

Volcanic Ash and Cloud Dispersion Roundtable Discussion

菲律賓馬尼拉

Mandarin Oriental Hotel

服務機關: 行政院國家科學委員會

姓名職稱: 陳副主委正宏

廖處長文峯

張研究員文彥

陳禹銘博士

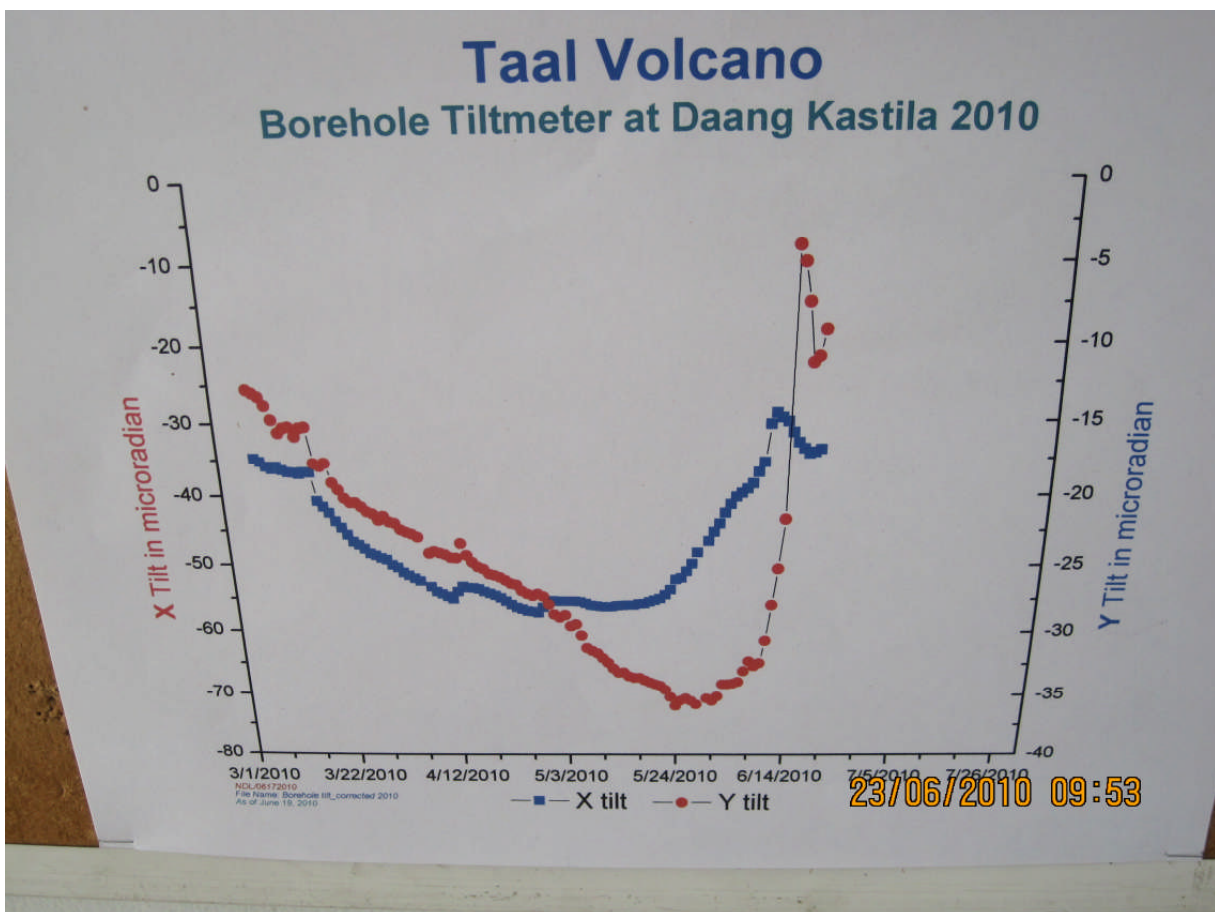
出國期間: 99年06月21日至99年06月24日

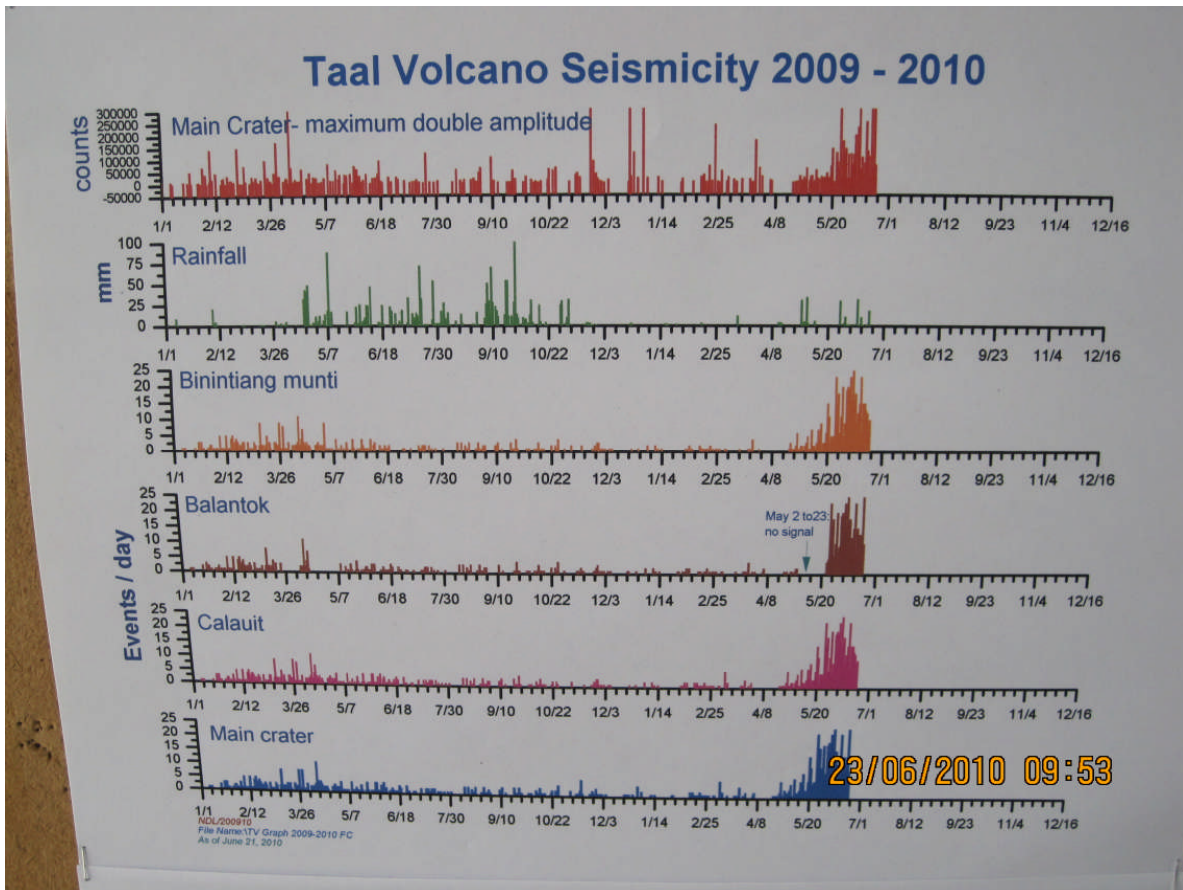
報告日期: 99年07月30日

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1 目地

繼菲律賓科技部部長Alabastro協同次長Yumul於本(99)年4月訪台後主動邀請本會主委及陳副主委赴菲律賓馬尼拉參加由菲律賓科技部主辦之「Volcanic Ash and Cloud Dispersion」Roundtable Discussion. 希望藉由此次會議再深入台菲於地質災害領域之科技交流。



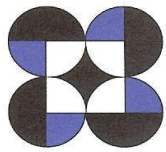


菲律賓火山與地震研究所 (PHILVOLCS) 針對菲律賓的 Taal Volcano 所監測之結果，Taal Volcano 於今年的活動頻繁，隨時有可能會爆發，目前 Taal Volcano 的危險等級已被 PHILVOLCS 提昇。

本會由陳副主委正宏協同自然處廖處長文峯率學者團與會，會議中除探討台菲於地質領域、地球科學領域、菲律賓之火山如爆發其火山灰之擴散對台灣之影響之預測及評估外，同時也就目前推動中之雙邊合作議題再深入探討，其中包括雷達站之可行性評估、亞太颱風及人文社會研究中心議題、台菲雙邊合作計畫之期程及台菲人才培育三明治 (Sandwich Project) 計畫進行探討。

菲國科技部安排菲律賓氣象局(PAGASA)及菲律賓火山與地震研究所 Philippine Institute of Volcanology and Seismology (PHILVOCS Center)相關人員與會，過程中與我國學者促進交流、交換意見及探討未來合作之相關研究議題及可行性。

1.1 菲律賓科技部邀請函



Republic of the Philippines

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Office of the Undersecretary for Research and Development



International Technology
Cooperation Unit (ITCU)

07 June 2010

The Honorable
DR. CHENG-HONG CHEN
Deputy Minister
National Science Council of Taiwan
19/F, 106 Ho-Ping E. Road., Section 2
Taipei, Taiwan, 106, R.O.C.

Dear Deputy Minister Chen:

I am writing on behalf of Undersecretary Dr. Graciano P. Yumul, Jr., of the Department of Science and Technology. We wish to invite you to attend the Roundtable Discussion on the Joint Research on Volcanic Ash Dispersion to be held on 22-23 June 2010 at the Mandarin Hotel.

Relative to this, we are pleased to inform you that we will provide for all your travel expenses which shall include the cost of your international airfare (roundtrip) on business class, hotel accommodation from 21-24 June 2010, transportation and meals during the meeting and for the duration of your stay in Manila. Further, we will extend the same hospitality to the following members of your delegation:

1. Dr. Wen-Feng Liaw, Director of Natural Sciences
2. Dr. Yu-Ming Chen, Program Director, Department of International Cooperation

We hope to see you in Manila and we look forward to a successful discussion with you and your delegation.

Thank you and best regards.

Very truly yours,

ELENITA M. LEUS
Head, International Technology Cooperation Unit

USB/TAIWAN/RoundtableDiscussion/Louis/ LN

"Building International Linkages for Tomorrow's S&T"

Room 301, 3/F DOST Bldg., Gen. Santos Ave., Bicutan, Taguig City ☎ (632) 838-8376; (632) 837-2071 to 82 loc. 2001 📠 (632) 838-

website: <http://www.dost.gov.ph>
<http://itcu.dost.gov.ph>

2 航程資料

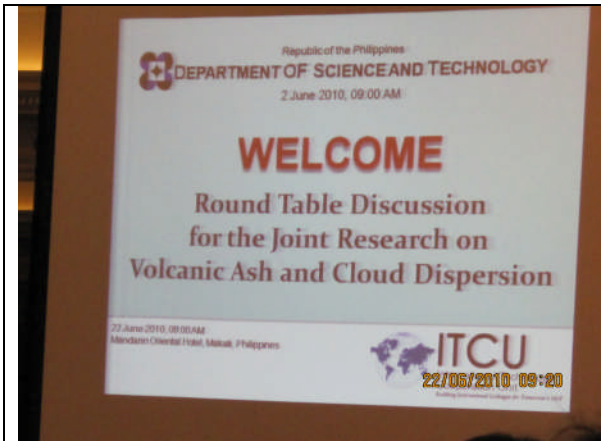
出發日	2010年6月21日 (星期一)
回程日	2010年6月24日 (星期四)
旅館	Mandarin Oriental Hotel
班機	長榮航空
6月21日出境	長榮航空 BR271 (第二航站) 09:30 出發：桃園國際機場 11:40 抵達：馬尼拉
6月24日入境	長榮航空 BR272 (第一航站) 12:45 出發：馬尼拉(MNL) 14:55 抵達：桃園國際機場

表 1: 長榮航空航線資訊

3 我方與會人員

陳正宏(國科會副主任委員)
廖文峯(國科會自然處處長)
張文彥(國科會陳副主委秘書+自然處承辦人)
林正洪副所長(中央研究院地球科學研究所)
許樹坤主任(國立中央大學地球科學系)
楊燦堯教授(國立臺灣大學地質科學研究所)
王國英教授(國立中央大學環境研究中心)
黃維智(交通部中央氣象局)
李維森博士(國家災害防救科技中心)
陳禹銘博士(國科會國合處)

4 Volcanic Ash and Cloud Dispersion 照片





Visit the PHIVOCS monitoring station nearby the Taal Volcano, presentation by PHIVOCS Director DR. RENATO U. SOLIDUM, JR.



Field trip to the Taal Volcano



Field trip to the Taal Volcano accompany by PHIVOCS Director DR. RENATO U. SOLIDUM, JR.





4.1 火山灰及塵埃擴散座談會議程

Roundtable discussion on the joint research for volcanic ash dispersion

11:40	Arrival via BR 271
11:40 - 13:00	Travel time and Check-in at Mandarin Oriental Manila
14:00– 16:00	Tour of the Ayala Museum
19:00	Welcome Dinner hosted by Undersecretary Graciano P. Yumul, Jr. Venue: <i>TIVOLI Restaurant, Mandarin Oriental Manila</i>
Tuesday, 22 June 2010	
ROUNDTABLE DISCUSSION	
08:30-09:00	Registration
09:00-09:20	Opening Ceremony Welcome Remarks Dr. Graciano P. Yumul, Jr. Undersecretary, Department of Science and Technology (DOST) Opening Remarks Dr. Cheng-Hong Chen Deputy Minister, National Science Council (NSC)
09:20-09:30	Group Photo

	PLENARY SESSION
09:30- 09:45	Presentation I – Describing Tools and Information for Monitoring the Atmospheric Transport and Dispersion of Volcanic Ash in the Philippines (PAGASA)
09:45– 10:00	Presentation II - Volcanic Activities, Volcanic Ash Studies and Warning Protocols in the Philippines (PHIVOLCS)
10:00– 10:15	Presentation III - Prediction of Volcanic Ash Dispersion and Passage (Prof. Kuo-Ying Wang)
10:15– 10:30	Presentation IV – Recently Seismic Monitoring in Philippines (Prof. Cheng- Horng Lin)
10:30– 10:45	Presentation V – Monitoring the Potential Magma Activity and Predicting the Volcanic Explosivity Index of an Volcano (Prof. Tsanyao Frank Yang)
10:45– 11:00	Presentation VI – Rebuild the Basco Radar: Findings and Recommendation (Prof. Wei-Jyh Hwang)
11:00– 11:15	Presentation VII - Evolution of the Philippine-Taiwan arcs: Collaborative Investigations into the Geodynamics of Active Subduction/deformation Systems (UP-NIGS)
11:15– 11:30	Presentation VIII - Geodynamic Context and Problems of Taiwan and Philippines (Prof. Shu-Kun Hsu)
11:30– 11:45	Presentation IX - Collaboration on Capacity Building of Disaster Risk Reduction and Emergency Preparedness (Dr. Wei-Sen Li)
12:10 -12:30	OPEN FORUM

12:30-13:30	Lunch Break Venue: Nash Room
BREAK-OUT SESSIONS	
13:30- 15:30	Session 1 – Joint Research on Volcanic Ash Dispersion
	Session 2 – Evaluation of Doppler Radar setting in Basco, Batanes
13:30- 15:30	Session 3 – Researches on Geodynamics (tectonics, earthquakes and volcanoes)
	Session 4 – Sandwich Program
	Session 5 – Follow-up activity of the Climate Change Workshop (07-08 April 2010)
15:30 -17:00	Wrap up (Report writing)
17:00 -17:30	PLENARY SESSION Presentation of Reports and Adoption of the Records of Discussion
19:00	Welcome Dinner hosted by Secretary Estrella F. Alabastro Venue: <i>Lotus Peony Room, Tin Hau Mandarin Oriental</i>
Wednesday, 23 June 2010 TOUR of TAGAYTAY	
7:50 – 8:00	Assembly at the hotel lobby
8:00	Departure
8:00 – 10:00	Travel time to Tagaytay
10:00 - 11:30	Visit to PHIVOLCS monitoring station
11:30– 12:00	Viewing of Taal Volcano
12:00– 14:00	Lunch Venue: Josephine’s Restaurant, Tagaytay City
14:00-16:00	Travel time back to the hotel
19:00	Dinner hosted by Taipei Economic and Cultural Office (TECO) Venue: Peking Garden, 4/F, Greenbelt 5
Thursday, 24 June 2010	
11:30	Depart hotel
12:45	Departure for Taipei via BR 272

5 心得與建議

會議紀錄如下

SUMMARY RECORD OF DISCUSSION

- I. The MECO-TECO Roundtable Discussion on Joint Research was held at the Mandarin Oriental Manila, Philippines on 22 June 2010. The meeting was jointly presided by Dr. Graciano P. Yumul, Jr., Undersecretary for Research and Development of the Department of Science and Technology (DOST) and Head of the Philippine Delegation and Dr. Cheng-Hong Chen, Deputy Minister, National Science Council (NSC) and Head of the Delegation of Taiwan. The list of delegations appears as Annex 1 and 2.

- II. After the Opening Ceremony, there were presentations from both sides:
 - A. Describing Tools and Information for Monitoring the Atmospheric Transport and Dispersion of Volcanic Ash in the Philippines (Dr. Nathaniel T. Servando)
 - B. Volcanic Activities, Volcanic Ash Studies and Warning Protocols in the Philippines (Dr. Renato U. Solidum, Jr.)
 - C. Prediction of Volcanic Ash Dispersion and Passage (Prof. Kuo-Ying Wang)
 - D. Recently Seismic Monitoring in Philippines (Prof. Cheng-Hong Lin)
 - E. Monitoring the Potential Magma Activity and Predicting the Volcanic Explosivity Index of a Volcano (Prof. Tsanyao Frank Yang)
 - F. Rebuild the Basco Radar: Findings and Recommendation (Mr. Wei-Jyh Hwang)
 - G. Evolution of the Philippines-Taiwan Arcs: Collaborative Investigations into the Geodynamics of Active Subduction/deformation Systems (Dr. Edanjarlo Marquez)
 - H. Geodynamic Context and Problems of Taiwan and Philippines (Prof. Shu-kun Hsu)

- I. Collaboration on Capacity Building of Disaster Risk Reduction and Emergency Preparedness (Dr. Wei-Sen Li)

III. After all the presentations, the meeting broke into the following sessions. Following is the summary of the discussions:

A. Joint Research on Volcanic Ash Dispersion

1. Basic data on volcano – characterize possible VEI (volume of eruption deposits ~ height of eruption column) for candidate volcanoes #Long term study to characterize volcanic ash dispersion in the marine environment
2. Numerical modelling of ash cloud dispersion using model used by Taiwan or open source
3. Volcanic ash and possibly gas cloud tracking; satellite images versus field observations (FORMOSAT satellite and other satellites)
4. Test ash cloud dispersal models versus actual eruptions/field observations (volcano and meteorological data)
5. Use of FORMOSAT satellite during emergencies; ash cloud dispersal during actual eruptions in the Philippines
6. Ash cloud volume/thickness and ash fall deposition estimation using satellite
7. Development of upper air data by numerical modelling using boundary conditions from global circulation models to complement actual upper air observations (to improve wind forecast for the Luzon-Taiwan region)

B. Evaluation of Doppler Radar setting in Basco, Batanes

Discussion was focused on the results and recommendations of the Feasibility Study regarding the establishment of a 'pilot' radar in Basco, Batanes. According to the results of the study, the existing infrastructure for the office building may be retained however, the tower for the radar is for a 4.5m diameter antenna. The CWB recommended antenna is 8.5m in diameter and should be able to withstand 90m/s winds. With this recommendation, the existing design should be reviewed by PAGASA civil engineers and/or accredited structural engineers to determine the compatibility of the technical specifications of the radar and the tower. This will be done to be able to decide whether to reinforce the existing tower or to

build a new tower altogether to accommodate the 8.5m diameter antenna. In which, this becomes a prerequisite before the contract signing to be able to identify the scope of work of the contractors and the funding requirement.

Operations and maintenance of the facility will be the responsibility of PAGASA-DOST, however. CWB will also be conducting monitoring and evaluation of the project at least once a year to identify technical support to be extended to PAGASA personnel in terms of training for maintenance and calibration.

For the communications protocol, CWB and PAGASA communication links will be established and that both raw and processed data should be made available to both Parties.

The second batch training course in relation to the project is very broad and should be streamlined to be accommodated in a 25 day training. However, the training syllabus should be made available 2 months before the start of the training. Target schedule for the training is on the last quarter of the current year (2010).

Financial requirements and grants related to the project should be approved by both sides. PAGASA and CWB should compose a joint team to formulate the proposal which would include among others information dealing with the equipment specifications, data exchange protocol, monitoring and evaluation procedure, operational considerations and budget requirements.

C. Researches on Geodynamics (tectonics, earthquakes and volcanoes)

1. Identify rotation blocks of the Philippine Mobile Belt
2. Study East Luzon Trough area and possible Benham Plateau collision with eastern Luzon
3. Characterize better the creeping and locked segments of Philippine Fault Zone
4. Understand earthquake and volcanic activities in the Philippines
5. Delineation of Palawan Block fragment and Philippine Sea Plate fragment

Activities

1. Extend the Global Positioning System (GPS) network to include points across Mindoro, Romblon, Masbate, Samar, Catanduanes, Negros and Panay
2. Conduct structural, paleontological, geochemical, geophysical studies of Mindoro, Romblon, Masbate, Samar, Catanduanes, Negros and Panay region

3. Establishment of micro seismic network
4. Researchers exchange
5. Data sharing
6. Holding of a joint bilateral meeting every two years

D. Follow-up activity of the Climate Change Workshop (07-08 April 2010)

Identified Joint S&T Cooperation Activities

Follow-up submission of Climate Change S&T Cooperation Joint Call for Proposals

- Observation, Monitoring & Scenario Projection
- Adaptation Strategies (including socio-economic dimension)
- Green House Gas (GHG) Mitigation

Climate Change Workshops/Fora

1. El Nino Southern Oscillation (ENSO) & Natural Hazards in July 2010, Manila
 - ENSO Projection
 - Sectoral impact – agriculture, energy, industry and health
 - Natural Hazards
 - Flood
 - Geo-hazards, decision support systems and early warning systems
2. APEC Risk Vulnerability Assessment in October 2010, Taipei
3. International Training Workshop on Natural Disaster in May of 2011, Taipei

NCDR Climate Change Task Force

1. Participation of the Philippines is welcomed

E. Sandwich Program

1. The sandwich program addressed here is currently limited to the field of Natural Science.
2. Academia Sinica is offering funds for the Sandwich Program in the field of Chemistry; this could be treated apart from the previously agreed 20 slots for sandwich scholarship.
3. Evaluation and recommendation of possible nominees shall be undertaken by the Philippine side and the final list of qualified nominees shall be submitted to NSC

4. The DOST will submit the list of nominees by 28 June 2010 to TECO for onward transmittal to NSC
5. It is required that student applicants should have a Taiwanese collaborator/host institution in Taiwan. However, this is not required in case of students applying in the field of Chemistry.
6. As for duration, the whole period for the Program with assured funding is normally two (2) years extendible for a maximum of four (4) years. Under this set-up, a student's diploma shall be obtained from the Philippines but he/she can stay in Taiwan for 2 years to do research and finish the course in the Philippines all for the maximum period of 4 years
7. Financial support from NSC will consist of the following:
 - a. NT\$15,000/month for Masters program.
 - b. NT\$25,000/month for PhD program.

The student is responsible for the cost of lodging/accommodation.
8. Support from the academic advisers shall consist of the following:
 - a. Accident insurance.
 - b. Assist in looking for suitable accommodation for the students
9. Support from the DOST shall consist of the following:
 - a. One round-trip plane ticket (economy)
 - b. Health insurance
10. As for visa, TECO agrees to check if visa fee can be waived similar to the case of exchange students/scholars being sponsored by Taiwan's Ministry of Education
11. The DOST ensures that the usual documentary requirements for fellowship shall be submitted by the students
12. The Engineering field is currently not included in the Sandwich Program. The NSC agrees to discuss the possibility of including it in the next phase of the Sandwich Program
13. As for the schedule, both sides agree that the start of the Sandwich Program will be in September 1, 2010

IV. CONCLUSION

The Taiwan side expressed their gratitude for the warmth hospitality extended to them.

Annex 1 & 2

Taiwan Side	Philippines Side
DR. CHENG-HONG CHEN Deputy Minister, National Science Council	DR. GRACIANO P. YUMUL, JR. Undersecretary for Research and Development Department of Science and Technology
DR. WEN-FENG LIAW Director of Natural Sciences Department National Science Council	DR. RENATO U. SOLIDUM, JR. Director, Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)
DR. WEN-YEN CHANG Program Manager of Natural Sciences Department, National Science Council	DR. ARTURO DAAG Senior Science Research Specialist Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)
DR. CHENG-HORNG LIN Deputy Director of Earth Science Institute, Academia Sinica	DR. JANE PUNONGBAYAN Supervising Senior Research Specialist Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)
DR. SHU-KUN HSU, Director of Earth Science Department, National Central University	DR. NATHANIEL T. SERVANDO Deputy Administrator Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA)
DR. TSANYAO FRANK YANG Department of Geosciences National Taiwan University	DR. TERESITO BACOLCOL Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)
DR. KUO-YING WANG Center of Environmental Studies National Central University	DR. PERLA J. DELOS REYES Officer-in-charge Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)
DR. WEI-JYH HWANG Director, Telecommunication and Radar Division, Central Weather Bureau (CWB)	ENGR. NONILO PEÑA Senior Science Research Specialist Philippine Council for Industry and Energy Research and Development (DOST-PCIERD)
DR. WEI-SEN LI Deputy Executive Secretary National Commission on Disaster Reduction	DR. CYNTHIA CELEBRE Senior Science Research Specialist Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA)

DR. YU-MING CHEN (Louis) Program Director, Department of International Cooperation, National Science Council	MR. BONIFACIO PAJUELAS Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA)
MR. MICHAEL HSU Deputy Representative Taipei Economic and Cultural Office (TECO)	MR. LAZARO MARQUESES Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA)
MR. FILAS CHEN Director, Economic Section Taipei Economic and Cultural Office (TECO)	DR. EDNA L. JUANILO Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA)
MR. WILLIAM TSAI Secretary, Economic Section Taipei Economic and Cultural Office (TECO)	ENGR. LYDIA G. TANSINSIN Consultant University of Sto. Tomas (UST)
	DR. KARLO QUEANO Department of Environment and Natural Resources (DENR)
	DR. CHRISTINA A. BINAG Director University of Sto. Tomas (UST)
	DR. BERNANRD JOHN TONGOL Chairman, Chemistry Department University of Sto. Tomas (UST)
	DR. EDANJARLO MARQUEZ Associate Professor University of the Philippines – Manila
	DR. RODOLFO TAMAYO, JR. Associate Professor University of the Philippines – National Institute of Geological Sciences (UP-NIGS)
	MR. RYAN CHRISTOPHER VIADO Research Associate III Philippine Council for Industry and Energy Research and Development (DOST-PCIERD)