

IHO-ROK Technical Cooperation Project

INToGIS PROJECT II

Presented by KHOA (Yong BAEK)



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



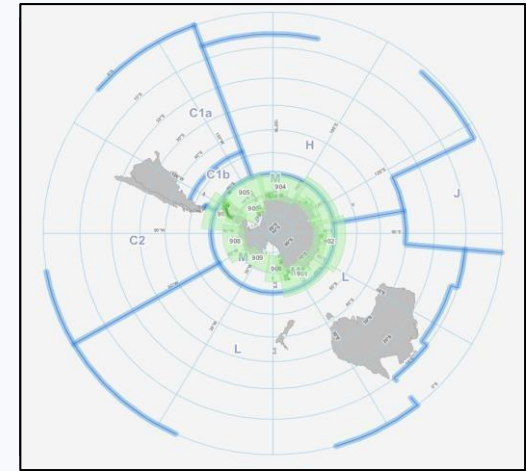
Improvement (1/9)

1. Base map of Polar region

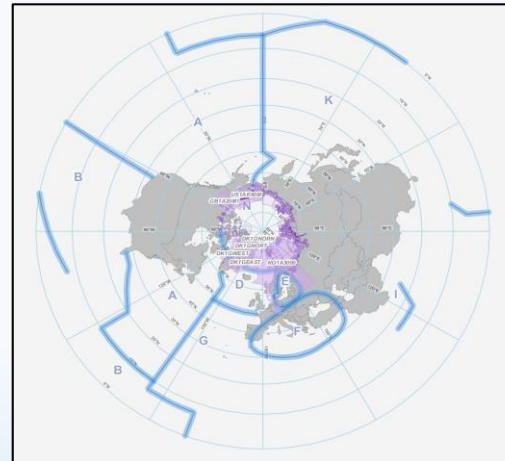
- Both INT Chart and ENC Scheme
- Apply to the management procedures
- Adding regional boundaries (feedback)



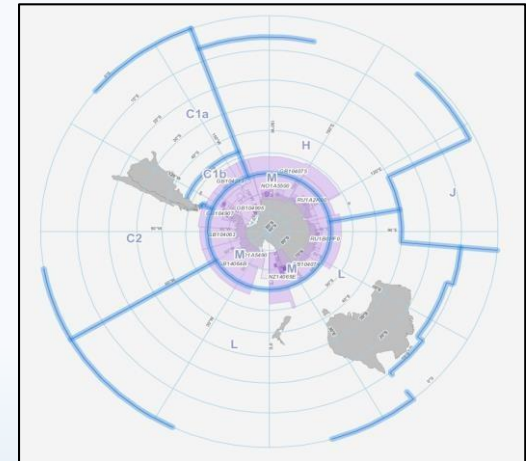
INT Chart Arctic



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 panel is open, showing "INT Charts" and "ENCs" tabs. Below the map, there is a table with search results for INT Charts.

<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 Haixi...	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 IHOA

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. Search bar
2. GAP Analysis / Overlap Analysis
3. Gap analysis provides contextual statistics by analyzing information on areas of the world's maritime regions that do not currently have electronic charts.
4. Step 2 - Select INT Region
5. Step 3 - Select Scale band
6. Step 4 - Tolerance Setting

* 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

Analysis Summary
GAP Area: 350,000km²
INT Charts Area: 1,450,000km²
ENCs 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



Improvement (5/9)

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

The interface is divided into several sections:

- Step 1: Select Overlap Data**: Source Data: ENCs
- Step 2: Select Area**: Includes a "Between" toggle and a grid of region/country buttons (A-K, L, M, N, 10M).
- Step 3: Select Scale band**: Overview, General, Coastal, Approach, Harbour, Berthing.
- Step 4: Tolerance Setting**: Input field for 0 m.
- Analysis Summary**: Shows "Overlap Area 20km2" and "General 91km2".
- Map View**: Displays ENC charts with overlapping areas highlighted in pink and purple.

Callouts and annotations:

- 1: Overlap Analysis tab
- 2: Step 1: Select Overlap Data
- 3: Between/In toggle
- 4: Country selection
- 5: Step 3 - Select Scale band
- 6: Step 4 - Tolerance Setting

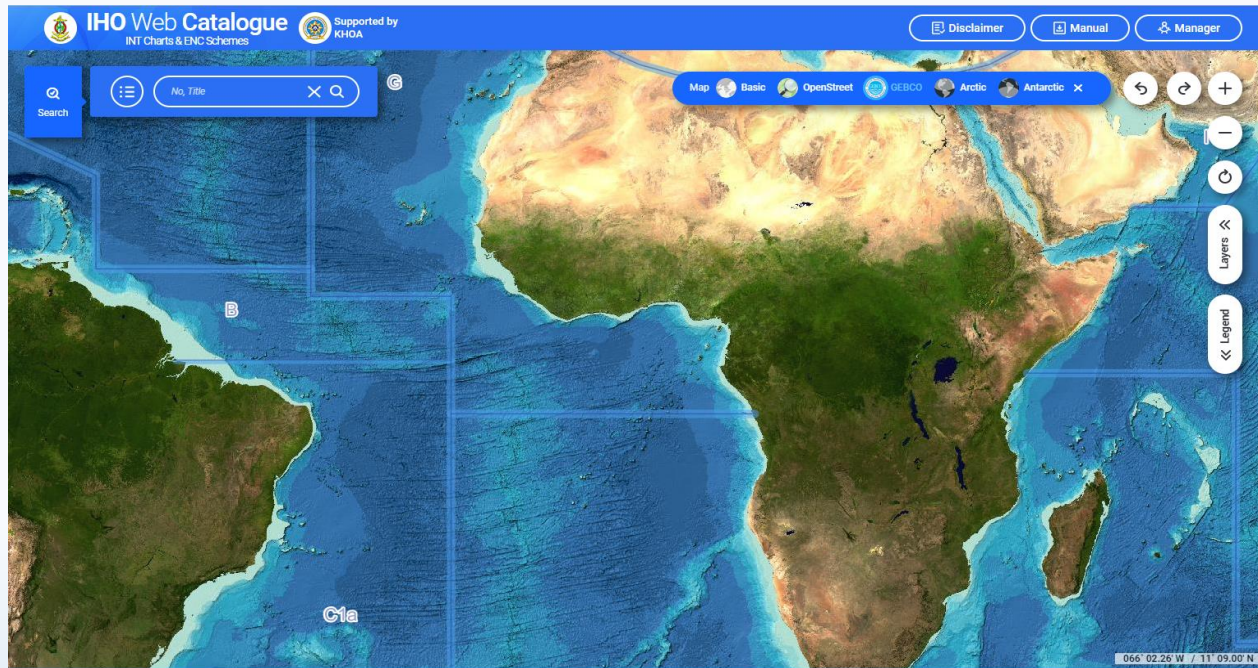
Additional panels on the right show detailed selection options for Region and Country, including Continent and Nation dropdowns.



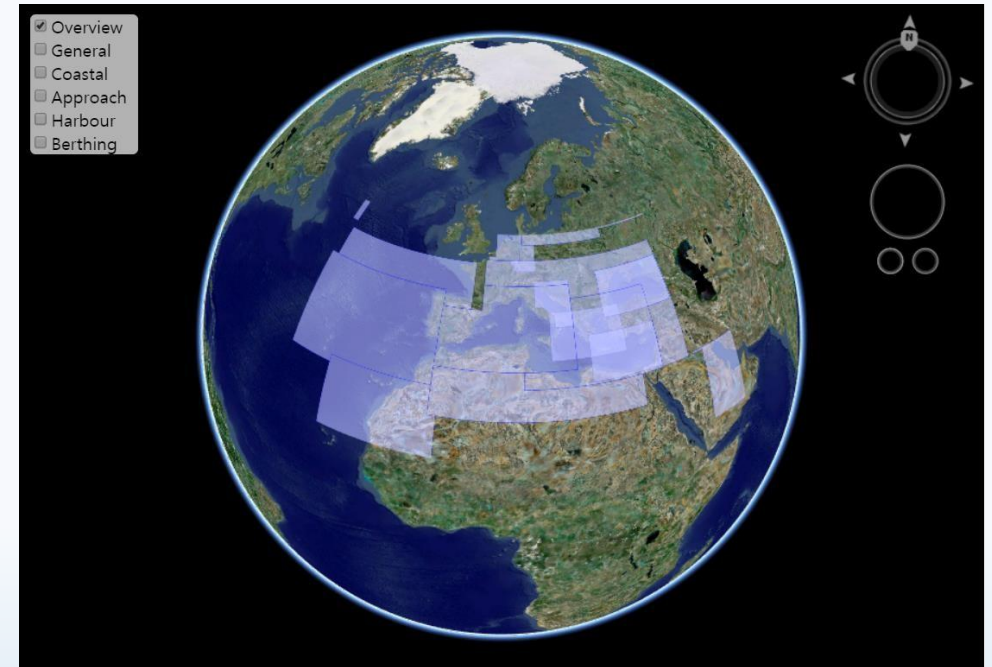
Improvement (6/9)

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. The top navigation bar includes the IHO logo, the text "IHO Web Catalogue" and "Supported by KHOA", and links for "Disclaimer", "Manual", and "Manager". A search bar is located in the top left. The main content area features a world map with several chart areas highlighted in green and purple. A filter panel is open on the left side, showing options for "INT Charts" and "ENCs", "Chart Scale" (All, General, Coastal), "Approach" (Harbour, Berthing), "Region" (A, B, C1, C2, D, E, F, G, H, I, J, K, L, M, N, 10M), "Status" (All, Schemed, Produced), "Producer" (Member States, Other States, Others), and "Prod. Nation" (FR) and "Pub. Year" (1987). A "Search" button and a "Reset" button are at the bottom of the filter panel. The map navigation toolbar on the right includes a search icon, a list icon, a search bar, a magnifying glass, a refresh icon, a zoom in icon, a zoom out icon, a home icon, and a layers icon.

Web Manager

The screenshot shows the IHO Web Manager interface. The top navigation bar includes the IHO logo, the text "IHO Web Manager" and "Supported by KHOA", and links for "Hello ADCS", "Disclaimer", "Manual", and "Logout". A search bar is located in the top left. The main content area features a world map with several chart areas highlighted in green and purple. A filter panel is open on the left side, showing options for "INT Charts" and "ENCs", "Chart Scale" (All, General, Coastal), "Approach" (Harbour, Berthing), "Region" (A, B, C1, C2, D, E, F, G, H, I, J, K, L, M, N, 10M), "Status" (All, Schemed, Produced), "Previous Regional Edition" (toggle), "Producer" (Member States, Other States, Others), and "Prod. Nation" (MA) and "Pub. Year" (2017). A "Search" button and a "Reset" button are at the bottom of the filter panel. The map navigation toolbar on the right includes a search icon, a list icon, a search bar, a magnifying glass, a refresh icon, a zoom in icon, a zoom out icon, a home icon, and a layers icon. In the bottom right corner, there is a small text box containing: "DB Version", "INT chart : 3.0.92 - Mar. 2019", "ENCs scheme : 1.2.33 - Jun. 2018", "ENC catalogue : Y", and "068° 38.55' W / 55° 004.7' S".



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

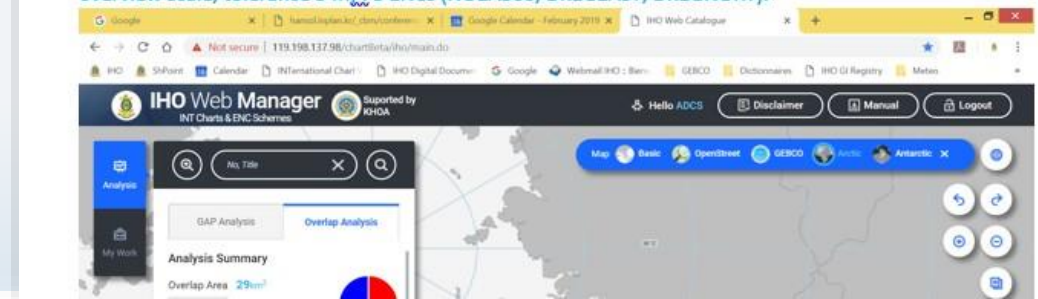
As Norway is the only country producing INT charts in Region N I have focussed on ENCs in my testing.

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 shows the IHO Web Catalogue interface. The browser address bar displays <http://119.198.137.98/chartBeta/iho/main.do#>. The page header includes the IHO logo, "IHO Web Catalogue", and "Supported by KHOA". Navigation links for "Disclaimer", "Manual", and "Manager" are present.

The main content area features a map of the Mediterranean and surrounding regions. The map displays INT Chart Coverage (General, Coastal, Approach) overlaid by ENC Coverage (General). The interface includes a search bar, filter panels for Chart Scale, Region, Status, and Producer, and a layers panel on the right.

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%).

ENCs - Regional: Overview (50%), General (50%), Coastal (50%), Approach (50%), Harbour (50%), Berthing (50%).

ENCs - Catalogue: Overview (50%), General (50%), Coastal (50%), Approach (50%), Harbour (50%), Berthing (50%).

Intarea: Intarea (50%).

Port: Large, Medium, Small, Very Small.

A red box labeled "User Mode" is overlaid on the map.



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 INT Charts & ENC Schemes', and 'Supported by KHOA'. It also features links 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	Country	Status
AU2597P0	1,500,000	AU	Produced
GB200716	700,000	GB	Produced
GB200717	700,000	GB	Produced
GB202949	700,000	GB	Produced
FR273490	350,000	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 also shows various ENC numbers such as 2570, ZA2N0040, ZA200010, ZA200020, ZA200030, ZA200040, FR277970, and FR277980. The layers panel on the right shows the following settings:

Category	Layer	Visibility	Opacity	Color
Layers	Harbour	On	50%	Red
	Berthing	On	50%	Green
ENCs - Regional	Overview	Off	50%	Purple
	General	On	50%	Purple
	Coastal	Off	50%	Purple
	Approach	Off	50%	Purple
	Harbour	Off	50%	Purple
	Berthing	Off	50%	Purple
ENCs - Catalogue	Overview	Off	50%	Purple
	General	On	50%	Purple
	Coastal	Off	50%	Purple
	Approach	Off	50%	Purple
	Harbour	Off	50%	Purple
	Berthing	Off	50%	Purple
Intarea	Intarea	On	50%	Purple
Port	Large	On	50%	Blue
	Medium	Off	50%	Blue
	Small	Off	50%	Blue
	Very Small	Off	50%	Blue

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



ENCOverlap Analysis: Port Victoria (Harbour)

The screenshot displays the IHO Web Manager interface for ENCOverlap 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 links for "Hello ADCS", "Disclaimer", "Manual", and "Logout" are present.

The main interface features a left sidebar with "Search", "Analysis", and "My Work" options. The top navigation bar shows "No, Title" and search icons. The "Analysis" section is active, displaying "GAP Analysis" and "Overlap Analysis" tabs. The "Overlap Analysis" section includes an "Analysis Summary" with an "Overlap Area" of 204km² and a pie chart. Below this is a table of analysis results:

Cell Name	Region	Area (km ²)	Overlap Status
GB500722-12000	H	0	GB
GB502758-12000	H	0	GB
GB54232A-4000	H	0	GB
IN52510B-12000	H	0	IN
IN52511A-12000	H	0	IN

The map area shows a geographical view with a tooltip for "CELL NAME : IN52511A" and "Region : H". A red box labeled "Manager Mode" is overlaid on the map. The bottom right corner displays the database version and chart 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 shows the IHO Web Manager interface for ENCOverlap Analysis. The main map displays the Porto da Beira Harbour area with several overlapping ENC cells highlighted in orange and purple. The sidebar on the left contains a search bar, an 'Analysis' button, and a table of selected cells. A 'GAP Analysis' tab is active, showing a pie chart with 0 km² of gap area. A 'Download' button is visible at the bottom of the sidebar. A detailed information window for cell IN52511A is open, showing its metadata. The interface is in 'Manager Mode' as indicated by a red box in the bottom right corner.

Cell Name	INT Area	Production Status	Producer	Scale	First Edition Year	Edition No	Edition Date	Region Version
GB500722-12000	H	Produced	India	12,000				1.0.5 - JUN. 2018
GB502758-12000	H	Produced	India	12,000				1.0.5 - JUN. 2018
GB54232A-4000	H	Produced	India	4,000				1.0.5 - JUN. 2018
IN52510B-12000	H	Produced	India	12,000				1.0.5 - JUN. 2018
IN52511A-12000	H	Produced	India	12,000				1.0.5 - JUN. 2018

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

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

IHO Web Manager INT Charts & ENC Schemes Supported by KHOA Hello ADCS Disclaimer Manual Logout

Search

Analysis

My Work

No, Title

GAP Analysis Overlap Analysis

Analysis Summary

GAP Area **350,000km²**

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

Map Basic OpenStreet GEBCO Arctic Antarctic

Layers

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

Legend

hsv(95, 69%, 95%)

cancel choose

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

TrafficDensity 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

The screenshot displays the IHO Web Manager interface for AIS traffic density data. The main map shows a density heatmap of AIS traffic in the North Atlantic, with a red box labeled "Manager Mode" overlaid on the map. The interface includes a search bar, navigation controls, and a layers panel on the right. The layers panel shows the following settings:

- Layers:** Default
- Intarea:** 50% (T)
- Navarea:** 100% (T)
- Port:** Default
 - Large
 - Medium
 - Small
 - Very Small
- Catzoc:** Default
 - Catzoc A1
 - Catzoc A2
 - Catzoc B
 - Catzoc C
 - Catzoc D
 - Catzoc U
- TrafficDensity:** Default
 - All
 - Cargo
 - Tanker
 - Passenger

Additional information at the bottom right of the interface includes:

- DB Version
- INT chart : 3.0.92 - Mar. 2019
- ENCs scheme : 1.2.33 - Jun. 2018
- ENC catalogue :
- 164° 19.95' W / 17° 20.57' N

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 navigation links for "Hello ADCS", "Disclaimer", "Manual", and "Logout".

The main content is a world map with several colored overlays representing different zones. A red box labeled "Manager Mode" is overlaid on the map. The right-hand sidebar contains the following settings:

- Layers:** Includes a refresh button and a "Layers" dropdown menu.
- Intarea:** Set to "Default" with a 50% transparency slider.
- Navarea:** Set to "Default" with a 100% transparency slider.
- Port:** Includes radio buttons for "Large", "Medium", "Small", and "Very Small".
- Catzoc:** Includes radio buttons for "Catzoc A1", "Catzoc A2", "Catzoc B", "Catzoc C", "Catzoc D", and "Catzoc U".
- TrafficDensity:** Includes radio buttons for "All", "Cargo", "Tanker", and "Passenger".
- DB Version:** Shows "INT chart : 3.0.92 - Mar. 2019", "ENCs scheme : 1.2.33 - Jun. 2018", and "ENC catalogue :".
- Coordinates:** Shows "061° 24.75' W / 22° 03.46' N".

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 links for "Disclaimer", "Manual", and "Manager".

The search results panel on the left shows a search for "No, Title" with 62 results under "INT Charts" and 0 under "ENCs". The results list includes:

- 5351 - Ulsan Man: 20,000 scale, K 1993, KR, Produced
- 5352 - Ulsan Hang: 10,000 scale, K 1993, KR, Produced
- 5354 - Pohang Hang: 15,000 scale, K 1991, KR, Produced
- 5356 - Busan Hang: 10,000 scale, K 1995, KR, Produced
- 5357 - Western part of Busan Hang: 10,000 scale, K 199...

The map shows the Republic of Korea and Japan. A download menu is open for the selected chart, offering formats: XLS, PDF, GML, and SHP. The interface also features a search bar, a "Layers" button, and a "Legend" button. The bottom right corner of the map area shows coordinates: 121° 08.07' E / 28° 30.42' 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, 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 (20017) 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

