



# **Industry Support for Capacity Building:**

## **IIC Technologies**

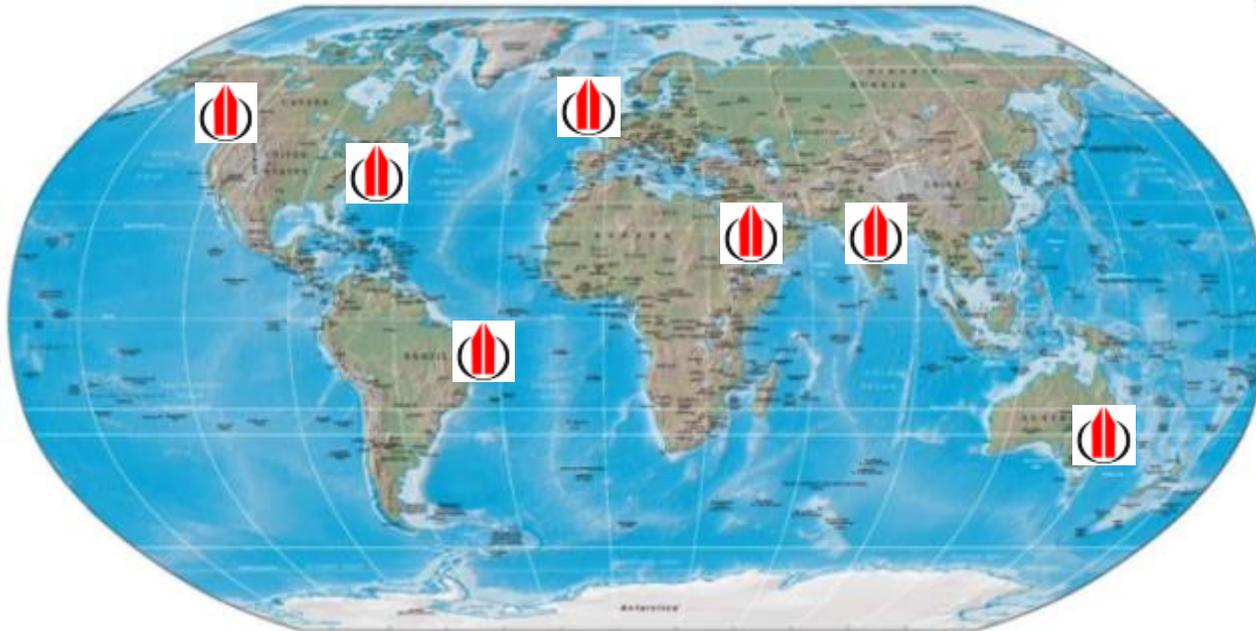
SWP HC  
November 2016

Ron Furness

- Established in 1993, Headquarters in Hyderabad, India
- Focus on Geospatial Sciences
  - Marine Solutions & Charting
  - Terrestrial Solutions & Mapping
  - Geodetic and Cadastral
  - Specialty Mapping (Heritage, Geoid)
  - Software (Innovation Centre)
  - Training (IIC Academy)
- Capability: 2,000+ specialists and technicians
- Quality: ISO 9001 certified
- Performance: Successful projects with over two dozen government agencies around the world

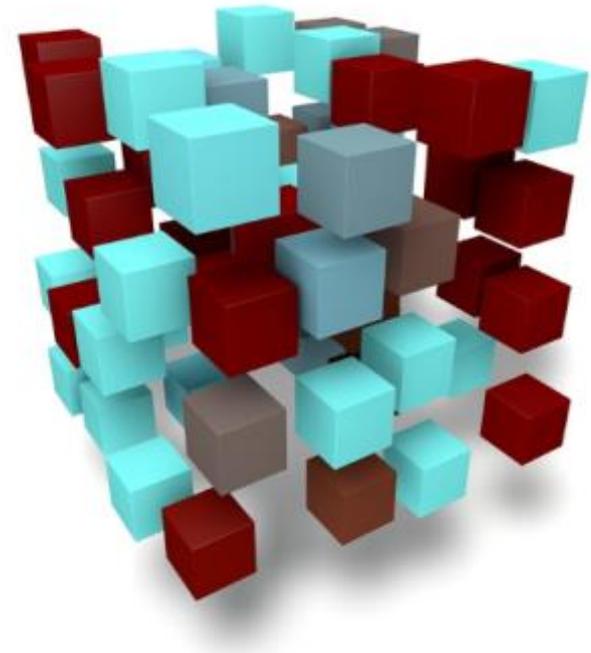


- Able to leverage specific expertise from across its offices worldwide while providing responsive, localized customer service and production capability
- Seven locations, Three production offices, six project support offices, two R&D offices, & one training Academy, all working seamlessly together



# How we are structured

- Matrix of Business Development and Project Management
- “Engine room” in Hyderabad and Vizag
- Field Offices throughout India, the Middle East and UK
- Specialist production facilities UK & US
- Services provided centrally
  - Aviation Services
  - Distribution
  - Innovations Centre
  - Training (IIC Academy)



# Headquarters



*IIC Headquarters, Hyderabad, India*



*IIC Innovations Centre embedded within the International Institute of Information Technology, Hyderabad*



**IIC Office UK – York University**  
**Security cleared facility , storage,**  
**people and IT,**  
**up to NATO Secret**



*“Industry Ready”*

# Capacity Building with Internationally Recognised Programmes



- Oman
- Saudi Arabia
- UAE
- Denmark
- Brazil
- Korea
- New Zealand
- US
- Bhutan
- India
- International Maritime Organization
- International Hydrographic Organization



## Cartography



## Surveying



# Capacity Building Evolving to blended learning



*Unfolding Creativity,  
Unraveling Potential*

[www.iicacademy.com](http://www.iicacademy.com)



- **Marine Solutions & Charting**
  - MBES, Bathy Lidar, SubBottom, Source Data Management
  - ENC, Paper Chart, AML, Data Management, MSDI
- **Terrestrial Mapping**
  - Aerial surveys, Satellite Imagery, Ortho Mapping
- **Geodetic and Cadastral Mapping**
  - Geodetic and Cadastral Surveys
  - Geoid Modernization
- **Specialty Mapping**
  - Heritage Mapping
  - Engineering Surveys
- **Software Solutions (Innovation Centre)**
- **Training (IIC Academy)**

# Hydrographic Value Chain



## Data Value Chain

### Data Acquisition

- Hydrographic
- Geophysical
- Oceanographic
- Airborne Lidar
- Satellite

### Survey Data Processing

- Bathy Data Cleaning
- Surface Modeling
- Image processing
- Deconfliction

### Marine Products

- ENCs / IENCs
- Military Overlays
- Paper Charts
- Geophysical Products

### Verification & Validation

- Spatial Accuracy
- Feature Verification
- Logical Consistency
- 3rd Party Checks
- Vertical/Horizontal Consistency

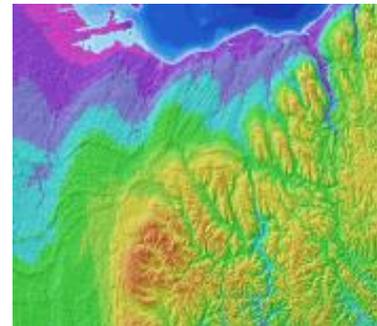
### Updating & Maintenance

- Database maintenance
- Data Assessment
- Data critical updates
- Data management
- Data warehousing

## Education & Training

# How Do We Do It?

- **Resources**
  - Hires a mix of recent graduates and those with deep domain knowledge
  - Emphasis on a large in-house training programme and a mentoring system to develop, challenge, and retain employees.
  - Utilizes knowledge matrix to match specialized expertise with project requirements
  - Leverage skills of resources across multiple offices to suit project
- **Involved in International Committees, including:**
  - IHO S100WG, ENCWG / ISO 19100 Standards Series
  - NATO Geospatial Maritime Working Group (GMWG)
  - Regional Commissions
- **Partnership Relationships with our Clients**
  - Continually working together to find solutions and to do things better
  - Invest in Quality (ISO 9001 Quality System since 1997)
- **Host of “Electronic Charting Workshop”**
  - Bringing together technical managers and decision makers from hydrographic offices in a workgroup forum in Vancouver to discuss a selection of topics of shared interest.



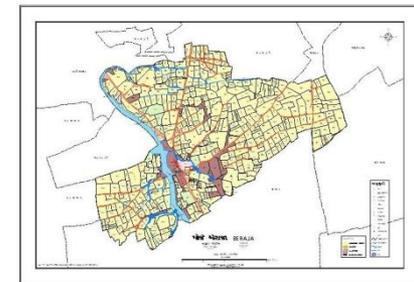
# Who We Do It For



Some current clients (this list represents 30 separate projects)

- Australian Hydrographic Service (AHS)
- NOAA
- Geoint New Zealand (GNZ)
- US Army Corps of Engineers (USACE)
- Land Information New Zealand (LINZ)
- Brazilian Navy Hydrographic Office
- UK Hydrographic Office (UKHO)
- Ordnance Survey (UK)
- UK Ordnance Survey (UK OS)
- Danish Geodata Agency
- UK Ministry of Defence (MOD)
- Indian Hydrographic Office
- Canadian Dept. of Defence (DND)
- Indian Survey & Mapping Organization
- Canadian Hydrographic Service (CHS)
- Government of Chile (Latitude)
- Natural Resources Canada (NRCAN)
- French Hydrographic Office / Navy
- Norwegian Hydrographic Office
- Panama Canal Authority

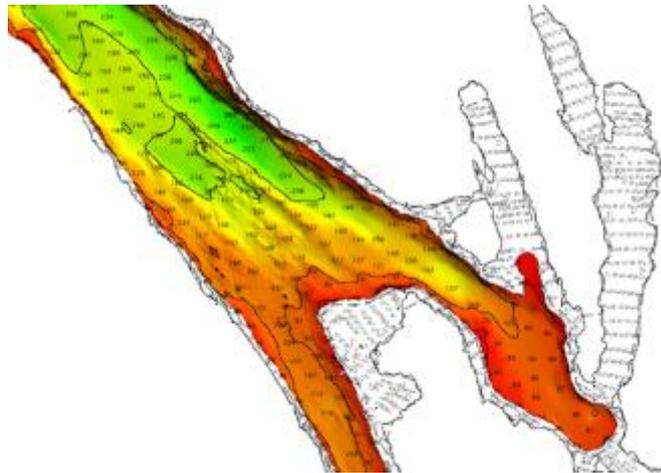
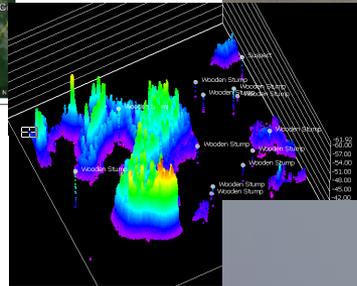
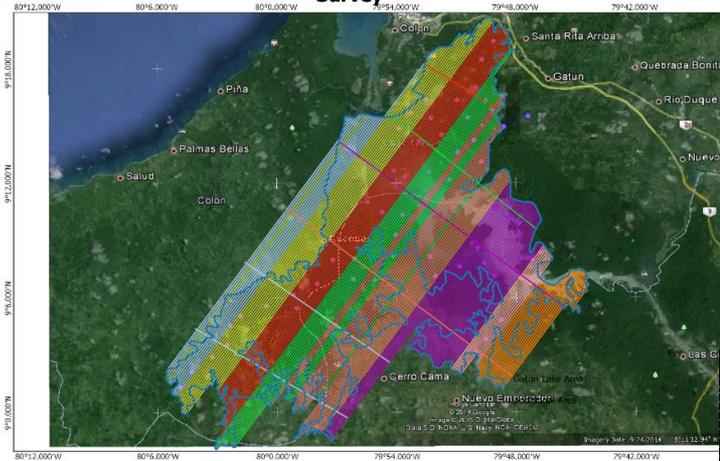
- Photogrammetry
  - Aerial Data Acquisition
  - Aerial Triangulation (MGCP)
  - Planimetric (3D Feature) & Topographic (MGCP)
  - Digital Orthophotography (MGCP)
- Feature Extraction & Editing (MGCP)
- LiDAR (DEM, DSM, Vertical extraction)
- Remote Sensing – Satellite Imagery Processing (MGCP)
- Flythrough modeling
- AM/FM – Utilities (water, sewer, electric, gas, telecom)
- Int. defense standards mapping (VPF/MGCP)
- Airport Mapping DB and Aeronautical Mapping (AMDB)
- Automated feature data extraction



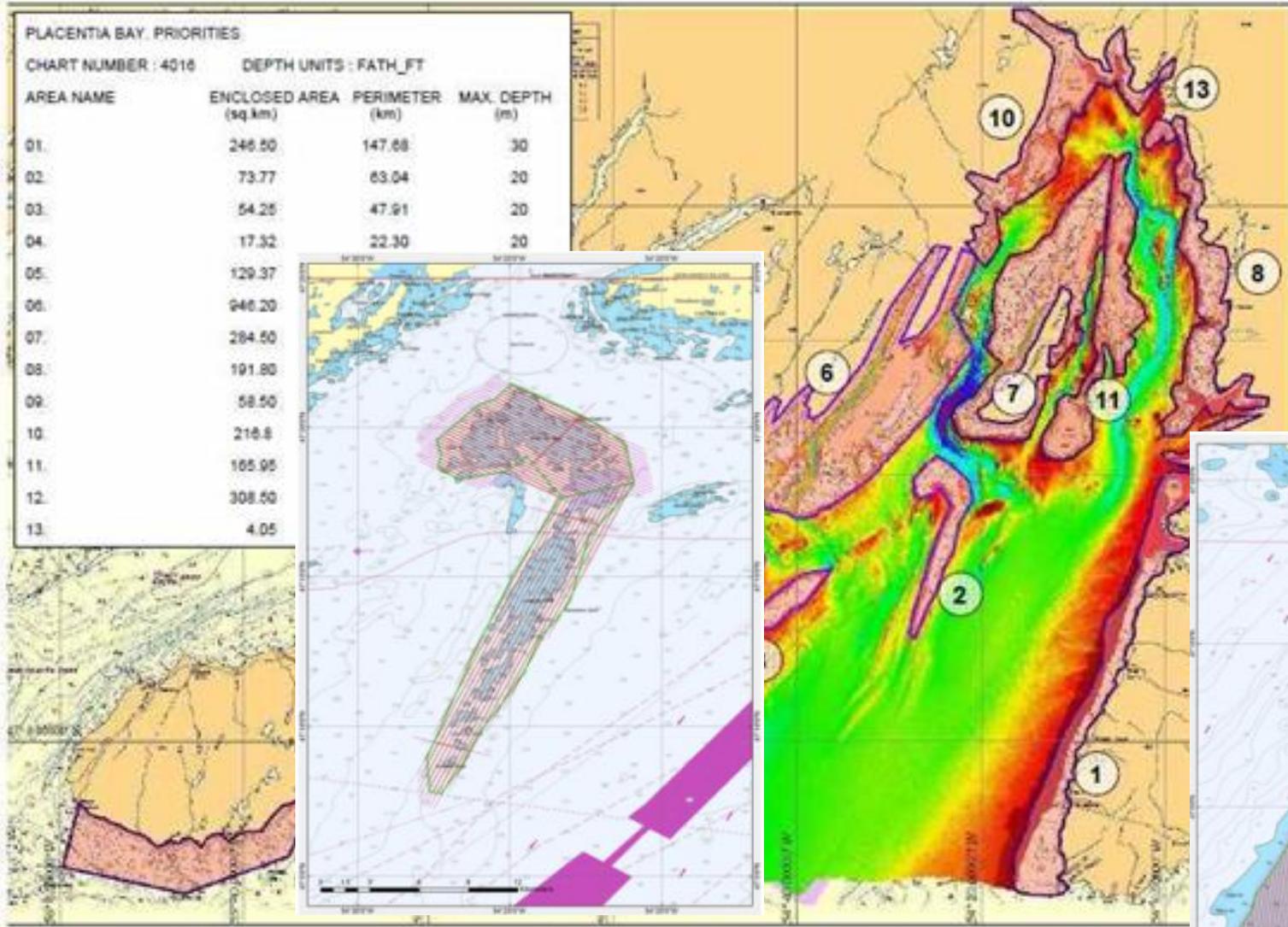
# Hydrographic Services



## Gatun Lake LiDAR Bathymetric & Topographic Survey



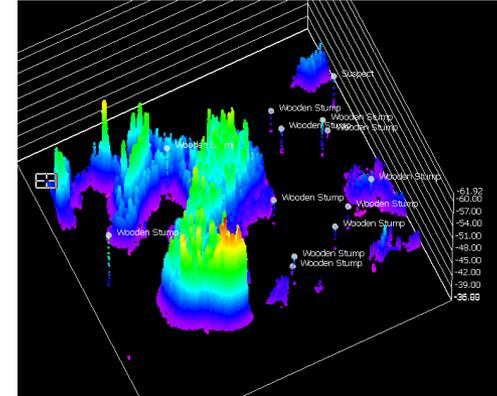
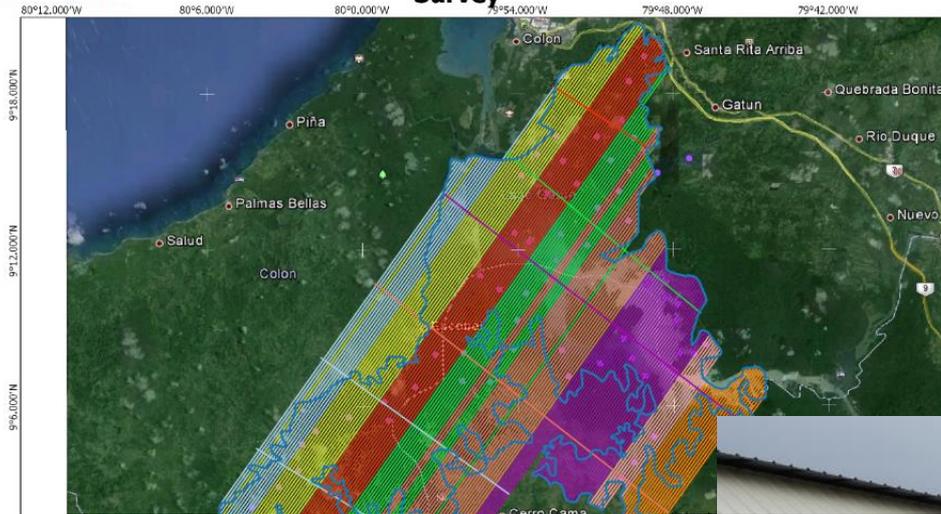
# Airborne Bathymetry Lidar - Canada



# Airborne Bathy Lidar– Panama



## Gatun Lake LiDAR Bathymetric & Topographic Survey



# Hydrographic Surveys – Saudi



Airborne Bath Lidar

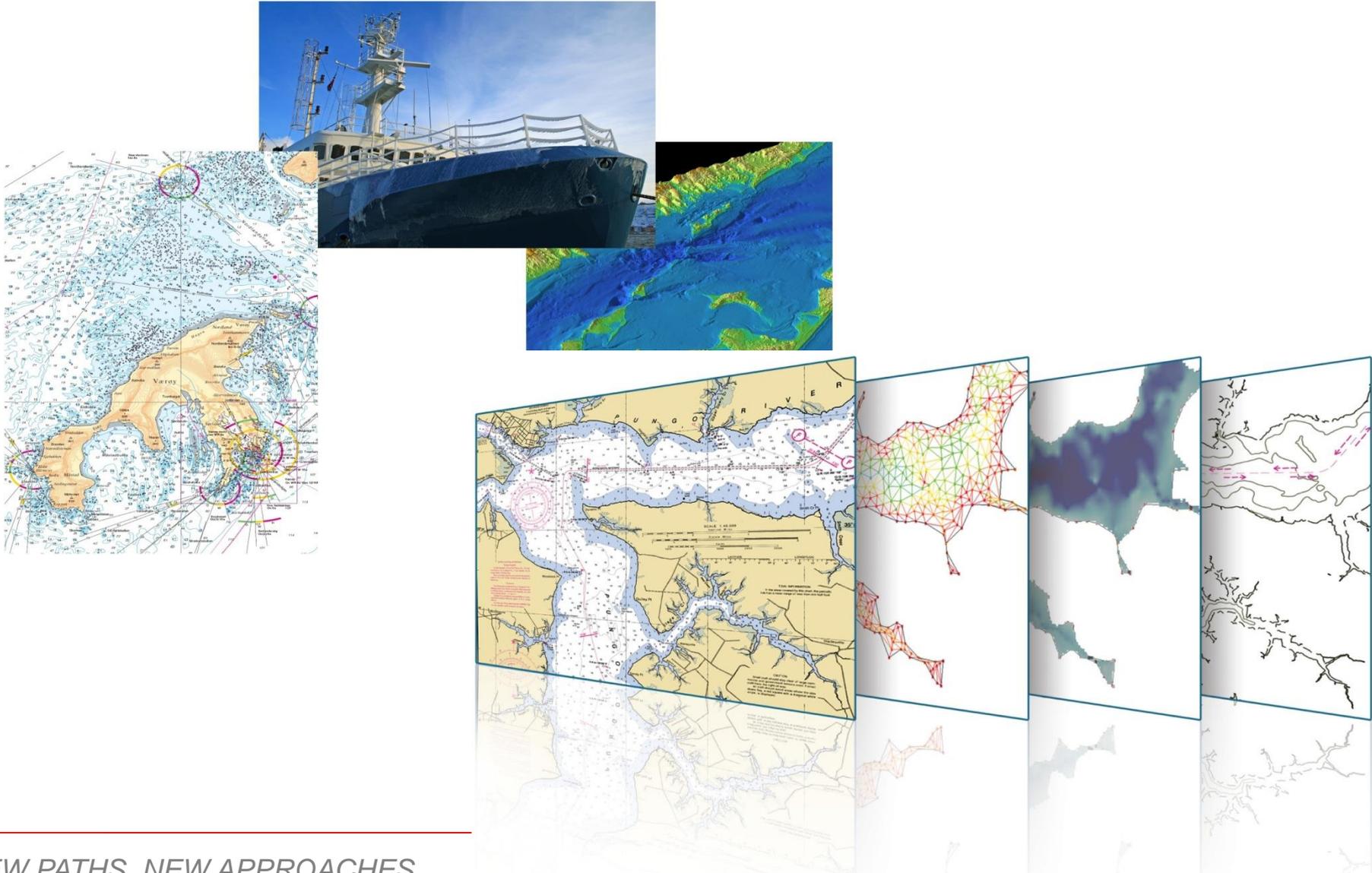


Multibeam, Sidescan,  
Sub-bottom Profiling



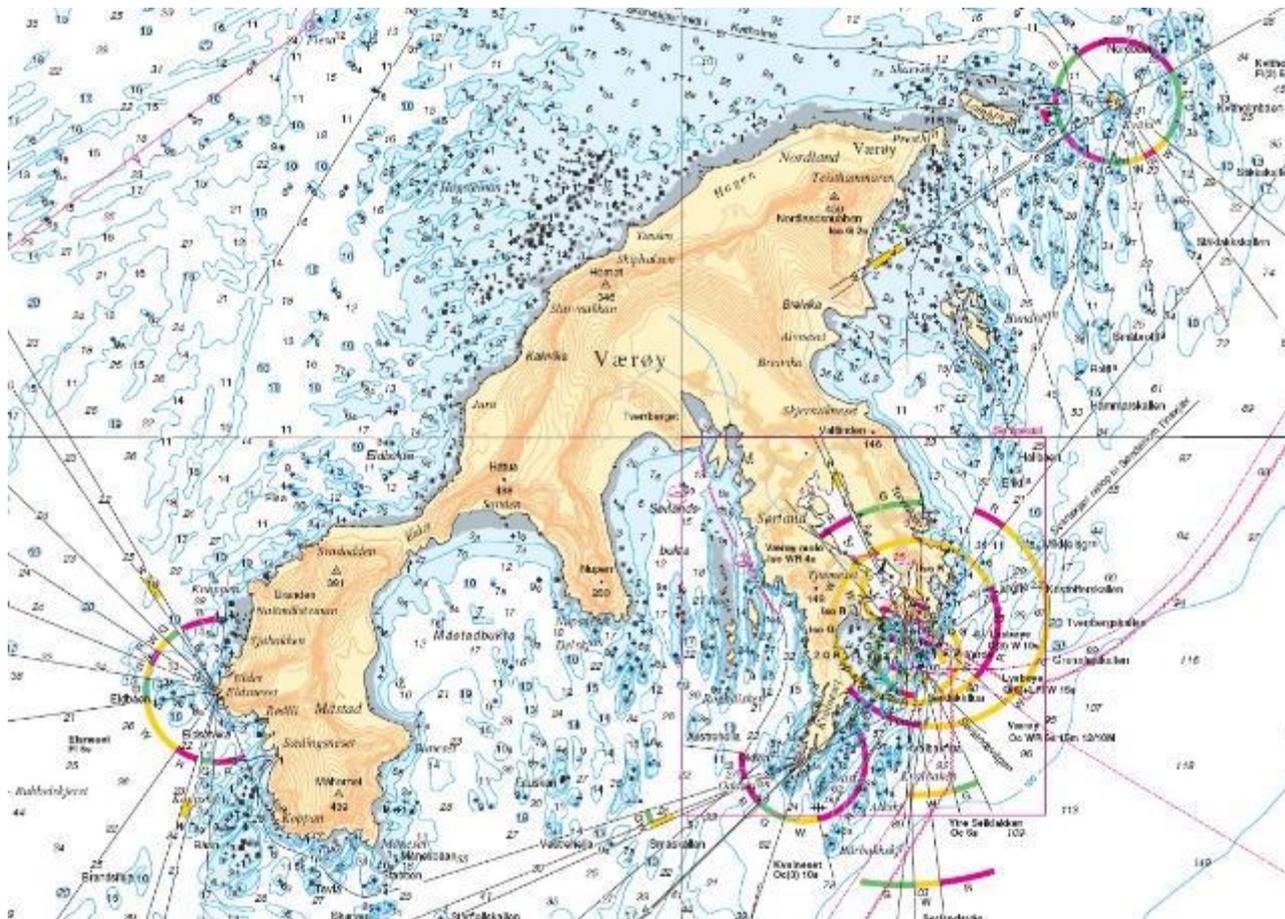
Geodetic & Tidal Control

# Cartographic Services



NEW PATHS. NEW APPROACHES

- Awarded First Prize at the 2009 International Cartographic Conference
- Paper chart No.71 produced for the Norwegian Hydrographic Service





## Category B

S5 (Hydrographic Surveys)

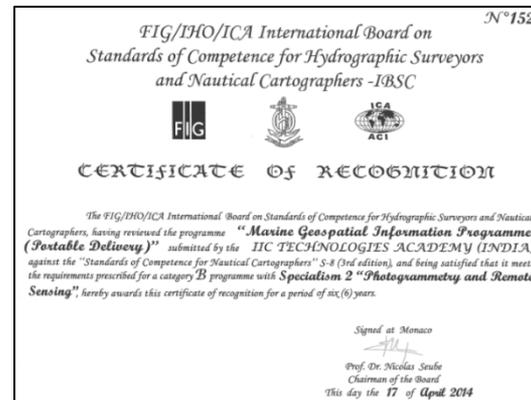
S8 (Nautical Cartography)

S8 (Nautical Cartography)

Cat B – Practical Knowledge

Cat B - Portable Programme

Cat B - Taught at IIC Adademy



**15 weeks theory/practice & 11 week final project**

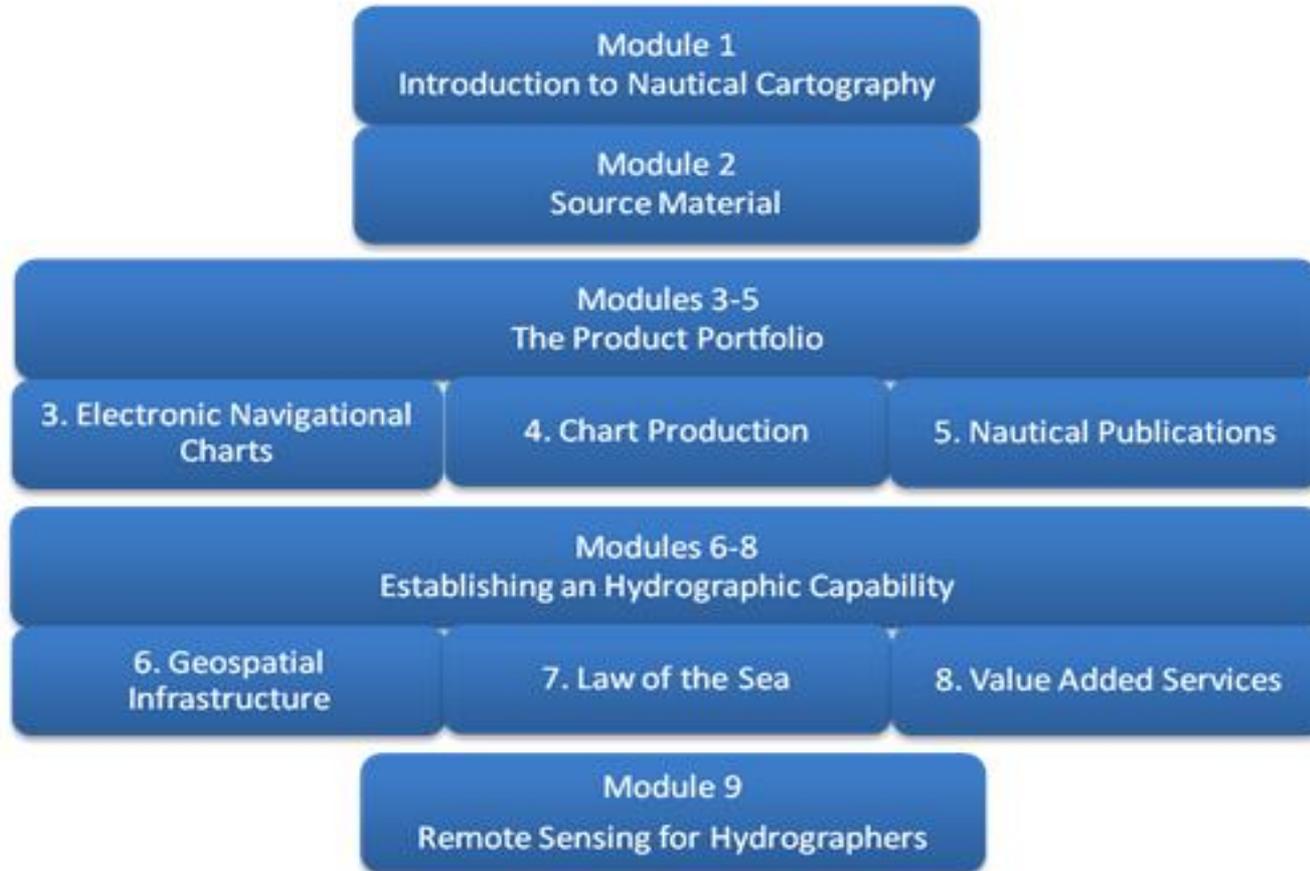


Figure 2. The modular design of IIC's S8 nautical cartography course.

- **IIC Technologies has experience in**
  - Hydrographic Surveying Data Acquisition
  - Data Cleaning and Processing Workflow
  - ENC & Paper Chart Production
  - Verification & Validation
  - Database Maintenance
  - Workflow
- **IIC Academy provide training & education**
  - Onsite and offsite
  - Transferable training skills and courses
  - Assist with IHO/FIG/ICA recognition
  - Provide ongoing mentoring and assistance (**CPD, SMEs**)
  - Provide ongoing course maintenance and upgrades

***“...we have enough capacity to do our job.....”***

**NOAA**.... *“until we have a hurricane Sandy or Katrina, a Horizon oil spill, a super tanker named EXXON Valdez hit a reef, the QEII finds a shoal.... ”*



**Chile** “ ... we were hit with a tsunami and all our hydrographers are focused on one area...”

**Canada** “... the ice cap is melting and there is not sufficient chart coverage in the north.... and we are about to have the budget of a thousand cuts”

**Others**... *“but everyone is retiring”.... “but no one wants to go to sea”*

***Sometimes the capacity builders do not  
have enough capacity***

**Government – Industry - Academia**

**Thank You**

**ronald.furness@iictechnologies.com**