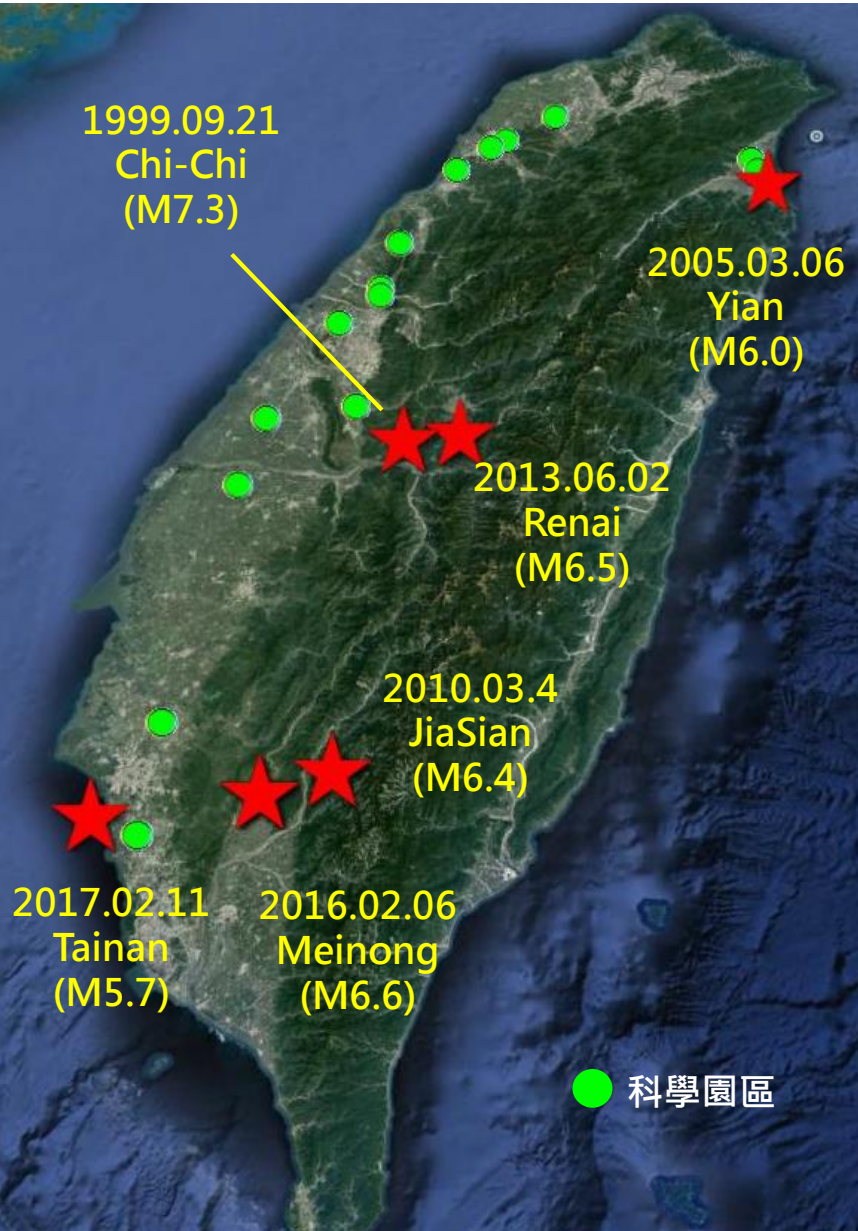


Earthquake Disaster Reduction for Industrial and Governmental Sectors

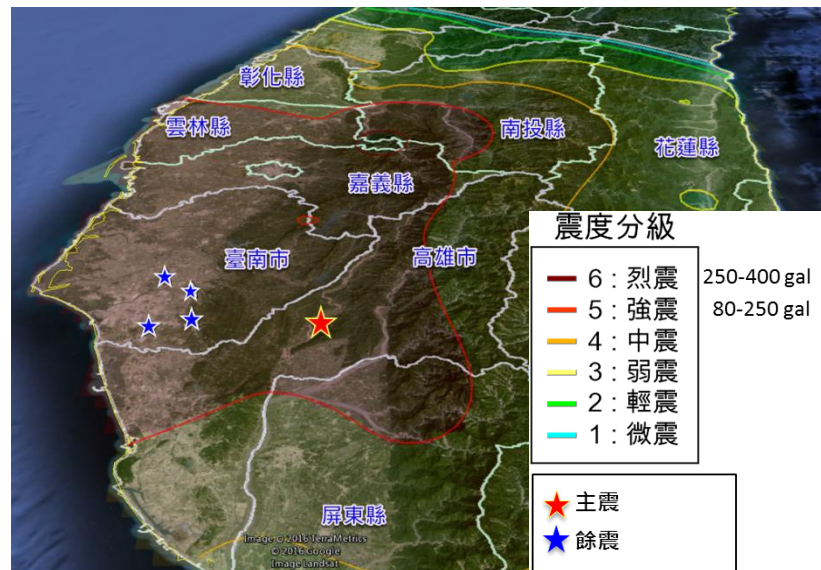
Chung-Sheng Lee

Department of Civil and Disaster Prevention Engineering
National United University

Earthquake Impacts on Science Parks

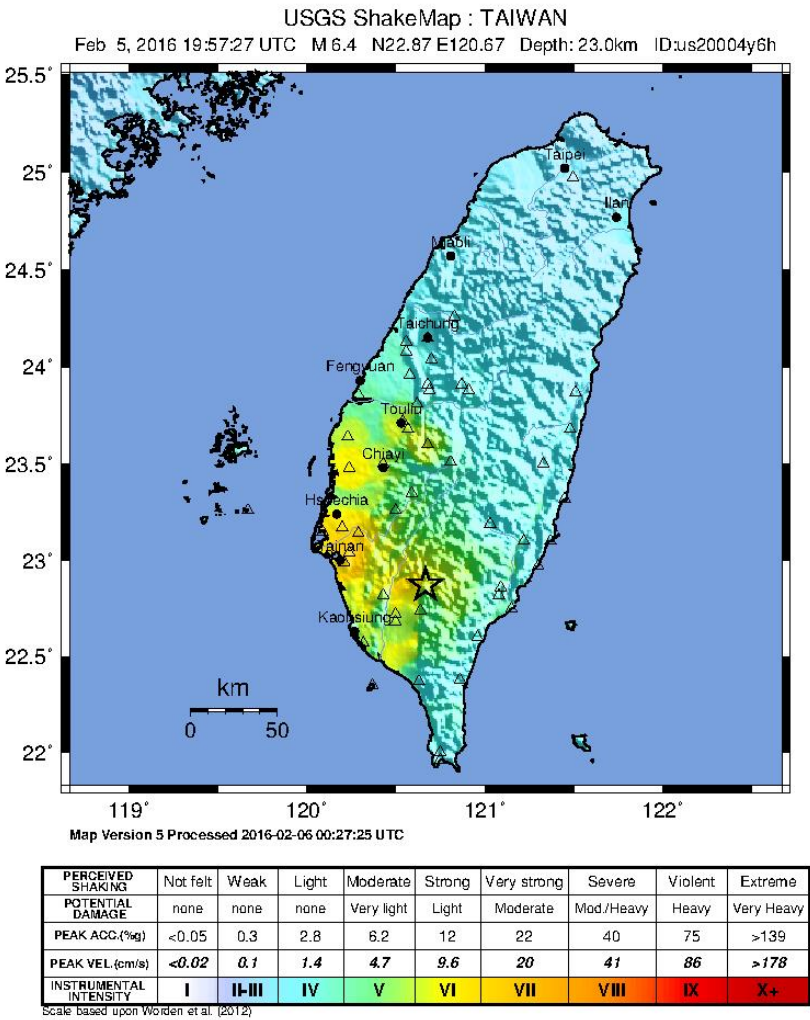


- 1999~2017: 6 earthquakes
- Magnitude : 5.7~7.3
- PGA at Sites : 9.93~229.04 gal
- 2016 Meinong : ~20 bn NTD loss
- 1999 Chi-Chi : ~ 10 bn NTD loss
- 1999 Chi-Chi : affected 2~3 weeks



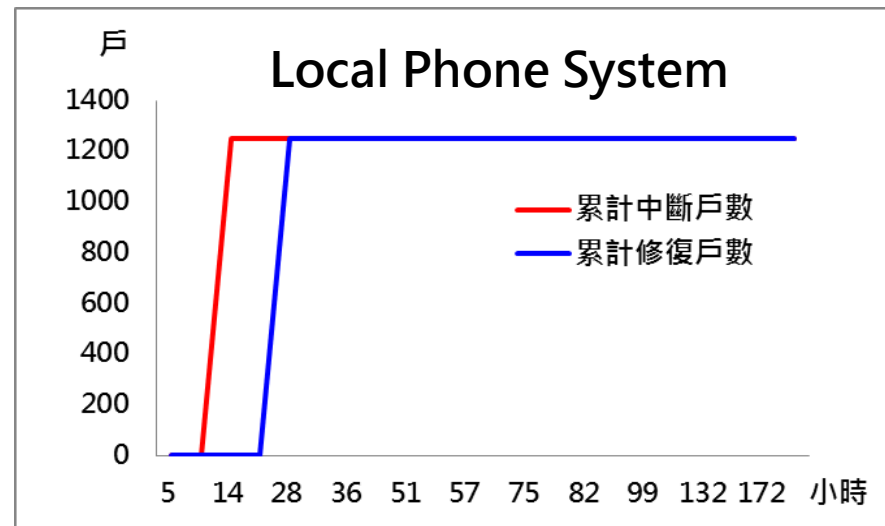
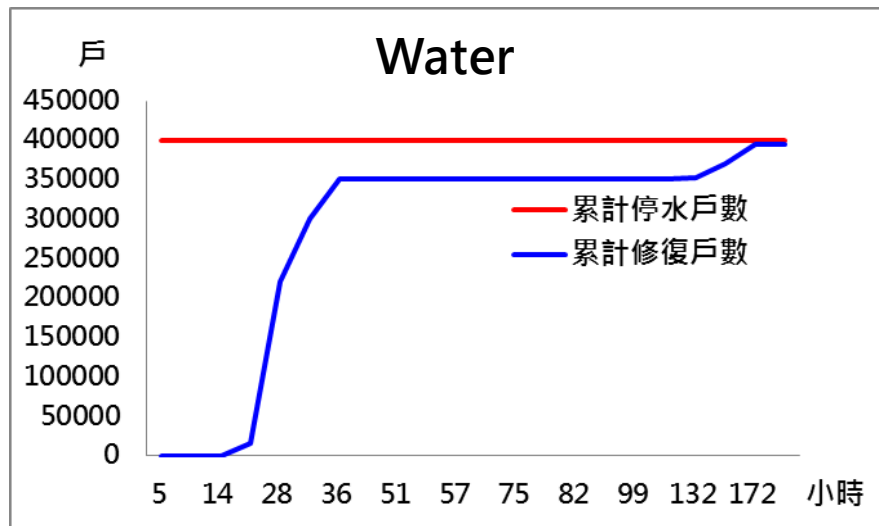
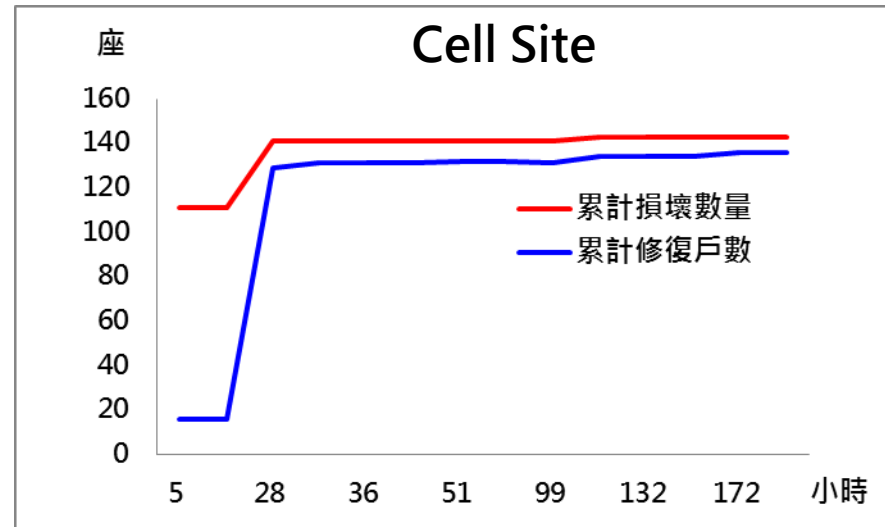
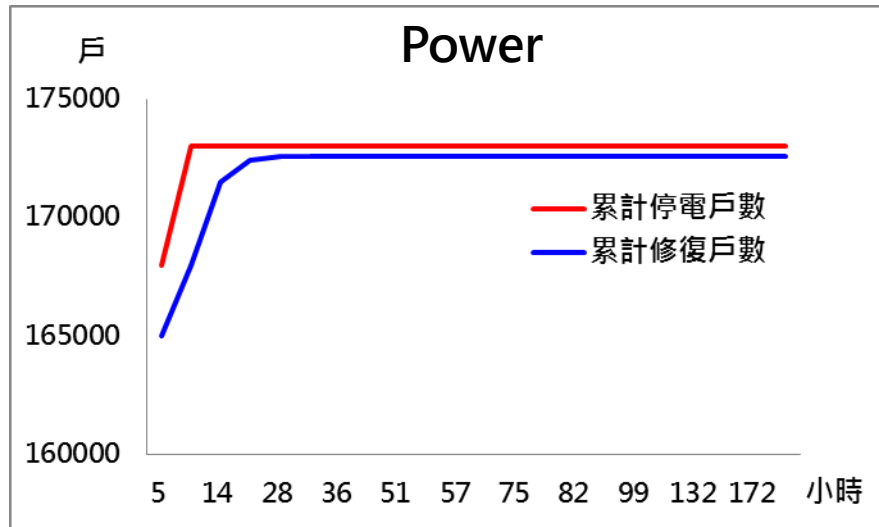
2016.Feb.06 the Meinong earthquake

	Disaster Statistics
Casualties	Death:117* 、injuries: 551*
Lifelines Damages	Power: 173 k households Water : 400 k households Local phone : 1248 households Cell base : 143 gas : 1304 households
House Damage	Severe: 85 、Moderate: 62
Road Damage	Provincial Highway : 2 locations
School Damage	469
Rescue Manpower	33,343

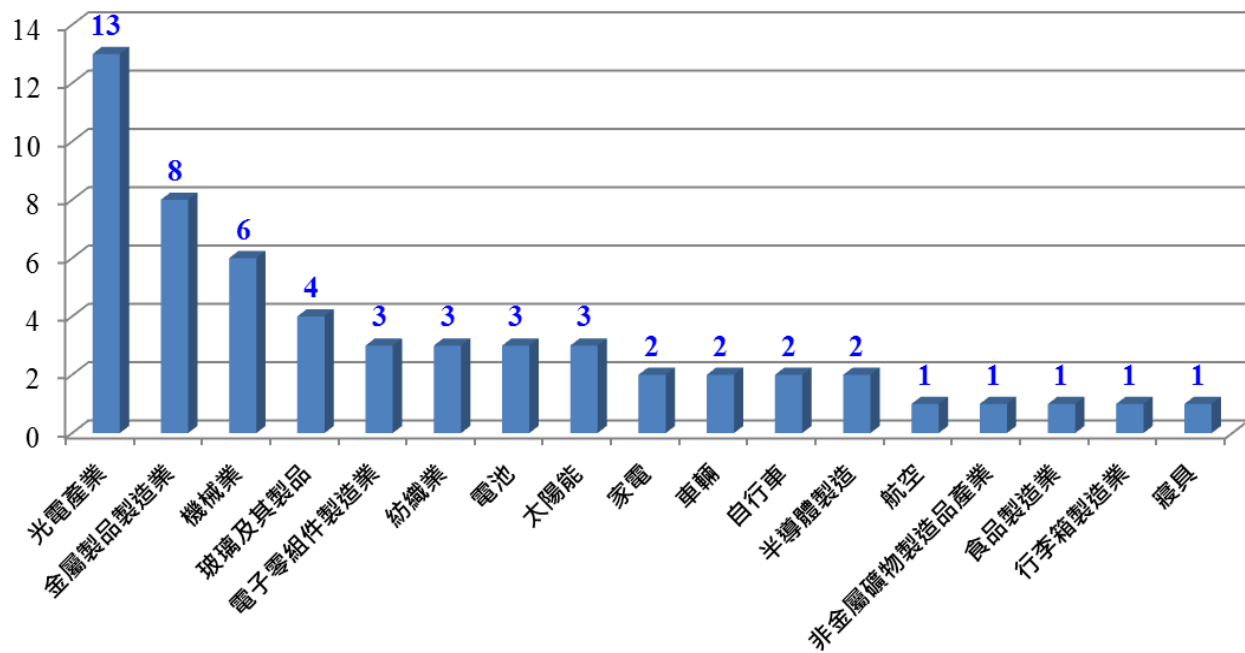


*資料來源：中央災害應變中心災情處置報告(2016.02.14)

Lifelines Recovery

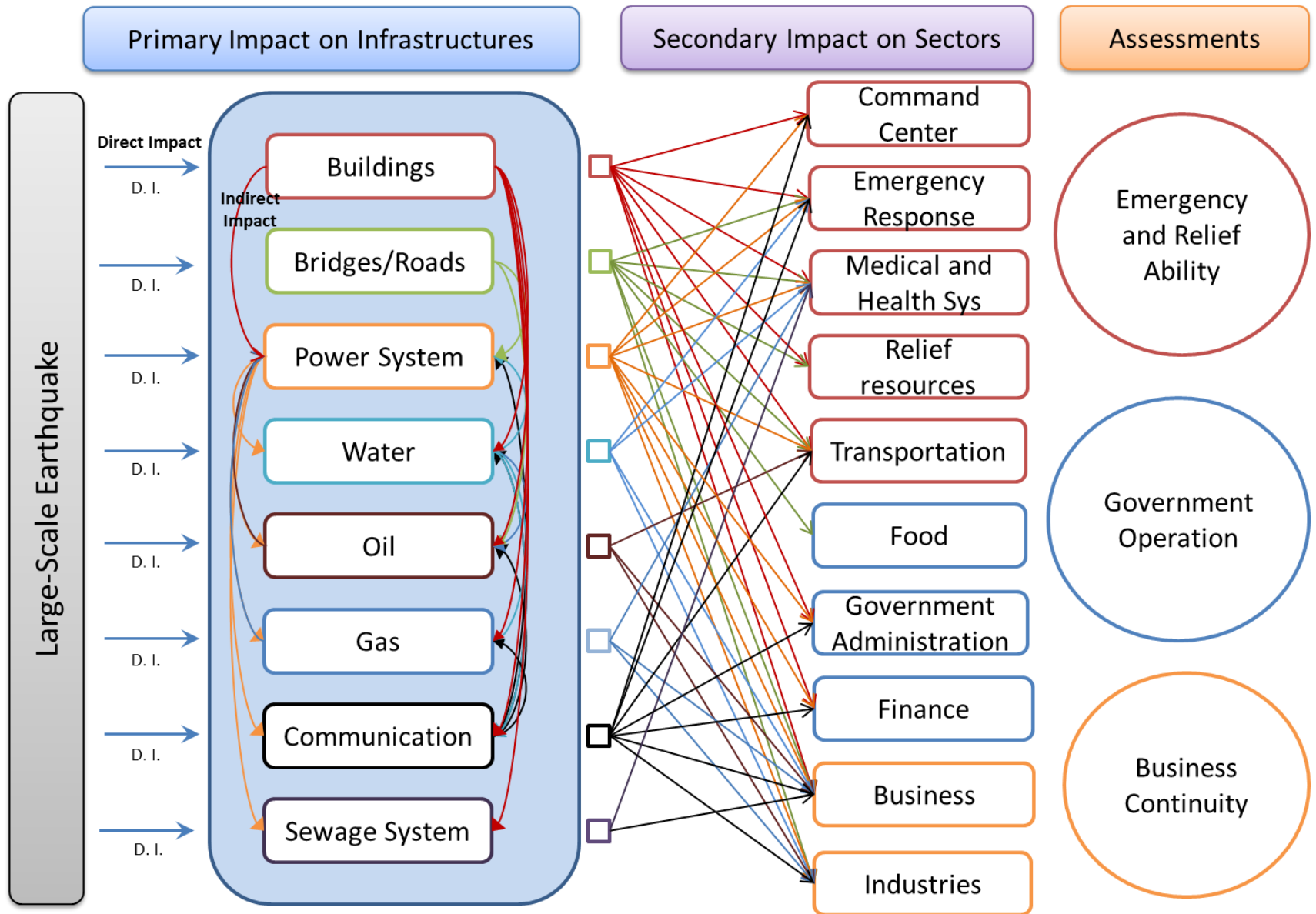


Impacts on industries

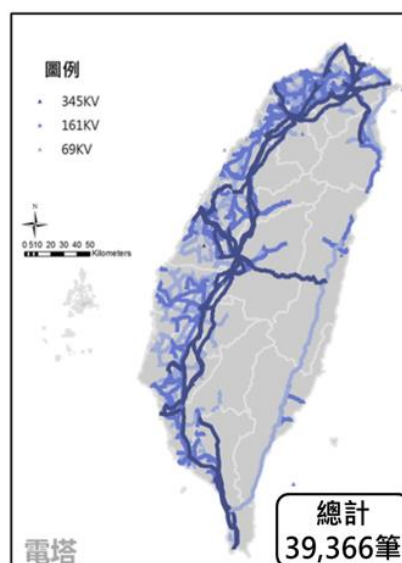
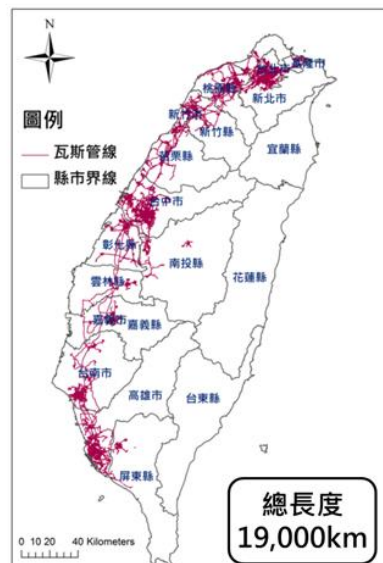
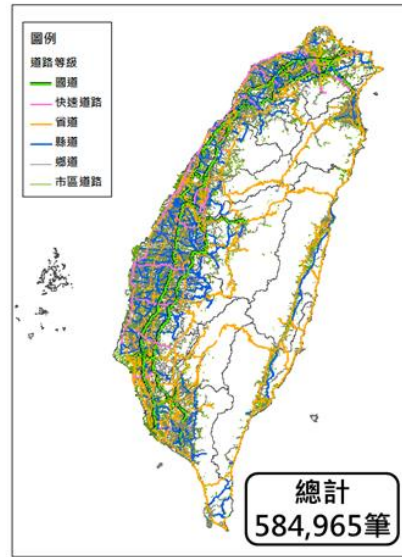
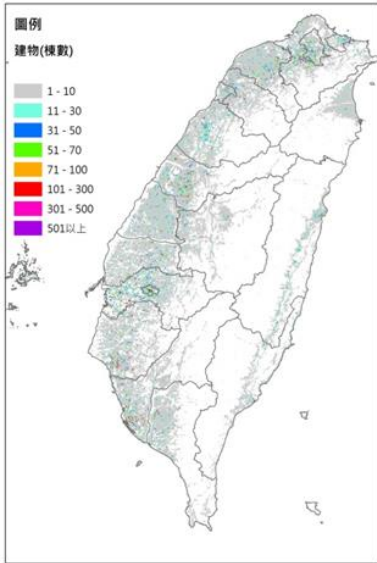


Industry Type	#
Optoelectronics	13
Mental Product	8
Machinery	6
Glass Product	4
Electronic Parts	3
Textile	3
Battery	3
Solar power	3

Earthquake Impacts



Inventory Database and Impact Scenario



損壞機率

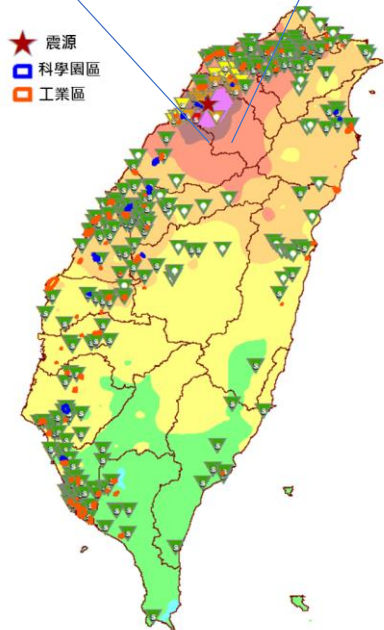
發電廠

- 0-25%
- 26-50%
- 51-75%
- 76-100%

變電所

- 0-25%
- 26-50%
- 51-75%
- 76-100%

震源
科學園區
工業區



Critical Infrastructure Sectors in Taiwan



Energy

能源



Financial Services

銀行與金融



Water

水資源



**Emergency Services
and Public Healthcare**

緊急救援與醫院



Communication

通訊傳播



Government Facilities

政府機關



Transportation System

交通

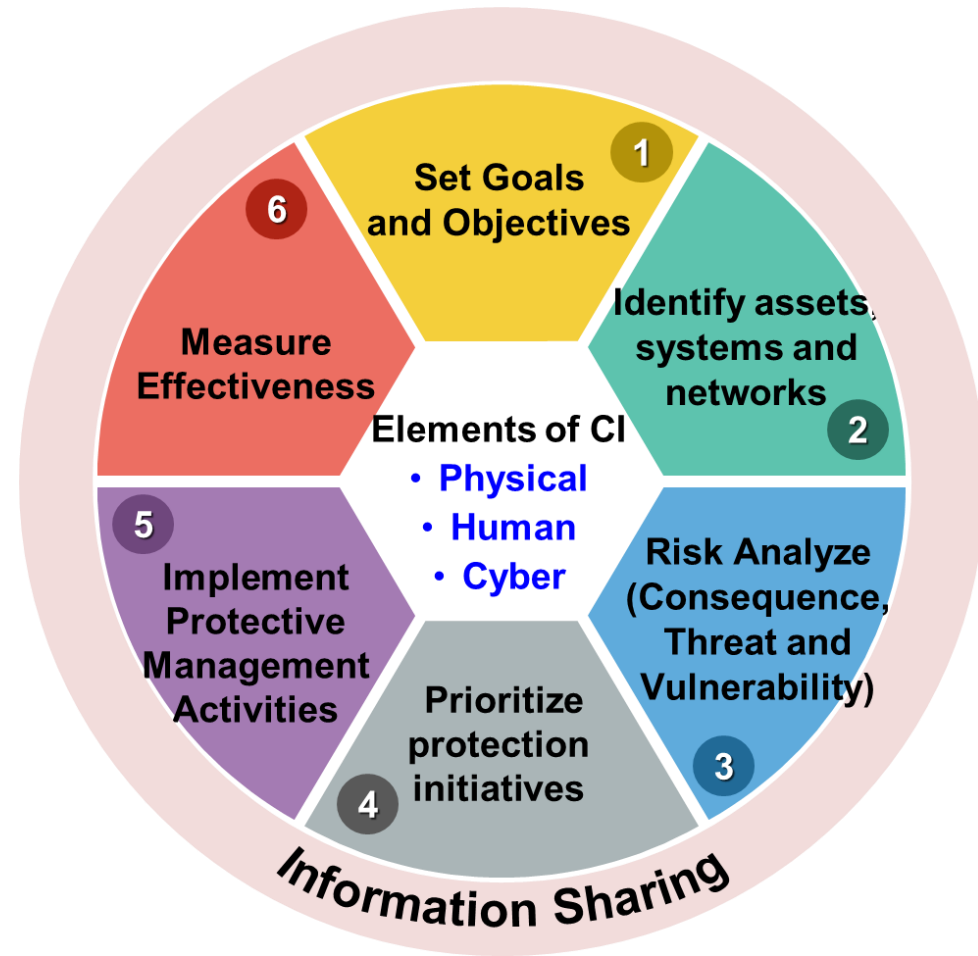


**Science and Industrial
Park**

科技與工業園區

Impact Scenario Assessment

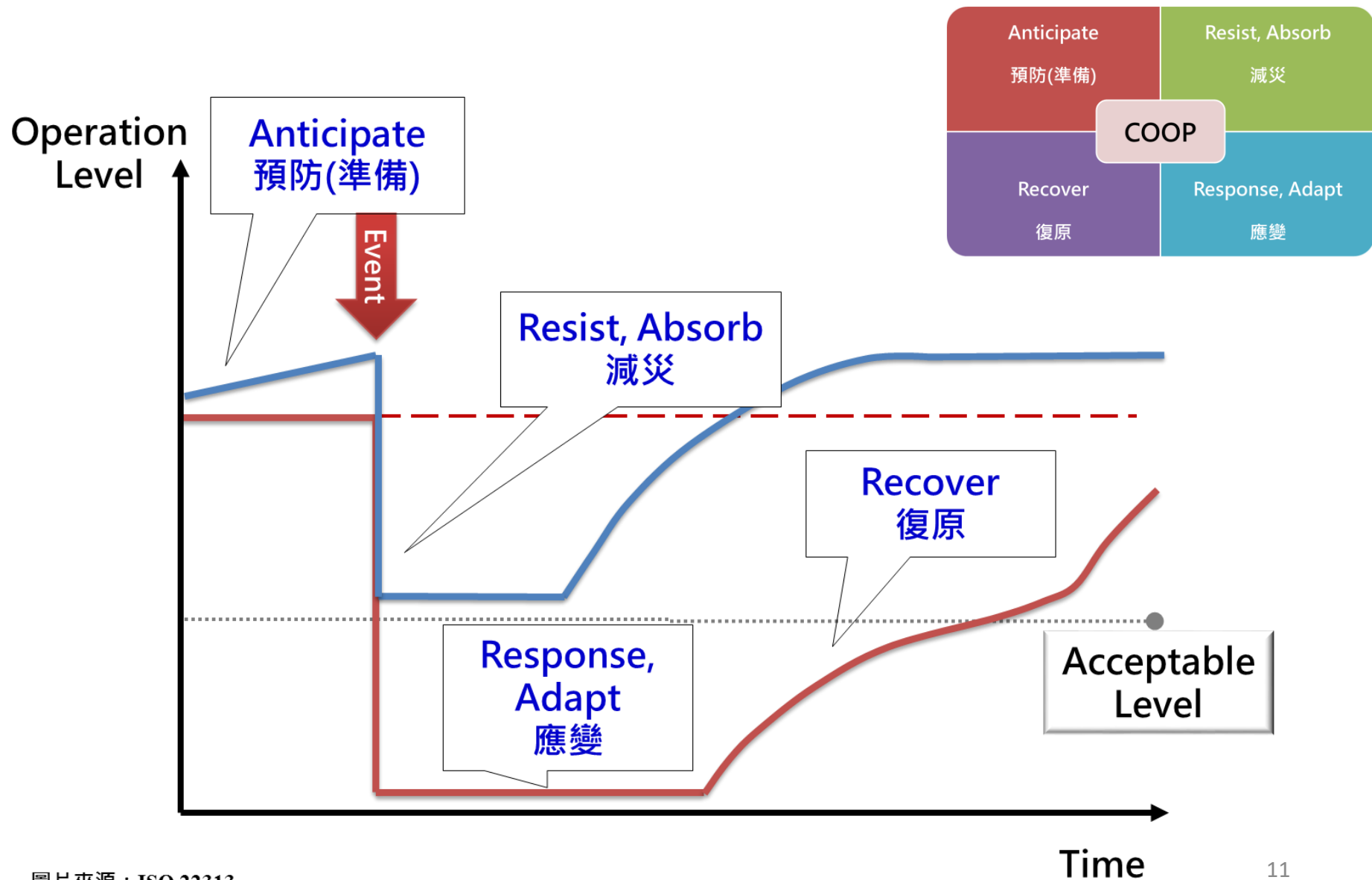
- Understand regional, local earthquake impact scenarios
- Impacts on logistics, supply chains, and key resources
- Impacts on the capacity of rescue and emergency response
- Understand household impact scenarios: Physical, Human



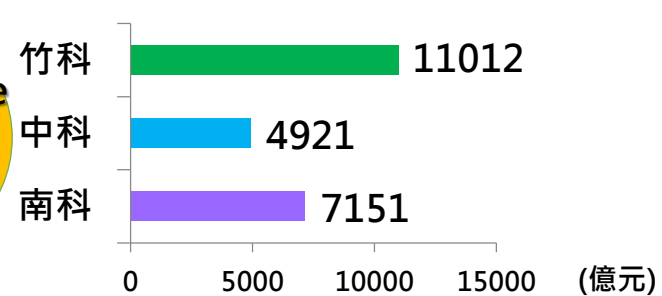
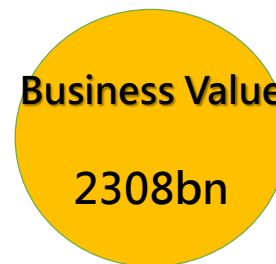
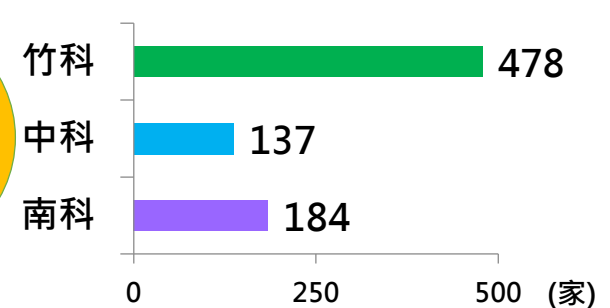
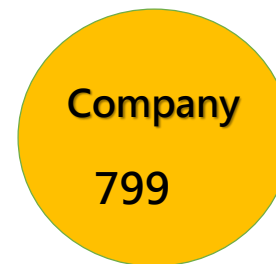
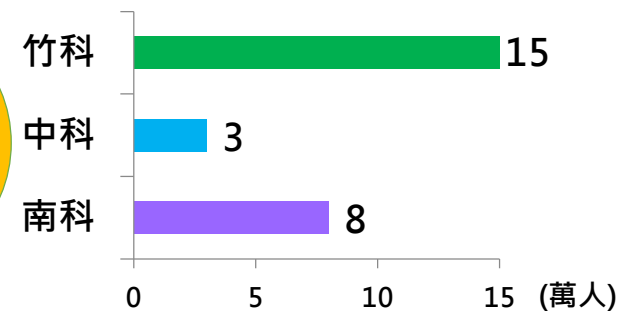
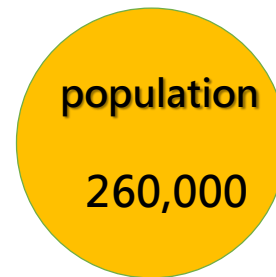
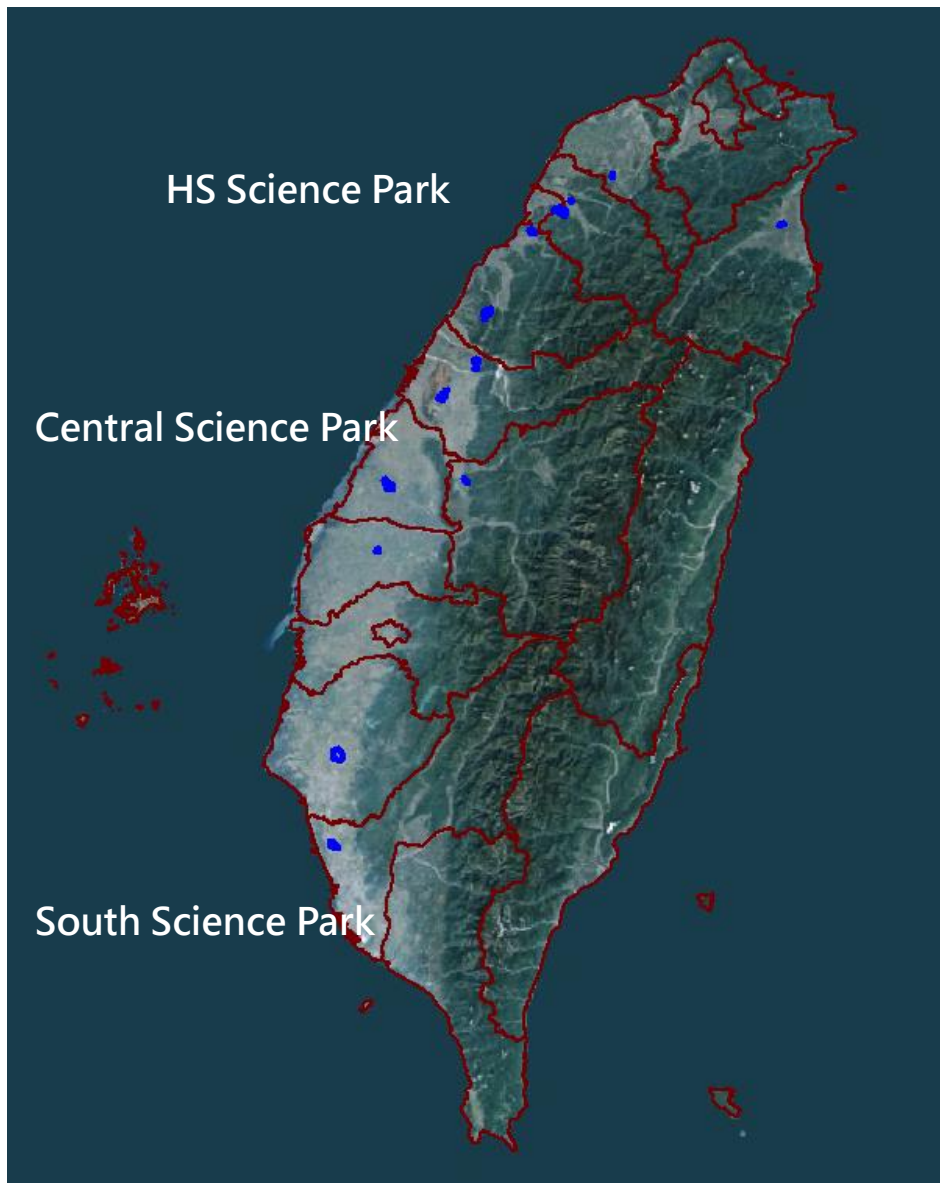
Emergency Response vs. BCP

	ER	BCP
Purpose	• Ensure personal safety • Reduce property damage	• Ensure personal safety • Key activity recovery, business continuity
Range	• Disaster area	• All interrupted business
focus	• Reduce casualties, money loss • Assist rescue, ensure safety	• Achieve objective recovery time • Recovery key activity • Ensure business continuity
Active Area	• site/area/building	• system/organization/company
Participants	• Disaster management department	• All related departments and units
Strategies	• Recovery Plan • Disaster Prevention	• Original site recovery • Backup site recovery

Security and Resilience



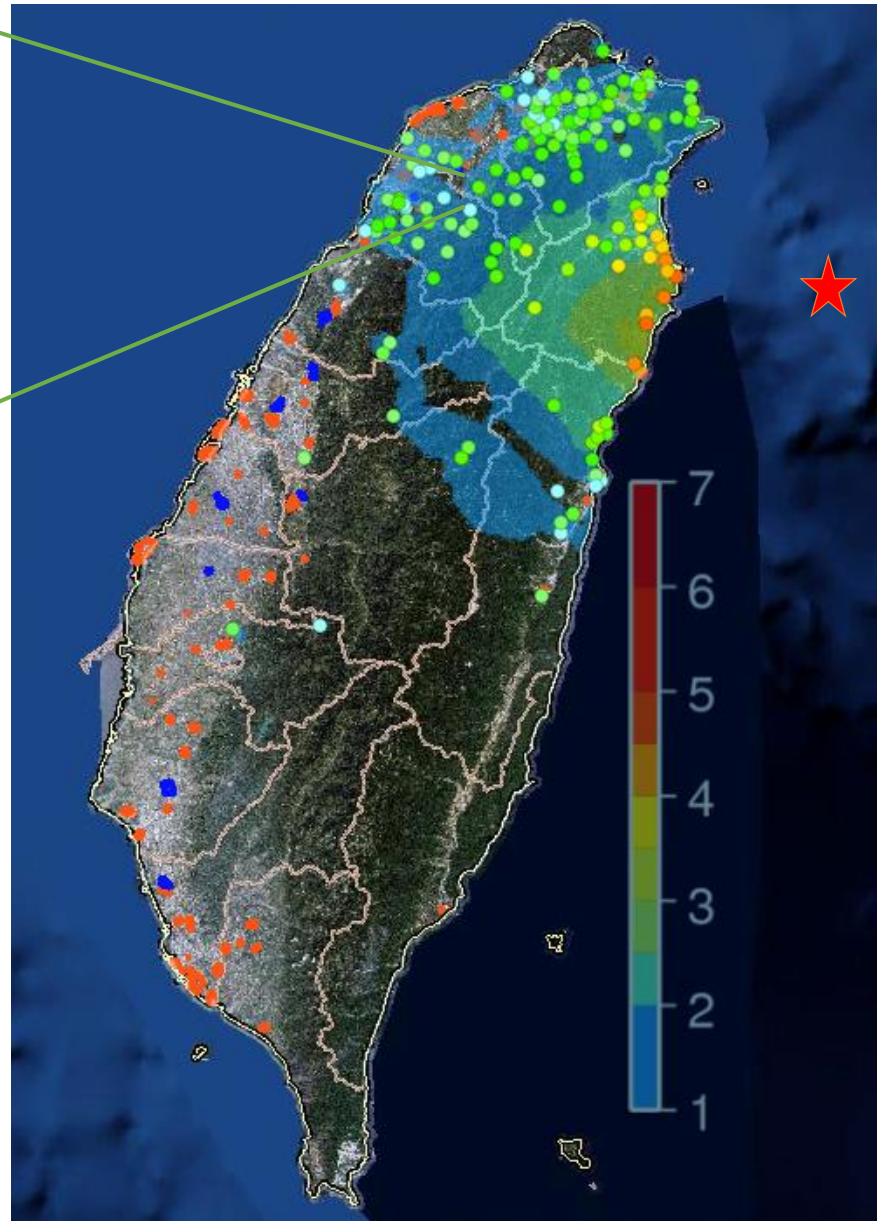
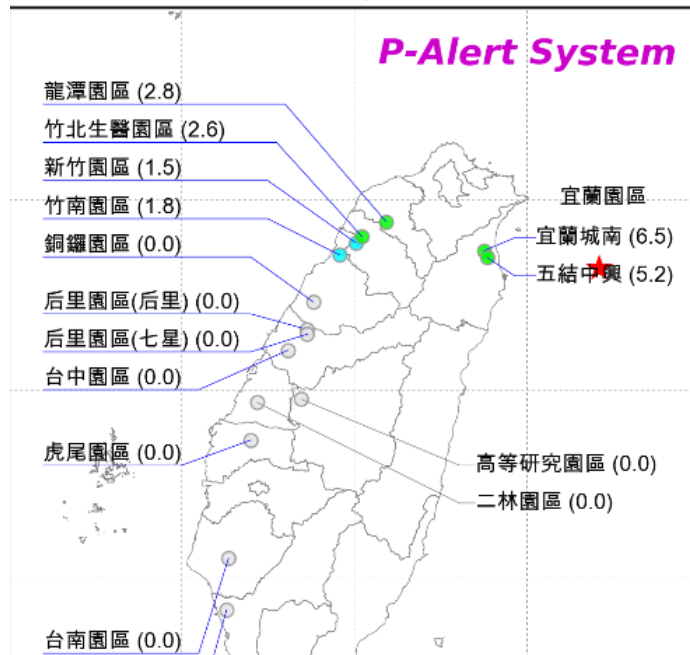
Statistics Display



Earthquake Monitoring and Information Dissemination



2017 年 06 月 04 日 21 時 24 分
地震規模 5.4 , 深 5.3 公里



Earthquake Disaster Risk Reduction

Some focal points between industrial and governmental sectors:

- Building a trusted partnership
- Having a common alertness of disaster risk
- Having a common understanding of risk management process and objectives
- Understanding stakeholders 'roles, responsibility and capabilities
- Establishing information exchange mechanism and learning from each other

Thank you
for your attention