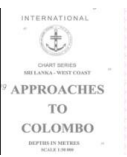


**NATIONAL HYDROGRAPHIC OFFICE**  
**OF**  
**NATIONAL AQUATIC RESOURCES RESEARCH & DEVELOPMENT AGENCY.**  
**SRI LANKA**

**NATIONAL REPORT**  
**TO THE 14<sup>TH</sup> MEETING OF THE**  
**NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION**  
**At**  
**THAILAND**

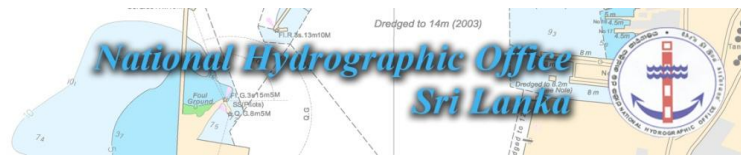
# CONTENT

1. INTRODUCTION.....	03
2. SURVEYS .....	04
3. VESSELS/ NEW TECHNOLOGIES AND EQUIPMENT.....	04
4. NEW CHARTS AND UPDATES.....	05
5. NEW PUBLICATIONS AND UPDATES.....	06
6. MARITIME SAFETY INFORMATION (MSI).....	06
7. C-55.....	08
8. CAPACITY BUILDING.....	10
9. OCEANOGRAPHIC ACTIVITIES.....	12
10. CONCLUSION.....	13



Reclaimed

(2008)



## 1. Introduction

National Hydrographic office(NHO) of National Aquatic Resource Research and Development Agency(NARA) is responsible for the national hydrographic and charting programme for the Democratic Socialist Republic of Sri Lanka.

The NARA is the apex national institute vested with the responsibility of carrying out and coordinating research, development and management activities on the subject of aquatic resources in Sri Lanka. The NARA is a statutory body duly established by NARA Act of No. 54 of 1981, during the past 30 years NARA conducted numerous scientific studies in the field of fisheries and aquatic resources. NARA also provides services for development and sustainable utilization of living and non-living aquatic resources.

Under NARA, the National Hydrographic Office was established in 1984 and has made steady progress to its present position as a professional national surveying and charting authority and is accredited to the International Hydrographic Organization (IHO) as the focal point for Hydrography in Sri Lanka.

The principle service of the NHO is carrying out hydrographic surveys through systematic data collection of inshore, near shore, and offshore. These activities in the sea cover up to the limit of Exclusive Economic Zone of Sri Lanka. In addition, hydrographic surveys of Inland water bodies are carried out too. NHO produces and disseminate information in support of maritime navigation safety and marine environment preservation, defence, exploration, and research & management plans.

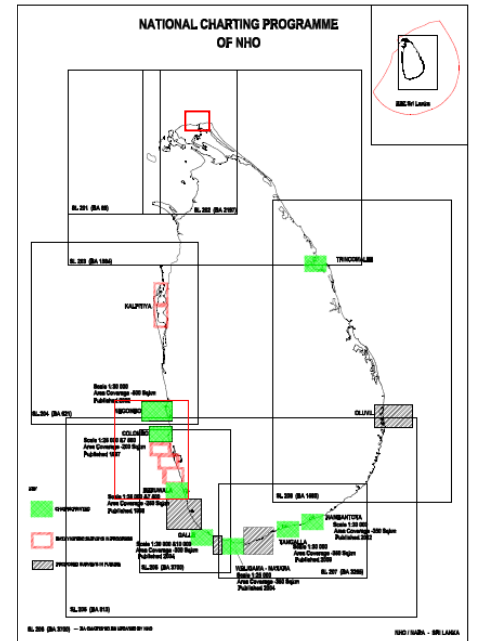


## 2. SURVEYS

### 2.1 Coverage of New Surveys

Bathymetric survey has been started at Colombo for update the Approaches to the Colombo Harbour Chart. Also NHO has planed to start bathymetric survey at Kankasanthurai and Kalpitiya area by May of 2014

In addition to those new surveys, NHO involved in some of custom made bathymetric surveys according to the client's requirements. NHO mainly cater consultancy services to local institute such as Coast Conservation Dept., Sri Lanka Ports Authority. Ceylon Fishery Harbour Corp., Sri Lanka Navy, Shell Gas Company, Ceylon Electricity Board and Ceylon Petroleum Corp etc.



## 3. VESSELS/ NEW TECHNOLOGIES AND EQUIPMENT

### 3.1.1 Vessels

RV Samuddrika- Medium size Survey Vessel

Taranga – Survey Boat

Tharani – Survey Boat

### 3.1.2 Instruments

RESON Sea Bat 8101 – Multibeam system

DESO 30 dual frequency echo sounder

*T196 NEPTUNE SONAR Dual frequency deep water Transducer (Newly purchased)*

SES 2000 – sub bottom profiler

SeaStar 8300HP/Omnistar GPS

RESON SVP 40 sound velocity prob

Leica TCR 1202 Robotic total station

### 3.1.3 Softwares

*Caris S-57 Composer (Newly purchased)*

Caris GIS 4.4

Hypack Gold

Leica GEO Office

PDS 200 multibeam processing software

Arc GIS 9.2 and Erdas Imagine softwares use for the purpose of GIS and Remote Sensing Analysis.

## 4. NEW CHARTS AND UPDATES

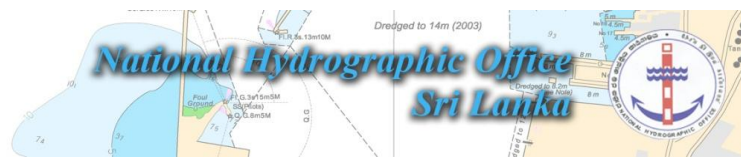
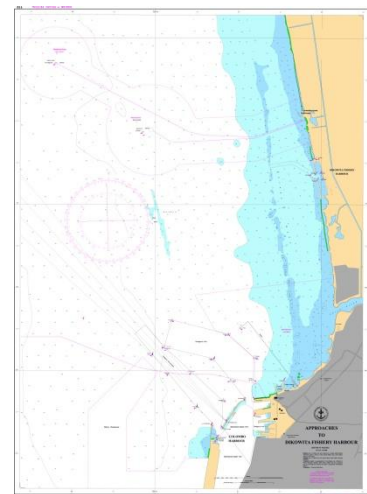
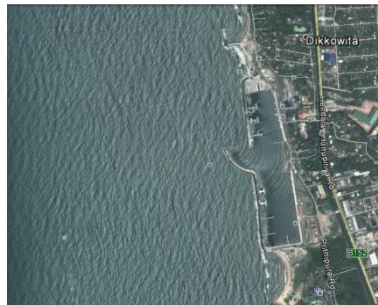
### 4.1 ENC's

NHO feels the necessity of production of ENC as per the requirement of IHO and NHO recently purchased Caris S –57 composer software. Also two Officer of the NHO have successfully completed the CAT B Programme, which was conducted by the UKHO and now NHO is ready to process ENC production.

UKHO has produced ENC for SRI LANKA – West Coast- Colombo Harbour and Approaches (4115(P) / 2007). Source : Sri Lanka Hydrographic Office (SEP-2007000052342-1

### 4.2 National Paper Charts

Nautical Chart for Dickovita (Chart No: 110) Fishery Harbour, which is the newly build harbour situated in Colombo.



### 4.3 Problems Encountered

NHO continue to develop and face challenges in that development. Whilst a number of minor areas of improvement are noted. There are two which require particular and early attention: the development of Multi-beam Echo Sounder (MBES) capability and the establishment and development of an electronic nautical chart (ENC) production and maintenance capability

## 5. NEW PUBLICATIONS AND UPDATES

### 5.1 NIL

## 6. MARITIME SAFETY INFORMATION (MSI)

### 6.1 Existing infrastructure for transmission

The point of contact for the NAVAREA VIII coordinator is the Harbour Master at Colombo port using his direct email address. The GMDSS facilities are not available in Sri Lanka. Telecommunication Regulatory Commission responsible for the order existing facilities. At the moment facilities available are VHF system channel 16 Medium frequency 2182HZS Communicating with Bangalore Maritime earth Satellite Station

### 6.2 Problem encountered

Still no viable project in progress to establish GMDSS system in Sri Lanka

### 6.3 Future Plan

1. NHO has planed to act as focal point to gather national MSI data and forward it to the appropriate authority for use by the mariner. Within NHO a competent officer will has to be nominated as the MSI officer. He be assisted by a small team to handle information.
2. Initially A brief assessment will be carried out by Main institutes responsible to MSI in Sri Lanka revealed the following:  
**NARA/NHO** - Responsibility for MSI within Sri Lanka and liaison with Navarea VIII and UKHO



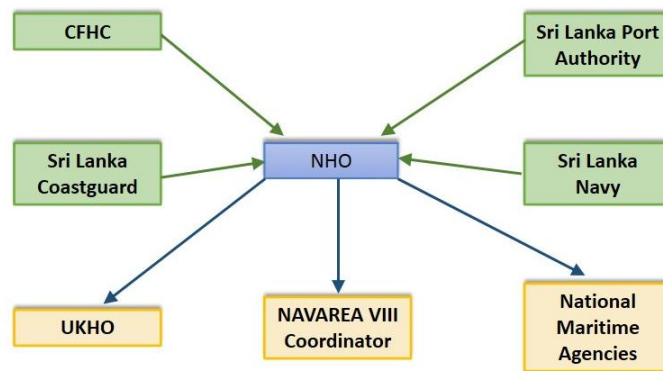
**Sri Lanka Port Authority-** The area within established port limits for each port in Sri Lanka.

**Ceylon Fishery Harbour Cooperation-** The area within established harbour limits for each fishery harbour in Sri Lanka.

**Sri Lanka Navy-** General information from routine patrols and SAR activity.

**Sri Lanka Coastguard-** General information from routine patrols and SAR activity.

- The proposed structure of the MSI organisation and the flow of information are shown in the diagram below.



## 7. C-55

### 7.1 Survey coverage, where

A = percentage which is adequately surveyed

B = percentage which requires re-survey at larger scale or to modern standards.

C = percentage which has never been systematically surveyed.

Depth	A	B	C
<200m	8.6	5	91.4
>200m	2	0	98

#### 7.1.1 Amplifying Information

Entire area under less than 200m depth has to be surveyed due to the effect of tsunami in the year 2004. Some areas such as main harbour approaches, fishery harbours, lagoons



and near shore passages have been surveyed in large scale with modern standards.

### 7.1.2 Navigational Information (S-53)

Service	Yes	No	Partial	Notes
Local Warnings	√			Via VHF Broadcast
Coastal Warnings	√			Via VHF Broadcast
Navarea Warnings		√		
Information of Ports and Harbours	√			

### 7.1.3 GMDSS Implementation (IMO Publication 970 – GMDSS Handbook)

Service	Yes	No	Partial	Notes
Master Plan		√		
A1 Area			√	Receiving only
A2 Area			√	Receiving only
A3 Area			√	Receiving only
NAVTEX		√		
Safety NET		√		

### 7.1.4 Status of National Charting within the limit of the EEZ.

Coverage of charts published by NHO/Sri Lanka

A = percentage covered by INT series, or a paper B = percentage covered by Raster

Navigational charts. C = percentage covered by ENC's

Purpose / Scale	A	B	C
Offshore passage / Small	100	100	70
Landfall and Coastal passage / Medium	100	100	30
Approaches and Ports / Large	70	100	15





## 8. CAPACITY BUILDING

### 8.1 Training received (2013)

1. CAT B programme on Hydrographic Data processing and Marine Cartography including specialism Electronic Navigational Charts-UKHO : Two placement
2. Short course on Remote Sensing with Special Emphasis on Digital Image processing, Indian Institute of Remote Sensing, Dehradun, India -one Placement

### 8.2 Training needed

NHO identified requirement of urgent training opportunity for senior staff on following areas

1. CAT A on Bathymetry and Ocean Mapping – 02 Placement
2. Training on Bathymetric Data Derived from Satellite Technology
3. Multibeam Training on Job Training
4. ENC on the job training

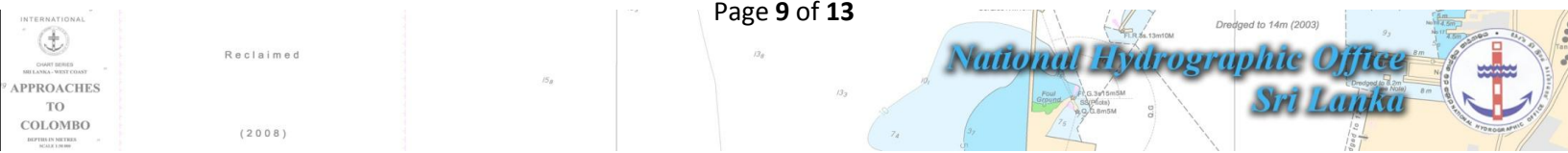
Also NHO interest for following training programme

1. Category B in hydrography
2. Digital Cartography

### 8.3 IHO Technical visit

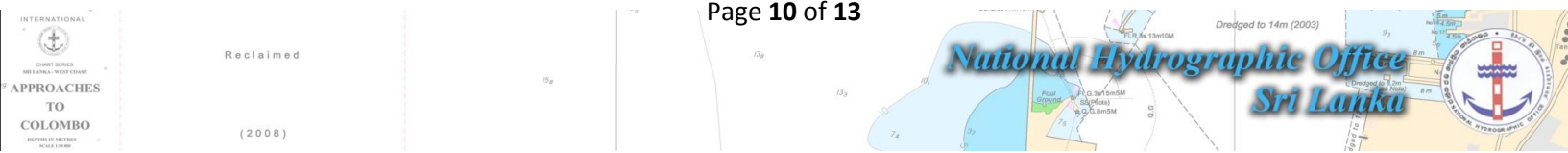
The IHO carried out technical evaluation to examine the state of Hydrography and Nautical Charting in Sri Lanka. It was conducted by Mr Bob WILSONn, SONUS International Hydrographic Consultancy Ltd, on behalf of the IHO during 6<sup>th</sup> and 10<sup>th</sup> January 2014

IHO identified requirement of urgent and efficient training which include experience on MBES system to gain value from NHO's considerable investment in Hydrography. As with the MBES situation effective staff training is required to achieve an indigenous ENC capability and thus full national autonomy in ENCs.



It is recommended that NARA consider the following actions:

- (1) To follow up on the agreements reached with the Secretary, Ministry of Fisheries and Aquatic Resources Development, the Director General of Merchant Shipping and Chairman NARA to establish formal links with NARA for SOLAS hydrographic issues.
- (2) That the NARA should offer the assistance of the Head of NHO in the Director General of Merchant Shipping's preparations for the IMO VIMSAS audit.
- (3) That the Director General of Merchant Shipping be invited on to the Board of NARA.
- (4) That the Director General of Merchant Shipping, or his representative, be invited to be a member of NARA's Scientific and Technical Committee.
- (5) That training be provided to the existing staff as a matter of priority particularly in view of the retirement of senior staff in the next few years.
- (6) That training for new recruits is allowed for in future budgets or plans.
- (7) That ways be found to maintain the senior staff in their present positions until at least the end of 2016 to allow the necessary staff training to be concluded and the NHO returned to a steady state.
- (8) It is recommended that, due to retirement dates, a new recruitment programme should be developed over the next few years to maintain staffing levels.
- (9) To request an established HO with good MBES experience to provide a two week in-country training and advisory visit as provided for Bangladesh.
- (10) The value of earth observations for bathymetry, modern coastline data, and environmental and coastal management purposes was discussed and it is recommended that NARA as a whole review this technology as a cost-effective, multifaceted data gathering programme valuable to all its divisions.
- (11) That an agreement is reached on the transfer of data from both SLPA and CFHC such that charts can be properly maintained.
- (12) To request that UKHO archive data is transferred to NHO as additional MSDI data.
- (13) To review an extension of 1:150,000 coverage of Sri Lanka
- (14) Notifying IHB of amendments to S11 page J23 and bring this to the attention of the NIOHC.



- (15) That under the agreement with UKHO NHO request in-country training in ENC's and ENC maintenance.
- (16) NHO to establish a national MSI system as a matter of priority.
- (17) NHO to request through the NIOHC for an MSI course in Colombo for Sri Lankan officers.
- (18) That NHO establish and MSI page on its website to carry MSI and Notices to Mariners.
- (19) That NHO review published charts for potential chart corrections and where corrections are required to withdraw them and replace with New Editions.
- (20) That as a matter of priority, NHO institute a chart correction system.

## 9. OCEANOGRAPHIC ACTIVITIES

### 9.1 Work done by the Oceanography Division/NARA in 2013

#### 9.1.1 Drifter deployment in the east coast of Sri Lanka

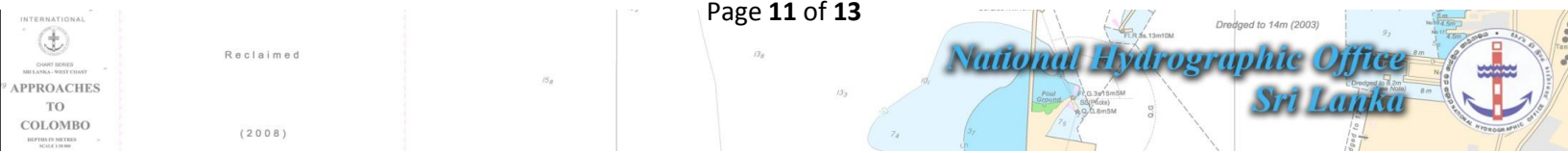
The oceanography division of NARA has conducted a survey on deployment of surface velocity drifters (SVP) during year 2013. The deployment program has jointly conducted with physical oceanographic research group in the Scripps Institute of Oceanography (SIO), University of California, USA. The objective of this program was to study surface current behaviour in the Bay of Bengal and associated waters using drifter trajectories. It mainly focused on Sri Lankan coastal currents during winter monsoon. The total numbers of fifteen SVP drifters were deployed and some extended their trajectories in to Arabian Sea

#### 9.1.2 Seaglider deployment in the East coast

During the year 2013, Seaglider was deployed in Olivil area in the east coast of Sri Lanka. The glider will measure salinity, temperature, Oxygen profile in the water column up to thousand meter water depth. The main objective of this deployment was to study Sri Lanka Dome which appears at the end of summer monsoon.

#### 9.1.3 Oceanographic Survey in the Bay of Bengal using M/V Roger Revelle

The joint Oceanographic survey was conducted by Sri Lanka, India and USA. There were three



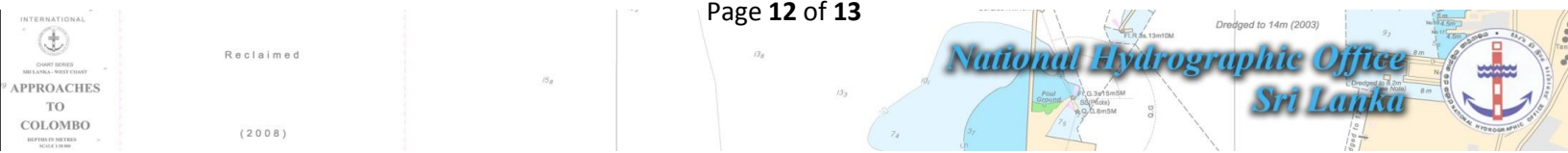
research cruises which included to the above study. The first cruise from November 10-27, second November 27 to December 13, and third from December 17-25 were conducted respectively. Almost 30 scientists were onboard in each cruise. The main objectives of these cruises were to study air sea interaction and its impact on monsoon break down as well as frontal dynamics in the Bay of Bengal. In addition, small scale turbulence and bathymetric data collection and acoustic current profiler data were collected as supplementary to main project. Ten scientists from NARA were jointly worked with US scientists during these cruises.

## 9.2 Tide Gauge Network

Currently three real time transmitting tide gauges covering west, south east and east coasts are operational in Sri Lanka, which are part of Indian Ocean Tsunami Early Warning System and GLOSS. Colombo station has equipped with 02 pressure sensors, 02 floating gauges and radar sensors. It measures sea level every 01 minute and transfers data every 15 minutes via Japanese Meteorological Satellite (JMA) and MeteoSat. Trincomalee and Kirinda Stations measure sea levels every 01 minute and transfer data every 15 minutes via MeteoSat. All three stations are equipped with pressure and radar sensors. Real time data are also in GTS. Plans are in place for further stations, starting with Battalangonduwa in the north-west of the island, which will be equipped with satellite transmission equipment for real-time monitoring as part of the Global Sea Level Observing System and Indian Ocean Tsunami Warning System.

## 10. CONCLUSION

The NHO is highly concentrating to survey near shore tsunami effected coastal areas. During last year, NHO was mostly engaged with coastal engineering and bathymetric surveys of western and southern coast. Most of these data are frequently used by coastal development institutions such as Coast Conservation Dept, Ceylon Fishery Harbours Corporation and Sri Lanka Ports Authority etc., this data will be used to produce near shore nautical charts too. According to the prevailing peaceful situation of North and Eastern regions of Sri Lanka, now NHO started new surveys of those areas which were neglected last three decades due to the war situation. The new research vessel is expected to deploy in North and Eastern regions of Sri Lanka and will be able



to give priority to acquire bathymetric data in those areas

The National Hydrographic Office has just started the ENC production with the use of Caris S 57 composer.

NHO has planed to implement MSI system with collaboration of other local institutes.

Presently NHO does not issue any NMs for local or international mariners. NHO expected to start web base NMs service and responsibility of issuing NMs will take over by NHO/NARA in near future

NHO has planed to derived shallow water bathymetry from Satellite Imagaries using Remote Sensing Technology

To strengthen the hydrographic service, the NHO is in need of further assistance in training on ENC and Multibeam surveying technique.