

# Reflections

Triannual Inhouse Newsletter



Dr Jitendra Singh, Hon'ble MoS (Independent Charge), DST, MoES, DoS, DAE, and Personnel, Public Grievances and Pensions giving away the National e-Governance Award 2022 (silver) to Director, NESAC and GID Team, NESAC

## From the Director's desk



The year 2022 has been very productive for NESAC which brings new hope for the year 2023. NESAC, a pioneer in demonstrating the benefits of space technology for the socio-economic development in the northeastern region of India, continued to make significant strides in fulfilling its mission.

The guidance and motivation from the President of NESAC Society, Hon'ble Union Minister of Home and Cooperation, Shri Amit Shah Ji has

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*Dibyajyoti Chutia, Puyam S Singh, Nilay Nishant*

National Award for e-Governance 2022 (Silver) was conferred to North Eastern Space Applications Centre for North Eastern Spatial Data Repository (NeSDR) for Excellence in Adopting Emerging Technologies. The award was conferred by Dr Jitendra Singh, Hon'ble Minister of State (Independent Charge), Ministry of Science and Technology, Earth Science, Personnel, Public Grievances and Pensions; Department of Atomic Energy and Department of Space during the during

NeSDR is one of the major projects of NESAC taken up as per the directive of North Eastern Council (NEC)/Ministry of DoNER and executed in collaboration with State Remote Sensing Applications Centre (SRSACs) of NER. The objective of NeSDR is to establish a single window spatial data visualization and sharing gateway pertaining to the NE region. NeSDR is a hub for geospatial big analytics that brings the centre's massive computational capabilities to address a



*Director, NESAC along with the Scientists from GID, NESAC*

25th National Conference on e-Governance held during 25-27th November at Shri Mata Vaishno Devi University (SMVDU), Katra, Jammu. The NeSDR is listed as one among selected 18 awardees out of total 432 applications submitted by different Ministries and Departments across India. Dr SP Aggarwal, Director, NESAC, Dr Dibyajyoti Chutia, Head, GID, Shri PS Singh, Scientist-SE and Shri Nilay Nishant, Scientist-SD received the award on behalf of NESAC. The conference was organized by the Department of Administrative Reforms & Public Grievances (DARPG) and Ministry of Electronics & Information Technology (MeitY), Government of India, in association with the Government of the Union Territory of Jammu & Kashmir.

variety of high-impact societal issues including deforestation, disaster, disease, food security, water management, climate monitoring and environmental protection. Platform consists of multi-terabytes of analysis-ready data that has been cataloged and co-located with a high-performance computation service. It provides the datasets as per OGC standards for visualization via web services. The interface has been designed to be more responsive in all kinds of platforms and devices. It's a platform for seamless data accessibility across various users for data visualization, interactive analysis, search and discovery of spatial based user's interest.

The NeSDR was publicly made available at <https://www.nesdr.gov.in> on 20<sup>th</sup> November, 2020. Currently, the portal is populated with 1392+ geospatial products pertaining to land and water resources, administrative base information, terrain, action plan inputs, infrastructure, utilities, weather and climate, disaster support inputs etc. of NE states. Geo-Analytics of NeSDR with more than 800 datasets with powerful geoprocessing platform is the major achievement of the project which incorporates a range of AI/ML/DL analytical tools. The application is designed to analyze the satellite images on-the-fly and produce the result as OGC

# National e-Governance Award 2022 to NESAC: A report

compliant WMS. The bulk of the catalogue is made up of Earth-observing remote sensing imagery, including the archive of MODIS and INSAT datasets pertaining to NER along with certain cloud free scenes of LANDSAT and Sentinel-2. Several e-Governance applications has been designed, hosted under the umbrella of NeSDR and are being used by

number of Government User Departments for various citizen-centric services. Tripura Banadhikar app, Fever Tracker App for health Workers with ICMR-RMRC-NE, Election e-ATLAS for the Office of Chief Electoral Officers (Manipur, Tripura, Sikkim, Nagaland), Smart AXOM App for ASDMA, Govt. of Assam, etc. important citizen-centric

The screenshot displays the NeSDR data discovery panel. At the top, there is a navigation bar with links for Home, Datasets, Geoportal, Groups, Safe custody form, News & Events, User Manual, Log In, and Register. Below the navigation bar, the breadcrumb trail shows Home / land use land cover / Dataset / Search. The main content area is divided into several sections:

- User's group & Statewise data:** A list of states with the number of datasets for each: Assam (91), Arunachal Pradesh (38), Meghalaya (28), Manipur (4), Mizoram (4), Nagaland (4), North East Region (4), Sikkim (4), and Tripura (4).
- Themes:** A section for Land Resource (181).
- Districtwise Data:** A dropdown menu.
- Data Type:** A dropdown menu with Vector (181).
- Scale:** A dropdown menu with options: 1:50000 (171), 1:10000 (9), and 1:4000 (1).
- Yearwise Datasets:** A dropdown menu with options: 2015-2016 (73), 2011-2012 (63), and 2005-2006 (43).

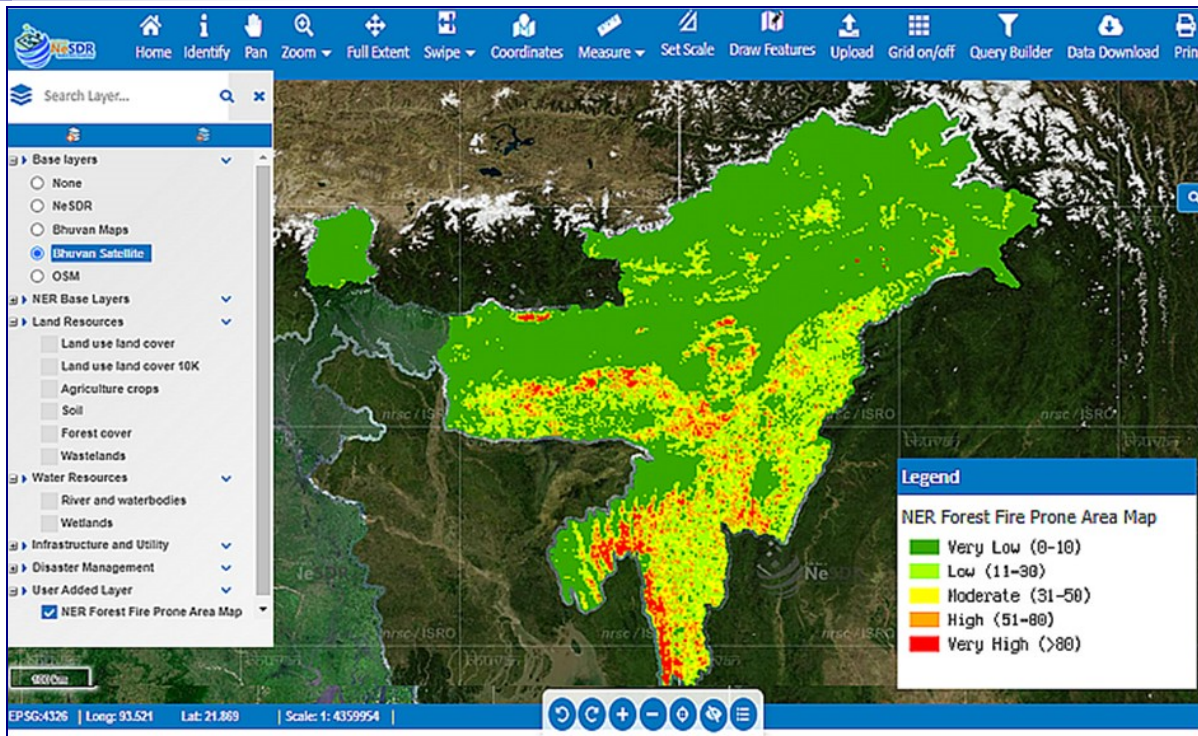
The search results are displayed in a grid of six map thumbnails. Each thumbnail includes the title of the dataset, the state name, a 'Land Resource' icon, a map preview, a 'wms' button, and a 'VIEW IN GEOPORTAL (1)' button. The search criteria are 'land use land cover', sorted by 'Published date' in 'Descending' order. There are 'APPLY' and 'RESET' buttons for the search filters. At the bottom, there is a pagination control showing page 1 of 9.

*NeSDR data discovery panel*

the different government user departments for their planning and monitoring activities. As of date, a total of 25 dashboards and 25 Mobile Apps for Governance applications have been developed for a

Governance applications has been developed and operationalised using NeSDR platform.

NeSDR is now becoming a decision making platform for many Government departments and

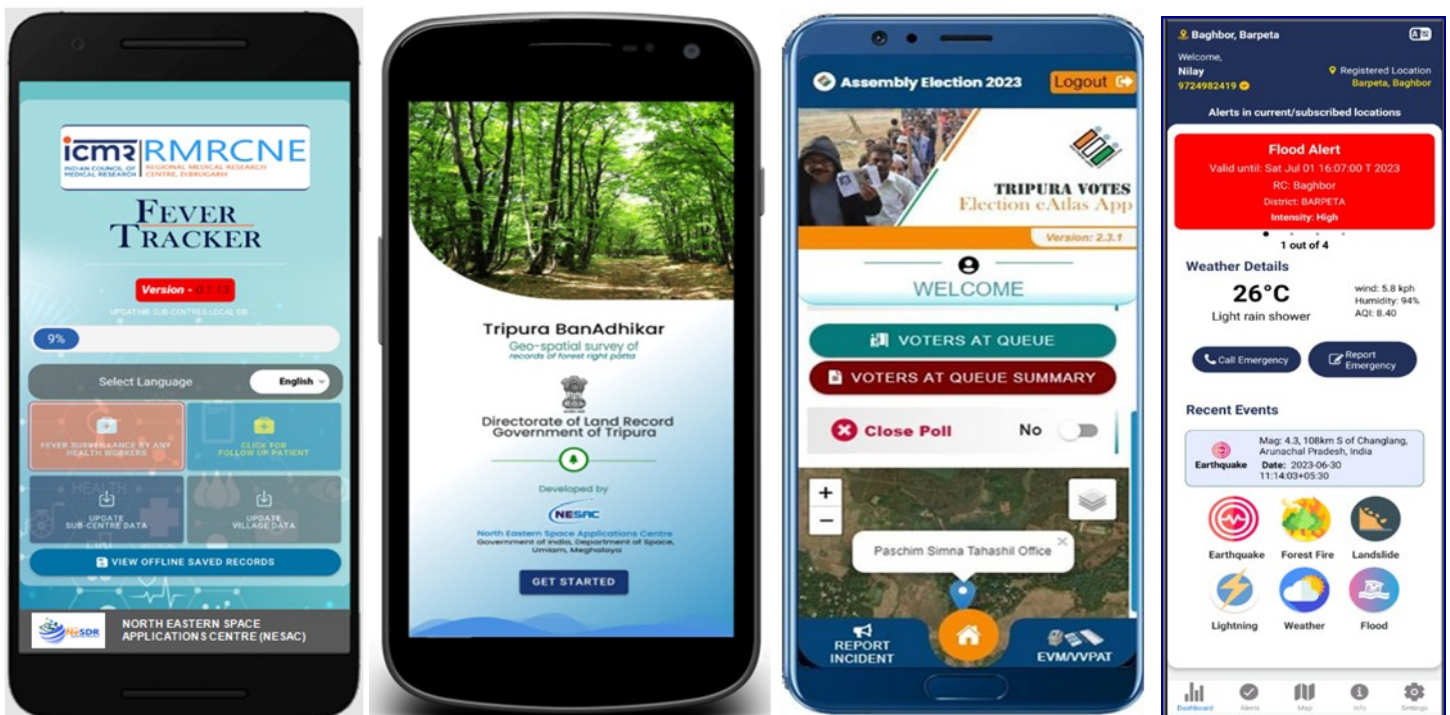


*NeSDR MapViewer showing the forest fire-prone area of NER*

traditional remote sensing scientists, but also a much wider audience that lacks the technical capacity needed to utilize high end cloud computing resources. The basic aim is to reduce the duplication of efforts by various departments for generating the same set of data, to provide an analytical

agencies for their developmental planning and monitoring activities. It is unique in the field as an integrated platform designed to empower not only

decision support platforms, intelligent monitoring mechanisms, gap analysis as well as overall planning and management of government processes.



*Few flagship governance applications hosted in NeSDR platform*

*Continued from page 1*

been the driving force for the accelerated and more action oriented activity of the Centre. The expert advises and continued support from the Chairman, NESAC Governing Council / Secretary, Department of Space, Government of India, Shri S Somanath Ji has enabled NESAC to successfully complete the task assigned to this centre. We are hopeful and committed that the good work carried out by this centre will only increase in the days to come.

We had the 10<sup>th</sup> meeting of NESAC Society held on 8<sup>th</sup> October, 2022 at Guwahati under the Chairmanship of Shri Amit Shah Ji, Hon'ble Union Home and Cooperation Minister and the President of NESAC Society. The Meeting was also attended by Hon'ble Union Minister of MDONER and Hon'ble Chief Ministers of NE states, in addition to the listed members of the Society. Hon'ble Union Home Minister while lauding the activities carried out by NESAC also stressed that NESAC should take the lead role in providing space technology support to all the sectors in the region, particularly the health, education and infrastructure. He called for greater use of the database created by NESAC while assessing gaps in infrastructure, planning and monitoring activities in NE region of India, He also gave valuable directions towards implementation of the Plan of Action projects, disaster management support services, etc. This gave us a renewed mandate and greater motivation to work hard and contribute significantly to the development journey of the beautiful NE region of India. Shri S. Somanath, Secretary, Department of Space and Chairman, NESAC Governing Council also appreciated the work carried out by NESAC and assured all possible support from ISRO/DoS.

I am extremely happy to share the news that NESAC has been awarded with the National e-Governance Award 2021-2022 (Silver Medal) for the project on North Eastern Spatial Data Repository (NeSDR) under the category of Excellence in Adopting Emerging Technologies. Hon'ble Minister of State (Independent Charge) for DST, MoES, DoS, DAE, Personnel, Public Grievances and Pensions, Dr Jitendra Singh Ji conferred the award during the 25<sup>th</sup> National Conference on e-Governance held during 25-27 November at Shri Mata Vaishno Devi University (SMVDU), Katra, Jammu. This is a testimony to the quality and user friendly database created by NESAC for all major users of Space and Geospatial technology. I congratulate the NESAC team and specially the Geoinformatics division at NEAC for

taking the lead in creating the repository.

Another happy occasion for NESAC was to receive the first prize for the implementation of the Official Language Policy of the Union of India during the year 2020-2021. Union Minister of State for Home Shri Ajay Kumar Mishra gave away the Shield during the Joint Regional Official Language Conference of East and North Eastern Region – 2022.

Several projects were completed during the time and special focus have been given towards timely implementation of the projects included in the Plan of Actions (PoA) of the respective states. There is also significant enhancement in the activities under the Training and Outreach program of NESAC. More than 500 persons are trained yearly in different aspects of geospatial technology and space applications through 15-20 training programs yearly. Additionally we participate in exhibitions, conduct student visits, etc.

We had two very eminent visitors at NESAC during last four months. Hon'ble Union Minister of Jal Shakti, Shri Gajendra Singh Shekhawat visited NESAC and stressed that NESAC should take the lead role in providing space technology support to all the sectors in the region, particularly floods, climate change, water security etc. Shri Talleen Kumar, IAS, Member Finance, Space Commission, Earth Commission and Atomic Energy Commission also visited NESAC and motivated the NESAC community towards finding ways to ensure that the benefits of space technology reach to the grass root level of population. We also signed MoU with National Institute of Technology – Silchar for collaborative activities in the field of innovative space applications and capacity building.

NESAC's achievements during this period would not have been possible without the dedication, expertise, and collaborative efforts of its team of dedicated scientists, engineers, and support staff. Their unwavering commitment to excell and their passion for leveraging space technology for societal benefit have been the driving force behind NESAC's success. As we reflect upon the accomplishments of the year 2022, NESAC's journey toward empowering the northeastern region with space technology continues to inspire and bring hope for a brighter future. The coming months hold promise for further transformative endeavors, all aimed at fostering sustainable development and improving the lives of the region's inhabitants.

Abhay Srivastav, Shyam S Kundu

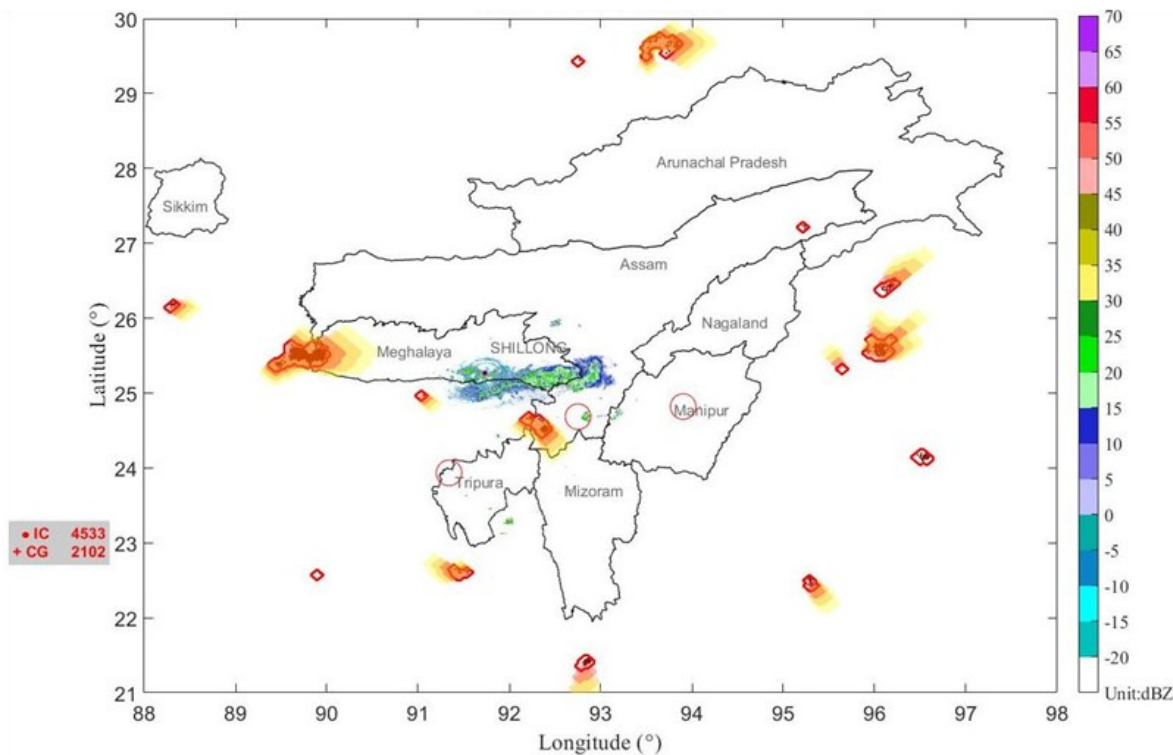
Lightning is one of the most spectacular and awe-inspiring natural phenomena that occur on our planet. It is the result of electrical charges building up within clouds or between the ground and the clouds, leading to a high-energy discharge of electricity. Lightning forms when there is a difference in electric charge between the ground and the atmosphere. This charge separation occurs due to the movement of water droplets, ice crystals, and other particles within clouds. The negatively charged particles tend to concentrate near the bottom of the cloud, while the positively charged particles are at the top. When the charge separation becomes large enough, an electrical discharge occurs, creating a lightning bolt.

Lightning has been the cause of highest number of

damage buildings, damage sensitive electronic and IT infrastructure, disrupt power lines, etc. However, despite its potential dangers, lightning also plays an important role in the Earth's atmosphere by helping to balance the electrical charges within the atmosphere and facilitating nitrogen fixation. The lightning gains its importance from the perspective of its potential to kill humans and animals. The lightning that normally occurs with severe storm is a very dynamic weather system that often evolves in less than an hour. Lightning nowcasting is therefore very challenging, but has the potential to save very valuable life. Scientists have been observing these severe weather and lightning events and tried different nowcasting technique including numerical, statistical, and machine learning techniques. The use

of satellite data, radars, lightning detectors, and other instruments improved the understanding of thunderstorms and lightning and enabled the meteorologists to collect and analyze data on lightning strikes in near real time and use it to make improved forecasts.

The North Eastern Region (NER) of India is one of the global lightning hot spots. The



*The severe weather tracking system indicating the areas that are likely to be affected by severe weather with lead time of 45 minutes*

human loss from any natural disaster at the national level and the scenario over the NER is also no exception. In addition, lightning can have a significant impact on the environment and human infrastructure. Lightning strikes can cause fires,

majority of lightning over NER occurs during the pre-monsoon season covering April and May months. The lightning events are more prominent over Meghalaya, Tripura, Mizoram, and Assam, although entire NER is affected by the lightning. One of the

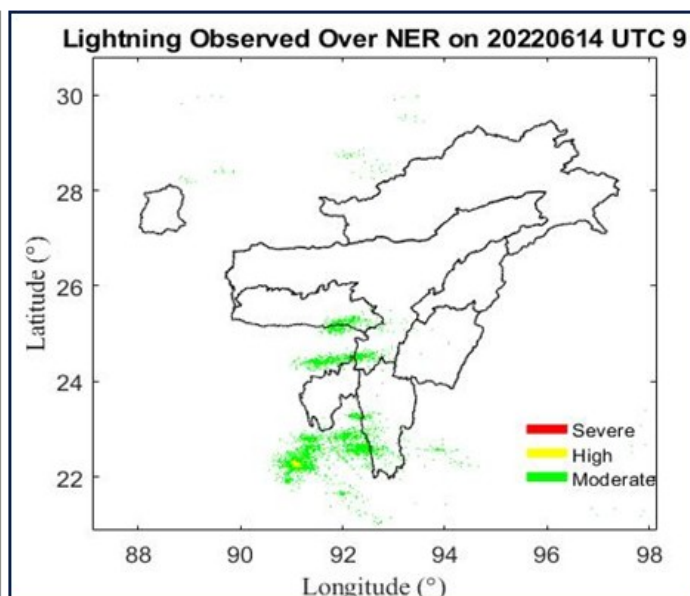
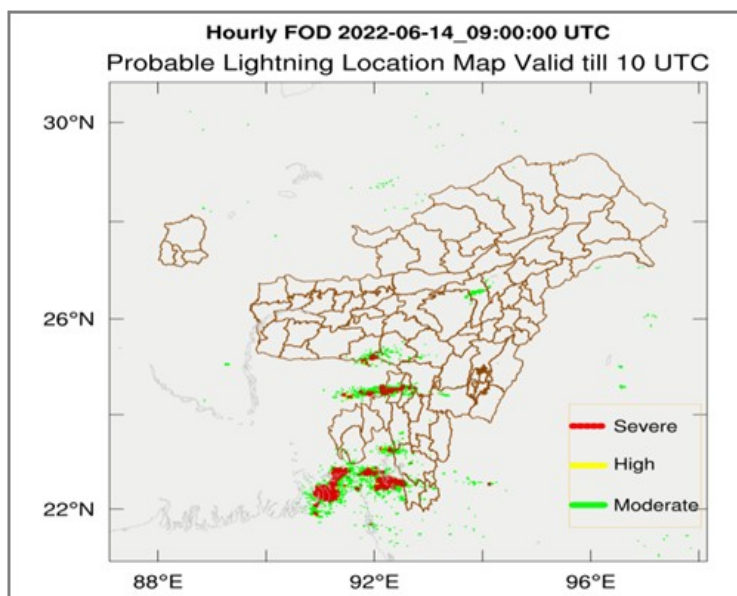
## NESAC developed Lightning Early Warning System for the NE region of India

best methods to reduce the losses from this natural disaster is to enhance the awareness on how to respond during thunderstorms and have an operational severe storm and lightning early warning system. North Eastern Space Applications Centre (NESAC) took up several studies to understand and characterize the thunderstorms and lightning activities over NER and converged those studies into developing a suitable nowcasting system for lightning for the NE region of India. The data from the lightning detectors installed by National Remote Sensing Centre (NRSC) and Indian Institute of Tropical Meteorology (IITM), Doppler Weather Radar (DWR) installed at Sohra (erstwhile Cherrapunjee in Meghalaya) as well as the data from INSAT 3D and INSAT 3DR satellite are used to develop the lightning nowcasting system.

The lightning warning is provided through multiple layers of lightning nowcasting, which begins with forecasting the lightning probable areas with 6 hours of lead time using numerical weather models and by assimilation of the ground based data in the model. The first layer of warnings is further supplemented by a near real time severe weather tracking system that provides more accurate location specific warnings with 30-45 minutes lead time. This development is accomplished by using a combination of data from weather radar and ground

based lightning observations to monitor and track each and every storm movement and predict where lightning is likely to strike. In addition, the observations from atmospheric electric field monitors are being integrated into the system to have an additional layer of information that has the potential to improve the warning services further. NESAC also prepared the lightning hazards map for the entire NER that may help in optimized planning of lightning disaster mitigation efforts by the state governments of the NER of India.

The model and the tracking system are currently in evaluation stage and could be made operational soon. The warning services are disseminated to the state disaster management authorities for their feedback and improvement. The service shall be web-hosted soon so that a larger group of people can utilize the warning services. This new development can significantly improve the safety of public working / participating in outdoor activities during thunderstorms, as well as for power companies, aviation, and other organizations that need to protect their assets from lightning. The overall activity is done as part of the North Eastern Regional node for Disaster Risk Reduction (NER-DRR) initiative of NESAC supported by the Department of Space, Government of India, aiming at reducing the risk from natural disasters in NER.



*WRF-Elec model based lightning forecast (left) and observed lightning (right)*

## A brief report on the 10<sup>th</sup> Meeting of NESAC Society

The 10<sup>th</sup> meeting of NESAC Society was held on 8<sup>th</sup> October, 2022 at Guwahati under the Chairmanship of Shri Amit Shah Ji, Hon'ble Union Minister for Home and Cooperation and the President of NESAC Society. The meeting was attended by all the distinguished members of NESAC Society. Meeting was also attended by Hon'ble Union Minister of DONER, Chief Ministers of all 8 NE states. Senior officials from Union Home and DONER Ministries attended the meeting as Special Invitees.



*Secretary, DoS felicitating Hon'ble President, NESAC Society*

Shri S. Somanath, Secretary, Department of Space and the Vice President of NESAC Society welcomed all the distinguished members and special invitees to the 10<sup>th</sup> meeting of the NESAC Society. This was



*A glimpse of the meeting In progress*

followed by conduct of the proceedings by the Hon'ble President of the Society. Dr. S.P. Aggarwal, Director, NESAC and the Secretary of the Society presented the action taken report with respect to the actions identified during the previous meeting, achievements and status of projects and activities taken up since the 9<sup>th</sup> meeting of the Society. He also presented the Annual Reports and Audited Statement of Accounts for the approval of the Society.

Hon'ble Chief Ministers from the NE states offered their views on space technology support required for their respective states. They also spoke about the status of projects taken up as part of the Plan of Action on the utilization of space technology by various user departments in NE states. In his remarks, Hon'ble Union Home Minister and the President of NESAC Society lauded the activities carried out by NESAC and stressed that NESAC should take the lead role in providing space technology support to all the sectors in the region, particularly the health, education and infrastructure development in addition to Natural Resource Management & Disaster Risk Management. He sought the support and cooperation of all the state governments in the region to coordinate the activities related to space technology utilization in their respective state



### Hon'ble Union Minister of Jal Shakti Shri Gajendra Singh Shekhawat visited NESAC

Shri Gajendra Singh Shekhawat, Honorable Union Minister of Jal Shakti visited NESAC on Nov 03, 2022 and chaired a meeting on 'Space Applications in Flood Management in the North Eastern Region'. Dr. S. P. Aggarwal, Director NESAC welcomed the Hon'ble Union Minister and all the distinguished delegates to the meeting. This was followed by a detailed technical presentation by Director, NESAC on various water resources and disaster related activities of NESAC with special focus on flood management activities including the Flood Early Warning System in Assam and other parts of NER. The meeting was attended by Shri Rajiv Yadav, Chairman of Brahmaputra Board and other distinguished senior officials from NESAC, Brahmaputra Board, State Water Resource Departments, Central Water Commission, NERIWALM etc.

In his remarks, Hon'ble Union Minister lauded the activities carried out by NESAC and stressed that NESAC should take the lead role in providing space technology support to all the sectors in the region,

### Shri Talleen Kumar, IAS, Member Finance, Space Commission, Earth Commission and Atomic Energy Commission visited NESAC

Shri Talleen Kumar, IAS, Member (Finance), Space Commission, Earth Commission, and Atomic Energy Commission visited NESAC on 22<sup>nd</sup> December, 2023. Dr S P Aggarwal, Director, NESAC welcomed him and made a detailed presentations on NESAC activities and achievements. Heads of all divisions and senior scientists of NESAC were present during the meeting.

Member, Finance appreciated the diversity and quality of work being carried out by NESAC. He expressed interest on several activities and provided many valuable suggestions to improve the impact of project outputs and service delivery by NESAC. He specifically asked NESAC to focus on finding ways to ensure that the benefits of space technology reach



*Director, NESAC felicitating Hon'ble Union Minister of Jal Shakti*

particularly floods, climate change, water security etc. He emphasized that the aim should be to make maximum use of modern science and technology to come up with workable solutions to the age-old problem of floods in NER of India. He sought the support and cooperation of all officials present in the meeting to coordinate the activities related to space technology utilization in their respective organization.

to the grass root level of population. He stressed on enhanced utilization of advanced technologies like machine learning and AI to develop smart systems to handle the complex problems faced by the region.



*Shri Talleen Kumar, IAS with NESAC officials*

## Training programs organized by NESAC

### NESAC conducted two weeks short course on “Applications of RS & GIS in Agriculture and Allied areas”

The third short course on “Applications of Remote Sensing & GIS in Agriculture and Allied areas” was conducted from 29th August to 9th September, 2022 at NESAC Outreach Facility, Umiam. 23 participants were enrolled for the course that included officers from state agriculture departments, faculty members from college and Universities, scientists, research scholars and post-graduate students. Dr. S.P. Aggarwal Director, NESAC welcomed all the participants of the course and highlighted the importance of geospatial technologies in Agriculture and allied areas. Dr. V. K. Mishra, Director, ICAR-NEH Region, Umiam was invited as the Chief Guest of the inauguration programme. A total of 15 theory classes and 11 practical sessions were conducted during the two weeks course. Three guest faculties, viz.. Dr. Dipanwita Halder (Scientist, IIRS, ISRO), Dr. B.K. Bhattacharya (Group Director, SAC, Ahmedabad) and Prof. J. Adinarayana (CSRE, IIT Bombay) delivered lectures on Microwave Remote Sensing, Hyperspectral Remote Sensing and IoT applications in agriculture respectively.



A field visit was conducted on 3rd September 2022 to Sohra, where the activities at the Doppler Weather Radar were demonstrated. Five mini projects were assigned group-wise on relevant agricultural topics, which the participants carried out meticulously within the short time period. The valedictory program was conducted on 9th September, 2022 and Shri. J.C Deka Joint Secretary, CSB, RO, Guwahati

was invited as the Chief Guest for the event. Course completion certificates were distributed during the valedictory Session. The program concluded with the vote of thanks offered by Dr. Pradesh Jena, Course Officer.

### NESAC conducted special training for ASDMA and NDMA Officials



NESAC conducted five days training program on “Applications of Geographic Information System in Disaster Risk Mitigation” for officials nominated by various state disaster management departments and National Disaster Management Authority (NDMA) during 12-16 September 2022 at NESAC Outreach Facility. A total of 21 participants attended the training course. The training focused on use of Remote Sensing and GIS tools and techniques, in disaster management and monitoring. A field visit with demonstration of UAV, DGPS, GNSS, and DWR was conducted to provide knowledge about data sources and uses. The program was inaugurated by Dr S P Aggarwal, Director, NESAC. The course was designed to cover several domains of disasters such as forest fire, rainfall, flood, earthquake, landslide, industrial hazards, and crop damage etc..

The training also covered lightning, cyclone, and hazards risk vulnerability assessment followed by dashboard demonstration application in disaster management. A Valedictory session was arranged on 16th September, 2022. A good number of suggestions were shared by the participants during the valedictory session. Dr S P Aggarwal, Director NESAC congratulated all the participants on successful completion of the course and distributed

## Training programs organized by NESAC

the course certificate. He also lauded the efforts of Dr K.K. Sarma, the Course Director and Dr (Mrs) Kuntala Bhusan, Course officer for successful conduct of the course. The program ended with vote of thanks offered by by Dr Abhay Srivastava, Course Officer of the training.

### Two weeks course on UAV Remote Sensing organized at NESAC

A two week course on “UAV Remote Sensing Technological Development and its Applications” was organized at NESAC from September 19 to 30, 2022. A total of 21 participants with diverse educational background from different states of India participated in this course. The course focuses on providing theoretical and practical knowledge on flight planning and data acquisition for various remote sensing applications. Focused on aerial mapping, 3D printing and its applications in UAVs, various data processing techniques, such as orthomosaic, digital surface model (DEM), digital terrain model (DTM), contour map, volumetric analysis, etc. The two-week course also included extensive practical sessions on flight simulator, mission planning and acquisition, data processing and analysis. The participants also did a two-day mini project mentored by a domain expert in four different thematic areas namely agriculture, urban planning, geosciences and water resources.



### NESAC conducted special training program on UAV Remote Sensing for ASSTC

NESAC conducted two days training program on “UAV technology for Remote Sensing” during Oct

10-11, 2022 and Oct 13-14, 2022 as part of the Recorders Certificate Course Training, 2021-22 (Batch-2, Group-A) of Assam Survey and Settlement Training Centre (ASSTC), Government of Assam. A total of 72 trainees attended the training program. The trainees were distributed into 2 groups with 36 trainees each. The training for 1st Group was conducted during Oct 10-11, 2022 and for the 2nd Group during Oct 13-14, 2022. The training focused on understanding the Photogrammetry, Remote Sensing & GIS, components of UAV platforms, various remote sensors, flight planning for data acquisitions and different data processing techniques for generation of ultra-high resolution data products such as Orthomosaics, Digital Surface/Terrain Models, 3D Textured Models, etc., which can be used for various planning and R&D purposes. The participants were also given demonstration on end-to-end work flow: UAV operations, mission planning, data acquisition, data processing and data analysis.



### One week Course on UAV RS Technology & Applications for CAPF and IB officials

A one week course on ‘UAV Remote Sensing and its Applications’ was successfully conducted at NESAC for Central Armed Police Forces (CAPF) and Intelligence Bureau (IB) officials working in Space Cell from 31st October, 2022 to 4th November, 2022. A total of 23 officials from BSF, CRPF, SSB, ITBP and IB participated in the course. The objective of the course was to disseminate knowledge to participants on UAVs and its components, flight planning for data acquisitions for various remote sensing applications. The course emphasised on mapping and surveillance

## Training programs organized by NESAC

applications, different data processing techniques such as generation of Orthomosaic, digital surface model (DSM), digital terrain model (DTM), contour maps, volumetric analysis etc. The five day course also included practical sessions on flight simulator, mission planning and data acquisition, data processing and data analysis.



### **NESAC conducted short course on “RS and GIS Applications in Forestry and Ecology”**

Two weeks short course on “Remote Sensing and GIS Applications in Forestry and Ecology” was conducted by Forestry and Ecology Division (FED), NESAC during December 05-16, 2022 at NESAC Outreach Facility. A total of 41 participants attended the course, which includes officials from forest department, faculties from colleges and universities, research scholars and post graduate students. Dr. S.P. Aggarwal, Director, NESAC welcomed all the participants and addressed the participants on the importance geospatial technology in various application of forest ecosystem such as forest management, forest working plan preparation, carbon stock assessment, climate change, etc.

The training covered basics of remote sensing and GIS, GPS, familiarization of remote sensing data and RS & GIS software. The topic covered in RS and GIS applications in forestry and ecology are forest cover and density mapping, growing stock and biomass assessment, wildlife habitat evaluation, species distribution modeling, forest fire monitoring and burnt area assessment. A brief introduction to advance remote sensing applications such as UAV, hyperspectral, microwave and LiDAR remote

sensing were given to the participants during the training course. Guest faculties were also invited to deliver the talk on some of the advance remote sensing technology. Dr. Subhash Ashutosh, IFS, Co-Chairman & Director (CoE, NRM & SL), MBDA was the chief guest during the valedictory program.



### **Short course on Satellite Communication Applications for Disaster Management**

One week short course on “Satellite Communication (SATCOM) Applications for Disaster Management” was conducted during 17-21 October in online mode. The course was targeted towards engineering students and working professionals of NE region. The subject matter of the course was planned to provide basic understanding of the satellite communication & navigation technologies and apprising about the diverse applications of SATCOM & SATNAV with special emphasis on disaster management applications. A total of 58 participants registered with diverse backgrounds. Faculties were a mix from various ISRO Centers and from all NER State Disaster Management Agencies (SDMA)s and West Bengal SDMA as well as from NESAC. One lecture was arranged from Industry Expert from Hughes Communications (India) Pvt. Ltd. Dr S.P. Aggarwal, Director, NESAC, during the valedictory program, highlighted the importance of emergency communication during disaster through various case studies. He congratulated the participants on their successful completion of the course and commended the Satellite Communication & UAV Activities Division (SUD) team for organizing the course. Shri Ramani Kumar Das, Head, SUD and Shri Anjan Debnath, SUD, NESAC served as the Course Director and Course Officer for the course respectively.

### Director, NESAC conferred with the Honour of ISRS Fellow

Dr. S.P. Aggarwal, Director, NESAC was conferred the honour of ISRS (Indian Society of Remote Sensing) Fellow during National Symposium of ISRS and ISG held during Nov 15-17, 2022 at HICC, Hyderabad. This prestigious honour recognizes his life time contribution in the field of space technology applications in different domains, particularly in the field of water resources management. He also made significant contributions to the growth of ISRS and the Journal of Indian Society of Remote Sensing (JISRS). He is currently serving as the Executive Editor of the JISRS, which saw significant enhancement in citation score during his tenure.



### The 22<sup>nd</sup> Foundation Day of NESAC was celebrated



NESAC celebrated its 22nd Foundation Day with a brief program on 5th Sept, 2022. The program started with the tree plantation by Prof. J. Adinara-

yana from IIT Bombay. Dr. B. K. Handique, Scientist-SF, NESAC felicitated Prof. Adinarayana on behalf of NESAC. Prof. Adinarayana also delivered the Foundation Day lecture at NESAC auditorium on the topic of Technology Intervention for National Development. He highlighted the recent developments in IoT (Internet of Things) applications. All the Division Heads of NESAC gave brief account of their divisions and highlighted the significant achievements of their respective divisions. The program ended with the vote of thanks offered by Shri Kumar Anand, Administrative Officer, NESAC.

### पूर्व - पूर्वोत्तर क्षेत्र का संयुक्त क्षेत्रीय राजभाषा सम्मेलन - 2022

08 दिसम्बर को सीएसआईआर-खनीज एवं पदार्थ प्रौद्योगिकी संस्थान, आचार्य विहार, भुवनेश्वर, उड़ीसा-75103 में आयोजित क्षेत्रीय राजभाषा पुरस्कार समारोह में भाग लिया।

उक्त कार्यक्रम में केंद्रीय गृह राज्य मंत्री श्री अजय कुमार मिश्रा तथा श्री भर्तृहरि महताब, उपाध्यक्ष, राजभाषा संसदीय समिति अध्यक्ष और मुख्य अतिथि के रूप में उपस्थित रहें। उत्तर पूर्वी अंतरिक्ष उपयोग केंद्र(एनईसैक), उमियम को वर्ष 2020-2021 के दौरान संघ की राजभाषा नीति के श्रेष्ठ निष्पादन के लिए प्रथम पुरस्कार स्वरूप शिल्ड की प्राप्ति हुई, जिसे निदेशक, एनईसैक की ओर से डॉ.

बिजय कृष्ण हैंडिक, कार्यक्रम नियोजन एवं मूल्यांकन समूह (पी.पी.ई.जी) ने केंद्रीय गृह राज्य मंत्री श्री अजय कुमार मिश्रा के कर-कमलों से ग्रहण किया और संगठन को प्रथम स्थान प्राप्त कराने में श्रीमती नमिता रानी पाल मित्रा, क.अनुवाद अधिकारी, एनईसैक के सहयोग हेतु श्री भर्तृहरि महताब, उपाध्यक्ष, राजभाषा संसदीय समिति द्वारा उन्हें प्रशस्ति पत्र से सम्मानित किया गया।



### NESAC signs MoU with NIT-Silchar

NESAC signed a Memorandum of Understanding (MoU) with National Institute of Technology – Silchar on 30th November, 2022 at Silchar, Assam. The MoU was signed by Dr S P Aggarwal, Director, NESAC and Prof Sivaji Bandyopadhyay, Director, NIT Silchar. The MoU will facilitate joint research and development activities and joint academic programs between the two institutions.



### Space on Wheel Bus displayed under AKAM

Space on Wheel bus Exhibition was organized by NESAC on 27th and 28th September, 2022 at Meghalaya Energy Corporation Limited Secondary School in Umiam, Meghalaya. The Exhibition was organized as part of the celebration of Azadi Ka Amrut Mahotsav (AKAM) by Government of India, in which the important sites related to freedom struggle of the country was showcased through different satellite imageries. Along with these, different achievements of ISRO and Indian space programs were also shown. More than 240 students of the school belonging to different age groups visited the exhibition and interacted with scientists of NESAC.



### Hindi Fortnight Celebration at NESAC

According to the guidelines issued by the Department of Official Language this year, Hindi Day celebration was inaugurated on 14th September, 2022 during the All India Official Language Conference, Surat (Gujarat). Shri Kumar Anand, Administrative Officer, NESAC participated in the program on behalf of NESAC. Hindi Pakhwada was organized at NESAC from 14th to 29th September, 2022 and a number of competitions were organized – such as Essay writing, Hindi poetry recitation, picture what speaks, noting translation (English to Hindi) etc. In addition, a creative writing and Drawing competition were also organized for the family members of NESAC employees.

A special typing competition was organized during this quarter in association with TOLIC, Shillong, in which a total of 4 employees were trained. During the closing ceremony organized on 29th September, 2022. Dr. S P Aggarwal, Director, NESAC, congratulated everyone for the successful organization of Hindi Pakhwada and also distributed the prizes to the winners of the competitions. The program concluded with vote of thanks proposed by Smt. Namita Rani Paul Mitra, Jr. Translation Officer and Member-Secretary, Official Language Implementation Committee, NESAC.

### Pada Yatra and Cycling organised at NESAC as part of Azadi Ka Amrit Mahotsav



As a part of the “Azadi Ka Amrit Mahotsav” celebration, a pada yatra and cycling was organised by NESAC on 31.10.2022. The pada yatra/cycling was flagged off after Director, NESAC administered the pledge on “Rashtriya Ekta Diwas” in the auditorium.

Scientists and staff of NESAC took part in the pada yatra and cycling, holding placards on National Unity Day and important events that led to Indian independence with an aim to create awareness among public residing near NESAC campus. The programme was coordinated by Dr. Pebam Rocky, Shri. Santanu Das and Shri. Sumanth B.C., Scientists, NESAC.

### **NESAC participates in Rastriya Bal Vigyan Pradarshani**

NESAC participated in the exhibition organized on the occasion of 49th Rastriya Bal Vigyan Pradarshani (RBVP), and the 'Space on Wheel' bus exhibition with the was placed at Srimanta Shankardev Kalashetra, Guwahati from 22nd November 2022 to 26th November, 2022. The exhibition was organized by State Council of Educational Research and Training (SCERT) Assam in association with RBVP, in which schools from all over India have participated. More than 500 students from various schools, teachers and local public visited to the exhibition and interacted with NESAC Scientists.



### **NESAC participates in 21st National Space Science Symposium at Science city Kolkata**

NESAC participated in the National Space Science Exhibition (NSSE)-2022 organized by the Centre of Excellence in Space Sciences, Indian Institutes of Science Education and Research (IISER), Kolkata, along with the Indian Space Research Organization (ISRO) and several partner institutions from 6th to 11th December, 2022. There was active participation from premier educational institutes of the state as well as Private partners of ISRO.

NESAC showcased the Centre's activities to the aspiring audience. Apart from researchers, school students as well as common public also got an opportunity to see, learn and discuss about various applications related to space science as well as earth observation. A number of renowned scientists and officials also interacted with NESAC team. The event provided a platform for NESAC scientists to interact with other researchers and experts to exchange ideas and knowledge, which will help them in accelerating research in the area of space science in the NE region.



### **Observance of activism on elimination of violence against women at Workplace**

The 'Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 was notified on 9th December 2013 to provide a safe and secure environment to women at the workplace. 25th November is observed across the globe as the International Day for the Elimination of Violence against Women and 10th December is observed every year as International Human Rights Day. The 16 days period between 25th November and 10th December is observed for raising awareness about elimination of all forms of violence and discrimination against women so as to ensure safety, security and holistic empowerment of women and to ensure that the basic human rights of women and girls are respected by all.

As part of the observance of 16 days (25.11.2022 to 10.12.2022) activism on Elimination of Violence against Women at Workplace, Banners were displayed in the Office premises. Apart from that, awareness and sensitization programmes such as survey on the awareness of sexual harassment of women at workplace was conducted for all employees by NESAC Internal Complaints Committee (ICC) on 07.12.2022 and a Lecture on the topic “Understanding Concept of Gender & Recognizing and Combating Sexual Harassments” was delivered by Ms. Balarisha Lyngdoh, Director and Founder of NGO, Keeping our Nature’s Gift (KONG) on 08.12.2022.

### **Students from St. Anthony’s College, Shillong visited NESAC as part of Industry Interaction**



Fifty four students from St. Anthony’s College, Shillong studying in the final year of B.Sc. and MCA in Computer Science accompanied by three faculty members visited NESAC on 1st September, 2022 as a part of their industry visit and interaction. The students’ visit was coordinated by Ms Ritu Anilkumar, Scientist, NESAC. The program began with a facility visit to Space and Atmospheric Science lab, Satcom Studio and ISTRAC

ground station. A demonstration of the facilities available at the NESAC UAV lab was also made by Mr. Sanjay Pandit, Scientist, NESAC. The students were also given a general overview of Indian Space Programme and various activities of NESAC and other ISRO/DOS Centres.

### **Students from IIT Roorkee visited NESAC**

A group of 30 students of integrated M.Tech course in Geological Technology from IIT Roorkee along with two faculties from the same department visited NESAC on 26th September, 2022. The visit was conducted as per the suggestion of Hon’ble Prime Minister of India to conduct study tours by Universities students to various destinations located in the North Eastern Region of the country. The group visited several locations in the NE region of our country along with NESAC during a week long program.

The day long program at NESAC comprised of four lectures/briefings on activities of NESAC with an emphasis on geology, geo-hazards, hydrology, water resources, etc. followed by visit to the major facilities. The students were taken to UAV lab, Atmospheric Science lab, NER-DRR facilities, and IRNSS ground station.



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