Asian Conference on Disaster Reduction 2019

PHILIPPINE INITIATIVES ON EARTHQUAKE RISK REDUCTION

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Capacity Building and Training Service
Office of Civil Defense – NDRRMC, Philippines

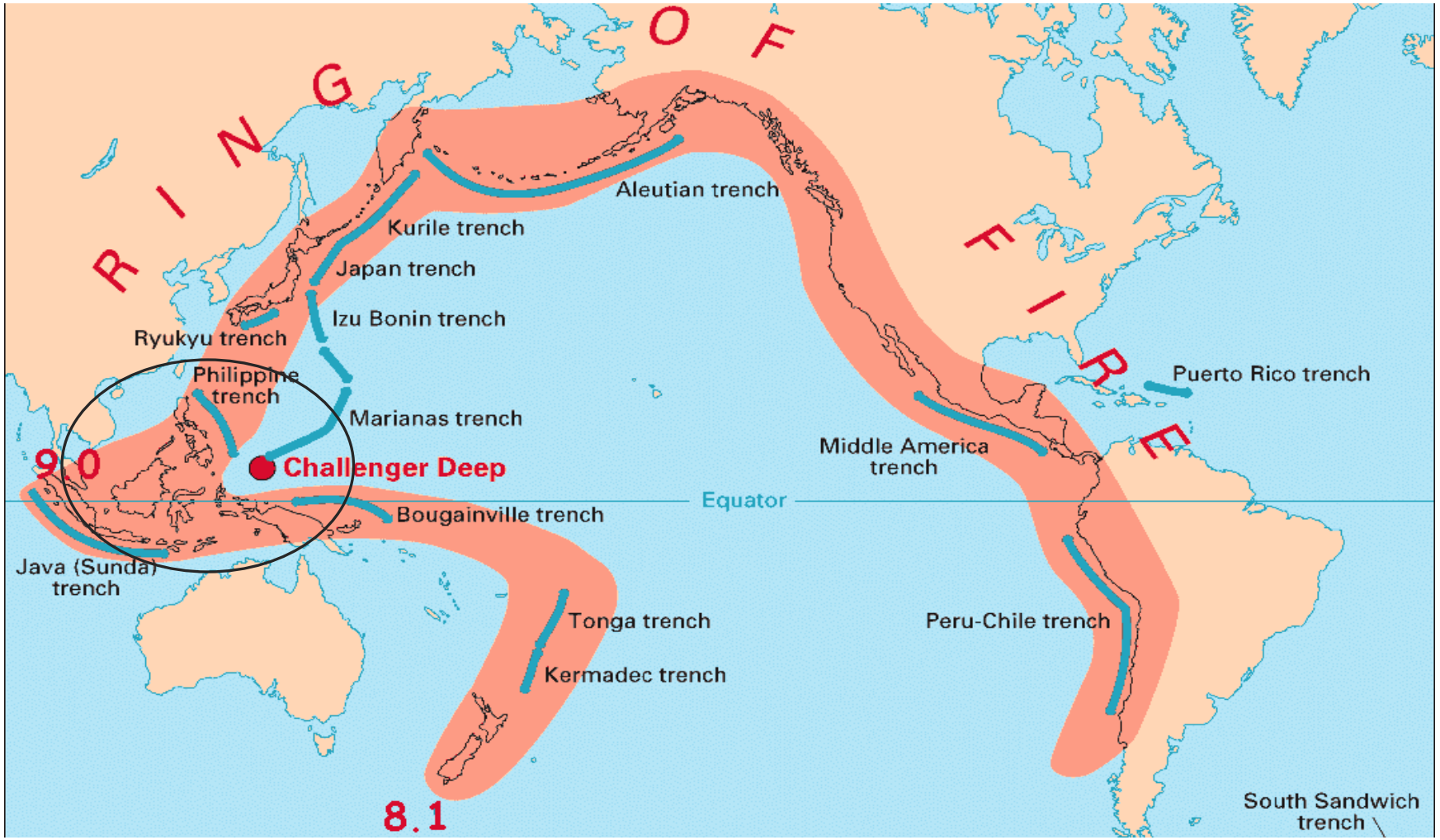
SCOPE OF PRESENTATION

1 **Earthquake Risk Profile**

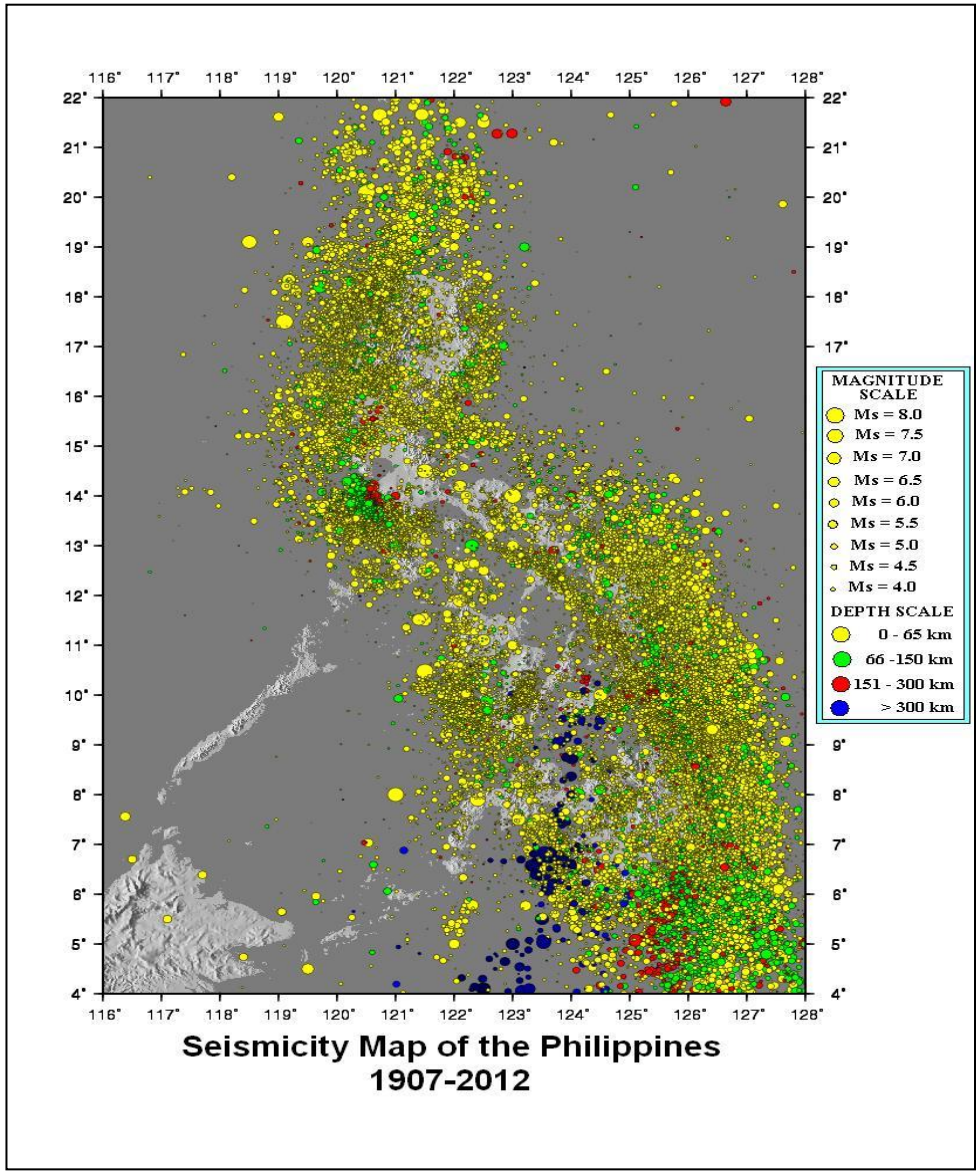
2 **National Government Initiatives**

Earthquake Risk Profile

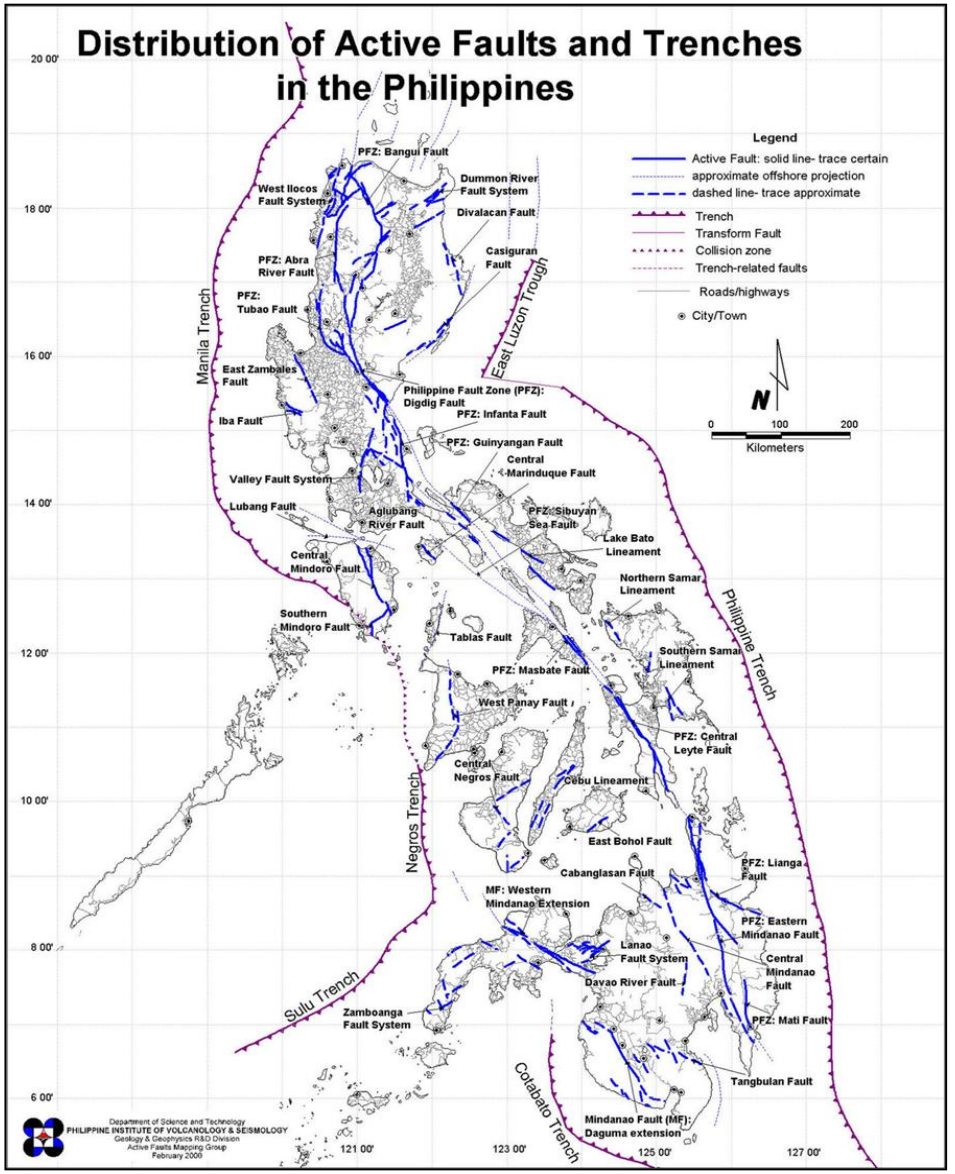
Pacific Ring of Fire



Credit: Google Images



Seismicity Map of the Philippines
1907-2012



Average of 20 Earthquakes Daily

1968 Casiguran Earthquake (M 7.3)

Credit: Google Images

1976 Moro Gulf Tsunami (M 8.1)

Credit: Google Images

1990 Luzon Earthquake (M 7.7)

Credit: Google Images

2013 Bohol Earthquake (M 7.2)

Credit: Google Images

2018 Davao Oriental Earthquake (M 6.4)

Credit: Google Images

2019 Earthquakes

Porac, Pampanga
(M 6.1)

Itbayat, Batanes
(M 5.9)

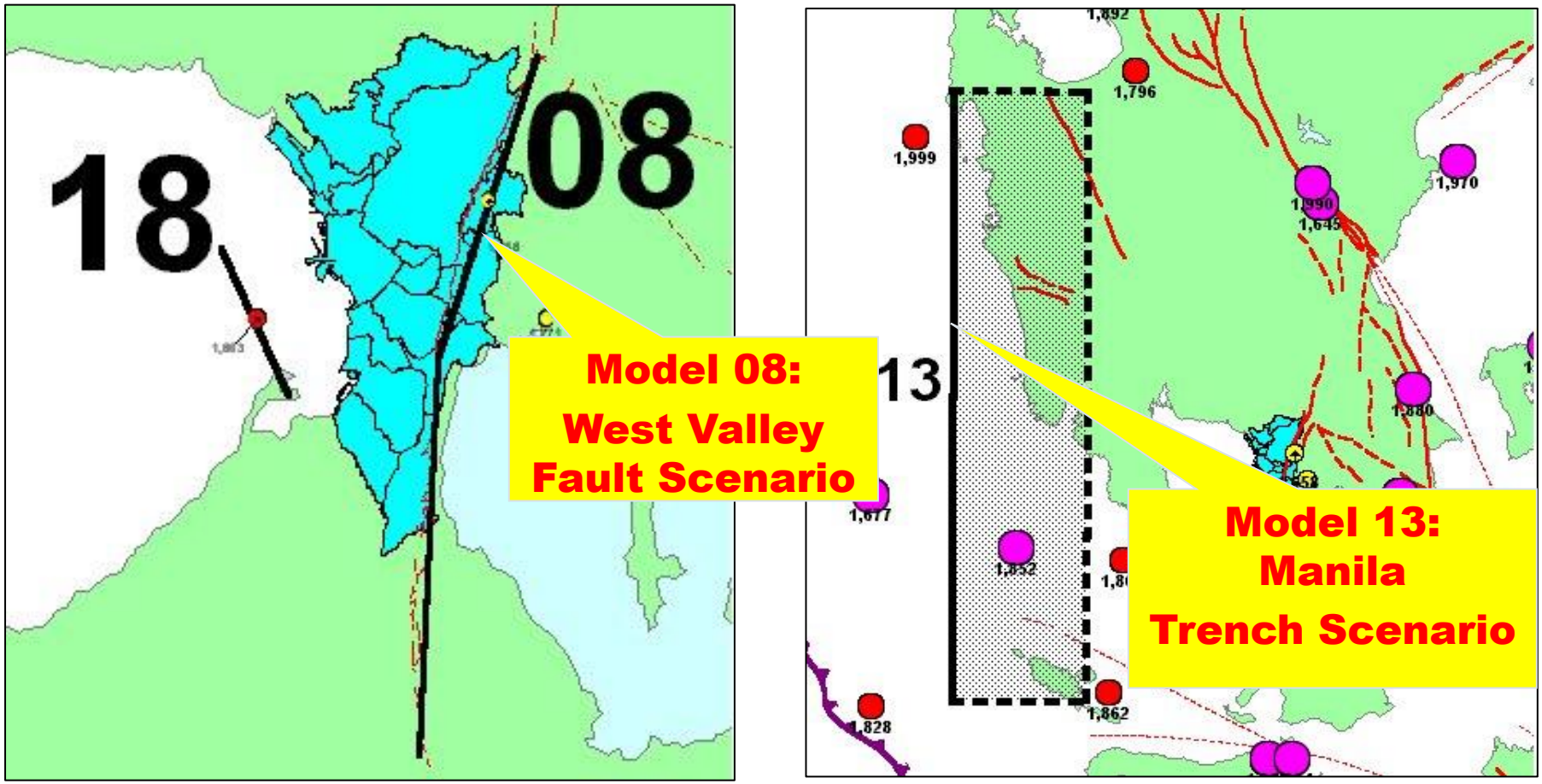
Castillejos, Zambales
(M 6.1)

San Julian, Eastern Samar
(M 6.5)

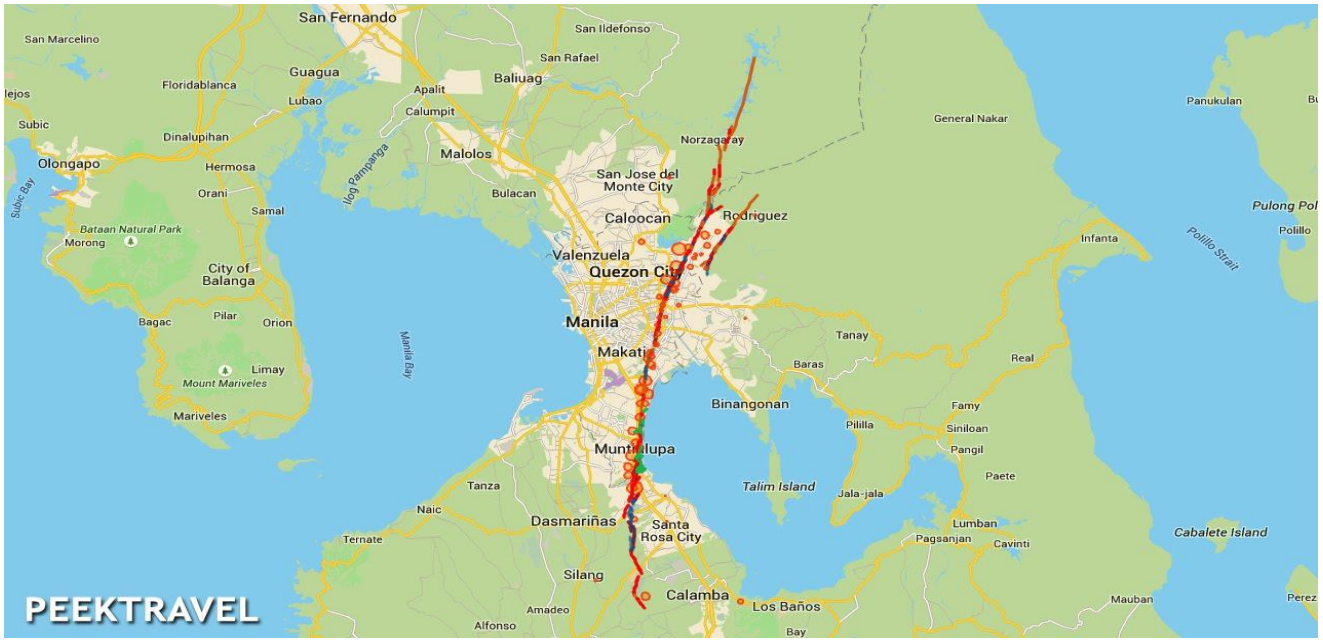
Tulunan, Cotabato
(M 6.6)

Credit: Google Images

Worst-Earthquake Scenarios in Metro Manila



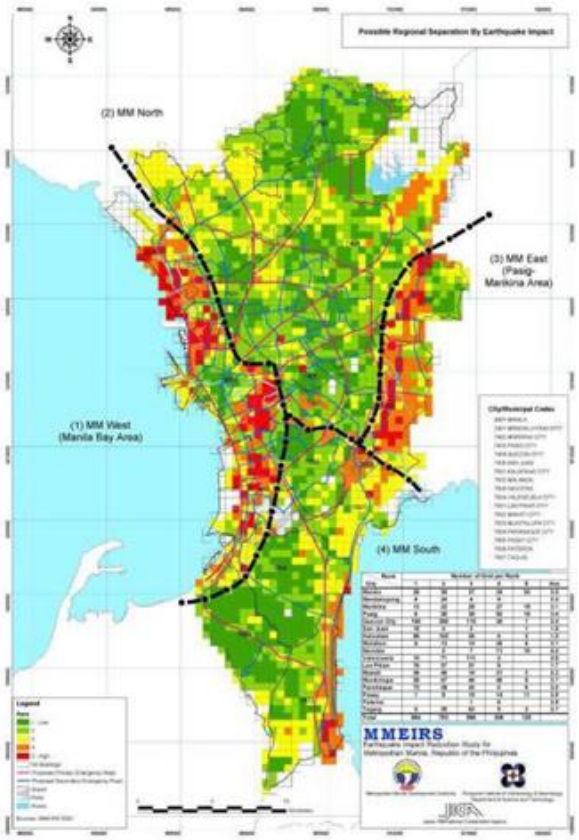
West Valley Fault: Magnitude 7.2 Earthquake



Moved 4 times in the past 1,400 years (around 400 years interval)

Last major earthquake recorded was in1658

Anticipated Regional Separation of Metro Manila



SECTORS	EXPECTED REGIONAL SEPARATION
East	Pasig, Marikina
West	Manila, San Juan, Mandaluyong
North	North 1: Caloocan, Malabon, Navotas, Valenzuela North 2: Quezon City
South	South 1: Las Pinas, Muntinlupa, Paranaque, Pasay South 2: Taguig, Makati, Pateros

Other Areas to be Heavily Affected by the Earthquake

REGION	LOCAL GOVERNMENT UNITS
Central Luzon	Bulacan (Doña Remedios Trinidad, Norzagaray and San Jose Del Monte City) Pampanga
CALABARZON	Rizal (Rodriguez) Laguna (San Pedro City, Biñan City, Sta. Rosa City, Cabuyao City, and Calamba City) Cavite (Carmona, General Mariano Alvarez, and Silang)

Reference: DOST-PHIVOLCS

Estimated Impacts in Three Regions
(Consolidated Working Data)

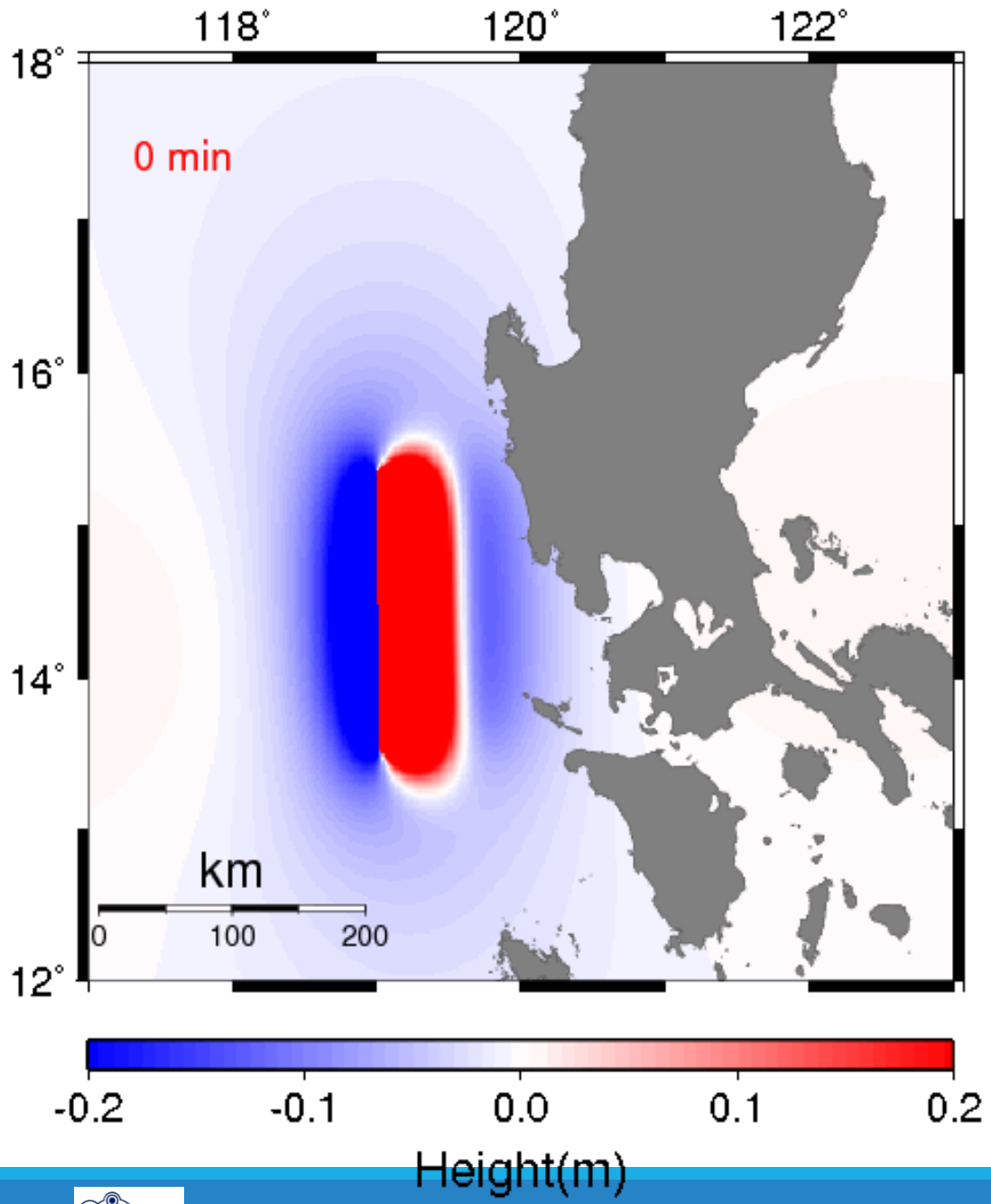
53k dead

145k missing

700k injured

5.3mil displaced

*Reference for Dead and Injured (consolidated): RAP 2014, RDRRMC III, Rizal, Cavite and Laguna CPs
*Reference for Missing: INSARAG ERE 2018
*Reference for Displaced: INSARAG ERE 2018



Manila Trench: Magnitude 8.3 Earthquake and Tsunami

Tsunami Height and Inundation

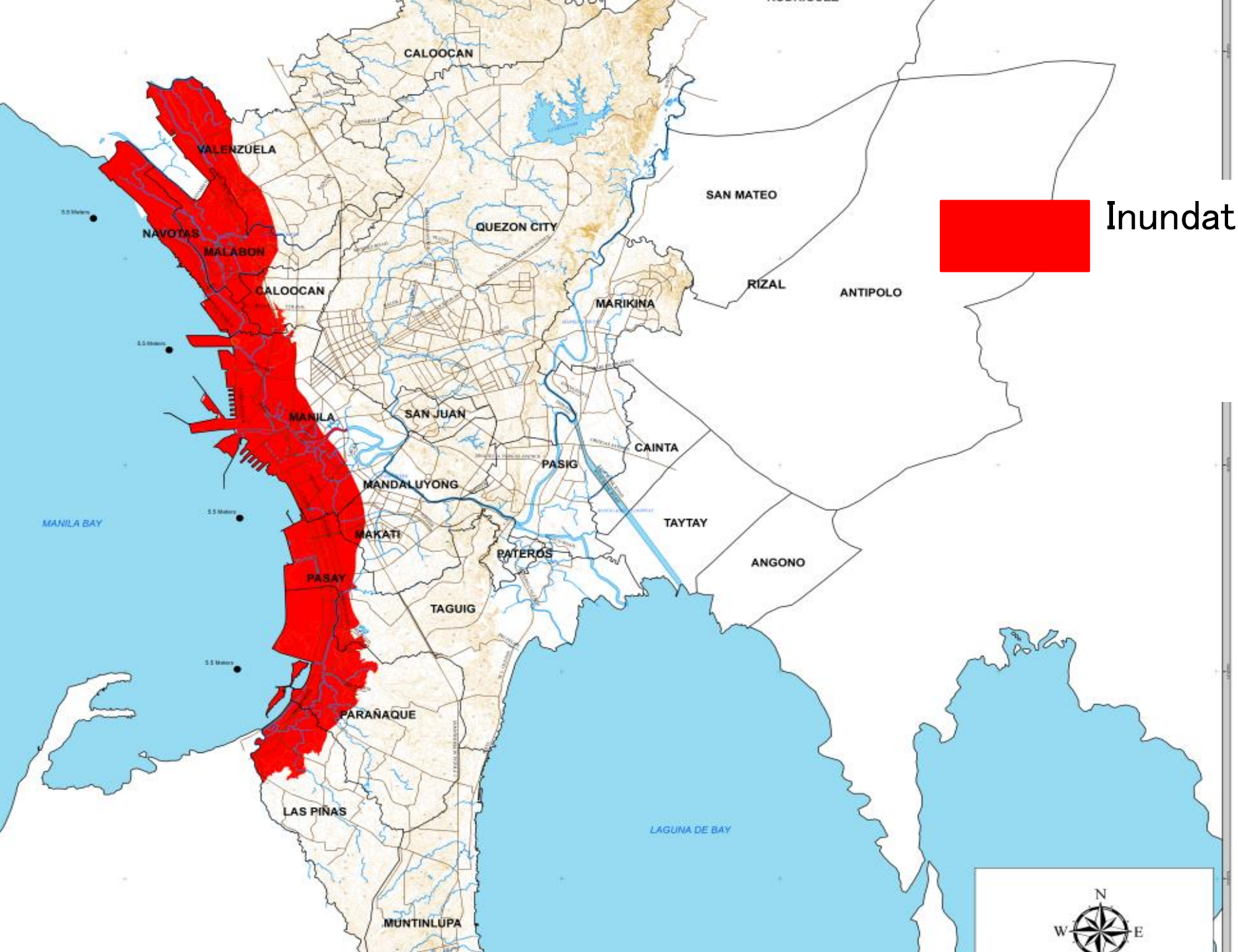
Table 1 : Modeled Tsunami Height in the coast of Manila Bay

Maximum Tsunami Run-up Height	Maximum Tsunami Run-up Height (w/ tide)
3.5 m	5.5 m*

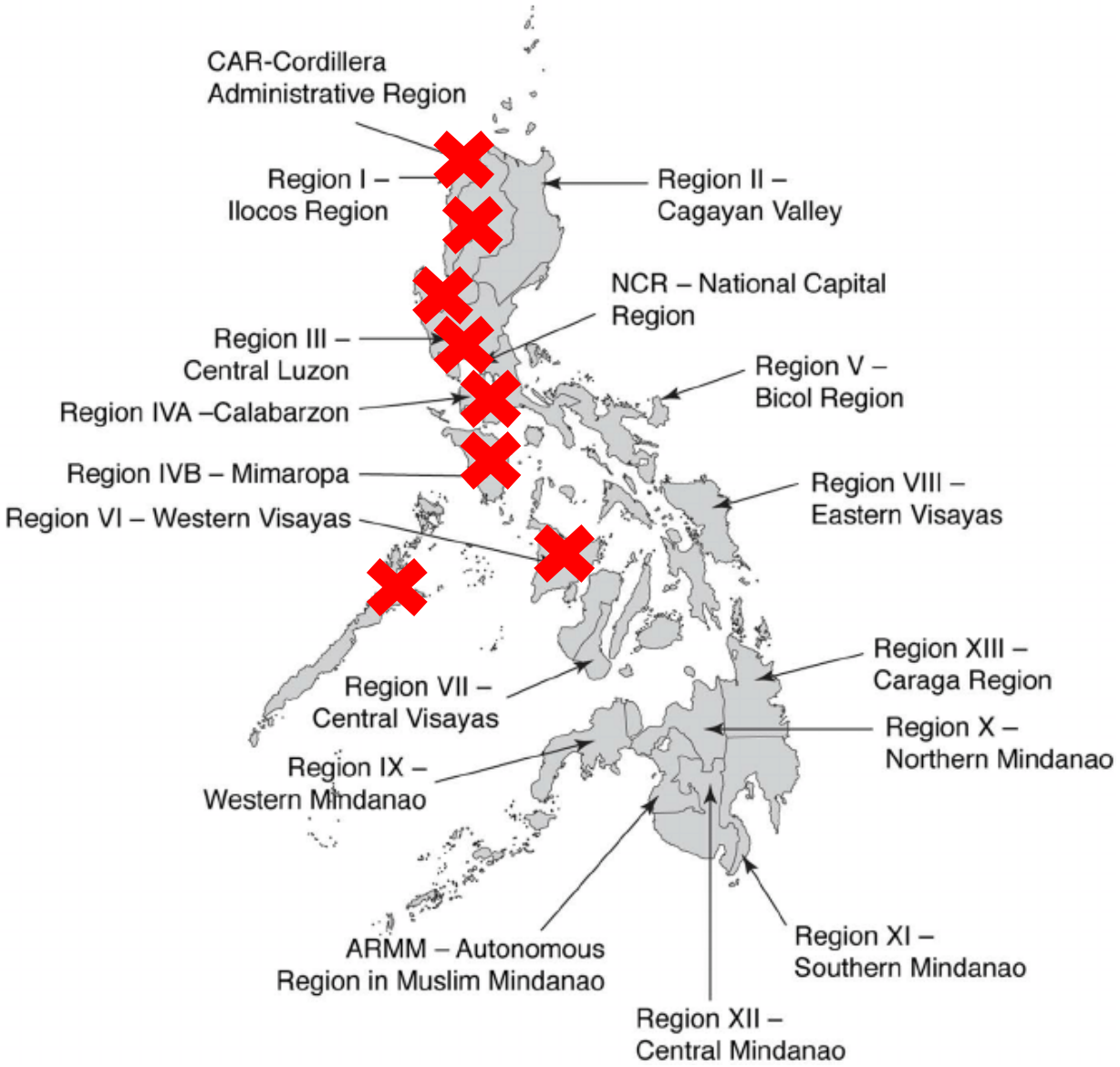
Table 2 : Modeled Tsunami Inundation distance considering different types of land surface

Land Surface (roughness coefficient)	Maximum Tsunami Distance (m)	Maximum Tsunami Distance – w/ tide (m)
Grassland (0.015)*	1411	2574*
areas covered with buildings (0.03)	353	644
areas densely covered with forest	65	118

* are values considered as worst case scenario


CALOOCAN
VALENZUELA
NAVOTAS
MALABON
CALOOCAN
QUEZON CITY
SAN MATEO
RIZAL
ANTIPOLO
MARIKINA
MANILA
SAN JUAN
CAINTA
PASIG
MANDALUYONG
MANILA BAY
MAKATI
TAYTAY
PATEROS
ANGONO
PASAY
TAGUIG
PARAÑAQUE
LAS PIÑAS
LAGUNA DE BAY
MUNTINLUPA
Inundation area
N
W
E

Regions to be Affected by M 8.3 EQ and Tsunami



National Government Initiatives

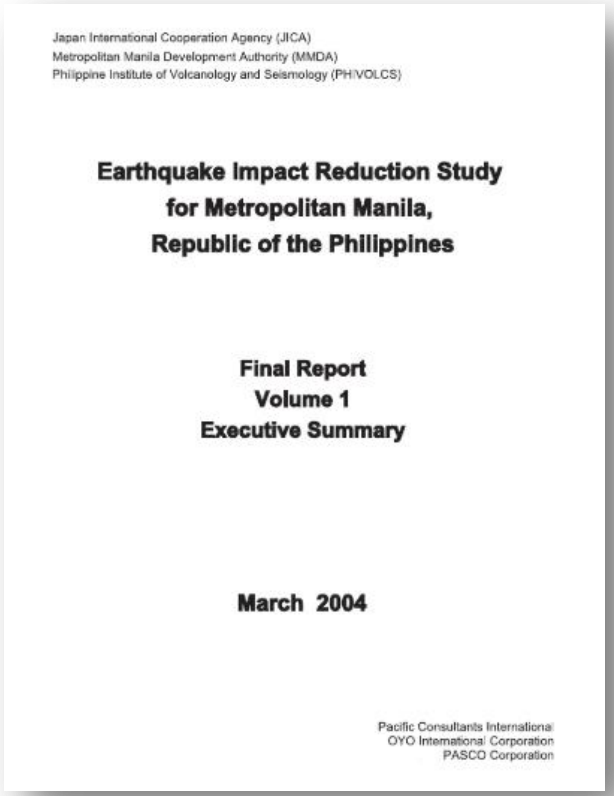
National Resiliency Team Meetings

- Regular high-level meetings being conducted by the national government led by the Presidential Management Staff
- Venue for discussing earthquake risk reduction strategies

NRT 10 Key Result Areas for Earthquake Risk Reduction

KEY RESULT AREAS	AGENCIES RESPONSIBLE
Water	MWSS, MWSI, MWCI, LWUA, DPWH, NWRB, NIA, DILG
Food	DA, DTI, NFA, DSWD
Shelter	NHA, DSWD, HUDCC, DPWH
Power	DOE, TRANSCO, NGCP, NPC, MERALCO, NEA, ERC
Medical, Health, and Psychosocial services	DOH, DILG, PRC, PHILHEALTH, PH HOSPITAL ASSOCIATION, PH MEDICAL ASSOCIATION, AFP, PNP, DILG-BFP
Command, Control and Communications	OCD, DICT, MMDA,NTC, KBP, PCOO, PIA
Search and Rescue	AFP, DILG-BFP, PNP, PCG, MMDA
Fire Protection	DILG-BFP, AFP, Fire Volunteers
Law and Order	DILG-PNP, AFP, DOJ, DILG-BJMP
Transport and Mobility	DPWH, DOTr, PPA, CAAP, PCG, MARINA

Metro Manila Earthquake Impact Study (MMEIRS)


Japan International Cooperation Agency (JICA)
Metropolitan Manila Development Authority (MMDA)
Philippine Institute of Volcanology and Seismology (PHIVOLCS)

Earthquake Impact Reduction Study for Metropolitan Manila, Republic of the Philippines

Final Report
Volume 1
Executive Summary

March 2004

Pacific Consultants International
OYO International Corporation
PASCO Corporation

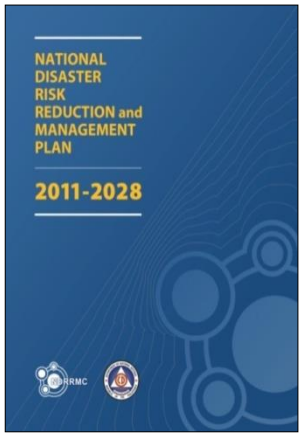
=

6 Priority Goals
and
105 Action Plans
for Earthquake Risk Reduction

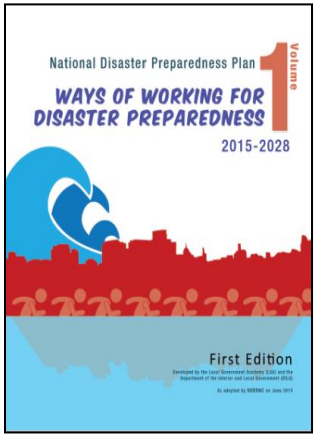
Greater Metro Manila Earthquake Impact Study (GMMEIRS)

An ongoing comprehensive study on earthquake risk reduction to update the original MMEIRS published in 2014

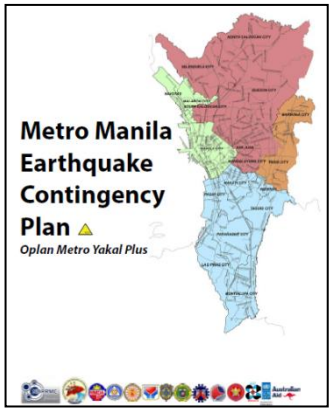
National Plans Formulated



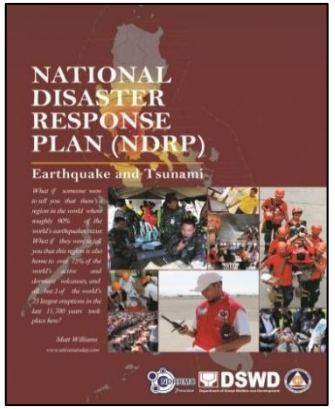
National DRRM Plan
(approved on 2011)



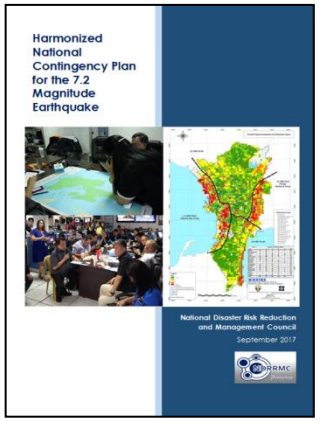
National Disaster Preparedness Plan
(approved on 2015)



Oplan Metro Yakal Plus
(approved on 2015)

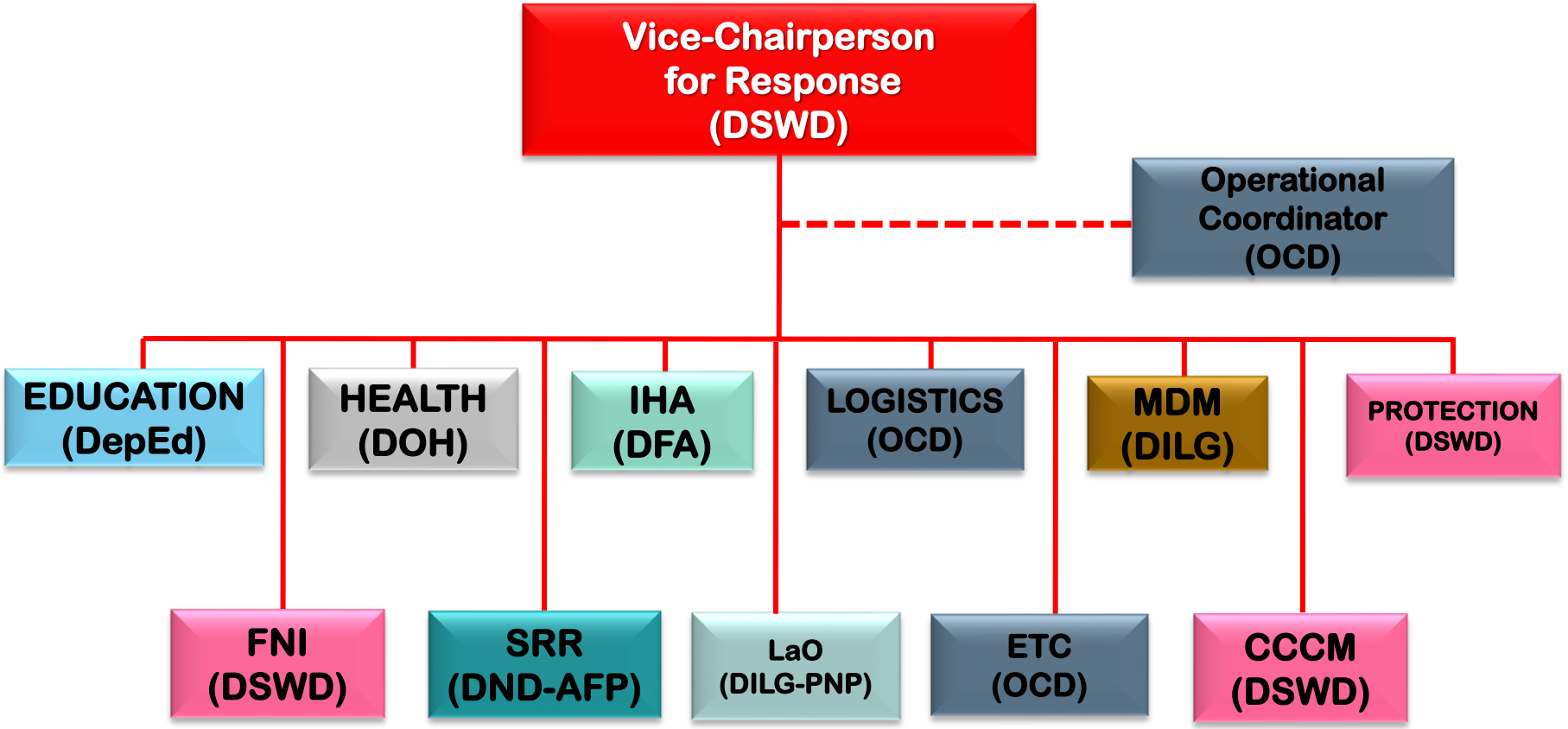


National Disaster Response
Plan for EQand Tsunami
(approved on 2017)



Harmonized National
Contingency Plan
(updated on 2019)

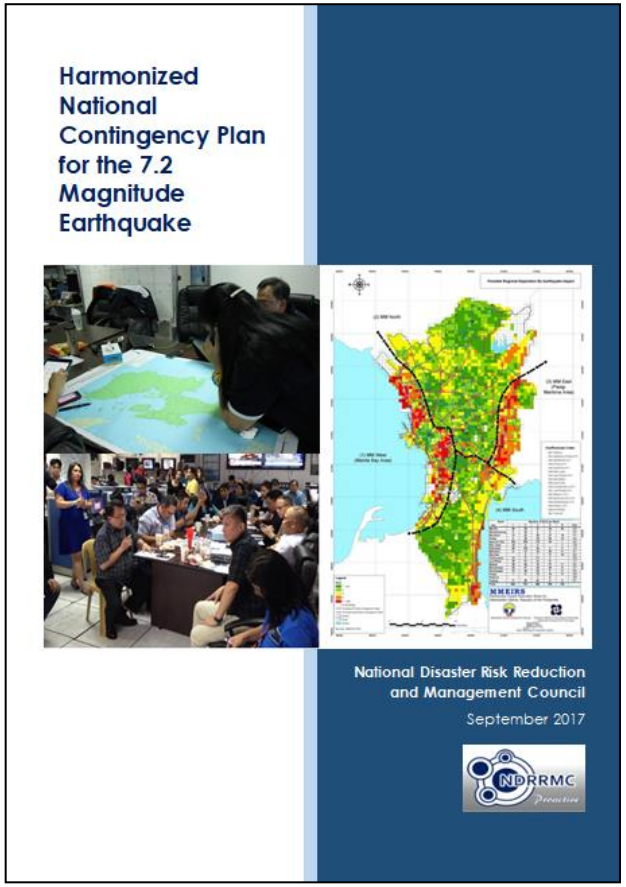
National Disaster Response Plan for Earthquake and Tsunami



Oplan Metro Yakal Plus

- Metro Manila's contingency plan based on the magnitude 7.2 earthquake scenario
- Formulated by the MMDRRMC, NDRRMC, private sectors and other stakeholders

Harmonized National Contingency Plan



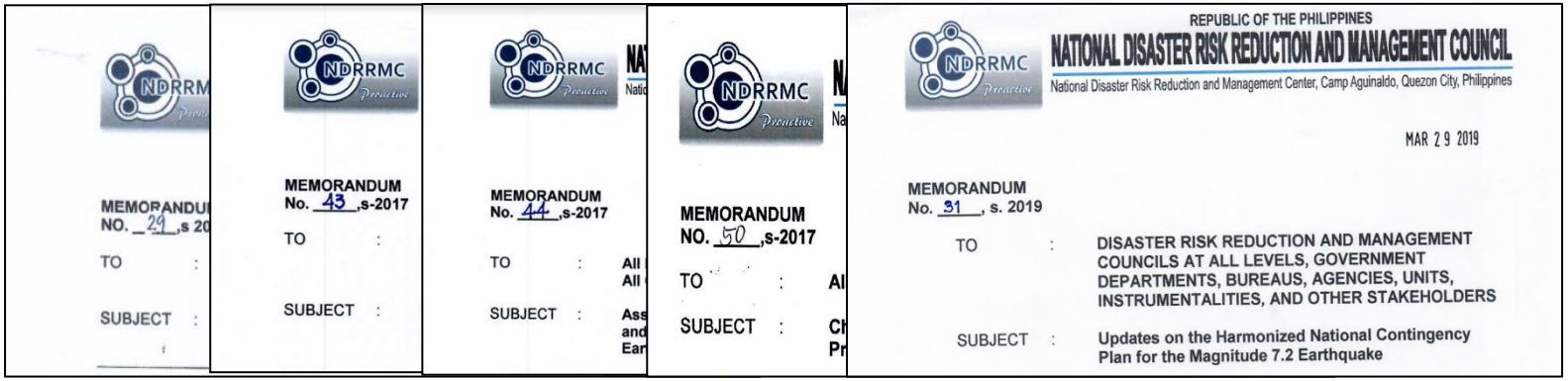
- NDRRMC's contingency plan for the magnitude 7.2 earthquake scenario

- Pre-arranges response actions of regions in Luzon, Visayas and Mindanao to provide assistance in earthquake-affected areas

Assisting Regions in case of M 7.2 Earthquake

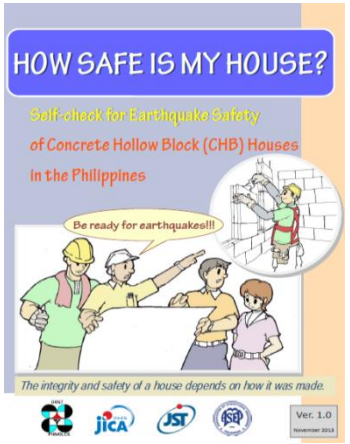
Areas to be Affected by Earthquake	Assisting RDRRMCs		
	1st Wave	2nd Wave	3rd Wave
Central Luzon	Region I	Region VII	Region VIII
Metro Manila – North Sector	Region I	Region VII	Region VIII
Metro Manila – East Sector	Region II	Region XI	Region XII
Metro Manila – West Sector	CAR	Region X	CARAGA
Metro Manila – South Sector	Region V	Region VI	Region IX, MIMAROPA ARMM
CALABARZON	Region V	Region VI	Region IX, MIMAROPA ARMM

NDRRMC Issuances on Earthquake Preparedness



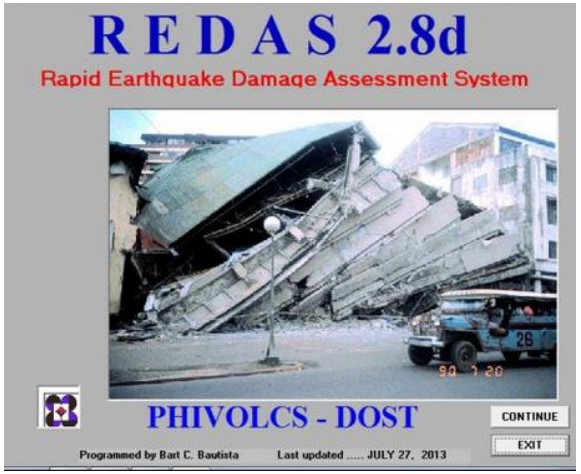
Memo No. 29 s 2017	Inventory of Emergency Response Assets in Preparation for Contingency Planning for the Big One
Memo No. 43 s 2017	Designation of Assisting RDRRMCs to Augment the NDRRMC in Preparation for the 7.2 Magnitude Earthquake in Metro Manila
Memo No. 44 s 2017	Assessment of Structural Integrity of Buildings, Facilities and Infrastructures in Preparation for the 7.2 Magnitude Earthquake in Metro Manila and in Other Region
Memo No. 50 s 2017	Checklist of Milestones and Actions for Earthquake Preparedness
Memo No. 31 s 2019	Provides for the approval of the latest version of the Harmonized National Contingency Plan

Earthquake Risk Assessment Tools

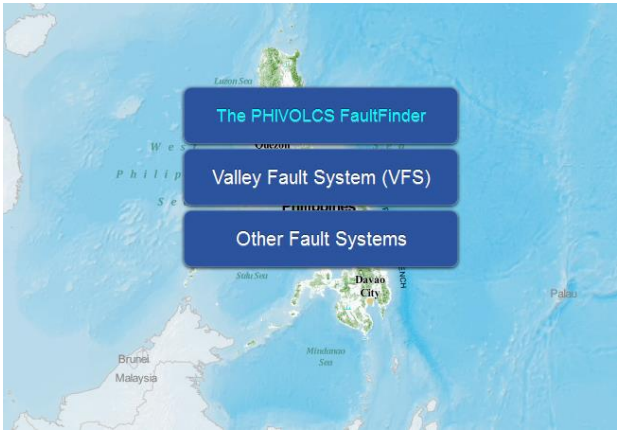


How Safe is my House – Self-check Simulator

Valley Fault System Atlas



Rapid Earthquake Damage Assessment System



Fault Finder

SOURCE: DOST-PHIVOLCS

Hazard Hunter

Photo credit: UNTV

Structural Retrofitting

RETROFITTING OF BRIDGES

10 FLYOVERS ALONG EDSA AND OTHER MAJOR THOROUGHFARES IN METRO MANILA RETROFITTED

Manila North Diversion Road – Camachile Flyover

EDSA – Santolan Flyover

EDSA – Ortigas Interchange

Roxas Blvd. – Gil Puyat Ave. Flyover

EDSA - Roxas Blvd. Flyover

EDSA – Kamias Flyover

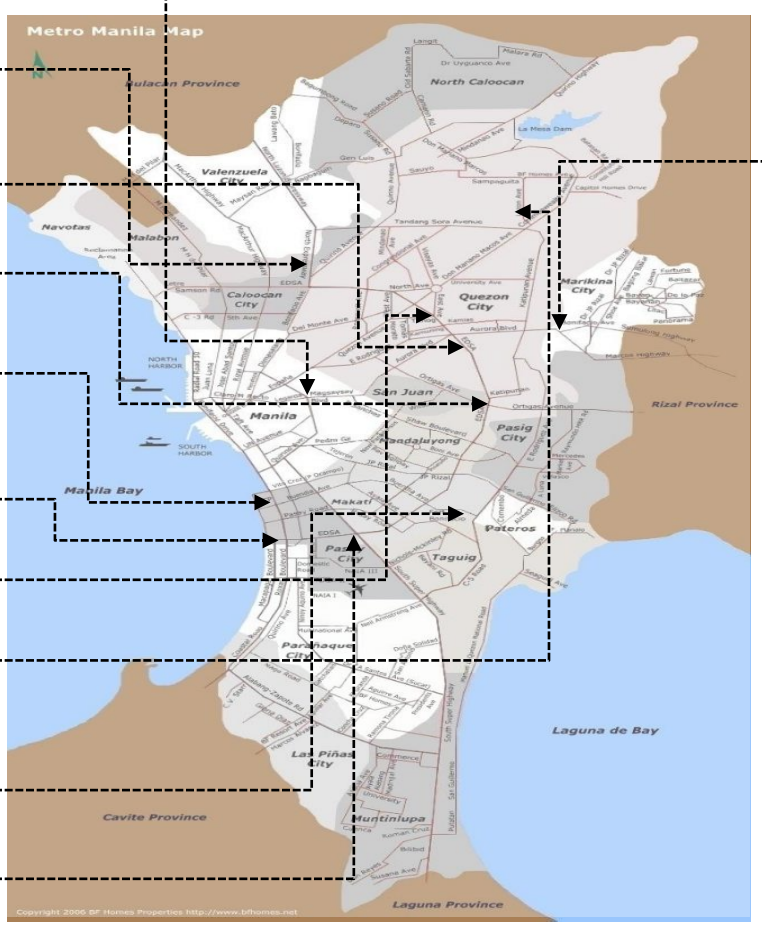
Tandang Sora – Commonwealth Flyover

EDSA – Gil Puyat Ave. Flyover

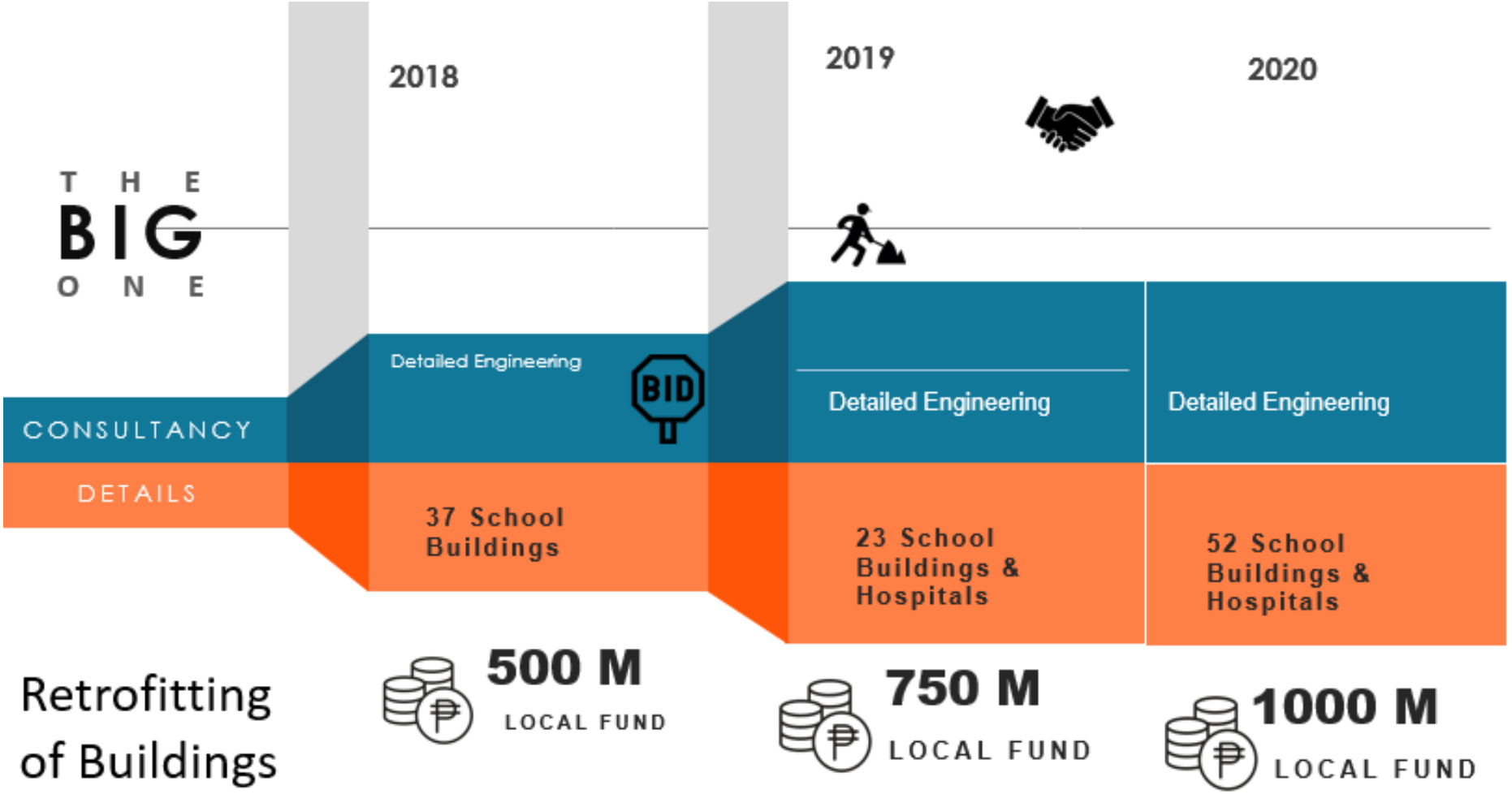
EDSA –Magallanes Flyover

Nagtahan Interchange

Barangka Viaduct Flyover

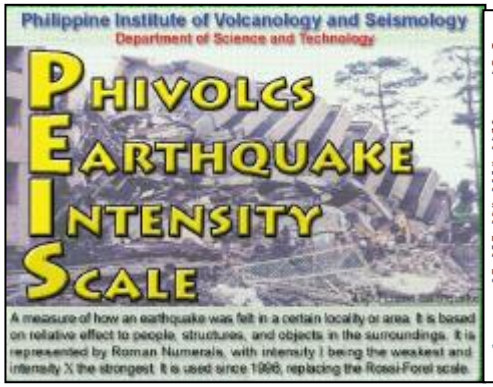


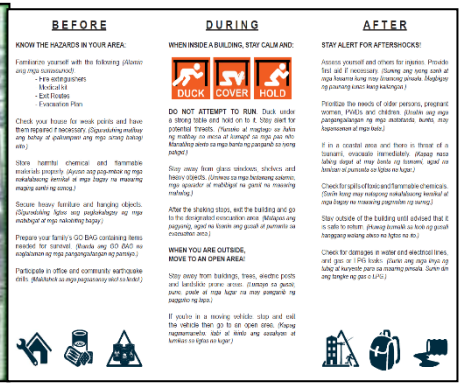
Structural Retrofitting



Information, Education, and Communication Campaigns

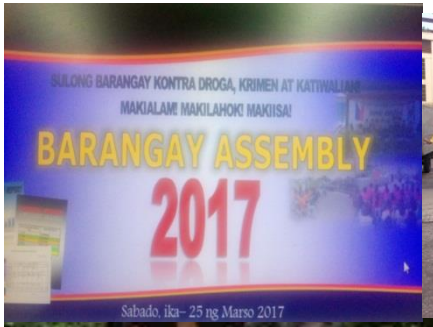
IEC Materials





Project Disaster Information for Nationwide Awareness

Community-based DRRM Initiatives



Quarterly Nationwide Simultaneous Earthquake Drill

Simulation Exercise for Cabinet Members for M 7.2 Earthquake

High-Level Exercise involving Top Government Officials

First in the ASEAN Region

For a safer, adaptive, disaster resilient Filipino Communities!