PREDIMED

Reunión DE TRABAJO 2012A

19 y 20 ABRIL 2012
Palma

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA E INNOVACIÓN

DIRECCIÓN GENERAL DE INVESTIGACIÓN
Y GESTIÓN DEL PLAN NACIONAL DE I+D+i

SUBDIRECCIÓN GENERAL DE
PROYECTOS DE INVESTIGACIÓN

COMUNICACIÓN SOBRE LA PROPUESTA DE RESOLUCIÓN PROVISIONAL Y TRÁMITE DE AUDIENCIA DE CONCESIÓN DE AYUDAS PARA LA REALIZACIÓN DE PROYECTOS DE INVESTIGACIÓN, SUBPROGRAMA DE PROYECTOS DE INVESTIGACIÓN FUNDAMENTAL NO ORIENTADA. CONVOCATORIA 2011

REFERENCIA: CGL2011-24458

INVESTIGADOR/A PRINCIPAL: VICTOR HOMAR SANTANER

ORGANISMO: UNIVERSIDAD DE LAS ISLAS BALEARES

TÍTULO: MEJORA DE LAS PREDICCIONES DE TIEMPO SEVERO MEDITERRANEO POR MEDIO DE OBSERVACIONES ADAPTATIVAS Y METODOS AVANZADOS DE PREDICCION POR CONJUNTOS EN EL MARCO DE LOS PROYECTOS ME

DURACIÓN EN AÑOS: 3

Ref.: CGL2011-24458

Observaciones de la comisión de evaluación - Sugerencias (si procede) - Condiciones (si procede):

El tema es de gran interés tanto científico como social pues afecta a la predicción de sucesos severos, además de su dimensión internacional al estar integrado en proyectos a nivel de la UE. Se trata de una propuesta ambiciosa y de gran relevancia y complejidad científico-técnica. Destaca la gran variedad de experimentos planteados para evaluar la relevancia de la calidad de las condiciones iniciales. El equipo investigador, compuesto por grupos de tres instituciones diferentes, todos ellos con colaboraciones internacionales de gran relevancia, tiene una vasta experiencia en el tema, avalada por publicaciones científicas de gran calidad, lo que le permite asegurar su capacidad para llevar a buen término la propuesta. El presupuesto solicitado se ha considerado sobredimensionado en algunos aspectos, espcialmente el de viajes, o no justificado suficientemente, como el de pesronal, teniendo en cuenta la dimensión del equipo y la financiación previa recibida en anteriores solicitudes de proyectos y Acciones Complementarias.

Equipo investigador

- UIB:
  - Climent Ramis (½)
  - Sergio Alonso (½)
  - Romu Romero (½)
  - Víctor Homar
  - Arnau Amengual
  - Lorena Garcies
  - Maria del Mar Vich
  - Maria Tous
  - ~~FPI~~
- AEMET IB:
  - Mª Àngels Picornell (½)
  - Joan Campins (½)
- AEMET SMN:
  - Isabel Martínez (½)
  - Carlos Santos (½)

+ “2” Contratados?

MINISTERIO
DE CIENCIA
E INNOVACIÓN

SECRETARÍA DE ESTADO
DE INVESTIGACIÓN

DATOS INDIVIDUALES POR PROYECTOS

REFERENCIA: CGL2011-24458

ORGANISMO: UNIVERSIDAD DE LAS ISLAS BALEARES

CIF: Q0718001A

CENTRO: DPTO. FISICA
INVESTIGADOR PRINCIPAL: VICTOR HOMAR SANTANER

TÍTULO: MEJORA DE LAS PREDICCIONES DE TIEMPO SEVERO MEDITERRANEO POR MEDIO DE OBSERVACIONES ADAPTATIVAS Y METODOS AVANZADOS DE PREDICCION POR CONJUNTOS EN EL MARCO DE LOS PROYECTOS ME
PLAZO DE EJECUCIÓN: DEL 01/01/2012 AL 31/12/2014

PRESUPUESTO FINANCIABLE: 244.420,00 €
REGIMEN PRESUPUESTO: COSTE MARGINAL
TOTAL CONCEDIDO: 244.420,00 € TOTAL ELEGIBLE FEDER: 244.420,00 €
APLICACIÓN ECONÓMICA: 21.04.463B.750 , 21.04.463B.823
EXPEDIENTE ECONÓMICO: PIA12011-1
DURACION EN AÑOS: 3

TOTAL FINANCIABLE DISTRIBUIDO POR CONCEPTO DE GASTO				
CONCEPTO DE GASTO	1ª ANUALIDAD (2011)	2ª ANUALIDAD (2012)	3ª ANUALIDAD (2013)	TOTAL
1.- GASTOS EJECUCIÓN (Contratación de Personal + Costes de Ejecución)	142.410,00	27.270,00	32.320,00	202.000,00
2.- COMPLEMENTOS SALARIALES	0,00	0,00	0,00	0,00
3.-COSTES DIRECTOS (1+2)	142.410,00	27.270,00	32.320,00	202.000,00
4.-COSTES INDIRECTOS	29.906,10	5.726,70	6.787,20	42.420,00
TOTAL (3 + 4)	172.316,10	32.996,70	39.107,20	244.420,00

5.RESUMEN DEL PRESUPUESTO SOLICITADO	
1. COSTES DE PERSONAL	340.575
2. COSTES DE EJECUCIÓN. Pequeño equipamiento científico-técnico y material bibliográfico Material fungible, Viajes y dietas, Otros gastos	174.661
TOTAL COSTES DIRECTOS	515.236
TOTAL COSTES INDIRECTOS	108.200
TOTAL	623.436
RÉGIMEN DE SUBVENCIÓN:	Costes Marginales

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TOTAL FINANCIABLE DISTRIBUIDO POR CONCEPTO DE GASTO				
CONCEPTO DE GASTO	1ª ANUALIDAD (2011)	2ª ANUALIDAD (2012)	3ª ANUALIDAD (2013)	TOTAL
1.- GASTOS EJECUCIÓN (Contratación de Personal + Costes de Ejecución)	142.410,00	27.270,00	32.320,00	202.000,00
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Objetivo general

PREDIMED is a project framed within priority lines of the WMO … and is fundamentally **aimed at improving society's ability to cope with high impact weather** through research focused on improving the accuracy, lead time and utilization of weather predictions.

The proposal focuses on two main axis:

- to provide better guidance for future operational targeting campaigns

- to ameliorate the exploitation of the wealth of information ensemble prediction systems can provide to improve the prediction of severe weather and reduce its damaging effects.

Objetivo I

IMPACT STUDIES (DATA TARGETING)

"PREDIMED proposes … and assess the impact of the targeted observations deployed during the MEDEX-DTS campaigns in 2008 and 2009."

Objective 1. To determine the impact of the targeted observations deployed during MEDEX Phase II field campaign on socially relevant aspects of hydrometeorological forecasts.

Objetivo II

VERIFICACIÓN DE INFORMACIÓN DE SENSIBILIDAD

"We also plan on performing a rigorous verification of the sensitivity fields available during the campaign together with new experimental products computed ad-hoc, to unequivocally identify the products that will better guide future Operations Center of the campaign by identifying sensitive areas where the deployment of extra observation means produce a significant reduction of forecast errors."

Objective 2. To identify the most accurate available sensitivity calculation methods for Mediterranean high impact weather events in order to provide a robust guidance to the managers of future similar Mediterranean campaigns in the context of MEDEX-EUMETNET or HyMeX.

Objetivo III

DISEÑO DE UN DTS "OPERACIONAL"

"We also plan on performing a rigorous verification of the sensitivity fields available during the campaign together with new experimental products computed ad-hoc, to unequivocally identify the products that will better guide future Operations Center of the campaign by identifying sensitive areas where the deployment of extra observation means produce a significant reduction of forecast errors."

Objective 3.

3a) To design a yearly operational implementation of the MEDEX Phase II campaign as a demonstration phase of PREDIMED and explore the options for a regular funding from EUMETNET as a natural extension of the agreement of 2009.

3b) Implement at the UIB an automatic daily sensitivity calculation as well as a corresponding verification system with academic and research purposes.

Objetivo IV

COMPARACIÓN DE 3 ENSEMBLES PARA MED SEV WEA

"Indeed, PREDIMED proposes comparing three mesoscale ensemble generation strategies, namely the multi-model and multi-analysis technique used in the AEMET SREPS, the rescaled bred vectors of Homar and Stensrud (2009), as well as a dynamical downscaling of the ECMWF medium-range ensemble prediction system."

Objective 4. To determine the optimal ensemble generation method among the three most suitable approaches proposed to date for limited area mesoscale ensembles: downscaling from a global ensemble, multimodel-multianalysis and initial condition perturbations by means of bred vectors.

Objetivo V

POSTPROCESO DE PREDICCIONES POR CONJUNTOS

"In PREDIMED we intend to continue the works started in previous projects such as ENSEMBLE, PRECIOSO and MEDICANES by incorporating the most recent techniques in order to optimize the probabilistic forecasts of mesoscale EPSs applied to extreme weather by investigating different methods of interpretation, postprocess and products generation, as well as to meet the need for more informative forecast evaluation with use of novel spatial verification methods."

Objective 5. To design a suite of postprocessing tools that, besides the standard statistical correction of the biases and probabilities calibration, we aim to extract from the ensemble the maximum forecasting value specifically oriented to high impact weather for the Mediterranean. This includes the use of hydrological simulations as an advanced verification tool for precipitation forecasts.

Objetivo VI

IMPLEMENTACIÓN DE UN EPS

Objective 6. To implement an experimental ensemble prediction system as a demonstration phase of PREDIMED build around the generation strategy and postprocessing tools developed in the project.

TAREAS

- T1: DATA ACQUISITION AND COMPLETION OF DATABASES
- T2: PROJECT CONVENTIONS AND MAINTENANCE OF NUMERICAL TOOLS
- T3: GENERATION OF EXPERIMENTAL SENSITIVITY FIELDS
- T4: GENERATION OF UNPERTURBED AND DATA-DENIAL EXPERIMENTAL ANALYSIS
- T5: GENERATION OF HIGH-RESOLUTION METEOROLOGICAL AND HYDROLOGICAL FORECASTS
- T6: VERIFICATION OF HYDROMETEOROLOGICAL PREDICTIONS
- T7: DIFFUSION AND IMPLEMENTATION OF SENSITIVITY RESULTS
- T8: GENERATION OF THE ENSEMBLE PREDICTIONS CATALOG
- T9: POSTPROCESSING AND VERIFICATION OF ENSEMBLE PREDICTIONS
- T10: TRANSFER AND REAL-TIME IMPLEMENTATION OF THE ENSEMBLE FORECASTING PRODUCTS

Equipo investigador

- UIB:
  - Climent Ramis (½)
  - Sergio Alonso (½)
  - Romu Romero (½)
  - Víctor Homar
  - Arnau Amengual
  - Lorena Garcies
  - Maria del Mar Vich
  - Maria Tous
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- AEMET IB:
  - Mª Àngels Picornell (½)
  - Joan Campins (½)
- AEMET SMN:
  - Isabel Martínez (½)
  - Carlos Santos (½)

+ “2” Contratados “científicos”, + 2 contratados “informáticos”

TAREAS

Tasks	Centers Involved
T1 DATA ACQUISITION AND COMPLETION OF DATA BASES	
T1.1 Selection, collection and characterization of MEDEX II case definitions	ALL
T1.2 Acquisition of ECMWF, UK MetOffice and MeteoFrance sensitivity fields	UIB
T1.3 Completion of the catalog of UIB MM5 Adjoint sensitivity fields	UIB
T1.4 Acquisition of operational ECMWF analysis and ensemble forecasts	UIB
T1.5 Acquisition of operational ECMWF analysis at verification time	UIB
T1.6 Acquisition of available meteorological observations at verification time	UIB,A-BAL
T1.7 Acquisition of geographical information of relevant basins and stream flow observations from selected cases of special hydrometeorological interest	UIB
T1.8 Acquisition of the AEMET-SREPS forecasts	UIB,A-MAD

TAREAS

Tasks	Centers Involved
T2 CONVENTIONS AND MAINTENANCE OF NUMERICAL TOOLS	
T2.1 Definition of limited area high-res simulations settings with WRF and HIRLAM	ALL
T2.2 Maintenance of UIB group computing and storage servers	UIB
T2.3 Optimization of adjoint models in parallel supercomputers	UIB
T2.4 Definition of consensus hydrometeorological verification scores	ALL

TAREAS

Tasks	Centers Involved
T3 GENERATION OF EXPERIMENTAL SENSITIVITY FIELDS	
T3.1 Generation of WRFPLUS sensitivity fields	UIB
T3.2 Generation of ECMWF ensemble sensitivity fields	UIB

TAREAS

Tasks	Centers Involved
T4 GEN. OF UNPERTURBED AND DATA-DENIAL EXPERIMENTAL ANALYSIS	
T4.1 Generation of unperturbed analysis with the AEMET HIRLAM DAS	A-BAL,A-MAD
T4.2 Generation of data-denial analysis with the AEMET HIRLAM DAS	A-BAL,A-MAD

TAREAS

Tasks	Centers Involved
T5 GEN. OF HIGH-RES METEOROLOGICAL AND HYDROLOGICAL FORECASTS	
T5.1 Generation of HIRLAM predictions	A-BAL,A-MAD
T5.2 Generation of Hydrological predictions	UIB,A-BAL

TAREAS

Tasks	Centers Involved
T6 VERIFICATION OF HYDROMETEOROLOGICAL PREDICTIONS	
T6.1 Standard verification of predictions	ALL
T6.2 Event-oriented verification of predictions	ALL
T6.3 Objects oriented verification: Mediterranean cyclones	A-BAL,A-MAD
T6.4 Verification of hydrological model results	UIB

TAREAS

Tasks	Centers Involved
T7 DIFFUSION AND IMPLEMENTATION OF SENSITIVITY RESULTS	
T7-1 Operational implementation of sensitivity calculation	UIB,A-BAL
T7.2 Tech. report with recommendations for future Mediterranean targeting campaigns	UIB,A-BAL

TAREAS

Tasks	Centers Involved
T8 GENERATION OF ENSEMBLE PREDICTIONS CATALOG	
T8.1 Gen. of EPS based on the rescaled bred vectors technique	UIB,A-MAD
T8.2 Gen. of EPS based on dyn. downscaling of the operational ECMWF global EPS	UIB,A-MAD

TAREAS

Tasks	Centers Involved
T9 POSTPROCESSING AND VERIFICATION OF ENSEMBLE PREDICTIONS	
T9.1 Bias removal and calibration of ensemble predictions	UIB
T9.2 Standard verification of the ensemble predictions	UIB,A-MAD
T9.3 Advanced verification of the ensemble predictions	UIB,A-MAD
T9.4 Design of advanced postprocessing and diagnostic tools	ALL

TAREAS

Tasks	Centers Involved
T10 TRANSFER AND REAL-TIME IMPLEMENTATION OF ENSEMBLE PRODUCTS	
T10.1 Operational implementation in AEMET of selected products in TASK 9	ALL
T10.2 Implementation of a real-time ensemble system for academic and research	UIB

Cronograma

Tasks	Centers Involved	Persons	First Year (Trimesters)				Second Year (Trimesters)				Third Year (Trimesters)			
			1	2	3	4	1	2	3	4	1	2	3	4
T1 DATA ACQUISITION AND COMPLETION OF DATA BASES														
T1.1 Selection, collection and characterization of MEDEX II case definitions	ALL	1 and ALL	X	X										
T1.2 Acquisition of ECMWF, UK MetOffice and MeteoFrance sensitivity fields	UIB	1,3,14	X	X										
T1.3 Completion of the catalog of UIB MM5 Adjoint sensitivity fields	UIB	1,6,7,14	X	X	X									
T1.4 Acquisition of operational ECMWF analysis and ensemble forecasts	UIB	2,7,8		X	X									
T1.5 Acquisition of operational ECMWF analysis at verification time	UIB	2,7,8		X										
T1.6 Acquisition of available meteorological observations at verification time	UIB,A-BAL	3,8,9,16	X	X	X									
T1.7 Acquisition of geographical information of relevant basins and stream flow observations from selected cases of special hydrometeorological interest	UIB	3,4,5	X	X	X	X								
T1.8 Acquisition of the AEMET-SREPS forecasts	UIB,A-MAD	1,11,12		X	X									
T2 CONVENTIONS AND MAINTENANCE OF NUMERICAL TOOLS														
T2.1 Definition of limited area high-res simulations settings with WRF and HIRLAM	ALL	**1**,9,12			X	X								
T2.2 Maintenance of UIB group computing and storage servers	UIB	**13**	X	X	X	X	X	X	X	X	X	X	X	X
T2.3 Optimization of adjoint models in parallel supercomputers	UIB	1,**15**	X	X	X									
T2.4 Definition of consensus hydrometeorological verification scores	ALL	**1**,2,5,6,10,11					X							
T3 GENERATION OF EXPERIMENTAL SENSITIVITY FIELDS														
T3.1 Generation of WRFPLUS sensitivity fields	UIB	1,6,7,**14**				X	X	X						
T3.2 Generation of ECMWF ensemble sensitivity fields	UIB	1,**7**,14				X	X							
T4 GEN. OF UNPERTURBED AND DATA-DENIAL EXPERIMENTAL ANALYSIS														
T4.1 Generation of unperturbed analysis with the AEMET HIRLAM DAS	A-BAL,A-MAD	**9**,11,12,16			X	X	X	X						
T4.2 Generation of data-denial analysis with the AEMET HIRLAM DAS	A-BAL,A-MAD	9,11,12,**16**					X	X	X	X				
T5 GEN. OF HIGH-RES METEOROLOGICAL AND HYDROLOGICAL FORECASTS														
T5.1 Generation of HIRLAM predictions	A-BAL,A-MAD	**9**,10,11,12,16					X	X	X	X				
T5.2 Generation of Hydrological predictions	UIB,A-BAL	1,4,**5**,9					X	X	X	X				
T6 VERIFICATION OF HYDROMETEOROLOGICAL PREDICTIONS														
T6.1 Standard verification of predictions	ALL	**6**,9,11							X	X				
T6.2 Event-oriented verification of predictions	ALL	**8**,9,12								X	X	X		
T6.3 Objects oriented verification: Mediterranean cyclones	A-BAL,A-MAD	9,**10**,11,12								X	X	X		
T6.4 Verification of hydrological model results	UIB	**4**,5								X	X	X		
T7 DIFFUSION AND IMPLEMENTATION OF SENSITIVITY RESULTS														
T7-1 Operational implementation of sensitivity calculation	UIB,A-BAL	1,6,7,10,**14**										X	X	X

Cronograma

T7.2 Tech. report with recommendations for future Mediterranean targeting campaigns	UIB,A-BAL	**1** and ALL											X	X
T8 GENERATION OF ENSEMBLE PREDICTIONS CATALOG														
T8.1 Gen. of EPS based on the rescaled bred vectors technique	UIB,A-MAD	**1**,11,14,17			X	X	X	X						
T8.2 Gen. of EPS based on dyn. downscaling of the operational ECMWF global EPS	UIB,A-MAD	1,11,**14**,17					X	X	X					
T9 POSTPROCESSING AND VERIFICATION OF ENSEMBLE PREDICTIONS														
T9.1 Bias removal and calibration of ensemble predictions	UIB	2,3,**6**						X	X					
T9.2 Standard verification of the ensemble predictions	UIB,A-MAD	2,3,**4**,11,12,14							X	X				
T9.3 Advanced verification of the ensemble predictions	UIB,A-MAD	1,6,8,**11**,12,14							X	X	X	X		
T9.4 Design of advanced postprocessing and diagnostic tools	ALL	**1**,7,8,11,12, 14,16,17								X	X	X	X	
T10 TRANSFER AND REAL-TIME IMPLEMENTATION OF ENSEMBLE PRODUCTS														
T10.1 Operational implementation in AEMET of selected products in TASK 9	ALL	**1** and ALL										X	X	
T10.2 Implementation of a real-time ensemble system for academic and research	UIB	1,4,5,**14**											X	X

Researchers: **1**: V. Homar (PI, UIB); **2**: S. Alonso (UIB); **3**: C. Ramis (UIB); **4**: R. Romero (UIB); **5**: A. Amengual (UIB); **6**: M. M. Vich (UIB); **7**: L. Garcies (UIB); **8**: M. Tous (UIB)
9: J. Campins (AEMET-IB); **10**: M. A. Picornell (AEMET-IB)
11: C. Santos (AEMET-MAD); **12**: I. Martínez (AEMET-MAD)
13: R. Guilabert (contracted technician, UIB); **14**: Post-doc researcher (contracted, UIB); **15**: Specialized programmer (contracted UIB)
16: Graduate researcher (contracted, AEMET-BAL)

Note: The tasks in which the solicited FPI fellow would develop their research are also indicated (**17**) in the chronogram.

BENEFICIOS ESPERADOS

B1: “First, the results from the impact-analysis experiments will render a clear picture of **the effects targeting campaigns**, such as the MEDEX DTS 2008-2009, have on the accuracy of event-specific aspects of the forecasts.”

B2: “… will deliver clear answers and recommendations regarding the **most accurate method to compute sensitivities** of Mediterranean high-impact weather in the context of a targeting campaign.”

B3: “The expected progress in the design … of new ensemble techniques is of major significance, in the short to medium term, for the **improvement of sensible weather forecasts in the mesoscale**”

B4: “The development of **new post-processing techniques** for the interpretation and communication of the probabilistic forecasts is likewise beneficial”

Cuentas

RESUMEN (k€)	SOLICITADO	CONCEDIDO
Total	515	202 (39.2 %)
Personal	341 (54.7 %)	134
Ejecución	175 (39.3 %)	68

EJECUCIÓN (k€)	SOLICITADO	CONCEDIDO
Blades cálculo	59	23
Almacenamiento	24	9.4
Fungible	8	3
Reuniones Proyecto	3	1.2
Reuniones puntuales	1.5	0.6
Viajes/Congresos/Cursos	54	21
Publicaciones	12	4.5
Imprevistos	3	1.2