

IHO-ROK Technical Cooperation Project

INToGIS PROJECT II

Prepared by KHOA (Yong BAEK) for the WENDWG-9 meeting,
completed by IHO Secretariat



Background (1/2)

- **Purpose** of the INTToGIS Project

- Support **International Chart and ENC Scheme** of S-11
- Provide **systematic management procedures** and functionality
- **Share the digital data** among the IHO MSs and other parties with common data format such as EXL, SHP and GML (S-128)

- **History**

- INTToGIS Project I (2014 ~ 2015) : INT chart web-service and management via web system
- Operation started since early 2016
- INTToGIS Project II (2017 ~ 2018) : adding ENC schemes to the system and overlay information, and improve the GUI



Background (2/2)

- **Key features for the Project II**

- Base map for **Polar regions** (Arctic & Antarctic)
- **ENC scheme** management procedures (S-11 Part 1 Ed. 3.1.0)
- **Additional layers** for 500 world ports and AIS traffic density
- Set up **maintaining ENC catalogue** with IHO ENC catalogue data
- Improve the chart **display functions**
- **User Feedbacks** from HOs, regional coordinators (experimentation phase; late 2018), thanks to EAtHC&MBSHC (France), ARHC (Norway), BSHC (Finland)
- And other improvements



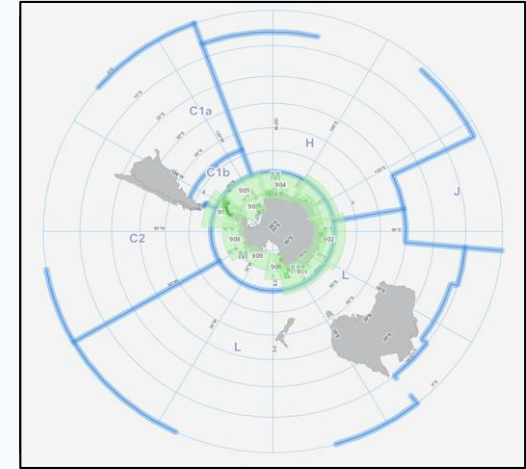
Improvement (1/9)

1. Base map of Polar region

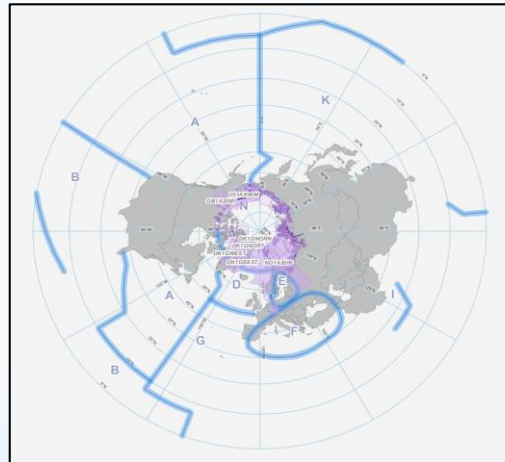
- Both INT Chart and ENC Scheme
- Apply to the management procedures
- Adding regional boundaries (feedback)



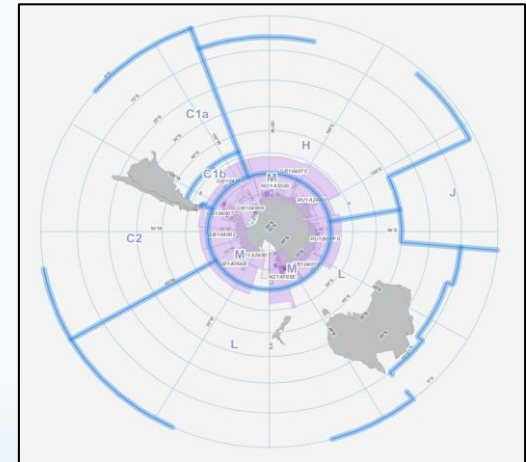
INT Chart Arctic



INT Chart Antarctic



ENC Scheme Arctic



ENC Scheme Antarctic



Improvement (2/9)

2. ENC Scheme Management procedure

- Management workflow
(HO → ICCWG → IHO Sec. → DB)
- Search options / Various Base Maps / Database for ENCs

The screenshot displays the IHO Web Manager interface. At the top, it says "IHO Web Manager" and "Supported by IHO". The main area shows a map with various ENC schemes overlaid in different colors (purple, blue, orange). A search panel is open on the left, showing "No. Title" and "117" results. Below the map, there is a table with columns for INT No, PanelID, INT Region, Region_Ver, INT Title, Producer, Nat.No., S_limit, N_limit, W_limit, E_limit, 1stEdYear, 1stEdWeek, NewEdYear, NewEdWeek, Status, Scale, ScaleLat, Print/Nation, PrintFormat, and Former.

INT No	PanelID	INT Region	Region_Ver	INT Title	Producer	Nat.No.	S_limit	N_limit	W_limit	E_limit	1stEdYear	1stEdWeek	NewEdYear	NewEdWeek	Status	Scale	ScaleLat	Print/Nation	PrintFormat	Former
506	MAIN	K	3.0.3 - Nov. 2017	Mariana Islands...	JP	W2004	1°50.00'S	20°0.00'N	14°0.00'E	17°30.00'E	1977		2008		Produced	3,500,000	22°30.00'N	DE FR GB(4306-11) US		
507	MAIN	K	3.0.3 - Nov. 2017	Philippine Isla...	JP	W2005	6°0.00'S	15°30.00'N	11°20.00'E	14°50.00'E	1983		2009		Produced	3,500,000	22°30.00'N	DE FR(1045-04) GB(4507-11) US		
508	MAIN	K	3.0.3 - Nov. 2017	South China Sea	JP	W2006	9°0.00'S	24°0.00'N	9°0.00'E	12°0.00'E	1977		2009		Produced	3,500,000	22°30.00'N	DE FR(8837-04) GB(4208-03) IN(750-03) KR MY US		
509	MAIN	K	3.0.3 - Nov. 2017	Western Portion...	JP	W10044	13°30.00'N	42°20.00'N	11°15.00'E	14°20.00'E	1974		2008		Produced	3,500,000	22°30.00'N	DE FR GB(4509-11) KR(W2509-04) IN		

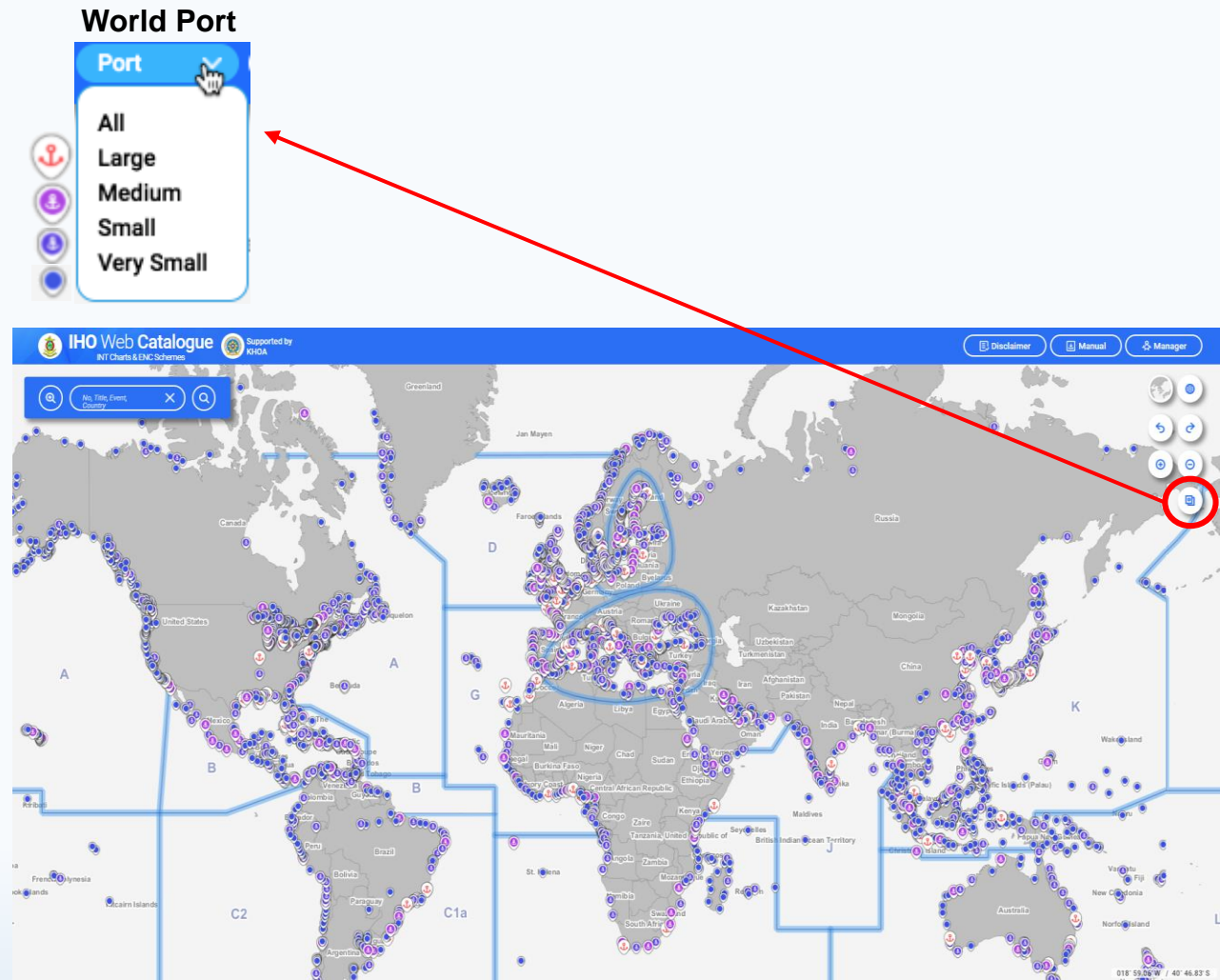


Improvement (3/9)

3. World Port layer

Size Code	Count	Harbor Size
L	159	Large
M	362	Medium
S	992	Small
V	2166	Very Small

Source from NGA



Improvement (4/9)

4. ENC scheme : Gap finder

- Comparison between ENC and INT Chart coverage as reference

Analysis button: Show analysis window

Gap Analysis Menu: Show detailed conditions for gap analysis

Step 1: Select an INT chart and ENC to be analyzed

Step 2: Select INT Region or country

Step 3: Select a scale

Step 4: Set tolerance (+ / -)

* Select a country

Step 2 - Select INT Region

Region Country

Continent J

Nation Select Please

BD x EG x

IHO Web Manager

Supported by KHQA

INT Charts & ENC Schemes

Analysis Summary

GAP Area 120,000km²

INT Charts Area 490,000km² ENC's Area 6,770,000km²

7005 - Jazirat et Tâ'ir to Bab el Mandeb
400,000 J 2001 GB Produced

7142 - Gulf of Aqaba
950,000 J 2011 GB Produced

7380 - Chagos Archipelago
360,000 J 2012 GB Produced

7425 - Malanča River to Saint Martin's Island
950,000 J 2001 BD Produced

Back Download



Improvement (5/9)

5. ENC scheme : Overlapping checker (inc. with adjacent charting regions)

Step 1 : Select Overlap Data
Source Data : ENCs

Step 2 : Select Area
Region Country

Step 3 - Select Scale band
Overview General Coastal Approach Harbour Berthing

Step 4 - Tolerance Setting
0 m

Analysis Summary
Overlap Area 20km²

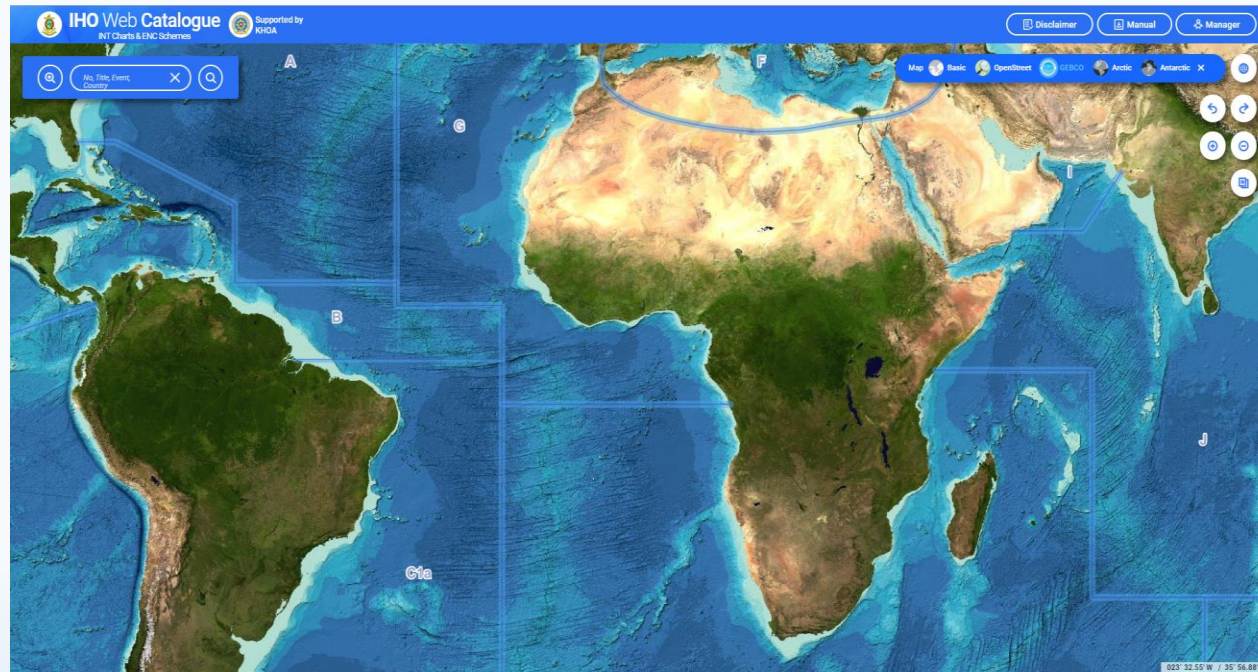
Chart ID	Chart Name	Scale	Year	Country	Status
KR2F4000	South Coast of Korea and Approaches	500,000	2015	Korea (Rep. of)	Produced
KR2F3000	Korea West Coast	500,000	2014	Korea (Rep. of)	Produced
KR2F2000	Korea East Coast	500,000	2015	Korea (Rep. of)	Produced



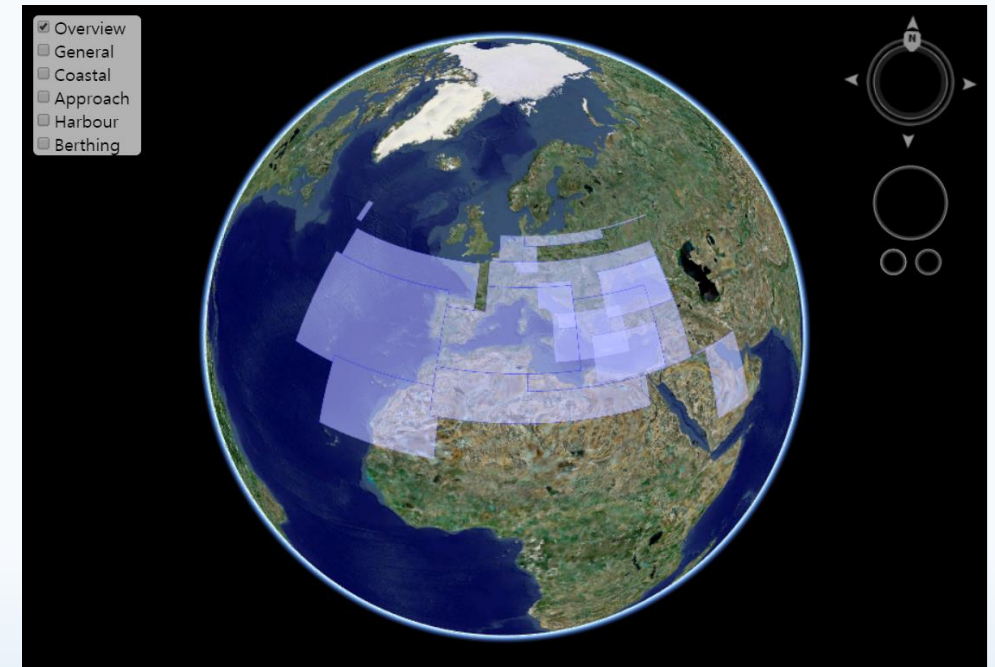
Improvement (6/9)

6. Other improvements

1) GEBCO Base Map



2) 3D Globe (will be removed)

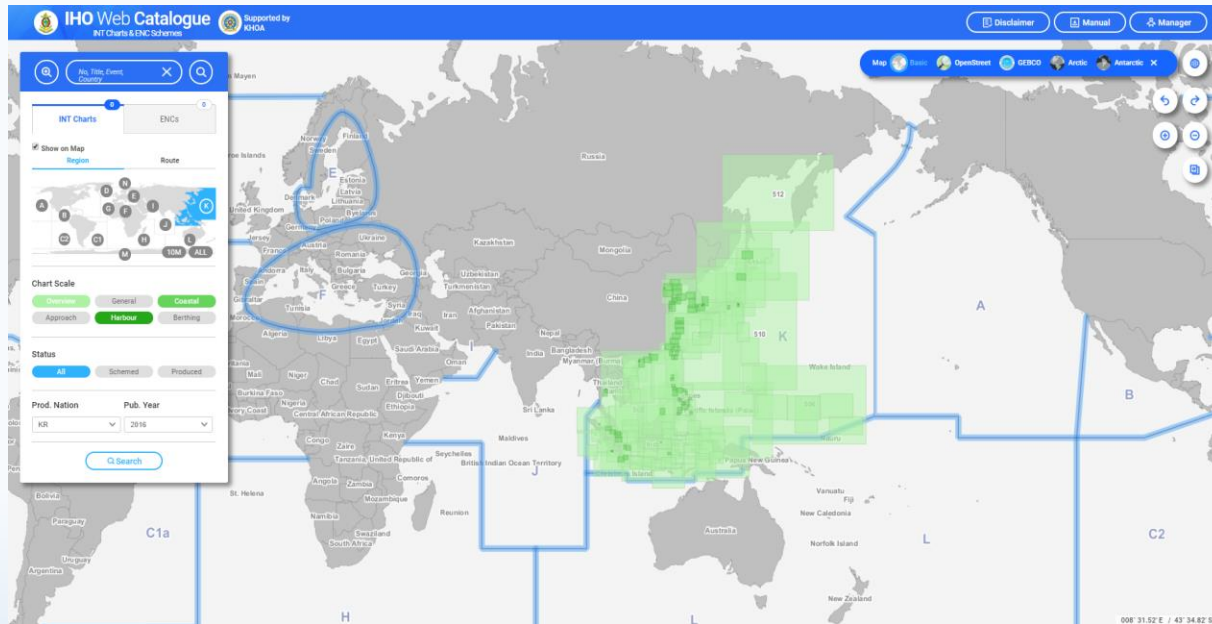


Improvement (7/9)

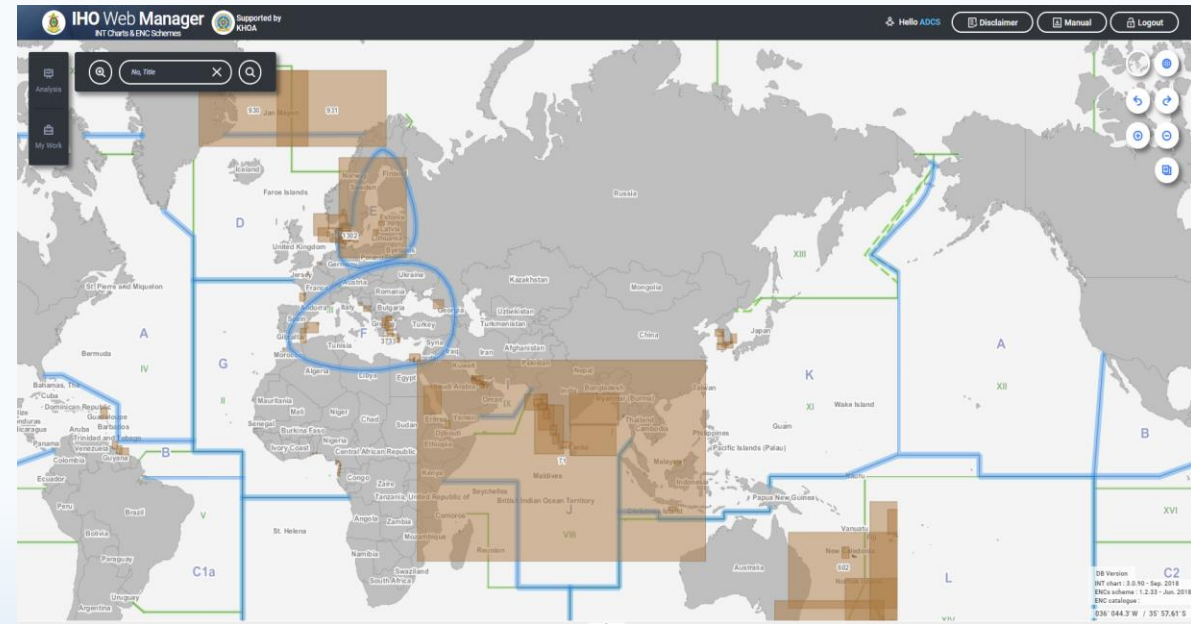
6. Other improvements

3) Renewal of INTOGIS interface

Web Catalogue



Web Manager



Improvement (8/9)

6. Other improvements

4) Additional layers

- AIS traffic density layer (on going)
- IHO meeting & event layer (removed)
- IHO member states layer (removed)
- CATZOC layer (improved with distinguishable colors)

d. Functions

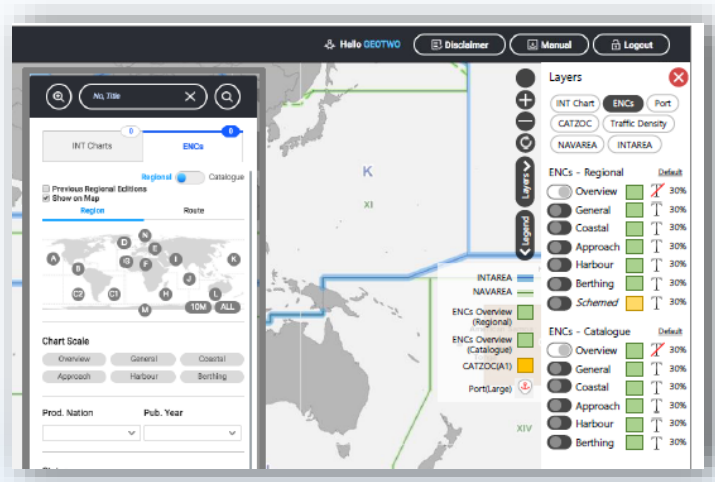
- Email notification
- S-128 applied
- Update contents ...



Improvement (8/9)

7. User feedbacks

- Total comments : 63
- Completed by Jan.2019 : 37
- Remaining items (26) : by April 2019



Require to Improve the GUI for the remain

Feedbacks from some Regional coordinators and HOs

Feedback Experimentation INToGIS II

See <http://119.198.137.98/chartBeta/iho/main.do>

(as of 17 Dec 2018) + Yves in blue + Yong with memo

1. ARHC – Region N – Edward Hands

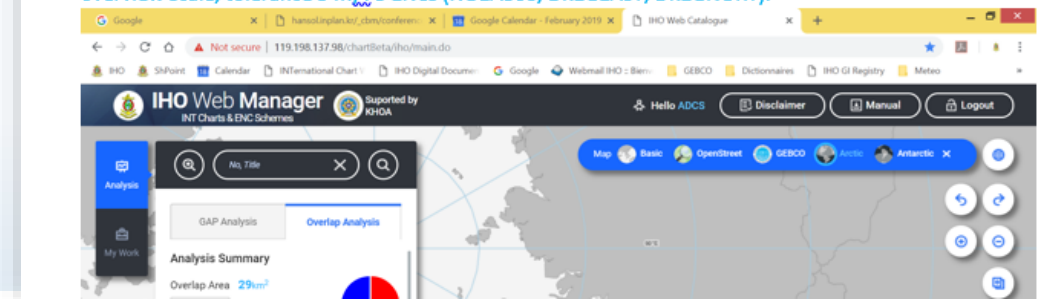
As Norway is the only country producing INT charts in Region N I have focussed on ENCs in my testing.

I have the following comments:

1.1 The inclusion of polar projections is very welcome and functions well. However I note that the INT area boundaries are not displayed when choosing arctic projection. This could be useful. I agree. same for Antarctic projection.

1.2 I think the overlap analysis will prove to be very useful. Is it such that overlaps between ENCs can be checked at the edit and submission stage so that changes can be amended to eliminate overlaps before ENC's are published? Yes, I believe so.

When the window "please add more search criteria provides more than 200 results" appear in the general user mode, little spelling mistake in the menu. Read: "Ignore", rather than "Ignore". When doing an Overlap Analysis, here are the results in such conditions (In, Region N, ENC overlap, overview scale, tolerance 5 m) : 3 ENCs (NO1A300, DK1GEAST, DK1GNORT).



INT Chart Coverage (General, Coastal, Approach) overlaid by ENC Coverage (General)

The screenshot displays the IHO Web Catalogue interface. The browser address bar shows the URL `119.198.137.98/chartBeta/iho/main.do`. The page header includes the IHO logo and the text "IHO Web Catalogue" and "Supported by KHOA".

The main interface features a search bar with the placeholder text "No, Title, Event, Country". Below the search bar are two tabs: "INT Charts" (active) and "ENCs". A "Show on Map" checkbox is checked. The "Region" filter is set to "H" (Indian Ocean), and the "Route" filter is set to "10M".

The "Chart Scale" section has buttons for "Overview", "General", "Coastal", "Approach", "Harbour", and "Berthing". The "Status" section has buttons for "All", "Schemed", and "Produced". The "Prod. Nation" and "Pub. Year" filters are set to "All" and "All" respectively.

The map shows the Indian Ocean region with overlaid chart coverage. The coverage is color-coded: light blue for INT Charts and green for ENC Coverage. The map includes labels for countries such as Angola, Zambia, Malawi, Mozambique, Zimbabwe, Namibia, Botswana, Swaziland, South Africa, Lesotho, Madagascar, Comoros, and Mayotte. Chart numbers are visible on the map, including GB200716, GB200717, GB200719, GB200759, GB200760, GB200780, GB200789, GB200799, GB200811, GB200812, GB200813, GB200814, GB200815, GB200816, GB200817, GB200818, GB200819, GB200820, GB200821, GB200822, GB200823, GB200824, GB200825, GB200826, GB200827, GB200828, GB200829, GB200830, GB200831, GB200832, GB200833, GB200834, GB200835, GB200836, GB200837, GB200838, GB200839, GB200840, GB200841, GB200842, GB200843, GB200844, GB200845, GB200846, GB200847, GB200848, GB200849, GB200850, GB200851, GB200852, GB200853, GB200854, GB200855, GB200856, GB200857, GB200858, GB200859, GB200860, GB200861, GB200862, GB200863, GB200864, GB200865, GB200866, GB200867, GB200868, GB200869, GB200870, GB200871, GB200872, GB200873, GB200874, GB200875, GB200876, GB200877, GB200878, GB200879, GB200880, GB200881, GB200882, GB200883, GB200884, GB200885, GB200886, GB200887, GB200888, GB200889, GB200890, GB200891, GB200892, GB200893, GB200894, GB200895, GB200896, GB200897, GB200898, GB200899, GB200900, GB200901, GB200902, GB200903, GB200904, GB200905, GB200906, GB200907, GB200908, GB200909, GB200910, GB200911, GB200912, GB200913, GB200914, GB200915, GB200916, GB200917, GB200918, GB200919, GB200920, GB200921, GB200922, GB200923, GB200924, GB200925, GB200926, GB200927, GB200928, GB200929, GB200930, GB200931, GB200932, GB200933, GB200934, GB200935, GB200936, GB200937, GB200938, GB200939, GB200940, GB200941, GB200942, GB200943, GB200944, GB200945, GB200946, GB200947, GB200948, GB200949, GB200950, GB200951, GB200952, GB200953, GB200954, GB200955, GB200956, GB200957, GB200958, GB200959, GB200960, GB200961, GB200962, GB200963, GB200964, GB200965, GB200966, GB200967, GB200968, GB200969, GB200970, GB200971, GB200972, GB200973, GB200974, GB200975, GB200976, GB200977, GB200978, GB200979, GB200980, GB200981, GB200982, GB200983, GB200984, GB200985, GB200986, GB200987, GB200988, GB200989, GB200990, GB200991, GB200992, GB200993, GB200994, GB200995, GB200996, GB200997, GB200998, GB200999, GB201000.

The "Layers" panel on the right shows the following options: "All", "Overview", "General", "Coastal", "Approach", "Harbour", and "Berthing". The "User Mode" label is located in the bottom right corner of the interface.



ENC Search Results (Harbour) overlaid by ENC Coverage (General) and Ports, GEBCO Base Map

The screenshot displays the IHO Web Catalogue interface. The browser address bar shows the URL `119.198.137.98/chartBeta/iho/main.do`. The page header includes the IHO logo, the text "IHO Web Catalogue" and "Supported by KHOA", and navigation buttons for "Disclaimer", "Manual", and "Manager".

The main interface features a search bar with the placeholder text "No, Title, Event, Country". Below the search bar is a filter panel with two tabs: "INT Charts" (set to 0) and "ENCs" (set to 40). The "ENCs" tab is active, displaying a list of search results:

ENC ID	Description	Scale	Status	Year	Region	Production Status
ZA200010	Orange River to Stompneuspunt	350,000	H	2018	ZA	Produced
ZA200020	Cape Columbine to Cape Infanta	350,000	H	2018	ZA	Produced
ZA200030	Cape Barracouta to Cape Padrone	350,000	H	2018	ZA	Produced
ZA200040	Great Fish Point to Cape Hermes	350,000	H	2018	ZA	Produced
ZA200050	South Sand Bluff to Ponta do Ouro	350,000	H	2018	ZA	Produced



The map area shows a satellite view of the southern coast of Africa. Overlaid on the map are several blue-outlined rectangular areas representing ENC coverage. A search result for "ENCs" is displayed in a dropdown menu, listing categories: "All", "Overview", "General", "Coastal", "Approach", "Harbour", and "Berthing". The "ENCs" category is currently selected. The map also shows "Port" and "INTAREA" layers. The coordinates at the bottom right of the map are `054° 35.53' E / 40° 21.11' S`. A red box in the bottom right corner of the map area contains the text "User Mode".



ENC Overlap Analysis: Port Victoria (Harbour)

IHO Manager Web Catalogue x +

← → ↻ 주의 요함 | 119.198.137.98/chartBeta/iho/main.do

 **IHO Web Manager**  Supported by KHOA
INT Charts & ENC Schemes

Hello ADCS [Disclaimer](#) [Manual](#) [Logout](#)


Analysis
My Work

Analysis Summary

GAP Analysis **Overlap Analysis**

Overlap Area **1,258km²**

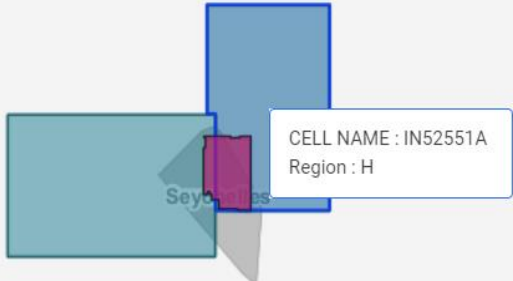
H
10,000km²



GB54232A - Dar es Salaam
4000 H 2016 GB

IN52505T - APPROACHES TO MATHURIN HARBOUR
22000 H 2018 IN

IN52506B - GRAND RIVIERE NOIRE BAY
22000 H 2017 IN



Manager Mode

DB Version
INT chart : 3.0.90 - Sep. 2018

ENC Overlap Analysis: Porto da Beira (Harbour)

The screenshot displays the IHO Web Manager interface for ENC Overlap Analysis. The browser address bar shows the URL `119.198.137.98/chartBeta/iho/main.do`. The page header includes the IHO logo, "IHO Web Manager INT Charts & ENC Schemes", and "Supported by KHOA". Navigation buttons for "Hello ADCS", "Disclaimer", "Manual", and "Logout" are present.

The left sidebar contains "Analysis" and "My Work" options. The main content area features a search bar with "No, Title" and a list of chart entries under "Overlap Analysis".

Chart ID	Title	Scale	Status	Year	IN
IN52511A	APPROACHES TO BEIRA PORT	12000	H	2013	IN
IN52512I	AGALEGA ISLAND	22000	H	2017	IN
IN52514A	Approaches to Port Louis	22000	H	2018	IN
IN52520A	Approaches to Dar Es Salaam	22000	H	2015	IN
IN52551A	Approaches to Port Victoria	22000	H	2018	IN

The map shows the harbour area with overlaid chart boundaries. A popup window for "IN52511A" provides the following details:

Field	Value
Cell Name	IN52511A
Cell Title	APPROACHES TO BEIRA PORT
INT Area	H
Production Status	Produced
Producer	India
Scale	12,000
First Edition Year	2013
Edition No	.
Edition Date	.
Region Version	1.0.5 - JUN. 2018

Additional interface elements include map style controls (Basic, OpenStreet, GEBCO, Arctic, Antarctic), navigation buttons, and a "Manager Mode" label in the bottom right corner.

ENC Coverage Gap Analysis: Region H (coastal) , reference is INT chart coverage, plus NAVAREA limits

IHO Manager Web Catalogue x +

주요 요약 | 119.198.137.98/chartBeta/iho/main.do

IHO Web Manager Supported by KHOA

INT Charts & ENC Schemes

Hello ADCS Disclaimer Manual Logout

Analysis My Work

No, Title

GAP Analysis Overlap Analysis

Analysis Summary

GAP Area **350,000km²**

INT Charts Area **1,450,000km²** ENC Area **1,920,000km²**

2516 - Plan A - Approaches to Ascension Island
150,000 H 1994 GB Produced

2516 - Plan B - Saint Helena
125,000 H 1994 GB Produced

2590 - Kunene River to Sand Table Hill
300,000 H 1991 ZA Produced

Layers ENC Port TrafficDensity CATZOC NAVAREA INTAREA

Opacity 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Manager Mode

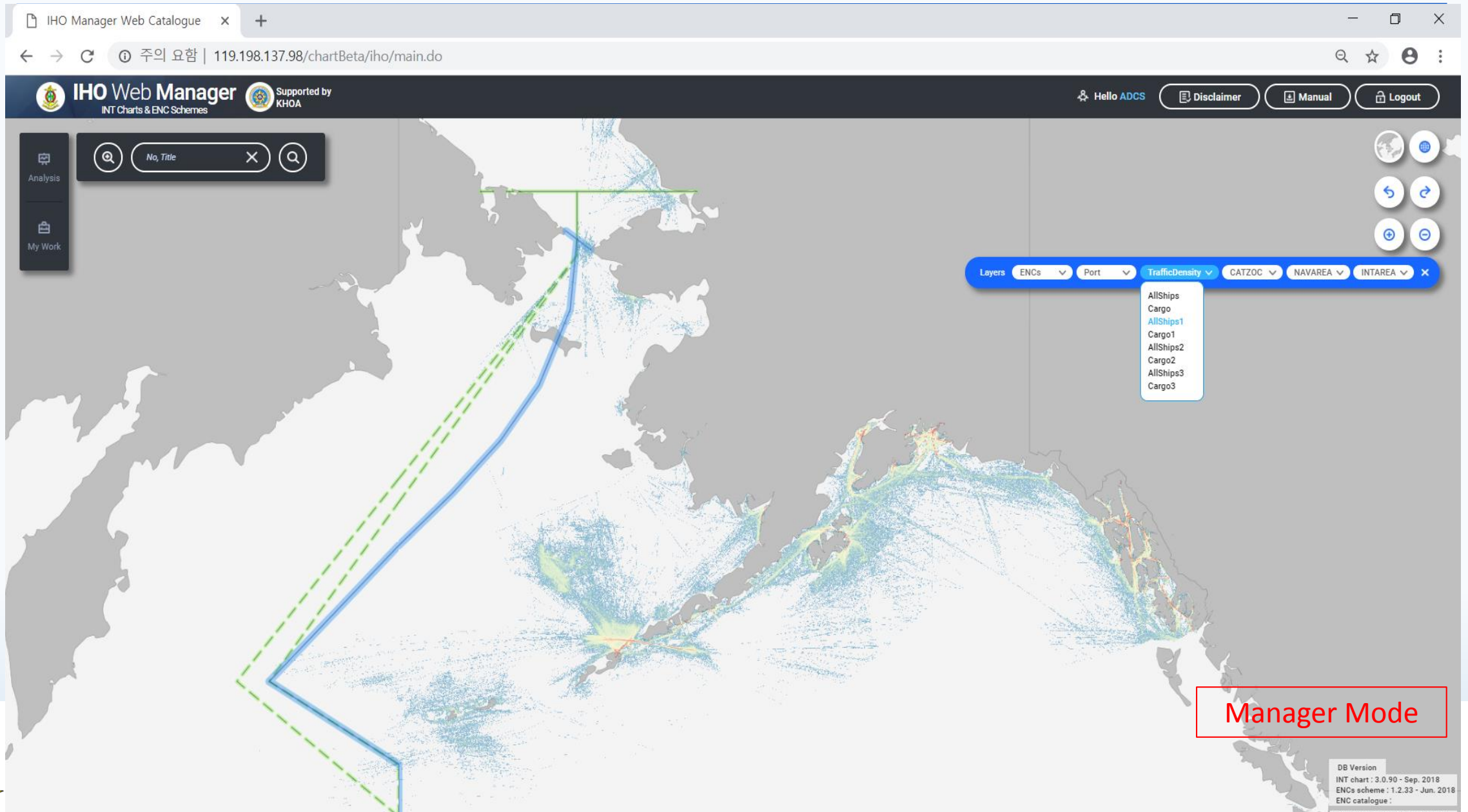
DB Version INT chart : 3.0.90 - Sep. 2018 ENC scheme : 1.2.33 - Jun. 2018 ENC catalogue :

C1a

VIII



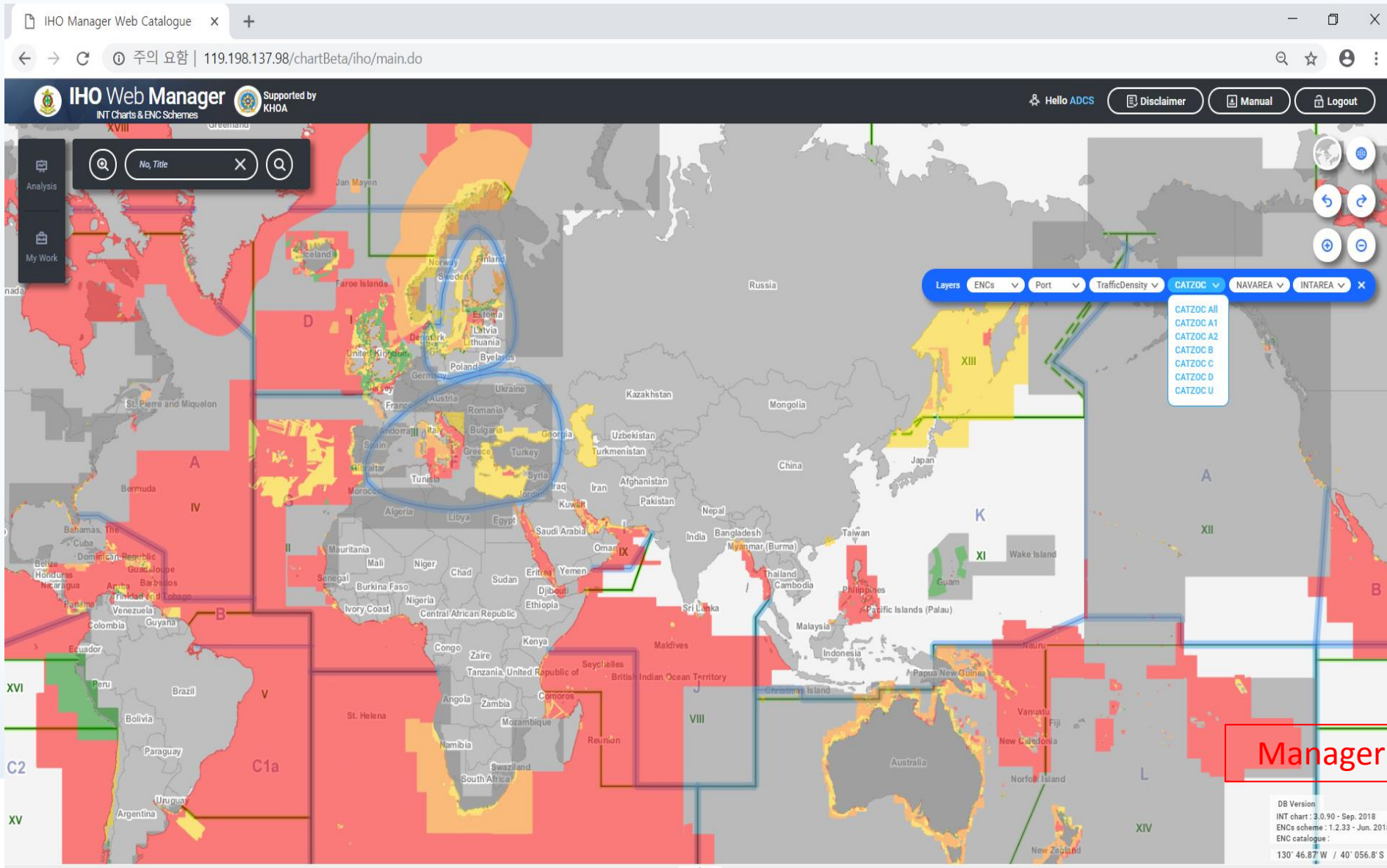
AIS traffic density: Sample to display density data



Manager Mode

DB Version
INT chart : 3.0.90 - Sep. 2018
ENCs scheme : 1.2.33 - Jun. 2018
ENC catalogue :

Additional layer : CATZOC with colors



Manager Mode

S-128 application

The screenshot displays the IHO Web Catalogue interface. At the top, there is a blue header with the IHO logo, the text "IHO Web Catalogue" and "INT Charts & ENC Schemes", and a "Supported by KHOA" logo. To the right of the header are three buttons: "Disclaimer", "Manual", and "Manager".

The main content area is divided into a search panel on the left and a map on the right. The search panel has a search bar with the placeholder text "No, Title, Event, Country". Below the search bar are four tabs: "INT Charts" (with a count of 720), "ENCs" (0), "IHO Event" (0), and "IHO Member" (0). The search results are listed as follows:

Chart ID	Chart Name	Scale	Country	Year	Status	Produced
12,500			D	1983	DK	Produced
1113	Reykjavik	10,000	D	2001	IS	Produced
1118	Akureyri	10,000	D	1998	IS	Produced
1131	Plan A - Uusikaupunki	20,000	E	2000		Produced

Below the search results is a pagination control with a "Back" button and a "Download" button. A dropdown menu is open over the "Download" button, showing options: XLS, PDF, GML, and SHP.

The map on the right shows the Republic of Korea with several blue markers indicating chart locations. The map includes navigation controls (home, back, forward, zoom in, zoom out, full screen) and a coordinate display at the bottom right: "137° 36.88' E / 37° 37.38' N".



Status of INTToGIS II Project

- Design and develop DB (Oct. 2017) , Develop the new interface and functions (Nov. 2017)
- Create additional layers (2018), Test operation (late 2018), Project Management Meeting (January 2019)
- Fixing anomalies and implementing improvements suggested by Charting Regions Coordinators (April 2019)
- Demo at WENDWG-9, possibly at HSSC-11
- Commissioning of INTToGIS II (mid-2019, tbc), workshop back-to-back with NCWG-5 (tbc)
- Pending Questions for the Future: Need to update the current (2007) experimental CATZOC database (every quarter?) AIS data/categories ? Towards INTToGIS III for Management and Coverage of S-100 based products? → *To be discussed*



Thank you

