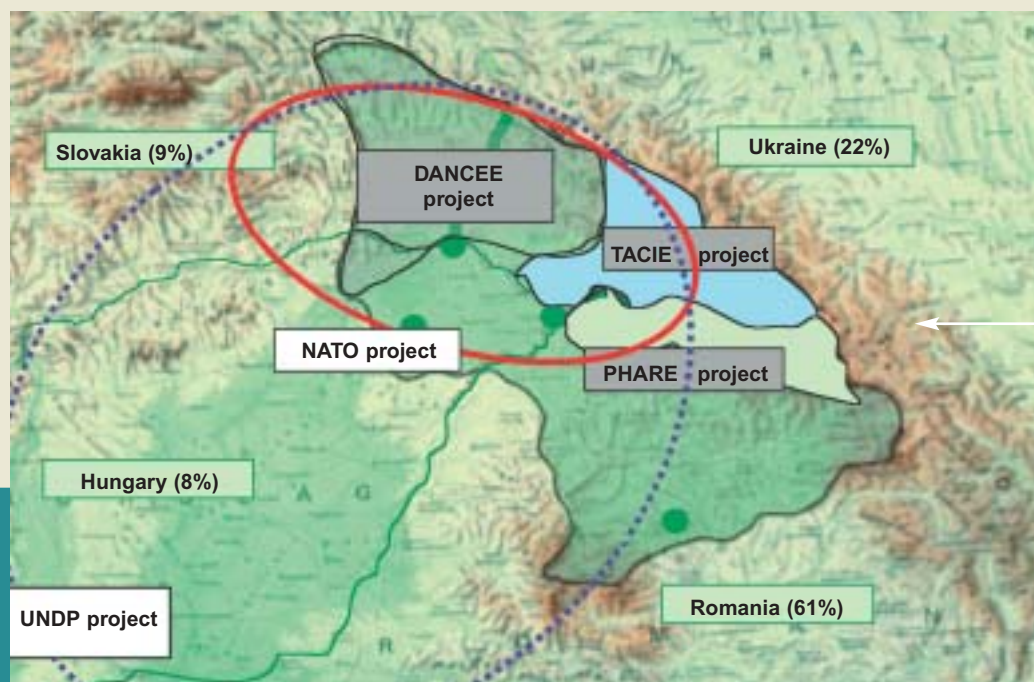




# Flood Prevention in Ukraine

Over the past few decades, there have been four major floods in the Transcarpathian region of Ukraine, all of which resulted in loss of life and extensive damage. With each passing year, the flooding and subsequent landslides and mudflows become increasingly catastrophic. In an effort to address this serious and recurring problem, the Ukrainian government proposed the development of a pilot project on flood prevention and response. Because civil emergency planning and disaster preparedness is a key component of the NATO-Ukraine Charter for a Distinctive Partnership, NATO agreed to fund and coordinate the first phase of the project. The project not only has direct practical benefits for Ukraine, but it also serves as an important mechanism to improve and expand NATO-Ukraine cooperation.



Territories of the various flood mitigation projects

## Did you know?

The official name of the affected region, located in the Northeast of the Carpathian Basin, is Zakarpatska Oblaszty. In English, this is translated as Transcarpathia. Since 22 January 1946, Transcarpathia has been an administrative area of Ukraine. The territory of the region encompasses 12 650 square kilometres, 80 per cent of which is mountainous terrain and 20 per cent flatlands. The number of inhabitants in Transcarpathia today is approximately 12 million.

## >> The flood problem defined

The particular combination of geography, characteristic of the western regions of Ukraine and of the Upper-Tisza region shared by Hungary, Romania, Slovakia, and Ukraine, makes flooding a devastating, yet natural, occurrence.

The Tisza, Tarac and Talabor rivers are situated in a hilly and mountainous area which receives high levels of annual precipitation. Flooding can be expected at any time of the year, except perhaps during the relatively dry months of August and September. At the end of winter in particular, rivers and their tributaries swell dangerously due to melting snow. Combined with heavy rainfall, the river levels can rise by as much as ten metres. The situation is exacerbated when the frozen soil is unable to absorb the large quantities of melting snow.

The resulting flooding washes away roads and railways, destroys homes and businesses, spoils farmlands and causes considerable damage to the natural fauna and flora. Additionally, the excess water washes away soil, stones and buildings and uproots vegetation.



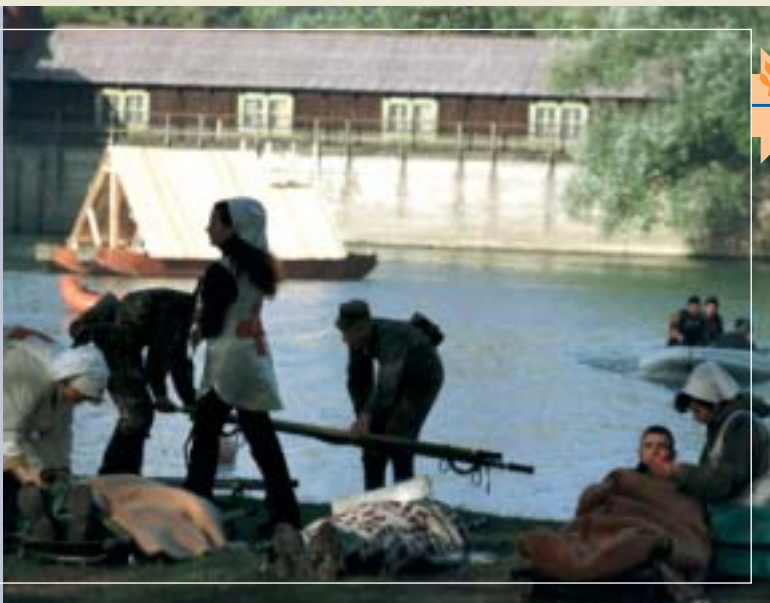
→ While there are protective dikes in place along the rivers, huge quantities of rain can easily surpass their capacity.

The Transcarpathian region is rich in natural resources, which form the basis of life for the population. Its grasslands and meadows are rich in vegetation and farmland and the abundance of salt mines represent a particularly valuable natural resource for the inhabitants. The highlands are covered in deep forests, which provide an extensive supply of wood used to construct buildings, produce furniture and create valuable wood carvings. The people of the region, whether farmers, craftsmen or tradesmen depend extensively on these natural resources for their livelihood. However, the possibility of continuing to make a living off the land is being directly hampered by the extensive flooding of the past few decades. It is having severe and prolonged consequences for the inhabitants, who lose family members and see their houses destroyed, as well as for the environment, which is left totally devastated.

## >> NATO's role in disaster assistance

As part of NATO's expanding network of practical cooperation with countries in the Euro-Atlantic region, Allies and Partners have been implementing measures to improve their ability to work together in the area of civil emergency planning and disaster response. The policy on "Enhanced Practical Cooperation in International Disaster Relief" was signed on 29 May 1998 to serve as the basis for enhanced cooperation in this field. Through seminars, workshops, exercises and training courses, NATO member and Partner countries work together to develop joint plans and procedures and to put in place the necessary infrastructure to be able to respond effectively and efficiently to future crises. Cooperation in the area of civil emergency planning and disaster preparedness has expanded to become the largest non-military component of the Partnership for Peace (PfP) Work Programme.

A concrete achievement in civil emergency planning and disaster response was the establishment of the Euro-Atlantic Disaster Response Coordination Centre (EADRCC) in May 1998. This centre, which works in close consultation with other international relief organisations, coordinates the response of NATO and Partner countries to disasters in the Euro-Atlantic region.



Following the extensive flooding in 1998, the Ministry of Emergency and Chernobyl Affairs in Ukraine officially asked NATO for emergency assistance. The request was quickly accepted and the EADRCC mobilised its resources to effectively coordinate the international humanitarian assistance offered to Ukraine by Partner countries in the Euro-Atlantic region.

## Did you know?

During the 1998 flooding:

- > 17 people were killed;
- > 21 000 people had to be evacuated from their towns and villages;
- > 2 877 houses were damaged and 2 695 were destroyed;
- > 48 bridges were damaged and 12 destroyed;
- > Approximately 100 000 hectares of land were submerged under water.





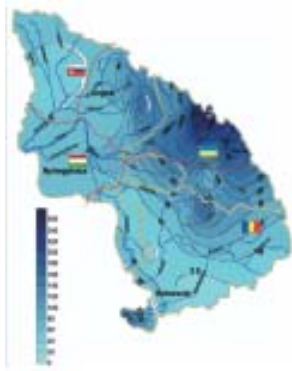
# Flood Prevention

## >> Project overview

The NATO-Ukraine partnership was brought to a new level with the signing of the Charter on a Distinctive Partnership in Madrid in 1997. Through seminars, working groups and practical-based programmes, NATO Allies and Ukraine cooperate in a number of areas, including Ukrainian defence reform, science and technology issues and the economic aspects of security.

In December 1997, NATO and Ukraine signed a Memorandum of Understanding on Civil Emergency Planning and Disaster Preparedness, thereby establishing it as a major area of cooperation. The Memorandum of Understanding states that “cooperation between the parties will focus on exchange of information, expertise and experience through seminars, workshops, and pilot projects concerning risk assessment, disaster prevention, improvement of regional response capabilities, and planning for the development of a natural hazards mapping system for the modelling of risk assessment”. Consultations on the substance and extent of cooperation in this field have since become a regular feature of Ukraine’s cooperation programmes with NATO.

The joint NATO-Ukraine Pilot Project on flood preparedness and response represents a significant practical initiative in the area of civil emergency planning; NATO’s Senior Civil Emergency Planning Committee (SCEPC) approved the project on 2 February 2001. Its overall objective is to improve the early flood warning systems and flood mitigation measures throughout the Tisza River Basin, thereby diminishing as much as possible the adverse effects of flooding.



→ The amount of precipitation in the Transcarpathian region exceeds 1 600mm each year. This map illustrates the high levels of rain that fell in the region in the days leading up to the catastrophic flood of 2001. As much as 250mm of rain was recorded in just three days and 34mm in just two hours.



During the flooding in March 2001, flood stages exceeded previous maximums by up to 1.1 metres. As a result of this flood, nine people were killed, 1 924 homes were destroyed, 4 948 residents were forced to evacuate, 17 bridges collapsed and 52.7 kilometres of highway were damaged.

# in Ukraine

The specific goals of phase one of the project were to outline the deficiencies present in the existing system of flood monitoring, to conduct data evaluation and validation, and to develop the work plan for phase two of the project. NATO set up an Expert Task Force to prepare an Assessment Report containing practical recommendations of various ways to improve the efficiency of flood forecasting, control and warning systems. In addition to two study tours organised to collect data, set up inventories and make initial assessments of existing emergency management plans and response procedures, several meetings have been held to share ideas and voice concerns.



During phase one of the project, the Expert Group visited Ukraine's network of hydrological and meteorological observation stations in order to assess their effectiveness and operating capabilities. The information transmitted to flood experts from stations such as this plays a crucial role in being able to predict future flooding.



## Six specific categories of focus were identified for this phase of the project:

- Firstly, the experts had to examine the existing legal and institutional framework of Ukraine's flood management and response system in order to adapt it to new requirements and changing technology;
- Secondly, the general data and information system on flood-related issues had to be reformed to make it both as sophisticated as possible and readily available to flood experts;
- Thirdly, the functioning of the non-automatic network of hydrological and meteorological observation stations had to be analysed to ensure that they function correctly and conform to internationally-accepted standards;
- Fourthly, the regional flood monitoring and forecasting system, shared by Hungary, Slovakia, and Ukraine, had to be assessed, along with the feasibility of extending the system to include additional countries and organisations;
- Fifthly, the availability and effectiveness of the country's flood management system, which includes methods of identifying regions and communities at risk, means of alerting the population to possible or expected flooding, and flood alleviation plans, had to be evaluated;
- Finally, Ukraine's system of emergency flood management, consisting of evacuation plans, material and personnel resource management, and communication channels, had to be assessed and measured against international standards.

## >> Working together for results

More than forty flood and emergency experts from twelve different countries have worked together in sometimes difficult conditions to achieve a common goal – the best solutions to Ukraine's flood problems. The project Task Force has successfully put together a set of practical recommendations to serve as a point of reference for Ukrainian authorities as they prepare phase two project proposals for presentation to international development and financial institutions. The Assessment Report is reflective of an excellent network of practical cooperation between NATO Member and Partner countries on this important regional initiative.



Twelve countries representing both NATO Member and Partner countries, participated in the Task Force, including Belgium (the lead country), the Czech Republic, Germany, Hungary, Moldova, Poland, Romania, Slovakia, Sweden, Switzerland, Ukraine and the United States.



It is anticipated that phase two of the project, following the successful implementation of the Task Force recommendations, will lead to the establishment of a powerful flood management system in Ukraine. Planners and developers will be able to use the Assessment Report to put in place a state-of-the-art hydro-meteorological network which will be capable of providing real-time satellite imagery of high-risk areas, of highlighting flood-prone areas, and of mapping out landslide susceptibility regions. This information will then be available to the relevant national and regional authorities to initiate their new and improved emergency response system in a timely manner that will ultimately save lives and property during future floodings.

## >> Project Expansion

The Assessment Report created by the NATO Expert Task Force not only forms the basis for the implementation phase of the project, but it also serves as a practical guideline for other flood-affected countries in the region that wish to implement similar proposals in their own flood-prone areas. Additionally, the project has paved the way for these neighbouring countries to harmonise their flood management systems and emergency procedures. Several workshops have been organised to bring together experts, government institutions, non-governmental organisations and various other organisations with interests in the field, to exchange ideas and share information.



## >> Dr. Zoltan Balint, Expert Task Force Leader

***You confront the problems and challenges of floods in your line of work. Do you think that this NATO-led project will have effective results for the Transcarpathian region in the future?***

My experiences have proven that the flooding problems are real and that the people continue to need assistance. They have also demonstrated that international goodwill and desire to solve problems, even in financial terms, are real too. Somehow, channels to connect the problem with the solution need to be established. I am convinced that this project has already built several of these channels.

## >> Colonel Ivan Ronsse, Project Leader

***Twelve countries support this project financially and/or by providing experts in the field. What do you consider to be the biggest achievement of the project?***

The countries involved with this project have voluntarily provided highly experienced and well-qualified experts in the field of flood warning and monitoring. This multinational group has been transformed into a very dynamic task force which is capable of operating effectively and with utmost flexibility. I am convinced that all experts actively involved in this project have expanded their individual knowledge and have learned a great deal from their colleagues. Through cooperation on this project, the foundations for a multinational network of experts have been created which can be consulted in the future when issues of flood management arise. The first phase of the project, namely the development of a comprehensive assessment report which includes recommendations for implementing new measures for flood monitoring and flood evaluation, has been completed. The second phase, or implementation phase, of the project should be started as soon as possible, provided the resources are available.

For more information:

- NATO Homepage - [www.nato.int](http://www.nato.int)
- Civil Emergency Planning - [www.nato.int/docu/handbook/2001/hb0809.htm](http://www.nato.int/docu/handbook/2001/hb0809.htm)
- EADRCC - [www.nato.int/eadrcc/home.htm](http://www.nato.int/eadrcc/home.htm)
- Partnership for Peace (PfP) - [www.nato.int/pfp/pfp.htm](http://www.nato.int/pfp/pfp.htm)
- NATO-Ukraine Relations - [www.nato.int/pfp/nato-ukr.htm](http://www.nato.int/pfp/nato-ukr.htm)