

TPM11 - Session 4

PRA9. Disaster Environment
- Disaster Environment



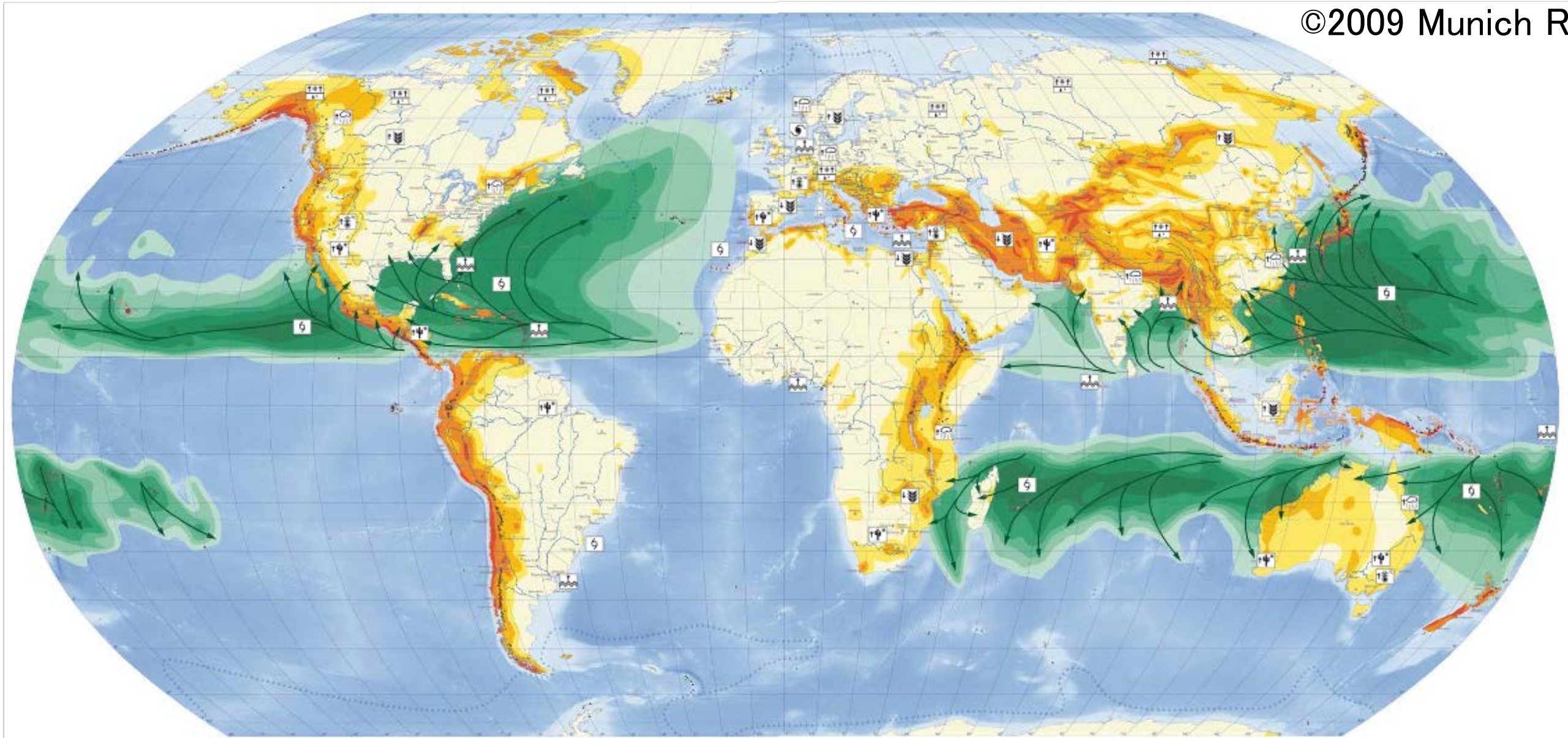
Disaster Environment

The 11th Tripartite Presidents Meeting among
NIES, NIER and CRAES

12 Nov., 2014

World Map of Natural Hazards

©2009 Munich RE



Earthquakes

- Zone 0: MM V and below
- Zone 1: MM VI
- Zone 2: MM VII
- Zone 3: MM VIII
- Zone 4: MM IX and above

Probable maximum intensity (MM: Modified Mercalli scale) with an exceedance probability of 10% in 50 years (equivalent to a "return period" of 475 years) for medium subsoil conditions.

 Large city with "Mexico City effect"

Tropical cyclones

Peak wind speeds*

- Zone 0: 76–141 km/h
- Zone 1: 142–184 km/h
- Zone 2: 185–212 km/h
- Zone 3: 213–251 km/h
- Zone 4: 252–289 km/h
- Zone 5: > 300 km/h

* Probable maximum intensity with an exceedance probability of 10% in 10 years (equivalent to a "return period" of 100 years).

 Typical track directions

Volcanoes

- ▲ Last eruption before 1800 AD
- ▲ Last eruption after 1800 AD
- ▲ Particularly hazardous volcanoes

Tsunamis and storm surges

-  Tsunami hazard
-  Isseismic sea-wave
-  Storm surge hazard
-  Tsunami and storm surge hazard

Iceberg drifts



Climate impacts

Main impacts of climate change already observed and/or expected to increase in the future






-  Change in tropical cyclone activity
-  Intensification of extratropical storms
-  Increase in heavy rain
-  Increase in heatwaves
-  Increase in droughts

-  Threat of sea level rise
-  Permafrost thaw
-  Improved agricultural conditions
-  Unfavourable agricultural conditions

Political borders

-  State border
-  State border controversial (political borders not binding)

Cities

-  Derby > 1 million inhabitants
-  San Juan 100,000 to 1 million inhabitants
-  Munich < 100,000 inhabitants
-  Berlin Capital city
-  Munich Re office

Data resources:

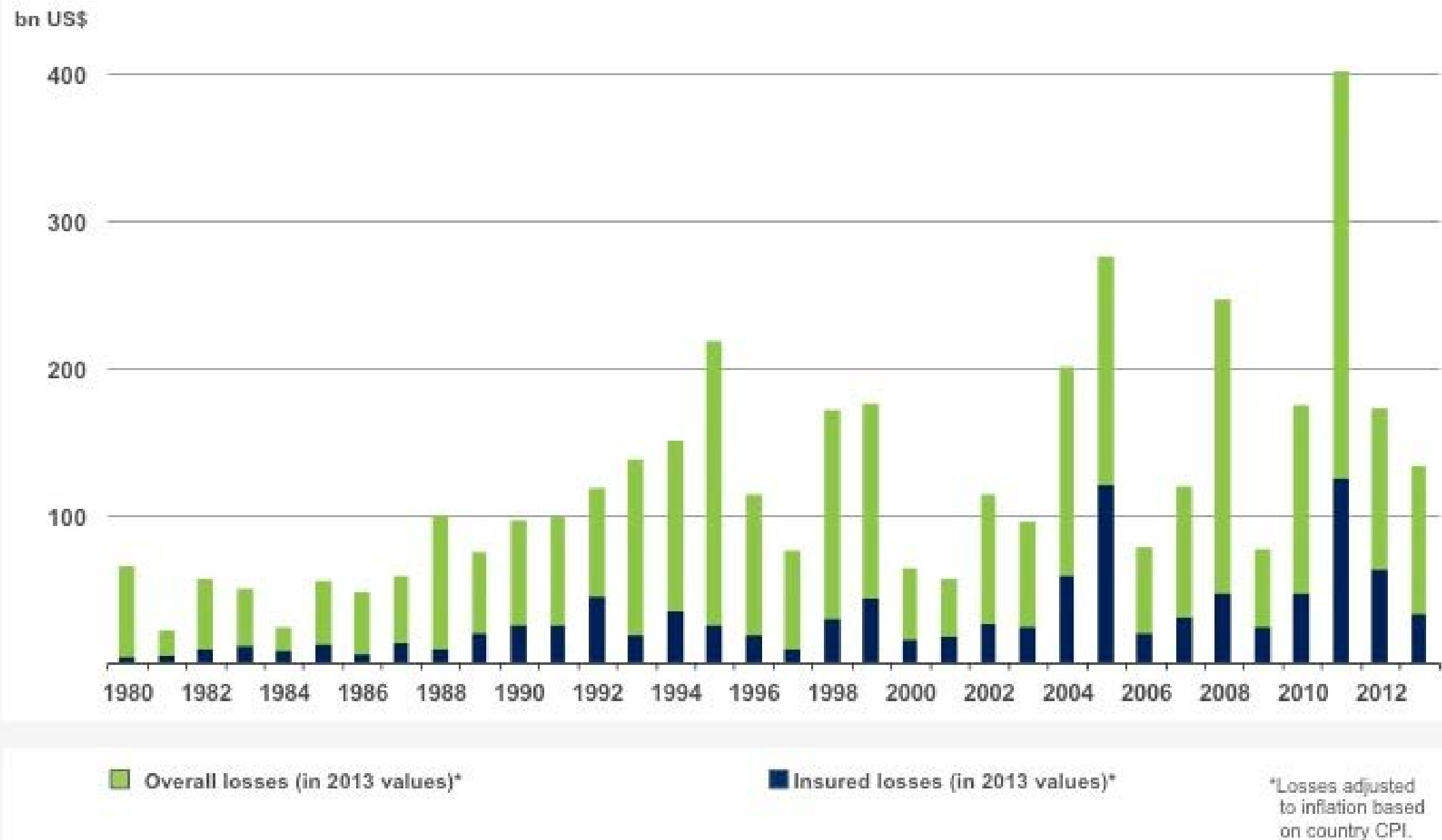
Bathymetry: Amante, C. and B. W. Eakins, ETOPO1 1 Arc-Minute Global Relief Model: Procedures, Data Sources and Analysis, National Geophysical Data Center, NESDIS, NOAA, U.S. Department of Commerce, Boulder, CO, August 2009.
Extratropical storms: KNMI/Royal Netherlands Meteorological Institute. **Lightning strikes:** NASA USQTD Science Team, NASA/MSFC/GHRC. **Temperature/Precipitation 1979–2007:** Climatic Research Unit, University of East Anglia, Norwich.

NatCatSERVICE

Munich RE 

Loss events worldwide 1980 – 2013

Overall and insured losses



© 2014 Münchener Rückversicherungs-Gesellschaft, Geo Risks Research, NatCatSERVICE – As at February 2014

Environmental Issues after 2011 Tohoku Disaster

1995 Hanshin-Awaji



2007 Niigata

Environmental Issues after 2011 Tohoku Disaster

Ohtsuchi, Iwate



Ishinomaki, Miyagi



Rikuzentakada, Iwate



Sendai, Miyagi

Environmental Issues after Flooding Disasters



Sanjyo City, Niigata

Nakanoshima Town, Niigata



Temporary Site
Toyooka City, Hyogo

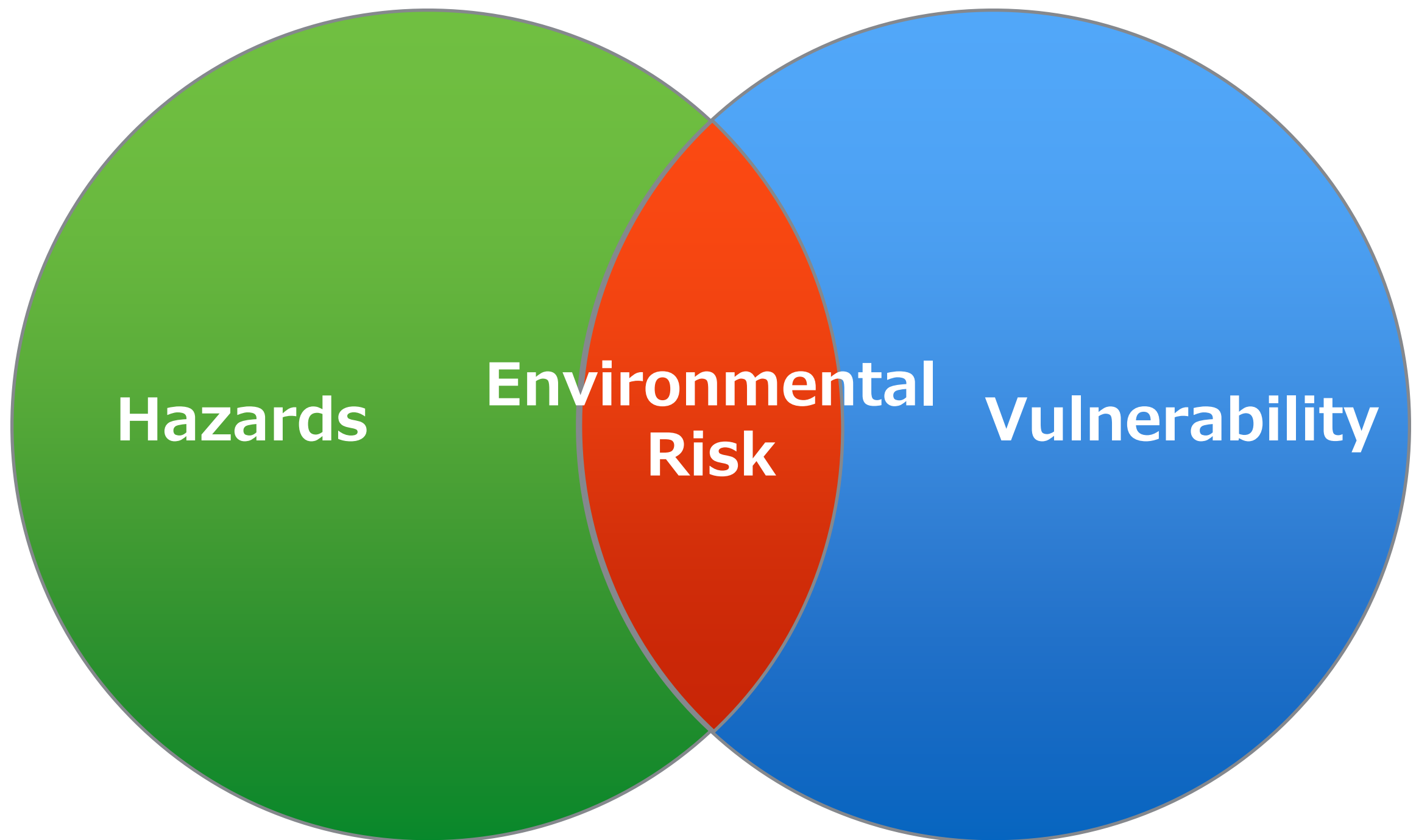


Fukui City, Fukui



Mitsuke City, Niigata

Disaster and Environment



Disaster and Society

$$> D = f(H, E, V, A, T)$$

- Disaster
- Hazard
- Effect
- Vulnerability
- Activity
- Timing

Disaster and Environment

$$> D = f(H, E, V_E, A, T)$$

- Disaster
- Hazard
- Effect
- Vulnerability in Environment
- Activity
- Timing

Environment Emergency Management

Concept of Disaster and Environment

**Vulnerability in
Environment System**

×

Hazards

=

**Environmental Risk
in Disasters**

Pre-Incident

Incident

Post-Incident

Prevention

Preparedness

Response

Crisis Management

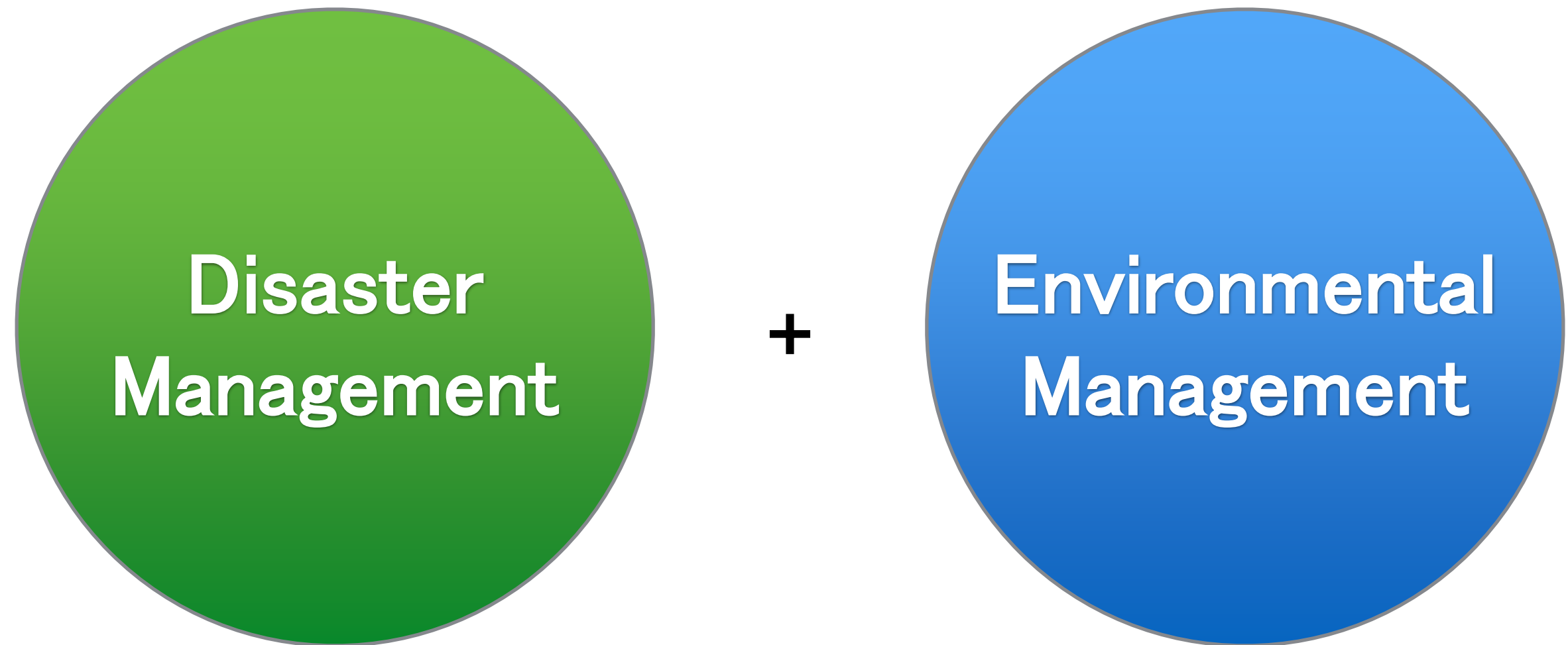
Risk Management

Recovery

Mitigation

**Reduction of Vulnerability in Environment System
Prevention of Emergency Environment, Human Security**

Disaster Management and Environment Management



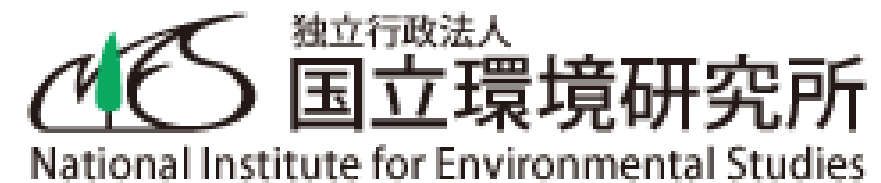
Safety and Security of
Society = Sustainable Society

Resilient Society, Community

Disaster Environment

> NIES (LCI)

- Dr. HIRAYAMA Nagahisa
- Dr. NAKAYAMA Shoji



> NIER

- Dr. KIM Kyung Hyun
- Dr. KANG Taegu



> CRAES

- Dr. ZHANG Linbo



Disaster Environment Keywords

- > Emergency environmental management
- > Emergency response
- > National response frameworks/system
- > Emergency planning
- > Environmental impact
- > Risk management
- > Water pollution accidents
- > Chemical incident prevention
- > Chemical accidents
- > Radioactive contamination
- > Zoonotic diseases such as avian influenza and Foot-and-Mouth diseases
- > Prevention of natural disasters (Typhoons/Tidal surges(Tsunami)/Floods/Earth quakes)
- > Disaster reduction in urban areas
- > Experiences exchange and networking

Disaster & Environment

- > Disaster & Environment, Preparedness, Resilience in Japan, Korea, and China
 - to share our experiences related to disaster environment
 - to transfer lessons of disaster environment

Disaster Environment Activities at First Step

- Information exchange among researchers
- Small workshop on exchange of our experiences in disaster and environment

Small Workshop (In Planning)

- > Objectives
 - To share case studies on ‘disaster environment’ among China, Korea, and Japan
 - To share research issues on ‘disaster environment’ among China, Korea, and Japan
- > Dec. 2014 or later