

2nd International Symposium on LAPAN-IPB Satellite (LISAT) for Food Security and Environmental Monitoring 2016

Procedia Environmental Sciences Volume 33

Bogor, Indonesia
25 - 26 October 2016

Editors:

**Yudi Setiawan
Hefni Effendi**

**Lilik Budi Prasetyo
Iskandar Zulkarnaen Siregar**

ISBN: 978-1-5108-3623-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com



Contents

Editorial

Y. Setiawan, H. Effendi, L.B. Prasetyo, I.Z. Siregar	1
--	---

Agriculture

Processing System of MODIS Data for Monitoring the Changes of Paddy Field M.T. Arifin, Liyantono, Y. Setiawan, A. Fatikhunnada	3
Identification of Agricultural Drought Extent Based on Vegetation Health Indices of Landsat Data: Case of Subang and Karawang, Indonesia R.I. Sholihah, B.H. Trisasonko, D. Shiddiq, La Ode S. Iman, S. Kusdaryanto, Manijo, D.R. Panuju	14
The Disparity of Watershed Development between Northern and Southern Region of Java Island Kaswanto, F.N.H. Utami	21
Analysis of Agricultural Land Use Changes in Jombang Regency, East Java, Indonesia Using BFAST Method P.A. Permatasari, A. Fatikhunnada, Liyantono, Y. Setiawan, Syartinilia, A. Nurdiana	27
The Utilization of Satellite Imagery Data to Predict Hydrology Characteristics in Dodokan Watershed S.M. Yusuf, K. Murtilaksono, M. Harjianto, E. Herlina	36
Analysis of the Dynamics Pattern of Paddy Field Utilization Using MODIS Image in East Java M. Muhammad, Liyantono, Y. Setiawan, A. Fatikhunnada	44
The Testing of Chicken Manure Fertilizer Doses to Plant Physiology Components and Bioactive Compound of Dewa Leaf A.Y. Perkasa, E. Gunawan, S.A. Dewi, U. Zulfa	54
Nitrogen Content Estimation of Rice Crop Based on Near Infrared (NIR) Reflectance Using Artificial Neural Network (ANN) S.D. Afandi, Y. Herdiyeni, L.B. Prasetyo, W. Hasbi, K. Arai, H. Okumura	63
Influence of Agro-ecology on Growth and Performance of Several Potential Mutants of Cassava N. Khumaida, Evii, S.W. Ardie, D. Sopandie	70
Modelling of Land Allocation Behavior in Indonesia D. Djaenudin, R. Oktaviani, S. Hartoyo, H. Dwiprabowo	78
Response of Five Soybean Varieties under Saturated Soil Culture and Temporary Flooding on Tidal Swamp M. Ghulamahdi, S.R. Chaerunisa, I. Lubis, P. Taylor	87
Remote Sensing and Land Suitability Analysis to Establish Local Specific Inputs for Paddy Fields in Subang, West Java Widiatmaka, W. Ambarwulan, P.B.K. Santoso, S. Sabiham, Machfud, M. Hikmat	94
Dynamics Pattern Analysis of Paddy Fields in Indonesia for Developing a Near Real-time Monitoring System Using MODIS Satellite Images Y. Setiawan, Liyantono, A. Fatikhunnada, P.A. Permatasari, M.R. Aulia	108
Characterizing Spatial Distribution and Environments of Sumatran Peat Swamp Area Using 250 M Multi-temporal MODIS Data Y. Setiawan, H. Pawitan, L.B. Prasetyo, M.I. Lubis, M. Parlindungan, A. Nurdiana	117

Climate

Performance of Decadal Prediction in Coupled Model Intercomparisso Project Phase 5 (CMIP5) on Projecting Climate in Tropical Area A. Purwaningsih, R. Hidayat	128
Sensitivity of WRF-EMS Model to Predict Rainfall Event on Wet and Dry Seasons over West Sumatra D.H. Febri, R. Hidayat, W. Hanggoro	140
Extreme Rainfall in Katulampa Associated with the Atmospheric Circulation G.B. Wicaksono, R. Hidayat	155
Modulation of Indonesian Rainfall Variability by the Madden-Julian Oscillation R. Hidayat	167
Heavy Rainfall Distributions over Java Sea in Wet Season D.E. Nuryanto, H. Pawitan, R. Hidayat, E. Aldrian	178
Comparison of TRMM Satellite Rainfall and APHRODITE for Drought Analysis in the Pemali-comal River Basin Levina, W. Hatmoko, W. Seizarwati, R. Vernimmen	187
Influences of IOD and ENSO to Indonesian Rainfall Variability: Role of Atmosphere-ocean Interaction in the Indo-pacific Sector M.N. Nur'utami, R. Hidayat	196
Open Green Space Development Priority Based on Distribution of Air Temperature Change in Capital City of Indonesia, Jakarta S. Ramdhoni, S.B. Rushayati, L.B. Prasetyo	204
The Effect of Temperature Rise to Rice Crop Yield in Indonesia Uses Shierary Rice Model with Geographical Information System (GIS) Feature T. Yuliawan, I. Handoko	214

Adaptation Strategy toward Urban Heat Island at Tropical Urban Area S.B. Rushayati, L.B. Prasetyo, N. Puspaningsih, E. Rachmawati	221
Forestry	
Evaluation of Pan-sharpening Method: Applied to Artisanal Gold Mining Monitoring in Gunung Pani Forest Area H. Sunuprapto, P. Danoedoro, S. Ritohardoyo	230
Forest Fire Vulnerability Mapping in Way Kambas National Park P. Amalina, L.B. Prasetyo, S.B. Rushayati	239
Detection of Mangrove Distribution in Pongok Island Umroh, W. Adi, S.P. Sari	253
Contextual Outlier Detection on Hotspot Data in Riau Province Using <i>k</i> -means Algorithm P.H. Thah, I.S. Sitanggang	258
Monitoring Model of Payment for Environmental Service (PES) Implementation in Cidanau Watershed with Stands Density Approach R.N. Khairiah, L.B. Prasetyo, Y. Setiawan, N. Kosmaryandi	269
Geographic Information System (GIS) Application on Urban Forest Development in Bandung City S. Narulita, A.F. Malik Zain, L.B. Prasetyo	279
Mapping of Fire Vulnerability in Alas Purwo National Park A. Mukti, L.B. Prasetyo, S.B. Rushayati	290
Dynamics Change of the above Carbon Stocks in Bogor Agricultural University, Darmaga Campus L. Lavista, L.B. Prasetyo, R. Hermawan	305
Web-Based Clustering Application Using Shiny Framework and DBSCAN Algorithm for Hotspots Data in Peatland in Sumatra R. Hermawati, I.S. Sitanggang	317
Challenges in Satellite-based Research on Forest and Land Fires in Indonesia: Frequent Item Set Approach L. Syaufina, I.S. Sitanggang, L.M. Erman	324
Web-based Classification Application for Forest Fire Data Using the Shiny Framework and the C5.0 Algorithm G.P. Siknun, I.S. Sitanggang	332
Spatial Distribution and Habitat Use of Javan Langur (<i>Presbytis Comata</i>): Case Study in District of Kuningan T. Supartono, L.B. Prasetyo, A. Hikmat, A.P. Kartono	340
Priority Assessment Method of Green Open Space (Case Study: Banjarbaru City) N. Humaida, L.B. Prasetyo, S.B. Rushayati	354
Nature Based Tourism Resources Assessment Using Geographic Information System (GIS): Case Study in Bogor T. Rahayuningsih, E.K.S. Harini Muntasib, L.B. Prasetyo	365
Biodiversity, Carbon Stocks and Community Monitoring in Traditional Agroforestry Practices: Preliminary Results from Two Investigated Villages in Berau, East Kalimantan A.P.P. Hartoyo, I.Z. Siregar, Supriyanto, L.B. Prasetyo, I. Thelaide	376
Land Cover Change and its Impact on Flooding Frequency of Batanghari Watershed, Jambi Province, Indonesia S.D. Tarigan	386
Distribution and Local Adaptation of Two Indigenous Jelutung Trees (<i>Dyera Costulata</i> and <i>D. Lowii</i>) in Jambi, Indonesia: Implication for Allopatric Speciation U.J. Siregar, M. Firdaus Imran, Hamzah, I.Z. Siregar, R. Finkeldey	393
Assessing Intensity of Mistletoe Infestation in Teak Clonal Seed Orchard (CSO) Padangan, East Java Z. Muttaqin, Sri Wilarsro Budi R, B. Wasis, I.Z. Siregar, Corryanti	404
Estimating Mean Tree Crown Diameter of Mangrove Stands Using Aerial Photo A. Suhardiman, S. Tsuyuki, Y. Setiawan	416
Land Cover Change in Kuningan District During 1994–2015 I. Nasihin, L.B. Prasetyo, A.P. Kartono, N. Kosmaryandi	428
Mapping and Monitoring of Mangrove Density Changes on Tin Mining Area S.P. Sari, D. Rosalina	436
Land Changes Monitoring Using MODIS Time-series Imagery in Peat Lands Areas, Muaro Jambi, Jambi Province, Indonesia A. Nurdiana, Y. Setiawan, H. Pawitan, L.B. Prasetyo, P.A. Permatasari	443
Historical Forest fire Occurrence Analysis in Jambi Province During the Period of 2000–2015: Its Distribution & Land Cover Trajectories L.B. Prasetyo, A.H. Dharmawan, F.T. Nasdian, S. Ramdhoni	450
Degradation Mangrove by Using Landsat 5 TM and Landsat 8 OLI Image in Mempawah Regency, West Kalimantan Province year 1989–2014 B. Khairuddin, F. Yulianda, C. Kusmana, Yonvitner	460
Analysis of Land Use and Cover Changes in Ciliwung and Cisadane Watershed in Three Decades Y. Arifasihati, Kaswanto	465
Marine & Fisheries	
Horizontal Distribution of Zooplankton in Tangerang Coastal Waters, Indonesia N.T.M. Pratiwi, Ardhito, D.Y. Wulandari, A. Iswantari	470
Modelling Complex Terrain of Reef Geomorphological Structures in Harapan-Kelapa Island, Kepulauan Seribu T. Subarno, V.P. Siregar, S.B. Agus, A. Sunuddin	478

The Effect of Sunlight on Benthic Habitats Mapping in Pari Island Using Worldview-2 Imagery A. Anggoro, V.P. Siregar, S.B. Agus	487
Distribution of Phytoplankton Diversity and Abundance in Mahakam Delta, East Kalimantan H. Effendi, M. Kawaroe, D.F. Lestari, Mursalin, T. Permadi	496
The Growth Rate of Coral <i>Porites Lutea</i> Relating to the El Niño Phenomena at Tunda Island, Banten Bay, Indonesia N.P. Zamani, A. Arman, Lalang	505
The Managing Plan for Abrasion in Coastal Area of Garut Regency R. Rostika, N.P. Purba, M. Lutfi, J. Kelvin, I. Silalahi	512
Land Use Change and its Impact to Marine Primary Production in Semarang Waters V. Siregar, A.F. Koropitan	520
Influences of Physical Processes and Anthropogenic Influx on Biogeochemical Cycle in the Java Sea: Numerical Model Experiment A.F. Koropitan, M. Ikeda	532
Stock Assessment of Brown Seaweeds (Phaeophyceae) Along the Bitung-Bentena Coast, North Sulawesi Province, Indonesia for Alginate Product Using Satellite Remote Sensing S. Wouthuyzen, S.M.C. Herandarudewi, T. Komatsu	533
River Water Quality Preliminary Rapid Assessment Using Pollution Index H. Effendi	562
Observations of Sea Surface Temperature on Spatial and Temporal Using Aqua MODIS Satellite in West Banda Sea M. Tadjuddah	568
Ecological Risk Assessment of Heavy Metal Pollution in Surface Sediment of Mahakam Delta, East Kalimantan H. Effendi, M. Kawaroe, Mursalin, D.F. Lestari	574
The Seasonal Variability of Sea Surface Temperature and Chlorophyll-A Concentration in the South of Makassar Strait B. Nababan, N. Rosyadi, D. Manurung, N.M. Natih, R. Hakim	583
Satellite Technology	
Coral Reef Ecosystem Monitoring Using Remote Sensing Data: Case Study in Owi Island, Biak, Papua D. Samuel H.L.M.K. Awak, J.L. Gaol, B. Subhan, H.H. Madduppa, D. Arafat	600
Development of Ferroelectric Solar Cells of Barium Strontium Titanate ($Ba_xSr_{1-x}TiO_3$) for Substituting Conventional Battery in LAPAN-IPB Satellite (LISAT) Irzaman, I.R. Putra, Aminullah, H. Syafutra, H. Alatas	607
Phasor Diagrams of Thin Film of $LiTaO_3$ as Applied Infrared Sensors on Satellite of LAPAN-IPB M. Misbakhussudur, A. Ismangil, Aminullah, Irmansyah, Irzaman	615
Optical and Electrical Characterizations of Niobium-doped $Ba_{0.25}Sr_{0.75}TiO_3$ (BSNT) on p-type Silicon and Corning Glass Substrates and its Implementation as Photodiode on Satellite of LAPAN – IPB A. Setiawan, Aminullah, J. Juansah, Irzaman	620
Extraction, Transformation, and Loading (ETL) Module for Hotspot Spatial Data Warehouse Using Geokettle W. Astriani, R. Trisminingsih	626
Hotspot Pattern Distribution in Peat Land Area in Sumatera Based on Spatio Temporal Clustering A.P. Kirana, I.S. Sitanggang, L. Syaufina	635
Drought Detection of West Java's Paddy Field Using MODIS EVI Satellite Images (Case Study: Rancaekek and Rancaekek Wetan) M.R. Aulia, Liyantono, Y. Setiawan, A. Fatikhunnada	646
Land Use/Land Cover Change Detection in an Urban Watershed: A Case Study of Upper Citarum Watershed, West Java Province, Indonesia M. Agaton, Y. Setiawan, H. Effendi	654
Preparation and Optical Properties Study of CuO thin Film as Applied Solar Cell on LAPAN-IPB Satellite M. Dahrul, H. Alatas, Irzaman	661
The Diffusion Coefficient of Lithium Tantalite ($LiTaO_3$) with Temperature Variations on LAPAN-IPB Satellite Infra-red Sensor A. Ismangil, Irmansyah, Irzaman	668
Corrigendum to 'Land Use Change and its Impact to Marine Primary Production in Semarang Waters' [Procedia Environmental Sciences 33 (2016) 520–531] V. Siregar, A.F. Koropitan	674