



<p style="text-align: center;">HIRLAM-B Programme 2011-2015 Memorandum of Understanding</p>
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Introduction

National Meteorological Services (NMS) are required to provide short and medium range weather forecasts, warnings and alerts for their territory. For medium range forecasts one needs to use global models. Most European NMSs use the products from ECMWF. For short range applications it is most cost effective, and even necessary, for very high resolution, to run the NWP systems for only a small part of the globe using a Limited Area Model (LAM). These LAMs require boundary conditions from global models, like the ECMWF model.

In Europe there are a number of consortia that collaborate on Limited Area Modelling. HIRLAM was the first group to be established (the High Resolution Limited Area Modelling project). It expanded from the Nordic countries to include others in Western and Southern Europe and it has been a successful collaboration since 1985. The members find considerable benefit from collaborating on a common modelling system, since the activities are too extensive for any single member to pursue on its own. The HIRLAM collaboration has originally been organised in Projects and there have been 6 of these (from HIRLAM-1 to HIRLAM-6). The members then decided to continue the collaboration in the form of a five-year programme, which was believed to form a better and more flexible basis for a long term collaboration. In the first programme, HIRLAM-A (2006-2010), the HIRLAM group engaged in a close collaboration with the ALADIN consortium on mesoscale modelling, in which both consortia are committed to a coordinated effort to achieve the common goal of delivering state-of-the-art operational short- and very short range numerical weather prediction systems. This collaboration will be continued in the follow-on programme to HIRLAM-A described in this MoU and which, unless explicitly stated otherwise, will be referred to as the HIRLAM-B Programme, or simply the Programme. The general terms of its scope, objectives and organization are set out below and further details are given in the annexes.

HIRLAM's prime long-term goal is to continue to provide its members with a state-of-the-art operational short and very short range numerical weather prediction system. The main application for this system is the production of operational weather forecasts for the member institutes, with particular emphasis on the detection and forecasting of severe weather, support for aviation meteorology and services related to public safety. The modelling system forms the basis of a very wide range of national operational applications, such as oceanographic, wave and storm surge forecasting, road condition predictions, aviation, hydrological

forecasting etc. Further applications involve regional climate modelling, air quality prediction, dispersion modelling and use of the model as a tool for other atmospheric research.

2. Definition of the HIRLAM-B Programme

The HIRLAM-B Programme is a co-operation between the members of HIRLAM on Limited Area Numerical Weather Prediction (NWP).

2.1 Scope of the programme

The primary purpose of the HIRLAM-B Programme is to carry out research and development together in order to provide the members with a NWP system as the best suitable means of support for their operational activities. Much of this work is carried out in a close collaboration with the ALADIN consortium under closely aligned scientific and work plans. The scope and terms of this collaboration are described in the HIRLAM-ALADIN agreement in Annex 1.

There are many additional benefits that can be realised through application of the NWP system or parts thereof in e.g. climate modelling activities, and modelling of other components of the earth system (hydrosphere and biosphere). Such activities are important in their own right, but with limited resources being available, they will not be pursued within the HIRLAM-B programme.

2.2 Objectives of the Programme

The following objectives are fundamental for the Programme:

- To carry out research and development of the NWP system, in collaboration with ALADIN, in order to provide a high quality operational short- and very-short-range deterministic and probabilistic analysis and forecasting system that is state-of-the-art and competitive, in a measurable way, with other modelling systems that could be available for production. To meet future operational requirements, the NWP system developments should take the evolution of supercomputer architectures into account.
- The NWP system shall be provided in the form of well-defined Reference systems which have passed full quality control so they satisfy the user requirements. The Reference systems shall be run and routinely monitored by the programme in a regular cycle (RCR) on one or more platforms and geographical domains (see Annex 6 for definitions).
- To form a basis for further collaboration on operational activities and joint production in the main Programme or in the form of optional Projects.
- To provide and maintain a level of NWP expertise among the HIRLAM members, such that HIRLAM can be recognised as a centre of excellence in NWP in Europe.

At the end of each year the fulfilment of these objectives shall be reported to the Council.

2.3 Duration of the Programme

The HIRLAM-B Programme commences on 1 January 2011 and will run for 5 years until 31 December 2015. Optionally, the HIRLAM Council may decide to extend the Programme beyond this, for up to five more years. Such a decision must be taken before 1 January 2015. The Programme may be terminated before the end of its term, provided the Council decides so and with at least one year's notice.

The Council shall review the terms of the Programme at regular intervals, at least once every 3 years.

3. Members of the Programme and collaborations

3.1 Members and membership procedures

Three types of memberships of the Programme are distinguished:

- regular members, who fully contribute to the Programme in terms of staffing, finances and computer resources, and who generally use the model for their operational activities
- acceding members, who wish to join the consortium but who are not yet able to fully contribute to the Programme
- cooperating members, who contribute to research areas within the Programme at a level of contribution agreed between them and the Programme.

The regular members of HIRLAM-B are the participating meteorological institutes:

1. The Danish Meteorological Institute (DMI),
2. The Estonian meteorological and Hydrological Institute (EMHI)
3. The Finnish Meteorological Institute (FMI),
4. The Icelandic Meteorological Office (IMO),
5. The Irish Meteorological Service (Met Éireann),
6. The Lithuanian Hydrological and Meteorological Service (LHMS)
7. The Royal Netherlands Meteorological Institute (KNMI),
8. The Norwegian Meteorological Institute (met.no),
9. The Meteorological State Agency of Spain (AEMET),
10. The Swedish Meteorological and Hydrological Institute (SMHI).

The French Meteorological Service, Météo-France, is a co-operating member.

The procedure involving the adoption of new regular or acceding members is described in Annex 2. A member may cancel its membership by giving at least one year's notice to the Council Chairman. The rights and obligations concerning the use and ownership of the HIRLAM code continue, following the rules of this MoU and any other agreements made with HIRLAM and co-operating consortia prior to leaving the Programme. These rights only extend to the versions of the code released before the cessation of membership.

3.2 Collaborations

HIRLAM collaborates closely with the ALADIN consortium in NWP research and development. This collaboration is organised around a shared code within the framework of the Integrated Forecasting System (IFS), used for some or all of the areas of activity. The

terms of the collaboration have been formalized in an agreement between HIRLAM and ALADIN, which is included in Annex 1.

ECMWF has a special role for HIRLAM, due to the operational role of providing boundary conditions and other data, its computer facilities, provision of software, common research interests, and, since HIRLAM-A, an increasingly strong common interest in the development of the IFS code framework. In view of the increasingly close ties with ECMWF in both research and system development, HIRLAM aims to formalize these relations in terms of a written agreement with ECMWF during the HIRLAM-B period.

HIRLAM also has co-operations of a mutual nature with other organisations, such as the Met Office (UK), other European NWP consortia in the context of the EUMETNET/C-SRNWP programme, and NWP groups elsewhere. The consortium seeks to actively strengthen its ties with the academic research community, through common research activities and projects, and through the provision of a more transparent and easy-to-use model version for academic use.

4. Steering of the HIRLAM Programme

4.1 Steering bodies of the Programme

The HIRLAM Council has the overall authority for the Programme.

The HIRLAM Advisory Committee (HAC) advises and reports to the Council.

The programme manager has the executive responsibility of the programme and reports to the Council. The programme manager may be supported by a scientific secretary.

HIRLAM project leaders are appointed to lead specific projects within the programme. One of the project leaders is appointed as deputy programme manager, to act in place of the programme manager when needed.

The HIRLAM management group (HMG) consists of the programme manager and the project leaders.

The detailed roles of all of these steering bodies are described below.

4.2 Steering documents of the Programme

This Memorandum of Understanding (MoU) determines the basic structure and organisation of the Programme and the commitments by the members. Co-operation agreements with other consortia as agreed by the Council are part of this MoU. The valid agreements are listed in section 7 and Annex 1.

The HIRLAM Strategy 2011-2020 describes the goals, high-level deliverables of the Programme and the scientific activities that will be pursued in the period 2011-2020. It is prepared by the HMG and the HAC.

The commitments and rights concerning the shared code with ALADIN are regulated in a co-operation agreement with ALADIN, which is included in Annex 1.

The research is formulated in a scientific plan, which covers the broad developments for the next five years and which follows the Strategy. It is aimed to achieve a fully common scientific plan with ALADIN as soon as possible within the period covered by this MoU. The scientific plan shall be updated as appropriate at least once during its life span.

The joint research activities with ALADIN will be detailed in a common work plan that shall be updated each year. This work plan will detail the tasks, staffing and time schedule that are needed that year to carry out the scientific plan.

Before the start of each calendar year the Council will agree on a budget with staffing, financial and computer resource commitments as well as the apportionment of the contributions between the members.

4.3 The HIRLAM Council

The HIRLAM Council consists of the Director Generals of the participating regular and co-operating member institutes, or representatives nominated by them. Overall authority for the Programme is vested in the Council. The HIRLAM Council shall normally meet twice a year. Co-operating consortia and acceding members are given a standing invitation to participate as observers. The Council may also invite observers from other organisations on a case-by-case basis. Acceding and co-operating members have no voting rights in Council.

The Council elects one of its members as chairman. The chairman may represent the Programme between meetings and inform or liaise with the Council members as appropriate. The Council selects one of its members as vice-chairman, to act in replacement of the chairman if needed.

The Council monitors the progress of HIRLAM and takes decisions on any overriding and principal issues. The steering documents need to be approved by the Council, as well as any changes that are subsequently made.

The Council appoints the following positions:

- The programme manager
- The deputy programme manager
- The project leaders
- The scientific secretary
- The HAC chairman
- The HAC vice-chairman

Council decisions shall be taken by simple majority except where explicitly stated otherwise in this MoU. The following issues require unanimous decisions:

- HIRLAM financial, computational resources and staffing commitments
- Changes to the MoU including its Annexes
- Accession of new members
- Co-operation agreements with third parties
- Dissolution of the consortium

4.4 HIRLAM Advisory Committee

The HIRLAM Advisory Committee (HAC) consists of a representative from each of the members and co-operating members. The national representatives shall in general not be HIRLAM scientific staff or HMG members. The HAC meetings shall generally be held twice annually. The programme manager takes part in the meetings. Acceding members have a standing invitation to send a representative to the HAC meetings. Co-operating consortia and ECMWF participate as observers, and representatives from other organisations, such as the programme manager of the EUMETNET/C-SRNWP programme, may be invited as observers. The HAC shall report to the Council.

The tasks and remits of the HAC are described in Annex 3.

4.5 External and scientific reviews

An external review of the Programme shall be done when considered appropriate by Council. The tasks of the review shall be specified by the Council and may concern scientific, technical or organisational issues. It will be carried out by a group of external experts who are proposed by the HAC and appointed by the Council for this purpose. The members are selected based on personal competence.

The scientific plans of the programme shall be subjected to review by external experts at least once every three years.

5. Programme organisation

5.1 HIRLAM programme manager and scientific secretary

The programme manager has the overall executive responsibility of the Programme and reports to the Council. The programme manager is responsible for the implementation of the Programme following the guidelines by the HAC and in liaison with the HIRLAM member institutes, and ensures that priority issues of the Programme are attended to in the projects. The programme manager leads the HIRLAM management group and has the overall authority for the core group and regular staff. He or she represents the Programme in the governing bodies and external contacts. The programme manager shall be affiliated full time with one of the member institutes. The programme manager may be supported by a scientific secretary. Annex 4 details the responsibilities of the programme manager.

5.2 HIRLAM projects and project leaders

The HIRLAM Programme encompasses a range of research areas. In order to focus the work and to ensure that resources are allocated effectively, a number of projects will be identified within the Programme. Each project will have specific objectives and targets, following the Strategy document. The projects may be of definite periods shorter than the whole Programme and new projects may be set up as required and subject to Council approval.

Each project shall have a project leader assigned and working most of the time in that capacity. The project leaders manage the day-to-day activities within the project and coordinate the work of core group members and regular staff allocated to the project. The project leaders prepare the plans in their area and ensure that reports are made on their progress.

One of the project leaders shall be assigned the responsibility for the maintenance and development of the Reference system, in close cooperation where necessary with staff having similar responsibilities within ALADIN. One of the project leaders shall be assigned responsibility for operationally oriented activities to be carried out within the Programme. He or she shall separately provide reports on these activities to the HAC and Council. One of the project leaders shall be appointed as deputy programme manager.

More detailed arrangements and instructions shall be prepared by the programme manager.

5.3 HIRLAM management group (HMG)

The HIRLAM management group consists of the programme manager and the project leaders. The HMG decides on priorities and organises the work, following guidance by the HAC and Council. The HMG has the collective responsibility to plan the work of core group members and to utilise the expertise of the core group and regular staff in the most efficient way.

HMG members may be recruited from outside of the institutes or the member nations. They are employed by or through a member institute, and have their salaries reimbursed by the Programme according to their share of full time and the salary scales in the budget.

5.4 HIRLAM core group

In order to address high-priority research issues or urgent problems effectively, and to support the Reference system, a core group is designated with full-time staff allocated to priority tasks identified by the HIRLAM Management Group. The goals for the work in the core areas may be related to high-priority novel developments, but also to ensuring and enhancing the quality of the already developed NWP system. Scientific and technical problems that turn up in the Reference system or in a Reference system installation in a member institute shall be addressed primarily by the core group. Furthermore the core group will carry out routine verification and document the performance of the Reference system. A number of staff from both the core group and the regular staff will work on system management and system co-ordination with co-operating consortia.

Core group members work full time in the HIRLAM Programme and they shall be managed by the HIRLAM management group. They will report directly to the programme manager or to a HMG member designated by him/her who will assign them to the appropriate projects. Each member institute will supply or fund core group members according to the annual budget. The positions are filled in agreement between the programme manager and the head of research (or equivalent) in each institute. The appointments shall run for one year at a time. Core group members may either be assigned directly by the member institute, or hired through funding via the HIRLAM budget. If a member cannot supply a full time person, core group members may be hired at other institutes instead.

5.5 HIRLAM regular staff

The main development and research work is carried out by research staff, regular staff, from the member institutes. The regular staff members shall in principle be allocated to the Programme at least on a half time basis.

5.6 Optional projects and task forces

The Programme may be extended with optional projects for activities in which not all HIRLAM members can or want to participate. A close co-ordination with the rest of the Programme is likely to be of advantage, but the level of steering from the Programme shall be decided on a case by case basis for each project. Each optional project shall bear its own cost in terms of finances, staff and computer resources. The implications for the work of the Programme, both in terms of additional load and in terms of contributions to the Programme, shall be clarified on each occasion. The Council decides on the establishment or cessation of optional projects.

The possibility exists to set up a joint task force or forces composed of HIRLAM and ALADIN staff, working together on a designated topic of importance for a limited period of time. The task force is led by a coordinator from either HIRLAM or ALADIN. As such, the task force concept represents a first step towards a common HIRLAM-ALADIN programme management structure. Topics for a task force are suggested through a joint proposal from the HIRLAM and ALADIN programme managers. The proposed topics are evaluated by the HAC and the ALADIN Policy Advisory Committee (PAC); coordinators and staff of the task force are designated by the HIRLAM and ALADIN programme management, after agreement by the NMS's on the man power commitments of the staff involved. HIRLAM task force coordinators may be selected from HMG members but also from regular or core group staff, depending on the required expertise. Both regular and core group staff may participate in a task force. The priorities of task force activities with respect to other programme activities are to be set by the HIRLAM and ALADIN management in consultation with the task force coordinator. In line with the fact that task forces are intended to be instigated only for subjects of critical importance, task force commitments are normally expected to take precedence over other commitments within the Programme. A task force cannot exist for more than 12 months. A limited number of task forces (not more than 3) should be active at any given moment. Once a task force activity is completed, its outcome is reported to the HAC and PAC.

6. Commitments by members

6.1 Minimum staff commitments

Each member shall provide core group staff and additional regular staff, at least up to their minimum commitment as detailed in the annual staffing budget. The members shall ensure sufficient staffing in the priority areas. Only work that is part of the work plan or is regarded as necessary for the Programme by the programme manager is taken into account as HIRLAM Programme work.

Member institutes shall commit themselves to precise deliverables and staff allocations defined in the projects as agreed with the programme manager and defined in the projects in the annual work plan. If there are changes of staff or other circumstances delaying the work, it is the responsibility of the member institute to make every effort to replace the staffing to carry out the allocated tasks.

6.2 Computer resources at ECMWF

Member institutes contribute a percentage of their national computer resources at ECMWF (the level of which is based on GNI) to a HIRLAM pool, which is added to HIRLAM Special

Project resources and used for experimentation and for testing of the Reference system. The percentage to be applied is established yearly in the budget. Resources required for operational applications are to be organized separately.

6.3 Other costs borne by the members

Costs for travel of regular staff and core group staff attending workshops, working weeks and incidental visits shall be borne by their home institutes. Likewise, costs for participation in HIRLAM Advisory Committee meetings shall be paid by the individual members. The programme manager may decide to cover the costs of visits by staff members or other experts on a case-by-case basis. The local costs of organising workshops will be met by the institute hosting them. The management group shall consider these aspects when planning such meetings, to ensure an equitable distribution of costs over the duration of the Programme.

All Staff Meetings will be organized once a year, on an alternating schedule between HIRLAM and ALADIN partners as host. The costs of All Staff Meetings will be borne 50% by the host institute, 25% by the HIRLAM Programme and 25% by the ALADIN programme. The expenses of invited outside experts for workshops organized by HIRLAM shall be paid by the Programme.

6.4 Shared Programme costs

The following costs shall be shared among the institutes participating in HIRLAM and including the co-operating members:

- (a) Salary of the Programme Manager
- (b) Salary costs of the Project Leaders
- (c) Secretarial and Publication costs (salaries, printing and distribution etc.)
- (d) Costs of teleconferences and travel and subsistence of the management group for HIRLAM meetings or other meetings where it is required to represent HIRLAM, as agreed with the programme manager.
- (e) Travel and subsistence costs for the HAC chairman that are additional to the ones needed for the normal national representation in the HAC itself
- (f) Finance for inviting or hiring, at times and when necessary, experts from outside or within the consortium to provide specific expertise
- (g) Travel and subsistence costs for external reviews

The Council may request an audit of the HIRLAM accounts.

6.5 Apportionment of contributions and budget procedures

The shared Programme costs shall be covered by direct contributions from the participating institutes. The apportionments are based on principles of solidarity and equality.

HIRLAM regular and acceding members are divided into standard members and small members. The assignment is decided by the Council and is valid for the duration of the membership in the Programme, unless there are exceptional circumstances.

Members have rights and obligations which are equal for all members except for the following considerations:

- Small members pay a reduced amount compared to standard members.
- Staff contributions include an element of size of the member institute.

- There is a minimum level of staff contribution below which it is not considered meaningful to participate in HIRLAM.
- Acceding members are not obliged to contribute to staffing or computer resources. Their contribution to the financial budget is set to 50% of the contributions of members of the same size category.
- Co-operating members contribute at a level negotiated between them and Council.

The following implementation rules are applied to take into account cases where there are big differences of resources between the HIRLAM member institutes.

- The contributions from co-operating members are negotiated separately each year.
- For financial contributions, small members pay an amount which is 1/9 of that of standard members. The remaining amount, after contributions from co-operating members and small members, is paid by all standard members in equal shares.
- For staff contributions, there is one basic contribution for small members and another larger one for standard members. The contribution for standard members is graded roughly according to GNI but not necessarily proportionally. The staff contributions shall be reviewed every year in connection with setting up the annual budget but the total number shall be consistent with requirements and extent of activities in the Programme. The staff number shall be rounded to the nearest half time equivalent.

The financial contribution from each participating institute is estimated in advance for each year. The contributions to the HIRLAM budget are paid annually, via bilateral financial arrangements between the meteorological institute of the country of the programme manager and the contributing meteorological institute.

The budget shall be drawn up by the programme manager each year, for consideration by the HAC and approval of the Council. The currency of the budget shall be Euro. Invoicing will take place in the beginning of March each year, with settlement two months thereafter, in the beginning of May.

7. Proprietary rights to the HIRLAM and Harmonie systems and products

The HIRLAM system is the collection of HIRLAM common codes, scripts and tools which have been jointly developed and are collectively owned by the HIRLAM members. The Harmonie system is the non-hydrostatic mesoscale model code and system ensuing from the collaboration with ALADIN within the IFS framework.

7.1 Use by the members

The members of HIRLAM own the HIRLAM common codes system jointly. They co-own with other consortia the HIRLAM and Harmonie co-owned codes, and they have rights to use the HIRLAM and Harmonie shared third party codes. As a result, they have full rights to use the HIRLAM and Harmonie Systems for their own requirements.

The shared third party codes within HIRLAM and Harmonie consist of EUMETSAT NWP SAF software for the QuikScat Data Processor (Licence agreement signed on 2003-03-10, http://research.metoffice.gov.uk/research/interproj/nwpsaf/request_forms/request_awdp_1.ht

ml) and for RTTOV-8 (and subsequent versions; Licence agreement signed on 2004-11-24, http://research.metoffice.gov.uk/research/interproj/nwpsaf/request_forms/terms_rttov_9.html) . For the Harmonie code, aspects of use by the member institutes are covered in the agreement with ALADIN in Annex 1.

7.2 Use for research purposes

The programme manager is authorised to consider requests from scientific or technical research groups for access to the HIRLAM system for non-commercial research purposes, taking into account the provisions of agreements on shared third party codes. Access is granted under the conditions stated in Annex 5 for the HIRLAM common codes.

The HIRLAM Council may allow access by a third party to the HIRLAM and Harmonie systems, or elements thereof, on a case by case basis, provided such access is compliant with agreements on shared third party codes . The software shall be protected against unauthorised access by any further outside party, taking into account, when appropriate, relevant provisions of agreements on shared third party codes.

Access to the Harmonie co-owned code follows the conditions stated in the co-operation agreement with ALADIN (Annex 1).

7.3 Use for commercial purposes

The commercial exploitation of the HIRLAM system within the European Economic Area, and the distribution of revenue arising from such exploitation, is done in accordance to ECOMET rules.

HIRLAM members are free to distribute forecast products based on the HIRLAM system, in real-time, to bodies outside the European Economic Area, provided only that they notify the HIRLAM Council in advance and that provisions of agreements with other consortia, as listed in section 7.1 and Annex 1, are respected. All such arrangements shall be consistent with the provisions of Resolution 40 of WMO CG-XII.

For the Harmonie code, and forecast products based on it, commercial exploitation aspects are covered in the agreement with ALADIN in Annex 1.

8. List of annexes

Annex 1: HIRLAM-ALADIN co-operation agreement.

Annex 2: Procedures for new and acceding members

Annex 3: Instructions for the HIRLAM Advisory Committee

Annex 4: Instructions for the programme manager

Annex 5: Conditions for use of the HIRLAM System, or parts thereof, for scientific or technical non-commercial research purposes by users outside the HIRLAM members and co-operating meteorological institutes

Annex 6: Definitions and acronyms

9. Signatures

Director General of DMI	Director General of EMHI
Director General of FMI	Director General of IMO
Director of Met Éireann	Director General of LHMS
Director General of KNMI	Director General of met.no
President of AEMET	Director General of SMHI
President-Director General of Météo-France	

8 December, 2010

Annex 1
Agreement between HIRLAM and ALADIN.

AGREEMENT

Preamble

This Agreement specifies the conditions for the collaboration between the ALADIN consortium and the HIRLAM consortium as mentioned in the Article 5 and Article 3 of their respective Memorandums of Understanding. This undersigned Agreement is an attachment to each Memorandum of Understanding.

1. Parties

- 1.1 On the one hand the ALADIN Consortium, represented by the Chairperson of its General Assembly, and on the other hand the HIRLAM Consortium, represented by the Chairperson of its Council, as the consortia are put together from time to time.

2. Prime objective

- 2.1 The prime long-term objective is to provide the ALADIN and the HIRLAM Members with a state-of-the-art NWP-model for Short and Very Short Range Forecasting including Nowcasting, for both Research and Development activities and Operational usage.

3. Scope of the collaboration

- 3.1 The Parties have agreed to co-operate in fields related to Mesoscale modelling including the full NWP suite of observation processing, assimilation, forecasting, post-processing and verification and probabilistic forecasting.
- 3.2 The co-operation shall be based on an agreed strategic framework, covering a five to ten-year period, open to innovations for the longer term future.
- 3.3 The collaboration aims at enabling each consortium and any of its Members or acceding Member to carry out research and development activities using a shared ALADIN - HIRLAM System, as defined in paragraph 5.1, which is developed, made available and maintained to facilitate the transition to a fully common ALADIN - HIRLAM code.
- 3.4 The collaboration focuses on the development of ALADIN - HIRLAM Common Codes, centrally maintained in compliance with IFS rules and standards, suitable for operational use. However, the decisions regarding the operational code implementation remain within each consortium.

4. Duration

- 4.1 This Agreement shall enter into force when signed by the Parties and shall be valid for a period of 5 years. Unless cancelled by either party giving two years notice the agreement shall each time be prolonged with an additional period of two years.

5. Definitions

- 5.1 For the duration of this Agreement the definitions shall be the following:
The shared ALADIN-HIRLAM System shall mean the complete code that is necessary for executing all configurations that are part of the agreed collaboration according to this Agreement. The ALADIN-HIRLAM System is composed of shared codes of four different types:

the ALADIN Common Codes, defined as the codes jointly developed, maintained and owned by the ALADIN Consortium;

the HIRLAM Common Codes, defined as the codes jointly developed, maintained and owned by the HIRLAM Consortium;

the ALADIN-HIRLAM Common Codes defined as the codes jointly developed and maintained by both consortia;

Other ALADIN-HIRLAM codes that are either co-owned or owned by third parties and shared under relevant provisions of agreements concluded by either consortium or by Member(s) thereof with such third parties extending rights to both consortia.

The Co-ordination Group shall mean the Programme Managers from ALADIN and HIRLAM, forming a common working group for the overall co-ordination of activities stipulated in accordance with this Agreement. The Co-ordination Group may appoint experts for support when ever they find it necessary.

Participant shall mean any national N(H)MS who is a party to either of the HIRLAM or ALADIN MoU:s, or an acceding Member to one of the two consortia.

6. Commitments of the Parties

- 6.1 The Parties shall contribute in research and development in accordance with annual agreements (common research/work plan), according to paragraph 7.2.
- 6.2 The Parties shall also contribute to Code coordination and phasing at agreed intervals.
- 6.3 All joint code developments that are validated and introduced in any national release or operational implementation should be made available as part of the ALADIN-HIRLAM Common Codes.

7. Collaboration

- 7.1 ALADIN and HIRLAM will co-operate in a number of areas. The co-operation, initially organised around the shared ALADIN - HIRLAM System defined above, will evolve towards a full ALADIN - HIRLAM Common System based on common codes. At a precise stage during the term of this Agreement and after successful collaboration, all of the respective ALADIN and HIRLAM Common Codes will be regarded as ALADIN - HIRLAM Common Codes upon a joint decision by the ALADIN Assembly and HIRLAM Council, including appropriate arrangements for co-ownership. Both Consortia will seek arrangements with third parties to convert other shared codes into ALADIN - HIRLAM Common Codes. The commitments and rights are regulated in paragraph 9.
- 7.2 The details of the work will be specified in a common research/work plan, including identified deliverables and milestones, and its realisation jointly evaluated at least once a year. The plan shall be renewed every year.
- 7.3 The Co-ordination Group shall prepare the common research/work plan in very definite terms and establish a close co-operation, including periodic discussions and meetings between the Parties. Other practical actions may also be delegated to the Co-ordination Group
- 7.4 The ALADIN Assembly and the HIRLAM Council shall annually decide upon the common research/work plan to be carried out.
- 7.5 A number of activities will be carried out within the collaboration stipulated in this Agreement. Each activity will have specific objectives and targets formulated, following the Strategic plan.

8. Quality assurance

- 8.1 A periodic review of the common work and results should be carried out as part of each consortium review process, in a coordinated manner as much as possible and at least every third year. Any evaluation report is communicated between the Parties.

9. Intellectual Property Rights

- 9.1 ALADIN - HIRLAM Common Codes shall be jointly owned by the Parties to this Agreement. This joint ownership shall be protected by the Members of both Consortia.
- 9.2 The parts of the shared ALADIN - HIRLAM System which are not ALADIN - HIRLAM Common Codes shall be duly authorised by the owning Consortium and/or third party owners for use by both consortia. The other Party shall have an irrevocable licence for use from the owner, as a minimum for official duty use and research. The licence agreement shall also stipulate the conditions for commercialization of products generated using the ALADIN - HIRLAM System.
- 9.3 Any Party introducing code or software to the collaboration stipulated by this Agreement without being the formal owner or right-holder to that code or software shall guarantee that it has secured the right to use such code or software within the scope of this agreement.
- 9.4 For the collaboration under this Agreement a list of all shared codes shall be drawn up and maintained by the Co-ordination Group, identifying (i) the ALADIN - HIRLAM Common Codes, (ii) the HIRLAM Common Codes (iii) the ALADIN Common Codes, and (iv) other shared Codes with appropriate reference to the owners and the rights granted by the owner to the Parties.
- 9.5 Any Participant to the collaboration stipulated in this Agreement shall have the right to grant licence for non-commercial research purposes (i) the ALADIN - HIRLAM Common Codes, (ii) the ALADIN Common Codes (iii) the HIRLAM Common Codes, and (iv) other shared codes subject to appropriate agreement of the owner. This right is limited to licensing its country or group of countries forming a single economic area, as stated in WMO Resolution 40 (Cg-XII) Adopts (2) or to the N(H)MS of a Member or Cooperating State of ECMWF which is not a Member of either consortium. Any such grant shall be reported without undue delay to the Co-ordination Group. A written contract shall be drawn up securing that the use of the licensed code by the Licensee is according to Appendix 2 of this Agreement as well as developments made by the Licensee may be used by the Parties within the scope of this Agreement.
- Licensing for non commercial purposes to other users is subject to prior agreement of the ALADIN General Assembly and the HIRLAM Council.
- 9.6 Licensing of ALADIN - HIRLAM Common Codes or shared codes owned by either consortium to third parties for any operational use shall be prohibited unless otherwise jointly decided by the ALADIN Assembly and the HIRLAM Council.
- 9.7 Commercialisation of products shall be in accordance with Appendix 1. The application of its item 5 "Charging principles", and in particular the element "development costs", may give rise to royalties. The definition, applicability, and apportionment of which between the Members of both consortia shall be approved by the ALADIN General Assembly and the HIRLAM Council.

10. Disputes

- 10.1 Any dispute concerning this Agreement, its validity, its interpretation or any circumstances in connection therewith shall be solved amicably. An arbitration panel consisting of one member from each of the Parties shall be formed which shall propose

a settlement of the dispute agreeable to both Parties. Should either of the Parties not accept the settlement proposal this shall lead to cancellation of this Agreement.

11. Amendments

- 11.1 Any amendment to this Agreement shall be in writing and signed by both Parties to be valid.

12. Language

- 12.1 This agreement and any circumstances in connection therewith shall be subject to the English language. Should this agreement be translated into any other language and the translation holds contradictions relative to the English version, the wording of the English version shall prevail.

SIGNED:

*Dr. Klemen Bergant
Chairperson and representative
for the ALADIN Consortium and
its members
Date: 15 December 2010*

*Dr. Frits Brouwer
Chairperson and representative
for the HIRLAM Consortium and
its members
Date: 16 December 2010*

Appendix 1

Conditions for the Commercialisation of Products generated using the ALADIN-HIRLAM System.

1. Introduction

The purposes of the ALADIN-HIRLAM System shared by the ALADIN and HIRLAM consortium is to enable the N(H)MSs to carry out their official duty functions. However, the ALADIN-HIRLAM System can be used to generate products which may be exploited for commercial use.

Any commercialisation of products generated using the ALADIN-HIRLAM System will be based on international and national legislation. For commercialisation within the EEA by ECOMET members, the rules of ECOMET shall apply. For other cases, WMO Resolution 40 (Cg XII) applies.

2. Definitions

In the context of this appendix, Products are defined as outputs of the model configuration run by any Member of either the ALADIN or HIRLAM consortium, using the shared ALADIN-HIRLAM System, ALADIN-HIRLAM Common Codes or other codes made available by the other consortium. Products are Type A products in the ECOMET sense, i.e. “meteorological information that results from the transformation or processing of data sets in the form of pictures, charts, text or data files, is considered to require meteorological know-how to be interpreted, and has been prepared specifically to meet the operational requirements of an N(H)MS”.

Products generated by a Member of the ALADIN Consortium are considered as ALADIN Products.

Products generated by a Member of the HIRLAM Consortium are considered as HIRLAM Products.

Educational Use: Any use of Products by a school, university, scientific institute or similar (private or institutional), solely for educational purposes, without transmission or redistribution of these products to any further third party, or use of them to generate a value added service.

3. Ownership of Products

ALADIN or HIRLAM Products and value-added services derived by an N(H)MS being a Member of either the ALADIN or HIRLAM consortium, are considered to be owned by the N(H)MS producing them.

4. Availability

The ALADIN Assembly and the HIRLAM Council aims at enhancing the use of ALADIN or HIRLAM Products for the benefit of society, while ensuring a reasonable return to the infrastructure costs of the participating N(H)MS. It is the understanding that:

- (a) ALADIN or HIRLAM Products shall be either declared as “additional” or considered as “other” data in the sense of Resolution 40
- (b) ALADIN or HIRLAM Products shall be supplied only at delivery charge for non-commercial research and Educational Use, under specific licenses.
- (c) The N(H)MS Members of either Consortium which are members of ECOMET will:
 - facilitate access and conditions for the use of Products for commercial purposes within the ECOMET Territory which consists of the European Economic Area and the national territory of ECOMET Members outside EEA;
 - make sure that their commercial arms are treated in the same manner as the private sector concerning conditions and prices for commercial use of ALADIN or HIRLAM Products.
- (d) WMO Resolution 40 (Cg XII) shall apply to commercialisation of ALADIN or HIRLAM Products outside the ECOMET Territory and the National Territories of Members of either consortium and acceding ALADIN Members.

5. Charging principles

The charging principles defined hereafter shall apply to all Members of either consortium commercialising products, irrespective of their status with respect to ECOMET.

The tariffs will normally reflect the target set for each N(H)MS for recovery of infrastructure costs in accordance with national requirements.

The following expenses should be taken into account when establishing the tariff for ALADIN or HIRLAM Products:

- (a) development costs,
- (b) the cost of the individual N(H)MS to run their own system,
- (c) a mark-up for meteorological infrastructure

Appendix 2

Conditions for use of the ALADIN HIRLAM System, or parts thereof, for scientific or technical non-commercial research purposes by users outside the ALADIN and HIRLAM Members

- (1) The list of codes of the ALADIN-HIRLAM System to which the user is granted access shall be notified to the user as part of the licence, and communicated to the ALADIN General Assembly and the HIRLAM Council. That list shall not include codes of the ALADIN-HIRLAM System that are not fully owned by either consortium, unless the owner of such codes has transferred appropriate rights to license the code.
- (2) The user shall not have access to the original version of the full ALADIN HIRLAM System available at ECMWF or other installations, or elements thereof. He/she shall make use of separate authorised copies of appropriate parts of the system kept under his or her own responsibility.
- (3) Under no circumstances shall the user pass on or sell the ALADIN-HIRLAM System or parts thereof which he/she has access to, to any third party without the written consent of the ALADIN Assembly and the HIRLAM Council. This restriction also applies to distribution over electronic networks such as the Internet.
- (4) Under no circumstances shall the user pass on or sell meteorological or climatological products based on the ALADIN HIRLAM System or parts thereof to any third party.
- (5) All results of research carried out with the licensed software shall be made available to the ALADIN and HIRLAM Consortium Members with appropriate rights to use such results.
- (6) In the publication resulting from the research carried out, the origin of the system shall be acknowledged by the following text: “The ALADIN HIRLAM System was made available by the ALADIN and HIRLAM Consortia involving the national meteorological services of <list of Members>”.
- (7) Access to the ALADIN - HIRLAM System or elements thereof shall be for a period of three years from the date of signing the license agreement. The Licensee shall provide annually a full report of research carried out in relation to the license agreement.
- (8) The license is for the user while at specified affiliation. The license is rescinded if the user leaves that affiliation and all installed elements of the ALADIN - HIRLAM System he/she was granted access to have to be removed. Instead a new application may be made.
- (9) A copy of the source code of all software developed directly as a result of the research involving the ALADIN HIRLAM System shall be made available to the Members of the ALADIN and HIRLAM consortia with full, irrevocable rights to use any such software for any purpose.
- (10) The Members of the ALADIN and HIRLAM consortia do not guarantee the correctness of the licensed codes in any sense, nor do they accept any responsibility for their maintenance or updating.
- (11) The Members of the ALADIN and HIRLAM consortia accept no responsibility for damage, financially or otherwise, caused by the use of any part of the licensed codes.

Annex 2

Procedures for new and acceding members

New members may be allowed to join HIRLAM on application and depending on a unanimous decision by the Council. A new member will have to contribute through a subscription fee and by staff contributions to the Programme at a level agreed by Council. There is also an entry fee corresponding to a share of the recent years' development and common costs of the Programme. New members must undertake to follow any agreements that HIRLAM has made with any other parties and that are still in force.

Potential new members who wish to join the consortium but who are not yet able to fully contribute to the Programme can be granted the status of acceding member for a period to be determined by Council. An acceding member is given full access to the HIRLAM code and system for its own research and operational purposes (including commercial ones). An acceding member does not yet have the obligation to contribute to the manpower and computer budgets of the HIRLAM Programme. Its contribution to the yearly financial budget is set to 50% of the contribution of institutes of the same class (small or standard). Financial contributions paid during the accession period will be deducted from the entrance fee. Acceding members commit themselves to build up the required NWP knowledge and infrastructure base at home within the accession period. The HIRLAM management group provides Council with an assessment of the steps that need to be taken and the time and assistance required from full members for this capacity-building period.

The Council decides on the granting of the status of acceding member, and the period of this status. This will be formalized in an agreement between the Council and the candidate for accession. In Council meetings, the progress of acceding members towards achieving full membership status is regularly reviewed. The HIRLAM Council has the right to revoke the status of acceding member, to grant the status of full membership, or to alter the accession period in exceptional circumstances.

The manner and process of payment of the entrance fee is to be settled during the accession period by negotiations between the acceding member and the Council. If the acceding member is able to actively participate in HIRLAM research and/or computer budget during the accession period, these activities should be counted as contributions to the entrance fee. Assessment of the amount of resources spent on HIRLAM research during the accession period will be done by the HIRLAM management group.

Annex 3
Instructions for the HIRLAM Advisory Committee

The HIRLAM Advisory Committee (HAC) is an advisory body reporting to the HIRLAM Council. The HAC advises the Council and the programme manager on scientific, technical, financial and administrative matters related to the HIRLAM Programme.

The responsibilities of the HAC are:

- (a) To assist in the preparation of the Council agenda.
- (b) To prepare and advise the Council on principal decisions and developments within the Programme.
- (c) To discuss and prepare the strategy of HIRLAM taking into account any results from external reviews.
- (d) To prepare and advise the Council on new projects in the Programme.
- (e) To support and advise the Programme Management on scientific, financial and organisational issues in connection with monitoring the progress or scrutinising the plans made by the Programme.
- (f) To monitor the expenses and staffing in the Programme and examine the annual financial and staffing budget and report to the HIRLAM Council.
- (g) To coordinate a regular assessment of user needs and satisfaction in respect to operational products in the member countries, and provide appropriate feedback to the HIRLAM management group for response or action.

To ensure an adequate representation of member institutes' interests in the HAC on all of the above issues, member institutes can elect to appoint their representative from a research or operational background on an alternating schedule.

Annex 4

Instructions for the programme manager

The programme manager shall be the manager of the HIRLAM Programme, and shall

- a) Take every action necessary to ensure an efficient accomplishment of the Programme objectives;
- b) Lead and co-ordinate the work of the HIRLAM management group; Lead the work of the core group personally or through another management group member; Prepare Programme work plans and co-ordinate them with the common activities of co-operating consortia.
- c) Prepare, in collaboration with the management group and the ALADIN programme management, a scientific plan of activities and yearly work plans; The plan shall reflect the guidance from the HIRLAM Advisory Committee, and shall be revised annually. The Strategy document shall be prepared in liaison with the HAC.
- d) Submit the scientific plan, annual work plan and annual budget for examination by the HAC and approval by the Council;
- e) Keep an account of all income and expenditure for the Programme, and provide a statement to the Council each year;
- f) Report about the common activities and co-ordinate the Programme reporting to the governing bodies and for other purposes as needed;
- g) Keep a record of the human resources contributed by the participating institutes;
- h) Ensure that user feedback or other information on user satisfaction which is obtained from the HAC or by means of other contacts, is taken into proper account when setting priorities within the Programme.
- i) Keep frequent contacts with the participating institutes to ensure good communication, encourage the participating scientists and co-ordinate the work in the different projects;
- j) Co-ordinate the updating of the Scientific documentation;
- k) Ensure that, at any time, a Reference system is available for operational implementation at the participating meteorological institutes;
- l) Represent the Programme in negotiations with outside bodies.

Annex 5

Conditions for use of the HIRLAM System, or parts thereof, for scientific or technical non-commercial research purposes by users outside the HIRLAM Members and co-operating meteorological institutes

1. The user shall not pass on or sell the HIRLAM system, or parts thereof, to any third party without the written consent of the HIRLAM Council. This restriction also applies to distribution over electronic networks such as the Internet.
2. The user shall not pass on or sell meteorological or climatological products based on the HIRLAM system, or parts thereof, to any third party.
3. All results of research carried out with software developed within the HIRLAM Programmes and the co-operative effort with Météo-France shall be made available to the HIRLAM community, including Météo-France.
4. In any publication resulting from the research carried out, the origin of the HIRLAM system or parts thereof shall be acknowledged by the following text: "The HIRLAM System was developed by the HIRLAM Programme group, a co-operative Programme of the national weather services in Denmark, Estonia, Finland, Iceland, Ireland, Lithuania, the Netherlands, Norway, Spain and Sweden." If the research was linked with any part of the co-operative effort with Météo-France, the sentence shall then be: "This research was carried out with software developed in the framework of the co-operation between the HIRLAM Programme group, a co-operative project of the national weather services in Denmark, Estonia, Finland, Iceland, Ireland, Lithuania, the Netherlands, Norway, Spain and Sweden, and Météo-France".
5. Access to the HIRLAM system shall be for a period of three years from the date of signing this agreement.
6. The license is for the user while at the specified affiliation. The license is rescinded if the user leaves that affiliation and all installed HIRLAM components have to be removed. Instead a new application may be made.
7. The HIRLAM community and Météo-France shall have full proprietary rights to any software developed directly as a result of the research involving the HIRLAM system.
8. The HIRLAM programme does not guarantee the correctness of the system in any sense, nor do they accept responsibility for the maintenance or updating of the system. (Applicable for HIRLAM software made available by full member institutes only.)
9. The HIRLAM Programme accepts no responsibility for damage, financially or otherwise, caused by the use of the system or parts thereof. (Applicable for HIRLAM software made available by full member institutes only.)

Name

Affiliation

Date

Annex 6

Definitions and acronyms.

MoU = Memorandum of Understanding, this entire document including the signatures by members.

Modelling = Simulation of atmospheric flow including lower and upper and lateral boundary conditions as well as assimilation of data for initial conditions

NWP = Numerical Weather Prediction including data assimilation, forecast model, post-processing and probabilistic modelling

LAM = Limited Area Modelling

Limited Area Modelling = Modelling in a fixed area less than global or hemi-spheric and where boundary conditions are handled, usually flow-dependent from a host model

HIRLAM = High Resolution Limited Area Model; refers to the HIRLAM Programme in this MoU except where explicitly stated otherwise

HIRLAM Programme = The Programme defined by this MoU

ECMWF = European Centre for Medium Range Weather Forecasting

IFS = Integrated Forecasting System. The NWP modelling system as developed by ECMWF in co-operation with Meteo-France.

HIRLAM (forecasting) System = The HIRLAM System is defined as the set of codes, scripts and tools jointly developed by the HIRLAM members and required to install and run a complete Limited Area NWP production in any of the member institutes. Its content is decided by the HIRLAM Programme.

Harmonie = HIRLAM – Aladin Research on mesoscale Modelling for NWP In Euromed. Name of the non-hydrostatic mesoscale model developed in a code collaboration with ALADIN within the code framework of the IFS.

Harmonie System = the set of codes, scripts and tools required to install and run a complete production with the Harmonie model in any of the member institutes.

The HIRLAM and Harmonie Systems are composed of shared software codes of three different types :

- the HIRLAM common codes, defined as the codes jointly developed and owned by HIRLAM members
- the co-owned codes, defined as the codes jointly developed and maintained with other consortia or partners and co-owned by HIRLAM and these consortia or partners;
- The shared third-party codes contributed and owned by partners, other consortia or third parties who have granted appropriate rights to HIRLAM for the use of such codes.

The HIRLAM and Harmonie Systems require observation input in agreed and common formats, boundary data coming from ECMWF or another internal or external global NWP system if so agreed by the programme. Their output consists of model parameter data in agreed and common formats and certain derived products as decided by the programme.

Reference system = A latest quality assured release of the HIRLAM or Harmonie System suitable for operational use as decided by the Programme Management following agreed criteria. Such an agreement is taken together with the member(s) that are responsible for running the Reference system operationally (RCR).

RCR = Regular Cycle of the Reference system, a continuous data assimilation-forecasting cycle with the Reference system with the recommended and agreed settings (assimilation frequency, observation usage, resolution, time-step, domain etc.).

WMO = World Meteorological Organisation

NMS = National Meteorological Service as defined by their WMO membership

C-SRNWP = Coordination in Short Range Numerical Weather Prediction - a EUMETNET programme for coordination of short range NWP activities among its members.

EUMETNET = European Meteorological Network - a European network to organise co-operative programmes

GNI = Gross National Income (as used for calculating contributions to other international programmes or organisations as e.g. ECMWF).