



# Programme Guide



The Second International Symposium on

## Remote Sensing for Ecosystem Analysis and Fisheries

15-17 January 2018, Kochi



Organised by:  
Indian Council of Agricultural Research  
**Central Marine Fisheries Research Institute**

The Venue

**ICAR - Central Marine  
Fisheries Research Institute  
Kochi**





The Second International Symposium on

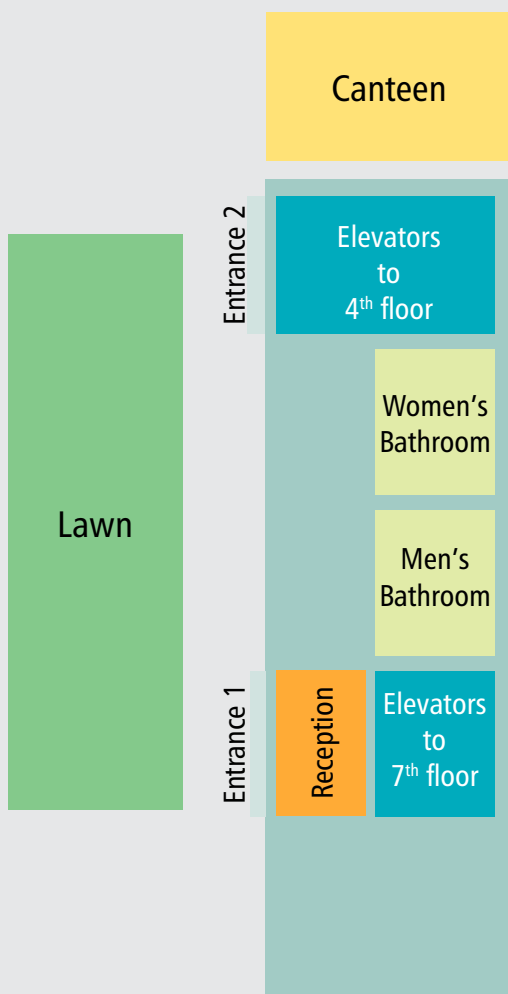
# Remote Sensing for Ecosystem Analysis and Fisheries

15-17 January 2018, Kochi



# CMFRI Ground Floor Plan

Conference on the 7<sup>th</sup> floor



\*Bathrooms can be found on each floor

# CMFRI 7<sup>th</sup> Floor Plan

**Dining Area**

**Conference  
Registration  
Desk**

**Elevators  
to  
Ground  
Floor**

**Conference Auditorium**



# How to Reach the Venue



CMFRI



Rail Stations

## Day 1: 15<sup>th</sup> January 2018

Time - 09.30 am - 06.05 pm

8.30-09.30 Registration

09.30 - 09.45 **Inauguration of The Platinum Jubilee Hall - 7<sup>th</sup> Floor, Cmfri**

Dr. Trilochan Mohapatra Secretary, Department of Agricultural Research and Education (DARE) & Director General ICAR, New Delhi

09.45-10.00 **Inauguration of The Exhibition Stalls**

10.00 -11.20 INAUGURATION

10.00 Invocation Vineetha & Team

10.03 ICAR Title Song

10.07 Inauguration by lighting the lamp by the Chief Guest

Dr. Trilochan Mohapatra, Secretary, Department of Agricultural Research and Education (DARE) & Director General ICAR, New Delhi

10.10 Welcome Address

Dr. A. Gopalakrishnan, Director, ICAR-CMFRI, Kochi & Convener, SAFARI 2

10.15 Felicitating the Chief Guest and other guests on the dais

Dr. A. Gopalakrishnan, Director, ICAR-CMFRI, Kochi & Convener, SAFARI 2

Felicitations Address

10.20 Dr. B. Meenakumari, Chairperson, National Biodiversity Authority, Chennai

10.25 Mr. Lasse H. Pettersson, Director, International Cooperation and Marketing, Nansen Environmental Remote Sensing Centre, Norway

10.30 Dr. Rodney M. Forster, Director, Institute of Estuarine and Coastal Studies, University of Hull, UK.

10.35 Prof. N.R. Menon, Chairman Nansen Environmental Research Centre India & Research Advisory Committee, CMFRI

10.40 Presidential Address Dr. J. K. Jena, Deputy Director General (Fisheries Sciences), ICAR, New Delhi

10.50 Release of Books & CD Dr. Trilochan Mohapatra, Secretary, Department of Agricultural Research and Education (DARE) & Director General ICAR, New Delhi

10.55 Inaugural Address Dr. Trilochan Mohapatra, Secretary, Department of Agricultural Research and Education (DARE) & Director General ICAR, New Delhi

11.15 Vote of Thanks Dr. T. V. Sathianandan, Head, Fishery Resource Assessment Division, CMFRI, Kochi

11.20 National Anthem

11.20-11.40

Tea Break

## Session: Symposium Introduction

Session chairs

Dr. T. Pankajakshan, Scientist-in-Charge, CSIR-National Institute of Oceanography (Regional Centre), Kochi

Dr. Hayley Evers King, Scientist, Plymouth Marine Laboratory, UK

Dr. G. Syda Rao - Former Director, CMFRI, Kochi

Invited talk

11.40-11.55

Marine Spatial Planning (MSP) for Sustainable Mariculture Development

Dr. A. P. Dineshababu, Principal Scientist, CMFRI, Mangalore.

11.55-12.05

UK Science and Innovation Network in India - Emphasis to fisheries and aquaculture

Ms. Shivani Sharma, Science & Innovation Network, British High Commission, New Delhi.

12.05-12.20

Indian Institute of Remote Sensing -Activities

Dr. A. K Mishra, Scientist SF, Indian Institute of Remote Sensing, Dehra Dun

## Session: Biodiversity

Session Chairs

Dr. B. Meenakumari - Chairperson, National Biodiversity Authority, Chennai

Dr. P. S. B. R. James, Former Director, ICAR - CMFRI

Dr. Joshi K.K, Head, Marine Biodiversity Division, ICAR-CMFRI

Session address

12.25 - 12.45

Dr. B. Meenakumari - Chairperson, National Biodiversity Authority, Chennai

Keynote address

12.45 - 13.00

Prof. N. R. Menon, Chairman, Nansen Environmental Research Centre India, Kochi

Invited talk

13.00 - 13.10

Dr. Marie-Fanny Racault, Earth Observation Scientist, Plymouth Marine Laboratory, UK.

13.10-14.10

Lunch Break

14.10 - 15.00

Oral presentations BD/O-1 to BD/O-5

BD/O-01

**Spatial temporal variation of mangrove forest in Bhatye Estuary of Ratnagiri district, Maharashtra**

Ajay D. Nakhawa, Ratheesh Kumar, Anulekshmi Chellapan, Akhilesh K.V., Ramkumar, Santosh Bhendekar and Singh V. V.

BD/O-02

**Ecological observations on some symbiont bearing foraminifera from the shelf sediments of eastern Arabian Sea**

Ranju R., Nandini Menon N. and Menon N. R.

BD/O-03

**Washing our colors away: A prediction of coral bleaching under different climatic scenarios**

Athira Prasad, Sreenath K. R., Joshi K. K., Grinson George, Shamiya Hasan, Haritha J., and Aarathy G. S.,



|         |   |
|---------|---|
| BD/O-04 | <b>Optical discrimination of phytoplankton community structure in coastal waters, of southeastern Arabian Sea</b><br><br>Minu P., Lotliker A. A., Srikanth A., Baliarsingh S. K., Souda V. P. and Muhamed Ashraf P. |
| BD/O-05 | <b>What triggers Noctiluca scintillans bloom in the northern Arabian Sea?</b><br><br>Satya Prakash, Rajdeep Roy and Aneesh Lotliker   |

## Session: Aquatic Environment and Ecology

|                |   |
|----------------|---|
| Session Chairs | Dr. N. P. Singh, Director, National Institute of Abiotic Stress Management, Baramati              |
|                | Dr. Jean-Baptiste Kassi, Lecturer, Earth Sciences, Universite felix houphouet-boigny              |
|                | Dr. V. Kripa, Principal Scientist and Head, Fishery Environment Management Division, CMFRI, Kochi |

### Keynote Address

|             |   |
|-------------|---|
| 15.05-15.25 | <b>Primary production in darkening shelf seas</b><br><br>Dr. Rodney M. Forster, Director, Institute of Estuarine and Coastal Studies, Reader in Applied Estuarine and Marine Sciences, University of Hull, UK |
|-------------|---|

### Invited talk

|             |   |
|-------------|---|
| 15.25-15.40 | <b>Remote Sensing for Coastal and Marine Ecosystems: Indian Experience</b><br><br>Dr. Aneesh Lotliker, Scientist D, Advisory Services and Satellite Oceanography Group (ASG), Indian National Centre for Ocean Information Services, India                              |
| 15.40-15.55 | <b>The role of calcifying plankton in the CO<sub>2</sub> dynamics in the ocean-atmosphere system at polar and subpolar latitudes</b><br><br>Mr. Lasse Pettersson, Director, International Cooperation and Marketing, Nansen Environmental Remote Sensing Centre, Norway |

### 15.55-16.15 Tea Break

|             |  |                      |
|-------------|--|----------------------|
| 16.15-17.05 | Oral Presentations   | AEE/O-01 to AEE/O-05 |
| AEE/O-01    | <b>A generalized algorithm for retrieval of the chlorophyll concentration from satellite data in coastal and inland waters</b><br><br>Palanisamy Shanmugam, Xianqiang He, Rakesh Kumar Singh and Theenathayalan Varunan                                      |                      |
| AEE/O-02    | <b>Observation of satellite derived sea surface temperature (SST) and pCO<sub>2</sub> distribution over the Bay of Bengal and Arabian Sea and its relation to chlorophyll variability</b><br><br>Sarangi R. K., Megha Pandya and Mini Raman                  |                      |
| AEE/O-03    | <b>Revisiting the deep chlorophyll maxima in Bay of Bengal in context to phytoplankton adaptation in low light biophysical environment</b><br><br>Rajdeep Roy, Nikhil Baranval, Abhinav G., Nagamani P. V., Sitaram Pondala, Choudhury S. B., Seshasai M. V. |                      |

|               |   |   |
|---------------|---|---|
| AEE/O-04      | <b>Using remote sensing imagery to assess impacts of El Niño variability on oceanic primary producers</b>                                     |   |
|               | Marie-Fanny Racault, Shubha Sathyendranath, Robert Brewin, Dionysios Raitsos, Thomas Jackson and Trevor Platt                                 |   |
| AEE/O-05      | <b>Application of remote sensing in identifying the salinity fronts and their influence on the biological production of the Bay of Bengal</b> |   |
|               | Kusum Komal Karatia, Vineetha G. B., Raveendran T. V., Muraleedharan K. R.  |   |
| 17.05 - 18.05 | Poster session-   | FM/P-1 to FM/P-7, AEE/P-1 to AEE/P-17, HF/P-1 to HF/P-8, AQ/P-1 to AQ/P-5, BD/P-1 to BD/P-8, SE/P-1 to SE/P-4 |
| Co-ordinators | Dr. G. Maheshwarudu, Head, Crustacean Fishery Division (CFD), CMFRI and CFD Team  |   |
| 18.05 - 19.00 | Exhibition Stall  |   |
| 19.00 - 20.30 | Dinner at CMFRI Platinum Jubilee Hall (7 <sup>th</sup> floor) along with Music Band   |   |

## Day 2: 16<sup>th</sup> January 2018

Time : 09.00 am - 06.00 pm

## Session: Aquatic Environment and Ecology

|                |   |                     |
|----------------|---|---------------------|
| Session Chairs | Dr. A. G. Ponniah - Former Director Central Institute of Brackishwater Aquaculture and Emeritus Scientist, CMFRI, Chennai                         |                     |
|                | Dr. M. Sudhakar - Director, Centre for Marine Living Resources and Ecology, Kochi   |                     |
|                | Dr. Mini Raman - Group Head, Space Application Centre, Ahmadabad  |                     |
| Invited talk   |   |                     |
| 09.00-09.15    | Dr. Prakash Chauhan, Group Director, BPSG, Space Application Centre, Ahmadabad  |                     |
| 09.15-10.05    | Oral Presentations  | AEE/O-6 to AEE/O-10 |
| AEE/O-06       | <b>Shrinking of lakes: A comparative study between a protected and an unprotected lake in Mumbai, Maharashtra</b>                                 |                     |
|                | Ratheesh Kumar. R., Ajay Dayaram Nakhawa, Renjith V. and Manju Lekshmi N.   |                     |
| AEE/O-07       | <b>Observed and modelled chlorophyll trends along Indian coastal waters: A synergistic approach using numerical model and satellite data sets</b> |                     |
|                | Smitha Ratheesh and Shailee Patel   |                     |
| AEE/O-08       | <b>Impact of large scale climatic events on chlorophyll and SST pattern in Arabian Sea and Bay of Bengal through remote sensing</b>               |                     |
|                | Meghal Shah, Mini Raman, Himanshu Pandya and Prakash Chauhan  |                     |

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|----------|--|
| AEE/O-09 | <b>Seasonal variation of Ekman mass transport and upwelling indices in Arabian Sea and the associated productivity changes using scatsat-1 wind fields</b><br><br>Ganguly D. and Mini. Raman |
| AEE/O-10 | <b>Surface water monitoring and vegetation analysis of Saraiya Man Lake using remote sensing</b><br><br>Ajey Kumar Pathak, Kuldeep Kumar Lal, Kripal Dutt Joshi, Ravi Kumar and Rajesh Dayal |

## Session : Harvest Fisheries

|                 |   |                  |
|-----------------|---|------------------|
| Session Chairs  | Dr. C. N. Ravishankar, Director, Central Institute of Fisheries Technology, Kochi   |                  |
|                 | Dr. S. Dam Roy, Principal Scientist and Former Director, Central Island Agricultural Research Institute, Port Blair   |                  |
|                 | Dr. A. K. Mishra, Scientist SF, Indian Institute of Remote Sensing, Dehra Dun   |                  |
| Keynote address |   |                  |
| 10.10-10.30     | Benefits of remote sensing in fishing and improvement of predictive capabilities<br><br>Dr. Leela Edwin, Head, Fishing Technology Division, Central Institute of Fisheries Technology, Kochi.   |                  |
| Invited talk    |   |                  |
| 10.30-10.45     | Application of Remote Sensing in Harvesting Fisheries Through Potential Fishing Zones (PFZ) - the Andaman Experience<br><br>Dr. S. Dam Roy, Principal Scientist and Former Director, Central Island Agricultural Research Institute, Port Blair. Andaman & Nicobar Islands, India |                  |
| 10.45-11.05     | Tea break   |                  |
| 11.05-12.25     | Oral presentations  | HF/O-1 to HF/O-8 |
| HF/O-01         | <b>Spatial model derived Potential Fishing Zone delineation in the northern Bay of Bengal near West Bengal coast</b><br><br>Sandip Giri, Anirban Mukhopadhyay and Sugata Hazra  |                  |
| HF/O-02         | <b>Applications of remote sensing in predicting the abundance of ribbonfish <i>Trichiurus lepturus</i> along north west coast of India</b><br><br>Abdul Azeez P., Mini Raman, Prathibha Rohit, Latha Shenoy, Mohammed Koya K. and Vinay Kumar Vase                                |                  |
| HF/O-03         | <b>Biogeochemical modeling in complementing satellite-aided operational marine fishery advisories</b><br><br>Kunal Chakraborty, Sourav Maity and Aneesh Lotliker  |                  |
| HF/O-04         | <b>Bio-optical characterization of coastal waters using ocean colour data for fishery applications</b><br><br>Anurag Gupta, Arvind Sahay, Syed Moosa Ali, Mini Raman Prakash Chauhan and Palanisamy Shanmugam   |                  |

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|---------|---|
| HF/O-05 | <b>A synergistic approach based on remote sensing and ocean model simulations to identify and track Potential Fishing Zone for the Bay of Bengal</b><br><br>Jishad M., Sarangi R. K., Smitha Ratheesh, Moosa Ali S. and Rashmi Sharma     |
| HF/O-06 | <b>Harnessing high temporal resolution data from geostationary orbit for marine fishery predictions</b><br><br>Nimit Kumar, Swetha Naga, Nagaraja Kumar M., and Sazid Mahammad  |
| HF/O-07 | <b>Studies on the correlation between satellite derived SST and yellowfin tuna catches through long line off the Andhra Pradesh coast</b><br><br>Sreedhar Utravalli, Umamahewara Rao R., Dhanunjaya D., Nimit Kumar and Nagaraja Kumar M. |
| HF/O-08 | <b>Optimal spectral bands for chlorophyll-a algorithm towards better prediction of fisheries along Indian coast using satellite remote sensing</b><br><br>Aneesh A Lotliker and Alakes Samanta  |

## Session: Fisheries Management

|                |  |  |
|----------------|--|--|
| Session Chairs | Dr. Beena Kumari, Retd. Scientist, Space Application Centre, Ahmadabad                                       |  |
|                | Dr. Mark James, Operations Director, The Marine Alliance for Science and Technology for Scotland (MASTS), UK |  |
|                | Dr. B. K. Das, Director, Central Inland Fisheries Research Institute, Barrackpore, West Bengal               |  |

### Keynote address

|             |   |  |
|-------------|---|--|
| 12.30-12.50 | Application of Remotely Sensed Data in Marine Fisheries Management<br><br>Dr. Sunil Kumar Mohamed, Head, Molluscan Fishery Division, CMFRI, Kochi                             |  |
| 12.50-13.05 | Invited talk<br><br>Application of Remote Sensing for Potential Yield from Indian EEZ<br><br>Dr. T. V. Sathianandan, Head, Fishery Resource Assessment Division, CMFRI, Kochi |  |

|             |             |  |
|-------------|-------------|--|
| 13.05-14.00 | Lunch Break |  |
|-------------|-------------|--|

|             |   |                  |
|-------------|---|------------------|
| 14.00-14.50 | Oral presentations  | FM/O-1 to FM/O-5 |
| FM/O 01     | <b>A study on yellowfin tuna <i>Thunnus albacares</i> distribution along north Andhra Pradesh coast using Generalized Additive Models</b><br><br>Muktha Menon, Satish Kumar M., Indira Divipala, Shubhadeep Ghosh and Jayasankar J. |                  |
| FM/O 02     | <b>Resource mapping of fishing systems of estuaries in Maharashtra</b><br><br>Abuthagir Ibrahlim S., Suraj Kumar Pradhan, Nakhawa Ajay Dayaram, Ratheesh Kumar R., Aswathy Ashokan and Latha Shenoy                                 |                  |
| FM/O 03     | <b>Decoding the discontinuous distribution of <i>Harpadon nehereus</i> (Hamilton, 1822) using satellite data</b><br><br>Lohith Kumar K.   |                  |

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|---------|---|
| FM/O 04 | <b>Biophysical drivers of <i>Sardinella aurita</i> in Ivorian waters: Applications from remote-sensing observations and GIS</b><br><br>Jean-Baptiste Kassi, Marie-Fanny Racault, Brice A. Mobio, Trevor Platt, Shubha Sathyendranath, Dionysios E. Raitsos and Kouadio Affian |
| FM/O 05 | <b>Estimating bio-optical properties of Chilika lagoon for ecosystem analysis using in-situ and ocean color satellite data</b><br><br>Syed Moosa Ali, Arvind Sahay, Gunjan Motwani, Anurag Gupta, Mini Raman, Prakash Chauhan and Ghansham Sangar                             |

## Session: Socio - Economics, Communication Technologies in Disaster Management

|                |   |
|----------------|---|
| Session chairs | Dr. A. Ramachandran, Vice Chancellor, Kerala University of Fisheries & Ocean Studies, Kochi |
|                | Dr. Jayaprakash V Thomas, Scientist G, ISRO Headquarters, Bangalore                         |
|                | Dr. R. Narayanakumar, Head, Socio-Economics and Technology Transfer Division, CMFRI         |

### Keynote Address

|             |   |
|-------------|---|
| 14.50-15.10 | Communication technologies in early warning of coastal disasters driven by oceanographic and meteorological forces<br><br>Dr. Antony Joseph, Retd. Scientist, National Institute of Oceanography, Goa |
|-------------|---|

### Invited talk

|             |  |
|-------------|--|
| 15.10-15.25 | Socio Economic Barriers Need to be Removed to Improve Application of Remote Sensing and IC Technologies in Marine Fisheries<br><br>Dr. E. Vivekanandan, Emeritus Scientist, CMFRI, Chennai |
| 15.25-16.15 | Oral presentations                      SE/O-1 to SE/O-4   |

|             |  |
|-------------|--|
| SE/O-01     | <b>Resonance between scientific findings and indigenous knowledge of fishing communities along the South African east coast about climate and environmental change</b><br><br>Tania Moyikwa, Ross Blamey, Serge Raemaekers and Juliet Hermes |
| SE/O-02     | <b>Physical and biological interactions during a cyclonic event in the Arabian Sea</b><br><br>Lix J. K., Sajeev R., Grinson George and Santosh K. M.   |
| SE/O-03     | <b>Fish identification app - a quick guide for the students</b><br><br>Rekha J Nair, Manu V. K. and Gopalakrishnan A.  |
| SE/O-04     | <b>Disaster preparedness - valuable lessons from the field in the aftermath of Ockhi cyclone</b><br><br>Swathi Iekshmi P. S., Narayana Kumar R and Shyam S. Salim  |
| 16.15-16.35 | Tea Break  |

## Session: Aquaculture

Session chairs      Dr. H.M.P. Kithsiri, Deputy Director General (Research & Development), National Aquatic Resources Research and Development Agency (NARA), Sri Lanka

Dr. P. Jayasankar, Principal Scientist, CMFRI and Former Director, Central Institute of Freshwater Aquaculture, Bhubaneswar

Dr. Imelda Joseph, Principal Scientist & Head, Mariculture Division, ICAR-CMFRI

### Keynote address

16.35-16.55      Application of remote sensing for sustainable development of aquaculture

Dr. G. Gopakumar, Former HOD, Mariculture Division, CMFRI & Emeritus Scientist, CMFRI, Vizhinjam

### Invited talk

16.55-17.10      Earth observation for global inland water quality monitoring and aquatic food security.

Dr. Evangelos Spyarakos, Lecturer in Earth Observation, University of Stirling, UK.

17.10-17.25      Sustainable use of Natural Resources for Brackishwater Aquaculture in India using Remote Sensing and GIS Technologies

Dr. M. Jayanthi, Principal Scientist, CIBA, Chennai.

17.25-18.25      Oral presentations      AQ/O-01 to AQ/O-06

AQ/O-01      **Development and assessment of remote sensing and GIS based decision support system for planning and management of the coastal aquaculture**

Jayanthi M., Thirumurthy S., Samynathan M., Duraisamy M., Muralidhar M. and Vijayan K. K.

AQ/O-02      **Deriving useful products for managing water quality impacts on aquaculture using multiple methods and Earth Observation Data**

Hayley L. Evers-King, Wiebke Schmidt, Andrey Kurekin, Carlos J. A. Campos, Keith Davidson, Jamie D. Shutler, Peter I. Miller

AQ/O-03      **Integrating water quality levels and remote sensing facilities to estimate aquaculture distribution in Egypt**

Maarouf R. and Farag M. M.

AQ/O-04      **Application of remote sensing and GIS in the selection of suitable marine aquaculture sites along Gujarat coast**

Divu D., Abdul Azeez P., Mohammed Koya K., Suresh Kumar Mojjada, Vinay Kumar Vase

AQ/O-05      **Development of GIS model for shrimp farms at self governance level**

Shaganimol C. N. and Manoj Kumar B.

AQ/O-06      **Earth observation for global inland water quality monitoring and aquatic food security**

Spyrakos E., Groom S., Norman R.1 & Tyler A.

|             |                 |   |
|-------------|-----------------|---|
| 18.25-19.00 | Poster session- | FM/P-1 to FM/P-7, AEE/P-1 to AEE/P-17, HF/P-1 to HF/P-8, AQ/P-1 to AQ/P-5, BD/P-1 to BD/P-8, SE/P-1 to SE/P-4 |
|-------------|-----------------|---|

19.00-21.00 Dinner at CMFRI Platinum Jubilee Hall (7<sup>th</sup> floor) along with cultural programme

## Day 3: 17<sup>th</sup> January 2018

Time : 09.00 am - 05.00 pm

## Special Session On Disaster Management (In Malayalam)

|             |  |   |
|-------------|--|---|
| 10.00-10.15 | Inaguration of Display Board at INCOIS stall (lawn of CMFRI) | Smt. J. Mercykutty Amma, Hon'ble Minister of Fisheries, Harbour Engineering & Cashew Industry, Govt. of Kerala                                      |
| 10.30-10.35 | Welcome  | Dr. A. Gopalakrishnan, Director, CMFRI, Kochi & Convener, SAFARI 2  |
| 10.35-10.50 | Presidential Address   | Smt. J. Mercykutty Amma, Hon'ble Minister of Fisheries, Harbour Engineering & Cashew Industry, Govt. of Kerala                                      |
| 10.50-11.10 | Keynote Address  | Dr. T. M. Balakrishnan Nair, Head, Information Services and Ocean Sciences Group, Indian National Centre for Ocean Information Services, Hyderabad. |

### Invited talk

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|-------------|---|--|
| 11.10-11.30 | Dr. A. P. Dineshababu, Principal Scientist, CMFRI, Mangalore. |  |
| 11.30-13.00 | Open Interaction session of Stakeholders                      | Moderator: Dr. Shyam S. Salim, Principal Scientist, Socio-Economics & Technology Transfer Division, CMFRI, Kochi |
| 13.00-13.05 | Summary and Recommendations                                   | Dr. Shyam S. Salim, Principal Scientist, Socio-Economics & Technology Transfer Division, CMFRI, Kochi            |
| 13.05-13.10 | Vote of Thanks.   | Dr. Aswathy N, Senior Scientist, Socio-Economics & Technology Transfer Division, CMFRI, Kochi                    |

### 13.10-14.00 Lunch Break

### Special Session - Capacity Building

|  |   |
|--|---|
| Session Chairs                           | Dr. K.S. Purushan, Former Dean, Kerala University of Fisheries and Ocean Studies                |
|  | Dr. P. U. Zacharia, Principal Scientist & Head, Demersal Fisheries Division, ICAR- CMFRI, Kochi |
| 14.00-14.10                              | Oral Presentation   |
| SAFARI- A Retrospection and Future Plans |   |
|  | Dr. Grinson George, Senior Scientist, Fishery Resource Assessment Division, CMFRI, Kochi        |
| 14.10-14.20                              | Oral Presentation   |

## PORSEC Activities - An Overview

Dr. Nimit Kumar, Project Scientist, Indian National Centre for Ocean Information Services, Hyderabad

### Oral Presentation - NANO Activities in a nut shell

14.20-14.30 Dr. Nandini Menon, Senior Scientist, Nansen Environmental Research Centre India, Kochi.

14.30-15.30 Poster session- FM/P-1 to FM/P-7, AEE/P-1 to AEE/P-17, HF/P-1 to HF/P-8, AQ/P-1 to AQ/P-5, BD/P-1 to BD/P-8, SE/P-1 to SE/P-4

15.30-16.00 Tea break

16.00-17.00 Prize distribution & Valedictory Session

Session Chairs Dr. A. Gopalakrishnan, Director, ICAR-CMFRI

Dr. C. Gopal, Member Secretary, Coastal Aquaculture Authority, Chennai

Dr. Marie-Fanny Racault, Earth Observation Scientist. Plymouth Marine Laboratory, UK

Dr. Sathianandan T. V., Principal Scientist & Head, FRAD, ICAR-CMFRI

Dr. G. Maheswarudu, Head, CFD, ICAR-CMFRI

## Poster Sessions

Co-ordinators **Dr. G. Maheswarudu**, Head, CFD, CMFRI and CFD Team.

### Session: Biodiversity

BD P-01 **Geospatial Technology: An effective tool for marine mammal conservation**

Shelton Padua, Jeyabaskaran R., Jayasankar J., Kripa V., Prema D., Lavanaya R., Seban John and Vysakhan P.

BD P-02 **Mapping and conservation value assessment of mangrove diversity and distribution in Kerala coast**

Monolisha S., Muhammed K. M., Pranav P., Dennis A., Renjith Kumar C. R., Rithin Raj, Mini K. G., Shyam S. Salim and Grinson George

BD P-03 **Improved indices for discrimination of mangrove forests using multispectral imagery**

Kaushik Gupta, Anirban Mukhopadhyay, Sandip Giri and Sugata Hazra

BD P-04 **Studies on the benthic polychaetes of Kadalundy-estuary, southwest coast of India**

Habeebrehman H.

BD P-05 **Habitat mapping of intertidal molluscs of Dakshina Kannada coast, Karnataka using remote sensing and GIS techniques**

Sandhya Leeda D'Souza, Bhasker Shenoy K. and Gangadhar Bhat H.

BD P-06 **A multi-method approach for marine phyto planktonic community structure determination with special emphasis on High Performance Liquid Chromatography (HPLC) and Scanning Electron Microscopy (SEM)**

Amir Kumar Samal, Grinson George, Jayasankar J., Nazar A. K. A., Nandini Menon N. and Ravi Kumar Avadhanula.



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|---------|--|
| BD P-07 | <b>Detection of <i>Noctiluca scintillans</i> bloom in the northern Arabian Sea using chlorophyll fluorescence from modis_aqua</b><br>Umamaheswara Rao Y., Nagamani P. V., Aneesh Lotliker, Baliyar Singh, Varaprasada Rao T. D. V., Nikhil Kumar Baranval, Rama Rao P. and Choudhury S. B. |
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| BD P-08 | <b>Tessellation of Indian geographic region based on proximity to the wildlife Protected Areas</b><br>Aiswarya Mohan A. M., Sreenath K. R., Athira Prasad, Joshi K. K., Grinson George, Varghese M., Sreeram M. P., and Sobhana, K. S. |
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## Session: Aquatic Environment and Ecology

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| AEE/P-01 | <b>Annual cycle of vertical structure of chlorophyll distribution in the northeastern Arabian Sea</b><br>Safin I. P. and Vijith V. |
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# Art Forms of Kerala



## Thiruvathirakali

A dance form originally performed by women on Thiruvathira day in the Malayalam month of "Dhanu" (December-January), in order to attain everlasting marital bliss, Thiruvathirakali has become a popular dance form for all seasons. The

dance, which follows a circular, pirouetting pattern accompanied by clapping of the hands and singing, is a celebration of marital fidelity and the female energy.

## Mohiniyattam

Believed to have originated in 16<sup>th</sup> century, it is one of the eight Indian classical dance forms. The term Mohiniyattam comes from the words 'Mohini' meaning a woman who enchants onlookers and 'aattam' meaning graceful and sensuous body movements. The vocal music of Mohiniyattam involves variations in rhythmic structure known as 'chollu'. The Mohiniyattam dance is performed to this accompaniment by the subtle gestures and footwork of the danseuse.



## Kuchipudi

Kuchipudi, which derives its name from the village of Kuchelapuram, in Andhra Pradesh, India enjoys a unique place among the Indian classical idioms in that it was originally a male dance tradition, enacting stories from Hindu mythology. It was only in the last 9 or 10 decades that women were introduced to this art form. Kuchipudi is characterized by fast rhythms and fluid movements. The music that accompanies the dance is according to the classical school of Carnatic music.

## Kathakali

A stylized classical Indian dance-drama noted for the attractive make-up of characters, elaborate costumes, detailed gestures and well-defined body movements presented in tune with the anchor playback music and complementary



percussion. Kathakali has its origins almost 1500 years ago in the early ritual folk dances and dance dramas of Kerala. A distinguishing characteristic of this art form is that the actors never speak but use hand gestures (mudras), expressions (rasas) and rhythmic dancing instead of dialogue.

## Ottamthullal

A dance-drama performing art form in Kerala. It was created as a medium to protest against the prevalent socio-political structure and prejudices of society. It went on to become the most popular folk art presented in Kerala temples. Ottamthullal features a solo performer and the distinguishing feature is the performer himself singing and enacting the story.

## Kalaripayattu

A martial art which originated in Kerala during the 13<sup>th</sup> Century AD, it is considered to be one of the oldest fighting systems in existence. Originally practiced in northern and central parts of Kerala and the Tulunadu region of Karnataka, it is now practiced widely in Kerala and in contiguous parts of Tamil Nadu. A Kalari is the school or training hall where martial arts are taught.



# Tourist Destinations



## Athirappilly Falls

Located on the west-flowing Chalakudy River in the Vazhachal Forest Division. This 24 m (80 ft) waterfall and the nearby Vazhachal Falls are popular tourist destinations. Athirappilly Falls is the largest waterfall in Kerala and is nicknamed 'The Niagara of India' and is about 62 km from Kochi.

## Valparai

Located 3,500 ft above sea level, Valparai is a hill station on the Anaimalai Hills range of the Western Ghats. About 138 km from Kochi, the route to Valparai passes through the beautiful rain forests of the Western Ghats. While major portions of the land are covered by tea plantations, existing forest areas remain a haven for wildlife.

## Munnar

Munnar is a town and hill station located in the Idukki District of Kerala at around 1,600 m (5,200 ft) above sea level, in the Western Ghats range of mountains. The name Munnar is believed to mean 'three rivers', referring to its location at the confluence of the Mudhirapuzha, Nallathanni and Kundaly rivers.





Located about 125 km from Kochi, Munnar is famous for the tea and spices grown here, in addition to the breathtaking scenery.

### Thekkady

The very sound of the word Thekkady conjures up images of elephants, unending chains of hills and spice-scented plantations. The Periyar Tiger Reserve in Thekkady is one of the finest wildlife reserves in India and spread across the entire district are picturesque plantations and hill towns that hold great opportunities for treks and mountain walks. Located about 170 km from Kochi, the sanctuary is famous for its dense evergreen, semi-evergreen, moist deciduous forests and savanna grass lands. It is home to herds of elephants, sambar, tigers, gaur, lion-tailed Macaques and Nilgiri Langurs.

### Varkala Beach

Located 164 km from Kochi, near the capital city of Thiruvananthapuram, Varkala beach is the only place in southern Kerala where cliffs are found adjacent to the Arabian Sea. This tertiary sedimentary formation is a unique geological feature on the otherwise flat Kerala coast, and is known among geologists as the Varkala Formation and is a geological monument as declared by the Geological Survey of India.

### Alappuzha Backwaters

Famous for its boat races, beaches, marine products and coir industry, Alappuzha is a place of immense natural beauty, referred to as the 'Venice of the East'. The speciality of this land is the region called 'Kuttanad' - a land of lush paddy fields referred to as the 'Rice Bowl of Kerala' and one of the few places in the world where farming is done below sea level. This one-time prosperous trading and fishing centre is today a world renowned tourist destination popular for house boat cruises in the backwaters.



## Notes

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