Scottish MPA Project

Data Confidence Assessments

HATTON-ROCKALL BASIN NATURE CONSERVATION MPA

JULY 2014

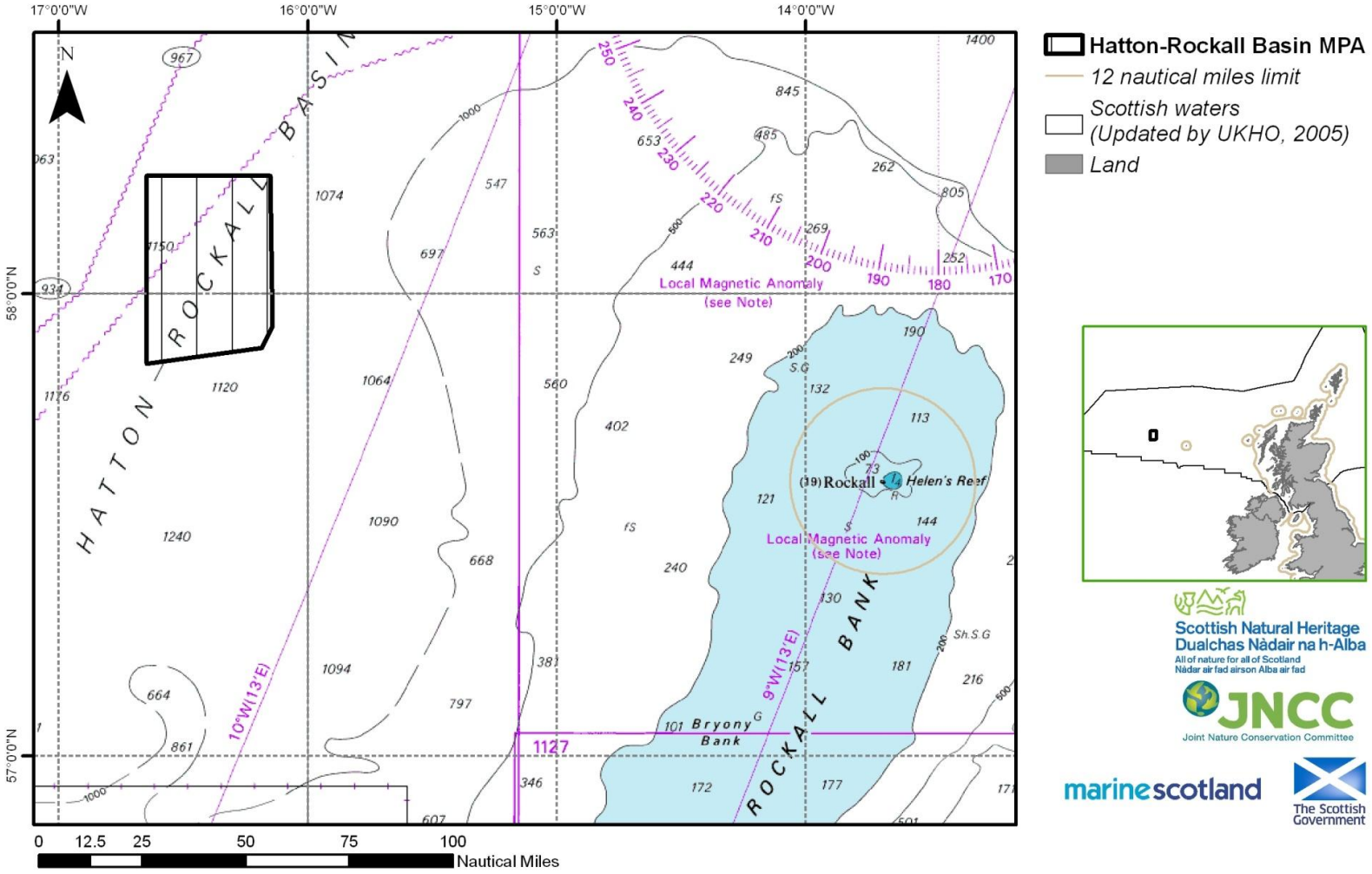
The following documents provide further information about the Hatton-Rockall Basin Marine Protected Area (MPA):

- Site Summary Document
- Detailed assessment against the MPA Selection Guidelines
- Management Options Paper

The documents are all available at www.jncc.defra.gov.uk/page-6482

Document Distribution List and Version Control				
Format	**Version**	**Issue date**	**Version development and review**	**Issued to**
Electronic	2.0	15/04/2013	Internal drafting and review of pre-version 2.0 drafts by JNCC SMPA team and Grade 7 staff review prior to release to MPA Sub Group	MPA Sub Group
Electronic	3.0	30/05/2013	Review of document to take into account MPA Sub-Group comments by JNCC SMPA team prior to release to MPA Sub Group for sign-off	MPA Sub Group
Electronic	4.0	15/07/2013	Review of document to take into account MPA Sub-Group comments by JNCC SMPA team and editorial before release of document for public consultation.	Uploaded to JNCC website
Electronic	5.0	18/07/2014	Document update to align with designation status and text revised in response to consultation and independent review report	Delivery to Marine Scotland to support MPA designation and upload to JNCC website

Figure 1 Map of Hatton-Rockall Basin MPA



Map projected in Mercator (World) projection, geographic coordinate system WGS1984. The exact limits of the UK Continental Shelf are set out in the Continental Shelf (Designation of Areas) Order 2013, Statutory Instrument 2013/3162 (© Crown Copyright). Landmass, Ordnance Survey © Crown Copyright and database right 2011. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. MPA © JNCC and SNH, 2014. All rights reserved. Admiralty Chart © Crown Copyright, 2013. All rights reserved. License No. EK001-20130405.
NOT TO BE USED FOR NAVIGATION

MPA name	Hatton-Rockall Basin	**Date of initial assessment**	31th July 2012	**Assessor(s)**	ALR, NC, PC, ML, OCA
The Hatton-Rockall Basin MPA is recommended for the protection of deep-sea sponge aggregations and Atlantic influenced off-shelf offshore deep-sea mud habitats. The area was selected following consideration of least damaged/more natural (LD/MN) locations (north-west Hatton-Rockall Basin) as detailed in Chaniotis *et al.* (2011). The shape of the MPA encompasses geodiversity features representative of the Hatton Bank (and adjacent sea floor) Key Geodiversity Area – polygonal fault systems and sediment drifts (Brooks *et al.,* 2013). The boundary is currently defined based on the extent of an area of the north-east Hatton-Rockall Basin LD/MN location because of limited data on distribution of the protected features across the MPA.					

Protected features			
Biodiversity	Deep-sea sponge aggregations (DSSA) Atlantic influenced offshore deep-sea muds (ODSM) off the shelf	**Geodiversity**	Overlaps with Key Geodiversity Area - Central Hatton Bank (and adjacent basin floor) Sediment drifts from the Marine Geomorphology of the Scottish Deep Ocean Seabed Block (Brooks *et al.,* 2013). Includes examples of polygonal fault systems – one of which is linked to fluid flow and the other focussed on the history of the Rockall Bank Mass Flow (Mortimer, 2008). Polygonal faulting is a widespread phenomenon, but is normally only observed in the sub-seafloor. The fact that polygons occur at the seabed surface makes the Hatton-Rockall Basin example unique (Brooks *et al.,* 2013). Sediment drifts, a representative feature of the Central Hatton Bank (and adjacent basin floor) Key Geodiversity Area, are also included.
Feature exclusions (MPA search features recorded within the MPA but excluded from the assessment with reasons)			
No features excluded			

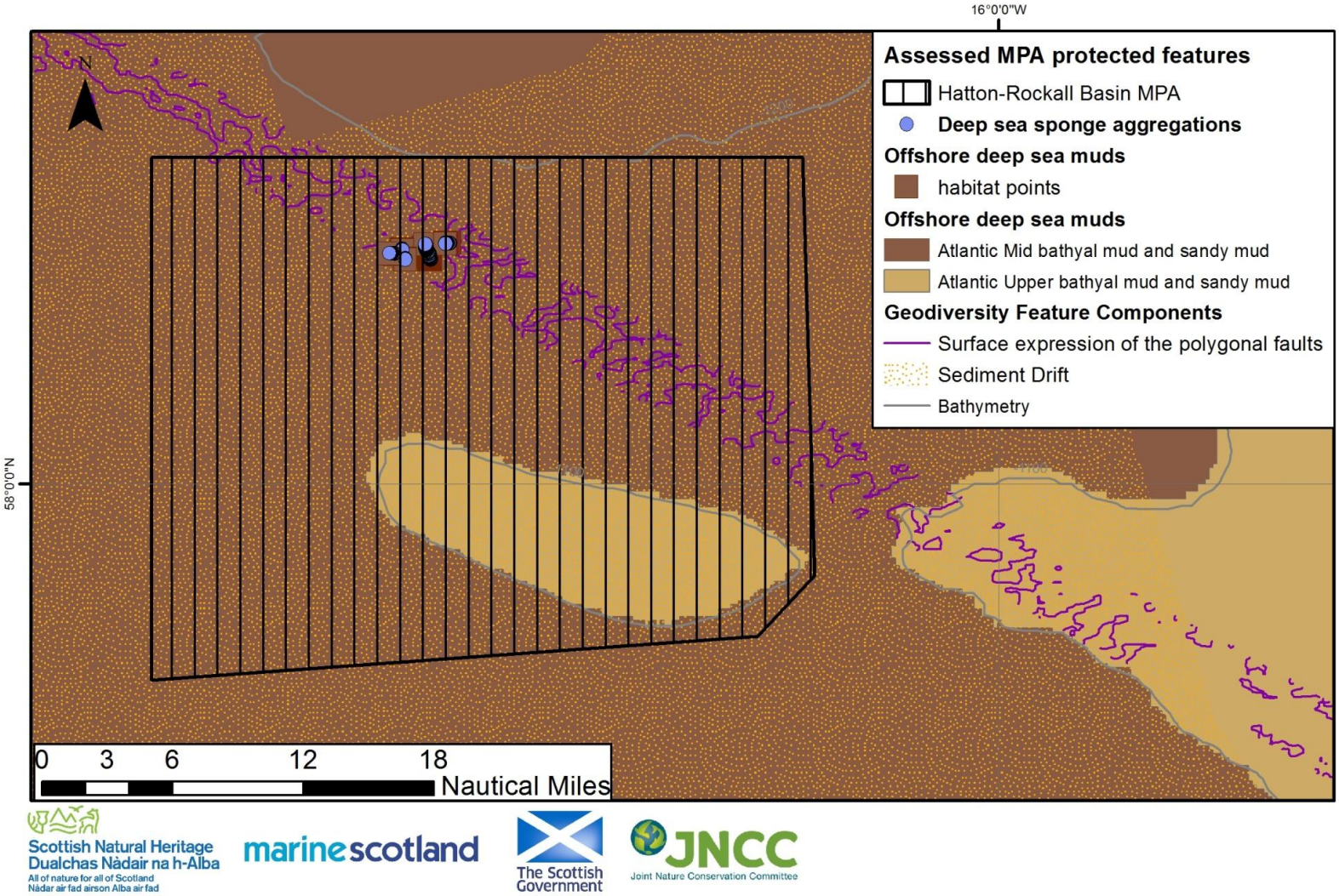
Data used in assessment			
Version of GeMS holding feature data used to support site selection	Ver.4	**Other datasets used** (not in GeMS) [superscripts are used to reference these datasets in the following discussion]	• [1]Substrate data from the RRS James Cook Cruise 60, 09 May-12 Jun 2011 investigating benthic habitats and the impact of human activities in Rockall Trough, on Rockall Bank and in Hatton Basin. • [2]Multibeam data from the 2005 SV Kommandor Jack DTI survey, • [3]Multibeam data from the 2006 BGS cruise to the Rockall-Hatton-Faroes region, Project 06/02 RRS Charles Darwin CD180) • [4]Multibeam data from the 2011 NERC JC060 cruise

Summary of data confidence assessment (see detailed assessment on following pages)						
Confident in underpinning data	**Yes**	DSSA	**Partial**	ODSM	**No**	-

Confident in presence of identified features?	DSSA ODSM	**Data suitable to define extent of individual protected features**	**Yes**	**Partial**	**No**
			-	✓all features	-

Summary	
	Offshore deep-sea mud habitats are predicted to be present throughout the MPA according to the habitat mapping project UKSeaMap 2010 habitat map (McBreen *et al.,* 2011). A cross-check against an updated version produced by EU SeaMap (Cameron & Askew, 2011) verifies the same type and extent of habitats are predicted to occur within the MPA. The boundary has been drawn to include the two types of offshore deep-sea mud habitats predicted to occur (Atlantic mid and Atlantic upper bathyal mud and sandy mud). However, there are limited ground-truthed data for the feature the extent within the MPA and the boundary is largely derived from a part of the north-west Hatton-Rockall Basin LD/MN location (Chaniotis *et al.,* 2011). Photographic samples collected during the MV Franklin 02/06 (F0206) cruise for the Department of Trade and Industry [DTI (offshore programme of work now under DECC)] and JNCC in 2006 (Jacobs & Howell, 2007)[1], as well as the JC060 cruise of the MAREMAP initiative in 2011 (Howell *et al,* 2014), provide evidence verifying the presence of offshore deep-sea muds[1]. We therefore have high confidence in the presence of offshore deep-sea mud habitats but low confidence in its extent and diversity based on the isolated nature of the survey stations. We have high confidence in the presence of deep-sea sponge aggregations based on recent records of the deep sea sponge known as the Bird's nest sponge (*Pheronema carpenteri*) occurring across a 3km^2 area in the northern portion of the MPA. The records originate from those same two surveys mentioned previously and have been assigned as fields of *P. carpentari* by Plymouth University (Howell *et al,* 2014) and verified by Herriot-Watt University (Henry and Roberts, 2014). We have lower confidence in the feature's extent based on the isolated nature of the survey stations. Further survey would be required to verify the extent of both of these features across the MPA area. We have high confidence in the presence of the polygonal faults geodiversity feature, illustrated by the multibeam data collected through DTI, BGS and NERC cruises in 2005[2], 2006[3] and 2011[4].

Figure 2 Map of the known distribution of protected features within the Hatton-Rockall Basin MPA



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Data confidence assessment	Our assessment of data confidence is based on the age and source of the data, type of sampling methodologies used and overall coverage across the MPA.

Age of data (Map A)			
Multiple or majority of records collected post 2000	DSSA OSDM	**Multiple records collected pre 2000**	**-**
Comments	The data for deep-sea sponge aggregations were collected during dedicated habitat investigation surveys conducted in 2006 and 2011. These same data verify the presence of offshore deep sea mud habitats. The underlying habitat map was created through the predictive seabed habitat mapping project UKSeaMap 2010 (McBreen *et al.,* 2011). A cross-check against an updated version released by the EU SeaMap Project (Cameron & Askew, 2011) verifies the same type and extent of habitats are predicted to occur.		

Source of data (Map B)					
Targeted data collection for nature conservation purposes	DSSA OSDM	**Statutory monitoring (marine licensing etc)**	-	**Fisheries survey work**	-
Data collection associated with development proposals (EIA etc.)	-	**Recreational / volunteer data collection**	-	**Other** (specify) – UKSeaMap 2010/EUSeaMap 2011	ODSM
Comments	The underlying habitat map is the result of work undertaken by JNCC to combine the physical data describing the marine environment with information from biological sampling, generating a broadscale predictive (or modelled) map of seabed habitats (UKSeaMap 2010), updated by the EU SeaMap Project (Cameron & Askew, 2011). Data for deep-sea sponge aggregations originate from surveys for the DTI (offshore programme of work now under DECC) and JNCC undertaken in 2006[1] and by the MAREMAP initiative (UK Marine Environmental Mapping Programme) with whom JNCC collaborated, conducted in 2011 (the JC60 cruise). The habitat was identified by Plymouth University then verified as representing fields of *P. carpentari* by Herriot-Watt University (Henry and Roberts, 2014)[3]. The records of offshore deep-sea muds originate from those same two surveys mentioned previously.				

Sampling methods / resolution							
Feature	**Modelled**	**Acoustic / remote sensing**	**Remote video / camera**	**Infaunal - grab / core**	**Sediment**	**Diving**	**Sediment sampling**
DSSA			✓				
ODSM	✓		✓				
Comments	The cluster of data points representing deep-sea sponge aggregations and confirming the presence of offshore deep-sea mud habitats were generated from sampling using remotely operated video systems launched from the survey vessels. The predicted habitat map (UKSeaMap 2010) was used to indicate the presence and extent of offshore deep-sea mud habitats. A cross-check against an updated version produced by the EUSeaMap Project (Cameron & Askew, 2011) verifies the same type and extent of habitats are predicted to occur.						

Data coverage (Maps A to H)					
Across the MPA					
Numerous protected feature records evenly distributed across MPA?	-	**Numerous protected feature records scattered across search location with some clumping?**	-	**Few or isolated protected feature records - possibly clumped?**	✓
For Individual features					
Multiple records of individual protected features providing indication of extent and distribution throughout MPA?	-	**Few or scattered records of specific protected features making extent and broad distribution assessment difficult?**	-	**Few or isolated records of specific protected feature records**	DSSA OSDM
Are acoustic remote sensing data available to facilitate the development of a full coverage predictive seabed habitat map?		No, Acoustic data only covers a small proportion of the MPA area – Map F to H, from the 2005 SV Kommandor Jack DTI survey, the 2011 JC060 survey and the 2006 BGS cruise to the Rockall-Hatton-Faroes region, Project 06/02 RRS Charles Darwin CD180) respectively			
Comments	**Offshore deep sea muds (ODSM)** • UKSeaMap 2010 (in GeMS v4) - The habitat map predicts that offshore deep-sea muds extend throughout the MPA boundary and beyond. The predicted map suggests that a continuous area of >1000km^2 of Atlantic mid bathyal mud and sandy mud is captured within the MPA boundary (covering ~86% of the total area of the MPA) and that this habitat encapsulates a patch of Atlantic upper bathyal mud and sandy mud component of offshore deep-sea muds (covering ~14% of the total area of the MPA in the southern portion of the MPA). The EUSeaMap project updated the UK SeaMap 2010 predicted habitat map. A cross-check of the outputs from both products suggests no differences in the EUNIS habitat types predicted to occur across the MPA. • [1]Substrate data from the 2011 RRS James Cook Cruise 60 & 2006 MV Franklin Cruise F0206 for the DTI and JNCC - Assessment of the substrate type from photographic imagery samples collected from these two cruises confirm the presence of offshore deep-sea muds within the boundary clustered in the northern portion of the MPA (Jacobs & Howell, 2007; Howell *et al,* in 2014). • 2011 JC060 Survey (in GeMS v4) - This deep-water habitat mapping cruise of the MAREMAP initiative (UK Marine Environmental				

Data coverage (Maps A to H)	
	Mapping Programme) conducted in 2011 by NERC organisations and partners with whom JNCC collaborated, carried out two ROV transects on the polygonal faults. Cluster analysis of the data from photographic samples using the SIMPROF routine, led to the determination of biotope proposals. Of the four biotopes determined, two may be considered components of ODSM; Unidentified (possibly Halcampoid) anemones in soft sediment and Cerianthid anemones & burrowing megafauna in bioturbated soft sediment (Howell *et al.,* 2014). The former was associated with the base of the faults and was dominated by a different burrowing anemone (c.f. halcampoidiae/haloclavidae/ Edwardsiidae) to the latter. The latter was only found on the upper slopes of the faults, and dominated by a Cerianthidae anemone species. This proposed biotope could possibly be considered as an ecological variant of the burrowed mud feature on account of the levels of bioturbation observed. **Deep sea sponge aggregations (DSSA)** • *P. carpentari* records from photographic imagery captured on the 2006 MV Franklin Cruise (F0206) (in GeMS v4) – the polygonal faults imaged in the Hatton-Rockall Basin during the 2005 SEA DTI survey aboard SV Kommandor Jack (Map E) were targeted to complete a single video transect for ground-truthing the habitat. This transect generated a cluster of records of the deep-sea sponge *P. carpenteri*. The species was found to be the dominant fauna, along with xenophyophores in muddy sediment on the edges of the polygon (Jacobs & Howell, 2007). • 2011 JC060 Survey (in GeMS v4) - This deep-water habitat mapping cruise of the MAREMAP initiative (UK Marine Environmental Mapping Programme) conducted in 2011 by NERC organisations and partners with whom JNCC collaborated, carried out two ROV transects upon the polygonal faults. These transects generated a further cluster of *P. carpenteri* records from photographic samples, across a 3km^2 area in the northern portion of the MPA. These samples were verified as representing fields of the Bird's nest sponge, (Henry and Roberts (2014)[3] confirming the presence of deep sea sponge aggregations within the boundary of the MPA. Cluster analysis of the photographic samples using the SIMPROF routine, determined the presence of the EUNIS biotope 'Facies with *Pheronema grayi*' (A6.621). *Pheronema grayi* is a synonym of *P. carpenteri* (WoRMS). The soft-sediment biotope is characterised by unidentified tube worms (Sabellidae sp.), *P. carpenteri*, massive lobose sponges, burrowing anemones (Cerianthidae sp.), ophuroids (*Ophiactis abyssicola*), small unidentified stalked (likely) sponges, yellow and pale encrusting sponges and bushy hydrozoans (Howell *et al.,* 2014). **Geodiversity features** • The MPA includes an area of polygonal faults and sediment drifts – features representative of the Central Hatton Bank (and adjacent sea floor) Key Geodiversity Area under the Marine Geomorphology of the Scottish Deep Ocean Seabed block (Brooks *et al.,* 2013). The polygonal fault systems are linked to fluid flow and the history of the Rockall Bank Mass Flow (Mortimer, 2008). Polygonal faulting is a widespread phenomenon, but is normally only observed in the sub-seafloor. The fact that polygons occur at the seabed makes the Hatton-Rockall Basin example unique.

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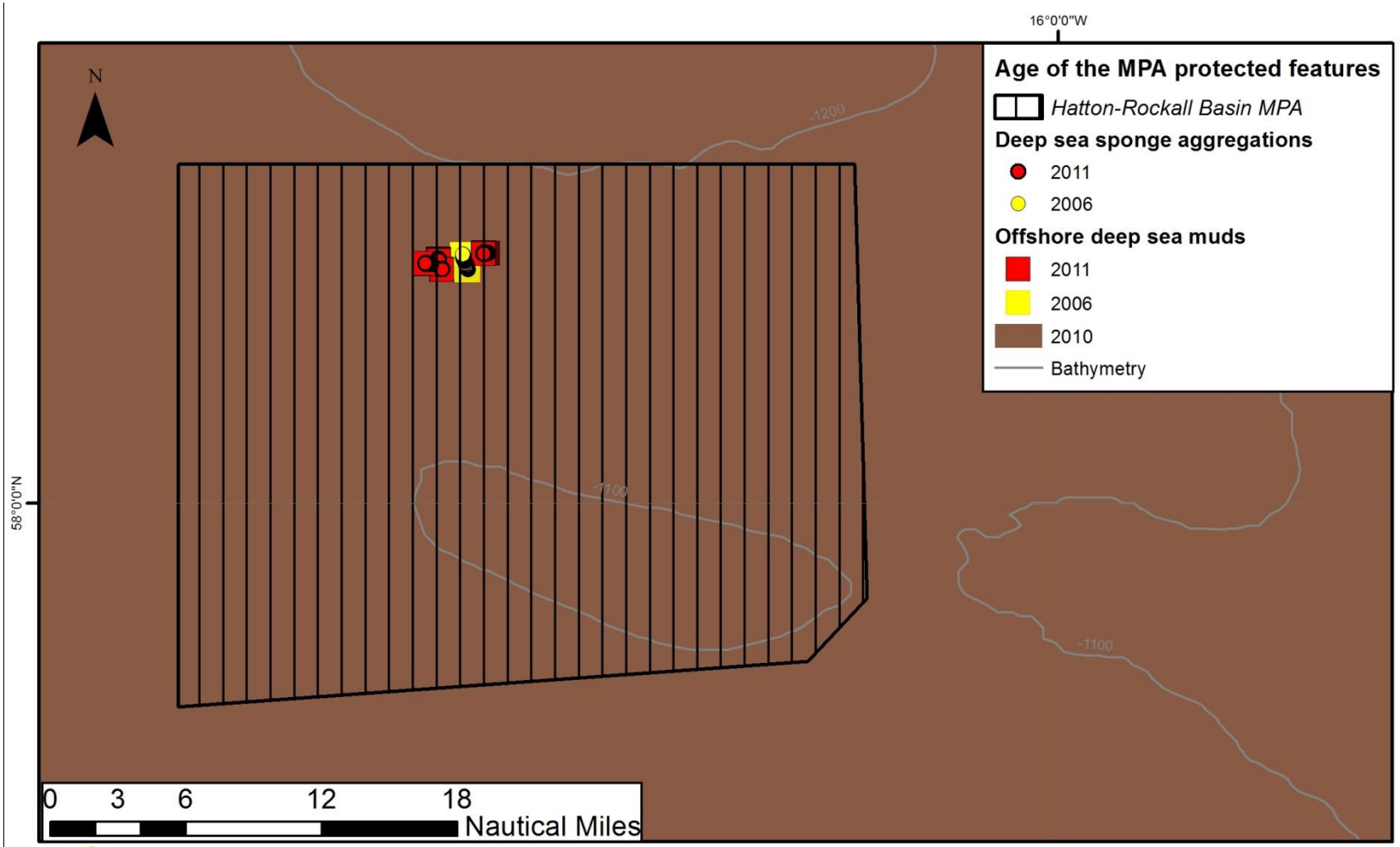
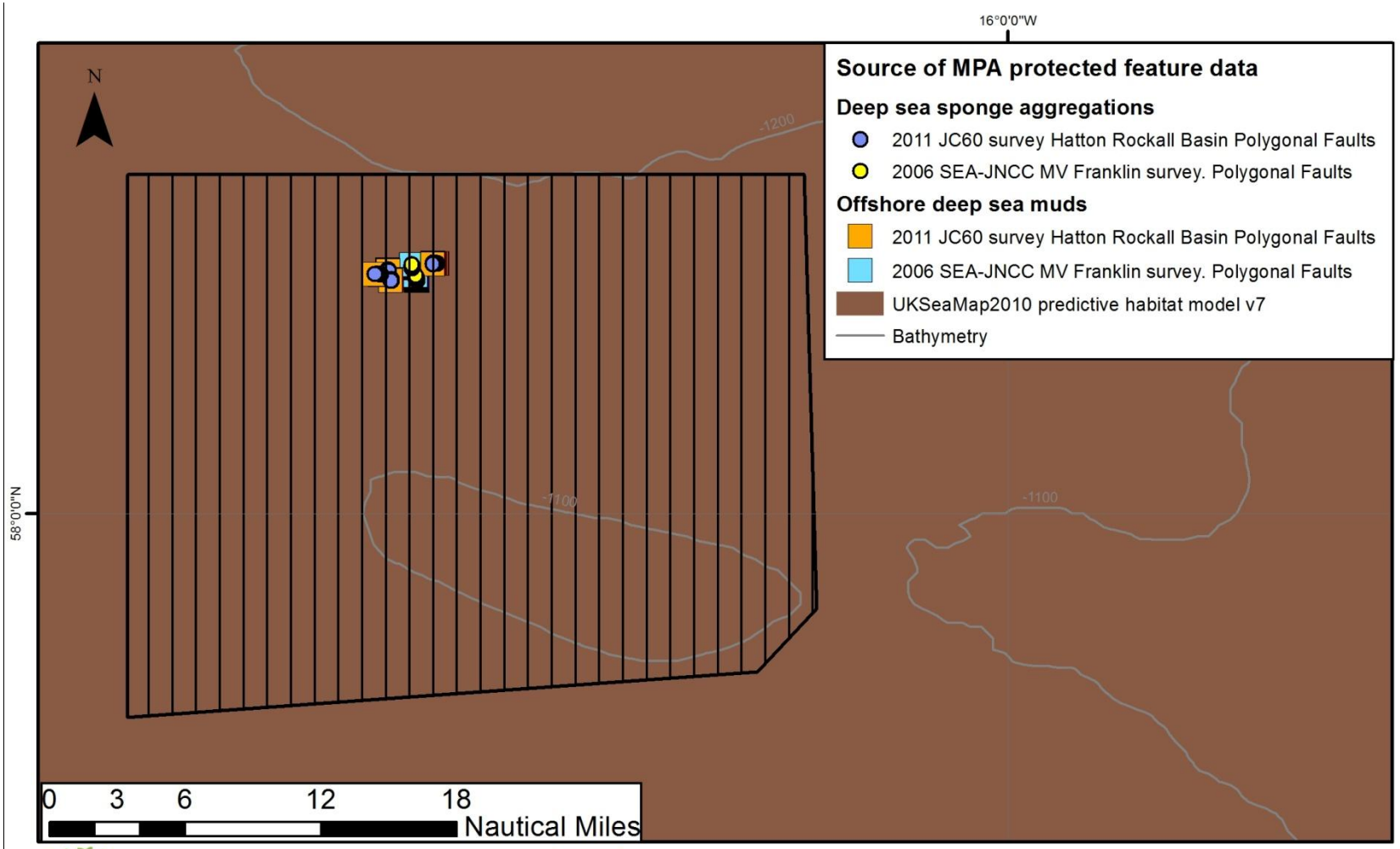


Map displayed in geographic coordinates WGS84. The exact limits of the UK Continental Shelf are set out in the Continental Shelf (Designation of Areas) Order 2013, Statutory Instrument 2013/3162 (© Crown Copyright). Landmass Ordnance Survey © Crown Copyright and database right 2011. All rights reserved. Scotland (Adjacent waters) Updated by the Law of the Sea Division, United Kingdom Hydrographic Office October 2005. Bathymetry © GEBCO, 2011. Biological data from Geodatabase of Marine features in Scotland (GeMSv4) © Crown Copyright; MPA © JNCC and SNH 2014. All rights reserved.

A



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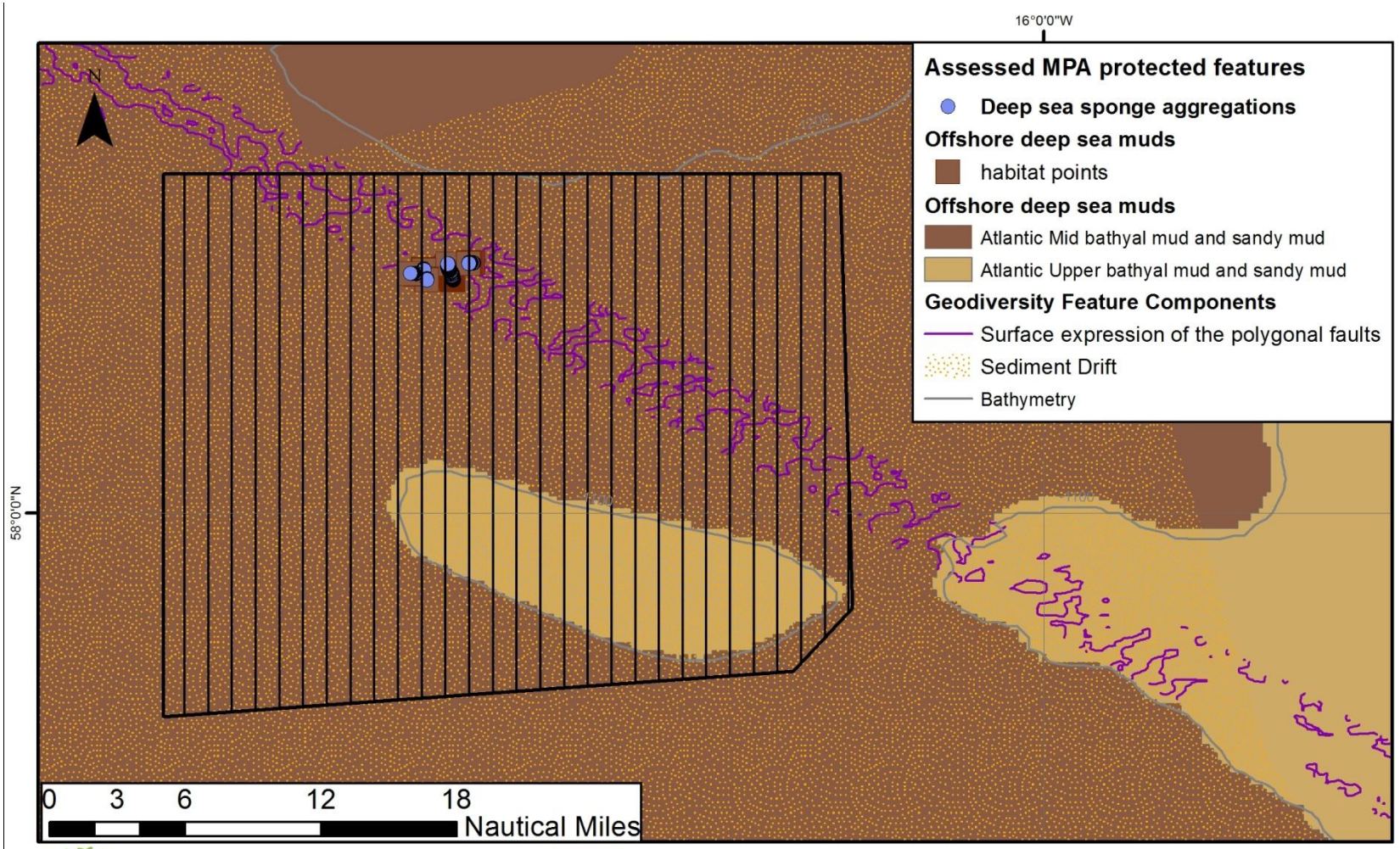

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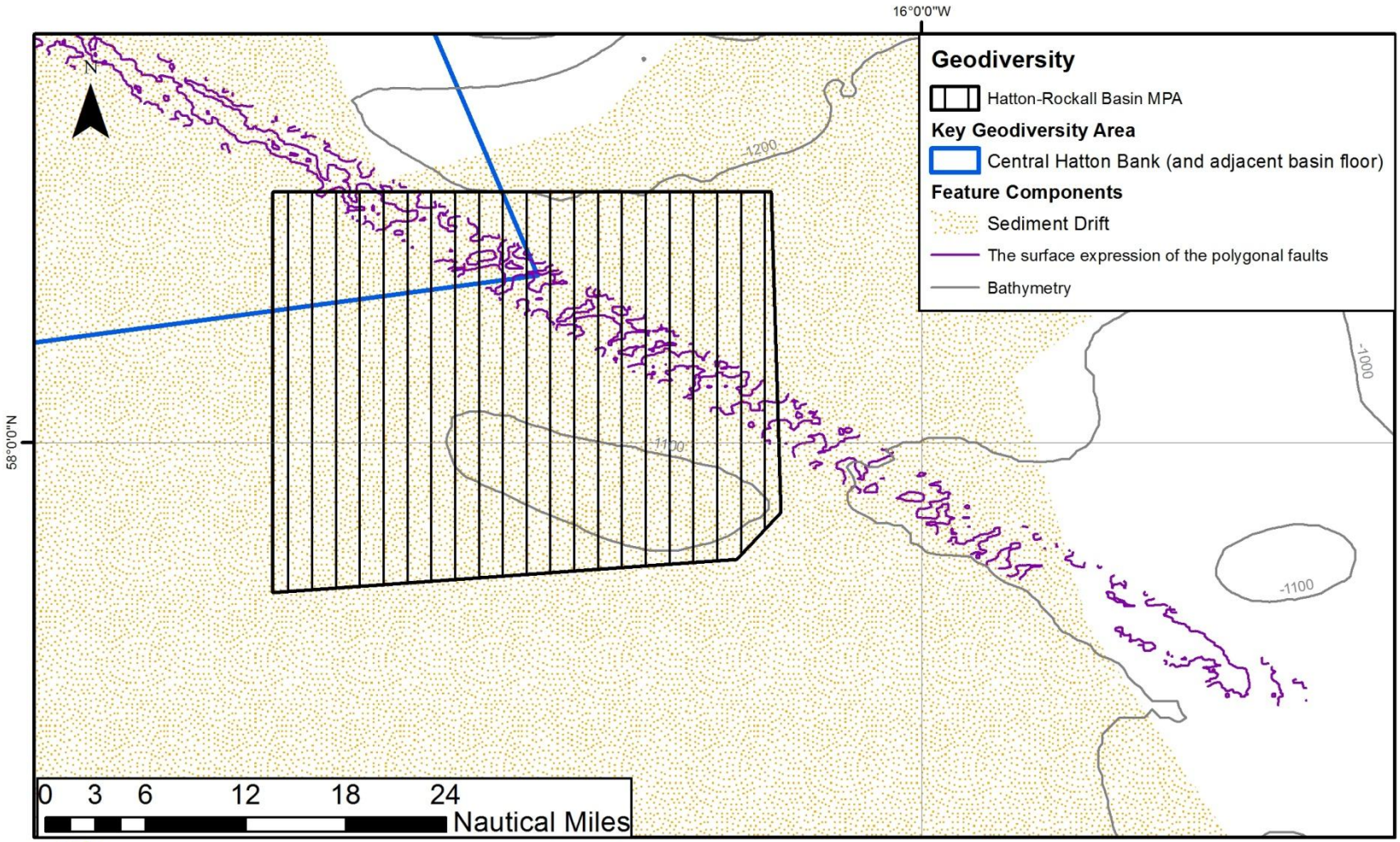

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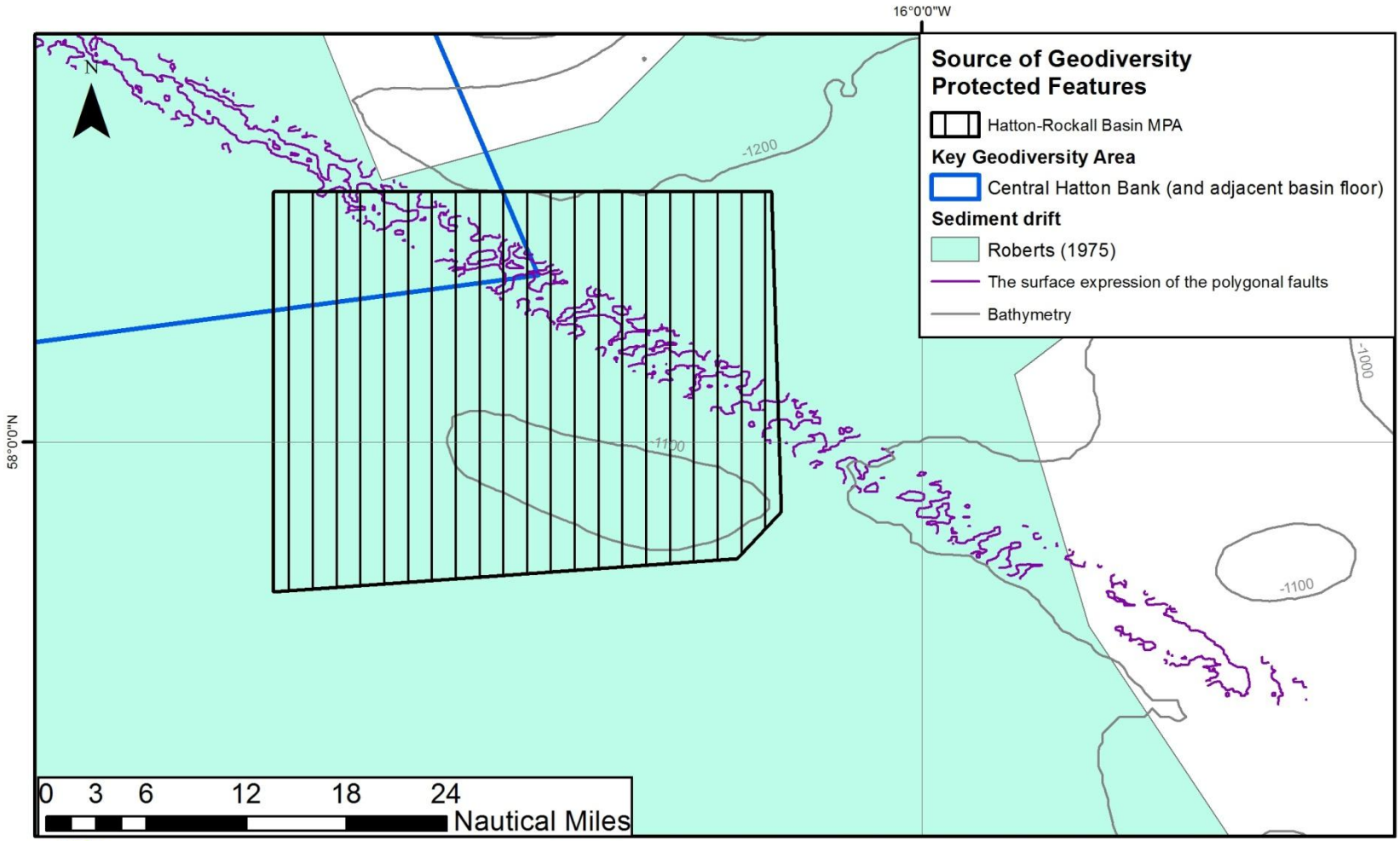

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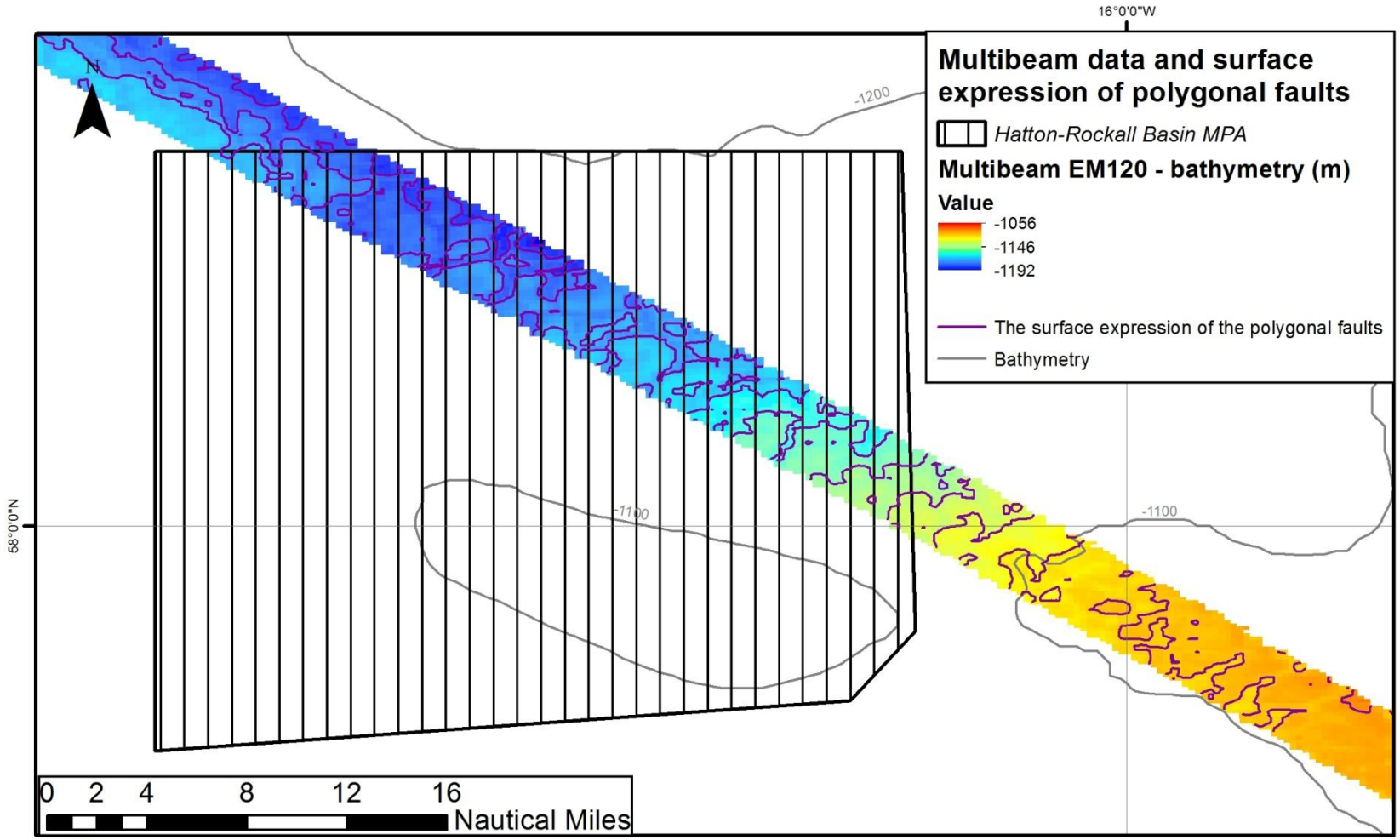

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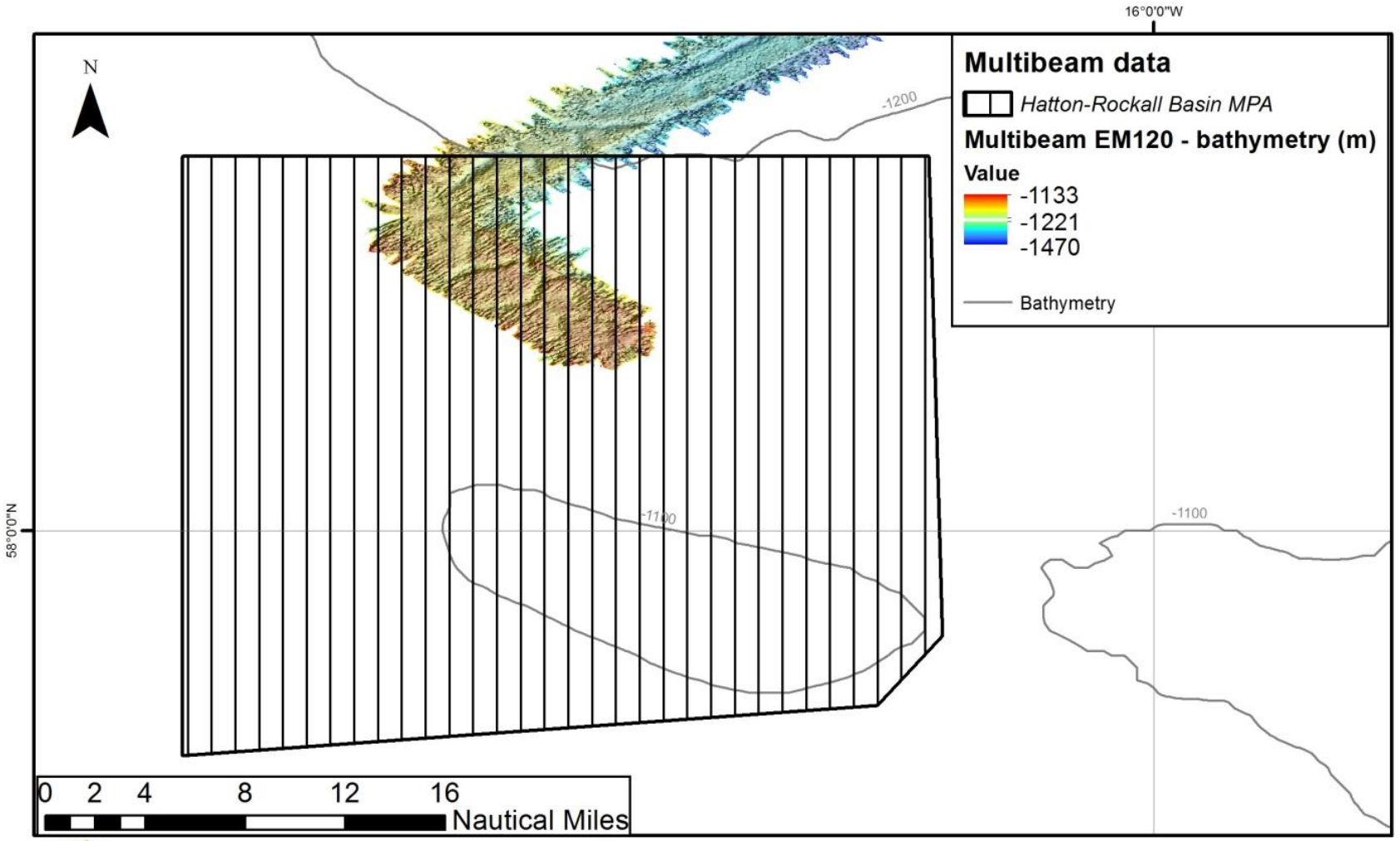
F



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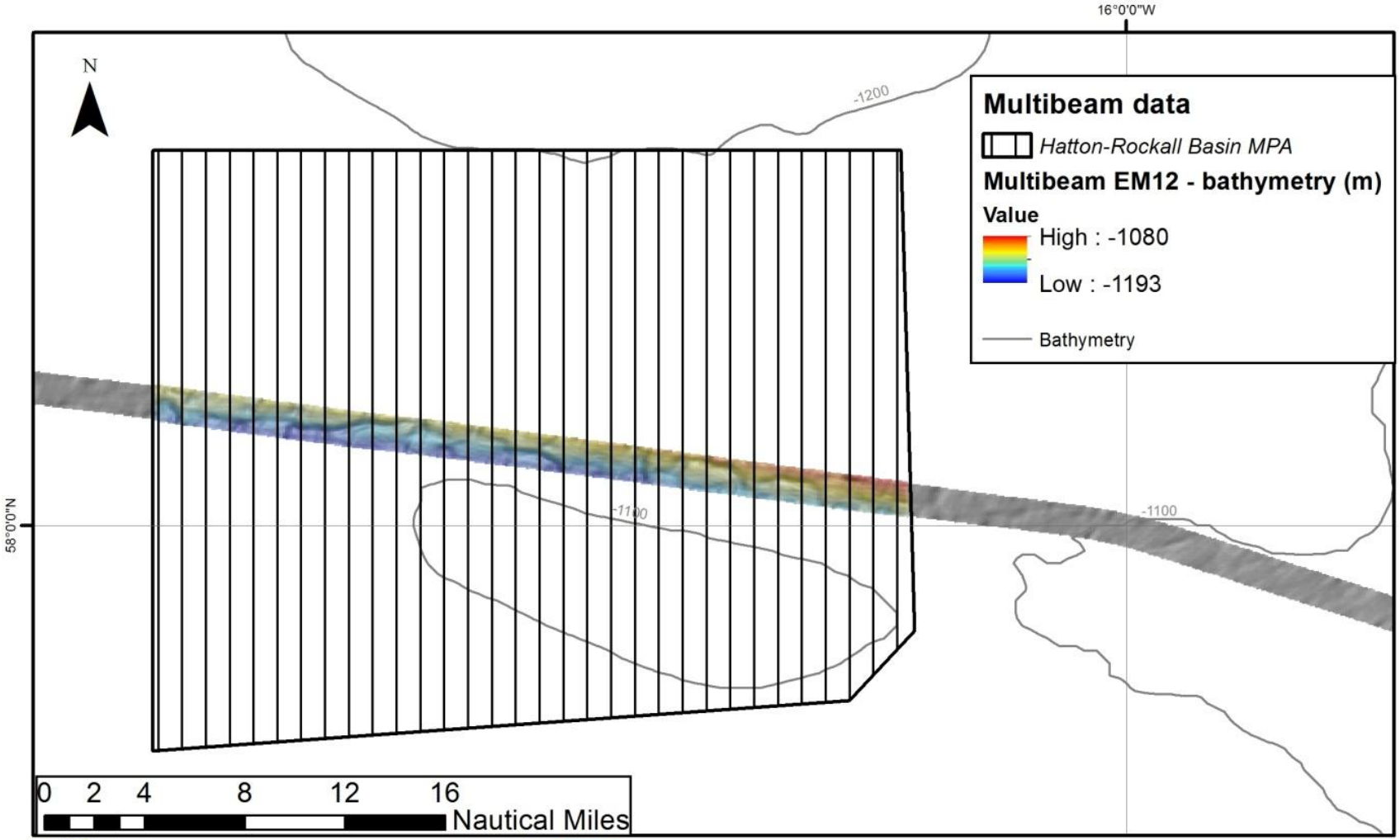

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Data sources and bibliography		
Year	**Title**	**Features covered**
2014.	Henry, L-A & Roberts, M. (2014). Verification of suspected records of deep sea sponge aggregations in Scotland's seas. JNCC Report No. 508.	DSSA
2014	Howell, K.L., Huvenne, V., Piechaud, N., Robert, K., Ross, R.E., Analysis of biological data from the JC060 survey of areas of conservation interest in deep waters off north and west Scotland. JNCC Report, No. 528.	DSSA, ODSM
2014	Geodatabase of Marine features in Scotland (GeMS) Version 4	DSSA, OSDM
2013	Brooks, A.J. Kenyon, N.H. Leslie, A., Long, D. and Gordon, J.E. (2013). Characterising Scotland's marine environment to define search locations for new Marine Protected Areas. Part 2: The identification of key geodiversity areas in Scottish waters (2nd interim report). *Scottish Natural Heritage Commissioned Report No.432*.	Geodiversity
2011	Cameron, A. and Askew, N. (eds.). (2011). EUSeaMap - Preparatory Action for development and assessment of a European broad-scale seabed habitat map final report. Available at http://jncc.gov.uk/euseamap	BM
2011	McBreen, F., Askew, N., Cameron, A., Connor, D., Ellwood, H. and Carter, A. (2011). UK SeaMap 2010 Predictive mapping of seabed habitats in UK waters. *JNCC Report 446*, ISBN 0963 8091. Available from <http://jncc.defra.gov.uk/page-5955#download>	ODSM
2011	Chaniotis, P.D., Crawford-Avis, O.T., Cunningham, S., Gillham, K., Tobin, D., Linwood, M. (2011). *Profiles of locations considered to be least damaged/more natural in Scotland's seas*. Supplementary report produced by the Joint Nature Conservation Committee, Scottish Natural Heritage and Marine Scotland for the Scottish Marine Protected Areas Project. Available from <http://www.scotland.gov.uk/Resource/Doc/295194/0121829.pdf>	-
2008	Mortimer, E. (2008). Strata-bound (polygonal) faulting-Hatton Basin. Available from <http://see-atlas.leeds.ac.uk:8080/homePages/generic.jsp?resourceId=090000648000f55b>	Geodiversity (polygonal fault system)
2007	Jacobs, C. L. & Howell, K. L. (2007) MV *Franklin* Cruise 0206, 03-23 Aug 2006, Habitat investigations within the SEA4 and SEA7 areas of the UK continental shelf, Research & Consultancy Report No. 24 , National Oceanography Centre, Southampton.	DSSA