National Taiwan University

University Capacity Building to help local government setup Resilience Community

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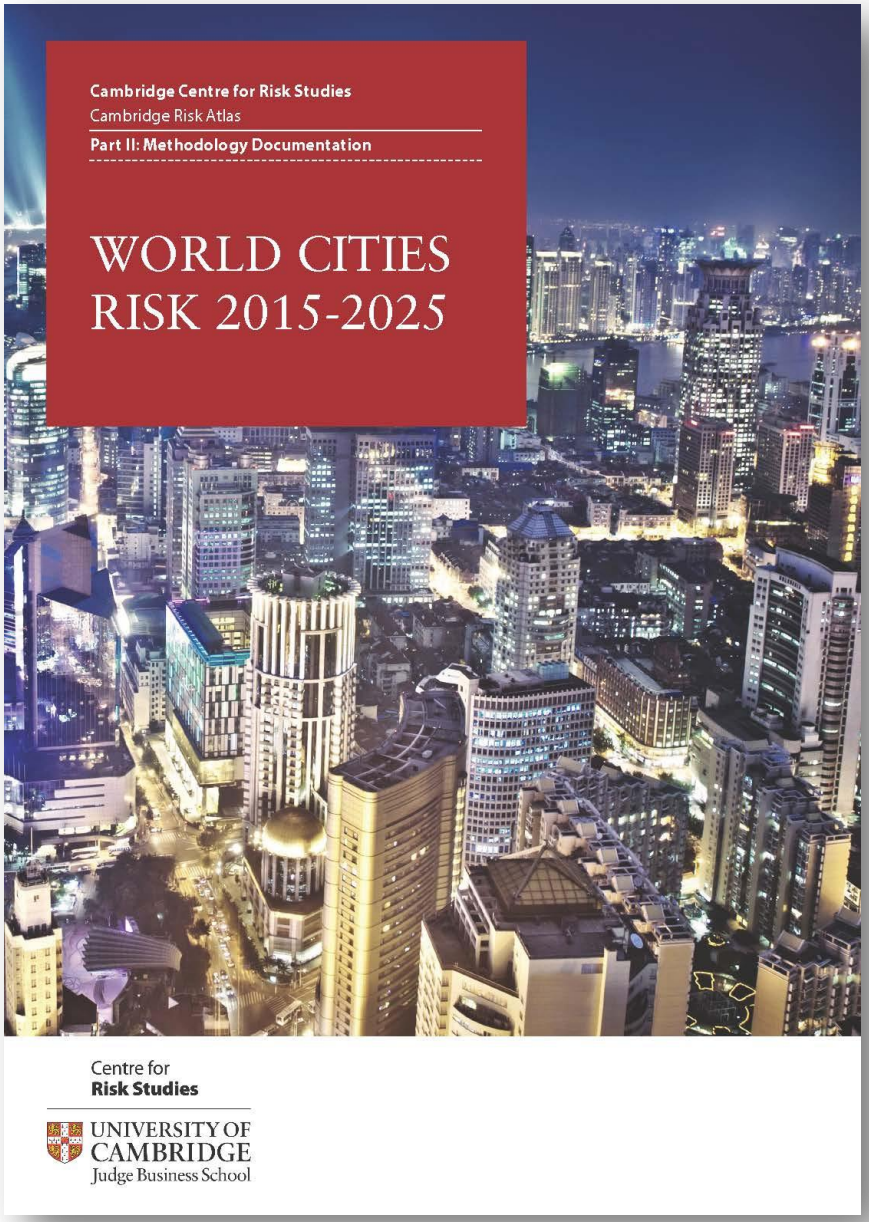


- **five broad threat classes:**
  - **Natural Catastrophe & Climate**
    - earthquake and windstorms
  - **Financial, Trade & Business**
    - market crashes, and commodity price shocks
  - **Politics, Crime & Security**
    - political instability, conflicts and terrorism
  - **Technology & Space**
    - cyber catastrophe
  - **Health & Environment**
    - pandemics and famines
- **The metric index**
  - GDP@Risk
- **ranking of 300 World Cities**

Rank	City Name	Country	GDP@Risk ($US Bn)
1	Taipei	Taiwan	202
2	Tokyo	Japan	183
3	Seoul	Republic of Korea	137
4	Manila	Philippines	114
5	Tehran	Iran	109
6	Istanbul	Turkey	106
7	New York	United States	91
8	Osaka	Japan	91
9	Los Angeles	United States	91
10	Shanghai	China	88

Cooperation of University and Local Government

- The local government is concerning more for damages caused by disasters in Taiwan.
- The capacity and manpower of local government is not enough to implement full disaster prevention in the community level without the help from outside resources.
- Universities in Taiwan have the capability of delivering non-structural methods and can help local government develop community resilience.

Goals of Resilience community

【Identify Disaster Potential】	•Define types of disaster? •Find Locations? Extents? Impact?
【Reduce Disaster Occurrence】	•Solve Problems? •strategies?
【Enhance Response Capacity】	•Skill training •Evacuation timing and routes •Necessary equipment
【Organize Response Team】	•Members recruitment •Tasks assignment
【Raise Public Awareness】	•Education •Knowledge instruction

Step 1 Preliminary Study of the community

Identify and visit the key man who could help promote the resilience community

Identify where disasters could happen and where people could hide when disasters do happen,

Step 2 Initiation and Activation

1. Raise public awareness through disaster cases in Taiwan or worldwide, such as
   - Typhoon Morakot triggered landslide in Siaolin Village, Taiwan.
   - 311 earthquake in Japan

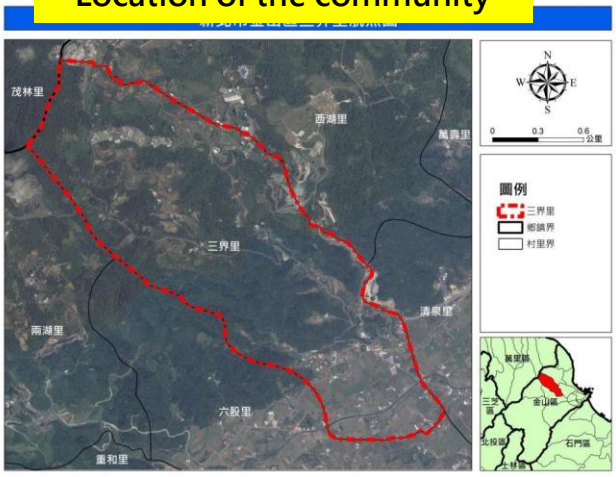


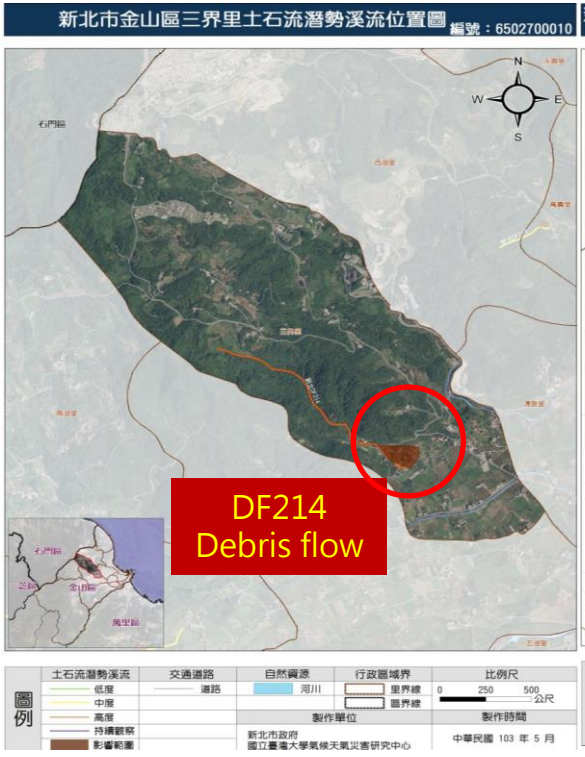

2. Successful cases of resilience community in Taiwan

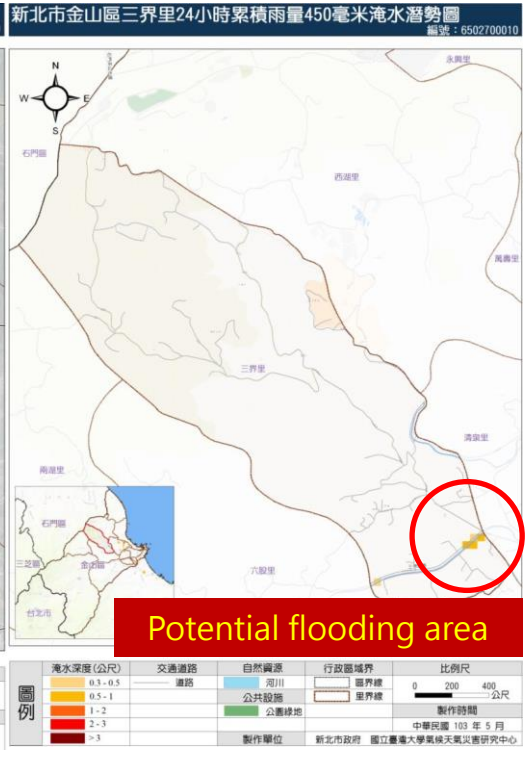
Step 2 Initiation and Activation

Introduction of local environment and disaster potential

Location of the community

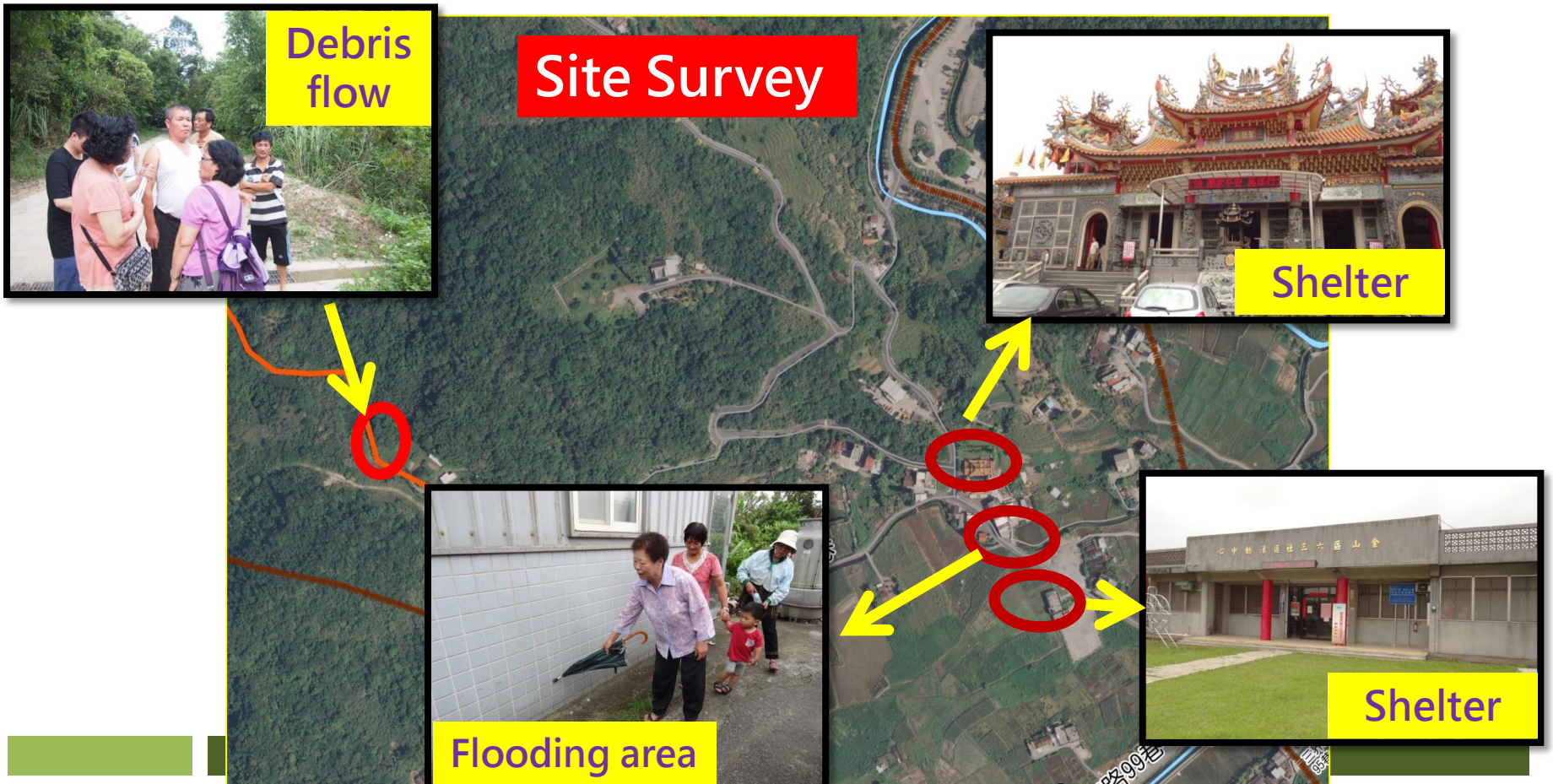






Step 3 Site Survey and Strategy Development

In order to let the local residents know more about their risks from disasters, we plan the survey routes and lead them to study the environment with the company of experts and professionals.



Step 3 Site Survey and Strategy Development

Strategy Development

Step 4 Education and Training

Wound dressing demonstration

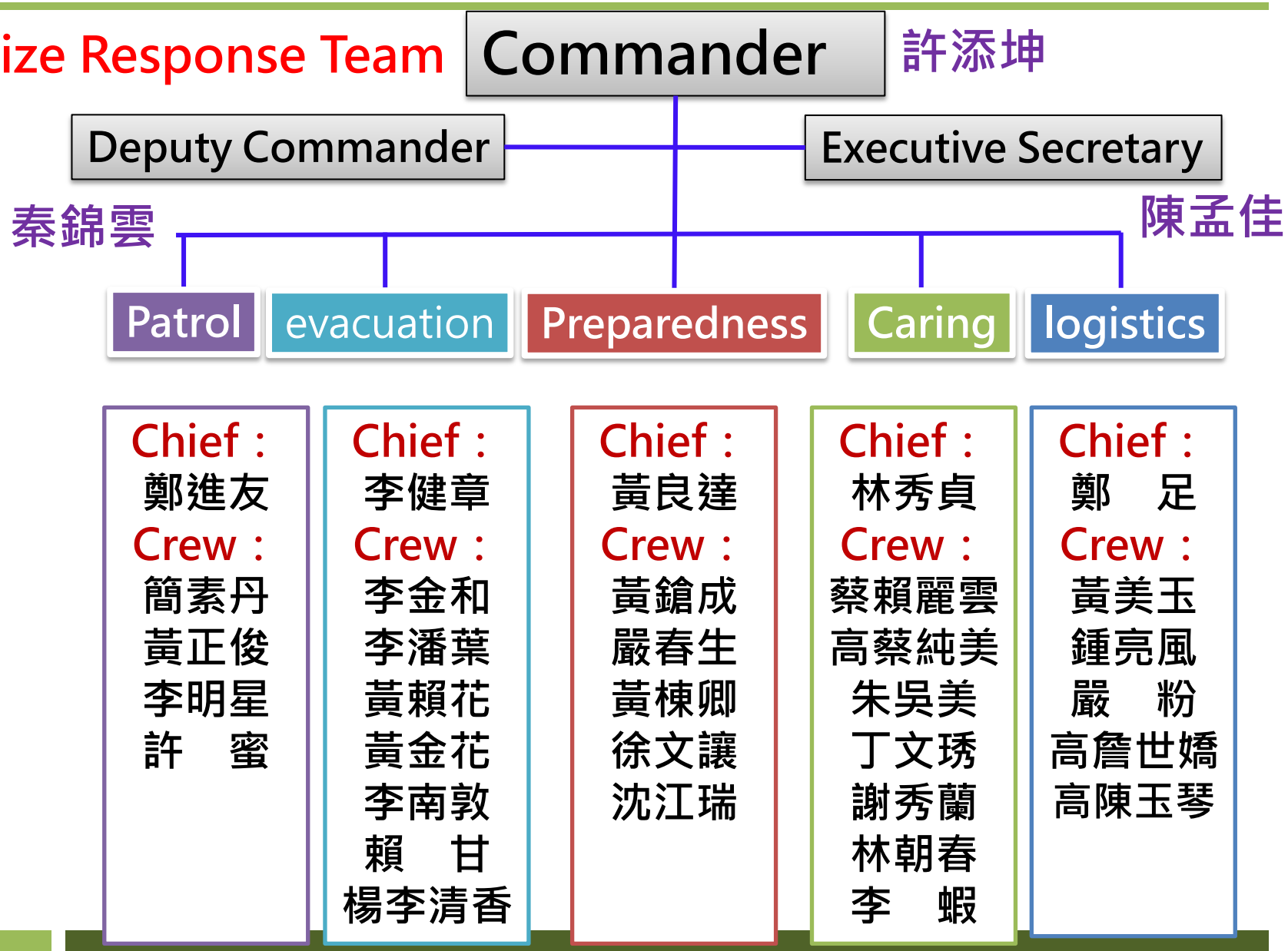
Operating fire extinguisher

Self operation

Lecture of debris flow

Step 4 Education and Training

Organize Response Team



Step 4 Education and Training

Disaster Prevention Map

防災資訊

區界圖

●里面積
6,320,900平方公尺
●總人口數
1,062人

災害通報單位

●新北市災害應變中心
電話-(02)89535599#6659
●泰山區災害應變中心(一級開設時)
電話-(02)22963223
●水土保持局土石流災害緊急應變小組
電話-(049)2347500
●水土保持局台北分局緊急應變小組
電話-(02)86664352
●新北市政府警察局-泰山分駐所
地址-新北市泰山區泰林路二段214號
電話-(02)29097947
●消防局-泰山消防分隊
地址-新北市泰山區明志路二段188號
電話-(02)22962640

緊急連絡人

●里長　黃金進
電話-(02)29098991、0937992727

防災資訊網站

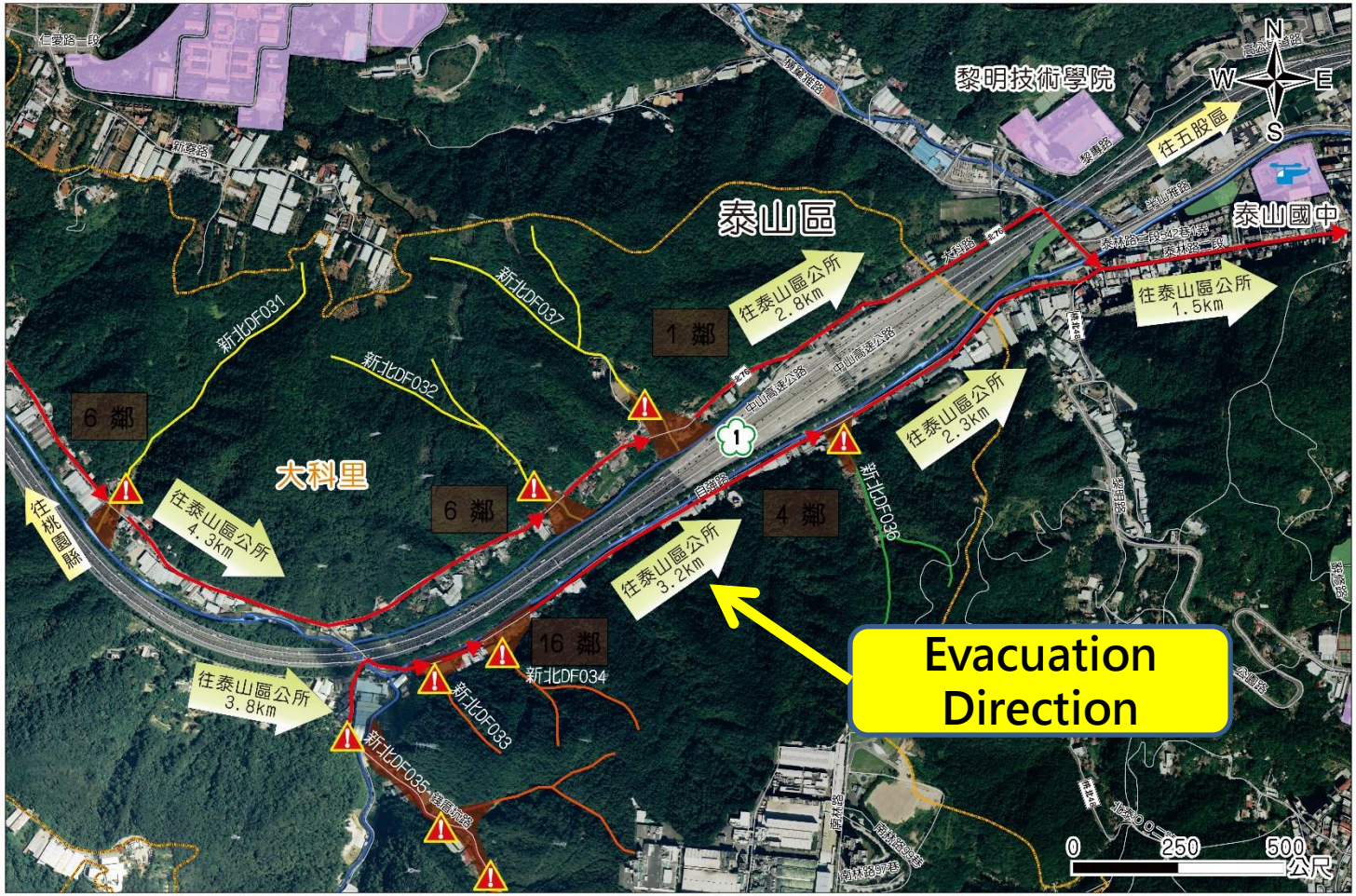
●內政部消防署
http://www.nfa.gov.tw/
●行政院農業委員會水土保持局
http://www.swcb.gov.tw/
●交通部公路總局
http://www.thb.gov.tw/tm/wcf.aspx
●新北市政府防災資訊網
http://www.dsc.tpc.gov.tw/home.asp

相關資訊

●直升機起降點
泰山國中操場
地址-泰山區
泰林路二段255號
電話-(02)22962519
●土石流緊戒值:500mm
●歷史災害:90年納莉颱風

避難收容所

1.泰山區公所
容納-100人
地址-泰山區同榮里
明志路一段322號
電話-(02)29099551



圖例	土石流潛勢溪流	防災	設施	道路	河川	行政區域界線
	低度	疏散避難路線	直升機起降點	道路	河川	里界線
	中度	臨時災民收容所	災害警告標誌設置點	臺灣鐵路		區界線
	高度	警察局		設施		
	持續觀察	消防局		公園	資料來源：行政院農委會水土保持局	
	影響範圍	醫療單位		學校	國立臺灣大學氣候天氣災害研究中心　101 年 5 月 製作	

Step 5 Drill of Disaster Prevention

Patrol

Caring

Evacuation

Refuge

Step 6 Achievement Presentation

103年「新北市災害防教深耕第2期計畫」

金山區三界里防災示範社區

年度成果展

歷史沿革

地理位置

防災示範社區推動前置作業

一、拜訪里長與金山區公所

二、防災示範社區工作指導會議

環境踏勘與防救災對策討論研擬

一、活動說明

二、環境踏勘

防救災教育訓練

社區防救災任務編組

啟蒙啟動

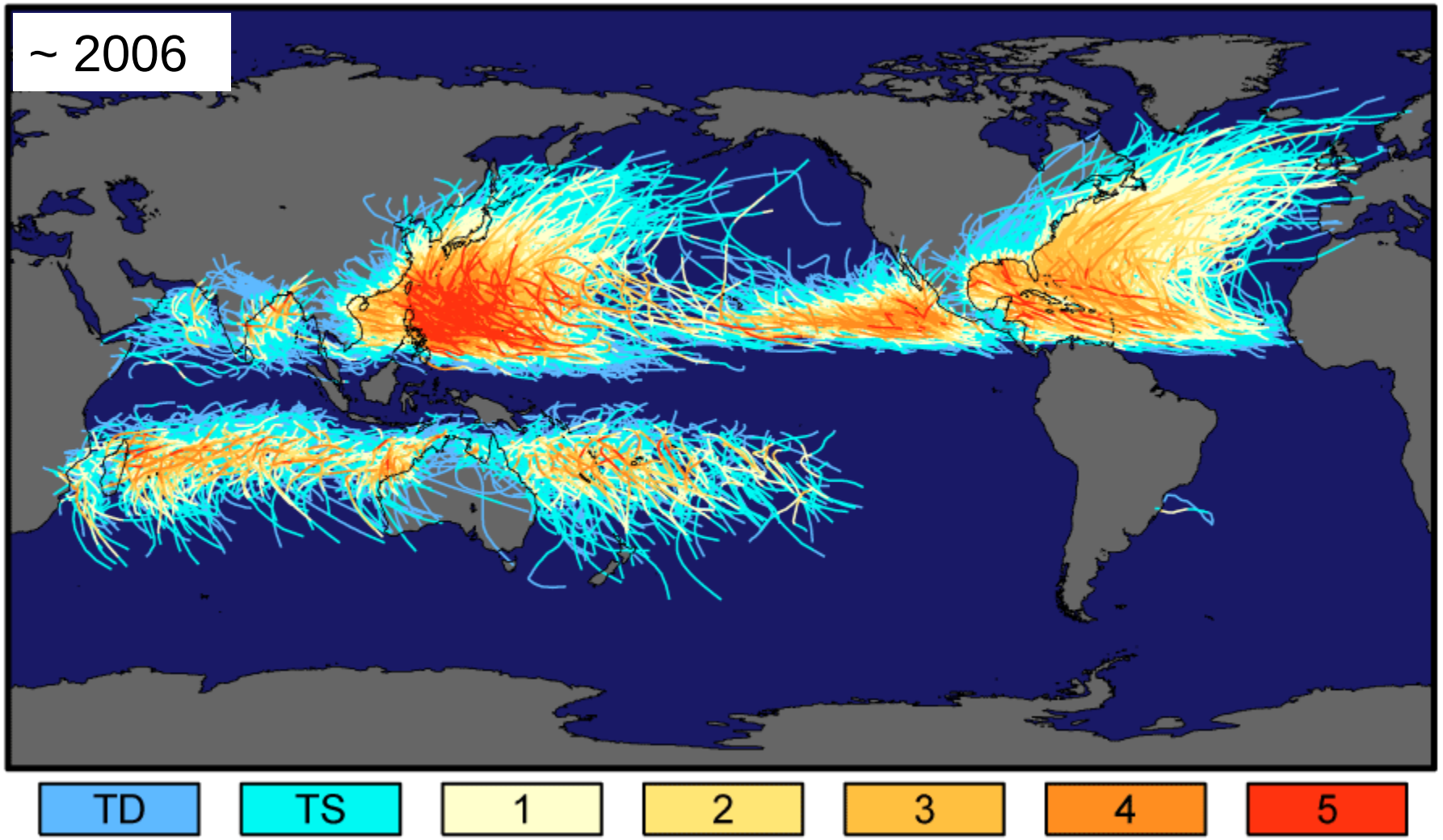
消防技能培訓

防災社區自助交流

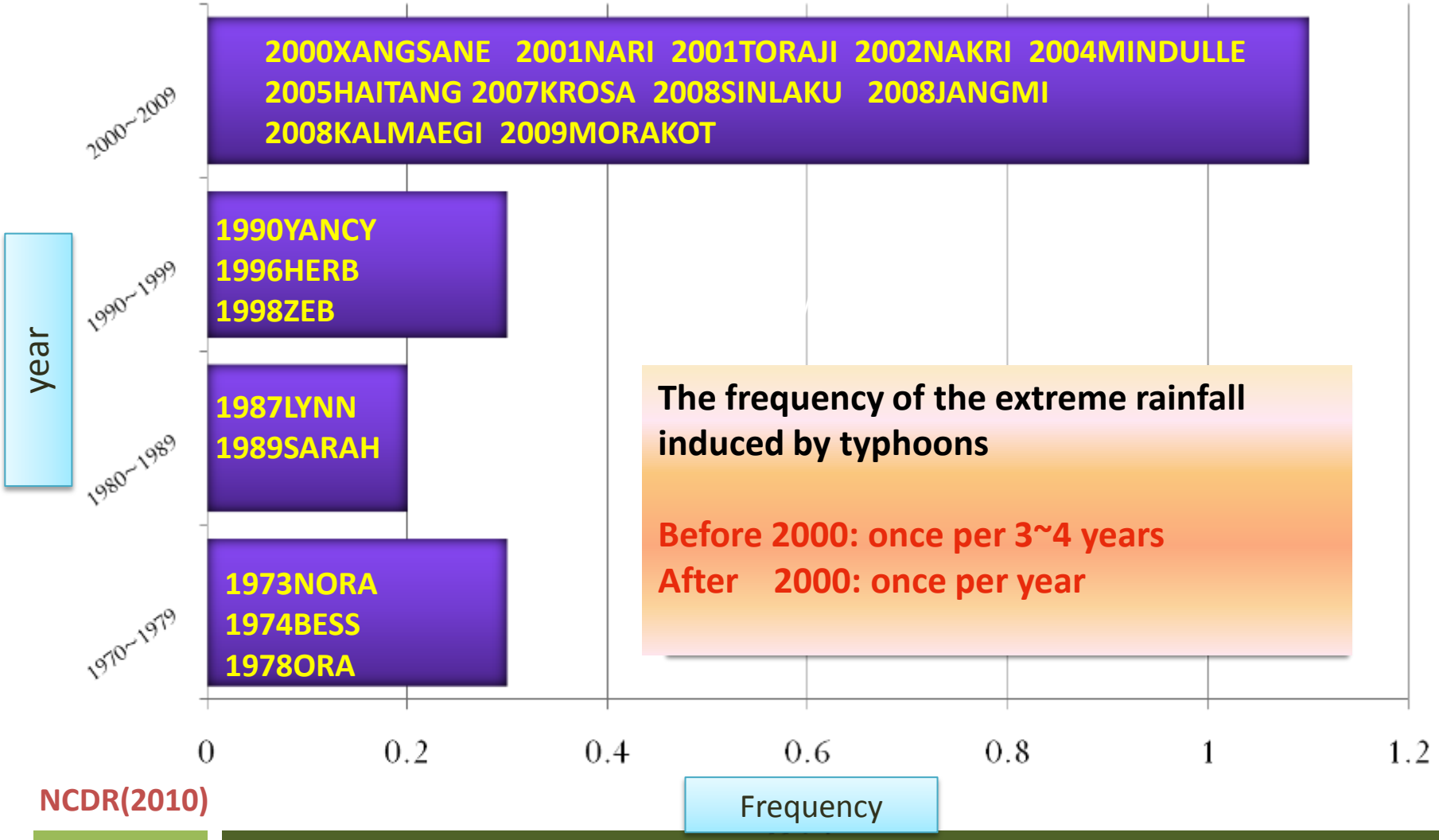
一、臺北市文山區明興里

二、宜蘭縣大同鄉寒溪村參訪交流

Tracks and Intensity of All Tropical Storms



Collect the extreme rainfall induced by typhoons (the top 20 of the rainfall index between 1970 and 2009)



The frequency of the extreme rainfall induced by typhoons

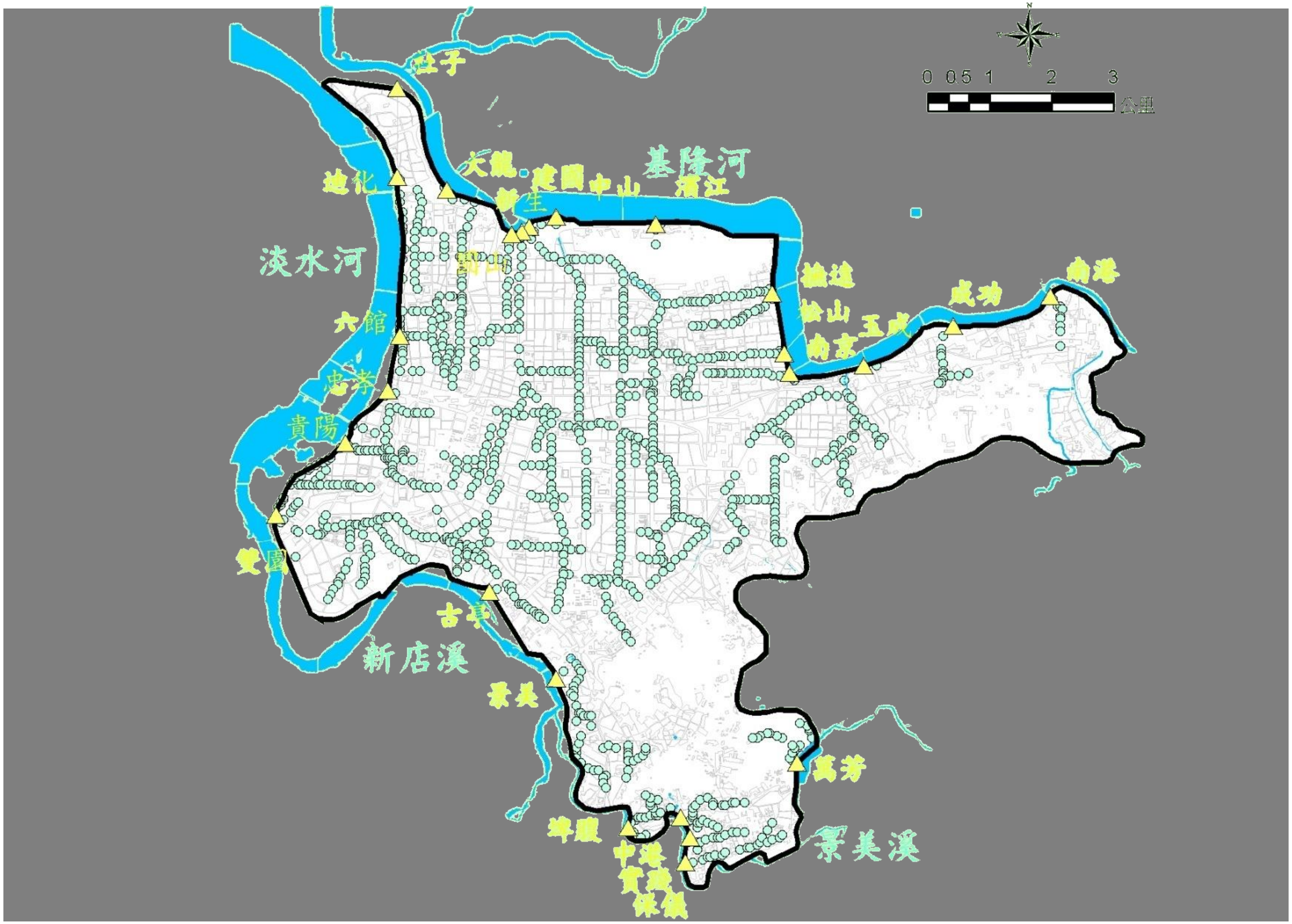
Before 2000: once per 3~4 years
After 2000: once per year

NCDR(2010)

Typhoon Xangsane (Oct, 2000)

Flooding in Xizhi District, New Taipei City

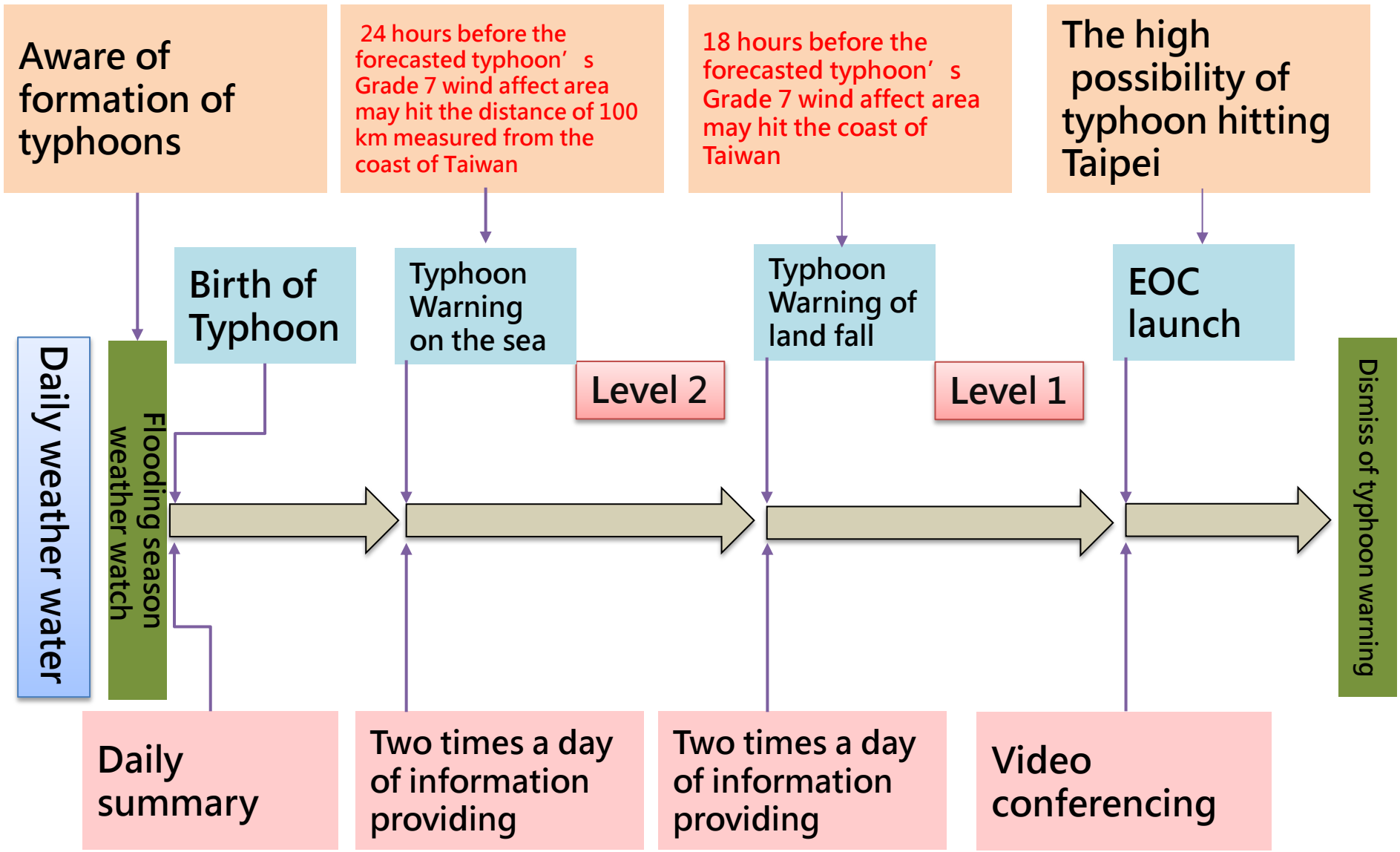
The map of levee, pumping systems around Taipei city



Pumping Station

Sep, 2001 NARI Typhoon –Taipei Metro Subway

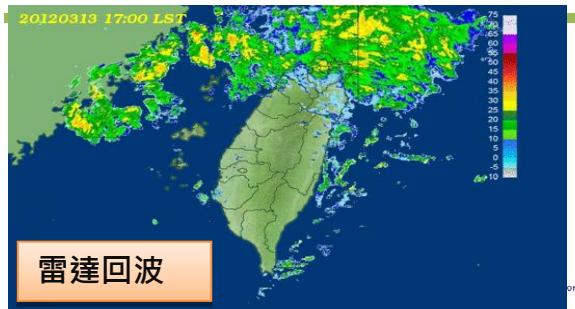
Work flow of Weather Monitoring



Video Conference

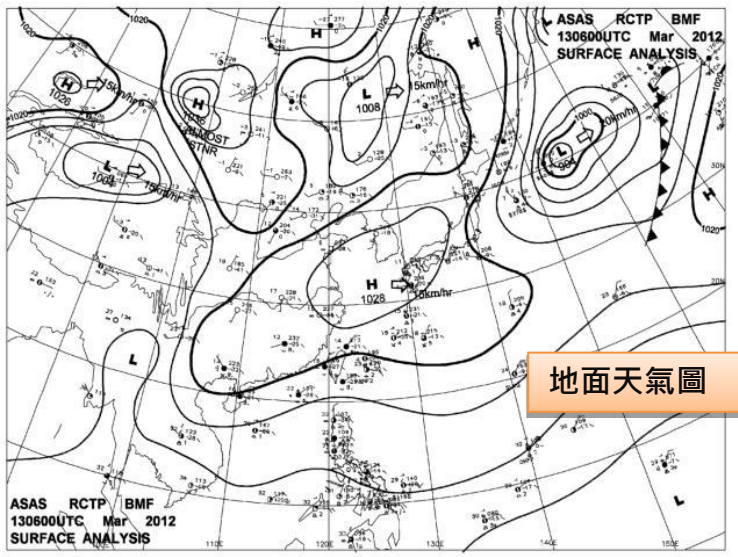
We provide video conference during Typhoon season

Integrated heavy rainfall or Typhoon information

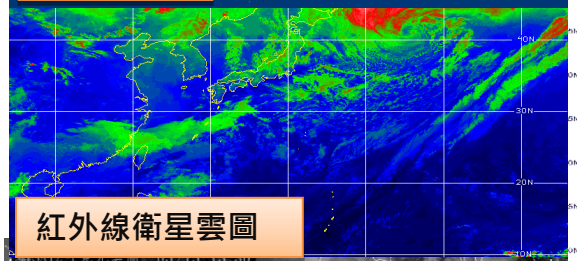


雷達回波

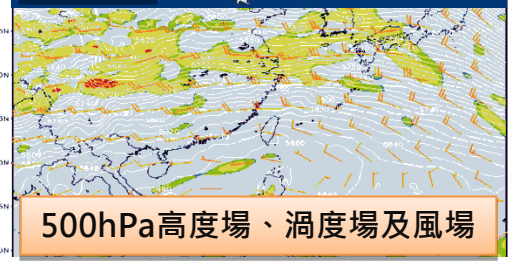
雨量



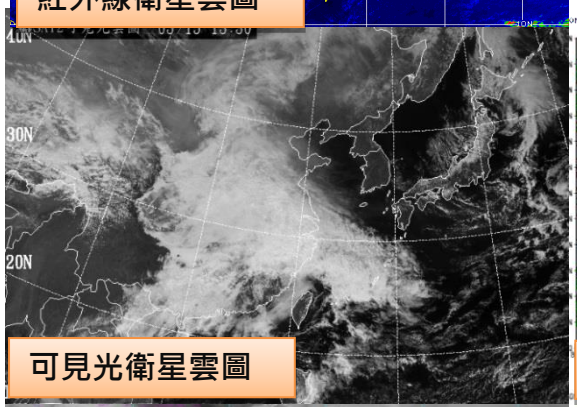
地面天氣圖



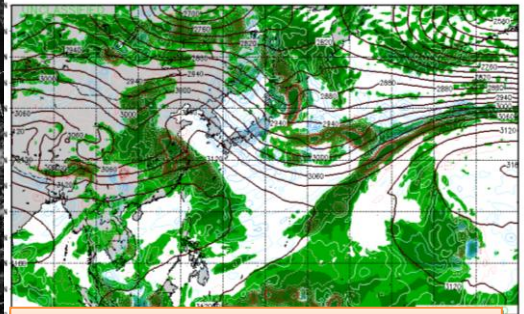
紅外線衛星雲圖



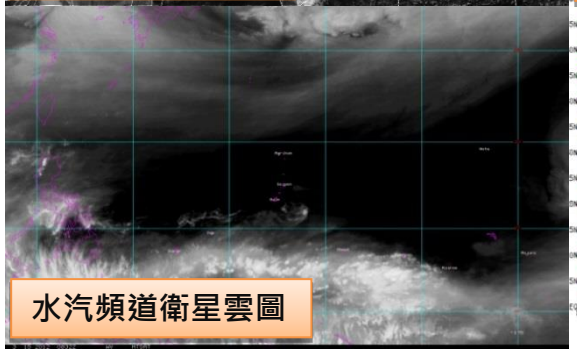
500hPa高度場、渦度場及風場



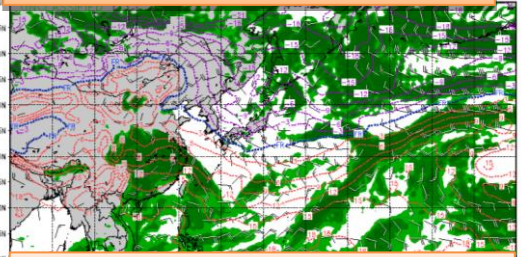
可見光衛星雲圖



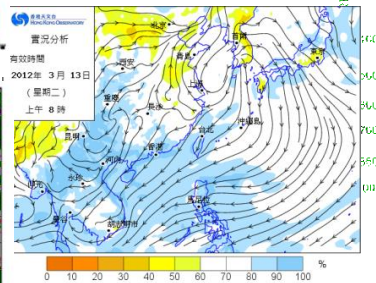
700hPa高度、垂直速度、濕度



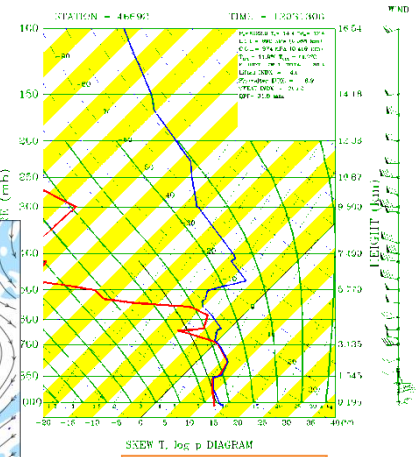
水汽頻道衛星雲圖



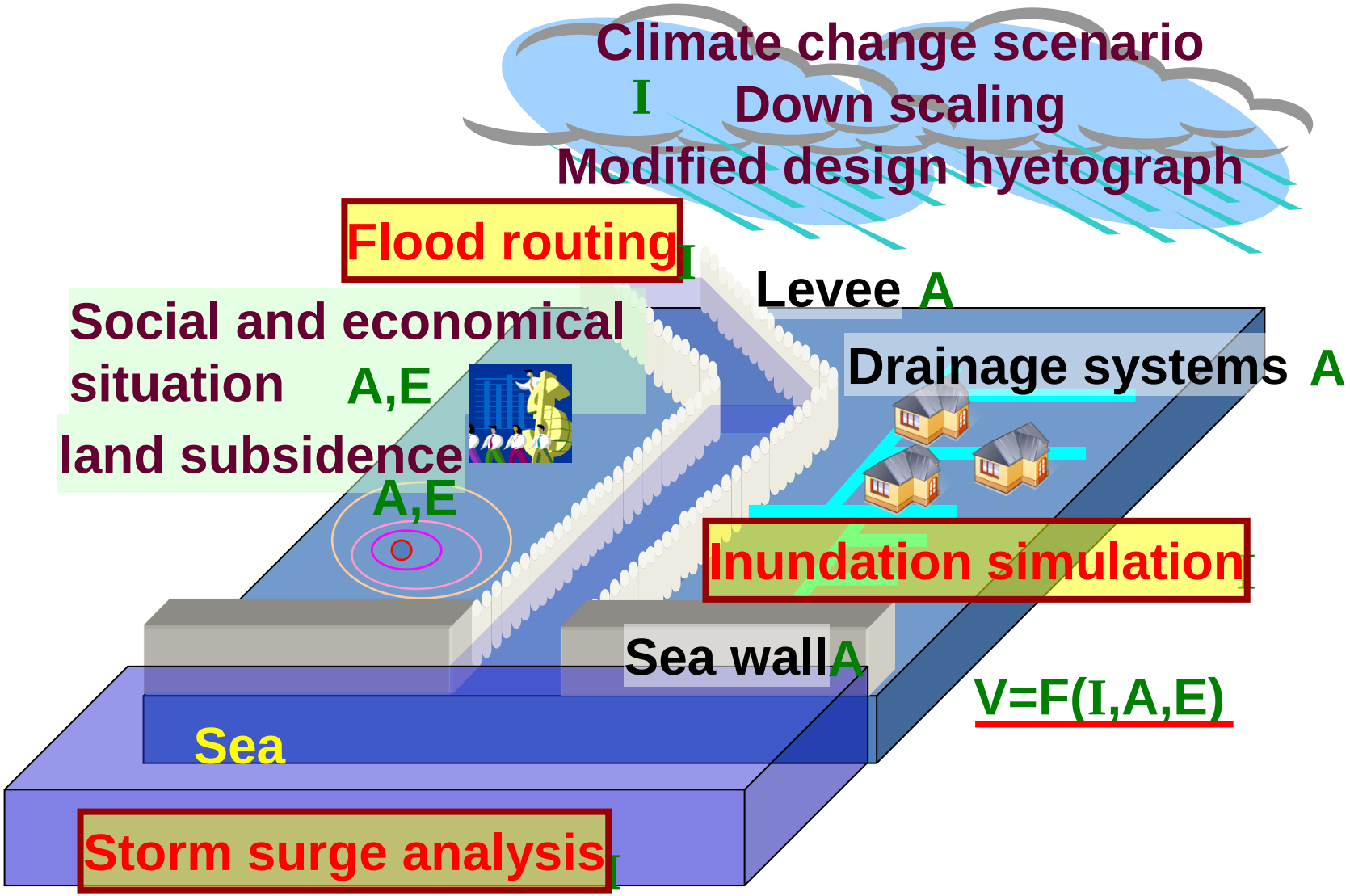
850hPa高度、溫度、濕度及風場



地面風速、流場

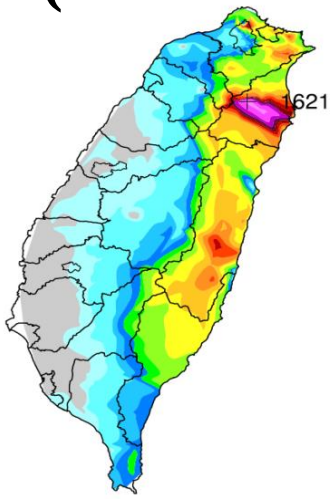


板橋探空圖

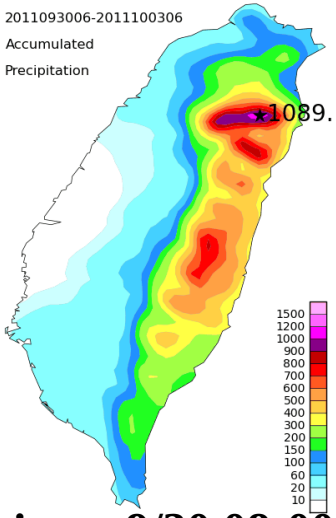

Climate change scenario
I
Down scaling
Modified design hyetograph
Flood routing I
Levee A
Social and economical situation A,E
Drainage systems A
land subsidence A,E
Inundation simulation I
Sea wall A
V=F(I,A,E)
Sea
Storm surge analysis I

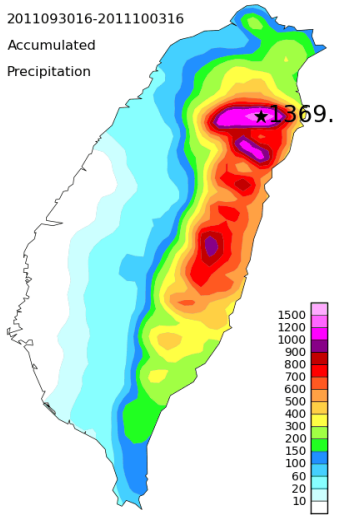
Ensemble Cluster Rainfall Forecasting (Typhoon Nalgae 2011)

Observed (10/01~10/03)

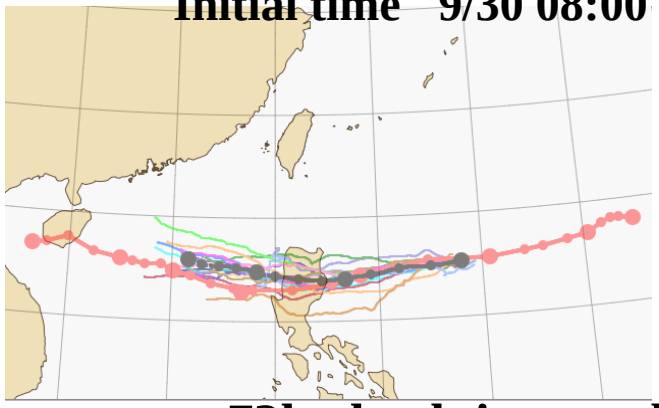


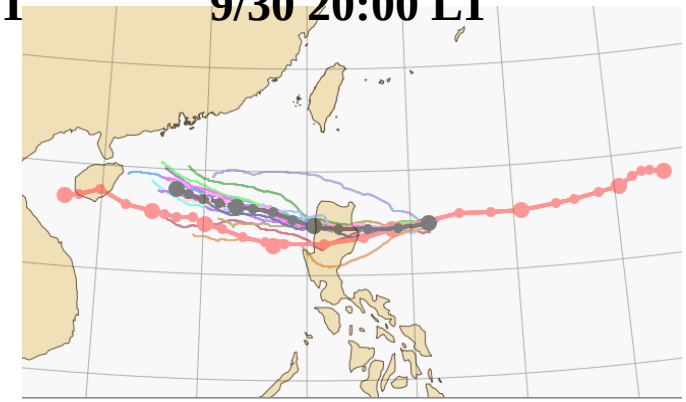
72hr-cluster- cumulative rainfall forecasting (mm)





Initial time 9/30 08:00 LT **9/30 20:00 LT**





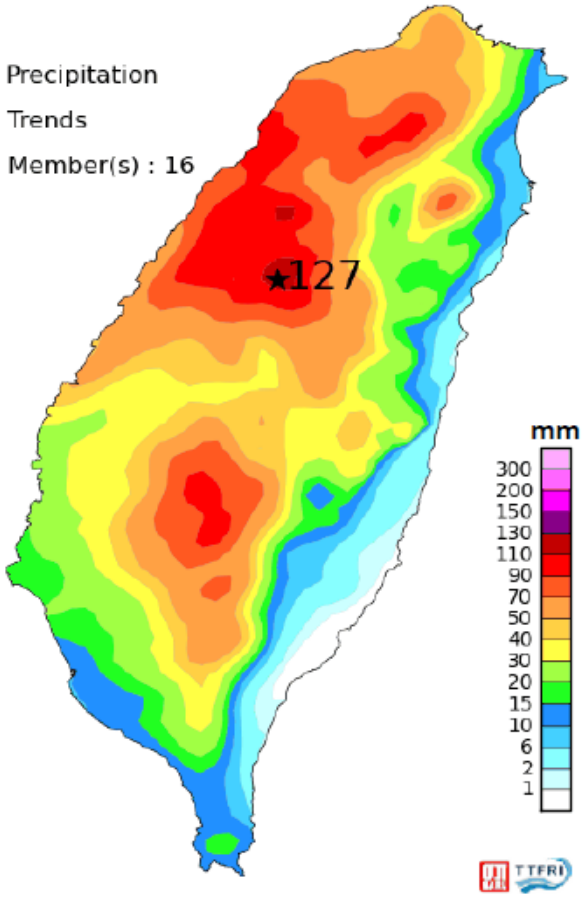
72hr-lead time-typhoon path prediction

Ensemble rainfall -Typhoon Saola

4 times/day, 22 members (16 finished)

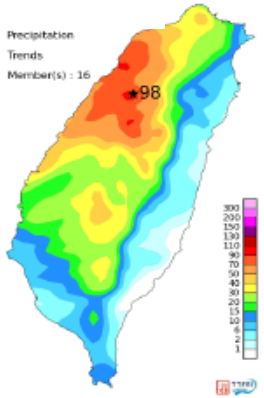
Average of 16 members

Day 1 8/2 20:00-8/3 20:00

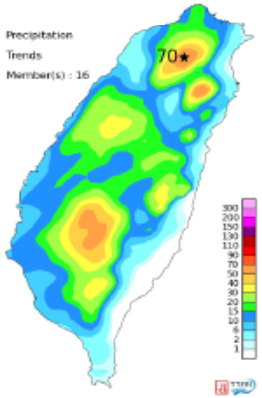


Start for simulation: 08/2 14:00

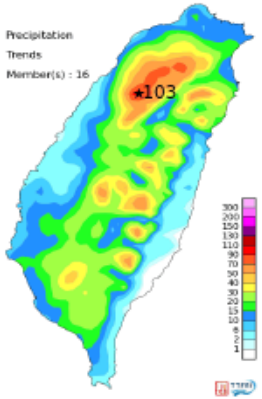
Day 1 8/2 20:00-8/3 08:00



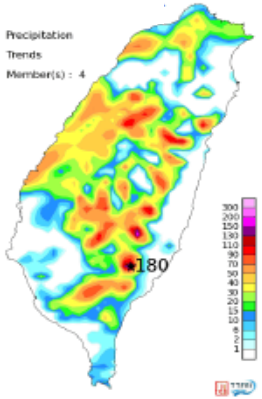
Day 1 8/3 08:00-8/3



Dav 2 8/3 20:00-8/4 20:00

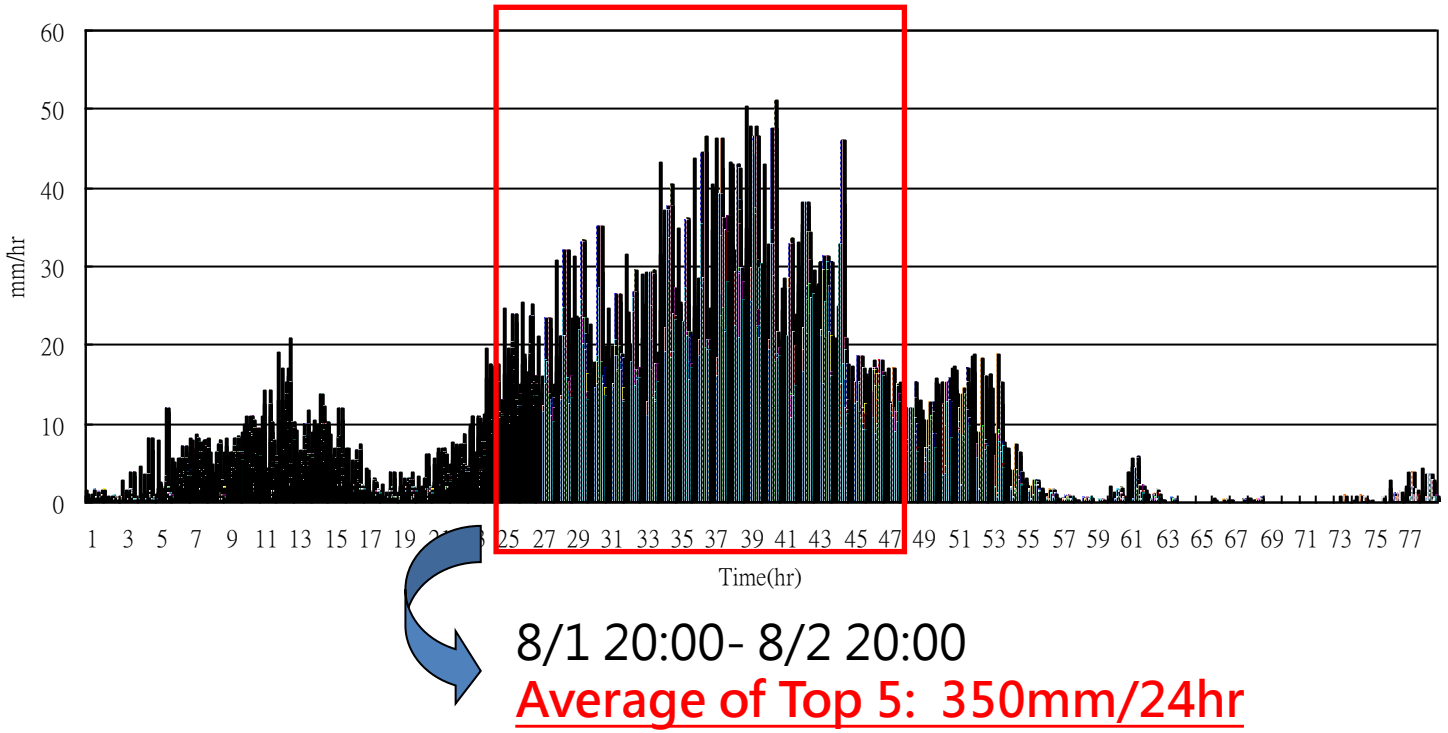


Day 3 8/2 20:00-8/3 20:00

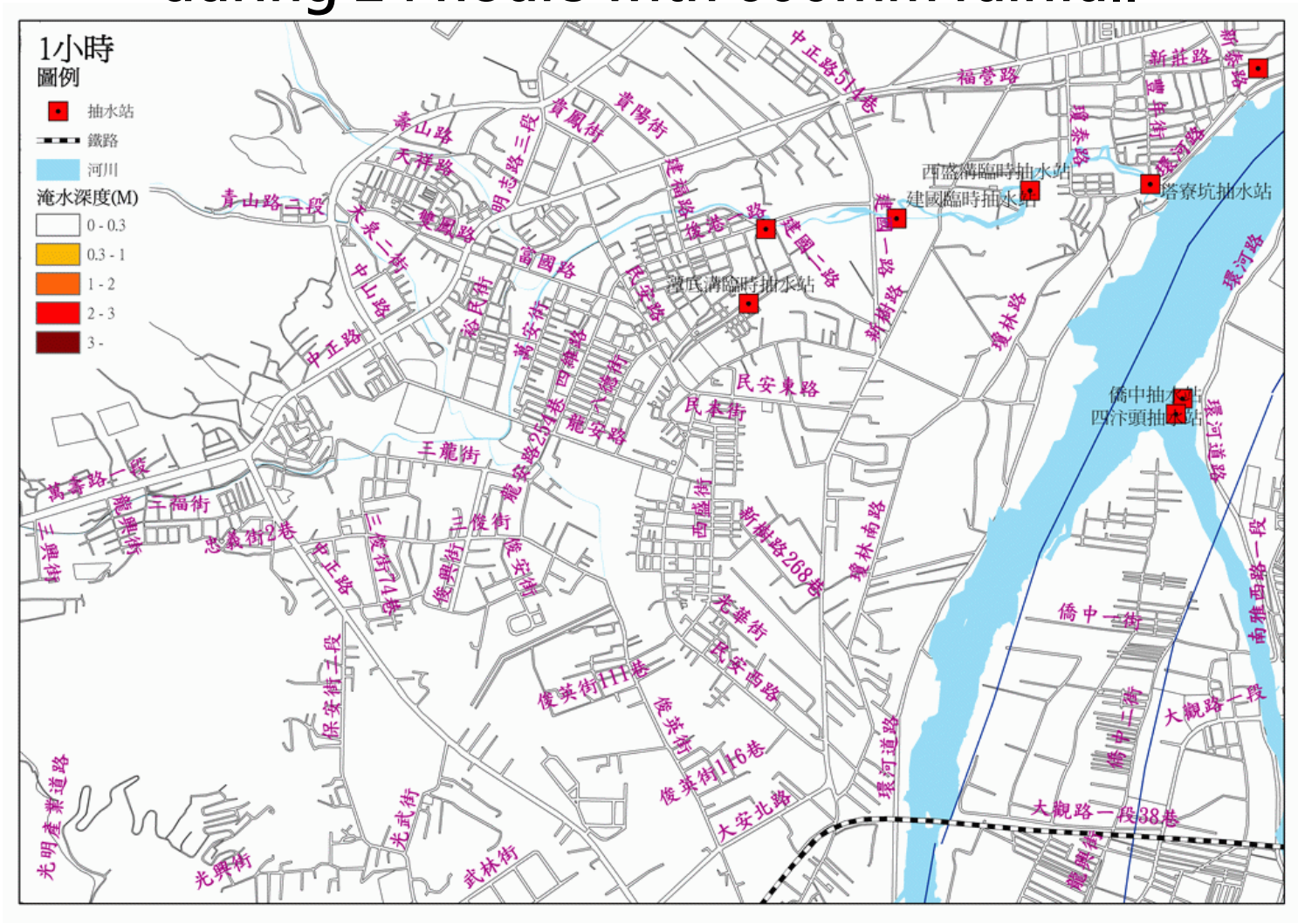


TTFRI-Typhoon Saola

- **16 of 22 members of TTFRI finished**
- **Lead time 72 hrs (Total simulation time =78 hrs., but needs about 6 hrs. to run simulation)**
- **Rainfall used for flood simulation 8/1 20:00-8/2 20:00, duration=24hr, Average of Top 5 of 16 members**



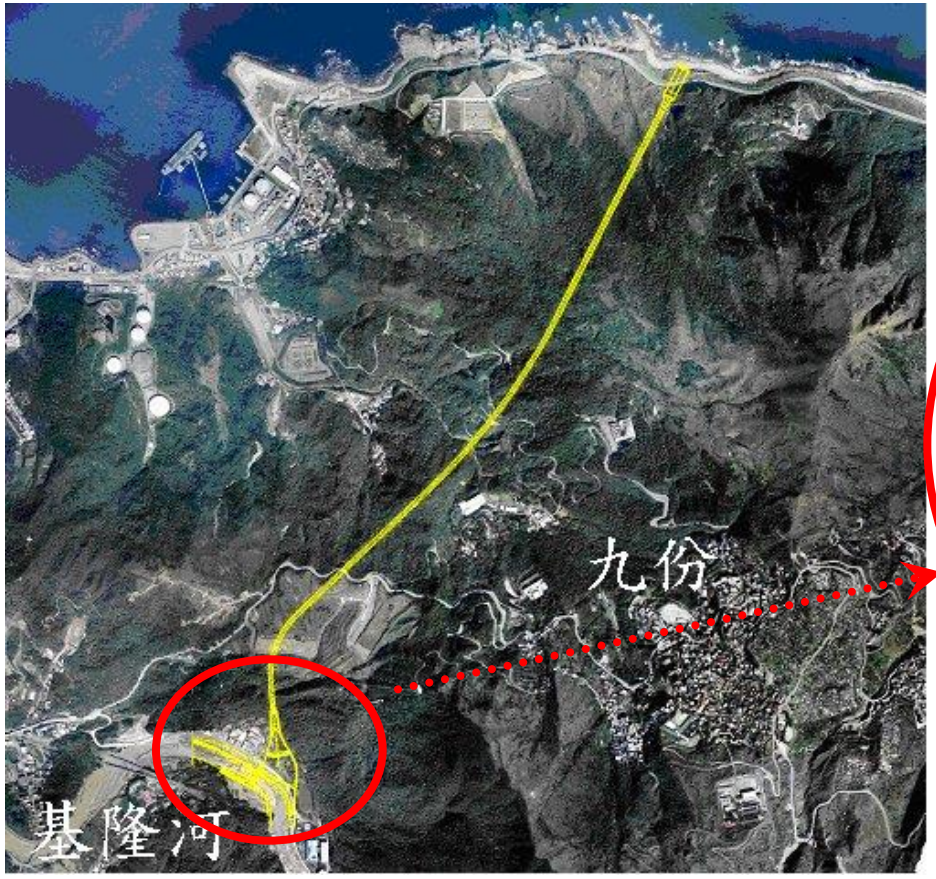
Dynamic potential flood map during 24 hours with 600mm rainfall



Flood Division Tunnel (Bypass Tunnel)

Site Description

East Sea



Yuanshantze Flood Diversion

River weir

1. For the criterion of 200-yr return period flood protection, 1,620 cms is the design flood discharge, diverting discharge is 1,310 cms, and 310 cms is released to the downstream of the river.
2. Main structures:

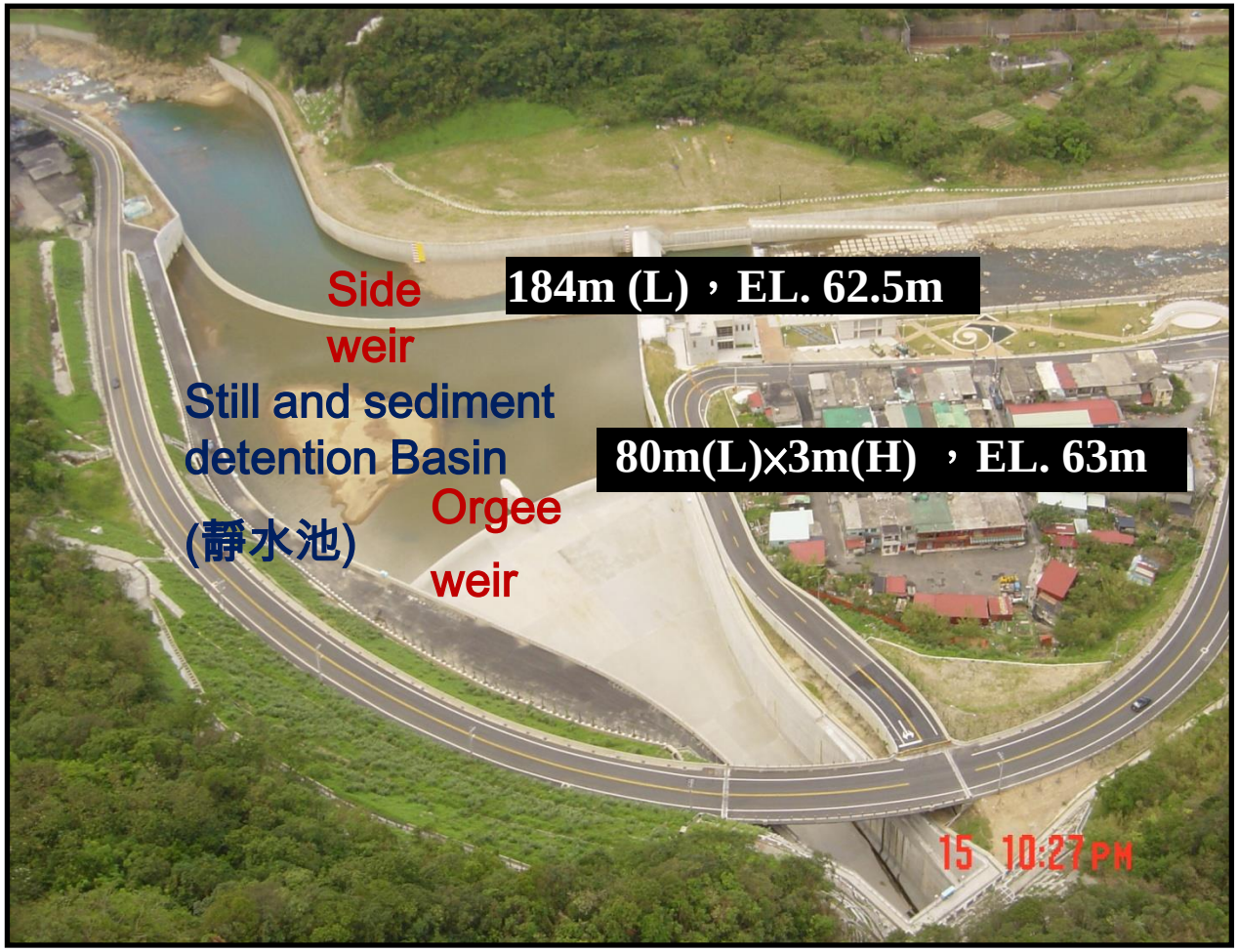
(1) Flood outlet

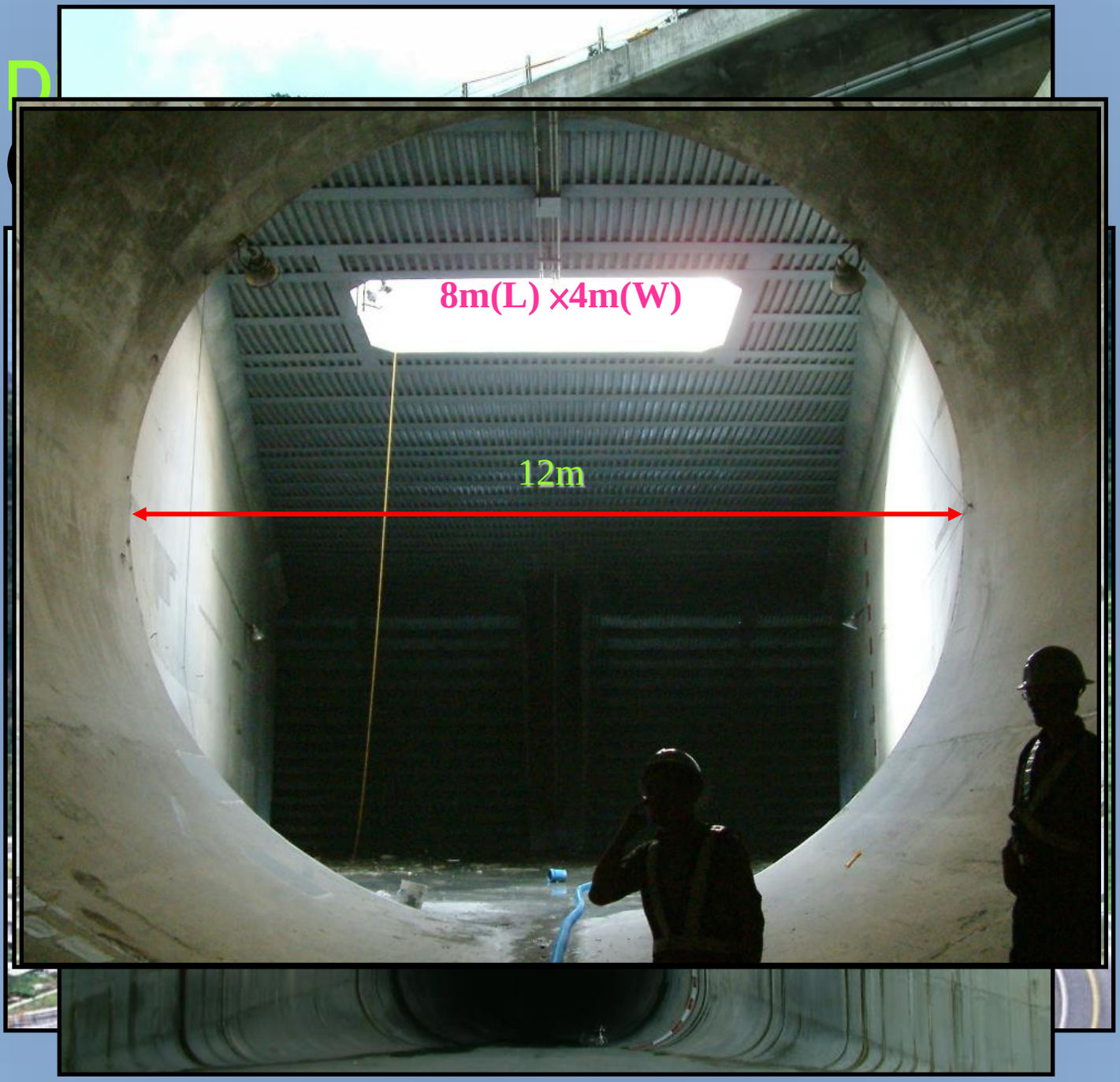
(2) Sluice way

(3) Fish way

Yuanshantze Flood Diversion

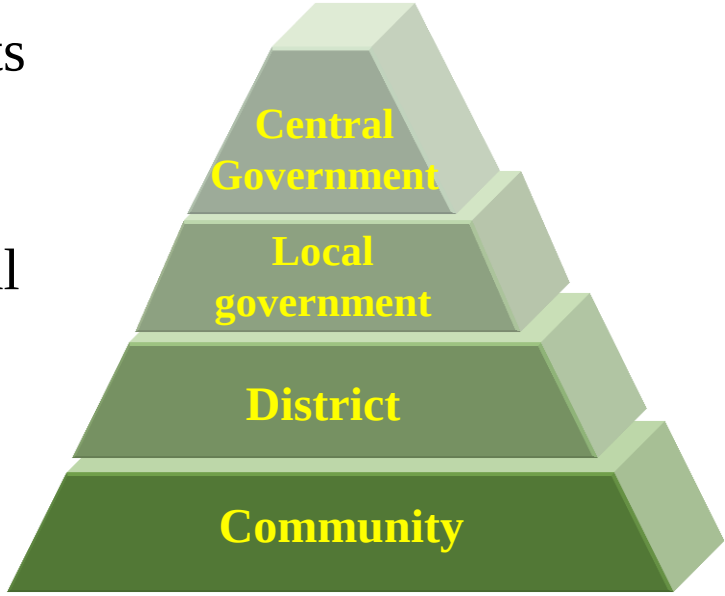
Intake works




8m(L) ×4m(W)
12m

Conclusion

- By cooperation between the local government and universities to promote the resilience community,
  - The **local government** could strengthen its connection to districts and community;
  - The **university** could put its non-structural methods into practice;
  - The **community** could learn to deal with catastrophic disasters by helping themselves before the government can further assist them.



Community is the basic and the most important level for disaster management

Thanks for your attention

yctan@ntu.edu.tw