TOWARDS A FAIR AND EQUITABLE ALLOCATION OF CAUVERY WATERS, INDIA

Siddharth Chaudhary

Asian Institute of Technology, Thailand

ABSTRACT

Conflict occurs between people in all kinds of human relationships and in all social settings. Because of the wide range of potential differences among people, the absence of conflict usually signals the absence of meaningful interaction.

In the history of water conflicts, various water appropriation doctrines and mechanisms have been proposed for the purpose of conflict resolution. Evidently, the interesting concepts of 'equity' and 'fairness' in water allocations were proposed as a preferred sharing doctrine but its translation beyond a mere theoretical enunciation has not been possible. Past investigators have not succeeded in their attempts to develop an objective frame work to define 'equitable apportionment' in real world water conflicts and this failure has been attributed to the largely perceptive nature of these concepts.

This is an attempt to address these and related issues with reference to the dispute over sharing of water resources of Cauvery basin in India between the states of Kerala, Tamil Nadu and Karnataka.

ANOMALY DETECTION RELATING TO TECTONIC FAULTS USING REMOTE SENSING AND GEOPHYSICAL METHODS: PRINCIPLES AND A TYPICAL RESULT

Diem Huong Dang, Thi Hong Quyen Vo, Trong Tan Vu, Van Tung Dinh, Van Linh Do

Ho Chi Minh City Space Technology and Application Center, Vietnam National Space Center

ABSTRACT

Determining the tectonic faults is important in the scientific research of geology, which is the fundamentals of mineralogy, hydrogeology and geological engineering. Besides the geological techniques, remote sensing and geophysics methods are tools to study the geological characteristics of faults. Remote sensing is useful for observation on wide area, otherwise, the geophysics methods that approach nearer the object will provide the information in the depth. This article refers to the combination of the information of remote sensing and geophysics on the anomaly detection relating to tectonic faults, which decrease the multi-root problem of each particular method and increase the accuracy of the final result. The major research way is to collect the document and to summarize the rule, advantages, disadvantages to each method for studying tectonic faults. An analysis from the obtained data for the Rach Gia – Bac Lieu fault is a typical example.

LONG–TERM SPATIO – TEMPORAL WARMING TENDENCY IN THE VIETNAMESE MEKONG DELTA BASED ON OBSERVED AND GRIDDED DATASETS

Dong Phuong Dang Nguyen, Thong Nhat Tran, Kim Loi Nguyen

Research Center for Climate Change – Nong Lam University Ho Chi Minh City – Vietnam

ABSTRACT

Detecting and estimating statistical characteristics of a given time series are one of the most essential tasks in hydrology and climatology. In this study, the annual mean and extreme temperatures from 11 meteorological stations over the Vietnamese Mekong Delta were subjected to normality, homogeneity and trend analysis by employing a number of powerful statistical tests (i.e., Shapiro–Wilk, cumulative deviations, Sen's slope estimator, classical Mann–Kendall and trend–free pre–whitening procedure with Mann–Kendall test). As for spatial assessment, the well–known (0.5° × 0.5°) gridded datasets (i.e., CRU TS 4.01) were also used to examine trend possibilities for three different time scales (i.e., 1901– 2016, 1951–2016 and 1981–2016) by integrating interpolation algorithms (i.e., IDW and ordinary kriging) with the classical/modified Mann–Kendall test. The outcomes show high domination of significantly increasing trends. Additionally, the results of trend estimation indicate that the magnitude of increase in minimum temperatures was mostly greater than the mean and maximum ones and the recent period (1981–2016) also revealed higher increasing rates compared to the previous periods. In general, these findings yield various evident indications of warming tendency in the Vietnamese Mekong Delta over the last three decades.

INTEGRATION OF GIS, GROUP AHP AND TOPSIS IN EVALUATING SUSTAINABLE LAND-USE MANAGEMENT IN THE ZONE OF THE SALTWATER AND FRESHWATER INTERACTIONS IN THE CONTEXT OF CLIMATE CHANGE: A CASE STUDY IN KIEN GIANG PROVINCE

Le Canh Dinh, Nguyen Tan Trung, Le Quang Tri

Sub-National Institute of Agricultural Planning and Projection
(Sub-NIAPP in the South - Ho Chi Minh city)

ABSTRACT

Climate change is a multi-criteria decision making (MCDM) problem that relates to various fields (natural, economic, social). In this research, the results achieved in the integration of GIS, AHP group and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) in solving ESLM problem. The integration process is as follows: i) Identify sustainability indicators using the FAO approach; ii) Calculating the weight of each sustainability element by using AHP in group decision making; iii) Using GIS to build thematic layers corresponding to suitability elements and to combine layers; iv) Using TOPSIS method to calculate and to rank land suitability. This integrated model is used to evaluate land in the zone of the saltwater and freshwater interaction in the context of climate change, Kien Giang province, Vietnam. The similarities and differences are drawn through comparing results obtained by this method with the results obtained by using GIS, AHP group and the weighted average method.

APPLICATION GIS AND REMOTE SENSING TO MONITOR THE IMPACT OF LAND COVER CHANGE ON URBAN INUNDATION OF HO CHI MINH CITY

Thu Dinh Tran Anh, Thy Pham Thi, Kha Phan Quoc Tran, Khang Nguyen Duy, Long Do Thanh

HCMC Space Technology Application Center

ABSTRACT

The land cover changes are the natural process of the formation and development of a region, especially in Ho Chi Minh City, the economic growth center of Vietnam. However, these change has caused many environmental problems like urban inundation. In this paper, by using GIS and remote sensing the land cover change in the period 2003-2007 in inner districts and relation with urban inundation status were assessed. The results showed that the increasing of impervious surface such as: asphalt, concrete and residential land expanding from the north to the lowland. This change has caused thousands of hectares of surface water and drainage surface lost.

Therefore, this leaded to reduce water storage capacity for this area and increase the amount of runoff that contributes to inundation. Consequently, pointing out roles of the land cover changes on urban inundation will support for urban growth planners to make decisions, Master Plan and solutions to reduce flooding inundation for Ho Chi Minh City.

RESEARCH ON USING OGC STANDARDS TO BUILD A TOOL SUPPORTING SPATIAL DATA DISPLAY

Long Do

HCMC Space Technology Application Center (STAC) – Vietnam National Space Center (VNSC)

ABSTRACT

For spatial data, sometimes it is difficult for users to understand the content of the data if the data is not properly displayed. Design and style map is very important but they also take a lot of time and effort... However, that each current GIS software has its own style and cannot be reused for another GIS application, example the style of QGIS cannot be used for UDig, Udig style, and QGIS style cannot be used for WMS... It is wasted time and effort to re-style the map when using on another software or publish map services for use on the Internet. To address that, the OGC announced the SLD standard for using with the WMS service.

Currently, some GIS software has supported importing and exporting SLD file such as QGIS, Udig,... but these software do not fully support SLD standard. ArcGIS itself has a third-party extension that supports pretty well but takes a fee, making it difficult for users. Therefore, the study of building a tool to support spatial data display is necessary.

MULTI-SCALE DEEP NEURAL NETWORK LULC CLASSIFICATION USING REMOTE SENSING DATA AND R SOFTWARE

Thi Hang Do, Venkatesh Raghavan, Xuan Luan Truong, Yonezawa Go

Osaka City University

ABSTRACT

Land Use/ Land Cover (LULC) map can be extracted from Remote sensing (RS) data in pixel-based or object-based approach. Deep neural network algorithms, which learn the representative and discriminative features in a hierarchical manner from the data have been applied for RS data analysis, including LULC classification. R is the free software environment for statistical computing and graphics which provides Keras package - a high level neural networks API develop which a focus on enabling fast experimentation. In this study, a deep neural network in Keras using Mini-batch gradient descent optimizer is explored to establish LULC maps in from multi-spectral RapidEye imagery in pixel-based and object-based approaches.

BUILDING MANAGEMENT AND EXPLOITATION NATURAL DATA WEBGIS BY OPEN SOURCE TECHNOLOGY

Long Do, Binh Tran, Khang Nguyen, Kha Phan

HCMC Space Technology Application Center (STAC) – Vietnam National Space Center (VNSC)

ABSTRACT

Data has always been an important part in the development of human society. Especially spatial data play not only an important role in the field of geography but also the others. However, these data are often collected, constructed and stored in various forms which cause some inadequacies such as wasting resources, money and time; difficulties in data management; limitations in the exchange and data connection.

In addition, the combination of Internet and GIS has created a new breakthrough in the management and exploitation of data. Therefore, building a WebGIS system to support management and data mining has become an urgent need and an indispensable direction in the development of science and technology of geography. Through this system, data stored in a new way with multi-user not only solve the problems mentioned above but also make the management and exploitation data easier, simpler and more convenient.

Abstract

ASSESSMENT OF GROUNDWATER QUALITY USING WATER QUALITY INDEX AND ESTABLISHING A GROUNDWATER MANAGEMENT TOOL AT THE LOCAL LEVEL: A CASE STUDY OF HAU GIANG PROVINCE, VIETNAM

Duong Quynh Thanh, Nguyen Dinh Giang Nam,
Huynh Ngoc My and Nguyen Thi Viet Trinh

Department of Water Resources, College of Environmental and Natural Resources, CanTho University

ABSTRACT

The objectives of this study are to analyze the groundwater quality (GWQI) of Hau Giang province by water quality index which is a mathematical instrument used to transform large quantities of water quality data into a single number which represents the water quality level. In this study, a simple methodology based on the definition of GWQI using the average value of 5 parameters for 8 wells in three aquifers namely, Holocene (qh), upper Pleistocene (qp3), mid-upper Pleistocene (qp2-3) during a period of 7 – year. Final indices for each well are calculated considering weight of each parameter. The result of the study showed that, the WQI index for the same has been calculated and the values ranged from 58 to 900, 46 to 556 and 46 to 668 in the qh, qp3 and qp2-3, respectively. The GWQI values from the present study indicate the very poor quality water which is primarily distributed in the qh dominated by the industrial and the saline intrusion. In the case study, the GWQI map reveals that groundwater quality in studied areas is extremely near to domestic usage standard. Besides, created index map and the simple tool to manage the monitor data by using Quantum – GIS provides a comprehensive view of easily approach for regional decision makers and the local government.

OPTICAL REMOTE SENSING IMAGE OPTIMIZED DEHAZING ALGORITHM BY COASTAL AEROSOL AND CIRRUS BANDS

Phi Phung Hoang, Diem Huong Dang, Van Anh Vu Nguyen

Ho Chi Minh City Space Technology Application Center - Vietnam National Space Center

ABSTRACT

With the development of remote sensing technology, the monitoring of subjects has become popular in many fields. Satellite remote sensing data is often used as optical images. However, optical image data is often affected by the phenomenon of haze and cloud, which significantly reduce the quality of images. In this paper, we applied an algorithm presented previously to dehazing for Landsat 8 and Sentinel-2. Multivariable linear regression analysis is used to compute reflectance values due to the effects of haze. The result is compared with no-haze image (within a cycle).

ACCESSIBILITY OF URBAN GREEN SPACE IN HO CHI MINH CITY

Truong Ho Lam

Vietnam National Space Center (VNSC)

ABSTRACT

Urban green space has natural, social and environmental benefits, especially in cities with the high level of urbanization. The term urban green space accessibility is being widely used as a measure in urban planning and management. In the development of GIS, especially the network model supports complex spatial analysis. This study is based on two main approaches: network analysis and two-step floating catchment area (2SFCA). Data used include census data, housing, road and green space in the inner region of Ho Chi Minh city. The result identified the service area of urban green space and calculated the accessibility index for residential areas to find locations with low green space accessibility. Therefore, this study contributes scientific methods in urban planning.

BUILDING GIS DATABASE TO SUPPORT HOUSEHOLD SOLID WASTE MANAGEMENT IN CU CHI DISTRICT, HOCHIMINH CITY

Nguyen Huy Anh

University of Natural Resources and Environment, Hochiminh City

ABSTRACT

This article presents the result from building a GIS database to support decision making process in management of household solid waste in Cu Chi District, Hochiminh City. The database includes 6 layers of spatial data compatiblely integrated in ArcGIS, namely: administration, transportation, transport terminal, collection sites, sites of waste generating, collection routes.

The research also presents map of current status of household solid waste management in study area. This is an important database to facilitate the effectiveness of management of household solid waste.

Abstract

REAL-TIME WEB GIS TO MONITORING WILDFIRE USING VIIRS SATELLITE IN CHIANGRAI PHAYAO PHARE AND NAN PROVINCES

Phaisarn Jeefoo, Nion Sirimongkonlertkun, Sukthai Pongpattanasiri

University of Phayao

ABSTRACT

We present a real-time wildfire monitoring service that exploits VIIRS satellite to detect hotspots and monitor the evolution of fire fronts. The service makes heavy use of VIIRS satellite for hotspots on national forest, forest conservation in Chiangrai, Phayao, Phare and Nan Provinces, Northern Part of Thailand. Geographic Information System (GIS) technology is ideally suited as a tool for the presentation of data derived from continuous monitoring of locations and used to support and deliver information to environmental managers and the public. Combined with GeoServer, PostgreSQL/PostGIS, it extends the web GIS capabilities in providing real-time data from the monitoring activities.

Therefore, there is a growing need of Web GIS for easy and fast dissemination, sharing, displaying and processing of spatial information which in turn helps in decision making for various natural resources-based application.

APPROPRIATE ACCURACY OF CARTOGRAM INVENTION FOR PESTICIDE USING AREA IN BANTAK AGRICULTURE COOPERATIVE SECTION, TAK, THAILAND

Jiratchaya Jewpanya, Anujit Vansarochana, Ratchada Pantong, Chonthicha Kammani, Thidarat Sunthonthip

Dept. of Natural Resources and Environment, Faculty of Agriculture Natural Resources & Environment, Naresuan University, Phitsanuloke, Thailand 65000

ABSTRACT

Cartogram is the highly diagrammatic representation as being more interested in GIS application ideas, for show Pesticide using area. This study area stand for corn fields and soybean plantation, our research collected pesticide using data in 5 years period (2011-2016) and apply with QGIS cartogram creator tool for create contiguous cartograms. Absolutely, accuracy of cartogram is be match up with cartographic concepts, all results has shown increasingly pesticide quantities in every years, thus, according to more expansion of farm plants area and almost farmers take pesticide to control Plant diseases.

Therefore, cartogram creation technique could be useful for symbolize any pesticide using areas and also good for inspire more farmers in South East Asian countries, to take a new turn to apply GIS techniques for his/her plants activities.

INUNDATION MAPPING USING MULTITEMPORAL SAR IMAGE CHANGE DETECTION

Thu Trang Le

Hanoi University of Mining and Geology

ABSTRACT

The paper presents a change detection methodology for determining the inundation region using multitemporal Sentinel 1 SAR images captured before, during and after the flood in November, 2017 in Hue, Vietnam. Changes on the ground caused by this flood have been detected based on statistical similarity measures between multitemporal SAR images. The results have been validated by ground truth, produced a total accuracy of 87.3%.

BIG DATA ANALYTICS WITH GIS

Hương Mai Tran, Xuân Truong Nguyen, Dung Thi Mai Nguyen, Chuyên Trung Tran, Thuy Thi Diem

Hanoi University of Mining and Geology

ABSTRACT

Advance increasing interest in large-scale, high- resolution, real-time geographic information system (GIS) applications and spatial big data processing, traditional GIS are not efficient enough to handle due to limited computational capabilities. Geospatial analytics in big data needed new approaches that are flexible. In this paper, the author group introduction to Geographic Information Systems (GIS) that are used to gather and present geospatial information of big data. At the same time we also use some GIS tools to to process and analyze big data processing experiments. This helps researchers understand different design methods and highlight open research issues in the field.

Abstract

ADAPTIVE OPTICAL TECHNOLOGY FOR ECOLOGICAL MONITORING

Ferdenant Mkrtchyan, Vladimir Krapivin, Vladimir Klimov

Kotelnikov IRE RAS

ABSTRACT

Unlike the microwave region of the electromagnetic spectrum, the visible range is used more efficiently in water body monitoring systems. This is due to the fact that the energy of solar radiation or artificial light fluxes interacts intensely with the aqueous medium. Different parts of the spectrum of solar radiation are absorbed by water in different ways. The minimum of light absorption is observed at a wavelength of 470 nm, in the blue part of the spectrum, whose energy is halved already at a depth of 47 m.

Ellipsometry refers to optical technologies that use a change in the polarization of the light flux when it is reflected from a surface or refracted during a passage through a liquid. In this paper, an adaptive optical instrument-information system for the diagnostics of water systems is provided. The system consist of a spectrophotometer and a spectroellipsometer, an information interface, a set of algorithms for identifying of spectral images, a database of spectral standards, algorithms for solving inverse problems of spectrophotometry, spectroellipsometry, and an algorithm for learning for the recognition of spectral images. The system can also be implemented as a portable device with the help of which the operator can perform the real-time control of the quality of water resources without taking samples and conducting chemical analyzes.

ON THE IMPACT OF LANDCOVER CHANGES ON LAND SURFACE TEMPERATURE VARIATION – A CASE STUDY IN THU DAU MOT CITY, VIETNAM

To Thi Bich Nga, Tran Hoang Dang Khoa, Pham Viet Hoa, Ho Dinh Duan

Vietnam Southern Surveying and Mapping Company

ABSTRACT

Landcover (LC) changes will inevitably affect the surface temperature, both in micro and macro scope. Thu Dau Mot city of Binh Duong province has undergone a rapid and robust urbanization and industrialization during the past two decades. This development of the city certainly leads to crucial changes of landuse/landcover. The landcover changes in turn effect the land surface temperature (LST), which may cause anomalies in the air temperatures and resulting in phenomenon like unusual micro-climate and city "heat islands". This paper presents a comparative study on the time series of LST with the corresponding landcover snapshots in the same area. Landsat TM and OLI have been used. Results showed that there is a positive, though not quite clear, correlation between the two series of collected data – LC and LST.

COMBINING OPTICAL AND RADAR SATELLITE IMAGE TIME SERIES FOR TROPICAL FOREST MONITORING

Duc Anh Ngo, Thi The Doan, Thu Hang Nguyen

Earth Observation system application

ABSTRACT

Reviewing satellite-based optical and Synthetic Aperture Radar (SAR) efforts for tropical forest monitoring revealed that operationalized optical-based approaches exist, but frequent cloud cover limits their applicability in the tropics. SAR remote sensing has also demonstrated its capability, not greatly affected by cloudy climate of tropical regions and the observed frequency of SAR imagery and appropriate time series methods are advantageous.

In this study, the authors build a model using contemporary Sentinel-1 and Landsat-8 imageries for tropical forest monitoring.

Analyzing VH back scattering computed from SAR time-series combined with Normalized Difference Vegetation Index (NDVI) and Modification of Normalized Difference Water Index (MNDWI) computed from Landsat 8 products, the results are near real-time maps of deforestation. This shows that compared to using each kind of data individually, using both SAR time-series and optical images have much higher efficiency in the detection of deforestation.

BUILDING WEB GIS APPLICATIONS USING OPEN SOURCE SOFTWARE FOR WATER QUALITY MONITORING

Khang Nguyen, Long Do, Binh Tran, Thy Pham

HCMC Space Technology Application Center (STAC) – Vietnam National Space Center (VNSC)

ABSTRACT

In the reality that environmental pollution is getting worse, climate change and extreme weather are major challenges in water quality monitoring serving human life, especially aquaculture. Besides, Internet and Geographic Information Systems (GIS) are well developing, especially open source technologies. Therefore, a water quality monitoring system should be developed to rapidly provide water quality information that assists users in making decision to respond, as well as limit damage caused by environmental pollution and climate change.

This study is about building the water quality monitoring system using open-source WebGIS in order to supply, display, manage water information and assist users in decision making in aquaculture.

DETERMINING THE CRITERIA FOR ASSESSING THE MODELS OF RICE PRODUCTION TOWARDS CLIMATE SMART AGRICULTURE (CSA) IN THE MEKONG DELTA

Mi Nguyen, Minh Vo, Du Thai

Can Tho University

ABSTRACT

Climate Smart Agriculture (CSA) has been formed and developed in Mekong Delta, Vietnam. However, selecting the potential and suitable farming models for rice cultivation in each specific context of the region that should be based on what criteria is the issue. This research was conducted to identify criteria for assessing and to choose suitable rice production models towards CSA for each area in the Mekong Delta. By research methodologies such as data collection, household surveys, statistics, analysis, Multi-criteria Evaluation (MCE) and GIS technology, the results have been achieved: there are seven basic criteria of CSA for rice in the Mekong Delta, including reduce the number of seeds and use higher quality seeds than traditional rice cultivation; Increase productivity per unit of area; increase income per unit of area; increase economic efficiency; there is impact of natural resource recovery (use of organic fertilizer to increase soil fertility); reduce the amount of inorganic fertilizer, reduce the number of spraying plant protection products; reduce greenhouse gas emissions compared to conventional rice cultivation. Besides, the study also identified four models of rice cultivation which are suitable to four different ecological zones in the Mekong Delta. These results are the bases for local to make more suitable and detailed plans for rice production toward CSA in the future.

APPLICATION REMOTE SENSING DATA FOR FLOODING DETECTION AND MANAGEMENT IN LAGOON AREA: CASE STUDY IN QUANG DIEN DISTRICT, THUA THIEN HUE PROVINCE

Ngoc Nguyen Bich, Ngu Nguyen Huu, Duc Tran Thanh, Chau Tran Thi Minh

University of Agriculture and Forestry, Hue University

ABSTRACT

The lagoon region of Quang Dien district has the low-lying terrain and is frequently facing with severe flooding for many years. As a result, there are many negative influences effect to living conditions of local people as well as for land use situation. This study indicated the flooded area by some indicators such as Land Surface Water Index (LSWI), Enhanced Vegetation Index (EVI) and Difference Index (DVEL) from Sentinel 2 images. The results show the flooded area of Quang Dien district in the year of 2017 is 4929.16 hectares and the deepest flooding was in September and November. The most affected communes included Quang An, Quang Phuoc, and Quang Thanh. In terms of land use, paddy land type is most affected followed by annual cropland and aquaculture land.

APPLICATION OF GIS FOR GAP ANALYSIS IN CULTURAL TOURISM DEVELOPMENT IN QUANG BINH PROVINCE, VIETNAM

Vien Nguyen Huu Duy

Geography Department, Quangbinh University

ABSTRACT

Quang Binh province is located in the North Center Coast region of Vietnam. Beside the unique values of geology, geomorphology and biodiversity have been exploited to develop the type of tourism based on nature, Quang Binh has also many potential for cultural tourism development. In tourism development, gap analysis shows the gap between development potential and current investment. This is an important basis to reallocate service resources compatible with development potential, towards utilisation of cultural resources sensibly and sustainable tourism development by location. This research designed process diagram of GIS application for gap analysis in cultural tourism development in Quang Binh province, gathered and processed GIS data, calculated input elements weight by AHP and analysed in GIS to build result maps. Based on result maps, the research suggested some solutions to use sensibly in cultural tourism development space at this area.

EVALUATE THE ACCURACY OF GOOGLE EARTH ENGINE IN SATELLITE IMAGERY CLASSIFICATION

Phuong Thanh Nguyen Ngoc, Bach Viet Pham, Lam Truong Ho

Vietnam National Space Center

ABSTRACT

Based on cloud-based platform, Google Earth Engine (GEE) has a capacity of storage and analaysis of a large free data. GEE combines a petabyte-scale archive of publicly available remotely sensed imagery and other data, its computational infrastructure is optimized for parallel processing of geospatial data, multi date at global scale. At the present, free remote sensing data includes of Landsat, Sentinel and MODIS is integrated into GEE that can be directly analysed throught service of Google Cloud Storage. In the field of remote sensing, these remote sensing images can be analysed and classified for land cover mapping, land cover change, urban mapping, deforestation detection by scientists in academic and scientific instutions, government at either small and large scale. This report presents comparision and evaluation on accuracy of land cover classification of Landsat 8 images using Support Vector Machine classifier. The results show that the classification images on Google Earth Engine and ENVI are similar. The overall accuracy are 79,25% in GEE and 86,95% in ENVI. Statistical z test indicates that this difference is not statistically significant. This evaluation can support further studies on taking advances of GEE in remote sensing data analysis.

ESTIMATING WATER USE FOR A RICE CROP IN PHU YEN PROVINCE BY REMOTE SENSING AND GIS TECHNIQUES

Anh Nguyen-Tuan, Vu Phan-Hien

Mientrung Industry and Trade College

ABSTRACT

Crop water requirements and irrigation scheduling are important in agricultural production. Recently, the water footprint model has been used to determine crop water use effectively, in which the total water-required volume, including surface and grounwater (WFBlue), precipitation (WFGreen), and fresh water to assimilate pollutants (WFGrey), is computed based on weather condition, land cover, and topography in the study area. This study applies the water footprint to estimate the water use for a rice crop in Phu Yen Provinc, and input data are collected from December 2015 to April 2016. The input data consist of in-situ measurements from meteorological stations, ASTER GDEM and Landsat 8 images. The meteorological measurements, including air temperature, humidity, wind speed, hours of solar radiation, and precipitation, are used to determine the reference crop evapostranpiration in combination with the topographical factors derived from ASTER GDEM. INDVIs, derived from Landsat 8 images, corresponding to rice growing periods, are used to determine crop factors. A data processing for estimation on rice crop water use is designed in the ArcGIS Model Builder. The results indicate that water use for a rice crop has different patterns in the whole Phu Yen province, and for yielding one ton of rice, the total required water equals approximate 2400 m3.

RIVERBANK CHANGE DETECTION IN THE DOWNSTREAM OF BA/DA RANG RIVER IN PHU YEN PROVINCE BY REMOTE SENSING

Anh Vu Nguyen Van

Ho Chi Minh City Space Technology Application Center-Vietnam National Space Center

ABSTRACT

The downstream of Ba/Da Rang River is important in the socio-economic development of Phu Yen province in general and Tuy Hoa City in particular. This paper presents the results of the extraction and assessment of changes in river bank of Ba/Da Rang river of Phu Yen province by remote sensing and GIS. Multi-temporal remote sensing data, natural conditions data and hydro-meteorology data in the downstream of Ba/Da Rang river are used to support the analysis and extraction of river bank of different periods. The results show that accretion and erosion in this area are complicated by the influence of many natural factors and human activities. The results give the authorities a scientific basis to give orientations, policies and action plans to minimize losses due to the change of river bank.

IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES OF DONG NAI RIVER SYSTEM

Thao Nhi Pham

Institute for computational science and technology hcm City

ABSTRACT

The aim of this research is to evaluate the effect of climate change on the water resources of the Dong Nai River valley,apply the SWAT model. The imitative result has been adjusted according to the observed date per day by a tool called SWAT-CUP (SUFI2).The result that analyses the sensitivity of the model's parameter shows that CN2 and CH_N2 have the biggest impact on the imitative result of the flow,the model has been adjusted and verified to the elements such as the volumetric flow rate,mud and sand (TTS),and get fine results. Hence, the effect of climate change's research on the flow and TTS according to two scripts,emission RCP4.5 and RCP8.5 in three periods 2015-2040, 2045-2070, 2075-2100 base on five climate models Can_ESM2, CNRM_CM5, HadGEM2_AO, IPSL_CM5A_LR, MPI_ESM_MR..The scripts demonstrates that the Dong Nai River basin will get hotter,rain more in the future,the annual flow will grow from 9,11% to 21,67%,the TTS will increase 8,1% - 29,72%.The increasing trend of the flow and sediment in the future will raise the flood risk,increase the erosion,especially in the rainy season.

URBAN EXPANSION AND ITS LAND SURFACE TEMPERATURE CHANGES IN SOUTH VIETNAM

Bach Viet Pham

Space Tecnology Appication Center of Hochiminh City

ABSTRACT

Urbanization includes of many aspects, one of these is its expansion in terms of space, which can be observed by satellite images. Landsat images from 2000 to 2017 were used to detect changes of urban expansion over times. Time series MODIS product data of land surface temperature on this period also was analyzed to identify changes of land surface temperature, focusing on urban areas. Analyzed results of the both data revealed that that there was a relationship between urban expansion for its areas and land surface temperature. Statistical analyses of correlation and regression displayed an effect of urbanization on increase of land surface temperature in urban area, which also indicate that contributes to a warming in urban areas of south Vietnam for the period of 2000 up to the present.

AN APPLICATION OF THERMAL REMOTE SENSING IN DETECTING AND MONITORING TEMPERATURE CHANGE IN DAI TU TEA GROWING AREA, THAI NGUYEN CITY BETWEEN 1990 AND 2015

Tuan Pham Van, Thi Nguyen Quang, Trung Chu Van, Viet Duong Hong,
Tuyen Ha Van, Linh Nguyen Thuy

Faculty of Natural Resources Management, Thai Nguyen University of Agriculture and Forestry

ABSTRACT

Nowadays, the demand for tea consumption and export is greatly increasing, the production of tea using the international standard of tea (UTZ) is a mandatory requirement. This paper presents the results of the study on surface temperature determination for tea plantations in Dai Tu district, Thai Nguyen province. The NDVI indicator (normalized difference vegetation index) was used to justify the results by determining the levels of surface thermal reflectance emission. The idea is applied to the heat distribution map with a higher spatial resolution. We conducted a pilot research on two types of high- spatial resolution Sentinel and Landsat satellite imagery, and its result showed the potential applications for agricultural practices. The results were compared with 5 temperature observatory stations corresponding to 5 tea-focused growing areas in Dai Tu district, and error analysis was done in the actual conditions of the study area. The research results of the project may potentially contribute to resolve the problems of detailed determination of meteorological, hydrological, irrigation and soil nutrients to develop tea-specialized areas in Thai Nguyen.

SENTINEL-1A SAR DATA FOR FOREST ABOVEGROUND BIOMASS AND CARBON ACCUMULATION ESTIMATIONS IN THUAN CHAU DISTRICT, VIETNAM

Manh Pham Van, Toan Dang Ngo Bao, Thach Nguyen Ngoc, Tam Pham Minh,
Thanh Bui Quang, Hong Nguyen Thi

Faculty of Geography, Hanoi University of Science, Vietnam National University, Hanoi

ABSTRACT

Estimation of aboveground biomass (AGB) and carbon accumulation (CAc) from remote-sensing data is an effective approach to control the carbon emissions in the forested area. This study presents the use of Sentinel-1A SAR data to express retrieval of the spatial variability of AGB and CAc at Thuan Chau districts of Vietnam. From the survey data and forest-covered map in 2015, the regression models were applied in 65 plots to represent the AGB value for each forest-type from mathematical formulation and the performance quality of correlation coefficient (R^2): univariate and multivariate linear regression analysis. With the same remote sensing data were used, the comparison of two methods was chosen to best-fit model to estimate the carbon accumulation accurately. The result of better performing univariate linear regression model ($R^2=0.71$) was more satisfied than the remaining results ($R^2=0.60$). From this comparison, the measurement of carbon accumulation was mainly majority in the extent of evergreen forest in Fold Mountains (72%). This methodology process is an as effective alternative to estimate forest AGB and CAc from remotely sensed data in the tropical region.

STUDY ON TYPICAL SEABED CLASSIFICATION OF SHALLOW WATER AREAS AROUND ISLANDS BY REMOTE SENSING AND GIS TECHNOLOGY

Yen Phan Quoc, Hieu Nguyen, Hoai Dao Khanh

Military Technical Academy

ABSTRACT

The paper studies the application of remote sensing technology and GIS processing techniques in combination with the field survey data in the shallow coastal water area in the Truong Sa archipelago to establish distribution maps sea bottom pattern. Use the invariant index to determine the effect of the water column on the spectrum of each type of bottom habitat. Image classification results show that: Basically, the coral reefs are living coral reef ecosystem with high coverage at depths greater than -5m. In addition, shredded sandy beaches of coastal coral are developed in two distinct seasons. The post-categorical test results show that the overall accuracy of the image classification process is 95% and the Kappa coefficient is 0.92.

MONITORING RICE AREA AND GROWTH STATUS IN THE MEKONG DELTA, VIETNAM USING MULTI-TEMPORAL SENTINEL-1 DATA

Hoang Phi Phung, Lam Dao Nguyen

Ho Chi Minh City Space Technology Application Center - Vietnam National Space Center - VAST

ABSTRACT

Food security has become an important issue as the population has increased rapidly in the recent years in Asia and Vietnam in particular. Specially, the impacts of climate change due to global warming and sea level rise have affected on the agricultural activities in the Mekong Delta which is almost rice growing area. Therefore, building a system to monitor rice area, crop calendar, growth status and production is essential. Recently, Sentinel-1A & -1B SAR satellites launched are not affected by atmospheric, sunlight conditions and can get signal through clouds and smoke even in rainy season, in day or night if comparing with optical data. SAR data can provide sustainable solutions to the challenges on mapping and monitoring rice cropping systems in tropical countries, Vietnam for example. In this paper, we present research results for identifying rice area, growth stages by using multi-temporal SAR imagery of C-band Sentinel-1 with dual-polarizations VH and VV, 20 m spatial resolution. The study has collected field survey data at the same time of Sentinel-1 acquired. This data with a high repeat-pass frequency which have been showed effective for the mapping of rice fields and growth stages.

Abstract

EVALUATE MEKONG DELTA'S RICE CROP CHANGES DURING FIFTEEN YEARS BY USING HIGH TEMPORAL RESOLUTION SATELLITE DATA

Kha Phan Quoc Tran, Thy Pham Thi Mai

Vietnam National Space Center

ABSTRACT

Rice is the most important staple food and occupies a main part of agricultural land in Vietnam like in most Asian countries. According publish from General Statistics Office of Vietnam, in 2016 the paddy planted area is nearly 7.9 million ha, accounted for almost 87 percent of total planted area, in Mekong Delta (MD) alone account for more than 50 percent of the paddy planted whole country. Mekong Delta (MD) which is the Vietnam's "rice bowl" is the major rice – producing region in Vietnam, half of production and 70 percent of exported rice on whole country come from MD. However, in recent years the MD's paddy area and its production is decrease is due to the effects of climate change, as drought and salt intrusion as well as water quality and water supply change. Therefore, rice crop monitoring is needed and important for optimizing food security, environmental sustainability and more other related issues. Recent advances on the resolutions (i.e., spectral, spatial, radiometric, and temporal) and availability of satellite imagery have allowed us timely collection of accurate information on the growth and development stages of the rice crop, rice growth conditions as well as to estimate rice crop area and its production. The aim of this paper was to review and evaluate MD's rice crop changes during more over fifteen years by using high temporal resolution satellite imagery data.

AGRICULTURAL WATER USED ASSESSMENT IN DROUGHT SEASON WITH SWAT MODEL: A CASE STUDY OF YOM RIVER BASIN

Kanida Phukongnam, Anujit Vansarochana, Ratchada Pantong, Chonthicha Kammani, Thidarat Sunthonthip

Dept. of Natural Resources and Environment, Faculty of Agriculture Natural Resources & Environment
Naresuan University, Phitsanuloke, Thailand 65000

ABSTRACT

Yom river basin is crucial intensive agricultural area in lower north of Thailand, in drought season also continue planting process. This study use the Soil and Water Assessment Tool (SWAT) as call QSWAT in QGIS, to evaluate Water efficiency index (WEI) associated with land use, soil type, climatic data, river tributaries, and DEM, all applicants ready stand in drought time (January - April) of 10 years (2007-2017). Conclusively, initiate 11 sub Basins of Yom River and being shown as I) sub basin 5 (middle Yom basin area) has highest WEI belong to hilly zone, while II) sub basin 11 (lower Yom basin area) has lowest WEI, according to intensive agricultural land use in this area. All these results as relevance issues for take care about stream water quantity reservation in similar river basin factors of any tropical countries, with GIS application ideas.

APPLICATIONS OF GIS AHP IN ASSESSMENT OF LAND FOR ORANGE TREE (CASE STUDY IN TAN PHU COMMUNE, TAN KY DISTRICT, NGHE AN PROVINCE, VIETNAM)

Tuyen Tran Thi

Vinh University

ABSTRACT

Based on the FAO land evaluation theory (1976, 1993b, 2007), application of GIS technology to the establishment, stacking of maps and AHP to determine the weights of indicators, Land evaluation for orange trees has been done quickly and accurately.

Case study in Tan Phu Commune, Tan Ky district identified 28 units of land on the basis of overlapping 9 component maps (irrigation, elevation, slope, thick layer, fertility). The weight of the indicators is determined by the Expert choice AHP method with the first level indicator group: land characteristics (0.660), terrain (0.140), fertility (0.200) and 7 level indicators. The research identified 12 most adaptable land units (1,162,341ha), 11 medium adapted land units (1216,573ha), 4 less adaptive units (209,672 ha) and 1 non-adaptable unit adapting (0.254ha).

DAMAGE MONITORING AND ADAPTATION IN CASE OF BANG RAKAM FLOODING, PHITSANULOK PROVINCE, THAILAND

Pathana Rachavong

Faculty of Agriculture Natural Resources and Environment, Department of Natural Resources and Environment, Naresuan University.

ABSTRACT

In 2011, Thailand suffered a great flood as well. The source of this condition is from the northern region of both Ping, Yom and Nan river basin. Of course, nearly 100% of Bang Rakam district, Phitsanulok province has been in heavy flood for more than 4 months, that he local people has suffered a living, occupation and health.

Since that year, I have continued to study in the area. To see the important things should be handled properly to meet the needs of the people. Using geographical concepts and GIS tools, it is possible to draw 3 conclusions:

1. The houses were flooded so badly that they were damaged. In the short term LAOs provided repairing equipment to enable them to live temporarily. But long-term homeowners must carry out and pay for themselves as they can. There are a number of houses raised high above the water. Then fill the ground with the same level of road. The cost is about 54,000 - 120,400 Thai Baht.

2. The 37 schools were damaged and lost their physical structure. But the survey found that the experience, preparation and assistance from the community, these are important for schools to quickly recover from floods.

3. The immersion of water in the area over 4 months created a lot of problems for farmers in Bang Rakam district. After 2011, I found many farmers who change their rice cultivation calendar. They accelerate growing time faster to be able to harvest before the last of August that a mass of water flooded this area. This is a model for the Thai government to encourage farmers in the area to do the same.

THE GIS APPROACH METHOD FOR SUMMARIZING VIETNAM AGRICULTURAL COOPERATIVES MODELS TRANSFORMED ACCORDING TO THE VIETNAM COOPERATIVE LAW 2012

Thai Tran Thi, Nghia Nguyen Viet

ABSTRACT

At present, the cooperatives in Vietnam are transforming both the mode of operation and the organization. However, the results of transformation are still limited. There are many cooperatives has not transformed or transformed but without successful. Therefore, it is necessary to apply the new technology to evaluate the causes, limitations, etc, from overview to the detail, since then the managers can be made a timely decision. This paper deals with the focused results of GIS serves to summarize successfully transformed agricultural cooperative models according to the Vietnam Cooperative Law 2012.

THE ANALYSIS OF THE RISK OF MALARIA OUTBREAK DUE TO CLIMATE CHANGE IN THAILAND USING GIS-BASED MODELLING

Chirakorn Seangprong

Naresuan University

ABSTRACT

The aims of this research are to simulate the climate change model in order to identify the relationship of malaria outbreaks and climate change indicators and to analyze the outbreak pattern of malaria due to climate change. SimClim program based on the global climate research framework of the comparative modeling work Group (CMIP5) was used in this research.

The simulation of climate change in Thailand during 2016-2066 showed that the average temperature change, the average maximum, and minimum temperature are higher in summer than in other seasons, moreover the average temperature is related to the outbreak of malaria in Thailand. This study used the mean temperature, forest area, proportion of farmers, and proportion of hospital beds as variables. The malaria endemic area analysis is based on the equation; Risk = Hazard x Exposure x Vulnerability. It is found that Kanchanaburi, Kamphaengphet, Chaiyaphum, Chiang Rai, Trat, Nakhon Ratchasima, Narathiwat, Nan, Petchabun, Ranong, Mukdahan, Lamphun, Loei, Sakon Nakhon, Satun, Sukhothai and Uttaradit are the areas with the highest outbreak of malaria, especially in summer and rainy season.

CNN BASED METHOD FOR SEMANTIC SEGMENTATION OF VNREDSAT-1 SATELLITE IMAGE

Dung Thi Mai Nguyen, Chuyen Trung Tran, Anh Hong Le, Huong Mai Tran, Anh Van Tran, Xuan Truong Nguyen

Hanoi Unviversity of Mining and Geology

ABSTRACT

Object segmentation on satellite image is one of the most important topics and it can be used to efficiently identify individual land features in greater detail. This paper proposes a Convolutional Neural Networks based method to automatically extract semantic maps of roads from high resolution satellite image – VNREDSAT-1. The predicted low-level pixel classes are then used to improve the high-level segmentation. Various design choices of the convolutional neural network architecture are evaluated and analyzed. We test our method on a collection of VNREDSAT-1 images and achieve promising experimental results, which shows robustness and efficiency of our proposed method.

PROPOSAL FOR DETECTION OF ALGAL BLOOM USING REMOTE SENSING IN COASTAL WATERS OF SOUTHERN VIETNAM

Phan Minh Thu, Pham Thi Phuong Thao, Ho Dinh Duan, Bui Hong Long, Thai Tieu Minh

Institute of Oceanography, Vietnam Academy of Science and Technology (VAST)

ABSTRACT

Algal bloom is a natural phenomenon in water bodies under certain eutrophication conditions (over-enrichment with nutrients) and can change water color by algal pigments. Although less than one percent of blooms of algal have been toxins actually and accumulate in the filtering organisms gradually, algal blooms may have negative effects on water environment, economy and human beings in coastal areas. Algal bloom may cause locally hypoxia conditions, diminish the light penetration into water bodies, Due to the complexity, scale, and fast-growing nature of algal bloom, the prediction and determination would need to be fast, real-time, and long-term monitoring to reduce their damage to ecosystems and economy. With the development of remote sensing and satellite systems, algal blooms in marine areas have been identified based on several remote sensing techniques: radiation-based classification, band ratio, and semi-empirical marine bio-optical algorithm. or cause harmful directly to aquatic organisms by preventing them for respiration. By analyzing and evaluating the advantages and the disadvantages of each algorithms for detecting algal blooms in coastal waters, the paper identifies the approach to conduct one of the objectives of our project (Application of remote sensing technology and GIS in monitoring and management of marine environment from Khanh Hoa to Ca Mau provinces Code: VT-UD.12/18-20). By review of the detection of algal bloom in the coastal waters of Southern Vietnam, the combination among in-situ data, modeling and remote sensing techniques with medium resolution (ocean color images), high resolution (Landsat, Sentinel) has increased the ability to monitor algal blooms in the study areas.

LANDSLIDE SUSCEPTIBILITY MAPPING BY MULTI-TEMPORAL RADAR SATELLITE IMAGES AND LOGISTIC REGRESSION MODEL

Van Anh Tran, Quoc Cuong Tran, Quoc Dinh Nguyen, Thi Mai Dung Nguyen

Hanoi University of Mining and Geology, Vietnam

ABSTRACT

Radar satellite images have been used to determine landslides with some methods such as DInSAR, PSInSAR, SBAS..., However, radar images can detect only landslide locations. For accessing landslide risk, Radar images were used as an input data. Logistic regression model was used to model the risk of landslide. The input data includes 15 ALOS PalSAR-1 satellite images from 2007 to 2010 and Sentinel -1 images from 2014-2017. With 15 ALOS-PalSAR-1 images, the landslides can be detected and used as one input layer. The other data layers are map layers created by geographic information systems GIS such as geological maps, land cover map, slope map. By using of logistic regression models, we have built a landslide susceptibility map. Sentinel-1 data with 20 images were also processed to determine the landslides location in the period of 2014-2017 which is used to validate the landslide risk model and achieve good accuracy.

ANALYSIS OF SPATIAL AND TEMPORAL CHANGES OF COASTAL WETLAND IN THAI THUY DISTRICT, THAI BINH PROVINCE USING REMOTE SENSING AND GIS

Tuan Tran Anh, Hang Chu Thi, Thu Ho Le

Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology

ABSTRACT

The coastal wetland of Thai Thuy district, Thai Binh province located in the Red River Delta Biosphere Reserve, characterized ecosystem of mangroves on the tidal delta. In recent years, the process of encroaching sea dikes, developing ecotourism, aquaculture of local people together with the impact of nature has significantly changed the area of wetland ecosystem, especially mangroves forest.

Based on analysis satellite images collected in various periods and GIS techniques, maps of wetland ecosystem types of the Thai Thuy coastal wetland in years of 2000, 2010 and 2018 that were established. Areas of each wetland types in each of above periods were calculated. Spatial and temporal changes of these wetland ecosystems were studied also. Study results show that wetland ecosystems, especially mangrove forest were changed on morphology, areas, and spatial distribution under influent of natural evolution and anthropogenic impacts. The results are also the basis for the establishment of models for sustainable use of estuary coastal wetlands that are available to each periods of ecological succession as well as the development of conservation planning in this area.

GIS AND REMOTE SENSING APPLICATIONS IN ANALYSIS THE CHARACTERISTICS OF FOREST LANDSCAPE FRAGMENTATION IN LAM RIVER BASIN

Tuyen Tran Thi

Vinh University

ABSTRACT

Forest fragmentation of the Lam basin was studied with the aid of the Infragmentation tool in GIS, with satellite imagery and current basin land use maps data. Landsat 8 (data acquisition time was 1st of April, 2007, source: http://glovis.usgs.gov) was analyzed by the supervised classification in the Envi software based on the spectral characteristics of natural objects. The land use map of Ha Tinh and Nghe An provinces in 2017 was provided by the Department of Natural Resources and Environment of Ha Tinh and Nghe An provinces. The data was processed by the Fragmentation tool that is installed, integrated in ArcGIS software in order to analysis, sorting and extraction of information on landscape as well as forest fragmentation. The results show that the forest landscape of the Lam basin is fragmented into four main types: core forest, patch forest, edge forest and perforated forest. The core forest occupies the largest area and is divided into three categories (small core forest, medium core forest and large core forest). Each type of forest fragmentation with its characteristics and structure requires an appropriate management method. The forest landscape in the upper Lam River varies from 2007 to 2017 with the following major trends: large core forest area increased 2.5%, the rest reduced. This demonstrates the effectiveness of protection and conservation in national parks and nature reserves.

A REAL-TIME MOBILE-BASED FRAMEWORK FOR TRUCKS MONITORING IN OPEN-PIT MINES

Chuyen Trung Tran, Dung Thi Mai Nguyen, Anh Hong Le, Huong Mai Tran, Oanh Nong Thi, Dieu Tien Bui

Hanoi University of Mining and Geology

ABSTRACT

Vietnamese open-pit mine companies currently use GPS devices integrated with trucks for monitoring the transportation. The GPS devices send data regularly to a software system in the center via cellular networks. The solutions, which is also popular in passenger transport, however, faces with several issues such as lacking real-time interaction with the center management, losing data if there is no internet connection, long delay, etc... In this paper, we propose a new real-time framework for monitoring trucks using smartphones. Smartphones attached in trucks send data to a web-based software system and drivers can interact with the management team in the center. The web-based center software receives data, then displays the movement of trucks with very short delay after performing route enhance algorithms.

ASSESSMENT WATER DISCHARGE UNDER THE IMPACTS OF CLIMATE CHANGE IN MEKONG RIVER BASIN USING SWAT MODEL

Sam Truong

Institute for Computational Science and Technology

ABSTRACT

The water resources of Mekong River Basin play an important role in the sustainable development, socio-economic stability of countries and regions in Mekong Basin, as well as the protection and consolidation of related ecosystems. At present, climate change poses many threats to the sustainability and security of water resources in this basin. By applying the SWAT model and GIS techniques, we assessed the impacts of climate change on the hydrology of Mekong River Basin and compared it with the scenarios results. In comparison with the observed data, the simulated data demonstrated an overall good model of streamflow in the research area through results at 8 gauge stations along with the Nash-Sutcliffe efficiency (NSE)>0.6 and R2>0.9 for the calibration period (1983-1988) and NSE>0.64, R2>0.89 for validation period (1989-2005). Thereby, the spatial distribution of water resources indicated that the amount of water is mainly concentrated in Myanmar and 3S River Basin in Viet Nam. However, the evaporation map showed the reversed distribution, which mainly concentrated at the downstream in Thailand, Cambodia, and Viet Nam. Climate change scenarios under the RCP4.5 and RCP8.5 emission scenarios were computed based on streamflow simulated data and regional climate model, which belongs to the Coordinated Regional Climate Change Downscaling Experiment (CORDEX) project in East Asia. Under the impact of climate change on a short-term period (2015-2040), changes in annual river discharge increase from 0.79% to 16.35%.

LANDSAT IMAGE PROCESSING APLICATION FOR EVALUATING THE LAND COVER CHANGE IN LAI GIANG RIVER CATCHMENT, VIET NAM

Ngoc Duong Vo

Department of Water Resource Engineering, University of Science and Technology, the University of Da Nang

ABSTRACT

Lai Giang, which covers an area up to 1.466 km2, is second largest river of Binh Dinh province. Its stream flow play an important role for local socio economic development. Due to socio economic developed requirement, land cover of Lai Giang catchment has varied significantly in recent years. The change has affected seriously on many aspects of locality, such as drought and flood disasters, landslide or green house gas emisson increasing. This study is to provide an overview of land cover change in Lai Giang river catchment. By processing the Landsat satellite image, the study demostrates the variation of land cover since 1970s. The result is expected to be a basic for forest management, land cover change impact assessment on natural disasters in the catchment.

SALINITY MAPPING USING REMOTE SENSING AND GIS: THE CASE OF CUNG HAU AND DINH AN ESTUARY, TRA VINH PROVINCE, VIETNAM

Nguyen Nguyen Vu, Le Van Trung, Tran Thi Van

Ho Chi Minh City University of Technology, Vietnam National University Ho Chi Minh City

ABSTRACT

This paper presents the methodology for mapping of salt intrusion in Cung Hau and Dinh An estuary (Tra Vinh province, Vietnam) based on the integration of satellite imagery and GIS. We used Landsat 8 satellite data to establish the relationship between the planetary reflectance and the ground measured data in dry season 2014. The three spectral bands (Blue, Green, Red) and the the principal component band were used to obtain the most suitable statistical model. The selected model showed a good correlation with the exponential function of the principal component band and the ground measured data (R2 > 0.8). The salinity map shows that the intrusion of 4g/l salt boundary from Cung Hau and Dinh An estuary to the inner field more than 30km. The salinity map will be an active contribution, providing managers with adaptation and response solutions suitable for intrusion in the estuary as well as the inner field of the Mekong Delta of Vietnam.

CONSTRUCTION AND EVALUATION OF 3-D GEOLOGICAL MODEL FOR URBAN GEOSPATIAL ANALYSIS

Go YONEZAWA, Susumu NONOGAKI, Muneki MITAMURA, Kenichi SAKURAI, Luan Xuan TRUONG, Shinji MASUMOTO, Tatsuya NEMOTO, Venkatesh RAGHAVAN

Osaka City University

ABSTRACT

In Southeast Asian area, the environmental problems such as land subsidence, flooding occurs by heavy rain, traffic problem and groundwater pollution have been increasing in recent years. This main reason is rapid urbanization and population increase. Regarding the mitigation and prevention of the environmental issues of urban area, it is important to prepare and analyze with the geospatial information. For the solution of these issues, it is necessary to provide the geological information accurately and effectively. The 3-D (three-dimensional) geological model are the geological information generated as a result of geological analysis based on the fundamental field survey data. However, the quantity and quality of the basic data, theory and assumption of geological process are not known for the user of these models. Therefore, it is important to actively provide the basic elements of the 3D geological model in addition to the geological information. The providing of this information can be realized by the construction of geological model as the logical model. The 3D geological model is important to consider the urban sustainability as in improvement of urban infrastructure and disaster prevention.

Abstract