**DAY 5 - SATURDAY, 7 October**

08:00 - 13:00 Local field trips and group activities for workshop participants (optional)

09:00 - 12:00 Convene Scientific Steering Committee Meeting

The Steering Committee will be charged with generating the final products from this workshop. These products will include initiating the development of a plan for future research in the Indian Ocean and organizing a special journal issue based upon the presentations communicated at this workshop.

With regard to the research plan, the SSC will recommend members for a new international steering committee that will be specifically tasked with developing a research plan. This document will consolidate all of the information, questions and recommendations that were put forward by the working groups and it will articulate a comprehensive plan for implementing an Ecological/Biogeochemical research program in the Indian Ocean that substantially leverages the planned CLIVAR/GOOS Indian Ocean observing system. A target journal will also be identified for a special issue and guest editors chosen.

**ADJOURN SSC MEETING**
SIBER A G E N D A

Session 1: Review of the state of our knowledge – Atmosphere-ocean interactions, physics and climate
Presentations focusing on recent discoveries in the Indian Ocean related to atmosphere-ocean interaction, linkages to global climate and the physical response of the IO to variability spanning seasonal to decadal and longer time scales.
10:40 - 11:40 B.N. Goswami: Increasing trend of extreme rain events over India: Role of Indian Ocean SST
11:50 - 12:00 Raghu Murtugudde: Indian Ocean climate at intraseasonal to decadal timescales
12:00 - 13:00 Posters and refreshments

Session 2: Review of the state of our knowledge – Nutrient cycling and limitation
Presentations that will provide a review of the state of our knowledge of the IO basin as it relates to nutrient cycling and limitation.
13:00 - 14:00 M. Okase Hama: Nutrients in the Indian Ocean
14:50 - 15:15 M. Nakamura: Nutrient regeneration and limitation
15:15 - 15:30 Jerry Wiggert: Modeling IO biogeochemistry: Fe limitation and ISOMM impacts
15:30 - 16:00 Convene first round of breakout sessions

Working groups will be broken out and charged with summarizing the information that has been presented and specifically identifying prominent gaps in our understanding and making recommendations for future research and observations to fill these gaps. Potential working groups: export and remineralization, nutrient cycling and limitation, climate variability and circulation, nutrient cycling, N2 fixation, Fe and trace metal cycling and limitation.
16:30 - 18:30 Poster presentations and refreshments

DINNER ON YOUR OWN

D A Y 2 - W E D N E S D A Y, 4 O c t o b e r

Session 2 (continued)
08:30 - 09:00 Karl Barsam: Observations in the central Arabian Sea using historic hydrographic data
09:00 - 09:15 Lou Codiplier: The NW Indian Ocean's N cycle in relation to a changing planet and changing concepts
10:00 - 10:15 Rajesh Agarwal: Past records of denitrification in the Arabian Sea, ETNE ETSP: Implications for atmospheric N2 variability
10:35 - 11:00 Tom Anderson: Modeling denitrification
11:00 - 11:30 TEA BREAK

Session 3: Review of the state of our knowledge – Biological production and remineralization of organic matter
Presentations reviewing the state of our knowledge of the IO basin as it relates to biological production, export flux variability and remineralization.
11:15 - 12:40 Jorge Sarmento: The role of Sub-Antarctic Mode Water in global biological production
12:05 - 12:30 Helga Gomes: Algal blooms in the Arabian Sea - are they changing?
12:30 - 13:00 John Murray: The effects of vertical mixing on phytoplankton productivity in the Arabian Sea
13:00 - 13:30 Prisciana Cameron: What drives the biological productivity of the Bay of Bengal and Arabian Sea?
13:45 - 14:00 LUNCH
14:00 - 14:25 Bengs Aarsmark: Nitrogen assimilation and f-ratios in the Indian Ocean
14:25 - 14:50 Mike Landry: Zooplankton grazing and secondary production in the Indian Ocean
14:50 - 15:15 Sharon Smith: Micronutrient dynamics and ecosystem impacts
15:15 - 15:30 LEA BREAK
15:30 - 15:55 Ramesh Nagapage: Bacterial abundance and production in the Arabian Sea and Bay of Bengal
15:55 - 16:15 Convene second round of breakout sessions

Working groups will be broken out and charged with summarizing the information that has been presented and specifically identifying prominent gaps in our understanding and making recommendations for future research and observations to fill these gaps. Potential working groups: detritification and DMZ processes, chlorophyll and primary production, zooplankton and secondary production, bacteria and microbial ecology.
17:00 - 18:30 Posters and refreshments

DINNER ON YOUR OWN

D A Y 3 - T H U R S D A Y, 5 O c t o b e r

Session 3 (continued)
08:00 - 09:45 Farooq Azam: Marine microbes and global habitability
09:45 - 10:10 Bess Ward: Diversity and dynamics of denitrifying bacteria in the Arabian Sea from analysis of nitrile reductase genes
10:10 - 10:35 Joe Montoya: Nitrogen isotopes and particle dynamics in the Arabian Sea
10:35 - 11:00 Moran Yiss: Isotopic studies of N and O in nitrate to understand sources and sinks of nitrogen in the Arabian Sea
11:00 - 11:15 TEA BREAK
11:15 - 11:40 Alan Desai: Excess nitrogen gas in oxygen deficient zones
11:40 - 12:05 Tim Ross: Monsoon and DMS impacts on the biological pump in the Indian Ocean
12:05 - 12:30 Man Mohan Sarin: Thorium-based upper ocean particle export fluxes in the seas around India

Session 4 (Review the state of our knowledge – Pelagic carbon cycling and air-sea exchange
Presentations that will provide a review of the state of our knowledge of the IO basin as it relates to carbon cycling and CO2 exchange.
12:30 - 12:55 Dennis Hansell: DOM in the Indian Ocean: review and assessment of our knowledge and needs
12:55 - 14:00 LUNCH
14:00 - 14:25 Dalena Unger: Biogeochemistry of particulate organic matter from the Northern Indian Ocean
14:25 - 14:50 Chris Sabine: Inorganic carbon distributions and air-sea CO2 exchange in the Indian Ocean
14:50 - 15:15 Catherine Guyot: Anthropogenic CO2 in the Indian Ocean
15:15 - 15:30 TEA BREAK
15:30 - 15:55 U.S. S. Suum Vadala: Net community production in northern Indian Ocean
15:55 - 16:20 Convene third round of breakout sessions

Working groups will be broken out and charged with summarizing the information that has been presented and specifically identifying prominent gaps in our understanding and making recommendations for future research and observations to fill these gaps. Potential working groups: export and remineralization, variable controlling processes, carbon cycling and air-sea exchange, and impact of climate and human activities on the IO.
17:00 - 18:30 Poster presentations and refreshments

CULTURAL PROGRAMME (NIO Auditorium)
19:00 - 20:00 Dinner to be hosted by Director NIO

D A Y 4 - F R I D A Y, 6 O c t o b e r

Session 5: Review of the state of our knowledge – Impact of climate and human activities on biogeochemistry and ecosystems
Presentations reviewing some recent findings related to anthropogenic impacts in coastal and open ocean regions of the Indian Ocean.
09:00 - 09:45 Joseph Giesye: Climate change and its impact on biological production in the Arabian Sea
09:45 - 10:10 Wafaj Naqi: Seasonal anoxia over the western Indian continental shelf
10:10 - 10:35 Sybil Seitzinger: Nutrient transport from watersheds to Indian Ocean coastal systems: Amount, forms and sources

Session 6: Review of the state of our knowledge – Benthic biogeochemistry and ecology
10:35 - 11:15 Greg Cowie: De-silting and shipboard studies of benthic biogeochemical processes across the Arabian Sea oxygen minimum zone
11:00 - 11:15 TEA BREAK
11:15 - 11:40 Babu Ingole: Pattern of macrobenthic diversity along the eastern margin of the Arabian Sea

Session 7: Future plans and technologies
Presenting the current status of the CLIWAK/GOOS IO observing system and plans for making use of several different types of observational platforms, including satellite remote sensing, moored sensors, survey cruises and ship-of-opportunity measurements.
11:40 - 12:05 Gary Meyers: The role of the Indian Ocean in the climate system implementation plan for sustained observations
12:05 - 12:30 Mike McPhaden: Development of an Indian Ocean moored buoy array for climate studies
12:30 - 12:55 George Kilcommons: Investigations on biogeochemical cycles and sedimentary processes at sediment-water interface under oxygen depleted environments: Dive cruise at margin of the Arabian Sea
12:55 - 14:00 LUNCH
14:00 - 14:25 Marina Levy: Linking seacolor to near-surface ocean dynamics in the Indian Ocean.
15:05 - 15:15 WJ Sarmiento: Ocean atmospheric carbon dioxide fluxes, the Indian Ocean, and SOLAS
15:15 - 16:15 Convene fourth round of breakout sessions

Working groups will be broken out and charged with summarizing the information that has been presented and specifically identifying prominent gaps in our understanding and making recommendations for future research and observations to fill these gaps. Potential working groups: anthropogenic impacts, benthic biogeochemistry and ecology, leveraging the CLIWAK/GOOS IO observing system for biogeochemical and ecological studies, moored sensor technologies and possibilities.
16:15 - 17:00 Convene final group discussion

A general discussion will be convened where the participants will be asked to provide recommendations on how to formulate a plan to address the outstanding research questions that they have identified in the preceding days that substantially leverages the planned CLIWAK/GOOS Indian Ocean observing system.

ADJOURN WORKSHOP
20:00 - 22:00 CONSPIRATORY DINNER on board “SANTA MONICA” off PALAM (MANDovi estuary)