स्मारिका Souvenir

स्वर्ण जयंती समारोह
Golden Jubilee Celebrations

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nrsc

पूर्व भूमिका Curtain Raiser

राष्ट्रीय सुदूर संवेदन केंद्र
भारतीय अन्तरिक्ष अनुसंधान संगठन
अन्तरिक्ष विभाग, भारत सरकार
बालानगर, हैदराबाद - 500 037

National Remote Sensing Centre
Indian Space Research Organisation
Dept. of Space, Govt. of India
Balanagar, Hyderabad - 500 037

सितंबर September, 2023

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आमुख Preface

With great pleasure, I put forward this souvenir prepared for the curtain raiser event of NRSC Golden jubilee celebrations being held on 29-30 September 2023 at Hyderabad. It is indeed a great moment of pride that National Remote Sensing Centre (NRSC) is completing 50 years of its service to the nation through remote sensing technology.

The then National Remote Sensing Agency (NRSA) was established as a registered society on 2nd September 1974 by Department of Science & Technology with the objective to undertake and facilitate remote sensing activities in the country. NRSA was transferred from DST to newly created Department of Space in 1980, as an autonomous organisation and further converted to a fully Government organisation under ISRO and renamed as National Remote Sensing Centre (NRSC) on September 1, 2008. Regional Remote Sensing Service Centres located at Dehradun, Kolkata, Jodhpur, Nagpur and Bengaluru were amalgamated with NRSC in December, 2009 and renamed as Regional Remote Sensing Centres.

The NRSC golden jubilee period spanning five glorious decades witnessed noteworthy developments on many fronts in the areas of satellite and aerial data acquisition, data processing and archival, data dissemination, applications development, disaster management support, web services, capacity building and outreach activities. This volume gives an overview of the important milestones accomplishments, achievements, projects and research activities carried out during five decades of journey of NRSC.

I would like to express my sincere appreciation and thanks to former Directors for their contributions and able leadership that aligned the organisation to meet national and global aspirations.

I would like to thank all who have provided the inputs on the activities carried out in their respective areas to prepare this souvenir and congratulate the entire NRSC fraternity on this momentous occasion.

Prakash Chauhan
Director, NRSC

आभार Acknowledgements

Celebrating the Golden Jubilee of our beloved organisation, National Remote Sensing Centre (NRSC), is indeed a momentous occasion and a cause for joyous celebration. As we embark on this remarkable journey of celebrating the start of golden jubilee year, we would like to express our gratitude and appreciation to our exceptional leaders, both past and present, for their vision and guidance through various phases of growth and transformation of NRSC in achieving this milestone. The commitment and unwavering support of dedicated employees and their families, government and partner agencies, and well-wishers have all contributed significantly in the success of NRSC.

This document is an attempt to reflect the major milestones and achievements of NRSC during its glorious journey from September 1974 to date. We are deeply grateful to all those who have contributed to make this document in the current form. We would especially like to place on record our sincere gratitude to our former Directors for sending their messages at an extremely short notice. The contributions from all Area/Entity Heads and focal points from technical as well as administrative areas in providing timely inputs are highly appreciated. We also thank Apex Committee for golden jubilee celebrations and Director, NRSC for their overall guidance and support.

Collective effort of everyone has helped in creating this document, which would be a treasure trove of our legacy and inspiration for younger generation. Once again, thanks to each and every member of NRSC fraternity for their contribution. Together, we look forward to a brighter future

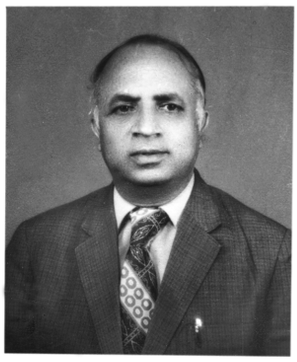
Publication & Archival Committee

संस्मृति Reminiscenes

Reminiscenses of NRSA

by

Wg. Cdr. K. R. RAO, A.V.S.M. (Retd).



The initial step of introducing Remote Sensing Technology in India for applications in various fields (agriculture, hydrology, forestry, Geology, landuse etc) was taken by the Department of Science and Technology, Govt. of India in 1974. I was selected to be the Director and charged with the responsibility of setting up an Institution to train Scientists and Engineers in receiving and analysing Remote Sensing data for various applications, and ultimately Operationalise the Technology for efficient management of Natural resources. This led to the establishment of the National Remote Sensing Agency (abbreviated to NRSA) in Hydrabad, A.P. in 1975. It operated from 4 Sardar Patel Rd., Secunderabad till permanent location was established in Balanagar, Hydrabad at the land purchased from H.A.L.

The NRSA consisted of Data and applications Centre at Hyderabad, a ground receiving Station to receive data from LANDSAT and Meteorological Satellites at Shadnagar (about 50 Km from Hyderabad) a Research Flight Facility in Bangalore and a Photo Interpretation Institute in Dehra Dun. An important event during this period was the Signing of a Memorandum of Understanding between India and U.S.A. which enabled access to U.S. Remote Sensing and meteorological Satellites.

The System design for the entire programme was done in NRSA. A large portion of the hardware was obtained from Indian Sources and the Software was developed by NRSA.

A number of operational projects were completed

for Central and State Governments, a number of instruments were developed in house. Interaction with user agencies was always emphasised, which led to the Confidence of the Users in Remote Sensing.

Many training programmes for Indian and International personnel were conducted.

A notable achievement was in using Remote Sensing to predict the water level in some of the dams in North India across rivers fed from melting of Snow in the Himalayan mountains. A national forestry map was also produced. The Research Flight Facility participated in the International MONEX project to study the development of the Monsoon in India.

By now, Remote Sensing Technology was widely accepted as a powerful tool for planning, monitoring and managing Natural resources on an operational basis.

In 1981, the NRSA was transferred from the Dept. of Science and Technology to the Dept. of Space.

In 1982, I was selected by the United Nations Food and Agriculture organization to set up Remote Sensing facilities in Viet Nam and I left NRSA.

I still cherish my memories of NRSA and the enthusiastic efforts of the personnel which contributed to the success of NRSA.

संदेश Message

It is a joyous moment to note that NRSA/NRSC is celebrating its Golden Jubilee with an Inaugural programme on September 29-30, 2023. The achievements of NRSC in furthering the utilization of Remote Sensing Science & Technology for the benefit of National Development would not have been possible without the involvement of stakeholders from Government Departments, Citizens and the International Space agencies. The team have worked in evolving NRSA from ground level to operational status.

It gives me immense pleasure in leading several developmental activities at NRSC during my role as Director (1982-1996). When I reflect back, I remember development activities including training, pertaining to Landsat, IRS and other satellite data acquisition and processing, aerial surveys, several projects under NNRMS, IMSD and their accomplishments. I am happy to note that NRSA/NRSC is quick to adopt newer technologies including the Deep Learning and AI technologies in Remote Sensing Data Processing and Applications. Also it is a pleasure to see NRSC starting new short course on Remote Sensing Data Acquisition and Remote Sensing Data Processing under CSSTEAP.

I take this opportunity to congratulate the NRSC fraternity for their hard work in making this organization standout and fulfil its vision.

B .L. Deekshatulu
Former Director, NRSC
Sep 1982 - Oct 1996

संदेश Message

I am delighted to learn that the National Remote Sensing Centre (ISRO), Hyderabad is organizing Golden Jubilee Curtain Raiser function this September 29-30, 2023. The National Remote Sensing Centre (earlier known as the National Remote Sensing Agency) is undoubtedly a pioneering institution in establishing and evolving remote sensing technology, science and applications for societal benefit in this country. Establishing the first earth station to receive data from the first operational space borne remote sensing satellite LANDSAT 1 in late seventies to receiving data from many national and international satellites and also setting up a station at the Antarctic region have been to its credit. Processing of the satellite data, applying necessary corrections, converting the data into products, value added products and their dissemination has been its hallmark. A number of nationally important and relevant application programmes in various areas of natural resources inventory and monitoring carried out by NRSA/NRSC have benefitted the country in many ways. The Bhuvan portal is meeting the aspirations of many of the stakeholders. Very significant and unique contributions of NRSA/NRSC in the area of disaster monitoring, mitigation, early warning and damage assessment have been exemplary and a role model to many of the countries worldwide. NRSA/NRSC has also maintained a unique aerial remote sensing facility for the benefit of many users and emergency situations. Its role in training the stakeholders of the technology and education has helped in propagating and absorption of the fruits of the new technology.

To me personally, my stint as director at NRSA provided invaluable experience in many different facets of remote sensing and brought me nearer to the last mile users.

I take this opportunity to wish each one of the staff of NRSC a glorious career and do hope the organization will rise to the newer and more challenging needs of the country.

R. R. Navalgund
Former Director, NRSC
May 2001 - Nov 2005

संदेश Message

I am delighted to note that ISRO's National Remote Sensing Centre (NRSC) that is a transformed National Remote Sensing Agency (NRSA) with legacy and lineage is celebrating its 50th year and the curtain raiser is scheduled during 29-30 September 2023.

This is an occasion to respect the founding leaders and stalwarts for their yeomen contributions to conceive, build and nurture an institution that became synonymous with remote sensing data from aerial platforms and satellites for human welfare, governance, and national applications.

I vividly recall my association with NRSA since the early 1980's, and particularly becoming part of it in the late 1990's, followed by a tenure as its Director from November 2005 to August 2008, besides its oversight from Antariksh Bhavan from November 2009 to December 2014. Ever, I cherish the affectionate bond with NRSA fraternity.

I had the unique privilege to convert NRSA from an autonomous body of the Department of Space to a governmental entity and as one of major centre of ISRO. Yet another opportunity was to initiate an Integrated Multi-mission Ground segment for Earth Observation Services (IMGEOS) and to harness the Shadnagar campus towards a transformative infrastructure.

It is satisfying to see the versatile and vibrant young team making impactful contributions to the nation, adapting them to the exponential advances in technology and emerging imperatives of space applications. I wish them the very best in their future endeavors.

Also, I take this opportunity to appreciate and acknowledge the yeomen contributions from every member of NRSA/NRSC of past and present for their self-less services for national development.

K. Radhakrishnan
Former Director, NRSC
Nov 2005 - Aug 2008

संदेश Message

I am very glad to note that the National Remote Sensing Centre (NRSC) is celebrating its Golden Jubilee year 2024 with a formal launching of a Curtain Raiser programme on September 29, 2023. Starting as National Remote Sensing Agency (NRSA) on September 02, 1974 under the Department of Science & Technology (DST), Government of India, as an autonomous Society and moving later to Department of Space (DOS), through a momentous decision made in December 1980, in the same capacity with a moderate partial funding as annual grant-in-aid support, the institution has the unique & rare distinction of being possibly the only major autonomous Society in the country to get converted into a full fledged Governmental entity, when it became National Remote Sensing Centre (NRSC) under the Indian Space Research Organisation (ISRO), Department of Space in September 2008.

From the beginning, NRSA (and later NRSC) was empowered by the Government as the sole authority responsible for the end-to-end ground segment activities pertaining to handling complex Earth Observation satellites (including those from foreign satellites), and aerial photography & photogrammetry systems in the civilian domain towards providing operational geospatial information services and innovative solutions at national as well as local levels. Obviously, such wide ranging expectations call for an agile institutional setting adept with cutting-edge technologies and operating within the institutional/policy framework under the Government with concerted focus on providing operational services with an entrepreneurial zeal without compromising on efficiency and efficacy. Looking back, it can be safely stated without fear of contradiction that working closely with other ISRO Centres such as SAC and URSC, NRSC has largely lived up to these expectations and carried out the following tasks reasonably well:

- Setting up state-of-the-art integrated multi-mission infrastructure for data acquisition, data processing, data archival and data dissemination for all the Indian EO satellites and upgrading them periodically in tune with the galloping technological advances and operational requirements.

- Expanding the footprint of Indian EO satellites for global coverage, including setting up a ground station in Antarctica

- Being in the forefront of showcasing many operational EO applications in a collaborative mode with user agencies with institutionalisation at the user-end as the watchword.

- Setting up information portals capturing the imagination of the user community such as BHUVAN

- Capacity building through transfer of technology, conduct of Government-industry-academia outreach programmes, and handholding with various State Governments & institutions.

As a result of these concerted actions and performance, NRSC has emerged as a reputed, globally well-known professional institution of reckoning, even as India is ranked among the top 5-6 players in remote sensing domain in the world. The history of the institution is, thus, an inspirational & motivational one, paved with meeting many operational challenges while keeping abreast with galloping geospatial technological advances; and milestones closely associated with engaging and being relevant with ever increasing societal demands in an impactful manner.

This story of professionalism and dedication needs to be told to the younger generation and I am sure, the year-long Golden Jubilee celebrations will address them. Obviously, celebrations such as Golden Jubilee also provide an opportunity for taking an objective relook into the past activities and build on them further for meeting the emerging challenges of the future; and, also learn from the shortfalls, if there are any.

I take the opportunity to congratulate the entire NRSC fraternity and wish the function all success

Dr. V. Jayaraman
Former Director, NRSC
Sep 2008 - Apr 2011

संदेश Message

Soon after joining SAC/ISRO in 1983, I had the opportunity to visit NRSA, Hyderabad for discussions related to IRS-Utilization Program and I became a part of NRSA when I joined as Dean of IIRS, Dehradun in July 2004. This association lasted over a decade till I joined IIST in July 2015. On the occasion of this Curtain Raiser event for Golden Jubilee of NRSC, let me recall some seminal events, especially during the latter half of my work at NRSC.

The most transformative evolution after formal conversion of NRSA to NRSC have been (a) the realization of IMGEOS which was followed up with a host of associated enhancements that were facilitated due to the second birth of Shadnagar campus, and (b) amalgamation of five RRSSCs as Regional Centres of NRSC. I had the privilege of inviting ISRO fraternity to IMGEOS formal inauguration and subsequently to the first day imaging by ISRO's first space SAR satellite, RISAT-1. These included a communication link to NRSC ground station at Antarctica, NDEM server and processing, a calibration site and instrumented atmospheric observatory in addition to laboratory spaces and housing. IMGEOS as well as all additional facilities have greatly contributed to growth and recognition of NRSC as central to EO applications in the country. During this period RC South and East moved to their new enlarged premises as well as newer applications.

NRSA/NRSC while holding the unique position of Earth Observation data supplier is more widely known and appreciated for its thematic products, applications and disaster management information support, aerial services, to name a few. The pace of adoption of current best practices of digital approaches, better spatial resolutions, photogrammetric processing and model-derived products and services was realized through Bhuvan, NDEM, WRIS, Bhuvan-Panchayat, NICES and a host of other projects. The outreach as well as support for future sensors and applications, for example the multi- location aerial campaign for AVIRIS-NG. However, no single page could do justice to accomplishments of NRSA/NRSC.

The world of science and technology as well as the space technology and its sub-component has changed dramatically in past fifty years. The need to have a premier national institute for governance, sustainability and application development continues to remain as critical now, as was fifty years ago. The most satisfying aspect is that NRSA/NRSC through its staff and leadership have continued to remain ahead in this curve. I take this opportunity to congratulate entire past and current NRSA/NRSC family on their achievements over the past fifty years and wish them bigger achievements and success in future

Vinay Kumar Dadhwal
Former Director, NRSC
May 2011 – Jul 2016

संदेश Message

It is a happy moment NRSC is completing glorious fifty years of its service to the Nation in Space Applications and getting ready for Golden Jubilee Celebrations. I am associated with NRSC (earlier NRSA) from late seventies as research scholar, more than four decades as user, and around ten years as part of team NRSC.

NRSC is a unique national institute of global acclaim, specialised in Space/Aerial data acquisition, data processing, applications in every domain of Socio-economic security, Disaster Risk Reduction, Sustainable development and Good Governance, with huge user base. NRSC with its five regional centres, five facilities in Hyderabad Metropolitan Region, ground stations at polar regions facilitates federal & state Governments and local bodies in pragmatic planning, effective implementation, periodic impact assessment and modelling early alerts. This is the only institute in the world, providing wide range of spatial information, timely, meeting the requirements of global models assessing climate change to decision making by individual farmers for economic benefit without endangering the environment and ecology. I am proud to be part of this saga of team NRSC in most of its global, national, regional and local endeavours benefiting the Nation, and have many memorable moments to cherish.

I congratulate and extend my warm greetings to all my colleagues at NRSC, felicitate members from the associated academia, industry, government entities, voluntary agencies and individuals, for trusting and being with NRSC.

It is time to honour/retrospect the glorious past, celebrate the golden present and envisioning the promising future.

My best wishes to team NRSC on this auspicious occasion.

Y. V. N. Krishnamurthy
Former Director, NRSC
Jul 2016 - Mar 2018

संदेश Message

I congratulate NRSC for celebrating its Golden Jubilee year enabling generations of scientists, engineers and staff members to come together & deliberate. I fondly remember NRSC activities spread over four campuses at Hyderabad & five Regional Centres spread over the country.

As the agency underwent structural changes from DST to DOS, NRSA to NRSC, integration of RCs and now operating with increased competition from the private sector, the community at NRSC has adapted themselves to the new requirements and challenges very well. Currently, NRSC scientists carry out R&D activities, deliver operational & turnkey projects as well as do training & outreach.

NRSC has been a forerunner in establishing ground station antennas and data processing systems for earth observation, carrying out airborne lidar surveys and remote sensing applications in Land Resources, Agricultural Sciences, Water Resources, Geo Sciences, Urban & Rural Studies, Forest & Ecology, Atmospheric Sciences & Oceanography and in providing Disaster Management support & Bhuvan services. I believe NRSC can significantly contribute to building forecasting & modelling components related to the study of climate change and RCs have the potential to become centre of excellence on specific applications themes.

My best wishes are to Dr. Prakash Chauhan, Director, NRSC and his entire team for future success in all R&D & operational endeavours.

Santanu Chowdhury
Former Director, NRSC
Apr 2018 – Dec 2020

संदेश Message

As we reflect on this momentous occasion of the celebrating a remarkable milestone in the history of r))emote sensing and geospatial technology, Golden Jubilee celebrations of the National Remote Sensing Centre (NRSC), synonym for Remote Sensing in India, we cannot help but be filled with gratitude for the visionaries and countless individuals who have contributed to its present status as premier institute of Indian Space Research Organisation.

From its humble beginnings of aerial survey, it has passed through various stages like ground station establishment, data centre, space-based solutions to the policy makers is now a global leader in satellite-based Earth observation with significant scientific contribution to India's space program and also playing a pivotal role on the international stage.

The journey that began in 1974 with a vision to harness the potential of remote sensing technology for the benefit of humanity has been nothing short of extraordinary. One of the most remarkable achievements of NRSC has been its ability to adapt and innovate continually. It has played a pivotal role in making space technology accessible to a broader spectrum of society. Collaborations with organizations, research institutions and international space agencies, have not only expanded our knowledge but also fostered global cooperation for addressing some of the most pressing issues facing our planet today, including disaster mitigation, climate change, land and water resources, urban planning through various national programmes. Over the past five decades, NRSC has been at the forefront of advancing our understanding of our planet, providing invaluable data and insights that have transformed policy-making, industries, and our understanding of Earth.

The leadership with vision and passion of my predecessors have played an indispensable role in its growth and reputation. What truly sets NRSC apart, is its dedicated team who have worked tirelessly to make these achievements possible. The commitment and expertise for pushing the boundaries of science by all have been the driving force behind NRSC's success.

The coming years promise even more exciting developments in remote sensing and geospatial technology. With the emergence of new sensors, artificial intelligence, and data analytics, NRSC is poised to continue leading the way in shaping the future of Earth observation.

I wish all the best on this important milestone of Golden Jubilee and confident that NRSC, with novel scientific thoughts, will continue to play a leading role in the development and utilisation of remote sensing technologies in India and the world in the years to come.

Thanks to each and every one who has contributed to this incredible journey. Together, we have made history, and together will shape the future

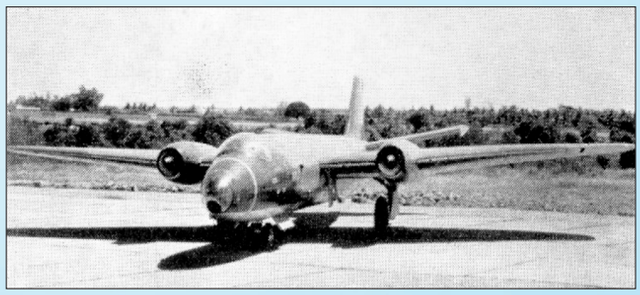
Raj Kumar
Former Director, NRSC
Jan 2021 - Feb 2022

विषय सूची Contents

एनआरएससी की 50 वर्ष की यात्रा - मुख्य बातें
50 years of NRSC's journey - Highlights

पहला दशक (1974-1984) - स्थापना वर्ष
First decade (1974-1984) - The Foundation Years

- The seed sown: National Remote Sensing Agency (NRSA) established as a registered society under the Department of Science & Technology (DST), Govt. of India – September 02, 1974
- Wg Cdr K R Rao AVSM (retd) appointed as Director and Chief executive Officer of NRSA – February, 1975
- NRSA office started functioning from hired premises in Secunderabad, A.P. – April 16, 1975
- First meeting of NRSA Governing Body held under the Chairmanship of the Prime Minister, Mrs Indira Gandhi – August 28, 1975
- 25 acres of HAL land in Balanagar, Hyderabad was taken over by NRSA – January, 1976
- Airborne magnetic and electromagnetic survey equipment procured from Canada and the instruments fitted on the Beaver aircraft hired from the Directorate of Agricultural Aviation – 1975-1976



- First aerial remote sensing project carried out for Aeromagnetic Survey of "Operation Hard Rock" area in Rajasthan using "Varian Proton Magnetometer" sensor
- Establishment of RFF at Bangalore to provide high resolution aerial data – 1976
- Acquisition of two aircraft Dakota DC-3, Canberra PR which were structurally modified to house aerial sensors
- Procured first 11 channel Bendix multi spectral scanner – 1976
- Two more aircraft Dakota with call sign VT-CGR and VT-DTS were added to the fleet for executing the low altitude surveys in 1976

- Photo Lab established to process MDAS classified satellite data films – 1977
- Indian Photo-interpretation Institute (IPI) of Survey of India, Dehradun merged with NRSA – 1977
- First building of NRSA campus "Image processing building" – 1976-77
- MoU signed between Indian & US governments to setup an Earth Station by NRSA for receiving Landsat data – January 3, 1978

- HS-748 AVRO pressurized aircraft with call sign VT-EFN bought from HAL – 1977-78
- Procured RMK make metric aerial cameras, two with 15cm and one with 30cm focal length – 1977-1978
- Government of Andhra Pradesh allotted 316 acres of land near Shadnagar, Mahaboobnagar district in March 1978 – 1977-78

- The aerial services of NRSA called upon for the first time in disaster mitigation works after the January 1978 crash of an Air India Boeing plane
- International experiment to study the monsoon, called MONEX-79 was initiated and realizing the importance of NRSA's emerging abilities, MONEX directorate requisitioned the participation of NRSA's flight facility in the programme – 1979
- Research Flight Facility carried out flights for range calibration in ITR, Balasore and SHAR before the commencement of launch vehicle programme
- Induction of Versamat roller transport processor and Kodak RT processor for processing Aerial color infra-red film – 1980

- The first Ground Station of NRSA was established at Annaram village, near Shadnagar with a 10 m Antenna (Terminal-1) to receive data from LANDSAT and NOAA Satellites in L & S Band frequencies – 1980
- NRSA transferred from Dept. of Science & Technology to Dept. of Space – Dec 4, 1980
- First User Interaction Seminar organised – Dec 19, 1980
- Establishment of NRSC Data Centre (NDC) – 1980-1981

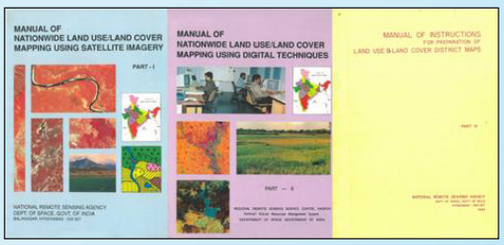
- Second antenna system (Terminal-2) with S & X band reception capability to receive MSS data and thematic mapper (TM) data from Landsat-D / Landsat-5 mission established – 1982-83
- National seminar on National Natural Resources Management System – 1983
- Data centre established for storage, retrieval, browse and distribution of LANDSAT and METSAT data
- Quick look film and video cassette for browsing Landsat series and SPOT satellite data
- Establishment of Regional remote sensing Service Centres (RRSSCs) catering for remote sensing requirement and outreach over five regions viz. Dehradun, Jodhpur, Nagpur, Bengaluru and Kharagpur, which later became part of NRSC in 2009 – 1985-86
- Satellite data storage on Computer Compatible Tapes
- IRS Utilisation Programme (IRS-UP) initiated. Quality Control Cell established Indian Photo-interpretation Institute (IPI) of NRSA in Dehradun renamed as Indian Institute of Remote Sensing (IIRS) Administrative offices shifted from Secunderabad to Balanagar – 1983-84

दूसरा दशक (1984-1994) - विकास युग

Second decade (1984-1994) - The Growth Era

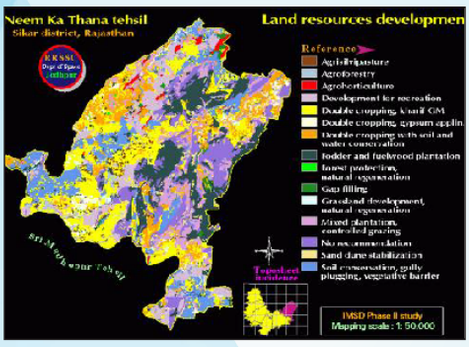
- NRSA developed Frame Synchronizer, display systems, data simulators, system interfaces for LANDSAT-5 TM data processing – 1985
- Conducted 6th Asian conference on Remote Sensing –1985

- Mapping India's forest cover (1972-1975 and 1982-1985) on 1:1M scale – 1985
- Facility Buildings and Service Infrastructures for ground segment (data reception, processing and dissemination) – 1985
- Launch of Nationwide wastelands mapping (using satellite Imagery of 1980-82) of India on 1:1 million scale – 1985-1986



- A near range Bore-sight facility established - 1986-87
- One NRSA scientist successfully completed the 5th Antarctica expedition – 1986-87
- Established X-band tracking from Terminal-2 and acquisition of SPOT satellite data through quick look display system was installed – 1986-87
- The real-time data archival systems used for storing the raw data in HDTR media
- Nationwide wastelands mapping on 1:50,000 scale (using satellite imagery from 1986 to 1999)

- Department of Space had set up a direct reception and processing facility at NRSA, Hyderabad by signing an MoU with M/s SPOT, a French Agency. The regular reception of SPOT-1 data at NRSA commenced from May 1987 and ended in 1992
- IRS-1A satellite successfully launched on 17-Mar-1988 and first day product acquired and generated – 18th Mar.1988
- Large Format Film Recorders were introduced to write the magnified data directly onto 1 m x 1 m negative film
- Large format Colenta processor was procured – 1988
- Pressurized twin turbo prop executive aircraft Beechcraft Super king Air B-200 was procured – 1988
- Induction of Airborne Daedalus 8 channel Multispectral Scanner – 1988
- Mapping of salt affected soils of the country at 1: 250,000 scale – 1988-1993
- Launch of Nationwide Land Use / Land Cover Mapping on 1:250,000 for planning for agroclimatic region – 1989
- NRSA started acquisition of SAR data with the development of X-band SLAR (Side Looking Airborne Radar) – 1989



- Creation of Spatial Data Repository for NATMO, Kolkata – 1989
- Launch of National Agricultural Drought Assessment & Monitoring System (NADAMS) using AVHRR data – 1989
- Quarterly Newsletter "Interface" was published– 1989-90
- Establishment of Department of Human Settlement Analysis at IIRS with ITC collaboration completed successfully – December 1990
- NRSA's Integrated Management Information System (NIMIS) implemented on Local Area Network (LAN) for non-technical areas – 1990-91
- Establishment of dedicated Local Area Network with central server on Novemberell Netware 4.11 OS connecting about 70-80 Nodes in Administrative areas –1987-1990
- National Watershed Development Project for Rainfed Areas (NWDPRA)
- Launching of Integrated Mission for Sustainable Ddevelopment (IMSD) – 1991
- Launch of ERS-1 SAR campaign – 1991
- First day product of IRS-1B generated on 30-August-1991 after successful launch on 29-August-1991
- Planitop F2, the 1st generation analogue stereo plotter for making measurements from diapositives. Utilized for generating topographic maps. Kal & Kumbhe Hydro Electric project executed.

- Procured DSR 15, the first analytical photogrammetry system with an attached pen plotter for aero triangulation, block adjustment, collection of DEM and 3D digital mapping – 1991
- First Digital browse facility established for IRS-1A/1B – 1991-92
- Urban Mapping Scheme - Large scale maps at the scale of 1:25000 using aerial photography for 53 towns – 1992
- Modest analytical photogrammetry facility started functioning under a project called Aerial Photogrammetry, Analysis and Cartography (APAC) – 1992-93
- For enlarged print generation requirements, Vertical Enlargers such as Durst 1800, 1840, HK enlarger and finally Horizontal Enlarger Durst 2501 procured in 1978, 1980 and 1993 respectively

- Established world class photo processing facility –1993
- Intial Test flights of airborne SAR – 1993
- International User Ground station project of EOSAT – 1993-94
- Introduced new Value-Added Products like Geocoded and Mosaic products
- GCP Library for IRS 1A/1B built for processing of LISS-I and LISS-II imagery

- Nationwide network of Disaster Management System (DMS) consisting of 7 primary and 22 secondary stations under National Emergency Operations Cell (NEOC) set up by Ministry of Home Affairs
- One Ku band DTH antenna installed at Balanagar and Shadnagar for receiving transmission during satellite launch
- Establishment of 7.5m Cassegrain Antenna system (Terminal-4) with newly designed dual polarization X-band feed to cater for RISAT-1 data reception

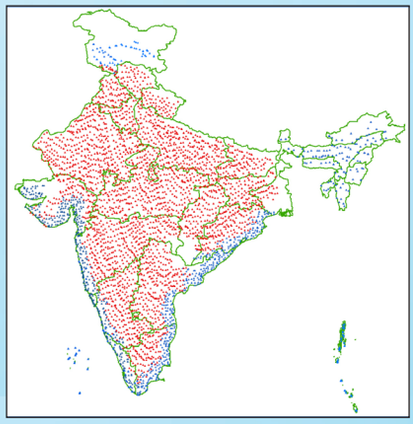
- Satellite data storage on High Density Digital Tapes
- Implemented Integrated Management Information System on Local Area Network for non-technical areas
- In-house software development using Foxpro 2.0 in DOS environment towards automation of administrative areas
- Training Division formed to provide the trainings to the Novemberice user community on basics of remote sensing

तीसरा दशक (1994-2004) - चुनौतियाँ और अनुकूलन

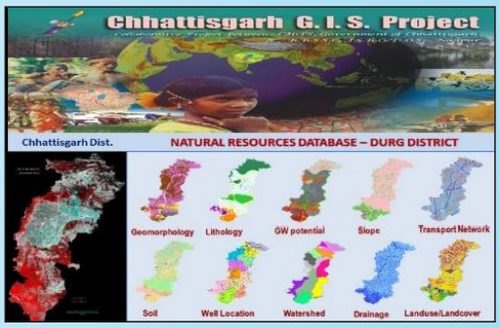
Third decade (1994-2004) - Challenges and Adaptation

- GCP library built for IRS-1C data products generation system – 1995
- Centre for Space Science and Technology Education in Asia and the Pacific Region (CSSTE-AP) established at IIRS, Dehradun – November 1, 1995
- MARine Services and Information System (MARSIS) & National Ocean Information System (NOIS) established for Potential Fishing Zone and ocean state forecast – 1995-2001
- Establishment of a Remote sensing satellite data reception, processing and product generation facility (SARPAD) at New Delhi for IRS-1C/1D mission – 1995-97
- Digital browse facility for IRS-1C using optical juke box was introduced.
- Drinking Water Technologies for Rural Areas of Rajasthan - Remote sensing and GIS based Water Resources Information System "SUJALAM" for location of desalination plants – 1996
- Dr D P Rao takes charge as Director, NRSA – November 1, 1996

- Established SD 2000, the compact analytical photogrammetry system for aero triangulation – 1996-2006
- Aerial facility Augmented with second Super king Air B 200 with call sign VT EBB – 1997
- Workshop at Kandy-Srilanka, Dhaka-Bangladesh, Khatmandu-Nepal was conducted to appraise IRS 1C data products – 1996-97
- First in-house developed OCM Data Simulator and MSMR data simulator with NRZ-L and NRZ-S output features – 1998



- Establishment of a remote sensing satellite data reception, processing and product generation facility (KARP) at New Delhi for receiving data from IRS 1C, 1D, TES and EROS (Israel) satellite – 1998-99
- GCPL Phase-I project taken up as part of IRS-P5 programme for creation of necessary Ground Control Points (GCPs) for Stereo strip triangulation of Cartosat-1 stereo data – 1999
- NRSA's website hosted (www.nrsa.gov.in) – 1998-99
- NRIS Application and Query shell launched – 1999
- IRS-P4 (OCEANSAT), launched with OCM and MSMR sensors designed for oceanographic studies, products released for user – 1999



- Chhattisgarh GIS Project – 2000
- Land Information System for Jharkhand State (Birsa Vasudha) – 2000

- Regional Plan for National Capital Region (NCR), 2001: First time Space-based geospatial technology used for preparation of an urban plan – 2001
- Dr R R Navalgund takes charge as Director, NRSC – May 1, 2001

- MODIS data reception commenced – August 3, 2002
- Establishment of Multi mission Remote sensing Ground station (MMRSGS) for National Geographic Organisation (NGO), near Tehran, Iran during October, 2002 for IRS 1C/1D data reception, processing and product generation
- Three Antenna Systems along with near range Bore-sight Test facility were made fully functional – 2002-03
- First day product of IRS-P6 (Resourcesat-1) generated – 26 Oct, 2003

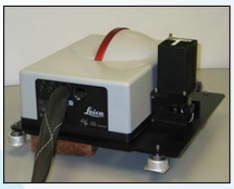
- Decision Support Centre (DSC) under Disaster Management Support Programme (DMSP) setup – 2003
- Integrated Simulation environment established using in-house developed Satellite Data Simulator with auxiliary data embedding feature – 2003

- Natural Resources Census - Land use / Land cover mapping at 1:250,000 scale using AWiFS multi-temporal satellite data – 2004
- Sujala Watershed Development Project taken up
- Natural Resources Census - Geomorphological and Lineament mapping on 1:50,000 scale using multi-temporal IRS LISS-III satellite data – 2004
- Assessment of Waterlogging and salt and / or alkaline affected soils in the commands of all major medium irrigation projects in the country using satellite remote sensing – 2004
- Software package, 'Integrated Satellite Coverage Information system', to assist user in selecting the area of interest was introduced
- Geotiff format was introduced in addition to super structure LGSOWG format
- Technology transfer for the subsystems like Multi-Function Digital Demodulator, Multiple Bit synchronizer, Multi function Simulator, SCR Power Amplifier, PC based Servo Control System and PC based Direct Archival and Quick Look System (PCDAQLS)
- Development of Web based ESMAPS for Purchase & Stores Division using JSP / Oracle 9i – 2003

चौथा दशक (2004-2014) - तकनीकी छलांग

Fourth decade (2004-2014) - Technological Leap

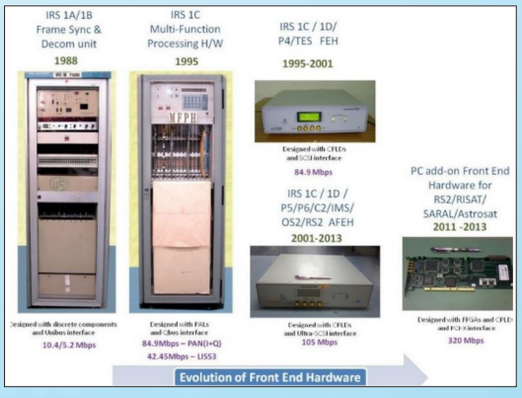
- Aerial Photography (1:40000 scale), Mapping (1:25000 scale) of 1189 islands – 2004
- Induction of LiDAR sensor technology with ALS-50 sensor – 2004



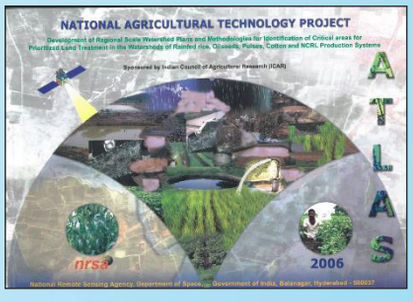
- Establishment of a state-of-art dual-shaped, high efficiency X & S-band 7.5 m antenna with 90% indigenous components for receiving IRS-P6 data (Resourcesat-1) at Terminal - III
- Establishment of Small Antenna System (1.2 m) for NOAA Data reception

- Digital Browse and Payload programming was integrated with Data ordering in User Order Processing (UOP) system
- Full fledged digital environment for satellite data reception chain simulation using in-house developed Data Serializer system – 2005
- Development of Time Code Generator, Time Code Translators – 2005
- Cartosat-1 satellite launched, data received, and first product generated – 2005

- Completion of Nation-wide Wastelands Mapping (13-fold wastelands classification) using one-time IRS LISS-III data of 2003 – 2005
- ISO 9001:2000 certification was obtained for NRSCs processes through STQC certification agency – February, 2005
- Dr K Radhakrisnan takes charge as Director, NRSC – November 6, 2005



- Remote Sensing & GIS based Infrastructure (Gas Pipeline, Powerline, Rail) Corridor alignment studies – 2005
- In-house development of Advanced Front-End Hardware (AFEH) which catered for IRS-P4, TES, IRS-P5 and IRS-P6 data reception and transfer to the computer on an Ultra SCSI bus for data rates upto 105 Mbps
- On Board Solid State Recorder (OBSSR) receiving station established at Svalbard, Norway & processing facility at Balanagar made operational – 2006
- Launch of Nationwide Land Use Land Cover Mapping (1st Cycle 2005-06) on 1:50,000 scale under Natural Resources Census – 2006



- Mapping of Maldives completed successfully; Remote Sensing Centre established at Male
- NATP - Development of regional scale watershed plans under different crop production systems – 2006
- Launch of Mapping Land Degradation (Cycle-1) of India on 1:50,000 scale using 2005-06 data – 2006

- Launch of Nationwide Land Use Land Cover Mapping on 1:250,000 scale on annual basis using AWiFS Data on annual basis – 2006
- Participation in Crop Acreage & Production Estimation (CAPE) and Forecasting Agricultural output using Space, Agro-meteorology, and Land based observations (FASAL) projects – 2006
- National Urban Information System (NUIS): First time National level large scale (1:10,000) thematic urban geospatial databases for Master Plan preparation for 152 cities – 2006
- Geo-LIMIS: Geographically Encoded Locust Impact and Minimization System
- Airborne Laser Scanner with Digital Camera (LSDC) procured – 2006
- DM-SAR test flights (which led to the final configuration of first Indian Synthetic Aperture Radar satellite RISAT-1) – 2006
- Establishment of Ground Station at NTRO-Doom Dooma, Assam during 2007-08 for reception of Cartosat-2/2A and 2B satellite data
- Airborne LIDAR ALS50 System coupled with medium format Digital Camera acquired – 2007

- First day products generated from Multi-spectral (MX) sensor and Hyper-spectral (HySI) sensor of IMS-1 and PAN sensor of Cartosat-2A – April, 2008
- Establishment of Algerian Ground station for Image Exploitation and Remote sensing (ALGIERS); Ouargla station was upgraded to receive and process the data from Algerian satellites, Alsat-2A and 2B
- Government of India decided to convert NRSA into a Government entity, to be called as "National Remote Sensing Centre" (NRSC), a centre under DOS/ ISRO; Dr V Jayaraman takes charge as first Director of NRSC – September 1, 2008


Ouagle Ground Station

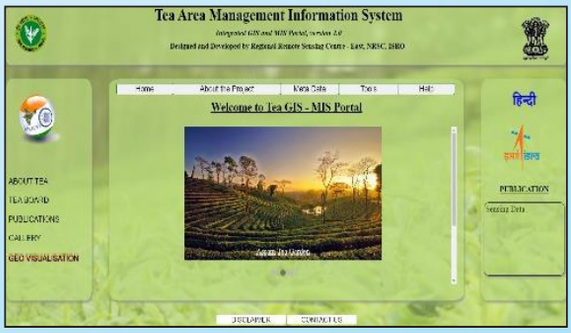

Data Reception Systems, Algeria

- First issue of in-house news letter 'Pixel 2 People' (P2P) launched – January 2009
- Operationalization of large format Durst Lambda Laser photo printer in 2009
- Participation in important national programs such as ISRO Geosphere-Biosphere Program (IGBP) and National Carbon Project (NCP) – 2008-2009
- Integrated Multi-mission Ground segment for Earth Observation Satellites (IMGEOS) approved and implementation initiated – April 2009
- First products generated from RISAT-2 – 30th April 2009
- First products generated from Oceansat-2 at data rate of 42.5 Mbps – 24th September 2009
- ISO 9001:2008 certification – Oct 2009
- Bhuvan (ver. 1.0) ISRO's web-based Earth Observation (EO) visualisation portal launched by MoS, PMO with 5m Color (IRS LISS-III + Mono) mosaic –12 August 2009

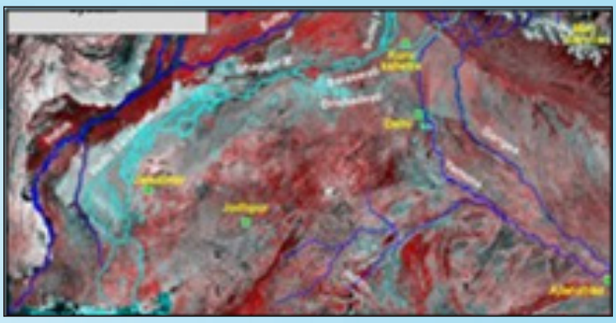
- RRSSCs were amalgamated with National Remote Sensing Centre and renamed as Regional Remote Sensing Centres (RRSCs) – 2009
- NRSC supplied a Mobile Ground station terminal for meeting the requirements of NTRO during 2009-2010

- Procured Ultracam-D, a Large Format Digital Camera, having Frame type multispectral camera and Augmented the systems – 2009
- Generation of Database and Implementation of Web Enabled Water Resources Information System (India-WRIS) in the Country – 2010
- Launch of Opensource Bhuvan 2D and awarded as OGC Website of the Month – Dec 2010
- Cartosat DEM for whole India Released – 5th May 2010
- First products generated from Cartosat-2B, – July 13, 2010
- Space Based Information Support for Decentralized Planning (SISDP) launched – 2010
- Nationwide Wastelands Mapping with 22-fold classification (using three seasons IRS Satellite Imagery of 2005-06) – 2010

- Antarctica Ground Station for Earth Observation Satellites (AGEOS) project initiated with MoU between NRSC and National Centre for Antarctica and Ocean Research (NCAOR), Ministry of Earth Sciences (MoES) – August 2010
- Tea Area Development and Management using Remote Sensing and GIS – 2010

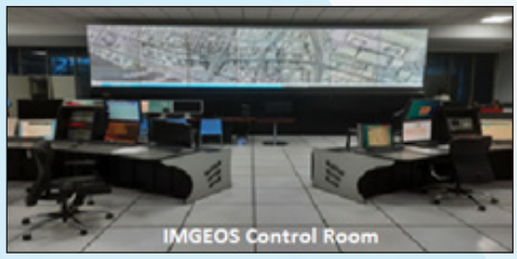


- The Antenna technology improved S/X Band capability with Cassegrain feed, 7.5 meter high efficiency dual shaped Antenna profile with Dual Polarization feed
- First Map Centric Application - Sarva Sikshya Abhiyan using Bhuvan Satellite Imagery as base – January 2011
- Completion of Nationwide Wastelands Mapping with change monitoring (using three seasons IRS Satellite Imagery of 2005-06 and 2008-09) – 2011



- Nationwide Land Use Land Cover Mapping (2nd cycle) under Natural Census Programme (using three seasons satellite Imagery of 2011-12) – 2011
- First products generated from Resourcesat-2 – 28th April, 2011
- Indian Institute of Remote Sensing (IIRS) was made as independent unit of ISRO and thus ceased to be a part of NRSC – April 30, 2011

- Dr V K Dadhwal takes charge as Director, NRSC – May 1, 2011
- Regional Remote Sensing Centre, Dehradun was merged with Indian Institute of Remote Sensing (IIRS), Dehradun – November 1, 2011
- Implementation of Remote Sensing Data Policy (RSDP) – 2011
- Establishment of INCOIS Ground Station at Hyderabad during September 2011 for Oceansat-2 Data Reception and Processing
- IMGEOS facility inaugurated by Chairman, ISRO – 4th November 2011
- Updation of HRS data, NRSC Open EO Data in Bhuvan as per RSDP - 2011 and release of Pocket Bhuvan – August 2011



- Institutionalization of NADAMS project technology to User Organisation (Dept of Agriculture) through newly-instituted Mahalanobis National Crop Forecast Centre (MNCFC), New Delhi – 2012
- Establishment of Earth and Climate Science Area (ECSA) – March 2012
- First products generated from RISAT-1 – 1st May 2012
- First User Centric Application in Bhuvan, Amritsar Tourism GIS for Punjab Heritage and Tourism Board – 2012

- Enabled near real time Disaster Management Information Support (NDEM Public) in Bhuvan – November 2012
- Bhuvan received Popular Geospatial Portal Award – 2012
- Release of report: Biodiversity Characterisation at Landscape Level: National Assessment – 2012
- Conceptualized of National Information System for Climate and Environment Studies (NICES) – 2012
- Release of National Geomorphology and Lineament database of India – 2013
- Release of First Geospatial Flood Hazard Atlas for Bihar – 2013
- Bhuvan implemented more User collaboration and user centric applications - Ludhiana Municipal GIS, Online Monitoring (AIBP) for Central Water Commission, HP Forest GIS, Geoprocessing for National Monument Authority of India and NICES data dissemination – 2013

- Bhuvan introduced Crowd-souring applications - Kedarnath Flood, Vijayawada GIS, Pest Surveillience with Mapper, Android Mobile Apps – 2013
- First products from SARAL/ Altika mission generated – 2013
- Bhuvan received Special Achievement in GIS, Special Achievement in Forestry awards – 2013

- Establishment of 4.5 m Antenna system (As5) at IMGEOS – 2013
- Establishment of new Bore sight tower of 45 m height at a new location in IMGEOS

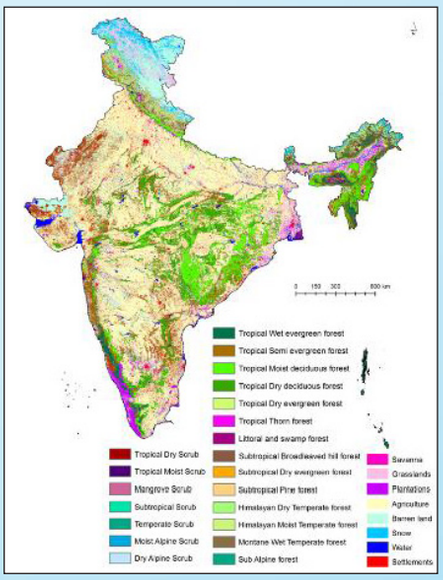
- Establishment of Antarctica Ground segment for Earth Observations Satellites (AGEOS) facility at Larsemann hills, Antarctica – 2012-13
- Payload programming made operational for international ground stations (IGS)
- FTP mode of data delivery introduced
- Customer Relationship Management (CRM) for automation of NDC pre-processing activities, analysis of customer feedback and Bulk announcement of various events – 2014

- Integrated CAL/VAL facility established for calibration of Optical and microware remote sensing sensors from Aerial and satellite sensors

पाँचवां दशक (2014-2023) - आगे बढ़ रहा है...

Fifth decade (2014-2023) - Marching Ahead...

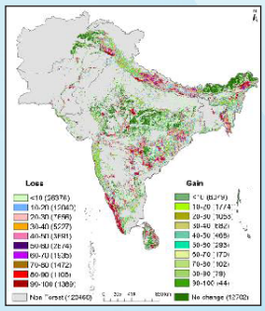
- NRSC bags the Platinum award for IMGEOS and NDEM building during the Green Building Congress held at HICC, Hyderabad – September 2014
- Assessment of soil carbon stocks of India – 2014
- ISRO-UNESCAP Project on Application of Space Technology for Agricultural Drought Monitoring & Early Warning in Sri Lanka and Myanmar for Govt. of Sri Lankan and Myanmar – 2014
- Bhuvan NUIS: Web application for usage of NUIS urban geospatial database by town planners & Capacity Building of 2500 town planning officials – 2014
- Guidelines for Urban Plan formulation using Remote Sensing & GIS introduced in URDPFI guidelines – 2014
- Ground water prospect map of India in 1:50000 scale hosted in Bhuvan Bhujal portal – 2014
- Inventory and Site Management Plan for Heritage Sites and Monuments of National Importance (SMARAC) – 2015
- Coordinated programme on Horticulture Assessment & Management using Geoinformatics (CHAMAN) – 2015
- Cartosat DEM for SAARC countries released – 2015
- Island Information System (IIS): First time established Number of Islands in Maritime zones of India using geospatial data – 2015
- Extension of IMGEOS Block A, Atmospheric Science Lab, Antenna Terminal Building (AS-5) and Technical Area Main Gate Complex – 2015-16



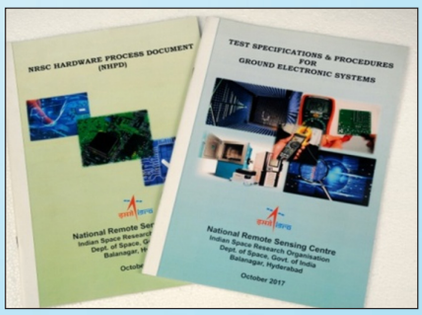
- Classification of Indian forest types using Resourcesat-2 AWiFS and multi-source data – 2015
- MoS PMO releases new Bhuvan applications on National Remote Sensing Day – 2015
- Use of Geo-spatial technologies in implementation and monitoring of major Government flagship programmes of Rural Development viz IWMP, NABARD, MGNREGA, RKVY & PDMC – 2015-2016
- Crop Insurance Decision Support System (CIDSS) developed; a new index - Crop Health Factor (CHF) developed for settlement of insurance claims – 2016
- Quality Assurance of Mission Projects Ground Segment elements initiated – 2016
- Updation of 1m High-resolution data for the entire country and release of Geospatial Content Management: SUVIHDA application – 2016
- DMSD Operational Service on oil-spill monitoring – 2016-18

- Daily cloud fraction product developed and hosted on the BHUVAN
- Total columnar ozone product over India based on OMI/TROPOMI data
- Radisonde measurements for vertical structure of atmosphere (RH, winds, and temperature) under the Radiosonde Network for NICES (RANN)
- Satellite-based indicators mandated for drought assessment and management in the Drought Manual 2016 brought out by the Govt. of India – 2016
- AMRUT: Release of Design & Standards for Formulation of GIS based Master Plans – 2016

- A Climate Research Laboratory for Atmosphere (CRL-A) established at Shadnagar – 2014-16
- Mapping and Spatial analysis for long-term forest cover change in natural forests (1930-2014) of India and South Asia under National Carbon Project – 2016
- Inventorization and Monitoring of Biosphere Reserves in India – 2016

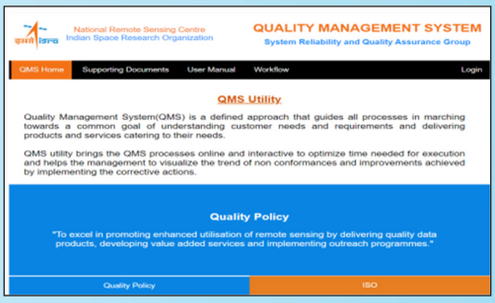


- Nationwide above ground biomass of Indian forests at 5km grid level – 2017
- National Health Resource Repository (NHRR) – 2017
- Graduated from ISO 9001:2008 to ISO 9001:2015 based on revision of International Standards – 2017
- Initiated generation of relevant standards and guidelines to streamline and strengthen QA procedures in NRSC – 2017-18

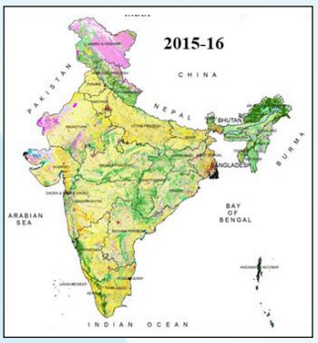


- Centre level design review mechanism established through SDRT - 2017
- ISRO eProcurement services facilitated to all the ISRO centres from NRSC, Shadnagar Data Center – 2017
- Relocation of RRSC- North from Dehradun to New Delhi – 2017
- Establishment of Tri-axis & Tri-band Antenna systems at AGEOS for all IRS-TTC, S/X/Ka-Payload data Rx – 2017-18

- Exclusive campus for Outreach Facility established at Jeedimetla campus – 2017-18
- NR Census - Nationwide mapping of Land degradation on 1:50,000 scale - 2nd cycle completed – 2018
- Establishment of National Water Informatics Centre (NWIC): Institutionalisation of geospatial technology under Ministry of Jal Shakti – 2018
- Established on-premise Private Internet Cloud for Dissemination services and on-premise Private IMGEOS Cloud for Data Processing services – 2018



- Upgraded and facilitated Web based Email services – 2018
- Established network services and operationalized Outreach facility at NRSC, Jeedimetla – 2018
- Released Citizen Centric Applications, Bhuvan Lite and Bhuvan Wiki – 2019
- Completion of Wastelands Mapping and change monitoring on 1:50,000 scale for the entire country using three seasons IRS LISS-III imagery of 2015-16 – 2019

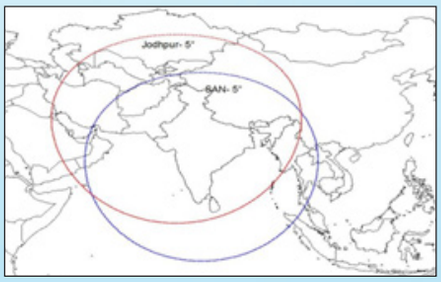


- First day products of Cartosat-3 released – 2019
- Completion of 3rd cycle National Land Use Land Cover Mapping on 1:50,000 scale using ortho-rectified satellite imagery (LISS-III) of 2015-16 – 2019
- Maha Agri Tech Project initiated for Agriculture Dept., Govt. of Maharashtra for digital agriculture solutions – 2019
- Ground Water Quality mapping for the country on 1:50,000 scale under National Rural Drinking Water Program (NRDWP) of Ministry of Jal Shakti – 2019


Ku Band Antenna

- Establishment of Ku-Band Data reception system for GISAT-1 & 2 Data reception – 2019
- Procurement of Mobile Mapping System consisting of Laser scanner (1550 nm) and digital cameras for 3600 FoV data acquisition – 2020
- Bhuvan Jaivoorja: A spatial information system for assessment of crop residue biomass towards biofuel solutions was launched – 2020

- Centre level review of new algorithms, methodologies developed at NRSC in satellite Data Products was established by constituting Algorithm Review Committee – 2020
- Establishment of Jodhpur Ground station for North Western and SAARC countries coverage – 2020



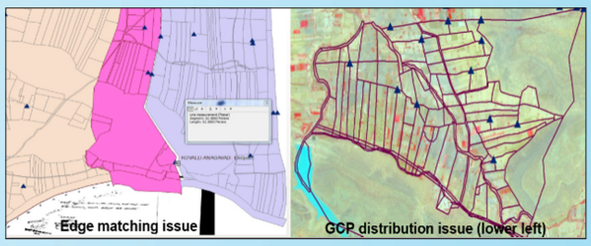

Antenna System @ JDP

- Established IT infrastructure for Bhoonidhi- Open Data Access portal – 2020
- Operationalized Unified Communications Manager facilitating centralized IP telephony and desktop virtual meeting services – 2020
- Geospatial Inventory of Coffee Plantations at national level (GEO-CUP)
- Implementation of lagrangian air-dispersion for monitoring of pollutants from forest fire and stubble burning – 2018-20
- Successful derivation of Cloud Top Temperature (CTT) based on INSAT-3D data and product hosted in BHUVAN on daily basis
- Land Surface Modelling for Glacio-Fluvial processes in the Himalaya intiated

- Ozonesonde Balloon launching experiment initiated under NICES program at 4 locations – IIST-Ponmudi, COH-Mojerla, RC-Nagpur, RC-Jodhpur
- Estimation of surface level pollutants from satellite-based measurements and numerical models over the coal mine
- Participation in Ocean Cruises for Ocean Parameter studies and Algal Bloom monitoring using OCM-data
- Geospatial support to Combat COVID-19: Mobile Rythu Bazar Tracking, Home Quarantine Tracker, Vaccination Centres, COVID Beds, Health Emergency Operation Centre, Meal Centres, API for 112+, MONAL: Mention of ISRO/Bhuvan efforts assisting Indian government during COVID-19 pandemic in UN report – 2020-21
- Housing For All (PMAY - U): Mobile & Web application using Geofencing approach for Geotagging and tracking/monitoring stages of beneficiary houses construction in urban areas – 2020
- Spatial inventory of Agroforestry Resources using Geospatial Technology & AI with very high-resolution images – 2021
- Spatial estimates forest above ground biomass – 2021
- Monitoring & Surveillance of Gas Pipeline Right of Usage (RoU) using Remote Sensing & GIS – 2021
- Geospatial enabled Urban Frame Survey (UFS) for National Statistics Office – 2021

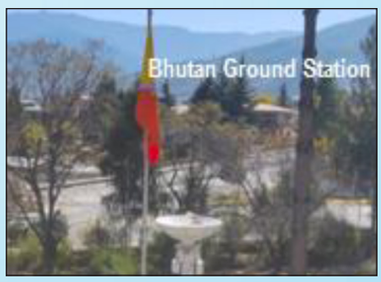
- Launch of Bhuvan-NHP Web Portal – 2021
- Release of Yuktdhara, a geo spatial planning portal for facilitating Gram panchayat level planning of MGNREGA activities – 2021
- Bhuvan Enabled higher frequency of Low-resolution IRS ortho images (AWiFS, LISS-III and LISS-IV) to enable time series visualization and free data downloads – 2021
- New Procedure was implemented for procurement of foreign satellites directly from the registered vendors – 2021
- Establishment of S/Ka 7.3 Mtr Antenna System, of S/X Tri-axis 7.5 Mtr Antenna System at DIPAC, Tirunelveli – 2021

- Established Centre level Instrument Repository and Calibration Monitoring Mechanism in 2021, through Instrument Calibration Management and Alert System (ICMAS) portal
- Establishment of Ist Tri-Axis S & Ka band Remote Sensing Ground Station (AS7) for Data Reception Systems Equipped with four high data rate demodulators to demodulate the received 8PSK modulation Ka band data for Cartosat-3 Series & NISAR Data Reception at IMGEOS – 2021
- Applications Projects Deliverables independent Quality Evaluation was initiated during 2021 and many projects were verified for meeting quality requirements
- Institutionalisation of geospatial application at NABARD Headquarters to monitor watersheds – 2021-22



- Implementation of new ISRO's E-Procurement System – 2021
- Decadal change of Night Time Light (NTL) over India, Solar Farms Inventory, Hotspot Analysis using Machine Learning/Deep Learning Techniques – 2022
- For EOS-04 (RISAT-1A), first day payload activities, first day product generation – 2022
- Establishment of 2nd Tri-Axis S & Ka band Remote Sensing Ground Station (AS8) for Data Reception Systems Equipped with four high data rate demodulators to demodulate the received 8PSK modulation Ka band data for Cartosat-3 Series & NISAR Data Reception at IMGEOS – 2022

- Installation & commissioning of in-house developed Antenna Control System at INCOIS Ground Station, Hyderabad – 2022
- Establishment of Tri-Axis S/X band Remote Sensing Ground Station (AS6) for Data Reception of IRS and Non-IRS missions at IMGEOS – 2022
- Established Virtual Desktop Platform for designers across ISRO – 2022
- Operationalized data transfer mechanism from NOAA, Fairbanks to NRSC Shadanagar in Near Real Time – 2022
- Timing reference changed over to NavIC (IRNSS) based timing signals
- Development of Data Path Controller, Five element tracking feed for cassegrain configuration, Monopulse Comparator, phase matching module for S and X – band Auto Tracking, FPGA based digital demodulator, Microstrip based Monoscan converter module, Compact Programmable Down Converter
- Ground stations established by NRSC for Ministry of Defence, Home and Earth sciences
- NRSC has handled major International ground station Turnkey projects like Augmentation of Norman Ground station, EOSAT-U.S.A, MMRSGS for NGO, IRAN and Ouargla ground station for INCT, Algeria

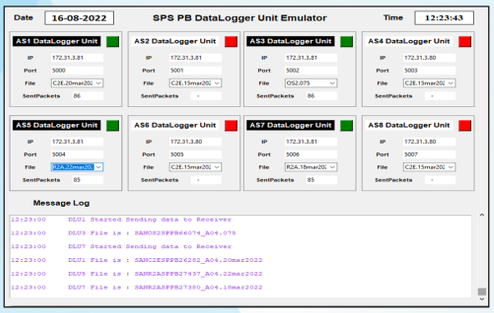


- Establishment of Bhutan Ground Station - an in-house designed and developed compact 2.7 m S Band Antenna System for Data Reception and Ingest from INS-2B (BhutanSat) Mission at DITT, Thimpu, Bhutan – 2022

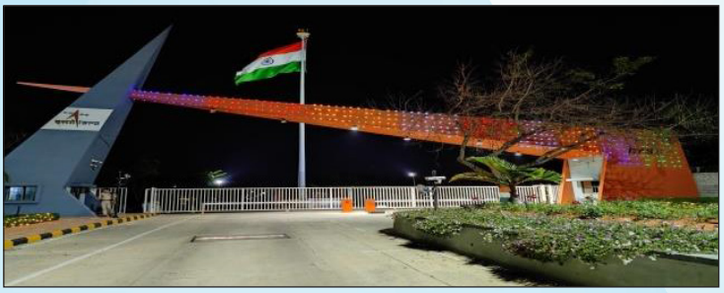
- Upgradation of INCOIS ground station for Oceansat-3/3A
- MP AgriGIS project initiated for Agriculture Dept., Govt. of Madhya Pradesh for technology-based yield estimation; Phase-II of MahaAgriTech project – 2022
- Released Urban waterbody Information System (UWaIS) – 2022
- Launch of HUMID Portal (Hydrologic Unit Model for InDia: a web-enabled system for hydrologic modelling in SWAT) – 2022

- Inducted two UAVs with RGB and multispectral camera having spectral bands in VNIR and Thermal region – 2022

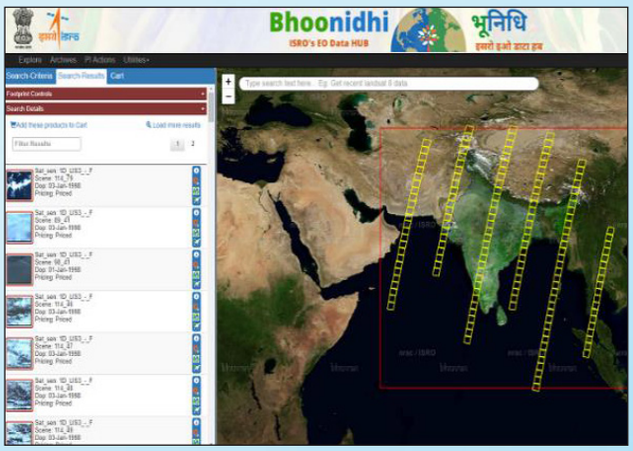
- Development of software based Emulator for multi channel Data Logger Unit for validating real-time performance of the software and its reliability – 2022



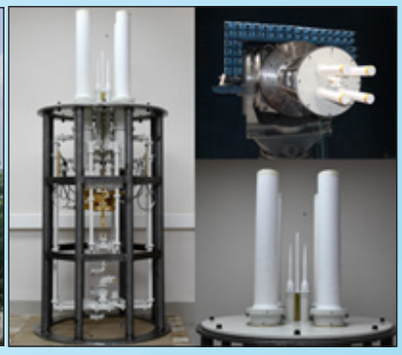
- Established nationwide lightning detection sensor network
- Preparation and hosting of 26 (out of 54) Essential Climate Variables as NICES products
- Software developed to handle EOS-06(OCM) ground based TDI (Time-Delay-Integration) schemes to generate Browse & NRT display



- First day products from EOS-04 & EOS-06 generated – 2022
- Development of NDEM 4.1 portal and mobile apps with enhanced disaster-specific services and database – 2023
- AMRUT: First time National Level Large scale (1:4000 scale) urban geospatial databases for 500 cities completed – March, 2023
- Development of fully automated operational spatial flood early warning models for the Godavari and Tapi river – 2023

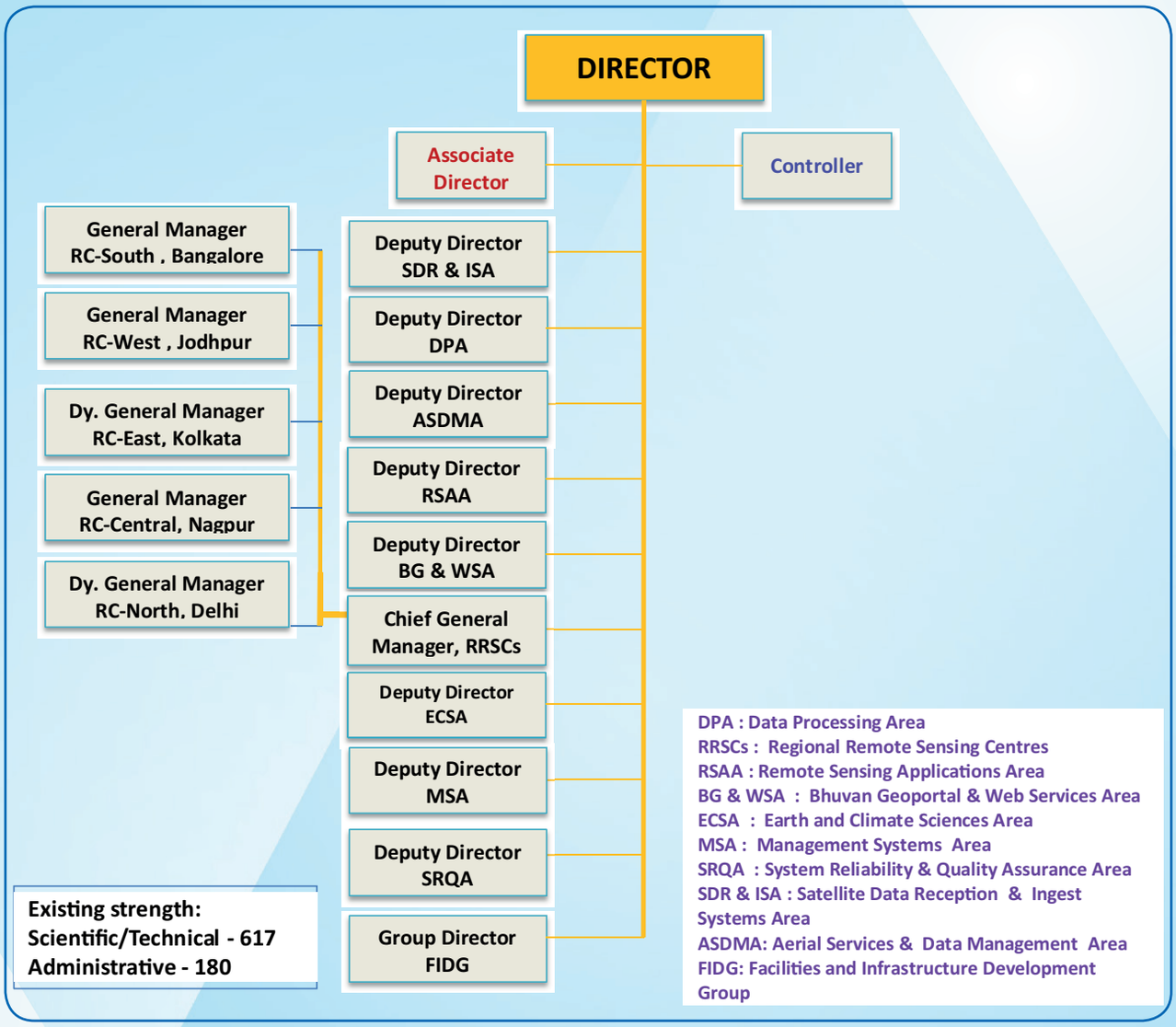


- Established Kubernetes platform for On Demand Data Processing Platform and Codelab for Bhoonidhi – 2023
- Business Opportunity with NGEs, Geospatial support to international cooperation – DWEPIC, Oman – 2023
- Operationalisation of BHOONIDHI PORTAL for Priced and Open data dissemination and NRT full resolution visualisation
- Operationalization of land surface reflectance products from Resourcesat-2 & 2A LISS-3 and AWiFS
- NovaSAR operations for acquiring the data and dissemination to the users
- In-house developed S/X/Ka band feed systems installed and made operational at IMGEOS – July 2023



- New CISF control room building at Shadnagar campus and at Balanagar campus are realised in early 2023 and same are inaugurated on 29th September 2023 during curtain raiser event of Golden Jubilee celebrations

वर्तमान संगठन संरचना
Current Organization Structure



एनआरएसए/ एनआरएससी के निदेशक
Directors of NRSA/NRSC

Name	Period	Photo
विंग कमांडर के आर राव, एवीएसएम Wg Cdr K R Rao, AVSM	4-Feb-1975 to 14-Jan-1982	
प्रो बुलुसु लक्ष्मण दीक्षतुलु Prof Bulusu Lakshmana Deekshatulu	15-Jan-1982 to 6-Sep-1982 (Director-in-charge) 7-Sep-1982 to 31-Oct-1996	
डॉ डी पी राव Dr D P Rao	1-Nov-1996 to 30-Apr-2001	
डॉ रंगनाथ आर नवलगुंड Dr Ranganath R Navalgund	1-May-2001 to 5-Nov-2005	
डॉ के राधाकृष्णन Dr K Radhakrishnan	6-Nov-2005 to 31-Aug-2008	
डॉ वी जयरमन Dr V Jayaraman	1-Sep-2008 to 30-Apr-2011	
डॉ वी के डढ़वाल Dr V K Dadhwal	1-May-2011 to 30-Jun-2016	

डॉ वाई वी एन कृष्णमूर्ति Dr Y V N Krishnamurthy	1-July-2016 to 31-Mar-2018	
श्री शांतनु चौधुरी Shri Santanu Chowdhury	1-Apr-2018 to 31-Dec-2020	
डॉ राज कुमार Dr Raj Kumar	1-Jan-2021 to 28-Feb-2022	
डॉ प्रकाश चौहान Dr Prakash Chauhan	1-Mar-2022 to till date	

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