



WMO FEATURE

WORLD METEOROLOGICAL ORGANIZATION
A SPECIALIZED AGENCY OF THE UNITED NATIONS

No. 1

April 1991

THE WORLD OF WEATHER AND WATER

WATER AT WORK, WORK ON WATER

2000th request through
Hydrological Operational Multipurpose Subprogramme

Interview with Dr John Miller

by Dr Sylvia Moore

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WMO FEATURES

THE WORLD OF WEATHER AND WATER

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In the first of our series we present:

WATER AT WORK - WORK ON WATER

Interview with Dr. John Miller (Scientific Officer)
(Hydrological Operational Multipurpose Sub-programme)

by

Dr. Sylvia Moore
(Press and Public Information Officer)

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The World of Weather and Water

WATER AT WORK - WORK ON WATER

2000th request through Hydrological Operational Multipurpose Sub-programme

Interview with Dr. John Miller (HWR HCMS)

by Dr. Sylvia Moore (PIP)

Dr. Moore: Today is a very important day for the HOMS Project. HOMS is the Hydrological Operational Multipurpose Sub-programme of the World Meteorological Organization. In fact it is a unique project in that it is a prototype started nine years ago, in 1981. Today is an important day because Dr. Miller who is in charge of this project at the World Meteorological Organization has just received the 2000th request. Dr. Miller, what was the request?

Dr. Miller: An Indian hydrologist who was visiting United Kingdom spoke to the HOMS National Reference Centre in that country and requested from the UK some technology dealing with the measurement of river flows in steep streams, and this constitutes the 2000th HOMS component which is being transferred between the countries participating in the project.

Dr. Moore: Dr. Miller you work with the Department of Hydrology and Water Resources. What is the importance of hydrology in the world today?

Dr. Miller: In many countries the available water is becoming fully utilized and we need to study more closely the amounts available, when it is available, where it is available and how we can best make use of this for providing drinking water, or water for agriculture, or for industrial purposes and of course how we can avoid flooding and droughts and other such disasters.

Dr. Moore: So there is clearly a link between the HOMS project and the Hydrological Services of the World. How did you get involved with this project.?

Dr. Miller: I was involved in some of the preliminary discussions for the project, not from the very early stage which goes right back to the mid-seventies, but towards the end of the seventies I was representing United Kingdom in discussions on this project. When the project became operational in 1981, I was recruited by the Hydrology and Water Resources Department of the World Meteorological Organization to work in the Office looking after the HOMS.

Dr. Moore: Let us have a little bit more information about how you work with the project - its application and its operation.

Dr. Miller: The Hydrological Services of the various WMO Members have to monitor their countries' water resources and for this they need access to the appropriate techniques and technology. For example they need to know what sorts of instruments they need to deploy to measure river flow, and to measure evaporation and rainfall and the other components of a hydrological cycle. They need to be able to collect the data from these instruments, to process them, to store them, to retrieve these data to make analyses so that they would know the volume of water available.

Dr. Moore: So from what you are saying it seems that your project has universal application. Does it have real benefit to the community in different parts of the world? Could you give me some examples?

Dr. Miller: Yes a number of the components which have been transferred are used by the Hydrologists in receiving country. Most of these Hydrologists are of course from developing countries, but developed countries also make use of the facilities.

A common request for technology is for data processing. Many hydrological services over the last decade have been computerising data collection activities and that gives access to computer programmes that can store and retrieve these data. The most frequently requested components have been for these data processing systems.

Another common source of request has been for hydrological models. These are used to estimate the amount of river flow which occurs from rain storms. A particular example here which we might mention is in Costa Rica. The Institute there which deals with hydro-electricity requested a model from Sweden which they are using for forecasting river flows into the hydro-electric reservoirs which may be used to improve the operation of their reservoirs and thus generate more electricity at reduced cost. Many other examples of this nature could be mentioned.

We also do a large amount of training under the project. We had UNDP support for a project in Asia and the South-West Pacific and about 10 or 12 countries in that region participated in the project. We organized a sizeable number of short training courses so that hydrologists in the region were trained in areas such as data processing to enable them carry out their day to day operations in a better fashion than just using water resources facilities available in their country.

Dr. Moore: I am interested in technology transfer because a lot of work is being done in this area and excellent projects are set up with sophisticated equipments. Would you say that this equipment is really transferable? Is the technology really transferable and does it work?

Dr. Miller: Yes, this is frequently a problem, technology transfer has a bad name because of large number of projects in this area have not functioned. Large factories have been established but they could not operate.

We have taken account of this in the design of HOMS. We transfer technology in the form of components, individual small items of appropriate technology which trained hydrologists can make use of in their work. If the hydrologist wishes to build a larger system he/she can put together a number of components all of which combine to work with each other to build a larger system.

We kept the process essentially on a small scale so that at each stage the hydrologist has only a small barrier to cross - that to learn a small range of new techniques and he is able to assimilate this and then move on to adding extra techniques and technology to his armoury so that he can in this way improve his operations incrementally.

Dr. Moore: And it works,

Dr. Miller: There is another point here too in that the technology which we offer is offered by other hydrological services in the world typically in the developed countries but not only in the developed countries: It is from the technology they use themselves every day or every month in their operations, so we know that it works and we know that it is fully supported because in the first place it is the country providing the technology which is maintaining it and keeping it in a working order. So this dual role is one that is supported and is actually used to ensure that technology is relevant to the needs of the receiver.

Dr. Moore: So now that you are up to the 2000th HOMS request would you say that 2000 is a fair number of requests or is it small number over a period of nine years?

Dr. Miller: When we started the project we were quite surprised at the rate which requests came in. 2000 is over 200 a year on an average of the nine years and we had no idea as to the number of requests we would receive. We were very pleasantly surprised that, not only did we have large numbers of requests to start with, but the numbers have by and large held up over the nine years of the project. So obviously the project has met the needs of hydrologists and it continues to meet their needs. 2000 is quite a large number.

It is perhaps because we have transferred technology in small pieces that we get a large number of these pieces. The 2000th request, from India was directed towards the United Kingdom, and it was for a method for measuring discharges in steep streams. There is difficulty in measuring discharges in steep streams. Steep streams are in areas where the river bed is not uniform and properly formed so it is extremely difficult to make these measurements.

This method proposed is based mainly upon the stream and the cross sectional area and uses a large of the size of the rocks in the river to estimate the river flow. This is a particular application of what hydrologists call the slope area method. Again a method which is being applied for measuring flood plains in lowland rivers. The Institute of Hydrologist in UK has developed a method of applying this to very steep streams.

Dr. Moore: Could you explain why?

Dr. Miller: This is the United Kingdom's Principal Hydrological Research Centre. They developed this method in the Yemen Arab Republic for measuring flows in the very steep wadis. Most of Yemen is at a very high altitude, above 2500 metres, while the Tihama Plain actually borders the Red Sea. Down the escarpment between these areas very steep wadis carry the river flow. The flows are intermittent because the climate is arid and it is extremely difficult to estimate the amount of water passing down these wadis. Not only is the flow intermittent but it also carries a large amount of sediments, so conventional instrumentation cannot be used. This method was developed for a project in that country, further tested in steep streams in Scotland, and it has been used in a number of other countries around the world.

Dr. Moore: I would like to know about the future applications of your project because it is unique, and WMO is the only place where there is such a project. Do you envisage any extensions?

Dr. Miller: We hope to continue helping hydrologists in our Member countries, in applications of new technologies and there are a number of new technologies becoming available which we would like to be able to assist them in having access to. In particular a lot of the traditional hydrological instrumentation is nowadays being converted to electronic operation, modern micro electronics, integrated circuits that are cheap and reliable and can be used in these environmental monitoring instruments. They are now reliable enough and cheap enough to be used any where, including developing countries. So we would be foreseeing transferring much of this technology to countries in the near future.

Another development in a slightly different field which is coming up is related to the International Decade of Natural Disaster Reduction. The UN has established this decade for the 1990's to assist its members in prevention of natural disasters due to tropical cyclones or floods or earthquakes and WMO will be participating fully in this decade. One of the projects which we are planning is an extension of HOMS and to provide the technology for disaster prevention, for pre-disaster planning and mitigation measures so that we hope that we can reduce the need for post-disaster relief measures which are needed too often these days.

Dr. Moore: One final note, how many requests do you expect by the year 2000?

Dr. Miller: Well that is another nine years away, and we would hope at least another 2000.