National Oceanography Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

New Polar Research Vessel Consultation: Science Requirements

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About us:

[1] The National Oceanography Centre (www.noc.ac.uk) is part of the Natural Environment Research Council (NERC) and is the UK national focus for Oceanography. It undertakes large-scale, long-term oceanographic research from coast to Deep Ocean. It provides national capability in oceanographic sciences

Declaration of interests:

[2] NOC welcomes the opportunity to respond to the NERC consultation into the New Polar Research Vessel: Science Requirements. The National Oceanography Centre (NOC) is a focal point for UK Marine Science and many of its programmes are funded through public money, accessed via NERC and ESPRC as well as other government departments such as DEFRA.

Submission Date:

[3] 31st January 2015

Consultation Response:

[4] As the National Oceanography Centre (NOC), we welcome the investment in a New Polar Research Vessel (NPRV) with sea ice-capability. Currently NOC is responsible for operating the *RRS Discovery* and the *RRS James Cook.* Neither of these ships has full ice breaking capacity (although the *RRS James Cook* is an Ice-C class vessel meaning the ship has operational capability in light ice conditions) and thus concentrate their time on open ocean science. ***The NPRV will therefore enhance the state of the art sea going capability of the UK Marine Science Community*** enabling the research to be undertaken in more extreme environments.

[5] In order to ensure that the NERC research vessel fleet provides the widest spectrum of research capabilities there needs to be ***on-going complementarity between NOC and BAS ship operations***. Thus the NPRV needs to be optimised for the delivery of science in Polar Regions, particularly those areas where the *RRS James Cook* or the *RRS Discovery* cannot sail (i.e. sea ice covered).

[6] In recent years the *RRS James Clark Ross* has undertaken the Atlantic Meridonal Transect (AMT) research cruise, whilst on transit to Antarctica for logistical supplies. Both the *RRS James Cook* and *RRS Discovery* have also undertaken AMT in previous years and will continue to serve this programme, likely alongside the NPRV, into the future as cruise planning allows. This overlap of the NPRV and the existing ships into open ocean science delivery makes sense from a logistics and planning point of view, however a ***cost benefit analysis should be undertake for logistical gain versus the loss of sea time*** in the more remote areas accessed by the NPRV. This is of particular importance in the light of the consolidation of the UK

polar research capacity through the retirement of the two existing ships (*RRS James Clark Ross* and the *RRS Earnest Shackleton*).

[7] Given the niche that the NPRV will be able to fulfil in terms of its operational environment, the ***scientific specification should also be optimised to fill the gaps left by the existing vessels***. For example the piston coring capability in the two NOC-operated vessels is restricted to 20m. In order to enhance the capability of the NERC fleet the NPRV could be specified with a greater (40 - 60m) piston coring capability.

[8] Investment in deeper piston coring capability would ***facilitate the international bartering of the NPRV's time***. For example the USA has recently retired the *RV Knorr*, which had deep piston coring capabilities. There are no current plans to replace this vessel in the USA, therefore US scientists currently have no deep piston coring capabilities. If NERC were to invest in a Piston Corer of with a 40m range then the UK would be in a strong position to barter the NPRV time to the USA, in exchange for access to other ships and equipment. This would work to enhance the reputation and capability of UK science internationally and enable UK scientists to undertake work more easily across the globe.

[9] It should also be ensured that ***duplication of capabilities is minimised***. The National Marine Equipment Pool (NMEP) based at NOC Southampton, and run by National Marine Facilities Sea Systems, is the largest centralised marine scientific equipment pool in Europe with a replacement value of around £30M. The NMEP consists of a wide range of re-usable equipment that many disciplines within marine science can use. It allows scientists' access to skilled engineers, technologists and facilities all from one central point. The NMEP includes the provision of:

- ***Marine Autonomous and Robotics Systems (MARS)*** – equipment including autonomous underwater vehicles, gliders and remotely operated vehicles.
- ***Base Engineering*** – heavier engineering systems, including trawling, coring and seismic systems, as well as laboratory equipment including specialised container laboratories.
- ***Sensors and Moorings*** – broad arrange of physics and chemistry sensing systems, deployed from the ship and on moorings arrays.
- ***Scientific Ship Systems*** – IT and ship based equipment such as seabed mapping systems and other permanently fitted acoustic systems.

Currently, all of the above except the last group of equipment are regularly deployed on BAS vessels in support of both BAS and other polar science community users.

[10] ***Consideration of the management and financing of the new equipment*** associated with the NPRV is therefore critical. The NPRV project currently proposes the acquisition of a large array of equipment that effectively constitutes a miniature NMEP. This raises two issues:

- Development of such an equipment pool operated outside NOC and the current NMEP is not likely to be an efficient use of resources in the longer term The NMEP is currently a highly efficient investment, supported by a flexible and multi-skilled group of technicians and engineers, which maximises the availability of equipment to the UK community. This is especially true of the MARS assets, which require highly specialist technical teams.
- Notwithstanding the above, the NOC team are currently running at full capacity and could not take on additional equipment, so it is assumed that this will fall to BAS staff; although they do not currently undertake this role. It is therefore critical that support arrangements for the portable equipment to be procured with the NPRV are clarified at an early stage.

The on-going discussions over the ownership and governance of NOC ***will have no impact on the availability of the current NMEP to the wider marine community***.