



Defence Maritime Geospatial Intelligence Centre (DMGIC)

Products and Services Guide



UK Hydrographic
Office

2022 Edition



UK Hydrographic Office

Defence Maritime Geospatial Intelligence Centre

Products and Services Guide

Defence Maritime Geospatial Intelligence Centre (DMGIC)

products are designed for navigation and the enhancement of situational awareness for dived and surface vessels as well as amphibious craft and maritime air platforms.

Extensive digital data holdings and expert compilation skills and techniques within DMGIC allow us to quickly compile products bespoke for operations, particularly emergency situations, or humanitarian operations such as disaster relief.

Products at a Glance at the beginning of this handbook, is a quick reference guide to products to enable easy identification of the most suitable product for a particular purpose.

Tell us about the task you need to do, and we can create products from existing data holdings to enable:

- maximum exploitation of the marine environment and littoral zone
- increased chance of successful outcomes
- a battle winning edge.

Requests for Information - RFI

As the Maritime Specialist Geospatial Centre for the MOD, UKHO contributes to the Request for Information (RFI) process managed by the Joint Forces Intelligence Group (JFIG). The RFI process allows the customer to state an information requirement (an example would be for bathymetric data or imagery within a particular area of interest) which the UKHO Support to Operations team can then manage and supply data and products as appropriate. It is particularly useful for the provision of bespoke products and datasets in support of specific operations.

For Requests for Information, the process is initiated by completing and submitting a RFI template using the guidance given at website below
https://jfig.ahe.r.mil.uk/serv_submit_rfi.htm

For further details please contact soe@ukho.gov.uk

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For general Defence enquiries contact Defence Service Delivery:

Telephone +44(0) 1823 48 3708
Email defence.servicedelivery@ukho.gov.uk

INDEX and Products and Services at a Glance 2022

Product or Service	Page	Use	Beach (above low water line)	Littoral (offshore)	Marine (blue water)	Paper	Digital	Digital Format	Supported Systems	Bespoke
AML	5-7	Situational Awareness	•	•	•		•	S57, NetCDF	WECDIS, SONAR, C2, MERLIN Mk2	
ARCS (Standard commercial product)	3	Navigation		•	•		•	HCRF	WECDIS	
AVCS (Standard commercial product)	3	Navigation		•	•		•	S57	WECDIS	
Beach Intelligence Geospatial Summary - BIGS	21	Situational Awareness	•	•			•	ESRI ArcReader	Generic	
Chart Catalogue (electronic)	4	Product ordering					•	Download	Generic	
Country Reports	23	Situational Awareness	•	•	•	•	•	PDF	Generic	•
Defence Maritime Environmental Briefs - DMEB	11-12	Planning			•		•	PDF & ESRI Arcreader	Generic	
Electronic Publications; Pilots, Reference books, Tide Tables, Lights Lists, Radio Signals	4	Navigation	•	•	•		•	AENP and ADP	Generic	
Environmental Awareness Charts - EAC	13-15	Situational Awareness		•	•	•	•	PDF	Generic	
Environmental Briefing Docket - EBD	15	Situational Awareness	•	•	•		•	HTML PDF	Generic	
Fleet ARCS	4	Surface navigation		•	•		•	HCRF	WECDIS	
Fleet Thematic Charts	8-9	Situational Awareness		•	•	•				
Fleet Exercise and Training Charts	25	Navigation training		•	•	•	•	HCRF	WECDIS	
Geotiffs of UKHO Standard Navigational charts	5	Powerpoint, planning		•	•		•	geotiff	Generic	
Global Ocean Atlas - GOA	16	Situational Awareness			•		•	HTML, HTML, PDF	Generic	
Gridded Physical Properties Database - GPPDB	24	Situational Awareness			•		•	Netcdf	various	
HMNAO Ground Illumination Diagrams (GIDS)	9,10	Situational Awareness	•	•	•		•	PDF	Generic	•
Hydrographic Port Assessment	20	Situational Awareness		Port			•	Powerpoint	Generic	•
Identification Guide to Whales, Dolphins and Porpoises	17	Planning & mitigation			•	•	•	PDF within DMEB, EBD and SPS	Generic	
Littoral and Riverine - LitR	18-23	Situational Awareness	•	•		•	•	as required	Generic	•
Maritime Foundation Database - MFDB	8	Situational Awareness	•	•	•		•	Various	Various	
Mine Warfare Pilots	24	Mine hunting		•			•	ARC Reader Project (see note)	NAUTIS-4, PC, Laptop	•
NavPac and Compact data DP330	10	Astro Navigation	•	•	•	•	•	•	Generic	
Operational Graphics	8	Situational Awareness	•	•	•	•	•	JPEG, PDF etc.	Generic	•
Request for Information - RFI	1	Navigation & SA	•	•	•	•	•	Any	as requested	•
Satellite Derived Bathymetry	18	Situational Awareness	•	•		•	•	Any	Generic	•
Submarine Electronic Navigational Chart (SMENC)	3	Submarine navigation			•		•	S-57	WECDIS	
STOIC - Special Tactical Operational Information Chart	22	Situational Awareness	•	•	•	•	•	PDF	Generic	•
STOIC - In Theatre	22	Situational Awareness	•	•				Various	Laptop	•
Strategic Port Summary - SPS	23	Situational Awareness		Port			•	HTML	Generic	•
Submarine paper charts	7	Submarine SA		•	•	•				

Note: ARC Reader software is free ESRI software that will read ESRI Published Map Files (.pmf); can be loaded onto any PC.

Navigation Products

AVCS

Admiralty Vector Chart Service

AVCS is a standard commercial service that delivers ENC's (Electronic Navigation Charts) from the world's hydrographic offices.

AVCS provides world coverage of all ENC's available from UKHO via DVD and permits that are delivered by email must be purchased to unlock the ENC data for the area of interest.

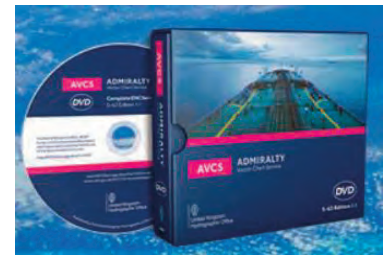
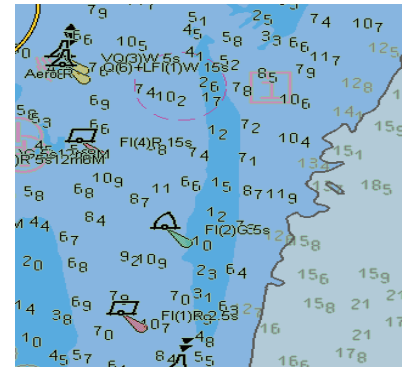
Defence Service Delivery at UKHO acts as the Distributor of world-wide AVCS to the RN and MoD and provides specialist support to Navigators and other Defence users.

Format: S57

Supply: Permits to use individual ENC's are ordered using the Admiralty Digital Catalogue available from the UKHO website.

Updates: Weekly chart updates (NMs) and New Editions are provided via the service.

UKHO contact: defence.servicedelivery@ukho.gov.uk



SMENC

Submarine Electronic Navigational Chart

SMENC is a vector based, bathy-rich, digital product that portrays seafloor configuration using additional contours in areas deeper than 30 metres. In addition to standard navigational data provided by AVCS, SMENCs include wrecks and obstructions in S-57 format suitable for subsurface navigation. SMENCs are stand alone navigational products covering littoral and offshore areas. Updates are provided as required.

Benefits: Detailed depiction of the seabed & S57 format with anti-grounding alarms.

Target user: Submarine and surface vessels towing submerged sensors or equipment and for training.

Format: S57

Supported systems: ECDIS/WECDIS

Contact: defence.servicedelivery@ukho.gov.uk

ARCS

Admiralty Raster Chart Service

This commercial product provides the digital raster version of standard Admiralty paper navigational charts.

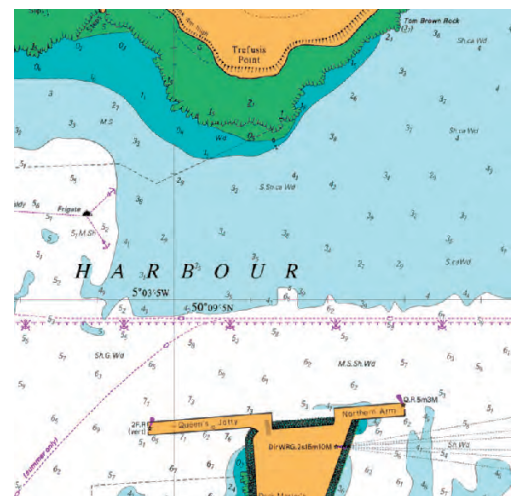
UKHO acts as the Distributor of ARCS to the Royal Navy and MoD and provides specialist support to users.

Format: HCRF

Supported systems: ECDIS/WECDIS

Supply: ARCS Licences and permits are delivered by Defence Service Delivery

Contact: defence.servicedelivery@ukho.gov.uk



Fleet ARCS

Fleet Admiralty Raster Chart Service

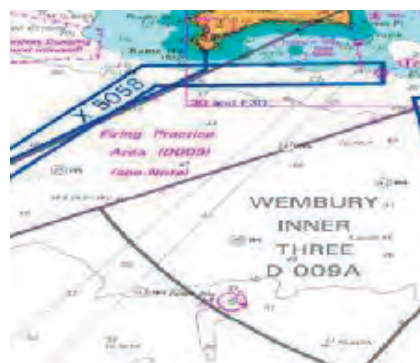
Standard navigational ARCS (as above) with additional data for Fleet operations and exercises. Not all Fleet charts are available as ARCS.

Format: HCRF

Supported systems: ECDIS/WECDIS

Supply: ARCS Licence from Defence Service Delivery and the RC20 disc with weekly updates.

Contact: defence.servicedelivery@ukho.gov.uk



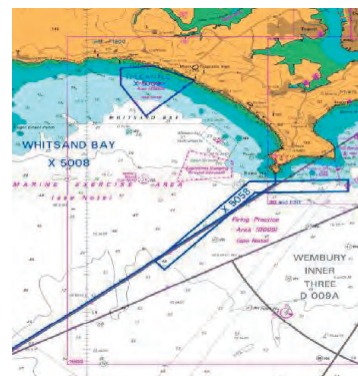
Fleet Charts

Based on Standard Navigational Charts with overlays adding exercises, training areas and operational or grid information. Most Fleet charts are available as Fleet ARCS charts. The Fleet data can also be viewed in AML.

Format: Some paper, TIFF, .pdf on request

Supply: Authorised demanders order through defence.servicedelivery@ukho.gov.uk

Updates: by Fleet ARCS Weekly update disc



Electronic Publications

Sailing Directions (Pilots), Tide Tables, Radio Signals, Lights Lists and other reference books are all available in electronic format. They require software installation and a license to be set up by Defence Service Delivery.

The ADMIRALTY Digital Catalogue (ADC) displays the limits of ENC's, paper charts and publications. It is available as a free download (60 meg) from the ADMIRALTY website:

<https://www.admiralty.co.uk/digital-services/catalogues/admiralty-digital-catalogue>

Benefits: Updates are quickly applied electronically via our website or via weekly discs
Additional products are supplied via a permit delivered by email; no need to wait for postal delivery of books.

Supply: Authorised demanders contact defence.servicedelivery@ukho.gov.uk

AENP (Electronic publications) includes:

Sailing Directions NP 1-74

NP 136 Ocean Passages for the World

NP 100 The Mariner's Handbook

NP 314 The Nautical Almanac

NP 231 Guide to the Practical Use of ENC's

NP 5012 Guide to ENC Symbols

Edition	Status	Expiry Date
2017	Up to Date	30 September 2020
2018	Up to Date	30 September 2020
2018	Up to Date	30 September 2020
2018	Up to Date	30 September 2020
2017	Up to Date	30 September 2020
2017	Up to Date	30 September 2020

Situational Awareness Products

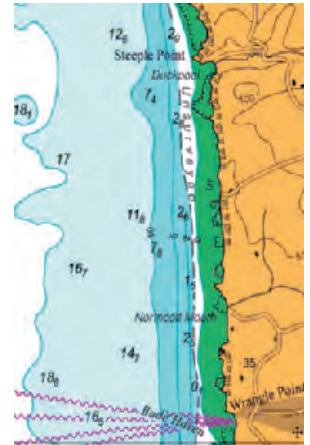
Geotiffs of Standard Nautical Charts

Derived as a by-product of ARCS, geotiffs have the borders removed and are not to be used for navigation. They are provided for situational awareness and briefing purposes only. Supplied as small digital files that can be delivered via email.

Purpose: Planning, briefings

Format: GEOTIFF

Supply: on request from defence.servicedelivery@ukho.gov.uk



AML

Additional Military Layers

Vector and gridded format digital data sets providing a unified, interoperable product for the enhancement of Situational Awareness. AML supports digital navigation within WECDIS to enhance manoeuvrability, access and reach of maritime forces.

The individual AML products are described below. More details are available in the AML Handbook and the AML User Guide; both are available from Defence Service Delivery.

Catalogues showing coverage are available from UKHO or MCSU.

Benefits: Increased operational effectiveness through better exploitation of the environment. A large amount of detailed data is available within the data sets.

Format: S57 AML v1.0 (and 2.0 for IWC)

Supported systems: WECDIS, DNA2, WAIS, SONAR Systems S2050 and S2091, CMS, S2117, ICC and non-surface combatant systems e.g. MERLIN Mk II Tactical Command System.

Supply: Automatic supply of the Global disc, by MCSU to Authorised Demanders; the CD is encrypted; supplied twice per year with additional New Editions of individual cells when required.

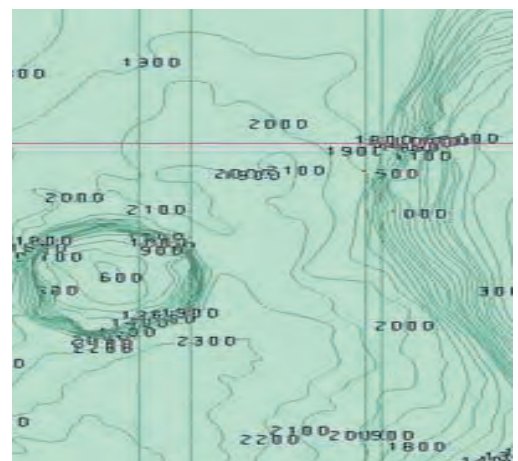
Updates: AML is updated according to the strategic priorities set by FLEET. Significant changes to AML RAL TTW limits are issued by New Edition as they occur.

MCSU Contact : +44 (0)2392212054 Email : NAVYIW-MCSUSVCDESK@mod.gov.uk

AML – Contour Line Bathymetry - CLB

High density contours, spot soundings, and depth areas.

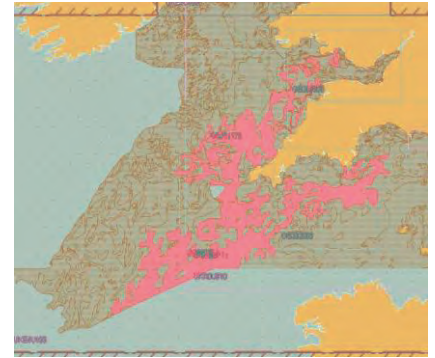
Designed for Anti-Submarine Warfare and any other maritime operations in which high definition bathymetric information is required.



AML - Environment Seabed & Beach – ESB

Designed to provide information about the seabed and beach areas in support of mine counter measures and amphibious operations. Includes:

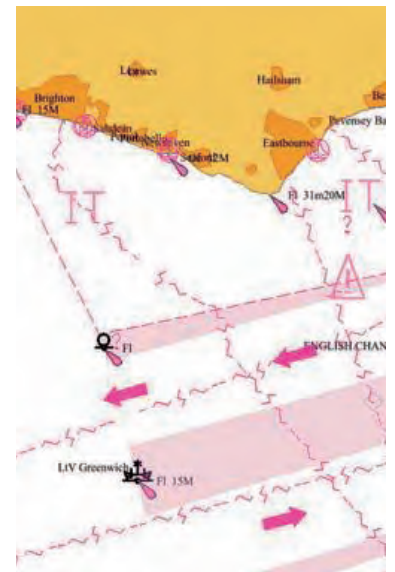
- Composition and depth of multiple sediment layers and bedrock
- Acoustic/physical properties
- Beach slope
- Sand waves
- Trawl scours
- Vegetation
- Large scale beach information
- Beach information is currently provided through the BISD products (see Beach Intelligence products).



AML - Maritime Foundation and Facilities – MFF

Contains features providing a reference background where standard navigational products such as ENCs are not available. Features included are:

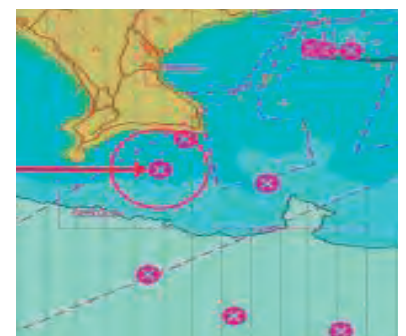
- Coastline
- Built up areas
- Lights
- Buoyage
- Magnetic information
- Tidal information
- Communications facilities
- Pipeline and cable data
- Fishing activity
- Wind farms, Oil gas production areas
- Traffic Separation Schemes
- Ice limits



AML – Large Bottom Objects - LBO

Contains all objects on the sea bed larger than 5 metres in any dimension. Each bottom object includes full attribution beyond that shown on a standard navigational chart; useful for submarine and anti-submarine operations and for mine warfare applications. LBO includes:

- Wrecks
- Rocks
- Obstructions



AML – Small Bottom Objects - SBO

Contains all known bottom contacts smaller than 5 metres in any dimension i.e. mines and mine-like objects.

Used for mine counter-measures, amphibious and route lead-through operations.

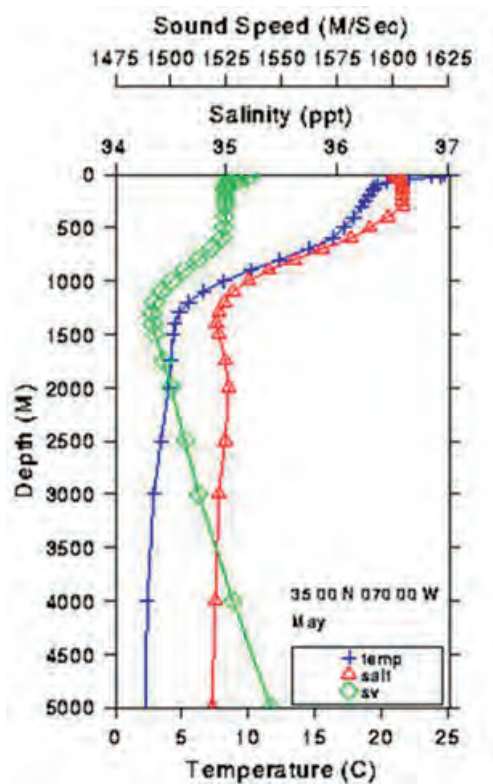
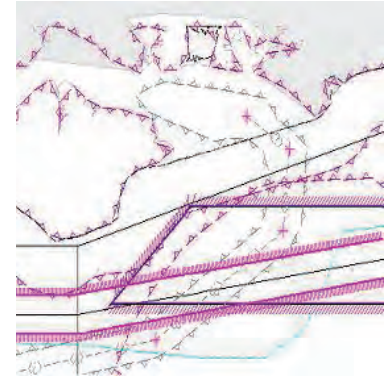
Mine Warfare data is supplied through the UKHO Mine Warfare Data Centre (see Mine Warfare Pilots).



AML – Routes Areas and Limits - RAL

A layer containing features useful for a variety of planning and operational purposes. It includes the following feature types:

- Territorial waters limits, EEZ, fishery limits, contiguous zone, continental shelf, straight territorial baselines
- Military Practice Areas – danger areas, PEXA, safe bottoming areas, testing and evaluation ranges
- Q routes
- Restricted areas e.g. historic wrecks, mine fields, safety zones
- Swept areas
- Waypoints/reporting/calling in points, NAVAIDS, helicopter reporting points, rendezvous points, radio calling in points



AML – Gridded Products

IWC – Integrated Water Column

Climatological data to describe the likely conditions to be found within the water column, including temperature, salinity and marine mammal distribution.

Format: NetCDF

AMC – Atmospheric and Meteorological Climatology

provided by the Met Office describes meteorological and climatological conditions to assist with operational planning. The gridded datasets include Wind speed direction and frequency, air temperature, relative humidity, dew point, pressure, cloud cover, visibility and the likelihood of meteorological phenomena.

Format: GRIB

GS-ESB – Gridded Sediment ESB contains gridded data on the geo-acoustic properties of the sediment layer in a gridded format.

Format: NetCDF

Submarine Paper Charts Shelf bathymetric contour charts

Submarine paper charts containing additional high-density contour information for submarine and ASW assets. These charts are not updated for Notice to Mariners and are for Situational Awareness use only.

Coverage is limited to 19 metric charts in Home Waters. These are available with authorisation from NAVY SHIPS SM NAVSEA SO2.

Benefits: Superior situational awareness.

Target User: Submariners, surface vessels and for training.

Format: Paper

Supply: Via Defence Service Delivery to Authorised Demanders.

General Geospatial Data Products

MFDB

Maritime Foundation Database

MFDB supports requests for standard Maritime data for GIS applications and users. The MFDB contains Global coverage of ARCS, AML, ENC, Fleet ARCS, Submarine ARCS and submarine ENCs data and is updated on a weekly basis.

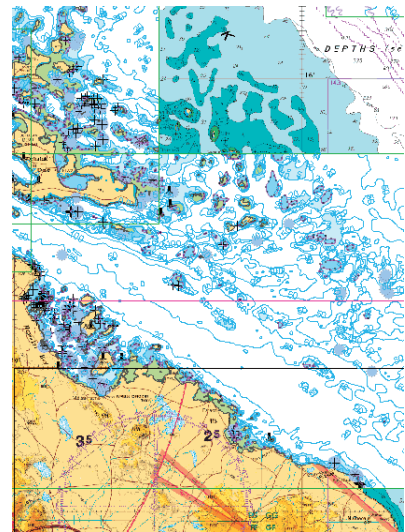
Formats: Shape Files, Personal Databases, File Database, Tiff and bespoke ArcGIS projects

Supported systems: ESRI Arc GIS

Benefits: Consistent structure and symbolisation of information. Standard ArcGIS projects supplied with standard MFDB layer files and presentation of data. Data is rendered to show vector data at the appropriate scale band.

Target User: Mission Planning and Situational Awareness support activities.

Supply: contact defence.servicedelivery@ukho.gov.uk



Operational Graphics

Generally, 'one-off' bespoke chart-like graphics, based upon existing navigational charts, using additional data held within UKHO or sourced from other organisations; for any operational, training, briefing purpose e.g. arbitrary grid for mine clearance.

Format: Any format as required

Supply: On request by Authorised Demanders via RFI

Fleet Thematic Charts

Non navigational charts and overlays e.g. Plotting, Grid, Planning. Coverage is shown in NP104 available from defence.servicedelivery@ukho.gov.uk

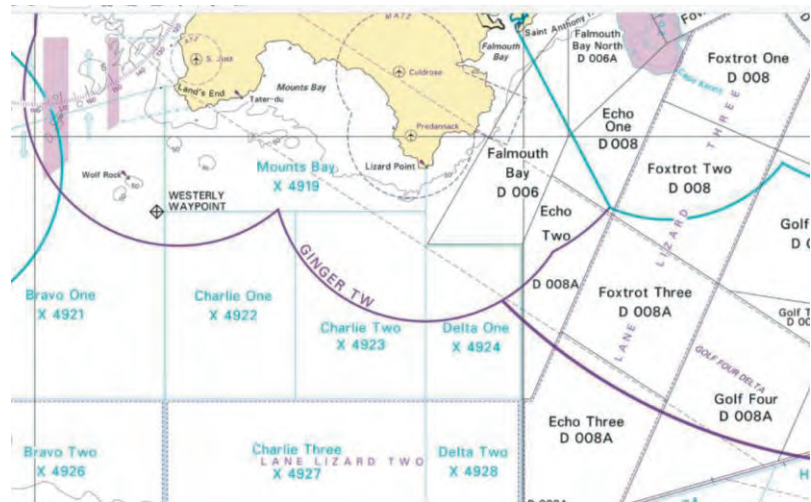
Purpose: Planning, Exercise, Situational Awareness

Format: Paper or digital

Supply: Supplied to Authorised Demanders as ordered



Examples of Fleet Thematic Charts



HMNAO Ground Illumination Diagrams (GIDs)

GIDs provide a significant amount of environmental awareness in a compact easy to understand format that can be annotated by the user for operational planning purposes.

The diagrams provide calculated millilux levels based on Sun and Moon positions and phase together with the effects of starlight and airglow. Three curves are provided for guidance on the effect of different sky conditions i.e. Clear, Cloudy and Very Overcast.

The diagrams also provide an assessment as to the darkest point/period, and the bearing and altitude of the moon during the 24hr period (midday to midday) together with the moon phase at midnight.

Sun rise/set, Moon rise/set, and twilight times are also included graphically on the diagram and in a separate table in the top right corner.

The three colour coded regions of the diagram provide guidance on how the human eye is likely to behave in the given millilux ranges, indicating whether colour vision or peripheral night vision is dominant.

Purpose: Designed to provide easy to understand situational awareness of natural lighting conditions, these offer a guide to how the human eye is operating at a specified location during a specified 24hr period.

Format: PDF

Supply: On request via RFI. Specifically request HMNAO GID and provide a location and date range.

Example of HMNAO Ground Illumination Diagram

HMNAO Ground Illumination Diagram

Location : UKHO, Taunton
Longitude : 003° 04' 35" W
Latitude : 51° 01' 23" N
Altitude : 22.0 metres
Time Zone : +00^h 00^m

Rise/Set & Twilight Times
Moon Set : 10:16
Moon Rise : 23:16
Sun Set : 17:10
Sun Rise : 07:42
Civil Twil. End : 17:44
Civil Twil. Start : 07:08
Naut. Twil. End : 18:23
Naut. Twil. Start : 06:28
Astr. Twil. End : 19:02
Astr. Twil. Start : 05:50
Hrs. Dark. Start : 17:40
Hrs. Dark. End : 07:12

Notes:

Daylight - Clear
Daylight - Cloudy
Daylight - Very Overcast

Civil Twilight

Photopic - Cones / Day

Mesopic - Cones & Rods

Scotopic - Rods / Night

Colour perception in the human eye requires cones

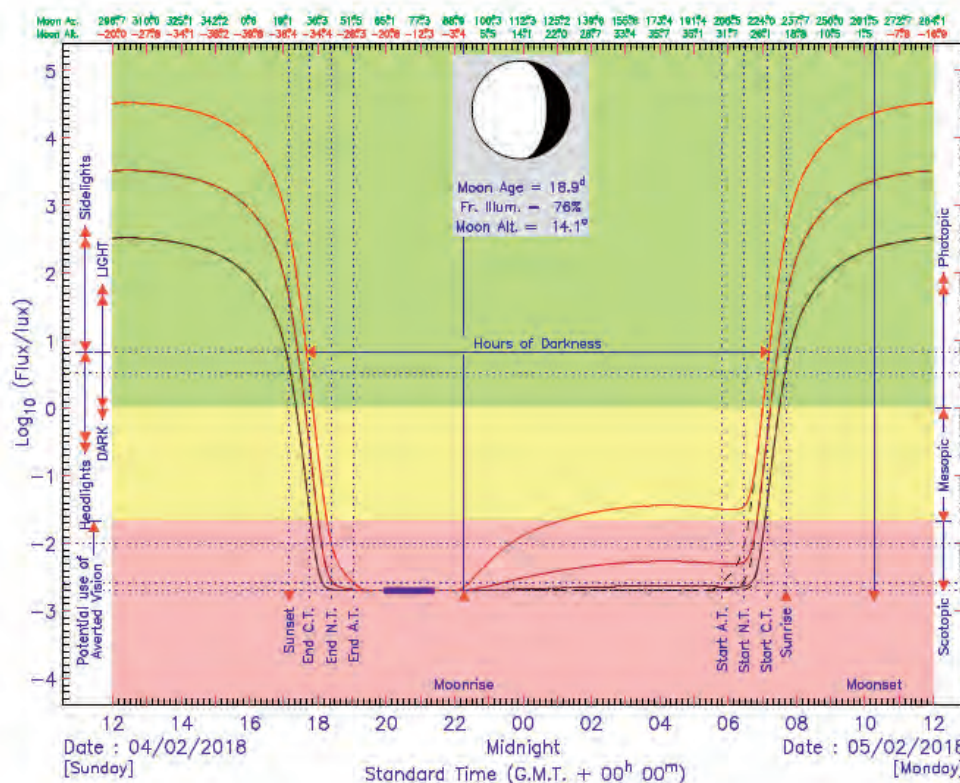
Nautical Twilight

Astronomical Twilight

Airglow & Starlight

■ - Probable darkest point or part of the night

Flux (millilux)



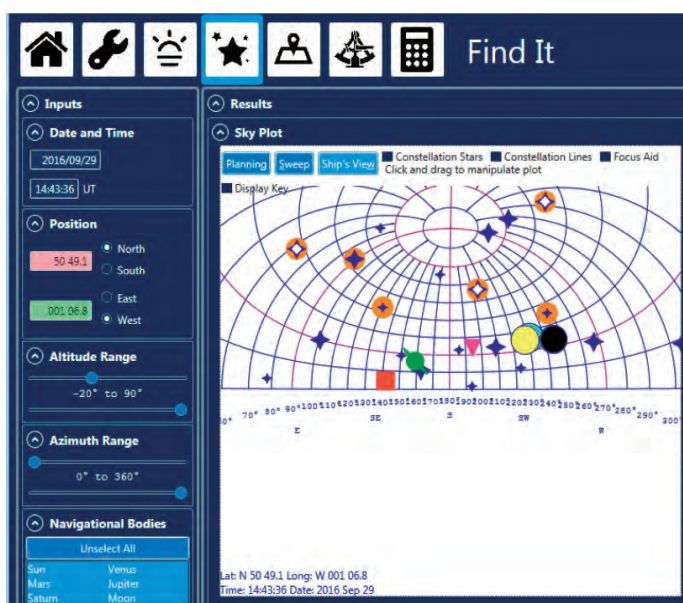
NavPac and Compact Data DP330

A software product designed to assist in Astro-Navigation and in situations where GNSS positioning data are denied or corrupted. Also, provides facilities for Sun and Moon rise/set times and twilight times for any location, and celestial navigational object azimuth positions for bearing-only navigation and mandatory compass checks.

Purpose: Designed to assist in the planning and practice of Astro-Navigation and provides situational awareness for celestial object positions.

Format: Software

Supply: contact
defence.servicedelivery@ukho.gov.uk



Maritime Environmental Awareness Products

DMEB

Defence Maritime Environmental Brief

Produced by the Tactical Products Team, DMGIC, the Defence Maritime Environmental Brief (DMEB) exists to support the Royal Navy by improving situational awareness and information superiority through the effective exploitation of marine environment information. Together the PDF and geospatial elements of the DMEB provide a comprehensive situational awareness tool for environmental planning to support RN exercises and operations.

Product description: An encyclopaedic environmental planning product comprising of the following: geological & geophysical, human and economic, meteorology, oceanography, biology, acoustics, mine warfare, atmospheric phenomena, and lessons learned. The DMEB consists of textual and graphical information in PDF format (including GeoPDF interactive graphics) and is supported by a geospatial ESRI ArcReader package.

Format: Adobe .pdf and ESRI ArcReader (.pmf)

Supply: Included on DMGIC laptop OR available on single CD/DVD via the channels below:

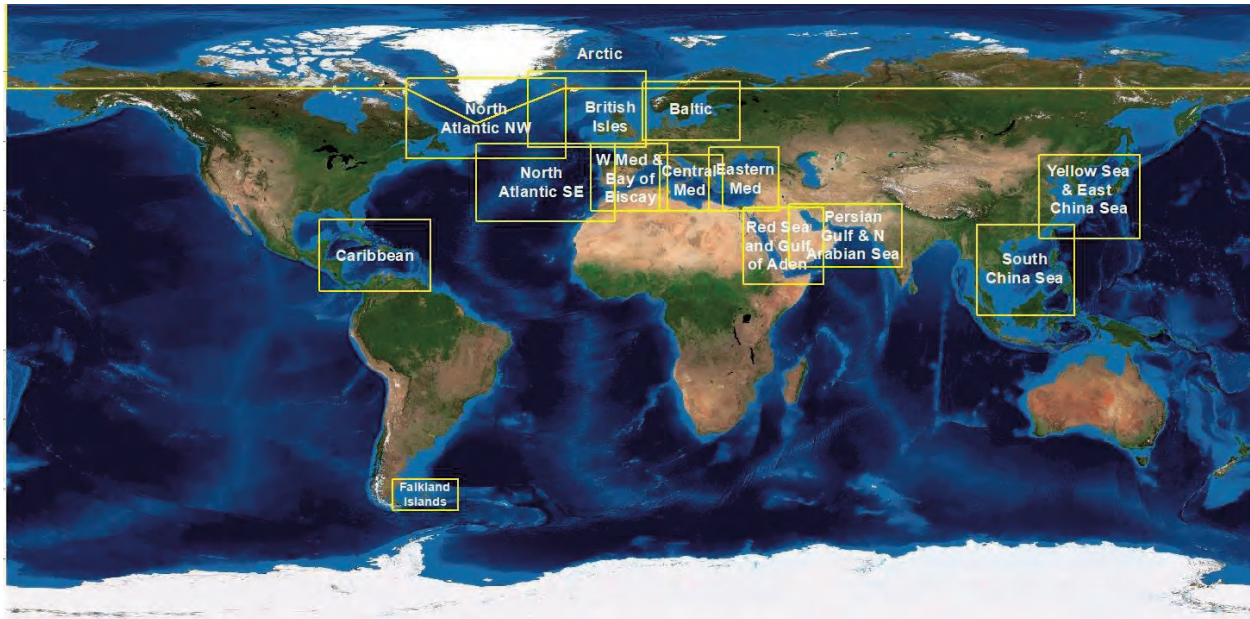
- Request from MSCU if not already on their distribution list
- Request via RFI

Note: DMEBs will gradually replace the existing EBDs as they become available in line with Fleet priorities.


DMEB coverage

DMEB Region	Versions available	Issue Date
Eastern Mediterranean & Black Sea	OS, S	September 2016
Red Sea & Gulf of Aden	OS, S	March 2017
Arctic	OS, S	September 2017
Central Mediterranean	OS, S	March 2018
North Atlantic Northwest	OS, S	September 2018
Baltic Sea	OS, S	April 2019
North Atlantic Southeast	O, S	August 2019
South China Sea	O, S	January 2020
Yellow Sea & East China Sea	O, S	March 2020
Western Mediterranean & Bay of Biscay	O, S	September 2020
Caribbean	O, S	March 2021
The British Isles - (Ed. 2)	O, S	April 2021
Falkland Islands	O, S	July 2021
Persian Gulf & North Arabian Sea - (Ed. 2)	O, S	October 2021

DMEB coverage




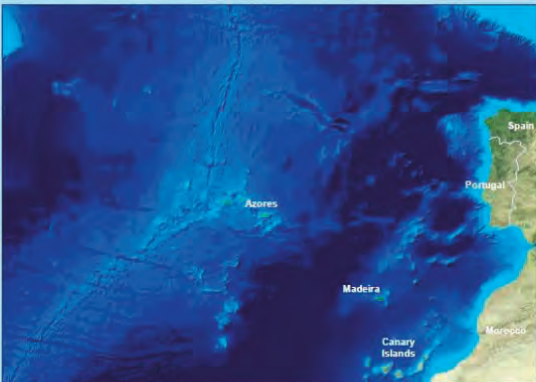
Example DMEB



UK Hydrographic Office

Defence Maritime Environmental Brief
NORTH ATLANTIC SOUTHEAST





GEOLOGICAL & GEOPHYSICAL

ACOUSTICS

OCEANOGRAPHY

ARCREADER PROJECT

BIOLOGY

METEOROLOGY

SOURCES

INTERACTIVE MAPS

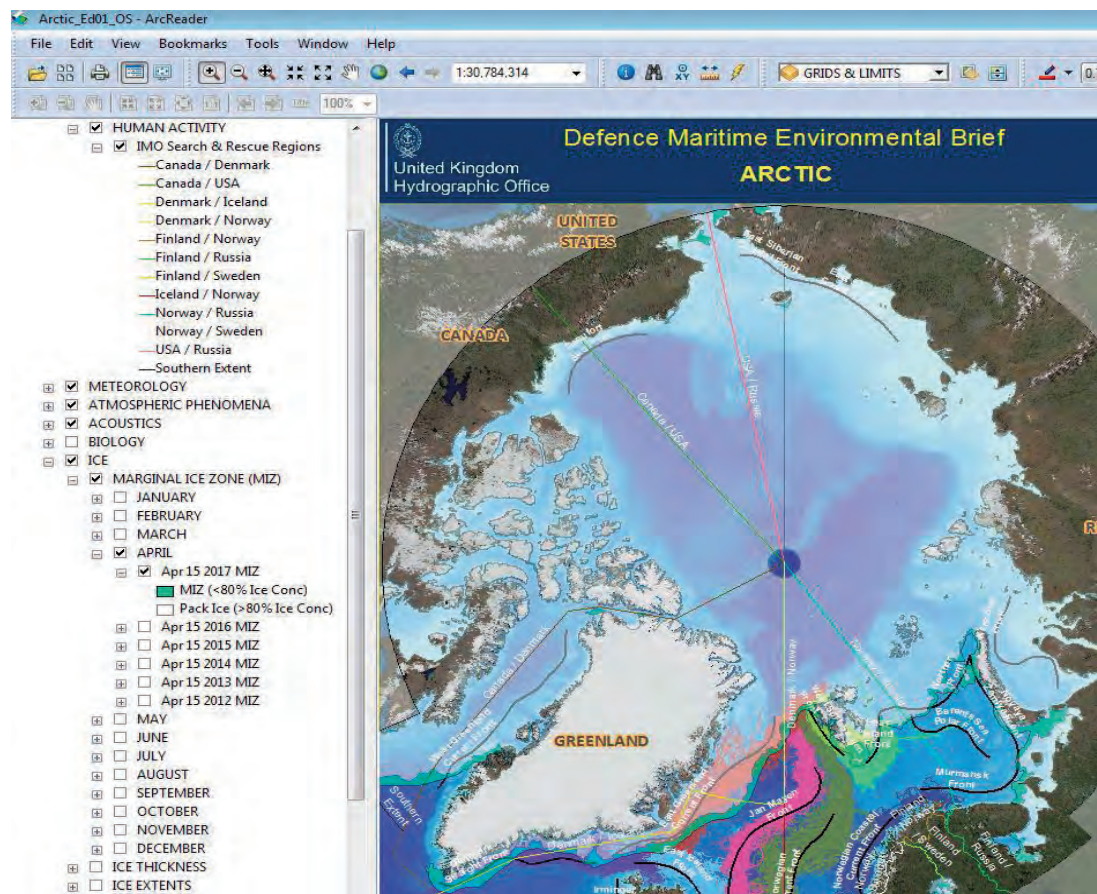
HUMAN & ECONOMIC

ATMOSPHERIC PHENOMENA

Produced by:
Tactical Products Team
Defence Maritime Geospatial Intelligence Centre
UK Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN, United Kingdom

Edition 1
September 2019

Extract of DMEB ArcReader Project

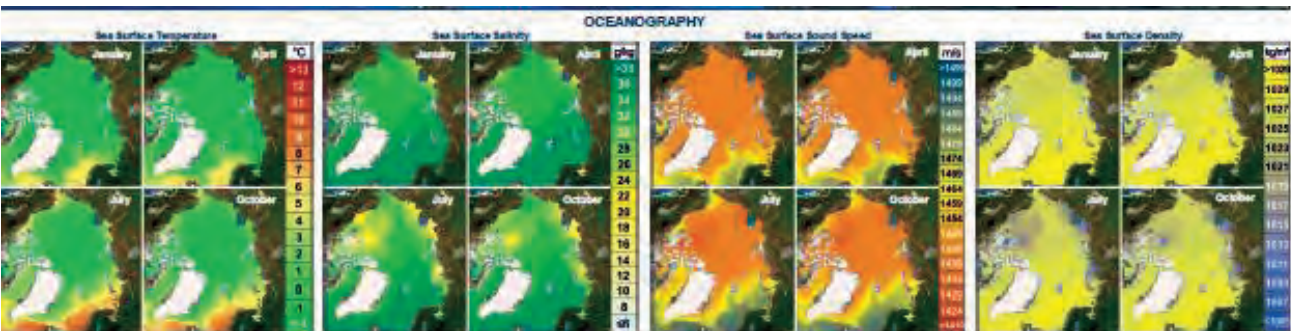


EAC
Environmental Awareness Chart

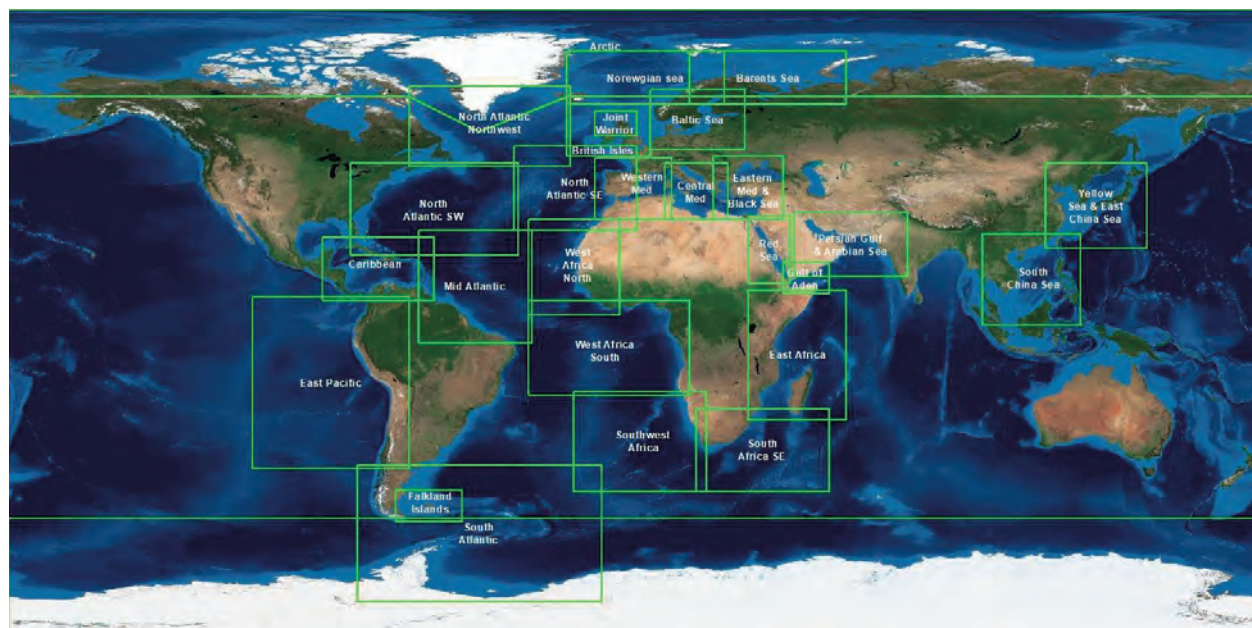
Initially developed and produced by JOMOC, Environmental Awareness Charts are produced by the Tactical Products Team, DMGIC. The product is used as a planning aid for RN exercises and operations.

Product description: Analogue Graphics which display a selection of key environmental parameters for quick reference. Information provided includes climate station data, sound velocity profiles, climatology, geology and marine mammal information.

Format: A1 size printed charts or as pdf supplied on a CD
Supply: On request for Authorised Demanders; contact defence.servicedelivery@ukho.gov.uk



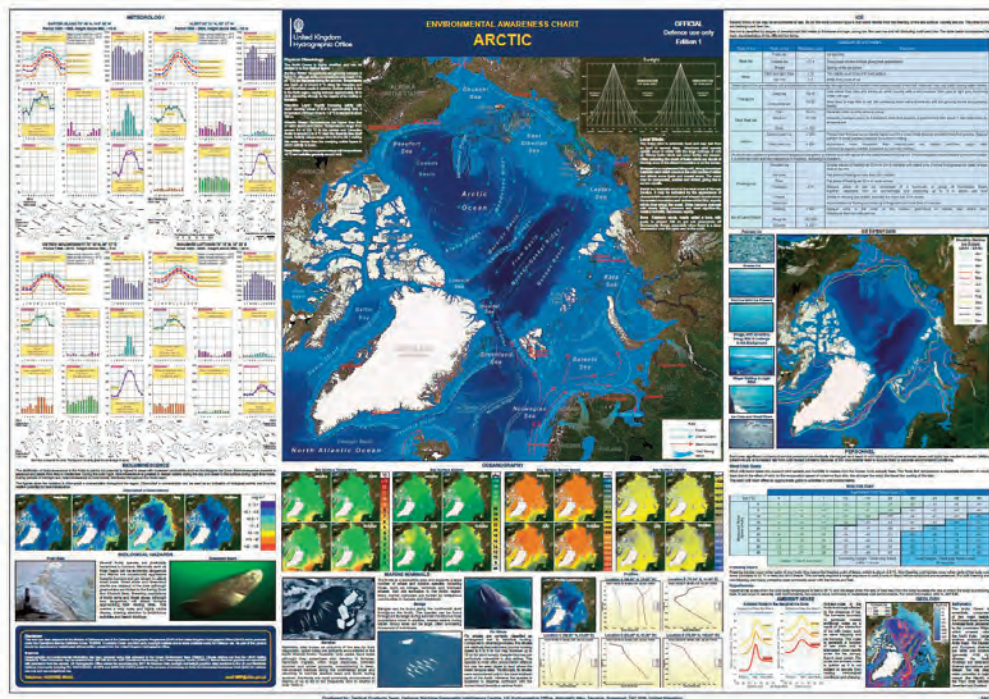
EAC coverage



EAC Catalogue

EAC Chart Order No.	EAC Digital CD Order No.	EAC Title	EAC Version
EAC1	EAC1CD	Persian Gulf & North Arabian Sea	1.0
EAC2	EAC2CD	Eastern Med. & Black Sea	1.0
EAC3	EAC3CD	Northern Waters (Norwegian Sea)	1.0
EAC4	EAC4CD	Northern Waters (Barents Sea)	1.0
EAC5	EAC5CD	Baltic Sea	1.1
EAC6	EAC6CD	Central Mediterranean	1.1
EAC7	EAC7CD	Western Mediterranean	1.0
EAC8	EAC8CD	British Isles	1.0
EAC8JW	EAC8JWCD	Joint Warrior	1.1
EAC9	EAC9CD	Red Sea	1.0
EAC10	EAC10CD	Gulf of Aden	1.0
EAC11	EAC11CD	North Atlantic SE	1.0
EAC12	EAC12CD	Caribbean	1.0
EAC13	EAC13CD	Falkland Islands	1.0
EAC14	EAC14CD	Arctic	1.0
EAC15	EAC15CD	East Pacific	1.0
EAC16	EAC16CD	South Atlantic	1.0
EAC17	EAC17CD	North Atlantic Northwest	1.0
EAC18	EAC18CD	South China Sea	1.0
EAC19	EAC19CD	Yellow Sea and East China Sea	1.0
EAC20	EAC20CD	East Africa	1.0
EAC21	EAC21CD	Southeast Africa	1.0
EAC22	EAC22CD	North Atlantic SW	1.0
EAC23	EAC23CD	West Africa North	1.0
EAC24	EAC24CD	West Africa South	1.0
EAC25	EAC25CD	Mid-Atlantic	1.0
EAC26	EAC26CD	Southwest Africa	1.0
EAC27	EAC27CD	Antarctic	1.0

Example EAC



EBD

Environmental Briefing Docket

Encyclopaedic review of environmental conditions likely to be expected in an area. Headings include: Geological & geophysical, human & economic, meteorology, ice, oceanography, biology, acoustics, atmospheric phenomena, mine warfare operations, lessons learned, exchange data.

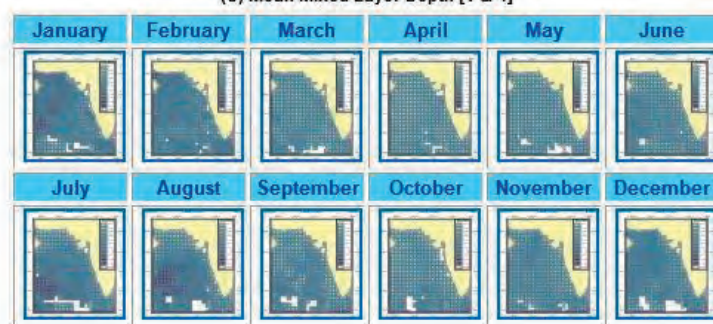
Purpose: Designed to assist in the planning of exercises and operations and to help an operator or user make the best tactical use of the environment.

Format: HTML or pdf

Supply: Distributed by MCSU

Note: EBD will gradually be replaced by DMEBs.

(U) Mean Mixed Layer Depth [1 & 4]



Example EBD

Arabian Sea EBD

Edition 2 - August 2009

- HOME
- INTRODUCTION
- GEOLOGICAL & GEOPHYSICAL
- HUMAN & ECONOMIC
- METEOROLOGY
- ICE
- OCEANOGRAPHY
 - 5.1 Data Collection
 - 5.2 Physical Climatology
 - 5.3 Mixed Layer Depth
 - 5.4 Sea and Swell
 - 5.5 Ocean Features
 - 5.6 Ocean Lunar Features
 - 5.7 Ocean Optics
 - 5.8 Sources
- BIOLOGY
- ACOUSTICS
- ATMOSPHERIC PHENOMENA
- MINE WARFARE OPERATIONS
- LESSONS

UNCLASSIFIED

5.3 MIXED LAYER DEPTH

INTRODUCTION

(U) The mixed layer depth (MLD) is defined as the surface layer of water which has very little vertical temperature gradient. The depth of the mixed layer is evaluated from observed temperature profiles. The MLD values are calculated on a 1° by 1° grid for each month, using a catchment area of 2° x 2° (50% spatial overlap). The temperature profiles are taken from the MEIC Maritime Environment Data Store (MEDS) database. [1]

(U) Plots have been generated for January through to December to represent the mean MLD range for each grid cell (see Figures 5.170 to 5.181). These plots give a colour graded indication of the spatial variability of the mixed layer. Areas left blank indicate insufficient observations for MLD analysis.

(U) Mean Mixed Layer Depth [1 & 4]

(U) The seasonal cycle of the mean mixed layer depths, are presented in graphs (see Figures 5.183 to 5.190) for the representative positions see Figure 5.182. From these graphs, the mean MLD values over the whole seasonal cycle approximate to the values shown below (Table 5.2).

Location	Latitude (N)	Longitude (E)	Mean MLD (m)
A. Arabian Sea, Oman coastal current	20.00	59.00	31.28
B. Murray Ridge	22.00	62.00	33.17
C. N. Arabian Sea	24.00	64.00	34.18
D. Adjacent to Indus Delta	23.00	67.00	31.51

Global Ocean Atlas

Detailed Global Encyclopaedias for:

- Marine Biology
- Ocean Features
- Internal Waves

Purpose: Situational Awareness planning for tactical exploitation of the marine environment

Target user: Royal Navy/MOD

Supply: Via MCSU

OCEAN FEATURES GLOBAL ATLAS

Edition 2 - September 2005

Celtic Sea Front

Alternative Names: None

General Description:
There is a clearly defined tidal front at the northern end of the Celtic Sea, which separates cool well-mixed Irish Sea water from warmer stratified Celtic Sea water. The general location of this feature is shown in Figure NEA-5-1.

The front occurs mostly between St. David's Head in South Wales and Rosslure in Ireland but has been observed to extend W along the southern Irish coast as far as Cork and S across the Bristol Channel to the North Devon coast.

The front is a seasonal structure caused by the summer stratification of the Celtic Sea. This warmer stratified water flows towards the cooler well-mixed Irish Sea. Where the two water masses meet the front occurs.

NP141A

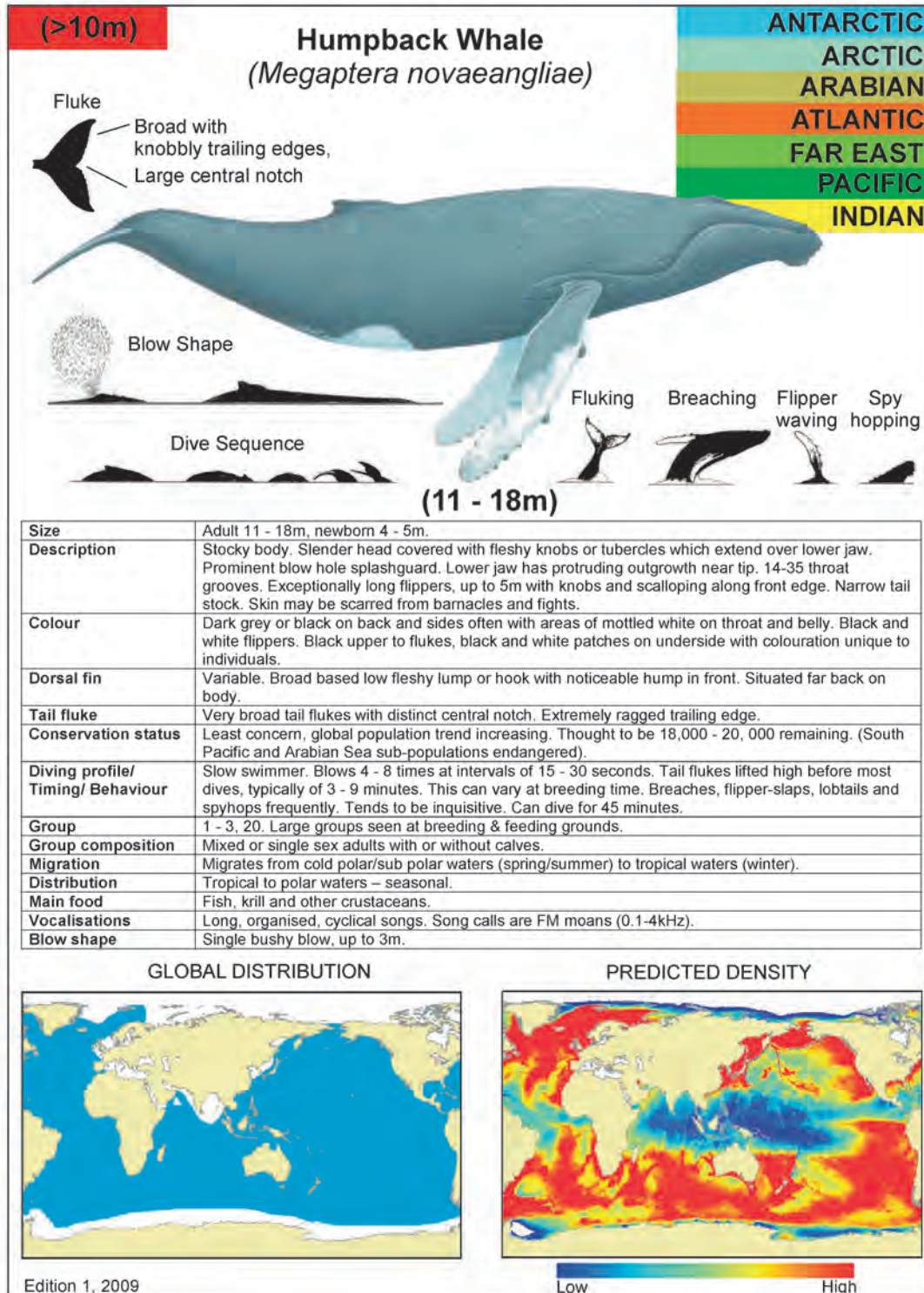
Identification Guide to Whales, Dolphins and Porpoises

Purpose: Provides species and behavioral information to assist Marine Mammal Observers with identification and accurate recording of sightings to aid effective planning and mitigation during naval exercises and operations.

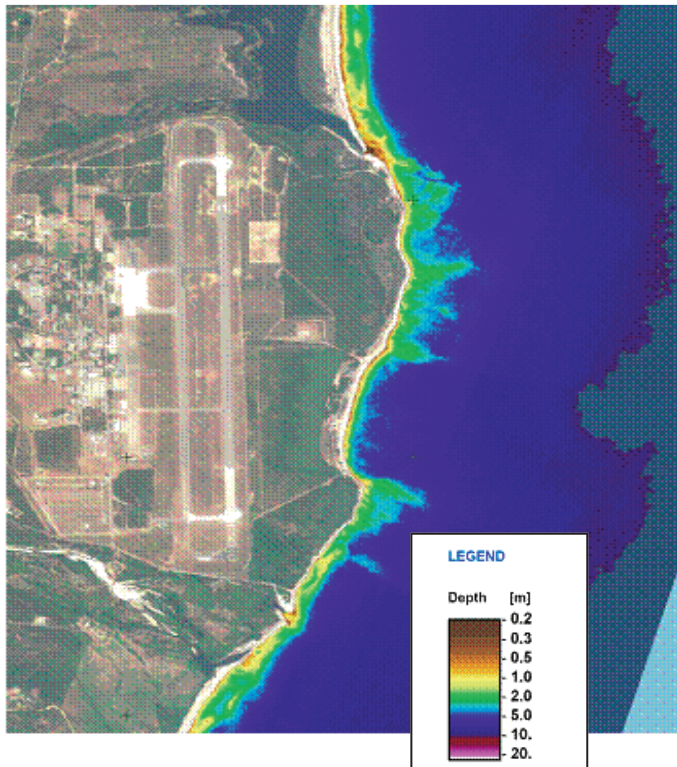
Target user: Royal Navy/MOD

Format: Water Resistant Hardcopy or PDF

Supply: Hard copy via Defence Service Delivery. PDF versions are contained within DMEB, EBDs and SPSs



Beach and Port Situational Awareness



Satellite Derived Bathymetry (SDB)

SDB provides depth information from the beach to approximately the 10m contour. While not as accurate as a full survey it can provide details of 'no-go' areas and areas for further investigation in the field. The product requires up to date cloud free satellite imagery which DMGIC will identify from either military or commercial sources. The data is normally merged into other beach or port products after analysis which may take several weeks.

Purpose: To provide increased situational awareness bathymetry in the near shore area

Target user: Royal Navy/Royal Marines

Format: printed or digital as part of other beach/port products

Supply: normally through the RFI process

LitR Littoral and Riverine

The LitR team within DMGIC provides bespoke products to enhance the situational awareness and tactical exploitation of the environment specific to littoral and riverine operations and exercises. Data and products are compiled from a wide variety of sources to meet applications including humanitarian crisis, Special Forces training and operational deployments. The LitR team welcomes visitors to UKHO and are equally happy to visit you where viable.

To discuss requirements, contact Beach-Intel@ukho.gov.uk

LitR products: **STOIC** - Special Tactical Operational Information Chart

BIGS - Beach Intelligence Geospatial Summary

HPA - Hydrographic Port Assessments

Country Reports

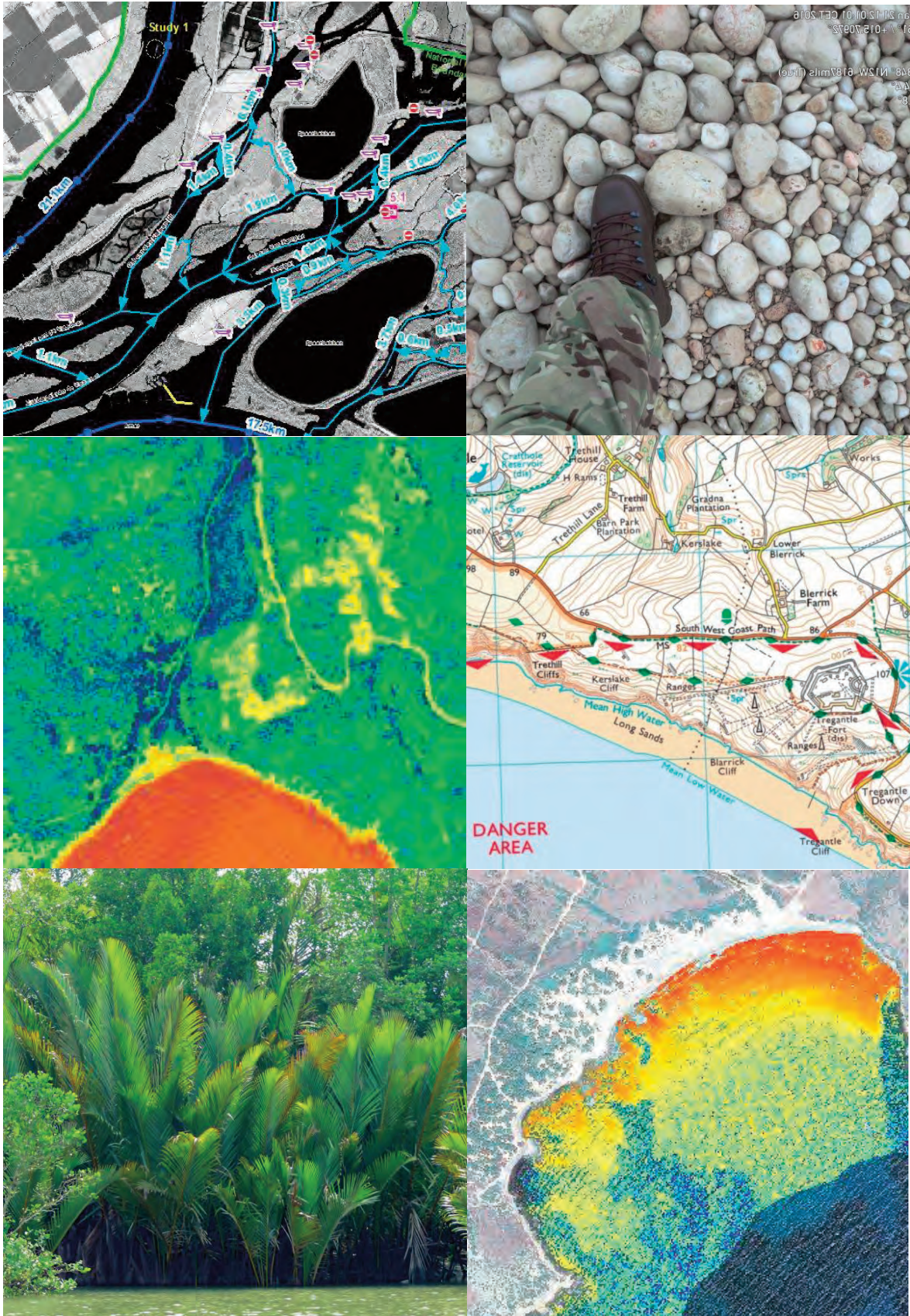
Data Sources: Charting, Mapping, 3D imagery, high resolution satellite imagery, vegetation vigour analysis, satellite derived bathymetry, cross-country movement, photography, ground illumination diagrams

Purpose: To provide Situational Awareness information specific to an operation or exercise at large scale and a level of detail greater than on nautical charts.

Target user: Royal Navy/Royal Marines

Format: bespoke to meet the needs of the deployment and location.

LitR product examples: overlays, photography, vegetation, mapping, satellite imagery



HPA Hydrographic Port Assessment from LitR

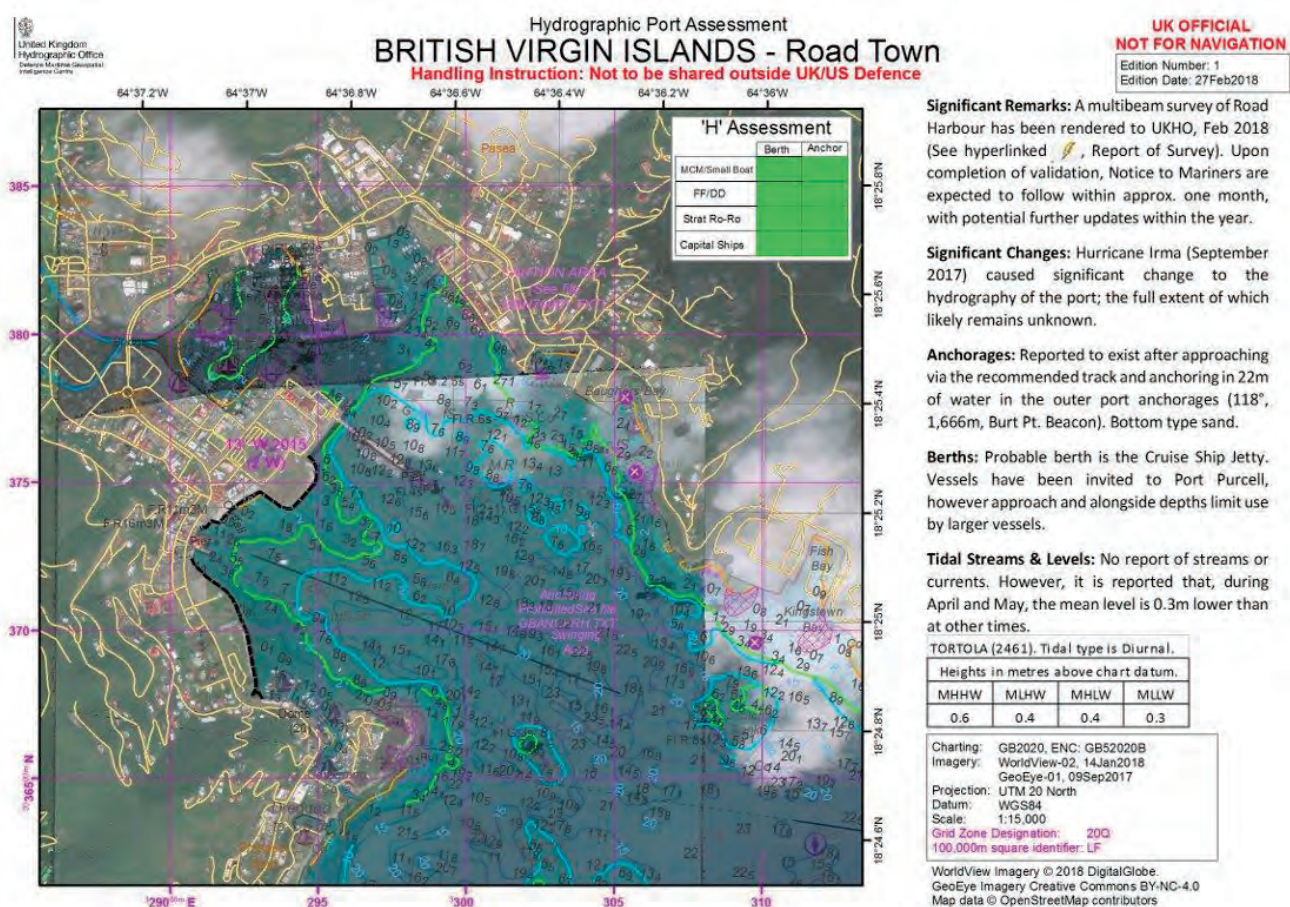
HPAs provide the hydrographic element of the Port Infrastructure Vulnerability Assessment (PIVA). They bring together high-resolution satellite imagery, charting and mapping and indicate the suitability of berths and anchorages and key features that would affect ship's movement. Can be provided at short notice.

Purpose: Port & Harbour Situational Awareness

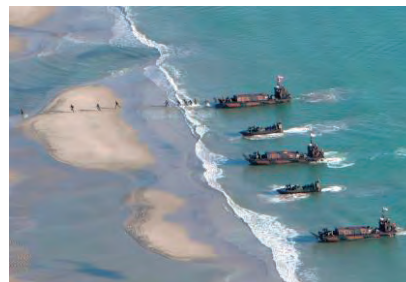
Format: Fully interactive ESRI ArcMap document with supporting data.

Supply: On request via RFI

Example of Hydrographic Port Assessment



HMS Mersey's seaboot



Beach Landing

BIGS
Beach Intelligence Geospatial Summary from LitR

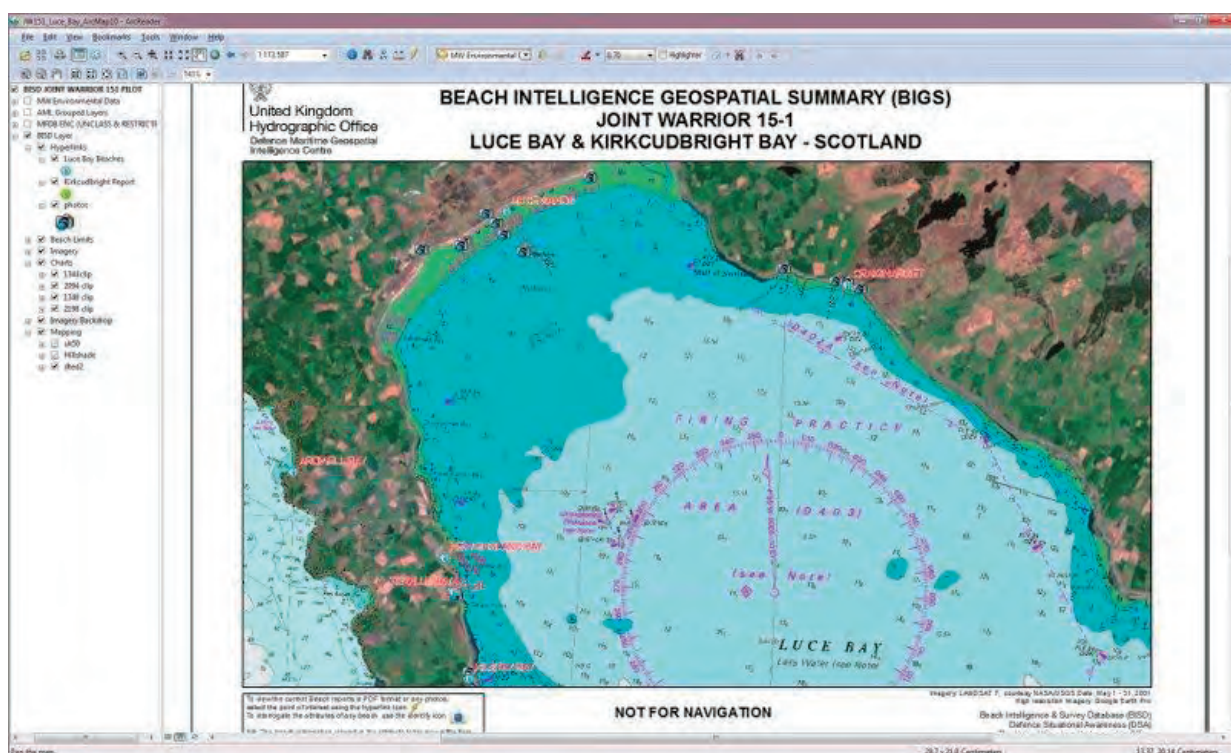
BIGS combine a variety of source data and software into a layered interactive ESRI ArcReader package bespoke for operations. Non-geo-spatial information such as photos, 3D views, beach reports, tidal and lunar information are hyperlinked within the project. Both the data and software are provided to enable you to pan, zoom and interrogate the area of interest.

Purpose: Increased situational awareness and planning tool

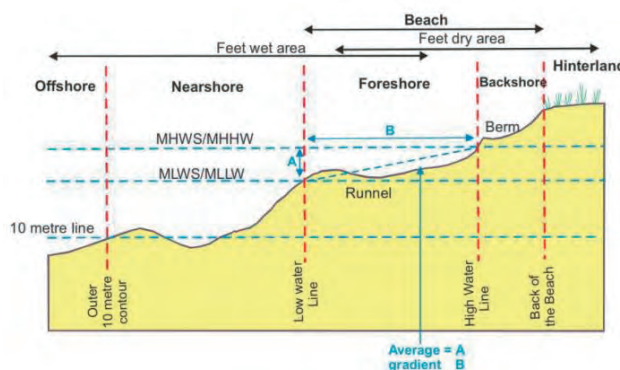
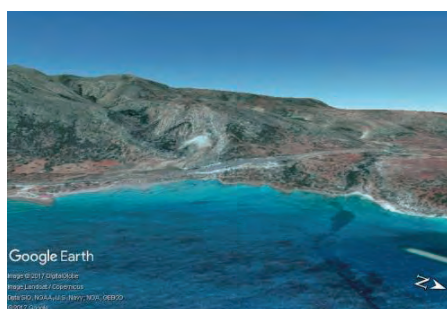
Format: Interactive ESRI ArcReader document with supporting data or fully functional ArcMap mxd. Project with supporting data.

Supply: On request via RFI or direct from Beach-Intel@ukho.gov.uk

Example BIGS



Extracts from BIGS



STOIC

Special Tactical Operational Information Charts from LitR

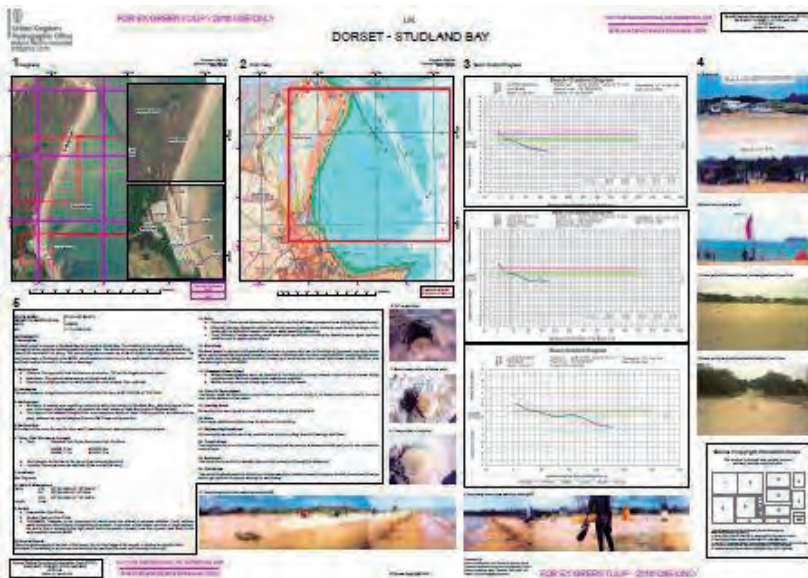
STOICs are multi-panel printed charts usually relevant to a single beach. They provide wide ranging information including beach gradients, large scale chart and map extracts, photography, satellite imagery, vegetation analysis, tidal data from data already held in UKHO. A bespoke service providing data for briefing purposes and operations such as beach landings. The delivery timescale is dependent on the complexity of the requirement. Should be destroyed after use as updating is not provided.

Purpose: Enhancement of Situational Awareness

Format: Generic eg. pdf, jpeg, geotiff, tiff or printed paper.

Supply: Through the RFI process but can be discussed prior to the RFI submission via Beach-Intel@ukho.gov.uk

Example STOIC



STOIC (In Theatre)

Create your own STOIC combining UKHO data and data collected in theatre.

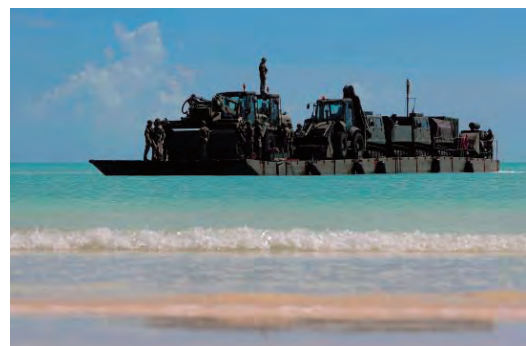
Existing data relevant to the operation or exercise is supplied on a laptop for users to create their own digital or printed STOIC, or Powerpoint document for briefing purposes. The software to create the document is provided. Field gathered data can be added to data supplied by UKHO. For briefing purposes and operations such as beach landings.

Limitations: Relies on the IT capability of the user but training can be provided at DMGIC if required.

Purpose: Briefings and operations.

Format: existing UKHO data supplied on a laptop

Supply: On request via Beach-Intel@ukho.gov.uk



HADR Team RFA Mounts Bay

Country Reports from LitR

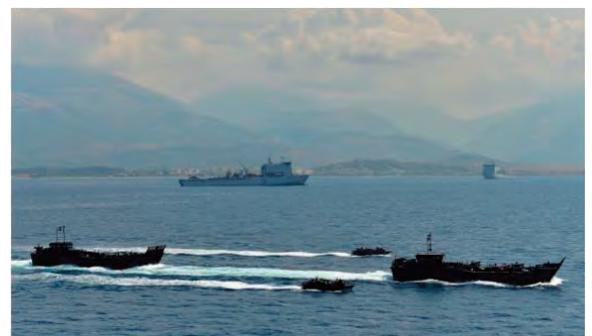
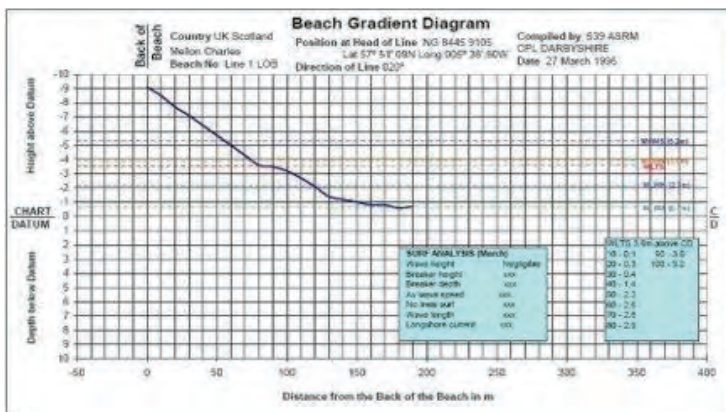
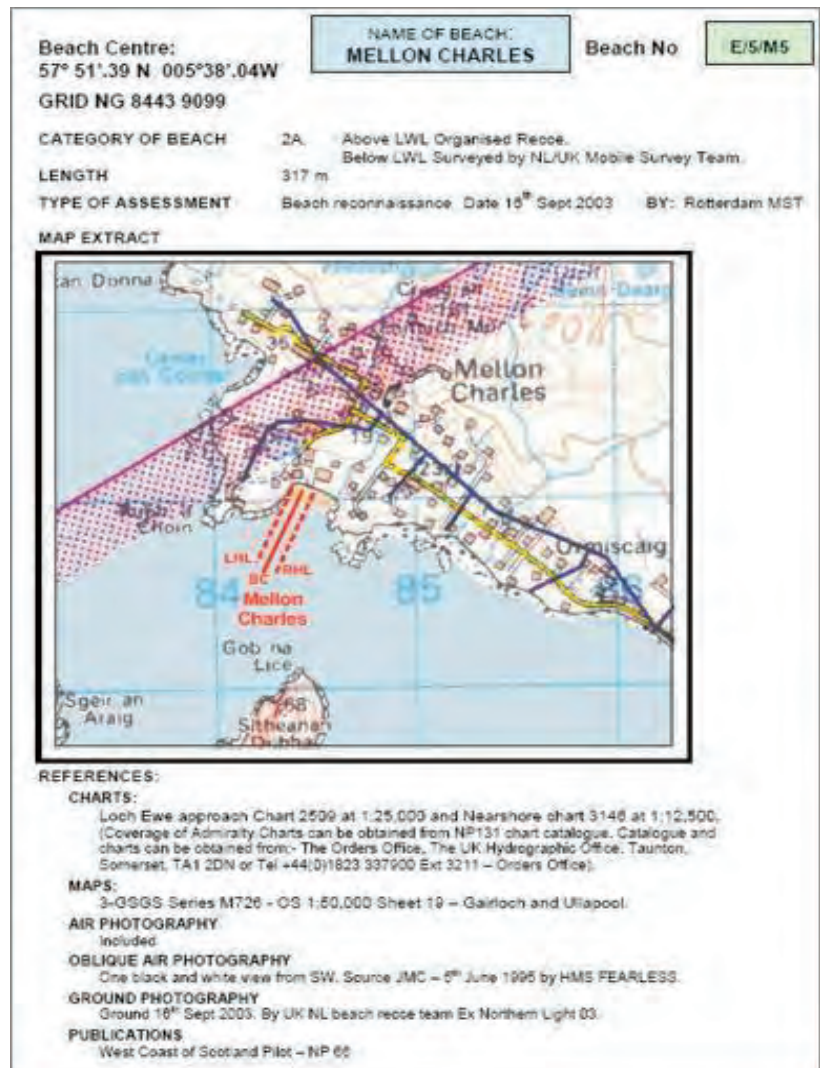
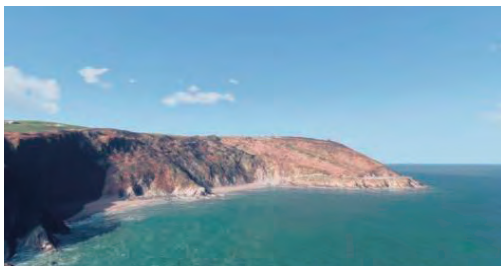
Country Reports provide information on specific beaches and landing places throughout the world. They are ideal for preliminary planning and contingency when an exact destination remains unknown until the last minute. More text based than other LitR products, Country Reports include graphics that have been scaled to fit small screen laptops and cover all recced beaches and landing places within the country.

Purpose: Preliminary planning

Format: pdf or printed paper.

Supply: On DMGIC laptops or requested directly via Beach-Intel@ukho.gov.uk

Also supplied directly to named RM/RN customers by MCSU DIS.



Strategic Port Summary

Encyclopaedic summary of environmental conditions effecting UK port approaches, relevant to certain RN and other operations.

Purpose: Situational Awareness products to be used to supplement the environmental information contained in the Electronic AMP11 Vol. XII product series, and MSIDS produced for OP ROCOCO areas and MCM Training.

Target user: Royal Navy/MOD

Format: HTML

Supply: Via MCSU DIS.

Mine Warfare Situational Awareness

Mine Warfare Pilots

A classified ESRI ArcReader package for Windows Laptop/PC or NAUTIS PC. The Pilots, accompanied by a software disc, provide enhanced situational awareness of the seabed environment in support of Mine Countermeasures Operations and Exercises. The Pilots are regularly updated.

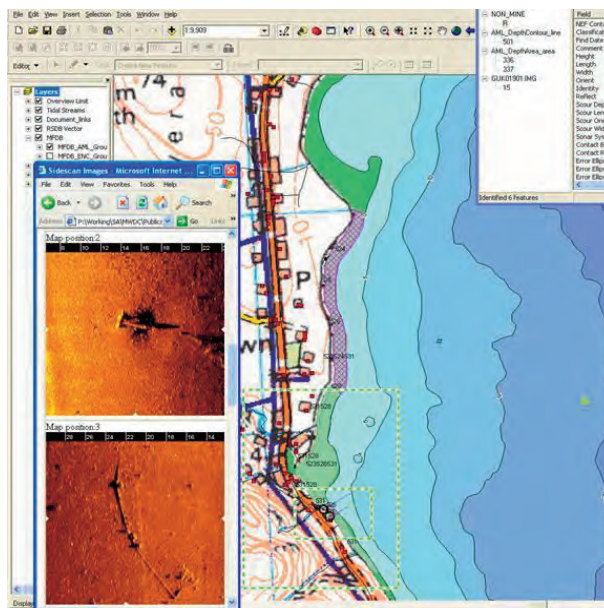
Purpose: Operational Planning and Briefing

Benefits: Increased geospatial intelligence of the seabed environment enhances operational planning and ultimately increases the tempo of Route Survey Operations and EOD clearance.

Target User: RN MCMVs, MASTT, FOST, JTEPS, MCM Squadron TAs and Fleet Diving Squadrons.

Format: Arc Reader Project (pmf) on CD or DVD

Supply: Directly from UK Mine Warfare Data Centre



Oceanography

GPPDB Gridded Physical Properties Database

The Gridded Physical Properties Database is a collective term for a series of gridded oceanographic products which contain representative vertical profiles of temperature, salinity and sound speed. Supported systems - WADER, SONAR 2117.

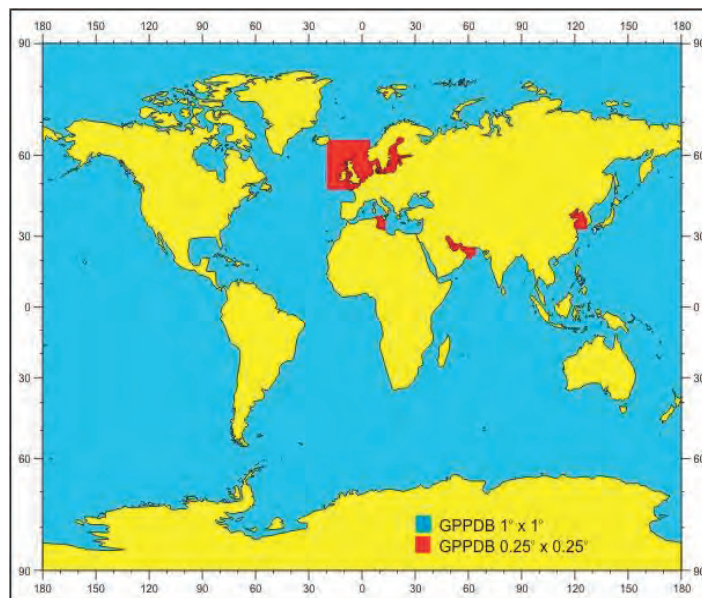
Purpose: Situational Awareness planning for tactical exploitation of the environment

Format: Internal UKHO
textformats/NetCDF

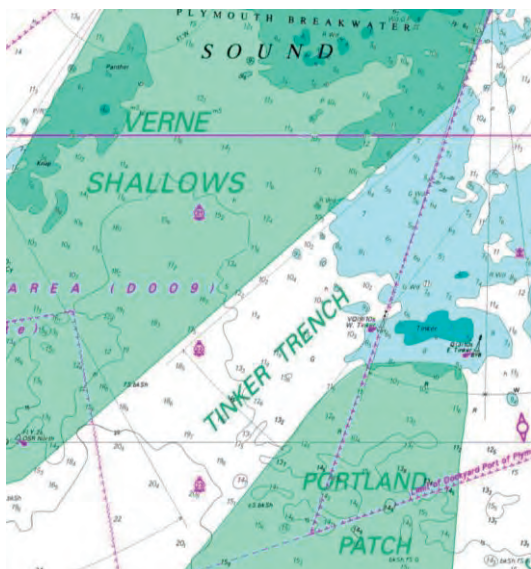
Supported systems: WADER, S2117, WECDIS

Target user: Royal Navy/MOD

Supply: WADER, S2117; Authorised bespoke requests.



Exercises & Training



Fleet Training Charts

Standard navigation charts with additional fictitious information, such as shoal patches, obstructions, land masses, for use in training scenarios.

Benefits: Enable training exercises to have fictitious scenario-based information on a navigational product, allowing safe navigation whilst carrying out training.

Format: Fleet ARCS (digital) and AML. Paper charts are supplied on an exceptional basis, digital is the default for Fleet overlays.

Supported systems: Any system capable of ingesting ARCS including WECDIS

Supply: Check availability in NP104

Contact: defence.servicedelivery@ukho.gov.uk



Defence Maritime Geospatial Intelligence Centre (DMGIC)

United Kingdom Hydrographic Office

Admiralty Way

Taunton

Somerset

TA1 2DN

Telephone +44(0) 1823 48 3708

Email defence.servicedelivery@ukho.gov.uk



UK Hydrographic Office

Defence Maritime Geospatial Intelligence Centre (DMGIC)
The United Kingdom Hydrographic Office
Admiralty Way, Taunton, Somerset
TA1 2DN, United Kingdom
Telephone +44 (0)1823 484444
Email defence.servicedelivery@ukho.gov.uk



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