



## In this Issue:

- Ocean State Forecasts through Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES)
- Daily Global Ocean Analysis products
- Research highlights
- 14<sup>th</sup> Foundation Day
- Our new scientists
- Workshops, lectures
- Other news at a glance
- Publications

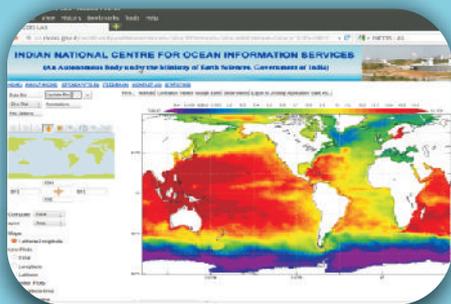
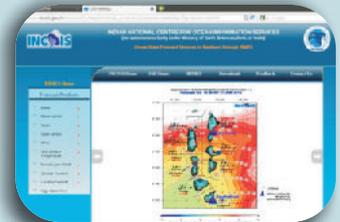
# Ocean News



Volume 5 Issue 1 January - June 2013 ISSN 0973- 9971

## Ocean State Forecasts through Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES)

- \* Ocean State Forecast Service for Maldives Islands: In response to the requests from the Maldives through RIMES, ESSO-INCOIS set up numerical models to provide forecasts on sea state (wave height and direction, surface currents, SST etc. ) on a daily basis for the waters around the Maldives. (See [http://www.incois.gov.in/Incois/osf\\_rimes/index.jsp](http://www.incois.gov.in/Incois/osf_rimes/index.jsp))
- \* Implementation Agreement with RIMES: RIMES signed an MoU with ESSO-INCOIS to disseminate customised value added ocean state forecasts to RIMES member countries. The agreement was signed on 8<sup>th</sup> March 2013 during the 3<sup>rd</sup> User Interaction Workshop at ESSO-INCOIS.



## Daily Global Ocean Analysis products

The GODAS Ocean General Circulation model has been fine tuned and operationalised to provide daily Global Ocean Analysis products. This new system is capable of providing ocean analysis, based on the Modular Ocean Model (MoM) with a delay of two days. From March 2013, daily data is available to the public from the ESSO-INCOIS Live Access Server (<http://las.incois.gov.in/las/UI.vm>).

## Research Highlights

- \* In situ weekly Argo Sea Surface Temperature (gridded using DIVA) and weekly TRMM/TMI Sea Surface Temperature(SST) for the Tropical Indian Ocean (TIO) (January 2009– December 2010), showed high correlation of more than 0.98 along with low bias and relatively low RMSE. These factors indicate that temperature data close to the surface from Argo floats can be used to compare microwave - derived SSTs on weekly time scales.
- \* In situ data over the North Indian Ocean was used to evaluate daily near-surface air temperature ( $T_a$ ) and specific humidity ( $Q_a$ ) from 3 hybrid flux products, (viz. Coordinated Ocean-Ice Reference Experiments version II (COREII), Objectively Analyzed Air-Sea Fluxes (OAFflux) and Air-Sea Fluxes for the Global Tropical Oceans (TropFlux)). It was noted that  $T_a$  from these products has a root-mean-square error (RMSE) of  $\sim 0.5$  °C . TropFlux captured the daily variability of  $T_a$  very well with a systematic deviation. All products overestimated  $Q_a$  by 0.3–1.5 g/kg. OAFflux showed (cont'd.)

- ✦ The smallest systematic deviation, while TropFlux showed the highest correlation with buoy data. The air-sea humidity difference is linearly related to sea surface temperature for values greater than 28 °C, similar to that of the western Pacific Ocean.
- ✦ Validity of the daily averaged gridded altimeter significant wave height (ASWH) (provided by AVISO) was assessed with the data for operational use was assessed by quantitative comparison of collocated significant wave height (SWH) data from buoys at around 9 buoy locations in the Northern Indian Ocean. The daily average gridded ASWH data during extreme conditions (cyclones) in the vicinity of buoy locations were poor. However, they compared well during normal conditions.
- ✦ Temperature inversions and their influence on the mixed layer heat budget at 8°N, 90°E in southern central Bay of Bengal (BoB) during winters(October to March) of 2006–07 and 2007–08 were studied using time series measurements from a RAMA buoy. The formation of temperature inversions was favoured by the existence of thick barrier layers and occurred when the heating in the mixed layer by net surface heat flux and horizontal advection was exceeded by penetrative shortwave radiation.

## 14<sup>th</sup> Foundation Day celebrations at ESSO-INCOIS

ESSO-INCOIS celebrated its 14<sup>th</sup> Foundation Day on 3<sup>rd</sup> February 2013. Dr Ch. Mohan Rao, Director, CCMB-CSIR, Hyderabad delivered the Foundation Day Lecture on the topic "**Current Excitement in Modern Biology and Medicine**". Celebration activities also included a special open-house programme in which about 300 students from different schools in Hyderabad participated.



## Our New Scientists:



Shri. Praveen Kumar



Dr. Abhishek Chatterjee



Shri. N. Sureshkumar



Shri. S. Shivaprasad



Shri. V.P. Thangaprakash



Shri. P.Vijay



Shri. U. Srinivasu



Shri. Dipankar Saikia



Dr. Supreet Kumar



Dr. G. Remya



Shri. B. Ajaykumar

## Workshops, Lectures

### Workshops:

The **NOAA-MoES workshop on "Development of Predictive Capabilities on Marine Fisheries and Harmful Algal Blooms in Indian Seas"** was hosted by ESSO-INCOIS in Hyderabad (11<sup>th</sup>-14<sup>th</sup> February 2013). Participants included scientists from India (ESSO-INCOIS, CMLRE, CMFRI, ICMAM, NIO) and USA (NWFSC, University of Maine, SWFSC, University of Washington).

The **3<sup>rd</sup> User Interaction Workshop** was held on 8<sup>th</sup> March 2013 to introduce new dissemination modes and obtain valuable user feedback. During this event, ESSO-INCOIS and RIMES signed an Implementation Agreement to disseminate ocean state forecasts. Around 170 participants including 25 fishermen (cont'd.)



Participants of the NOAA-MoES workshop

representing the fishing community in Tamil Nadu, Andhra Pradesh and Kerala and officials of ONGC, Indian Navy, Coast guard, Ports and Harbours, Shipping companies, Coastal Police, Universities and various Scientific organizations attended the workshop.

On 5<sup>th</sup> June 2013, ESSO-INCOIS held a Workshop on **“Standard Operating Procedure for Tsunami Warning”** to understand the preparedness of Disaster Management Officials of Coastal States, facilitate improvement of their SOPs, to provide a briefing on upcoming mock tsunami drills and solicit their feedback for participation in the drill. On 11<sup>th</sup> September 2013, a similar workshop was jointly organised at Port Blair, Andaman&Nicobar(A&N) Islands by ESSO-INCOIS and the Directorate of Disaster Management, A&N.

### Lectures:



*Dr. Ch. Mohan Rao, CCMB-CSIR, Hyderabad delivered the Foundation Day lecture “Current excitement in modern biology and medicine” on 3<sup>rd</sup> Feb 2013.*



*Prof. Eric D'Asaro and Dr. Craig Lee, Applied Physics Laboratory, University of Washington, USA delivered a lecture on “Autonomous Physical, Chemical and Biological Measurements in the North Atlantic Bloom” on 27<sup>th</sup> Feb 2013.*



*Prof. Lakshmi Kantha, University of Colorado, USA delivered a lecture on “Sub-grid Scale Parameterization in Ocean Models: Turbulent Mixing” on 6<sup>th</sup> May 2013.*

### Other News at a Glance

- \* **Increase in number of PFZ Advisory Nodes :** The number of fish landing centres to which PFZ advisories are provided has been doubled from 267 to 586.
- \* **Tracking Tuna using satellite telemetry tags – SATTUNA:** Sixteen Yellow Fin Tuna have been tagged so far to study their behavior and migration patterns in collaboration with CMFRI, CMLRE and FSI.
- \* **ESSO-INCOIS released a DVD (version 2.2.)** containing about 2,00,000 T-S Profiles collected by the Argo floats during 2002-2012. Gridded data is accessible on the DVD through a user friendly GUI for easy navigation, browsing and data extraction. Also available at [http://www.incois.gov.in/Incois/argo/products/argo\\_frames.html](http://www.incois.gov.in/Incois/argo/products/argo_frames.html).

### Publications

1. Chakraborty, K., Das, K., Kar, T.K. Combined harvesting of a stage structured prey-predator model incorporating cannibalism in competitive environment (2013) *Comptes Rendus - Biologies*, 336 (1), pp. 34-45.
2. Chopra, S., Kumar, D., Rastogi, B.K., Choudhury, P., Yadav, R.B.S. Estimation of site amplification functions in Gujarat region, India (2013) *Natural Hazards*, 65 (2), pp. 1135-1155.
3. Chopra, S., Kumar, D., Rastogi, B.K., Choudhury, P., Yadav, R.B.S. Estimation of seismic hazard in Gujarat region, India (2013) *Natural Hazards*, 65 (2), pp. 1157-1178.
4. Mohanty, P.C., Mahendra, R.S., Bisoyi, H., Kumar Tummula, S., Grinson, G., Nayak, S., Kumar Sahu, B. Assessment of the coral bleaching during 2005 to decipher the thermal stress in the coral environs of the Andaman Islands using remote sensing (2013) *European Journal of Remote Sensing*, 46 (1), pp. 417-430.
5. Bhaskar, T.V.S.U., Jayaram, C., Rao, E.P.R. Comparison between Argo-derived sea surface temperature and microwave sea surface temperature in tropical Indian Ocean (2013) *Remote Sensing Letters*, 4 (2), pp. 141-150.
6. Glejin, J., Kumar, V.S., Nair, T.M.B., Singh, J., Mehra, P. Observational evidence of summer shamal swells along the west coast of India (2013) *Journal of Atmospheric and Oceanic Technology*, 30 (2), pp. 379-388.
7. Rahaman, H., Ravichandran, M. Evaluation of near-surface air temperature and specific humidity from hybrid global products and their impact on latent heat flux in the North Indian Ocean (2013) *Journal of Geophysical Research C: Oceans*, 118 (2), pp. 1034-1047.
8. Glejin, J., Sanil Kumar, V., Balakrishnan Nair, T.M., Singh, J. Influence of winds on temporally varying short and long period gravity waves in the near shore regions of the eastern Arabian Sea (2013) *Ocean Science*, 9 (2), pp. 343-353.
9. Harikumar, R., Balakrishnan nair, T.M., Bhat, G.S., Nayak, S., Reddem, V.S., Shenoi, S.S.C. Ship-mounted real-time surface observational system on board Indian vessels for validation and refinement of model forcing fields (2013) *Journal of Atmospheric and Oceanic Technology*, 30 (3), pp. 626-637.

10. Sabique, L., Balakrishnan Nair, T.M., Srinivas, K., Nayak, N.S. Comparison of Grid Averaged Altimeter and Buoy Significant Wave Heights in the Northern Indian Ocean (2013) *Marine Geodesy*, 36 (1), pp. 72-85.
11. Yadav, R.B.S., Tsapanos, T.M., Bayrak, Y., Koravos, G.C. Probabilistic Appraisal of Earthquake Hazard Parameters Deduced from a Bayesian Approach in the Northwest Frontier of the Himalayas (2013) *Pure and Applied Geophysics*, 170 (3), pp. 283-297.
12. Yadav, R.B.S., Tripathi, J.N., Kumar, T.S. Probabilistic Assessment of Tsunami Recurrence in the Indian Ocean (2013) *Pure and Applied Geophysics*, 170 (3), pp. 373-389.
13. Baliarsingh, S.K., Srichandan, S., Naik, S., Sahu, K.C., Lotliker, A.A., Kumar, T.S. Distribution of hydro-biological parameters in coastal waters off Rushikulya Estuary, East Coast of India: A premonsoon case study (2013) *Pakistan Journal of Biological Sciences*, 16 (16), pp. 779-787.
14. Francis, P.A., Vinayachandran, P.N., Shenoi, S.S.C. The Indian ocean forecast system (2013) *Current Science*, 104 (10), pp. 1354-1368.
15. Girishkumar, M.S., Ravichandran, M., McPhaden, M.J. Temperature inversions and their influence on the mixed layer heat budget during the winters of 2006-2007 and 2007-2008 in the Bay of Bengal (2013) *Journal of Geophysical Research C: Oceans*, 118 (5), pp. 2426-2437.
16. Nanjundiah, R.S., Francis, P.A., Ved, M., Gadgil, S. Predicting the extremes of Indian summer monsoon rainfall with coupled ocean-atmosphere models (2013) *Current Science*, 104 (10), pp. 1380-1393.

### **Editorial Committee:**

**Advisor:** S.S.C. Shenoi, Director.

**Chairman:** Francis Pavanathara.

**Members:** M. Nagaraja Kumar, C. Patanjali Kumar, R. S. Mahendra, K. Annapurnaiah, K.G. Sandhya, M.S. Girish Kumar, N. Srinivasa Rao, Celsa Almeida, Sidhartha Sahoo.



### **Indian National Centre for Ocean Information Services**

(An Autonomous Body under the Ministry of Earth Sciences, Government of India)

'Ocean Valley', Pragathinagar (BO), Nizampet (SO), Hyderabad – 500 090, India

Phone: +91-040-2388 6000 | Fax: +91 -040-2389 5001

Email: [director@incois.gov.in](mailto:director@incois.gov.in) | url: [www.incois.gov.in](http://www.incois.gov.in)