GOBIERNO DE ESPAÑA
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE
AEMet Agencia Estatal de Meteorología

Perspectives on EPS at EUMETNET and at AEMET

Bartolomé Orfila

24th ALADIN Workshop & HIRLAM All Staff Meeting
7-11 April 2014, Romania

OUTLINE

What should be the content of the Project Proposal for the EUMETNET SRNWP-EPS Phase II?

How the use of EPS could improve the issue of meteorological warnings of severe weather?

Perspectives on EPS at AEMET for the next two years

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What should be the content of the Project Proposal for the EUMETNET SRNWP-EPS Phase II?

Context for requirements

Requirements

Staff and computer resources

Annexes

Introduction

The content of the Project proposal for the EUMETNET SRNWP-EPS Phase II has a main aim: to contribute to build European very high-resolution ensemble systems, resolving the convection-permitting scale phenomena.

The context for requirements is given in the Annex I scientific methodology document. It concludes the following two challenges for further progress in the convection permitting ensembles field:

Challenge 1:to get initial state accuracy
Challenge 2: Timely production

List of Annexes

Annex I ET-EPS contribution for Action A3: Explore the scientific methodologies suitable to build a very high-resolution ensemble

Annex II Purpose, Objectives, Description of topics agreed in June 2013 meeting in Madrid

Annex III Estimated staff and computing resources

Annex IV Availability of boundaries for convection permitting modelling

Annex V Comparison among ensembles with different resolution over Europe

These challenges highlight the existence of a competition between two demands: **high accuracy** and **swift production**.

How much are the capabilities of the **convection-permitting ensembles** invalidated (or reduced) by the operational constraints (e.g. need of running a "not too complex" model physics, need of nesting on older BCs, need of short cut-off for observations) is a worth investigating issue.

Topics tackled by the four working Groups of experts set up on the June 2013 Madrid meeting

Interaction of EPS with data assimilation in the convection permitting scale **WG1**

Modelling and data assimilation of ground surface properties **WG2**

Model uncertainties. Can EPS help understand model sensitivities? **WG3**

Use and interpretation of probabilistic products? **WG4**

List of Annexes

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The objective of topics i) and ii) are respectively

i) to achieve a better assessment of the potential of an EnDA system; and

ii) To achieve an enhanced knowledge about the impact of different soil and surface properties on forecast for useful and reliable operational and probabilistic predictions on convective-permitting scales.

The suggested tasks under topic i) are :

3.1.1 Construction and evaluation of a candidate EnDA system (essential)
3.1.2 Comparing EnDA systems (if resources allow)
3.1.3 Sensitivity to cycling interval (essential)
3.1.4 Sensitivity to resolution and domain size (if resources allow)
3.1.5Sensitivity study on LBC and DA (essential)
3.1.6 Sensitivity study on LBC and DA (continued if resources allow)
3.1.7 Link with land surface (essential)

The most important tasks suggested under WG2 are :

a) Combination of stochastic perturbations and multiphysics for soil.
b) Test impact of improved soil type datasets over specific places
c) Perturbation of land use data
d) DA of soil moisture using EnKF (only with extra funding)
e) Sensitivity tests with SURFEX/ISBA configurations (only with extra funding)

Objective of topic WG3 :

3.2 The objective of topic iii) is to use EPS as a tool to analyse and validate model physics parameterizations by carrying out multi-physics tests in different models and draw generalized conclusions that are independent of the model backgrounds. These parameterizations should be developed with EPS and complementarity in mind.

.

3.3 The objective and deliverables of topic iv)

3.3 The objective and deliverables of topic iv) are to provide the best possible support, uniform all over Europe, for specific and tailored operational applications according to user needs, defined both from forecasters and end users; and develop transnational generic products defined and visualized in a generic format that can be derived from standard EPS products.

Proposed subtasks of these projects are:

3.3.1 Analysis of the main users and applications at NMSs, specially focusing on transnational applications (aviation, civil protection).
3.3.2 Identify the application(s) for which products should be developed.
3.3.3 Inventory of available software, already developed by members.

3.3 The objective and deliverables of topic iv) (cont.)

3.3.4 Define a set of products . Definition includes the development of the methodologies to compute/elaborate the products

3.3.5 Develop SW for product preparation and visualization, homogeneous over the addressed areas, applicable on standard EPS outputs

.

Ensembles may be run in cooperation among few adjacent countries

Staff resources

5.- Staff Resources for WG1 and WG2 tasks

5.1.- Interaction of EPS with data assimilation in the convection-permitting scale: 3 to 5 person*year, overall.

5.2.-Modelling and data assimilation of ground surface properties: 4.75 person*year, overall.

5.3.- Staff Resources for WG3: 3 person*year

5.4.- Staff Resources for WG4: 5 person*year

Computing resources

One example of the computing time in terms of ECMWF SBU units needed for undertaking some of the subtasks of the aforementioned 5.2 tasks (See Annex III for details) are:

5.2.1.- Ensemble data assimilation of surface/soil property data; in close collaboration with topic of WG1. 1.5 million SBU Units

5.2.2.- Perturbation of soil scheme parameters

5.2.2-a) Test different configurations of surface and soil parameterizations and surface-atmosphere interactions schemes: 3.0 million of SBU U.

5.2.2.-b) Perturbation of the soil and surface parameters: 3.0 million of SBU U.

5.2.3..- Involve uncertainties of land use data in the perturbations 1.0 million of SBU U

They correspond to a 1-month experiment with 15 members

Annexes

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STAC conclusions

From Dick Blaauboer, Head of he EUMENET Forecasting Programme:.

“The main outcome is that we should go on with the plan with some remarks. I'll come back to that later.

Financing the plan will be a big issue. SESAR2020 and H2020 should be investigated.”

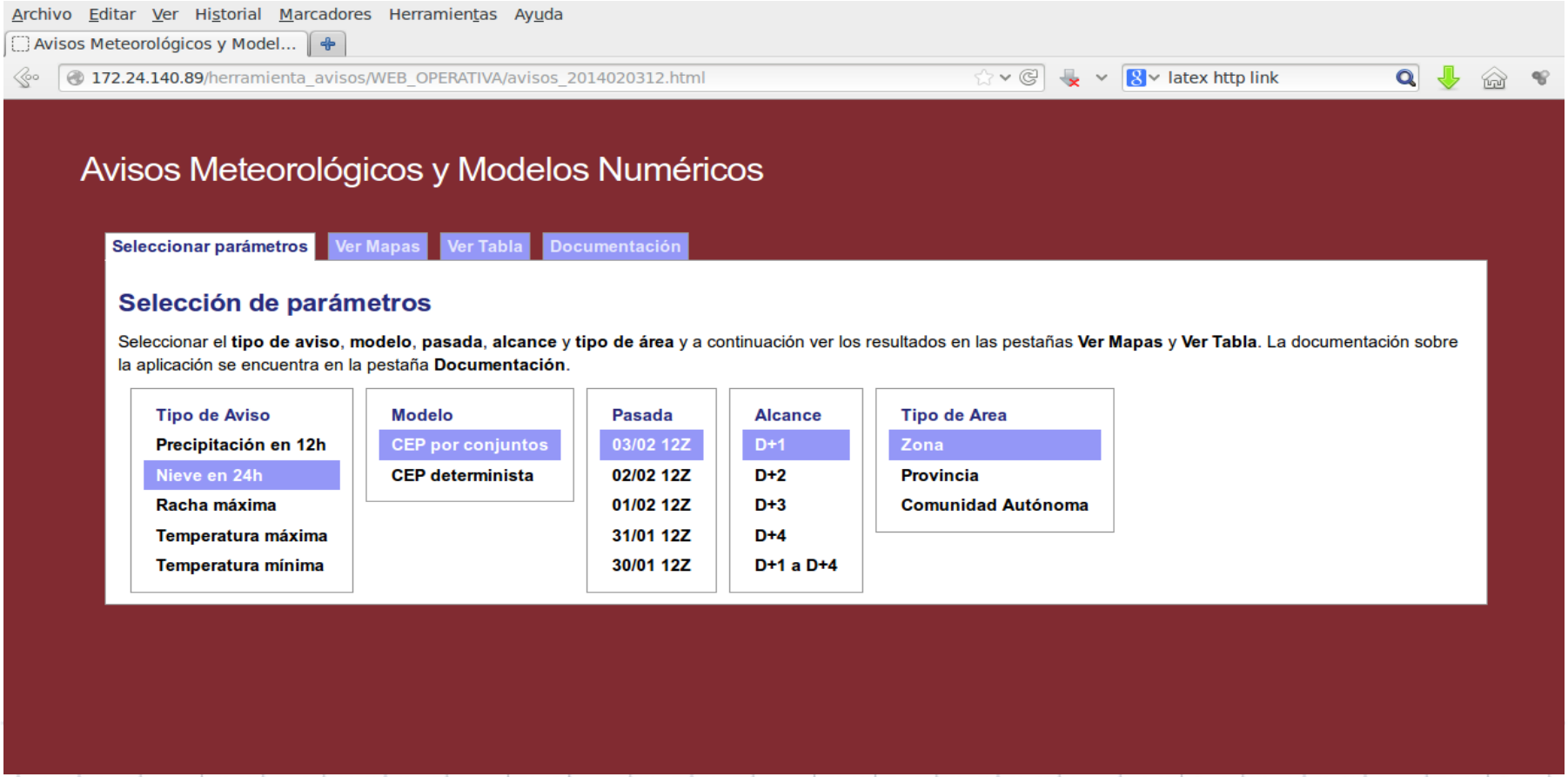
The following application is an example of products that could be developed in the frame of WG4

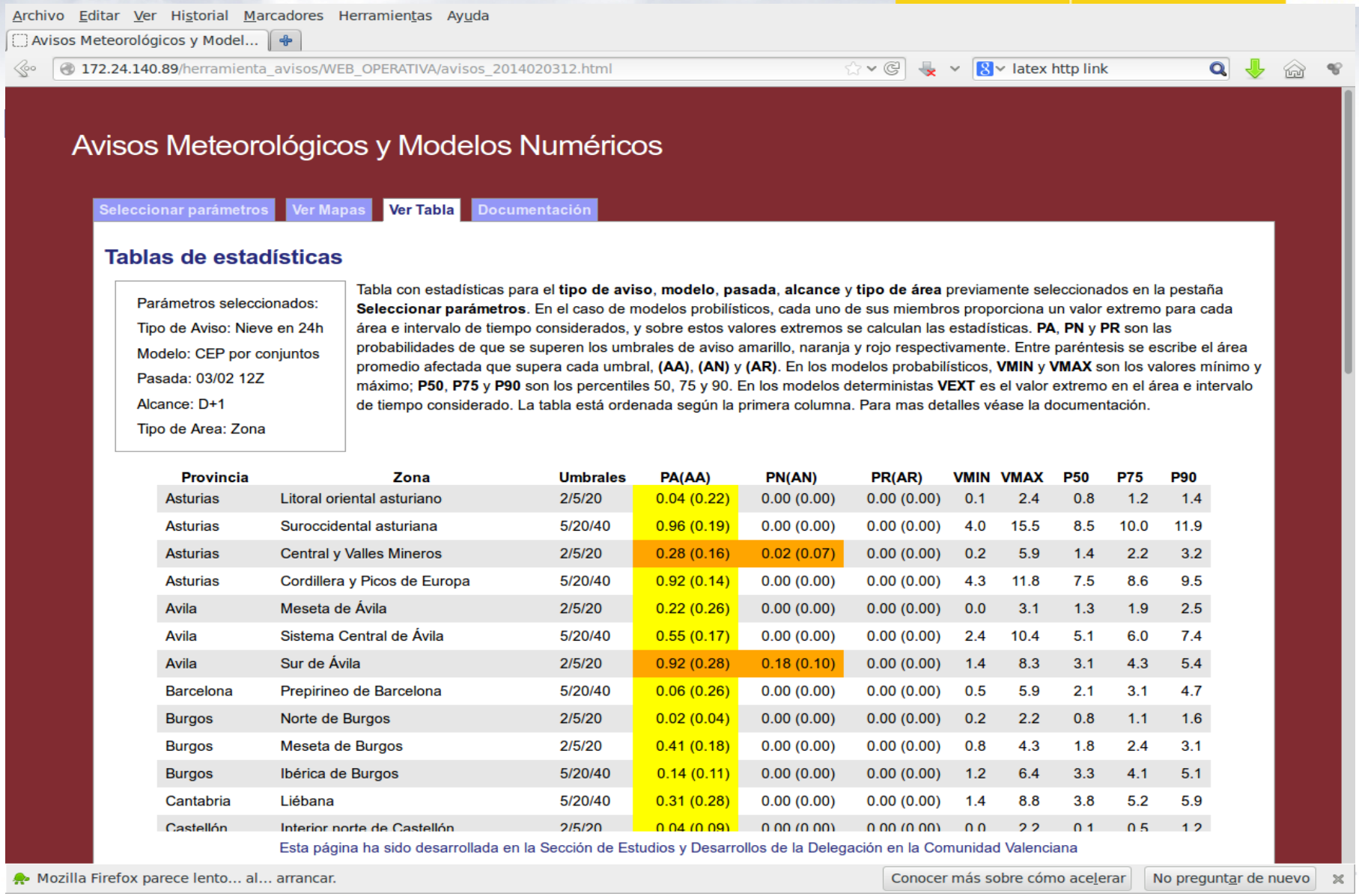
How the use of EPS could improve the issue of meteorological warnings of severe weather?

Probability to be over warning thresholds for zones, meteorological elements and time periods. (Juan Simarro)

Included	Not included
Tmax, Tmin	Storms
Maximum gust wind	State of sea state and on shore winds
24h accumulated snow	Other elements
12h accumulated rain	1h accumulated precipitation
IFS deterministic and probabilistic Prediction	Harmonie deterministic and GLAMEPS
Spanish Iberia and Balearic islands	Canary Islands

How the use of EPS could improve the issue of meteorological warnings of severe weather?





Archivo Editar Ver Historial Marcadores Herramientas Ayuda

Avisos Meteorológicos y Model...

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Avisos Meteorológicos y Modelos Numéricos

Seleccionar parámetros | Ver Mapas | Ver Tabla | Documentación

Tablas de estadísticas

Parámetros seleccionados:
Tipo de Aviso: Nieve en 24h
Modelo: CEP por conjuntos
Pasada: 03/02 12Z
Alcance: D+1
Tipo de Area: Zona

Tabla con estadísticas para el **tipo de aviso**, **modelo**, **pasada**, **alcance** y **tipo de área** previamente seleccionados en la pestaña **Seleccionar parámetros**. En el caso de modelos probilísticos, cada uno de sus miembros proporciona un valor extremo para cada área e intervalo de tiempo considerados, y sobre estos valores extremos se calculan las estadísticas. **PA**, **PN** y **PR** son las probabilidades de que se superen los umbrales de aviso amarillo, naranja y rojo respectivamente. Entre paréntesis se escribe el área promedio afectada que supera cada umbral, **(AA)**, **(AN)** y **(AR)**. En los modelos probabilísticos, **VMIN** y **VMAX** son los valores mínimo y máximo; **P50**, **P75** y **P90** son los percentiles 50, 75 y 90. En los modelos deterministas **VEXT** es el valor extremo en el área e intervalo de tiempo considerado. La tabla está ordenada según la primera columna. Para mas detalles véase la documentación.

Provincia	Zona	Umbrales	PA(AA)	PN(AN)	PR(AR)	VMIN	VMAX	P50	P75	P90
Asturias	Litoral oriental asturiano	2/5/20	0.04 (0.22)	0.00 (0.00)	0.00 (0.00)	0.1	2.4	0.8	1.2	1.4
Asturias	Suroccidental asturiana	5/20/40	0.96 (0.19)	0.00 (0.00)	0.00 (0.00)	4.0	15.5	8.5	10.0	11.9
Asturias	Central y Valles Mineros	2/5/20	0.28 (0.16)	0.02 (0.07)	0.00 (0.00)	0.2	5.9	1.4	2.2	3.2
Asturias	Cordillera y Picos de Europa	5/20/40	0.92 (0.14)	0.00 (0.00)	0.00 (0.00)	4.3	11.8	7.5	8.6	9.5
Avila	Meseta de Ávila	2/5/20	0.22 (0.26)	0.00 (0.00)	0.00 (0.00)	0.0	3.1	1.3	1.9	2.5
Avila	Sistema Central de Ávila	5/20/40	0.55 (0.17)	0.00 (0.00)	0.00 (0.00)	2.4	10.4	5.1	6.0	7.4
Avila	Sur de Ávila	2/5/20	0.92 (0.28)	0.18 (0.10)	0.00 (0.00)	1.4	8.3	3.1	4.3	5.4
Barcelona	Prepirineo de Barcelona	5/20/40	0.06 (0.26)	0.00 (0.00)	0.00 (0.00)	0.5	5.9	2.1	3.1	4.7
Burgos	Norte de Burgos	2/5/20	0.02 (0.04)	0.00 (0.00)	0.00 (0.00)	0.2	2.2	0.8	1.1	1.6
Burgos	Meseta de Burgos	2/5/20	0.41 (0.18)	0.00 (0.00)	0.00 (0.00)	0.8	4.3	1.8	2.4	3.1
Burgos	Ibérica de Burgos	5/20/40	0.14 (0.11)	0.00 (0.00)	0.00 (0.00)	1.2	6.4	3.3	4.1	5.1
Cantabria	Liébana	5/20/40	0.31 (0.28)	0.00 (0.00)	0.00 (0.00)	1.4	8.8	3.8	5.2	5.9
Castellón	Interior norte de Castellón	2/5/20	0.04 (0.09)	0.00 (0.00)	0.00 (0.00)	0.0	2.2	0.1	0.5	1.2

Esta página ha sido desarrollada en la Sección de Estudios y Desarrollos de la Delegación en la Comunidad Valenciana

Mozilla Firefox parece lento... al... arrancar. Conocer más sobre cómo acelerar | No preguntar de nuevo

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Avisos Meteorológicos y Model...

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latex http link

Avisos Meteorológicos y Modelos Numéricos

Seleccionar parámetros | **Ver Mapas** | Ver Tabla | Documentación

Mapas de nivel máximo de aviso y categorías de probabilidad

Parámetros seleccionados:

Tipo de Aviso: Nieve en 24h

Modelo: CEP por conjuntos

Pasada: 03/02 12Z

Alcance: D+1

Tipo de Area: Zona

Mapa

Nivel de aviso máximo

Probabilidad amarillo

Probabilidad naranja

Probabilidad rojo

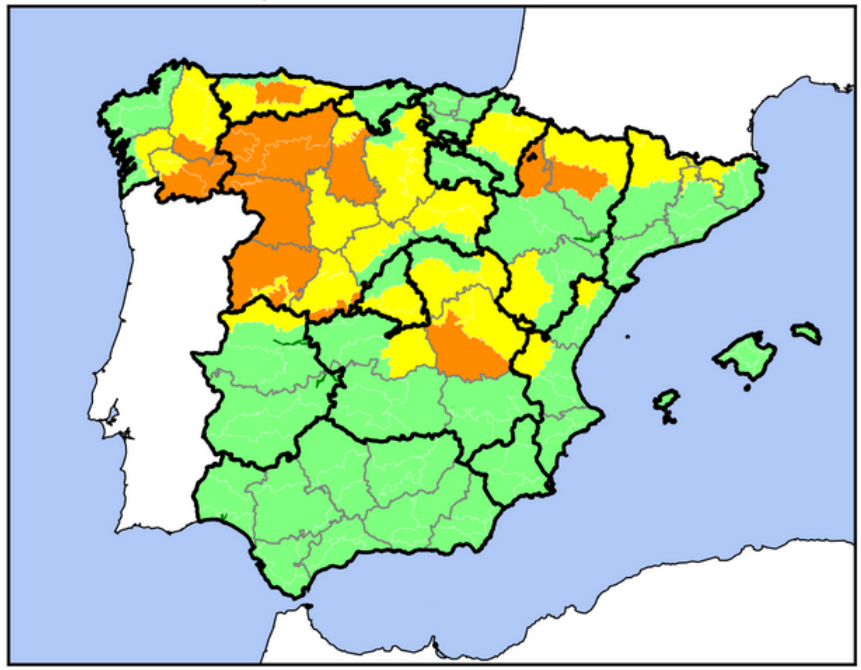
Area amarillo

Area naranja

Area rojo

Mapas obtenidos para el **tipo de aviso**, **modelo**, **pasada**, **alcance** y **tipo de área** previamente seleccionados en la pestaña **Seleccionar parámetros**. Los mapas disponibles son: **nivel de aviso máximo** y **mapas de probabilidad** de que se superen los umbrales de aviso amarillo, naranja o rojo. No hay mapas de probabilidad disponibles para modelos deterministas.

Nieve 24h: Umbral de aviso superado mas alto por Zona
CEP Por conjuntos, Pasada: 2014-02-03-12Z, Validez: 2014-02-04



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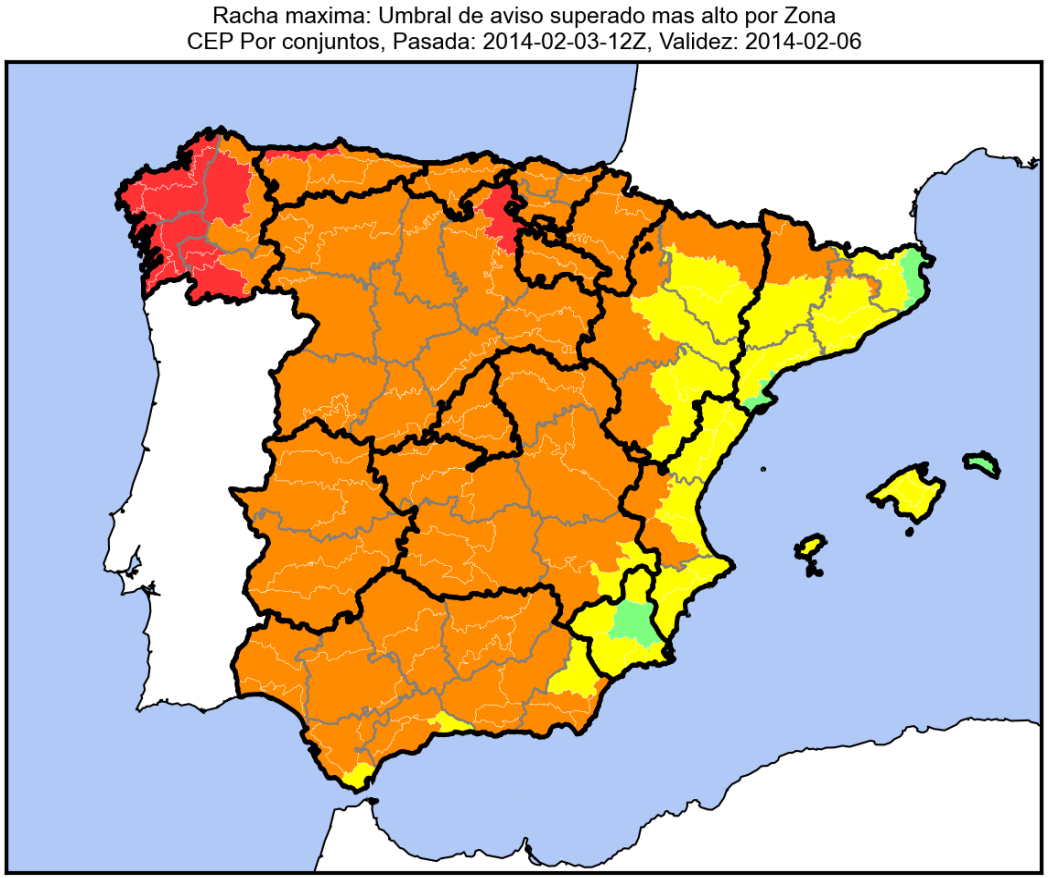
How the use of EPS could improve the issue of meteorological warnings of severe weather?

Maximum gust wind



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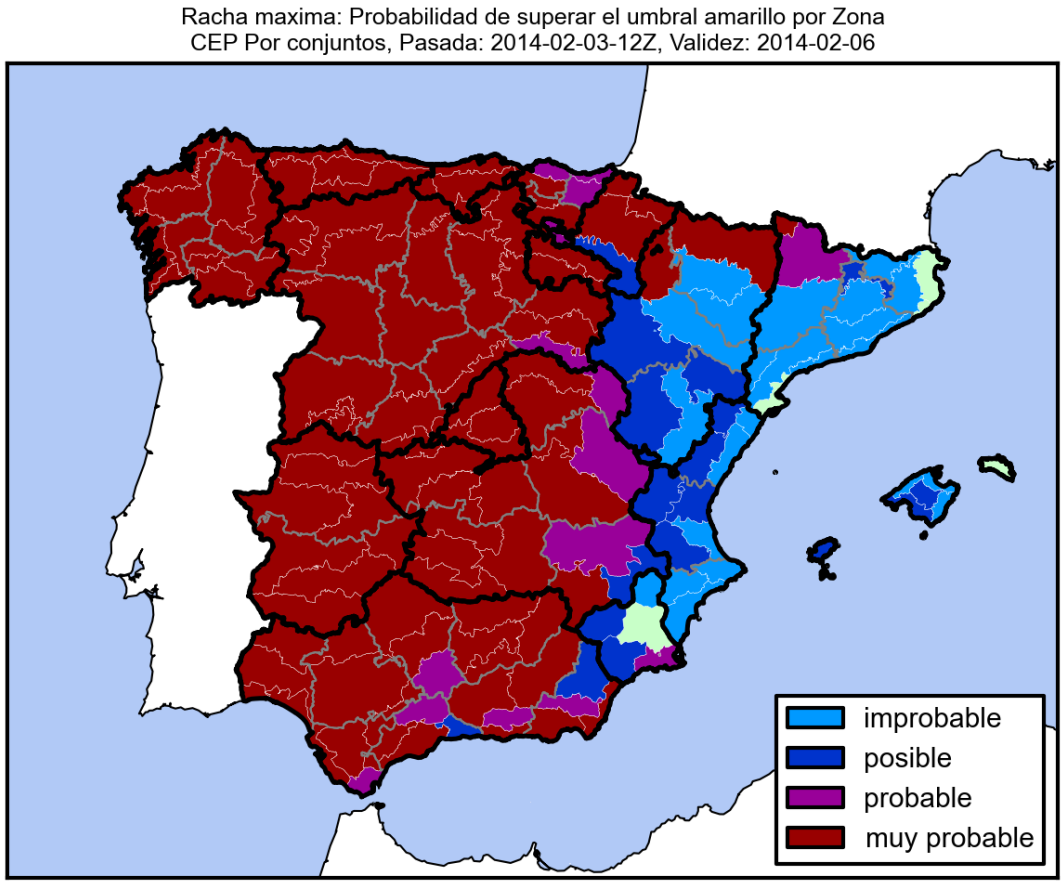
How the use of EPS could improve the issue of meteorological warnings of severe weather?

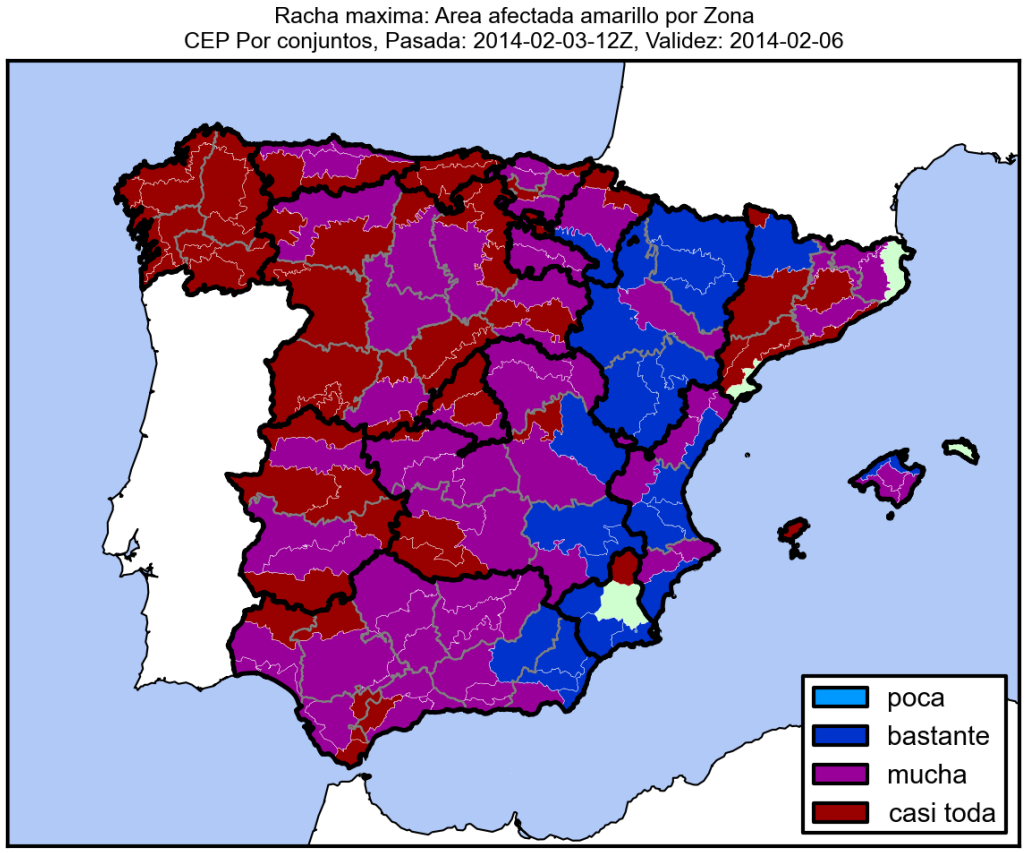
Over yellow threshold



Unlikely
Possible
Likely
High likely

How the use of EPS could improve the issue of meteorological warnings of severe weather?

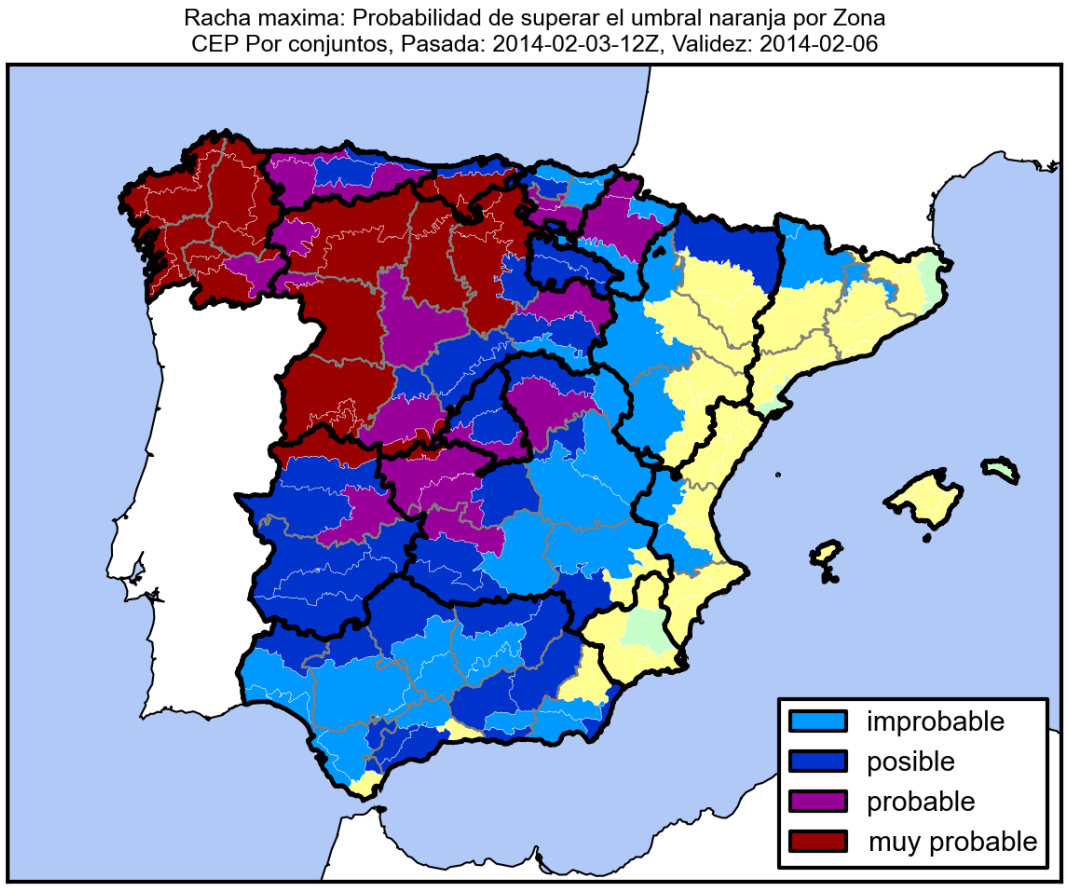
Yellow area



Small area
Moderate area
Large area
Near all area

How the use of EPS could improve the issue of meteorological warnings of severe weather?

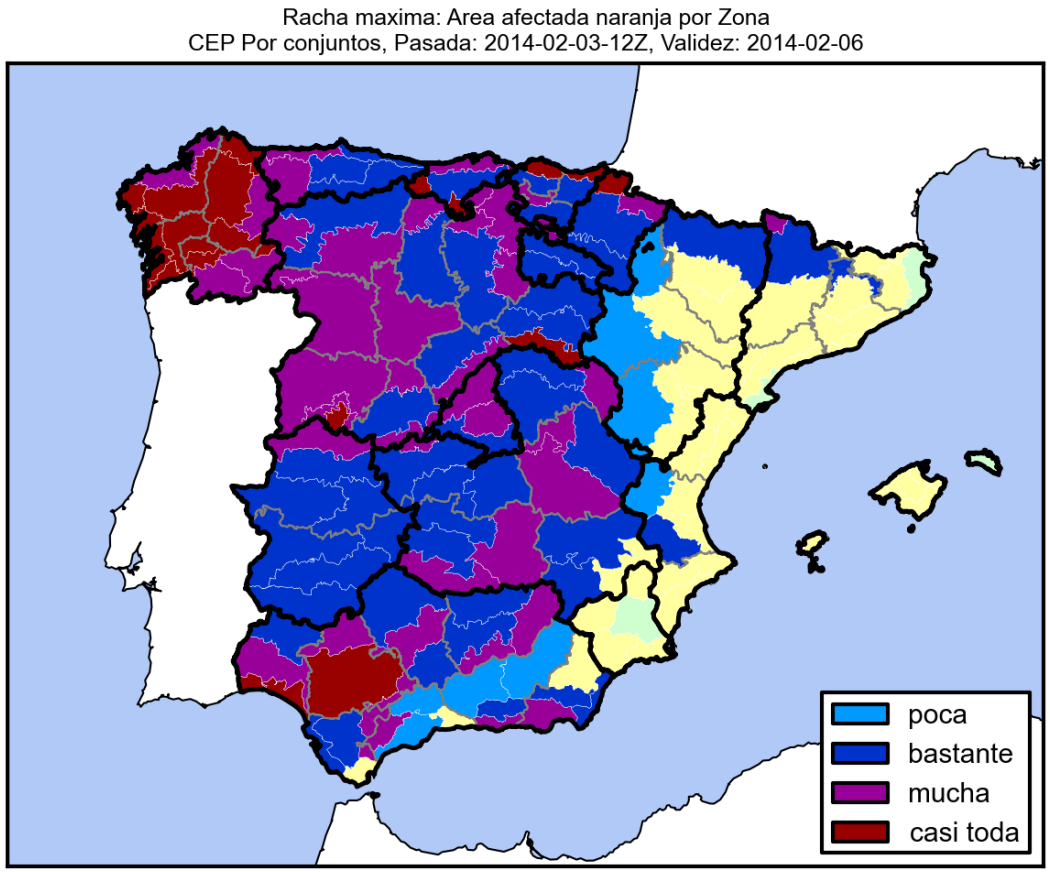
Over orange threshold



Unlikely
Possible
Likely
High likely

How the use of EPS could improve the issue of meteorological warnings of severe weather?

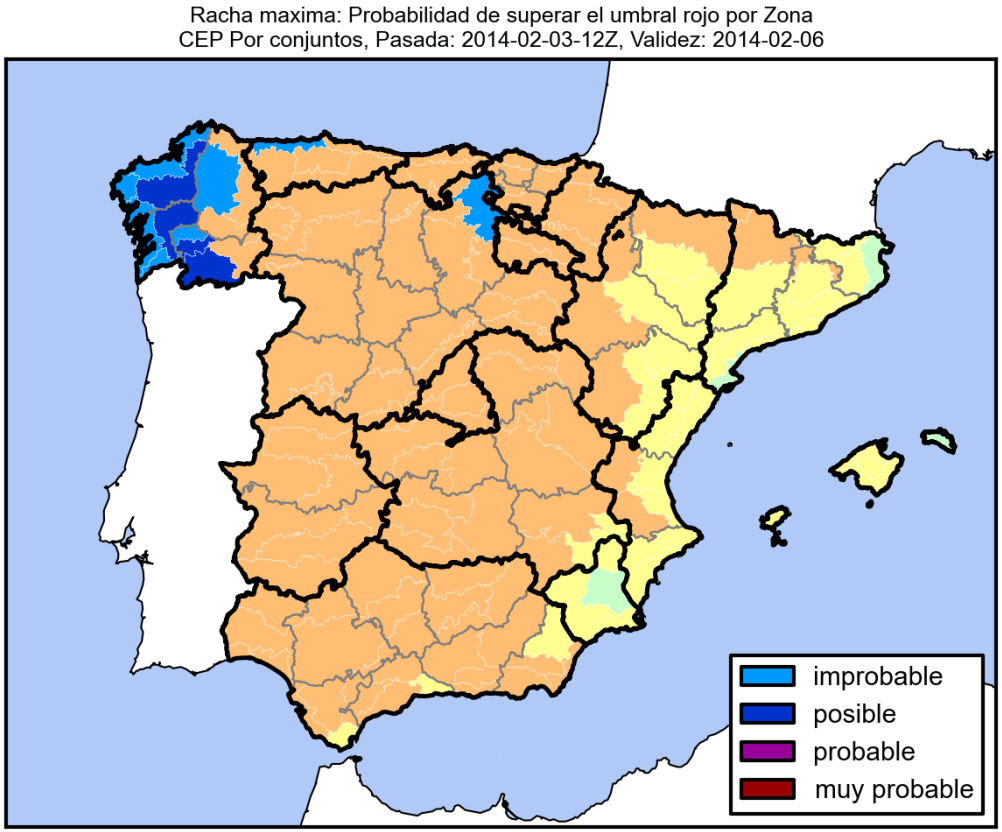
Orange area



Small area
Moderate area
Large area
Near all area

How the use of EPS could improve the issue of meteorological warnings of severe weather?

Over red threshold



Unlikely
Possible
Likely
High likely

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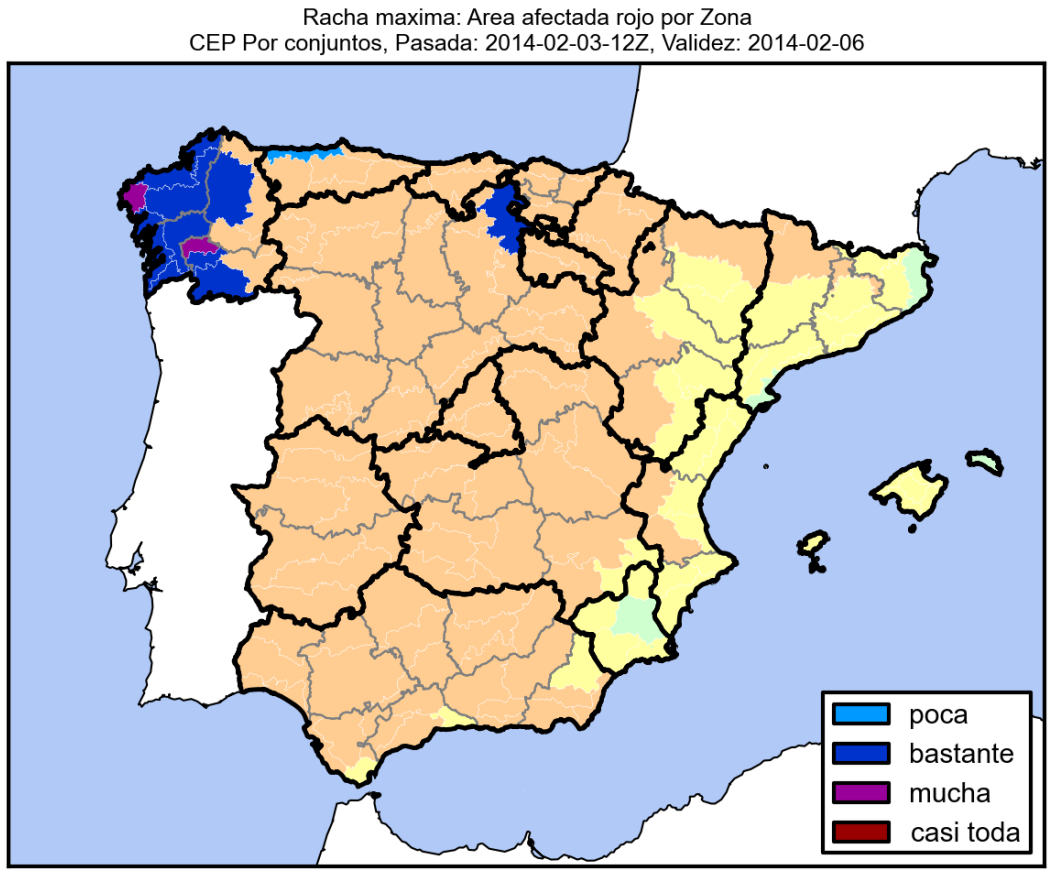
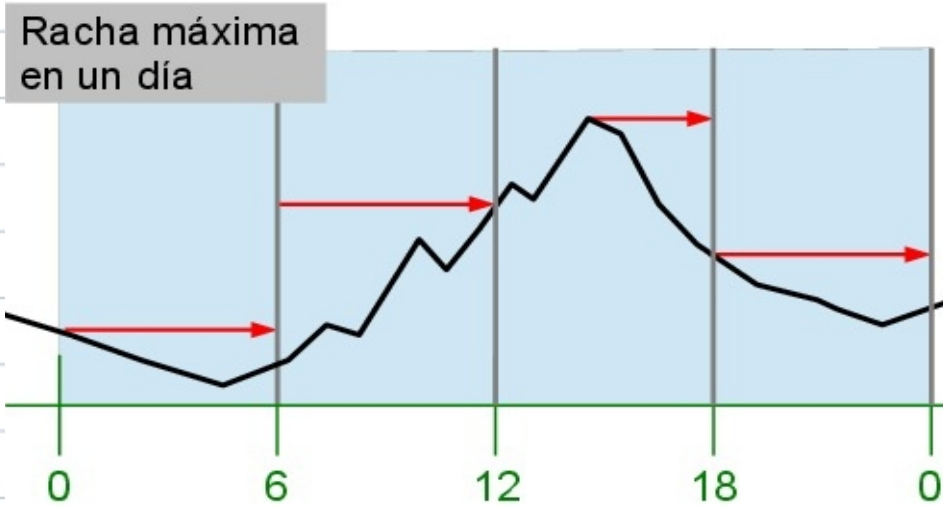
How the use of EPS could improve the issue of meteorological warnings of severe weather?

Red area



Small area
Moderate area
Large area
Near all area

How the use of EPS could improve the issue of meteorological warnings of severe weather?



Perspectives on EPS at AEMET

Perspectives on EPS at AEMET

- Since 2006 an AEMET SREPS has been run experimentally at AEMET. It is Muli-model and Multi-boundaries running at 25 km. Now It is considered obsolete. (MM5, HRM)
- When the next AEMET computer is installed (end of 2014) SREPS will be diconnected.
- A new AEMET Gamma SREPS at 2.5km is under development.
- A cronogramme for the new SREPS with its components follows in the next transparencies

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Perspectives on EPS at AEMET

Task	Sub task	Objective	Persons Months or quarters	Year 2014 2º	3º	4º	Year 2015 1º	2º	3º	4º
		Implentation of an EPS with Harmonie	¿?	X	X	X				
1	1.1	LBCs from ECMWF EPS	AC	X	X		X	X		
	1.2	LBCs from global models with SLAF	¿?		X	X				
		Implementation of an EPS with WRF	JAGM / AC	X	X	X	X			
2	2.1	Instalation of the WRF	JAGM / AC	X	X					
	2.2	LBCs from ECMWF EPS	JAGM / AC		X	X				
	2.3	LBCs from global models with SLAF	JAGM / AC		X	X	X			

Task	Sub task	Objective	Ppersons Months or quarters	Year 2014 2º	3º	4º	Year 2015 1º	2º	3º	4º
3		**Perturbations in Harmonie physics: SPPT, multiphysic and multi-model**	AC	X	X	X	X	X	X	X
	3.1	SPPT: Implementatión in Harmonie	AC	X	X	X				
	3.2	SPPT: Revision of the implementation in WRF	AC				X	X	X	X
	3.3	Multiphisic: implementation en Harmonie	AC	X	X					
	3.4	Multiphysic: revision of the implementation in WRF	JAGM / AC				X	X	X	X
	3.5	Multi-model: Harmonie and WRF	JAGM / AC				X	X	X	X
	3.6	Combined experiments of the three techniques	AC			X	X	X	X	X

Task	Sub task		Persons Months or quarters	Year 2014 2º	3º	4º	Year 2015 1º	2º	3º	4º
		LETKF for perturbations in the Initial Conditions	PE	X	X	X	X	X	X	X
4	4.1	Implementation in Harmonie	PE	X	X	X				
	4.2	Revision of the implementation in WRF	PE				X	X		
	4.3	Experiments	PE				X	X	X	X
		Postprocessing and verification of probabilistic predictions	CS	X	X	X	X	X	X	X
5	5.1	Migration to python of the hppv software	CS		X	X				
	5.2	Validation tests at the ECMWF ecgate	CS				X			
	5.3	Aplication to gamma-SREPS	CS					X	X	X

Perspectives on EPS at AEMET

Tarea	Sub tarea	Objeto	Personas Meses o trimestres	Año 2014 2º	3º	4º	Año 2015 1º	2º	3º	4º
6		**Implementation of a statistic calibration package of the ELR type**	CS						X	X
	6.1	Instalation of the software at ecgate	CS						X	
	6.2	trials with gamma-SREPS	CS							X
7		**gamma-SREPS**	Todos				X	X	X	X
	7.1	Pararel runs	Todos				X	X	X	
	7.2	Verificación y estudio de resultados	Todos					X	X	
	7.3	Instalación de una pasada diaria en el ECMWF	JAGM / CS						X	X
	7.4	Monitorización y verificación de la pasada diaria	JAGM / CS							X

Perspectives on EPS at AEMET

Tarea	Sub tarea	Objeto	Personas / Meses o trimestres	Año 2014 2º	Año 2014 3º	Año 2014 4º	Año 2015 1º	Año 2015 2º	Año 2015 3º	Año 2015 4º
8		**Estudio de las técnicas de interpolación horizontal estocástica**	¿?							
	8.1	Desarrollo del software	¿?							
	8.2	Pruebas de validación	¿?							
	8.3	Implementación, en su caso, en la interpolación de LBCs de Harmonie y WRF	¿?							

Calendario pendiente de recursos humanos para dedicar a esta tarea

THANK YOU FOR YOUR ATTENTION !