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# LABE-ELBE 2012<sup>PLUS</sup>

Results and recommendations from the LABEL Project



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#### PROJECT:

**Duration:** 09/2008 – 08/2012

**Total budget:** 4.215.680 EUR

**thereof:** ERDF 3.317.246 EUR

[www.label-eu.eu](http://www.label-eu.eu)

This project is implemented through the CENTRAL EUROPE Programme co-financed by ERDF



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## PREFACE

The natural event of flooding is one of the worst natural risks in Central Europe. We experienced what this means ten years ago, during the large Elbe flood of 2002 and since then again in 2006 and 2010. Thus we at the Saxon State Ministry of the Interior are pleased to meet the challenge of establishing and further intensifying transnational and interdisciplinary cooperation for providing flood prevention in the Elbe catchment. With the INTERREG projects ELLA and LABEL that are supported by the European Union we have jointly succeeded in creating a basis for long-term risk reduction together with our neighbours and partners on the Elbe. This simultaneously provides a basis to develop Saxony as a business location, support the efforts of the Saxony-Bohemia-Lower Silesia region in global competition and to increase its attractiveness as an economic location, cultural and tourism region.

The multi-faceted and extensive results of the LABEL project from 2008 to 2012 are summarised in this brochure. The messages it includes will provide a stimulus for the respective stakeholders to consider subsequent steps and measures. It would be desirable if some of them were further elaborated and implemented. Interdisciplinary and cross-border cooperation will play a central role in future, particularly in the implementation. "Water is a friendly element for those who are familiar with it and know how to handle it," said Johann Wolfgang von Goethe. And his words have not lost any of their topicality today!

And this is exactly the task that we have to take on: to draft and implement plans in times when there is no hazard, plans that are partly unpopular too, in order to take precautions for days when hazards have to be averted. All resources and possibilities have to be used to strengthen this field.

We in Saxony are in the middle of the Elbe catchment area. So we are very well aware of what it means to be both up- and downstream. Floods in our region are substantially influenced by our neighbours upstream. How extensive and positive these effects can be has been shown in past floods, such as in 2006. During those floods sophisticated management of the options for flood retention in the Czech Republic made a considerable contribution to protecting those downstream in Germany. This is the solidarity and cooperation on the river that we need.

I would like to thank most sincerely everyone who has made this publication possible with their reports, contributions and commentaries and who has thus supported the LABEL project. I would also like to thank the European Union, which has supported the project from the European Regional Development Fund in the INTERREG Central Europe Programme 2007-2013. The long-term continuation of the very successful work of this project is desirable. However, to do this it is essential that cooperation on the issues of flooding, risk prevention and spatial development in the endangered areas is also supported by the European Union in the new 2014-2020 funding period.

By sharing our knowledge and experiences with each other as comprehensively as possible we can help each other to find the right way of dealing with water and thus to keep it as our friend!

**Markus Ulbig,**  
Saxon State Minister  
of the Interior



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# SUMMARISED RECOMMENDATIONS FROM LABEL



In 2002, extreme flooding caused major damage, which for a long time had a negative effect on the economy. Homes were destroyed, businesses were affected and infrastructure was significantly damaged. Many lives were also lost. The flooding was also the impetus for careful consideration of flood risk management. This challenge had already been raised by experts in the 1990's. Above all, the focal point of future flood risk management was to be the strengthening of interdisciplinary and international cooperation. The successful measures for flood prevention in the last 10 years mean that both the people who live in the Elbe catchment and those who are responsible are better prepared for extreme flooding and are thus better protected.

## THE INTERREG IVB PROJECT LABEL

Transnational cooperation in the Elbe catchment area has made significant contributions. After 2002 many experts in water resource management and spatial planning from Germany, Czech Republic, Poland, Austria and Hungary joined together in the INTERREG IIIB ELLA Project, in order to create a central basis for international and interdisciplinary flood prevention. The successful cooperation was continued and completed with the INTERREG IVB LABEL Project. Measures for adaptation of diverse uses to flood risks along the river were identified; common approaches for flood risk management developed and the affected public were made aware of the risks. Infrastructural and tourist uses of the river were the central focus point.

The cooperation was supported by the EU-INTERREG IVB programme CENTRAL EUROPE. This support enabled ministries, water authorities, districts and municipalities in the Elbe catchment to share their methods, approaches and ideas, e.g. regarding the implementation of the EU flood risk management directive (FRM-Directive). Joint works such as the Elbe Atlas or the excursion guide "WasserKulturLandschaft Elbe" (WaterCultureLandscape Elbe) were developed and a long-term cooperation was established.

# FUTURE TASKS AND REQUIREMENTS

There still remains much to do in order to ensure a sustainable, flood risk adapted development in the Elbe catchment area:

### ➤ TAKING EVERYONE INTO THE SAME BOAT!

Sustainable flood risk management requires the daily cooperation between all those responsible from the areas of water resource management, spatial planning, nature conservation, agriculture, local economy and others. Here it is especially important to include all administrative levels in the Elbe catchment. The international cooperation is formally ensured through the appropriate commission (IKSE-MKOL), however it also lives from the direct international cooperation of the persons responsible on a national and federal level, as well as regional and local authorities. This has to be secured on a long-term.

### ➤ REDUCING THE RISKS LOCALLY!

Whether risks are taken into consideration when planning is largely decided in municipal processes. Therefore, the close ties from the international cooperation to the local authority are decisive for the success of risk prevention. Much tangible work was achieved with the LABEL project to strengthen the involvement of local authorities in flood risk management. E.g. an international municipal flood partnership was initiated. No risk management can be successful without a continuous communication and cooperation with and between the local authorities on hazards, risks and their responsibility to promote flood prevention. Here regular activities are necessary, especially when there is no flooding.

### ➤ SOLIDARITY!

Many flood protection and retention measures do not only have an impact locally. Mostly they also influence areas and regions downstream. Therefore, it is crucial that in the planning of measures the whole basin should be considered, and to coordinate all activities with both the upstream and downstream riparian. There are more challenges in the practical implementation of this principle. Acceptance and the willingness to pay for the measures, which help others, are essential. Common financial models with neighbouring countries and regions must be pursued further. The practice of EU solidarity funds for damages should not weaken the obligation for prevention. And finally, the Elbe catchment needs a common understanding of the legal positions in connection with the upstream and downstream principle.

### ➤ LEARNING FROM EACH OTHER!

Through the regular exchange across regions, we can pass on information and experience and learn from each other. Methods, approaches and experiences can be transferred even past the borders of the Elbe catchment and beyond - as the exchange with the Danube / Tisza basin in LABEL shows. The goal for the future should be to establish an exchange between all bordering river basin areas, also with the catchment area of the Oder.

### ➤ STAY AWARE!

After a flooding event, the risk awareness level among the people diminishes over time. Only through a continuous flow of information and the upkeep of events for awareness raising as well as special measures of public relations work, such as internet information, exhibitions and flooding protection exercises, will the public and stakeholders remain prepared.

### ➤ FOLLOWING UP THE SUCCESS!

The cooperation in the Elbe catchment area and the transnational cooperation between stakeholders and levels must be followed up, in order to target further developments in flood prevention. The consolidated network in LABEL should be ensured for the intermediate implementation of the described targets and measures here. For this, the LABEL project partnership will seek assistance in the next INTERREG funding period. The LABEL partnership appeals therefore to the responsible bodies, to engage further for the EU funding of projects on flood risk management. A decisive requirement of the implementation of the LABEL project is that, in the forthcoming funding periods the natural borders in the catchment areas, as in the Elbe catchment area, will be illustrated in the funding programmes.

OVER NEARLY **10 YEARS**, DURING THE INTENSIVE **TRANSNATIONAL COOPERATION** THE REGIONS IN THE ELBE CATCHMENT HAVE GROWN CLOSE IN THE AREAS OF **FLOOD PREVENTION** AND **FLOOD RISK MANAGEMENT**. IN THE FUTURE, THE AIM IS TO FURTHER PROMOTE AND EXPAND ON THE COLLECTED EXPERIENCES AND KNOWLEDGE FROM THE PROJECT **LABEL**!





**RESULTS AND  
RECOMMENDATIONS FROM  
THE LABEL PROJECT**

# 1 INTRODUCTION

Economic development requires secure life and local conditions. Natural risks, especially flooding, new risks from climate change; these factors do not contradict an economic development if the risks are analysed and known and if they are given enough consideration in the decisions made on location and development. The claim that risks can be stemmed with technical measures, so that development in every location is possible is out of date. It is null and void. However, with the combination of all measures, reducing the risk of flooding, avoiding flooding areas and adapting the planning with risks, a development and damage prevention can be accomplished. The synonym for this contemporary strategy is called “integrated flood risk management”.

The Elbe catchment area is distinguished by natural riverine landscapes, attractive living environment and economic potential. However, many uses along the river are exposed to high flood risk, which in turn is influenced by the effects of climate change. Flooding leads again and again to considerable ecological, economic and cultural damages and in the worst case to the loss of human lives. The causes for the problem are diverse:

- › **Changes of drainage conditions and climate;**
- › **Limited information about risks, forecast and awareness of problems;**
- › **High demand for usage and economic interests in areas with flood risks;**
- › **Insufficient risk priority in decisions about usage.**

In 2002 the Elbe catchment was affected by extreme flooding, which caused billions of damage and cost many human lives. The event revealed a huge need for action in risk prevention. Since then many measures have been taken. Almost 10 years later, the regions in the Elbe catchment are better prepared for similar flooding. This is also thanks to the transnational cooperation with the ELLA and LABEL projects.

After 2002, many regions from Germany, Czech Republic, Poland, Austria and Hungary came together for the INTERREG IIB project ELLA and drafted common strategies and measures on the international and interdisciplinary procedures on flood prevention.

The successful cooperation was continued with the INTERREG IVB LABEL project. Between 2008 and 2012, the 20 LABEL project partners worked on a common implementation under the leadership of the Saxony State Ministry of the Interior (SMI). Solutions for flood risk management, as well as the adaptation of diverse river-related usages and measures for raising the level of public awareness about risks were developed. Initially in pilot activities, measures on risk prevention and flood protection, on adaptation of spatial planning, tourism and navigation to flood risks were carried out. These were combined and recommendations for the future development of the Elbe catchment were deduced.

The results and recommendations from the LABEL project work are finally presented in this brochure. “LABEL-ELBE 2012 plus” is the common strategy of the LABEL partnership, consisting of experts on water management, spatial planning, tourism, economy etc, for the adaptation of flood risk development in the Elbe catchment area. Apart from the results and deduced recommendations, the LABEL partnership also describes the collected practical experiences during the cooperation in the brochure.

The recommendations are intended for the administrations of the countries, regions and local authorities in the Elbe catchment, as well as the broad specialist public. The core messages and the conclusions from the common strategy should also encourage the politicians and decision

makers to take action. The LABEL partnership invites all experts and decision makers to use the results of the project to:

- › **Support a risk adapted and sustainable development in the Elbe catchment**
- › **Deepen the common approaches in flood risk management for a continuous exchange**
- › **Maintain the level of risk awareness among the affected population which has been established through regular events and meetings.**

The regions in the Elbe catchment have thus, after three years of intensive transnational cooperation, compiled the following results and recommendations on the subject of flood protection. In the future, with the support of further experts and policy areas, the following detailed recommendations can be further considered and implemented over frontiers.

BRIDGE OVER THE ELBE IN MAGDEBURG



# 2 FLOODING – A TRANSNATIONAL CHALLENGE

## 2.1 | FLOOD RISK IN EUROPEAN SPATIAL DEVELOPMENT POLICY

Rainfall, melting snow and floods do not conform to political or administrative borders. A comprehensive risk prevention has to be orientated on the catchment area of the river, independent of regional and state borders. Risk management and the necessary adapting of spatial and economic development can no longer be based on only the local or regional approaches.

Strategies of flood prevention are also based on these findings:

- › **Economic regions have always been developed around rivers and the river flat lands;**
- › **Flood hazards have long since been underestimated in spatial developments;**
- › **In the future, climate change can lead to a heightened flood risk.**

Since the 1990's, there has been an increasingly comprehensive and transnational dealing with the risks. The European spatial development and expert policy have taken this into account in particular with their framework and the funding programme: the Territorial Agenda<sup>1</sup>, the European Spatial Development Perspective<sup>2</sup> (ESDP), the funding programme of the European Territorial cooperation<sup>3</sup> and the EU directive on flood risk management<sup>4</sup>.

### EU INITIATIVE ROLE OF FLOOD RISK MANAGEMENT

<b>TERRITORIAL AGENDA (SCHEDULED 2020)<sup>1</sup></b>	Under the heading “Management and linking of environment resources” it was agreed that a common risk management was also to be a priority of an European cooperation in the future.
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<b>EUROPEAN SPATIAL DEVELOPMENT PERSPECTIVE (ESDP)<sup>2</sup></b>	This perspective presents the diverse flood risks for European regions and names flood prevention as a central issue for EU spatial development policy (including activities of member states and funding programmes).
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<b>EUROPEAN TERRITORIAL COOPERATION (ETC)<sup>3</sup></b>	Within the framework of the ETC (formally INTERREG) cross-border, transnational or inter-regional cooperation is promoted. A funding area in all programmes is also the flood risk management. In past years, the funding priority “floods” was decisive for the initiation of several international river area projects. LABEL was significantly supported by this funding programme. Preparations of the 2014 – 2020 funding period are currently taking place, which are based on the strategy “Europe 2020”. The role of FRM is yet to be decided.
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<b>EU – FLOOD RISK MANAGEMENT DIRECTIVE<sup>4</sup></b>	With the EU FRM-Dir, the EU laid the foundation for the professional-political basis for a European-wide development of flood risk management plans; including the necessary cooperation of all stakeholders. The nationwide and international cooperation in larger river areas plays a decidedly significant role.
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<b>SOLIDARITY FUNDS<sup>5</sup></b>	The solidarity fund of the European Union was set up after the flooding in Central Europe in the summer of 2002. Members as well as those countries, for which their entry into EU is still being discussed, receive a large amount of financial aid when hit by a severe natural catastrophe. The annual budget is one billion Euros. The money from the funds may not be used to compensate damage to private property.
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WATER FRONT ALONG THE VLTAVA IN PRAGUE

The LABEL project supports in various ways the European initiatives for the cooperation and risk prevention. It is worth noting that the cooperation has lasted many years and has thus proved to be sustainable. However, it can be assumed that the long-term securing of this far-reaching cooperation, which goes far beyond “normal” administrative relations, requires incentives, which should be created through the European Territorial Cooperation 2014–2020.

## 2.2 | TEN YEARS TRANSNATIONAL COOPERATION IN THE ELBE REGION

Since 1990, German, Czech, Polish and Austrian water management officials have been cooperating within the framework of the international commission for the protection of the Elbe (ICPE/MKOL) regarding flood protection. Even beforehand, there was already an intensive cooperation on water management questions along the Elbe River.

### LABEL-BOX 1

#### ADAPTATION TO CLIMATE CHANGE IN ELBE CATCHMENT

In LABEL, on behalf of the Saxon State Ministry of Environment and Agriculture around 80 studies from the Elbe catchment (Germany, Czech Republic and Austria) were assessed regarding climate changes, consequences on water-related uses and possible adaptation measures. Here the focus was placed on the adaptation strategies and objectives of the countries and states in the Elbe region.

Despite a certain variance of the results, clear trends were identified. A large number of possible adaptation measures were put together. The conclusion was also drawn that the uncertainty of the projections is still large.

The great flood events since 2002 have made it painfully obvious that the effective strategies on flood risk reduction have to include not only the whole river area but, above all the persons responsible for planning and the operators of objects which are at risk. With every flood and ensuing damage, it becomes again and again clear that, only with common transnational agreements can unfavourable developments be avoided and flood risk management optimised. As a result of the floods in 2002, the interdisciplinary, transnational cooperation of stakeholders from spatial planning and water resource management in the Elbe catchment was created.

#### ELLA – Elbe–Labe: preventive flood management measures by transnational spatial planning

After the initiative in 2002, the EU funded INTERREG III B Project ELLA “Elbe-Labe preventive flood management measures by transnational spatial planning” created the basis for transnational cooperation between the authorities of spatial planning and water management in the Elbe catchment. 23 institutions and many other project partners worked together between 2003 and 2006 to compile flood hazard maps and to integrate these into the spatial development plans, in order to optimize concrete residential and infrastructure decisions.

In 2006, the political representatives of all partners signed a common declaration for a long-term cooperation. They agreed to:

- Gradually implement the ELLA proposals for action;
- Extend and intensify the interdisciplinary, transnational cooperation of spatial planning and water management officials as well as other authorities;
- Strengthen the preventive flood protection, above all in spatial and municipal planning;
- Use the established network for a long-term cooperation;
- Further implement the commenced measures with the aid of a subsequent project.

In this way and apart from the extensive expert findings, the foundation was laid for the reinforcement of the cooperation over a longer period of time ([www.ella-interreg.org](http://www.ella-interreg.org)). It also became clear that especially the managing of land use and risk conflicts against the backdrop of the economic development in the Elbe catchment would require much effort. The further development of the interdisciplinary flood risk management for the Elbe-Labe economic area was the starting point for the follow-up project LABEL.

#### LABEL – Adaptation to flood risks in the Elbe river basin

In the LABEL project between 2008 and 2012, emphasis was placed on flood risk management with all stakeholders, risk-adapted spatial development planning, tourism and navigation. LABEL had the goal, to further improve relations between the affected states, countries, districts and municipalities, as well as further stakeholders on an European level, in order to develop joint prevention measures and strategies for the adaptation to the increasing risk of flood.

The foundations for a sustainable development in the Elbe catchment were laid, with the help of risk determination and evaluation and their inclusion in spatial planning documents. On the basis of this, plans were adapted and adjusted to flood hazards. The cooperation of spatial planning with the water resource management presented here a starting point. The following, in particular was worked out:

- Flood hazards and risk maps;
- Flood risk management plans (for pilot areas);
- Development and adaptation concepts for tourism and urban usage in risk areas;
- Concept on dealing with navigation under flood aspects;
- Diverse local and regional implementation of risk adaptation measures.

The LABEL project successfully continues and intensifies the cooperation in the Elbe catchment. Besides the transnational strategies, the insight from numerous local pilot projects, showing that the daily planning and approval practice is decisive for the development of risk situations, is important. This is considerably improved through the continuous and

long-term securing of the cooperation, as local planners and decision makers will only act in terms of risk prevention, if the subject always remains present and if regular exchanges are held. For this purpose, formal international commissions are not enough; but they complement the project level well.

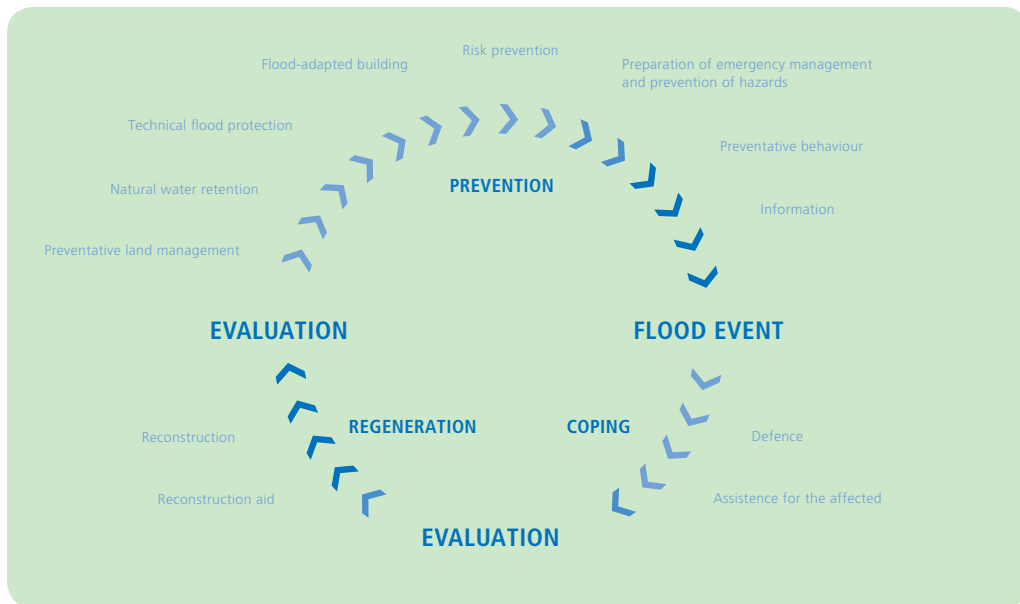
## 2.3 | CLIMATE CHANGE IN THE ELBE REGION

Central Europe is also affected by climate change. The consequences of global changes will also be noticeable in the Elbe catchment. In LABEL, existing studies on the impacts of climate change and required adaptation were evaluated and discussed (see LABEL-Box 1). The individual climate projections for the Elbe catchment with its diverse environment show a wide range and are still characterised by uncertainty. However clear trends can be named:

- Rise in temperature in summer and winter, also regarding extreme temperatures such as heat waves.
- Slight increase in rainfall during the winter months and decrease in rainfall in summer, the water balance is rather negative.
- Frequent extreme conditions: increase in heavy rainfall and dry periods.

Therefore, the impacts of climate change for the Elbe catchment are expected to be:

- Higher temperatures and heat waves in summer go hand in hand with water scarcity and low water in rivers. This does not only burden the nature, agriculture and navigation, but will also cause health problems for the population.
- Sporadic higher rainfall and warmer temperatures lead to increasing flood risks. Heavy rain is expected more frequently in summer and winter; especially water management, agriculture and flood protection in residential spaces are affected by this.
- Diminished groundwater regeneration and additional problems for the water quality (generally less drainage).



FLOOD RISK MANAGEMENT CYCLE

The hydrologic balance in the Elbe catchment is highly susceptible to the potential climate changes. In particular, water-related usages are often negatively affected by these changes. The water management has therefore an important role in the development of adaptation measures.

Adaptation measures should be specifically coordinated with the local existing problems, conditions and demands. Additionally, existing uncertainties, in connection with climate changes, should be included in the planning of measures: Flexibility is here the key to success. Several comprehensive measures, in accordance with sector, regional and cross-border cooperation can be underlined by the LABEL project:

- › Development of new and review of existing construction and technical standards as well as overall concepts concerning a climate adapted spatial usage (regarding all sectors);
- › Creation of maps as basis for planning, which take into consideration the influence of climate induced hazards and risks;
- › Development of an integrated, cross-sectoral spatial use and resource management under the consideration of climate change (e.g. regarding flood, domestic and ground water, land use, tourism development, agriculture);
- › Regulation of spatial uses in the areas affected by climate change, as well as the securing and retrieving of areas, which act as preventive protection (e.g. allocation of flood generation areas, renaturalisation of surface waters and flood lands);
- › Planning of climate adapted and climate-proof infrastructure;
- › Increase in the awareness of risks and problems in all sectors (e.g. water consumption, structural adaptation, agricultural methods);
- › Development and further development of integrated, cross-sector emergency plans and protection concepts;
- › Insurance against damages of climate change and set up of reserves for adaptation measures.

Under consideration of the collected measures, the following central conclusion became obvious: A large part of the proposed measures are already known in the regarded sectors and have already been applied against a different background. Thus, the adaptation measures can be linked, mostly with no problem, to existing guidelines and targets. Therefore, adaptation to climate change does not present a stand-alone field of action, but rather a task which requires a cross-sector, transnational and cross-border cooperation.

## 3 FLOOD RISK MANAGEMENT IN THE ELBE CATCHMENT

### 3.1 | NEW CHALLENGES TO FLOOD RISK MANAGEMENT

The flood risk management directive (FRM-Dir) 2007/60/EC which was approved by the European parliament and Council in 2007 created a framework for the evaluation and management of flood risks and the reduction of adverse consequences of floods. It provides three phases of implementation: the evaluation of flood risks, the drawing up of flood hazard and risk maps, as well as the establishment of flood risk management plans. The implementation of the directive sets the following new demands for the institutes responsible for flood risk management:

- › The standardised and agreed work in river basins is to be carried out on both international and national levels.
- › The consideration of all phases of flood risk management: prevention, emergency management and aftercare are mandatory.
- › All relevant stakeholder groups, which could contribute to a minimisation of damage, should have to be included.

The individual phases of implementation of the FRM-Dir are initially carried out on state and country levels. In order to standardise the management planning in the whole of the river basin, it is necessary to mutually inform, directly and intensively, about methods and tasks, to comprehensively coordinate and harmonize the approaches for flood risk management plans (FRM plans). The first foundations for this have already been laid in LABEL (See LABEL-Box 2).

Tested coordination structures to guarantee a transnational cooperation are already in place. The inclusion of diverse stakeholders on a municipal level for emergency management, spatial planning, agriculture and forestry, insurance industry and nature conservation requires a further development and the systematic anchoring of cooperation platforms. The water management institutions are responsible for the coordination. Apart from acknowledgement of their important tasks and responsibilities for risk management, the other stakeholders also have to make active contributions to flood risk management planning, introduce their own measures and implement them. Only when those responsible are actively involved in the management planning, will measures be implemented.

These tasks can be solved most effectively in the long-run and within the framework of a close nationwide and transnational cooperation of all those responsible stakeholders.

### 3.2 | PRELIMINARY ASSESSMENT OF FLOOD RISKS

The aim of the preliminary assessment of potential flood risks is to identify the stretches of water, for which more exact hazard and risk mapping, as well as extensive risk management planning is to be carried out. Within the framework of the LABEL working group RISK, the procedure of flood risk assessment in partner regions are comparatively discussed, evaluated and recommendations are worked out. In accordance with the FRM-Dir, a preliminary assessment of the flood risks took place at the end of 2011 for the whole Elbe catchment, based on the available or easy applicable information. The investigation of stretches of rivers with potentially significant risks relies on both reports and analyses of historical flood events, as well as on already available concepts and measures for flood prevention. In principle, the possible damages, the potentially affected residents and the risks for the environment and cultural heritage, which could arise from flooding, were taken into consideration. The applied significance criteria are however country-specific and thus different. An assessment by experts in all countries of the LABEL project partners indispensable, it makes the risk areas plausible and further complements them. The map illustration of the preliminary risk assessment follows on a small scale, with the presentation of the affected river stretches.

#### LABEL-BOX 2



#### REGULAR EXCHANGE OF THE WORKING GROUP RISK

Corresponding to the three implementation phases of the FRM-Dir, the approaches of the project partners from Czech Republic, Austria, Hungary, Thuringia and Saxony were compared in this LABEL working group, in the form of a synoptic comparison. Out of this, conclusions were drawn for an aligned approach and potential for harmonisation.

#### LABEL-BOX 3

##### TESTING THE REPORTING REGARDING THE FRM-DIR WITH WISE

The Czech Ministry of Environment tested the reporting of data for the preliminary evaluation of flood risks, in advance within the framework of a pilot project. For this purpose, a prototype of data records was created and set up in WISE. It demonstrated, that individual required data did not match with the applied evaluation methodology and adaptations in the data records were necessary. In the study, an efficient working method was worked out for the future filling in of the templates.



LABEL-BOX 4

A COMPARISON OF FLOOD RISK MAPS FROM GERMANY AND THE CZECH REPUBLIC

The upper map shows the flood risk map for the Thuringia part of the Weiße Elster. Below, a flood risk map can be seen for the Czech Jizera (section). Apart from the colour scheme and signature, the maps differ substantially by the illustrated contents: affected residents, IPPC structures, agricultural and forestry areas are not displayed in the Czech maps.



Conclusion: the basis for the preliminary assessment of flood risk is the same in all partner regions of LABEL. The criteria used are however different. In order to ensure a better comparison of the results in the future, the following is recommended:

- Comparability of significance criteria: **The underlying significance criteria in the determination of the potentially affected water stretches should be further specified and mutually agreed and even possibly standardised.**
- Determination of expected damages: **Analogous to the Czech methods, damage expectations should be used, as this can give an indication of the prevailing risks. Damage expectations only represent a part of the total risk. Scenario-based approaches for evaluating the total risk should be worked out transnationally.**
- Harmonisation of the map layout: **A standardized map layout is especially helpful for cross-border river basins.**

One of the tasks of every EU member state is to provide the results of the individual phases of the directive of the European commission by the reporting of data to the Water Information System for Europe (WISE). The LABEL project checked this in advance, with test data on the preliminary evaluation of flood risk. Against the background of an international river basin, the following can be concluded:

- Clarification of terms when reporting to the EU: **The used terms in the reporting forms are interpreted differently in the different countries and do not always conform to the applied evaluation approaches. For a transnational cooperation, a further close coordination is necessary in this matter, in order to avoid border discrepancies (see LABEL-Box 3).**

3.3 | FLOOD HAZARD AND RISK MAPS

According to article 6 of the FRM-Dir, flood hazard maps and subsequently flood risk maps have to be drawn up by 2013 for those areas mentioned in the preliminary assessment as having potentially significant flood risk.

The flood hazard maps which have, up to now, been drafted in the LABEL partner countries, contain the required criteria and are therefore comparable. The different starting points of the data basis cause partly varying illustrations (see LABEL-Box 4).

A general agreement between the countries with regards to Hydrology is necessary. The classification of intensities, such as water depth and flow velocities are the result of a risk analysis and is based upon, among other things, the risk of harm to people or the expected damages. Information on flow velocities are not available everywhere. However, especially in the low mountains area they should be part of the flood hazard maps. The flood hazard behind protective equipment is considered an important prerequisite by all LABEL partner regions for the risk evaluation, to increase the level of risk awareness and the reduction of potential damage. The selected map scale differs in the regions; however they all use the scale 1:10.000 as a benchmark. Larger scales are used e.g. in the upper regions of the considered rivers. The corresponding risk maps are, by all the involved LABEL project partners in the river basin, always drawn to the same scale as the flood hazard maps of the areas. The approach for the risk mapping follows different country-specific methods, but at the same time fulfils the required criteria from the FRM-Dir. Potentially affected residents are portrayed in the risk maps (e.g. in Saxony, Thuringia) or treated thematically (e.g. in the Czech Republic). Due to the distinctive character of the alpine area, in Austria the sediment transport is more intensely discussed there.

Conclusion: The current flood hazard and risk maps include the necessary fundamental water management information about flood risk. The users of these water management maps at e.g. the municipal level can

complement them with further information and adapt them to their specific requirements or demands. At the state and country borders, a clash of different illustrations can occur. The causes for the differences have to be sufficiently communicated to the public and at the same time the possibility of a standardised illustration should be examined.

A way to harmonise the hazard and risk maps was worked out and implemented in the LABEL pilot project “Weiße Elster” (see LABEL-Box 7) and in the LABEL working group RISK (see LABEL-Box 2). Out of the working group, the following conclusions for future flood hazard and risk mapping are made:

- Separate modelling of water estuaries: **Water estuaries require a special consideration in the designation of flood areas, the boundary conditions of the modelling should, if needed, be aligned in the river basin (LABEL-Box 5).**
- Increase the level of risk awareness behind protective structures: **In the future, stop lines for extreme flood events should be presented in the maps showing frequent and medium events. The extreme events should be considered without the effect of protection structures or should assume a malfunction of these.**
- Adaptation of risk maps to the demands of the user: **An intensive cooperation is necessary, in order to guarantee the further necessary adaptation of the risk maps by the respective user.**
- Harmonising maps in (sub) river basins: **It is necessary to also create harmonised hazard and risk maps for sub-basins. A standardized map illustration is especially helpful for cross-border river basins.**
- Creation of flood hazard zone maps: **Hazard zone maps, in which the intensity of flooding and the probability of occurrence are combined, are seen as an important aid for spatial and urban planning and should be created (LABEL-Box 6).**

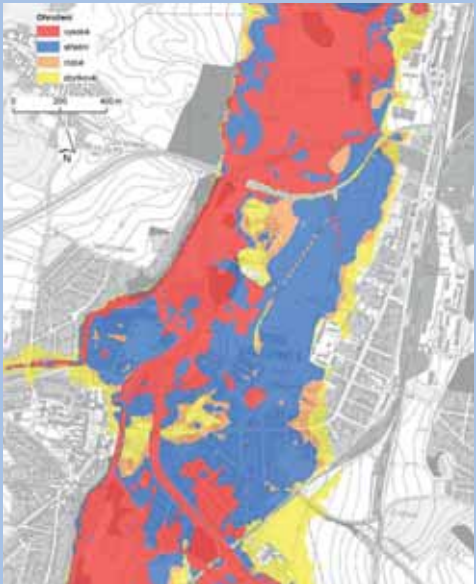
LABEL-BOX 5



HAZARD AND RISK MAPS AT RIVER ESTUARIES

The Vltava water authority has worked out a new approach for the modelling of river estuaries in a pilot project. These were tested for two river estuaries: Beroun / Vltava and Litavka / Beroun. Furthermore, hazard and risk maps were created, as well as maps on flow velocities and water levels.

LABEL-BOX 6



HAZARD ZONE MAPS ACCORDING TO CZECH METHODOLOGY

In the Czech Republic, so-called hazard zone maps, which combine the intensity of the flood with the probability of occurrence, were created as an interim step between the creation of hazard and risk maps.



## LABEL-BOX 7

### CREATION OF FRM PLANS FOR THE WEIßE ELSTER

A FRM plan was created in a LABEL pilot project for the basin of the Weiße Elster. The objective was an alignment of the methodology between the states of Saxony, Thuringia and Saxony-Anhalt and the Czech stakeholders involved in the LABEL working group RISK. A preliminary assessment of flood risks was carried out for the whole Weiße Elster catchment. For areas with a significant flood risk, hazard and risk maps, with a standardised layout and largely uniform specialist contents were made. The FRM plan for the Weiße Elster was worked out and aligned in three sub-sections (the Saxon, Thuringia and Saxony-Anhalt sections) and then added to the aggregated plan "Weiße Elster", which will in turn be included in the FRM plan for the Elbe basin. It became clear that the need for alignment during the creating of sub-plans was already very great, but worthwhile: the intensive exchange of opinion guaranteed the comparability of the whole plan.

## 3.4 | FLOOD RISK MANAGEMENT PLANS

The FRM-Directive requires the compiling of flood risk management plans by 2015, in order to avoid and reduce the negative effects of floods in the affected areas. In these plans, appropriate targets for flood risk management have to be specified. The focal point is the reduction of possible adverse consequences of flooding on human health, environment, cultural heritage and economy. Flood risk management plans encompass measures to achieve the specified targets while taking into account relevant aspects such as costs and benefits, flood extent and flood conveyance routes and areas which have the potential to retain flood water. They cover all aspects of flood risk management, whereby prevention, protection and preparedness, flood forecasts and early warnings should be in the focus. Furthermore, the focus is laid also on non-structural flood protection measures and/or a reduction of flood probability. The objective is to generally improve the FRM with the knowledge about risks, to use the measures of flood prevention more intensively and to implement the measures of technical flood protection more specifically and efficiently.

In this way, the FRM plans are a decisive instrument in the integrated flood risk management. In their creation, the diverse stakeholders from the field of municipal planning, emergency management, spatial planning, nature conservation, agriculture and forestry, insurance industry and those affected have to be included. Especially on the municipal and local authority level, as well as the affected people locally, the working focus is on the implementation of the directive in the sub-basin areas. Out of the management plans and measures of the sub-basin area, summarised national plans are developed. The FRM plans created within the framework of the implemented FRM directive, there are water management- and implementation-oriented plans and conceptions for the sub-basins, which complement and substantiate the FRM plans. In all LABEL partner countries, studies or groundwork were carried out for the preparation of the FRM plans. However, they show different work status. In a LABEL pilot project, regarding the sub-basin of the Elbe, the Weiße Elster a flood risk management plan was developed in cooperation of the German states of Thuringia, and Saxony-Anhalt (LABEL-Box 7).



BLUE WONDER IN DRESDEN

From extensive discussions in the LABEL working group RISK and the project work in LABEL, the following implementation-oriented recommendations were derived:

- **Harmonisation of FRM plans:** Based on the structure of the flood risk management plan for the whole river basin, a harmonisation of the plans on sub-basin and national level is to be strived for (LABEL-Box 7).
- **Description of the underlying strategy:** With the definition and naming of measures and targets under consideration of the diverse fields of action in flood risk management, the necessary strategic approaches are also to be described. The focal point should herewith lie in the consideration of transnational and interdisciplinary aspects in flood risk management.
- **Selection of feasible measures:** The selection of measures should be made under the premise that the implementation of the proposed measures should begin before the year of the next update of the FRM plan. Goals are to be defined regarding the fields of action, protected property and cost efficiency. A categorisation for the protected property should be established.
- **Harmonisation of measures weighing:** A harmonised prioritisation of measures is not possible, due to the diverse legal situations in the countries. Joint features and criteria should however be formulated.
- **Observance of interactions:** The measures of the FRM plan, in particular those of technical flood protection are to be checked for their conformity to the Water Framework Directive (2000/60/EC). To use the potential for synergy in the implementation of plans, it is advisable to coordinate all plans on all levels. These measures should be recorded in an interdisciplinary management system, to point out positive and negative interactions. This applies to the coordination with the measures, which were created within the framework of Flora Fauna Habitat Directive (92/43/EWG) or the bird protection directive.
- **Strengthening of the responsible institutions:** The appropriate involvement of the diverse stakeholders in the creation of the FRM plans is complicated and a, to that extend, new task for the water management. For this, an increase in the efficiency of the responsible water management institutions for the coordination is necessary.
- **Building cooperation structures:** The existing national and federal legal jurisdictions make it more difficult to achieve standardization in the implementation of the FRM-Directive. It is essential to highlight new paths of cooperation, to coordinate through limits of responsibility and to establish congruencies in the implementation approaches between the processed sections. These should also be obligatory on the sub-basin level (e.g. in nationwide working groups).

## 4 CONTRIBUTIONS TO DECREASE THE FLOOD HAZARD

### 4.1 | INCREASING THE NATURAL RETENTION OF WATER

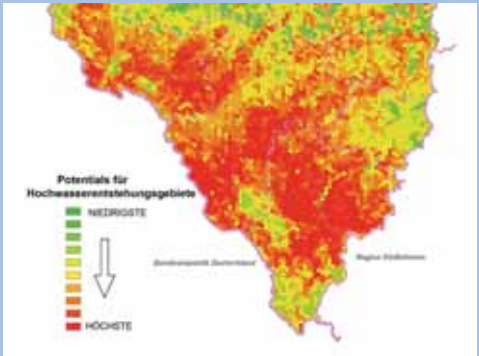
In the Elbe catchment, the low mountain range is often affected by heavy rainfall with short-term extreme outflows. The delay of outflows and the reduction of peak flows are essential in order to prevent a further increase of flood risks. An effective measure, in order to achieve this locally, is to identify and secure the flood generation areas and control the usage in these areas. There the infiltration capacity of the ground can be improved and the retention for the water in the troughs and streams can be increased. Thereby, the outflow to the rivers is delayed (retention) and a reduction of the flood peaks can be effectuated.

Which areas contribute to flood generation and which are suitable for retention, can be analysed by using diverse methods. In general, the soil properties, type of usage, ground slopes and the expected rainfall play a decisive role. In order to increase the infiltration capacity, the soil properties have to be improved by adapting their use.

Based on the activities carried out during LABEL in Germany, Czech Republic and Austria, the following strategic actions are recommended:

- Identifying and protecting areas where reductions of water infiltration or water retention should be avoided. **This can occur through the protection or the regulated use of flood generation areas or surfaces which contribute substantially to flood generation (LABEL Box 8).**
- Realisation of measures to improve water infiltration or water retention: **These can be achieved by the strict implementation of landscape conserving and improving measures, e.g. by the creation of landscape and nature preservation areas, reinforcement of woodland in the mountains or adapted cultivation of arable land (LABEL Box 8).**
- Legal instruments are necessary, in order to ensure the protection of flood generation areas: **Up until now there was no effective legal basis, which continually protects the identified flood generation areas from adverse land use. There are legal foundations for the assessment of these areas in Saxony. The implementation into the planning principles and practice is however still patchy.**

LABEL – BOX 8



IDENTIFICATION OF FLOOD GENERATION AREAS AND MEASURES TO REDUCE OUTFLOW

Flood generation areas in Saxony were determined locally by ELLA, the predecessor project of LABEL, with the help of the newly-developed methods and the expert system WBS FLAB. In the LABEL project, this method was applied and adapted to corresponding circumstances, in two Czech regions, Usti and Pilsen. Apart from the identification of flood generation areas, measures were proposed to improve water retention; by for example the renaturalisation of river systems, the revitalization of high moor lands or the transformation of arable lands into pasture land in the Usti region.

Due to the different natural landscape in Austria, another focal point was chosen. The effects of land-use changes on the outflow were analysed. From this, an optimised management strategy was deduced.

LABEL – BOX 9



EFFECT OF FLOOD RETENTION MEASURES IN THE ELBE CATCHMENT

The Federal Institute for Hydrology (BfG, DE) has, together with the Masaryk Water Research Institute (CZ), modeled the management of the existing barrages and dams (at the Ohre, Vltava and Saale) in the Elbe catchment during the past flood events (2002, 2006 and 2011). The results show a significant reduction of the flood peaks in all downstream regions, no matter which flood type was simulated.

These findings are to be specified in further large-scale studies, regarding their implementation in the second cycle of the flood risk management directive.

LABEL – BOX 10

EVALUATION OF EXISTING AND NEW RETENTION AREAS

With regards to the cooperation of the municipal working group on the **upper middle Elbe**, flood retention areas were evaluated regarding their possibilities and limits of use under the special consideration of the pollution caused by past floods. The objective was to optimize the uses of the retention areas in connection with flood prevention.

The Federal Institute for Hydrology evaluated the effect of the **Havel polder** on floods in the Elbe, in cooperation with 4 German Federal states. The model results show, that the effects are not homogenous but are dependent of the length of the flood peaks.

An evaluation of retention areas was carried out in LABEL by a study on retention capacities in the **Pilsen region**. Existing and potential retention areas, as well as measures on preventative flood protection were examined and evaluated. The findings are included in the regional planning documents of the region.

The examination of the Vltava water authority also evaluates existing possible retention capacities on the estuaries **Lužnice – Nová řeka – Nežárka**.



WATER FRONT ALONG THE ELBE IN DRESDEN DURING THE FLOOD IN JANUARY 2011

4.2 | SECURING AND EXPANDING RETENTION AREAS

For a long time, it was thought that the best protection against floods was to contain the course of a river. The overflow of the river banks should be prevented by constructed protection structures, such as dykes and protective walls. After numerous flood catastrophes which, despite the protective dykes, caused huge damages, a rethinking followed. With the expansion of agricultural land, increasing sealing of soil, and the straightening and confining of rivers, the natural retention areas were destroyed, flood flows were speeded up and flow peaks increased. In order to counteract this development, retention areas are used upstream (using dams), as well as on the mid and lower reaches of the river (using flood polders). In the event of heavy rainfall, these ensure that the water was temporarily held back, so that the water level downstream can sink.

This task especially highlights the need for transnational cooperation: The upstream areas hold the water to prevent floods downstream in the neighbouring area. A completely effective retention is not possible without unity and solidarity with one's neighbours, as the retention measures are affecting the river downstream (LABEL-Box 9).

Out of the results of LABEL activities, the LABEL partners draw the following conclusions:

- › Protection of existing natural retention areas: **In order to be able to permanently keep the existing natural retention areas, these must be protected with the corresponding spatial planning instruments. In Germany, this can be achieved by the determination of priority areas for flood prevention in regional plans.**
- › Evaluation of existing reservoirs regarding their retention potential: **To the same degree as the existing natural retention areas of the river should be protected, the existing reservoirs (dams) should also be taken into consideration. This potential should be identified and optimised for the event of a catastrophe. However, it should be discussed and assessed against the background of the diverse usage interests (LABEL-Box 9 & 10).**
- › Identifying and protecting suitable new areas to create polders and retention areas: **The aim should be a multifunctional usage of this location (LABEL-Box 10).**
- › Securing of retention areas and flood areas in spatial planning as well as their consideration on municipal and urban planning: **This can be reached through the presentation of flood areas in the water management planning without the effect of flood protection structures, by the illustration of flood areas at extreme floods<sup>6</sup>, as well as through the protection through suitable retention areas on a municipal level. In one LABEL pilot project the planning methodology for the Upper Elbe Valley / Ore mountains was investigated with regard to a stronger focus on the adaptation of uses to flood risk. The activity was carried out in a close dialogue with affected municipalities of the region, to secure the practical application sustainably (LABEL-Box 13).**

- › Solution of conflicts of usage with all affected: **all affected administrative levels, all influenced regions in a river basin (upstream and downstream) as well as all relevant experts should be integrated into the solution of conflicts of usage in the flood risk management through joint events. The EU flood risk management directive explicitly stipulates their involvement.**
- › Clear regulations regarding the solidarity principle between upstream and downstream have to be found: **The ever present big challenge is the securing of a joint financing, management and liability of structures to preventive flood management. This issue was also discussed in the LABEL legal workshop. International legal foundations could not be identified though. In this context, the practice of solidarity funds for past damages is of particular importance: The applicable principles have to consider the solidarity at flood prevention. It has to be ensured that they do not contradict the principle of flood prevention (LABEL-Box 11).**

## LABEL – BOX 11



### LEGAL WORKSHOP ON THE PROBLEM OF UPSTREAM AND DOWNSTREAM RIPARIANS

At the LABEL workshop, the “problem of upstream and downstream riparian” was discussed with legal experts from Germany and the Czech Republic and how to deal with questions regarding the liability and financing of flood protection measures. A clear prevailing legal foundation could not be found. However, it was emphasised that the European countries present a mutually supportive society with a duty for reciprocal tolerance and respect. That is firmly embedded in the EU flood risk management directive (Art.7).

## LABEL – BOX 12



### TECHNICAL FLOOD PROTECTION IN THE CENTRAL BOHEMIA AND USTÍ REGIONS

In the Elbe drainage basin, the residential settlements are already, for the large part, protected by technical protection measures, in the form of dykes and mobile protective elements.

LABEL systematically checked the status of flood protection in the region of Central Bohemia. Weak points were identified and goals for flood protection were newly established, as well as the proposal of concrete measures to improve flood protection.

In the region of Aussig, the municipality Chodouny-Lounky was affected many times by flooding over the last few years. Flood protection measures for the area were conceived in the LABEL project and the following was planned: a protective wall in the Northern area, earth fill and another protective wall in the southern area. The protection will be complemented by mobile construction elements.

## 4.3 | TECHNICAL FLOOD PROTECTION

Mostly technical protection measures are considerably more expensive than non-technical measures, but they are indispensable, where existing settlements, infrastructure and other objects are to be protected. At the same time, technical protection measures can never provide an absolute protection against floods. Furthermore, technical equipment can lead to higher flow velocities in downstream sections of the river which in turn causes higher peaks.

Out of the results of the executed LABEL studies, as well as the intensive expert discussions in the LABEL working groups, the following measures are recommended for the Elbe catchment:

- › Technical protective structures should only be constructed where preventative protection measures are neither possible nor practical: **Here the technical flood protections may not worsen the present situation, as far as the loss of retention space and increase in damage potential in the flood area is concerned (LABEL-Box 12). For the lost retention areas, it should be compensated for locally.**
- › Increased consideration and communication of the risks of failing technical structures: **Technical structures can fail to function properly, which can have catastrophic consequences. Bursting of dykes also regularly takes place in extreme flood events: nevertheless the residents believe that they are safe behind dykes. The risk of technical equipment failing must be offensively communicated and integrated into the risk considerations.**
- › Inclusion of technical structures in regular transnational exercises (emergency management): **The technical structures should not only be tested for their functionality. Exercises for the event of failure should also be held. Technical equipment can furthermore be used in demonstrations so that emergency situations can be visualised. With the sudden outlet of water from a dam for example, a small flood surge could be simulated.**

# 5 ADAPTATION OF USES TO FLOOD RISKS

## 5.1 | REGIONAL AND MUNICIPAL PLANNING

The increasing use of land in residential regions, the intensification of economic development, but also the possible climatic changes, result in increased challenges for flood risk management, and demand from all stakeholders the adaptation to the existing and future risks at the river.

Also in the residential areas which are threatened by flooding, there is a continuous increase in damage potential. The reasons for this are among other things, the densification of the population, and the increase in values or the restructuring of uses on the existing and former settlement areas. Even new building sites are sometimes planned in risk areas, because either the possible risks were not sufficiently recognised in the planning stages or given too little importance against other usage interests. The spatial planning employs their instruments' with increasing damage potential, in order to prevent the increase in potential dangers in flood risk areas by using new definitions and planning. However, it is not possible to prevent a further increase in the current risks with neither water resource nor spatial planning instruments.

In the newly planned building sites the risks situation is nowadays mostly taken into consideration. However, structural flood protection measures are still often viewed as adequate for complete risk prevention. The location of new building sites in the areas with a high level of residual risk (behind protection structures and dykes) does not often lead to a change in the planning, but request for the demand for further structural protection measures. Therefore, the regional planning attempts to limit the extent of the arable areas in the regions which are susceptible to flooding and to protect the natural flooding areas. In the enforcement of this goal the cooperation between regional and urban planning, as well as water resource is of central importance. The regional planning contributes with prevention. However, they can only really be effective, if the municipal planning follows the same objective.

Here, it is important that the level of awareness about the flood risk as well as about the prevention possibilities should also be expanded.

Out of the transnational exchange, the following can be concluded for the whole of the Elbe catchment:

- › Reduction of damage potential in flood areas:
  - Complete integration of hazard information in spatial planning: Consideration of hazard information in the planning; in this context other aspects such as demography development and climate change should also be considered.
  - Intensification of the cooperation between region and municipal planning, to better coordinate the methods of risk prevention and the planning practice in municipal and regional planning. The actual planning and usage decisions in the municipalities are decisive for the success of the influence of spatial planning (see LABEL-Box 13).
  - Mandatory building precautions: mandatory structural protection of buildings in risk areas (e.g. sealed house apertures, secured technical equipment). Also the vulnerability of traffic-technical equipment should be diminished by building precautions.
  - Promoting precautionary behaviour through the provision of comprehensible and extensive information, which should be provided by diverse media.

## LABEL – BOX 13



### COOPERATION BETWEEN REGIONAL AND MUNICIPAL PLANNING ON FLOOD RISK MANAGEMENT IN SAXONY

In a LABEL pilot project in Saxony, existing development plans in flood areas were evaluated together with the affected municipalities. The following deficits were identified:

- › Building permission in flood areas are often not turned down, even if possible flood depths of more than 4 metres or high flow velocities exist.
- › Important aspects of risk prevention, such as limitation of potential damages or the number of residents to be evacuated do not play a role in the building permission process. Here the welfare of the general public is not taken enough into consideration, compared to the attention paid to the protection of private property.
- › Consideration of possible extreme flood does not take place.
- › The realised building volume according to the paragraph § 34 BauGB has already exceeded the building plans in many municipalities many times over. Therefore, the instruments of regional planning remain greatly limited in their effectiveness.

Possibilities were examined on limiting the priority areas for flood prevention not according to the probability of occurrence or available use (for both within city limits and outside) but according to the intensity of the danger (flood depths and river flow velocity).

- › Securing retention areas and flood generation areas through spatial planning instruments. In order to increase the water retention and to reduce flow rates, it is also important to ensure that the affected areas, especially flood generation areas are appropriately used and managed.



## LABEL – BOX 14



### FLOOD INFORMATION FOR THE ELBE DRAINAGE BASIN AREA

A fundamental transnational source of information about flood hazards and risks makes up the **Elbe Atlas**. In LABEL it was expanded by maps on damage evaluation on the Elbe in the second edition.

The further development of the **River Hydrology Software (FLYS)** as an information and evaluation system for hydrological model-based geographic data to an internet application makes possible a transnational employment in the whole of Elbe basin.

**Interactive hazard map for the municipal flood protection (INGE)**: an instrument for the planning and implementation of emergency defences by local authorities. It is to be employed transnationally in the Elbe catchment.

## 5.2 | PROVISION OF INFORMATION ABOUT RISKS

To be able to plan and take action orientated by risks, the relevant stakeholders have to have access the necessary risk information. For example, regional and municipal planning require easy access to risk maps, which are based upon a mutual understanding of similar scenarios and on comparable foundations. These demands are underpinned by the EU flood risk management directive. For international catchments, a joint understanding of methods, tasks and implementation has to be reached. Both by the processing of risk management elements (maps, measure planning etc.) as well as in the publishing of information, a close national and international exchange between the responsible regions is necessary.

A central part of the LABEL cooperation is the development and publishing of hazard and risk maps in the Elbe Atlas (**LABEL-Box 7**). Moreover the exchange of expert knowledge and diverse approaches in the corresponding regions of the Elbe catchment and moreover in the Danube and Tisza catchment areas is fundamental. The understanding of the similarities and differences of approaches as the implementation of the EU flood risk management directive is decisive, in order to develop joint approaches and to discuss recommendations of actions. This process was made possible by the regular meetings of the LABEL working group, as well as the interdisciplinary expert workshops. The exchange of data and background information beyond these personal meetings is

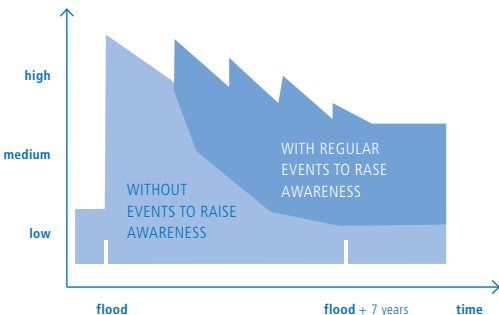
nevertheless still difficult due administrative and language barriers. The common understanding of the tasks of flood risk management, the insights won by LABEL should be further developed and continued.

Therefore the project partnership recommends:

- Provision of specialized information throughout the river basin area: Difficulties in the active transnational cooperation frequently arise, when it relates to the exchange and the use of expert data and information. Also specialised applications, such as flood portals and information systems should be provided and established for the whole of the river basin. Numerous such information systems were created in LABEL (LABEL Box 14).
- Information and education in the handling of hazard and risk maps: The hazard and risk maps will be gradually compiled by the responsible persons by 2013 in the context of the EU FRM-Directive. In LABEL, an intensive exchange took place between German states and the countries Czech Republic, Austria and Hungary. However, the collected experiences and information must be forwarded on to the right places, which will use the maps in the future but are not involved in LABEL. Also a regular transnational exchange and cross-border training to update the hazard and risk maps and flood risk management are necessary, so that the joint understanding of the FRM tasks won by LABEL does not get lost.

## 5.3 | RAISING FLOOD RISK AWARENESS

RISK AWARENESS



A central task of flood risk management is to create and maintain an awareness of living with the risk of flood. Only when every single decision maker or person affected is aware of the flood risk, he can be prepared and avoid ensuing damages: by foresighted planning, structural prevention measures on endangered buildings or through preventive behaviour. In this way, house-owners can ensure that e.g. expensive objects or water-hazardous material such as oil or paint is stored in elevated rooms. Such measures can diminish the damages your own, but also the danger to others<sup>9</sup>. Apart from that, prudent behaviour can in the case of emergency facilitate the work of the rescue workers and could even save a life.

A further big challenge emerges, due to the fact that after a flood event, the level of risk awareness among the public gradually decreases over time. That means that the residents living close to a river, which did not experience a major flood event recently are not sufficiently aware of the flood risk. It is essential that the level of risk awareness is kept at a high level, with the help of regular information events or other activities.

Based on the experiences from the LABEL activities (**LABEL-Box 15**) the following recommendations for the future work of increasing the awareness of risk were collected:

- Communicate the subject of flood and the tasks of the flood risk management simply and target-group specified. **Complex connections, such as flood risk management are often presented in a too complicated manner.** One example is the statistical recurrence intervals; it is often not understood what a 100 yearly flood means. Therefore, it is important to convey simple and comprehensive messages, without too much specialist terminology (see LABEL-moving exhibition in LABEL-Box 15).
- Attracting attention through innovative measures: **New approaches with modern forms of presentation can put the focus on not yet considered connections, e.g., flood risk and tourism in the LABEL tourist guide "WasserKulturLandschaft Elbe" (WaterCultureLandscape Elbe) (LABEL-Box 17).** In this way, even less approached target group can be addressed.
- Don't let past flood events be forgotten: **Many people, who live in close proximity to the Elbe, have already directly or indirectly experienced flood events.** To take up on these personal experiences and at the same time to give recommendations, how the individuals can better protect or prepare for a flood has more of an effect than just simply informing them.

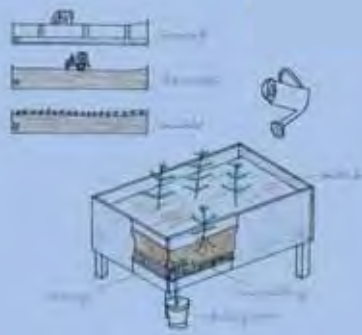
## 5.4 | RISK-ORIENTED DEVELOPMENT OF TOURISM

The Elbe and its tributaries have a high recreational value. The Elbe catchment is well known for its untouched natural and scenic beauty. In many places, tourism is already an important economic factor and still further great tourist potentials exist. The areas/locations along the river are extremely valuable for bike and water tourism, but also for touristic infrastructure like campgrounds. At the same time, the progressive exploitation of these areas produces conflicts with risk management: retention areas are lost and damage potentials increase.

The linkage between flood risk and tourism development is often little considered or ignored by the stakeholders. The communication concerning this linkage and the raising of awareness for risks is necessary, in order to guarantee risk management goals and sustainable tourism development.

Within the framework of the LABEL project five partner regions have taken up the challenge to combine sustainable flood risk prevention and the development of tourism. Saxony-Anhalt (DE), South Bohemian region (CZ), Central Bohemian region (CZ), Pilsen region (CZ) as well as the holiday region Bohemian Forest (AT). The natural and tourist features of the regions differ very greatly. While the water tourism infrastructure is very well developed in Saxony-Anhalt, thanks to the help of the initiative "Blaues Band", adequate infrastructure and touristic offers are missing in many Czech regions. However, great potential is available. The interest from potential users in transnational offers is very large; however the obstacles often are the lack of information material, the poor quality of the facilities and the language barriers.

## LABEL – BOX 15



### INCREASE IN FLOOD RISK AWARENESS ON THE ELBE

The LABEL partnership demonstrates how the affected public can be made aware of the topic of flood risk through numerous creative and innovative activities:

**Moving exhibition:** based on the moving exhibition from the ELLA project, LABEL produced an updated exhibition. The exhibition was held in the whole of the Elbe basin and can also be let elsewhere.

**Media contest on flood protection:** Under the motto "Hochwasserschutz beginnt im Kleinen. Und jeder kann mit wenig Aufwand dazu beitragen" (Flood prevention begins on a small scale. Everyone can make a difference with a little effort) a public media contest was started. The best ideas in the categories: poster, film and creative will be announced at the LABEL final conference.

**Project day with school children:** 36 children between the ages of 6 and 10 took part in the project day "Life on the river". A focal point was to make the children aware of how floods form.

**LABEL-Films:** The three LABEL Films show, how individual people in the Elbe region profit from the findings of LABEL.



## LABEL – BOX 16



### EXPANSION OF WATER TOURISM INFRASTRUCTURES AT THE ELBE

The **Central Bohemia region** has examined in LABEL the potentials of water tourism and recreation areas. Within the framework of the study, flood adapted landings and suitable locations for the expansion of small marinas were determined, as well as refuge ports for floods.

In the **Pilsen region** existing structures were checked for their protection against flood. Measures for the protection of individual locations and further possibilities to promote adapted water tourism were proposed.

## LABEL – BOX 17



### INCREASING THE FLOOD RISK AWARENESS OF THE TOURISTS.

Points of interest and structures on the subject of water are shown in the brochure "WasserKulturLandschaft Elbe" (WaterCultureLandscape Elbe) – traces and testimonials of water". A corresponding website [www.wasserkulturlandschaft-elbe.de](http://www.wasserkulturlandschaft-elbe.de) offers extensive information and moreover offers the inclusion of further water-related attractions by the interested users. Tourists and residents can, in this way, be sensitized for the subject of water management and towards flood risk.



ON THE ELBE RIVER NEAR MĚLNÍK

First, the partners drew up diverse local studies, which investigated the risk-adapted water tourism in the corresponding regions. Furthermore, a joint workshop on the subject of water tourism was carried out on which the potentials along the Elbe were defined and the possibilities to improve the risk-adapted water tourism were worked out. Based on the results of the studies and workshop, the following joint recommendations were developed:

- Expansion of water tourism infrastructure under the consideration of flood risks: **There is a great need to bring the water tourism infrastructure to similar standards. Marinas, information centres and clear signposting have to be set up to appeal to more tourists. Here the security of the facilities against flooding and the access to them in the event of flooding has to be guaranteed and preventative aspects must also be considered. The possibility to integrate the structures for flood prevention with touristic use should be taken to account (LABEL-Box 16).**
- Improved communication of flood risks at tourism providers: **A survey in Saxony-Anhalt found that the majority of tourism providers have neither structural protection nor financial insurance for the event of flooding. The tourism providers have to be provided with custom-made information on flood risks, which are tailored to fit the demands of water tourism use. An objective is to sensitize the providers so they can forward the information to guests which raises risks awareness in general.**
- Increasing flood risk awareness among the tourists: **Tourists are also interested in the natural environment at their holiday destination. Living with the risk of flooding at the Elbe is part of life. First experiences from LABEL with materials specifically prepared for this target group show that they were met with great interest (see LABEL box 17).**

- Networking of water tourism offers and their marketing along the Elbe **The importance of permanent superregional and transnational cooperation to support water tourism was highlighted in the project and the joint workshop from all sides. This cooperation should refer to both the possibilities of water tourism offers as well as their marketing:**

- **Expansion of the water tourism offers through better networking, for example in the area of touristic navigation. Here associations, organisations and authorities need to work together better.**
- **Strengthened cooperation between the German federal states, as well as between the countries (Germany, Czech Republic, and Austria) in the marketing of water touristic offers.**

**Standard symbols for points of interest and water tourism infrastructures (harbours, marinas, landing stages etc.) should be introduced both nationally and transnationally.**

## LABEL – BOX 18



### ASSESSMENT OF THE NAVIGATION ON THE ELBE

In **Saxony-Anhalt** an evaluation of current studies on navigation on the German part of the Elbe was commissioned. The assessment showed that the inland ports present a modern and efficient infrastructure, which is only partly exploited due to the fluctuations in the water level. A further obstacle presented is the limited availability of navigation space, in times when the navigation conditions are favourable. Since the flooding in 2002 and many years before, the capacities have migrated. The effects of climate change on navigation conditions were discussed with much controversy during the study.

The **region of Central Bohemia** has investigated alternative expansion classes to the classification proposed by TEN-T, which would interfere less with other uses along the river as well as the nature.

The Děčín barrage is a subject of discussion in the **Usti region**. The possible effects of the structures on the sustainable development in the region and the downstream areas were examined. For Germany, there were no negative effects expected. Minor flood events (up to HQ2) can be reduced by the barrage, bigger events should be, through the structure, neither positively nor negatively influenced.





WATER WAY CROSSING IN MAGDEBURG

## 5.5 | PERSPECTIVES FOR NAVIGATION ON THE ELBE AND VLTAVA

In the past, navigation on the Elbe has contributed greatly to the economic development and exchange along the Elbe. Navigation is today still of particular interest for many regions. However, they are often competing with other uses, among which are measures to prevent flooding, as well as ecological objectives. At the same time, and ultimately due to the effects of climate change, periods of extreme water levels (above all low waters) present an increasing challenge for navigation on the Elbe (see also Chapter 2.3).

In 2006, the Ministers of Transport in both Germany and the Czech Republic signed a “joint declaration of intent for the cooperation and the transport aims and measures for the Elbe waterway up to the Geesthacht barrage” in Hamburg, in which the restoration and the security of the status quo of the navigation conditions before 2002 are described. This means that for inland cargo a navigation depth between Geesthacht and Dresden should be at least 1,60 m and between Dresden and the border to Czech Republic 1,50 m during 345 days on average. An expansion of the conditions is not planned.

Navigation on the Czech Elbe is noticeably influenced by the 40 km long stretch, upstream of the German border. The reasons for this are the distinctive flow fluctuations, which make navigation in this critical stretch impossible for approximately three to six months a year. Therefore, these conditions prevent the effective use of the whole of the Czech Elbe waterway as a navigation route. In order to address the problem, a project has been planned for some time, to build a barrage in the city Děčín, under the Tyrš-Bridge. The aim is to guarantee

### LABEL – BOX 19

#### CHANCES FOR NAVIGATION ON THE VLTAVA

The Vltava is the most important inflow of the Elbe in the Czech Republic. Presently, regular navigation traffic can be found on the stretch of water between the Orlik dam and the town of Týn nad Vltavou. The region of Southern Bohemia supports the expansion of navigation, especially that of passenger and recreational navigation. The liners, which run according to a regular timetable, should optimise the facilities for public passenger traffic. Furthermore, the recreation liners for tourists from Central and Western Europe should be extended. The large tourism potential of the Southern Bohemia region, along the Vltava is yet to be exhausted.

the following water level for navigation in the Czech Republic, a depth of 1,40 m for 345 days a year and a minimum level of 2,20 m for 180 days. These improvements fulfilled similar parameters, which apply for the connecting Elbe waterway in Germany.

In many respects, the work on the subject of navigation and flood risks in the LABEL project was an interesting challenge. In recent years, the topic of navigability has become a “hot topic” for both public and political debates especially in Germany. Numerous studies since the flooding in 2002 have found that, concerning this matter, ecological and economic interests diverge. With the LABEL activities in Saxony-Anhalt and the Czech regions of Usti, Central Bohemia and South Bohemia, the dialogue was constructively continued. An overview on the very complex debate and the active exchange of the stakeholders in the regions was reached.

#### Development goals for the Elbe from a German point of view:

- › “Maintenance goal Elbe”: **Re-establishment and maintenance of the conditions before the flood of 2002, as signed in the 2006 declaration of intent. The Elbe should not be expanded beyond the conditions defined there.**
- › **Reliable surveys should be created on the development of cargo volumes, the effects of climate change and the compatibility of economy and ecology (see LABEL Box 18).**

#### Development goals for the Elbe from a Czech point of view:

- › **Improvement of navigation conditions: The regions along the Elbe Usti, Pardubice and Central Bohemia consider it necessary to improve the navigation in the critical stretch from Usti on the Elbe to the German border. Here a compromise should be found between the expansions of navigation, nature conservation and flood prevention (see LABEL-Box 18). The transport connection from the Czech Republic with the North Sea and other waterways should be ensured in that way.**
- › **Building of the Děčín barrage: The barrage is seen as an important prerequisite, to improve conditions for the navigation on the Elbe. Through numerous investigations and long years of planning, the ecological effects on the river should be minimised (LABEL-Box 18).**

The Czech regions accentuate that the Elbe presents an important waterway. The river is the most important water connection to the North Sea. This corresponds with the principles of the European Commission, which included the Elbe as an international waterway in the TEN-T priority projects.

#### Development goals for the Vltava:

- › **Expansion of navigation until České Budějovice for ships up to 300 tonnes. The navigability of the Vltava for transport ships, up to 300 tonnes, would make ecological transport of bulk cargo from Southern Bohemia to other regions along the Vltava and Elbe possible. Furthermore, passenger and touristic navigation were also made possible (see also LABEL-Box 19).**



CONFLUENCE OF VLTAVA AND ELBE

## 6 FUTURE TRANSNATIONAL TASKS IN THE ELBE CATCHMENT

### 6.1 | TRANSNATIONAL AND NATIONWIDE COOPERATION

The international cooperation in the Elbe catchment is well established across countries: For decades, the water management has worked together. The international commission for the protection of the Elbe (ICPE) has existed for over 20 years, and is involved in both the water quality management and flood protection along the Elbe. Since 2002, a complementing close cooperation and active transnational exchange on a working level has existed through the ELLA and LABEL INTERREG projects.

However, there is still much to do. The threat of flood risk will be also be present in the future. Adaptation of existing uses can often not be realised. Adaptation in new projects is not implemented everywhere in

the Elbe catchment as it would be necessary. Moreover, there are new requirements for an extensive flood risk management, which demand a close transnational cooperation: the Elbe catchment should be even more intensively dealt with. This is also true concerning the effects between measures in the different river stretches and for the economic aspects of the development of the river basin.

The implementation of the EU flood risk management directive and coping with the climate change requires a close international cooperation. Also, cooperation with neighbouring river catchment areas, such as the Oder, should be supported.

Within the countries, administrative borders between responsibilities for flood risk management have to be overcome. The planning in river catchments are partly more characterised by administrative borders. With its federal structure, Germany is an example of this: the individual federal states, as far as water management is concerned, have their own rules, which differ from those of the neighbouring states. Cooperation beyond regions is an important side effect of transnational projects like LABEL. In the Czech Republic, the cooperation between the regions within the Czech Republic but also with German States intensified significantly.



The LABEL partners concluded the following:

- Continuation of the LABEL partnership: In the medium term, the river basin wide and transnational exchange between the stakeholders and levels should be continued, in particular to achieve long-term improvements and further progress on the working level. The network which was created in ELLA and consolidated in LABEL should be continued for the implementation of the goals and measures described here.
- Adapt geographical scope of funding programmes to river catchments: It is important that natural borders of international river basins, like the Elbe catchment are illustrated in future funding programmes. This also can be carried out with corresponding regulations on the approval of the partners from the other areas, if it supports the cooperation. This is a core point in river management within international river catchments.
- Clarify legal questions on cooperation: There continues to be a deficit, as far as a clear joint understanding of the formal framework of international cooperation is concerned, when realising flood prevention measures. In particular legal questions in connection with the upstream-downstream principle (e.g. joint transnational financing of retention measures in the upstream region of river, claims for compensation for the interference of flow conditions) could present an obstacle for the closer and more effective cooperation in flood prevention.
- Understand transnational effects of measures: The assets of transnational effective measures and e.g. the cost or savings related to it, can only be assessed, if the effects of the measures are already reliably known. A comprehensive analysis of transnational effects of retention measures was carried out in LABEL. The findings show impressively the value of transnational cooperation. Corresponding considerations have to be regularly updated, improved and above all conveyed to the public.



- Creation of municipal flood partnerships: During the LABEL project the "Flood partnership Labe-Elbe" was started as a communication platform. This was extended for the whole of the river basin area, to enable a direct exchange for the realisation of measures and goals between those affected and the most important stakeholders. This is an important contribution for the extensive regional cooperation and the information exchange on all questions of flood risk management. In particular, this cooperation has to involve the local planners and decisions makers and should not be confined to trans-regional and national representatives.

## 6.2 | TRANSNATIONAL TASKS REGARDING FLOOD RISK MANAGEMENT

The LABEL partnership understands flood risk management as a joint and integrative task of the diverse stakeholders (i.e. water management, spatial urban planning, nature conservation, forestry and agriculture, navigation and tourism, building industry, insurance and banks) in the Elbe catchment. All levels work together: international level through the ICPE, national and federal state level, as well as municipalities. The main aim of risk management is less the creation of maps or a plan, but rather the coordinated fulfilment of the preventative and aftercare obligations by the diverse stakeholders.

The flood risk management itself is most effective, if risk management plans are worked out and implemented comprehensively transnational. However, the responsibility for the risk management is divided in administrative borders, as described in other places. The degree of coordination has not yet been legally clarified.

Diverse approaches were compared in LABEL. Transnational plans were developed on a pilot basis. In this way, LABEL provides methodical and organisational foundations for the work on an international river catchment.

In the extensive implementation, however, the following transnational tasks are to be performed:

- Comparison of assessment and significance criteria: to evaluate the flood risks a comparative assessment has to be guaranteed for all sub-areas. This also applies to the methods of investigating damage potential.
- Harmonisation of map illustrations: The hazard and risk maps are, as far as the necessary contents within the river basin are concerned, mostly generally comparable. However, the comparisons in LABEL show that there are considerable regional differences in the illustrations and the basis for the illustrations. This also partly concerns the diverse regions or states respectively. The aim, in the medium-term, is to achieve greater alignment of the maps for international river basins.
- Simplification of the exchange of data and transnational alignment: Calculation basis, data used for creating the maps and for flood risk management plans should be made easier accessible in the transnational cooperation, so that they are mutually understandable.
- Joint planning of measures: Measures of flood risk management must be jointly assessed and implemented according to aligned priorities. For this a unified catalogue of types of measures would be helpful, as a basis for the regional adaptation. This could include fundamental comparative assessments. Examples for diverse European river areas have already been developed.

The transnational development and distribution of solutions is helpful. The acceptance of adaptation measures and related costs or restrictions increases demonstrably, if they are not dealt with locally isolated. Furthermore, the national cooperation of adaptation measures can make it clearer, how local measures are integrated into complex effective connections and spatial structures in the Elbe catchment and cannot be solved by sector-related or local considerations. Therefore, the future tasks in this field are:

- Inclusion of all affected stakeholders in the river basin in adaptation concepts: For example, the tasks of urban planning are of great importance. Here up to now less considered stakeholders, such as tourism industry should be included in flood risk management planning.
- Adaptation of municipal planning to hazards: Urban planning plays an important role in flood risk management. Settlements are not only the affected ones but also a decisive cause of flood risk. Instruments to control the risk-adapted land use are known. This enforcement must be carried out more effectively and also be monitored. Apart from the reduction of damage potentials in settlements, retention areas can be provisionally secured.
- Support of municipal cooperation: International municipal flood partnerships present very suitable foundations, in order to stipulate local actions in the context of the impact of floods. In this way, the awareness of the problem and the acceptance of the adaptation can be raised. Furthermore, the planned measures on flood protection can be directly aligned with each other.
- Greater involvement on the municipal level in flood risk management planning: The municipalities should be involved in the creation and checking of the flood risk management plans and in the planning and implementation of measures by the responsible officials.
- Consequently consider adaptation to flood risks and climate change in new developments and existing uses in risk areas. Despite many years of attempting to avoid and reduce the damage potential in flood areas, further action in the future is necessary which urges an adaptation to flood risks in the catchment area. Furthermore, in the future there is the added challenge of climate change, which is especially applicable to the field of inland navigation, with an expected reduction in navigable days.
- Regularly informing and up-keeping of risk awareness to prepare all relevant stakeholders and the affected population for a possible emergency. Here the aim should be an integrated consideration of the arising risks due to floods and climate change.

- Continuation and intensification of expertise cooperation: Firstly, a coordinated flood risk management demands the understanding of approaches and methodology used by all neighbouring regions. To ensure the groundwork achieved by LABEL sustainably, regular meetings on a working level are necessary. For this a stronger transnational cooperation in research projects and the immediate exchange of results between experts and the political level are significant.
- Transnational agreement on emergency management: The principles and procedures in the event of a catastrophe should be mutually known by all involved regions and countries. Joint crisis strategies and plans of actions, for the event of a flood, based on international agreements, are especially important in border regions. In this area, there is still a need for improvement.
- Transnational cooperation of flood handling: Joint cross-border exercises, the use of information systems which are compatible with each other, as well as tightly controlled information paths (information is channelled directly to the persons affected / stakeholders) are recommended.
- Improvement of the forecast and risk management of flash floods: Flash floods can, especially against the background of possible consequences of climate change (increase in strong rainfall), pose a considerable danger. This type of flooding has been, up to now, little considered in flood risk management plans, due to insufficient available data.
- Communication and raising risk awareness: The existing foundations (information of diverse target groups, hazard and risk maps etc.) must be more effectively used to make the affected parties aware of the requirement for action and to trigger the necessary actions by the stakeholders. For this, a greater involvement is needed of municipalities, the local economy and the affected public. However, many very good approaches demonstrate difficulties, in maintaining the risk awareness high. As in the past, successful, transferable resources are still required.

## 6.3 | TRANSNATIONAL TASKS REGARDING ADAPTATION TO FLOOD RISKS

As the hazard of flood in the future cannot be eliminated, all possibilities to adapt the uses to the flood risks have to be exhausted. Extensive possible measures have been developed and documented. However the status of the implementation and execution is not sufficient.

The adaptation of new projects often fails due to higher costs or the inadequate knowledge of occurring risks. The adaptation of existing uses additionally fails due to the lack of acceptance for restrictions or changes, or due to technical limits, which are often associated with high costs.

The effective and sustainable adaptation to flood risks in the Elbe catchment requires these obstacles to be overcome. For this, on the one hand instruments are necessary (Planning instruments, information, financial instruments) and appropriate local solutions. On the other hand examples derived from LABEL show, that the most effective changes are not achieved by ordinances and regulations. In fact a continuous cooperation between experts, responsible authorities and local stakeholders is required.

# OVERVIEW OF ALL ACTIVITIES IN LABEL







## GENERAL MAP OF ACTIVITIES

- Comparison of the implementation of EU flood risk management directives in the LABEL regions
- Methodology of preliminary assessment of flood risks and definition of areas with high flood risk
- Standardization minimum criteria for the creation of flood hazard and flood risk maps
- Coordination with the International Commission for the protection of the Elbe (ICPE)
- Testing the reporting to the EU in connection with the Flood Risk Management Directive
- Effects of the Czech and German dams on Elbe floods
- Elbe-Atlas II: Damage potential in the Elbe catchment
- Tourist and leisure guide "WasserKulturLandschaft Elbe" (WaterCultureLandscape Elbe)
- Municipal Flood partnership Labe-Elbe
- Adaptation to climate change in the Elbe catchment
- Media competition on flood protection
- Creation of documents for the mapping of flood risks and flood hazards in the Hradec Králové, Pardubice and Liberec regions
- Elbe tourism in the Hradec Králové region
- Documentation on areas with high flood risk – pilot project in the town of Přepeře
- Risk Atlas Elbe – Creation of flood hazard maps and flood risk maps – Pilot project on the Jizera river
- Mathematic model to simulate hydrological conditions in the Elbe catchment area
- Study of the retention areas in the Vltava river basin
- Flood risk and hazard maps for river mouth areas
- Tourism at the European watershed between Danube and Elbe
- Influence of changes in land use on floods and torrents in Austria
- Regional study Orlik
- Tourist traffic and flood protection in South Bohemia
- Analysis of the retention potential in the region of Pilsen
- Water tourism in the Pilsen region
- Concept of regional flood protection measures in Central Bohemia region
- Improvement of water tourism infrastructure in Central Bohemia
- Significance of Elbe Navigation in Central Bohemia
- Political workshop "Flood protection – on a local and international level" and the Elbe conference
- Web application to present selected data on flood area
- Regional Flood Protection Measures in the Usti region
- Water tourism in the Usti Region
- Flood retention in the Czech Ore Mountains
- Improvement of WBS FLAB (Knowledge-based system of areas with similar run-off generation) and comparison of the determination of flood formation areas in Saxony and Czech Republic
- Assessment of the Děčín lock
- Project day with school children
- Involvement of municipalities in flood risk management
- Workshop on legal matters "Upstream and downstream riparians"
- Further development of flood management system INGE
- Pilot implementation of EU flood risk management directive for the White Elster
- LABEL at the eureka
- Reconstruction of the course of the Elbe river from Schöna to Geesthacht in the first half of the 19th Century
- The river hydrological software FLYS, the water level information system of the BfG
- Political workshop on water tourism
- Influence of the flooding of lowlands of the river Havel on the flooding of the Elbe
- Risk prevention and water tourism
- Analysis of navigability in Saxony-Anhalt
- Review of flood retention areas, evaluation of risk resulting from flood and pollutants and recommendations for adapted uses
- Cross and inter project exchange: The LABEL-SAWA Conference "Elbe without borders"
- Study trip from the Tisza to the Elbe
- LABEL mobile exhibition
- Film and articles about LABEL on behalf of the EU Commission
- Integrated regional concept „Lower Middle Elbe“
- Flood risk mapping at polders in the Hungarian Tisza catchment



## 1 COMPARISON OF THE IMPLEMENTATION OF EU FLOOD RISK MANAGEMENT DIRECTIVES IN THE LABEL REGIONS

Flood risk management directives schedule three phases for the implementation of flood risk management: preliminary assessment of flood risks/creation of hazard and risk maps/ development of flood risk management plans. In this project, the procedures of the LABEL countries and states, Czech Republic, Austria, Hungary, Thuringia and Saxony were compared and alignment recommendations were developed. The recommendations are the results of both the diverse LABEL pilot projects and of the intensive experience exchanges of the LABEL working groups RISK and sub-RISK. They are coordinated with each other and supported by all project partners. These implementation-oriented core messages are contained in the document “Labe-Elbe 2012 plus – Results and Recommendations from the LABEL project”.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LfULG) AS LEADER OF THE WORKING GROUP RISK  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

## 2 METHODOLOGY OF PRELIMINARY ASSESSMENT OF FLOOD RISKS AND DEFINITION OF AREAS WITH HIGH FLOOD RISK

According to the European flood risk management directive (FRM-Dir), the flood risks were preliminarily assessed for the whole catchment in the Czech Republic. This assessment was carried out homogeneously and using the spatial analysis instrument of the GIS. The basis of which was accessible information and standard databases from the Czech Republic. Two essential criteria were selected; according to which the effects of flood risk could be quantified: the number of residents and the value of the assets which would be affected by floods of varying probability of occurrence - the so-called risk scenarios: HQ5, HQ20 and HQ100. In this way, areas with a potentially high flood risks were defined. Additionally, river sections in towns were identified, which would be affected by a 100 year flood.

Currently, flood hazard and flood risk maps are being created for areas with potentially high flood risks.

**RESPONSIBLE PARTNER:** MINISTRY OF ENVIRONMENT IN THE CZECH REPUBLIC  
**FURTHER INFORMATION:** [WWW.POVIS.CZ](http://www.povis.cz), SECTION “KE STAŽENÍ” – IMPLEMENTACE  
POVODŇOVÉ SMĚRNICE  
DEFINITION OF CATCHMENTS WITH POTENTIALLY HIGH FLOOD RISKS IN THE CZECH REPUBLIC (ATTACHMENT\_1\_APSFR)

## 3 STANDARDIZATION MINIMUM CRITERIA FOR THE CREATION OF FLOOD HAZARD AND FLOOD RISK MAPS

The aim of flood hazard and flood risk maps which were created outside of LABEL are based on a procedure intended to identify the extent of flooding risks in the flooding areas and the determination of the extent of potential flood damage to houses, buildings, infrastructure, and industrial and agricultural production. The standardization for the creation of flood hazard and flood risk maps defines the standardized minimum requirements for drawing up maps by the state enterprises in the river basin area. Consideration was also given to the duty of the Czech

Republic towards the European Commission regarding the principle of “reporting duty”. The standardization minimum was especially developed for clients and professional producers of maps, in order to achieve homogeneous results for the mapping projects for the whole of the Czech Republic. For every catchment and every river section with a potentially high flood risk, there are three reports planned on the mapped area: an “explanatory report”, a “technical report –hydrology models and flood hazard maps” and a “technical report – flood danger and flood risk maps”.

**RESPONSIBLE PARTNER:** MINISTRY OF ENVIRONMENT IN THE CZECH REPUBLIC  
**FURTHER INFORMATION:** [WWW.POVIS.CZ](http://www.povis.cz), SECTION “KE STAŽENÍ” – IMPLEMENTACE  
POVODŇOVÉ SMĚRNICE

## 4 COORDINATION WITH THE INTERNATIONAL COMMISSION FOR THE PROTECTION OF THE ELBE (ICPE)

A cooperation between the representatives of LABEL and the International Commission for the Protection of the Elbe took place on one hand by presentations of the representatives of LABEL at numerous meetings of the working group “Flood protection” of ICPE. On the other hand, representatives of ICPE took part in political workshops of LABEL, e.g. 13-14 April 2011 in Prague. The aim was the exchange of information about working projects and the subsequent activities, as well as joint cooperation.

**RESPONSIBLE PARTNER:** MINISTRY FOR THE ENVIRONMENT IN THE CZECH REPUBLIC AND SAXON STATE MINISTRY OF THE ENVIRONMENT AND AGRICULTURE (SMUL)

## 5 TESTING THE REPORTING TO THE EU IN CONNECTION WITH THE FLOOD RISK MANAGEMENT DIRECTIVE

The EU flood risk management directives stipulate that the results of the individual phases must be made openly accessible for the European Commission by means of data reporting through the WISE system. For this purpose, the Czech Ministry of Environment tested the final version of the reporting entry form for the preliminary assessment of flood risks - taking the valid procedures in the Czech Republic into consideration. A data reporting model was created for the data required in the entry form and a proposal was developed for an efficient way to fill out the form. Furthermore, the ministry created a record for the Czech part of the international Elbe catchment and sent it provisionally to the WISE system. These findings were taken into consideration in the actual subsequent data reporting.

**RESPONSIBLE PARTNER:** MINISTRY OF ENVIRONMENT IN THE CZECH REPUBLIC  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

## 6 EFFECTS OF THE CZECH AND GERMAN DAMS ON ELBE FLOODS

In the catchment of the river Saale (DE) and the river basins of Vltava and Ohře (CZ) there are numerous dams, which played an important role as reservoirs and flood outlets, during the significant Elbe floods in 2002, 2006 and 2011.

For the first time, within a transnational project the German and Czech partner examined together the positive effects for the Elbe. The effect of the dams, during the historic floods of 2002, 2006 and 2022, as well as 30 artificially generated flood modes were analysed. The project showed that the flood retention measures in Czech Republic and the management of the Saale dam in Thuringia ensured that during the mentioned floods on the whole of stretch of free flowing German Elbe, there occurred considerably less flooding (several decimetres) than if had been no use of measures. The measures of the upstream riparians contributed a great deal to reducing the flood danger for the downstream riparians on the upper and middle Elbe in Germany.

**FLOOD DRAINAGE ON THE ORLIK DAM ON 14.08.2002 (SOURCE: IKSE)**



**RESPONSIBLE PARTNER:** GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG) IN COOPERATION WITH, T. G. MASARYK WATER RESEARCH INSTITUTE (PRAGUE, CZ), AQUALOGIC CONSULTING (PŠÁRY, CZ)

**FURTHER INFORMATION:** BFG (2012): HYDRODYNAMIC- NUMERICAL- DRAINAGE SIMULATIONS FOR THE VLTAVA, OHŘE AND ELBE TO DEMONSTRATE THE EFFECTS OF TECHNICAL DAMS ON EXTREME FLOODING ON THE VLTAVA AND OHŘE IN THE CZECH REPUBLIC AND ON THE ELBE IN BOTH THE CZECH REPUBLIC AND GERMANY. REPORT BFG-1725. GERMAN FEDERAL INSTITUTE FOR HYDROLOGY, KOBLENZ

## 7 ELBE-ATLAS II: DAMAGE POTENTIALS IN THE ELBE CATCHMENT



The German State and Czech region members of LABEL created joint maps for Elbe Atlas II for damage assessment along the Elbe. For this, asset values were determined for the entire Elbe catchment. Where water heights of extreme floods of the Elbe were available, damage potential was calculated. These complement the existing maps of the first Elbe-Atlas. Furthermore, potentially hazardous sites were added on the maps and the affected populations in the flood areas displayed. With the addition of risk maps to the existing Elbe Atlas, important requirements of the EU-Flood risk management directives are met. Apart from information for experts, the information of the public on flood protection in the Elbe catchment area will also benefit from the usage of the data from this atlas.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LfULG)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

## 8 TOURIST AND LEISURE GUIDE “WASSERKULTURLANDSCHAFT ELBE” (WATERCULTURELANDSCAPE ELBE)

Together, all the LABEL partners along the Elbe created the brochure “WasserKulturLandschaft Elbe (WaterCultureLandscape Elbe) - traces and testimonials of water” and a complementary website. The objective is to sensitise tourists and residents for water resource themes and to raise the public awareness of this subject. The handy brochure guides the reader to 185 points of interest, both natural and man-made, like sources, dams, dykes, water-gauges, high and low water markings,

canals and estuaries. The brochure is meant to complement existing travel guides and contains maps, coordinates, short explanations, as well as photos. The guide is available in German and Czech.

For further information, there is an internet site which provides considerably more places of interest and extensive background information. The information can be easily updated and is also available in English.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG)  
**FURTHER INFORMATION:** WWW.HOCHWASSERZENTRUM.SACHSEN.DE  
WWW.WASSERKULTURLANDSCHAFT-ELBE.DE  
WWW.REKA-LIDE-KRAJINA-LABE.CZ

## 9 MUNICIPAL FLOOD PARTNERSHIP LABE-ELBE

Effective flood protection is only possible, if all those involved along the river pull together. The flood partnership Elbe is a voluntary union of all affected municipalities, cities and districts who are supported by competent expert authorities. Through this exchange of experiences and cooperation between all the people involved, plans are agreed upon, conflicts resolved and strategies to improve the local flood prevention and catastrophe defence are developed and optimized. Cities and municipalities from the German states of Mecklenburg-Vorpommern, Lower Saxony, Saxony-Anhalt and Schleswig Holstein, as well as the Euro region of Elbe/ Labé. The union is open to further members. The partnership has the following objectives:

- **Information and raising the awareness of flood danger among the residents, industry and businesses**
- **Setting up of a network between all those involved in a river catchment area**
- **Exchange of knowledge and experiences in the field of flood prevention**

A workshop held at the end of August 2011, already managed to bring to one table the existing and future members, institutions and stakeholders who are active in the area of flood prevention, flood coverage and flood management. The focal points of the event were: municipal urban planning, progress reports from the municipalities on the handling of floods, solutions for driftwood management, advantages of dyke removal and renaturation measures and the implementation of EU flood risk management directive.

**RESPONSIBLE PARTNER:** COUNTY OF LUDWIGSLUST-PARCHIM  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/RESULTS0/FURTHER-TOPICS/FLOOD-PARTNERSHIP-ELBE.HTML](http://www.label-eu.eu/de/results0/further-topics/flood-partnership-elbe.html)

## 10 ADAPTATION TO CLIMATE CHANGE IN THE ELBE CATCHMENT

The impacts of climate change will also become apparent in the Elbe catchment. Climate change will mean that, future winters in the Elbe catchment will be frequently milder and wetter, while the summers will be dryer on average. In addition, a general accumulation of extreme weather events, including heavy rain is forecasted. This suggests that in future, the Elbe catchment will have to deal with more floods but also more low water situations. Against this background, flexible and sustainable solutions to adapt to the impacts of the current and future climate change are needed. In the affected sectors, such as water management, regional planning or tourism, both sector specific and cross sector adaptation measures need to be implemented. Possible adapta-

tion measures thereby range from the development of climate-adapted concepts, the change of usage in vulnerable areas to the implementation of structural changes. Suitable adaptation measures for the Elbe region are currently being compiled and evaluated systematically in a study.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (SMUL)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/RESULTS0/FURTHER-TOPICS](http://www.label-eu.eu/de/results0/further-topics)

## 11 MEDIA COMPETITION ON FLOOD PROTECTION

Everyone can contribute to flood protection - with very little effort... In order to communicate this message in a more attractive and entertaining way, a media competition has been launched under the motto "Is everything flowing all right?" The objective is to present to the public, using the media, tips and behaviour patterns on flood protection. Those interested in taking part in the competition were contacted and informed via a homepage, flyers, placard and Facebook. The best ideas in the categories placard, film and creativity have been evaluated by an expert jury and will be awarded a prize at the LABEL final conference.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG)  
**FURTHER INFORMATION:** [HTTP://WWW.MEDIENWETTBEWERB-HOCHWASSERSCHUTZ.ORG/](http://www.medienwettbewerb-hochwasserschutz.org/)

## 12 CREATION OF DOCUMENTS FOR THE MAPPING OF FLOOD RISKS AND FLOOD HAZARDS IN THE HRADEC KRÁLOVÉ, PARDUBICE AND LIBEREC REGIONS

Within the framework of a pilot project, the Czech regions of Hradec Králové, Pardubice and Liberec drafted joint documents to create flood hazard and flood risk maps for the river basin area of the river Orlice (Adler), a part of the river basin area of the Divoká Orlice (Wilde Adler) and for the river basin area of the Jizera (Iser), including the most important tributaries. Here, every region mapped the located rivers in their region. The survey gives an overview on historic floods and flood areas with the probability of repeat floods categorized from HQ5, HQ20, and HQ100 to HQ active ("active zone" in the Czech Republic). Furthermore, they demonstrate which road sections could be affected by floods at different high water levels and which objects are at risk of damage. Natural retention areas were mapped and existing flood prevention measures like polders or dams were marked and identified.

Within the framework of a pilot project in the Padubice and Liberec regions, a flood area was determined for test purposes with a probability of HQ500.

**RESPONSIBLE PARTNER:** REGIONS OF HRADEC KRÁLOVÉ, PARDUBICE AND LIBEREC  
**FURTHER INFORMATION:** THE RESULTS OF A STUDY WERE PRESENTED IN SEMINARS AND WORKSHOPS TO REPRESENTATIVES OF MUNICIPALITIES AND STATE ADMINISTRATION, AS WELL AS TO A SPECIALIST AUDIENCE. FURTHERMORE, THEY WERE MADE ACCESSIBLE TO THE PUBLIC ON INTERNET SITES IN THE CORRESPONDING REGIONS: WEBSITE OF THE LIBEREC REGION: [HTTP://MAPY.KR-KRALOVEHRADECKY.CZ/LABEL/HTML/](http://mapy.kr-kralovehradecky.cz/label/html/). FURTHERMORE, INTEREST GROUPS RECEIVED THE STUDY ON DVD.

## 13 ELBE TOURISM IN THE HRADEC KRÁLOVÉ REGION

### LABE AT HRADEC KRÁLOVÉ



The region of Hradec Králové commissioned a study on the use of the Elbe for touristic navigation. The study is in the form of catalogue pages, which each contain a map with location markers and photos of the finishing and starting points. In total three places were selected for the Hradec Králové region, which could be used for navigation purposes: the Elbe section from the border to the region of Pardubice at Předměstí nad Labem, the section at Smiřice and at the town of Kuks.

**RESPONSIBLE PARTNER:** HRADEC KRÁLOVÉ REGION  
**FURTHER INFORMATION:** THE CATALOGUE PAGES CAN BE PRINTED OUT AND ARE ALSO AVAILABLE ON CD. THEY WERE PRESENTED AT THE CONFERENCE IN PRAGUE, TO THE SPECIALIST PUBLIC, WITHIN THE FRAMEWORK OF THE PROJECT. THE CATALOGUE PAGES WERE ALSO MENTIONED AT THE "WATER AND WATER TOURISM" CONFERENCE IN HRADEC KRÁLOVÉ, WHICH WAS DESIGNED FOR BOTH AN EXPERT AUDIENCE AS WELL AS THE WIDER PUBLIC

## 14 DOCUMENTATION ON AREAS WITH HIGH FLOOD RISK – PILOT PROJECT IN THE TOWN OF PŘEPEŘE

### PLANS ON FLOOD RISK MANAGEMENT



The documentation on areas with high flood risk (czech : Dokumentace oblastí s významným povodňovým rizikem) relates to another LABEL pilot project on flood risk maps compiled for the Jizera river on the Mladá Boleslav-Turnov segment. The model documentation is limited to a single area- the town of Přepere. This model is to be the basis of decision making for the implementation group "Flood risk management" of the

Environment Ministry. On the one hand, it is to be the foundation for the standardization of plans of existing risks in the Czech Republic, and it also acts as prototype to work out a joint and binding model of a flood risk study for the whole of the Czech Republic.

**RESPONSIBLE PARTNER:** ELBE RIVER BASIN AUTHORITY  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

## 15 RISK ATLAS ELBE – CREATION OF FLOOD HAZARD MAPS AND FLOOD RISK MAPS – PILOT PROJECT ON THE JIZERA RIVER

The objective of this work was to find a cost effective and at the same time reliable and precise method to create flood danger and flood risk maps, according to EU flood risk management directives. The demands of the assessment of the level of flood protection for the upper and middle reaches of the Elbe were also to be taken into consideration. The creation of the maps dealt with the river Jizera, on the segment of Mladá Boleslav-Turnov. This section of the river covers flood areas, which were defined according to diverse geodesic documents and different flow models. A further objective was to examine the possible use of flood risk maps to define the active zones of the flooded area; especially the lower parts of the river with extensive flood areas. The risk maps were created by means of a risk matrix.

The pilot project was divided into three sections; in each section a new mathematical model was used. The pilot project served as a basis for the creation of a standardization minimum. The Environment Ministry in the Czech Republic used it to test a data system for the storage of flood hazard and flood risk maps. The results of the individual flood scenarios HQ5, HQ20, HQ100 and HQ500 were elevation maps, flow speed maps as well as flood danger and flood risk maps.

**RESPONSIBLE PARTNER:** ELBE RIVER BASIN AUTHORITY  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

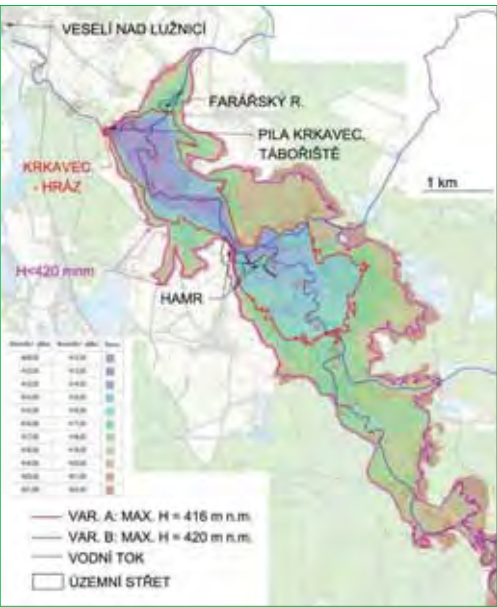
## 16 MATHEMATIC MODEL TO SIMULATE HYDROLOGICAL CONDITIONS IN THE ELBE CATCHMENT AREA

Based on the experiences with the progression of the 2002 Elbe flood, the Czech state Elbe water association company wants to develop an instrument for the prognosis of the water levels and flow behaviour of this important river. Within the framework of LABEL, a mathematical model to simulate the hydrological conditions in the Elbe catchment was created. The objective is to be able to predict the expansion of the flooding areas and the water levels and flow paths in selected sections of the Czech part of the Elbe. The creation of the mathematical model which covers an area of 250km was made with a combination of 1D and 1D+ models. Additionally, a 2D model was used for the small areas and, with regard to currents, complicated segments of the river at the confluence of the Elbe and Vltava in Mělník and at the confluence of Elbe and Ohře at Litoměřice. The outputs of the model are the estimated water level and flow patterns in the individual river profiles. The findings from this method were presented to the public in the form of a web application created within a further LABEL sub-project.

**RESPONSIBLE PARTNER:** ELBE RIVER BASIN AUTHORITY  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)



17 STUDY OF THE RETENTION AREAS IN THE VLTAVA RIVER BASIN



The aim of the study was to assess the contribution of more important existing and potential retention capacities for flood protection. The Rožmberk reservoir was assessed, in view of its existing retention effect, as well as on the potential increase in its retention volume. Moreover, the Krkavec dam was examined, as to what extent it could be used as potentially important reservoir on the Nežárka river.

RESPONSIBLE PARTNER: VLTAVA RIVER BASIN AUTHORITY  
FURTHER INFORMATION: [HTTP://WWW.PVL.CZ/PLANOVANI-OBlastI-VOD/PROJEK-LABEL](http://www.pvl.cz/planovani-oblasti-vod/projek-label)

18 FLOOD RISK AND HAZARD MAPS FOR RIVER ESTUARIES



© 2010 DHI a.s. a podniku veřejného práva v rámci projektu  
Předmět: Územní plánování a územní plánování v rámci projektu

20 INFLUENCE OF CHANGES IN LAND USE ON FLOODS AND TORRENTS IN AUSTRIA

The role of land use and land coverage in river basin areas of torrents, in view of their protective effect against erosion, mudslides, floods and avalanches is well-known. In LABEL the potential hazards was reviewed with the aid of an improved method. The comparative review of the last decade revealed that the accelerated structural change in the agriculture and forestry has led to a deterioration of hydrological conditions. In other flood formation areas extensive damage has been caused by the mining of lignite in the past, as well by secondary damage induced by forest pests, insects, fungi and other parasites.

RESPONSIBLE PARTNER: FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT (AUSTRIA)  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

The pilot study deals with the creation of flood danger and flood risk maps in the confluence areas of selected rivers. The problem with confluences is very specific as it is difficult to connect the heterogeneous data and the mathematical model. Here attention should be paid to the correct entries of the boundary conditions for the calculations.

The results of the study are a proposal for a standardized procedure which will be used in the creation of flood hazard and risk maps for the Czech Republic.

RESPONSIBLE PARTNER: VLTAVA RIVER BASIN AUTHORITY  
FURTHER INFORMATION: [HTTP://WWW.PVL.CZ/PLANOVANI-OBlastI-VOD/PROJEK-LABEL](http://www.pvl.cz/planovani-oblasti-vod/projek-label)

19 TOURISM AT THE EUROPEAN WATERSHED BETWEEN DANUBE AND ELBE

The Federal Ministry of Agriculture, Forestry, Environment and Water Management of Austria compiled a study within the project LABEL in which cross border strategies for adaptation to the rising flood risk in the Austrian Elbe catchment area are developed. A characteristic in the area is the Schwarzenberg'sche Schwemmkanal, a man made water way over the watershed between Danube and Elbe, which was primarily created for timber transport to Vienna. In close cooperation with the Czech Region of South Bohemia the sustainable touristic use combined with environmental aspects, will be enhanced across borders.

Special focus is paid to environmental education of the visitors regarding the water related protection function of the forest. Also, the recent political history of the border region has hardly been touched on. The following ways of improving the tourism potential are planned:

- › Completion of the visitor information system at the canal
- › Development of a educational trail along the alluvial canal
- › Design a Folder
- › Development of programmes for schools
- › Reconstruction of the guiding system for visitors alongside the alluvial canal

RESPONSIBLE PARTNER: FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT (AUSTRIA)  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-12.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-12.html)

21 REGIONAL STUDY ORLIK



The study area of the Orlik Dam is one of the areas of particular regional importance. It is an economically weak region where sustainable development and the preservation of regional characteristics must be encouraged. There are competing interests between water management, power generation, tourism, infrastructure and environmental protection. Therefore, it is important to identify sustainable and risk-adapted development options: the pilot action is contributing to the risk-adapted touristic development of the Orlik area.

The current situation, its general conditions and future development options for flood-adapted tourism have been examined in the regional study Orlik. The results of the completed study will be used for the updating and further development of the principles of spatial development for the South Bohemian region. Manuals, which will in future serve as a basis for local decision-makers and administrations, are part of the study. The project is in line with the Programme for Regional Development of the South Bohemia region.

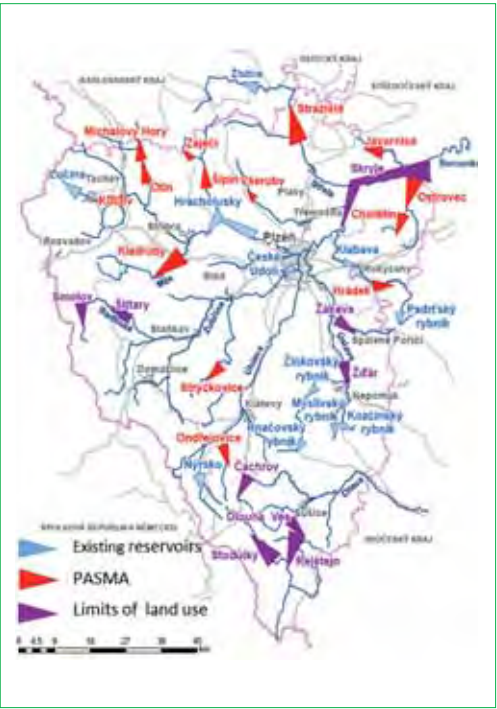
RESPONSIBLE PARTNER: REGION OF SOUTH BOHEMIA  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-15-19.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-15-19.html)

## 22 TOURIST TRAFFIC AND FLOOD PROTECTION IN SOUTH BOHEMIA

The Region South Bohemia has analyzed potential locations for the development of water tourism and tourist navigation along the rivers Vltava, Otava and Lužnice. The different locations were evaluated regarding their flood risk, their influence on the discharge in case of a potential flood, their traffic connection and connection to public infrastructure as well as concerning their attractiveness for tourism in the region. The most important result of the study is a catalogue about existing and potential tourist navigation infrastructures, as well as camping sites or recreation centres. This catalogue puts together all relevant information on the different locations: facilities, tourist connections, traffic connections, legal aspects and flood risks.

RESPONSIBLE PARTNER: SOUTH BOHEMIAN REGION  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-15-19.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-15-19.html)

## 23 ANALYSIS OF THE RETENTION POTENTIAL IN THE REGION OF PILSEN



The region of Pilsen lies in the upper part of the Elbe catchment. In this mountainous area with relatively high precipitation it is important to slow down the surface run-offs. The company IRI devised an analysis of the retention potential in the Pilsen region (in Czech Posouzení retenčních kapacit území Plzeňského kraje), in which the natural retention conditions and the significance of the existence of the planned basin to slow down the river flow was assessed. This was done with the aid

of a retention capacity model taking into consideration the natural general conditions and the management and the spatial distribution of the new reservoirs. Furthermore, the effects of the flood protection measures were analysed. A model was newly designed to protect the natural retention area. Moreover, the study shows further possibilities to improve the water resource management in the region. For example, to guarantee the water reserves in dry periods or the drainage by extreme rainfall. The results of the study were included in the update of the region spatial development plans, as well as in the area planning of the local municipalities.

RESPONSIBLE PARTNER: PILSEN REGION  
FURTHER INFORMATION: [WWW.PLZENSKY-KRAJ.CZ/CS/ARTICLE/STUDIE-LABEL](http://www.plzensky-kraj.cz/cs/article/studie-label)

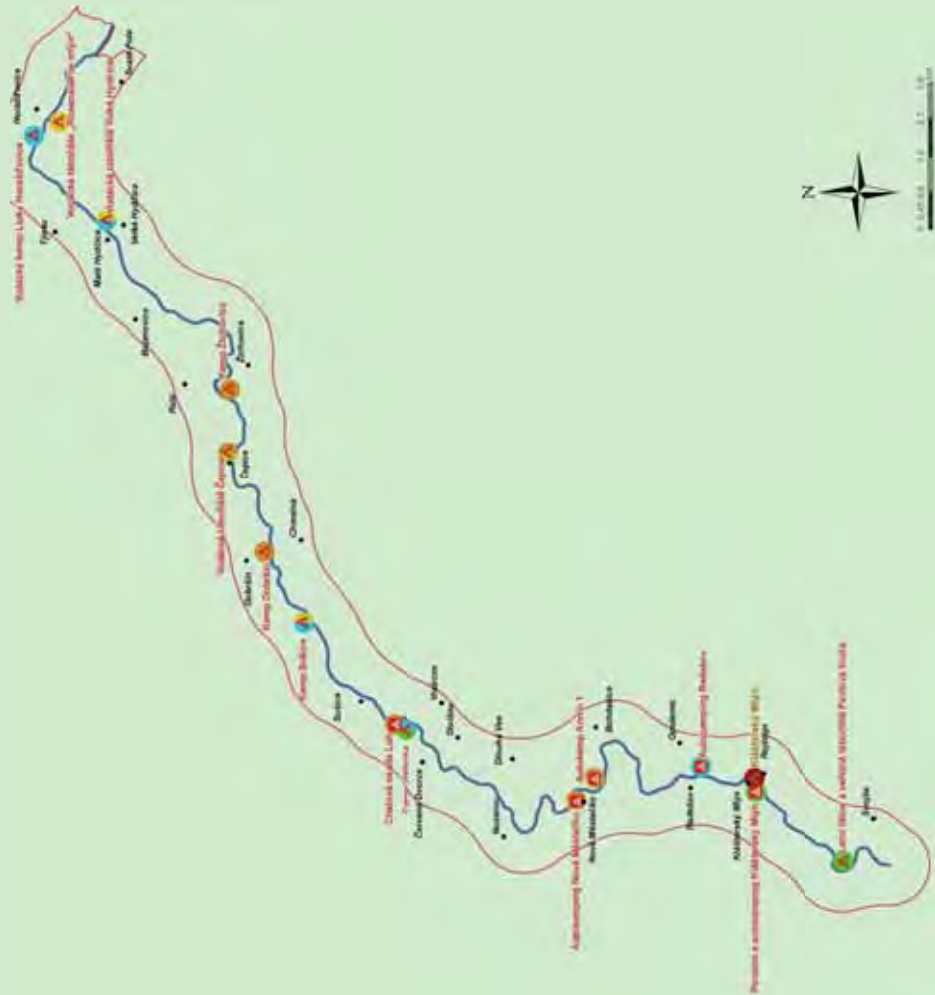
## 24 WATER TOURISM IN THE PILSEN REGION

The possibilities for water tourism in the Pilsen region have not yet been realised to their full potential. Apart from the lack of tourist infrastructure, the further development and use is also hindered by existing flood risks. The association DHV CR GmbH carried out the study "Evaluation of the conditions for water tourism in Pilsen Region" and proposed measures to improve the required infrastructure and flood protection on the rivers Berounka and Otava.

Particular attention was paid to the comprehensive use of the tourism potential. Flood risk areas were identified and possible solutions were suggested. Among the 36 locations for water tourism, 6 were judged to be completely unsuitable. The planned measures for improving water tourism in the Pilsen region will be integrated into development plans of the municipalities, as well as that of the region.

RESPONSIBLE PARTNER: PILSEN REGION  
FURTHER INFORMATION: [WWW.PLZENSKY-KRAJ.CZ/CS/ARTICLE/STUDIE-LABEL](http://www.plzensky-kraj.cz/cs/article/studie-label)  
[HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-12.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-12.html)

## 24 WATER TOURISM IN THE PILSEN REGION





## 25 CONCEPT OF REGIONAL FLOOD PROTECTION MEASURES IN CENTRAL BOHEMIA REGION



- \* obce s rozšířenou působností
- hranice Středočeského kraje
- hranice dílčích povodí
- vodní toky
- vodní nádrže
- řádkové faktory:
- výškové do 0,025 m/min
- výškové do 35 mm
- sklonové 6 a více stupňů
- urbanizované území
- omá půda
- Q 100 skutečné oporné odvozením
- značné menší
- malé menší
- malé větší
- značné větší

1:500 000

A.5 – Odtokové poměry

The conception of flood protection measures in Central Bohemia assesses the current flood situation within the context of the natural environment in the Central Bohemia region. The level of protection of the existing settlements along the most important rivers is analysed. The final part of the concept contains concrete measures to improve the flood protection for 100 communities of the region.

RESPONSIBLE PARTNER: CENTRAL BOHEMIA REGION

FURTHER INFORMATION: [HTTP://WWW.KR-STREDOCESKY.CZ/LABEL\\_PROTIPOVODNOVA\\_OPATRENI/](http://www.kr-stredocesky.cz/LABEL_PROTIPOVODNOVA_OPATRENI/)

## 26 IMPROVEMENT OF WATER TOURISM INFRASTRUCTURE IN CENTRAL BOHEMIA

Good conditions exist in the region of Central Bohemia for the development of water tourism along the Elbe and Vltava rivers, thanks to functioning, reconstructed manned locks. However, the necessary infrastructure along these rivers is still lacking. In a study, the region proposed 53 locations in the Elbe catchment area which are suitable for the building of landing stages/facilities. These locations will be categorized according to what facilities are available (stopping places, landing stages, marinas and protected harbours). Furthermore, the study revealed a solution which combines flood protection with touristic navigation. It is based on the calculated expansion of the corresponding flood areas in diverse flood scenarios (HQ5, HQ20, HQ100) and the "active" zones. Four selected locations were proposed in the event of a flood situation as protected harbours.

There is a catalogue and a flyer on every one of the proposed locations.

RESPONSIBLE PARTNER: CENTRAL BOHEMIAN REGION

FURTHER INFORMATION: [HTTP://WWW.KR-STREDOCESKY.CZ/LABEL\\_REKREACNI\\_PLAVBA/](http://www.kr-stredocesky.cz/LABEL_REKREACNI_PLAVBA/)  
[HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-12.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-12.html)

## 27 SIGNIFICANCE OF ELBE NAVIGATION IN CENTRAL BOHEMIA



The international agreement on inland navigation plans an improvement of the navigability parameters of the Elbe to the city of Pardubice. This intention has a significant influence on the natural environment, drinking water sources, urban development and cultural value, as well as on the public infrastructure, including the measures for flood protection, to which no attention has been paid up to now. Therefore, the region of Central Bohemia commissioned a regional study which named the influences and values in the affected region. It also compared the plan to reshape the water way (in a water way of category Vb) with a version of a consistent upkeep of the Elbe based on the existing param-

eters (category IV) and presented a compromise which would see an improvement of the parameters to category Va. This category complies better to the characteristics of the river and would considerably contribute towards avoiding the existing conflicts about the assets of the region and ultimately lead to a reduction in investment costs. The recommendation also takes into consideration a confirmed agreement between Germany and the Czech Republic made in 2006.

RESPONSIBLE PARTNER: CENTRAL BOHEMIA REGION

FURTHER INFORMATION: [HTTP://WWW.KR-STREDOCESKY.CZ/LABEL\\_UZEMNI\\_STUDIE/](http://www.kr-stredocesky.cz/LABEL_UZEMNI_STUDIE/)

## 28 POLITICAL WORKSHOP "FLOOD PROTECTION – ON A LOCAL AND INTERNATIONAL LEVEL" AND THE ELBE CONFERENCE

The Czech Ministry of Environment organized two actions with an international presence, within the framework of LABEL. The political workshop "Flood protection – on a local and international level" from 13-14 April 2011 in Prague concerned flood prevention. The Elbe conference, which took place in Prague on 07 February 2012, made the participants aware of the problems in the fields of flood protection, water tourism, and navigability and navigation traffic, against the background of LABEL. The objective of these events was to make in particular an expert audience familiar with the findings of the LABEL projects and of their possible current and future usage.

RESPONSIBLE PARTNER: CZECH MINISTRY OF ENVIRONMENT

FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

## 29 WEB APPLICATION TO PRESENT SELECTED DATA ON FLOOD AREAS

### WEB APPLICATION

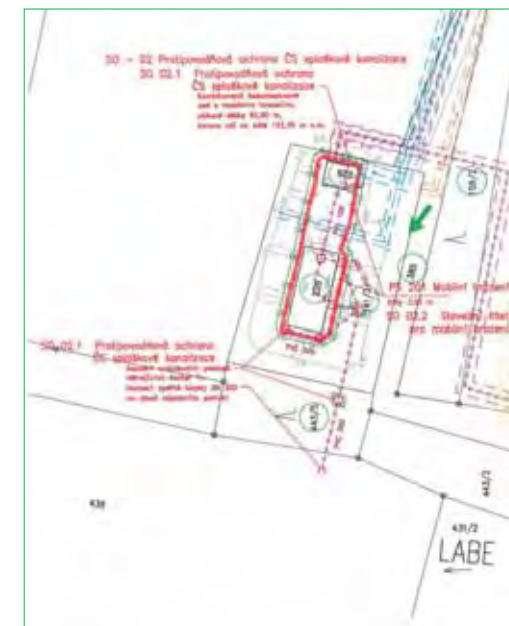


A web application was created, with which the forecasts gathered within the scope of the LABEL sub-project "Mathematical model to simulate the hydrological conditions in the Elbe catchment" is accessible to the wider public. The web tool is designed as a functional self-contained application system, which is linked via an interface to the information data bank required for visualization. On the basis of the predicted flow rates, the user receives information about the forecasted expansion of the flooded areas on the individual Elbe sections. The presentation of this information is based on a previously created series of map cards. Using the cards, the flow rates predicted for a certain period of time show the extent of the resulting nearest flooding area in each case. The information should only be available at times of flooding.

RESPONSIBLE PARTNER: ELBE RIVER BASIN AUTHORITY

FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

## 30 REGIONAL FLOOD PROTECTION MEASURES IN THE USTI REGION



The pilot project prepares all the necessary steps to protect the municipality of Chodouny-Lounky from a 100 year flood. The small municipality lies in a hollow on the right bank of the Elbe between the towns Roudnice nad Labem and Litoměřice. In the last years, it was hit many times by floods. In the northern part of the area a reinforced concrete wall is planned. A dam and a further reinforced concrete wall are intended for the south of the area. The flood protection is moreover complemented by mobile and, if required, integrated structural elements.

RESPONSIBLE PARTNER: USTI REGION

FURTHER INFORMATION: [HTTP://WWW.KR-USTECKY.CZ/VISMO/ZOBRAZ\\_DOK.ASP?ID\\_ORG=450018&ID\\_KTG=984798P1=178642](http://www.kr-ustecky.cz/VISMO/ZOBRAZ_DOK.ASP?ID_ORG=450018&ID_KTG=984798P1=178642)

### 31 WATER TOURISM IN THE USTI REGION

For many years now, the region of Usti has been promoting leisure navigation and water tourism on the Elbe. While devising a catalogue of places to establish an infrastructure for touristic navigation, already existing Elbe tourism attractions were linked in. From the available locations in the region, twelve sites were chosen which could be potentially further developed. The selection was diverse and made according to different level of facilities available; marinas, landing stages stopping points etc. Moreover, new plans were conceived connecting interesting places nearby (cultural monuments, touristic and cyclist paths, natural attractions). It is worth noting that the new harbour project “Marina Labe” in Pišťany is now also seen as a priority site for its “protection function” in the event of an unpredicted situation. Even if several projects have been successfully implemented, the potential of the Elbe for water tourism has not yet been exhausted.



**RESPONSIBLE PARTNER:** USTI REGION  
**FURTHER INFORMATION:** [HTTP://WWW.KR-USTECKY.CZ/VISMO/ZOBRAZ\\_DOK.ASP?ID\\_ORG=450018&ID\\_KTG=98479&P1=178642](http://www.kr-ustecky.cz/vismo/zobraz_dok.asp?id_org=450018&id_ktg=98479&p1=178642)

### 32 FLOOD RETENTION IN THE CZECH ORE MOUNTAINS

A study about the flood formation areas in the Ore Mountains assessed the vulnerability of different locations for floods and shows the main run-off direction and the corresponding potential dangers. The study shows that the ecological stability and the capacity for retention of the area have to be promoted. Here, the following could be introduced: erosion protection measures, the naturalization of river systems with a better structure of the river bed and banks, the conversion of arable land into permanent green land, the correction of badly implemented soil improvement measures, the creation of a constant vegetation cover as well as adaptation of grazing in the surroundings of the preflooders.

**RESPONSIBLE PARTNER:** USTI REGION  
**LINK:** [HTTP://WWW.KR-USTECKY.CZ/VISMO/ZOBRAZ\\_DOK.ASP?ID\\_ORG=450018&ID\\_KTG=98479&P1=178642](http://www.kr-ustecky.cz/vismo/zobraz_dok.asp?id_org=450018&id_ktg=98479&p1=178642)

### 33 IMPROVEMENT OF WBS FLAB (KNOWLEDGE-BASED SYSTEM OF AREAS WITH SIMILAR RUN-OFF GENERATION) AND COMPARISON OF THE DETERMINATION OF FLOOD GENERATION AREAS IN SAXONY AND CZECH REPUBLIC

The developed methods used to determine flood generation areas in Saxony by ELLA, the predecessor project of LABEL, were achieved with the help of the expert system WBS FLAB. In order to ascertain transnational flood generation areas, the Czech soil types were categorized using the same system for the German soil types in project LABEL and the data was entered into the WBS-FLB archive. It is thus possible, to identify the run-off properties of the soil for the transnational river basin areas (D//CZ) according to a standardised method.

The data base and the procedure used in all the three regions compared in Saxony and Czech Republic are similar. A large difference only occurred when considering rainfall due to the different objectives of the studies used. The applied methods are suitable to illustrate the run-off behaviour of the areas cartographically. For the transnational determination of flood generation areas it is nevertheless essential to use databases which are as similar as possible.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-9.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-9.html)

### 34 ASSESSMENT OF THE DĚČÍN LOCK



The objective of this pilot project was the assessment of diverse concepts on the construction of a lock in Děčín, in view of its influence on the sustainable development of the area. The study consists of two parts: part 1 contains an analysis of the navigability of the affected river section. Part 2 is the actual assessment of the plan, as well as a recommendation for the update of spatial planning instruments on both state and regional levels. The study was to also examine the problematic river section on this important waterway between the city Usti nad Labem and the German border. How would constant navigation have an impact on the environment, the economic development of the region, civic solidarity and the problem of flood protection? The benefits of the potential of the Elbe, as the only waterway which connects the Czech Republic with the North Sea harbours, is a priority for the region of Usti. At the same time, the benefits for recreation and tourist navigation should also be supported and a contribution made to the containment of floods thus improving the living conditions of the residents.

**RESPONSIBLE PARTNER:** USTI REGION  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-15-19.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-15-19.html)

### 35 PROJECT DAY WITH SCHOOL CHILDREN

In July 2011, 36 children between the ages of 6 and 10 years took part in a project day named “Life on the river”. The focal point of the day was to inform the children about how floods occur and what can be done to minimise the damage. For this purpose, experiments were carried out on infiltration; infiltration and saving of rain water by looking at several different land uses and soil types. The concepts and materials, such as experiment boxes, instructions and children’s work sheets which were developed within the scope of LABEL are now available for further educational work.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULTS0.HTML](http://www.label-eu.eu/results0.html)

### 36 INVOLVEMENT OF MUNICIPALITIES IN FLOOD RISK MANAGEMENT

The pilot action deals with current issues of spatial planning and flood prevention: Almost all municipalities in eastern Saxony are affected by flood hazards in the planning region Upper Elbe Valley / Eastern Ore Mountains. In recent years, many plans for flood protection systems started and have been implemented. Flood protection systems however offer only limited protection so the problem itself was not solved. If land use behind the dykes is intensified, if new settlements are created, or more and more vacant building lots are filled in, the risk increases for extreme floods when dikes overflow. More and more damage from these events is the result, more and more people are affected and need to be evacuated by local authorities. One solution is to adapt the building uses to the flood risk. But the communities are facing difficult challenges here. Conflicts of interest must be handled and planning principles have proved to be insufficient. This is where the pilot action applies: together with the communities, ways to improve risk prevention are to be found.

Based on an evaluation for land use planning in flood areas in Saxony conducted by the State Directorate Dresden, interviews were conducted with selected local planners and decision makers. These were aimed at identifying problems in the implementation of risk management and protection measures in urban planning and at discussing alternatives. The results of the surveys were compiled in profiles of the individual municipalities. These findings were presented and discussed in a workshop on 19th May 2010 in Dresden to develop joint solutions.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-8.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-8.html)

### 37 WORKSHOP ON LEGAL MATTERS “UPSTREAM AND DOWNSTREAM RIPARIANS”

A workshop on legal matters in international river basin areas was held between 20 and 21 January 2011 in Dresden. The workshop dealt with the relation between upstream and downstream riparians in measures of preventative flood protection on international rivers. The starting points were the existing legal instruments of national, cross-border, European and international laws which contain regulations on the relationship between upstream and downstream riparians. It was discussed whether the present instruments are necessary, suitable or adequate and which

further measures would be necessary to reconcile the interests between upstream and downstream riparians. Here both the formal and informal instruments of the cooperation were taken into consideration.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

### 38 FURTHER DEVELOPMENT OF FLOOD MANAGEMENT SYSTEM INGE

The flood information & alert service in the Free State of Saxony is managed by the Saxon Flood Centre based in the Saxon State Agency for Environment and Geology. It is a software (INGE) which provides an overview of the alarm status for endangered locations and objects. INGE provides the local authorities and relief workers with an instrument which will help them with the planning and implementation of catastrophe defence measures. The software originated out of the EU supported and financed project ELLA. In the LABEL project, GIS components which were subject to payment were replaced with components which are free of charge. Furthermore, current water gauge data and predictions are integrated into the system, which enables the alarm system to react to water levels. Moreover, the planning of measures has been considerably improved and simplified, the GIS illustration of the location map has been further developed and a training concept has been designed. In the towns of Berga/Elster, Thuringia, a reference location was created to use the software. The objective is to establish the software in further municipalities of Thuringia. Before the end of the project LABEL (July 2012) a Thuringia /Saxony meeting of INGE users will take place.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG), THURINGIAN MINISTRY FOR AGRICULTURE, FORESTRY, ENVIRONMENT AND CONSERVATION (TMLFUN)  
**FURTHER INFORMATION:** [WWW.HOCHWASSERZENTRUM.SACHSEN.DE](http://www.hochwasserzentrum.sachsen.de)

### 39 PILOT IMPLEMENTATION OF EU FLOOD RISK MANAGEMENT DIRECTIVE FOR THE WHITE ELSTER

For the basin of the White Elster river, a sub catchment of the Elbe, a flood risk management plan was created according to the specifications of the EU flood risk management directive. The objective of the pilot project was an alignment of the methodology between the Federal States, Saxony, Thuringia and Saxony-Anhalt, as well as with the Czech stakeholders involved in the LABEL working group „RISK”. A preliminary assessment of the flood risk was carried out for the whole of White Elster. Hazard and risk maps with a standardized layout and largely uniform specialist content for areas with significant flood risks were created. The FRM-plan for the White Elster was worked out and aligned for three stretches of water (running through Saxony, Thuringia and Saxony-Anhalt) and added to the whole plan “White Elster”, which was included in the FRM plan for the Elbe catchment. The experiences and results won were transferable to other areas and have already been used.

**RESPONSIBLE PARTNER:** SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG), THURINGIAN MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND NATURE PRESERVATION (TMLFUN)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-2.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-2.html)



40 LABEL AT THE EUREGIA

At the specialist trade fair euregia 2010 in Leipzig, the project LABEL presented its first findings. At the specialist event, the participants could inform themselves about LABEL activities. Furthermore, an exchange took place with other projects and concepts. A focal point was climate change, especially the handling of climate change in the Elbe catchment. Moreover, the strategies to adapt to flood risks in the Elbe basin and the pilot activities with the emphasis on risk-adapted spatial uses were presented and discussed.

RESPONSIBLE PARTNER: SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

41 RECONSTRUCTION OF THE COURSE OF THE ELBE RIVER FROM SCHÖNA TO GEESTHACHT IN THE FIRST HALF OF THE 19TH CENTURY

ELBE FLOW MAP WITH FLOOD BORDER OF THE 1890 FLOOD AND A CROSS-SECTION (ELBE-KM 81-84; MAPBASE OF THE WSA DRESDEN)



In a new study, the German Federal Institute for Hydrology (BfG) reconstructed the historical course of the free flowing Elbe, based on maps from the 19th Century. Analogue plans were researched, digitalized; georeferenced for the river section between the Czech-German border and Geesthacht in Schleswig-Holstein and then GIS data was derived. The reconstruction of the water status focussed on the period of around 1830, as on the one hand there were already high-quality river cards for this period available and on the other hand it was at the time that the systematic development of the river was just beginning. Furthermore, the dyke lines of individual flow sections have been changed decidedly since.

With the conclusion of this project, for the first time, digital data exists for the course of Elbe during the first half of the 19th Century, which has a scale of 1:20.000 and is scientifically valuable for various scientific questions and investigations.

RESPONSIBLE PARTNER: GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG)  
FURTHER INFORMATION: BFG (2012): RESEARCH AND PREPARATION OF THE CONTENTS OF HISTORICAL MAPS OF THE ELBE TO USE WITH THE RIVER HYDROLOGICAL SOFTWARE FLYS. REPORT BFG-1724. GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG): KOBLENZ

42 THE RIVER HYDROLOGICAL SOFTWARE FLYS, THE WATER LEVEL INFORMATION SYSTEM OF THE BFG

FLOODING MAPS OF THE ELBE CREATED BY FLYS



“What will the water level be at a random place of a water body depending on the outflow?” In order to answer this classic hydrological question, the Federal Institute for Hydrology (BfG) and its partners have developed the river hydrology software FLYS. FLYS is not a hydraulic flow model but processes model results as well as the geographical basic data and the geo specialist data. It permits the consideration of the water levels of a river from different perspectives: at a specific point, longitudinal section, cross profile and as flooding area.

Within the framework of the LABEL, the system was extensively re-worked and further developed. The demands of the users were here-with taken into consideration. The software is now accessible as a web application on the BfG information portal GGINA for a wider, more international circle of users; functions have been improved and new modules have been implemented. The expansion of the database, especially for the Elbe catchment area, has also been pushed forward. “The use of the software to realize the FRM-Dir was tested on the Thuringian stretch of the Saale, within the framework of LABEL.

RESPONSIBLE PARTNER: GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG), THÜRINGER MINISTERIUM FÜR LANDWIRTSCHAFT, FORSTEN, UMWELT UND NATURSCHUTZ (TMFLF) (FOR THE TEST ON THE SAALE)  
FURTHER INFORMATION: [WWW.BAFG.DE/IM2](http://www.bafg.de/Im2), SECTION “FLIESSGEWÄSSERMODELLIERUNG”

43 POLITICAL WORKSHOP ON WATER TOURISM

Out of the results of the regional tourism studies, which are part of the project LABEL, the wish for a joint politics workshop on the topic of water tourism emerged. The aim is to discuss the common aspects which have been identified and to communicate them to the relevant stakeholders. Besides the administrative regions and touristic associations, many small and medium touristic enterprises of the Elbe region showed interest in the workshop. Furthermore, regional and national administrations as well as chambers of industry and commerce took part. The workshop focused on networking. In different working groups the opportunities and potentials of tourism along the Elbe were defined and concrete recommendations for improvement of a risk-adapted water tourism were compiled. Furthermore, all representatives asked for a closer cooperation in the Elbe area. This is no easy task due to large differences in infrastructural facilities in the regions. For further development of the infrastructure along the Czech part of the Elbe, the Czech Ministry for Regional Development announced the possibility of subsidies. The Ministry of Economy Saxony-Anhalt affirmed its intentions for

closer coordination of water tourism activities along the Elbe. Representatives of existing water-tourism networks underlined that a future joint marketing of the Elbe tourism should be aspired.

RESPONSIBLE PARTNER: MINISTRY OF STATE DEVELOPMENT AND TRANSPORT, SAXONY-ANHALT (MLV), COUNTY OF LUDWIGSLUST-PARCHIM  
FURTHER INFORMATION: [HTTP://WWW.LABEL-EU.EU/EVENTS/PAST-EVENTS/WORKSHOP-ON-WATER-TOURISM-MAGDEBURG.HTML](http://www.label-eu.eu/events/past-events/workshop-on-water-tourism-magdeburg.html)

44 INFLUENCE OF THE FLOODING OF LOWLANDS OF THE RIVER HAVEL ON THE FLOODING OF THE ELBE

SCHEMATIC DIAGRAM OF THE POLDER SYSTEM IN THE HAVEL LOWLANDS (SOURCE: WSV)



With the linked 1D river model of the Elbe and the lowlands of the Havel simulation calculations were carried out which quantified the effect a flooding of the Havel polder would have on the 100 year Elbe flood. For this, on the basis of diverse boundary conditions (number of flooded polders, maximal water level in the Elbe etc), numerous scenarios of flood formation were defined. Also, models were used which had already been generated as part of the EU ELLA project and are based on the 2002 and 2006 floods.

The model results show that it cannot be assumed that there is one general effect of the Havel polder on the flood levels of the Elbe. For a typical summer flooding with short flood waves, a much higher water peak level reduction occurred (approx 50-60 cm) than for the Spring flooding with a longer duration (20-25 cm). The results of the study show that the flooding of the Havel lowlands can only be effectively and practically carried out if flood outflow does not occur at the same time in the Havel as well.

RESPONSIBLE PARTNER: GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG) IN COOPERATION WITH WATERWAY AND NAVIGATION OFFICE (WSA) IN BRANDENBURG, MINISTRY OF ENVIRONMENT, HEALTH AND CONSUMER PROTECTION OF THE FEDERAL STATE OF BRANDENBURG, STATE OFFICE FOR ENVIRONMENT AND AGRICULTURE WEST MECKLENBURG (STALU WM), LOWER SAXONY MINISTRY FOR ENVIRONMENT, ENERGY AND CLIMATE PROTECTION. STATE OFFICE FOR FLOOD PROTECTION AND WATER MANAGEMENT OF SAXONY-ANHALT.  
FURTHER INFORMATION: BFG (2011): DETERMINATION OF THE INFLUENCE ON THE FLOODING OF THE HAVEL LOW LANDS ON THE FLOOD OF THE ELBE IN THE AREA OF HQ100. REPORT BFG-1726. 62 S. GERMAN FEDERAL INSTITUTE FOR HYDROLOGY (BFG), KOBLENZ

45 RISK PREVENTION AND WATER TOURISM

TOURISTIC NAVIGATION PORT IN FRONT OF THE MAGDEBURG CATHEDRA



Saxony-Anhalt has positioned itself for several years to promote the field of water tourism with the “Blue Band” ([www.blauesband.de](http://www.blauesband.de)). In cooperation with the Ministry of Economy of Saxony-Anhalt the pilot action identifies measures to stimulate the Blue Band and adapt it to flood risk. The focus of the evaluation will therefore lie on tourism marketing and strategy development. A close cooperation with Czech partners will be pursued as relevant results from different regional studies will feed into supra-regional strategies and actions. First synergies were already identified: German water tourism suppliers named the lack of tourism infrastructure in the Czech Republic as an obstacle to better cross-border water tourism; LABEL will counteract this matter.

In their pilot studies the Regions of Southern and Central Bohemia will focus on the development of flood risk adapted infrastructure and opportunities for boosting tourism, e.g. through risk-adapted anchorages. Thus, good opportunities exist to strengthen risk-adapted water tourism through regional cooperation.

RESPONSIBLE PARTNER: MINISTRY OF STATE DEVELOPMENT AND TRANSPORT, SAXONY-ANHALT (MLV)  
FURTHER INFORMATION: [WWW.BLAUESBAND.DE](http://www.blauesband.de)  
[HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-12.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-12.html)

## 46 ANALYSIS OF NAVIGABILITY IN SAXONY-ANHALT

The pilot action, developed in cooperation between the German and Czech partners, is in many ways an interesting challenge. First, transnational focuses were identified that are related to navigability, such as flood risk, environment, climate change and economic aspects. Each region must meet specific requirements – for some regions spatial planning issues are of special importance, for others social cohesion is more important. Another challenge is the fact that the issue of navigability of the rivers Elbe and Saale has in the recent past become a “hot topic” in public debate, especially in Germany. Many studies since the year 2002 testify that in this respect ecological and economic interests diverge. Due to the fact that a further study did not seem useful, the existing studies were evaluated and an overview was established with the objective of bringing together ecological and economic aspects.

**RESPONSIBLE PARTNER:** MINISTRY OF STATE DEVELOPMENT AND TRANSPORT, SAXONY-ANHALT  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/ABOUT-LABEL/PILOT-PROJECTS/PILOT-ACTION-15-19.HTML](http://www.label-eu.eu/about-label/pilot-projects/pilot-action-15-19.html)

## 47 REVIEW OF FLOOD RETENTION AREAS, EVALUATION OF RISK RESULTING FROM FLOOD AND POLLUTANTS AND RECOMMENDATIONS FOR ADAPTED USES

The “Elbe corridor” was the observation area for this study. It consists of the flood plains and flood-endangered regions along the Elbe as well as in the confluence zones of the tributaries in the entire cooperation area of the communal working groups from 7 regions in Lower Saxony, Mecklenburg-Vorpommern, Brandenburg, and Saxony-Anhalt.

In the first part of the study, restrictions on use and risks and the use alternatives which can be then derived are shown. A second part of the survey will review the condition of the flood retention areas, their present and potential future dimensioning as well as the technical safety measures, in particular special dykes, polders and retention areas. In particular, the following tasks will be realized:

➤ **Presentation of existing and potential flood retention areas and their dimensioning**

➤ **Description of function and usages in the shown areas**

➤ **Presentation of the existing essential risks of utilization and of the utilization restrictions under the special consideration of pollution by floods**

➤ **Derivation of recommended uses in the areas shown including the nature conservation related marginal conditions and development ideas**

➤ **Derivation of recommendations for adapted utilizations including utilization alternatives as contribution to the regional concept “Lower Middle Elbe”**

**RESPONSIBLE PARTNER:** COUNTY OF LUDWIGSLUST-PARCHIM  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

## 48 CROSS AND INTER PROJECT EXCHANGE: THE LABEL-SAWA CONFERENCE “ELBE WITHOUT BORDERS”

Sustainable flood risk management requires expert, river basin-wide cooperation beyond state, regional and funding programme borders. Against this background, the conference “Elbe without borders -flood risk prevention in the INTERREG projects LABEL und SAWA” was held from 14-15.06.2011. The conference was organized by the Free and Hanseatic City of Hamburg and the Saxon State Ministry of the Interior together with 42 project partners from 8 states. It allowed a deeper exchange between the project activities of LABEL and SAWA, their project partners, professionals and regional interested stakeholders. At the conference, common ground was identified where a more intensive exchange should take place. An example is the subject of presenting information about floods in schools.

Differences also came to light here, for example regarding the kind of territory involved: In LABEL, the binding element is the river Elbe, on the other hand, in the SAWA partner regions, the experts exchanged information on the theme of flood risk management who come from regions with diverse natural landscapes.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

## 49 STUDY TRIP FROM THE TISZA TO THE ELBE

From August 8th to August 11th 2011, a group of experts from the Middle-Tisza Water Directorate in Hungary and project partners in LABEL visited locations of expert interest along the Elbe. The Czech and German project partners presented their daily work and the LABEL activities to their guests. The study trip focused on the exchange of methods and best-practice examples for flood risk management.

**RESPONSIBLE PARTNER:** MIDDLE-TISZA WATER DIRECTORATE, ELBE CATCHMENT AUTHORITY, REGION OF USTI, SAXON STATE OFFICE FOR ENVIRONMENT, AGRICULTURE AND GEOLOGY (LFULG)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/VERANSTALTUNGEN.HTML](http://www.label-eu.eu/de/veranstaltungen.html)

## 50 LABEL EXHIBITION

Based on the moving exhibition of the project ELLA, an updated version was developed for the LABEL project. The placards cover themes such as historic flood catastrophes, spatial planning, flood hazard and flood risk maps, personal precautions and emergency measures. The exhibition was shown in the whole of the Elbe catchment area and has already been loaned to other projects.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/MOVING-EXHIBITION2.HTML](http://www.label-eu.eu/moving-exhibition2.html)

## 51 FILM AND ARTICLES ABOUT LABEL ON BEHALF OF THE EU COMMISSION

The EU Commission, Directorate General Regional Policy has chosen LABEL as an exemplary INTERREG project for a new publication as well as an image film about European Territorial Cooperation. The films can be watched on the LABEL website.

**RESPONSIBLE PARTNER:** SAXON STATE MINISTRY OF THE INTERIOR (SMI)  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/DE/DOWNLOAD/SONSTIGES.HTML](http://www.label-eu.eu/de/download/sonstiges.html)

## 52 INTEGRATED REGIONAL CONCEPT „LOWER MIDDLE ELBE”



The integrated regional concept (IREK) considers the rural area on the left and right side of the river Elbe between the cities of Magdeburg and Lüneburg. The aim of the regional development concept was to create an identity giving strategy to the districts working together in the municipal working group (“Kommunale Arbeitsgemeinschaft”): Börde, Jerichower Land, Ludwigslust, Lüchow-Dannenberg, Lüneburg, Prignitz and Stendal as well as for all municipalities in the area.

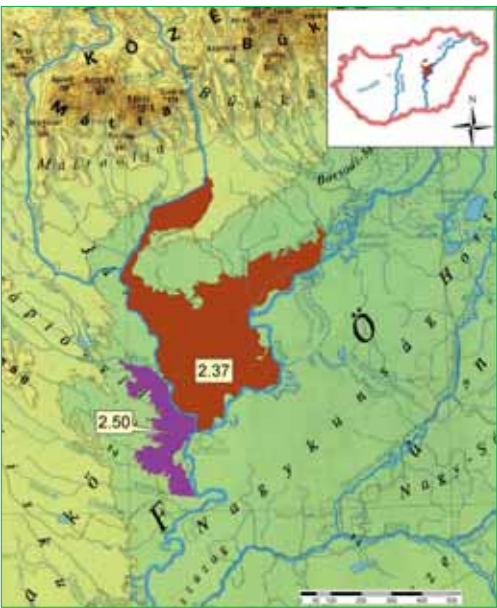
The studied area is heterogeneous and had never been jointly and systematically analysed in this way. The different districts have a distinctive but common feature: they are situated along the Elbe with its tributaries and back waters within the Middle Elbe Biosphere Reserve.

The region understands itself as a model or pilot area for sustainable and environmentally friendly development, in which economic, ecological and social development stand equally side by side. The topics analysed within the concept IREK, flood protection, climate change mitigation, river related economy and settlement development/demographic change are the binding links between the different districts and municipalities.

The concept was worked out with a broad participatory process. Despite several expert working groups and expert interviews, a public participatory workshop was set up. The concept identifies 19 possible practical measures. In the meantime, a first meeting took place which dealt with networking and integrated spatial planning along the Elbe. .

**RESPONSIBLE PARTNER:** COUNTY OF LUDWIGSLUST- PARCHIM  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULT50.HTML](http://www.label-eu.eu/result50.html)

## 53 FLOOD RISK MAPPING AT POLDERS IN THE HUNGARIAN TISZA CATCHMENT



In the Hungarian Tisza catchment, two flood risk mappings were made: at polder 2.49 and 2.37.

The flood polder 2.49 is situated at the lower third of Zagyva-Tarna water system, on the Zagyva river, between the towns of Jászberény and Újszász. Two settlements, Jászberény and Jánoshida, are endangered by flooding. The inner part of Jánoshida is protected by a dyke. In the study of the polder, the following was investigated: Access time, water depths during flooding, maximal inundation level and access time of the maximal inundation level.

In the flooding area 2.37 (Laskó-Tisza-Zagyva-Tarna), a possible dyke breach on the left bank of the Zagyva river was simulated. There are 16 settlements in the flood polder area which are endangered of a possible Zagyva river dike break. Szolnok city is the most endangered regarding population and damage potentials. The following was investigated:

➤ **Different dyke breach scenarios**

➤ **Modelling of flooding scenarios**

➤ **Analysing access time and inundation levels for the various scenarios**

➤ **Based on the modelling results, production of a proposal for regional and municipal measures**

**RESPONSIBLE PARTNER:** MIDDLE TISZA WATER DIRECTORATE  
**FURTHER INFORMATION:** [HTTP://WWW.LABEL-EU.EU/RESULT50.HTML](http://www.label-eu.eu/result50.html)



# FOOTNOTES

- <sup>1</sup> Territorial Agenda of the European Union. Towards a more competitive and sustainable Europe of diverse regions, 25 May 2007
- <sup>2</sup> European Commission (1999): ESDP - European Spatial Development Perspective. Towards Balanced and Sustainable Development of the Territory of the European Union. Luxembourg
- <sup>3</sup> For example LABEL is funded by the programme CENTRAL EUROPE, Priority 3: Using our environment responsibly with the area of intervention “Reducing risks and impacts of natural and manmade hazards”
- <sup>4</sup> DIRECTIVE 2007/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2007 on the assessment and management of flood risks
- <sup>5</sup> Council Regulation (EC) No 2012/2002 of 11 November 2002 establishing the European Union Solidarity Fund
- <sup>6</sup> In the part of the Elbe catchment, generally the 200-year flood is used as extreme flood, in the Czech Republic the 500-year flood is used (flood hazard and risk maps). If historical flood events are known, which were higher than the defined extreme flood, these are additionally taken into account.
- <sup>7</sup> In Germany priority and restricted areas; in the Czech Republic, according to building and area legislation, analytic documents and spatial planning documentation.
- <sup>8</sup> In December 2010 the German Federal Ministry of Transport, Building and Urban Development published the second edition of “Hochwasserschutzbibel”, which gives construction companies, house owners and people renting accommodations useful hints on protecting their property and building precautions (BMVBS, 2010).

# PHOTOS

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**Translation:** Martina Matern / KERN / INFRASTRUKTUR & UMWELT, Professor Böhm und Partner

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