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Message from Director's Desk

Indian Institute of Remote Sensing has kept pace with fast changing technology and with needs in the arena of advance training in cutting technology & applications; education including recent technological trends and in research areas. Under the regular education courses (M.Tech, M.Sc, PG Diploma and NNRMS), IIRS has introduced additional new technological specialization as spatial data science, Geo-computation and Visualization in Web Platforms and introduced M.Tech in Natural Hazards & Disaster Risk Management. In the last few months, IIRS has organized customized training programs & under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) for Town & Country Planning Organization (TCPO); NDMA decision makers and working officials; Central water commission and cabinet Secretariat; Indian railways and Decision makers and senior officials from various government departments.



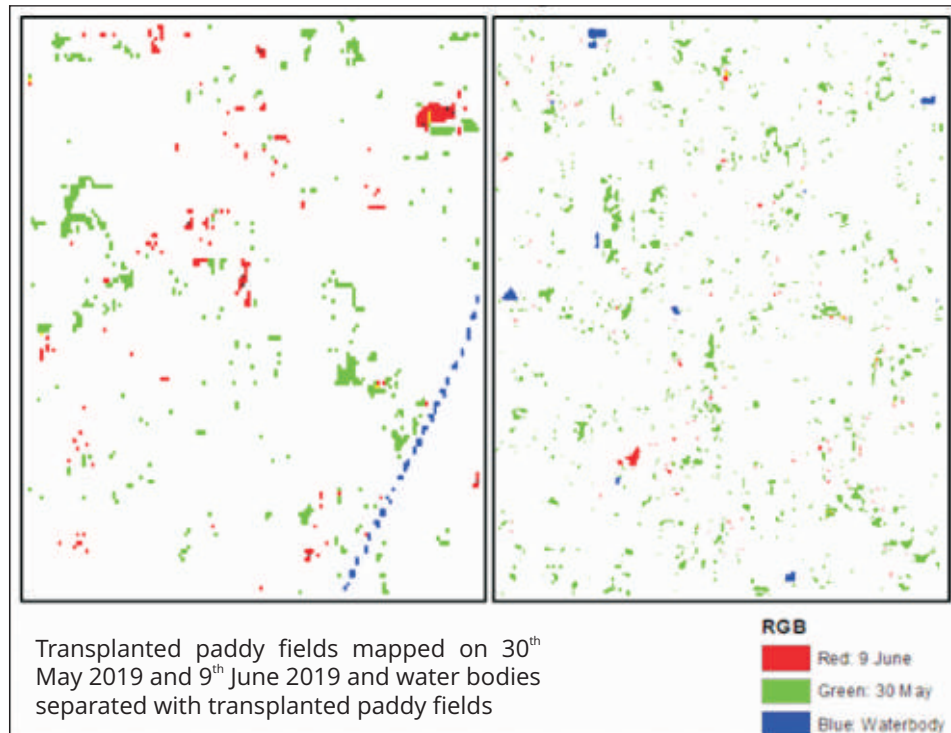
IIRS has seen recent advancement in multi-disciplinary research expertise in the area of glaciology, planetary remote sensing, disaster risk reduction, forest fire management, cyclone modelling, floods, urban modelling, air quality forecasting and modelling of cultural heritage sites. IIRS has developed a knowledge portal to meet capacity building requirements for beginners, students, working and research professionals in universities, user departments and ministries in the field of remote sensing, geospatial technology and GNSS. The e-learning contents are developed in form of videos, animation, e-learning digital content, online tutorials, data information repositories, case studies and success stories etc. With its popular outreach program, IIRS has reached out students the deep roots of educational institutes, professionals, students and society which is truly Dr. Vikram Sarabhais' vision of using space technology to society. IIRS colleagues are also contributing in spreading awareness to young students school and colleges of through space exhibitions, specialized lecture and organizing different events. I hope through this present issue researchers, alumni and readers would get a feel of recent research and capacity building initiatives at IIRS.

Research Highlights

Mapping transplanted paddy fields from temporal remote sensing data - A fuzzy machine learning approach

During paddy transplantation stage, paddy crop displays a high spectral correlation with existing water bodies in the area, so single date imagery cannot help to distinguish between transplanted paddy fields and existing water bodies. Paddy transplantation activity is time tagged activity which can be mapped using temporal information of remote sensing images. Paddy transplantation being specific activity can be mapped using a classifier which can map single class. Some of the fuzzy based classifier do not follow the probability rule, so these classifiers can map single class of interest. The Technique uses, temporal information which is incorporated using Sentinel-2 A/B data to map paddy fields transplanted at two different dates. Temporal information has been incorporated while generating temporal indices data base using four dates Sentinel-2 A/B data. Fuzzy based Modified Possibilistic c-Mean (MPCM) machine learning algorithm capable for single class mapping has been applied on temporal indices database. The classification result shows a high positive correlation among paddy fields transplanted on same date and a negative correlation with water-bodies. The best temporal dates suitable for such mapping were tested on two different sites in Pehowa and Radaur. For 30th May, 2019 transplanted paddy fields data used were of 5th May, 25th May, 30th May and 9th June 2019 while for 9th June transplanted paddy fields data used were of 25th May, 30th May, 9th June and 14th June 2019.

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Anuvi Rawat and Anil Kumar

SAR polarimetric analysis for major land cover including pre-monsoon crops

The potential of single date fully polarimetric SAR data was brought out in discriminating various land cover at level 3 by deriving various polarimetric parameters. Various decompositions method viz. coherent (Krogager), model based-incoherent (Freeman-3 and Yamaguchi-3) and Eigen based (Van Zyl and H-A- α) were analyzed to evaluate its potential for crop identification. Freeman-3 decomposition overestimates the volume component predominantly for high biomass crops but is sensitive across variable range of biomass (Fig.1a). Yamaguchi-3 seems to be more realistic based on the normalized difference between scattering components of different decompositions and results in distinctive values for crops as compared to other decomposition (Fig. 1b). The Entropy-Alpha scatter plot exhibits its capability in discriminating various land covers. Due to high randomness associated with crop fields and vegetated areas, high entropy (H) values > 0.7 were observed for them, whereas low entropy values resulted for urban areas (0.3). Alpha angle values were useful in discriminating areas such as natural vegetation (42°), agricultural crops (33° - 38°), and settlement (closer to 90°) (Fig. 2).

Further, polarimetric signature resulted in unique response for various land covers that can be exploited for their identification. Tall elephant grass showed pedestal height of ~ 0.4 because of high biomass as compared to short vegetation crops (Fig. 3). Eucalyptus having dominant surface scattering results in signature similar to that of a dominant surface scatterer. Pearl millet results in a pedestal height of ~ 0.2 which is higher in comparison to low biomass crops such as field beans and green gram $\sim (0.1)$. These variation in the polarimetric responses of different land covers can be exploited in their identification, parameter retrieval, and condition assessment.

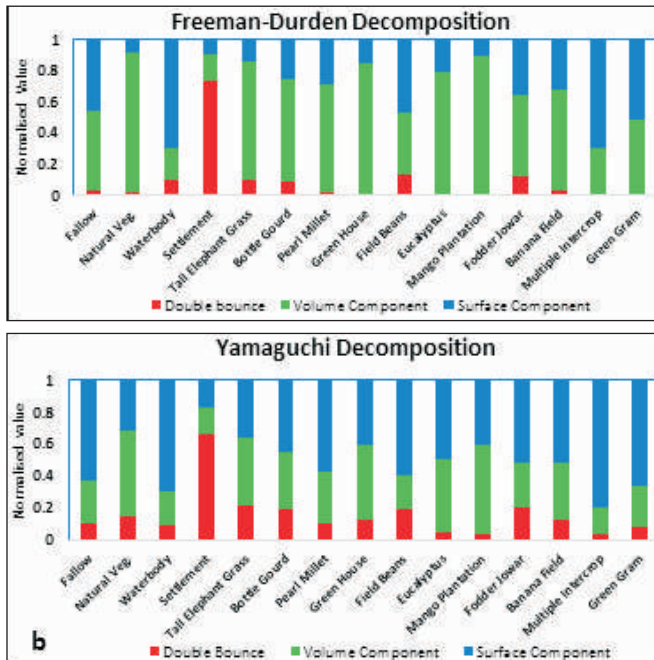


Fig. 1: Scattering component for various land covers
a) Freeman-Durden b) Yamaguchi decomposition

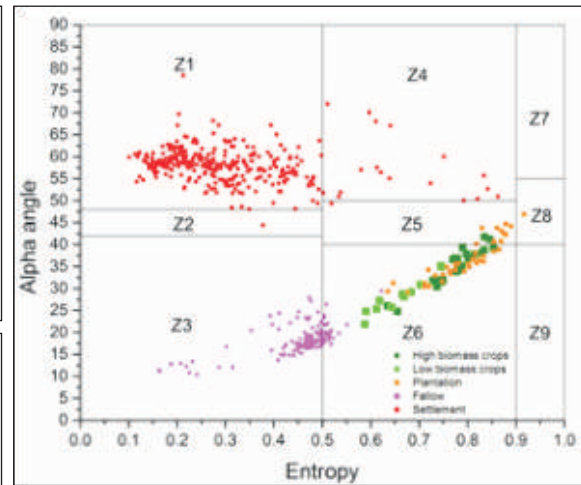


Fig. 2: Entropy-Alpha (H- α) scatter plot for various land covers

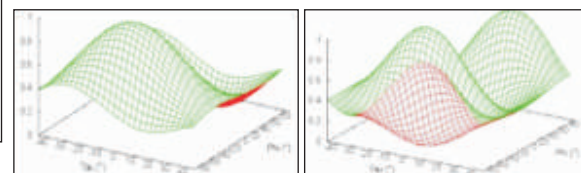


Fig. 3: Polarimetric signature of Elephant grass

Quantification of Urban Landscape Dynamics - Case study Haldwani city

Urban areas are witnessing a dramatically incessant growth. The unregulated growth process occurs in the periphery of cities and also results in densification of the existing built up areas. This unregulated growth is not only, affecting the capacity of the cities to meet their infrastructure demands but also disturbing various ecological and hydrological cycles. The present study attempts to analyse the densification process of an Indian city using temporal land cover maps and Urban Landscape Analysis Tool (ULAT) model. The ULAT model, generates a urban footprint map (consisting of six classes) using land cover map as input. The definitions of the six foot print classes is as follows:

1. Urban built up: built-up pixels with urbanness values greater than 50%
2. Sub-urban built up: built-up pixels with urbanness values between 10-50%
3. Rural built up: built-up pixels with urbanness values less than 10%
4. Fringe open land: undeveloped pixels within 100 meters of developed pixels
5. Captured open land : patches of undeveloped pixels, less than 200 hectares, that are completely surrounded by the urban built-up, suburban built-up, and fringe open land pixels
6. Rural open land: undeveloped pixels not classified as fringe or captured open land

The land cover maps of Haldwani city of years 2013 and 2019 generated using LISS-IV and Sentinel datasets respectively, were input into the ULAT model and urban footprint maps of respective years were generated (Fig a , b). The distribution of different footprint classes is shown in Table 1.

Table 1: Distribution of urban foot print classes(2013 and 2019)

Classes	T ₀ (2013) (in ha)	T ₁ (2019) (in ha)
Urban built up	671.2	1020.8
Sub-urban built up	886.3	942.1
Rural built up	43.13	19.10
Fringe open land	2676.19	2673.2
Captured open land	108.20	108.4
Rural open land	603.8	227.7

The urban footprint maps of year 2013 and 2019 were overlaid to find the pattern of urban growth during the period 2013-19 (Fig. c). The urban growth was classified into three patterns viz.

1. Infill: newly developed pixels that are in the urbanized open land of the previous time period.
 2. Extension: newly developed pixels that are in the fringe open land of the previous time period.
 3. Leapfrog: newly developed pixels that are outside of the rural open land of the previous time period.
- The comparative analysis of the different growth patterns is shown in Table 2. While fringe development in form of extension was the most dominant growth pattern, growth in form of infilling was also significant. The greater part of the city of Haldwani has attributed to development through extension. The extension accounts for about 72 % for the new development. The development through infill

contributes to more than 26% and leapfrog development just 1.47% respectively. It is seen that the extension is dominated in the west, south and south western parts of the city, whereas leapfrog development can only be seen towards south west part of the city.

The present study, thus helps in bringing out the densified parts of the city, as well as the scattered areas and analysing the patterns of urban expansion in the city. These results can serve as an input for master plan formulation.

Table 2: Area under different growth patterns

Classes	Area (in ha)
Infill	126.67
Extension	345.01
Leapfrog	7.06

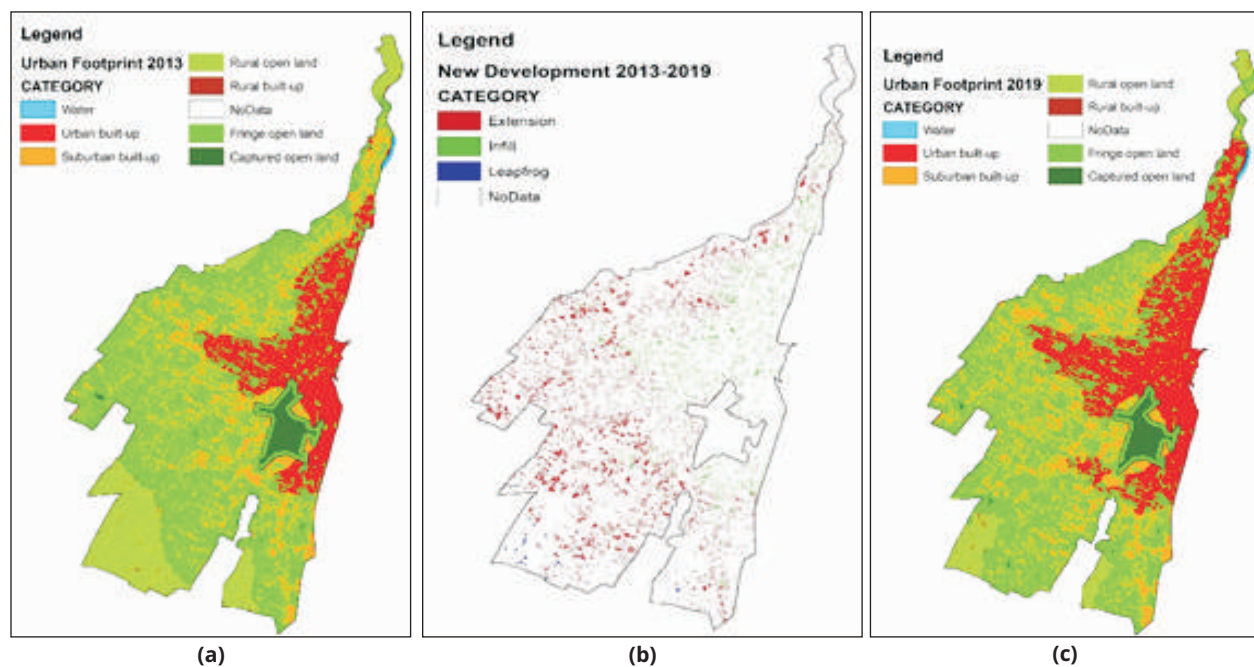


Fig: (a) urban foot print map of year 2013 (b) urban foot print map of year 2019 (c) Urban growth pattern 2013-2019

Sandeep Maithani, Arifa Begum and Pramod Kumar

Probable Inundation Mapping of Lakhwar Hydropower Project using Geospatial Technology

The geospatial technology can play an important role in hydropower project site identification, its monitoring, reservoir sedimentation and flood forecasting. In the present study, the geospatial approach was validated for proposed Lakhwar Dam, which will be constructed at Lohari village, Lakhwar town, Kalsi block, Dehradun, Uttarakhand on Yamuna River. This multi-purpose project will provide irrigation to 40,000 ha land and generate 300 MW hydroelectric power. Project will hold 580 million cubic metres water during monsoon and release into Yamuna during dry months. For preliminary survey, the authorities require geological formation of the site. In the present study the geomorphological and lineament map of the region were analysed in GIS platform using Bhuvan Portal WMS layer facility. It was found that the present dam site is located on "Structure Origin" and there are no lineament nearby the site. Then the SWAT hydrological model was setup to estimate the inflow of water at dam site. To setup the hydrological model, the ASTER GDEM was used for extracting topographic features and the NBSSLUP soil database was used for soil properties. The model was forced with IMD gridded precipitation and temperature data at daily time step. It was then calibrated and validated with the observed discharge data at Bausan gauging site. A very high agreement between observed and estimated discharge was found. It can be said that annually the dam shall/should receive $89 \text{ m}^3/\text{s}$ of discharge. Later, an attempt was made to estimate the probable water spread of the reservoir behind the dam. The information is very critical for management and environmental impact studies. The probable water spread was estimated using the neighbourhood operations in GIS platform. In this approach the user defines the height of the dam and then manipulates the DEM at the dam site by adding its height into it. Then the operator searches all its surrounding pixel in the DEM for elevations less than the revised DEM behind the dam site. In this way, the water spread was estimated (as shown in the Figure 1b). The water spread area at the highest elevation of 785 m is 9.28 km^2 . The extracted water spread area was overlaid on land use land cover map and it was estimated the around 760 ha of forest land and 8 ha of agriculture land will be submerged as shown in Figure 1c. On the contrary, the project will provide irrigation to 40,000 ha. In a similar guideline, the water spread at regular interval of 10m below the FRL, was also estimated and the capacity of the reservoir was estimated at each water level. In this way the Elevation-Area-Capacity curve of the reservoir was derived in (Figure 2).

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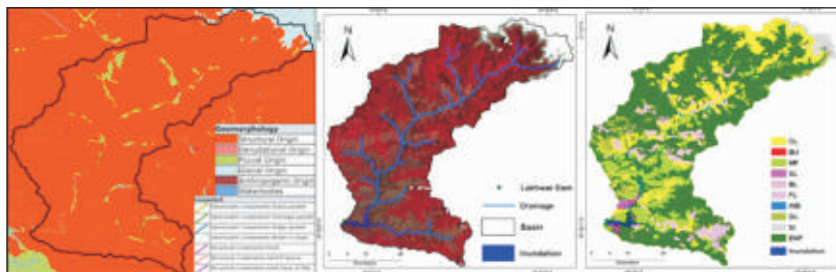


Fig. 1: a) Geomorphology and Lineament Map of the Region; b) Derived Watershed Boundary & Water Spread; c) Derived Water Spread Overlaid on LULC

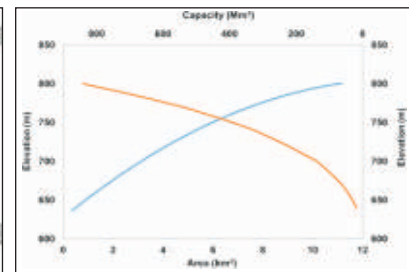


Fig. 2: Derived Elevation-Area-Capacity Curve of Lakhwar Dam Reservoir

Vaibhav Garg, Rajeev Ranjan and Praveen Thakur

Courses

Geospatial Inputs for Enabling Master Plan Formulation under AMRUT Sub-scheme (January 07-19, 2019)

The Govt. of India has launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT) which has a sub-scheme on 'Formulation of GIS Based Master Plan for AMRUT cities'. Initially, 500 towns are selected for the project. IIRS along with Town & Country Planning Organisation (TCPO), Ministry of Housing and Urban Affairs (MoHUA), GoI has developed the course contents for country-wide training and capacity building of personnel involved in sub-scheme at three levels (Tier-1: Decision Makers, Tier-2: Middle-level and Tier-3: Junior-level Officers). The course contents are designed to build capacity among urban planning professionals for utilising geospatial data for Master Plan Formulation and for Utility Management.

IIRS has organised a series of face-to-face training programmes and one Outreach Programme under AMRUT Sub-scheme. A two-week programme from January 7-19, 2019 for Middle-level Officials was organised at IIRS. Thirty-seven participants from seven states, namely Andhra Pradesh, Arunachal Pradesh, Chhatisgarh, Punjab, Rajasthan, Uttarakhand and West Bengal attended the programme. The course contents included lecture/ demo/ practical related to geospatial data and techniques for enabling Master Plan Formulation, utility management, etc. The participants were exposed to ground control points (GCPs), field data and utility data collection using Mobile GPS, DGPS and Total Station devices. The participants had rated the courses to be extremely useful and the quality of course contents to be excellent.

IIRS along with TCPO has also developed a Mobile App with web-enabled GIS dashboard as per AMRUT Design and Standards guidelines. It facilitates smart field data collection for LULC, building footprints, base map mapping, etc. It also helps in attribute coding for urban utilities such as water supply, sanitation, transport, solid waste management, etc. The App shall be helpful in accelerating training and capacity building activity under AMRUT Sub-scheme.



Course report of workshop cum training programme on “Coastal & Ocean Management” held during January 29 - February 1, 2019

This year IIRS organized a special workshop cum training programme on “Coastal & Ocean Management” during January 29 - February 1, 2019. The Workshop was designed for professionals and specialists from university, educational institutes, operational & research institutes and JRFs/SRFs/students in Marine Science, Earth Science, Oceanography, Fisheries, Environmental Science and related fields. The workshop had a blend of lecture, few expert lectures, case studies, demonstrations and hands on exercises. A total of 51 applications were received and 36 participants were selected to attend the programme. However, finally 31 participants reported to undergo the training programme. An inaugural function of the workshop was organized on first day for which Dr. M. V. Ramana Murthy, Director NCCR Chennai was invited as chief guest.

The aim of the programme was to provide participants an understanding of the scientific concepts associated with coastal and marine ecosystems, coupled with a practical knowledge of marine management. It was also kept in view that the participants must gain knowledge and ability to access, analyze, and apply satellite remote sensing data for coastal and ocean management. The participants also got the understanding of advantages and limitations of using remote sensing observations for coastal and ocean management.

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Valedictory of workshop cum training programme on “Coastal & Ocean Management”

One-Day Workshop on 'Workshop on IRNSS and GNSS based observations for Crustal Deformation, Weather and Soil moisture studies' (March 15, 2019)

A one-day workshop on 'IRNSS and GNSS based observations for Crustal Deformation, Weather and Soil moisture studies' as a part of IIRS User Interaction Meet, 2019 (March 14-15, 2019) was organized on Oct 26th, 2018 by Geosciences Department, Geosciences and Disaster Management Studies Group, IIRS. This was the second workshop of this year, related to ongoing EOAM project on Himalayan geodynamics under IIRS's direction Mountain Ecosystem project. There were 342 participants including EDUAST Distance Learning Programme coordinators from all over India. The delegates were from IIT Roorkee, IIT Bombay, Kumaun University, Kurukshetra University, HNB Garhwal Univeristy, BHU, JNU, Punjab University, USAC, WIHG, IIT-ISM Dhanbad, DIT, SDMC, Govt of Uttarakhand and invited speakers from National Centre for Seismology, MoES, SAC, Ahmedabad, ISRO HQ Bangalore and IIRS Dehradun. The broad themes of the workshop includes: Overview on IRNSS system, opportunities and future plans, IRNSS data processing, data quality and application potentials, GNSS based crustal deformation in Indian sub-continent with special reference to Peninsular India, GNSS applications for Geodynamics studies in Himalaya-Karakoram-Tibet region, GPS Occultation and Reflectometry (Future Space Based Observations, GNSS Reflectometry for soil moisture, snow depth and water level studies, IRNSS/GNSS applications for precipitable water vapour monitoring and analysis). There were deliberations, exchange of ideas and brainstorming discussions by technology experts and application scientists to harness the benefits of this technology. The workshop was concluded with recommendation for future R&D and collaborative initiatives in the related field.

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Plenary session of Workshop

44th IIRS Outreach Programme on Remote Sensing based Mapping, Monitoring and Modelling of Landslide and Earthquake Hazards (April 22-26, 2019)

Earthquakes and landslides are the major geological hazards that have maximum destructive effect in the Himalayan states of India. Landslides, around the globe, owe to a wide variety of causative as well as triggering factors like heavy rainstorms, cloudbursts, earthquakes, geo-engineering setting and unplanned human activities. Comprehensive assessment of landslide hazard which requires process based modeling using numerical simulation methods is at a preliminary stage in India. Precipitation triggered landslide models have been attempted in tectonically disturbed regions. Collision-related seismicity across this region has caused hundreds of thousands of deaths and catastrophic economic losses in this area. Spaceborne geodetic observation by Differential Interferometric SAR (DInSAR) and DGNSS techniques facilitate to measure co-seismic and intersiesmic land surface deformations, crustal shortening and identification of strain accumulation zones in and around major tectonic features. In order to assess the seismic hazard, it is also important to consider ground based measurements to achieve highest precision. Ground based measurements with the aid of GNSS CORS receivers are capable of providing temporal ground deformation and strain accumulation which is the prime factors for earthquake occurrences. Accurate assessment of the earthquake hazard is a critical step for earthquake risk mitigation and therefore, there is an urgent need for multi parametric earthquake precursory study based on current seismicity observations which will augment space based observations based on VLF, TEC and thermal data analysis.

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In this pretext, it was planned to have a one-week course to educate participants about the role of remote sensing based mapping, monitoring and modelling of landslide and earthquake hazards and share the present knowledge-base on this burring issue. Pertinently, the online mode was preferred so as to reach to maximum number of participants from all registered network institutions. This distance learning programme was attended by 95 network institutions and attended by 818 registered participants. The lectures delivered included Role of RS and GIS in landslide and earthquake hazards study in the light of geodynamics of the Himalaya; Application of remote sensing in landslide (physical based) and liquefaction modelling, EO data for rainfall thresholding and seismicity induced landslide hazards, Spaceborne geodetic observations by Differential Interferometric SAR (DInSAR) to measure co-seismic and intersiesmic land surface deformations, Ground based techniques for measurement of crustal deformation, strain accumulation and geophysical tools for active tectonics. The course ended with a panel discussion session where all queries and doubts raised by the participants were cleared and two-way deliberations took place. The course as followed by an online objective exam. The feedback obtained from the course participants revealed that the course served its purpose and most of the participants were highly beneficiated. After having the overwhelming response from the course, it was decided to conduct courses on similar topic on regular intervals with availability of newer technology and high resolution data set.

Microwave Remote Sensing Applications in Geosciences with Emphasis on Surface Deformation Studies (22-26 April, 2019)

A one week special course on “Microwave Remote Sensing Applications in Geosciences with Emphasis on Surface Deformation Studies” was organized by Geosciences Department between April 22-26, 2019. The motive of the course was to expose young researchers, scientists and professionals from various National Institutes and Universities working in the areas seismicity, landslide, sustainable mining, groundwater depletion, glacier dynamics to fundamental applications of RADAR, SAR interferometry (InSAR) and Differential InSAR. A total number of thirty three participants working in various fields of Geosciences and related areas were benefitted from the course.

The course content include: (i) Fundamentals of Microwave Remote Sensing, (ii) Concepts of Polarimetric and Interferometric SAR, (iii) Principles of Differential Interferometric SAR (DInSAR), (iv) SAR Data processing with emphasis on InSAR and DInSAR processing, (v) Applications of InSAR and DInSAR in Geosciences (Seismicity, Landslide, Land Subsidence, Glacier Dynamics). Hands-on training was given on generation of backscatter image from SAR data, processing of InSAR for DEM generation, DInSAR processing for deformation mapping, Earthquake displacement studies, InSAR and DInSAR processing for glacier dynamics. The participants were exposed to ALOS 1/2, ENISAT, ERS 1/2, SENTINEL-1 and TanDEM-X datasets in hands-on training. Two guest lectures were delivered by Mr. Sumeet Pandey from ADRIN, Hyderabad and Dr. Anup Das from SAC, Ahmedabad to the participants. The course was highly appreciated by the participants however most of the participants suggested for longer duration courses of similar nature.



Training cum workshop on Machine Learning and its applications (June 3-7, 2019)

A five days training cum workshop was conducted during June 03-07, 2019 for professionals from Central/ Sate Govt./Private Organizations/NGO, University researchers engaged in remote sensing technology and its application. This training cum workshop introduces several fundamental concepts and methods for machine learning. The objective was to familiarize the audience with machine learning algorithms, techniques and their applications, as well as general questions related to analyzing and handling large remote sensing data sets. Several software libraries and data sets publicly available were used to illustrate the application of these algorithms. Experts from IIIT Jabalpur and Sastra Deemed University Tirumalaisamudram Thanjavur were also the resource persons for this training cum workshop. The course was of five days duration and the target group were Central/ Sate Govt./Private Organizations/NGO, University researchers engaged in remote sensing technology and its application. These were 34 participants in the course. The topics covered in this workshop were:

Salient Topic Covered: Earth Observation data sets and applications; Machine Learning - A Journey; Methods in Machine Learning; Fuzzy concept in machine learning, Fuzzy based temporal remote sensing data processing; Neural Networks, Gradient Descent with Momentum; Motivation for Deep Learning, Deep Learning-CNN and RNN; Data hiding using Convolution Neural Networks; Deep Networks, Generative Adversarial Networks, Other Machine Learning Algorithms: Random Forest/Decision Trees/Logistic Regression/Support Vector Machines/KNN/Naïve Bayes/Ant Colonization/ Evolutionary Computing; Machine Learning Applications Theory topics are synchronized with demonstration.

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Space Based Water Level, Discharge Estimation and / Water Quality Studies with Emphasis on Hydrological and Hydrodynamic Modelling of Brahmaputra River Basin (June 10-21, 2019)

Considering the importance of transboundary contribution a special course on "Space Based Water Level, Discharge Estimation and/Water Quality Studies with Emphasis on Hydrological and Hydrodynamic Modelling of Brahmaputra River Basin" was organized during June 10-21, 2019 at Indian Institute of Remote Sensing (IIRS) for officials of Central Water Commission (CWC) and Cabinet Secretariat. 15 participants from CWC and 02 participants from Cabinet Secretariat attended the course. The participants were exposed to basics of remote sensing data processing, geographical information system, web GIS, data formats, data visualisation and database creation in initial two days with hands on exercises. The participants were also taught about the GPS/GNSS surveys and accuracy issues. As large number of landslide activities are observed in the upper Brahmaputra River Basin, a lecture on remote sensing applications in landslide mapping and monitoring was also delivered. The participants were educated on the applications of geospatial technology in water resources. It started with water body mapping using optical and microwave data. Later, role of remote sensing in water quality mapping and its issues were discussed extensively in 2 lectures and practical exercises. As each type of data has its own advantages and disadvantages, a lecture of challenges and issues of SAR data applications in hilly regions was taken up. Further, the participants were trained in space based altimeters and their application in retrieval of water level of inland water bodies, those can act as virtual gauging stations. There were 02 dedicated hands on exercises on retrieval of water level from space based altimeters. The participants were also very excited to learn this upcoming technology for water level estimation. Apart from thus the participants were exposed to various sources of digital elevation model and its applications in water resources studies. They also studied the reservoir sedimentation assessment using remote sensing techniques. Again, use of space based altimeter in retrieving water level was stressed in the lecture. Finally, the participants were trained in hydrological and hydrodynamic modelling using free wares such as HEC-HMS and HEC-RAS with hands on exercises for stretches of Brahmaputra River on each modelling technique. They were also taught the dam break and GLOF analysis using geospatial tools along considering the activities in this specific region with validation strategies of virtual river gauging stations. Through a guest lecture, the trainees were given exposure to

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Group Photograph of Participants and Resource Persons

flood early warning system developed for Brahmaputra River and geospatial inputs for the same. During the lectures the special care was taken to show case studies for each theme or subject. The participants were taken to field to interpret the satellite image with different land features. On special request, the participants were demonstrated with the use of Google Earth Engine in analysis temporal data. The participants were supplied with lecture notes, lecture presentations, practical hands on data, list of free data sources and free/open source software for the said assignment. A formal feedback was taken from the participants, where, they rated the course as extremely useful and mentioned that, content was adequate. However, they also mentioned that the course duration was very short. Some of them emphasized on conducting special course on geospatial technology applications in water quality assessment.

Usefulness of Remote Sensing & GIS for Environmental Studies (June 24-28, 2019)

Marine and Atmospheric Sciences Department of IIRS has been conducting a special course on "Usefulness of Remote Sensing & GIS for Environmental Studies" for school students from 9th to 12th standard every year since last eight years. The aim of the course is to create an awareness about remote sensing technology & its use for the study of earth and its environment among the school students. This time, the course was organized from June 24-28, 2019. Although there was a restriction of two students from each school, a huge response was received. A total of 76 students from 45 different schools of Dehradun and other parts of the country participated in the course. The focus of the course was on principles of Remote Sensing (RS) & GIS and its applications for environmental studies. Broad subjects covered in the lectures were: a view of solar system from space, origin of universe, basics of remote sensing, basics of GIS, Tsunami and its impact on coastal zones, RS & GIS applications in geological studies, water resources, agriculture, soils, atmosphere and urban studies. Practical demonstrations were also arranged to familiarize them with satellite images for land & atmospheric studies and GIS data collection & mapping. Students had good interaction with faculty from various departments of IIRS. Students also visited the Edusat studio of IIRS. Videos on Indian space programme including Chandrayan mission, Mars mission and Space capsule recovery experiment were also shown to the students. As the participants were a mix group from English and Hindi medium schools, a care was taken to deliver lecture in English and Hindi both.



Remote Sensing: An Overview for Decision Makers (June 11-14, 2019)



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This is a regular course organized by IIRS and has been specially designed for Decision Makers and Senior officials from various government departments, PSUs and Private Sectors. The training program has been organized with the objective to provide a broad overview of the geospatial technology and its application in various aspects of governance, natural resource management, food and water security, environmental monitoring, disaster management and weather and atmospheric related issues. This course has received a good response and had 20 Officials from different parts of India. The participants were from Government of Himachal Pradesh, Jharkhand, Haryana, Madhya Pradesh, Chhattisgarh, Goa, Jammu and Kashmir, Border Road New Delhi, Mizoram, Ministry of Defence, and PSUs like Steel Authority of India Limited, Hindustan Petroleum Corporation, New India Assurance Limited, and Agricultural Insurance Sectors. The lectures covered various aspects of the use of remote sensing and GIS and spatial information generation in informed decision-making, which included fundamentals of remote sensing and thematic applications of remote sensing in various areas of governance.

Events

IIRS Academia Meet (IAM) 2019

IAM-2019 on theme 'Capacity Building in Geospatial: Requirements, Challenges and Opportunities' was held on March 14, 2019 at IIRS. Besides faculty & staff from IIRS there were more than 180 registered participants from various academic institutions, industries, government departments, JRFs, Students & Edusat-users from all over India.

Dr. Prakash Chauhan, Director, IIRS gave the introductory remarks during the inaugural session of the Meet, which was followed by the addresses of Chief Guest and Guests of Honour. An interactive-session and panel discussions were held with senior delegates from Academia and Industries to dwell upon the future activities of Institute on enhancing capacity-building activities and aligning them with the developmental programmes of the Government for meeting the diversified needs of the country. Outreach feedback session was organised as part of IAM-2019. The placement brochure 2019 was also released on this occasions.

An exhibition by M.Tech. & M.Sc students for showcasing the departmental activities was also organized for benefit of academia and industries highlighting training opportunities and research initiatives of IIRS students. Technical, plenary & panel discussions were organized.

The meet was followed by a workshop on 'IRNSS and GNSS based observations for Crustal Deformation, Weather and Soil moisture studies on March 15, 2019. Feedback for IIRS-DLP was also organised on March 15, 2019 wherein 81 participants attended the session.

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(CEOS WG CAPD) (Working Group on Capacity Building and Data Democracy Committee on Earth Observation Satellites)

8th meeting of Working Group on Capacity Building and Data Democracy (WGCapD), Committee on Earth Observation Satellites (CEOS), was organised during March 6-9, 2019 at Indian Institute of Remote Sensing (IIRS), Indian Space Research Organisation, Department of Space, Government of India, Dehradun, India. Twenty participants from ISRO, NASA and UK NCEO attended in person. Additional 17 participants from CEOS CEO, CEOS, CRECTEALC, ESA, GODAN, NASA, VLab, ITC, ASI, DST, VNESC, INPE and DLR attended virtually. The meeting has provided an opportunity and platform to assess the progress made so far as well as planning for future for the Working group of Capacity building and data democracy.

The three day meeting discussed on lessons learnt, global activities and capacity building for advance sensors, status of MOOC and proposed webinars and tools, technology and best practices for capacity building. There were discussion on the support to GEO regional initiatives and collaboration with other CEOS WGs, VCs and AHTs & GEO, SDGs, and thematic areas.



SASHA Workshop on Sexual Harassment at Workplace Act 2013

To create an awareness about sexual harassment and the consequences they may face if they indulge in such an act, a half a day session for the employees of IIRS, JRFs, students, CISF and contractual staff at IIRS was conducted on March 29, 2019 on the topic Sexual Harassment at Workplace (Prevention, Prohibition and Redressal) Act 2013.

A team comprising of two experts namely Mrs. Kanti Joshi and Mrs. Sowmya Lakshmi Bhat from an NGO SASHA, (Support Against Sexual Harassment), Bengaluru conducted the session. The speakers covered the following aspect, fundamentals of "What is Sexual Harassment" and what is not?, guidelines as per the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act 2013, Organization's commitment, policy guidelines. They also briefed that in case of any unfortunate event of harassment how an employee can seek support and the organization will extend its support. It was an interactive session participated by staff, students and contractual employees.



Academic and Training Programs

IIRS conducts academic and training programs in the area of geospatial technology to meet the requirements of various target/user groups, i.e., for professionals at working, middle and supervisory levels, fresh graduates, researchers, academia and decision makers. The duration of courses ranges from one-week to two-years. The programmes are meticulously designed by the domain experts, and are then approved by the Board of Studies (BoS) and Academic Council (AC) consisting of eminent subject experts.

Education Programme:

- M.Tech. (RS&GIS) in eight disciplines conducted in collaboration with Andhra University, Visakhapatnam.
- M.Sc. in Geoinformatics conducted in collaboration with the Faculty of Geo-information Science & Earth Observation (ITC) of the University of Twente (UT), The Netherlands.

Training Programme:

- PG Diploma 9 Specializations (10 months).
- PG Diploma Geoinformatics conducted in collaboration with the Faculty of Geo-information Science & Earth Observation (ITC) of the University of Twente (UT), The Netherlands.
- Certificate courses Remote Sensing/ Geoinformatics (8 weeks, Sponsored by ITEC/MEA, Govt. of India).
- Certificate Courses for University Faculty 8 themes (8 weeks, NNRMSISRO Sponsored).
- Decision Makers Course (1 week).
- Special on-demand/tailor-made courses (1-8 weeks).

Awareness programmes, and IIRS Outreach Programme:

- Live & Interactive courses and elearning courses

International training programme- CSSTEAP (UN Affiliated Centre)

- RS & GIS Educational Programs (PGD/M. Tech. & Short Courses)
- Short Course on remote sensing for ITEC, Ministry of External affairs, Government of India

Details regarding the qualification requirement and the admission procedure is available at

www.iirs.gov.in/academiccalendar

Superannuation | Transfers | New Appointment

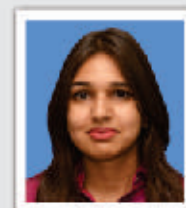
Superannuation and Transfer



Shri Sewak Ram
(14/01/2015) VRS



Shri Shailendra Kumar
Transfer



Ms. Supriya Sharma
Transfer

New Appointments



Ms. Prashansa Dang



Ms. Nirjara Jain



Shri. Bhaskar Prasad



Ms. Priyanka Das

Republic Day Celebration



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Dear Readers,

This issue of *CONTACT* newsletter contains articles on Recent Trends in Remote Sensing and Geospatial Application Research.

Kindly write to us at newsletter@iirs.gov.in for suggestions/feedback.

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