Institution: University of York
Unit of Assessment: 7, Earth Systems and Environmental Science
Title of case study: Creation of the world's first network of high seas marine protected areas
1. Summary of the impact (indicative maximum 100 words)

History was made in late September 2010 when the world's first network of high seas marine protected areas (MPAs) was declared in the North Atlantic. Environment Ministers from 15 nations within the OSPAR region created six MPAs in international waters covering half a million square kilometres, twice the size of the UK. Proposals for these MPAs were researched and drafted by a group led by Professor Callum Roberts of the Environment Department. The work involved a 3-year international collaboration among the scientific team and the political delegations of OSPAR member states, particularly Germany and the Netherlands, as well as the London-based OSPAR Secretariat.

2. Underpinning research (indicative maximum 500 words)

The German delegation to OSPAR led the process of establishing OSPAR's MPAs. They approached Professor Roberts in 2008 based on his extensive track record of research at York on the design and function of MPAs (particularly Roberts et al. 2001, and 2003 a,b, see Section 3, below, for all cited references). Roberts et al. (2001) provided the world's first demonstration that marine protected areas can enhance surrounding fisheries. Roberts et al. (2003a,b) set out criteria for design of marine protected area networks, adaptations of which have since been widely adopted, e.g. Convention on Biological Diversity criteria for high seas MPAs, and OSPAR criteria for MPAs. Roberts was also approached to do the work because of his seminal work on high seas conservation and MPA establishment (Roberts 2002, Roberts et al. 2006), the latter work showcased in 2006 by Roberts in a plenary presentation to the 8th Conference of Parties to the United Nations Convention on Biological Diversity in Brazil, which was attended by all of the parties to OSPAR, including Germany. Roberts was asked by Henning von Nordheim of the German delegation to assemble and lead an international team of experts on the high seas and deep sea in the North Atlantic, to identify and draft proposals for areas worthy of protection. The great majority of the scientific analysis was done at York by Roberts (at York 1995-present, Lecturer then Professor) and a team of three post-graduate students (Beth O'Leary (at York 2008-12), Rachel Brown (at York 2008-13) and Melanie O'Rourke (at York 2008-9). Two external scientific collaborators contributed to two of the eight MPA proposals.

Between 2008 and 2010, this research network of academics, non-governmental organisations and political partners worked closely to identify sites worthy of protection, producing its first report on candidate sites in 2008. The study identified eight potential MPA sites by reviewing scientific literature on the all aspects of the physical and biological features of the high seas in the North Atlantic, mapping the distribution of significant and vulnerable marine habitats, consulting with scientists familiar with the region to establish their views on where the greatest threats to wildlife were, and prioritising areas currently within reach of serious impact based on bathymetry and human uses such as fishing. The sites chosen were spread over a range of habitats and geographical zones to maximise representation of biodiversity. The resulting network emphasises protection of rugged seamount habitats. They are the richest in threatened species, are the target of intensive fisheries and have the greatest level of historical impacts.

Assembling the scientific case was made difficult by lack of data due to the high seas' remoteness. Nonetheless, robust cases for protection were made based on a wide range of information, from bathymetry and geophysical data to old whaling records and fishery investigations. Navigating the politics was complex and often frustrating, and members of the York team and network attended a series of international meetings to nurture the proposals through. In the end, six of the original eight candidate sites successfully made it through to designation.

3. References to the research (indicative maximum of six references)

Among the numerous papers produced by the York research group during the REF period that led to their selection to lead this project, the most important were:

Roberts, C.M, J.A. Bohnsack, F.R. Gell, J.P. Hawkins and R. Goodridge. 2001. Effects of marine reserves on adjacent fisheries. Science, 294: 1920-1923. DOI: 10.1126/science.294.5548.1920. Cited 736 times to June 2013, Google Scholar. This is Roberts' most important and widely known publication on marine protected areas and was published in one of the world's foremost scientific journals.

Roberts, C.M. (2002) Deep impact: the rising toll of fishing in the deep sea. Trends in Ecology and Evolution 17: 242-245. DOI: 10.1016/S0169-5347(02)02492-8. 190 citations to June 2013, Google Scholar. This paper reviewed the impacts of fishing in the deep sea, and was the first to propose an outright ban on deep sea fishing.

Roberts, C. M., S. Andelman, G. Branch, R. Bustamente, J.C. Castilla, J. Dugan, B. Halpern, K. Lafferty, H. Leslie, J. Lubchenco, D. McArdle, H. Possingham, M. Ruckelshaus, and R. Warner. (2003a) Ecological criteria for evaluating candidate sites for marine reserves. Ecological Applications 13 (Supplement): S199-S214. DOI: 10.1890/1051-0761(2003)013[0199:ECFECS]2.0.CO;2. 303 citations to June 2013, Google Scholar. This and the following paper set out guidelines for the design of marine protected area networks, cementing Roberts' reputation as a leader in this field.

Roberts, C.M., G. Branch, R. Bustamente, J.C. Castilla, J. Dugan, B. Halpern, K. Lafferty, H. Leslie, J. Lubchenco, D. McArdle, M. Ruckelshaus, and R. Warner. (2003b) Application of ecological criteria in selecting marine reserves and developing reserve networks. Ecological Applications 13 (Supplement): S215-S228. DOI: 10.1890/1051-0761(2003)013[0215:AOECIS]2.0.CO;2. 212 citations to June 2013, Google Scholar.

Roberts, C.M., L.C. Mason and J.P. Hawkins. (2006) Roadmap to Recovery: A Global Network of Marine Reserves. Greenpeace International.
http://www.greenpeace.org/france/PageFiles/266559/roadmap-to-recovery.pdf
Although not a peer reviewed publication, this document describes the results of the first attempt to design a network of marine protected areas for the high seas. It was featured in Plenary at the 8th Conference of Parties to the UN in Brazil in 2006.

O'Leary, B.C., R.L. Brown, D.E. Johnson, H. von Nordheim, J. Ardron, T. Packeiser, and C.M. Roberts (2012) The first network of marine protected areas (MPAs) in the high seas: The process, the challenges and where next. Marine Policy 36: 598-605. DOI: 10.1016/j.marpol.2011.11.003
This paper describes in detail the research undertaken and the process leading to the establishment of the protected areas.

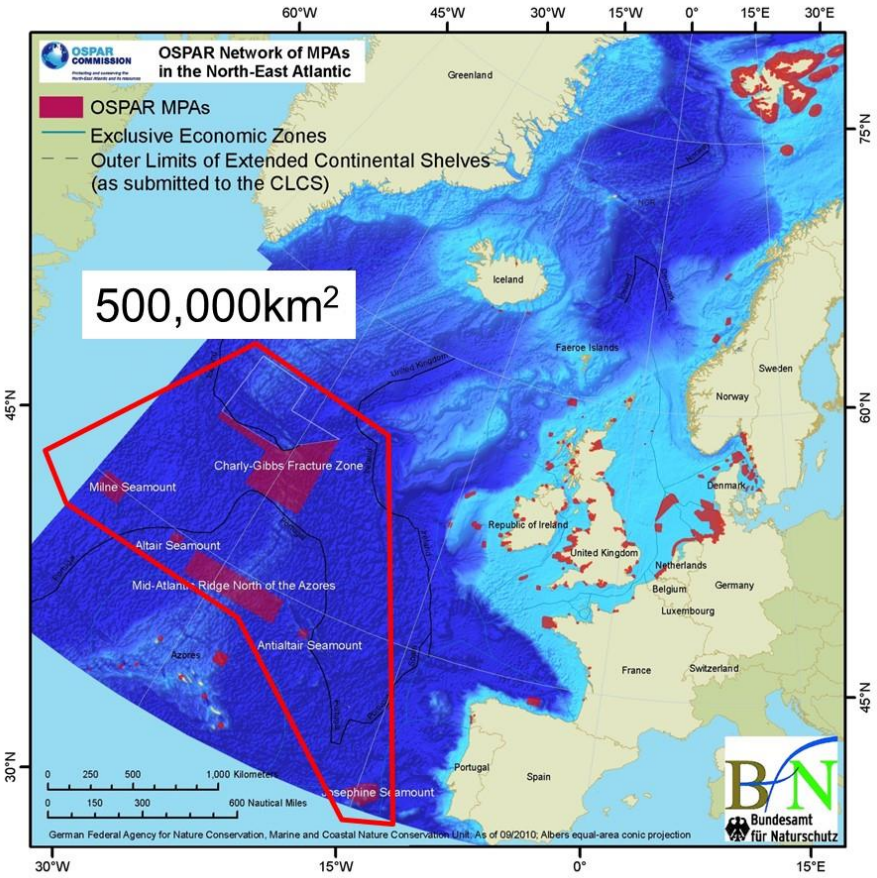
4. Details of the impact (indicative maximum 750 words)

The research of the York-led research group has led directly to the establishment of the world's first network of high seas marine protected areas (MPAs) in the north Atlantic. On the basis of the York work, in 2009 OSPAR accepted 'in principle' the scientific case and conservation objectives for seven of the eight potential MPAs, six of which were then created in 2010 (Figure 1). As the oceans are under increasing pressure, the establishment of this network will provide protection from exploitation and other damaging activities, so helping to rebuild depleted populations of commercially important fish, as well as protecting other wildlife and habitats like dolphins and birds.

This MPA network is groundbreaking on both scientific and political grounds. Prior to its establishment, there were only two other high seas MPAs, one in Antarctica and one in the Mediterranean. The high seas lie beyond the 200 nautical mile limits of national sovereignty at sea and are governed under the United Nations Convention on the Law of the Sea which came into effect in 1992. They constitute 45% of the area of the planet but remain virtually unprotected, a

place where overfishing and pirate fishing is rife and few restrictions apply on what can be taken. There have been widespread and steep declines in fish stocks as a result, together with heavy collateral mortality of turtles, dolphins, birds and other megafauna (as detailed in Roberts et al. 2006).

Figure 1: OSPAR MPA Network, highlighting the six high seas MPAs established in 2010 (outlined), based on work by Professor Roberts and his team. The 500,000km2 refers to the area of the six MPAs, not the area within the outline around them. Figure courtesy of BfN and OSPAR.



The Law of the Sea was drafted in the 1970s and assumes full exploitation of fishery and other resources. There is no provision for protected areas within it and therefore no mechanism exists to establish them in the high seas. This means that OSPAR, as a regional seas governance body, had to go it alone, navigating a new legal pathway to MPA establishment while undertaking delicate political negotiations to set up the network proposed by Roberts and his team. Such negotiations expanded to include a regional fisheries management body, the North East Atlantic Fisheries Commission, the International Seabed Authority and the International Maritime Organisation. Roberts and other members of the York team took part in several of these meetings, bringing the concept of marine protected areas into their serious consideration. For this reason, the impact of the work is two-fold. Not only has a network of six high seas MPAs been established for the benefit of wildlife and people, but a mechanism has been established to create more, both under the auspices of OSPAR, but also by other regional seas bodies. Given that pressures on high seas living resources are escalating, the need for many more MPAs is now obvious and there have been urgent calls to create them from the 2002 World Summit on International Development, the UN Convention on Biological Diversity, and the UN General Assembly.

To make it easier for others to follow OSPAR's lead, York team members and members of the German delegation and OSPAR secretariat published a paper (O'Leary et al. 2012, Section 5, below) describing the scientific and political processes followed and how they intertwined. They distil from the experience words of advice to others to help them avoid the pitfalls encountered and smooth the path to a much bigger global network of high seas MPAs in the future.

It is too soon to say how well these MPAs are working since the high seas are remote and monitoring difficult and expensive. As of 2013, some management measures are still being negotiated with competent authorities. However, three years on, the network is still unique. Because of his key role in the creation of this network, Professor Roberts was invited to the United Nations in May 2013 to address the first meeting of a UN body tasked with amending the Law of the Sea to provide a new legal tool to create marine protected areas. The OSPAR network was repeatedly referred to at this meeting as a path breaking example of how protection can be given to the high seas.

5. Sources to corroborate the impact (indicative maximum of 10 references)

OSPAR reports and minutes, including the following that describe the scientific case for each of the protected areas established:

http://www.ospar.org/documents/dbase/publications/p00551_bd_josephine.pdf
http://www.ospar.org/documents/dbase/publications/p00552_bd_mid-atltantic%20ridge.pdf
http://www.ospar.org/documents/dbase/publications/p00550_bd_antialtair.pdf
http://www.ospar.org/documents/dbase/publications/p00549_bd_altair.pdf
http://www.ospar.org/documents/dbase/publications/p00524_bd_milne_seamount_complex.pdf
http://www.ospar.org/documents/dbase/publications/p00523_background%20document_charlie%20gibbs.pdf

Email from the Secretary of OSPAR dated 8th October 2010:

OSPAR Press Release:
http://www.ospar.org/content/news_detail.asp?menu=00600725000000_000013_000000

A publication in press that describes the process and the scientific and political challenges that were experienced

O'Leary, B.C., R.L. Brown, D.E. Johnson, H. von Nordheim, J. Ardron, T. Packeiser, and C.M. Roberts (2012) The first network of marine protected areas (MPAs) in the high seas: The process, the challenges and where next. Marine Policy 36: 598-605.