

Introduction – end of HIRLAM-5 and into HIRLAM-6.

This is the last Newsletter in the HIRLAM-5 Project. There is however no reason for sadness about this, since the HIRLAM members have agreed to continue the co-operation in HIRLAM-6 with continued activities in most areas, including the so important publication work. HIRLAM Newsletter No 42 is an intermediate and quite thin newsletter, but it reflects only some of the recent work. Inside there are articles about some modifications to the semi-Lagrangian dynamics, prompted by the Norwegian high resolution problems, results from the convection scheme work, both STRACO and Kain-Fritsch/Rash-Krisjansson and finally two articles resulting from the Workshop on NWP Systems.

A lot of other work has reached a more mature status and has been or will be published in a number of Technical Reports. There has been one about the semi-implicit non-hydrostatic scheme, a comprehensive paper about the subgrid-scale orography and there are papers on review about 4D-VAR, ISBA and ATOVS, which I expect you will see in the near future. Furthermore is the Scientific Documentation also ready for going to print. Also some results have been presented at the recent meetings and the Meso-scale modelling workshop in Dublin.

I want to take this opportunity for thanking all of you who have contributed to the development of the HIRLAM-5 system during these three years. The time has passed very quickly and this phase of the HIRLAM project is approaching its end. It has been very stimulating to be in contact with so many dedicated people and our meetings have always been in very good spirit and everybody has tried to contribute as much as possible. In a distributed project, meetings are essential and many things are quickly sorted out at or in conjunction with meetings. I think we have had good progress in most of our areas, although maybe some goals have not been reached as quickly as originally stated in our plans, but that is quite normal in research and development.

We did set out with an ambitious plan and we have put resources and advanced in practically all of the areas that were required. Major efforts in data assimilation during the last three Projects have reached fruition in that 3D-VAR has successfully replaced OI at a majority of our operational institutes and it is also becoming the Reference soon. The more advanced and complex 4D-VAR method has been developed and tested extensively. It has been demonstrated to work well, and although still quite expensive, is or will be feasible to use in the next few years for at least some members. The variational method is well suited for use of non-conventional data. It has been used for very instructive experimentation on the assimilation of satellite radiances, radar backscatter, ground radar and ground GPS signals.

The biggest forecast model change is the introduction of the ISBA surface parameterisation scheme together with a completely new surface analysis code. A lot of other parameterisation work has been to improve the previously introduced turbulence and convection schemes. The so far missing subgrid-scale orography parameterisation has been further developed, from the Météo-France scheme. It is ready for introduction. A new convection scheme has also been worked on and tested extensively. The ECMWF physics have been interfaced with HIRLAM and tried quite successfully. Some updates to the model semi-Lagrangian dynamics have been done, both for accuracy and for technical correctness. A major research development is of course the continuing developments with the non-hydrostatic HIRLAM

from Tartu University and with collaboration in some of the member institutes. Research has continued on lateral boundary conditions and on physics-dynamics coupling. Ensemble prediction research has barely started, but workshops have been held and there is some experience in member institutes. Verification methods are always of high demand and planned developments have been implemented and there has also been a workshop in the area. HIRLAM workshops have otherwise been in the physics area (surface, turbulence and orography), data assimilation and satellite data and very recently in meso-scale modelling. Both the workshops and mini-workshops have been very useful to the Project in detailing plans and guiding for the future. A large number of staff have contributed to the Scientific Documentation, which represents a lot of effort and is of high demand.

The HIRLAM system has evolved as well. A major change was the new control structure of the jobs, particularly necessary on the ECMWF distributed computer system. Improvements in the parallelization, and particularly of the I/O on some machines, have been developed. An almost continuous near real time run of the system has been maintained, albeit at low resolution, but it has nevertheless been useful for diagnosing some problems. A lot of testing and evaluation work has been carried out in connection with new releases of the HIRLAM system. A relatively strict policy has been adapted for testing and approving Reference releases and consequently there have relatively few of them (3 with one more coming), but each one including a number of separate developments. In addition there were two main releases (4.8 and 4.9) before the policy was adopted.

The above is just a short summary of all the research and developments in the Project; in addition there are of course a number of other research activities going on. One must also consider that HIRLAM is run operationally in 7 institutes and a lot of work has gone into introduction of new versions and many experiences have been learnt from this work, leading to subsequent improvements or further research. Consequently, we also have seen progress on issues that, although not in the original plans, were urgently needed.

The HIRLAM-6 Project will initially have many similarities with HIRLAM-5, as the new Memorandum of Understanding builds on the old one in many aspects, although with more emphasis on gradually putting more effort into the meso-scale modelling, assimilation and very short range forecasting, while still maintaining as good as possible a synoptic scale system. The Management of the HIRLAM-6 Project will be changed in that the two Deputy Project Leaders are exchanged for four Area Leaders, while abolishing the formal layer of subproject co-ordinators. The idea is that with more confined Areas, the Leaders will deal directly with staff. The Project Leader and System Manager remain the same as in HIRLAM-5. The four Area Leaders will soon be appointed by the Council, given recommendations from the Advisory Committee.

Recent meetings

- SRNWP Workshop on NWP system design, 13-15 May, Météo-France, Toulouse.
- HIRLAM-5 Council Meeting No. 6, 26 June, Reading.
- HIRLAM Advisory Committee telephone conference, 19 August 2003.
- HIRLAM MG Visit to SMHI, 9-10 September 2003, Norrköping.

- HIRLAM-5 extra Council Meeting, No. 7, 12 September, Copenhagen.
- 1st European workshop on short range LAM EPS, 3-4 October 2002, INM, Madrid.
- EWGLAM/SRNWP meeting, 7-10 October, KNMI, De Bilt.
- HIRLAM workshop on Meso-scale modelling, 14-16 October 2002, Dublin.
- HIRLAM Advisory Committee meeting, 25 October, Puerto de la Cruz, Tenerife.

Forthcoming meetings

- HIRLAM-5 Council Meeting No. 8, 4 December, ECMWF, Reading.
- HIRLAM-6 All Staff Meeting 2003, 31 March-2 April, Helsinki.
- HIRLAM Advisory Committee meeting, 24-25 April, Dublin.

Per Undén, 8 November 2002.