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Some Ways Forward

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1. Background

The seminar was organised because of a consensus that marine research is becoming more expensive in character and most nations do not have the resources to carry out all the investigations that its scientists would wish to under Wce. Because of its global nature, marine science has a well established tradition of international participation in research projects. At the present time this is exemplified by programmes such as WOCE, TOGA, GOFS etc., where it is necessary for many countries to commit resources to allow these experiments to be undertaken.

The cost of research vessels and their associated equipment is a major factor, not only in large international experiments, but also in many national marine science programmes. One of the aims of this seminar is to consider ways of reducing that cost by some form of pooling or sharing of ships, and indeed other items of major equipment that the marine scientist may require.

This paper reviews three possible ways that the potential for such sharing of resources may be approached, and briefly discussed some of the associated administrative processes that may be required.

2. The Scientist

The primary aim of deploying a research ship and scientific equipment in a particular area is to act as a platform for data acquisition or the collection of samples for the scientist. Accordingly, one way of addressing the problem of sharing resources would be to attempt to match the requirements of individual scientists or small scientific groups with the availability of berths on ships that are already programmed to work in the areas of interest. To some extent, this already occurs within co-operative projects, but what is proposed here is at a lower level of formality. An example might be that a European geophysicist has made a sound scientific case to his funding organisation to carry out some research in a distant sea or ocean. His own country may not be able to programme a vessel to work in the area for financial or other reasons, but his requirements could be met if he were offered a berth and possibly the ability to use equipment on a foreign vessel that was already programmed for geophysical research in the area.

This exchange of berths should present few administrative problems other than a mechanism for making known the availability of the berths.

3. Ships

An alternative to the exchange of the occasional berth on another ship is the exchange of agreed time slots on another country's ships. The UK and USA (NSF) have already operated such a scheme quite successfully, and it is understood that the USA has similar bilateral agreements with a number of other countries.

For such a scheme to operate effectively, it is necessary for the participating partners to be aware of the opportunities, and be able to match them as closely participants should be aware of, although not necessarily involved in, the cruise planning processes of other organisations.

One of the prime aims of the current meeting is to explore practical mechanisms for this mutual exchange of information so that the shared utilisation of ships could be developed. A question of great importance to this

seminar is what should these mechanisms be?

For an exchange scheme to operate successfully, two "notice boards" are necessary. The first comprises a full listing of planned ship dispositions for up to a year ahead, and the second might list scientific requirements that cannot be satisfied by the scientists' own national resources. The meeting will have heard of a scheme already available internationally which offers the first

notice board, but the second may be less easy to set up. However, with the widespread access to international electronic mail systems, the practical difficulties could be overcome given a willingness of purpose and a modest level of financial support.

4. Equipment

Some major items of equipment are either unique to a specific organisation or are too expensive to be universally available. One possibility might be to consider shared use of such equipment. This could take a number of forms. One would be to make use of the equipment when it is fitted to the owner's ship, in which case the arrangements would be as in the previous sections. Another might be to arrange for the equipment to be loaned when its owner's vessel was in a convenient geographic location. Yet a third might be for the equipment to be loaned on an exchange basis for shipment to the borrower's vessel wherever it is working.

There are a number of potential difficulties to be overcome here that will need considerable discussion. For example, some arrangements would have to be agreed for indemnity to the owner for loss of or damage to the equipment either in use or transit. Again in the case of specialist equipment it is very unlikely that the owner would agree to the loan without insisting that his own support team go with it. Methods would need to be found to pay or compensate for this support.

Another area that would enhance both the ability of scientists to work on other countries' Ships and to facilitate the exchange of equipment would be the development of containerisation facilities for both laboratories and equipment. This must go hand-in-hand with the development of agreed standards for the container fixings and services.

5. "The Mechanics"

Whilst any or all of the above proposals are relatively straightforward, actually making the arrangements could present problems that should be addressed constructively at an early stage. Clearly, exchange of berths can be effected on a "one-for-one" basis, with the "guest" scientist making his or her own travel arrangements, and the host ship providing the hotel services on the cruise. Some discussion will be necessary on what personal insurance cover for the guest scientists is required and how this should best be achieved.

When the exchange of ships or equipment is being considered, there is clearly a need to attach some notional value to the resource being utilised so that the return in kind is fair and equitable. In NERC's own case, we operate a number of ships ranging in size from inshore fishing vessels through to vessels with world wide capability, and we do not regard these as equal value resources.

Similarly, the extent of scientific/technical support that we can and do provide for any cruise can vary widely, and so this too needs a notional value attaching to it. When these factors are taken into account, they lead to a precondition that, other things being equal, any exchange will have to be of ships, equipment or support of broadly comparable notional value.

Unfortunately, this simple statement raises almost more problems that it resolves unless the participating partners are flexible in their interpretation of notional value. One factor that might influence the mutual assessment of "value" is the "guest's" strategic requirement to carry out the research, which may dictate that he is prepared to offer an apparently greater notional value to this host simply because of the convenience in

either time or geographical location that he gains thereby.

Finally, it will be necessary to clarify beforehand the users' responsibility for personnel and resource, i.e. ship and/or equipment liability. If he has use of the ship or equipment, what are his liabilities to the owners or third parties in the event of loss or damage to the ship or equipment and what responsibility will fall on the host organisation. A common approach to this problem would offer a beneficial way forward.

6. Time scales

A key item in any collaboration will be the time scales on which plans are prepared or on which they can be changed. Some things, such as a strategic programming of a series of cruises to a remote ocean, clearly dictate a longer lead-time than tactical changes of port call within such a programme. Equally, circumstances may change within a previously prepared cruise programme in such a way that opportunities for collaboration may arise at short notice or opportunities may disappear. It would be prudent, therefore, in considering any notice-board approach, to recognise these two conditions and make the appropriate arrangements for keeping the "end user" in touch with developments.

7. Recommendations

The following recommendations on the way forward are by no means exhaustive, they are offered for consideration and discussion,

- Organisations wishing to participate in a scheme for collaborative use of research vessels and equipment should provide information, preferably via electronic mail, to a centrally-maintained database of their planned ships' programmes.
- A similar database should be maintained of scientists seeking opportunities to use foreign ships or equipment, a basic requirement being that any scientist on this database should have some guarantee of funding from his parent body.
- A file or notice board should also be set up to list short-term opportunities for collaboration.
- Any participant would undertake to access these files or databases or a regular basis, and to keep them updated as necessary.
- Participants should consider within their own countries or organisations the level to which they could provide support in either personnel, finance or other resources, for the successful operation of these databases, and report back to the seminar organisers.
- Participants should undertake to address any of the potential problems identified in this paper, but not resolved by the meeting, and report back
- Any outstanding problems or suggestions for improving the mechanics of sharing resources in this way should be identified and addressed at the next meeting.