



## CESS Releases

# District Level Multi Hazard Zonation Maps

CESS released the district level multi hazard zonation maps for the entire Kerala and made available the hard copy and digital versions to all the user departments in the State. The maps were released by Sri. K. P. Rajendran, Hon'ble Minister for Revenue on 25 August 2009 by handing over the copies to Dr. Nivedita P. Haran, Principal Secretary (Revenue), Government of Kerala at a function presided over by Sri. M. Vijayakumar, Hon'ble Minister for Law, Government of Kerala. The State being multi-hazard prone, the zonation maps at the district level is the first step in crisis management. Spatial distribution of hazard prone areas indicated in the maps will help the planners in preparing the Disaster Management Plans at the State and district levels. The Hon'ble Minister for Revenue inaugurated the two day 'National workshop on natural hazards, disaster mitigation and management' organized on the occasion. The Hon'ble Minister for Law released the proceedings volume of the workshop and inaugurated the exhibition on research activities of CESS related to disaster management. The function was followed by a two days national workshop on 'Natural Hazards, Disaster Mitigation and Management'. The workshop was attended by the all the key functionaries of the government of Kerala related to disaster management, officials from the district administration involved in the preparation of disaster management plans, representatives of various NGOs, research scholars and students from universities, scientists from research organizations etc.

Twenty three research papers were presented including keynote presentations by Dr. A. D. Rao, IIT, Delhi and Dr. P.V. Joseph, Emiratus Professor, Cochin University of Science and Technology. The team of scientists from CESS who developed the hazard zonation maps made presentations for the benefit of the users.



*Sri. K. P. Rajendran, Hon'ble Minister for Revenue, Government of Kerala, addressing the gathering during the release of the district level Hazard Zonation Maps and the inauguration of the National workshop on 'Natural Hazards, Disaster Mitigation and Management' on 25 August 2009 at CESS*

## CESS takes lead role to establish Kerala Spatial Data Infrastructure

CESS has taken the lead role in establishing the Kerala Spatial Data Infrastructure (KSDI) to create, maintain and deliver geospatial data in real time. The Govt. of Kerala has established an institution named the Kerala Spatial Data Infrastructure at the Technopark premises in Thiruvananthapuram based on a joint proposal by CESS, KSREC, NIC and KSCSTE. The Spatial Data Infrastructure (KSDI) is a collection of technologies, policies and institutional arrangements to facilitate access to spatial data from different sources to the user community at local, state, regional and national levels. The KSDI is conceived as a single window-access to the spatial/non spatial data, by building an open architecture accessible from a common web portal so that users can access and download data of their choice.

The KSDI allows the users to connect to data services from different sources in real time and create different data combinations, interact with the data, through an internet bus, using thin

client application without installing specific GIS applications or geospatial data. In the Geospatial world, Service Oriented Architecture (SOA) implemented by means of interoperable OGC Web Services is particularly useful for setting up such applications. It enables to combine seamlessly spatial information from different sources through Web Services and share it between many users and applications.

In the absence of a single window access mechanism to spatial data sources in the State, it has not only been difficult and time-consuming to discover/ access the spatial data sets, but also resulted in enormous duplication of work.

In spite of various geo-spatial related activities and data availability in the State, the decision making process is getting affected mainly due to non-availability of data catalogue, metadata in centralized platform, lack of a mechanism to access available data from dif-

*Continued in page 2*

## Director Speaks



In India, various national scientific organizations and educational institutions are conducting and supporting studies on different fields of Earth Sciences. Some of these institutions have developed into specialized agencies for carrying out research and surveys on more specific branches of Earth Sciences. Although the relevance to and possible impact on applied and practical fields of national interest of the new dimension of geosciences, enumerated above, are being realized in India, co-ordinated and multidisciplinary approach in Earth Science Studies has not yet been given functional emphasis. In the present state of modern scientific and technological development, specialization is indeed desirable, but at the time it is necessary that a country needs institutions where meaningful interaction between the specialists can be effectively fostered. This aspect is of paramount importance in a country like Indian where scientific know-how and the results of research activities should be involved and linked with the developmental activities and national perspective planning. The Earth Scientists of the country can play a vital role in this endeavor, because they are trained and equipped for evaluation and exploitation of the natural resources of all types that constitute the basic materials for national growth and prosperity and for dealing with the environment, the influence of which needs immediate assessment and futuristic projections. In view of these, the need for the establishment of an institution dealing with the Earth Science problems of India, either sector-wise or region-wise, in a co-ordinated manner through multidisciplinary approaches, as practiced in many countries of the world was realized with the creation of the Centre for Earth Science Studies. Although initially the Centre proposed to deal with Earth Science and environmental problems on a somewhat restricted scale within the Kerala region, has now slowly expanded and grown with time into an institution attracting national attention.

CESS was established at a time when the negative aspects of unscientific development with its cascading effects on society have dawned upon us the urge to understand the intricate dynamics of the earth. This urge, in fact, catalyzed genesis of CESS in 1978 and shaped its trajectory with a view to streamline the

scientific development in earth sciences on sustainable lines. Moulded to carry out multidisciplinary research in various facets of Earth Sciences, CESS has developed a unique multidisciplinary scientific culture unheard of till that time. This holistic approach of earth was translated into reality by organizing activities of CESS in the realms of land, water and atmosphere.

Looking ahead, with the increasing conflicts between developmental pressures and the need for resource conservation and environmental protection, the scope for the R & D strategy originally evolved by CESS has great significance. Time and again it has been proved by several initiatives in the country and the worldover that the multidisciplinary approach envisioned originally by CESS was in the right direction for achieving the goal of sustainable development.

Earth Science plays a key role in catering to the needs of human society in solving the problems related to environment, population and natural resources. Resource/terrain data base developed by CESS have already been put to use by the Government. The developments in earth sciences has been reasonably used in solving various societal problems.

Centre for Earth Science Studies with its motto "Vasudhava Kudumbakam" meaning 'earth is one family' will continue to approach the process of geosphere, hydrosphere and atmosphere under the holistic umbrella of earth system studies. While there are some expert groups in the country to handle the individual components of the earth systems, the land-water-air interactive processes are dealt with only a few. With the strong 'commitment of CESS to our earth and our future', which is nothing but achieving the ultimate goal of sustainability in the natural processes and resources, the multidisciplinary approach adopted in studying the interactions between land water and air has become highly relevant. The biosphere component, which is also important in this context, is integrated though the studies of other specialized institutions, wherever applicable. Optimisation of the use of natural resources and to protect it from natural hazards has also become essential in the context of sustaining life. Further, the assessment of the impact of human activities on the environment is also needed. Therefore CESS has now organized its R & D activities in the study of earth system sciences dovetailing natural resource management, environmental assessment and understanding of natural hazards.

Dr. M. Baba

*Continued from page 1*

## **Spatial Data Infrastructure.....**

ferent sources, non-existence of standards in terms of scale, projection, content, formats and quality, restrictive policies among organizations in data shairing, etc.

To overcome these issues, a single standard has to be specified and all available data has to be converted into a globally acceptable interoperable format. Under the national e-governance plan the Government of India is planning to set up large data centres in all 28 states and union territories with an estimated outlay of 1600 crores spread over five years. The state data centres will be part of a larger national e-governance plan to provide delivery of digital services to citizens, such as the state-wide area network (SWAN) project, which will provide intranet facilities between government offices and the common service centres that will be the front end of the government services. To tide over these difficulties, Department of Science & Technology, Government of India has established a geoportal and a clearing house under the National Spatial data Infrastructure (NSDI) for the purpose of acquiring, processing, storing, distributing and improving utilization of spatial data generated by various agencies of the Government of India.

The KSDI is the next logical step of NSDI set up at the national level. Main objective of KSDI is to develop web-based OGC compliant portal services to acquire, process, store, distribute and improve the utilization of geospatial data for planners, decision makers and public, especially in the Kerala State. The web-based geo-portal would be OGC compliant and developed based on complete meta data standard Version 2.0 of the NSDI. The implementation of the Open Geospatial architecture enables the secure, high performance spatial web services infrastructure necessary for the next generation of net-centric geo-spatial intelligence. The KSDI is a web-gateway to find and access geospatial information and associated geographic services (display, editing, analysis, etc.) via the Internet. It offers the facility to securely search, discover, access, visualize and even update geospatial data and services, online and in real-time, via a customized web user interface. As the system follows open standards, it is totally non-proprietary and an organization does not have to be dependent on any one particular format and neither has to buy multiple products to access the data.

*Continued in page 3*





Sri. K. P. Rajendran, Hon'ble Minister for Revenue, Kerala releasing the hazard zonation map by handing over a copy to Dr. Nivedita P Haran, Principal Secretary Revenue, Govt. of Kerala. Sri. M. Vijayakumar, Hon'ble Minister for Law and Dr. M. Baba, Director, CESS are also seen.

Continued from page 2

### Spatial Data Infrastructure.....

The Clearing House is a decentralized system of servers that contain descriptions of available digital geo-spatial data. This descriptive information, known as metadata, is collected in a standard format to facilitate query and consistent presentation across multiple participating sites. Once all the data is published to the server by the data providers, then various clients would be able to view the metadata and allowed to download the required data or be able to perform various spatial and non spatial functions and analysis through the KSDI web portal. All that a user need is an internet explorer and a network connection.

With the availability of the geoportal, availability of spatial data in different domains such as infrastructure, traffic planning, resource availability, socio-economic status, demographic status, health and culture-related information, crime management, flood mitigation, environmental restoration, community and land use assessment and disaster recovery, and can support their information discovery, access and use of the information within a click of a mouse even up to the cadastral scale. Thus, the community can have a better understanding of their area of interest.

### CESS to establish 'Kerala Resources Information System & Services (KRIS)

CESS initiated steps to establish a state-of-the-art data centre named Kerala Resources Information System & Services (KRIS). CESS has spatial/non-spatial data on a variety of themes related to land, water and air pertaining to Kerala, prepared under different projects, available in digital form. Besides satellite images for the entire state are also available. It has good facilities for geographic data processing as well as for digital image processing. The data center proposes to organize the digital data in CESS (~ 3 TB) in a suitable manner using latest technology for efficient storage and retrieval as well as for secured web access. Anticipated growth of data in CESS is around 1 TB per year. The KRIS is expected to provide web-based information on natural & environmental resources of Kerala. An attempt has already been made in the Geomatic Laboratory to archive part of the data and disseminate it through CESS intranet under a CESS plan project. A prototype WebGIS has been developed using UMN Mapserver, HTML, ASP.NET and CSharp to enable visualization of maps and images in CESS intranet. The proposed modular data centre can provide complete physical infrastructure for data processing, data analysis, data storage, data warehousing, data mining, and data dissemination remote monitoring. Once made operational, the data centre can function as a data providing agency to Kerala Spatial Data Infrastructure (KSDI)

### Publications

Murali Das S., Mohan Kumar G. and Sampath. S., (2009) 'Investigations into Mechanisms of Involvement of Objects and Personnel in Lightning Disasters', Journal of Lightning Research, (Open Access) Vol.1, pp. 36-51.

Sukumar B., Sukumar A. and Savitha N., (2008) 'Delineation of Agriculturally drought prone areas in Wayanad district, Kerala using satellite imagery and GIS' INCA Journal, Vol. 28, pp. 335-38.

Sukumar A., Savitha N. and Sukumar B., (2008) 'Spatio-temporal growth of Thrissur Corporation, Kerala: A study using satellite imagery and GIS' INCA Journal, Vol. 28, pp. 535-44.

Savitha N., Sukumar A. and Sukumar B., (2008) 'Changing Occupational Structure of Thrissur District, Kerala State: A Cartographic Appraisal' INCA Journal, Vol. 28, pp. 339-44

Deepthi P., Sukumar A. and Sukumar B., (2008) 'Regional variation in development: A cartographic appraisal using GIS in Kottayam District, Kerala' INCA Journal, Vol. 28, pp. 367-372.

Diji V., Sukumar A. and Sukumar B., (2008) 'Regional variation in development: A cartographic appraisal using GIS in Kozhikode District, Kerala' INCA Journal, Vol. 28, pp. 353-360.

Divya U. M., Sukumar A. and Sukumar B., (2008) 'Regional variation in development: A cartographic appraisal using GIS in Malappuram District, Kerala' INCA Journal, Vol. 28, pp. 361-366.

Anuja S. and Sukumar B., (2008) 'Application of GIS in Fluvial geomorphic studies in Kollam district, Kerala' INCA Journal, Vol. 28, pp. 545-48.

Udayakumar P., Abhilash P. P. and Ouseph P. P., (2009) 'Assessment of water quality using Principal Component Analysis – a case study of the Mangalore Coastal Region', India Journal of Environ. Sci.& Engg, Vol.51, No.3, pp. 179-186.

Chattopadhyay S., (2009) 'Earth Science input for micro-level environmental management and planning: Examples from Kerala', Geographical Review of India, Vol.70, No.1 pp 16-28.

Sukumar B. and Sukumar A., (2009) 'Mapping the Disaster-prone areas for Mitigation – A GIS solution for Kannur District, Kerala' in Natural hazards and Disasters: Essays on Impact and Management, Ed. by K. Ravindra Reddy, Ramaniah, Y. V. A. Krishnakumari and S. Subbiah, Dept. of Geography, Sri. Krishnadevaraya University, Anantapur, pp 100-110.

## Independence Day Celebrations



Dr. M. Baba, Director, CESS hoisting the National Flag at CESS Campus.

## Seminar/ Meeting/Workshops

Sri. G. Sankar has made a presentation on landslides of Kerala at Munnar as part of the Orientation Programme for the Hon'ble Judges of Kerala High Court organised by the Kerala Judicial Academy during 11-13 September 2009

Dr. Muralidas presented a paper in the National Workshop on Natural Hazards, Disaster Mitigation and Management organised and conducted by CESS during 25-26 August 2009.

Dr. Srikumar Chattopadhyay presented a paper on Flood management: Mitigation and adaptation lessons from Kerala in the National Workshop on Natural hazards, disaster mitigation management held in CESS, during 25-26 August 2009.

Sukumar B. presented a paper on Need for mapping agriculturally drought prone areas in Kerala in the National Workshop on Natural hazards, disaster mitigation management held in CESS during 25-26 August 2009.

Jyothirmayi P, Project Fellow, presented a paper on 'Mitigation and management of agricultural drought prone area in Kannur District, Kerala' using GIS, in the National Workshop on Natural hazards, disaster mitigation management held in CESS, during 25-26 August 2009.

## New arrivals in CESS library

Jain, A.K. and Sandeep Singh. Geology and Tectonics of the South-Eastern Ladakh and Karakoram. Geological Society of India, Bangalore, 2009

Dhana Raju, R. Handbook of mineral exploration and Ore Petrology: Techniques and applications. Geological Society of India, Bangalore, 2009

Navale Pandharinath and Rajan, C.K. Earth and Atmospheric Disasters Management : Natural and man made. B.S. Publications, Hyderabad, 2009

Svendsen, Ib.A. Introduction to Nearshore Hydrodynamics. World Scientific Publishing Co., Singapore, 2006

Oke, T.R. Boundary layer climates. Routledge, London, 2006

Kantha, Lakshmi H. and Clayson, Carol Anne. Numerical models of oceans and oceanic processes. Academic Press, San Diego, California, 2000

Balagurusami, E. Programming with Java : A Primer. Tata-McGraw Hill Publishing Ltd, New Delhi, 2008

Tripathi, S.C., Tandon, S.K. and Bhattacharya, A.R.(Eds.). Advances in Earth Sciences. Satish Serial Publishing House, Delhi, 2009

## Membership in Committees

Sri. G. Sankar, Scientist E2 has been nominated as the leader of the expert team constituted by the Government of Kerala to study the impact of natural calamities in the State and to suggest mitigation measures. He has also been nominated as a member of the special team for preparing river basin master plan for Chaliyar river, Kozhikode district.

## Ph. D Awarded

Rupananda Mallia J. has been awarded Ph. D Degree under the Faculty of Science, Cochin



University of Science and Technology, Kochi for his research thesis entitled 'Photodiagnosis of oral malignancy using laser-induced fluorescence and diffuse reflectance spectroscopy'. Dr. N. Subhash,

Head, Atmospheric Sciences Division was the supervisor of Dr. Mallia.

## Retirement

Dr. K. Soman, Head, Resources Analysis Division and Dr. P. P. Ouseph, Head, Chemical Sciences Division retired on 31 May 2009

## Exhibition

CESS participated in the exhibition conducted in connection with 'Aavishkar 09' - a national inter-collegiate technical festival, organised by the College of Engineering, Trivandrum as part of its 70<sup>th</sup> anniversary celebrations during 10-13 September, 2009.

## 'Onam' Festival'



CESS Recreation Club celebrated the Onam festival with traditional gaiety and fervor on 28 September 2009

Edited by the Publication Committee & Published by the Director, Centre for Earth Science Studies, Akkulam, Thiruvananthapuram 695 031, India.  
Phone: 0471-2511502,2511506 Fax: 0471-2442280, E-mail: [cess@nic.in](mailto:cess@nic.in), Website: <http://www.cessind.org>

Printed at Akshara Offset, Thiruvananthapuram