



**GOVERNMENT OF INDIA
DEPARTMENT OF SCIENCE AND TECHNOLOGY
(NRDMS and NSDI Divisions)**

CALL FOR RESEARCH PROPOSALS

Introduction: The Natural Resources Data Management Systems (NRDMS) and National Spatial Data Infrastructure (NSDI) of Department of Science and Technology (DST) are for encourage and support to Geo-spatial technologies, applications development and to provide standards based data, web services and interoperable spatial products.

The Scheme: The Divisions invites research proposals from interested investigators/organizations. The broader areas where studies could be taken up in grant-in-aid mode are as given below:

A. Sensor Networks and Web Enablement (SWE)

Development and application of SWE in healthcare, infrastructure development for rural areas, disaster management, climate change, emissions, environmental observations and agriculture. The main components of SWE as defined by OGC (www.opengeospatial.org) where R&D projects could be developed are:

1. **Observations and Measurements Schema (O&M)** – Development of standard models and XML Schema for encoding observations and measurements from a sensor, both archived and real-time.
2. **Sensor Model Language (SensorML)** – Development of standard models and XML Schema for describing sensors systems and processes; to provide information needed for discovery of sensors, location of sensor observations, processing of low-level sensor observations and listing of taskable properties.
3. **Transducer Markup Language (TransducerML or TML)** – Development of the conceptual models and XML Schema for describing transducers and supporting real-time streaming of data to and from sensor systems.
4. **Sensor Observations Service (SOS)** – Development of standard web service interface for requesting, filtering, and retrieving observations and sensor system information. This is the intermediary between a client and an observation repository or near real-time sensor channel.
5. **Sensor Planning Service (SPS)** – Standard web service interface for requesting user-driven acquisitions and observations. This is the intermediary between a client and a sensor collection management environment.
6. **Sensor Alert Service (SAS)** – Standard web service interface for publishing and subscribing alerts from/to sensors.
7. **Web Notification Services (WNS)** – Standard web service interface for asynchronous delivery of messages or alerts from SAS and SPS web services and other elements of service workflows.

B. GeolCT: An Integrated Research Programme on Multi-dimensional Geo-spatial Data Modeling, Analysis and Applications

1. **Geo-spatial information, acquisition and processing**
 - Network based real time 3D geo-spatial visualizations and data streaming
 - Open and distributed Internet and Wireless GIServers
 - Location Based Services (LBS)
 - Intelligent geo-spatial algorithms for 3D data analysis
2. **Geo-spatial Imaging, Media and Information Processing Stream**
 - 3D mapping and modeling from high resolution remote sensing images
 - Automated 3D modeling from LiDAR systems
 - Automated feature extraction, data fusion and change detection
 - Automated feature extraction from imageries
 - Land based and air borne mobile mapping technologies
3. **Integrated GeolCT Systems and Applications**
 - 3D modeling of Heritage sites of India (Indian Digital Heritage)
 - Location based spatial decision support for security and risk assessment
 - Application of GeolCT in disaster management, location based health tracking and monitoring and communicable disease/invasive species monitoring and management

C. Hyperspectral Remote Sensing (HSRS)

1. Core R&D in HSRS, Hyperspectral Data requirements, acquisition, analysis, quality visualization, spatio-temporal modeling and applications
2. Spectral Database Management (development, updation and maintenance)

3. Spatial data models and Geostatistical approaches for uncertain objects and their relationships
4. Visualizing uncertainties in remote sensing and spatial data and analysis
5. High Resolution Hyperspectral Sensors: Applications and Processing
6. Application of HSRS in agricultural, marine, mineral, pollution, carbon mapping, greenhouse gases, other emissions and water resources/quality, monitoring of ecological land surface changes
7. The spectra library development for natural features

D. Geo-spatial technology based tools development for NSDI

1. Development of Spatial Information Processing (SIP) Models
2. Retrieve and analytics of spatial and corresponding attribute data from disparate geo-spatial and non-spatial databases from different Geo-spatial Data Generators. Interoperability issues for both spatial and non-spatial data from Govt, industry, academics and researchers
3. GeoVisualization and spatio-temporal analysis
4. OGC compliant web services based applications and integration of GSM/CDMA/GPRS, W3C and Web 2.0, etc.
5. Configurable multi-lingual support tools (Indian official languages)

Who can apply: Scientists, technologists and interdisciplinary researchers from academics, universities, research institutions, registered scientific societies may submit their proposals any time in a prescribed format.

Approval Mechanism: Periodically, the received proposals first scrutinized and screened by NRDMS and NSDI Divisions. Screened in proposals shall be peer reviewed and then referred to the respective Programme Advisory and Monitoring Committees (PAMC's) for technical evaluation before final approval. For further details about programmes, research areas, thrust areas, prescribed formats, guidelines for formulating/submission of projects and for other details visit www.nrdms.gov.in, www.dst.gov.in, www.nsdi.gov.in. The complete proposals may be addressed to: **Head**, NRDMS, Department of Science and Technology, Technology Bhawan, S J Marg, New Mehrauli Road, New Delhi 110 016.

For any other clarification, please contact **Dr K. R. Murali Mohan**, Member-Secretary, Programme Advisory and Monitoring Committee (PAMC); Tel.: 011-2656 7373, Ext: 319; e-mail: krmm@nic.in

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Requires

1. Senior Research Fellow

Qualification: B.A.M.S. or M.D. (Ayurveda)

2. Junior Research Fellow

Qualification: B.Pharm.

Please apply with detailed resume to the General Manager **within 7 days** from the date of advertisement.