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Opening & Closing Program

Opening | Closing

Program - Opening
07 August, Monday | Nicoll Room, Level 3 | 15:30 - 18:30

From	
15:30	Arrivals, Coffee/Tea Service
16:00	Opening & Addresses Benjamin Fong CHAO, *AOGS President*
16:15	Axford Lecture 1 **"Competing Influences of Greenhouse Warming and Aerosols on Asian Monsoon Climate Change"** William K. M. LAU, *University of Maryland*
17:00	Axford Lecture 2 **"Long-term Drivers of Aboveground-Belowground Linkages and Ecosystem Functioning"** David WARDLE, *Nanyang Technological University*
17:45	General Assembly Secretary General's Report Treasurer's Report Publication Comittee's Report Award Presentations Ratification - Honorary Members - Honorary Auditor General Election - Introduction and Briefing - Meet the Candidates - Voting Rules & Regulations
18:30	Adjourn to Welcome Reception - *Exhibition Hall at Summit on Level 3*

Program - Closing
11 August, Friday | Nicoll Room, Level 3 | 15:30 - 19:00

From	
15:30	Arrivals, Coffee/Tea Service
16:00	Axford Medal Special Lecture **"Challenges and Perspectives in Regional Climate Modeling"** Dong-Kyou LEE, *Seoul National University*
16:45	AOGS2017 Special Lecture **"Remote Sensing of Aerosols, Air Quality and Assessment of their Global and Regional Impacts"** Jack A. KAYE, *AOGS Honorary Member* *Earth Science Division, NASA Headquarters*
17:30	Award Presentations - Honorary Members - Best Student Posters
17:45	Next Meeting Destination Presentation - AOGS2018 in Hawaii
17:55	Announce General Election Results
18:00	Adjourn to Farewell Reception - *Nicoll Foyer*

Announcements

2017 AOGS General Election
View Results

2017 Best Student Poster Competition
View Results

AOGS2018 Session Proposals
Opens: 01 Sep 2017
Closes: 13 Oct 2017 (Special)
Closes: 20 Oct 2017 (Regular)
Notification - Acceptance/Rejection: 27 Oct 2017

AOGS2018 Abstract Submission
Opens: 10 Nov 2017
Deadline: 19 Jan 2018
View Abstract Submission Instructions

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Attractions

Other than the touching the water to absorb the qi at the world's largest fountain – The Foundation of Wealth in Suntec City Mall, there are number of attractions near the Suntec Convention Centre which includes the War Memorial Park, Raffles Hotel, the Esplanade, Singapore Flyer, Merlion Park & Marina Bay Sands, etc. You can read the Top Attractions page & the Top Foods page under About Singapore tab where there is some attractions & walking trails listed near Suntec Singapore.

Announcements

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View Results

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Scientific Program: Schedule at a Glance

Slot Code	Time	Duration
AM1	8:30AM - 10:30AM	2 hours
AM2	11:00AM - 12:30PM	1.5 hours
Lunch	12:30PM - 2:00PM	1.5 hours
PM1	2:00PM - 3:30PM	1.5 hours
PM2	4:00PM - 6:00PM	2 hours

AS BG HS IG OS PS ST SE SS

PV - Poster Viewing Session
Lect - Section Lecture
BZ Meeting - Section Business Meeting

Double click on the Session Code to view the presentation order within the timeslot.
* Please note that the presentation schedule is tentative as there may be late changes in the program.

Day 1 -- Monday, August 07, 2017																
Room:	**308**	**309**	**310**	**311**	**327**	**328**	**329**	**330**	**331**	**332**	**333**	**334**	**335**	**336**	**Summit**	**Nicoll**
AM1	ST04-13-21	ST14-20-24	PS11	SE05	SE10	OS01	AS19	AS34	AS03	IG10	HS01	HS16-04	AS15			
AM2	ST04-13-21	ST09	PS11	SE27	SE06	OS04	AS19	AS34	AS03	IG03	HS01	HS03	AS11-38			
Lunch																
PM1	ST25	ST09	PS15	SE24	SE19	OS10	AS19	AS34	AS03	IG03	HS07	HS17	AS11-38			
PM2																Opening
EVE															Welcome Reception	
Day 2 -- Tuesday, August 08, 2017																
Room:	**308**	**309**	**310**	**311**	**327**	**328**	**329**	**330**	**331**	**332**	**333**	**334**	**335**	**336**	**Summit**	**Nicoll**
AM1	AS01	AS07	PS05-13	SE12	SE21	OS12	OS14	HS21	Kamide Award Special Lecture	IG28	AS10	AS13	AS11-38			
AM2	AS01	AS14	PS05-13	SE04	SE21	OS17	OS13	HS DL	ST DL	IG25	AS10	AS13	AS11-38			
Lunch								HS Meeting	ST Meeting							
PM1	AS28	AS14	PS05-13	SE04	SE13	OS19	OS13	SS07	SS10	IG15	AS10	AS13	AS35		PV - HS, ST	
PM2	AS28	AS20	PS05-13	SE25	SE13	OS19	OS14	SS08	SS04	IG05	AS10	AS32	AS35			
EVE																
Day 3 -- Wednesday, August 09, 2017																
Room:	**308**	**309**	**310**	**311**	**327**	**328**	**329**	**330**	**331**	**332**	**333**	**334**	**335**	**336**	**Summit**	**Nicoll**
AM1	ST06	ST07	PS07	SE25	SE09	OS18	OS08	HS23	AS10	IG21	IG19	HS06	BG03			
AM2	ST05-15	ST26-27	PS04	SE21	SE22	OS02	OS22	HS23	AS DL	IG11	IG24	HS10	BG DL			
Lunch									AS Meeting				BG Meeting			
PM1	ST05-15	ST26-27	PS04	SE20	SE22	OS02	OS22	HS19	SS06	IG11	IG12	HS10	BG08		PV - AS, BG	
PM2	ST08	ST22	PS07	SE25	SE14	OS02	OS08	HS08	Public Lecture 1	IG26	IG27	HS09	Workshop 1			
EVE																
Day 4 -- Thursday, August 10, 2017																
Room:	**308**	**309**	**310**	**311**	**327**	**328**	**329**	**330**	**331**	**332**	**333**	**334**	**335**	**336**	**Summit**	**Nicoll**
AM1	AS02	AS40	PS09	PS14-16	HS14	ST02	ST18	OS03	SE16	IG01	AS21	AS04	BG01-02	AS24		
AM2	AS02	AS40	PS12-ST23	PS03	HS14	ST02	ST18	OS DL	SE DL	IG01	AS21	AS04	BG06-07	AS24		
Lunch								OS Meeting	SE Meeting							
PM1	AS29	AS40	PS12-ST23	PS03	HS18	ST10-03-17-19	ST12	Public Lecture 2	SS09	IG06	AS21	AS04	BG06-07	AS24	PV - SE, OS	
PM2	AS29	AS27	PS10	PS14-16	HS20	ST10-03-17-19	ST12	SS11	SS02	IG04	AS36	AS41	BG04	AS23		
EVE																
Day 5 -- Friday, August 11, 2017																
Room:	**308**	**309**	**310**	**311**	**327**	**328**	**329**	**330**	**331**	**332**	**333**	**334**	**335**	**336**	**Summit**	**Nicoll**
AM1	AS42	ST16	HS13	SE02	HS11	OS07	OS11	IG04	PS08	AS17	AS36	AS41	AS31			
AM2	AS42	ST16	HS13	SE15	HS11	OS21	OS11	IG DL	PS DL	AS16	AS36	AS18	AS31			
Lunch								IG Meeting	PS Meeting							
PM1	AS06	ST Session Discussion	HS15	SE11	HS12	OS21	OS05		Workshop 2	AS16	AS22	AS18	AS31		PV - PS, IG	
PM2																Closing
EVE																Farewell Reception

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AS01 - Climate Change, Tropical Climatic hazards and Meridional Circulation Changes in Asia-Oceania
AS02 - Mesoscale Meteorology and High-impact Weather
AS03 - Asian Haze: Sources, Transformation and Its Impacts from Regional to Global Scales
AS04 - Middle Atmosphere Science
AS06 - Spatial and Temporal Variability of Aerosol in an Around Indian Subcontinent and the Associated Radiative Forcing - a Study from In-situ and Satellite Derived Data

◯ **Oral Presentations - Browse by Section and Presentation Day**

Section: - Select Section - Day: - Select Day -

◉ **Poster Presentations - Browse by Section**

Section: IG - Interdisciplinary Geosciences

Browse Abstracts

Poster Presentations of Section IG

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IG01-D5-PM1-P-014 (IG01-A006)

Drilling in the Right Place: GPR Reconstruction of Topography for Paleotsunami Research

Hiraku TAKEDA[1], Kazuhisa GOTO[1#+], James GOFF[2], Hideaki MATSUMOTO[3], Daisuke SUGAWARA[4]
[1] Tohoku University, Japan, [2] University of New South Wales, Australia, [3] Tohoku Gakuin University, Japan, [4] Museum of Natural and Environmental History, Japan
#Corresponding author: goto@irides.tohoku.ac.jp +Presenter

Field surveys soon after recent tsunamis reveal that local topography significantly affects the spatial distribution of tsunami deposits. In some cases it is often found that no tsunami deposits are laid down on the top of beach ridges or topographic highs. It is therefore logical to expect that this would also be the case for paleotsunami deposits. This in turn suggests that we may well misunderstand the paleotsunami history of an area if we do not take cores in the right place. In order to clarify the relationship between local paleo-topography and the spatial distribution of tsunami deposits, and to explore the best method for finding the optimum locations for paleotsunami studies, we conducted a Ground Penetrating Radar (GPR) and coring survey on the Ishinomaki Plain on the Pacific coast of Tohoku, Japan. Here it is known that large tsunamis including the 2011 event have inundated the area in the past. We worked in an area where the beach ridge-swale system had been buried by subsequent infill and to all intents and purposes the site looked like a flat coastal plain where cores could be taken anywhere. We found that the number of paleotsunami deposits laid down on top of the buried beach ridge system varied from 0 to 3 and tended to increase in number within the low-lying swales. It is important to note that this change in number was quite marked even within the narrow survey area (an approx. 10 m survey grid within a 90×60 m area). GPR survey results fit well with the core data and the paleo-topography of the buried beach ridges could be successfully reconstructed. We therefore propose that the use of GPR surveys prior to coring is extremely useful for helping to determine the right places to core for paleotsunami research.

IG01-D5-PM1-P-015 (IG01-A009)

An Empirical Model to Estimate Wind Erosion from Construction Activities

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We built a model to estimate Wind Erosion from CONstruction activities (WECON) by streamlining a group of empirical equations. The foundational soil and wind factors that control wind erosion, and other impacting factors including soil moisture, surface cover, and wind breaker, as well as some constructive factors including shape and height of aggregate pile, degree of surface soil disturbance were considered with a minimum requirement of input factors to meet the needs of users from construction, supervision, and administration departments. The relationships among different factors were defined by intuitional and easily-understandable equations, and values of some factors were tabulated. The model works when some basic soil and wind data are absent in different extent, which is common in the construction processes, and is shown to be robust when compared to observation and experiment results. The workflow of the model is explicitly open and could be updated easily when new or better knowledge are available. Further, a software with graphical interface was built for user's convenience.

IG01-D5-PM1-P-016 (IG01-A012)

Storm Surge Early Warning System in Eastern Visayas, Philippines Using ADCIRC + SWAN Through Parallel Computing

Christelle Anne DIVINA[#+], Camille Grace BACISTER, Vena Pearl BONGOLAN
University of the Philippines Diliman, Philippines
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The Philippines, situated next to the warm waters of the western rim of the Pacific Ocean and being directly in the path of tropical cyclones formed in the Western Pacific, typically experiences an average of twenty cyclones per year. With 7,000 islands, the country's coastline is more vulnerable to storm surges. Over the past century, at least ten typhoons have been recorded to have casualties not lower than 1,000 and last 2014, Eastern Samar was acknowledged as the country's new typhoon belt due to the changing pattern of typhoon occurrences in the country. Thus, this research paper aims to develop and produce an efficient storm surge early warning system for the Eastern Visayas through a beta web app which contains an inundation map that shows real-time simulations of a predicted storm surge in a certain area.

The model being used for this research is the Advanced Multi-Dimensional Circulation (ADCIRC) model coupled with Simulating Waves Nearshore (SWAN) model. The ADCIRC model employs a barotropic three-dimensional run which incorporates a continuous-Galerkin finite element solution of the Generalized Wave Continuity Equation while the SWAN model incorporates an adaptive of the Gauss-Seidel sweeping method. A cluster-based and task-parallel computation is being used and this is done through a 10-node parallel computer network through a Beowulf cluster built using 10 units of used AMD64 boxes (Intel x86 64 architecture).

IG01-D5-PM1-P-017 (IG01-A013)

Interdisciplinary Approach to the Integrated Assessment of Multi-Hazard Risks for Coastal Systems

Valerii KULYGIN[#+]
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Natural hazards lead to significant casualties and damage of property and infrastructure annually. Natural hazards processes do not develop separately. Multiple hazardous processes may interact and possibly increase their damage to greater extent than in an additive way. Further uncertainty is induced by climate change, affecting both the intensity and the frequency of extreme events. We propose the approach for the integrated assessment of multi-hazard risks in coastal systems. The assessment is interdisciplinary at the scale of coastal systems, which are considered consisting of natural ecosystems and relevant economic activities. Tools of GIS modeling are used to represent the key spatial features of such systems. The Decision-Making Trial and Evaluation Laboratory (DEMATEL) method is adopted to assess the importance of natural hazards' interactions and to determine the weight of each hazardous process. The application of probabilistic graphical models and scenario approach are used as basic tools to address uncertainty, associated with climate change. A method to assess the multi-hazard risks, applying Bayesian network and spatial analysis techniques with GIS is presented.The reported study was funded by RFBR, according to the research project No. 16-35-60043 mol_a_dk.

IG01-D5-PM1-P-018 (IG01-A014)

The Importance of Underground Three-Dimensional Model on Evaluating Risk of Earthquake Disaster

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As earthquake hit, the commander of Emergency Operation Center usually need many references to support scheduling or description of the earthquake event. So there a seismic risk modeling is a crucial parts of emergency preparedness and it could mitigate relevant impacts on society. However the seismic risk model is based on geologic database. For example, seismic risk analysis models are usually based on ground motion, which is modified from point source, fault line source and fault plane source and the profile plane of projection is used to explain the hypocenter at what type of tectonic environment. Although these parameters or geological profiles are affected by the accuracy of geological data, their accuracy could be improved. This program invites experts and scholars from Taiwan University, National Central University, and National Cheng Kung University, and uses historical records of earthquakes, geological data and geophysical data to model the three-dimensional underground structure planes of active faults and improve the accuracy of earthquake prevention analyses. These three-dimensional data can be applied to different stages of disaster prevention. For pre-disaster, results of earthquake risk analysis obtained by the three-dimensional data of the fault plane are closer to real damage. This conclusion is obtained by simulating the results of Chin-Cheng Fault, Taiwan. For disaster, the terrain data created by the underground three-dimensional data can describe the structural environment of location of hypocenter and help to predict the distribution of the aftershocks and the affected objects. Till now, this program has built underground three-dimensional of active faults in north-western area and western area in Taiwan. As on 2018, this program would be finish all underground three-dimensional data of active faults in Taiwan.

IG01-D5-PM1-P-019 (IG01-A015)

Using Earthquake Building Damage Data in Establishing Building Fragility Curves for Taiwan Seismic Risk Assessment

Ming-Kai HSU[1#+], Chung-Han CHAN[2], Yu-Ju WANG[3], Kuo-Fong MA[1], Thomas Chin-Tung CHENG[4], Siao-Syun KE[5]
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The object of Taiwan Earthquake Model (TEM) is assessing the seismic hazard and risk for Taiwan by considering the social and economic impacts of various components from geology, seismology, and engineering. The disaggregation on the hazard to risk is currently under developed, and the concern on the reliability of fragility curve becomes an important task. The fragility curves in Taiwan were previously developed based on the value in peak ground acceleration (PGA). In the knowledge finding on the relation of hazard to damage as to be risk related, PGA is not a critical parameter for this estimation. In view of this, we intend to develop building fragility curves in other strong motion parameters (e.g., peak ground velocity or revised intensity) in comparison to the previously established PGA-based curves. The fragility curves will be made based on the building damage records collected from the 1999 Chi-Chi and 2016 Meinong earthquakes. The evaluation of seismic risk involves the combination of three main components: probabilistic seismic hazard model, exposure model defining the spatial distribution of elements exposed to the hazard and vulnerability functions capable of describing the distribution of percentage of loss for a set of intensity measure levels. We implemented both the pre-existing fragility curves and those we have obtained to the probabilistic seismic risk assessment for Taipei and Tainan City. Seismic hazard are presented expected strong ground motion to be exceed at 10% and 2% probability level in 50 years (i.e., return period of 475 and 2475 years, respectively) obtained by the TEM. An analysis through disaggregation of hazard components also be made to prioritize the seismic risk. Our intention is to give the new building fragility curves in different types of intensity and the first attempt on the modeling the seismic risk on an open platform for Taiwan.

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The water turbidity in the Xidian catchment, Northern Taiwan rapidly increased up to 33.9 thousand Nephelometric Turbidity Units (NTU) during typhoon Sudela period. Typhoon-induced floods led to such high turbidity of 3000 NTU supply for thirty hours and over the capacity of the water treatment plant. Therefore, the high turbidity was disastrously affect water quality in Taipei area. It was difference from events induced by typhoon Jangmi in 2009 and typhoon Sula in 2012 the water turbidity decreased down to 3000 NTU in 3 hours. The study aims to disclose the relationship between water turbidity in the Xidian catchment and the debris slide from the upstream reach. In order to explore the relationship between turbidity and rainfall parameter, landslides caused by various typhoons have been delineated by SPOT satellite imagery and the aerial photography and the water turbidity is measured following seven typhoon events during the 16-year period from 2000 to 2015. The results shows that the landslide ratio for above typhoon events ranges from 0.065 % to 0.172 % in Xidian basin, typhoon Soudelor especially. The averaged landslide ratio for other events is approximately to 0.078 %. Furthermore, the combinations of hourly precipitation, 3-hrs, 6-hrs, 12-hrs, and total accumulated precipitation and the water turbidity were surveyed from 2010 to 2015 following various typhoon events. Finally, time series data of water turbidity during and after typhoon were used in the study to reconstruct the process and impact of forming high turbidity water in the Xidian catchment area.

IG27-D5-PM1-P-010 (IG27-A005)

Landslide Hazard Assessment of Mountainous Roads in Taiwan – Using High Resolution Dem and Numerical Simulation

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Landslide in mountainous roads is common and usually causes road closure, infrastructure damages or casualties in Taiwan. We choose landslide-prone mountainous road Provincial Highway Route No. 7 and No. 9 in the eastern Taiwan as case study and propose a landslide susceptibility and hazard assessment procedure that incorporated micro-topography interpretation and numerical simulation. Hillshade, slope gradient, sky view factor and openness map are produced by using high resolution raster data acquired from both airborne and terrestrial LiDAR for the purpose of identifying susceptible areas as well as interpreting micro-topography structures. In order to obtain the sliding depth and volume of landslide, 2-D slope stability analysis and joint analysis are applied for rock slide / debris slide and rockfall respectively. With these data and the results of field investigation, numerical simulation for specific scenario can therefore be performed to evaluate the area that may be affected by landslide.

Micro-topography interpretation in Route No. 7 shows that there are several deep-seated landslide characteristics at mileage 88K+150. According to RAMMS::DEBRIS FLOW simulation, landslide materials may initiate from rock or debris slide and then transform into gully-type debris flow, leading to the road closure. In Route No. 9, rockfall is the main failure type due to high strength of metamorphic rock and the existence of release joints. The density and orientation of joints are analyzed to evaluate the slope stability. Kernel density estimation is also performed for lineament interpretation so that the possible size of hanging boulders could be determined. RAMMS::ROCKFALL simulation shows that rockfall boulders would cover not only Route No. 9 but also a railway station adjacent to the road. The proposed procedure for landslide hazard assessment can provide crucial information for deciding the location of destructive landslide and assess the possible affected area of mountainous roads.

IG27-D5-PM1-P-011 (IG27-A011)

The Deformation and Accumulation Behavior of Simplified Dip Slope Model Using Centrifuge Testing and Discrete Element Modeling

Jheng-Yu HSIEH, Kun-Che LI, Wen-Chao HUANG[#+], Wen-Yi HUNG, Chia-Hao HU
National Central University, Taiwan
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With abundant sedimentary environments in Taiwan, a lot of dip-slopes can be easily found in many regions. There are numerous dip-slope related disasters in recent years. Most of the above severe disasters are related to extreme rainfalls, earthquakes and improper design of the stabilization system. However, most of the dip slopes are experiencing a slower deformation process under the change of boundary conditions. When the geometric sizes are different for the dip slopes, the sliding behavior may also be different. In this study, the deformation behaviors of dip slopes characterized by interbedded thick and thin rock layers were analyzed and discussed. In order to realize dip-slope deformation and accumulation features with different geometric sizes, the dip slopes were simulated using discrete element method and centrifuge models. In addition, the toe of the simplified dip slope was assumed to be partially submerged at different height. The numerical models were verified using the results from centrifuge testing, afterwards, the deformation and accumulation features were obtained from the numerical model. The following conclusions can be addressed: (1) With the increase of the geometric size of the dip slope, the model is deformed more severely. (2) The increase of the geometric size indicates a deeper and wider influenced area for the dip slopes. (3) The height of the water table is a crucial factor to affect the deformation characteristic of the dip slope. Usually the boundary between dry and submerged slope is where the first failure can be observed from the numerical models.

IG27-D5-PM1-P-012 (IG27-A013)

Geophysical Investigation of Shallow Subsurface Fracture Distribution on the Accretionary Prism Off Southwest Taiwan

Win-Bin CHENG[1#+], Jing-Yi LIN[2], Shu-Kun HSU[2], Jia-Jyun DONG[2], Huai-Houh HSU[3]
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A multicomponent ocean-bottom seismometer (OBS) data set was collected by National Central University, Taiwan in the accretionary prism off southwestern Taiwan in 2013 and 2016, respectively. GI-gun shots located at 1 mile and 1.5 miles radius from the OBS, with spacing approximately 40 m along the sail line that were analysed as common receiver azimuthal gathers. The OBS recorded data at a sampling rate of 250 Hz and from a shot pattern that gave good azimuthal coverage around the OBS. Methods to obtain information about fractured sediments have been developed from these data since anisotropy, an effect of parallel fracture trains, generates birefringence of P-S converted waves. The multicomponent seismic method allows recording the complete wave field, including P-S converted waves. Based on P and P-S converted waves recorded between the direct and multiple arrivals, this experiment targeted the top few hundred meters of sediment in the study area. After preliminary processing, including a static correction, the data were optimally rotated to radial (R) and transverse (T) components. The principal technique used to detect the anisotropy was azimuthal stacking of the radial and transverse horizontal geophone components. The R component shows azimuthal variation of traveltime indicating variation of velocity with azimuth; the corresponding T component shows azimuthal variation of amplitude and phase. From the radial component azimuthal gather and mode-converted wave amplitude variation for the first few layers and determined corresponding anisotropy parameter and Vp/Vs values. Significant results were found, that might imply the presence of natural fracturing directions. We attribute the observed azimuthal anisotropy to the presence of microcracks and grain boundary orientation due to stress since fracture at this depth is not likely to occur. This result requires to be tested with complementary geological information.

IG28-D5-PM1-P-009 (IG28-A002)

Rapid Land Cover Change in the Merang Kepahyang Peat Hydrological Region, South Sumatra, Indonesia Associated with the Peat Fires

Raden PUTRA[+], Edy SUTRIYONO, Sabaruddin , Iskhaq ISKANDAR[#]
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Peat fires is one of a serious environmental issue in Indonesia, in particular in the South Sumatra region. The fires usually occur during dry season from July to September. This study is designed to evaluate the impact of peat fires on land cover change in the Merang Kepahyang Peat Hydrological Region (MK-PHR) in the South Sumatra using Landsat satellite imagery for a period of 2002 – 2015. The Normalized Difference Vegetation Index (NDVI) was used an index to calculate the density of green on patch of land (land cover). The results showed that extreme peat fires associated with anomalous climate events were occurred in 2006, 2012 and 2015. In particular, the 2015 peat fires associated with the largest anomalous climatic index had the largest hotspot distribution and the rapid land cover changes were observed in the most area of the MK-PHR. The total average of land cover loss was about 49% of the total MK-PHR area. The spatial and temporal land cover changes will be discussed in more detail.

IG28-D5-PM1-P-010 (IG28-A003)

Towards High Resolution Estimates of Surface Solar Radiation in East Asia from MTSAT Observations

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Climate change has become a challenge of the sustainable development in East Asia due to its long coastline, population density, strong dependence of economic on agriculture and resource, extremely vulnerable to climate change impact. The Tibetan Plateau (TP) in this region has strong interactions among the atmosphere, hydrosphere, cryosphere, and biosphere. The TP has been experiencing an overall increase in surface air temperature and moistening, solar dimming and wind stilling since the beginning of the 1980s. Surface Solar Radiation (SSR) plays an important role of the hydrological and land process modeling, which particularly contributes more than 90% to the total melt energy for the TP ice melting. The primary motivation for this study is to advance the quality and resolution of currently available information on SSR in East Asia. Six years (2007-2012) of high resolution (hourly; 5 km) of SSR have been recently developed for the main East Asian region (20ºN-60ºN; 70ºE-140ºE). The SSR estimates have been derived from the optimized geostationary satellite observations - the Multi-functional Transport Satellite (MTSAT), based on updating an existing physical model, the UMD-SRB (University of Maryland Surface Radiation Budget) which is the basis of the well-known GEWEX-SRB model. In the updated framework introduced is the high-resolution Global Land Surface Broadband Albedo Product (GLASS) with spatial continuity. The developed SSR estimates are evaluated against ground observations and other satellite products from: China Meteorological Administration (CMA) radiation stations; and the universal used satellite products (i.e. ISCCP-FD, GEWEX-SRB) in relatively low spatial resolution (0.5º-2.5º) and temporal resolution (3-hourly, daily, or monthly). Such information is needed to meet the challenge for accurate input into the land process and hydrological models for us to better understand the mechanism of the climate change in East Asia. Bottom of Form.

IG28-D5-PM1-P-011 (IG28-A004)

The Estimation of Surface Solar Radiation Considering the Distortion of the Cloud Shadow on Complex Terrain

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Clouds and topography are the two most important factors that affect the surface radiation, and cloud shadows are also an important influencing factor to estimate the surface radiation with remote sensing method. Cloud and its shadow under different observation angle and the angle of the sun will lead to 3-D geometry effect. Furthermore, the terrain also has influence on downward solar radiation. At the same time, the cloud shadow distortion under complex terrain also should be taken into consideration in the estimation of radiation. So "coupling" the clouds and the terrain under the certain condition has the vital significance on estimating the surface radiation values.

Cloud detection results of high resolution satellite data was used, according to the height of the cloud and satellite observation angle information the position of cloud on the image was corrected to get the true position of the cloud. To more accurately describe the shadow distortion caused by the terrain, a geometrical method was used to calculate the true position of cloud shadows on complex terrain.

On the basis of the result after the calculation of shadows, downward surface solar radiation of the corresponding position was calculated based on some parametric methods for clear and cloudy sky respectively. Then, according to the mountain radiative transfer theory, DEM and albedo was employed in the topographic correction model for the downward surface solar radiation (DSSR) calculated above. Finally, we made some comparisons between cloud shadows on smooth surface and complex terrain as well as DSSR without any correction and with correction of terrain effect. The results showed that it is necessary to make these corrections on complex terrain. There were some big difference of the DSSR distribution and values before making correction.

IG28-D5-PM1-P-012 (IG28-A006)

Assessment of Satellite Land Surface Albedo Based on Land Surface Parameters Validation System

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Satellite derived Land surface albedo is an essential climate variable which controls the earth energy budget and it can be used in applications such as climate change, hydrology, and numerical weather prediction. However, the accuracy and uncertainty of surface albedo products should be evaluated with a reliable reference truth data prior to applications.

A Web-based validation system named Land surface remote sensing Product Validation System (LAPVAS) , which belongs to a new comprehensive and systemic project of china, called the Remote Sensing Application Network (CRSAN) and aims to validate satellite land surface product with a reference validation data.

IG28-A002

RAPID LAND COVER CHANGE IN THE MERANG KEPAHYANG PEAT HYDROLOGICAL REGION, SOUTH SUMATRA, INDONESIA ASSOCIATED WITH PEAT FIRE

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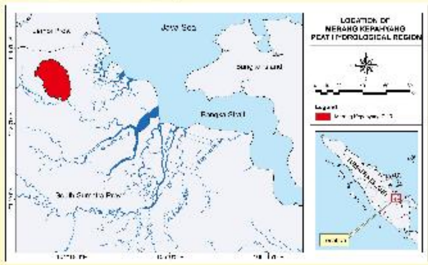
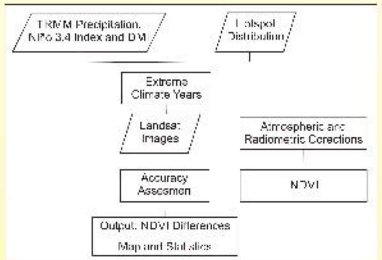
ABSTRACT

Peat fires is one of a serious environmental issue in Indonesia, in particular in the South Sumatra region. The fires usually occur during dry season from July to September. This study is designed to evaluate the impact of peat fires on land cover change in the Merang Kepahyang Peat Hydrological Region (MK-PHR) in the South Sumatra using Landsat satellite imagery for period of 2002 – 2015. The Normalized Difference Vegetation Index (NDVI) was used an index to calculate the density of green on patch of land (land cover). The results showed that extreme peat fires associated with anomalous climate events were occurred in 2006, 2012 and 2015. In particular, the 2015 peat fires associated with the largest anomalous climatic index had the largest hotspot distribution and the rapid land cover changes were observed in the most area of the MK-PHR. The total average of land cover loss was about 49% of the total MK-PHR area.

INTRODUCTION

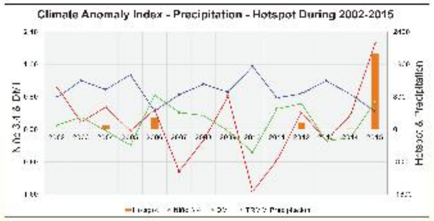
DATA AND METHOD

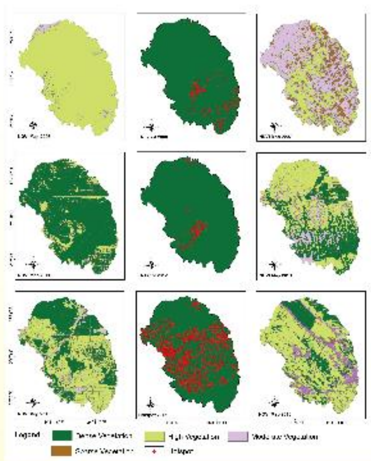




Data	Record Time	Source
Hotspot	2002-2015	*http://firms.modaps.eosdis.nasa.gov*
Niño 3.4 Index	2002-2015	*http://ioc-goosoopc.org*
Dipole Mode Index (DMI)	2002-2015	*http://ioc-goosoopc.org*
TRMM Precipitation	2002-2015	*https://mirador.gsfc.nasa.gov*
Landsat 5 Image (Patch 125;062)	08/06/2006; 26/05/2007; 02/03/2011; 27/06/2013	*https://ers.cr.usgs.gov*
Landsat 8 Image (Patch 125;062)	03/07/2015; 06/08/2016	*https://ers.cr.usgs.gov*

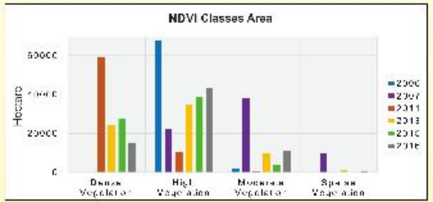
RESULT

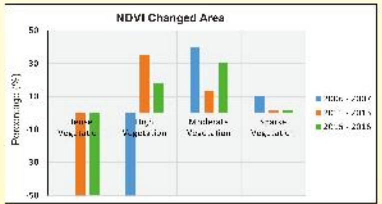




NDVI Density Classes	NDVI Classes Area (Hectare)					
	2006	2007	2011	2013	2015	2016
Dense Vegetation	0	0	50178	24325	27460	15324
High Vegetation	67780	22019	10311	34705	36708	43110
Moderate Vegetation	2062	38260	340	9734	3642	11064
Sparse Vegetation	1	9519	2	975	10	368

NDVI Density Classes	Changed Area (%)		
	2006 - 2007	2011 -2013	2015 - 2016
Dense Vegetation	0.00	-50.00	-49.93
High Vegetation	-60.00	35.13	18.12
Moderate Vegetation	39.57	13.48	30.47
Sparse Vegetation	10.43	1.40	1.47





CONSLUSION

Climate anomaly totally affects the total hotspot in the study area. It's evidenced by increasing of hotspot amount when the anomaly index has a high rate and precipitation has a low rate. Based on the result, the changes of land cover occurs at hotspot distribution areas and surrounding. Changes in vegetation density levels occurring outside the hotspot distribution area are thought to be due to crop adaptation to climatic conditions that result in green matter declining. The land cover changes due to fires occurred negatively, in which the high-density vegetation class moved to the lower class. The year of 2015 has the highest rate of anomaly index with the biggest score of a hotspot and the land cover changed occurred in most of MK-PHR area.

ACKNOWLEDGEMENT

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