



# **NATIONAL HYDROGRAPHIC OFFICE OF SRI LANKA**



**NATIONAL REPORT  
TO THE  
18<sup>TH</sup> NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION  
GOA, INDIA (9-12 APRIL 2018)**

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## **1. Introduction - National Hydrographic Office**

The National Hydrographic Office (NHO) of the government of Democratic Socialist Republic of Sri Lanka was established in 1984 under the purview of National Aquatic Resources and Research Agency (NARA). The NARA is a statutory body provides services for development and sustainable utilization of living and non-living aquatic resources in the country and the National Hydrographic Office has been vested with the responsibility of conducting country's Hydrographic and Nautical Charting operations by NARA Act of No. 54 of 1981 as amended Act No. 32 of 1996.

The Sri Lanka Navy (SLN) having re-established its Hydrographic operations in 2012, after the neutralization of three decades long insurgency in the country, entered into an MOU with NARA in 2016 in order to expedite national hydrographic operations which is demanded by SOLAS. This has enabled joint Hydrographic surveys and expedited updating of existing nautical charts around the country and paved the way for an efficient development in providing of Hydrographic services within the waters of Sri Lanka during the recent past, thus meeting the SOLAS requirements.

In addition, this amalgamation has shown a remarkable progress in the field as the same has facilitated to share resources and professionalism to achieve common goals. Thereby today the NHO of Sri Lanka has been capable to complete long outstanding survey requirements within a very short span of time.

The SLN's involvement has also facilitated to complete a couple of joint Hydrographic surveys with the assistance of the Indian Navy Hydrographic Department along the west coast to east coast where it's considered navigationally significant. This could be considered as significant benchmarks in the field of Hydrographic surveying in Sri Lanka.

The principle services of the NHO include conducting of systematic Hydrographic surveys up to the Exclusive Economic Zone of Sri Lanka. In addition, hydrographic surveys are carried out in lagoons, lakes and other inland water bodies. Further, NHO produces and disseminate information in support of maritime navigation safety and marine environment preservation, defence, exploration and research & management plans.

## **2. Surveys**

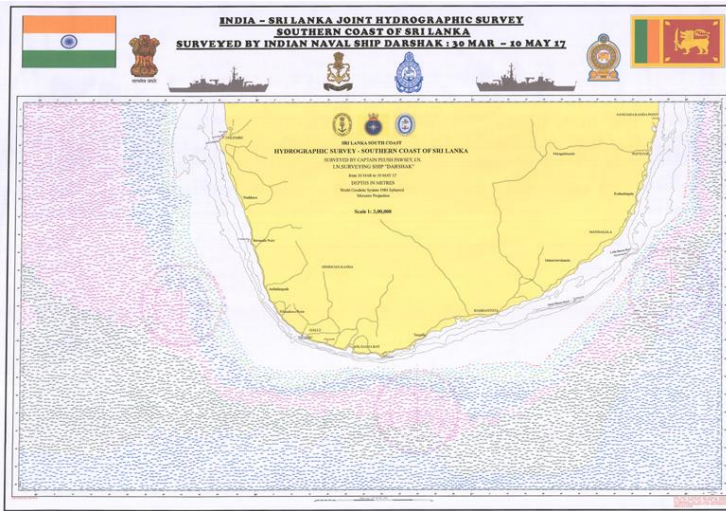
Hydrographic surveys, which are conducted by NHO within the waters of Sri Lanka are a joint effort of NARA and the Sri Lanka Navy Hydrographic Service. So far, two surveys were completed for navigation purposes and two surveys are underway to produce new navigational charts for the country.

Apart from the said surveys, SLNHS conducts defence surveys in support of naval operations in

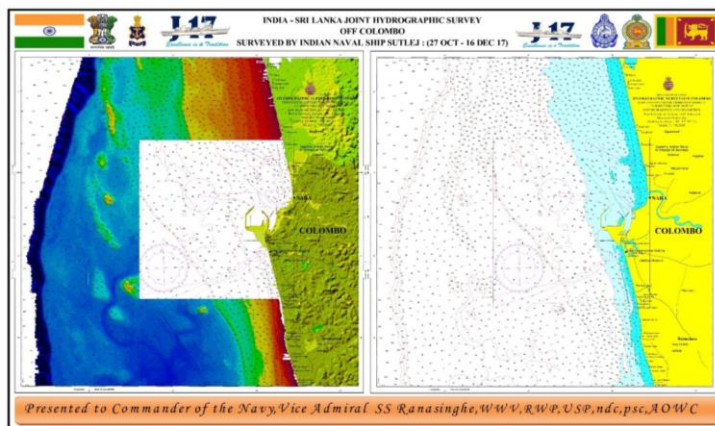
the country.

During 2017, SLNHS and the Indian Navy Hydrographic Department conducted joint surveys to produce new INT chart of scale band 3 from Colombo to Sangamankanda and one new chart for Weligama bay at the scale band 4.

### Colombo to Sangamankanda Phase I



### Colombo to Sangamankanda Phase II



## Weligama Bay



### 2.1 Coverage of New Surveys

Presently, following new surveys are being carried out for coastal and approaches charts.

SR.No.	Name of the Chart	Scale Band	Remark
01	Approaches to Oluvil	4	completed
02	Approaches to Kankasanthurai	4	in progress
03	Approaches to Colombo	4	-do-
04	Colombo Harbour	5	-do-
05	Colombo to Weligama	3	-do-
06	Colombo to Sangamankanda	3	-do-
07	Trincomalee to Kudiramalai	3	-do-
08	Little Basses to Trincomalee	3	-do-

Table 1 – Coverage of New Surveys

In addition to those new surveys, NHO has involved in some custom made bathymetric surveys according to the client's requirements. NHO mainly cater consultancy services to local institutes such as Coast Conservation and Coastal Resources Management Department, Sri Lanka Ports Authority, Ceylon Fishery Harbour Corporation, Shell Gas Company, Ceylon

Electricity Board and Ceylon Petroleum Corporation etc.

## 2.2 New Technologies and Equipment

Having pooled resources of SLNHS, the NHO utilizes state of the art modern technologies, equipment and software applications to conduct surveys and produce nautical charts. Accordingly, NHO possesses following resources in providing Hydrographic services in the country.

### 2.2.1 Survey Vessels/boats

RV Samuddrika	– Medium size Research and Survey Vessel
Tharanga	– Survey Boat
Bar Reef	– Survey Boat
P 105	– Survey Motor Boat

Other suitable survey platforms can be obtained from Sri Lanka Navy as required.

### 2.2.2 Equipment

SYQWEST Bathy 500	-	Single Beam Echo Sounder
ECHO TRACK CV 500	-	Single Beam Echo Sounder
VALEPORT MINISVP	-	Sound Velocity Profiler
NORTRACK	-	Current Meter
TELEDINE	-	Dynamic Motion Sensor
SOKKIA SX-101	-	Total Station
SOKIA –SDL1X	-	Digital Level
RUIDE RTS-820	-	Total Station
RUIDE DL 200	-	Digital Level
LIECA VIVA	-	GPS Systems
HEMISPHERE	-	GDPS Systems
RESON SEA BAT	-	Multibeam System
DESO 30	-	Dual frequency Echo Sounder
T196 NEPTUNE SONAR	-	Dual frequency Deep Water Transducer
Digital Levels		
SES 2000	-	Sub Bottom Profiler
Sea Star 8300HP/Omnistar GPS		
RESON SVP 40	-	Sound Velocity Probe
SOKKIA CX 105C	-	Total Station
Tide Gauges		
OCTAN	-	Motion Sensor

### **2.2.3 Software Applications**

HYPACK  
Caris S-57 Composer  
Caris PCC  
Caris Base Editor  
Caris HIPS/SIPS  
Caris GIS  
Leica GEO Office  
PDS 2006

### **2.3 Problems Encountered**

NHO requires to build capacities in maintaining its new chart portfolio when it is completed. Accordingly, it is required that to prepare and publish supporting nautical publications covering its waters, which include new Sailing Directions for Sri Lankan coast, new List of Lights, Tide Tables etc. enabling mariners to use its new products.

## **3 New Charts and Updates**

### **3.1 ENCs**

So far, NHO has produced two ENC cells of band 4 and 5 for Approaches to Hambanthota and Hambanthota harbour, which has validated by IC-ENC. NHO is planning to produce 04 new ENC cells of the scale bands of 3, 4 and 5 in 2018. At present, the SOLAS requirements of maintaining up to date nautical products within the waters of Sri Lanka are met by UKHO under a bilateral arrangement with Sri Lanka.

### **3.2 INT Charts**

Sri Lanka has not produced any INT charts yet. However, NHO is planning to produce one new INT chart for Approaches to Kankasanthurai Harbour and to produce four other INT Charts on completion of joint survey with Indian Hydrographic Department and other ongoing surveys.

### **3.3 National Paper Charts**

In addition to the production of INT Charts, NHO has produced one nautical chart “Approaches to Oluvil” of scale band 4 for national requirements.

### 3.2.1 Approaches to Oluvil



Approaches to Oluvil

#### 4. New Publications and Updates

NIL

#### 5. Maritime Safety Information (MSI)

Relevant details are enclosed as Annex 'A' to this report

#### 6. C-55 (Updated Table)

The updated C-55 table is attached as Annex 'B' to this report.

#### 7. Capacity Building

##### 7.1 Training Received

Since the last NIOHC, following training opportunities has been received from regional navies and through IHO Capacity Building as follows:

SR.No	Name of Training	Sponsored by	Country	Duration	No. of berths
1	CAT "A" Hydrography	Indian Navy	India		02
2	CAT "B" Hydrography	Indian Navy	India		03
3	CAT "B" Cartography	UKHO	UK	15 Weeks	01
4	Oceanography Course	Indian Navy	India	04 Weeks	02
5	On Job Training	Royal Netherlands Navy	Netherlands	02 Weeks	06



6	MSI Training	IHO CB	South Africa	05 Days	02
7	Survey Recorder I	Indian Navy	India	18 Weeks	02
8	Cartography	Indian Navy	India	04 Weeks	04
6	Survey Recorder I	Bangladesh Navy	Bangladesh	24 Weeks	01
7	Survey Recorder II	Indian Navy	India	10 Weeks	07
8	Survey Recorder III	Indian Navy	India	16 Weeks	02

## 7.2 Training Provided

Sri Lanka Navy Hydrographic School was established in 2014, since then the school has provided annually one Survey Recorder III course and from 2016 onwards one Survey Recorder II course for the sailors of Sri Lanka Navy Hydrographic Service.

## 7.3 Training Needs

NHO expects capacity building on following aspects to meet future objectives of the NHO through NIOHC and IHO Capacity Building Fund:

- a. On the Job training on MB surveying and processing
- b. Training on MSI
- c. Training on MSDI
- d. Cartographic training for production of ENC's, AMLs & Paper Nautical Charts and their maintenance
- e. CAT 'A' and CAT 'B' Hydrography training
- f. Training on Database Management

## 8. Oceanographic Activities

Oceanographic activities continued with planning and conducting coastal and offshore oceanographic studies around Sri Lanka, in addition to providing scientific and technological services to a wider range of applications such as coastal constructions, living and non-living resource exploitation, and energy harnessing including environmental impact assessments (EIA).

## **8.1 Work done by the oceanography division/NARA in 2017**

### **8.1.1. Operation ocean observation centre and sea level monitoring station**

Ocean Forecasting Centre had continued with capacity building for establishing observing system for monitoring the real time and near real time ocean conditions around Sri Lanka waters. The activities under the project are aimed at implementing an end-to-end system with the capability to detect, model and ultimately forecast changes in the ocean conditions around Sri Lanka Waters. In 2017, Ocean observation Centre had focused on observation of sea level, wind and wave condition and prediction.

Mirrisa Seal Level Station construction is completed in February, 2017. Meteorological and hydrological sensors were installed at the newly constructed Mirrisa sea level station and set up communication system to transfer data from the Mirrisa sea level station to Head office of NARA in Colombo. Furthermore, a User Friendly Interface (UFI) was installed for the easy display and archival of the meteorological and hydrological parameters from the Mirrisa sea level station.

### **8.1.2. Spatio-temporal variability of Hydrography at southwestern and eastern coasts of Sri Lanka**

Two survey lines, perpendicular east (8.58 °N) and north (80.23 °E ) coast were occupied to collect water samples for biological, chemical and physical oceanographic studies. On a 20 km survey line, 10 sampling locations at 2 km spacing were occupied. To study spatio-temporal variation off south coast of Sri Lanka, Sea glider was deployed at 5.5°N and 80.5°E.

Volume transport by the East Indian Coastal Current is estimated to be about 5 Sv (1x10<sup>6</sup> m<sup>3</sup>). Maximum transport is recorded during June that may be due to effect of south west monsoonal circulation in the Bay of Bengal.

### **8.1.3. Tuna fishing ground forecasting and fisheries information services**

Sea surface properties such as temperature, chlorophyll, height, velocities, derived from Satellite observations and subsurface temperature, mixed layer depth, velocities, obtained from ocean modelled data are used in predicting potential fishing zones.

Forecast dissemination was expanded to all major fishery harbours via fax, email and radio communication. Forecasting area has been increased to cover almost all the area where Sri Lankan fishing vessels are engaged in fishing. During 2017, fuzzy logic base forecasting model

was developed and accuracy assessments with VMS verified fisheries logbooks shown 67% accuracy of improved forecasts.

#### **8.1.4. Oceanographic Database - Integration of Ocean Data and Information**

The project is initiated to develop capacity to create a dynamic oceanographic data repository, so that oceanographic data and information are made available to the users, including researchers and academic.

Sea level data from Trincomalee and Colombo sea level station are retrieved, quality control (Verify the quality of the data - using agreed standards), inventorized and the data is archived.

Data from the Mirrissa sea level station is retrieved and quality controlling of water temperature, water level, air temperature, relative humidity, air pressure and precipitation are completed and the data are inventorized and archived.

### **9. Other Activities**

#### **9.1 Disaster Prevention**

Assisted in data collection and provided expertise for flood modelling in three districts namely: Colombo, Gampaha and Kaluthara during the floods in 2016 and 2017.

#### **9.2 Support for National Interests**

Contribution to NOAC (National Ocean Affairs Committee) with expertise and Hydrographic survey assistance in view of the extension of EEZ of Sri Lanka beyond 200 nm to the Commission on the Limits of the Continental Shelf (CLCS).

#### **9.3 Introduction of new Database Management Policy for NHO**

This database management policy was developed by NHO under the guidance of National Geophysical Data Center (NGDC), USA.

#### **9.4 Introduction of Integrated Management System for NHO**

All the activities and functions from field activities to chart production are integrated to support the management to increase the efficiency and effectiveness of the nautical chart production.

## **9.5 Assistance to CAT B Hydrography Course**

Faculty of Geomatics, Sabaragamuwa University of Sri Lanka is conducting 4 year degree programme in geomatics. The expertise of NHO conduct lectures for student those who are specialized in Hydrography in the said degree programme. The programme is accredited as IHO/FIG/ICA Category B in Hydrography.

In addition, NHO supports University of Ruhuna and Uva Wellassa University conducting Hydrographic modules in their degree programmes covering theory and practical aspects of Hydrography.

## **9.6 Future Plan**

### **9.6.1 Production of Sri Lanka ENCs and INT Charts**

It is envisaged that NHO in collaboration with Indian Navy Hydrographic Department, UKHO and other supportive hydrographic offices will develop capacities towards producing its own ENCs and INT charts within the waters of Sri Lanka within next couple of years.

Accordingly, priority will be given to accomplish ENCs and ENT charts, which are of navigationally as well as commercially significant along the west coast and South coastal stretch of Sri Lanka.

## **10. Conclusion**

With the new collaboration with Sri Lanka Navy, NHO is striving to carryout surveys for coastal chart productions amidst budgetary constrain to provide updated nautical information for marines and keep in phase with acquisition of modern skills such as developing MSDI, developing capacity for ENC production, deriving shallow water bathymetry by using high resolution satellite imageries and evaluating existing charts for adequacy.

In this endeavour NHO seeks collaboration with regional Hydrographic offices through NIOHC achieving its future goals and objectives in view of providing professional Hydrographic services to its stakeholders.

