



2nd International
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Expedition
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Newsletter

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(A basin-wide research program co-sponsored by IOC-UNESCO, SCOR and IOGOOS)

To advance our understanding of interactions between geologic, oceanic and atmospheric processes that give rise to the complex physical dynamics of the Indian Ocean region, and to determine how those dynamics affect climate, extreme events, marine biogeochemical cycles, ecosystems and human populations.

IIOE-2 poster at the conference of the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science (FUST), 14-15 May 2018, Brussels, Belgium.

The FUST poster provides an up to date precis of the status of the IIOE-2, and refers to the nearly 30 endorsed research activities (many involving deep ocean research cruises) and the growing number of IIOE-2 National Committees that are forming to provide coherent national engagements in IIOE-2.

The poster may be downloaded via the IIOE-2 website at

http://www.iioe-2.incois.gov.in/IIOE-2/pdfviewer_pub.jsp?docname=IIOE-2-DOC_ME_105.pdf

[Report Courtesy : Nick D'Adamo, IIOE-2 JPO: nick.dadamo@bom.gov.au;]

What triggers *Noctiluca scintillans* bloom in the northern Arabian Sea during the winter monsoon?

The occurrence of green *Noctiluca scintillans* bloom in the Northern Arabian Sea during the winter monsoon is perplexing. Although not known to produce organic toxins, these blooms are still categorized as a harmful due to their association with massive fish mortalities attributed to toxic levels of ammonia. The decay phase of green *Noctiluca* blooms can result in the decline of dissolved oxygen levels in nearshore subsurface regions, leading to fish mortality and evasion in the region of the blooms. The multi-disciplinary Joint Global Ocean Flux Study (JGOFS) programme in the Arabian Sea had attributed high productivity and export flux to large diatom bloom but had failed to report occurrences of *Noctiluca scintillans* bloom in this part of the basin.



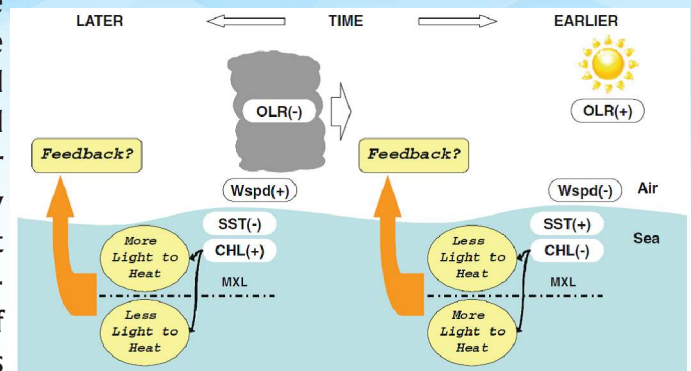
Hyperspectral radiometer deployed during a *Noctiluca Scintillans* bloom in the northern Arabian Sea.

Some recent work, however, has attributed the occurrence of *Noctiluca scintillans* to the vertical expansion of the oxygen minimum zone, driven by cultural eutrophication from major coastal cities in western India.

Aneesh Lotliker and team argue in an article due in June 2018 issue of Ocean Bubble-2, that northern Arabian Sea has too oxygenated upper layer to trigger *Noctiluca scintillans* bloom. They, however, propose that climate induced surface stratification may have reduced the net nutrient flux to the photic zone thereby altering the silicate to nitrate ratios (Si:N) and may have provided a competitive advantage to green *Noctiluca scintillans* over diatoms.

Can Chlorophyll signal help predict IODZM?

The Sun, as an ultimate source of energy, drives whole ocean-atmosphere processes/interactions. Jerlov in the late 1960's characterised water based on optical properties and since then his formulations have immensely contributed toward understanding the optical properties and role of the ocean in our climate system, using both models and observations. Primary productivity in the ocean also depends on intensity of sunlight apart from availability of nutrients. Recent analysis of satellite-derived ocean color data has revealed a two month lead of chlorophyll response over that of the SST. A new study suggests that chlorophyll signals can be used as an indicator of El Niño considering its sufficient lead time compared to SST indices.



Putative bio-physical feedbacks in the convective and dry phases of MJO according to Jin et al. (2012)

Dr. Raghu Murtugudde in his stimulating article, due for publication in the June 2018 issue of Ocean Bubble-2, stresses on the need to understand the role of chlorophyll in the coupled climate variability in the Indian Ocean and to explore the possibility of using chlorophyll to predict Indian Ocean Dipole/Zone Mode (IODZM).

IIOE-2 representations through the IIOE-2 Joint Project Office (JPO) and IIOE-2 Steering Committee representatives during June/July 2018 in India and France.

The IIOE2- will be featured through presentations at a series of forums during June and July 2018;

- ☞ IIOE-2 presentation by the JPO at 'Coordination Group for Meteorological Satellites - 46th Annual Conference' (CGMS-46) – Bangalore, India, 3-6 June 2018.
- ☞ IIOE-2 presentation and related strategic and operational discussions by the JPO relating to IORP, IOGOOS, SIBER and IRF at the 'Indian Institute of Tropical Meteorology' (IITM) – Pune, 7-9 June 2018.
- ☞ Keynote IIOE-2 presentation by the UNESCO IOC Executive Secretary and IIOE-2 JPO participation at the 'USA-India Colloquium: Earth Observations and Sciences for Society and Economy'- National Institute of Oceanography, Goa, India, 10-13 June 2018.
- ☞ IIOE-2 update by the UNESCO IOC Executive Secretary with a supporting IIOE-2 Information Document by the JPO at the '51st Session of the UNESCO IOC Executive Council', Paris, 2-6 July 2018.

[Report Courtesy : Nick D'Adamo, IIOE-2 JPO: nick.dadamo@bom.gov.au;]

New IIOE-2 JPO India Node Coordinator

Dr. Sivaramakrishnan Rajan, who was heading IIOE-2 Joint Project Office (JPO) India, has handed over the responsibility to lead JPO India node activities to Dr. Satya Prakash, INCOIS due to personal commitments. We take this opportunity to thank Dr. Rajan for his exemplary contributions towards IIOE-2 and look forward to his guidance and support in future as well.

We warmly welcome Dr. Satya Prakash as Coordinator of JPO India Node. He can be reached at satyap@incois.gov.in

Endorse your projects in IIOE-2

Don't miss the opportunity to network, collaborate, flesh out your research project and participate in IIOE-2 cruises!!

Over 30 international, multi-disciplinary scientific projects have already been endorsed to date by the IIOE-2. Yours could be the next one!

Visit <http://www.iioe-2.incois.gov.in/IIOE-2/EndorsementForm.jsp> for further details and for projects already endorsed by IIOE-2.

Some Upcoming Events

- ☞ A Session on "The Eastern Indian ocean Upwelling Research Initiative (EIOURI) and the Second International Indian Ocean Expedition" at 15th Annual Meeting of the Asia Oceania Geosciences Society, Honolulu, Hawaii, 03-08 June 2018. <http://www.asiaoceania.org/aogs2018/public.asp?page=home.htm>
- ☞ CLIVAR-FIO Joint Summer School on 'Past, Present and Future Sea Level Changes' and the UNESCO/IOC ODC Training Course on 'Ocean Forecast Systems', at Qingdao, China, from June 25 - 30, 2018 and July 2-7, 2018, respectively. <http://www.clivar.org> or http://www.fio.org.cn/en/training_center/index.htm
- ☞ 2018 Gordon Research Conference (GRC) in Marine Microbes 1-6 July, 2018 <https://www.grc.org/marine-microbes-conference/2018/> and the affiliated and co-located 2018 Marine Microbes Gordon Research Seminar 30 June-1 July 2018, Lucca, Italy. <https://www.grc.org/marine-microbes-grs-conference/2018/>
- ☞ OTGA-INCOIS Training Course on "Data Visualization of Marine Met data (using FERRET)" during 27 - 31 August, 2018, International Training Centre for Operational Oceanography (ITCOcean), ESSO-INCOIS, Hyderabad, India. <http://www.incois.gov.in/ITCOcean/otga0818.jsp>
- ☞ IV International Conference on El Niño Southern Oscillation: ENSO in a warmer Climate, 16-18 October 2018. Guayaquil – Ecuador. <http://www.ensoconference2018.org/>

Call for Contributions

Informal articles/short notes of general interest to the IIOE-2 community are invited for the next (June-end) issue of the IIOE-2 Newsletter. Contributions referring IIOE-2 endorsed projects, cruises, conferences, workshops, "plain language summary" of published papers focused on the Indian Ocean etc. are welcome. Articles may be up to 500 words in length (Word files) accompanied by suitable figures, photos. (separate.jpg files).

Deadline: **25 June, 2018**

Send your contributions to iioe-2@incois.gov.in

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