

NEWSLETTER LIFE PRIMES  
n.3 January 2018



LIFE14CCA/IT/001280  
With the contribution  
of the LIFE financial  
instrument of the  
EuropeanCommunity

## INDICE

Safer and more informed communities. The experience in Emilia-Romagna	1
An agreement between administrators and citizens, in order to make territorial management policies and risk protection more effective	3
The results of the CAAP and adaptation actions	5
Ca we learn resilience? We just need some practice	7
The opinion of the administrators of the test areas in Emilia-Romagna	8
The results of the risk perception analysis of the test areas in Emilia-Romagna	11
The climatological-hydrological and coastal-marine variability over the pilot areas of the project	12
Events	14

## EDITORIAL

# SAFER AND MORE INFORMED COMMUNITIES. THE EXPERIENCE IN EMILIA-ROMAGNA

The Life Primes Project represents an important opportunity, which consists in encouraging the adaptation of communities to the most fatal consequences produced by climate change, thank to a greater awareness and an adequate level of risk protection. It is a common commitment for the promoters of this project: the regions of Emilia-Romagna, Marche and Abruzzo, Arpa ER and the Marche Polytechnic University. Together, they have created a network based on knowledge and good practices as far as hazard and risk management, alert procedures, information and communication, which will be useful to the local communities.

The actions included in the Life Primes Project provide important tools for the creation of resilient communities, such as the CAAP, Civic Adapt-Action Plans, which have been tested during the participatory process implemented in Emilia-Romagna during the last six months, and whose history and results are described in this newsletter.

In the Municipalities of the pilot areas - Lido di Savio (RA), Poggio Renatico (FE), Lugo and Sant'Agata sul Santerno (RA), Imola and Mordano (BO) - which are historically subject to floods and over-washing, a process of gradual involvement of the communities



has been started, involving administrators and technicians, as well as stakeholders and citizens, in exercises, training and information activities. The promotion of the project by the local administrators, to which we are really thankful, has proved to be essential.

The preparation of the meetings - organized by the staff of the Regional Department for Territorial Safety and Civil Protection, its territorial services of Area, Arpa, and the Marche Polytechnic University, together with the support of the companies Eurocube and Area Europa - has reached a first important result: a strengthened relationship with the local communities, in order to make them feel part of a single major programme aiming at risk management, the strengthening of adaptability and the reduction of vulnerability. Administrators, technicians and citizens have found new opportunities for confrontation and discussion, testing the actions to be carried out, each according to their roles and skills, aiming at the protection of the common good, as it happened during the practical exercises that took place on November, 18th.

The news of recent months has shown once again the progress of disasters, primarily floods and storms, which hit the territory hard and put the structures of the Civil Protection under pressure, without a break. An effective response to this kind of emergencies is irremissible, but it is not the only activity on which the commitment of institutions in charge is measured. Preparation, organization of the involved forces through clear and shared rules, and prevention, especially through effective works that can ensure the safety of the territory, are equally important. Finally, the spread of appropriate behaviours in situations of risk is equally relevant. It is a challenge that requires time, expertise and collaboration. The important thing is to believe and engage in this challenge together.

*Maurizio Mainetti*  
*Chief Executive of the Regional Department for Territorial Safety and Civil Protection Region of Emilia-Romagna*

## An agreement between administrators and citizens, in order to make territorial management policies and risk protection more effective

TORNA ALL' INDICE

Some first important steps have been taken in the implementation of the Life PRIMES project, especially with regard to Action C3, which includes, among its objectives, the involvement of communities in order to improve information on climate change and make it more ready and aware in case of disasters. In Emilia-Romagna there are three test areas that, since last May, have participated in a series of activities concluded with the workshops and exercises that took place in October and November.

There were six municipalities involved in the test; with the conclusion of the activities, a Memorandum of Understanding was signed with the tested areas, in order to put the project into practice. The above-mentioned areas are: Poggio Renatico (FE - area of Gallo), Imola (BO), Mordano (BO), Lugo (RA) Sant'Agata sul Santerno (RA - as far as the area around the River Santerno is concerned); Ravenna (area of Lido di Savio, as far as the coast is concerned).

In order to make the project circulate, a programme has been set with the municipal administrations; this programme consists of two separate workshops dedicated to administrators and citizens, and a third workshop which will be open to both categories. In this regard, a special IT tool, accessible via the web, has been developed, in order to: test the citizens' responsiveness through a quiz, inform them about climate change and how to face emergency; allow the drafting of a CAAP (Civic Adapt-Action Plan) to be submitted to each administration, classifying the actions to be carried out according to an established priority order; give the opportunity to bring further proposals to the attention of the Municipality.

The results will be discussed during the third workshop, which will be the highlight of the confrontation between citizens and their representatives.



### Action C3 in details

- **Spreading knowledge** on climate change
- **Informing the population** about how the alert system and the civil protection are structured
- Making **the citizens aware of the flood risk** affecting their territory
- Making **the citizens aware of the actions** they can undertake in order to reduce the risks
- Connecting **the citizens and the local administrations** in order to create a community that can collaborate and improve its emergency responsiveness
- **Implementing Civic Adapt-Action Plans (CAAP)** to be integrated into emergency plans, with proposals from citizens in order to improve the security of their own area and to create a relationship of mutual exchange and confrontation.



### The first workshop

On May, 3rd, 2017, the first workshop addressed to the local administrations of the three regions involved in the project was held, in order to share the experiences and steps to be taken.

On that occasion, the drafts of the Civic Adapt-Action Plans were presented, in order to receive contributions and suggestions. Moreover, a strategy of intervention on pilot areas in Emilia-Romagna was elaborated, in order to define the activities aiming at identifying the most suitable tools to involve citizens - in this regard, the dates for the preparatory meetings have also been set.

The exercise area has also been defined in the municipalities of Imola and Sant'Agata sul Santerno.

### Preparatory meetings and workshops between June and September 2017

The first session, whose protagonists were the local administrators, took place in Lido di Savio (RA) on June, 12th, in Poggio Renatico (FE) on June, 15th, and in Lugo, throughout the area surrounding the Santerno, on June, 20th. The logistics of the meetings and the actions to be implemented in order to involve the communities were on the agenda.

The September activities were dedicated to stakeholders; special meetings were organized for them according to the following schedule: September, 16th, Poggio Renatico; September, 25th, Lido di Savio; September, 27th, Lugo - Sant'Agata, October, 2nd, Imola – Mordano.

The above-mentioned meetings were organized by the staff of the Regional Department for Territorial Safety and Civil Protection.

In October, the third phase of the process officially started. The meetings - organized by the staff of the Regional Department for Civil Protection, with

the support of the Eurocube company - were held in Lido di Savio, on October, 14th, in Poggio Renatico on October, 21st, and in Lugo on October, 28th. These 3-hour meetings involved a total of about one hundred administrators, stakeholders and citizens.

### The programme of the day

#### *Territory and perception of risk*

- Local climate scenarios (Arpae)
- UNIVPM data collection results

#### *Civic Adapt-Action Plans*

- Completion of the questionnaires
- Reporting of the results
- Circulation (n. of requested questionnaires and deadlines)
- Questions

#### *Conclusions with the presentation of the prize, practical demonstration, final meeting and final workshop.*

The participants, equipped with IT tools, completed the questionnaire prepared to assess their level of risk awareness and the adequacy of the CAAP.

In Lido di Savio, a place that in winter has a very low percentage of resident population compared to the summer months, the presence of representatives of the commercial and tourist-bathing activities was significant. Part of the work was to introduce the alert system and the regional portal, as well as the possible response to emergency situations.

In Poggio Renatico the participation of representatives of the world of associations and economic categories was such as to consider the idea of making the project circulate among the neighbouring administrations. The meeting in Lugo saw the participation of the four Municipalities of the area surrounding the River Santerno involved in the project, as well as a large group of volunteers from the Civil Protection Department.

One month after the workshops, we can draw the first conclusions. The results are good and they prove how a continuous spreading of knowledge and good practices on the territory helps to make citizens more aware and careful about their territory and their role as promoters of a culture of safety and civil protection.

#### *Regional Department for Territorial Safety and Civil Protection*

# The results of the CAAP and adaptation actions

[TORNA ALL' INDICE](#)

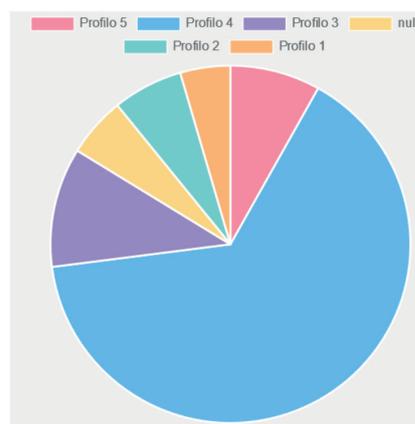
The CAAP - Civic Adapt-Action Plan - is one of the products of the Life PRIMES Project and aims at assessing citizens' knowledge on the risk of floods, as well as increasing their level of knowledge through five short friendly tutorials. The CAAP is a tool aiming at the active participation of citizens in local policies for territorial management; it is structured as a catchy on-line game, which is easy to compile.

During the workshops, each stakeholder compiled his own CAAP; therefore, it was possible to analyse the results and get a general overview of the level of knowledge of the involved communities on the topic of floods and sea storms.

Overall, the stakeholders of the target areas of Emilia-Romagna compiled a total of 110 CAAPs; based on the results, the sample of participants has been divided according to their profile of resilience; the profiles can go from Profile 5, in case the participant answered correctly to 100% of the questions, to Profile 1, in the event that a maximum of 20% of the questions have been correctly answered. Each profile has been associated with an evocative image of the level reached (Figure 1).

Based on the number of the correct answers to the CAAP questions, the total sample of participants is

divided as follows (Figure 2):

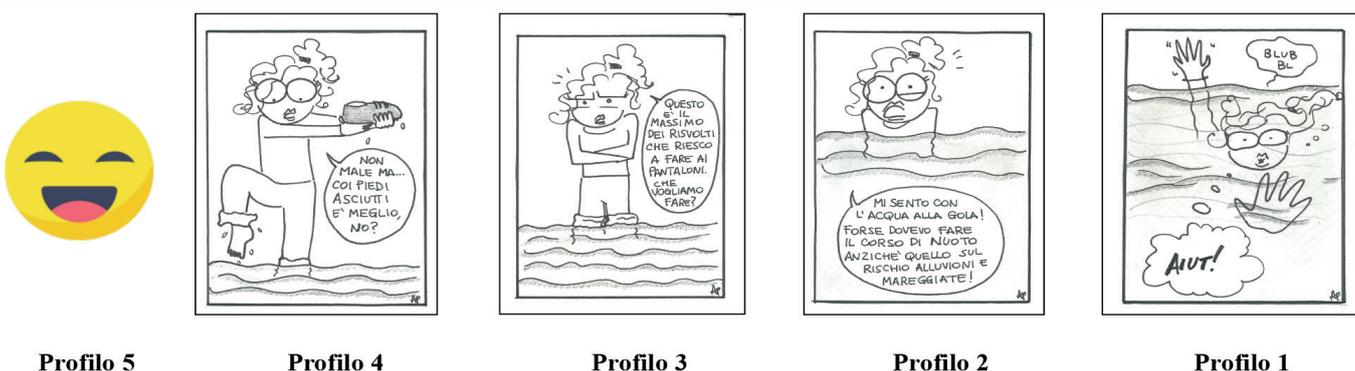


*Figure 2*  
Sample composition based on the profile of resilience obtained while compiling the CAAP

- 9% of participants belong to profile number 5
- 65% of participants belong to profile number 4
- 11% of participants belong to profile number 3
- 6% of participants belong to profile number 2
- 5% of participants belong to profile number 1
- 5% of the sample was null due to technical problems of the on-line platform, which were solved later.

These results show that, overall, the stakeholders of the territories included in the target areas of Emilia-Romagna have a good perception of risk, and mainly belong to profile 4 (more than 80% of correct answers).

*Figure 1* Graphical representation of the CAAP resilience profiles



**Profilo 5**

**Profilo 4**

**Profilo 3**

**Profilo 2**

**Profilo 1**



Another interesting fact emerging from the results of the CAAP reveals that almost 25% of the participants actively contributed to the definition of the adaptation actions that will possibly support the drafting of the new civil protection plans, and therefore be integrated into the municipal emergency plans. Particularly, the adaptation actions suggested by the stakeholders mainly concerned:

- **Mitigation actions**  
Green systems, in order to meet the energy needs of homes, vehicles, public buildings.
- **Actions to protect the territory**  
Protection of the coastlines through beach nourishment, control and cleaning of water collection systems, monitoring of river embankments and prompt notification to the Municipality in case of problem detections, cleaning of the rivers obstructed by tree growth.
- **Alerting actions**  
Creation of an alert system via SMS or easily accessible app.
- **Sensitization and communication actions**  
Survey and public disclosure of the places at risk of pollution or catastrophe, promotion of voluntary work among the population, organization of neighbourhood meetings on flood and storm risk, spreading of adaptation actions, especially in schools.
- **Training actions**  
Training sessions dedicated to illustrating and spreading the municipal emergency plan in schools, education and training for adults and

children in case of disasters, periodic refresher meetings, periodic exercises simulating the alert.

In the next months, the participation process set by the Life PRIMES Project will be repropoed in the target areas of Marche and Abruzzo, where the CAAP will be presented to the stakeholders of the areas of Scerne di Pineto, Torino di Sangro, Senigallia and San Benedetto del Tronto. The results of the CAAP will allow us to know the level of knowledge and perception of the flood and storm risks among the citizens of these areas, as well as to obtain further contributions in order to define the most effective adaptation actions.

*AreaEuropa - Eurocube*

# Can we learn resilience? We just need some practice

## The Life Primes Project reaches Sant'Agata sul Santerno and San Prospero di Imola

[TORNA ALL' INDICE](#)

The River Santerno overflows and bursts its banks in two points, in the province of Bologna: San Prospero, a fraction of Imola, and Sant'Agata. On November, 18th, the recorded flood levels were comparable to those of the historic flood of three years ago, when, on September, 20th, 2014, intense rainfall concentrated in a few hours filled the whole watercourse. Luckily, this time it was just an exercise, organized in order to test the responsiveness of the Civil Protection system and provide the population and local administrators with the most adequate information to be prepared in case of an emergency situation. The involved areas are two of the six pilot areas of the European Life Primes Project in Emilia-Romagna.

Among the population, the simulations involved six families (sixteen people in total), residing on the banks of the River Santerno in San Prospero, and about eighty students of the Giovanni Pascoli school in Sant'Agata. In both cases, the evacuation operations were preceded by pre-alarm messages sent by the Municipality. In Imola (San Prospero), a preregistered voice alert addressed to the affected population started at 8.30 am, then the real alarm followed, half an hour later, confirming the flood in progress. The families residing on the banks of the river were evacuated and guided to the reception area, which was set up by the volunteers of the Civil Protection service within the municipal sports ground. Meanwhile, the Supra-municipal Operational Centre was opened. In the late morning, the families were taken to the local community centre, where they received training and information on risks, as well as behaviour advice, by officials and volunteers of the Civil Protection. 40 volunteers of the Civil Protection Department of Imola, 20 regional officials and 6 officials from the Municipality contributed to the success of the day.

In Sant'Agata sul Santerno, the protagonists of the



exercise were approximately eighty students of the Giovanni Pascoli school; at the time of receiving the pre-alarm message, issued due to an embankment break, the students were attending their Saturday morning lessons on the lower floors of the school building. The students were immediately guided up to the highest levels, that would not have been reached by the water in case of a real flooding. After the emergency, the students took part in training initiatives on good behavioural practices in the event of real floods; afterwards, they were guided to the school yard, where the volunteers showed them some demonstration actions. This opportunity allowed us to test the specific actions we will need to perform in order to secure a school population during a flood.

Both exercises are part of the European Life Primes Project. As a matter of fact, they are an expression of Action C3; one of the objectives of this action is to spread among the population the awareness of risks and the need to adopt adequate and responsible behaviours aiming at self-protection. The main goal can be summarized in one single adjective: to make citizens "resilient".

*Regional Department for Territorial Safety and Civil Protection*

## THE INTERVIEWS

# The opinion of the administrators of the test areas in Emilia-Romagna

*Interviews carried out by Cervelli In Azione - Eurocube*

[TORNA ALL' INDICE](#)

### Gianandrea Baroncini - Assessor delegated to the Civil Protection Department of the Municipality of Ravenna (pilot area of Lido di Savio)

I believe that the activation of participatory projects like these on our territory is a fundamental contribution in order to build a culture of civil protection.

The world is changing, knowledge is changing, new problems are threatening a territory like ours, that is structurally complicated, because of its nature and its history, and because it has 32 km of coastline, 5 rivers that cross it, a chemical plant, and an industrial port; therefore, I believe that carrying out initiatives that involve citizens and trying to improve their awareness, first of all as far as the risk of their territory is concerned, is the first action in order to build resilient communities.

Every day, as an institution, together with the other regional bodies and the Land Reclamation Consortia, we are committed to implement concrete measures and make courageous administrative choices; alongside this process, we give a cultural support for schools and citizens, in the most sensitive and affected areas, in order to try and build this new awareness.

Climate changes are more and more tangible and there are challenges that can be faced if we all play our part.

Innovative adaptation tools, such as the CAAP, are very useful and allow us to have new opportunities to create a dialogue with citizens. Life PRIMES is a pilot project and we are happy to be part of it; we expect this process to help us to communicate with citizens in order to build a two-way relationship, as well as reciprocally exchange needs and methods of intervention and action.

We are curious to know what kind of perception of the risk citizens have, and to understand what they think, in order to take into account their considerations while updating the municipal plan.



### Daniele Garuti - Mayor of Poggio Renatico

The problem of flood risk is strongly perceived by those who still remember the floods of 1949 and 1951 that submerged the territory of Poggio Renatico, as well as part of the Municipality of Ferrara. These were important emergencies, and even the President of the Republic, who was Luigi Einaudi at that time, visited the areas of the disaster.

The territory of Poggio is funnel-shaped, so part of it is at a lower level and it is,



therefore, the most critical one. There are two main problems: on one hand, continuous rains affect the Apennine arc and increase the water level of the River Rhine; on the other hand, very intense but short rainfalls are able to flood limited areas. In the modern period, the flood risk has been faced with much more effective technological systems; for example, a point of derivation in Sant'Agostino is able to channel water during the flood peaks into the Cavo Napoleonico, a human-made canal, and bring it into the River Po; therefore, this process already has an important mitigation effect.

Then, there is a group of prepared and trained municipal civil protection officials that allows us to monitor the situation and create the conditions of security for the involved areas, even by implementing practical exercises that always give excellent results. For example, in the Gallo area there is the drainage channel of the River Reno, which is a controlled subsidence area just near the old course, that allows the river to overflow in a controlled manner when it is in flood. Then we intervene by closing the roads, alerting the population and implementing all the necessary measures.

During the last exercise, about a year ago, we simulated a flood affecting a very large area of several hundred hectares; the exercise also included the warning and evacuation of non-autonomous people, individuals with limited mobility, etc. Through the interaction with the medical monitoring system, we had access to important sensitive information and the feedback from the citizens was excellent. When the Region told us we would have been one of the pilot areas of the Life PRIMES Project, we thought it was a privilege because it allows us to focus on our reality and increase our level of prevention, making people aware of how important the actions implemented by both the Municipality and the citizens are, in terms of risk awareness and self-protection.

During the preliminary meetings that took place at the beginning, the first aspect we wanted to point out was 'What can we do as adaptation actions?', but then we realized that self-protection and awareness are fundamental; that is, as a matter of fact, the purpose of the project, and it is very important in order to save lives.

### Enea Emiliani - Mayor of Sant'Agata sul Santerno

In the Municipality of Sant'Agata there have never been any floods, but the flood risk is real because our municipality is crossed by the River Santerno and particularly in the autumn and spring months there are frequent floods, so the water levels rise; therefore the concern of the citizens increases and the mayor, as the first citizen, is even more concerned than other people.

It is essential to intensify the training of citizens as far as the perception of flood risk is concerned. I expect the Life PRIMES Project to go in this direction; actually, I wish it because, even at a cultural level, it is important to shift the focus, which is currently on post-emergency in Italy, on prevention. Maybe in time of peace it may almost seem a waste of time; on the contrary, informing the citizens, making them understand the risk levels of the areas where they live and which tools we can use to cope with the emergency is essential to reduce any possible damages caused by a disaster.

I think that the choice of a participatory process is the best one, because the municipal emergency plan should not be left in a locked drawer; on the contrary, it must be shared and implemented by administrators and citizens. The choice of



creating it together, acknowledging the problems and putting them into an updated municipal emergency plan, means not that it will be just a sheet of paper, but that it will be more easily implemented by our citizens when needed, even if we hope that it will never happen.

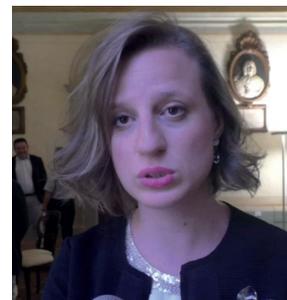
### Valentina Ancarani - Assessor to the Civil Protection of the Municipality of Lugo

I have been an Assessor in the Municipality of Lugo since June 2016 and in my assessorship I have never experienced any flood events. But at the beginning of the mandate of this Council, in February 2015, when I was President of the Town Council of Southern Lugo, my neighborhood, Western Lugo and other parts of the territory were flooded; therefore, I experienced the emergency in the first place because, along with the Mayor and the Assessor for Public Works, I was a reference point for the flooded population.

The citizens of Lugo perfectly know they live in an area at risk of flooding, because the last event occurred recently, and the territory of Lugo is located between two rivers, the Senio and the Santerno.

The Life PRIMES Project was born in a particular moment in the history of our Municipality, since the last flood occurred in 2015 and the project started in 2016; so the project is very useful for our population, because it makes the citizens become even more aware of the risks and measures to be implemented in the event of a flooding.

Involving the population of Lugo in the drafting of the emergency plan can increase their level of resilience, so the civic adaptation plans of the project are fully integrated into our emergency planning. As a matter of fact, the emergency plan involves the municipal administration, particularly the Mayor and the technicians of the offices in charge, as well as the volunteers of the Civil Protection based on the territory, but it also involves the citizens, thus transforming them into an active part in the emergency situation.



### Stefano Ravaoli - Person in charge for the Civil Protection of the Union of Municipalities of Lower Romagna Region (pilot areas of Lugo and Sant'Agata sul Santerno)

I believe that the Life PRIMES Project is extremely useful, both as far as the information given to citizens and as far as the training we receive, as operators, on new methods to transmit information on flood risk.

I also think that the civic adaptation plan used in the participatory process can be very useful if included in the emergency plan that we are currently revising, as a Union of Municipalities, by involving the citizens of Lugo and Sant'Agata, but also from the other territories.

In my experience, I have been an active witness of several emergency situations. I have been in charge of the Civil Protection measures for a few years, but before this I used to work in a town in the Lower Romagna region and I experienced the flood events occurred in 1996 and 1999, and then in 2014 and 2015. I must admit that, over the years, the knowledge and experience of the population have increased, but we must continue to work in this direction in order to encourage the citizens to participate actively and increase their resilience to flood risk.



# The results of the risk perception analysis of the test areas in Emilia-Romagna

[TORNA ALL' INDICE](#)

---

In October 2017, during the three meetings for the presentation of the LIFE PRIMES Civic Adaptation Plans (CAAP) to the citizens of the pilot areas of the Emilia Romagna Region, the Università Politecnica delle Marche presented the results of the Risk Perception Analysis.

The analysis was performed by administering specific questionnaires to the adult population and to the students of primary and first degree secondary schools.

The results showed that the area in which there is greater awareness of living in a territory at flood risk is the coastal one (Lido di Savio), whose citizens also believe that this risk is going to grow over time. In the territory of Poggio Renatico the respondents do not believe that such a risk will increase and in the Santerno area they are uncertain both regarding the current presence of the risk and its evolution over time.

In all three areas, the most part of respondents believes to be able of effectively managing an emergency procedure, but does not show the same trust towards the fellow citizens.

The emergency plan is unknown to most, in all municipalities, vice versa, with regard to familiarity with other documentation, there are territorial differences: in Lido di Savio the majority knows different kinds of documents, as well as half of the sample of the Imola's municipality, in the Santerno area. In the other municipalities of this pilot area the majority does not know any documentation, as in Poggio Renatico.

In all areas, however, citizens are willing to attend flood preparation courses, declaring themselves convinced that a good information campaign is the basis for the prevention; regarding this last point the municipality of Poggio Renatico is an exception. For the schools were presented, in particular, the results concerning the variation with age growth of two antagonist behaviours: running outdoor (dangerous behaviour for excellence, for this type of phenomenon) and reaching a higher place (self-protective behaviour for excellence).

To get effective answers was used the fairy-tale tool, realizing a story without an end, in which the main character is a child (Lorenzo) who is facing an emergency flood situation. The young interviewed played to imagine to be Lorenzo, finishing the story with their own considerations in terms of actions and feelings.

Children show a lower awareness in Lido di Savio, however, in all the municipalities of the Santerno area they realize, growing up, that it is effective to reach a high place, but it remains significant, at all ages, the choice to run outside. Poggio Renatico is the area where they are more aware: as they grow older running outside becomes less important and reaching a higher place more important.

Overall, the results show how crucial is to intervene in terms of raising awareness, at all ages and especially for children, underlining, thus, the importance of the LIFE PRIMES project objectives.

*Marche Polytechnic University*

# The climatological-hydrological and coastal-marine variability over the pilot areas of the project

TORNA ALL' INDICE

The last decades have recorded an increase in frequency and intensity of extreme weather events, causing impacts on life, urban settlements, territory and various sectors of activity. In Italy, 18 regions were affected by approximately 100 extreme events that caused floods or landslides, since 2013 to 2016. PRIMES (PREvent flooding risks by Making resilient communitiES) is a Life project in the framework of climate change adaptation strategies with a direct participation of citizens, born with the objective to reduce the damage caused to the territory and the population, by events as floods and storms. The case studies of the project are: Emilia-Romagna, Marche and Abruzzo, regions characterized by common problems such as landslides, floods, storms, coastal erosion. The climate variability as well as the hydrological and coastal-marine variability is the starting point of the project. A common data-base and a common set of climatic-hydrological-marine indices have been defined and analysed over the period 1961-2014. Seasonal trends in total amount of precipitation, number of days in which the precipitation from the warning areas exceeds 50mm in 24 hours, are some climate indices analysed to define the present and future climatic profile over the three regions. The results of seasonal precipitation reveal slightly negative trends during winter and summer and slightly positive trends during autumn and spring. Focusing on extreme events, which actually produce damage in a short time, it has been obtained that the number of events is concentrated during autumn, for all three regions of the project (about 55%). Figure 1 presents the seasonal distribution of the frequency of intense areal precipitation (mean over the three pilot areas).

The hydrological analysis of river floods is done using time series of events with different lengths,

namely 15 years for Marche and Abruzzo and 35 years for Emilia Romagna. The data set of events has been classified according to the maximum levels achieved, by comparing with a system of 3 hydrological thresholds, highlighting the floods occupying the plain area and involving the embankments (> threshold 2), and the exceptional ones, next to the flooding (> threshold 3).

The analysis of floods for each basin show an increase in time of the number of events, and of their magnitude (number of exceedance of thresholds 2 and 3). The increasing trend in the frequency and magnitude of floods is more pronounced in the last ten years, confirming the increase in the frequency of intense rainfall on the Apennine area, highlighted also by the weather-climatic analysis of precipitations.

Regarding the coastal-marine framework, it is to highlight the strong lack of long and homogeneous time series of meteo-marine measurements. For this reason, on the basis of the available databases, different type of analyzes were carried out, on the basis of the considered period, variable or geographical area. Wave storms study, in terms of wave

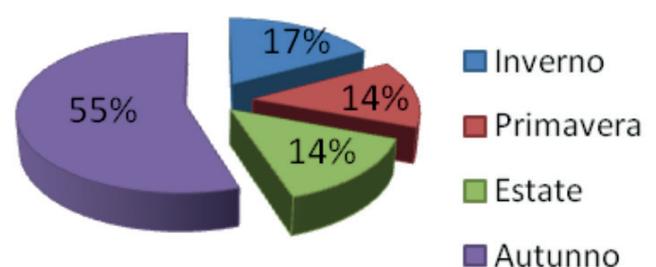


Figure 1 Seasonal distribution of the frequency of intense areal precipitation over the common area: Emilia-Romagna, Marche, Abruzzo; period 1961-2014

height and direction as well as energy and duration of storms occurred during 10 years of data (June 2007 - June 2016) recorded by the Emilia-Romagna wave buoy in Cesenatico, highlighted only high interannual variability. Extending to the whole Adriatic basin and considering meteorological data recorded by the coastal synoptic stations in the period 1960-2016, the meteorological conditions that generate intense wave storms have been analyzed, obtaining in this way climatological information on meteorological storminess.

The long-term trend (1960-2016) is different if we consider the adverse weather conditions that generate storms from Bora compared to those that generate sea storms from Scirocco. In the first case (Bora) a positive trend has been identified over 1961-2000 and negative over 2001-2016; in the second case (Scirocco) the trend is positive. In both cases, however, there is strong interannual variability (Figure 2).

How could change these events in the future over the three pilot regions?

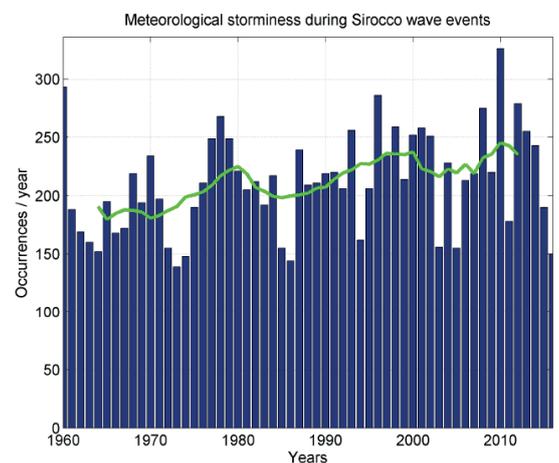
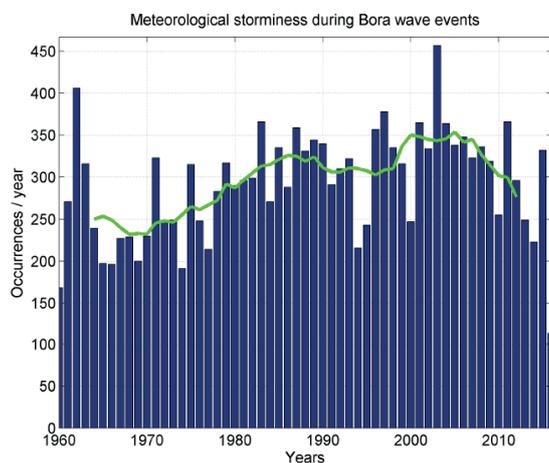
The response is obtained from the climatic simulations carried out within the project using different tools: the statistical downscaling with simulations at a resolution of 5km and, the dynamic downscaling at a resolution of 8km (COSMO-CLM). Both models used conditions from CMCC-CM global climate model. Climate changes have been estimated for the period 2021-2050 under the radiative concentration pathways RCP4.5 and RCP8.5. The projec-



tions of the seasonal quantity of precipitation show a decrease during spring and summer (mean over regions of -15%) and an increase during autumn (mean over regions of 20%), over the period 2021-2050 respect to period 1971-2000. Autumn resulted to be the season with more intense projected changes, characterized also by an increase in the frequency of extreme precipitations (mean over the regions of 15%). These changes could connect to an increase of the frequency and intensity of floods signal already registered over Apennines basins in the last ten years.

[Arpaè-Servizio IdroMeteoClima](#)

Figure 2. Figura 2 Histograms of storminess during Bora (left) and Scirocco (right) over 1960-2016. The green line is the moving average of 10 years.



## 1 FEBRUARY 2018, MANCHESTER (ENGLAND)

Stakeholder dialogue to find solutions for strategic adaptation planning in European cities

This event will bring together city practitioners, critical infrastructure providers and experts on climate change adaptation and resilience in cities for a one-day event to make connections, exchange knowledge and plan for future collaboration on urban climate change adaptation.

## 5-7 FEBRUARY 2018, TOURS (FRANCE)

International conference on climate change and water

The goal of this conference is to stimulate exchanges and new developments to foster the diversity of local responses to the impacts of climate change on water, including biological, technical and social adaptations.

## 24 APRIL 2018, SOFIA (BULGARIA)

Biodiver-City.

Improve urban biodiversity and ecosystem services to make cities more resilient

The conference aims to provide a series of messages and key principles on how cities can contribute to politics and achieve goals on regional, national and European biodiversity.

## 21-25 MAY 2018, BRUSSELS (BELGIUM)

Green Cities for a Greener Future

The next edition of the EU's Green Week will examine the ways in which the Union helps cities become better places to live and work. Presenting developments in policies on air quality, noise, management waste and water resources, will promote participatory approaches to development urban, network schemes and tools to share best practices.

## 11-14 JUNE 2018, CAPE TOWN (SOUTH AFRICA)

Adaptation Futures 2018, Dialogue for Solutions

Biennial Conference of the Global Vulnerability Research Program, impacts and adaptation to climate change (PROVIA), offers an opportunity for international networking with more than 1000 participants coming from universities, governments, civil society and businesses.