REPUBLIC OF CYPRUS

NATIONAL REPORT OF CYPRUS TO THE MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION (MBSHC)

MAY 2019

Table of Contents

1. Hydrographic Office / Service

In Cyprus the "hydrography stakeholders" are scattered across various departments of the government. In order to avoid duplication of work, to make full use of the existing infrastructure and for better coordination it was decided to establish a National Hydrographic Committee.

1.1 Cyprus National Hydrographic Committee

The Council of Ministers of the Republic of Cyprus with its decision number 513/7 established Cyprus National Hydrographic Committee (**CNHC**) which deals with all hydrographic matters in the country. The CNHC is composed by the representatives of the Ministry of Defence, Ministry of Foreign Affairs, and from the Departments of Lands and Surveys (**DLS**), Public Works, Geological Survey, Fisheries and Marine Research, Merchant Shipping and the Cyprus Ports Authority. The CNHC is chaired by the Director of DLS. On a later stage, the Cyprus Joint Rescue Coordination Centre, the Department of Environment, the Department of Antiquities and the Cyprus Police, joined the CNHC.

1.2 Hydrographic Office in Cyprus

The responsibilities of a typical Hydrographic Office are allocated to the Department of Lands and Surveys and the Cyprus Joint Rescue Coordination Centre.

1.2.1 Department of Lands and Surveys

Although CNHC made significant progress, it became clear that the cartographic contribution of DLS should be further strengthened. On 11/07/2014, the Law concerning the organisation and conduct of hydrographic activities and issuance of nautical charts, was voted for by the House of Representatives of the Republic of Cyprus.

The Department of Lands and Surveys, according to the legislation, is responsible to process and evaluate information and data of hydrography and nautical cartography for the purpose of:

(a) contributing to the safety of mariners;
(b) implementing, exploiting, promoting and developing sciences related to hydrography and marine cartography.

The Director of DLS is the Hydrographer of Cyprus. The DLS has a Hydrographic Unit which deals with all aspects of Hydrography and Nautical Cartography. The Hydrographic Unit operates under the supervision of the Geodesy-Hydrography-Photogrammetry Branch. The DLS represents the Republic of Cyprus to the International Hydrographic Organisation and its subordinate organs.

In the Hydrographic Unit of DLS, 5 employees are appointed. DLS is a department with extensive knowledge and experience in land surveying, cartography, photogrammetry, GIS, geodesy, etc. Since 2006 DLS has been investing in knowledge of hydrography and nautical cartography.

DLS has bilateral agreements with the Hellenic Navy Hydrographic Service (Memorandum of Understanding) and the United Kingdom Hydrographic Office (Exchange of Letters).

In February 2019, the Hellenic Navy Hydrographic Service visited DLS after a formal invitation. During the official visit aspects of common interest were discussed. No other official or technical visits occurred

from neither IHO officials nor other HOs. Finally, the DLS represents Cyprus at the IHO Council, and took part at the meetings of the Council.

Figure 1: Director of DLS Mr. An. Sokratous with the Director of HNHS Cdr D. Evangelidis (from the left to the right)

1.2.2 Cyprus Joint Rescue Coordination Centre

The CYPRUS RADIO is the coastal station of the Republic of Cyprus and it is under the command of the JRCC LARNACA. Cyprus Radio is the responsible authority for broadcasting Maritime safety information services within its service area.

2. Surveys

2.1 General information

Waters of the Republic of Cyprus from 0-200 m have been adequately covered with various surveys conducted until 1960. With the establishment of CNHC, a resurvey program was defined, which started implementation in 2012. Three Hydrographic Surveys have been conducted:

- 2012 with MBES
- 2014 with LiDAR
- 2018 with MBES

Data retrieved are S-44 compliant. So far, all coastal areas controlled by the Republic of Cyprus, from 0 – 280 m depth, have been resurveyed.

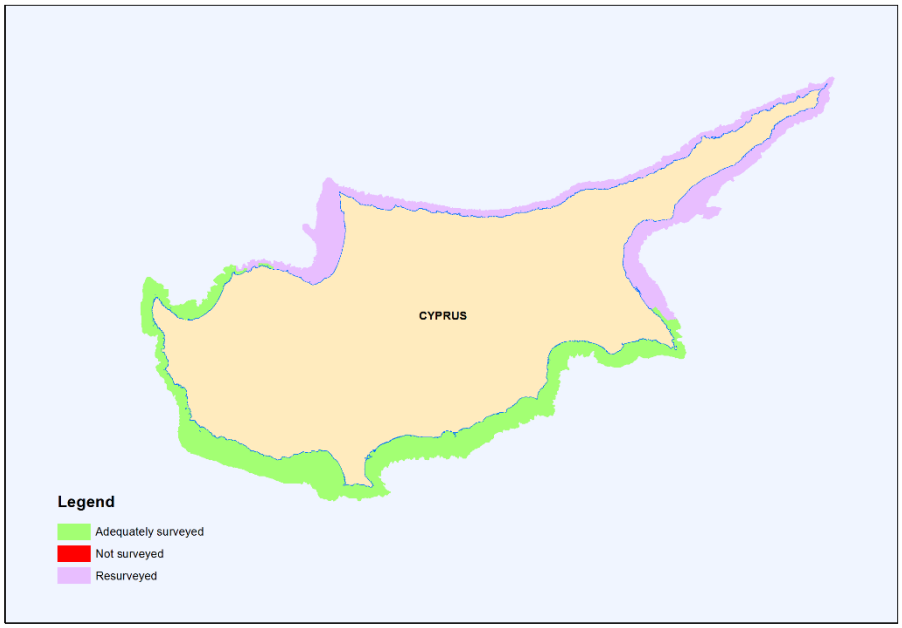

Figure 2: Areas surveyed from 0-200m depth

Waters beyond 200 m depth have not been adequately surveyed. DLS collects data from various activities carried out in the Exclusive Economic Zone of the Republic of Cyprus.

2.2 Coverage of new surveys / Future plans

The DLS in cooperation with the Department of Fisheries and Marine Research have conducted a hydrographic survey (order 1a) to cover waters from 50m – 200m depth, started in September 2018 and finished in April 2019. The project, called BYTHOS, was funded by the European Maritime and Fisheries Fund and National Funds.

The DLS is participating in a project named THAL-CHOR 2 which is part of the Interreg V-A Greece Cyprus 2014-2020 program. One of the deliverables is Satellite Derived Bathymetry for the northern part of the island, which is not accessible due to the continuing illegal, military occupation of 36,2% of Cyprus' territory by Turkey.

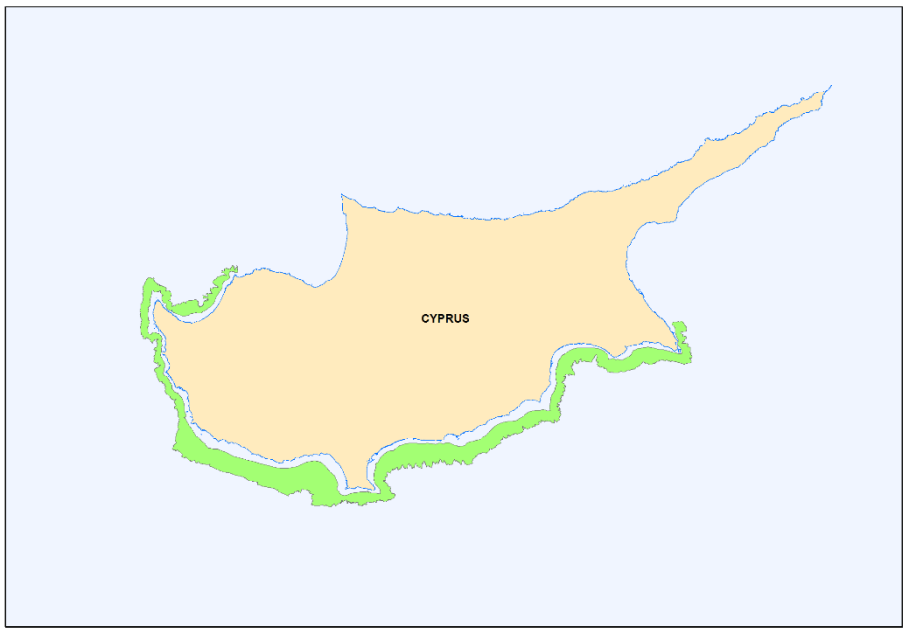

Figure 3: BYTHOS Coverage (approximately from 50-280 m depth)

2.3 New technologies and /or equipment

Part of the aforementioned project THAL- CHOR 2 is the supply of a multibeam echosounder (MBES). The MBES will be suitable to survey waters up to 400 m depth. The DLS will launch the procurement in the following months. The system is anticipated to be operationally available in the second semester of 2020.

2.4 New Ships

The Department of Fisheries and Marine Research has decided to support DLS through providing a vessel for the MBES to be installed on.

2.5 Problems encountered

Lack of an established vertical datum to support hydrographic activities. The existing Vertical Reference System was established in 1930 using limited extent of sea level data deemed not suitable for hydrographic purposes. A new Vertical Reference System is under development which shall be connected directly to sea level, objective of one of the deliverables of the aforementioned project THAL-CHOR 2.

3. New charts & updates

3.1 ENCs

For the time being Cyprus does not produce ENCs. The Republic of Cyprus has authorised the UKHO to produce on its behalf ENCs (11 cells) and other nautical publications that cover the maritime zones of Cyprus. Any other ENCs produced by a third party, in relation to the maritime zones of the island, and, in

particular, the ENCs produced by Turkey in relation to the maritime zones of Cyprus, north of the island, are being produced without the consent of the Republic of Cyprus, thus, illegally, and may not, therefore, be deemed as official.

DLS considers the option to undertake the production and maintenance of ENCs in the future.

3.2 ENC Distribution method

Nothing to report.

3.3 RNCs

Nothing to report.

3.4 INT charts

Nothing to report.

3.5 National paper charts

Chart DLS 1001 has been produced and it is only for intergovernmental use.

3.6 Other charts, e.g. for pleasure craft

Various coastal maps were prepared for use by government departments, members of the CNHC. These include maps showing Maritime Zones, maps for prevention of coastal erosion, maps for coastal management etc.

3.7 Problems encountered

Lack of an established vertical datum to support hydrographic activities (see paragraph 2.5)

4. New publications & updates

4.1 New Publications

An official publication was issued by the Cyprus Permanent Committee for the Standardization of Geographical Names, related to coastal sea names. It was a result of the collaboration of the Committee and the DLS. The publication was submitted officially by the Republic of Cyprus to the 11th Conference of the United Nations for the Standardization of the Geographical Names, which took place in New York in August 2017. The publication is available online through the following links:

http://geonoma.gov.cy/myfiles/ekdoseis/thalassia-toponymia/10/index.html (gazetteer)

http://portal.dls.moi.gov.cy/en-us/maps/Pages/default.aspx (charts)

One of the deliverables of project BYTHOS, was the survey of all lights and buoys of the island. The data is being processed and DLS shall prepare a relevant publication.

4.2 Updated publications

Nothing to report.

5. Maritime Safety Information (MSI)

5.1 Existing infrastructure for transmission

Cyprus Radio Coastal Station is providing Maritime Safety Information (**MSI**) within the area of Cyprus Search and Rescue Region which coincides with the Nicosia FIR. Cyprus Radio, currently is operating on the command of the Joint Rescue Coordination Centre in Larnaca.

Cyprus Radio collects and elaborates all the relevant navigational, meteorological and any other safety and urgent information and preparing NAVTEX bulletin accordingly, in order to ensure the safety of navigation within its area of responsibility.

Cyprus Radio has all the distress and safety communication facilities according to the GMDSS Master Plan and is operating on a 24/7 basis.

The NAVTEX transmissions are conducted according to the defined prototypes and procedures determined in the NAVTEX manual (IMO/IHO NAVTEX Manual). Cyprus Radio is broadcasting the MSI Warnings using the English language on frequency 518 KHz.

Year	NAVTEX Bulletins	NAVWARS	NAVAREA III Warnings	NAVMETEO	SARWARNS
2015	1012	245	9	767	8
2016	1136	374	15	762	7
2017	1210	474	35	736	9
2018	1212	465	130	747	5
2019 (until 15 Apr)	435	212	112	223	0

Figure 4: Cyprus Radio NAVTEX Service and Coverage Area

5.2 New infrastructure in accordance with GMDSS Master

Nothing to report

5.3 Problems encountered

Cyprus has been notified that other coastal stations in the region broadcast MSI warnings out of the prefixed timetable, affecting at that time the transmitting of MSI warnings on Cyprus Radio.

Specifically, on the 21st of October, from 15:43 LT until the 22nd of October 2018,08.00 LT, a station operating illegally in the occupied part of Cyprus, the so-called 'CYPRUS TURKISH RADIO', broadcasted without any authorization and interfered the transmission of the Cyprus Radio and as a subsequent, the NAVTEX services at the frequency of 518khz. Vessels sailing in the region of the Eastern Mediterranean were affected on the reception of safety information and meteorological data.

The above incident, after relative information sent to the IMO, a Note Verbale of the Republic of Cyprus to all the members states of the Organization were circulated by IMO (No.3921).

Another problem encountered is that Turkish Hydrographic Service is issuing navigational warnings, within the Republic of Cyprus Navtex Service area, which are overlapping pre - existing navigational warnings of the Cyprus Radio coastal station. Additionally, without taking into consideration the overlapping, the above-mentioned navigational warnings are also issue by NAVAREAIII coordinator. These actions are posing in danger the navigation in the area.

5.4 Research and development

JRCC Larnaca / Cyprus Radio aiming to enhanced the available maritime safety developed an interactive map accessible online which includes the navigational warnings in force within the service area of Cyprus Radio, updated on a daily basis (http://jrccmap.mod.gov.cy).

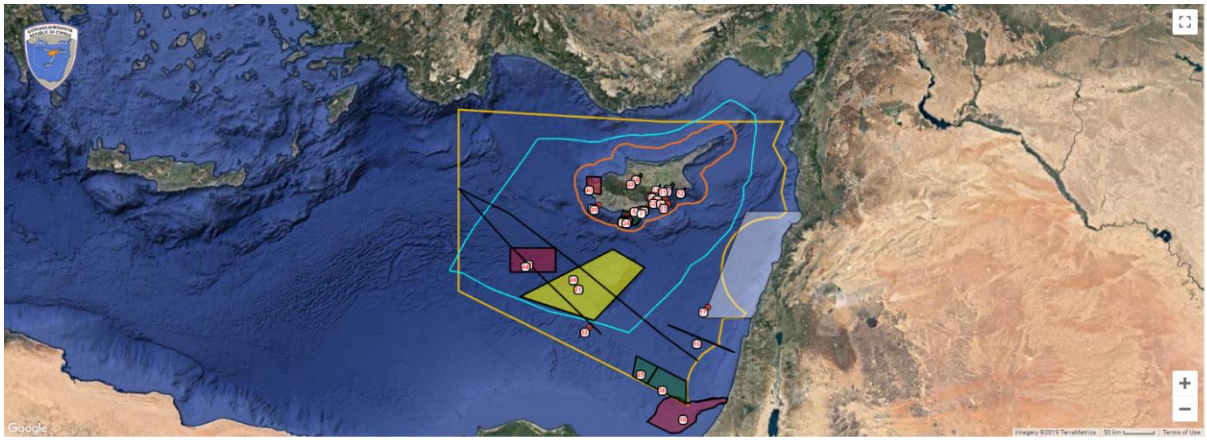

Figure 5: Navigational warnings in force

6. C-55

6.1 Latest update (Tables)

Last updates have been sent electronically through IHO online form.

7. Capacity Building

7.1 Offer of and/or demand for Capacity Building

7.1.1 Offer

At this stage it is not possible to offer a program to the Capacity Building.

7.1.2 Demands

DLS needs further knowledge and experience regarding Hydrography and Hydrographic Data Management, so support on these topics is substantial.

7.2 Training received, needed, offered

7.2.1 Training received

Cyprus during 2018 – 2019 has received the following training through the IHO Capacity Building:

A/A	Year	Title of Program / Project / Course
1	2018	Hydrographic survey program (FIG/IHO/ICA Category B) sponsored by the Republic of Korea
2	2018	Port and Shallow Water Survey Course (Updated 2018 CBWP, P-30)

8. Oceanographic activities

8.1 General

Oceanographic Activities are carried out by the Cyprus Oceanography Centre (**COC**). The data are shared amongst the members of the CNHC.

8.2 Cruises / Observational Programs

Usually, an annual cruise is planned in the Cyprus EEZ to measure water properties like temperature, salinity, dissolved oxygen, nutrients, etc. During 2017 and 2018, due to lack of funding, no cruises took place.

The Oceanography website http://www.ucy.ac.cy/oceanography/en/ maintains predictions regarding waves and currents corrected by merging with glider data which derived by CINEL.

8.3 GEBCO/IBC's activities

Nothing to report

8.4 Tide gauge network

The DLS in an effort to replace the old inoperative tide gauge network, established a new network, named PYTHEAS, to support not only the tsunami warning system, but also the establishment of a Vertical Reference System to suit all hydrographic activities. For the completion of this project, three main stakeholders are collaborating: the DLS which has the overall responsibility of implementation, the Cyprus University of Technology (**CUT**) and the COC. PYTHEAS is fully operational and consists of 5 stations (Paralimni, Larnaka, Lemesos, Pafos and Pomos), of which four belong to the DLS and one belongs to the CUT. The stations are positioned approximately 40 Km apart.

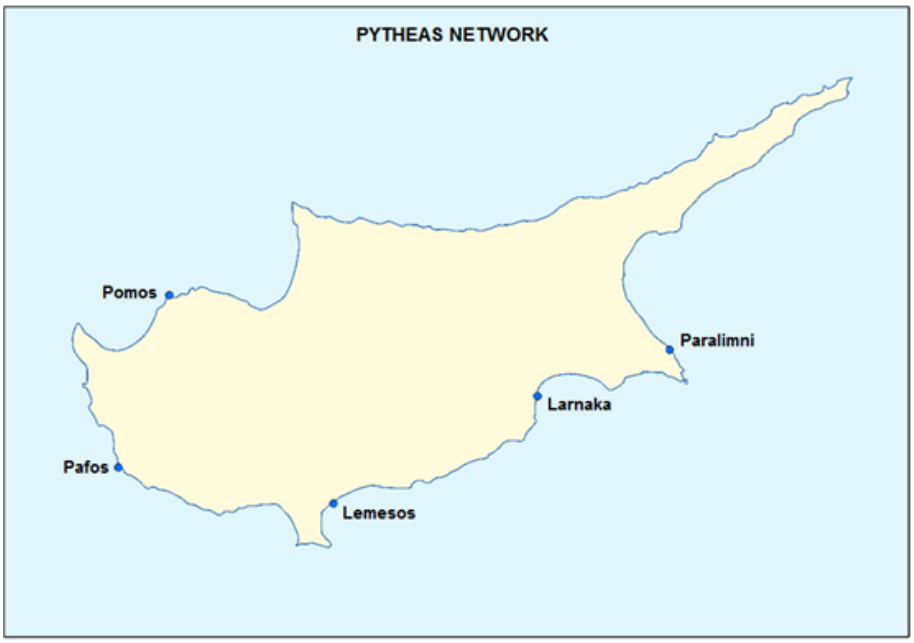

Figure 6: PYTHEAS network locations

8.5 New equipment

The five stations of PYTHEAS are equipped with:

1. Sea Level sensor
2. Sea water temperature
3. Meteorological sensor that acquires the following data: wind direction, wind speed, air temperature, relative humidity, barometric pressure.

In the following table the units of measurement and the frequency of data acquisition is presented:

Element	Units	Frequency
Sea Level	m	1 measurement / min
Water Temperature	°C	1 measurement / 15 min
Wind Direction	°(deg)	1 measurement / 10 min
Wind Speed	m/sec	1 measurement / 10 min
Air Temperature	°C	1 measurement / 10 min
Relative Humidity	%	1 measurement / 10 min
Barometric Pressure	hPa	1 measurement / 10 min

The CUT has updated the original tide gauge configuration in Lemesos by adding a GPS/GNSS permanent reference station, a water temperature sensor, and two specifically designed stainless steel support bars to enhance monumentation stability (see Fig. 1) and, therefore, position reliability.

GNSS receivers shall be added to the rest of stations of PYTHEAS as part of a deliverable of THAL-CHOR 2 project. This action shall be completed until the end of 2019.

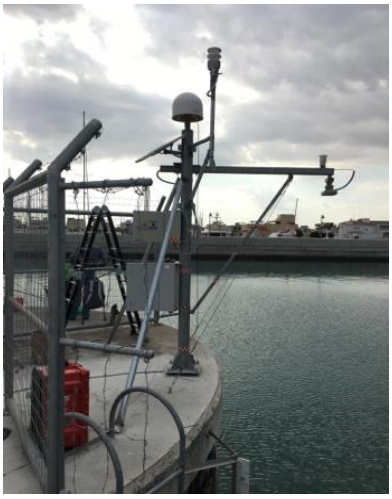

Figure 7: PYTHEAS network station in Lemesos

8.6 Problems Encountered

Due to lack of funding, the usual cruise taking place since 1995 by COC (originally supported by government budget) was discontinued in 2013 and has not yet been restored.

9. Other Activities

9.1 Participation in IHO Working Groups

No participation in IHO working groups.

9.2 Meteorological data collection

The Sea Area forecasts provided by Larnaka Forecasting Office covers the sea region around the island and 8 Km seawards. All forecasts issued consist of a concise statement of the expected wind and sea state conditions at a certain area during the forecasting period.

The weather forecasts for NAVTEX service provided by Larnaka Forecasting Office cover the sea region in four NAVTEX areas, namely SOUTHEAST KRITIKO, DELTA, CRUSADE and TAURUS (shown below) which are registered in WMO No 9 Volume D, ("Information for shipping"). Warnings are also issued for the aforementioned areas, if and when necessary.

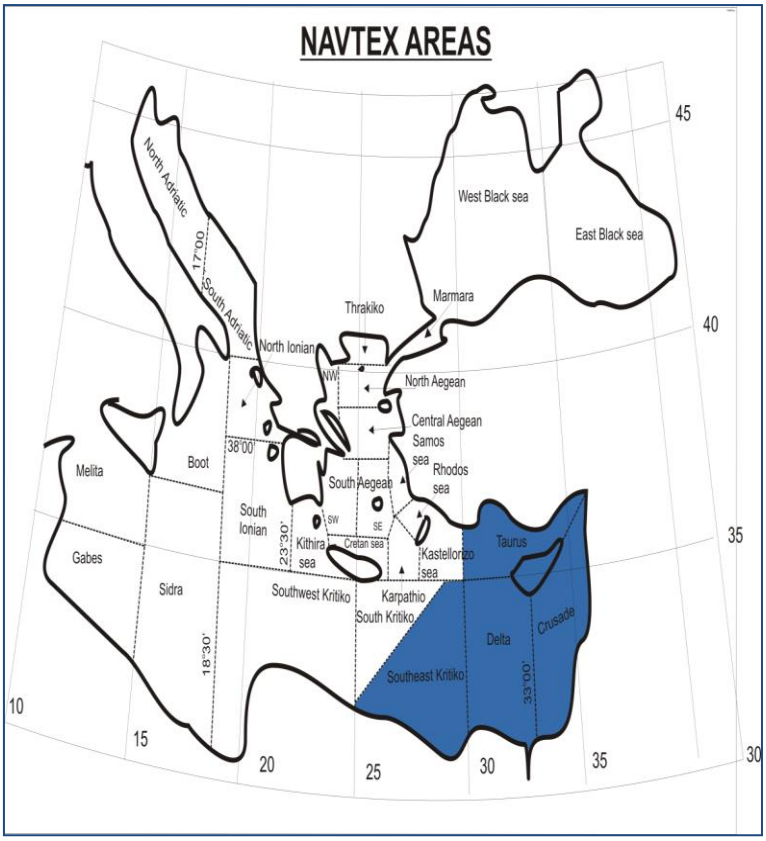

Figure 8: Larnaka Forecasting coverage

The NAVTEX reports (including warnings) are sent to Cyprus Radio by email for further dissemination. They are also uploaded to the WMO Website http://weather.gmdss.org/ **,** through the Aeronautical Fixed Telecommunication Network (AFTN), and to the Department of Meteorology website. Marine Gale Warnings must be sent via AFTN independent of NAVTEX forecasts and even if their time of issue is identical.

9.3 Geospatial studies

The Cyprus University of Technology Laboratory of Geodesy (**CUT)** has received a 1M EUR grant by the European Union Regional Fund and the Republic of Cyprus to establish a Strategic Research Infrastructure Unit, abbreviated CyCLOPS, to monitor geohazards in Cyprus and the South-eastern Mediterranean region. Specifically, a network of co-located IGS-compliant GPS/GNSS permanent reference stations, weather stations, tiltmeters and novel InSAR Corner Reflectors is about to be deployed throughout Cyprus to enhance preparedness and prevention. The initial focus will be shed on earthquakes and landslides. Furthermore, CyCLOPS will augment the National GPS/GNSS Permanent Station network (CYPOS), which is operated by DLS. Consequently, the interstation distances will be shortened, and the accuracy and reliability of the provided services will be enhanced. CyCLOPS will also provide the backbone for the definition of a new, modernized National Coordinate Reference System. Furthermore, the cooperation of CyCLOPS and PYTHEAS will assist in geoid determination tasks for the area of Cyprus and the definition of the new National vertical datum.

9.4 Disaster prevention

The Council of Ministers of the Republic of Cyprus, with its decision number 1795/2018 (09/10/2018), modified the composition of the Cyprus National Committee – Tsunami Warning System (CNCTWS) as follows:

- The representative of the Oceanographic Center of the University of Cyprus was named as observer
- The representative of the Department of Lands and Survey was named as member.

The mandate of the Committee remains the same, namely:

- Represent the Republic of Cyprus at the NEAMTWS of IOC
- Exchange of seismic and geophysical data and cooperate with Tsunami Service Providers within the framework of bilateral agreements.
- Prepare action plan for the response to a tsunami, evaluate existing action plans

This committee is chaired by the Geological Survey Department and operates under the supervision of the Minister of Agriculture, Rural Development and Environment. The CNCTWS has defined so far the focal points for the various working groups that operate under NEAMTWS. Furthermore, the CNCTWS has submitted locations from Cyprus coast as tsunami forecast points for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS). In addition, the CNCTWS has subscribed to tsunami alert services from the following accredited Tsunami Service Providers (TSPs):

- NOA (Institute of Geodynamics, National Observatory of Athens, Greece),
- INGV (Istituto Nazionale di Geofisica e Vulcanologia, Italy), and
- KOERI (Kandilli Observatory and Earthquake Research Institute, Turkey)

In December 2017, one IDSL device (Inexpensive Device for Sea Level Measurement) was installed in Zygi Marina by the Oceanography Center, University of Cyprus, in the frame of the initiative between JRC and UNESCO for the installation of a series of mareographs in the NEAMTWS area (North East Atlantic and Mediterranean Tsunami Warning System). The exact location of the instrument is Lat/Lon 34.726315 / 33.340228. The data of the IDSL device are available at:

https://webcritech.jrc.ec.europa.eu/TAD_server/Device/130

Figure 9: IDSL device in Zygi Marina

9.5 Environmental protection

The Republic of Cyprus on February 2019 has approved a new national contingency action plan for oil pollution combat, which will be published shortly on DFMR's website. Moreover, after the trilateral agreement signed on May 2018 between Cyprus, Greece and Israel, Cyprus has proceeded with preparation of sub-regional contingency plan for oil pollution combat involving the above countries with REMPEC's guidance and assistance.

When an oil spill occurs, the Department of Fisheries and Marine Research (DFMR) takes action with Republic of Cyprus means. If the scale of the problem is not manageable, then DFMR collaborates with the Deputy Ministry of Shipping, which in its turn contacts EMSA through CECIS program of Civil Defence. At the same time, REMPEC is also notified to take their own actions and any other needed support.

The Republic of Cyprus is equipped with airborne and waterborne means to confront such incidents. DFMR conducts table top exercises and up to two operational exercises on field annually for NCP's testing and the signed agreements. The National Contingency Plan is available online through the following link:

http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/EFC47876B89A5BB5422583E500414E9E

The Department of Environment is responsible for the implementation of environmental legislation in Cyprus.

9.6 Astronomical observations

Nothing to report

9.7 Magnetic/Gravity surveys

Nothing to report

9.8 MSDI Progress

The Department of Lands and Surveys continues the development of the National Land and Hydrographic Data Base. Various online services, including data downloading services, are available in DLS-Portal (http://portal.dls.moi.gov.cy).

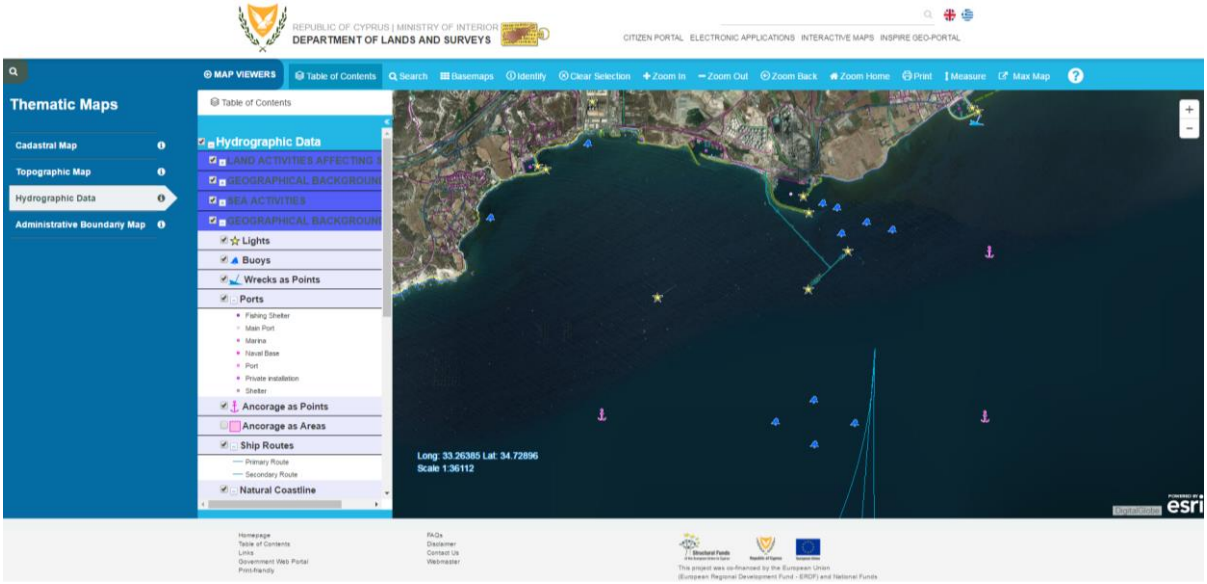

Figure 10: DLS Portal

9.9 Legislation and other related activities

List of Laws and Regulations of the Republic of Cyprus in relation to its maritime zones (non exhaustive)::

- The United Nations Convention on the Law of the Sea (Ratification) Law of 1988 (No. 203 of 1988)

Territorial Sea:

- Territorial Sea Law (N. 45 of 1964), as amended in 2014
- Law concerning the regulation of innocent passage through the territorial waters (28(I)/2011)

Contiguous Zone:

- Law to provide for the proclamation of the Contiguous Zone (63(I)/2004)

Exclusive Economic Zone and Continental Shelf:

- Exclusive Economic Zone and Continental Shelf Law (64(I)/2004), as amended in 2014

Regulations issued in accordance with the Law 64(I)/2004:

- Marine Scientific Research Regulations of 2014
- Submarine Cables Regulations of 2014
- Submarine Pipelines Regulations of 2014

Regulations still in force, issued in accordance with the abolished Law on Continental Shelf of 1974:

- Safety Zones Regulations of 2013

Other laws applying in the maritime areas

- Organisation and Execution of Hydrographic Activities and Publication of Nautical Charts Law of 2014 (N.96(I)/2014)
- Geological Surveys Law of 2013 (N.140(I)/2013)

- Antiquities Law, Cap. 31 (as amended in 2014)
- Maritime Spatial Planning Law of 2017 (N. 144(I)/2017)
- other European Union legislative acts

A strategic action plan was prepared as part of the National Integrated Maritime Policy.

Finally, there is a National Working Group (WG) responsible for the Integrated Coastal Zone Management (ICZM) chaired by the Department of Environment.

10. Conclusions

Cyprus is heading towards Blue Growth and this can be achieved through investment in the development of Hydrographic Services, promoting safety of navigation. The CNHC has established a mechanism to further develop hydrography in Cyprus. Through collaboration it was managed to acquire data extending to 200 m depth and complete the resurvey program.

All data retrieved by members of CNHC is collected, stored and maintained by the DLS, thus creating the appropriate conditions to take on a substantial and active cartographic role. Throughout the work cycle issues emerge, which are acknowledged, thoroughly considered and efforts are made for their resolution.

DLS has been collaborating, not only with other governmental departments, but also with different countries and organisations. These actions are significant to exchange experience and knowledge. Capacity Buildings funds offer means for further development.