

MEMBER COUNTRY: INDIA
National Report to SCAR for year: 2009-10

Activity	Contact Name	Address	Telephone	Fax	Email	web site
National SCAR Committee						
	Rasik Ravindra, Chairman	[1] Director, National Centre for Antarctic & Ocean Research, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	91-832-2525501/ 2520876	91-832-2520877	rasik@ncaor.org; rasikravindra@yahoo.co.in;	www.ncaor.gov.in
	Dr. M.K.Tiwari	National Physical Laboratory, Dr.K.S.Krishnan Marg, New Delhi - 110 012,India			mktiwari@mail.nplindia.ernet.in	
	Dr.Prakash Chauhan	Space Application Centre (ISRO), Ahmedbad - 380 015	040-27192504	040-27160591	prakash@sac.isro.gov.in	
	Dr.S. Shivaji	Centre for Cellular & Molecule Biology, Uppal Road, Hyderabad 500 007			shivas@ccmb.res.in	
	Dr. N.Khare	Ministry of Earth Sciences, Mahasagar Bhavan, Block 12, CGO Complex,Lodhi Road, New Delhi - 110 003	011-24306818	011-2430336	nkhare45@gmail.com	
SCAR Delegates						
1) Delegate	Secretary	Ministry of Earth Sciences, Mahasagar Bhavan, Block 12, CGO Complex,Lodhi Road, New Delhi - 110 003				
	Rasik Ravindra	Director, National Centre for Antarctic & Ocean Research, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	91-832-2525501/ 2520876	91-832-2520877	rasik@ncaor.org; rasikravindra@yahoo.co.in;	www.ncaor.gov.in
2) Alternate Delegate						
Standing Scientific Groups						
Life Sciences						
1)	Dr. B. Ingole	National Institute of Oceanography, Dona Paula,Goa-403 004	91-832-2450242	832245060	baban@nio.org	
2)						
3)						
4)						
Geosciences						
1)	Dr. S. Mukherji	Director,Antarctic Divison, Geological Survey of India, NH5, NIT, Faridabad - 121 001;	0129-2417335	0129-2417341	mukherjeesharad@rediffmail.com	
2)	Dr. Rajan	National Centre for Antarctic & Ocean Research, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	0832 2525511	0832 2520871	rajan@ncaor.org	
3)	Dr. N. C. Pant	Indian Institute of Technology Kharagpur 721 302	91 3222 283396		pantnc@gg.ernet.in	
4)	Dr V M Tiwari	National Geophysical Research Institute uppal Road Hyderabad 500 003	91 40 2343 2494	91 40 2343 4651	vmtiwari@ngri.res.in	
Physical Sciences						
1)	Dr. S. L. Jain	Emeritus Scientist, National Physical Laboratory, Dr.K.S.krishnan Marg, New Delhi-110 012	91-11-45608584	91-11-45609310	sljain@mail.nplindia.ernet.in	
2)	Dr C G Deshpande	Indian Institute of Tropical Meteorology Dr Homi Bhabha Road Dr Homi Bhabha Road Pashan	91 20 2589 3600	+91 20 2665 5961	cgdesh2004@yahoo.com	
3)	Dr. Shailendra Shaini	National Centre for Antarctic & Ocean Research, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	0832-2525521	0832 2520871	shailendra.saini@gmail.com	
4)	Shri. Rasik Ravindra	National Centre for Antarctic & Ocean Research, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	0832 2520876	0832 2520871	rasik@ncaor.org	

Scientific Research Program						
1) 2) 3) 4)	ACE					
1) 2) 3) 4)	AGCS					
1) 2) 3) 4)	EBA					
1) 2) 3) 4)	ICESTAR					
1) 2) 3) 4)	SALE					

Activity	Contact Name	Address	Telephone	Fax	Email	web site
ACTION GROUPS						
1) 2) 3) 4) insert others as needed						
EXPERT GROUPS						
1) 2) 3) 4) insert others as needed						
JCADM						
1) 2)	Shri. Mirza Javed Beg	Project Director, Inf., & Comm. Tech. Div, NCAOR, Ministry of Earth Sciences, Headland Sada, Goa - Pin-403804, INDIA.	91-832-2525521	91-832-2525520	mjbeg@ncaor.org	
NATIONAL ANTARCTIC DATA CENTRE						
SCAR DATABASE						
insert name of database for which your country has responsibility						

A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS:

36 projects from 33 different premier institutes / universities of India were taken up during the said period of 2009-10. Four students participated under the Student participation Scheme and one in other field. Brief highlights have been provided under subheads:

Atmospheric & Meteorology

Space Application Centre (SAC):

- 1) Meteorological observations at three-hourly interval were taken from Cape Town to the Larsemann Hills. The observations include air temperature, DB/WB temp, barometric pressure, wind speed and direction (true wind), cloud coverage, sea state condition and weather conditions.
- 2) These measurements were carried out for the validation/calibration of satellite data and also, for the ocean circulation models.

Indian Institute of Geomagnetism (IIG):

Three instruments namely, DFM, GPS and AWS are being run successfully.

A Wind Turbine and Solar Panel systems are also operational for providing continuous power supply to the instruments by charging the batteries. The work carried out after reaching Larsemann Hills.

Survey of India (SOI):

The members of SOI team carried out following work: 1. Out of the two areas allotted at Larsemann Hills for large scale mapping on 1:5,000 scale with contour interval 5m, large scale mapping of Bharti Top falling in Latitudes 69024'10" to 69024'45" South and Longitudes 76014'00" to 76016'45" and covering an area of 0.75 sq.km. has been completed.

3. Carried out large scale mapping of part of Fisher Island on 1:5000 scale with 5m contour interval between the Latitudes 69°23' 30" & 69° 24' 30" and Longitude 76° 13' 00" & 76° 16' 00" covering an area of 1.0 sq km.

4. Collection of tidal data for 9 days w.e.f. 12.01.2010 (A/N) to 22.01.2010 has been done using VTM 710 tide gauge (pressure sensor type) instrument.

Geomagnetism

Magnetic observatory at "Maitri" for monitoring variation in Earth's magnetic field, which aims to study the storm - substorm relationship. This also aims to identify signatures in atmospheric electrical parameters, study in decline of Total Magnetic field 'F' as observed in Southern hemisphere. This would also help to monitor the ionospheric Total Electron Count (TEC), scintillation and tropospheric water vapour content. Global Electric Circuit (GEC) Expt. At Maitri the diurnal variations of GEC potential gradient are some of the interesting feature of this study. Digital Fluxgate Magnetometer was installed at Larsemann Hills to record variations in three orthogonal components of Earth magnetic field. This would help us to understand the auroral current systems and this throw light on the auroral current system.

IMD

Collected synoptic data measurements for the meteorological parameters as also AWS data at Maitri.

NPL

Ionosonde and VLF both are working properly at Maitri and the ionograms being generated will be utilised to infer the ionospheric variation over Antarctic region.

IIG

Magnetic Measurements: at Maitri.

Diurnal and short period variations of H, Z and D of the earth's magnetic field is being recorded continuously in digital form with a Digital Fluxgate Magnetometer, at one second interval.

Total Magnetic Field (F) variation is monitored with Proton Precession Magnetometer, to understand the rapid declining trend at Maitri.

Imaging Riometer is working continuously under test condition, and the functioning of it, is being monitored.

Induction Coil Magnetometer has been installed to study the micro pulsation activity.

GEC parameters:

Data being collected continuously in different meteorological conditions with Maxwell current system, Air-Earth current system, and Electric Field Meter-100 to understand the Global Electric Circuit parameters.

SASE

Hourly observations of various snow-meteorological parameters (Incoming Solar Radiation, Outgoing Solar Radiation, Sun Shine duration, Net Radiation, Average Ambient Temperature, Maximum Temperature, Minimum Temperature, Instantaneous Temperature, Relative humidity, Wind Speed, Wind Direction, Atmospheric Pressure, Snow Surface Temperature, Snow Depth) have been taken over the continental ice sheet to estimate surface energy budget of the glacier.

Earth Science

Geology & Glaciology

National Hydrographic Office (NHO):

The Naval Hydrographic team continued six hourly meteorological observations. The NHO team carried out 25 hourly static observations using GPS 530 at LH_Ref station on 04-05 Jan 2010 to ascertain its accurate position using RINEX and Precise Ephemeris data. The coordinates of Bharti Top (Larsemann Hills) was also re-observed on 03 Jan 10 and its position was ascertained.

BARC

Radiation studies being carried out by BARC include Ionizing background field radiation survey using sodium iodide scintillation portable survey meter and using GPS around MAITRI. GROSS RADON EMISSION FLUX ACCUMULATOR FROM SOIL incorporating LR115 dosimeter film at MAITRI near helipad was installed.

GSI

GPR surveys were carried out for the convoy route. **NCAOR**

GPR survey was conducted near the Wohlthat Mountains as a part of the ongoing collaborative project between Geological Survey of India and NCAOR. The location near 71deg35 min S and 10 deg 00 min E was selected for the survey to locate the ice core drilling point for the next expedition.

Biology

Wildlife Institute of India

Monitored wildlife in the Southern Ocean and coastal regions of Larsemann Hills (around Bharthi station). Monitoring program was initiated as soon as ship sailed from South Africa. Regular observations for oceanic birds and other wildlife were made from onboard the expedition vessel Ivan Papanin. As per protocol, 6 hr (morning 2 hr, after noon 2 hr and evening 2 hr) were spent daily observing birds and other wildlife. Other information on the outside temperature, pressure, wind velocity, ship speed along with GPS coordinates were also collected. During the journey to Larsemann hills 30 species of birds (including two species of Penguins), two species of whales and two species of seals were recorded.

Shriram Institute of Industrial Research (SIIR) With an objective of long term environmental monitoring and impact assessment at the upcoming Indian Scientific Base Bharti in Larsemann Hills, East Antarctica along with nearby areas namely, Mc.Leod, Fisher, Broknes, and Stornes Peninsula, relevant observations, data collection and sampling were carried out during this period. A total of 38 water samples were collected from these locations. Some of the vital data for surface water were collected in-situ and remaining samples were preserved for detailed laboratory analyses in India.

Human Physiology & Medicine

DIPAS

It is well known that stressful environmental conditions are a major determinant of immune activity. It is very much affected by environmental conditions like heat, cold, isolation, stress etc. The effect of these conditions on the immune system is the subject of limited research. There are certain studies reporting decreased immunological responsiveness but the mechanisms are presently unclear. The studies performed are on different expeditions at different time periods. So it needs to be focused on all three types of immunity i.e. humoral, cell mediated and mucosal in the expeditioners going for long stay at Antarctica at the same time which have long term health implications.

Aim & Objective: The objective of the study is to determine the effect of Antarctic environment like extreme cold, isolation and other stress factors (cumulative stress) on human immune system.