



# Marine Spatial Data Infrastructure Course Report

20 June 2016 – 24 June 2016



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## About IIC Academy



*IIC Academy, Visakhapatnam, India*

IIC Academy is an autonomous institution committed to capacity building in the area of geospatial sciences. Headquartered at Visakhapatnam, the Academy seeks to be an international center of excellence offering customized programs on nautical cartography, terrestrial and hydrographic surveying, GIS, Photogrammetry, LiDAR, as well as, software and professional management courses. Internships are also offered to deserving university students who wish to make a career in the field of geospatial sciences.

The Marine Geospatial Information and Hydrographic Surveying courses of the Academy are the flagship programs recognized by international professional bodies FIG/IHO/ICA as meeting their S8 Cat B and S5 Cat B standards respectively.

As an annual offering, the Academy conducts the Multibeam Surveying course, generally in the month of February in Visakhapatnam, India.

Over the last five years, the Academy has trained 4000 participants, including participants from seventeen countries, in its varied courses. The participants generally come from government and private organizations and graduating students from the Indian Universities. The Academy has actively supported the capacity building initiatives of the International Hydrographic Organization.

The Academy has Memorandum of Understanding with two prominent universities in Andhra Pradesh, India, namely, the Koneru Lakshmaiah, and Vignan's universities. Through collaboration with these universities, the Academy is focused on skill development to support several of the Indian Government initiatives like building smart cities, infrastructure development, inland waterways, and digitization of assets that include, land and water.

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## Marine Spatial Data Infrastructure Course (20-24 June 2016)

### Background

The IIC Academy was requested to conduct a five-day Marine Spatial Data Infrastructure (MSDI) course for the member countries from the North Indian Ocean Hydrographic Commission (NIOHC), as part of the capacity building initiative of the International Hydrographic Organization. The participants attending the course were exempt from the course fee. The travel, stay and other logistical expenses were borne by the IHB-CBC.

The course was conducted from 20 to 24 June 2016 at the Academy's campus in Visakhapatnam, India. Seven participants from Bahrain, Bangladesh, Iraq, Malaysia, Mauritius, Oman and Saudi Arabia attended the course. The list of participants who attended the course is placed in Annexure 'A'.

### Inaugural Function – 20 June 2016



### Lamp Lighting Ceremony

The course was inaugurated by the former union secretary to the Government of India and distinguished scientist, Dr Shailesh Nayak on 20 June 2016. Speaking on this occasion, Dr Nayak stressed on sustaining the health of oceans as they are the true harbinger of life on earth. Emphasising on the blue economy, he stated that systematic observations and information, especially physical, geological, biogeochemical, biological and ecological parameters must be collected collaboratively across the countries and shared in a meaningful manner to forecast productivity of marine waters using earth system models. He reiterated that MSDI is the basis of all ocean information systems and stressed that it is not enough for the agencies to collect information, but they should also train users in the use of the

information. In this context, he lauded the efforts of the IIC Academy and the International Hydrographic Organization.

### **Keynote Session**

## **Towards Blue Economy: Role of GIS**

**Shailesh Nayak**  
**Earth System Science Organization**  
**New Delhi**

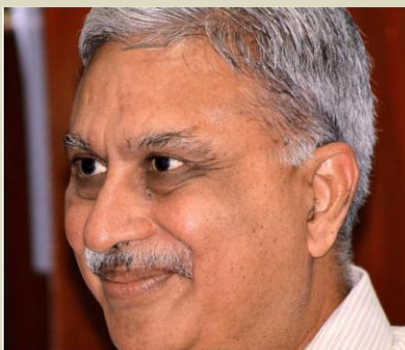
**Key-note Address. Marine Spatial Data Infrastructure  
Course, IIC Academy, Visakhapatnam. June 20, 2016.**

Dr Nayak delivered a very informative and inspiring keynote session which covered various aspects related to marine GIS and its influence on the blue economy. The major topics covered during the session included the following:

- History of spatial information;
- Living resources and assessment of marine productivity;
- Ecosystem modelling;
- Marine biodiversity;
- Ocean Biogeographic Information system;
- Exploration of sea for resources including fresh water and development of technology;
- Increasing resilience to natural hazards;
- Numerical weather prediction system;
- Cyclone monitoring;
- Indian tsunami warning system;
- Renewable energy;
- Wind forecasting and scheduling
- Shipping and port development;
- Coastal ocean state forecasts;
- Shore protection measures;
- Vulnerability mapping;
- Indian ocean observing system;
- Earth observations for earth science and services.



Dr Nayak concluded his session by assuring the participants that his organisation will be willing to cooperate with any agency working in the field of ocean systems.



Dr. Shailesh Nayak

**On the Sidelines – Chat with “The Hindu” Correspondent  
Beach erosion a natural process, says expert  
The Hindu, 24<sup>th</sup> June 2016**

Erosion is a natural phenomenon and beaches exist only because of the process of erosion. Beach or sand erosion and accretion are normal and when viewed over a longer time period they balance out.

There are three major reasons for beach erosion – rising sea levels, natural erosion and anthropogenic – there is no model to quantify the damage caused by each, distinguished scientist and former Secretary Ministry of Earth Sciences Shailesh Nayak told The Hindu after formally inaugurating the course on Marine Spatial Data Infrastructures being conducted by the IIC Academy in association with International Hydrographical Organization here on Monday.

Rising sea levels due to global warming increase the erosion, he said. Erosion is a natural process and the beaches are a result of this process. “Fortunately, we have detailed maps and charts of the regions from over 100 years. If we want aerial maps then we have a database of satellite images of over 40 years now. A detailed study of these maps will reveal the details of erosion and accretion of the beaches,” Dr Nayak said.

Anthropogenic activity contributes to erosion. However, there is no scientific evidence to quantify the erosion due to this activity. It is convenient to blame the anthropogenic activities for the erosion and the people who target it are highly vocal and their voice carries weight, former Union Secretary said.

## Course Schedule

Date	Forenoon	Afternoon
20 June 2016	<p>MSDI and Hydrography</p> <ul style="list-style-type: none"> <li>• Why an SDI? The reasons behind an SDI and the benefits;</li> <li>• Putting the “M” into SDI: the relationship between the land and the sea;</li> <li>• Frameworks and guidelines including those of the IHO;</li> <li>• Standards: international and national;</li> <li>• Spatial layers: base and thematic;</li> <li>• Understanding the bathymetric layer;</li> <li>• How hydrography fits into an SDI;</li> <li>• Case Study: a national SDI exemplar;</li> <li>• Case study: a regional SDI exemplar.</li> </ul>	<ul style="list-style-type: none"> <li>• Data models and data dictionaries.</li> <li>• Infrastructure requirements for hosting SDI’s: the hardware and software;</li> <li>• Cataloguing data holdings; meta-data standards;</li> <li>• Designing access to data repositories;</li> <li>• Facilitating data exchange and retrieval;</li> <li>• MIOs – the IHO Standards;</li> <li>• Designing an MIO.</li> </ul>
21 June 2016	<ul style="list-style-type: none"> <li>• Exploring the wider uses of marine data by others;</li> <li>• Discovering how other datasets can complement traditional products;</li> <li>• Crowd sourced data and its role;</li> <li>• Applying GIS to access data.</li> </ul>	<p>Case Studies</p> <ul style="list-style-type: none"> <li>• How geospatial data can be used in port management;</li> <li>• How geospatial data assist coastal zone management.</li> </ul>
22 June 2016	<ul style="list-style-type: none"> <li>• Formats and standards including S-100;</li> <li>• Vertical and horizontal de-confliction;</li> <li>• The available toolsets;</li> <li>• Selecting and collecting external data.</li> </ul>	<ul style="list-style-type: none"> <li>• Preparing data; format conversions, datum reconciliation and geo-referencing;</li> <li>• Practicing merging datasets, identifying the issues that arise.</li> </ul>
23 June 2016	<ul style="list-style-type: none"> <li>• Preparing data and data harmonization;</li> <li>• Validating the data or caveating the data?</li> <li>• Preparing data for presentation and sharing;</li> <li>• Presenting the data; techniques for visualization.</li> </ul>	<ul style="list-style-type: none"> <li>• Data Management</li> <li>• Workflow management</li> <li>• Copyright and controlling data usage and access.</li> </ul>
24 June 2016	<p>Built on the experiences and issues of attendees, tutors will lead the group through demonstrations based on appropriate case studies and analogous situations that may help collective problem solving.</p>	<p>Conclusions</p> <ul style="list-style-type: none"> <li>• Re-visiting the benefits;</li> <li>• Re-visiting the issues;</li> <li>• Where next for MSDI?</li> </ul>



**Center for Studies, Bay of Bengal, Andhra University, Visakhapatnam, India**

The hallmark of the course was the visit to the Center for Studies on Bay of Bengal, Andhra University where the participants had lecture and demonstration sessions as follows:

- Demonstration on Kolleru Lake bathymetry a study that was jointly undertaken by the University and IIC Technologies Limited;
- Lecture on 'mike model' and its utility in coastal waters;
- Lecture on wave rider buoy;
- Demonstration of lab equipment and systems.

## **Faculty**




**Session in progress**

The course was led by Dr Vijay Kumar and supported by Mr Shekhar Murthy, Mr Ravi Ayyagari, Mr. NV Tataji Jarjapu, and Mr VRK Sharma. Mr Satyanarayana, the nautical cartographic expert with over four decades of experience, was the mentor and director for this course.


Apart from Dr Shailesh Nayak, Major General Dr Siva Kumar also was the guest faculty to the course.



## Course Material

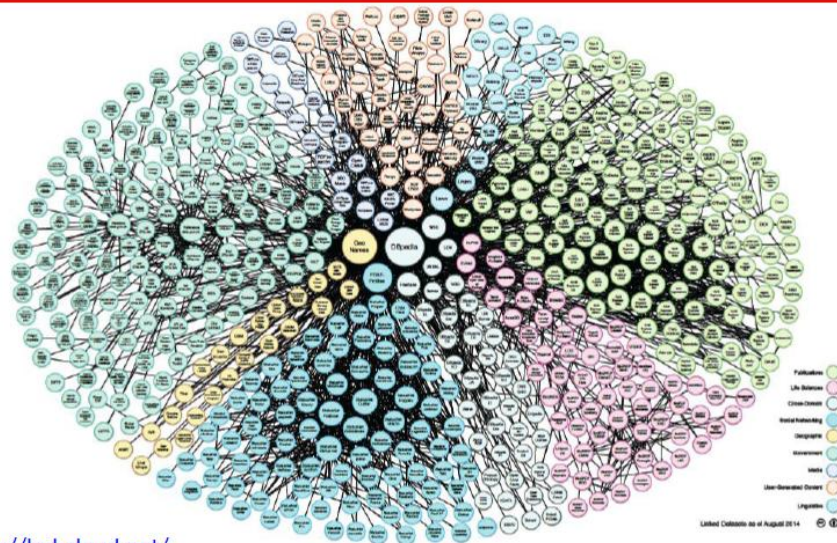


**IIC ACADEMY**  
Training Course on  
Marine Spatial Data Infrastructure



20-24 June 2016  
IIC Academy, Visakhapatnam, India  
www.iicacademy.com

## How interconnected are we?



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All participants who attended this course were provided with the hard copy of course material. The course content was supported by cases studies, examples and demonstrations where applicable.

## Course Feedback



The end-of-the-course feedback from the participants was obtained through a structured feedback questionnaire on a five-point Likert scale. The feedback indicated as follows:

## Course Feedback Metrics

4.63

### Course Content: Excellent

1. The content of the course was useful and supported the learning objectives
2. The content of the course will be a useful reference material for future



4.42

### Course Design: Very Good

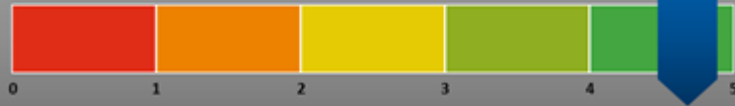
1. Case-studies and discussions stimulated learning.
2. Course was well structured and logically sequenced.



4.65

### Course Delivery: Excellent

1. The instructors were highly knowledgeable on the topics covered in the course.
2. The instructors explanations added value to the lecture materials
3. The instructors encouraged positive interactions during the sessions
4. The instructors motivated the learners to learn



4.0

### Overall: Very Good

1. Overall, the learners consider this course very useful to them and their organizations and will recommend the course to others



### Other Metrics

### Rating out of 5

Pre-course activities and communication

4.63

Registration and inaugural function

4.50

Hotel and local conveyance

4.38

Training room ambience

4.75

## Marine Spatial Data Infrastructure Course – Panorama



MSDI Course – 20 June 2016



Valedictory Function – 24 June 2016



## **Accommodation and Conveyance**

All participants and the guest faculty were accommodated in 'The Gateway Hotel' on the beach road, Visakhapatnam. Meals were provided to the participants to synchronise with their specific requirements of fasting during this holy Ramadan month.

The local conveyance was provided to the participants to move between the hotel and the Academy campus. Two short shopping visits were also organised.

All participants were picked-up and dropped from the Visakhapatnam airport to the hotel and were escorted both ways.

## **Administration and other issues**

In hindsight, considering the audience who attended the course, it would have been preferable if the course dates did not clash with the Ramadan period. Keeping their specific needs in mind, the sessions were started at 08:30 hours instead of the customary start time of 09:30 hours.

There were a couple of challenges with the issue of Visa to the participants. Despite the fact that the invitation letter specifically mentioned the purpose of visit as 'to attend the MSDI course', the participant from Malaysia reported with a tourist visa, and the participant from Iraq with a business visa without mention of the purpose of visit. The local security agencies detected these discrepancies and accordingly, the Malaysian participant had to be sent back after the fourth day of the course. All other participants completed the entire five-day course as scheduled.


## **In Conclusion**

The IIC Academy and IIC Technologies thank the IHO for providing us with this opportunity to conduct this first course on Marine Spatial Data Infrastructure. The participants found the content useful and desired if some practice element with a detailed case study may be added in the future courses.

The support and encouragement from Captain Alberto P. COSTA NEVES and Sandrine BRUNEL from the International Hydrographic Bureau, and Mr Jeff BRYANT, International Capacity Building Manager, United Kingdom Hydrographic Office, in particular, helped us in completing the course successfully.

The Academy looks forward to the IHO to collaborate with the future capacity building initiatives in nautical charting, hydrographic surveying and marine SDI.

Best Regards.

  
Shekhar Murthy  
President, IIC Academy



Thank you.

## Annexure A

### Participants of the Marine Spatial Data Infrastructure Course: 20-24 June 2016 IIC Academy, Visakhapatnam

#	Participant (Country)	Country - Designation
1	LT MOHAMMAD RAFEQ BIN PAIMIN RMN	Malaysia Geospatial Marine Officer National Hydrographic Center
2	INSTR LT COMMANDER NASRIN UMME NAHAR	Bangladesh Instructor Navy Bangladesh Navy
3	HEMBAL TECKMUN	Mauritius Senior Surveyor Ministry of Housing and Lands
4	LAILA SALIM RASHID AL-HARRASI	Oman Marine Science Officer National Hydrographic Office
5	ALQAHTANI, GHAZI HUSSAIN A	Saudi Arabia Marine Cartographer General Commission for Survey
6	CAPTAIN SAMEER ABD ALI MARZOQ	Iraq Head of Dredging Department General Company for Ports of Iraq
7	BADER ALI YUSUF LAHDAN	Bahrain Hydrographic Surveyor National Hydrographic Office