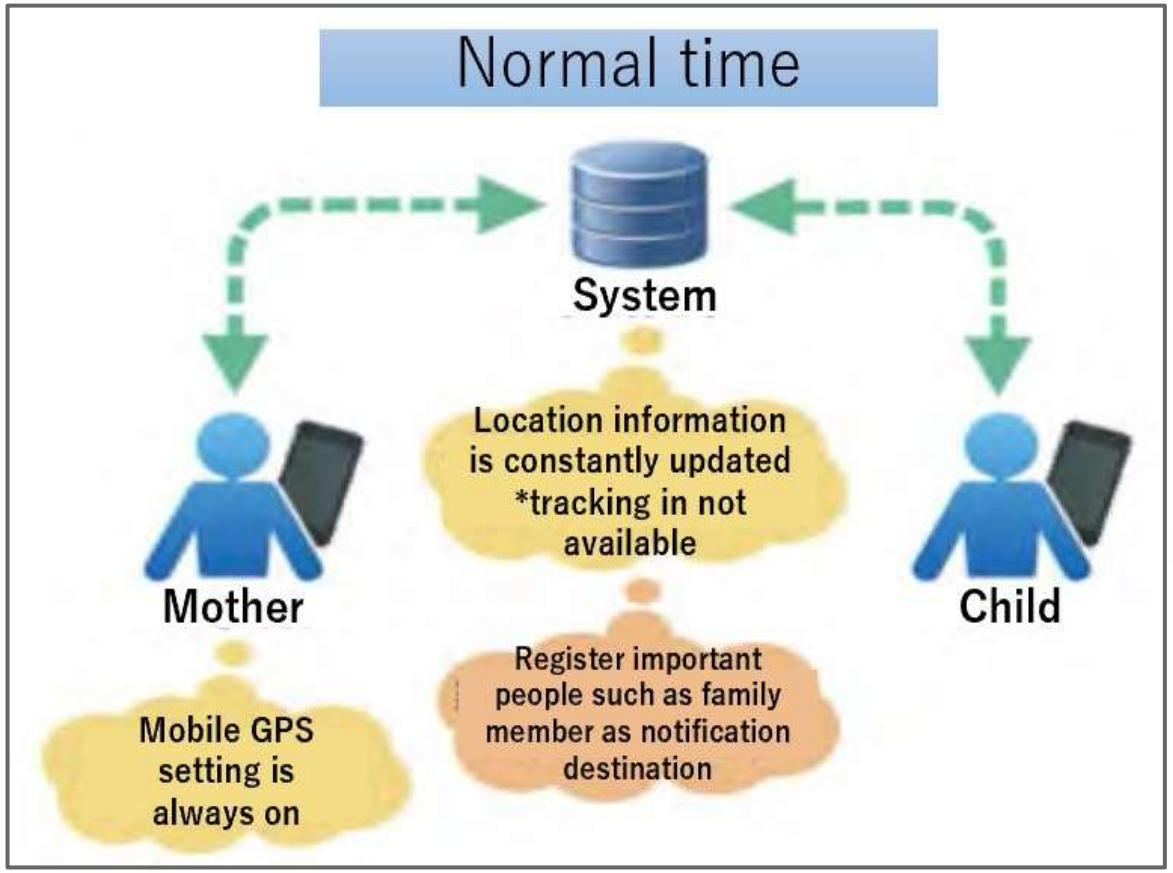


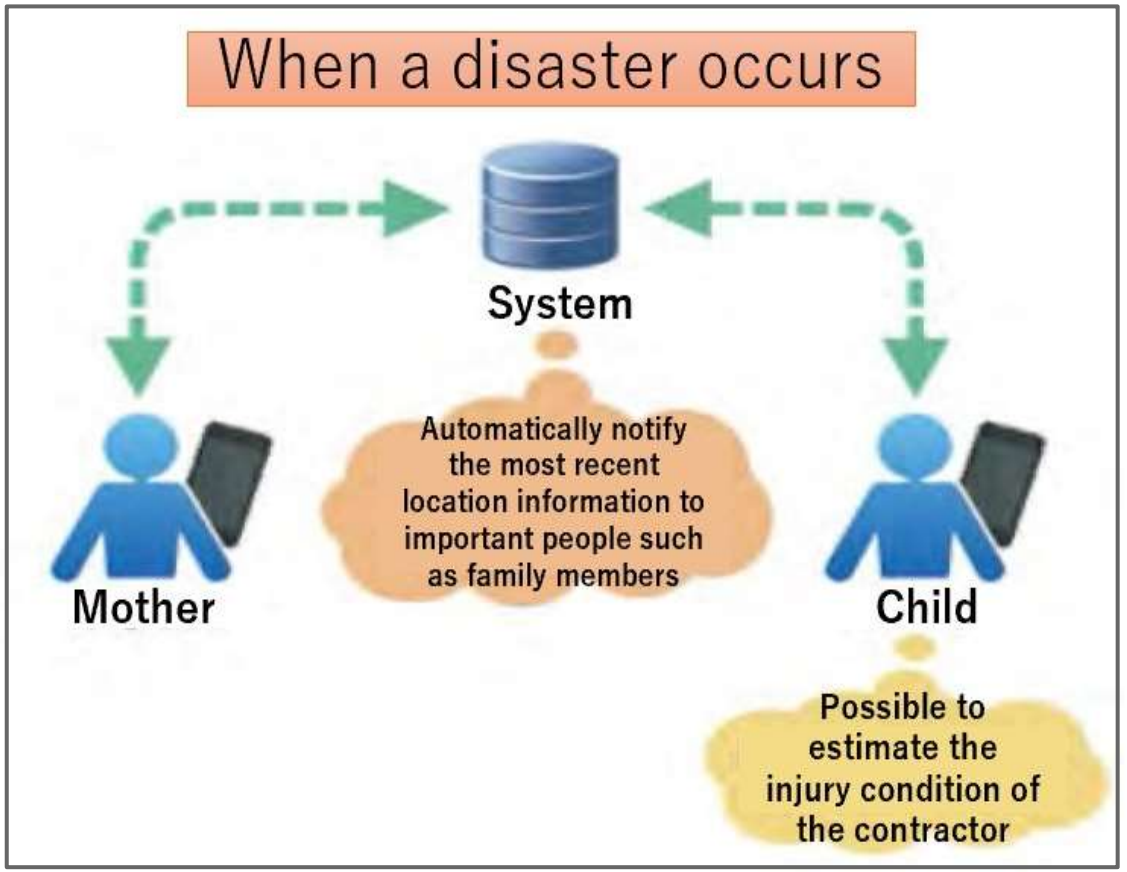
Note: The estimation based on mobile spatial statistic for 15-79 years old on 1st-7th December 2010

Source: NTT DOCOMO provided materials

Example 3： Sharing safety information

- The location information is informed automatically according to the Earthquake Emergency Warning“
- When communication is difficult due to a great disaster, we will notify you of location information
- You can share your safety information and location with a simple operation not only when a disaster occurs but also when you are in trouble or want help on a daily basis.



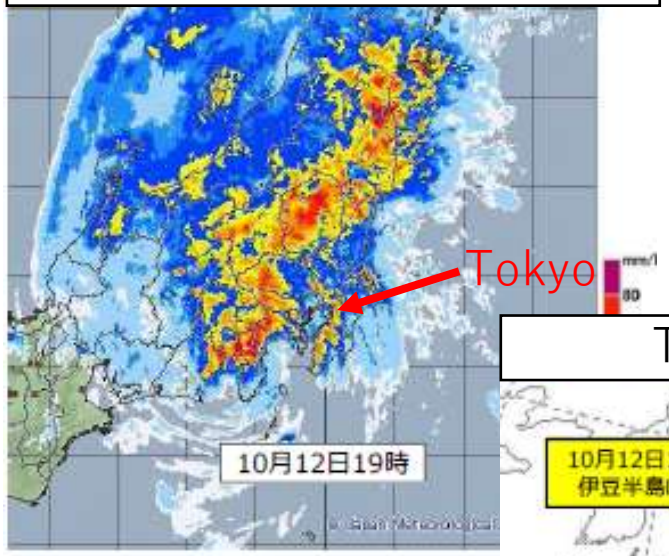


Source: Genetec HP “Cocodayo, an application that supports safety and security” http://www.cocodayo.jp/

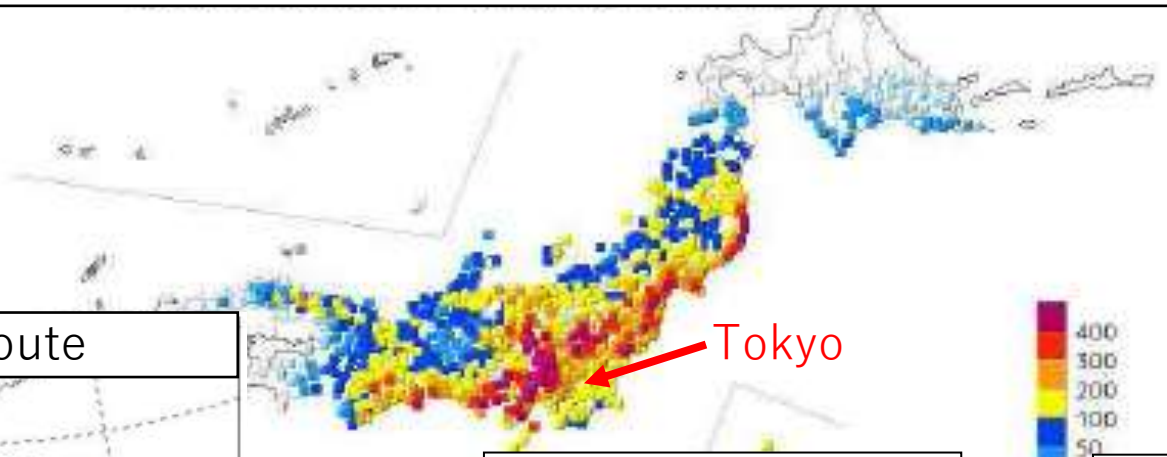
Typhoon Hagibis

- Typhoon Hagibis brought record-breaking rain in Japan on 12th-13th October 2019, especially in Tokyo and surrounding areas.
- Total amount of rainfall reached 1000mm in Hakone and exceed 500mm in 17 spots

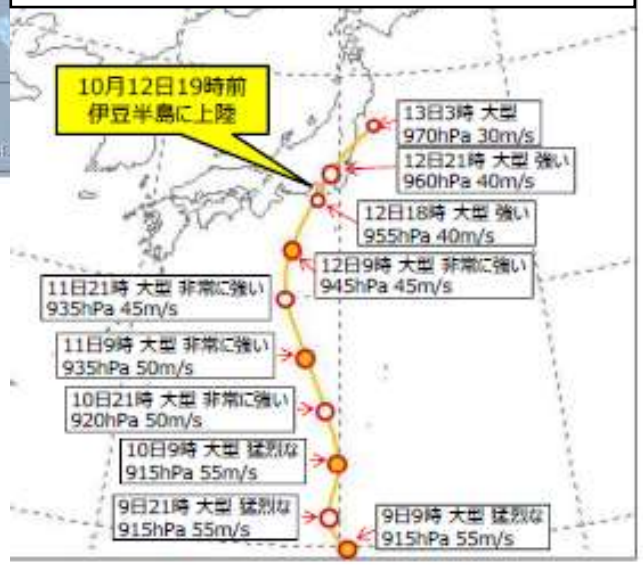
Rainfall radar (10/12 19:00)



Total amount of rainfall

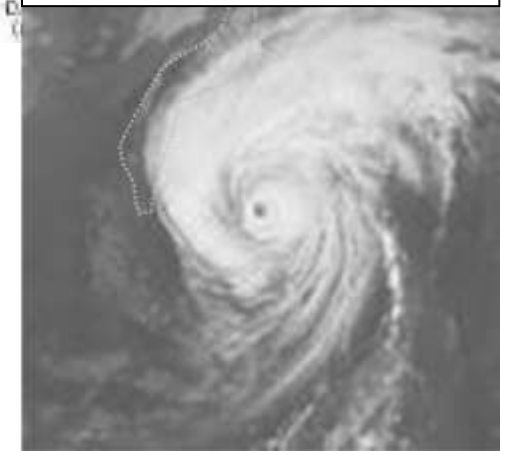


Typhoon route



Typhoon Faxai

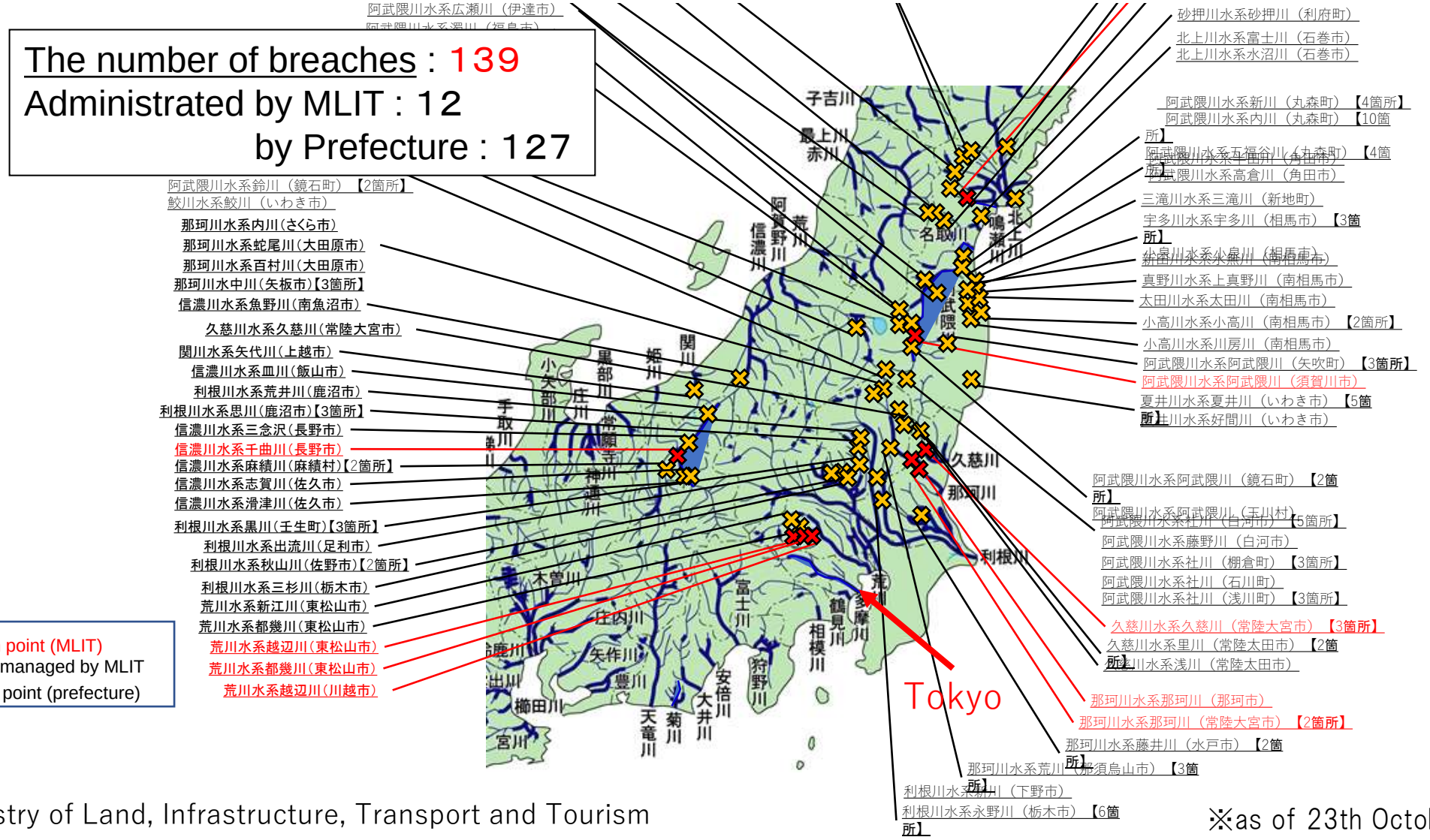
Typhoon Hagibis



Source: Ministry of Land, Infrastructure, Transport and Tourism

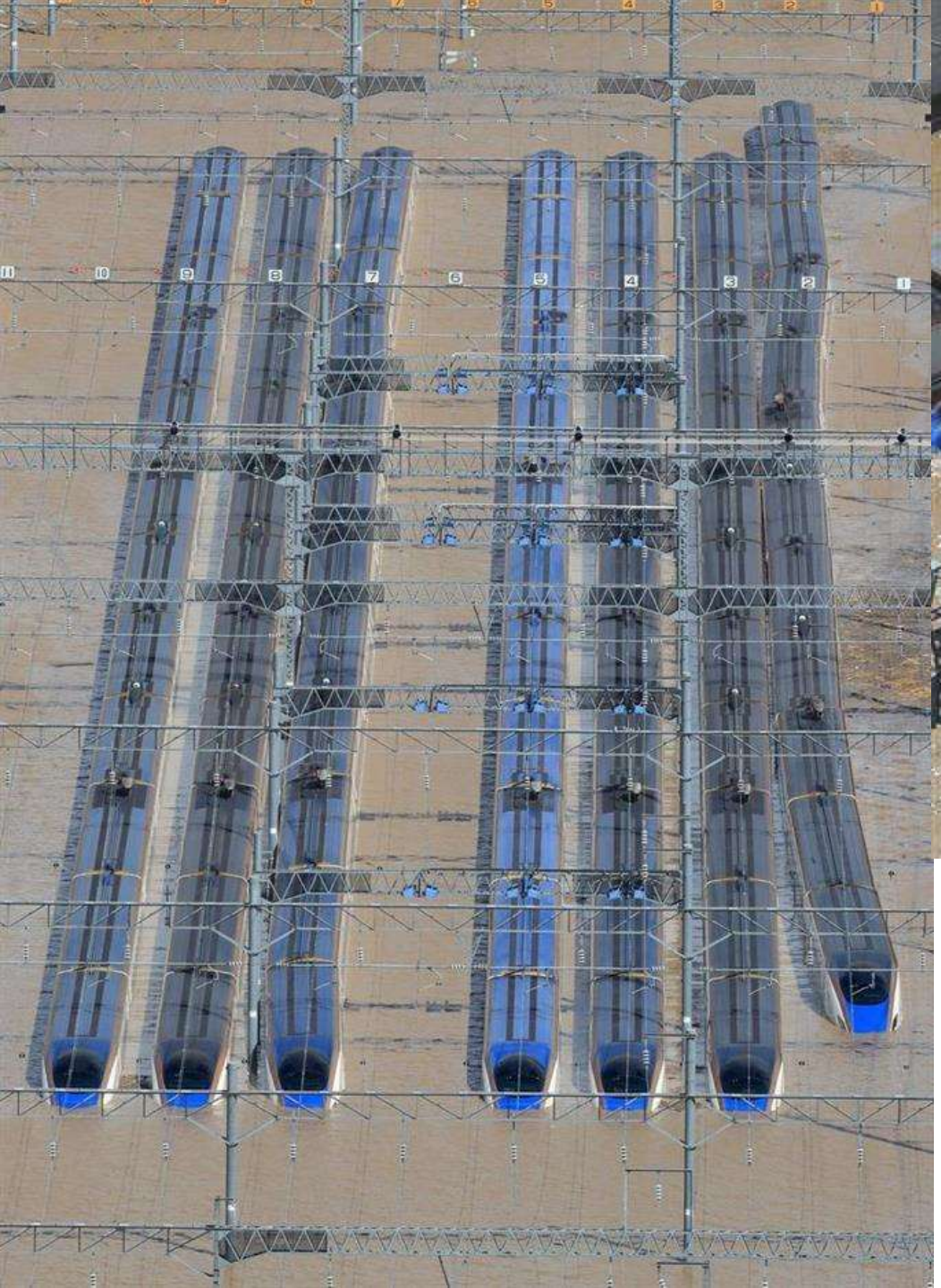
Damage due to Typhoon Hagibis (Levee Breach)

- The torrential rains caused flooding and levee breaches in many areas
- Over 90 people died, 9 people were missing, and 69,215 houses were inundated



Source: Ministry of Land, Infrastructure, Transport and Tourism

※as of 23th October 2019



The Hokuriku-Shinkansen line trains were parked in in Nagano city

Source: Ministry of Land, Infrastructure, Transport and Tourism

Example 4: Prediction of flood damage

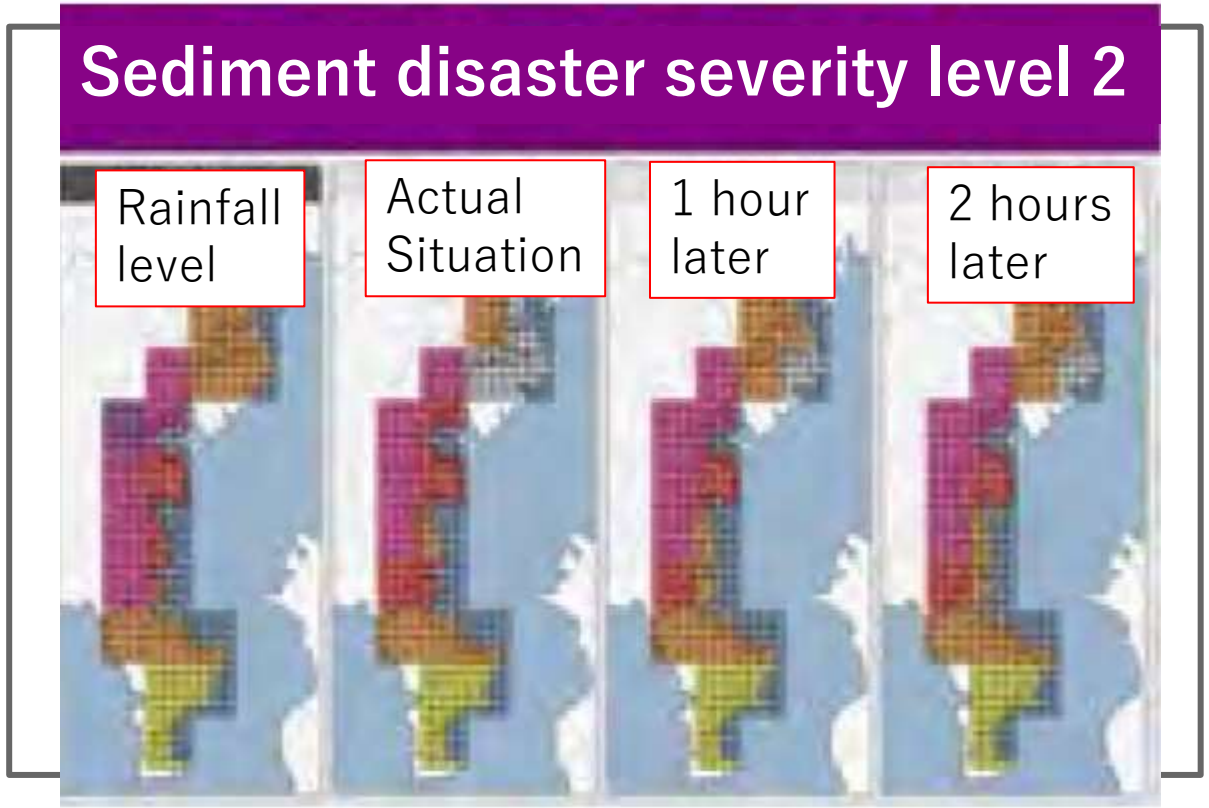
- Advancing river management such as flood forecasting by automatically setting highly predictive parameter values from rainfall data and river flow data
- Simulating of flood spread at the time of bank breakage from topographical data

Large-scale flood damage in the Tone River basin expected to occur due to rainfall with an annual probability of 1/200 and bank breakage

Source: Hitachi Power Solutions HP "Real-time flood simulator DioVISTA/Flood Simulator"
Source: Fujitsu Laboratories Press Release “減災に向け、洪水予測シミュレーターのパラメーター値を自動的に決定する技術を開発”, PW/Fujitsu Labs, March 9, 2015

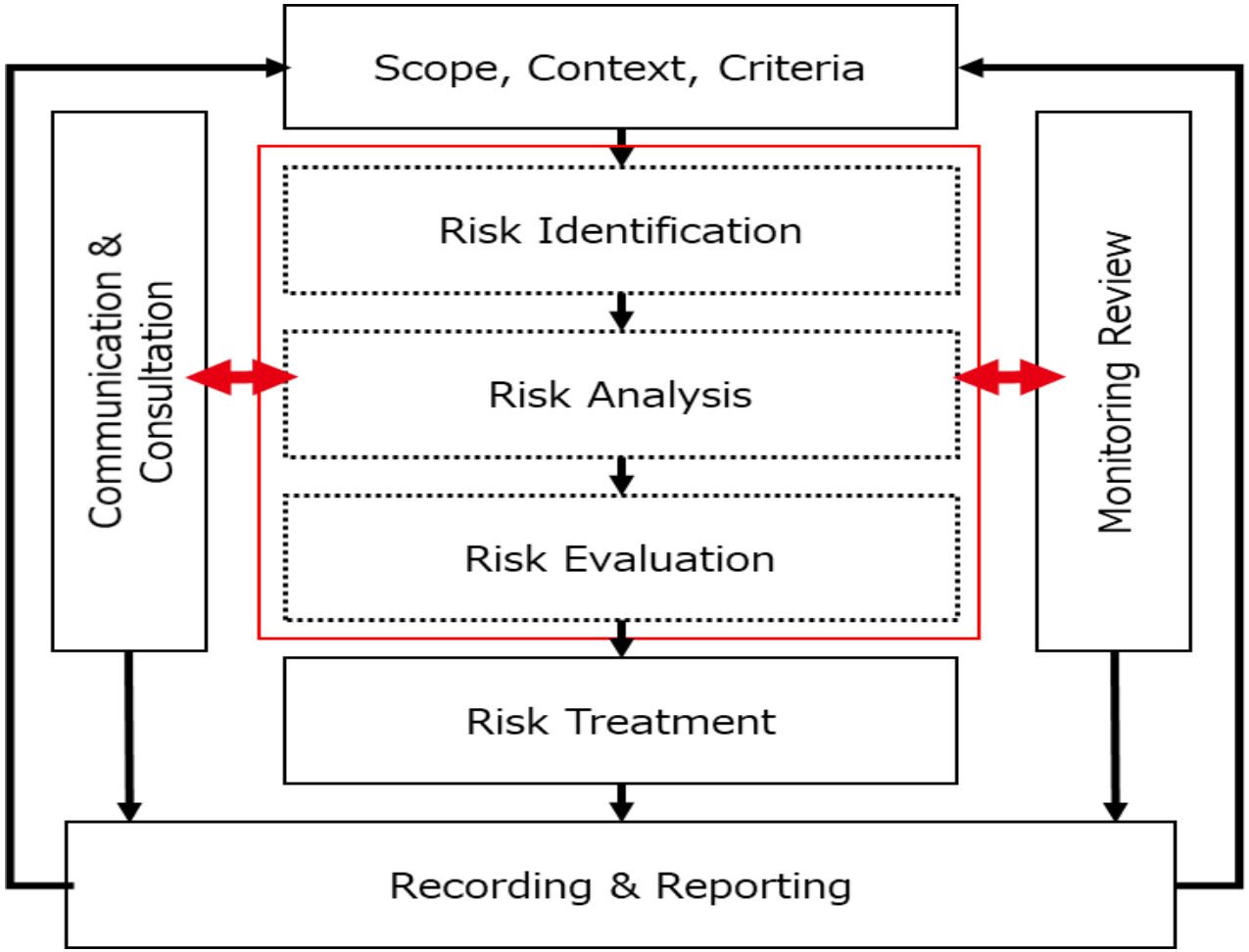
Example 5: Utilization of weather data

- Predict the amount of rainfall along the railway with a 1km mesh, automatically monitor the rain on the entire line and visualize the danger.
- Utilize the soil rainfall index of the Japan Meteorological Agency, visualize the risk of sediment-related disasters up to 6 hours ahead.



Source: Presentation material by President Ochi, Halex Corp., "Protecting life and property by utilizing meteorological big data!"

Process of Risk Management (ISO 31000)



Source: International Organization for Standardization (ISO) 31000 standard ("Risk Management—Guidelines")

Road Geohazard Risk Management Handbook. The management framework is comprised of the stages of (1) Institutional Capacity and Coordination, (2) Systems Planning, (3) Engineering and Design, (4) Operations and Maintenance, and (5) Contingency Planning.

ROAD GEOHAZARD
RISK MANAGEMENT
HANDBOOK

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RISK MANAGEMENT

APPENDIX C:
JAPAN, SERBIA, AND BRAZIL CASE STUDIES

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APPENDIX A: TERMS OF REFERENCE
APPENDIX B: OPERATIONS MANUAL

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https://www.gfdrr.org/en/road-geohazard-handbook