

Baudouin Raoult\*

Operations Department, ECMWF

## 1. INTRODUCTION

The ECMWF Meteorological Archival and Retrieval System (MARS) is a 450 Tbyte archive containing more than 2.5 billion meteorological fields. Two years ago ECMWF endeavoured to offer its Member States users a Web access to this large archive.

This paper describes the various modules offered by this application.

## 2. MONITORING

The MARS system has a client/server architecture and is used in batch from the supercomputers and interactively through Metview, the ECMWF data manipulation and plotting package.

A retrieval request can take a long time if it involves a large number of tape mounts, or if it is queued because the MARS server is already handling hundreds of concurrent requests

A module allows users to follow the progress of their requests with a Web browser. Using this tool, users have learned how to optimise their retrievals and the whole system performance has improved.

## 3. CATALOGUE

The MARS server maintains its metadata in an on-line object-oriented database.

The application allows a user to browse this database. Web pages are created dynamically as the user navigates the hierarchy of metadata.

Using this module, a user can reach any one of the billions of meteorological fields in a few mouse clicks. The catalogue gives an accurate view of the archive, and fields are visible there as soon as they have been archived.

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\* Corresponding authors address: European Centre for Medium-Range Weather Forecasts (ECMWF), Shinfield Park, Reading, Berkshire RG2 9AX, U.K.;

e-mail: baudouin.raoult@ecmwf.int.

## 4. DATA FINDER

One of the shortcomings of the catalogue is that web navigation is done along the way the metadata database is organised. This database was designed to handle efficiently archival and retrieval requests, which may not be the best organisation for task oriented web navigation, such as finding answers to questions like:

- What is the period covered by the 15 years reanalysis?
- Where can I find snow parameters?
- When did ECMWF start producing ozone related parameters?
- What parameters were available in the analysis of 1995?

Each of these answers could be found if a user could navigate through all the dimensions (time, meteorological parameters, data sources, ...) of the information held in the MARS metadata database, in any order he or she wishes.

To solve this problem, a subset of the catalogue is extracted once a day and fully cross-referenced. The "data finder" module allows the user to navigate this cross-reference efficiently and find the answer to his or her quest.

## 5. PLOT AND RETRIEVALS

Having selected fields in the catalogue or data finder, the user may decide to retrieve or plot them. He or she will first have to select a set of post-processing directives, such as sub-area extraction or changes of resolution, and a set of graphical attributes (contour colours, map projection, ...) if required.

Data retrievals are performed asynchronously. Plots are done in batch using Metview. Once ready, data and plots can be downloaded.

## 6. CONCLUSION

This application has been in service for more than a year and has been very popular, with visits from hundreds of Member States users.

Further developments will be made, in particular a facility to allow commercial and research organisations to order and purchase ECMWF data through the web