

C-SRNWP (SHORT RANGE NUMERICAL WEATHER PREDICTION NETWORK) AND THE FORECASTING CAPABILITY AREA OF EUMETNET

Responsible member: Hungarian Meteorological Service

Period: 2008-2011

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C-SRNWP: MAIN OBJECTIVES

- Improved **scientific cooperation** between the 5 LAM Consortia (ALADIN, COSMO, HIRLAM, LACE, Met Office) in Europe for numerical weather prediction (NWP) through the initiation and execution of joint projects
 - Expert Teams and their workplans
- Enhanced **operational cooperation** through harmonisation of standards and increased interoperability between models
 - Interoperability (SRNWP-I) and verification (SRNWP-V) programmes
- Effective **diffusion of NWP knowledge** and enhanced practical cooperation in NWP
 - Thematic SRNWP workshops
 - Webpage: srnwp.met.hu

SRNWP CONSORTIA (5) and MODELS (4)

CONSORTIA	MODEL
ALADIN	ALADIN (ALARO, AROME, HARMONIE)
COSMO	COSMO
HIRLAM	HIRLAM, HARMONIE (ALADIN, ALARO, AROME)
LACE	ALADIN (ALARO, AROME, HARMONIE)
Met Office	Unified Model

Remark: ALADIN (LACE) and HIRLAM are working on code collaboration around the IFS/ARPEGE/ALADIN/ALARO/AROME (HARMONIE) code



SRNWP Consortia in Europe



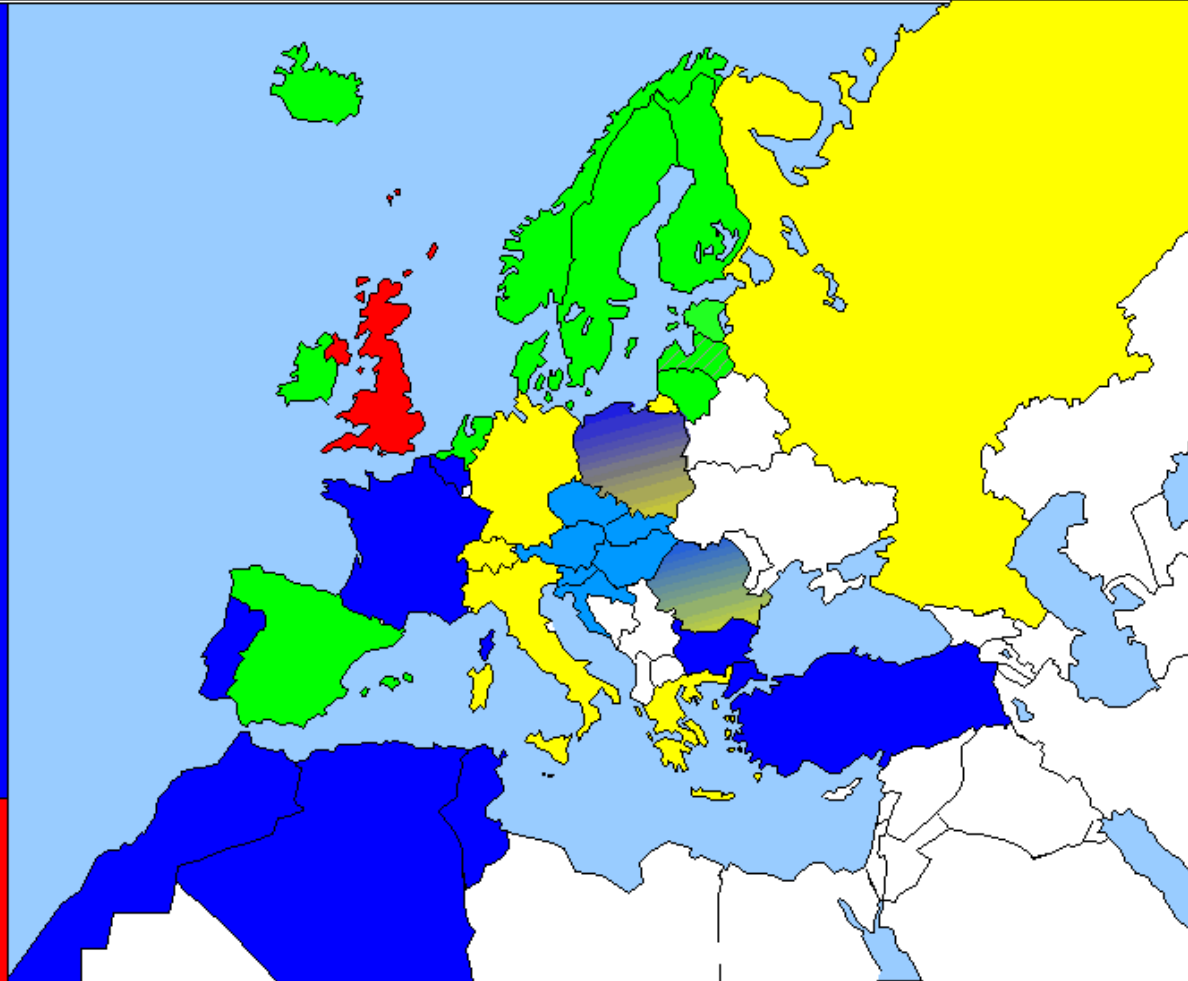
ALADIN

Algeria
Belgium
Bulgaria
France
Morocco
Poland
Portugal
Tunisia
Turkey

Austria
Croatia
Czech Rep.
Hungary
Romania
Slovakia
Slovenia



UKMO
United Kingdom



HIRLAM

Denmark
Estonia
Finland
Iceland
Ireland
Lithuania
Netherlands
Norway
Spain
Sweden
(Latvia)

COSMO

Germany
Greece
Italy
Poland
Romania
Russia
Switzerland



LIST OF EXPERT TEAMS (CROSS-CONSORTIA WORKING GROUPS)

- **Data assimilation** and use of observations
- Diagnostics, validation and **verification** (→ **SRNWP-V**)
- **Dynamics** and lateral boundary coupling
- Link with **applications**
- **Physical parameterisation** (upper air)
- Predictability and **EPS**
- **Surface** and soil processes (model and data assimilation)
- **System** aspects (→ **SRNWP-I**)

SURFACE DATA EXCHANGE FOR VALIDATION

- The COSMO consortium initiated the surface and near-surface data exchange for the validation of surface schemes of the NWP models
- The involved „supersites”: Lindenberg, Payerne, Capofiume, Sodankylaa, Cabauw, Toulouse, Cardington (Valday, Debrecen)
- The data access can be granted to SRNWP members at the <http://www.cosmo-model.org/srnwp/content/default.htm> webpage (already 10 users: de Morsier, Machulskaya, Mahfouf, Bush, Vogel, Calvet, Bonafe, Kangas, Samuelsson, Albergel)

LATERAL BOUNDARY CONDITION (LBC) ISSUES

- ECMWF TAC subgroup: on the update of the Optional Project on LBCs
- A possible future Optional Programme on EPS boundaries were emerged (two options)
 - Operational resolution (T639) and operational ensemble size (50+1)
 - Higher resolution (T799) and half of the operational ensemble size (24+1)
- A third proposal from the LAMEPS community
 - „VAREPS” system: High resolution (T1279 or T799) until two days and lower resolution (T639) afterwards (until 6 days)

LATERAL BOUNDARY CONDITION (LBC) ISSUES

- Next steps
 - Tests for the newly proposed option (thanks to Martin Leutbecher)
 - Scientific and user meeting at ECMWF during the spring of 2012

SRNWP-I: DELIVERABLES (1)

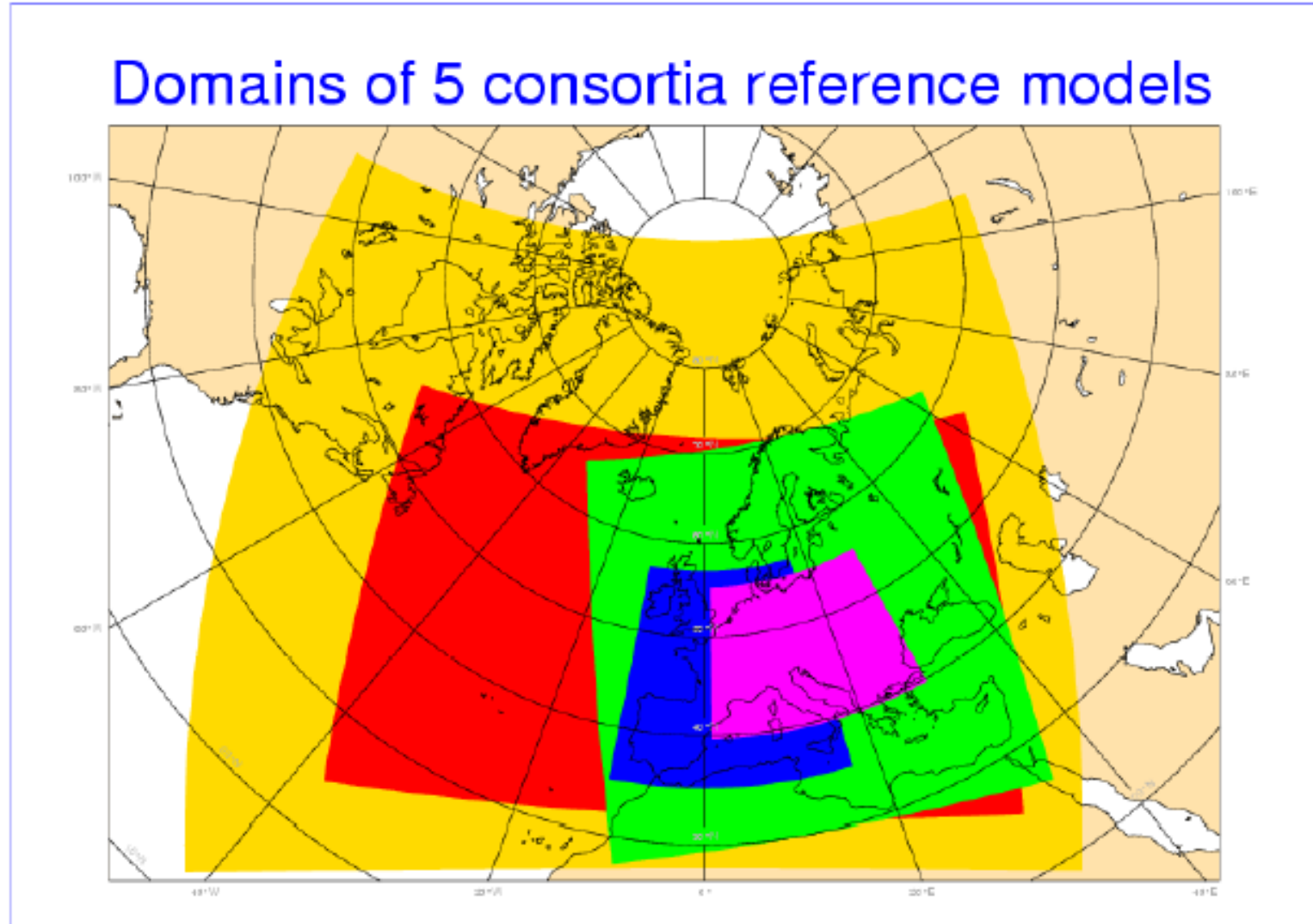
- D1: report about the standard output format (+list of parameters, maintenance plan)
 - Achieved (see EUMETNET portal, GRIB2 on model grids, Consortia softwares to be used → the maintenance would be easier)
- D2: Requirements and specifications of the adaptors
 - Not yet fully ready (see also EUMETNET portal)
- D3: Development of four 2-way adaptors (specific LAM format to standard format and its inverse)
 - Completed

SRNWP-I: DELIVERABLES (2)

- D4: Software for enabling any of the LAMs to use any of the global models as initial and lateral boundary conditions
 - Ongoing
 - D5: Long term sustainability plan
 - Outline plan
 - D6 (extra): Encoding/decoding of model outputs into GRIB2 format
- **Delay of the programme execution (the complete surface solution cannot be given during this programme phase)**

SRNWP-V

Domains of 5 consortia reference models

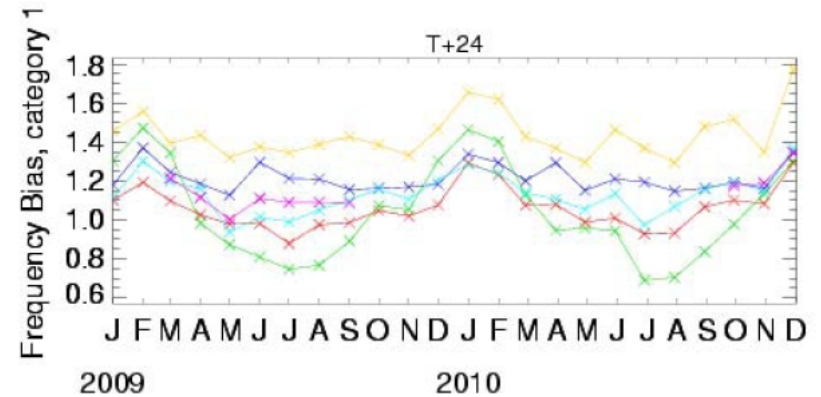
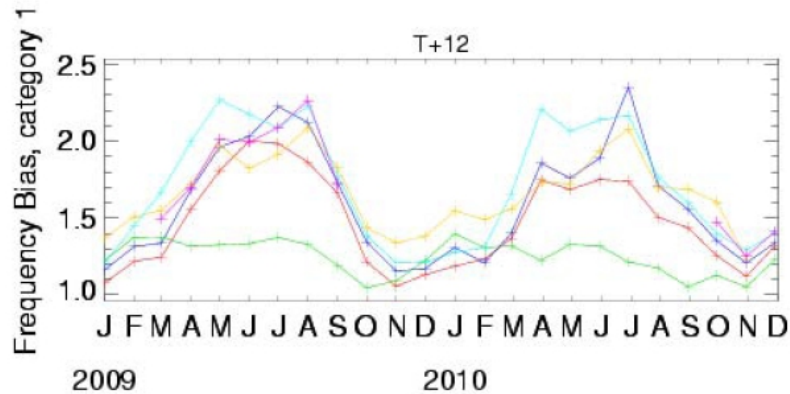
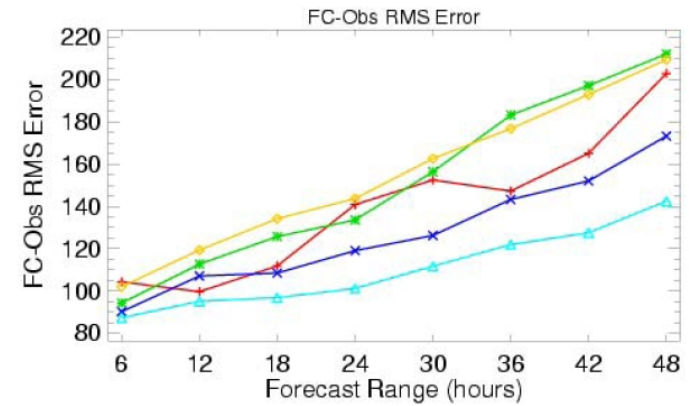
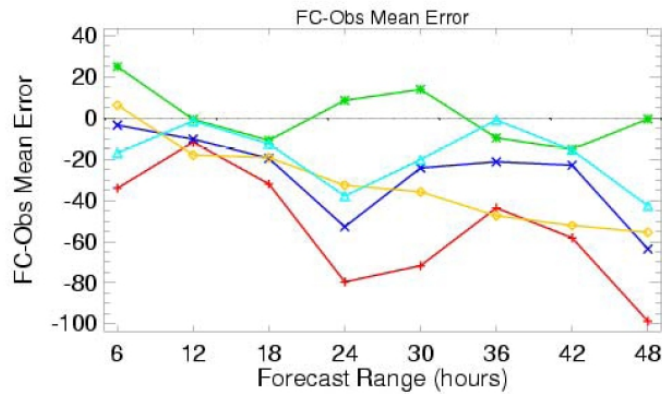


SRNWP-V: DELIVERABLES (PREVIOUS PROGRAMME)

- All the main deliverables are completed:
 - D1: Operational verification comparison of one version of each of the 4 regional European LAM model (ALADIN, COSMO, HIRLAM, Unified Model, see at EUMETNET portal)
 - D2: Additional models to the intercomparison
 - D3: Inventory and recommendations of „new” scale selective verification methods
 - D4: Catalogue of non-GTS data sources
 - D5: Exchange methods and code for verification of severe weather forecasts (too early for completion)

Mean sea level pressure bias and RMSE

Monthly frequency biases for precipitation $\geq 1\text{mm}$



SRNWP-V: DELIVERABLES (Phase II, just started)

- ND1: Continuation of **operational verification** comparison of one version of each of the 4 regional European LAM model (ALADIN, COSMO, HIRLAM, Unified Model)
- ND2: **Additional verification variables**: cloud amount, cloud base, visibility, wind gusts for instance)
- ND3: Spatial and scale **selective verification of precipitation** using gridded daily precipitation analyses, high resolution radar data and OPERA radar composites
- ND4: Inclusion of **severe/high impact weather verification**
- ND5: **Full documentation** of the methods used in the intercomparison

SRNWP: ISSUES

- At the moment there is no chairperson for the physics ET
- C-SRNWP PM is asked to act as Interim Forecasting Capability Programme Manager (resource difficulties)
- SRNWP-V: summary of verification results to be „published” soon
- SRNWP-I: a follow-on proposal should be prepared
- Pushing OPERA to produce 2D and 3d radar data with proper quality control at the OPERA Data Hub (already in 2012?)



EUMETNET FORECASTING ROADMAP (UNTIL 2020)

INTRODUCTORY REMARKS

- EUMETNET adopted its (high-level) strategy last year
 - Improved efficiency with shared services
 - Collective investment in science, technology and skills
 - Essential partnership with EU/EC
- The next step is to produce roadmaps for observations, climate, **forecasting**, aviation and EU
- Drafting Teams were established for these „capability areas”
 - Forecasting Roadmap Drafting Team members: Massimo Ferri (chair, STAC), Vesa Nietosvaara (EUMETCAL), Michael Staudinger (EMMA), Clive Wilson (SRNWP-V), Rachel North (SRNWP-I), Jeanette Onvlee (HIRLAM), Piet Termonia (ALADIN), Marco Arpagaus (COSMO), Fredrik Linde (Sweden), Ilda Novo (Portugal), Adrian Broad (PFAC), Jose Antonio Garcia-Moya (Spain), Andras Horanyi (C-SRNWP); Massimo Capaldo („external support”)

HIGH-LEVEL GOALS ALREADY DEFINED BY THE ASSEMBLY

- F1: Throughout the decade EUMETNET will support Members in ensuring that they always have highly skilled forecasters through shared training and shared best practise
- F2: EUMETNET will assist members and their modelling Consortia to develop their forecast models and processes in order to produce the best possible short term forecasts for their clients
- F3: EUMETNET will have facilitated through a strategic discussion among Members, the identification and initiation of projects for collaboration, harmonisation and coordination in support of more efficient forecasting systems and improved regional and short range weather forecasts

TASKS OF THE DRAFTING TEAM

- Identification of priorities between existing (C-SRNWP, SRNWP-I, SRNWP-V, EMMA, SATREP, EUMETCAL) and proposed new programmes
- Propose programmes (with their rationale, resource requirements) in the period of 2013-2020
- Identify cross-cutting issues with the other EUMETNET capability areas

HIGH PRIORITY AREAS

- Protection of past investments
- Improved communication with users and understanding their requirements
- Severe and high impact weather forecasting to be improved via
 - Better nowcasting (also addressing developments of advanced applications for key customers)
 - High resolution EPS forecasts to address the reliability of convection permitting forecasts and improvement their accuracy
- Enhanced coordination (Forecasting Capability Area)

PROPOSED HIGH PRIORITY NEW PROGRAMMES

- Nowcasting: as extension of SRNWP towards ultra-short range
 - 0,3 FTE as programme manager
- Short range ensemble prediction: based on the tools already developed by SRNWP-I and SRNWP-V (including the interpretation of uncertainty information by the forecasters – through EUMETCAL)
 - Phase I: feasibility study
 - Phase II: demonstration project
- (Regional climate modelling – should be part of the Climate Roadmap)

Forecasting Roadmap Summary

Roadmap Key	
	List of key activities (or deliverables) during 2011-2020
	Explanation of the rationale for the activities and possible options for delivery that will need to be considered
	Proposed timetable for delivery of the activities
	Resources needed
	Likely risks
	Definition of constraints and dependencies

Forecasting goals
F1 - TO SUPPORT Members in ensuring that they always have highly skilled forecasters through shared training and shared best practice.
F2 - TO ASSIST Members and their modelling consortia to develop their forecast models and processes in order to produce the best possible short term forecasts for their clients [avoiding duplication of activities with the consortia and ECMWF]
F3 - TO FACILITATE through a strategic discussion among Members, the identification and initiation of projects for collaboration, harmonisation and coordination in support of more efficient forecasting systems, and improved regional and short-range weather forecasts.

Key activities or deliverables	2011		2012		2013		2014		2015		2016		2017		2018		2019		2020	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
F1 Goal (Training)																				
Continuation of EUMETCAL Programme	A	B	C																	
Training on aviation topics																				
Renewed Phase of EUMETCAL Programme				A	B	C														
Programme Management																				
Maintenance of Virtual Library																				
Advanced Training																				
Competencies																				
Training Support																				
Cooperation																				
F2 -Goal (Support to NWP Consortia)																				
Evolution of C-SRNWP towards FCPM Programme	A	B	C																	
FCPM Programme																				
Continuation of SRNWP - I Programme	A	-----B	C																	
Continuation of SRNWP - I Programme																				
Continuation of SRNWP - V Programme																				
Creation of a SRNWP - N (Phase I) Programme				A	B	C														
Creation of a SRNWP - N (Phase II) Programme				A	B	C														
F3 - Goal (Support to more efficient forecasting services)																				
Continuation of EMMA Programme																				
New Phase of the EMMA Programme				A	B	C														
Eur- EPS																				
Feasibility Study																				
Demonstration Project																				

Explanation of the rationale for the activities and possible options for delivery that will need to be considered

1) Protection of past investments
All EUMETNET results matured over the years call for a high level of attention in order not to lose resources invested in the past.

2) Improved communications with users and understanding of their requirements
The customer base of NMSs have users characterized by different requirements. Consequently it is essential that, great attention be given to these user requirements in order to develop services in line with the real and stated needs of the user community.

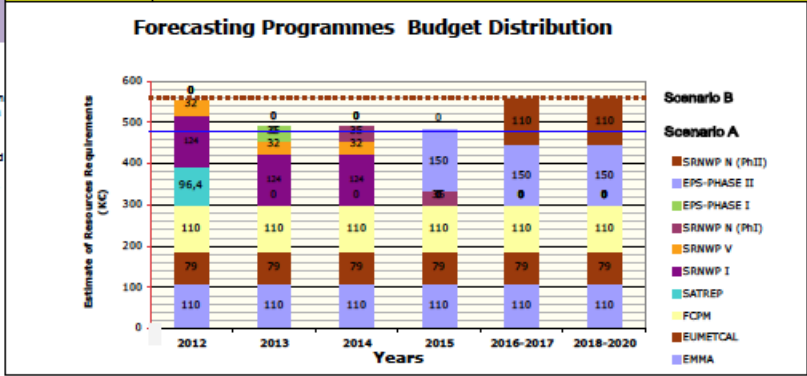
3) Severe Weather Forecasting and High Impact Weather High Impact Weather
NMSs have strong commitments towards severe weather forecasting and detection of high impact weather. During the next decade, together with the improvement of high-resolution NWP models, most promising results are expected by nowcasting and convection-permitting ensemble prediction systems developments.

4) Enhanced coordination programmes
Coordination within NWP has been particularly valuable for EUMETNET Members also in view of the peculiar situation in Europe where so many consortia are active. This coordination might be even more profitable if extended on more general terms to cover most of the coordination required.

Likely risks

*Risks are linked to a reduced money stream preventing some deliverables to be realized in minor cases and to cancel a capability area in full in worst cases.
If Phase II of Eur-EPS should not show positive results, its corresponding resources will be distributed to cover sufficient funding in other forecasting programmes.

Initial estimate of scale of resources required

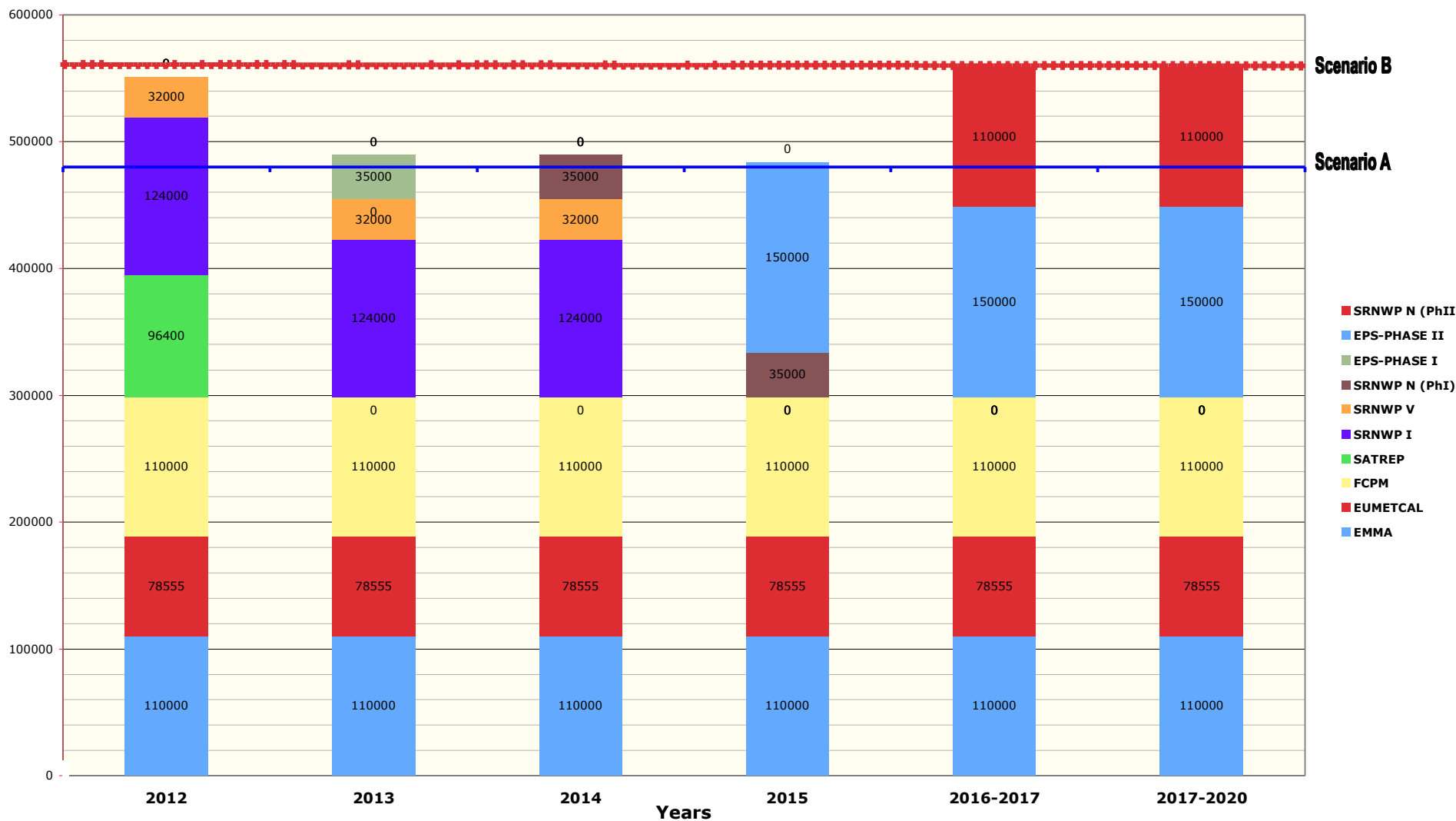


Definition of constraints and dependencies

Affordability Scenario A - Money stream as currently assigned.
Scenario B , 20 % increase
Scenario C - stable contributions from Members but addition of third parties resources

A - Approval of Programmes
B - Call for Proposals
C - Selection of Responsible Member

Forecasting Programmes Budget



SRNWP - RECENT STAGE: TRANSITION

- SRNWP-V programme is accepted until the end of 2012
- SRNWP-I is valid until the end of 2011 (just prolonged without new resources and deliverables)
 - Continuation proposal should be prepared until autumn
- C-SRNWP is valid until the end of 2011: no decision yet on its prolongation or its transformation to the EUMETNET Forecasting Capability Programme

(FORECASTING) ROADMAP: NEXT STEPS

- The roadmap should be accepted until the end of the year
→ the priorities will be clarified
- Full programme proposals should be ready until spring 2012 (preliminary ones until this autumn)
- The new (updated) programmes (in agreement with the roadmaps) can start at the beginning of 2013



SRNWP Consortia in Europe



ALADIN

Algeria
Belgium
Bulgaria
France
Morocco
Poland
Portugal
Tunisia
Turkey

Austria
Croatia
Czech Rep.
Hungary
Romania
Slovakia
Slovenia



UKMO
United Kingdom



HIRLAM

Denmark
Estonia
Finland
Iceland
Ireland
Lithuania
Netherlands
Norway
Spain
Sweden
(Latvia)

COSMO

Germany
Greece
Italy
Poland
Romania
Russia
Switzerland



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