MEMBER COUNTRY: **INDIA**

National Report to SCAR for year: **2014-15**

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Activity	Contact Name	Address	Telephone	Fax	Email	Website
Life Sciences						
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3)	Dr. V D Mishra	Snow & Avalanche Study Establishment Research & Development Centre Himparisar, Sector 37-A Chandigarh-160 036	(+91)-172-2699804	(+91)-172-2699970	vd_mishra@rediffmail.com	

Activity	Contact Name	Address	Telephone	Fax	Email	Website
Scientific Research Program						
ACE **1)** **2)** **AGCS** **1)** **2)** **EBA** **1)** **2)** **ICESTAR** **1)** **2)** **SALE** **1)** **2)**						
ACTION GROUPS						
1) **2)** **3)**						
EXPERT GROUPS						
1) **2)** **3)**						
SCADM						
1)	Shri S Samy	ESSO-National Centre for Antarctic & Ocean Research Headland Sada, Goa 403 804, INDIA	(+91)-832-2525515	(+91)-832-2520877	vssamy@ncaor.gov.in	
NATIONAL ANTARCTIC DATA CENTRE						
National Antarctic Data Centre of India is under construction	Shri S Samy	ESSO-National Centre for Antarctic & Ocean Research Headland Sada, Goa 403 804, INDIA	(+91)-832-2525515	(+91)-832-2520877	vssamy@ncaor.gov.in	
SCAR DATABASE						
insert name of database for which your country has responsibility						

A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS:

31 projects from 18 different premier institutes / universities of India were taken up during the said period of 2014-15. Brief highlights have been provided under subheads:

Atmospheric & Meterology

IMD (Maitri) I Observations of Meteorological Parameters and Ozone observations.

Continuous recording of wind speed, wind direction, pressure, temperature, diffused & direct solar radiation on self recording instruments were carried out.) 3 hourly observations are recorded as a routine. Hourly observations are recorded during extreme weather conditions.One Ozonesonde ascent taken in a week .

IMD (Voyage)-II Observation of Meteorological Parameter, Solar Radiation and Ozone

Radiation data logger installed in IMD Observatory and working satisfactorily. Radiation data logger gives continuous logging, recording of Global & UV-A radiation parameter.Mini Steven-sun screen was installed on 18 feet wind mast.Earthing / Ground connection was made for instruments and sensors.

Installation of Automatic Weather Station (AWS): A new AWS was installed during December 2014 nearer to the ice drilling site of NCAOR **Maintenance and data retrieval**: Two AWSs are located at Dozer point near Maitri on drifted snowpack and at Sankalp point on blue ice sheet. At every 15 days interval, data from both the AWS were collected.

Data collection at Maitri Station: More than 700 observations have been taken with sun photometer & ozonemeter at Maitri on sunny days only.

NPL (Maitri) Response of high latitude Ionosphere to the sub-storm and storms

1. CADI- Ionosonde instrument is working continuously and collecting data for studying the ionospheric phenomena during sub-storms and storms.2. GPS- instrument is being operated to obtain the Total Electron content of Ionosphere over Maitri station.

IIG (Maitri) Geophysical Studies in Polar Regions.

1. Digital fluxgate magnetometer is in operation continuously to record the diurnal variations of H, Z & D components to understand the storm & sub-storm relationships. Data collected in one second sampling and archived.2. Proton Precession Magnetometer is being operated to record the declining trend of the Total Magnetic field at Maitri.3. Induction Coil Magnetometer is continuously recording the short period fluctuations of the geomagnetic filed and also Schumann resonance frequencies. Data collected and archived. 4. To understand the particle precipitation & Cosmic Noise Absorption (CAN) during the sub-storm activities in the auroral ionosphere over Maitri, an Imaging Riometer is working continuously.

SPL (Bharati) Climate Change Research and Low Latitude and High Latitude Coupling

Balloon Borne GPS radiosonde and Ozonsesonde flights: A total 10 balloon flights.Out of these, 3 flights are Ozonesondes, which gives vertical profiles of Ozone in the atmosphere and GPS provides the vertical information of temperature, winds and RH to study the dynamical coupling between troposphere and stratosphere. Ozone analyser was utilized during the Voyage which gives gives columnar ozone concentration in continuous mode. In addition the GPS receiver which was operational at Bharati since February 2013 was upgraded and data stored since February 2014 was collected.

Earth Science

Geology & Glaciology :

NGRI (Maitri) Permanent Seismological and GPS observatory at Maitri-Antarctica.

GPS Station for Crustal deformation study is continously recording date along with a Seismological observatory.

GSI (Maitri)-I

Mapping and petrological study of lamprophyres of Schirmacher Range, East Antarctica to constrain the genesis:

1. Twenty five lamprophyre dykes have been identified, delineated and sampled for further petrological studies. 2.Samples have also been collected from the country rocks and associated mafic intrusives for further studies. In order to understand the relationship of lamprophyre intrusions with the regional geological structure, structural data has been collected from several parts of Schirmacher hills. 3.Fieldwork for this project is complete and a preliminary map delineating all the lamprophyres is being prepared.

GSI (Maitri)-II

Recessional history of the Polar Ice sheet in the Schirmacher Oasis, East Antarctica

1.Field work was carried out covering Schirmacher Oasis. Most of the area is covered by moraines, which serve as a proxy for the recession of the Polar ice sheet. These moraines are studied in detail and the orientation as well as the shape and size are noted down. 2.Sediment samples from different type of valleys were collected. TL samples from moraines are collected from the entire length of the oasis. Fieldwork for this project is complete and data is being plotted on the map.

GSI (Maitri)-III

Glaciological Studies in Central Dronning Maud Land, East Antarctica

During the period mentioned above, the annual glaciological data is showing a net recession which was collected from the Dakshin Gangotri glacier snouta a tongue like projection of the Polar ice sheet south of Schirmacher Oasis. To expand the glaciological observations on the Polar ice sheet, covering a large area, 23 stakes were fixed in a grid pattern. Field work for this project is not yet complete as the glaciological data from the ice shelf area is yet to be taken with the help of helicopter support.

Rajasthan University (Bharati) Investigating the India – Antarctic connection during Paleoproterozoic: geochemistry and paleomagnetism of the Vestfold Hills mafic dykes, East Antarctica

Five different sets of dykes were encountered in the field, the most prominent being the N – S trending ones that are also younger than other ones. For the purpose of present study, oriented hand samples were collected from the E – W and NW – SE trending dykes during three field visits for Paleomagnetic studies and in addition, one representative sample from each lithology including the host granite gneiss for geochronology.

Goa University & MoES (Bharati) Estimation of Beryllium concentration from polar regions

Reconnaissance survey was done of different lakes . Firstly surface sample was collected from a dry lake and a trench of around 40cm was made to collect sample. Grab sampling was done at different depths from coastal regions and almost three samples were retrieved from depths of around 85 metres,120 metres and 200 metre.

SOI (Bharati)Large Scale Topographical Mapping and Geophysical Studies for Neo-tectonics & Monitoring Inter-plate movement of Antarctica plate w.r.t. Indian plate

Topographical Mapping on scale 1:5000 with 2 mt contour interval of Mcleod , Easther, Harley Islands and Bridge & Bharati area on 1:2500 scale with 1 mt contour interval is completed.

NCAOR (Voyage) Biogeochemistry and Paleoenvironmental studies of Larsemann Hills, Prydz Bay and Schirmacher Oasis: a past-present-future perspective

Measured the pH and water temperature of water samples collected at every one degree latitude during the voyage.Filtered the surface water samples for chlorophyll, coccolithophores (using filter papers of 4, 2 and 0.8 microns), particulate organic carbon (POC).Collected surface water samples at every one degree latitude.Collected the meteorological parameters for every one degree latitude.Measured the chlorophyll properties of water sample collected using FLUOROPROBE instrument.Collected water samples from the lakes of Grovnes (L8 and L7) and Broknes(Discussion Lake, Reid Lake, Stepped Lake, Njella Lake).

NCAOR (Voyage) Hydrodynamics of the Indian Ocean sector of coastal Antarctica

Launched CTD probes from Cape Town to Bharati station at every half degree latitude.Recorded the meteorological data for every CTD probe launching.Spectroradiometer instrument testing inside Bharati station lab to collect laboratory spectra of natural surface features.Collected 8 moss samples from Broknes Island and tested using spectroradiometer inside Bharati lab.Collected field spectra of snow/ice and debris samples from shelf/ near piston bulley point.Field spectra collection at Thala fjord and collected samples for laboratory spectra measurement

NCAOR (Voyage) Antarctic Cryospheric process studies and climate change reconstruction using snow and ice core records

Set up of the in situ heterotrophic and autotrophic production experiment with the cryoconite holes.Snow and water sampling at the polar ice sheet near Piston Bully point.Set up of the in situ photochemistry experiment in the cryoconite holes.Lab instrument setup, sample processing and chemical solution preparations at Bharati station Lab.

Biology & Environmental Sciences

BARC (Maitri) Cosmic Ray Dosimetry

DOSIMETER Data Logging: - The neutron detection and gamma ray radiation is measured by this instrument which is placed inside the Nandadevi hut at Maitri.

NCAOR (Maitri)Environmental Monitoring and Health of Indian Antarctic Stations in Pursuit of Antarctic Treaty System

Water Sample Collection Surface water sample collected from three glacial lakes, Priyadarshini Lake as well as few Lakes located adjacent to Maitri station. More than 40 water samples collected following special and temporal variation. In order to study the nutrient flux in Priyadarshni Lake, volume assessment of feed water to Priyadarshini Lake was also carried out.

Human Phsiology & Medicine

DIPAS (Voyage) The consequences of Antarctic conditions and ship voyage: Immunological, Haematological and Genomic responses in Indian expeditioners.

Psychological tests were conducted twice till today one during voyage and another at Bharati.Urine,stool and saliva have been collected twice during voyage in fasting conditions.

Students Participation Scheme

CMFRI (Voyage) Studies on phytoplankton diversity of Antarctica with special reference to diatoms

A total of 31 sampling stations were covered during 25-01-15 to 09-02-15 from the Lat. 65° to 69° South. Surface water samples were collected from 8 stations during the voyage, 9 stations near the coast of north Groveness island and 14 stations near the coast of broknes. Water parameters were checked and filtered samples were preserved in 4% buffered formaldehyde solution for further taxonomic studies.