

REPORT ON NESAC USER INTERACTION MEET

2nd Edition

NeUIM 2024

Harnessing Space Science & Technology to enhance Societal benefits, Governance, Natural Resource Management, Disaster Management Support, and Outreach and Networking with Stakeholders, Academia, and Industry

September 5-6, 2024



NeUIM-2024 Report

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Director's Preface

North Eastern Space Applications Centre (NESAC) under Department of Space has been providing dedicated services for planning and developmental activities of NE region using space science and technology since its inception in the year 2000. Over the past 24 years, NESAC has made substantial contributions to sectors such as natural resource management, disaster management, infrastructure planning, and environmental monitoring. Since its establishment, NESAC has successfully executed more than 400 projects across various thematic areas. Currently, NESAC is working on 131 projects in collaboration with numerous state and national-level user departments. Of these, 110 projects fall under the Plan of Action (PoA) for leveraging space technology in the North East Region, an initiative outlined by the Hon'ble Union Home Minister during the 9th NESAC Society meeting. Most of these PoA projects have been completed, with a few in the final stages. This has led to the development of a vast geospatial database encompassing all eight northeastern states. Majority of user departments in the NE region are provided with geospatial data and services to support their development and monitoring efforts. In addition, NESAC has collaborated with many prestigious research and academic institutions by signing MoUs to enhance research and development for operational services. Large number of capacity-building programs have been implemented to ensure the effective application of geospatial inputs and to strengthen human resources in space technology within the region. NESAC had conducted 1st User Interaction Meet (NeUIM) on May 23-24, 2022 in hybrid mode. The event fostered significant user engagement, assisting in the acquisition of feedback on the wide range of space-based products and services provided by NESAC in multiple application domains.

During the 11th NESAC Society Meeting on January 19, 2024, the Hon'ble Union Home Minister stressed the importance of using space technology for enhanced governance and administrative support. Additionally, a significant rise in the demand for support in space science and technology has been noted among various user departments. The 2nd Edition of NeUIM took place on September 5-6, 2024, in a hybrid format to encourage the optimal use of space technology for development and governance. Its goal was to leverage Space Science and Technology to improve societal benefits, enhance governance, strengthen natural resource management, support disaster management, and foster connections and outreach among stakeholders, academia, and industry. This event marked the beginning of

NESAC's yearlong Silver Jubilee Celebrations, culminating in September 2025. The NeUIM-2024 program was crafted to help user departments, academia, and industry explore areas where space technology can make an impact and provide feedback on NESAC's products and services. It also included a special start-up session in collaboration with IN-SPACe. The event received excellent participation, with more than 1,121 attendees from state and central departments, academic bodies, PSUs, and industries nationwide.

I would like to express my deep appreciation to all the scientists, engineers, and supporting staff at the center for their remarkable efforts in ensuring the success of NeUIM-2024.

(Dr SP Aggarwal)

Executive Summary

The 2nd Edition of the NESAC User Interaction Meet (NEUIM) was held on September 5-6, 2024, in a hybrid format. This event marked the commencement of NESAC's yearlong Silver Jubilee celebrations, culminating in September 2025. NeUIM 2024 aimed to leverage Space Science and Technology to enhance societal benefits, improve governance, strengthen natural resource management, support disaster management, and promote outreach and networking among stakeholders, academia, and industry. The event was inaugurated by Dr. R.R. Navalgund, Former Director of NRSC and SAC, as Chief Guest, alongside Guests of Honor Shri Shantanu Bhatawdekar, Scientific Secretary of ISRO, and Dr. Prakash Chauhan, Director of NRSC, who attended online. The event included several key technical sessions: "EO Applications in India: Legacy, Current Trends, and Future Directions"; "Understanding User Needs and Expectations" (targeted sessions for various northeastern states); "Geospatial Technology for Disaster Risk Reduction and Governance"; and "Interfacing with Academia and Industry." Additionally, the event featured an exhibition and a special session focused on IN-SPACe startups, mentored by Dr SP Aggarwal, Director, NESAC and AVM DV Khot from IN-SPACe. The exhibition highlighted innovative applications, while the special session provided startups with a platform to transition space technologies from lab to operational use, promoting innovation and entrepreneurship in NE region. At the conclusion of the technical sessions, Shri Angshuman Dey, IFS, Secretary of NEC, addressed the participants virtually.

Over the two-day program, 38 speakers representing NESAC/ISRO, various state and central departments, academic institutions, and industries shared valuable insights. NeUIM-2024 garnered an overwhelmingly positive response, attracting over 1,121 participants from state and central departments, academic and research institutions, PSUs, and industries nationwide, with approximately 170 attending in person. The YouTube live stream also recorded more than 885 views.

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Background

The North Eastern Space Applications Centre (NESAC) was established on September 5, 2000, at Umiam, Shillong, Meghalaya, as an autonomous institution under the Department of Space (DOS), jointly with the North Eastern Council (NEC). NESAC leverages space science and technology to address the unique challenges of the eight North Eastern states, aiming to drive socio-economic growth through space-based innovations. The vision of NESAC is to become a leading center of excellence in applying space technology to drive socio-economic growth in the NE Region, fostering transformation through the effective use of space-based innovations. NESAC is equipped with advanced IT and geospatial technology labs, including high-end workstations, servers, and GPU resources for research and applications. The Centre also offers cloud-based computing for outreach and training, with high-speed internet and open-source software. Recently, NESAC initiated the North East Artificial Intelligence (NeAI) lab for advanced research and GeoAI support in various application areas. The Centre is also well-prepared for satellite communication projects, including emergency communication, and features sophisticated tools like the Doppler Weather Radar (DWR), a high-performance computing cluster, and a state-of-the-art drone facility for imaging and disaster management.

Over the past 24 years, NESAC has made substantial contributions to sectors such as natural resource management, disaster management, infrastructure planning, and environmental monitoring. The Centre has generated an extensive geospatial database and developed a variety of dashboards and mobile applications tailored for the NE region. NESAC has also conducted numerous capacity-building programs to enhance human resource development in space technology applications across the region, training over 40,000 personnel. Additionally, NESAC has signed MoUs with good number of numerous premier research and academic institutions, as well as government departments, to foster research and development for operational services. Since its inception, NESAC has successfully completed over 400 projects in various thematic areas. Presently, NESAC is engaged in 131 projects, collaborating with numerous user departments at both state and national levels. Among these, 110 projects are part of the Plan of Action (PoA) on the use of space technology in the NER, as envisioned by the Hon'ble Union Home Minister during the 9th NESAC Society meeting. Most of the PoA projects have been completed, with a few nearing completion.

There has been a substantial rise in the demand for space science and technology support across different user departments. Although a number of departments are already leveraging

space-based data for their planning and development activities, many are still in the learning phase with these technologies or they need more advanced technological supports. To address these needs, NESAC organized the first edition of the NESAC User Interaction Meet (NeUIM-2022) on May 23-24, 2022. This event fostered valuable dialogue with close to 400 users, gathering their feedback on NESAC's space-based products and services.

As NESAC approaches its 25th year, the yearlong Silver Jubilee celebration was kicked started with the 2nd Edition of the NeUIM (2024) which was held during September 5-6, 2024, in a hybrid format (online and in-person). The NeUIM-2024 was focused on utilizing Space Science and Technology to boost societal benefits, improve governance, enhance natural resource management, provide disaster management support, and foster outreach and networking with stakeholders, academia, and industry.

The NeUIM-2024 was spread over the course of two days and the technical agenda included sessions on Earth observation applications, stakeholder interactions to understand user needs, and fostering collaboration between key stakeholders, academia, and industry. Special sessions on interfacing with academia, industry, and IN-SPACe for startups were also featured.

Inaugural Programme

The inaugural session on 5th September, 2024 began with an invocation, lighting of the lamp, and Saraswati Vandana. Dr. SP Aggarwal, Director, NESAC, extended a warm welcome to the participants and introduced NESAC, highlighting the Centre's accomplishments in completing over 400 projects with 100 ongoing, supported by the collaboration of stakeholders. This was followed by a virtual address from the Guest of Honor, Shri Shantanu Bhatawdekar, Scientific Secretary, ISRO. He emphasized the importance of understanding the requirements of departments, industry, and academia and commended NESAC for its contributions in remote sensing, disaster response, meteorological services, and satellite communication, as well as its diverse applications. Shri Bhatawdekar also acknowledged NESAC's upcoming Silver Jubilee and lauded its efforts in extending space technology infrastructure to the last mile. The event was honored by the presence of Dr. Prakash Chauhan, Director, NRSC, who outlined the significance of India's space policy in promoting geospatial development in the Northeast. He stressed the importance of engaging with academia for skill development and urged startups to partner with IN-SPACe to collaborate with stakeholders across the region.

The keynote address was delivered by the Chief Guest, Dr. R.R. Navalgund, former Director of SAC and NRSC, who shared his extensive experience in ISRO and DoS. He reflected on the decision to establish NESAC as a dedicated space applications centre for the North Eastern region and praised the Centre's remarkable transformation. Dr. Navalgund appreciated key NESAC projects such as FLEWS, the Forest Working Plan, Tele-Education, and Tele-Medicine. The inaugural event was further enriched by the esteemed presence of former NESAC Directors, Shri PLN Raju and Shri KC Bhattacharyya. The inaugural session concluded with a vote of thanks from Dr. KK Sarma, Group Head, RSAG, NESAC. The event was anchored by Dr. Kasturi Chakraborty, Head, FED, NESAC.



Photo mosaic of the Inaugural session

Technical Sessions

Technical Session-1: EO Applications in India: Legacy, current trends & future directions

The Technical Session-1 was chaired by the Chief Guest Dr. R.R. Navalgund, Former Director, SAC and NRSC. The session was started with a lead talk from session chair on "Transforming India: Space technology and applications". There were total 4 talks in the first technical session which includes the lead talk. Dr. S.P. Aggarwal, Director, NESAC, served as the Co-Chair.

Dr. R.R. Navalgund began his talk by tracing the transformative role of space technology across multiple domains in India. He provided a brief history of the Indian space program, beginning with the establishment of INCOSPAR in 1962, the launch of Nike Apache in 1963, and the contributions of pioneers like Vikram Sarabhai and Satish Dhawan in setting up

ISRO's structure and operational focus. Dr. Navalgund touched upon key achievements, such as the launches of Aryabhata and Bhaskara, and the development of SLV-3 and ASLV rockets, leading to the establishment of launch sites on India's east coast. He also discussed advances in rocket technology, from solid to cryogenic propulsion, and highlighted the importance of developing a semi-cryogenic stage. In his broad overview of the present state of the Indian space program, Dr. Navalgund covered the main launch vehicles of ISRO—PSLV, GSLV Mk II and III, and SSLV—while mentioning plans for a third launch pad to accommodate private sector launches. He highlighted advancements in communication satellites, particularly the INSAT and GSAT series, and the utilization of satellite communication for a range of applications, including tele-education, telemedicine, and search and rescue operations, with a focus on the North East. He also spoke about India's progress in remote sensing, starting from the use of helicopters to detect coconut rot wilt, and the establishment of the National Natural Resources Management System (NNRMS) in 1983. The launch of IRS-1A in 1988 marked the beginning of India's journey in remote sensing, which has since expanded to cover forestry, fisheries, disaster monitoring, and weather forecasting. He concluded with India's ventures into planetary exploration, highlighting missions like Chandrayaan, Mangalyaan, and Aditya L1, and future goals such as cost-effective access to space.

The second talk, delivered by Dr John Mathew, Associate Director, EDPO, ISRO HQ, focused on the trends in Earth Observation (EO) systems and future missions. He discussed how EO systems contribute to sustainable development goals, disaster risk management, and governance. Dr. Mathew highlighted the increasing role of advanced technologies such as machine learning, artificial intelligence, and blockchain in enhancing EO programs. He noted that ISRO will transition to focusing on research and development, with industry taking over operational responsibilities. Future EO missions, including RISAT-1B, Oceansat, and TRISHNA, were also discussed, with a focus on their applications in agriculture, water management, energy, and biodiversity. He concluded by underscoring India's leadership in geospatial services for the Global South and ISRO's dedication to emerging technologies and data policies.

Dr. D. Ramadevi, from DPOG, DPA, NRSC, delivered the third presentation, focusing on improving access to Earth Observation (EO) data through policy reforms and platform initiatives. She outlined the key reforms introduced under the National Geospatial Policy (NGP) and the Indian Space Policy (ISP) 2023, which aim to democratize publicly funded data. Dr. Ramadevi explained that satellite data with a resolution finer than 5 meters is freely available to government agencies, while value-added data comes at a cost. She emphasized

the removal of restrictions on satellite data access, benefiting both public and private entities. The Bhoonidhi platform, designed to simplify access to satellite data, was also highlighted, offering features like direct downloads, filtering, and real-time analysis.

The session concluded with a presentation by Dr. S.P. Aggarwal, Director of NESAC, who gave an in-depth overview of the geospatial ecosystem and NESAC's role in advancing the development of the North East region. Dr. Aggarwal emphasized the critical role of technologies like miniaturized sensors, geospatial AI, UAVs, and LiDAR in delivering real-time, high-resolution data. He outlined NESAC's contributions, showcasing 400 completed projects and 89 ongoing initiatives, and detailed the cutting-edge facilities at the center, including high-performance computing and advanced sensors. Highlighting key projects in the NER, such as flood early warning systems, forest fire monitoring, and Geo-tourism dashboards, Dr. Aggarwal also stressed the importance of collaboration between the government, academia, and industry to further regional growth.



Scenes from Technical Session-1

Outcome of the Technical Session-1

Following are the outcomes of Technical Session-1:

- **Strengthen Public-Private Collaboration:** Increase private sector involvement in space technology, particularly in Earth Observation (EO) services encouraging end-to-end operational services by private entities.
- **Focus on Emerging Technologies:** Prioritize the integration of AI, machine learning, blockchain, and cloud computing in EO applications to enhance real-time analysis, disaster monitoring, and sustainable development planning.
- **Expand Geospatial Infrastructure:** Existing and future satellite constellations to be used to improve spatial and temporal resolution for applications such as precision agriculture, disaster risk reduction, and atmospheric monitoring.
- **Enhance Data Accessibility and Policy Implementation:** Access to satellite data through platforms like Bhoonidhi, NeSDR is important and implementation of the new National Geospatial Policy and Indian Space Policy 2023 to support data democratization and utilization by government and private sectors.

Technical Session-2.1: Understanding User Needs and Expectations: Arunachal Pradesh, Assam, Manipur & Meghalaya

The Technical Session-2.1 was chaired by Shri PLN Raju, Special Secretary, DST & CC, & Director, ASSAC, Govt. of Assam. Dr BK Handique, Head, ASD & PPEG, NESAC co-chaired the session. The session included eight presentations, the first of which was delivered by Dr. H.K. Dutta, Director of AR-SRSAC. He provided an overview of the activities and accomplishments of the centre. The center has been involved in projects focusing on natural resource management, disaster management, and the creation of geospatial repositories. Significant achievements include hydro-geomorphological mapping, wetland mapping, and monitoring of snow and glacier areas. APSAC has also made progress in crop expansion by identifying suitable sites for cultivating orange, kiwi, and walnut crops. Additionally, the center has collaborated with ISRO, NEC, and NESAC to tackle regional issues such as landslide and flood susceptibility mapping.

Shri B. Baishya from the Assam State Disaster Management Authority (ASDMA) delivered a presentation on ASDMA's leadership in disaster risk reduction within Assam. Established in 2007, ASDMA has created a flood hazard atlas and early warning systems to bolster

disaster resilience. Shri Baishya outlined ASDMA's collaboration with NESAC in mapping major rivers, generating flood scenarios, and using UAVs for flood monitoring. He also emphasized the creation of a decision-support web portal that maps key state infrastructure such as schools and hospitals. One major challenge highlighted was the lack of data interoperability across departments, as well as the limitations caused by cloud cover in satellite imagery.

Dr. Amitav Chakravorthy from the Government of Assam spoke about using geospatial tools to manage transboundary animal diseases, focusing on African swine fever's outbreak in 2020. He highlighted the use of buffer analysis and zoning, along with the creation of a TADS project dashboard and mobile app for monitoring livestock and veterinary infrastructure.

Dr. M. Chutia from the CSB presented on how geospatial technology aids sericulture development. He explained the use of site suitability analysis to find suitable areas for silkworm food plants in the Northeast, focusing on eri, muga, tasar, and mulberry silks. He also highlighted a geoportal and mobile app for sericulture, which incorporates early warning systems for silkworm diseases, supported by NESAC's technical expertise in UAV mapping and spectral analysis.

Md. SD Khan from the Manipur CEO's office provided insights into the election eATLAS system, designed to monitor polling stations, track real-time incidents, and assess infrastructure in proximity to these stations. He emphasized the critical need for ensuring safe and efficient polling processes, which include providing the most direct routes to polling stations and overseeing sector officers. Future initiatives aim to incorporate AI for enhanced crowd management and security risk assessments at polling locations.

Shri O.N. Singh, Director, MARSAC discussed the usage of space technology for effective governance in Manipur, particularly in disaster management and combating illegal poppy cultivation. He shared how NESAC-supported satellite data was used to identify and destroy poppy plantations, conduct drone surveys, and monitor flood-affected areas.

Dr. G. Singh from the Meghalaya Basin Development Authority (MBDA) highlighted geospatial services provided in collaboration with NESAC. These services included the use of UAVs and GIS tools for springshed management, village boundary demarcation, and precision agriculture. Community engagement played a significant role, with village-level facilitators using mobile apps and GNSS for data collection and planning.

The session wrapped up with Shri PLN Raju, the session chair, presenting on NESAC's collaboration in geospatial services, such as UAV-based cadastral mapping and land encroachment monitoring. He stressed the need for technology transfer to state governments and startups and recommended expanding the NESAC user meet to involve state-level participation for better engagement and capacity building.



Scenes from Technical Session-2.1

Outcome of the Technical Session-2.1

The discussions during the session can be summarized as follows:

1. Enhanced Disaster Risk Management: Strengthen flood and landslide early warning systems by improving data sharing across departments, enhancing real-time inundation mapping, and addressing interoperability issues for disaster preparedness.
2. Request to expand user meet to every state delegating responsibility to state centres to ensure the usefulness of space technology reaches all government departments.

3. Operation and maintenance services and support pertaining to UAV activities can be supported by NESAC and NGISRSC.
4. Online analytics services to be added and augmented to ensure departments that don't have access to costlier software will not be left behind in utilizing geospatial data.

Technical Session-2.2: Understanding User Needs and Expectations: Mizoram, Nagaland, Sikkim & Tripura

Shri KC Bhattacharyya, former Director of NESAC, chaired Technical Session 2.1, co-chaired by Smt H. Suchitra Devi, Scientist-SF, FED, NESAC. Dr. Ipsita P. Bhowmick from RMRC, ICMR, introduced the FeverTracker app, designed for malaria surveillance in Tripura in collaboration with NESAC. The app, which supports multiple languages, allows users to log travel history and symptoms, aiding ASHA workers in providing accurate diagnoses and treatment options with pictorial drug representations. Originally developed during the COVID-19 pandemic, it has since expanded to other northeastern states and is now used for various diseases, including dengue and chikungunya. The session also included the MosquitoTracker app, which uses AI for genus-level mosquito identification and has been patented. Dr. Bhowmick discussed the link between shifting cultivation and malaria incidents in Tripura, using weather data to study fever trends.

The second talk by Ms. Hmingthanpui, Principal Scientist, MIRSAC, Mizoram discussed the geospatial applications in Mizoram, particularly focusing on agriculture and horticulture projects conducted in collaboration with NESAC under the Plan of Action (PoA). She also emphasized the future requirement for landslide hazard mapping and vulnerability assessments in the state.

Er. M. Kithan, Project Director of NGISRSC, Nagaland, highlighted the state's geospatial services, including the Nagaland Bee and Honey Mission, which focuses on locating suitable sites for wild bees. His collaboration with the Department of Aquaculture has led to the identification of key water bodies, such as lakes and rivers. UAV technology has been employed for medical deliveries and precision agriculture, including biofertilizer and pesticide spraying. He also discussed AI applications for traffic management and parking systems, as well as the use of 3D printing for drone components. Additionally, initiatives to enhance the state's geospatial capabilities are underway, with support from NESAC for updating the data repository.



Scenes from Technical Session-2.2

Ms. Lucy H, State Project Officer, Rural Development, Nagaland explained the application of geospatial technology in rural development under the MGNREGA scheme. She discussed the GeoMGNREGA app, which is used to geotag assets at various stages of development to ensure transparency and better governance. The app has been particularly useful for sustainable resource management at the village level. She emphasized the need for NESAC's support in identifying site suitability for water conservation projects, such as spring management.

Shri A. Dasgupta, In-charge of TSAC in Tripura, outlined the state's geospatial services developed over 20 years in collaboration with NESAC. He highlighted important projects like the Flood Early Warning System (FLEWS) for flood monitoring, UAV-based landslide mapping, and agarwood plantation management. He also discussed GIS-based master plans and property tax mapping in Tripura's towns. For the future, he emphasized the need for capacity building in line departments, creating a GIS data-sharing platform, and launching pilot projects for wider departmental application.

Shri D. Das, Deputy General Manager (C) of NEEPCO, discussed NESAC's support for weather data monitoring in governance and development. He noted that weather stations have been installed in remote areas for real-time data access at control centers. He also stressed the need for NESAC to implement a GLOF (Glacial Lake Outburst Flood) early warning system and requested more frequent data updates, proposing to shorten the interval from one hour to 30 minutes.

Outcome of the Technical Session-2.2

Support sought from NESAC as highlighted in this session are listed below:

1. GLOF early warning systems and enhanced hazard mapping: Support for real-time monitoring of glacial lake outburst floods, landslides, and vulnerability assessments.
2. Site suitability for water conservation projects: Assistance in identifying and managing critical water resources through geospatial analysis.
3. Computing support and data analytics: Provide advanced data analytics and computing infrastructure for regular systems and decision-making processes.

Technical Session-3: Geospatial technology for disaster risk reduction and governance

The Day-2 event on 6th Sept, 2024 was started with Technical Session-3 which was chaired by Dr KK Sarma, Group Head, RSAG, NESAC and co-chaired by Dr Dibyajyoti Chutia, Head, GID, NESAC. This session had a well rounded list of speakers from IIT Guwahati, CDAC, NIC, and also from NESAC, talking about various aspects of disaster preparedness and management.

Dr. S. Dutta, Professor, IIT Guwahati presented on the socio-hydrological dimensions of fluvial disasters in Brahmaputra basin. Dr. Dutta discussed how the river systems are intricately connected with other components of the earth system, like sediment transport, rainfall, etc. He also explained about the mechanism of spatial distribution of sediments in mountain rivers, with special emphasis on Brahmaputra. In his talk he emphasized on the socio-hydrological approach to river management.

Dr. Dutta's talk was followed by a talk on HPC based disaster management systems by Dr. Manoj K. Khare, Senior Director & HoD, CDAC, Pune. Dr. Khare showed how CDAC, Pune, is

applying its HPC resources for various earth system applications, like weather forecasting, flood prediction, predicting the spread of forest fire, etc. He started his presentation by emphasizing the need for using HPC infrastructure for disaster management, advanced data acquisition services, and integrated modeling approaches for extreme weather events. He showcased the various applications developed by CDAC, Pune, for disaster support, like their early warning system for flood prediction which is an integrated framework that includes flood modeling and sediment transport modeling, a forest fire spread model using satellite images and computational fluid dynamics modeling, an integrated modeling approach for urban modeling for enabling decision support systems, no name a few.



Scenes from Technical Session-3

The session included a presentation by Dr. Ujjal D. Baruah from Cotton University, who discussed the application of geospatial technology in climate-resilient planning. Additionally, Shri Sekhar Dey from the National Informatics Centre (NIC) presented on the National Knowledge Network and its role in facilitating various academic and research organizations in their diverse activities.

The session featured presentations from NESAC scientists addressing different facets of disaster management and governance. Shri P. S. Singh, Scientist-SF, GID at NESAC, highlighted the various geoportals developed by the organization to assist user agencies in the North East. Among these, he presented the North Eastern Spatial Data Repository (NESDR), which serves as a comprehensive solution for users seeking geospatial data of interest. This platform is utilized by various departments for planning and development. Singh emphasized its analytical capabilities and customizable features for creating user-specific geospatial applications. These support electoral processes, project monitoring, health surveillance, disaster warnings, agriculture, forestry, tourism, and infrastructure management. He highlighted the Election e-ATLAS used in the northeastern states during the 2018-2024 elections, enhancing electoral planning. A multi-pronged imaging approach involving apps, satellites, and drones enables geo-tagging and monitoring of 1,686 project sites for timely completion. Singh discussed space technology's role in improving health access and generating AI-based disease risk maps for malaria. He also introduced geotourism and mentioned GeoAI applications in governance, such as precision agriculture to boost crop production.

Dr. Rekha B. Gogoi, Scientist-SF at NESAC, presented the activities of the North Eastern Node for Disaster Risk Reduction (NER-DRR), designed to utilize space technology for inclusive disaster management. She described NER-DRR as a one-stop platform for disaster information relevant to the North East Region. Highlights included 48-hour weather forecasts from the Weather Research and Forecasting Model for flood predictions, a lightning alert system, forest fire warnings, a landslide inventory for monitoring, and earthquake precursor maps using SAR interferometry. Dr. Gogoi mentioned that NESAC's flood warning accuracy is as high as 85%.

Shri V. Saikhom, Scientist-SF at GID, NESAC, showcased the diverse applications of Unmanned Aerial Vehicles (UAVs) employed by NESAC. He highlighted the transformative impact of UAVs on near real-time and on-demand geospatial services in the North East Region (NER), emphasizing their unique advantages over traditional methods, including rapid assessments, cost efficiency, scalability, and accuracy. Additionally, he illustrated the use of UAV-based remote sensing for various purposes, such as project monitoring, topographic surveys, mapping, and precision agriculture.

Outcomes of Technical Session-3

The key outcomes of this session are:

- NESAC's North Eastern Spatial Data Repository (NESDR) and North Eastern Node for Disaster Risk Reduction (NER-DRR) provide crucial platforms for real-time disaster information and early warning systems. Their continuing support is critical for disaster risk reduction activities for all states.
- Enhanced collaboration with local agencies is needed for grassroots-level dissemination of disaster-related data.
- UAV-based geospatial services by NESAC can assist states with rapid assessments, project monitoring, and disaster response.
- High-performance computing (HPC) for advanced disaster modelling and integration of multi-source data can significantly improve preparedness and decision-making in the North East.

Technical Session-4: Interfacing with the Academia and Industry

Dr. M.A. Paul, Associate Director at ISRO Headquarters, chaired the session with Dr. S.S. Kundu from NESAC as co-chair. Dr. Paul opened the discussion on collaboration and funding opportunities for academia in the space sector, spotlighting the RESPOND initiative, launched by Satish Dhawan in 1971 to support high-impact research. He outlined several initiatives, including RESPOND projects, Space Tech Cells at institutions like IISc and IITs, and the Regional Academic Centre for Space at Gauhati University to promote partnerships in the Northeast. The Space Tech Incubation Centers (STIC) designed to support startups were also mentioned, with projects submitted through the iGRASP portal and ISRO scientists serving as co-principal investigators. He highlighted the STIC at NIT Agartala's role in encouraging product-oriented startup projects.

Dr. R. K. Josmee from CAU followed with a presentation on empowering farmers using drones. He demonstrated how UAVs are used to gather data on target crops, including details like crop health and growth stage. He emphasized the importance of real-time data processing for farmers to take immediate action. The need for longer battery life and AI integration for real-time decision-making was also highlighted. Questions from the audience

raised concerns about early warning versus post-event monitoring, with some insights shared on the use of NIR for early advisories.

Dr. Ferdous A. Barbhuiya, Professor, IIIT, Guwahati gave a talk on the 'AI revolution' and its impact on redefining how we live and work. He explained how advancements in GPU, IoT, and cloud computing have enabled rapid data processing and service-oriented AI applications. He introduced new concepts such as autonomous AI, generative AI, and quantum AI, which are transforming the AI landscape. The session concluded with a discussion on quantum computing for AI and its potential applications.

Shri Adesh Dhar from Trimble showcased geospatial solutions that link field data collection with cloud computing. Following this, Shri Harnam Singh and Shri Kalyan from IGIS and Capella Space presented on SAR imagery, emphasizing their collaboration with Capella and Maxar to achieve 25cm resolution autonomously and provide change detection products. Shri Goswrisankar from VassarLab discussed emerging technologies for climate change, introducing a disaster management platform that combines real-time rainfall data, cloud monitoring, flood forecasting, and early warnings for extreme weather events.

In an insightful presentation, Dr. Deb Jyoti Pal from GalaxEye Space shared how they are harnessing drones, aircraft, and high-altitude pseudo-satellites (HAPS) to map and monitor ground assets across the Northeast. He detailed their innovative approach to integrating SAR and EO data for superior asset management and revealed plans for future satellite launches that promise even more advanced monitoring solutions.



Scenes from Technical Session-4

Outcomes of the Session

The key takeaways of this session are:

- **Create Joint Research Platforms:** Academia is invited to utilize the services and participate in STCs, STICs, RACs to encourage product-oriented startup projects and joint research.
- **Encourage Cross-Sector Innovation:** Promote interdisciplinary research that leverages AI, UAVs, and geospatial technologies for solving real-world challenges, especially in agriculture, disaster management, and climate change. This can be a suitable interface between government users, industry and academia.
- **Industry-Backed Academic Projects:** Support research through initiatives like RESPOND, where industry can co-fund and co-guide academic research aligned with commercial and societal needs.

Interaction with Secretary, NEC



At the conclusion of the technical session, Shri Angshuman Dey, IFS, Secretary, delivered special remarks in which he expressed his pride in NESAC's significant contributions as a vital branch of ISRO in the Northeast. He highlighted the organization's innovative work in collaboration with state departments and NEC, emphasizing the need to convey the benefits of space technology to grassroots levels. Projects like crop site suitability and geotagging of MDoNER-funded initiatives for disaster mapping were mentioned as key examples. Dey recommended leveraging PM-Gati Shakti for geotagging all MDoNER projects and extending this approach to central and state-level initiatives. He also suggested the creation of a Drone Center of Excellence and emphasized the potential for a dedicated satellite to offer tailored data to various departments. He urged increased usage of NESAC's datasets and geospatial services and assured that NEC would back innovative tech projects. Dey concluded by thanking NESAC, celebrating its strengths and future collaborative opportunities.



Special Session on IN-SPACe for Start-Ups

The special session entitled "IN-SPACe for Startups" was chaired by Dr. S.P. Aggarwal, Director of NESAC, with Shri AVM D.V. Khot from IN-SPACe as the co-chair. AVM D.V. Khot provided an overview of IN-SPACe's initiatives aimed at advancing innovations from laboratory settings to operational stages, focusing on data dissemination and the establishment of ground segments. The session featured a total of five presentations from various start-up industries.

Shri Dhruva Ranjan, representing Satsure, took the stage to discuss space-based decision intelligence specifically designed for the North East. He illustrated how his company is at the forefront of producing analysis-ready data to enhance the efficacy of space technology. Among the tools he introduced were Sparta, a comprehensive data catalog and analysis instrument, and ForestStack, an open-source solution for assessing forest health and carbon levels, developed in collaboration with Rajasthan. In addition, he shed light on their agricultural initiatives, which include crafting credit scores for farmers, and mentioned their sister organization, KaleiEO, which is working on a satellite constellation.

Shri Ankit Bhateja from Xovian discussed the importance of addressing the challenges of broken remote sensing infrastructure in the North East. He detailed how his company uses multiband radio frequency signals and GNSS reflectometry for monitoring surface parameters, landslides, avalanches, cyclones, and even earthquakes. He emphasized Xovian's development of space-grade hardware and their participation in IN-SPACe's opportunity fund scheme to deploy receivers in the North East.

Shri Vignesh from Thazhal Geospatial Analytics Pvt. Ltd. shared his work on leveraging geospatial data for infrastructure and environmental monitoring. His company, incubated through IIM and supported by IITs, integrates AI with satellite data to monitor deforestation, floods, and infrastructure. He also described how they collaborate with district administrations to monitor changes in lakes and use drones for 3D reconstruction of assets.

Shri Swarn Pant from Suhora focused on disaster resilience in the North East using space technology, particularly through flood inundation mapping using SAR data and developing solutions for monitoring glacial lake outburst floods (GLOFs). He discussed the integration of SAR and meteorological data to assess changes in snow cover and slope deformation, providing decision-making tools for disaster management.



Scenes from special session on INSPACE for startups

Mr. Kiran from Skyserve presented the capabilities of AI-driven solutions in providing real-time insights for the management of natural resources. His company specializes in disaster management, infrastructure development, and agricultural applications, utilizing multisensor data visualized through web-based GIS dashboards. He also emphasized the advantages of edge computing for enhanced data processing and storage efficiency.

Outcomes of the Session

During the session, various insightful suggestions and comments about startups and IN-SPACE were shared, summarized as follows.

- **Workshops and Resources:** Multiple workshops will be conducted soon to foster startup growth, and the IN-SPACE website provides a detailed map of startup categories which can be leveraged for easy navigation and exploration of opportunities.

- **Technology Transfer for Startups:** Transform the geospatial ecosystem in the North East by facilitating technology transfer to local startups, enabling them to contribute to the region's development.
- **Timely and Accurate Engagement with Government:** Startups are advised to approach state government departments with clearly defined, timely, and precise solutions to ensure effective collaboration and impact.

Concluding Session: Way forward towards innovative space applications in NER

Dr. SP Aggarwal, Director of NESAC, moderated the concluding session, during which several important suggestions and additional needs from the user community and industry were addressed. Representative from Assam mentioned about the requirement of a dedicated management-based cell within ISRO, which could facilitate state-level collaboration. While enhanced forest monitoring is necessary, concerns were expressed regarding the state government's potential apprehension stemming from financial limitations. Additionally, the existence of multiple startups operating in similar sectors was discussed.

The issue of acquiring cloud-free satellite data emerged as a prominent challenge for Manipur. Moreover, participants called for increased support in GeoAI to advance geospatial applications in the region.

In Meghalaya, the focus was on the need for real-time ecosystem monitoring, especially for payment schemes based on ecosystem services. Additionally, landslide mapping through community engagement and land restoration was emphasized as a priority.

NEEPCO proposed that startups register on the GeM platform to increase their visibility and accessibility. Additionally, they suggested that NESAC implement a funding model akin to that of the DIO in the defense sector, where NESAC would cover 50% of startup funding, with the remaining 50% being provided by the startups themselves. This approach could stimulate innovation and support the growth of startups in the North East. There was also a recommendation to test sensors on high-speed aerial platforms, with an invitation for NESAC or other organizations to facilitate such tests on aircraft.

In his concluding remarks, Dr. R.R. Navalgund, Former Director of SAC and NRSC, acknowledged that NESAC has successfully fulfilled its founding purpose, as demonstrated by the numerous challenges presented by state governments requesting its assistance. He lauded NESAC's remarkable growth, comparing it favorably to leading remote sensing centers in India, such as SAC and NRSC, and praised the dedication and enthusiasm of the NESAC team. Additionally, he commended the North Eastern states for their clear comprehension of their needs and requirements.

Dr. Navalgund further urged startups and private sector players to harness their intellectual resources to advance cutting-edge technology. He recommended that they focus on

international competition rather than competing for the same projects, emphasizing the need to engage with all sectors of the space ecosystem, where IN-SPACe could play a crucial role. Additionally, he stressed the importance of utilizing publicly funded facilities for sensor testing while ensuring that innovations originate from startups. Finally, he proposed that NESAC expand its focus beyond operational applications to pursue more advanced research, given that other organizations can now manage operational workflows.

Way Forward & Outcomes of the NeUIM-2024

The primary outcomes and associated potential courses of action are categorized into the following broad domains, each of which are discussed in detail subsequently:

1. Initiate projects using state of the art techniques for regional development
2. Enhanced disaster risk mitigation support and real time disaster management
3. Improved data dissemination leveraging techniques such as AI and cloud processing services
4. Encourage state-level engagement and focused collaboration with industry and startups

A) Initiate projects using state of the art techniques for regional development

1. Forestry, Ecology, and Biodiversity

- Forest Parameter retrieval: High-resolution satellite and UAV based monitoring of forested lands to assess forest canopy health, species type classification, forest density, biomass and total carbon stock. This can include all broad domains of multispectral, hyperspectral, thermal, SAR and LiDAR remote sensing.
- Near real time forest loss assessment: Operational high-resolution optical and SAR satellite constellations can provide daily imagery of forested lands. This can be augmented with on the fly change detection statistics driven by AI techniques to assess forest gaps.
- Resource mapping: Implement satellite-based monitoring combined with UAV surveys to estimate coverage and health of selected species such as

bamboo, sal, teak etc which are essential for the region's economy and ecology.

- Wildlife habitat suitability mapping: Use machine learning models to map and predict suitable habitats for endangered species, leveraging remote sensing data to monitor wildlife corridors, poaching risks, and human-wildlife conflict zones.

2. Agriculture, Horticulture, and Allied Areas

- Precision Agriculture Using UAVs: Use UAVs with high-resolution multispectral sensors to monitor crop health, soil moisture, and nutrient levels. Machine learning algorithms can help analyze these datasets for optimizing irrigation, fertilizer application, and pesticide use.
- Site Suitability for Horticulture: Apply GIS-based multi-criteria analysis and machine learning tools to identify suitable areas for expanding crops like orange, kiwi, and tea plantations, factoring in climate, soil, and water availability.
- Crop Yield Prediction Models: Utilize machine learning to develop crop yield prediction models using remote sensing data and climatic variables for better agricultural planning and market supply.

3. Geology and geosciences

- Mineral Resource Mapping: UAVs equipped with hyperspectral sensors can assist in mapping and identifying mineral deposits in remote and inaccessible areas of the region. Identification of sustainable mining strategies on a case by case basis.

4. Land and Water Resource Studies

5. Urban and Regional Development

- Smart City Planning: Use high-resolution satellite imagery and UAVs for detailed mapping of urban areas to support infrastructure development, traffic management, and land-use planning. This can be integrated with IoT and AI-based solutions for smarter urban governance.

- 3D City Models for Urban Planning: UAV-based photogrammetry and LiDAR can be used to create 3D models of cities for planning infrastructure, managing space, and assessing vulnerability to disasters.
- Monitoring Urban Growth and Land Encroachment: Utilize satellite-based change detection algorithms to monitor urban sprawl, land encroachment, and illegal construction, providing real-time insights for better governance.

6. Atmospheric and Climate Sciences

- Air Quality Monitoring: Use satellite data and UAV-based sensors to monitor air pollution levels in urban and industrial zones. Integrating this data with AI models can provide real-time air quality forecasting.
- Climate Modeling and Monsoon Prediction: Leverage satellite data (e.g., cloud cover, sea surface temperatures) combined with machine learning models to predict variations in rainfall patterns and assess climate variability in the region.
- Aerosol and Cloud Monitoring: Use remote sensing techniques to study aerosols, clouds, and their interactions with climate systems, critical for understanding the impact of industrial activities and wildfires on the region's atmosphere.

B) Enhanced disaster risk mitigation support and real time disaster management

1. Real-time disaster management support: Utilize satellite communication and navigation techniques for post-disaster management and support. UAV based relief operations such as provision of emergency food, water and medical supply can also be initiated. Finally, emergency support through geospatial services can be integrated in a crowd-sourced manner with the dissemination of information such as best practices and safe routes to support centres.
2. AI-based Early Warning Systems: Develop AI-based models to analyze satellite imagery, topographic information and weather data and predict extreme events like cyclones, Glacial Lake Outburst Floods, avalanches, annual rainfall induced floods, earthquakes, and landslides.

3. Real-Time Disaster Impact Mapping: Utilize satellite data (e.g., SAR) combined with UAV surveys for real-time disaster monitoring. Providing real time surveillance images to aid the planning of rescue and support activities can be carried out. For e.g flood inundated area mapping, landslide impact studies.
4. Disaster Susceptibility Mapping and Risk Assessment for NER: Use high-resolution satellite data (e.g., SAR) and machine learning algorithms to generate susceptibility maps for various categories of disasters such as rainfall-induced, seismic, anthropogenic etc. This can help identify hazard zones and inform disaster support readiness teams.

C) Improved data dissemination leveraging techniques such as AI and cloud processing services

1. Expand Data Accessibility and Platforms: Implementing policies from the National Geospatial Policy and Indian Space Policy 2023 will support greater data democratization and utilization across both public and private sectors. Provide a 1 platform service for all geospatial data for the north east. Augment NeSDR platform by developing a regional geospatial data platform that integrates data from multiple sources (UAVs, satellites, and ground-based sensors) to support decision-making.
2. Integrated Data Analytics Platform for Decision Support: Offer online analytics services, ensuring that departments without access to advanced software are not left behind. This will help government agencies use geospatial data effectively for decision-making processes in disaster management, agriculture, infrastructure development, and more.
3. Machine Learning for Geospatial Data Processing: Use machine learning algorithms to process large volumes of geospatial data for tasks such as land-use classification, change detection, and anomaly detection in environmental monitoring.

D) Encourage State-Level Engagement and Focused Collaboration with industry and startups

1. Mentorship to state departments: NESAC can play the role of a mentor for state government departments in the north eastern region. Support can be provided on targetted capacity building of state departments and executing agencies on several operational services developed at NESAC. A combined approach of mentorship and technology transfer of operational activity will help build a healthy geospatial

environment that brings the fruits of space technology to the grassroots level more effectively. For e.g., personnel can be delegated by state departments to NESAC for a few months who will be responsible to development of a locally relevant geospatial product. This will improve the capacity of the state government in the development of state of the art geospatial products in addition to providing a useful service to the public.

2. Capacity building: Enhanced capacity building programs in a phased manner starting from the fundamentals of geospatial technology to emerging technologies such as AI, machine learning, and cloud computing. The training programs can be aimed at state user departments as well as private players and academic institutions to bring in the next generation of geospatial transformation.
3. Strengthen Public-Private Collaboration: NESAC can enable focussed collaborations and even technology transfer to local startups, particularly in space-based decision intelligence, geospatial analytics, and UAV technologies. NESAC can facilitate partnerships where startups can work closely with government projects, thereby contributing to regional development. This will foster innovation and encourage entrepreneurship in the region. Additionally, ensuring registering the startups on the GeM platform will enhance their visibility and accessibility for government projects.
4. Delegating User Meets: Expand the scope of user meets to every state in the North East, delegating responsibility to state centers to ensure that space technology reaches all government departments. This will help bridge the gap between NESAC and local government agencies, ensuring wider adoption of geospatial solutions.

Registration for NeUIM-2024 and Participation in the Event

Registration details

The online registration portal for participation in NeUIM-2024 was launched at the end of July, 2024 with the url hosted at <https://neuim2024.in>. Total 732 participants have done their registration in the portal and out those around 120 participants have opted for in-person participation and remaining has chosen for online mode. The category-wise user registration is given in Table-1 and state-wise user registration is depicted in Table-2.

Table-1: Category-wise user registration

Sl. No.	Category	Nos.
1	Central	79
2	State	294
3	PSU	15
4	Academia	105
5	Industry	47
6	Student	145
7	Others	40
Total		732

Table-2: State-wise user registration

Sl. No.	State	Nos.
1	Arunachal Pradesh	19
2	Assam	226
3	Manipur	28
4	Meghalaya	117
5	Mizoram	30
6	Nagaland	36
7	Tripura	49
8	Sikkim	28
9	Other states	199
Total		732

Participation details

NeUIM-2024 has received an extremely positive response, with over 1121 participants from state and central departments, academic and research institutions, PSUs, and industries across the country. Total in-person participants in the event were around 170. In addition, more than 885 views were observed in YouTube live video streaming. Most of the participants were from various states Govt. departments of NE states such as State Remote Sensing Applications Centres, Science and Technology Councils, Agriculture, Horticulture, Soil and Water Conservation, Rural Development, Forest, Water Resources, Disaster Management Authority etc.

Feedback of NeUIM-2024

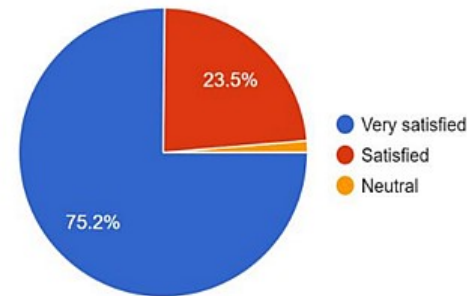
The feedback for the NeUIM-2024 program was overwhelmingly positive, with many participants expressing satisfaction with the event's organization and content. Attendees praised the insightful presentations, informative sessions, and the overall structure of the event. Several participants suggested extending the duration of the program to allow more time for discussions and practical sessions. There were calls for holding future events in

physical mode to foster greater interaction and collaboration, and some recommended more outreach and awareness programs, particularly for disaster management and geospatial technology.

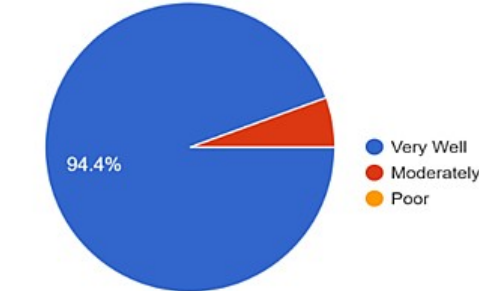
Participants also requested access to lecture materials and presentations for further study. Specific suggestions included developing a central platform to access the innovative tools discussed during the program, and creating more opportunities for collaborative projects with academia and industry. There was a strong interest in organizing similar events more frequently, with a focus on capacity building, real-time data usage, and advanced topics like AI and ML in geospatial applications.

Additional recommendations included involving NGOs and students more actively, addressing practical implementations of space technologies, and adding sessions on ecosystem services, Civil Engineering projects, and space biotechnology. Overall, the program was highly appreciated, and many attendees expressed their eagerness to participate in future events. More details are given below.

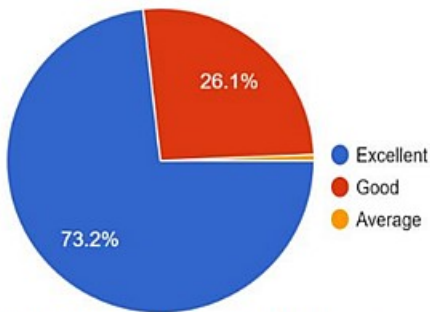
NeUIM-2024 Feedback analysis



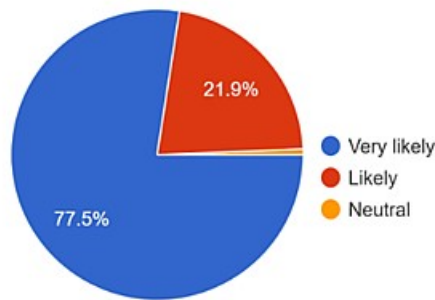
How satisfied are you with the overall organization of the NeUIM-2024 ?



How well did NeUIM-2024 cover the various applications of space technology?

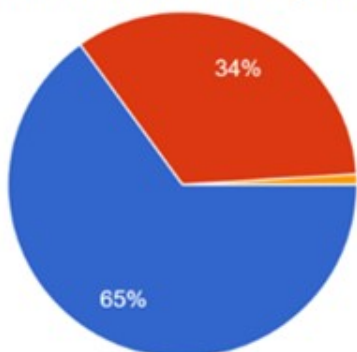


How would you rate the quality of the presenters and their delivery?

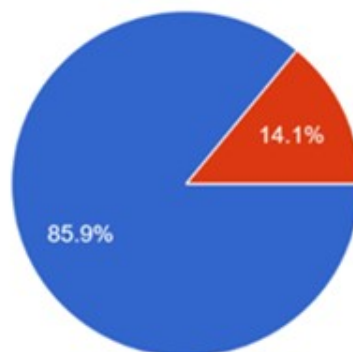


How likely are you to apply the knowledge gained from the NeUIM-2024 to promote regional development?

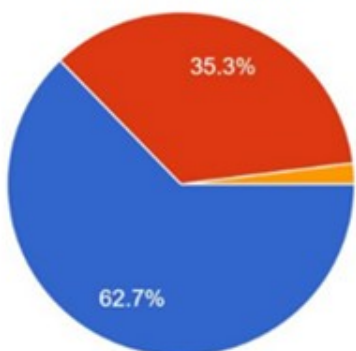
Natural Resource Management



Disaster Management Support

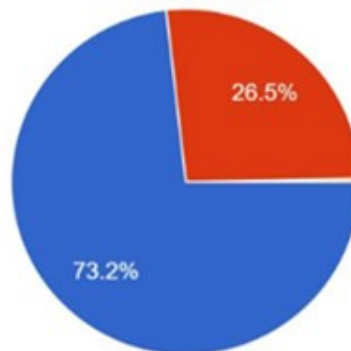


Networking among stakeholders & decision makers



● Very likely
● Likely
● Neutral

Governance



How effective was NeUIM-2024 for the above domains ?

Cultural programme

The Day-1 evening on 5th September, 2024 was also enlivened by a lilting cultural program followed by dinner hosted by Director, NESAC.



Scenes from the cultural event

Memories of NeUIM-2024





NESAC User Interaction Meet (NeUIM-2024)



September 5-6, 2024
Venue: NESAC Outreach Facility



PROGRAM SCHEDULE

Day - 1: September 5, 2024 (Thursday)	
09:00 – 10:00 Hrs	Registration
10:00 – 11:00 Hrs	Inaugural Session (NESAC auditorium, Main building) - Invocation, lighting of lamp, and felicitation of the guests - Welcome and opening remarks - Dr. S P Aggarwal, Director, NESAC - Address by Guest of honour - Dr. Prakash Chauhan, Director, NRSC - Address by Guest of honour - Shri Shantanu Bhatawdekar, Scientific Secretary, ISRO - Address by Chief Guest - Dr. R R Navalgund, Former Director, SAC & NRSC - Vote of Thanks - Dr. K K Sarma, GH, RSAG, NESAC
11:00 – 11:30 Hrs	Tea break and networking
11:30 – 13:00 Hrs	TS - 1: EO Applications in India: Legacy, current trends, and future directions Chair: Dr. R R Navalgund, Former Director, SAC & NRSC Co-Chair: Dr. S Dutta, IIT Guwahati - Transforming India: Space technology & applications - Dr. R R Navalgund, Former Director, SAC & NRSC - Trends in EO systems and future missions - Dr. John Mathew, ISRO HQ - Enhancing EO data access: Policy & platform strategies for effective sharing – Ms. D Ramadevi, NRSC - Geospatial ecosystem: Towards accelerated development of NER - Dr. S P Aggarwal, NESAC
13:00 – 14:00 Hrs	Lunch break
14:00 – 16:00 Hrs	TS - 2.1: Understanding user needs and expectations: Arunachal Pradesh, Assam, Manipur & Meghalaya Chair: Shri P L N Raju, ASSAC Co-Chair: Dr. B K Handique, NESAC - Geospatial services delivered in Assam in collaboration with NESAC - Shri P L N Raju, ASSAC - Activities and achievements of APSAC - Dr. H K Dutta, AR-SRSAC - Role of ASDMA in DRR using geospatial services - Shri B Baishya, ASDMA - Geospatial solutions in managing transboundary animal disease risks - Dr. A Chakravarty, Govt. of Assam - Geospatial technology in Sericulture development: A user's perspective - Dr. M Chutia, CSB - Manipur election E-ATLAS for electoral planning & monitoring - Md S D Khan, CEO Office, Manipur - Usages of space technology in effective governance through need base - Shri O N Singh, MARSAC - Geospatial services in Meghalaya in collaboration with NESAC - Dr. G Singh, MBDA - Any other user
16:00 – 16:30 Hrs	Tea break and networking
16:30 – 18:30 Hrs	TS - 2.2: Understanding user needs and expectations: Mizoram, Nagaland, Sikkim, & Tripura Chair: Shri K C Bhattacharyya, Former Director, NESAC Co-Chair: Ms. H S Devi, NESAC - Use of space technology in Forestry sector in Mizoram - Shri M Z Singson, Govt. of Mizoram - Geospatial services in Mizoram in collaboration with NESAC - Shri H Lalsawmliana, MIRSAC - Geospatial services in Nagaland in collaboration with NESAC - Shri M Kithan, NGISRSC - Application of geospatial technology in rural development: Nagaland - Ms. Lucy H, Govt. of Nagaland - Advancing geospatial services in Tripura through NESAC partnership - Shri A Dasgupta, TSAC - NESAC's role to support NEEPCO in leveraging space technology for development - Shri D Das, NEEPCO - FeverTracker for surveillance of malaria incidents in Tripura - Dr. Ipsita P Bhowmick, RMRC, ICMR - Any other user
19:00 – 20:00 Hrs	Cultural Program (NESAC auditorium, Main building)
20:00 – 21:30 Hrs	Dinner

NESAC User Interaction Meet (NeUIM-2024)



September 5-6, 2024
Venue: NESAC Outreach Facility



PROGRAM SCHEDULE

Day - 2: September 6, 2024 (Friday)	
09:15 – 10:45 Hrs	TS - 3: Geospatial technology for disaster risk reduction and governance Chair: Dr. K K Sarma, NESAC Co-Chair: Dr. D Chutia, NESAC
	- Socio hydrological dimensions of fluvial disaster in Brahmaputra basin - Dr. S Dutta, IIT Guwahati - HPC based disaster management system - Dr. Manoj K Khare, CDAC - Space based near real time geospatial services for governance - Shri P S Singh, NESAC - Space technology for inclusive disaster risk reduction in NER - Dr. Rekha B Gogoi, NESAC - Geospatial technology for climate resilient planning - Dr. Ujjal D Baruah, Cotton University - Transforming near real time & on-demand geospatial services in NER using UAVs - Shri V Saikhom, NESAC - Role of NKN in expanding ICT services, research, and outreach - Shri Sekhar Dey, NIC
10:45 – 11:00 Hrs	Tea break and networking
11:00 – 12:00 Hrs	TS - 4: Interfacing with the Academia and Industry Chair: Dr. M A Paul, ISRO HQ Co-Chair: Dr. S S Kundu, NESAC
	- Collaboration and funding opportunities for academia in space ecosystem - Dr. M A Paul, ISRO HQ - From data to action: Empowering farmers using drone - Dr. R K Josmee, CAU - The AI revolution: Redefining the way we live and work - Dr. Ferdous A Barbhuiya, IIIT-Guwahati - Trimble solution for geospatial applications - Shri Adesh Dhar, Trimble System - SAR imagery for critical applications - Shri Harnam Singh & Shri Kalyan, IGIS & Capella Space - Use of emerging technologies for the challenges related with climate change - Shri P Ranjan, Vassar Lab - Mapping and monitoring of ground assets in NER - Dr. Deb Jyoti Pal, GalaxEye Space
12:00 – 13:30 Hrs	Special Session: IN-SPACE for start-ups Chair: Dr. S P Aggarwal, NESAC Co-Chair: AVM D V Khot, IN-SPACE
	- Introduction to SAAW - AVM D V Khot, PC, IN-SPACE - Space based decision intelligence for North East - Shri Dhruva Ranjan, SATSURE - Eyes in the space for NER - Shri Ankit Bhateja, Xovian - Transform NER: Leveraging geospatial data for infrastructure & environment - Shri Vignesh, Thazhal Geospatial Analytics Pvt. Ltd - Disaster resilience in NER through space technology - Shri Swarn Pant, Suhora - Real time insights for natural resource management - Ms. Kiran, SkyServe - Space for NER: Aligning space enabled products with NER needs - Open house discussion
13:30 – 14:00 Hrs	Concluding Session: Way forward towards innovative space applications in NER (Moderated by Dr. S P Aggarwal, Director, NESAC)
14:00 Hrs	Lunch



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