DO YOU KNOW?

EARTH SYSTEM SCIENCE ORGANIZATION

What is Earth System Science Organization and what is its vision?

Recognizing the importance of strong coupling among various components of the earth, viz. atmosphere, oceans, cryo-sphere and geo-sphere the Ministry of Earth Sciences was founded in 2006. Soon after in 2007 came in a virtual organisation, an executive arm of the Ministry, the Earth System Science Organisation (ESSO). It has three major branches of earth sciences viz., (i) Ocean Science & Technology (ii) Atmospheric Science & Technology and (iii) Geoscience and Technology. The sole purpose of the endeavor was to address holistically various aspects relating to earth processes for understanding the variability of earth system and for improving forecast of the weather, climate and hazards.

Primarily aimed to develop and improve capability to forecast weather, climate and hazard related phenomena for societal, economic and environmental benefits including addressing aspects relating to climate change science, climate services and integrated Himalayan meteorology, the ESSO is also responsible for development of technology towards the exploration and exploitation of marine resources in a sustainable way for the socio-economic benefit of the society by taking into account the global developments in the field of marine environment.

The Vision

The overall vision of the ESSO is to excel in knowledge and technology enterprise for the earth system science realm towards socio-economic benefit of the Indian sub-continent and in the Indian Ocean region. It has three major components:

- Provide scientific and technical support for both academic and applied research in Earth System sciences as a whole comprising the atmosphere, hydrosphere, cryosphere and the geosphere, with particular reference to the Indian sub-continent and the surrounding oceans as well as the Polar Regions.
- Provide the Nation with the best possible services in forecasting the monsoons and other weather/ climate parameters, ocean state including early warnings to natural disasters like storm surge, earthquakes, tsunamis and other phenomena through well integrated programs.
- Support science and technology development for exploration and exploitation of ocean resources (living and non-living), ensuring their sustainable utilization.

How does ESSO Work?

The ESSO contributes to the areas of Weather (General), Weather advisories specific to agriculture, aviation, shipping, sports, etc. Monsoon, Disasters (cyclone, earthquake, tsunami, sea level rise), Living and non-living resources (fishery advisory, poly-metallic nodules, gas hydrates, freshwater etc), Coastal and Marine Ecosystems and Climate Change, Underwater Technology. One of the major schemes of the ESSO, on defining and deploying satellite based, airborne and in-situ atmospheric, ocean and lithosphere observing systems, acts as backbone for achieving the objectives. These policies/programmes are being pursued through its centres viz., autonomous bodies and subordinate offices. The institutions, viz. India Meteorological Department (IMD), National Centre for Medium Range Weather Forecasting (NCMRWF) and Indian Institute of Tropical Meteorology (IITM), National Centre for Antarctica and Ocean Research (NCAOR), National Institute of Ocean Technology (NIOT), Indian National Centre for Ocean Information Services (INCOIS), Centre for Marine Living Resources (CMLRE) and Integrated Coastal and Marine Area Management (ICMAM) were grouped under the ESSO. These institutions are under Earth System Science Organization (ESSO), managed by the ESSO Council. Each centre has been created with a specific well defined mandate. The ESSO operates through ESSO council, an apex body to formulate policies and plans, and provide programme directions for the Centres/Units and review the implementation of programmers.

How do you explain Desalination Technology and how does it work?

Desalination refers to the process by which pure water is recovered from saline water by the application of energy. The commercially relevant desalination processes are broadly classified as thermal and membrane processes. The Low Temperature Thermal Desalination (LTTD) is a process by which warm surface seawater is flash evaporated under low pressure and condensed with cold deep seawater, for generation of freshwater. The ESSO has set up till

date 4 Low Temperature Thermal Desalination (LTTD) plants successfully in the country, one each at Kavaratti, Minicoy, Agatti, Lakshadweep and at Northern Chenai Thermal Power Station (NCTPS), Chennai. The technology is completely indigenous, robust and environment friendly. Out of this four plants, the Minicoy and Agatti plants were established in April 2011 and July 2011, respectively. The capacity of each of these LTTD plants is 1 lakh litre per day of potable water.

What is South Pole Scientific Expedition?

India had successfully completed a scientific expedition to the South Pole during November-December 2010. It was a very important expedition as it was part of the international celebration of centenary of man's reaching South Pole in 1911.The first expedition to the South Pole started in 1902 and completed in 1911.This expedition was scientific in nature and was carried out with ice trucks, ice vehicles which travel 80 to 90 km/hour against the first expedition which was an adventure expedition where dogs and sledges were used. The 8-member team collected valuable atmospheric aerosol data and several short ice cores in the course of its transect from the Schiramcher Oasis to the South Pole.

What is India's preparedness to monitor Tsunami and is Tsunami Early Warning System in place now?

A state-of-the-art Tsunami Warning System was made operational in September 2007 has been in continuous operation to forewarn of an impending disaster in less than 10 minutes of an occurrence of an earthquake. The National Tsunami Early Warning Centre (NTEWC) is operated 24x7. So this ensures that the warning of a possibility of a Tsunami is given out ahead of it actually hitting the coast, allowing people to evacuate and take necessary precaution.

What is Monsoon Mission?

The ESSO has launched the Monsoon Mission for improving the predictability of the Indian Monsoon. Better monsoon prediction will help the Nation in taking advance action in preparing for the agricultural and other impacts of the monsoon. It consists of two sub-themes-Seasonal and Intra-seasonal Monsoon Forecast and Medium Range Forecast. The mission will support focused research by national and international research groups with definitive objectives and deliverables to improve models in the medium range as well as in the extended and seasonal range scales through setting up of a framework for generating dynamical forecasts and improving skill of forecasts. The Mission will also support observational programme that will result in better understanding of the processes. Under the Mission, Indian Institute of Tropical Meteorology (IITM) will coordinate and lead the effort for improving the forecasts on seasonal and intra seasonal scale. National Centre for Medium Range Weather Forecasting (NCMRWF) will lead and coordinate the efforts for improving the forecasts in the medium range scale. These will be made operational by the India Meteorological Department (IMD). In a bid to improve the skill of the forecasts in various temporal and spatial ranges, proposals will be invited from national as well as international Institutes on very specific projects and deliverables. Provisions for funding the national as well as the international partners will be provided. These partners will be allowed to use the HPC facility at IITM and NCMRWF which will be suitably enhanced for the purpose. A National Steering group is being put in place to steer the programme and review the progress of the mission. ❑