act Adapting to Climate change in Time

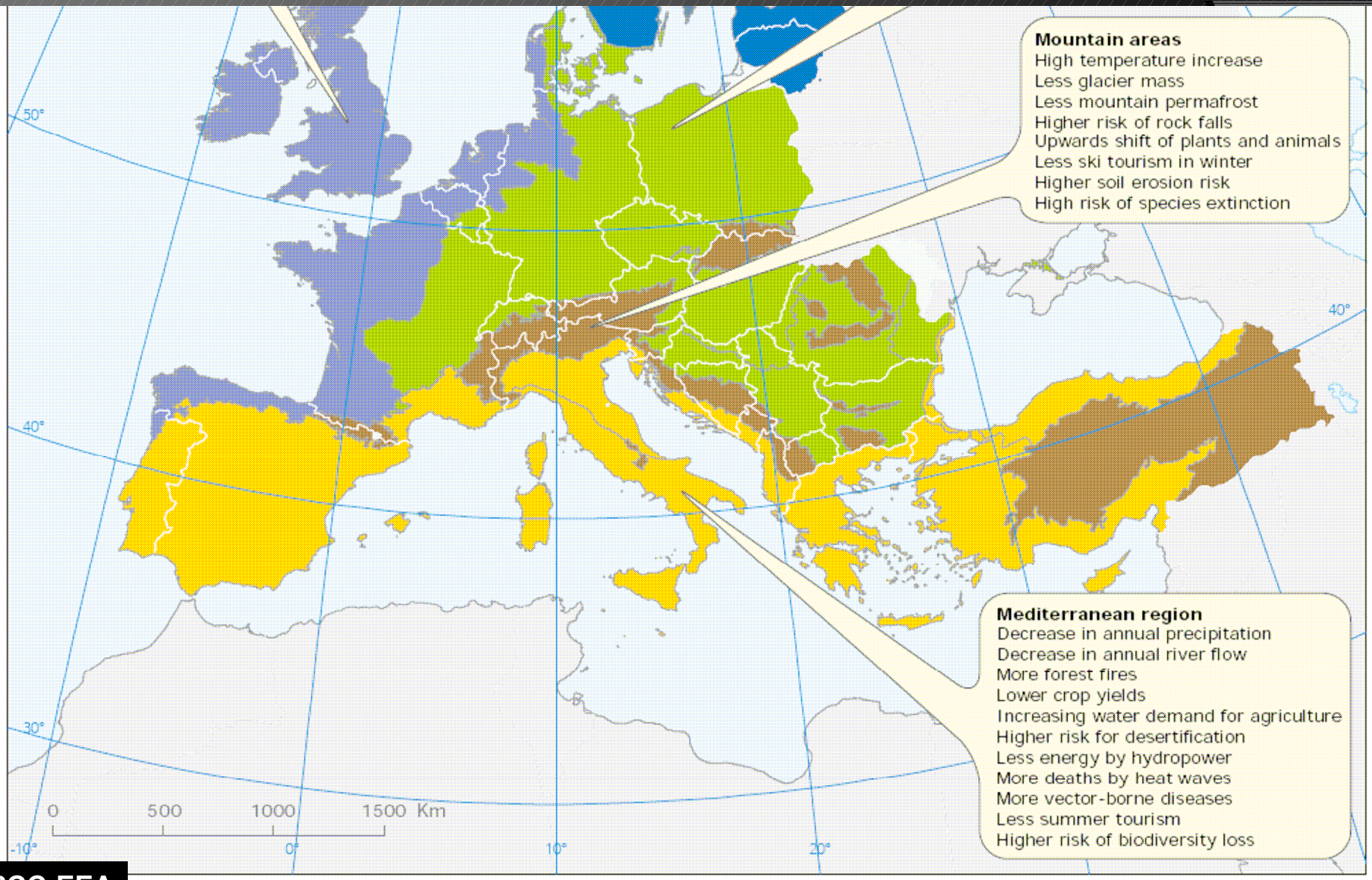
AGENDA 21 – 20 ANNI DI LIFE IN ITALIA

ACT: *VERSO UN PIANO di ADATTAMENTO LOCALE per le CITTA' del MEDITERRANEO*

MARCO CARDINALETTI

ACT PROJECT MANAGER

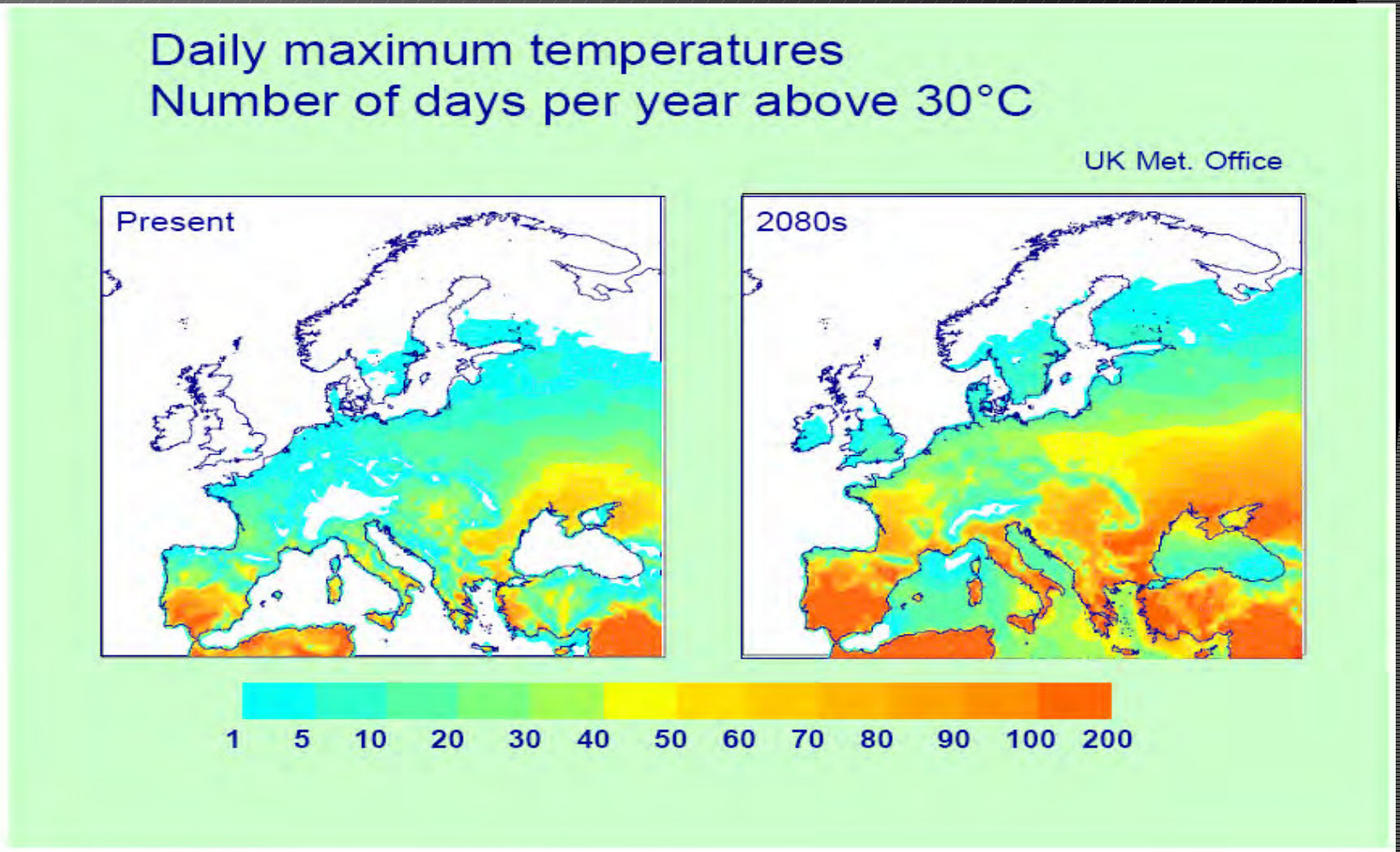
IMPACTS and EFFECTS for the main Biogeographic Regions of Europe



IPCC-EEA

CLIMATE CHANGES - Temperature Rise

Compared yearly number of days with temperature larger than 30°C between present and the second part of the 21st century



CLIMATE CHANGES - Precipitation

[…] reduction of the regional average precipitation, within the range of -4 % on the northern coasts, to -27 % on the southern coasts (scenarios A1B) (Christensen et al., 2007)

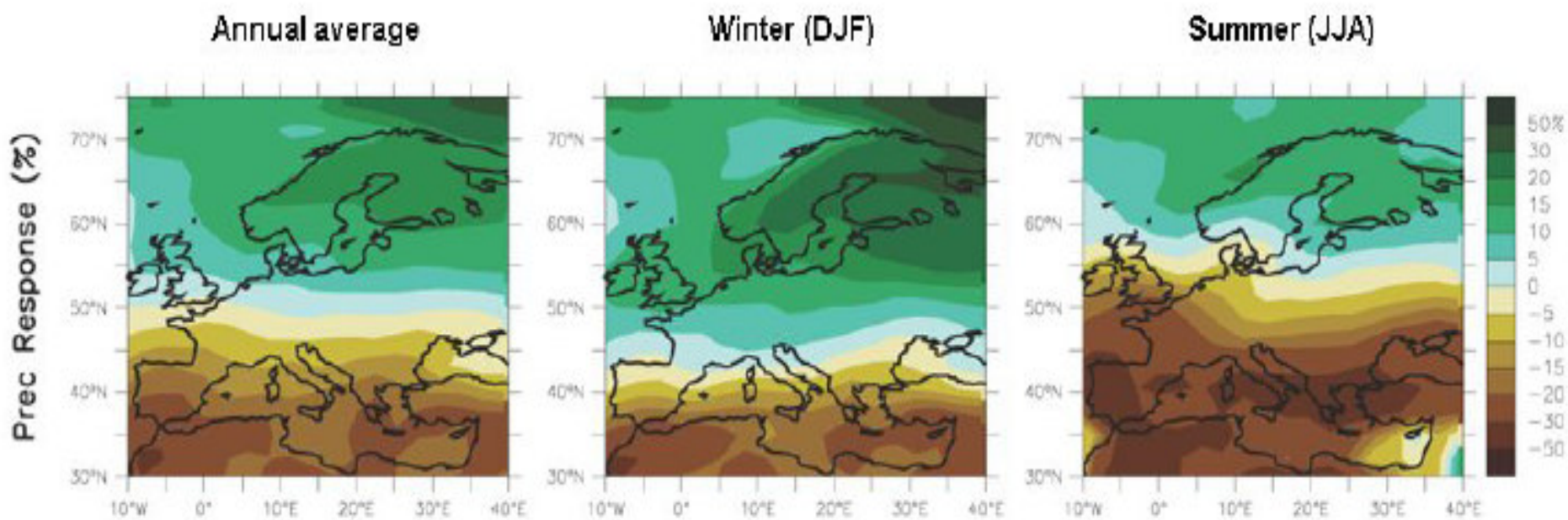


Figure 4. Evolution of precipitation in the Mediterranean and in Europe for 2080 to 2099, compared to the period of 1980 to 1999, according to the emissions scenario A1B (Source: IPCC, 2007b)

CLIMATE CHANGES - Sea Level Rise

THE TOTAL GLOBAL RISE IN THE 20TH CENTURY AMOUNTED TO 17 CENTIMETRES.

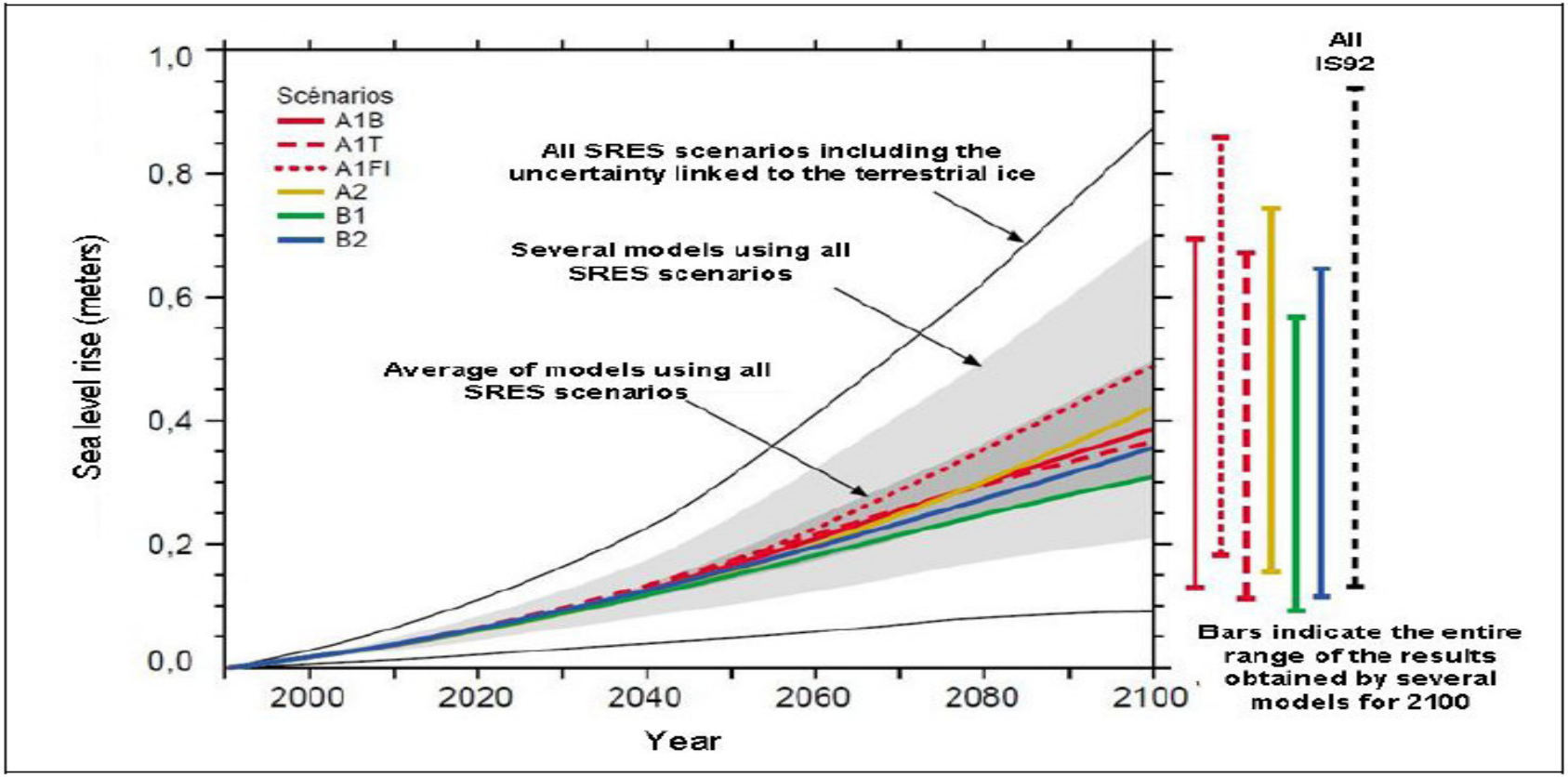


Figure 5. Uncertainties regarding the expected elevation of sea level during the 21st Century (IPCC, 2001)

CLIMATE CHANGES

SOUTH EUROPE COUNTRIES

ARE AFFECTED

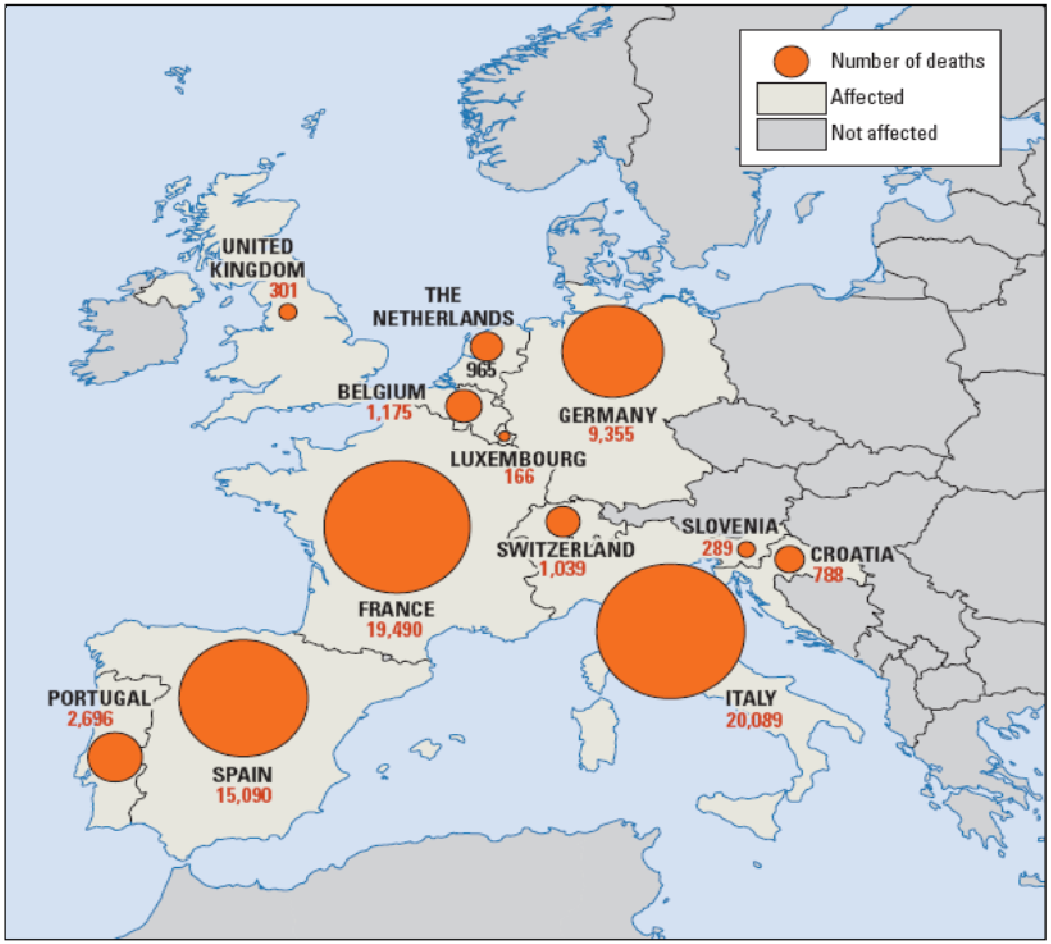
BY ANOMALOUS CLIMATE

THE 2003 HEAT WAVES

KILLED MORE THAN

70,000 PEOPLE IN EUROPE

ap 1.2 Rich countries are also affected by anomalous climate: The 2003 heat wave killed more than 70,000 people in Europe



Source: Robine and others 2008.

Note: Deaths attributed to the heat wave are those estimated to be in excess of the deaths that would have occurred in the sence of the heat wave, based on average baseline mortality trends.

CLIMATE CHANGES

INTERNATIONAL Herald Tribune

SATURDAY-SUNDAY, DECEMBER 23-24, 2007

Charting the emergence of the Renaissance world

SOUREN MELIKIAN ON ART 11

A tropical epidemic — in northern Italy

Global warming lets tiger mosquitos roam far afield and infect a village

By Elizabeth Rosenthal

CASTIGLIONE DI CERVIA, Italy

Panic was spreading in August through this city village of 2,000 as one person after another fell ill with weeks of high fever, exhaustion and excruciating bone pain, just as most of Italy was entering Ferragosto, its most important summer holiday.

"At one point, I simply couldn't stand up to get out of the car — I fell," said Antonio Ciano, 68, an elegant retiree in a pashmina scarf and trendy blue glasses. "I thought YOU'RE up to date in Italy! Imagining this to were really that dramatic."

By mid-month, more than 100 people had come down with the same malady. Although the worst symptoms disappeared after a couple of weeks, the doctor could figure out what was wrong.

"In the bar, people were really hysterical," said Elisa Ricchi, a food worker who fell ill.

They blamed pollution in the river. They attacked the government. But most of all they blamed recent immigrants for bringing each pestilence to their sleepy settlement of pastel houses by the sea.

"Why immigrants? I kept thinking of these terrible diseases that you see on TV. Like malaria," said Elisa Ricchi, who owns a shop selling shoes and purses. "We were terrified — there was no name and no treatment."

Oddly, the villagers were both right and wrong. After a month of [illegible] tests, doctors viewed that the people of Castiglione di Cervia were, in fact, suffering from a tropical disease — Chikungunya, a relative of dengue fever, normally found in the Indian Ocean. But the "immigrants" who were spreading disease were not humans but insects: tiger mosquitoes, who can thrive in a warming Europe.

Added by global warming and globalization, Castiglione Di Cervia has the dubious distinction of playing host to the first outbreak in Mediterranean of a disease that had previously been seen only in the tropics.

"By the time we got back the name and surname of the virus, our outbreak was over," said Dr. Rafaella Angelini, director of the public health department in the regional capital of Ravenna. "When they told us it was Chikungunya, it was not a problem for Ravenna anymore. But I thought: This is a big problem for Europe."

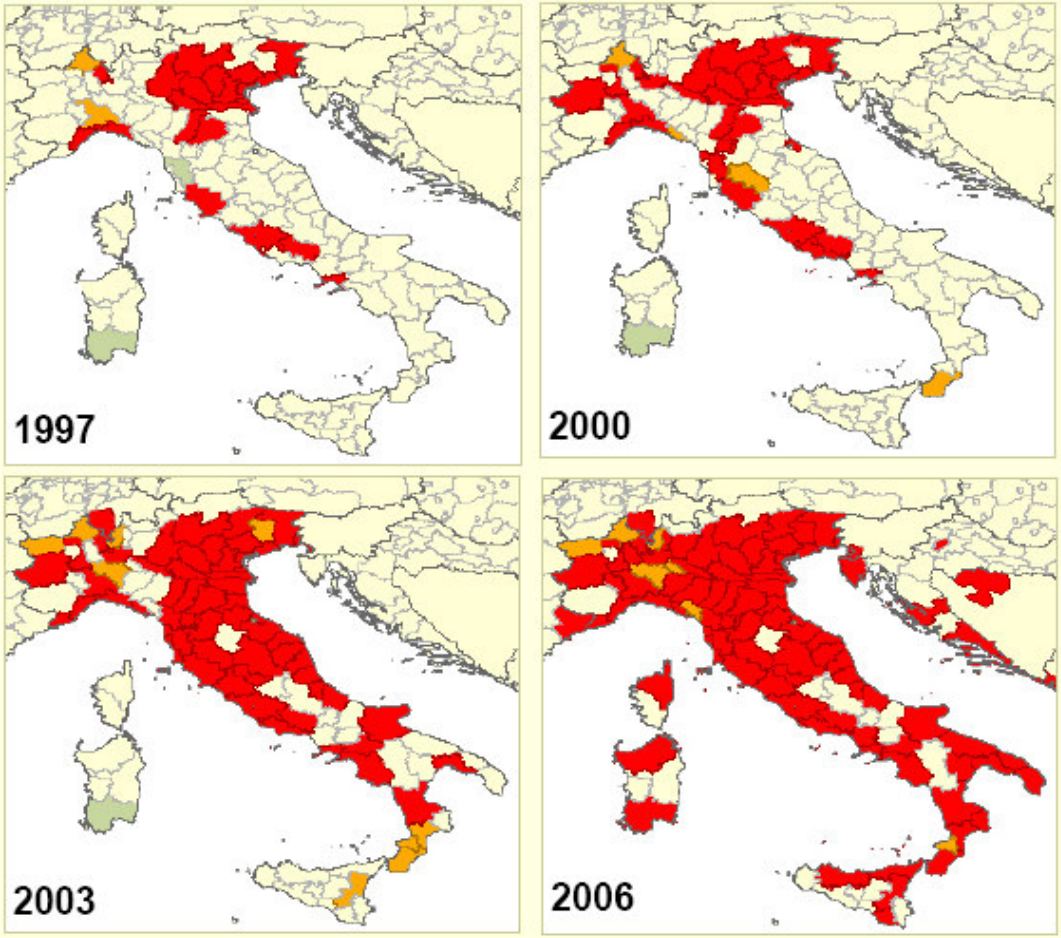
The epidemic proved that tropical viruses are now able to spread in new areas, far north of their previous range. The tiger mosquito, which first arrived in Rome a few years ago, is thriving across southern Europe and even in France and Switzerland.

And if Chikungunya can spread to Castiglione — "a place not special in any way," Angelini said — there is no reason why it cannot go to other Italian villages. There is no reason why dengue, an even more debilitating tropical disease, cannot as well.

"This is the first case of an epidemic of a tropical disease in a developed, European country," said Roberto Bertollini, director of the World Health Organization's Program on Health and the Environment. "Climate change creates conditions that make it easier for this mosquito to survive and it opens the door to diseases that didn't exist here previously. This is a real issue. Now, today, it is not something a crazy en-

ITALY, Continued on Page 6

DIFFUSION of TIGER MOSQUITOS



CLIMATE CHANGES
...HOW TO MAKE OUR CITIES RESILIENT?

NEW ADAPTATION STRATEGIES

REACT OR ACT ?

Photo © Victor Zastolskiy - Fotolia.com

THE ACT PROJECT

act | Adapting to Climate change in Time

mira a SVILUPPARE , attraverso un PROCESSO METODOLOGICO STANDARD, INTEGRATO, PARTECIPATO e soprattutto CONDIVISO da tutti GLI ATTORI LOCALI del territorio, un **PIANO di ADATTAMENTO LOCALE** che consenta all'Amministrazione di prevedere e contenere gli impatti ECONOMICI, SOCIALI, e AMBIENTALI legati ai cambiamenti climatici.

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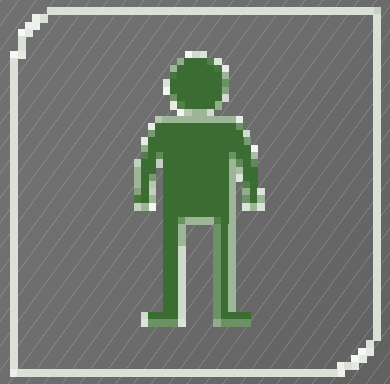
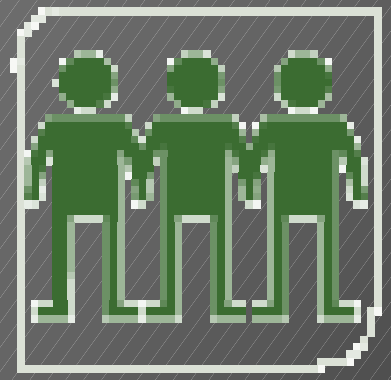
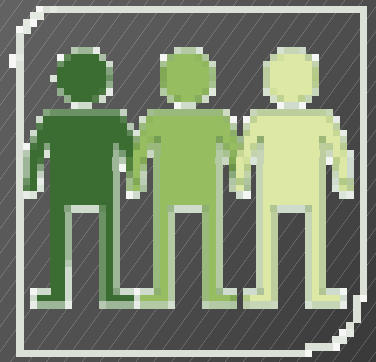


ACT NOW



ACT TOGHETER



ACT
DIFFERIANTLY

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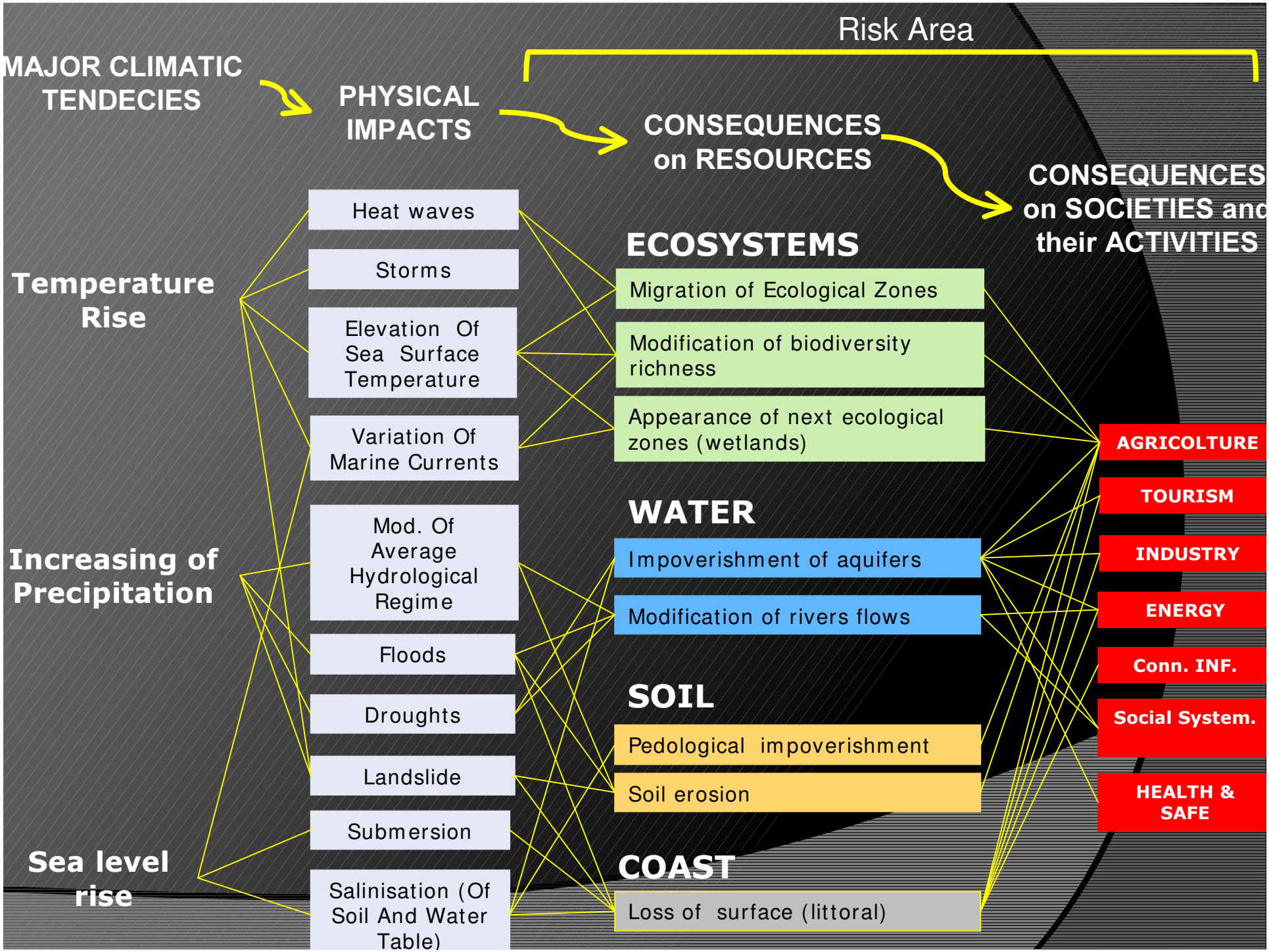
IL PROGETTO ACT

Nome del Progetto	**Adapting to climate Change in Time**
Beneficiario	Comune di Ancona
Partner	ISPRA Patras Bullas Forum of Adriatic and Ionain cities & Towns
Durata	34 Mesi (Gennaio 2010-Novembre 2012)
Budget complessivo	1.840.000
Co-finanziamento UE	920.000 € (50 %)

E' il primo progetto italiano sull'adattamento finanziato da LIFE

ACT COUNTRIES

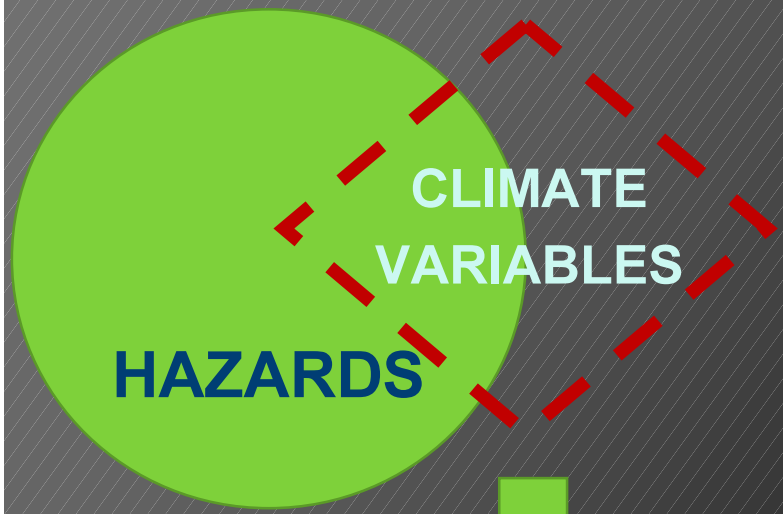
The municipalities chosen as partners represent different context due to their dimensions (Bullas counts 11,000 inhabitants, Patrass counts around 200,000 inhabitants and Ancona 100.000) and to their main economic activity. This will facilitate the diffusion to other contexts and will enhance the applicability of the model.


Risk Area
MAJOR CLIMATIC TENDECIES
PHYSICAL IMPACTS
CONSEQUENCES on RESOURCES
CONSEQUENCES on SOCIETIES and their ACTIVITIES
Temperature Rise
Increasing of Precipitation
Sea level rise
Heat waves
Storms
Elevation Of Sea Surface Temperature
Variation Of Marine Currents
Mod. Of Average Hydrological Regime
Floods
Droughts
Landslide
Submersion
Salinisation (Of Soil And Water Table)
ECOSYSTEMS
Migration of Ecological Zones
Modification of biodiversity richness
Appearance of next ecological zones (wetlands)
WATER
Impoverishment of aquifers
Modification of rivers flows
SOIL
Pedological impoverishment
Soil erosion
COAST
Loss of surface (littoral)
AGRICOLTURE
TOURISM
INDUSTRY
ENERGY
Conn. INF.
Social System.
HEALTH & SAFE

RISK vs RESILIENCE

- **Risk**: conditions or situations that are empirically related to particular outcomes *(Reddy et al., 2001)*
- **Resilience**: the self-organization capacity of a social/economic system to maintain its structures and functions in the presence of multiple risk factors *(Finley, 1994)*

HOW TO "BUILD" RESILIENCE ?



- FREQUENCY
- INTENSITY
- VULNERABILTIY
- SENSITIVITY
- UNCERTANTY

HOW to PREDICT ?

HOW to MEASURE ?

HOW to ADAPT ?

RESILIENCE

DATA COLLECTION and BASELINE SCENARIOS

PRIMARY IMPACT EVALUATION

Qualitative approach

Heritage

Coastal Erosion

Mobility System

Natural Risks

Biodiversity

Agriculture

Health

IMPACT ASSESSMENT on PRIORITY SECTORS
(Risks Exposure, Sensitivity, Vulnerability)

Quantitative approach

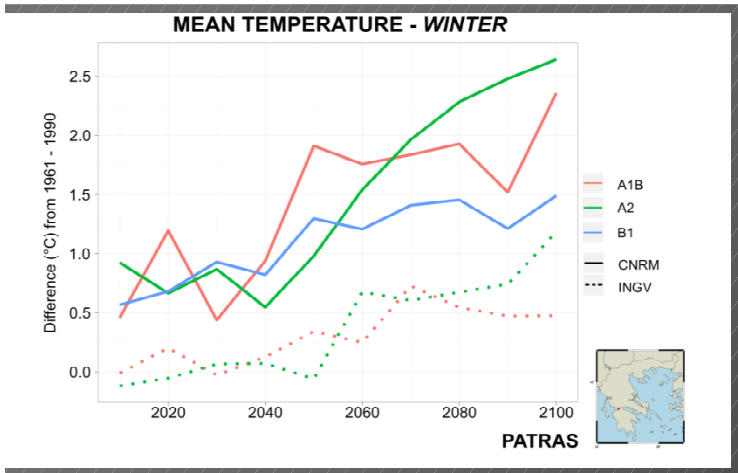
Local Adaptation Board

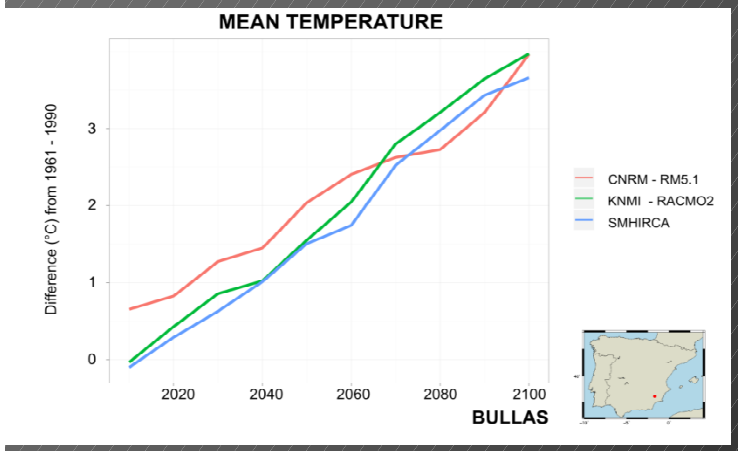
MAKING POSSIBLE SCENARIOS

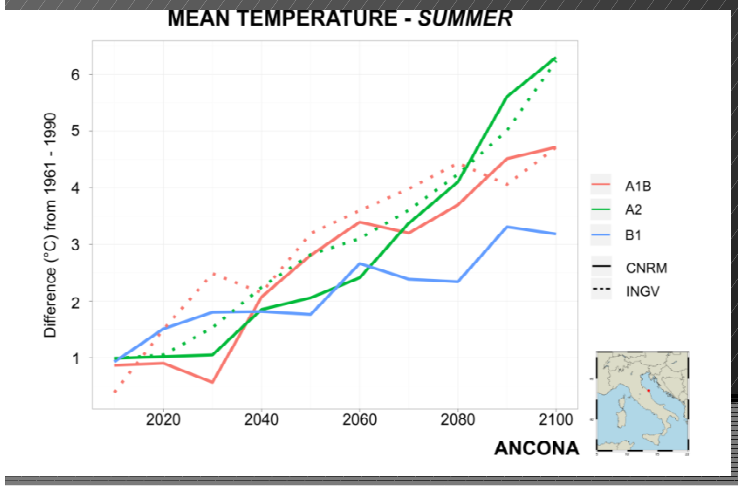
SHARING of a LOCAL ROAD MAP

LOCAL ADAPTATION PLAN

Temperature projections: general results for Ancona, Bullas and Patras







A warming stronger in summer and weaker in winter is predicted for all the emission scenarios

- Then mean temperature exhibits an increasing trend which is almost linear throughout the whole century.
- For minimum and maximum temperatures, the trend does not show significant differences with respect to the increase of mean temperature.

Precipitation projections: general results for Ancona, Bullas and Patras

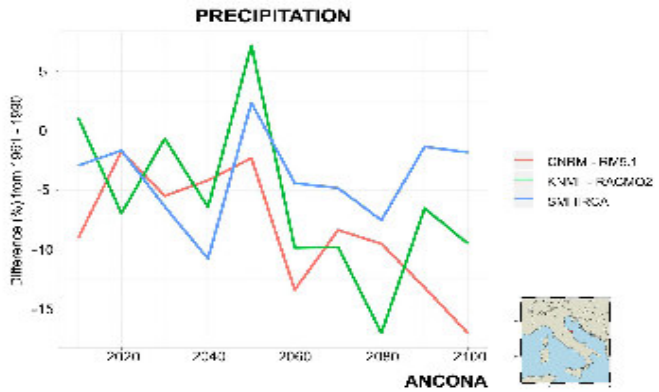


Figure 2.25 Annual cumulated precipitation variation predicted by RCMs (%)

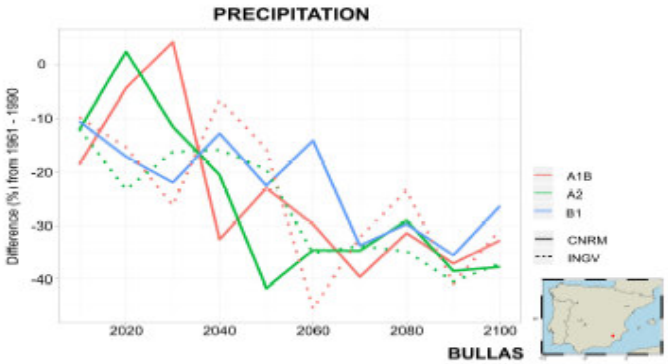


Figure 2.36 Annual cumulated precipitation variation predicted by GCMs (%)

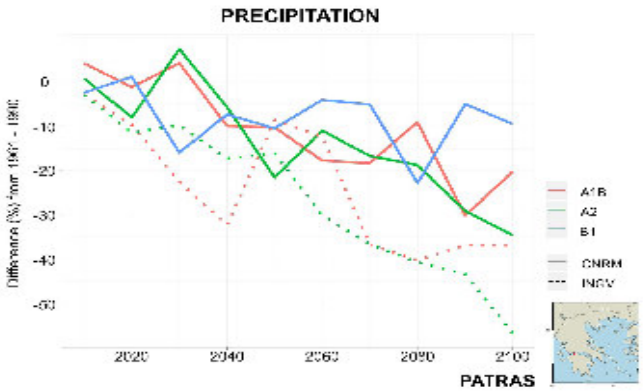


Figure 2.42 Annual cumulated precipitation variation predicted by GCMs (%)

Larger uncertainty and irregular behaviour of precipitation projections

- **ANCONA:** the model predicts a reduction of the annual cumulated precipitation during the last 10 years of the century, ranging between - 1.8% (SMHIRCA) and - 17.0% (RM5.1).

-**BULLAS:** ranging between - 29.7% (SMHIRCA) and - 39.0% (RACMO2).

- **PATRAS:** it's estimated a reduction of the annual cumulated precipitation at the end of the 21st century, ranging between - 5.5% (RACMO2) and - 28.3% (RM5.1). The

The Local Adaptation Board

- **The *Local Adaptation Board*** is one of the main instruments of stakeholder engagement thought in the project.
- ***3 LABS*** were established last March to ensure a lasting participation of all local stakeholders as a place where all the actors involved in a particular sector have the possibility to discuss and decide a common strategy and common actions to tackle the local impacts of climate change
- ***10 members per Board totally***: The number of participants can vary according with city dimension, but in any case it won't be more than 10 people in order to assure an effective collaboration and team work between members.
- ***Focused Teams*** directly interested to the specific impacts and issue analysed (4 Ancona, 3 Patras, 2 Bullas)

ANCONA LAB

IMPACTS – INFLUENCE *MATRIX*

STAKEHOLDER / ISSUE	DIRECT	INDIRECT	WIDER COMMUNITY
TRASPORT INFRASTRUCTURES	▪ Regional/Provincial Department of Transportations ▪ Rail sector ▪ Municipality Department ▪ Civil Protection ▪ University	▪ Associations of ▪ Society of Managing Highway ▪ Port Authority ▪ Private Compnies for Logistisc and Freight Transports ▪ Airport Aauthority ▪ Chamber of Com.	▪ Citizens ▪ Customers Associations ▪ Media ▪ Schools
LANDSLIDES	▪ Civil Protection ▪ University of Rome ▪ Early Warning Department ▪ Companies for the ICT	▪ Families living close to the landslide area at high risk of exposure	▪ Citizens ▪ Media ▪ International Partners
COASTAL EROSION	▪ Regional Department for ICZM ▪ University of the sea	▪ Port authority ▪ Coast guard ▪ Fishers	▪ Citizens ▪ Media ▪ Schools
HISTORICAL HERITAGE	▪ Ministry Department for Cultural and Historical Heritage ▪ Urban Planning and Environmental Department	▪ Institute of Research for the Vulnerability assessment	▪ Citizens ▪ Media ▪ Schools

THE ACT PROJECT

Margareta Wahlström
Special Representative of the Secretary-General (SRSG) for Disaster Risk Reduction

European Commission

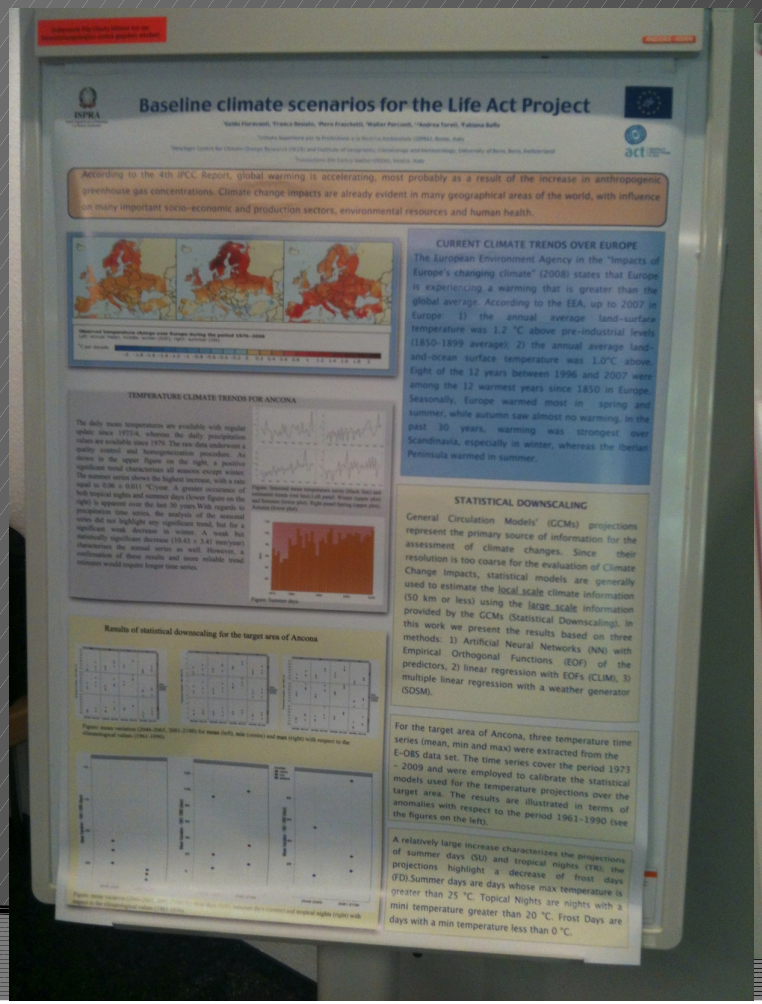
11 LUGLIO 2012
STAKEHOLDER DIALOGUE DAY
WITH DG CLIMA e EU COMMISSION

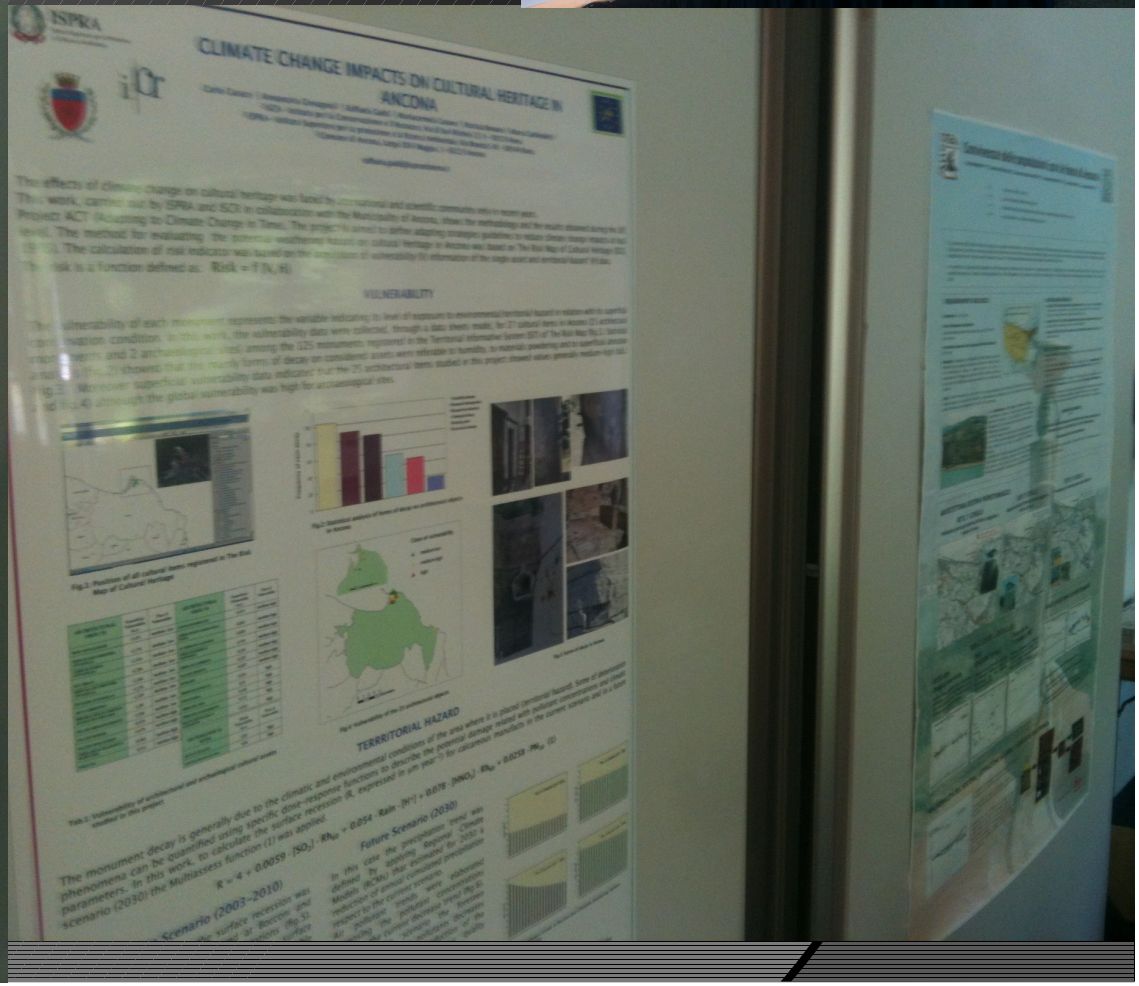
UNISDR
United Nations
International Strategy for Disaster Reduction

COINVOLGERE le CITTA'
Nella ridefinizione del
Hyogo Framwork

act
www.actlife.eu

Piancone
Gaddi
Vicini


Baseline climate scenarios for the Life Act Project
ISPRA
act
According to the 4th IPCC Report, global warming is accelerating, most probably as a result of the increase in anthropogenic greenhouse gas concentrations. Climate change impacts are already evident in many geographical areas of the world, with influence on many important socio-economic and production sectors, environmental resources and human health.
CURRENT CLIMATE TRENDS OVER EUROPE
The European Environment Agency in the "Impacts of Europe's changing climate" (2008) states that Europe is experiencing a warming that is greater than the global average. According to the EEA, up to 2007 in Europe 1) the annual average land-surface temperature was 1.2 °C above pre-Industrial levels (1850-1899 average); 2) the annual average land-and-ocean surface temperature was 1.0°C above. Eight of the 12 years between 1996 and 2007 were among the 12 warmest years since 1850 in Europe. Seasonally, Europe warmed most in spring and summer, while autumn saw almost no warming. In the past 30 years, warming was strongest over Scandinavia, especially in winter, whereas the Iberian Peninsula warmed in summer.
TEMPERATURE CLIMATE TRENDS FOR ANCONA
STATISTICAL DOWNSCALING
General Circulation Models' (GCMs) projections represent the primary source of information for the assessment of climate changes. Since their resolution is too coarse for the evaluation of Climate Change Impacts, statistical models are generally used to estimate the local scale climate information (50 km or less) using the large scale information provided by the GCMs (Statistical Downscaling). In this work we present the results based on three methods: 1) Artificial Neural Networks (NN) with Empirical Orthogonal Functions (EOF) of the predictors, 2) linear regression with EOFs (CLIM), 3) multiple linear regression with a weather generator (SDSM).
Results of statistical downscaling for the target area of Ancona
For the target area of Ancona, three temperature time series (mean, min and max) were extracted from the E-OBS data set. The time series cover the period 1973 - 2009 and were employed to calibrate the statistical models used for the temperature projections over the target area. The results are illustrated in terms of anomalies with respect to the period 1961-1990 (see the figures on the left).
A relatively large increase characterizes the projections of summer days (SU) and tropical nights (TR), the projections highlight a decrease of frost days (FD).Summer days are days whose max temperature is greater than 25 °C. Topical Nights are nights with a mini temperature greater than 20 °C. Frost Days are days with a min temperature less than 0 °C.


ISPRA
CLIMATE CHANGE IMPACTS ON CULTURAL HERITAGE IN ANCONA
VULNERABILITY
TERRITORIAL HAZARD

THE ADAPTATION PLAN OF ANCONA (I)

Four categories of actions – Making my city resilient

1. POLICY

- Set up a coordination structure (1.1)
- Modify the current planning (1.2)
- Create a specific budget (1.3)

2. MANAGEMENT

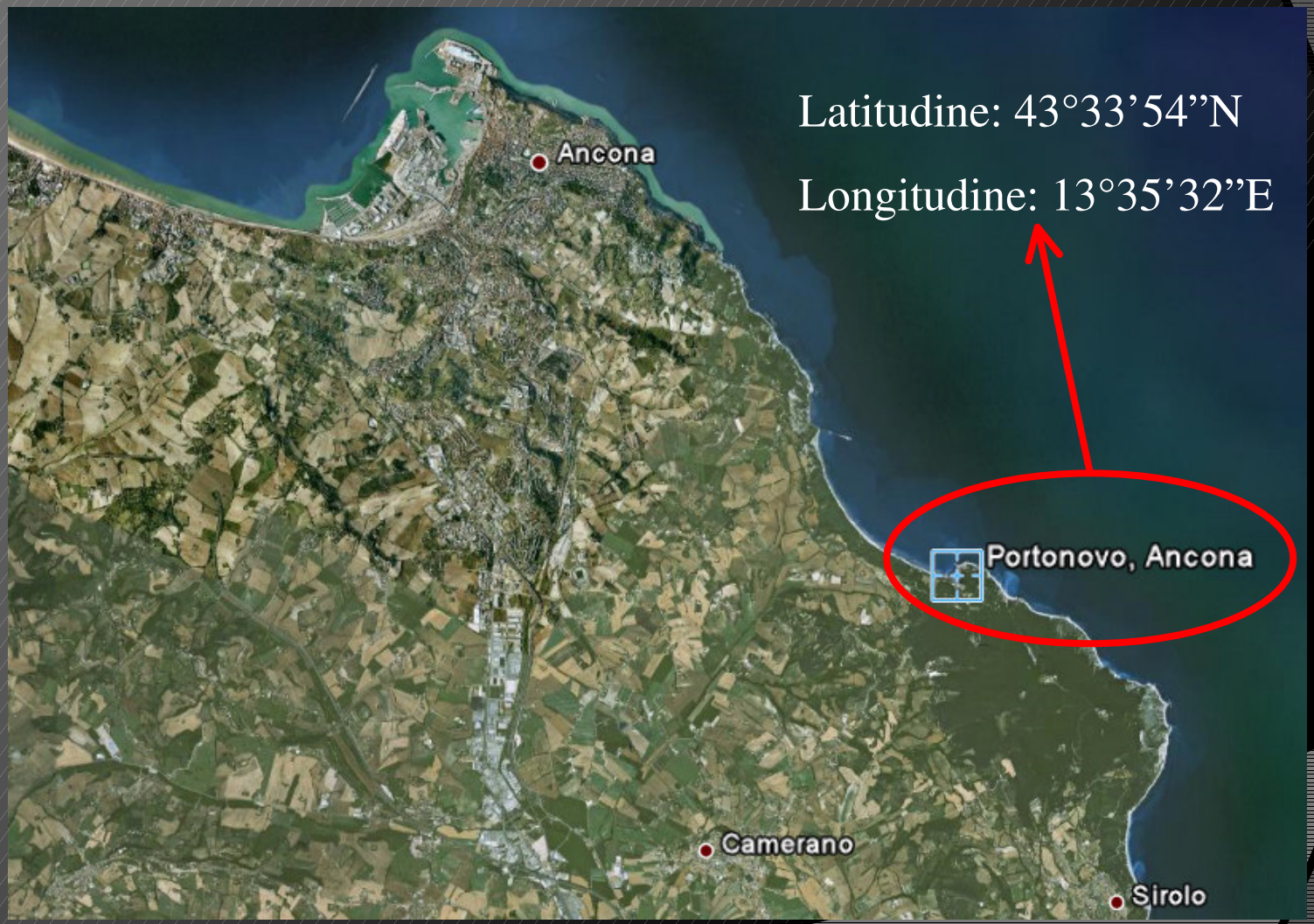
- Organize and manage data collection (2.1)
- Updating the emergency Plan (2.2)
- Straightening the Governance including Private sector(2.3)
- Define an Acion Plan post-disaster (2.4)

3. TECHNOLOGY

- Realize infrastructure to drain underground water to canalize into an industrial pipeline for the Port Area (3.1)
- Extending the application of the Monitoring System to the entire Area of Ancona (3.2)

4. BEHAVIOUR

- Organize training initiatives for EWS technicians (4.1)
- Organize educational activities at schools (4.2)
- Establishing an Historical Landslide Museum (4.3)


Latitudine: 43°33’54”N
Longitudine: 13°35’32”E
Ancona
Portonovo, Ancona
Camerano
Sirolo

Novembre 2011

La difesa del litorale attraverso l' arretramento degli stabilimenti balneari e dei ristoranti

arretramento ristoranti e stabilimenti balneari

To encourage owners to retract and rebuild their restaurants **a bonus volume up to 40% will be assigned.**

The action shall be done by the 31st December 2010

INTERVENTI	*TEMPI (mesi riferiti alla singola fase) ANNO 2012*												*TEMPI (mesi riferiti alla singola fase) ANNO 2013*												*TEMPI (mesi riferiti alla singola fase) ANNO 2014*												COSTI OPERE PUBBLICHE
	G	F	M	A	M	G	L	A	S	O	N	D	G	F	M	A	M	G	L	A	S	O	N	D	G	F	M	A	M	G	L	A	S	O	N	D	
Attuazione PPE area denominata «del Molo» - zona A – Realizzazione nuova viabilita' e parcheggi Realizzazione di 180 posti auto e circa 200 posti per motorini e della nuova strada di accesso alla spiaggia in sostituzione di quella posta a lato del Lago Grande, da eliminare perche' situata nella zona di esondazione del lago.	x	x	x	x																																	**€ 480.000**
Attuazione PPE area denominata «del Molo» zona B – Riqualificazione e ampliamento Lago grande	x	x	x	x																																	**€ 240.000**
Attuazione PPE area denominata «del Molo» zona B1 - Opere a verde per rinaturalizzazione Lago grande	x	x	x	x						x	x	x																									

Ripascimenti (attuazione «Piano di Gestione Integrata delle Aree Costiere» approvato dalla Regione Marche con delibera C.R. n. 169 del 2-2-2004)												x	x	x	x	x	x																				**€ 100.000**
Interventi di miglioramento delle difese e di protezione della costa attraverso demolizione e ricostruzione degli stabilimenti balneari ***privati*** e dei ristoranti con ARRETRAMENTO in sito più lontano rispetto al mare e conseguente allargamento della spiaggia – **INTERVENTI AD INIZIATIVA PRIVATA (UMI 1a - 1c – 1d – 1e -1g)**									x	x	x	x	x	x	x	x						x	x	x	x	x	x	x						x	x	x	**FONDI PRIVATI**
Interventi di miglioramento delle difese e di protezione della costa attraverso demolizione stabilimenti balneari ***comunali*** per successiva ricostruzione in sito più lontano rispetto al mare e conseguente allargamento della spiaggia - **INTERVENTI AD INIZIATIVA PUBBLICA (UMI 1b - 1f -)**									x	x	x	x	x	x	x	x						x	x	x	x	x	x	x						x	x	x	**€ 1.650.000**
Ripascimenti e sistemazione definitiva spiaggia (compresa ristrutturazione del Molo UMI 1l)																																		x	x	x	**€ 530.000**

Fase progettazione

Fase progettazione

TABELLA A dell' elaborato 1 :

TIMEPLAN and FORECASTED EXPENCES

Gennaio	Febbraio	Marzo	Aprile	Maggio	Giugno	Luglio	Agosto	Settembre	Ottobre	Novembre	Dicembre	Gennaio	Febbraio	Marzo	Aprile	Maggio	Giugno	Luglio	Agosto	Settembre	Ottobre	Novembre	Dicembre	Gennaio	Febbraio	Marzo	Aprile	Maggio	Giugno	Luglio	Agosto	Settembre	Ottobre	Novembre	Dicembre	**€ 3.000.000 esclusi fondi privati**

contributo Regione Marche (Ass. Difesa della Costa)

spesa interamente a carico PRIVATI – fase progettazione 2012-2013 – fase lavori 2013-2014

Contributo Comune di Ancona - fase progettazione 2012-2013 – fase lavori 2013-2014

contributo Regione – fondi Comunitari – contributi Cariverona

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