Charting & Re-scheming – Building Capacity in Nigerian Waters

Lt UK EREGE

Nigerian Navy

BACKGROUND

- In July 2017, Visit by the Hydrographer of the Nigerian Navy, Commodore Okafor, to NOAA's Marine Chart Division (MCD). NOAA was willing to provide its cartographic expertise to support Nigerian Navy's building capacity effort to establish an independent cartographic unit in Nigeria.
- Key steps in collaboration between the two groups included:
  - Train a Nigerian Officer in the U.S. through the CAT-B in Cartography program and through production work.
  - Produce Nigerian ENCs in the U.S.
  - Produce and maintain ENCs in Nigeria
  - Chart updates in Nigeria
  - Train more cartographers in Nigeria
  - Make Nigerian ENCs available to mariners and other marine uses

BACKGROUND (cont'd)

Constitutional Mandate;

- Nigerian Navy Ordinance of 1 Aug 56 conferred hydrographic surveying functions of Nigerian waters on the Nigerian Navy (NN).
- Section 217 of the 1999 Constitution (as amended)and the Armed Forces Act Cap A20.

The Nigerian Navy Hydrographic Department (NNHD) as the coordinating centre of all hydrographic surveys in Nigeria has as some of its functions;

- Conducting hydrographic surveys.
- Charts productions.
- Dissemination of Maritime Safety Information within Nigeria's Maritime domain.

Source:; www.allposters.com

OVERVIEW – Geographic settings

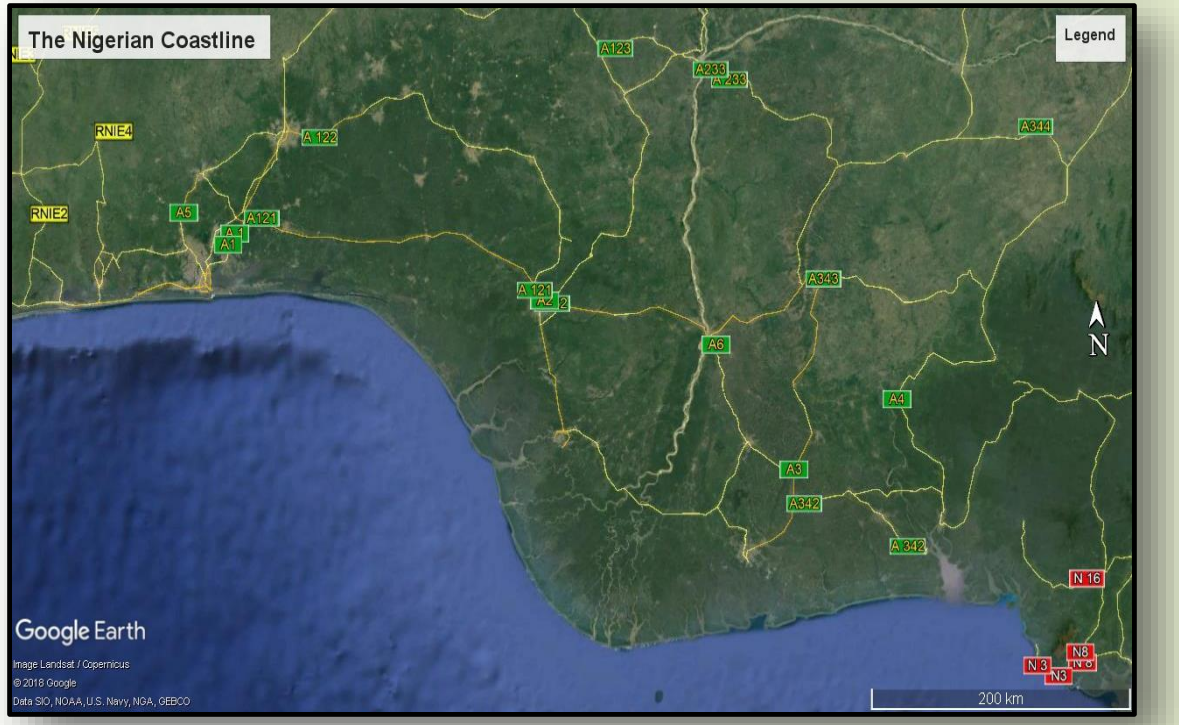
Source: Google

Location

- West Africa

Population

- 186 million



Source: Google Earth

- ❑ Nigerian coastline spans around 853km
- ❑ Over 8000km of Inland Waterways

MOTIVATION –
Building Charting Capacity

- Need for Nigeria to begin chart production. This an opportunity for developing a standardized, seamless ENCs, RNCs & Paper Chart suite for Nigeria.
- Critical charting sources and hydrographic data to be resident in NNHO instead of the UKHO.
- Nigeria to become a major player in cartography and hydrography for West Africa and a significant IHO and ICA member for the African Continent.
- Ability for NNHO to become a subject matter expert in ocean mapping and provide internationally recognized hydrography and cartography courses.

PRESENT CHART SCALE RANGES FOR VARIOUS HYDROGRAPHIC OFFICES

Navigational Purpose	Code	IHO Recommended Scale Ranges
Berthing	6	<1:4,000
Harbor	5	1:4,001 – 1:21,999
Approach	4	1:22,000 – 1:89,999
Coastal	3	1:90,000 – 1:349,999
General	2	1:350,000 – 1:1,499,999
Overview	1	>1:1,500,000

Most suitable for Nigeria

	Scale
Usage Band 6	• 3,125
Usage Band 5	• 6,250 • 12,500
Usage Band 4	• 25,000 • 50,000
Usage Band 3	• 100,000 • 200,000
Usage Band 2	• 400,000 • 800,000
Usage Band 1	• 1,600,000 • 3,200,000

PRESENT CHART COVERAGE FOR NIGERIAN WATERS (UKHO)

Cell Title

- Abidjan to Cotonou
- Africa - Nigeria - Approaches to Lagos
- Africa - West Coast - Nigeria - Approaches to Bonny River
- Africa - West Coast - Nigeria - Chanomi Creek and Warri
- Africa - West Coast - Nigeria - Forcados Oil Terminal to Lagos
- Africa - West Coast - Nigeria - Niger Delta - Port of Warri
- Africa - West Coast - Nigeria - Ports of Forcados and Burutu
- Africa - West Coast - Nigeria - Warri River - Warri to Aladja
- Atlantic Ocean - Ascension Island and Freetown to Luanda
- Calabar to Campo - Isla de Bioko
- Ghana - Togo - Benin and Nigeria - Cape Saint Paul to Cotonou
- Lagos Harbour
- Lagos to Gamba
- Nigeria - Bonny River - Bakana Point to Port Harcourt
- Nigeria - Bonny River - Field Point to Ford Point
- Nigeria - Bonny River - Ford Point to Bakana Point
- Nigeria - Entrances to Escravos and Forcados Rivers
- Pennington River to Opobo River
- Port Harcourt

CURRENT SCALE BANDS (USAGE BANDS)

SCALE	USAGE_BAND	CELL_TITLE
3500000	Overview	Atlantic Ocean - Ascension Island and Freetown to Luanda
700000	General	Abidjan to Cotonou
4000	Berthing	Port Harcourt
8000	Harbour	Africa - West Coast - Nigeria - Niger Delta - Port of Warri
8000	Harbour	Africa - West Coast - Nigeria - Ports of Forcados and Burutu
12000	Harbour	Africa - West Coast - Nigeria - Warri River - Warri to Aladja
12000	Harbour	Nigeria - Bonny River - Bakana Point to Port Harcourt
12000	Harbour	Lagos Harbour
22000	Approach	Africa - West Coast - Nigeria - Chanomi Creek and Warri
22000	Approach	Nigeria - Bonny River - Ford Point to Bakana Point
22000	Approach	Nigeria - Bonny River - Field Point to Ford Point
45000	Approach	Africa - West Coast - Nigeria - Approaches to Bonny River
90000	Coastal	Nigeria - Entrances to Escravos and Forcados Rivers
350000	Coastal	Pennington River to Opobo River
350000	Coastal	Africa - West Coast - Nigeria - Forcados Oil Terminal to Lagos
350000	Coastal	Ghana - Togo - Benin and Nigeria - Cape Saint Paul to Cotonou
45000	Coastal	Africa - Nigeria - Approaches to Lagos
350000	Coastal	Calabar to Campo - Isla de Bioko
700000	General	Lagos to Gamba

RADAR-range scales versus binary scales

	Present Scale	Proposed Scale	
Usage Band 5	1:8,000	1:6,250	Usage Band 5
	1:12,000	1:12,500	
Usage Band 4	1:22,000	1:25,000	Usage Band 4
	1:45,000	1:50,000	
Usage Band 3	1:90,000	1:100,000	Usage Band 3
Usage Band 2	1:350,000	1:200,000	

BENEFITS FOR ENC RE-SCHEMING

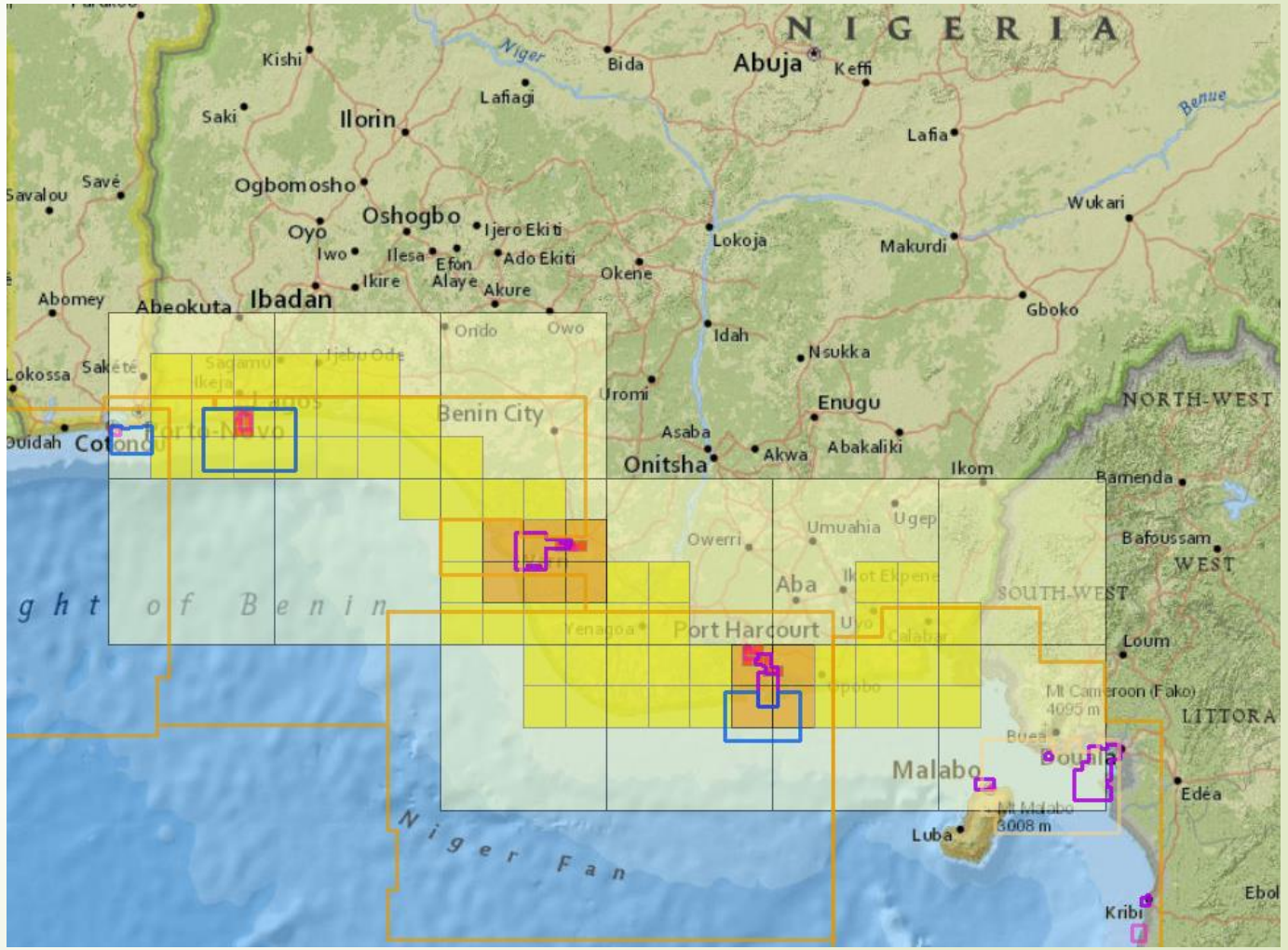
- Seamless gridded coverage
  - Reduced number of scales
- Grids can be easily segmented or extended
- Binary scales help simplify chart displays for mobile services, online services etc.
- Ease of generalization rules

PROPOSED RE-SCHEMING COVERAGE

Scale	Usage Band	No of Cells
1:12,500	5	16
1:25,000	4	10
1:50,000	4	58
1:200,000	3	13

The new re-scheme coverage proposed is based partly off the existing UKHO ENC cells.

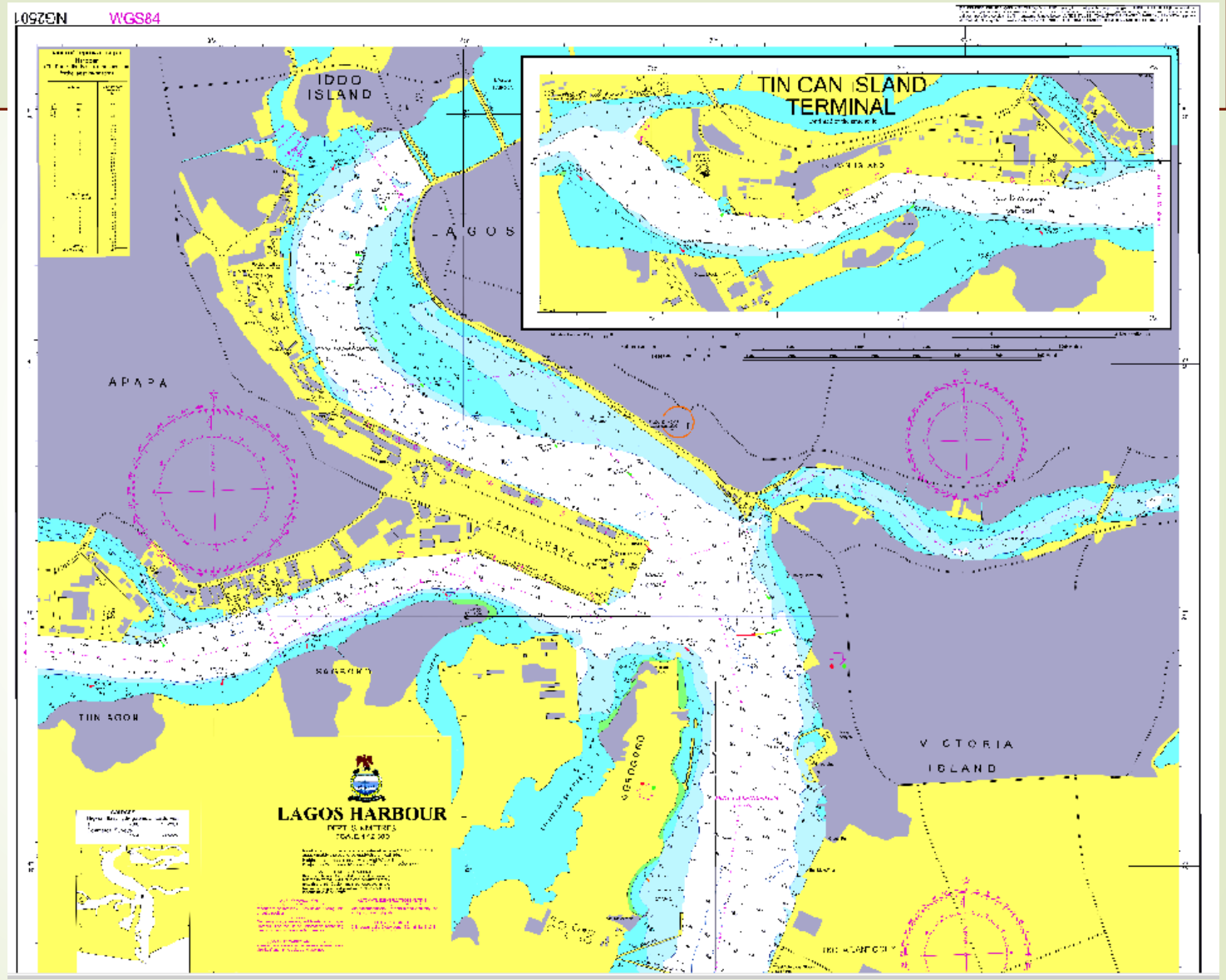
Additional cells for usage band 4 are proposed at 1:25k and 1:50k scales.



WHAT WAS ACHIEVED SO FAR

Paper Chart Production (NG2501)

First indigenous paper chart produced and certified by the Nigerian Navy Hydrographic Office



WHAT WAS ACHIEVED SO FAR….

IC-ENC CIRCULAR LETTER – No. 08 OF 2019

45th Member Nation - **NIGERIA**

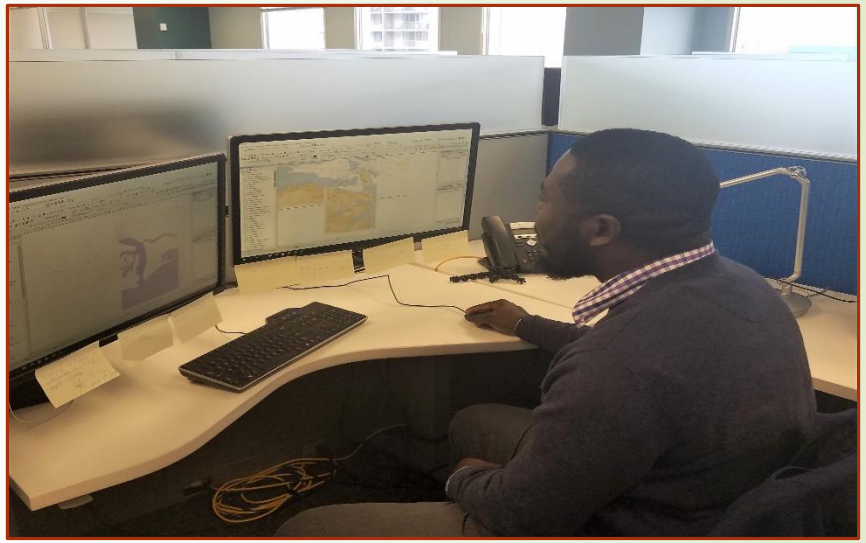
ic-enc.org
International Centre for ENCs

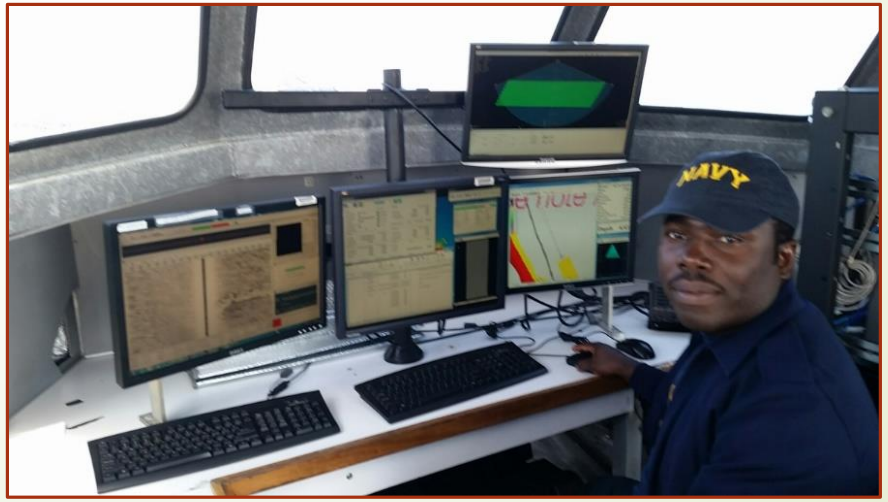
WHAT WAS ACHIEVED SO FAR….

Skillset & Technology development

Train a Nigerian Navy Officer in;

- CAT-B in Cartography
- Production work with MCD Product Branch





FUTURE ASPIRATIONS

- ENCs available before end of 2019 (Lagos & Port Harcourt).
- Educating colleagues back in NNHO (Train the Trainer).
- Development of inland ENCs over the intracoastal waterways of Nigeria.
- Possible collaboration with neighboring west African nations.
- High resolution Imagery & Lidar for Shoreline generation and updating.

Thank You for Listening