Disaster Mitigation Competence Centre Project Meeting

Coordinator: Simon Lin

April 26, 2018

Agenda

- Introduction (Simon Lin)
- From Previous Meeting on March 17, 2015 (Eric Yen)
- Progress Report (Eric Yen)
- Partner Status Report (All Partners)
- Discussion
- Future Events
- AOB

Minute of APGI and DMCC Joint Meeting at ISGC

- Date & Time: 1230-1400, March 17, 2016
- Participants: Lucien (AU), Gang (CN), Matti (DE), Basuki (ID), Nakamura (JP), Nergui (MN), Suhaimi (MY), and Simon, Stella, Vicky, Eric (TW)
- Agenda and Materials:
  - https://indico.egi.eu/indico/event/2962/
- Action Item
  - Update progress and case studies status on the project wiki (Eric)
  - Provide materials of simulation portals on tsunami and weather to all partners (Eric)
  - Partners please provide observation data (from rain gauge, radar, weather station, etc., as well as the bathymetry data) according to the requirements of case studies (All partners)
  - Formation of next F2F meeting at APAN42

Progress Report

Environmental Computing Workshop

- https://indico4.twgrid.org/indico/event/1/session/2/?slotId=8#20160313
- Computing power requirements
- Emerging links between disciplines
  - atmosphere, seismology, Env modeling, agriculture, health, etc.
- Multi scale issues
  - global-to-urban climate model, tsunami, aerosols on climate, typhoon
- Data issues
- Training and education: awareness and accessibility to services
- Best practices of using IT infrastructure
- Research to production and linkage to the practitioners
- Time to impact
- Partnership, knowledge discovery and collaboration model
- Limitations
  - computing capacity, data access, technical, sustainability, process, policy, manpower, etc.

Disaster Mitigation Case Study & Collaboration Model

Partner	Selected Case	Required Data Sets	Status	Check Point	Simulation Framework
PH, TW	Typhoon Haiyan	Doppler Radar, Tidal gauge, air pressure, wind speed, typhoon path; hourly resolution	Finish 1st numerical study by combining atmospheric and ocean model	Demo @ APAN41	gWRF, iCOMCOT
MY, TW	Flooding 2014-15		First simulation by AS (global data) was done.	Demo @ APAN42	gWRF, Scouring
TH, TW	Flooding 2011		Simulation by NECTEC and AS (global data) were done. Aim to improve the accuracy and EWS.		gWRF, Scouring
ID, TW	Tsunami cave —> Forest Fire	air pollutants such as, CO, NOx (NO, NO2), SO2, O3, PM10, PM2.5 etc. with high temporal resolution	Data Collection and User Engagement	Demo @ APAN42	gWRF
Nepal, TW	Flooding 2014	High altitude and geographical features need to consider	Waiting for more necessary observation data		gWRF, Scouring
TW, PH	Tsunami Impact Analysis in South China Sea	Bathymetry, fault geometry, historical events,	In progress. Depends on high resolution bathymetry data from partners		iCOMCOT

DE will provide advanced visualization support whenever it is possible

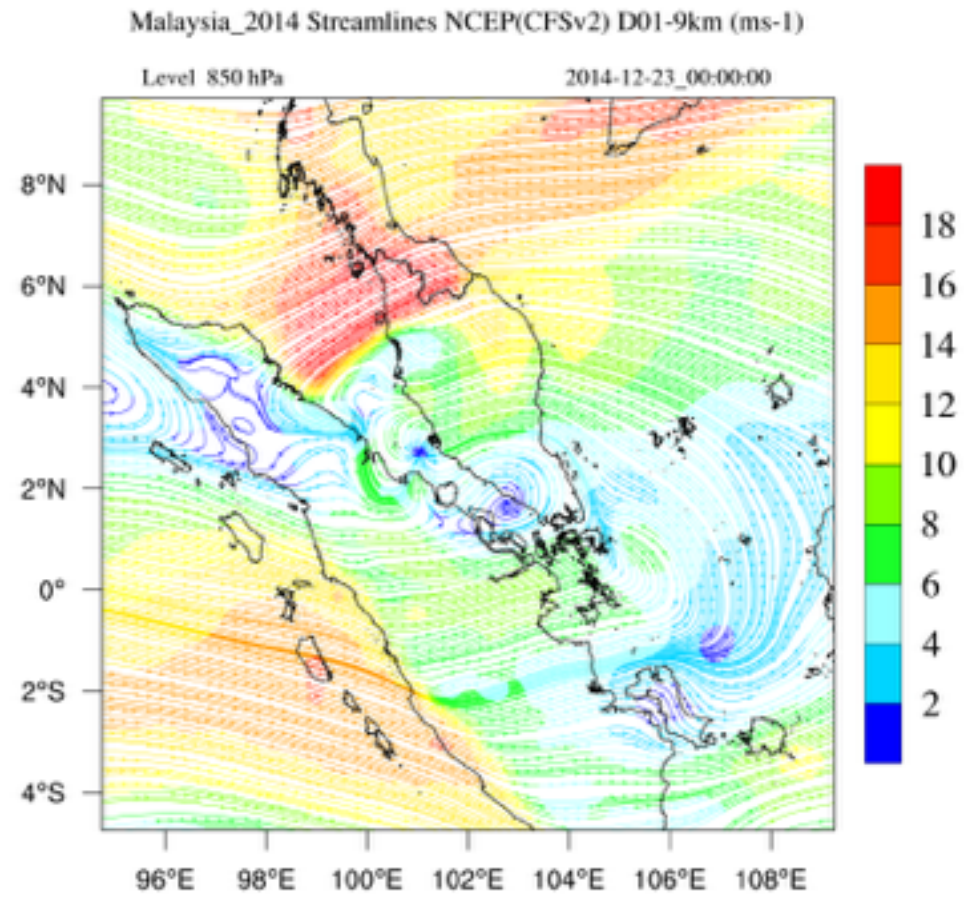
Overview of the Simulation Setup

Model	WRF 3.6.1
Vertical levels	σ-coordinate system with 37 σ –levels (up to 100 hPa)
Landuse Data	MODIS - 30 seconds (~900 m) of spatial resolution
Domain Resolution	D01 – 9 km (181 X 181 grid points)
Initial and boundary conditions	NCEP global analyses (0.5^0 X 0.5^0) (~54 km) 6-hourly
SST update	ON
Feedback	OFF
Fdda	OFF

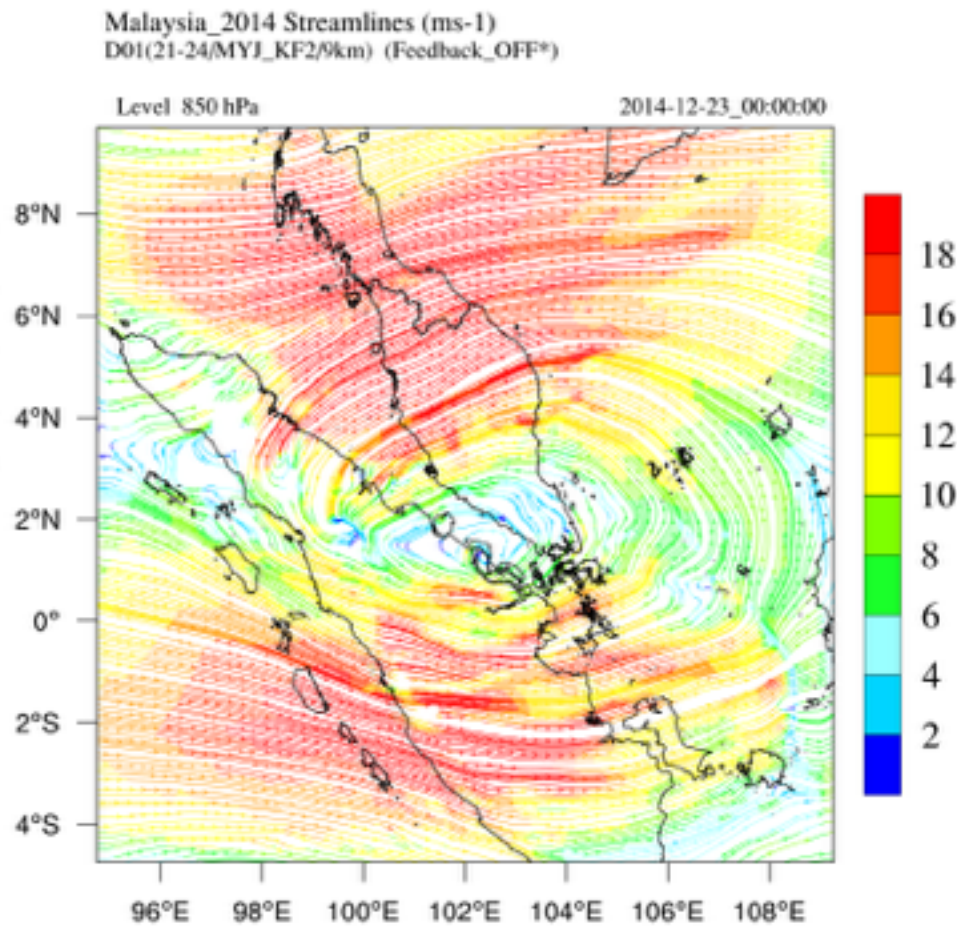
Streamlines

Simulation period > Dec 21-24 | 2014.12.23 – 00:00

NCEP Data



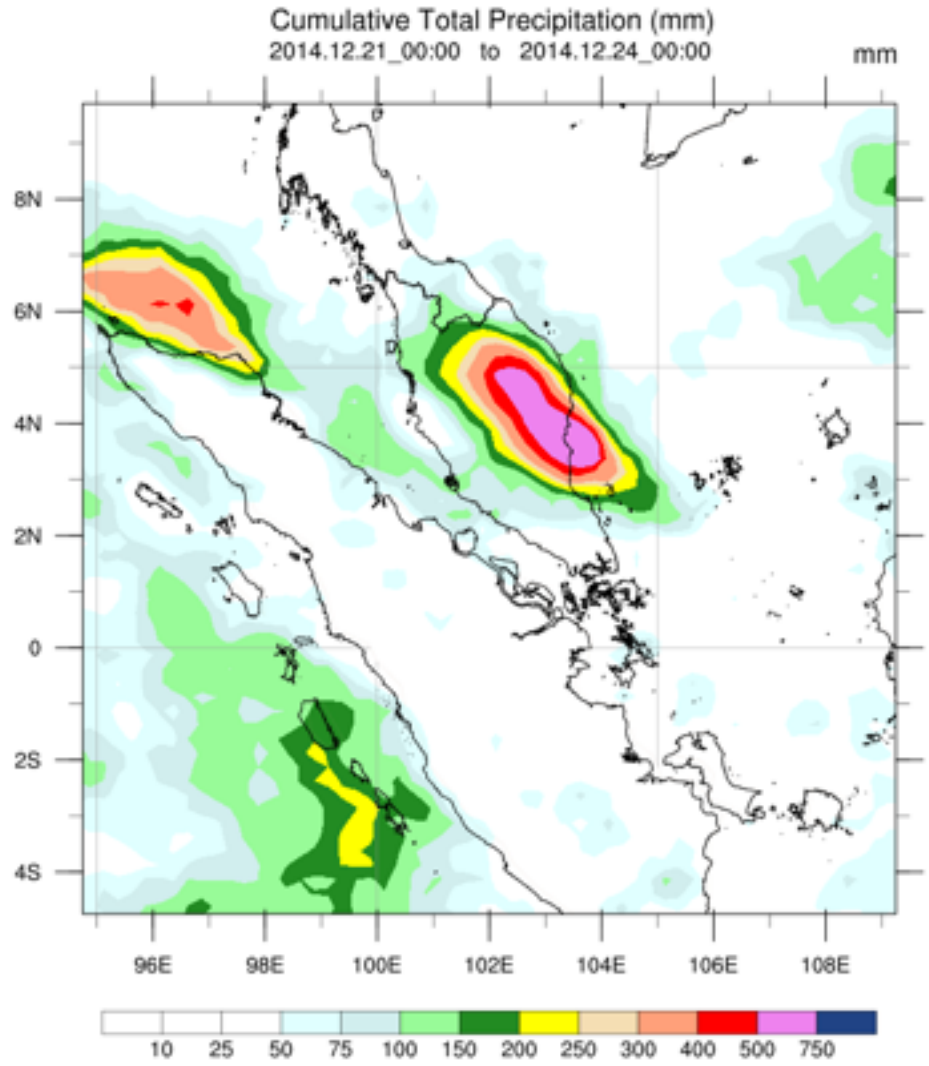
Simulation Results



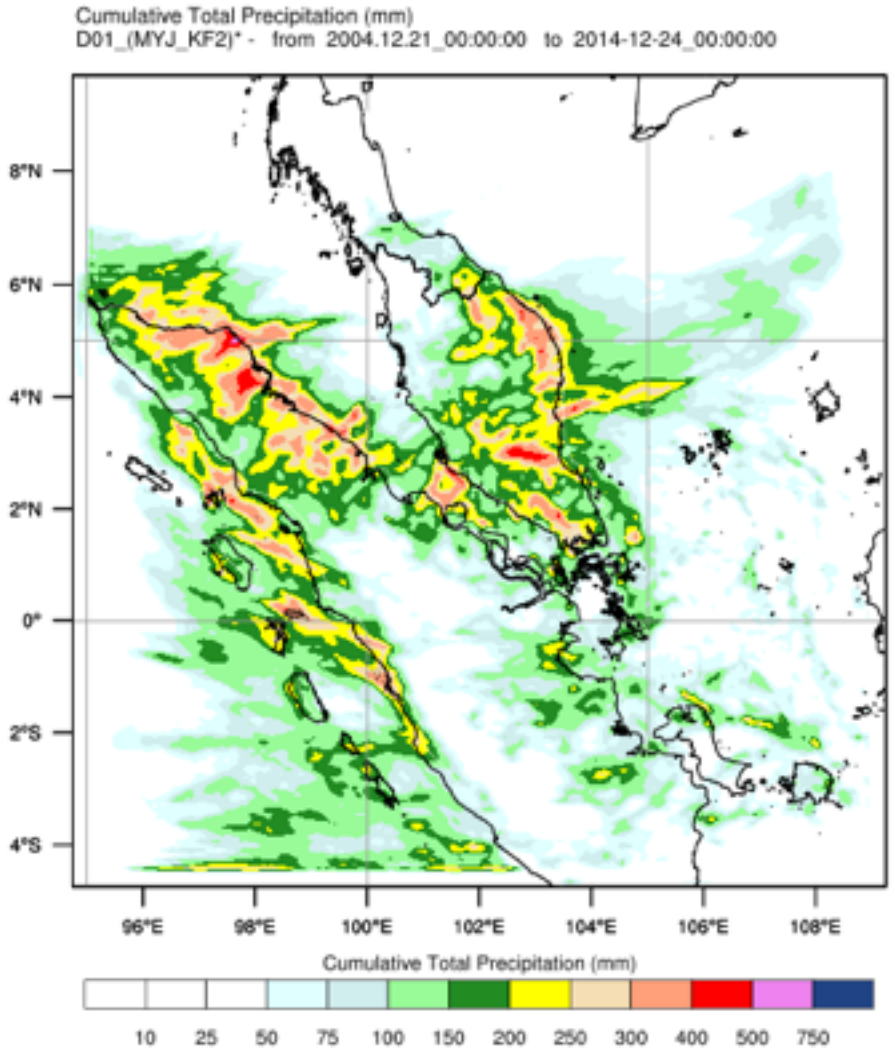
Cumulative Rainfall

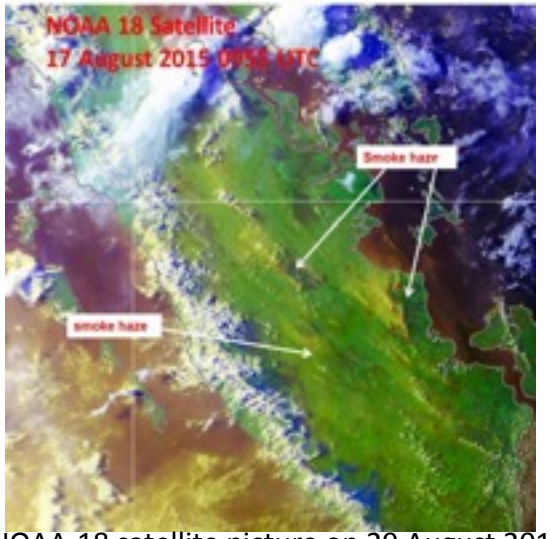
Domain 02 - Simulation > Dec 21-24 | Cumulative Rainfall (Dec 21-24)

TRMM Data

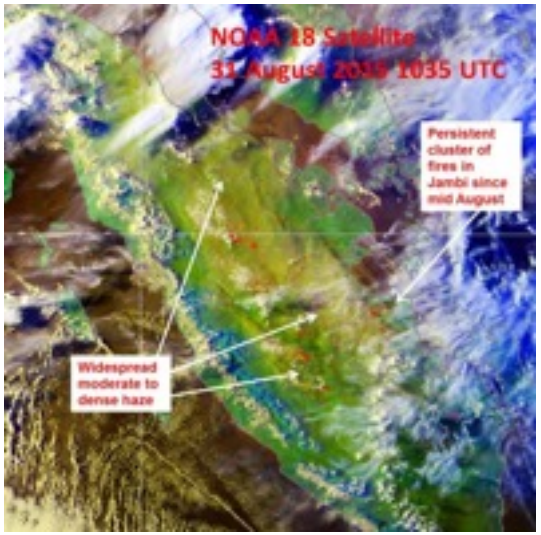


Simulation Results

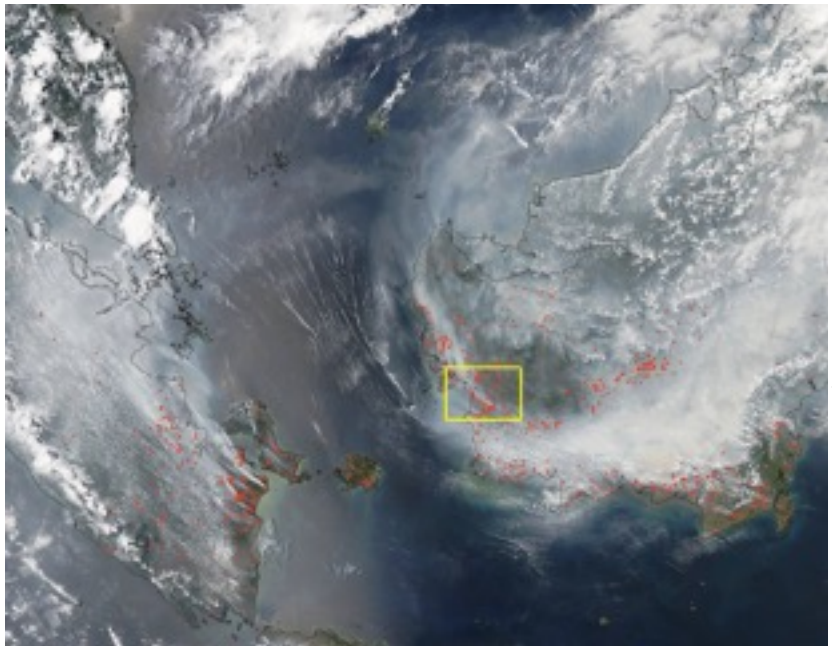




NOAA-18 satellite picture on 29 August 2015 shows deterioration of smoke haze situation in Kalimantan



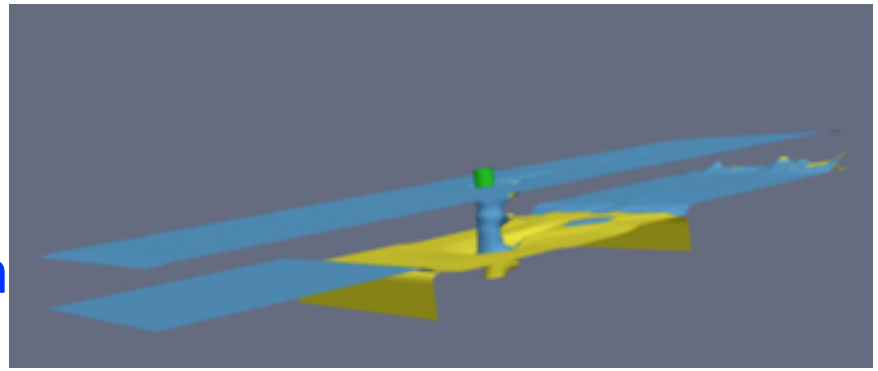
NOAA-18 satellite picture on 31 Augusts 2015 shows widespread smoke haze from Sumatra spreading into the Strait of Malacca.



NASA's Aqua satellite collected this natural-color image with the Moderate Resolution Imaging Spectroradiometer, MODIS, instrument on September 22, 2015.

Advanced Visualization

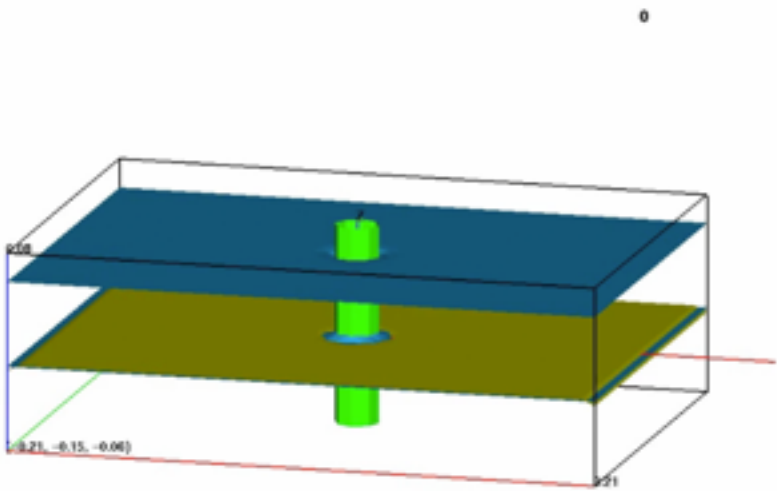
- Local Scouring case study is the first example by collaboration between NCU, ASGC and LRZ
- 3D Typhoon Morakot Visualization is the next case study



Advance Visualisatio

LRZ: Siew Hoon Leong (12 May 2015)

lrz Chosen Case Study: Dey and Barbhuiya, 2005



Compute domain: 1.1m by 0.3m by 0.14m

Abutment model: Circular

Column radius: 0.015m

Uniform sediments

Mud: 6cm thick
Clean water: 6cm thick

Provided by:
Chun-Wei Lin & Tso-Ren Wu (NCU)

Next DMCC F2F Meeting at APAN42

- Date & Time: 9:30 - 17:30, August 3rd, 2016
- Agenda
  - Session I
    - Introduction (Simon), 50 min
    - Application of numerical model on extreme weather and environmental studies (CY Lin), 50 min
  - Session II
    - The Applications of Advanced Numerial Simulation on the Tsunami and Flooding Hazard Mitigation (TZ Wu), 50 min
    - Forest Fire Case Study (ID), 30 min
  - Session III
    - Malaysia Flood Case Study (MY), 30 min
    - Thailand Flood Case Study (TH), 30 min
    - Typhoon Haiyan Case Study (PH), 30 min
  - Session IV
    - Advanced Visualization on Typhoon Morako (DE), 30 min
    - Mekong Delta Case Study (VN), 30 min ???
    - Discussion, 30 min

Future Meetings and Events

- Future Routine Project Meeting (last Tuesday of each month)
  - 16:00-17:00, 31 May, 2016
  - 16:00-1700, 28 June, 2016
- DMCC face-to-face Meeting at APAN42, 31 July - 5 Aug, 2016, Hong Kong
- EGI Flagship Event: Digital Infrastructures for Research 2016
  - http://www.digitalinfrastructures.eu
  - 28-30 September, 2016
  - Krakow, Poland