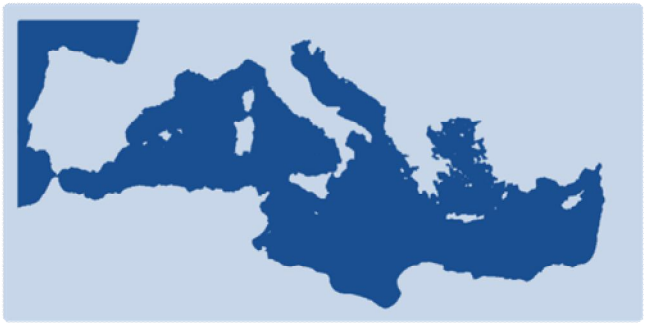
Collaborative Project



CLIM-RUN

Climate Local Information in the Mediterranean region Responding to User Needs

WP 9 – Training and dissemination of final results
Task9.3 - Organization of scientific sessions and of final dissemination

Deliverable 9.4

Congress sessions report

Project No. 265192– CLIM-RUN

Start date of project: 1st March 2011 Duration: 36 months

Organization name of lead contractor for this deliverable: Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)

Due Date of Deliverable: month 31 (Dec 2013) Actual Submission Date: Dec 2013

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1. Introduction

The main goal of WP9 is the dissemination of the main outcomes of CLIMRUN project. In particular one of the goals of Task 9.3 is the dissemination of scientific results of the project in international meeting such as European Geosciences Union (EGU) and European Meteorological Society (EMS) annual general assemblies where meetings with stakeholders should be also expected.
To fulfil this goal, since 2012 a scientific session about climate services has been proposed and co-organised at EGU General Assembly in collaboration with ECLISE project. In this context, a stakeholders meeting has been also organised in 2012 in collaboration with WMO to present to a wider audience the Global Framework of Climate Services (GFCS). At EMS, a session on climate services was pre-existing and several contributions from CLIMRUN have been there submitted to further disseminate the CLIMRUN activities.

2. The climate services sessions at EGU General Assembly

The Climate Services session at EGU General Assembly ("Climate services –Underpinning science") has been thought as a room where gather and present climate services initiatives at International (GFCS; CSP) and European level (EU FP7 projects,…) in the context of EGU where this kind of space was missing. The session has been co-organised in collaboration with ECLISE project . The convener is Alessandro Dell'Aquila (ENEA) with the support of Paolo Michele Ruti (Coordinator of CLIMRUN) and Roeland Van Oss (Coordinator of ECLISE). The session has been thought to keep open even after the end of CLIMRUN project, in order to maintain a room to gather and discuss the forthcoming climate services initiatives (new FP7 project SPECS, EUPORIAS, NACLIM) in such a high visibility and participation meeting as EGU General Assembly.

2.1. The 2012 EGU session

In the 2012 session **34 abstracts** have been submitted, leading to the following session program Major details of the 2012 session can be found in
http://meetingorganizer.copernicus.org/EGU2012/session/9704

Oral session:

Thursday, 26 Apr 2012
Room: 13
Chairperson: P. M.Ruti

13:30–13:45 EGU2012-14214
Global Framework for Climate Services (GFCS) (solicited)
F Lùcio

13:45–14:00 EGU2012-2588 | Presentation
The WMO RA VI Regional Climate Centre Network - a support to users in Europe
S. Rösner

14:00– EGU2012-9751
14:15 **Climate services at the international level**
C.D. Hewitt and C. Buontempo

14:15– EGU2012-6780
14:30 **The Climate Services Partnership (CSP): Working Together to Improve Climate Services Worldwide**
S. Zebiak, G. Brasseur, and Members of the CSP Coordinating Group

14:30– EGU2012-6658
14:45 **Climate Services for Development Planning and Implementation: A Framework for Assessing and Valuing Climate Services**
G. Anderson

14:45– EGU2012-7284 | Presentation
15:00 **IMPACT2C: Quantifying projected impacts under 2°C warming**
D Jacob, L Kotova, and IMPACT2C Team

COFFEE BREAK

Chairperson: R. van Oss

15:30– EGU2012-4797
15:45 **The German Climate Service Center: Philosophy, First Achievements and Lessons Learnt**
G. Brasseur, R. Braun, D. Jacob, M. Schaller, and R. Schwarze

15:45– EGU2012-1118 | Presentation
16:00 **Facilitating a stakeholder-led approach to the development of Mediterranean climate services: co-ordinating the CLIM-RUN case studies**
C.M. Goodess and the CLIM-RUN Climate Expert (CET) and Stakeholder Expert (SET) Team

16:00– EGU2012-12515
16:15 **CLIM-RUN: Tourism cas study over the French Alps**
C. Dubois and the CLIM-RUN Team

16:15– EGU2012-14318
16:30 **Towards new Climate Scenarios for The Netherlands; connecting science and society**
A Feijt

16:30– EGU2012-3308
16:45 **Projected Changes in Northern Europe Storm and Precipitation Characteristics: Uncertainty and the Implications for Climate Services**
S. Sobolowski, M. Mesquita, and K. Keay

16:45– EGU2012-4335 | Presentation
17:00 **An example of model result correction to study the impact of climate change on**

electricity consumption
S. Parey, G. Galloy, and M. Nogaj

Poster session:

XY310 EGU2012-2076 | Presentation
Service Center for Climate Change Adaptation in Agriculture - an initiative of the University of West Hungary
Cs. Matyas, I. Berki, A. Drüszler, A. Eredics, B. Galos, N. Moricz, and E. Rasztovits

XY311 EGU2012-5149 | Presentation
Spatial differences in drought vulnerability
M. Perčec Tadić, K. Cindić, M. Gajić-Čapka, and K. Zaninović

XY312 EGU2012-8154
Extreme Events and Energy Providers: Science and Innovation
P. Yiou and R. Vautard

XY313 EGU2012-12735
Energy demand forecasting by means of Statistical Modelling: Assessing Benefits of Climate Information
M. De Felice, A. Alessandri, and P.M. Ruti

XY314 EGU2012-12490
Monitoring of Climate Change in Germany - Data, products and services of Germany's National Climate Data Centre
F. Kaspar, E. Penda, G. Müller-Westermeier, K. Zimmermann, and H. Mächel

XY315 EGU2012-13309
Climate change impacts on forest fires: the stakeholders' perspective
C. Giannakopoulos, A. Roussos, A. Karali, M. Hatzaki, G. Xanthopoulos, E. Chatzinikos, N. Fyllas, N. Georgiades, G. Karetsos, G. Maheras, I. Nikolaou, N. Proutsos, T. Sbarounis, K. Tsaggari, I. Tzamtzis, and C. Goodess

XY316 EGU2012-10138
DESYCO: a Decision Support System to provide climate services for coastal stakeholders dealing with climate change impacts.
S. Torresan, V. Gallina, V. Giannini, J. Rizzi, A. Zabeo, A. Critto, and A. Marcomini

XY317 EGU2012-11047 | Presentation
Dynamical downscaling inter-comparison for high resolution climate reconstruction
J. Ferreira, A. Rocha, J. M. Castanheira, and A. C. Carvalho

XY318 EGU2012-11068
Territorial Climate Profiles: a methodological approach to provide local climate information for climate change adaptation (withdrawn)

M. Kolasinski, H. Loukos, and P.A. Michelangeli

XY319 EGU2012-5898
Developing Climate Services in Europe: The Challenges Ahead
R. Schwarze, A. Navarra, **D. Jacob**, and G. Brasseur

XY320 EGU2012-7640
Swiss Climate Change Scenarios: The CH2011 Initiative
A. Fischer, C. Appenzeller, I. Bey, T. Bosshard, T. Corti, M. Croci-Maspoli, E. M. Fischer, J. Fuhrer, R. Knutti, S. Kotlarski, A. Kress, C. Kull, M. A. Liniger, A. Lustenberger, C. Schär, S. C. Scherrer, and A. P. Weigel

XY321 EGU2012-9483
Future IDF curves for regional planning in Europe
P. Kutschera, J. Olsson, D. Havlik, and G. Gruber

XY322 EGU2012-10534
Model based climate information on drought risk in Africa
S. Calmanti, J. Syroka, C. Jones, F. Carfagna, A. Dell'Aquila, P. Hoefsloot, S. Kaffaf, and G. Nikulin

XY323 EGU2012-7988
Developing services for climate impact and adaptation baseline information and methodologies for the Andes
C. Huggel and the AndesPlus project Team

XY324 EGU2012-80
An Interface between Law and Science: The Climate Change Regime
Y. Kuleshov, M. Grandbois, and S. Kaniaha

XY325 EGU2012-2511
Climate services as practised in the southeast USA
J. O'Brien

XY326 EGU2012-13782
Regional and State Climate Services in the United States (withdrawn)
T. Brown and D. Todey

XY327 EGU2012-2811
Towards improving the reliability of future regional climate projections: A bias-correction method applied to precipitation over the west coast of Norway
A. Valved, I. Barstad, and S. Sobolowski

XY328 EGU2012-5855
Scientific services related to climate-induced natural hazards in the Vrancea Seismic Region, Romania
M. Sima, **D. Micu**, C. Dragota, V. Chendes, M. Micu, and D. Balteanu

XY329 EGU2012-4180
A step towards realizing a pan-European Climate Service - Activities of the Climate Service Center in the ECLISE project
B. Weber

XY330 EGU2012-1221
Climate Services for Thermoelectric Power in Europe and the U.S.
M.T.H. van Vliet, J.R. Yearsley, F. Ludwig, S. Vögele, D.P. Lettenmaier, and P. Kabat

XY331 EGU2012-13542
The joint threat of storm surges and high discharge for the Netherlands
S.F. Kew, F.M Selten, and G. Lenderink

The 4 abstracts received from CLIMRUN community have been more extensively reported in the annexes

2.2. The 2012 EGU Townhall meeting Climate Services - Think Forward. The presentation of GFCS

As side event of the 2012 EGU scientific session a townhall meeting, devoted to a wider audience, has been organised in collaboration with WMO to present to science community and stakeholders the Global Framework of Climate Services (GFCS). The motivation for this meeting can be found in the several initiatives organised for climate services in 2012 that needed a more coherent and comprehensive presentation and background. In fact the year 2012 could be regarded as the year of the "climate services". Firstly, WMO have presented the implementation plan of the Global Framework for Climate Services at WMO's Extraordinary Congress in October 2012. Also, THE EMS-ECAC conference in 2012 have been devoted to 'European Climate Services Capabilities - user needs and communication with stakeholders'. At EGU, in the townhall meeting for this purpose organised, an innovative discussion has been opened on this Climate Services year by gathering different initiatives at international and European level and presenting new perspectives of innovative thinking on the role of climate information in the society. The event has been organized as a panel discussion proceeded by a keynote presentation to set the stage for the discussion The moderator engaged panelists with specific questions about their perspectives on concrete activities they were involved in that promote climate services.

Oral Programme Moderator: Filipe Lúcio, WMO 19:00 hrs Introduction Moderator, Filipe Lúcio, WMO 19:05 hrs Key note presentation: Global Framework for Climate Services Filipe Lúcio, WMO 19:20 hrs Panel Discussion Panelists: Stephen Zebiak, International research Institute Chris Hewitt, UK Met Office Roeland Van Oss, KNMI Glen Anderson, International Resources Group Paolo Ruti, Enea

2.3.The 2013 EGU Climate Services session

In the 2013 session **37abstracts** have been submitted, leading to the following session program.

Major details of the 2013session can be found in
http://meetingorganizer.copernicus.org/EGU2013/session/11621

Oral program
Thursday, 11 Apr 2013
Room: Y6
Chairperson: Alessandro Dell'Aquila

13:30–13:45 EGU2013-4553
Global Framework for Climate Services (GFCS): implementation approach
Filipe Lucio

13:45–14:00 EGU2013-1465
Climate change scenarios and key climate indices in the Swiss Alpine region
Elias Zubler, Mischa Croci-Maspoli, Christoph Frei, Mark Liniger, Simon Scherrer, and Christof Appenzeller

14:00–14:15 EGU2013-4211
Seasonal and decadal information towards climate services: EUPORIAS
Carlo Buontempo and Chris Hewitt

14:15–14:30 EGU2013-10375
Application of seasonal climate forecasts for electricity demand forecasting: a case study on Italy
Matteo De Felice, Andrea Alessandri, and Franco Catalano

14:30–14:45 EGU2013-5638
Continuing and developing the engagement with Mediterranean stakeholders in the CLIM-RUN project
Clare Goodess and the CLIM-RUN Climate Expert Team and Stakeholder Expert Team

14:45–15:00 EGU2013-13196
Providing tailored climate information to forest fire stakeholders and end-users
Christos Giannakopoulos, Vasso Kotroni, Kostas Lagouvardos, Evi Korakaki, Maria Hatzaki, Vassilis Tenentes, Anargyros Roussos, Anna Karali, and Clare Goodess

COFFEE BREAK
Chairperson: Paolo M Ruti

15:30–15:45 EGU2013-9914
Understanding Climate Service Science: Balancing Users' Needs with Providers' Capabilities
Roger B Street, Dagmar Bley, and Maria Manez

15:45–16:00 EGU2013-9267
High resolved reanalyses as reference data sets for Europe
Thomas Remke, Daniela Jacob, Christopher Moseley, Hinnerk Ries, and Walter Sauf

16:00–16:15 EGU2013-1591
Adapting Dam and Reservoir Design and Operations to Climate Change

René Roy, Marco Braun, and Diane Chaumont

16:15–16:30 EGU2013-9026 | Presentation
Climate services for energy production: are regional climate models reliable for future solar power generation scenarios?
Marcello Petitta, Mariapina Castelli, and Sandro Calmanti

16:30–16:45 EGU2013-10705
ClimateImpactsOnline: A web platform for regional climate impacts
Thomas Nocke

16:45–17:00 EGU2013-4462
Developing local climate services to support climate adaptation policies for Greek region
Ioannis Tsanis, Manolis Grillakis, Aristeidis Koutroulis, and Daniela Jacob

The poster session:

Z287 EGU2013-1085
Pacific-Australia Climate Change Science and Adaptation Planning program: supporting climate science and enhancing climate services in Pacific Island Countries
Yuriy Kuleshov, David Jones, Harry Hendon, Andrew Charles, Kay Shelton, Roald de Wit, Andrew Cottrill, Toshiyuki Nakaegawa, Terry Atalifo, Bipendra Prakash, Sunny Seuseu, and Salesa Kaniaha

Z288 EGU2013-2942
A Decision Support System for Climate Change Adaptation in Rainfed Sectors of Agriculture for Central Europe
Csaba Mátyás, Imre Berki, Áron Drüszler, Attila Eredics, **Borbála Gálos**, Gábor Illés, Norbert Móricz, Ervin Rasztovits, and Kornél Czimber

Z289 EGU2013-6086
Towards a climate service for the Tunisian tourism industry
Latifa Henia and Zouhaier Hlaoui

Z290 EGU2013-6191
CARICOF - The Caribbean Regional Climate Outlook Forum
Cedric Van Meerbeeck

Z291 EGU2013-8627
Climate services for an urban area (Baia Mare City, Romania) with a focus on climate extremes
Mihaela Sima, Dana Micu, Carmen-Sofia Dragota, and Sorin Mihalache

Z292 EGU2013-8695
European temperature presented as Climate Information Bulletin
Ge Verver, Else van den Besselaar, Albert Klein Tank, Gerard van der Schrier, Lizzie Good, Dale Barker, and Phil Jones

Z293 EGU2013-9435
Climate services for the assessment of climate change impacts and risks in coastal areas at the regional scale: the North Adriatic case study (Italy).
Gallina Valentina, Silvia Torresan, Valentina Giannini, Jonathan Rizzi, Alex Zabeo, Silvio Gualdi, Alessio Bellucci, Filippo Giorgi, Andrea Critto, and Antonio Marcomini

Z294 EGU2013-9118
The climate4impact portal: bridging CMIP5 data to impact users
Wim Som de Cerff, Maarten Plieger, Christian Page, Ronald Hutjes, Fokke de Jong, Lars Barring, and Elin Sjökvist

Z295 EGU2013-9653
Assessment of the destructive potential of hail
Roxana Diana Cica, Sorin Burcea, Roxana Bojariu, and Alexandru Dumitrescu

Z296 EGU2013-10093
Heatwave risks in urban area - a case study for Arad municipality in Romania
Roxana Bojariu, Diana Roxana Cica, Liliana Velea, Cosmin Turcus, and Marius Golea

Z297 EGU2013-10165
Climate Ireland - Tailoring Climatic Information for Adaptation (withdrawn)
Barry O'Dwyer, Anthony Patterson, Stefan Gray, and Jeremy Gault

Z298 EGU2013-11866
Bridging the gap between the impact and climate communities: lessons from the IS-ENES use cases
Celine Deandreis, Pascale Braconnot, Christian Page, and Sylvie Joussaume

Z299 EGU2013-13530
Drought risk assessment of food security in a regional climate model perspective
Sandro Calmanti, Tinebeb Yohannes Gelassie, Joanna Syroka, Grigory Nikulin, and Colin Jones

Z300 EGU2013-13
Assessment of six dissimilarity metrics for climate analogues
Patrick Grenier, Annie-Claude Parent, David Huard, François Anctil, and Diane Chaumont

Z301 EGU2013-11490
I-AMICA: infrastructure of high technology for environmental and climate monitoring in Southern Italy
Paolo Bonasoni and the I-AMICA Team

Z302 EGU2013-9273
Overview of the research underpinning climate services provision at AEMET
Ernesto Rodriguez-Camino and Antonio Mestre-Barceló

Z303 EGU2013-4636
Climate information for the wind energy industry in the Mediterranean Region

Sandro Calmanti, Melanie Davis, Peter Schmidt, and Alessandro Dell'Aquila

The 6 abstracts received from CLIMRUN community have been reported in the annexes.

3. The CLIMRUN contributions at EMS climate services session

Since the very early stages of the project, several contributions from CLIMRUN partners have been successfully presented in the pre-existing climate services session "Climate services - best practices" at EMS annual General Assembly.

More in details, at the 2011 General Assembly 2 abstracts from CLIMRUN have been presented:

1) Climate Local Information in the Mediterranean region: Responding to User Needs. The CLIMRUN FP7 project. *PM Ruti, H Ravenel, S Somot, M Lange, C Goodess, G Dubois, C Giannakopoulos, F Doblas-Reyes, A Marcomini, F Giorgi, and A Dell'Aquila*
2) Climate Services and Renewable Energy: Providing Climate Information for the Next 1-30 Years; *F. J. Doblas-Reyes and M. Davis*

At the 2012 GA 2 abstracts from CLIMRUN have been presented:

1) The challenges of developing stakeholder-led climate services - Mediterranean case-study examples from the CLIM-RUN project *C.M. Goodess and the CLIM-RUN Climate Expert Team and Stakeholder Expert Team*
2) Addressing stakeholder needs in the Mediterranean climate services: the wildfires case studies *C. Giannakopoulos, V. Kotroni, K. Lagouvardos, E. Korakaki, A. Roussos, M. Hatzaki, A. Karali, G. Xanthopoulos, and C.M. Goodess*

At the 2013 GA 3 abstracts from CLIMRUN have been presented:

1) Providing climate services for the wind energy industry: a case study for the Mediterranean Region *A. Dell'Aquila and S. Calmanti*
2) Climate change and wildfire risk: the route from applied research to stakeholder services for the case study of Greece *C. Giannakopoulos, A. Karali, M. Hatzaki, A. Roussos, E. Korakaki, and C.M. Goodess*
3) New perspectives and products from the CLIM-RUN project: continuing and developing the engagement with Mediterranean stakeholders *A. Dell'Aquila, C Goodess, PM Ruti and the CLIM-RUN Climate Expert Team and Stakeholder Expert Team*

The abstracts are reported in the annexes.

4. ANNEXES: The CLIMRUN abstracts

4.1. THE CLIMRUN Abstracts at EGU

2012 General Assembly

Facilitating a stakeholder-led approach to the development of Mediterranean climate services: co-ordinating the CLIM-RUN case studies

C.M. Goodess and the CLIM-RUN Climate Expert (CET) and Stakeholder Expert (SET) Team

University of East Anglia, Climatic Research Unit, Norwich, United Kingdom (c.goodess@uea.ac.uk)

The CLIM-RUN case studies provide a real-world context for bringing together experts on the demand and supply side of climate services. They are essential to the CLIM-RUN objective of using iterative and bottom-up (i.e. stakeholder led) approaches for optimizing the two-way information transfer between climate experts and stakeholders. The region of interest for CLIM-RUN is the Mediterranean, which is a recognised climate change hotspot (i.e. a region particularly sensitive and vulnerable to global warming) and which does not currently have developed climate service networks such as exist in a number of Central and Northern European countries.
The case studies focus on the energy and tourism sectors, but also include a cross-cutting study on wild fires (an issue of increasing concern in the Mediterranean) as well as a cross-sectorial integrated case study for the Venice lagoon. They span coastal (e.g., Tunisia and Croatia), island (e.g., Cyprus) and mountain (e.g., Savoie) environments, the eastern (e.g., Greece) to western (e.g., Spain, Morocco) Mediterranean regions, and regional to local foci.
Stakeholder involvement has been critical from the start of the project in March 2011, with a series of targeted workshops helping to define the framework for each case study. Two specific workshop objectives were to (i) better understand who are the climate services stakeholders and (ii) what they need/want from climate services (both in terms of data products and broader knowledge). Many of the workshops were held in local languages to maximise stakeholder participation, with expert knowledge provided by the CLIM-RUN climate and stakeholder expert teams (the CET and SET). Following the workshops, CET members are 'translating' the user needs into specific requirements from climate observations and models and identifying areas where additional modelling and analysis are required.
As part of the central co-ordination of the case studies, a perception and data needs questionnaire was produced to solicit information about stakeholder institutions and organisations, risk perception and current use of climate/weather information, perspectives on climate services, data requirements and handling uncertainties. The questionnaire was designed to be used in a very flexible way, adapted to individual case studies. It has been circulated via email, during and after workshops, made available in on-line form and has also provided the basis for structured interviews with stakeholders.
From the preliminary CLIM-RUN work, it is evident that the different sectorial requirements and contexts, including differences in stakeholder expertise and perspectives and the importance of non-climatic considerations in decision making, support the tailored, bottom-up approach adopted. For instance, the energy sector is more keen to use detailed present-day climate information, while tourist stakeholders, although less constrained by climate issues, prefer seasonal timescale information. At the same time, these differences provide a challenge in terms of developing common methodologies and identifying priorities for the provision of climate services. Other challenges relate to the differences in stakeholder engagement across the case studies.

DESYCO: a Decision Support System to provide climate services for coastal stakeholders dealing with climate change impacts.

S. Torresan (1), V. Gallina (1,2), V. Giannini (3), J. Rizzi (1,2), A. Zabeo (1,2), A. Critto (1,2), A. Marcomini (1,2)
(1) Centro-Euro Mediterraneo per i Cambiamenti Climatici (CMCC), Impacts on Soil and Coast Division c/o Consorzio Venezia Ricerche, Ricerche, Viale della Libertà 5-12, Marghera-Venice, Italy (torresan@unive.it, valentina.gallina@cmcc.it,
jonathan.rizzi@unive.it), (2) Department of Environmental Sciences, Informatics and Statistics, University Ca' Foscari Venice, Calle Larga S. Marta 2137, I-30123 Venice, Italy (critto@unive.it, marcom@unive.it)., (3) Centro-Euro Mediterraneo
per i Cambiamenti Climatici (CMCC), Economical and Political Impacts related to Climate Change Divison c/o Fondazione
Eni-Enrico Mattei (FEEM) Isola di San Giorgio Maggiore, I-30124 Venezia, Italy (valentina.giannini@cmcc.it)

At the international level climate services are recognized as innovative tools aimed at providing and distributing climate data and information according to the needs of end-users. Furthermore, needs-based climate services are extremely effective to manage climate risks and take advantage of the opportunities associated with climate change impacts. To date, climate services are mainly related to climate models that supply climate data (e.g. temperature, precipitations) at different spatial and time scales. However, there is a significant gap of tools aimed at providing information about risks and impacts induced by climate change and allowing non-expert stakeholders to use both climate-model and climate-impact data.
DESYCO is a GIS-Decision Support System aimed at the integrated assessment of multiple climate change

impacts on vulnerable coastal systems (e.g. beaches, river deltas, estuaries and lagoons, wetlands, agricultural and urban areas). It is an open source software that manages different input data (e.g. raster or shapefiles) coming from climate models (e.g. global and regional climate projections) and high resolution impact models (e.g. hydrodynamic, hydrological and biogeochemical simulations) in order to provide hazard, exposure, susceptibility, risk and damage maps for the identification and prioritization of hot-spot areas and to provide a basis for the definition of coastal adaptation and management strategies.
Within the CLIM-RUN project (FP7) DESYCO is proposed as an helpful tool to bridge the gap between climate data and stakeholder needs and will be applied to the coastal area of the North Adriatic Sea (Italy) in order to provide climate services for local authorities involved in coastal zone management.
Accordingly, a first workshop was held in Venice (Italy) with coastal authorities, climate experts and climate change risk experts, in order to start an iterative exchange of information about the knowledge related to climate change, climate models and projections, impact and risk parameters and to know what are stakeholder needs related to climate change in a climate service perspective. The preliminary results gained from the workshop showed that DESYCO is an helpful tool for the impact and risk assessment related to climate change that could be improved in order to fulfill stakeholder needs.

CLIM-RUN: Tourism case study over the French Alps

C. Dubois and the CLIM-RUN Team
Meteo France/CNRM, Toulouse, France (clotilde.dubois@cnrm.meteo.fr)

Climate information for societal use has becoming a major challenge for tourism management and adaptation in a context of strong climate variability and change. Within the CLIMRUN EU FP7, a case study on summer tourism in the French Alps has been identify. I will introduce the bottom-up approach use in the project where stakeholders and local users meet with climate experts. From those meetings, they thus identify the climate dependence and information which impact their summer activities over this region. All the activities are located in a mountainous region where outdoor leisure is the main economic driver of the region.
It has emerged that the climate requirements are as well on past as on future climate information. On one side, the past climate parameters are found to be an invaluable information to evaluate the climate dependence of the different activities. A better knowledge as well as a growing interest in climate variability has been express to quantify the climate dependence on their activities. On the other side, the future climate information requested mainly on seasonal to decadal timescale. A particular interest has been express on the snow cover at the end of the winter season, evolution of heavy precipitations, heatwave, air temperatures and well as the water temperature of the mountainous lakes. Those climate variables are used to create comfort index under climate change. All those targeted climate information are based on on-going projects as well as future model development.

Climate change impacts on forest fires: the stakeholders' perspective

C. Giannakopoulos (1), A. Roussos (1), A. Karali (1), M. Hatzaki (1), G. Xanthopoulos (2), E. Chatzinikos (3), N. Fyllas (4), N. Georgiades (5), G. Karetsos (2), G. Maheras (6), I. Nikolaou (7), N. Proutsos (2), T. Sbarounis (8), K. Tsaggari (2), I. Tzamtzis (9), and C. Goodess (10)
(1) Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Athens, Greece (cgiannak@meteo.noa.gr), (2) Forest Research Institute of Athens, National Agricultural Research Foundation, Athens, Greece (gxnrtc@otenet.gr), (3) Greek Hunting Federation, Athens, Greece (info@dkose.gr), (4) Faculty of Biology, Iniversity
of Athens, Greece (nfyllas@gmail.com), (5) WWF Hellas, Athens, Greece (n.georgiadis@wwf.gr), (6) Forest Service of Piraeus, Piraeus, Greece (m_yorgos@hotmail.com), (7) Ministry of Energy, Environment and Climate Change, Athens, Greece (i.nikolaou@prv.ypeka.gr), (8) Argyroupolis Environmental Education Centre, Athens, Greece (tsbarounis@hotmail.com), (9) Freelance forester, Athens, Greece (itzamtzis@hotmail.com), (10) Climatic Research Unit, University of East Anglia, Norwich, UK (C.Goodess@uea.ac.uk)

In this work, we present a synthesis of the presentations and discussions which arose during a workshop on 'Impacts of climate change on forest fires' held in September 2011 at the National Observatory of Athens, Greece in the framework of EU project CLIMRUN.
At first, a general presentation about climate change and extremes in the Greek territory provided the necessary background to the audience and highlighted the need for data and information exchange between scientists and stakeholders through climate services within CLIMRUN. Discussions and presentations that followed linked climate with forest science through the use of a meteorological index for fire risk and future projections of fire

danger using regional climate models. The current situation on Greek forests was also presented, as well as future steps that should be taken to ameliorate the situation under a climate change world. A time series analysis of changes in forest fires using available historical data on forest ecosystems in Greece was given in this session. This led to the topic of forest fire risk assessment and fire prevention, stating all actions towards sustainable management of forests and effective mechanisms to control fires under climate change. Options for a smooth adaptation of forests to climate change were discussed together with the lessons learned on practical level on prevention, repression and rehabilitation of forest fires. In between there were useful interventions on sustainable hunting and biodiversity protection and on climate change impacts on forest ecosystems dynamics. The importance of developing an educational program for primary/secondary school students on forest fire management was also highlighted.
The perspective of forest stakeholders on climate change and how this change can affect their current or future activities was addressed through a questionnaire they were asked to complete. Results showed that the majority of the participants consider climate variability to be important or very important and to influence their activities. Extreme climate events, desertification and drought were regarded as the most important environmental problems along with loss of biodiversity. Most of the participants answered that they use historical data for research, and would welcome climate data and services targeted to their sector if offered.
Acknowledgement: This work was supported by the EU project CLIMRUN under contract FP7-ENV-2010-265192.

2013 General Assembly

Continuing and developing the engagement with Mediterranean stakeholders in the CLIM-RUN project

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The CLIM-RUN case studies provide a real-world and Mediterranean context for bringing together experts on the demand and supply side of climate services. They are essential to the CLIM-RUN objective of using iterative and bottom-up (i.e. stakeholder led) approaches for optimizing the two-way information transfer between climate experts and stakeholders – and focus on specific locations and sectors (such as tourism and renewable energy).
Stakeholder involvement has been critical from the start of the project in March 2011, with an early series of targeted workshops used to define the framework for each case study as well as the needs of stakeholders. Following these workshops, the user needs were translated into specific requirements from climate observations and models and areas identified where additional modelling and analysis are required. The first set of new products and tools produced by the CLIM-RUN modelling and observational experts are presented in a series of short briefing notes.
A second round of CLIM-RUN stakeholder workshops will be held for each of the case studies in Spring 2013 as an essential part of the fourth CLIM-RUN key stage: Consolidation and collective review/assessment. During these workshops the process of interaction between CLIM-RUN scientists and case-study stakeholders will be reviewed, as well as the utility of the products and information developed in CLIM-RUN. Review questions will include: How far have we got? How successful have we been? What are the remaining problems/gaps? How to sustain and extend the interactions?
The process of planning for and running these second workshops will be outlined and emerging outcomes presented, focusing on common messages which are relevant for development of the CLIM-RUN protocol for providing improved climate services to stakeholders together with the identification of best practices and policy recommendations for climate services development.

Climate information for the wind energy industry in the Mediterranean Region

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According to the World Wind Energy Association the total wind generation capacity worldwide has come close to cover 3% of the world's electricity demand in 2011. Thanks to the enormous resource potential and the relatively low costs of construction and maintenance of wind power plants, the wind energy sector will remain one of the

most attractive renewable energy investment options.
Studies reveal that climate variability and change pose a new challenge to the entire renewable energy sector, and in particular for wind energy. Stakeholders in the wind energy sector mainly use, if available, site-specific historical climate information to assess wind resources at a given project site. So far, this is the only source of information that investors (e.g., banks) are keen to accept for decisions concerning the financing of wind energy projects. However, one possible wind energy risk at the seasonal scale is the volatility of earnings from year to year investment. The most significant risk is therefore that not enough units of energy (or megawatt hours) can be generated from the project to capture energy sales to pay down debt in any given quarter or year.
On the longer time scale the risk is that a project's energy yields fall short of their estimated levels, resulting in revenues that consistently come in below their projection, over the life of the project.
The nature of the risk exposure determines considerable interest in wind scenarios, as a potential component of both the planning and operational phase of a renewable energy project. Fundamentally, by using climate projections, the assumption of stationary wind regimes can be compared to other scenarios where large scale changes in atmospheric circulation patterns may affect local wind regimes.
In the framework of CLIM-RUN EU FP7 project, climate experts are exploring the potential of seasonal to decadal climate forecast techniques (time-frame 2012-2040) and regional climate scenarios (time horizon 2040+) over the Mediterranean Region as a tool for assessing the impact of changes in climate patterns on the energy output of wind power plants. Subsequently, we will give here a brief overview of these techniques as well as first results related to wind projections for different sites across the Mediterranean Region. We will highlight that regional climate models have a large potential for enhancing the quality of climate projections in the presence of complex orography and in the proximity of coastal areas.

Towards a climate service for the Tunisian tourism industry

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Until today's Tunisia, there is little communication between generators of meteorological or climatological data and stakeholders in the tourism sector. However:
- A recent survey shows that professionals in the tourism sector are aware of the importance of integrating relevant climate information in their tourism management and development strategies.
- Tunisia has expertise in the field of meteorology and climatology which meets the demand of the tourism sector in relevant climate information.
The program CLIM RUN has created a framework allowing the introduction of a climate service in the Tunisian tourism sector. It identified the needs of the sector in climate information as well as examined together with specialized services and trained researchers the possibility of responding to these needs. The "GREVACHOT" research unit based at the University of Tunis and partner of the CLIM RUN program has developed one of the products for which great demand was formulated by tourism stakeholders: this is climate-tourism comfort indices (ICT) at regional and local scales.
We here present:
- The Tunisian experience in identifying climate information needs of the tourism sector,
- The approach method to the development, study, mapping of ICT and results.

Climate services for energy production: are regional climate models reliable for future solar power generation scenarios?

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In this study we present an analysis of surface solar radiation from Regional Climate Models (RCMs) scenario simulations produced during the ENSEMBLES project in order to understand the relation between changes in atmospheric properties and variation of the energy produced by solar power plants.
Several studies have recently pointed out the inability and the scarce accuracy of IPCC models in capturing the past decadal variability of Surface Solar Radiation (SSR) (Wild 2009, Wild et al 2010). Most of these works compare observed and estimated SSR for the last 6-7 decades and show that only half of the models are able to reproduce partially the observed decrease (global dimming) and the increase (global brightening) in SSR which occurred respectively in the time intervals 1950-1980 and 1990-2000.
We focus on the Euro-Mediterranean area and we compare the SSR data for the period 1951-2000 in order to assess

the error associated to the model ensemble. Furthermore we analyze the XXI century regional ENSEMBLES scenarios in order to quantify potential future changes of SSR. The preliminary results obtained so far confirm the findings of Wild et al. for the period 1950-2000. For the future, the analysis shows a positive linear trend over the Mediterranean region. On the other hand, most of the models predict a negative linear trend over Central Europe. We also discuss future energy strategies considering the variability of energy production from solar panels estimated by probabilistic climate change scenarios.

Climate services for the assessment of climate change impacts and risks in coastal areas at the regional scale: the North Adriatic case study (Italy).

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At the international level, the interest for climate services is rising due to the social and economic benefits that different stakeholders can achieve to manage climate risks and take advantage of the opportunities associated with climate change impacts. However, there is a significant gap of tools aimed at providing information about risks and impacts induced by climate change and allowing non-expert stakeholders to use both climate-model and climateimpact data.
Within the CLIM-RUN project (FP7), the case study of the North Adriatic Sea is aimed at analysing the need of climate information and the effectiveness of climate services for the integrated assessment of climate change impacts in coastal zones of the North Adriatic Sea at the regional to local scale. A participative approach was developed and applied to identify relevant stakeholders which have a mandate for coastal zone management and to interact with them in order to elicit their climate information needs. Specifically, the participative approach was carried out by means of two local workshops and trough the administration of a questionnaire related to climate information and services.
The results of the process allowed identifying three major themes of interest for local stakeholders (i.e. hydroclimatic regime, coastal and marine environment, agriculture) and their preferences concerning key climate variables (e.g. extreme events, sea-level, wave height), mid-term temporal projections (i.e. for the next 30-40 years) and medium-high spatial resolution (i.e. from 1 to 50 km). Furthermore, the workshops highlighted stakeholder concern about several climate-related impacts (e.g. sea-level rise, storm surge, droughts) and vulnerable receptors (e.g. beaches, wetlands, agricultural areas) to be considered in vulnerability and risk assessment studies for the North Adriatic coastal zones. This information was used by climate and environmental risk experts in order to develop targeted climate information and services (e.g. climate projections and maps) for coastal stakeholders.
The final results include climate products developed by climate experts through the analysis of climate observations and scenarios (e.g. standard indices of extreme precipitations and droughts, consecutive days of heavy rain, mean sea level pressure) and risk-based maps supplied by environmental risk experts to facilitate the definition of adaptation strategies (e.g. sea-level rise/storm surge risk maps with the surface of receptor lost; drought risk maps with the percentage of suffering agricultural areas).
The preliminary climate products and the results of North Adriatic case study will be here presented and discussed

Providing tailored climate information to forest fire stakeholders and end-users

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In EU project CLIMRUN, there has been a continuous interaction with stakeholders and end-users to develop new and improved tools to extract useful and useable information tailored to the needs of specific sectors. In this work, we review the provision of climate information services required in the Mediterranean country of Greece where forest fires represent a major hazard. Intense terrain, sparsely vegetated with typical Mediterranean flora makes Greece a fire prone environment. That, in addition to the abandonment of rural lands and extreme weather

conditions due to climate change the last few decades, constitutes an issue of an annual cycle of catastrophe from forest fires.
An iterative and bottom-up (i.e. stakeholder led) approach for optimizing the two-way information transfer between climate experts and stakeholders has been adopted from the start of the project with a workshop in Athens helping to define the framework for the forest fires case study.
The main objectives of this workshop were to better understand who the wildfires stakeholders are and what they need from climate services. After the first workshop three main categories of stakeholders were identified: short term fire planners, long term policy makers and education stakeholders. To address the needs of these stakeholders' categories the following actions were taken:
1. In collaboration with the forecasting team at the National Observatory of Athens, an application providing fire risk forecasts for the following 3 days (http://cirrus.meteo.noa.gr/forecast/bolam/index.htm) was developed, to address the needs of short term fire planners.
2. A web-based application providing long term fire risk and other fire related indices changes due to climate change (time horizon up to 2050 and up to 2100) was developed in collaboration with the Greek WWF office, to address the needs of long term fire policy makers (http://www.oikoskopio.gr/map/).
3. Finally, an educational tool was built in order to complement the two web-based tools and to further expand knowledge in fire risk modeling to address the needs for in-depth training. An initial version of this educational software tool was presented in the first CLIMRUN summer school, held at ICTP, Trieste in October 2012 (http://cdsagenda5.ictp.trieste.it/askArchive.php?base=agenda&categ=a1257&id=a1257/announcement) .

4.2. THE CLIMRUN Abstracts at EMS

2011 General Assembly

Climate Local Information in the Mediterranean region: Responding to User Needs. The CLIMRUN FP7 project

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The FP7 EU-Project CLIM-RUN (www.climrun.eu) aims at developing a protocol for applying new methodologies and improved modeling and downscaling tools for the provision of adequate climate information at regional to local scale that is relevant to and usable by different sectors of society (policymakers, industry, cities, etc.). Differently from current approaches, CLIM-RUN will develop a bottom-up protocol directly involving stakeholders early in the process with the aim of identifying well defined needs at the regional to local scale. The improved modeling and downscaling tools will then be used to optimally respond to these specific needs. The protocol is assessed by application to relevant case studies involving interdependent sectors, primarily tourism and energy, and natural hazards (wild fires) for representative target areas (mountainous regions, coastal areas, islands).
The region of interest for the project is the Greater Mediterranean area, which is particularly important for two reasons. First, the Mediterranean is a recognized climate change hot-spot, i.e. a region particularly sensitive and vulnerable to global warming. Second, while a number of countries in Central and Northern Europe have already in place well developed climate service networks (e.g. the United Kingdom and Germany), no such network is available in the Mediterranean.
CLIM-RUN is thus also intended to provide the seed for the formation of a Mediterranean basin-side climate service network which would eventually converge into a pan-European network. The general time horizon of interest for the project is the future period 2010-2050, a time horizon that encompasses the contributions of both inter-decadal variability and greenhouse-forced climate change. In particular, this time horizon places CLIM-RUN within the context of a new emerging area of research, that of decadal prediction, which will provide a strong potential for novel research

Climate Services and Renewable Energy: Providing Climate Information for the Next 1-30 Years

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The variability of climatic conditions, understood as the change of average weather from one year or a decade to the next, represents one of the greatest uncertainties for a renewable energy plant's predicted performance and management costs. Short-term weather forecast information is commonly used by renewable energy stakeholders in their decision making processes, however little is known about how climatic conditions may vary throughout the system's life. The current development of climate forecast systems intends to further understand how climate will change over the next 1-30 years and the subsequent effects on a renewable energy system's yield and management. This contribution will introduce the EU-funded CLIMRUN. CLIMRUN aims to develop relevant climate forecast information in periods ranging from one season to decades (changing conditions of solar radiation, cloud cover, precipitation, wind profiles, etc.) for the Mediterranean region. The final objective is to find ways to support key stakeholder decisions in aspects such as the location and management of new and existing renewable energy plants or the load balance in energy grids

2012 General Assembly

The challenges of developing stakeholder-led climate services-Mediterranean case-study examples from the CLIM-RUN project

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Mediterranean case studies are central to the CLIM-RUN project's goal of developing stakeholder-led climate services and provide a real-world context for bringing together experts on the demand and supply side of climate services. The case studies focus on the energy and tourism sectors, but also include a cross-cutting study on wild fires as well as a cross-sectoral integrated case study for the Venice lagoon. The first year of CLIM-RUN work focused on two key questions: (i) how to identify user needs, and (ii) how to initiate and maintain/develop stakeholder involvement? A perception and data needs questionnaire together with a series of local workshops were the principal mechanisms for identifying 'who' the stakeholders are and 'what' they want. The information obtained has been 'translated' into more clearly specified products and outputs based on observed and simulated climate data. This task was undertaken by the Climate Expert Team working closely with the Stakeholder Expert Team. As examples of climate service products are produced – initially based on existing outputs and then on new modelling runs – they provide the basis for ongoing iterative consultation and collaboration with stakeholders. As well as the scientific challenges of providing robust and reliable material at appropriate temporal and spatial scales covering the diverse needs across the different sectors and case studies considered, broader challenges include addressing the differences in stakeholder motivation, expertise and engagement. Other communication challenges include how to demonstrate the value of climate services and to explain and represent the different uncertainties associated with seasonal forecasting, decadal prediction and climate change projections. The practical experience of the case-study approach is being used to develop a more generic protocol for climate services development, and a Climate User Interface prototype.

Addressing stakeholder needs in the Mediterranean climate services: the wildfires case studies

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One of the case studies in EU funded project CLIMRUN aims at the provision of climate services for the forest fires sector in the Mediterranean. An iterative and bottom-up (i.e. stakeholder led) approach for optimizing the two-way information transfer between climate experts and stakeholders has been adopted from the start of the project in March 2011 with a workshop in Athens helping to define the framework for the forest fires case study. In the forest fires, stakeholders can be broadly split into two main categories: those engaging in long term planning,

forest fire research and education and those engaging in day-to-day fire fighting activities.
Extensive discussions during and after the workshop between the climate experts and the first stakeholder category provided fire data, necessary for the evaluation of the meteorological fire danger index. More specifically it was evaluated whether fire danger index is a skillful predictor of actual fire risk as judged by fire occurrence and area burnt data provided by the stakeholders. Additionally, critical thresholds of the fire danger index were established for various vulnerable regions.
As part of the workshop, a perception and data needs questionnaire was filled by the stakeholders mainly to solicit information about their climate services needs. The questionnaire results processing as well additional personal communication with them facilitated the identification of 2 ways to address their needs in CLIMRUN:
1) To link the fire danger index with meteorological forecasts already provided by the National Observatory of Athens operationally on a daily basis for the Greek territory (www.noa.gr/forecast). This will adequately address the needs of fire fighting stakeholders requiring forecasts of fire risk on an operational basis.
2) To update the public website of the Greek WWF on climate and forest fires (www.oikoskopio.gr) with near-future (2021-2050) fire risk projections using output from available regional climate models. This will adequately address the needs of long term policy makers and education stakeholders requiring information on the impacts of climate change on forest fire risk.

2013 General Assembly

Providing climate services for the wind energy industry: a case study for the Mediterranean Region

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During the first phase of EU-FP7 CLIMRUN project, wind speed has been identified as a key climate variable of interest for the case studies on energy that cover the Greater Mediterranean region involving Morocco, Spain and Cyprus. Most of the interest concerning wind modelling focuses on the very short-range (nowcasting) and on seasonal forecasts, because the largest part of the manageable risk is concentrated on these time-scales. However, the interaction with stakeholders, especially in the energy sector, has highlighted the need for more in depth understanding of wind modelling capacities at a longer time scale, which may contribute to both site evaluation in the absence of very accurate wind atlases and on the assessments of risks that may affect the return on investments on longer time scale.
In this framework, climate experts involved in CLIM-RUN EU FP7 project are exploring the potential of seasonal to decadal climate forecast techniques (time-frame 2012-2040) and regional climate scenarios (time horizon 2040+) over the Mediterranean Region as a tool for assessing the impact of changes in climate patterns on the energy output of wind power plants. Subsequently, we will give here a brief overview of these techniques as well as first results related to wind projections for different sites across the Mediterranean Region. We will highlight that regional climate models have a large potential for enhancing the quality of climate projections in the presence of complex orography and in the proximity of coastal areas.

Climate change and wildfire risk: the route from applied research to stakeholder services for the case study of Greece

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One of the objectives in EU project CLIM-RUN is the analysis of the fire risk for regions in the Mediterranean where forest fires represent a major hazard at local scale and the provision of appropriate climate indices to estimate future changes especially designed for the needs of relevant stakeholders. The main case study region in the project is Greece.
In order to investigate the future changes in fire risk in relation to the meteorological conditions in the Mediterranean, the Canadian Fire Weather Index (FWI) is applied. FWI is a daily meteorologically-based index depending solely on daily noon measurements of dry-bulb temperature, air relative humidity, 10 m open wind speed and 24 h accumulated precipitation.
An evaluation of the index is performed using fire and meteorological data, in order to examine whether FWI values

can adequately reflect fire risk as judged by actual fire occurrence and area burnt. FWI is confirmed to be skillful in predicting fire occurrence and thresholds of elevated (FWI>15) and extreme (FWI>45) fire risk are established. Then, the research moves into the investigation of the impacts of climate change on fire risk, for two future time periods, 2021-2050 and 2071-2100, compared to the control run period 1961-1990. Regional climate models output is used to provide input for the FWI system. The results indicate that the future projections suggest a general increase in fire risk over the domain of interest for the near-future period 2021-2050, while a very strong impact is projected for the end of the century (2071-2100).
Through an iterative and bottom-up (i.e. stakeholder led) approach we move towards the provision of services to long term forest fire planners and policy makers providing a web-based application for long term fire risk and other fire related indices (time horizon up to 2050 and up to 2100) in collaboration with the Greek WWF office (http://www.meteo.noa.gr/oikoskopio).
This web-based application is further refined and improved with the use of land cover data which can help identify the actual fire prone regions combining both the vegetation type and the meteorological fire risk.

New perspectives and products from the CLIM-RUN project: continuing and developing the engagement with Mediterranean stakeholders

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The CLIM-RUN case studies provide a real-world and Mediterranean context for bringing together experts on the demand and supply side of climate services. They are essential to the CLIM-RUN objective of using iterative and bottom-up (i.e. stakeholder led) approaches for optimizing the two-way information transfer between climate experts and stakeholders – and focus on specific locations and sectors (such as tourism and renewable energy). Stakeholder involvement has been critical from the start of the project in March 2011, with an early series of targeted workshops used to define the framework for each case study as well as the needs of stakeholders.
Following these workshops, the user needs were translated into specific requirements from climate observations and models and areas identified where additional modelling and analysis are required. The first set of new products and tools produced by the CLIM-RUN modelling and observational experts are presented in a series of short briefing notes and will be shown in the second round of CLIM-RUN stakeholder workshops that should be held for each of the case studies in Spring-Summer 2013 as an essential part of the fourth CLIM-RUN key stage: Consolidation and collective review/assessment.
During these workshops the process of interaction between CLIM-RUN scientists and case-study stakeholders will be reviewed, as well as the utility of the products and information developed in CLIM-RUN. Review questions will include: How far have we got? How successful have we been? What are the remaining problems/gaps? How to sustain and extend the interactions?
The process of planning for and running these second workshops will be outlined and emerging outcomes presented, focusing on common messages which are relevant for development of the CLIM-RUN protocol for providing improved climate services to stakeholders together with the identification of good practice and policy recommendations for climate services development.
New perspectives from the iterative interaction with stakeholders, together with the new climate information based on the climate tools developed by the CLIM-RUN climate modelling community will be presented. We will also take advantage of the results of the next CLIM-RUN general assembly (Summer 2013) where the experiences from the second round workshops will be collected and discussed.