

Background (1/2)

- **Purpose** of the INToGIS 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**

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



Background (1/2)

- **Key features for the Project II**

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



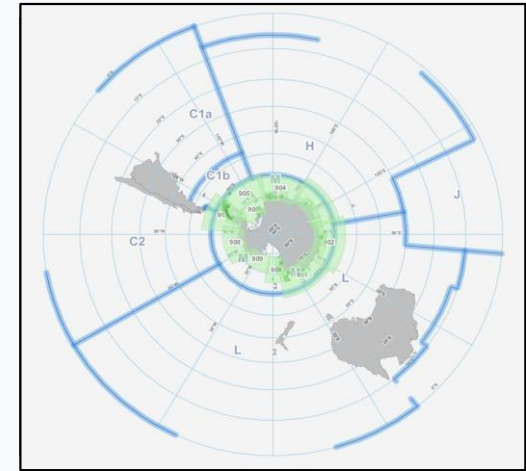
Improvement (1/9)

1. Base map of Polar region

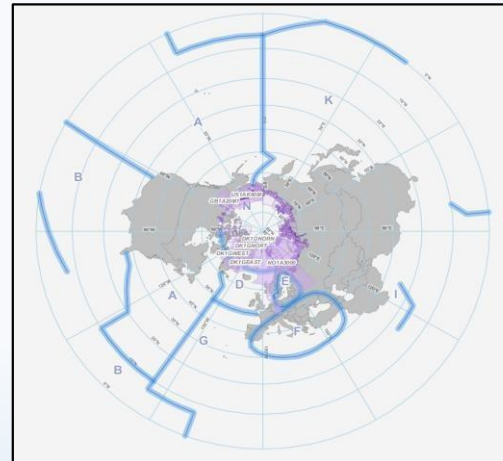
- Both INT Chart and ENC Scheme
- Apply to the management procedures
- Adding regional boundaries (feedback)



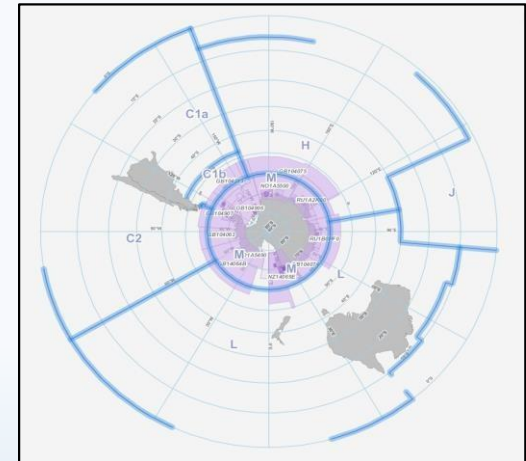
INT Chart Arctic



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 KHOA". The main area shows a map of East Asia with various ENC boundaries overlaid in different colors (blue, orange, purple). A search filter is applied, showing "112" results. Below the map is a table of search results for ENC schemes.

<input type="checkbox"/>	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
<input type="checkbox"/>	5010	MAIN	K	3.0.5 - MAR. 2019	Okinawa Shima t...	JP	W1203	21°50.00'N	26°55.00'N	12°48.00'E	12°48.00'E	1993		2012		Produced	750,000
<input type="checkbox"/>	5011	MAIN	K	3.0.5 - MAR. 2019	Chichi Shima to...	JP	W2130	20°0.00'N	27°15.00'N	14°40.00'E	14°50.00'E	2002				Produced	750,000
<input type="checkbox"/>	5030	MAIN	K	3.0.5 - MAR. 2019	Northern Part o...	CN	10011	35°30.00'N	41°0.00'N	11°0.00'E	12°15.00'E	2006		2010		Produced	1,000,000
<input type="checkbox"/>	5031	MAIN	K	3.0.5 - MAR. 2019	Qingdao, Shang...	CN	10012	30°30.00'N	36°24.00'N	11°15.00'E	12°40.00'E	2006				Produced	1,000,000
<input type="checkbox"/>	5032	MAIN	K	3.0.5 - MAR. 2019	Changjiang Kou ...	CN	13000	24°47.00'N	31°27.00'N	11°33.00'E	12°45.00'E	2006		2009		Produced	750,000
<input type="checkbox"/>	5033	MAIN	K	3.0.5 - MAR. 2019	Taiwan Strait a...	CN	14000	21°45.00'N	26°9.00'N	11°20.00'E	12°5.00'E	2006		2009		Produced	700,000
<input type="checkbox"/>	5034	MAIN	K	3.0.5 - MAR. 2019	Qiongzhou Haikl...	CN	16010	15°45.00'N	20°15.00'N	10°30.00'E	11°48.00'E	2006		2006		Produced	500,000
<input type="checkbox"/>	5035	MAIN	K	3.0.5 - MAR. 2019													



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

World Port

Port

- Large
- Medium
- Small
- Very Small

IHO Web Catalogue
INT Charts & ENC Schemes
Supported by KHQA

Layers

- Harbour 50% T
- Berthing 50% T

ENCs - Regional

- Overview 50% T
- General 50% T
- Coastal 50% T
- Approach 50% T
- Harbour 50% T
- Berthing 50% T

ENCs - Catalogue

- Overview 50% T
- General 50% T
- Coastal 50% T
- Approach 50% T
- Harbour 50% T
- Berthing 50% T

Intarea

- Intarea 50% T

Port

- Large
- Medium
- Small
- Very Small



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 (+ / -)

1

2

3

4

5

6

* Select a country

Step 2 - Select INT Region

Region Country

Continent: J

Nation: Select Please

BD x EG x

IHO Web Manager
INT Charts & ENC Schemes
Supported by KHOA

Search

Analysis

My Work

GAP Analysis

Overlap Analysis

Analysis Summary

GAP Area **350,000km²**

INT Charts Area **1,450,000km²**

ENC's Area **1,920,000km²**

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

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

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

2600 - Sand Table Hill to Cape Cross
300,000 H 1992 Produced

2610 - Cape Cross to Conception Bay
300,000 H 1993 Produced

1 2 3 4 5 6 7 8



Improvement (5/9)

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

The interface is divided into two main sections: a configuration panel on the left and a results/map panel on the right.

Configuration Panel (Left):

- Step 1: Select Overlap Data** (1): Source Data is set to "ENCs".
- Step 2: Select Area** (2): Includes a "Between" toggle (3) and "In" button (4). Below are "Region" and "Country" selection grids.
- Step 3: Select Scale band** (5): Includes buttons for Overview, General, Coastal, Approach, Harbour, and Berthing.
- Step 4: Tolerance Setting** (6): A text input field set to "0 m" and a "Q Search" button.

Results/Map Panel (Right):

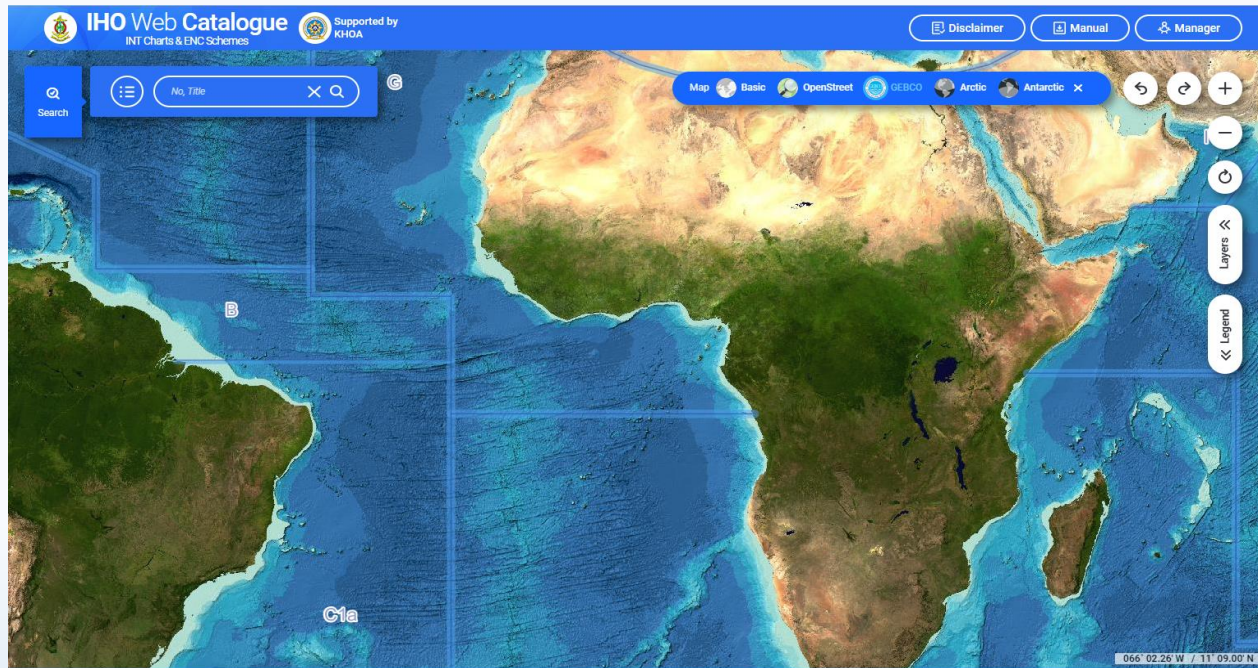
- Analysis Summary:** Shows "Overlap Area 20km2" and "General 91km2" with a pie chart.
- Map:** Displays a map of the Korean coast with overlapping ENC chart boundaries. A pink shaded area indicates the overlap.
- Legend:** Lists ENC chart details:
 - KR2F4000 - South Coast of Korea and Approaches: 500,000 scale, 2015, Korea (Rep. of), Produced.
 - KR2F3000 - Korea West Coast: 500,000 scale, 2014, Korea (Rep. of), Produced.
 - KR2F2000 - Korea East Coast: 500,000 scale, 2015, Korea (Rep. of), Produced.



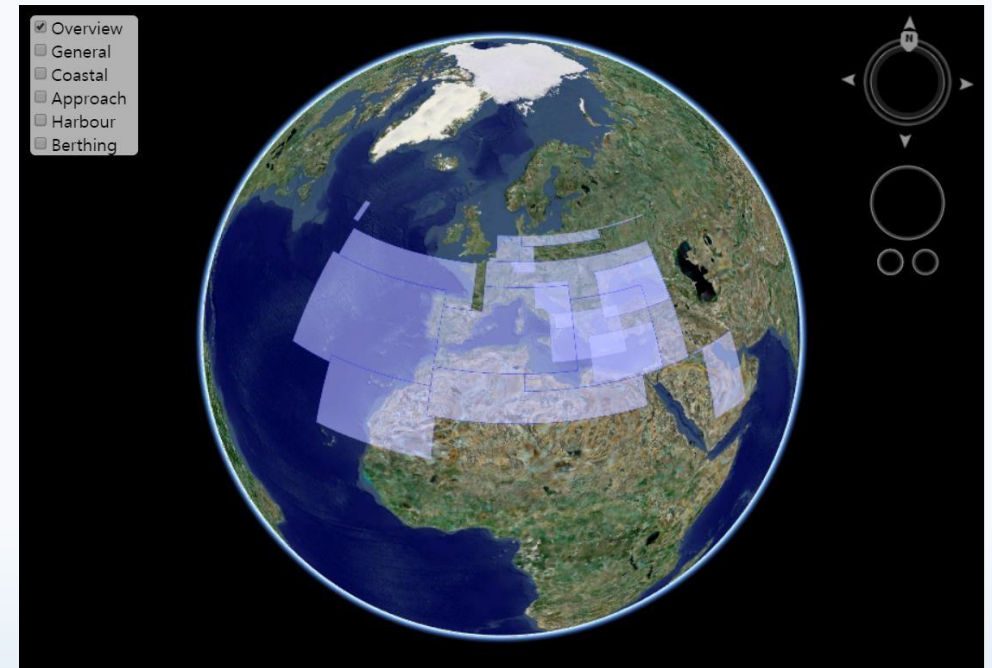
Improvement (6/9)

6. Other improvements

1) GEBCOBase Map



2) 3D Globe (removed)



Improvement (7/9)

6. Other improvements

3) Renewal of INTToGIS interface

Web Catalogue

The screenshot shows the IHO Web Catalogue interface. At the top, there is a navigation bar with the IHO logo, the text "IHO Web Catalogue" and "Supported by KHQA", and links for "Disclaimer", "Manual", and "Manager". Below the navigation bar is a search bar and a filter panel. The filter panel includes sections for "INT Charts" and "ENCs", "Chart Scale" (with options: Overview, General, Coastal), "Approach" (with options: Harbour, Berthing), "Region" (with a grid of letters A through T), "Status" (with options: All, Schemed, Produced), "Producer" (with options: Member States, Other States, Others), and "Prod. Nation" and "Pub. Year" dropdown menus. A "Search" button and a "Reset" button are at the bottom of the filter panel. The map in the background shows various chart areas highlighted in different colors, with a search bar and a "Layers" panel on the right side.

Web Manager

The screenshot shows the IHO Web Manager interface. At the top, there is a navigation bar with the IHO logo, the text "IHO Web Manager" and "Supported by KHQA", and links for "Hello ADCS", "Disclaimer", "Manual", and "Logout". Below the navigation bar is a search bar and a filter panel. The filter panel includes sections for "INT Charts" and "ENCs", "Chart Scale" (with options: Overview, General, Coastal), "Approach" (with options: Harbour, Berthing), "Region" (with a grid of letters A through T), "Status" (with options: All, Schemed, Produced), "Previous Regional Edition" (with a dropdown menu), "Producer" (with options: Member States, Other States, Others), and "Prod. Nation" and "Pub. Year" dropdown menus. A "Search" button and a "Reset" button are at the bottom of the filter panel. The map in the background shows various chart areas highlighted in different colors, with a search bar and a "Layers" panel on the right side. In the bottom right corner, there is a small text box containing version information: "DB Version: INT chart : 3.0.92 - Mar. 2019, ENC scheme : 1.2.33 - Jun. 2018, ENC catalogue :".



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 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

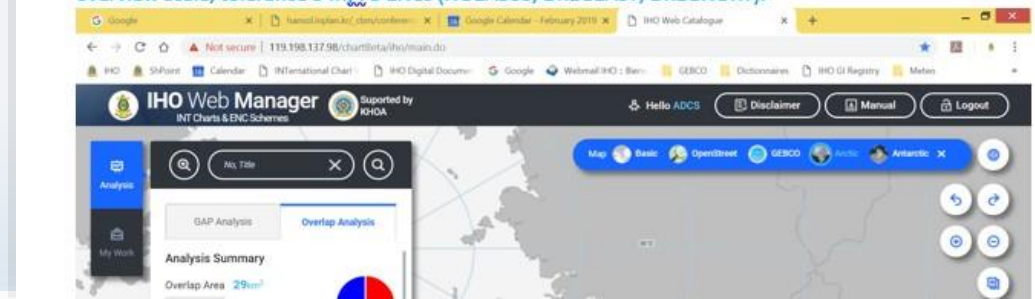
As Norway is the only country producing INT charts in Region N I have focussed on ENCs in my testing.

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 main map shows the Mediterranean region with various chart coverage areas overlaid. The interface includes a search bar, filter panels for Chart Scale, Region, Status, and Producer, and a layers panel on the right. A red box highlights the text "User Mode" in the bottom right corner.

Chart Scale: All, User Define, Overview, General, Coastal, Approach, Harbour, Berthing

Region: All, A, B, C1, C2, D, E, F, G, H, I, J, K, L, M, N, 10M

Status: All, Schemed, Produced

Producer: All, Member States, Other States, Others

Prod. Nation: [Dropdown], **Pub. Year:** [Dropdown]

Layers: Harbour (50%), Berthing (50%), ENC - Regional (Overview, General, Coastal, Approach, Harbour, Berthing), ENC - Catalogue (Overview, General, Coastal, Approach, Harbour, Berthing), Intarea (Intarea), Port (Large, Medium, Small, Very Small)

Legend: Legend

User Mode

083° 29.77' W / 56° 59.57' S

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

The screenshot displays the IHO Web Catalogue interface. The top navigation bar includes the IHO logo, 'IHO Web Catalogue' text, 'Supported by KHOA', and buttons for 'Disclaimer', 'Manual', and 'Manager'. The search panel on the left shows 'No, Title' in the search bar and a list of ENC results:

Chart ID	Scale	Status	Region	Production
AU2597P0	1,500,000	H	AU	Produced
GB200716	700,000	H	GB	Produced
GB200717	700,000	H	GB	Produced
GB202949	700,000	H	GB	Produced
FR273490	350,000	H	FR	Produced

The map area shows a GEBCO base map with ENC coverage overlays. The overlays include Harbour (red), Berthing (green), and ENCCoverage (General) (purple). The map is titled 'Map Basic OpenStreet GEBCO Arctic Antarctic'. The layers panel on the right shows the following settings:

Category	Item	Status	Scale	Production
Layers	Harbour	On	50%	T
	Berthing	On	50%	T
ENCs - Regional	Overview	Off	50%	T
	General	Off	50%	T
	Coastal	Off	50%	T
	Approach	Off	50%	T
	Harbour	Off	50%	T
	Berthing	Off	50%	T
ENCs - Catalogue	Overview	Off	50%	T
	General	On	50%	T
	Coastal	Off	50%	T
	Approach	Off	50%	T
	Harbour	Off	50%	T
	Berthing	Off	50%	T
Intarea	Intarea	On	50%	T
Port	Large	On		
	Medium	Off		
	Small	Off		
	Very Small	Off		

A red box labeled 'User Mode' is overlaid on the bottom right of the map area. The bottom right corner of the map shows coordinates: 011° 30.23' E / 41° 22.92' S.



ENCOverlap Analysis: Port Victoria (Harbour)

The screenshot displays the IHO Web Manager interface for ENC overlap analysis. The browser address bar shows the URL <http://119.198.137.98/webManager/iho/main.do>. The page header includes the IHO logo, the text "IHO Web Manager INT Charts & ENC Schemes", and "Supported by KHOA". Navigation buttons for "Hello ADCS", "Disclaimer", "Manual", and "Logout" are visible.

The left sidebar contains a search bar and three main menu items: "Search", "Analysis", and "My Work". The "Analysis" menu is currently selected.

The main content area is titled "No, Title" and features two tabs: "GAP Analysis" and "Overlap Analysis". The "Overlap Analysis" tab is active, showing an "Analysis Summary" section. This section includes a pie chart and the text "Overlap Area 204km²". Below the summary is a table listing ENC details:

ENC ID	Scale	Region	Overlap Area
GB500722-12000	H	GB	0km ²
GB502758-12000	H	GB	
GB54232A-4000	H	GB	
IN52510B-12000	H	IN	
IN52511A-12000	H	IN	

The map view on the right shows a geographical area with a tooltip for cell IN52511A, indicating "Region : H". A red box labeled "Manager Mode" is overlaid on the map area. The bottom right corner of the interface displays the following information:

DB Version
INT chart : 3.0.92 - Mar. 2019
ENCs scheme : 1.2.33 - Jun. 2018
ENC catalogue :
055° 30.21' E / 04° 29.99' S

ENCOverlap Analysis: Porto da Beira (Harbour)

The screenshot displays the IHO Web Manager interface for ENCOverlap Analysis. The main map shows the Porto da Beira Harbour area with overlaid ENC cells. The sidebar on the left provides controls for the analysis, including a search bar, a list of selected cells, and a 'Download' button. A detailed information window for cell IN52511A is open, showing its attributes.

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

Manager Mode

INT chart : 3.0.92 - Mar. 2019
ENCs scheme : 1.2.33 - Jun. 2018
ENC catalogue :
034° 18.39' E / 20° 09.56' S

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

Browser: http://119.198.137.98/webManager/iho/main.do

IHO Web Manager | Supported by KHOA | Hello ADCS | Disclaimer | Manual | Logout

Search

Analysis


My Work

GAP Analysis | Overlap Analysis

Analysis Summary

GAP Area **350,000km²**

INT Charts Area	ENCs Area
1,450,000km ²	1,920,000km ²



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

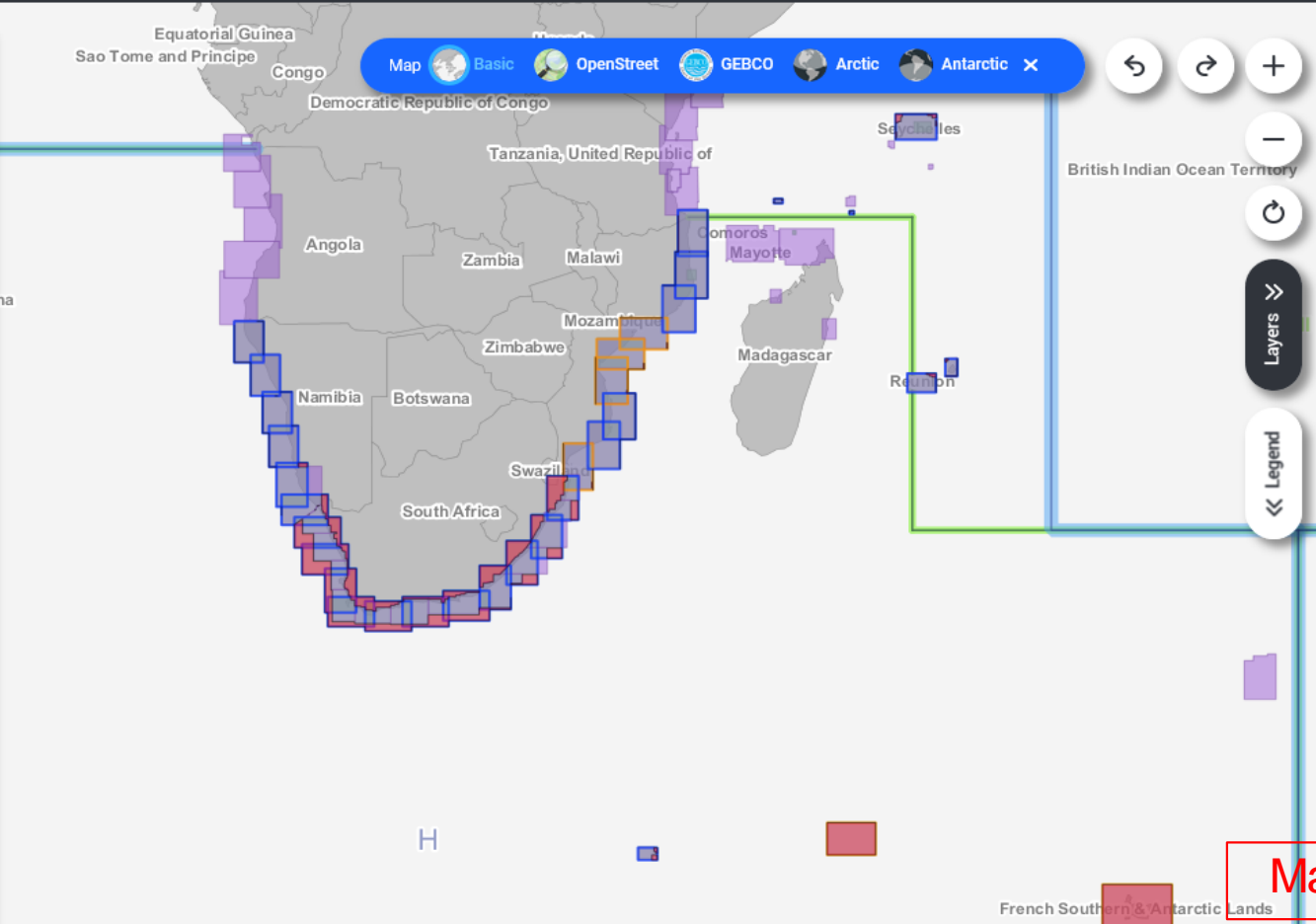
2516 - Plan A - Approaches to Ascension Island
150,000 | H | 1994 | Produced

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

2600 - Sand Table Hill to Cape Cross
300,000 | H | 1992 | Produced

2610 - Cape Cross to Conception Bay
300,000 | H | 1993 | Produced

1 2 3 4 5 6 7 8



Layers

- Approach 50%
- Harbour 50%
- Berthing 50%
- Intarea Default
- Intarea 50%
- Navarea Default

Color picker: hsv(95, 69%, 95%)

Legend

Catzoc A1, Catzoc A2, Catzoc B, Catzoc C, Catzoc D, Catzoc U

Traffic Density Default

DB Version

INT chart : 3.0.92 - Mar. 2019

ENCs scheme : 1.2.33 - Jun. 2018

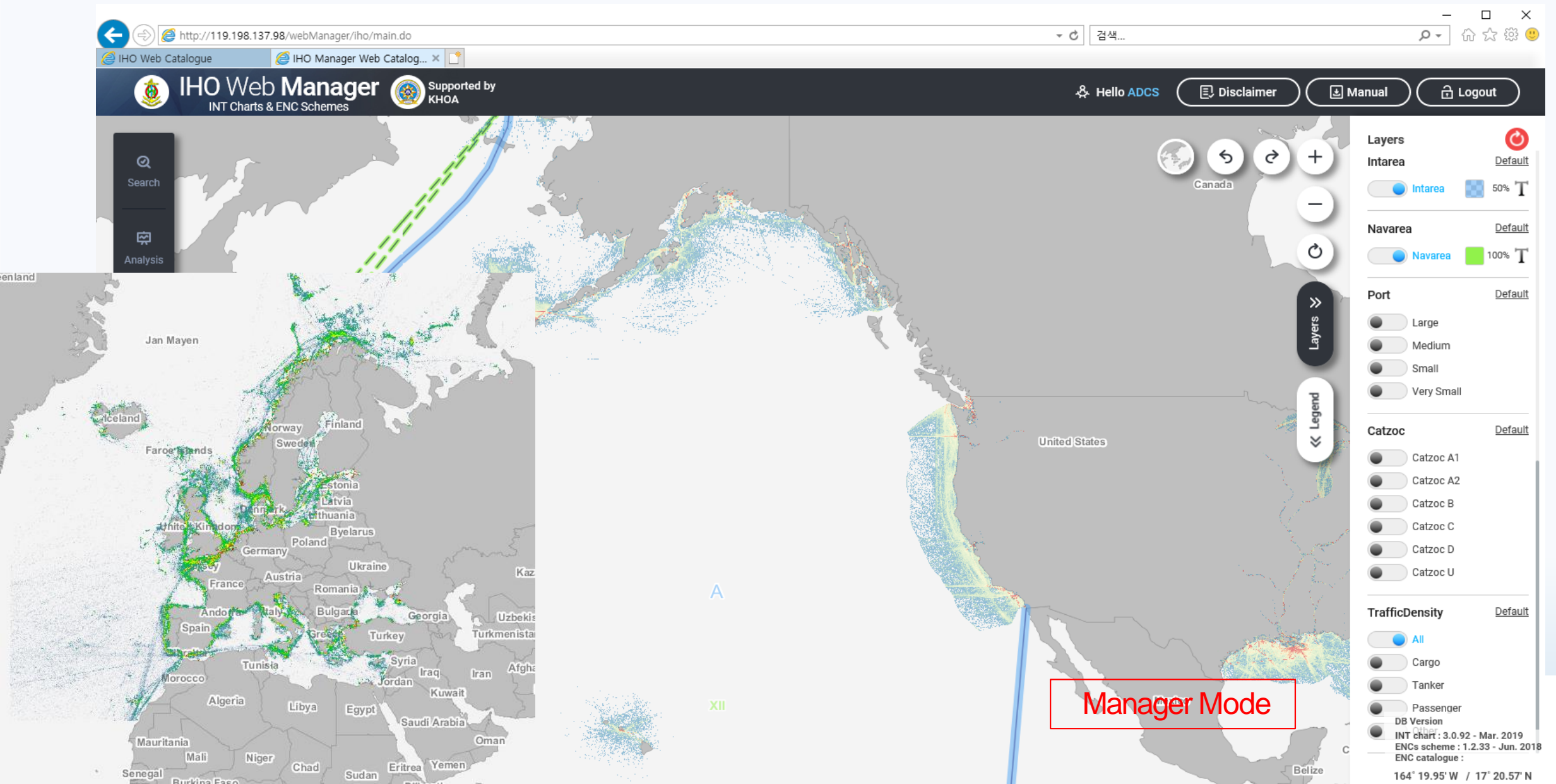
ENC catalogue :

077° 48.37' E / 31° 23.89' S

Manager Mode



AIS traffic density: Sample to display density data



Additional layer : CATZOC with colors

The screenshot displays the IHO Web Manager interface. At the top, the browser address bar shows the URL <http://119.198.137.98/webManager/iho/main.do>. The page header includes the IHO logo, the text "IHO Web Manager INT Charts & ENC Schemes", and "Supported by KHOA". Navigation links for "Hello ADCS", "Disclaimer", "Manual", and "Logout" are present.

The main content is a world map with various colored zones overlaid. A red box labeled "Manager Mode" is overlaid on the map. The right-hand sidebar contains several control panels:

- Layers:** Includes a refresh button and a "Layers" dropdown menu.
- Intarea:** A toggle switch is checked, with a "50%" value and a "T" icon.
- Navarea:** A toggle switch is checked, with a "100%" value and a "T" icon.
- Port:** Includes radio buttons for "Large", "Medium", "Small", and "Very Small".
- Catzoc:** A "Default" dropdown menu and a list of Catzoc layers (A1, A2, B, C, D, U) with toggle switches.
- TrafficDensity:** Includes radio buttons for "All", "Cargo", "Tanker", "Passenger", and "DB Version".

At the bottom of the page, the text "INT chart : 3.0.92 - Mar. 2019" and "ENCs scheme : 1.2.33 - Jun. 2018" is visible.

Catzoc

- Catzoc A1
- Catzoc A2
- Catzoc B
- Catzoc C
- Catzoc D
- Catzoc U



S-128 application

The screenshot displays the IHO Web Catalogue interface. The browser address bar shows the URL <http://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 content area features a search bar with the text "No, Title" and a search icon. Below the search bar, there are two tabs: "INT Charts" (with a count of 62) and "ENCs" (with a count of 0). A list of charts is displayed, each with its name, scale, country code, year, and status:

Chart Name	Scale	Country	Year	Status
5351 - Ulsan Man	20,000	K	1993	Produced
5352 - Ulsan Hang	10,000	K	1993	Produced
5354 - Pohang Hang	15,000	K	1991	Produced
5356 - Busan Hang	10,000	K	1995	Produced
5357 - Western part of Busan Hang	10,000	K	199	Produced

The chart "5357 - Western part of Busan Hang" is selected, and a download menu is open, showing options for "XLS", "PDF", "GML", and "SHP". A "Back" button and a "Download" button are also visible. The background features a map of the Republic of Korea and Japan, with a search bar and navigation controls on the right side. The coordinates "121° 08.07' E / 28° 30.42' N" are displayed at the bottom right of the map area.



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, and 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 (2017) experimental CATZOC database (every quarter?) AIS data/categories ? Towards INTToGIS III for Management and Coverage of S-100 based products? → *To be discussed*

