

**HARMONIZATION OF SEISMIC HAZARD MAPS  
FOR THE WESTERN BALKAN COUNTRIES  
BSHAP**

(SfP Project Number 983054)

**OCTOBER Progress Report - 2008**

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## 1. LIST OF ABBREVIATIONS USED IN THE PROJECT PLAN

<b>ARSO</b>	Environmental Agency of The Republic of Slovenia
<b>DTM</b>	Digital Terrain Model
<b>DEMA</b>	Danish Emergency Management Association
<b>EC</b>	European Commission
<b>GIS</b>	Geographical Information System
<b>GPS</b>	Global Positioning System
<b>IGEO</b>	Institute of Geosciences, Tirana, Albania
<b>IPR</b>	Intellectual Property Right
<b>IZIIS</b>	Institute of Earthquake Engineering and Seismology at the University "Ss. Cyril and Methodius", Skopje, FYR Macedonia
<b>METU</b>	Middle East Technical University, Ankara, Turkey
<b>MSO</b>	Montenegro Seismological Observatory
<b>MSK</b>	Scale of Seismic Intensity (Medvedev-Sponhouer-Karnik)
<b>PGA</b>	Peak Ground Acceleration
<b>GMP</b>	Ground Motion Prediction
<b>PSHA</b>	Probabilistic Seismic Hazard Analysis

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### **3. BACKGROUND AND OBJECTIVES**

During past centuries, the southern part of Europe has been devastated by a great number of large earthquakes, resulting in human victims and enormous material loss. Because of intensive building construction and increasing urban population density for the last two decades, the current consequential effects of such disastrous events would be even more drastic. It is therefore, of great importance to assess the seismic hazard properly, raise public awareness and improve disaster planning and management in the whole region.

Besides exceptional willingness and cooperation of the participating countries, in developing of this Project the most important role acted Disaster Preparedness and Prevention Initiative (DPPI) of the Stability Pact for South Eastern Europe. DPPI recognized possibility to, through launching of this Project, introduce necessary, basic steps towards the complex seismic risk management process in this region. DPPI organized four Project Working Group meetings (Macedonia, Albania, Montenegro and Serbia) for the purpose of elaboration, preparation of the Project Proposal Plan.

The main objective of the Project is the preparation of new seismic hazard maps of the region using modern scientific methodologies that will ensure harmonization within the region as well as with the European standards. The fact that current seismic provisions have been updated in early 1980-is (practically in all of participating countries) underlines an evident need to upgrade these technical norms. The foreseen logical step is harmonization with EU standards (EUROCODE 8), what impose the seismic hazard harmonization as the first step towards.

Another important objective of the Project is to improve scientific collaboration between the project partners. Enhancement of joint cooperation and coordination in the field of seismic hazard will provide an important step towards preparedness and prevention activities in disaster management. Through lecturing of invited experts in seismic hazard related topics introduction of the state of the art of methodology will be achieved as well as the training of young scientists. Also, the project deliverables will help achieving the deployment of new seismic instruments in the participating countries and foster real time data exchange between national seismic networks.

The end users of the Project results will be governmental disaster management agencies, ministries of environment or agencies responsible for environmental protection and sustainable development in the Balkan region. The civil protection agencies as well as the insurance companies, in all of the participating countries, may benefit from this Project results using it to estimate seismic risk at certain region/location. Consequently, civil protection agencies should risk prevention, preparedness and mitigation measures. Direct users of Project results should be structural engineers, earthquake engineers, and physical planers in the whole region.



## 5. TECHNICAL PROGRESS

### A) MONTENEGRO

#### ***A.1 Major Accomplishments***

On October 2<sup>nd</sup> 2007, for the purpose of bringing the project objectives to the attention of public, Montenegro Seismological Observatory successfully organized the Project kick off Meeting.

At the very beginning of the Project realization, by the midst of September, according to the project plan MSO also established a dedicated Web presentation ([www.wbseismicmaps.org](http://www.wbseismicmaps.org)). As it is planned MSO continuously maintains the Web and updates it with all project-relevant information and documents.

As the leading project partner, MSO, coordinated work in the initial phases of signing of Grant letter, organizing workshops, preparation of Minutes of the meetings and as well as the preparation of Six-month reports.

Representatives and involved personal of MSO actively participated to all project workshops: Ig, Skopje and Dubrovnik. The major activities realized through and besides these workshops have been as follows: compilation of national earthquake catalogue (earthquakes occurred on the territory of Montenegro and surroundings) with threshold magnitude 3.0. Later on the national catalogue has been reexamined and filled in with additional catalogue data got through collaboration with NEREIS project whose representative Ms. Paola Albini (INGV) participated on Dubrovnik Workshop.

All relevant data on seismotectonics related to the Montenegro and surrounding area have been investigated and presented.

Preliminary results of seismic hazard using OHAZ software (developed and introduced by ARSO) had been presented in Skopje workshop. As the input data only MSO national catalogue has been used. Output results have been graphically presented and the influence of catalogue filtering and involvement of seismotectonic file in the hazard calculation was discussed.

The process of international bidding for the Project related purchase of equipment was successfully ended. The procurement of instruments for the MSO should be finished soon: the 50% of advance is already paid and the delivery of instruments is expectable. In the mean time the planning of stations, field observation of convenient sites as well as the negotiations on property issues started.

As the donation of DEMA the purchase of one permanent GPS station was realized. Planned seismological station will be additionally supplied by permanent GPS antenna: Earth crust deformations will be continuously measured for the purpose of better understanding of seismotectonical movements.

In the frame NATO SfP Project No. 983054 "Harmonization of Seismic Hazard Maps for The Western Balkan Countries", all involved institutions, wishing to establish cooperative mutual relations, especially to interchange seismic data, have agreed in Dubrovnik, to sign The Protocol on Multilateral cooperation in seismic Data Exchange. MSO prepared the Protocol document whose signing is in process.

#### ***A.2 Actions to insure the implementation of results***

For the purpose of future implementation of results of the project Co-Director Prof. Glavatovic took part in the Meeting organized by University of Montenegro, Civil Engineering Faculty in Podgorica, on the subject of training for the implementation of EUROCODES in practice. He informed the engineering community about the major objectives of The NATO SfP 983054 and its importance for the tailoring of

EUROCODE 8. Also, the similar information was issued on the Annual Assembly of Montenegrin association for earthquake Engineering held in Podgorica on May 9<sup>th</sup>.

At the time MSO is contributing in organization of 112 Service, in the frame of Emergency Management Sector of Ministry of Interior.

### ***A.3 Milestones for the next six months***

Within the next months the deployment of purchased instruments should be realized: resolving of land property rights, preparation of sites to place and house the purchased instruments, and site construction work. The new seismic stations should be tested, calibrated and integrated in existing seismic network. The capacities of the MSO should be broadened and prepared so to make possible data exchange primarily with partner institutions.

Finalization of regional unique, compiled earthquake catalogue should be over. The contributing part of Montenegro catalogue has be already prepared. Comparison of different GMP formula for region should be investigated.

In coordination with local UNDP office the training of personnel for the GIS is agreed for the November what fits to project plan of GIS implementation. According to gained experience and agreement with other partner institutions the GIS software will be purchased so that the creation of Project related thematic maps may start with earthquake catalogue at the beginning.

The EZ FRISK program for seismic hazard computation will be purchased so to familiarize with the main features of software and format input data accordingly.

### ***A.4 Involvement of young scientists***

In the time period from the beginning of the project two young scientists were involved in the realization of the project activities.

Ms. Ljiljana Vucic, Mathematician assistant researcher, has prepared the Web presentation for the Project, and maintains it as the permanent task. With respect to *the Protocol on Multilateral cooperation in seismic Data Exchange* Ms Vucic is the nominated liaison officers in charge of coordinating the activities listed in the areas of cooperation. Nowadays, new connections and collaboration in this field has been established with: MEDNET, Italy, Slovenia, Croatia, Macedonia, Bosnia and Herzegovina, Bulgaria.

Ms. Jadranka Mihaljevic, civil engineer, has participated on both Workshops dedicated to the Project. In the second workshop in Skopje she presented the first results of OHAZ software implementation to the seismic hazard assessment for the territory of Montenegro. The resulting differences of output hazard, depending on earthquake catalogue filtering, have been emphasized. The appropriate format of seismotectonic model for Montenegro was also presented. The model itself was developed using neighboring Albanian seismotectonic model (presented in Ig Workshop) as well as already known geological, seismic and seismotectonic data gathered through basic study of Survey of Seismicity of the Balkan region (1974), as well as newly gathered in the COST Action 625 Project "3-D monitoring of active tectonic structures in the Peri-Adriatic Region". Croatia (Sept. 2007). Also, on behalf of the Montenegro as the Project leading country, Ms. Mihaljevic presented the current state of the Project realization on XV DPPI SEE Regional Meeting held in October 2008, Zagreb. Also, in the role of the invited key-speaker she participated on "Seminar for Experts and Senior Managers on NATO Standards and Project Evaluation Procedures, focusing on Hydro-Meteorological aspects" that was organized by DPPI. Ms. Mihaljevic is the person in charged for the preparation and compilation of Six month reports.



### **A.5 Major travel**

Major travels were related to participation to Project related workshops: Ig, Slovenia (7-9 November 2007) and Skopje, Macedonia (17-18 December 2007) and Dubrovnik (26-27 March 2008) Also, in the role of project leading country, MSO representatives traveled to Zagreb, Croatia (20-22 February) ("Seminar for Experts and Senior Managers on NATO Standards and Project Evaluation Procedures, focusing on Hydro- Meteorological aspects") as well as to Brussels to NATO Forum on Environmental Security. Few domestic travels were realized for the purpose of site investigation for the placement of new seismic stations.

### **A.6 Visit by experts/advisors and NATO consultant**

As the guest expert from Slovenia, Agency for Environment, Mr. Mladen Zivcic has been invited to Podgorica for the occasion of Official Launching of the Project.

### **A.7 Visibility of SfP project**

For the purpose of visibility of the project, the Web site: [www.wbseismicmaps.org](http://www.wbseismicmaps.org) was dedicated to the Project following the NATO existing recommendations. Besides ongoing and planned activities related to the Project, important document on outcomes, all necessary links to participating institutions, as well as to NATO SfP Programme are available. Web presentation is developed and hosted by Montenegro Seismological Observatory.

For the purpose of focusing the national and international attraction the event of Official Launching of The Project was held in Podgorica on October 2nd 2007, (<http://www.wbseismicmaps.org/Events.htm>) with the participation of distinguished guests from NATO SfP Programme, DPPI, diplomatic chore, as well as Montenegro Government representatives and ministries. The event itself was preceded by reports of all major national media: newspapers and TV.

A special March addition Security of daily news *Vijesti*, which is financed by the British Council, was dedicated to the objectives and significance of the Project.

The importance of collaboration within the NATO SfP Project No 983054 is emphasized on several occasions as the good example of streaming of Montenegro towards Euro-Atlantic integrations.

### **A.8 Technical and administrative difficulties**

All technical and administrative difficulties related to establishing of dedicated banking account and tax-free exoneration were successfully resolved.

### **A.9 Changes in personnel**

Ms. Natasa Kaludjerovic, BS of physics, employee of MSO, will be involved as the Project participant.

### **A.10 Changes in project plan**

A special attention was paid to procurement and selection of necessary seismic equipment. Having in mind the significant improvements of acquisition system that MSO undertook during the summer of 2007 and at the beginning of the current year, specific needs to improve capacity and performance of MSO seismic network were more precisely defined. In that since the final decision regarding the purchase of instruments was, as it stated in the justification of procurement.

## **B) ALBANIA**

The main foreseen objectives of the Project for this period have been as follows:

- Compilation of earthquake catalogue data, and
- Equipment purchase and deployment.

During the six month period of time: October 2007 - March 2008, three workshops are organized, as follows: the first Workshop in Ig Slovenia, 7-9 November 2007; the second in Skopje, Macedonia 17-18 December 2007; and the third one in Dubrovnik, Croatia, 26-27 March 2008.

The principle topic of Ig Workshop was integration of Earthquake Catalogues of the Western Balkan Countries, and discussion on delineation of potential seismic source zones affecting the region under the study.

At Ig Workshop was decided that the Working Group for Earthquake Catalogue would complete its draft before early spring 2008. The first results on earthquake catalogues were discussed at Skopje Meeting, and at Dubrovnik Workshop the final drafts of national earthquake catalogues with threshold magnitude  $M=3$  were presented.

Below is shortly described the work performed by the Albanian Group during the first six month period: October 2007 - March 2008 for the realization of the Project objectives.

By the Albanian Working Group for Earthquake Catalogue were prepared and have been sent to Dr. Marian Herak, responsible for the compilation of Earthquake Catalogues of the Western Balkan Countries, two catalogues of Albanian earthquakes as follows:

1. Catalogue of Albanian earthquakes with  $M_s > 4.5$ , for the time period 58-2006, sent on November 28, 2007.
2. Catalogue of the Albanian earthquakes with  $M_L > 3.0$ , for the time period 1964-2000, sent on December 10, 2007.

### **1. Catalogue of Albanian earthquakes for the period 58 A. D. - 2006**

A revised catalogue for Albanian earthquakes with  $M \geq 4.5$  was compiled by Sulstarova et al., 2005, with the purpose of seismic hazard analyses. This catalogue includes earthquakes occurred within the area with geographical coordinates 39.00-43.00N and 18.50-21.50E. Part of this catalogue, covering the period 0058-1964, includes earthquakes occurred within the area with coordinates 38.5-43.00N; 18.5-22.5E.

The catalogue includes in total 667 earthquakes, from which 450 are main shocks assigned with (1), and 117 earthquakes are for/after shocks assigned with (0). The catalogue sources, reported magnitudes and its completeness are given too.

### **2. Catalogue of Albanian earthquakes for the period 1964 – 2000**

The catalogue for the time period 1964-2000 (which covers the instrumental period) was elaborated by Emanuel Scordilis, Veronika Peçi and Shpresa Shubleka, at the Geophysical Department of the Aristotle University of Thessaloniki, Greece. This was done in the framework of the NATO project "Seis Albania".

The catalogue for the period 1964-2000, contains 19 453 events from which 14 818 events has computed magnitudes based on ASN data. Events occurred within the area with geographical coordinates: 38.028-43.854N; 18.024-22.00E. Reported magnitudes and references are given for this earthquake catalogue.

Relevant data for the seismogenic model determination of participating countries: A special session in Ig Workshop was dedicated to the reports of participating countries on delineation of potential seismic source zones affecting the region under the study. The contribution of Albania, prepared by Prof. Shyqyri Aliaj, and presented there by MSc Edmond Dushi, was entitled “Seismogenic Model for Albania: Overview of Relevant Data“. An overview of the knowledge about the relevant data used to delineate the seismogenic model for Albania, such as earthquake catalogue, neotectonic structure and active faults, as well as the seismogenic models delineated last twenty years for Albania, are described in that paper.

On 1/01/2008, a new research institute – Institute of Geosciences (*IGEO*), started its activity based on a decision of the Albanian Government (VKM No. 561, date 22/08/2007). IGEO includes the former Institute of Seismology of the Albanian Academy of Sciences and some research units of Albanian Geological Survey (geology, geophysics, geoinformation technologies). The Institute of GeoSciences is a national research unit that operates under the umbrella of the Polytechnic University of Tirana. According to the above mentioned decision, all the assets and activities of the former Institute of Seismology, including projects and bilateral contractual agreements, are now transferred to the new Institute of Geosciences.

During the period April 1 – September 30, the Institute of Geosciences has been under the process of stabilization of its structure. Meantime, during this period the new Director of IGEO has been in permanent contact with the authorities of the SfP Project 983054, in order to undertake the necessary actions for the reorganization of the Albanian team in this project, and to formulate all the documents for the procurement of the equipments foreseen for the Albanian part (the PRFs of 50%, 40% and 10% payments, quotations from the preferred vendor, budget table and the justification about the preferred vendor).

In the framework of NATO SfP Project 983054, for instrument bidding IGEO has confirmed to buy the following seismological instruments:

No.	Vendor	Items	Pieces
1	Guralp Systems	CMG-5T Sensor	8
2	Guralp Systems	CMG-5T SM Instrumentation	10

### **Actions to insure the implementation of results**

As one of the main objective of the project is the harmonization with the Eurocode 8, the Institute of Geosciences has excersize its influence to the authorities of the Ministry of Public Works Transportation and Telekomunication for the adoption of the Eurocode Standarts in Albania. A consultative round table was organized under the guidance of the Vice Minister on May 5, 2008 with the participation of a large number of interested institutions and specialists. The Director of the Institute of Geosciences, the Head of the Department of Seismology and Seismic Engineering as well as two other specialists took part in this meeting, where some guidelines were drawn for the future.

### **Changes in personnel**

After retirement of the former Albanian Co-director, Prof. Shyqyri Aliaj, and his resign from the Co-Director function for the Albanian partner, the new Director of the IGEO expressed his interest to take over the Co-Director function for the Albanian partner

into the NATO SfP 983054 project, and also his engagement to fulfill all the agreements that comply the project objectives.

The necessary documents are already been sent to the NATO SfP project authorities, but we have not received as yet any official approval. The new Co-Director urges the necessity to reorganize the Albanian project team under the new circumstances. The new project team will be announced after the above mentioned approval.

### **Articles in Newspapers**

A paper dedicated to the NATO Science for Peace and Security Project No 983054 "Harmonization of Seismic Hazard Maps for the Western Balkan Countries", and entitled "The NATO and Albanian Seismology" was published by Prof. Shyqyri Aliaj in Albanian Newspaper "Albania", February 27, 2008, page 10 (in Albanian).

The young scientists MSc Edmond Dushi and Ilir Shinko were engaged in Project activities during the first six-month period.

## **C) BOSNIA AND HERZEGOVINA**

### **C.1 Major Accomplishments**

In the past twelve months period (October 2007 to October 2008), Seismological Survey of Bosnia and Herzegovina conducted tasks consistent to the methodology, project structure and activities of the approved Project Plan.

*The main objectives of the Project for this twelve months period are as follows:*

- Equipment purchase and deployment.
- Completion of the National earthquake catalogue consisting of verified data as one of the most important steps in seismic hazard assessment.
- Strengthening of co-ordination and work on Project of two seismic institutions
- Creating pre-conditions for unique seismic network (with two centers)

To fulfill this goal we organized several meetings among representatives of both seismic institutions, and established principles of common work (of both institutions) on the national earthquake catalogue consisting of verified data, data exchange (among institutions) and joint efforts on developing a future unique seismic network with two (main) centers, as described in Project DIRECTE, to be developed.

Within the working package (section 7 of the Project Plan), the participants from Bosnia and Herzegovina finished following tasks: survey of available catalogues of both seismic institutions; unifying of catalogues of both seismic institutions, re-assessment of historical earthquakes and fulfillment of missing data; investigation of the national catalogue completeness according to  $M_{min}= 2.5$  and magnitude scales; investigation of possibilities for the unification of magnitude type.

As part of equipment purchase efforts, we decided to accept Geotech tender proposal as the very best and in accordance with existing stations and analysis software of both seismic institutions. We believe this equipment will be delivered and deployed in next month or two period of time, as described in Project Plan.

Improvement of an existing seismic station network in the region and real time data exchange is another important objective of the Project.

One of the (major) achievements in a first six months was a meeting with donators (to be) from the Slovak Republic.

Under mediations and facilitation of our Serbian hosts in Belgrade (in December 2007-th) was organized a meeting, in order to provide donation of Slovak Aid for both participating seismological institutions from Bosnia and Herzegovina.

On that meeting is defined a main goals of the future Project (DIRECTE). That is development of infrastructure for rapid earthquake data collection and exchange in the Bosnia and Herzegovina composed of the eight new seismic stations network. It was agreed that the Project within Slovak Aid plan will be prepared by the Slovak partner and that the Project proposal should be complementary to the activities of the NATO Project SfP – 983054. As for now, we still have NO valid information from the Slovak partners about it.

### ***C.2 Actions to insure the implementation of results***

Providing a consistent background is one of the main objectives of the Project. For that purpose we undertake activities on involving Federal Geological Institute - Sarajevo in Project. This institution developed most recent and most updated Map of Hazard, based on (it's own) Geological survey and catalogue of earthquake of seismic institution of Federation of BiH.

Mr. Hazim Horvatovic, Head of Federal Geological Institute – Sarajevo expressed a wish to his institution participate in the Project.

We also, provide all necessary back up, from Ministry of Civil Affairs and Council of Ministers of Bosnia and Herzegovina, aiming to fulfill all obligations of Bosnia and Herzegovina, regarding equipment purchase and deployment and generally regarding this Project.

### ***C.3 Milestones for the next six months***

According to the Project Plan, in the next six months period, following tasks should be achieved:

- equipment deployment
- networking; (among institutions and other partners in Project)
- further activity in additional founding and institutional contribution to the Project in order to provide one (missing) stipend 1.800 EUR and (missing) money for training of one more young researcher 3.000 EUR
- investigation of the existing geological, neo tectonic, remote sensing and other relevant data in the Bosnia and Herzegovina and surrounding regions for the purpose of seismic source determination (in co-operation with Federal Geological Institute – Sarajevo)

### ***C.5 Major travel***

Four participants from Bosnia and Herzegovina attended the first workshop on November 2007 in Ig, Slovenia. Benefits of first workshop were in terms of presentation of different experiences in preparation of input earthquake catalogue data, treatment of historical earthquakes, as well as presentation of participating countries reports, and in to the training in OHAZ software as an appropriate tool for the fast seismic hazard assessment. The software was tested on preliminary prepared national catalogues.

Mr. Amer Zoranic traveled in Belgrade (December 2007) on a meeting with possible Slovak donors, in order to provide donation of Slovak Aid for both participating seismological institutions from Bosnia and Herzegovina inside of the future Project (DIRECTE). (All travel costs were covered by Ministry of Civil Affairs of BiH).

One participant attended the second workshop on December 2007 in Skopje, Macedonia. First day session offered an opportunity to find out about state of the art in seismological investigation of Bulgarian and Romanian institutions. Some preliminary conversation has been negotiated with Bulgarian colleagues about possible future cooperation. Also, we have learned valuable information from Prof. Akkar about most recent researches related to strong motion records and prediction formulas. Second day session participants heard more about OHAZ software from Slovenian colleagues. It was further discussed about instrument minimum requirements and bid details; technical suggestions concerning earthquake catalogue contents and policy suggestions concerning usage and modalities of publishing of the final catalogue.

Three participants attended the Workshop in Dubrovnik March 26-27-th. The workshop was dedicated to analysis of seismic instrument bid. The letter of request to provide technical documentation and quotation for instruments was issued by the NPD as result of Skopje Workshop and previous agreement among Co-Directors. The *Guralph* proposal was found most attractive in eyes of most participants. Also, Prof. Marijan Herak from Croatia presented the First progress report on unification of earthquake catalogue.

### ***C.8 Technical and administrative difficulties***

During this twelve months period of time many of technical and administrative difficulties occurred, mostly because of different administrative and financial procedures between NATO and Bosnia and Herzegovina.

However, most of (if not ALL) these administrative and financial difficulties were successfully resolved and created conditions for a further successful work on Project of all participants.

### ***A.9 Changes in personnel***

As far as it was no changes in personnel, but we are creating additional possibilities for involvement of new personnel and young researchers in the Project.

### ***C.10 Changes in Project plan***

No significant changes in the Project plan were undertaken. Our intention to use all available money (for this purpose) in order to provide as much as possible of seismic equipment is in accordance with Project plan.

## D) CROATIA

### A.1 Major Accomplishments

During the last 6 months of the project, Croatian participation in the project was mostly oriented to earthquake catalogue compilation and completion, as Croatian team is merging and compiling all the catalogues together.

#### A.1.1 Process of verification and completing of Croatian catalogue

Process of verification and completion of the catalogue has been continued. Main accomplishments are completion of the catalogues: earthquake catalogue for 2006 - that is now complete, as well as the first iteration of completion of 2007 catalogue.

#### A.1.2 Process of compiling the catalogues

There are still no all national catalogues available, so the complete final catalogue is still not able to be built.

So far submitted catalogue are as follows (Fig. 1):

- Albanian catalogue, containing earthquakes from year 58-2000, and no magnitude threshold
- Bosnia and Herzegovina's catalogue, containing earthquakes from 306-2006, and magnitude threshold 3.5
- Croatian, containing earthquakes from 373 BC – 2008 and no magnitude threshold
- Macedonian catalogue, containing earthquakes from 479 BC – 2005 and magnitude threshold 2.9
- Montenegrin catalogue, containing earthquakes from 1444 – 2008 and magnitude threshold 3.0
- Romanian catalogue, containing earthquakes from 984 – 2006 and no magnitude threshold.

Additional catalogues that were used are ANSS Catalogue, Shebalin et al. (also known as 'Leydecker catalogue'),

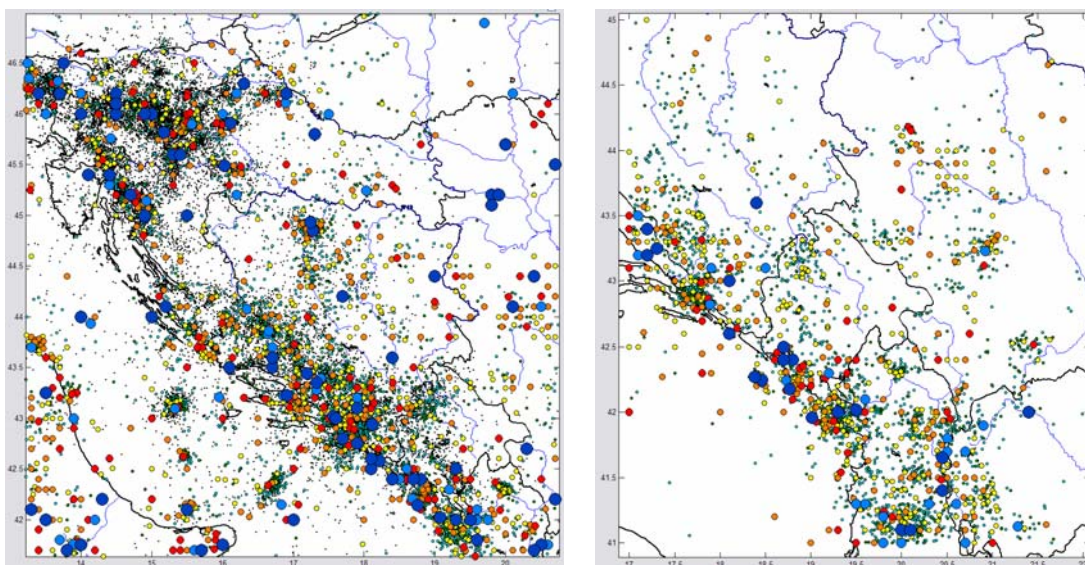


Figure 1. *Epicenters from the Croatian (top) and Montenegrin earthquake catalogues, as submitted*

Catalogues were first declustered, merged and multiples removed. Declustering was done by spatial – temporal windowing (as proposed on meeting in lg last year). The important assumption was that all magnitudes were taken as  $M_L$ .

Epicenters from the unified main shock catalogue are shown in Figure 2. This was done without manual checks of the data. It will have to be done as soon as all catalogues will be included. Analyses of completeness were performed for each country separately as a check, and for the whole region.

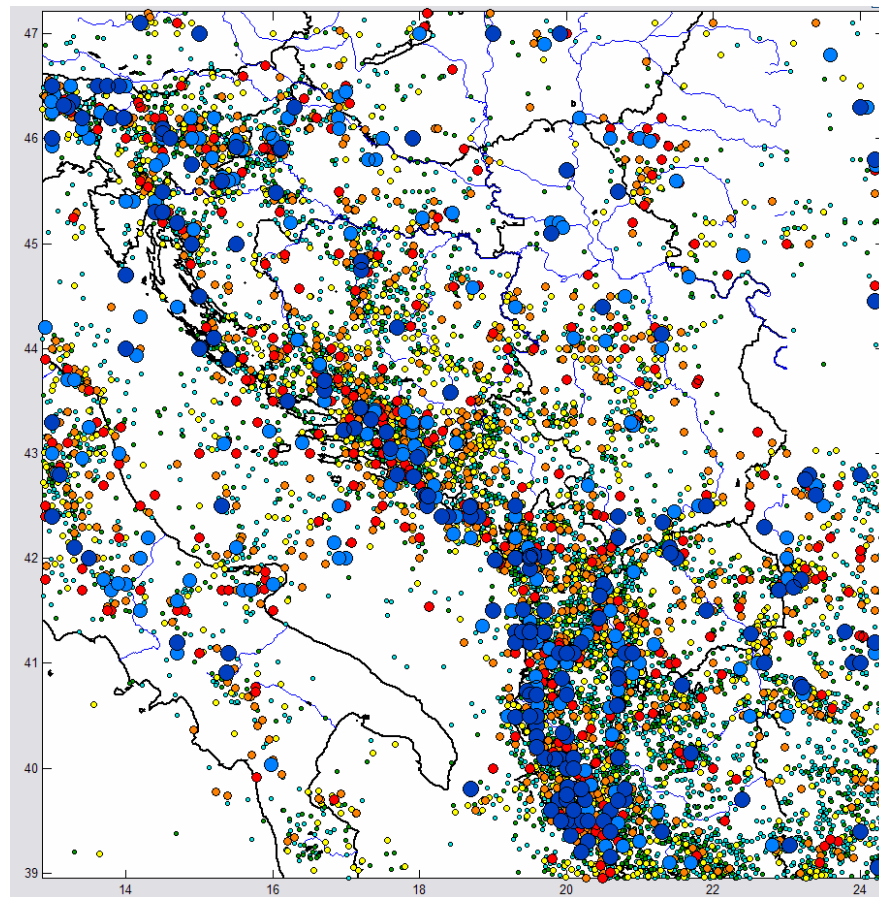


Figure 2. *Unified main shock catalogue for the region*

Maps showing completeness threshold were also computed, and two examples are presented in Fig. 6.

### A1.3 Seismic source modeling

Regarding the source modeling lot has been done in seismotectonical elaboration, collecting and analyzing existing seismotectonical data. The main database is being built for making the seismotectonical map.

### A.1.4 Deployment of purchased instruments

Regarding the instruments that are about to be purchased and deployed, Croatian team is making efforts and progress in site selection and investigation for 5 new seismograph stations. The microseismic tremor measurements were performed on several macro locations on some islands (Ugljan) and Mountain Ucka, as the first step in determining the micro locations of stations.



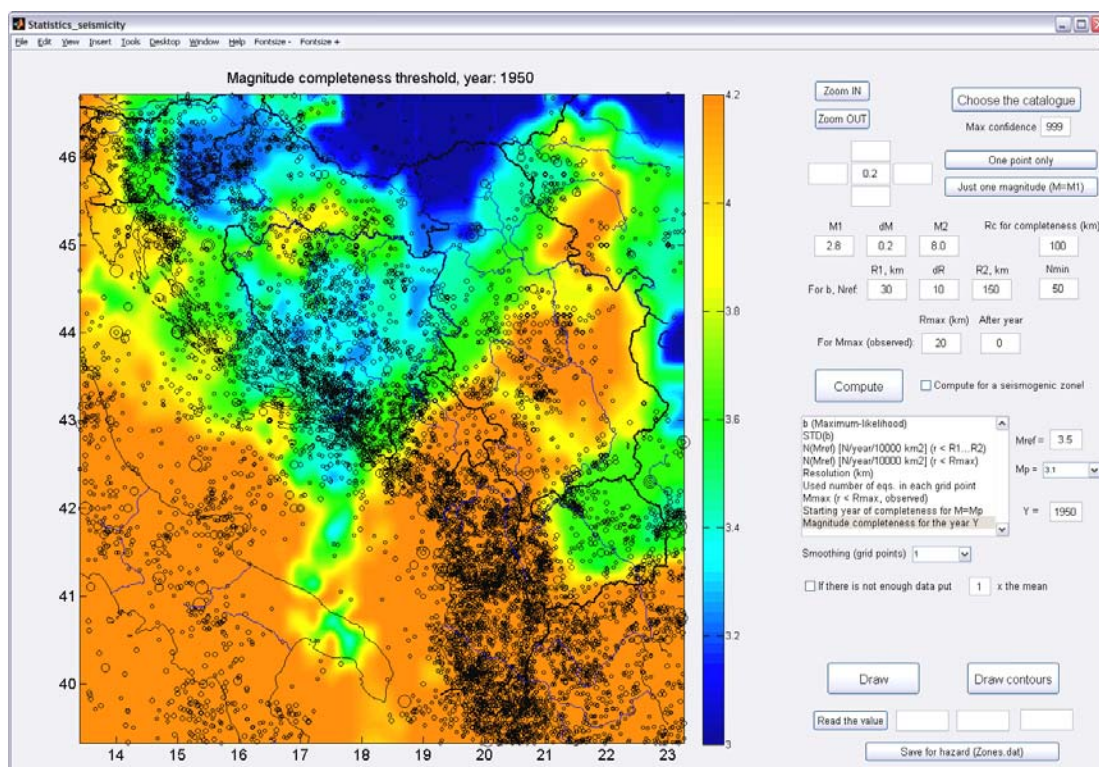
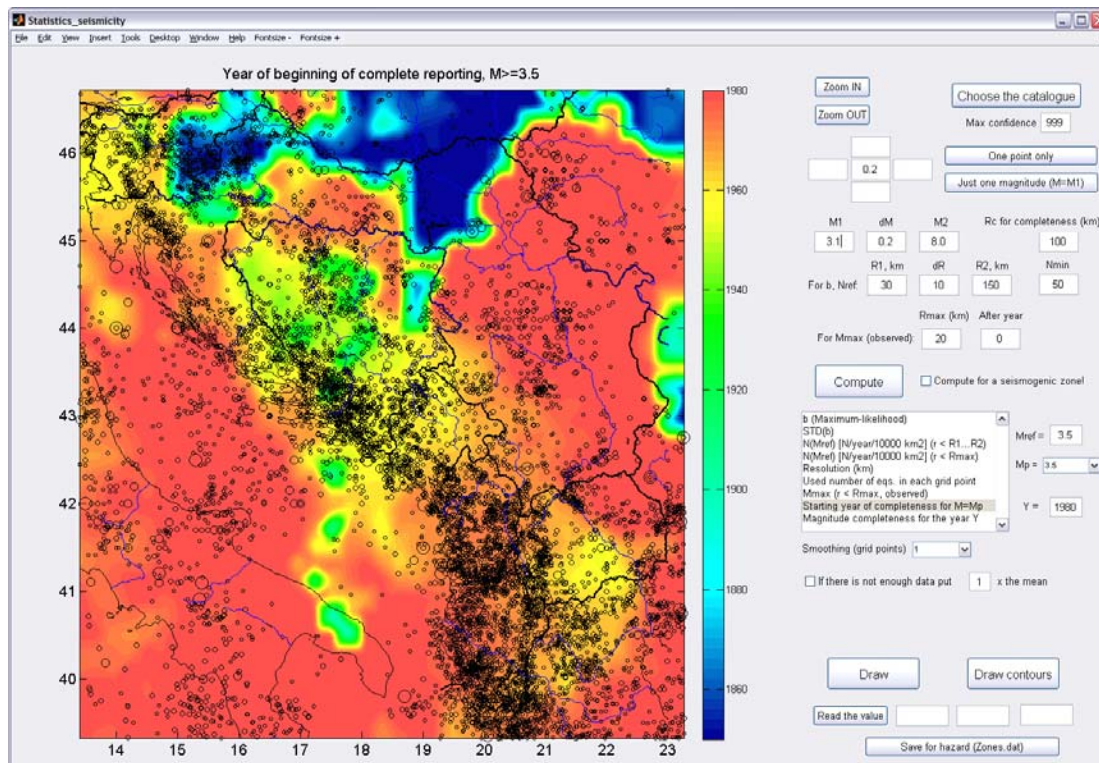


Figure 6. Year of the beginning of complete reporting for  $M \geq 3.5$  (top), and magnitude completeness threshold for the year 1950 (bottom).

### A.2 Actions to insure the implementation of results

Croatian team representatives in Croatian Technical Committee for Euro code 8 continued their work in harmonization with EU standards.

Collaboration between Croatia and other project partners continued and increased rapidly in the field of real time data exchange, after the bilateral agreements were

reached during the previous period of the project even the agreements have mostly not been signed yet. The significant contribution to the data exchange and collaboration between neighboring countries also resulted from other common projects that are going on (CoSEESNet, A Collaborative South East Europe Seismic Network: "Towards Early Warning System and Real Time Seismic Monitoring in South East Europe").

### ***A.3 Milestones for the next six months***

In the next six months of project realization, first and most urgent is that complete earthquake catalogues should be compiled and unified. Then the ground motion prediction models should be discussed and investigated, appropriate software chosen, purchased and tested. The final formats and software tools (GIS, etc.) should also be implemented and elaborated.

Croatian team will also continue to investigate and analyze potential locations for new stations that should be installed as soon as possible.

### ***A.4 Involvement of young scientists***

One or two new young scientists should soon be involved in project activities, as new members of Croatian project team.

### ***A.5 Major travel***

No major travel were realized in the previous six months

### ***A.7 Visibility of SfP project***

All international activities of Croatian team, as well as presentations, are permanently being announced and updated on the official web site of the University of Zagreb. The project and ongoing activities were also several times mentioned in national news and television by Croatian project Co-Director Mr Vlado Kuk.

### ***A.8 Technical and administrative difficulties***

There were no technical and administrative difficulties in project realization.

### ***A.9 Changes in personnel***

There is one change in personnel in Croatia. Mr. Vladimir David (PhD.) is not involved in the project any more. A new researcher is to be found soon to join the Croatian project team.

## **E) MACEDONIA**

In the period April - October 2008, the Institute of Earthquake Engineering and Engineering Seismology (IZIIS-Skopje) in cooperation with Seismological Observatory, Faculty of Natural Sciences (SO/PMF) conducted tasks compliant to methodology, project structure and activities of the adopted Project Plan, i.e., along activities to fulfill Milestone requirements as declared in the October 2007 – March 2008 six months report:

1. Re-compilation of Macedonian earthquake catalogue;
2. Testing of selected SMA models against parameters of regional SM data; and,
3. Procurement of the SM and WM instruments, selection of station sites and assurance of additional budget for construction of facilities to accommodate SM instruments.

Consequently, the principal activities have continued along the following lines: (1) Re-compilation of the Macedonian Earthquake Catalogue; (2) Assembling of regional strong motion data set; (3) Procurement of strong motion instruments; (4) Selection of locations for installment of instruments; (5) Compilation of other relevant data and other preparatory works; and, (6) Training of young scientists.

### ***A.1 Major Accomplishments***

The earthquake catalogue with  $M_{\min} = 2.9$  was re-compiled by SO/PMF and delivered to Prof. Marijan Herak, Croatia, for further analyses and regional harmonization by the end of 2007. Further refinement of the catalogue continued in the period April-October 2007.

The strong motion instruments are ordered from Guralp Systems Ltd. 12 CMG-5TD Strong Motion Sensor Systems consisting of CMG-5 accelerometers and CMG-DM24 modules at cost of \$58,341.50. While the first allotment to Guralp Systems Ltd. is realized by NATO on 09.06.2008, so far neither instruments were delivered, nor is any explanation presented why the bid condition "delivery in 90 days from the payment" has not been respected. If the instruments are not delivered by the end of October (7 weeks delay) the position of IZIIS is to withdraw the order.

Preparing the strategy for instrument deployment, IZIIS designed typical shelter for the installing free field instruments as well as lounged feasibility study to define the location of instruments. More than 25 locations in Macedonia were inspected and microtremor measurements taken in order to define the level of ground noise. All recordings have been processed, analyzed and catalogued.

### ***A.2 Actions to insure the implementation of results***

The main objective of the project is producing the harmonized Seismic Hazard Map as National Annex that conform with EU standards (i.e. Euro code 8) that shall be adopted by Macedonian structural design and construction legislation. Along this line, the collaboration with Macedonian Institute for Standardization (ISRM; <http://www.isrm.gov.mk>) established in 2007 continued in particular within the Working Group 8 (TC/WG8): Design of Structures for Earthquake Resistance.

### ***A.3 Milestones for the next six months***

In the next six months of the project performance the following tasks shall be completed:

1. Completion of the re-compilation of Macedonian earthquake catalogue and harmonization with earthquake catalogues from neighbor countries (Albania, Greece, Bulgaria and Serbia);
2. Testing of selected SMA models against parameters of regional SM data and NGA attenuation models;
3. Selection of locations for deployment of strong motion instruments, accompanied by shallow geophysical refraction measurements; and,
4. Definition of seismotectonic model for Macedonia.

### ***A.4 Involvement of young scientists***

From the project commencement, two young scientists (Ms. Radmila Salic and Ms. Irena Gjorgjeska) were involved in realization of project activities. Ms. Radmila Salic, assistant in IZIS-Skopje, is in the first phase of the preparation of her PhD. Thesis: "Advanced Approach to Seismic Hazard Assessment of Republic of Macedonia (Working Title)", whereas Ms. Irena Gjorgjeska completed preparatory works for her MSc Thesis in the field of array microtremor measurements and determination of lithostratigraphic and physical characteristic of surface soil deposits.

### ***A.5 Major travels***

The travels were related to Project workshops: 1) Young Seismologist Training Course (YSTC) in association with the ESC2008 General Assembly, Technological Educational Institute of Crete [TEICR] Chania, Crete, Greece (2-7 September 2008) /Ms. R. Salic/; 2) 31st General Assembly of the European Seismological Commission (ESC 2008), International Conference Center "Creta Maris", Hersonissos, Crete, Greece (7 to 12 September, 2008) /Ms. R. Salic/; and, 3) International Exercise on Post-earthquake Damage Assessment (within the boundaries of STEP Project - Strategies and Tools for Early Post-Earthquake Assessment), Centre for Civil Protection and Disaster Relief in Ig, Slovenia, Čezsoča in Bovec, Slovenia, (24-27 September 2008) /Ms. R. Salic/.

### ***A.7 Visibility of SfP project***

The project and ongoing activities have several times been mentioned on national television by Macedonian project Co-Director Prof. Mihail Garevski and Prof. Zoran Milutinovic.

The Project was reported and promoted on the several meetings of EUR-OPA Major Hazard Agreement and Annual Board of Directors of the Network of Specialized Euro-Mediterranean Centers of Councils' of Europe Major Hazard Agreement (EUR-OPA MHA), all being both helpful in assuring the additional budget of about 6,000 € annually in the period 2008-2010.

### ***A.8 Technical and administrative difficulties***

There were no technical and administrative difficulties in project realization.

### ***A.9 Changes in personnel & project plan***

There were no changes in project realization .

## **F) SERBIA**

In the period between April 2008 and September 2008, Seismological Survey of Serbia (SSS) conducted the tasks in accordance with the Project structure and activities. The most important activities in the past six month period have been: a) re-compilation of the national earthquake catalogue, analyzing its completeness, de-clustering and seismic hazard assessment for the test area; b) equipment purchase and deployment; c) assigning stipend for one young researcher.

### **1. Major Accomplishments**

After the process of examining the historical earthquakes intensities, for the period 1879–1900, the assessment of earthquake parameters – magnitudes and focal depths have been undertaken. On the basis of available sources it was found that the most of the historical earthquakes have lower intensities compared to the reported in the existing catalogues. It was clear that the existing intensity attenuation relations were not satisfactory and that the new ones should be established. Isoseismic radius of all instrumentally recorded earthquakes with macro seismic data has been calculated as input data. New isoseismic lines for all historical earthquakes with intensity 7-8 degrees (EMS scale) have been delineated using reliable sources and their radius calculated. Earthquake magnitudes and focal depths are calculated applying new intensity attenuation equation and the position of epicenter have been derived.

The procedure for the assessment of historical earthquake parameters has been applied to earthquakes for the period 1900-1970. Some major disagreements with data in existing catalogues were discovered. It was decided that all earthquakes with intensities 5-8 degrees should be overviewed and their parameters re-assessed. Related to that, it can be expected that the activities on earthquake catalogue completing will be extended on the next two-three months period.

For the test area,  $W=18.00^{\circ}$   $E=23.00^{\circ}$   $S=43.50^{\circ}$   $N=46.50^{\circ}$ , earthquake catalogue have been finished and its completeness at different time periods analyzed. It have been deduced that for the time period 1879-2007, the catalogue is complete at magnitude level  $\geq 3$ . Next, catalogue de-clustering has been attempted (after Gardner, Knopoff, 1974). Earthquake catalogue prepared in this way have been used for the assessment of a seismic hazard at the area. Spatially smoothed seismicity approach and software OHAZ 6.0 have been adapted. Seismic hazard map of the tested area is indicated at Figure 1.

The cooperation with the Department for Remote Sensing Geology from the Faculty for Mining and Geology has been induced and the activities regarding seismotectonical elaboration agreed.

Seismological Survey of Serbia received twelve (12) units of strong motion instruments of model ETNA on August 11, 2008. Thereby we successfully finished the process of equipment purchase, after careful consideration of all requirements as agreed earlier and the agreement of Project Directors. Administrative problems related to tax-free exoneration were successfully resolved.

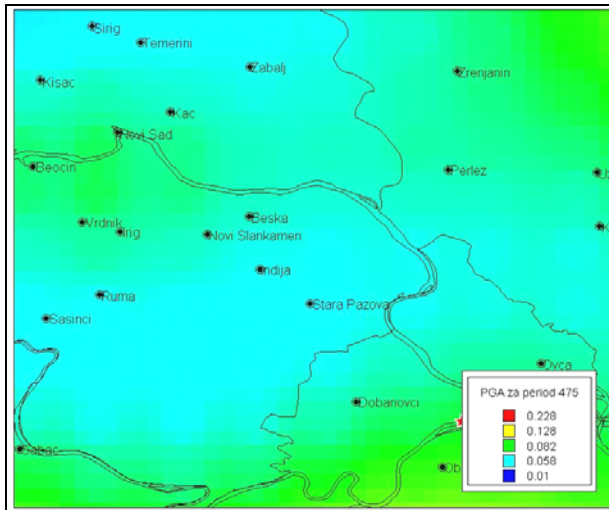


Figure 1. Seismic hazard map of the tested area

Right after obtaining the equipment, we started its deployment at seismically active areas and at locations with different soil conditions. By the end of September, instruments are deployed at five locations as indicated on Figure 2.

New installed Etna instrument at Radoina (SW Serbia) recorded on September 19, the first earthquake with a magnitude  $M_I=3.5$ , at 20 km distance.

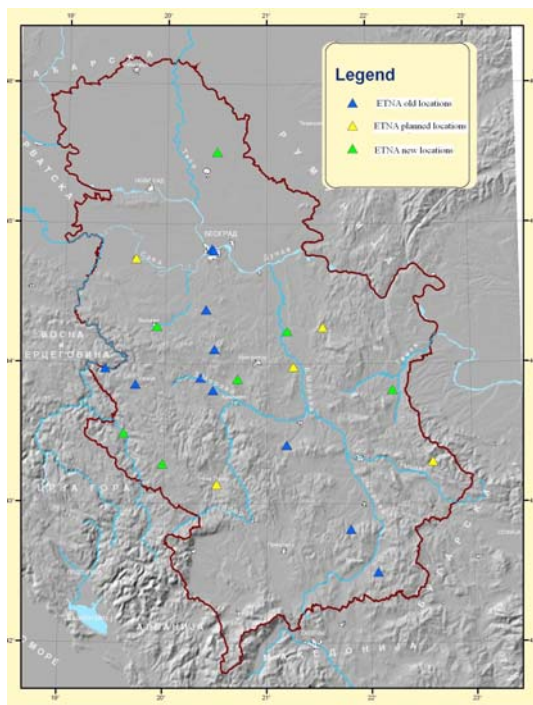


Figure 2. Map of ETNA locations on the territory of Serbia

## **2. Actions to insure the implementation of results**

All the relevant results derived from the Project activities are implemented in seismic hazard assessment for the design of earthquake resistant structures throughout projects of local civil engineering companies.

## **3. Milestones for the next six months**

In the next six months of project realization, the following tasks should be accomplished: national earthquake catalogue completed and de-clustered; GIS software purchased; seismic source zones modeled; available GMP models investigated and the results compared.

#### ***4. Involvement of young scientists***

From august 2008 one young researcher, Miss Dragana Petrovic, a student at Faculty of Mining and Geology in Belgrade, Department for geophysics, was involved in the realization of the project activities. The Contract for assigning the stipend has been made and signed by both sides. In the next period of one year she will participate in the preparation of tectonic and geologic maps and other Project tasks.

In the next six month period, two young researchers more should be engaged and involved in Project activities.

#### ***5. Major travels***

There were no major travels in the past six month period. Participants on the Project traveled around the territory of Serbia in order to make decision about the locations for equipment installation and subsequently to install it.

#### ***6. Visibility of SFP project***

All activities of the Seismological Survey of Serbia are being announced and updated on the official web site, in national media and throughout cooperation in the field of seismic hazard assessment.

#### ***7. Technical and administrative difficulties***

There were no technical and administrative difficulties in Project realization except the needing for time extension for the activities on earthquake catalogue completion.

#### ***8. Changes in personnel***

Stipend for young researcher was assigned to Miss Dragana Petrovic, after the tragical loss of the initially envisaged one. There were no other changes in personnel.

#### ***9. Changes in project plan***

No participants attended conference in September as planned, as a consequence of organizational difficulties.

### **G) TURKEY**

During the 2nd 6-month period, the NPD, Prof. Akkar, collaborated with Prof. Glavatovic (PPD) to finalize the procurement of the seismic instruments. The seismic instrument bidding was finalized and the participating countries have started to order the strong- and weak-motion equipment. Prof. Akkar also collaborated with Prof. Glavatovic during the official correspondence about the change of project co-directorship in Albania. Prof. Ismail Hoxha replaced former co-director Prof. Shyqri Aliaj who retired by the end of 2007. Prof. Akkar attended to the First Accelerometric Workshop in Europe and the Mediterranean Countries held in Grenoble, France and he briefly referred to the ongoing progress in the BSHAP project as part of his talk.

# FINANCIAL STATUS

## 6.1 Annex 4a: Sfp NATO BUDGET TABLES

### A) MONTENEGRO

Project number: Sfp - 983054	Project short title: Sfp - BHSAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2008	Duration of the Project <sup>1</sup> :	1.10.09. 2007 – 1.10. 2010 / 3 years
Project Co-Director: Prof Branislav Glavatovic, Podgorica, Montenegro		

Detailed Budget Breakdown (to be completed in EUR <sup>3</sup> )	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 30.09 (current year) <sup>2</sup>	(2) for the following six months	(3) for the following period until project's		
<b>29200(a) Equipment</b>					
(A1) Three integrated weak and strong motion instruments	23,575	23,575			50% advance paid for the equipment, other is on hold – in following 6 months
(A2) Accelerograph installation		4,850			1850 not spent for instruments redirected for installation costs
<b>Subtotal "Equipment"</b>	<b>23,575</b>	<b>28,425</b>			
<b>(b) Computers - Software</b>					
(B1) PC laptop and Printer	1,574	1,331			
(B2) Norton fire wall and antivirus	45				
(B3) PC monitor	750				
(B4) EZ FRISK licence		2,000	500		
(B5) GIS software licence+DMT		3,500			
<b>Subtotal "Computers - Software"</b>	<b>2,369</b>	<b>6,831</b>	<b>500</b>		
<b>(c) Training</b>					
(C1) Training of three younger researchers		3,000	6,000		3000 Eur not spent in 1 <sup>st</sup> year redirected to 2 and 3 year
<b>Subtotal "Training "</b>		<b>3,000</b>	<b>6,000</b>		
<b>(d1) Books and Journals (global figure)</b>	60	440			440 Eur not spent in 1 <sup>st</sup> year redirected to following 6 months
<b>(d2) Publications (global figure)</b>					
<b>Subtotal "Books - Publications"</b>	<b>60</b>	<b>440</b>			
<b>(e) Experts - Advisors</b>					
(E1) Mr. Mladen Zivcic from ARSO, Slovenia to Project Official Launching	769		1,213		231 Eur not spent in 1 <sup>st</sup> year redirected to following period
<b>Subtotal "Experts - Advisors "</b>	<b>769</b>		<b>1,231</b>		
<b>(f) Travel</b>					
(F1) Meetings	3,053	1,947	4,000		
(F2) Conferences		1000	3,000		
<b>Subtotal "Travel"</b>	<b>3,053</b>	<b>2,947</b>	<b>7,000</b>		
<b>(g) Consumables - Spare parts:</b>	1,000		1,000		
<b>Subtotal "Consumables - Spare parts"</b>	<b>1,000</b>		<b>1,000</b>		
<b>(h) Other costs and (i) stipends (specify)</b>					
(H1) Web: design, domain registration and one year lease	1197		303		In September domain registration and Web maintenance paid for 2009.
(H2) Mailing costs- DHL service etc.	228	147	375		
(H3) Missellineous	1,250	600	1,900		
(I1) Stypends for Ms Ljiljana Vucic	1,950	900	2550		
(I2) Stypends for Ms Jadranka Mihaljevic	1,950	900	2550		
<b>Subtotal "Other costs"</b>	<b>6,575</b>	<b>2,547</b>	<b>7,678</b>		
<b>TOTAL (1), (2), (3) :</b>	<b>37,401</b>	<b>44,190</b>	<b>23,409</b>		
<b>CURRENT COST OUTLOOK =(1)+(2)+(3)</b>			<b>105,000</b>		



## B) ALBANIA

Project number: SFP - 983054	Project short title: SFP - BHSAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2008.	Duration of the Project <sup>1</sup> :	1.10.09. 2007 – 1.10.2010 / 3 years
Project Co-Director: Prof. Ismail Hoxha, PhD in Geoinformatics, Albania		

Detailed Budget Breakdown <i>(to be completed in EUR<sup>3</sup>)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved Project Plan
	(1) from start until 31.08. / 31.03. (current year) <sup>2</sup>	(2) for the following six months	(3) for the following period until project's end	
<b>(a) Equipment</b>				
(A1) <i>Guralp Systems CMG-5T Sensor &amp; CMG-5TSM</i>	20,845	20,845	310	<i>Equipment 50% of advance paid and rest to be paid within next six months.</i>
<b>Subtotal "Equipment"</b>	<b>20,845</b>	<b>20,845</b>	<b>310</b>	
<b>(b) Computers - Software</b>				
(B1) <i>2 PC laptops</i>		2,000		
(B2) <i>2 printers</i>		1,000	1,000	
(B3) <i>1 computer code EZ- FRISK</i>		1,000	1,500	
(B4) <i>1 license for GIS software</i>		2,000		
<b>Subtotal "Computers - Software"</b>		<b>6,000</b>	<b>2,500</b>	
<b>(c) Training</b>				
(C1) <i>Training of three younger researchers</i>		4,000	5,500	
(C2) <i>Study tours for two younger researchers</i>			3,000	
<b>Subtotal "Training "</b>		<b>4,000</b>	<b>8,500</b>	
<b>(d) Books and Journals</b>				
(d1) <i>Books and Journals</i>		1,000	1,000	
<b>Subtotal "Books - Publications"</b>		<b>1,000</b>	<b>1,000</b>	
<b>(e) Experts - Advisors</b>				
(E1) <i>Invited</i>		1,000	1,000	
<b>Subtotal "Experts - Advisors "</b>		<b>1,000</b>	<b>1,000</b>	
<b>(f) Travel</b>				
(F1) <i>Meetings</i>	5,057	2,443	3,200	
(F2) <i>Conferences</i>		1,000	2,000	
<b>Subtotal "Travel"</b>	<b>5,057</b>	<b>3,443</b>	<b>5,200</b>	
<b>(g) Consumables - Spare parts:</b>		1,500	3,000	
<b>Subtotal "Consumables - Spare parts"</b>		<b>1,500</b>	<b>3,000</b>	
<b>(h) Other costs and (i) stipends (specify)</b>				
(I1) <i>Stipends for two young scientists</i>	2,100	3,300	5,400	
<b>Subtotal "Other costs"</b>	<b>2,100</b>	<b>3,300</b>	<b>5,400</b>	
<b>TOTAL (1), (2), (3) :</b>	<b>28,002</b>	<b>41,088</b>	<b>26,910</b>	<i>Total budget reduced for 1.800 Euros according to Grant Letter</i>
<b>CURRENT COST OUTLOOK =(1)+(2)+(3)</b>		<b>96,000</b>		

## C) BOSNIA AND HERZEGOVINA

Project number: SfP - 983054 Report date: 30.09.2008 Project Co-Director: Mr. Amer Zoranic, Sarajevo, Bosnia and Herzegovina	Project short title: SfP - BSHAP Duration of the Project <sup>1</sup> :	Harmoniz. of Seis. Haz. Maps for Western Balkan Countries 1/10/2007 – 1/10/2010 3 years
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Detailed Budget Breakdown <small>(to be completed in EUR<sup>2</sup>)</small>	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 30.09.2008		(2) for the following six months	(3) for the following period until project's	
<b>(A) Equipment</b>					
<i>(A1) Three seismograph stations for the national network &amp; (A2) five strong-motion accelerograph for the national strong-motion network improvement</i>	33,540		33,540		<i>Equipment 50% of advance paid and rest to be paid within next six months.</i>
<b>Subtotal "Equipment"</b>	<b>33,540</b>		<b>33,540</b>		
<b>(B) Software</b>					
<i>(B1) EZ-FRISK licence with two years extension</i>				2,500	
<i>(B2) GIS software-Mapinfo+Vertical Mapper</i>				4,000	
<b>Subtotal "Computers - Software"</b>				<b>6,500</b>	
<b>(C) Training</b>					
<i>(C1) Training of two young researches</i>			2,000	3,000	
<b>Subtotal "Training "</b>			<b>2,000</b>	<b>3,000</b>	
<b>(E) Experts - Advisors</b>				1,000	
<b>Subtotal "Experts - Advisors "</b>				<b>1,000</b>	
<b>(f) Travel</b>					
<i>(F1) Meetings</i>	1,830		1,190	5,500	
<i>(F2) Conferences</i>			1,500	2,000	
<b>Subtotal "Travel"</b>	<b>1,830</b>		<b>2,690</b>	<b>7,500</b>	
<b>(h) Other costs and (i) stipends (specify)</b>					
<i>(h) Other costs</i>			1,000	2,000	
<i>(i) stipends</i>	1,800		900	2,700	
<b>Subtotal "Other costs"</b>	<b>1,800</b>		<b>1,900</b>	<b>4,700</b>	
<b>TOTAL (1), (2), (3) :</b>	<b>37,170</b>		<b>40,130</b>	<b>22,700</b>	
<b>CURRENT COST OUTLOOK = (1)+(2)+(3)</b>			<b>100,000</b>		

## D) CROATIA

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries (BSHAP)
Report date: 30.09.2008	Duration of the Project <sup>1</sup> :	31.10.2007 – 31.10.2010 / 3 years
Project Co-Director: Vlado Kuk, Zagreb, Croatia		

Detailed Budget Breakdown <i>(to be completed in EUR<sup>3</sup>)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 30.09.08. (current year) <sup>2</sup>	(2) for the following six months	(3) for the following period until project's	
<b>(a) Equipment</b>				
<i>(A1) Two integrated systems (weak / strong motion)</i>	13,000	13,000		<i>Equipment 50% of advance paid and rest to be paid within next six months.</i>
<i>(A2) Three weak motion seismographs</i>	12,278	12,278		
<b>Subtotal "Equipment"</b>	<b>25,278</b>	<b>25,278</b>		
<b>(b) Computers - Software</b>				
<i>(B1) PC, laptops and printers</i>				
<i>(B4) EZ FRISK licence</i>		2,500		
<i>(B5) GIS software licence+DMT</i>			2,000	
<b>Subtotal "Computers - Software"</b>		<b>2,500</b>	<b>2,000</b>	
<b>(c) Training</b>				
<i>(C1) Training of two younger researchers</i>		3,000	6,000	
<b>Subtotal "Training "</b>		<b>3,000</b>	<b>6,000</b>	
<b>(e) Experts - Advisors</b>				
<b>Subtotal "Experts - Advisors "</b>		<b>1,000</b>	<b>1,000</b>	
<b>(f) Travel</b>				
<i>(F1) Meetings</i>	5,750	2,000	2,000	
<i>(F2) Conferences</i>			1,600	
<b>Subtotal "Travel"</b>	<b>5,750</b>	<b>2,000</b>	<b>3,600</b>	
<b>(h) Other costs and (i) stipends (specify)</b>				
<i>(H3)Miscellaneous</i>		500	1,994	
<i>(I1)Stipends for Mr Kresimir Kuk</i>	1,800	900	3600	
<i>(I2)Stipends for Mr Josip Stipcevic</i>	1,800	900	3600	
<i>(I3)Stipends for new young researcher</i>		900	3600	
<b>Subtotal "Other costs"</b>	<b>3,600</b>	<b>3,200</b>	<b>12,794</b>	
<b>TOTAL (1), (2), (3) :</b>	<b>34,628</b>	<b>36,978</b>	<b>25,394</b>	
<b>CURRENT COST OUTLOOK = (1)+(2)+(3)</b>		<b>97,000</b>		

## E) MACEDONIA

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.08.2008.	Duration of the Project <sup>1</sup> :	1.10.09. 2007 – 1.10. 2010 / 3 years
Project Co-Director: Prof. Mihail GAREVSKI, Skopje, Macedonia		

Detailed Budget Breakdown <i>(to be completed in EUR<sup>3</sup>)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 31.08. / 31.03. (current)	(2) for the following six months	(3) for the following period until project's	
<b>(a) Equipment</b>				
(A1) Five strong-motion accelerograph stations	18,726	18,726	5,548	<i>Equipment 50% of advance paid and rest to be paid within next six months.</i>
(A2) Accelerograph installation & site preparation		6,000	6,000	
<b>Subtotal "Equipment"</b>	<b>18,726</b>	<b>24,726</b>	<b>11,548</b>	
<b>(b) Computers - Software</b>				
(B1) PC - laptops and printers		3,300	900	
(B4) EZ FRISK licence		2000	500	
(B5) GIS software licence+DMT			2,000	
<b>Subtotal "Computers - Software"</b>		<b>5,300</b>	<b>3,400</b>	
<b>(c) Training</b>				
(C1) Training of two younger researches			5,000	
(C2) Study tours for two young researches			5,000	
<b>Subtotal "Training "</b>		<b>3,000</b>	<b>10,000</b>	
<b>(e) Experts - Advisors</b>				
<b>Subtotal "Experts - Advisors "</b>		<b>1,000</b>	<b>1,000</b>	
<b>(f) Travel</b>				
(F1) Meetings	4,579	1,421	3,000	
(F2) Conferences	1,434		2,566	
<b>Subtotal "Travel"</b>	<b>6,013</b>	<b>1,421</b>	<b>5,566</b>	
<b>(h) Other costs and (i) stipends (specify)</b>				
(H3) Miscellaneous		1,500	2,600	
(I1) Stipends for Ms Irena Gjorgjeska	1200	600	1,800	
(I2) Stipends for Mr Goran Jekic	1200	600	1,800	
<b>Subtotal "Other costs"</b>	<b>2,400</b>	<b>2,700</b>	<b>6200</b>	
<b>TOTAL (1), (2), (3):</b>	<b>27,139</b>	<b>38,147</b>	<b>31,714</b>	<i>Total budget reduced for 400 Euros according to Grant Letter</i>
<b>CURRENT COST OUTLOOK =(1)+(2)+(3)</b>			<b>97,000</b>	

## F) SERBIA

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2008	Duration of the Project <sup>1</sup> :	1.10. 2007 – 1.10.2010 / 3 years
Project Co-Director: Ms Svetlana Kovacevic, Belgrade, Serbia		

Detailed Budget Breakdown <i>(to be completed in EUR<sup>2</sup>)</i>	ACTUAL EXPENDITURES		FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved
	(1) from start until 30.09 2008.	(2) for the following six months	(3) for the following period until project's		
<b>29200(a) Equipment</b>					
(A1) Seven strong-motion accelerograph stations	21,500	21,500			Equipment 50% of advance paid and rest to be paid within next six months.
(A2) Accelerograph installation		7,000			
<b>Subtotal "Equipment"</b>	<b>21,500</b>	<b>28,500</b>			
<b>(b) Computers - Software</b>					
(B1) One data storage unit			1,000		
(B2) Software for creating and managing acc. data base		1,000			
(B3) Upgrade for Arc view 8.1 Gis software		4,500			
(B4) EZ FRISK licence		2,000	500		
<b>Subtotal "Computers - Software"</b>		<b>7,500</b>	<b>1,500</b>		
<b>(c) Training</b>					
(C1) Training of three younger researchers			9,000		
<b>Subtotal "Training "</b>			<b>9,000</b>		
<b>(d1) Books and Journals (global figure)</b>		500	2,500		
<b>(d2) Publications (global figure)</b>					
<b>Subtotal "Books - Publications"</b>		<b>500</b>	<b>2,500</b>		
<b>(e) Experts - Advisors</b>		1,000	1,000		
<b>Subtotal "Experts - Advisors "</b>		<b>1,000</b>	<b>1,000</b>		
<b>(f) Travel</b>					
(F1) Meetings	1,500	3,000	4,500		
(F2) Conferences		800	2,700		
<b>Subtotal "Travel"</b>	<b>1,500</b>	<b>3,800</b>	<b>7,200</b>		
<b>(h) Other costs and</b>	113	887	2,500		
<b>(i) stipends (specify)</b>	150	900	7,950		
<b>Subtotal "Other costs"</b>	<b>263</b>	<b>1,787</b>	<b>10,450</b>		
<b>TOTAL (1), (2), (3):</b>	<b>23,263</b>	<b>43,087</b>	<b>31,650</b>		
<b>CURRENT COST OUTLOOK =(1)+(2)+(3)</b>			<b>98,000</b>		

## G) TURKEY

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmoniz. of Seis. Haz. Maps for West. Balkan Countries
Report date: 30.09.2008	Duration of the Project <sup>1</sup> :	1.10.2007 – 1.10.2010 / 3 years
Project NPD: Prof. Sinan Akkar, Ankara, Turkey		

Detailed Budget Breakdown <i>(to be completed in EUR<sup>3</sup>)</i>	ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in the financial planning compared to the approved Project Plan
	(1) from start until 31.09.08	(2) for the following six months	(3) for the following period until project's end	
<b>(f) Travel</b>				
<i>(F1) Meetings</i>	5,925	3,000	9,075	
<i>(F2) Conferences</i>	1,852	2,000	5,148	
<b>Subtotal "Travel"</b>	<b>7,777</b>	<b>5,000</b>	<b>14,223</b>	
<b>(g) Consumables - Spare parts:</b>		3000	6000	
<b>Subtotal "Consumables - Spare parts"</b>		<b>3000</b>	<b>6000</b>	
<b>(h) Other costs and (i) stipends <i>(specify)</i></b>				
<i>(H1) Contingency</i>	452	250	798	
<i>(H2) Administrative Costs</i>		2500	5000	
<b>Subtotal "Other costs"</b>	<b>452</b>	<b>2,750</b>	<b>5,798</b>	
<b>TOTAL (1), (2), (3):</b>	<b>8,229</b>	<b>10,750</b>	<b>26,021</b>	
<b>CURRENT COST OUTLOOK = (1)+(2)+(3)</b>				<b>45,000</b>

## 6.2 Annexe 4b: SfP NATO SUMMARY BUDGET TABLES

Project number: SfP - 983054	Project short title: SfP - BSHAP	Harmonization of Seismic Hazard Maps for The Western Balkan Countries
Report date:	Duration of the Project <sup>1</sup> : 1.10.09. 2007 – 1.10. 2010 / 3 years /	
The Project is in the year (please indicate): <u>1</u> - 2 - 3		

Breakdown per Project Co-Director			ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in financial planning compared to the approved Project Plan
	APPROVED BUDGET: Total year 1-5	CURRENT COST OUTLOOK:	since start until 31/03/ 2008 of current year <sup>2</sup>	for the following 6 months	for the following period until project's end	
Prof Branislav Glavatovic, Podgorica, Montenegro	105,000	38,127	37,401	43,921	23,678	
Prof. Dr. Shyqyri Aliaj, Tirana, Albania	96,000	28,354	28,002	41,088	26,910	
Mr. Amer Zoranic, Sarajevo, B&H	100,000	41,039	37,170	40,130	22,700	
Vlado Kuk, Zagreb, Croatia	97,000	32,778	34,628	36,978	25,394	
Ms. Svetlana Kovacevic, Belgrade, Serbia	98,000	29,000	23,263	43,087	31,650	
Prof. Mihail GAREVSKI Prof. Zoran MILUTINOVIC,	97,000	26,226	27,139	38,147	31,714	
Prof. Sinan Akkar, Ankara, Turkey, PPD	45,000	14,750	8,229	10,750	26,021	
<b>TOTAL</b>	<b>638,000</b>	<b>210,274</b>	<b>195,832</b>	<b>254,101</b>	<b>188,067</b>	

Breakdown per item (to be completed in EUR <sup>3</sup> )			ACTUAL EXPENDITURES	FORECAST EXPENDITURES		Comments on changes, if any, in financial planning compared to the approved Project Plan
Prof Branislav Glavatovic, Podgorica, Montenegro	APPROVED BUDGET: Total year 3	CURRENT COST OUTLOOK:	since start until 31.03. 2008 of current year <sup>2</sup>	for the following 6 months	for the following period until project's end	
(a) Equipment.	306,000		143,464	161,314	5,858	The overall sum of the purchased equipment overcame the approved figure –consequently the other costs have been changed so to fit the overall project sum.
(b) Computers - Software	50,900		2,369	28,131	16,400	
(c) Training	61,000			15,000	42,500	
(d) Books - Publications	5,500		60	1,940	3500	
(e) Experts - Advisors	12,000		769	4,000	6,231	
(f) Travel	104,700		30,980	21,301	50,289	
(g) Consumables - Spare parts:	19,000		1,000	4,500	10,000	
(h) Other costs and (i) stipends	78,900		17,190	18,184	53,020	
<b>TOTAL :</b>	<b>638,000</b>	<b>210,274</b>	<b>195,832</b>	<b>254,370</b>	<b>187,798</b>	

## 6.3 Annexe 4c: SfP NATO NATIONAL CONTRIBUTION TABLES

### A) MONTENEGRO

Project number: SfP – 983054 (BSHAP)
Project Co-Director: Prof. Branislav Glavatovic, Podgorica, Montenegro
Report date: September, 2008

#### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
1. Mr. Branislav Glavatovic, Prof, director	5,000	5,000	5,000
2. Ms. Jadranka Mihaljevic, consultant in eq. engineering, civil engineer	2,000	2,000	2,000
3. Ms. Ljiljan Vucic, applied mathematician	1,500	1,500	1,500
4. Mr. Marin Cavelish, electrical engineer	2,000	2,000	2,000
5. Ms. Velisa Supic, MS geologist, senior consultant in seismology	2,500	2,500	2,500
6. Ms. Natasa Kaludjerovic, applied physicist		2,000	2,000
7. Mr. Vladan Dubljevic, MS, director of Geological Institute	5,000	5,000	5,000
<b>Subtotal "Salaries"</b>	<b>18,000</b>	<b>20,000</b>	<b>20,000</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	500	500	500
(B2) Consumables	500	500	500
<b>Subtotal "Overhead"</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>
<b>(c) Equipment - Computers</b>			
(C1) Equipment - Computers, scanners etc.	1,000	1,000	1,500
(C2) Office tolls: photocopiers, faxmachine etc.	800	800	1000
<b>Subtotal "Equipment"</b>	<b>1,800</b>	<b>1,800</b>	<b>2,500</b>
<b>(d) Other costs</b>			
(D1) Local experts and consultantss	1,500	1,500	1,500
(D2) National workshops	2,000	2,000	3,000
<b>Subtotal "Other costs"</b>	<b>3,500</b>	<b>3,500</b>	<b>4,500</b>
	<b>24,300</b>	<b>26,300</b>	<b>28,000</b>
<b>TOTAL :</b>		<b>78,300</b>	

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			



## B) ALBANIA

Project number: SfP - 983054 (BSHAP)
Project Co-Director: Prof. Dr. Shyqyri Aliaj ,Tirana, Albania
Report date: September, 2008

### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
<i>Prof. Dr. Shyqyri Aliaj , Director</i>	3,000	After the formal nomination of Project Co-Director the new team will be appointed along with the expenditures for the 2 <sup>nd</sup> and 3 <sup>rd</sup> year	
<i>Prof.Dr. Eduard Sulstarova, Secretary General</i>	3,000		
<i>Mr. JaniSkrami, Head of Dep Eng. Seism.</i>	1,000		
<i>Mr. Rexhep Koci, Geologist, MS</i>	500		
<i>Mr. Edmond Dushi, Head of Dep. of Seismic Network, MS Cand.</i>	2,000		
<i>Mr. Ilir Shinko head of Electronic Laboratory, MS Cand.</i>	1,000		
<i>Mr. Llambro Duni, Eng. Seismologist, Ass. Prof., Dr.</i>	1,000		
<i>Ms. Albana Zotaj, Head of GIS and Remote Sensing Department</i>	500		
<i>Ms. Anuela Prifti, Specialist in GIS, MS</i>	500		
<b>Subtotal "Salaries"</b>	<b>12,500</b>		<b>app. 12,500</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
<i>(B1) Energy, local transportation etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
<b>Subtotal "Overhead"</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>
<b>(c) Equipment - Computers</b>			
<i>(C1) Equipment - Computers, scanners etc.</i>	1,000	1,000	1,000
<i>(C2) Office tolls: photocopiers, faxmachine etc.</i>	800	800	800
<b>Subtotal "Equipment"</b>	<b>1,800</b>	<b>1,800</b>	<b>1,800</b>
<b>(d) Other costs</b>			
<i>(D1) Local experts and consultantss</i>	1,500	1,500	1,500
<i>(D2) National workshops</i>	2,000	2,000	3,000
<b>Subtotal "Other costs"</b>	<b>3,500</b>	<b>3,500</b>	<b>4,500</b>
	<b>18,800</b>	<b>18,800</b>	<b>19,800</b>
<b>TOTAL :</b>		<b>57,400</b>	

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			

## C) BOSNIA AND HERZEGOVINA

Project number: Sfp - 983054 (BSHAP)
Project Co-Director: Mr. Amer Zoranic, Sarjevo, Bosnia and Herzegovina
Report date: September, 2008

### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1st year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
Mr. Amer Zoranic	5,000	5,000	5,000
Mr. Ivan Brlek, BS	5,000	5,000	5,000
Mr. Rusmir Gorusanin, BS	3,800	3,800	3,800
Dr. Drago Trkulja	5,000	5,000	5,000
Ms. Snjezana Cvijic, BS	4,000	4,000	4,000
Mr. Sveto Vrhovac, BS	4,000	4,000	4,000
<b>Subtotal "Salaries"</b>	<b>26,800</b>	<b>26,800</b>	<b>26,800</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	1,000	1,000	1,000
(B2) Consumables	800	800	800
<b>Subtotal "Overhead"</b>	<b>1,800</b>	<b>1,800</b>	<b>1,800</b>
<b>(c) Equipment - Computers</b>			
(C1) Equipment - Computers, scanners etc.	2,000	2,000	2,000
(C2) Office tolls: photocopiers, faxmachine etc.	1,600	1,600	2,000
<b>Subtotal "Equipment"</b>	<b>3,600</b>	<b>3,600</b>	<b>4,000</b>
<b>(d) Other costs</b>			
(D1) Local experts and consultantss	1,500	1,500	2,500
(D2) National workshops	2,000	2,000	2,000
<b>Subtotal "Other costs"</b>	<b>3,500</b>	<b>3,500</b>	<b>4,500</b>
	<b>35,700</b>	<b>35,700</b>	<b>37,100</b>
<b>TOTAL :</b>	<b>108,400</b>		

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			

## D) CROATIA

Project number: SfP – 983054 (BSHAP)

Project Co-Director: Mr. Vlado Kuk, Zagreb, Croatia

Report date: September, 2008

### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 <sup>st</sup> year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
1. Mr. Vlado Kuk, Ms, director	4,000	4,000	4,000
2. Mr. Marijan Herak, prof.	4,000	4,000	4,000
3. Mrs. Davorka Herak, prof.	3,000	3,000	3,000
4. Mrs. Snjezana Markusic, dr.	2,500	2,500	2,500
5. Mr. Ivo Allegretti, M.S.	2,200	2,200	2,200
6. Mr. Kresimir Maric, M.S.	2,200	2,200	2,200
7. Mr. Ivica Sovic, M.S.	2,160	2,160	2,160
8. Mr. Kresimir Kuk, B.SC.	2,000	2,000	2,000
9. Mrs. Ines Ivancic, B.SC.	2,000	2,000	2,000
10. Mr. Josip Stipcevic, B.SC.	2,000	2,000	2,000
11. Mr. Vladimir David, dr.	2,500	2,500	2,500
<b>Subtotal "Salaries"</b>	<b>28,560</b>	<b>28,560</b>	<b>28,560</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
(B1) Energy, local transportation etc.	1,000	1,000	1,000
(B2) Consumables	500	500	500
<b>Subtotal "Overhead"</b>	<b>1,500</b>	<b>1,500</b>	<b>1,500</b>
<b>(c) Equipment - Computers</b>			
(C1) Equipment - Computers, scanners etc.	1,000	1,000	1,500
(C2) Office tolls: photocopiers, fax machine etc.	1,000	1,000	2,000
<b>Subtotal "Equipment"</b>	<b>2,000</b>	<b>2,000</b>	<b>3,500</b>
<b>(d) Other costs</b>			
(D1) Local experts and consultants	2,000	1,000	2,000
<b>Subtotal "Other costs"</b>	<b>2,000</b>	<b>1,000</b>	<b>2,000</b>
	<b>34,060</b>	<b>34,060</b>	<b>35,560</b>
<b>TOTAL :</b>		<b>103,680</b>	

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			

## E) MACEDONIA

Project number: SFP – 983054 (BSHAP)
Project Co-Director: Prof. Dr. Mihail Garevski, Skopje , Macedonia
Report date: September, 2008

### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 <sup>st</sup> year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
<i>Dr. Mihail Garevski</i>	7,000	7,000	7,000
<i>Dr. Zoran Milutinovic</i>	6,000	6,000	6,000
<i>Dr. Snezana Stamatovska</i>	6,000	6,000	6,000
<i>Dr. Dragi Dojcinovski</i>	6,000	6,000	6,000
<i>Slobodan Micajkov, BS</i>	3,000	3,000	2,000
<i>Dr. Lazo Pekevski</i>	6,000	6,000	6,000
<i>Ms Radmila Salic, MS</i>	3,500	3,000	3,000
<i>Mr Kemal Edip, MS</i>	3,500	3,000	3,000
<i>Ms Irena Gjorgjeska</i>	3,000	3,000	
<i>Mr Goran Jekic</i>	1,840	1,640	1,800
<b>Subtotal "Salaries"</b>	<b>45,840</b>	<b>44,640</b>	<b>40,800</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
<i>(B1)Energy, local transportation etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
<b>Subtotal "Overhead"</b>	<b>1,000</b>	<b>1,100</b>	<b>1,000</b>
<b>(c) Equipment - Computers</b>			
<i>(C1) Equipment - Computers, scanners etc.</i>	1,500	1,500	1,500
<i>(C2) Office tolls: photocopiers, fax machine etc.</i>	800	800	1000
<b>Subtotal "Equipment"</b>	<b>2,300</b>	<b>2,300</b>	<b>2,500</b>
<b>(d) Other costs</b>			
<i>(D1) Accelerograph installation, site preparation,</i>		4,000	
<i>(D2) Purchase of digital and other relevant national digital data</i>	5,000		
<i>(D3) Procurement of licensed software</i>	3,500	1,500	
<i>(D4) Local experts and consultants fees</i>	1,500	1,500	1,500
<i>(D4) Organization of national workshop</i>	2,000	2,000	3,000
<i>(D5) Miscellaneous</i>	1,000	1,000	1,000
<b>Subtotal "Other costs"</b>	<b>13,000</b>	<b>10,000</b>	<b>5,500</b>
	<b>62,140</b>	<b>57,940</b>	<b>49,800</b>
<b>TOTAL :</b>		<b>169,880</b>	

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			

## F) SERBIA

Project number: SfP – 983054 (BSHAP)

Project Co-Director: Ms. Svetlana Kovacevic, Belgrade, Serbia

Report date: September, 2008

### A. TYPE OF EXPENDITURE

Budget breakdown	Year of expenditure		
	1 <sup>st</sup> year	2nd year	3rd year
<b>(a) Salaries</b> (Name and qualification of research and support personnel)			
<i>SvetlanaKovacevic,MS</i>	2200	2200	2200
<i>SlavicaRadovanovic,MS</i>	2400	2400	2400
<i>BrankoDragicevic,BS</i>	1,500	1,500	1,500
<i>VladanKovacevic,B.Sci</i>	1,500	1,500	1,500
<i>MiodragPetrovic,PhD</i>	2400	2400	2400
<i>Vidosava Knezevic,B.Sci</i>	1,400	1,400	1,400
<i>BrankaVeselinovic,BS</i>	1,400	1,400	1,400
<i>StepaPetrovicCacic, BS</i>	1,400	1,400	1,400
<i>GoranKronic, BS</i>	1,400	1,000	
<i>Dejan Valcic,BS</i>	1,400	1,400	1,400
<i>Dr Mira Petronijevic</i>		2000	2400
<i>Dr Radmila Pavlovic</i>	2400		
<b>Subtotal "Salaries"</b>	<b>19.400</b>	<b>18.600</b>	<b>18.000</b>
<b>(b) Overhead Costs</b> (specify: consumables, energy, local transportation)			
<i>(B1) Energy, local transportation etc.</i>	500	500	500
<i>(B2) Consumables</i>	500	500	500
<b>Subtotal "Overhead"</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>
<b>(c) Equipment - Computers</b>			
<i>(C1) Equipment - Computers, scanners etc.</i>	3000	3000	3000
<i>(C2) Office tolls: photocopiers, fax machine etc.</i>	500	500	500
<b>Subtotal "Equipment"</b>	<b>3.500</b>	<b>3.500</b>	<b>3.500</b>
<b>(d) Other costs</b>			
<i>(D1) Local experts and consultants</i>		3.000	3.000
<i>(D2) Organization of national workshop</i>		2.000	2.000
<b>Subtotal "Other costs"</b>		<b>5,000</b>	<b>5,000</b>
	<b>23.900</b>	<b>28.100</b>	<b>27.500</b>
<b>TOTAL :</b>	<b>79.500</b>		

Name of sponsoring institution	1st year	2nd year	3rd year
<b>TOTAL :</b>	(1)	(2)	(3)
<b>GRAND TOTAL = (1) + (2) + (3) + (4) + (5)</b>			

## 6.4 SFP NATO REPORT ON CO-FUNDING

### REPORT ON CO-FUNDING (SfP 983054)

Initiatives Undertaken and Results Obtained for Project Co-funding

Report by: <b>Prof. Branislav Glavatovic, Project Co-Director</b> Montenegro Seismological Observatory					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
September 26, 2008	XV DPPI SEE REGIONAL MEETING,	Mr. Miroslav Vujanic, DPPI Office, Srajevo	Reccomandation to contact national UNDP offices		
February 2008	Denish Emergency Managament Agency	Mr. Michael Elmquist, senior advisor, +45 45 906000 , +45 45 6060, elm@brs.dk	Co-funding realized through Bilateral Ageement between DEMA and Montenegrin Ministry of Internal affair	one year	35,000 Eur
Report by: <b>Svetlana Kovacevic, Project Co-Director</b> Seismological Survey of Serbia					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
December 14, 2007	Geophysical Institute, Slovak Academy of Sciences, Bratislava	Peter Labak	Agreement on preparation of Project plan for B&H	one year	8 seismic stations
Report by: <b>Prof. Mihail GAREVSKI/Prof. Zoran MILUTINOVIC</b> IZIIS, Skopje					
Date	Organization Contacted (Name & Full Address)	Name Person Contacted (incl. telephone number; e-mail)	Results and Comments	Co-Funding	
				Duration Period	Amount
31/03/2008	Council of Europe "European and Mediterranean Major Hazards Agreement" (EUR-OPA MHA), ECILS-Skopje	Eladio FERNANDEZ-GALIANO, Executive Secretary; Council of Europe F-67075 Strasbourg Cedex; Tel:+33.3.88.41.22.59 Fax.+33.3.88.41.27.87; e-mail : eladio.fernandez-galiano@coe.int;	ECILS Skopje on annual basis is obliged to apply for budgeting for a next year. 2007 application has been approved, and Euro 6,000 used to organize a Workshop by inviting all NATOSfP983054 countries. Application for 2008, amounting at Euro 6,000 and for the same purpose has already been submitted in February 2008 and results will be known by end of April 2008.	2007-2009	3 x 6,000 = 18,000

## 6. EQUIPMENT INVENTORY RECORDS

	Inventory Label No.	Property Item	Manufacturer	Model Number	Serial Number	Date of Purchase	Cost (EUR)	Location
MONTENEGRO	601	PC laptop	HP	Pavilion DV276EA	CNF7060M TD	21/09/2007	1345	MSO, Podgorica - central station
ALBANIA								
BOSNIA AND HERZEGOVINA								
CROATIA								
MACEDONIA								
SERBIA	0681	accelerograph	Kinematics Inc.	ETNA	6441	25.06.2008.	4,300	Valjevo 44.26/19.91
	0682	accelerograph	Kinematics Inc.	ETNA	6444	25.06.2008.	4,300	Gruza 43.89/20.71
	0683	accelerograph	Kinematics Inc.	ETNA	6438	25.06.2008.	4,300	Zajecar 43.81/22.23
	0684	accelerograph	Kinematics Inc.	ETNA	6439	25.06.2008.	4,300	Radoirja 43.52/19.74
	0685	accelerograph	Kinematics Inc.	ETNA	6443	25.06.2008.	4,300	Svilajnac 44.23/21.2
	0686	accelerograph	Kinematics Inc.	ETNA	6437	25.06.2008.	4,300	Banatski Dvor 45.51/20.50
	0687	accelerograph	Kinematics Inc.	ETNA	6440	25.06.2008.	4,300	Sjenica 43.28/19.98
	0688	accelerograph	Kinematics Inc.	ETNA	6433	25.06.2008.	4,300	Novi Pazar 43.13/20.51
	0689	accelerograph	Kinematics Inc.	ETNA	6434	25.06.2008.	4,300	Sabac 44.75/19.7
	0690	accelerograph	Kinematics Inc.	ETNA	6435	25.06.2008.	4,300	Zavoj 43.29/22.61
	0691	accelerograph	Kinematics Inc.	ETNA	6436	25.06.2008.	4,300	Jagodina 43.97/21.26
	0692	accelerograph	Kinematics Inc.	ETNA	6442	25.06.2008.	4,300	Gornjak 21.26/21.55

## 7. CRITERIA FOR SUCCESS TABLE

Project number: 983054	Project short title: BSHAP
Report date: March 31, 2008.	Duration of the Project : 1.10.2008-1.10.20010 /3 years/
The Project is in the year : <u>1</u> - 2 - 3 - 4 - 5	

Criteria for Success as approved with the first Grant Letter on: 20-06-2007	%	Criteria for Success: Achievements as at 1.10. / 31.03. of current year <sup>3</sup> (changes should be reflected here)	%
1) Consistent GIS database of earthquake catalogue information for the participating countries	15	1) Earthquake catalogues of participating countries with threshold magnitude 3.0 collected; magnitude type unified	7
2) Unique seismotectonical regional GIS database	15	2) Presented all available seismotectonical data related to referred region	5
3) Hazard assessment applying unified methodological approach consistent to EU standards and GIS hazard maps	35	3) First preliminary hazard results from testing of OHAZ software for the territory of Montenegro and Serbia	4
4) Seismic instruments deployments and integration into national networks	30	4) The 50% of advance paid for the instruments for all the countries. Some of the countries already installed equipment.	17
5) Dissemination of the results	5	5) Web presentation operable and regularly updated	2
<b>TOTAL :</b>	<b>100%</b>	<b>TOTAL :</b>	<b>35 %</b>



## SUMMARY REPORT

### SfP – BSHAP

SfP – 983054

Project Co-Directors: *Prof. Sinan Akkar, METU, Ankara, Turkey (NPD)*  
*Prof. Branislav Glavatovic, MSO, Podgorica, Montenegro (PPD)*  
*Prof. Ismail Hoxha, Institute of Geosciences, Tirana, Albania*  
*MSc Vlado Kuk, Faculty of Sciences, Zagreb, Croatia)*  
*Amer Zoranic, Ministry of Civil Affairs, Sarajevo, Bosnia and Herzegovina*  
*Prof. Mihail Garevski, IZIS, Skopje, FYR Macedonia*  
*MSc Svetlana Kovacevic, Seismological Survey of Serbia, Belgrade, Serbia*

Approval Date: 20th July 2007 Effective Date: 1st October 2008  
Duration: 3 years till 1st October 2010  
NATO Budget: 638 000 EUR

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Information about the SfP Project through Internet: [www.wbseismicmaps.org](http://www.wbseismicmaps.org)

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### Abstract of Research

*Seismic hazard maps for the territory of participating Western Balkan countries will be realized. In the methodological approach unified earthquake catalogues, seismotectonic data and a consistent ground motion prediction model will be implemented to the probabilistic seismic hazard analysis. The output ground-motion parameter(s) describing the seismic hazard in the region will be provided that is consistent with the EUROCODE 8 and the design regulations of the countries involved in the project. All seismic input and output results will be presented through a consistent GIS database. Future researches in this field will be enhanced by new data collected by seismic instruments that will be deployed within this project realization.*

### Major Objectives

- *Establishing complete and consistent GIS database for the regional earthquake catalogue, seismotectonics and seismic hazard.*
- *Methodological improvement and harmonization of seismic hazard maps of the participating countries to surmount the existing artificial differences in the cross-border seismic hazard levels.*
- *Improvement of existing seismic monitoring networks through the deployment of strong- and weak-motion stations in the participating countries.*
- *Providing a consistent background for tailoring the seismic provisions of the participating countries harmonized with EU standards (Eurocode 8).*
- *Establishing active scientific collaboration between the participating countries, and training of future-promising young scientists in earthquake-hazard related topics,*
- *Publishing the major project findings that include the improved seismic hazard maps to share the outcomes with the seismological and engineering community.*
- *Encouraging the implementation of harmonized and upgraded seismic hazard maps by the concerned civil authority of each participating country to improve the seismic safety and seismic risk management.*

## Overview of Achievements since the Start of the Project until 30 September of current year

- *The complete earthquake catalogue information with threshold magnitude 3.0 was collected for the territory of involved countries; Agreements on providing earthquake catalogues have been reached with neighboring countries: Greece, Bulgaria, Romania,*
- *Magnitude scaling for the unified earthquake catalogue has been adopted,*
- *Unified earthquake catalogue was filtered from the dependant earthquake events (foreshocks and aftershocks),*
- *Training of last version of Software OHAZ 6.1 was realized during the Ig workshop, sponsored by ARSO, Slovenia. The essential elements about the calculation procedure, type and format of input data were explained; First results in computing seismic hazard for the territories of Montenegro and Serbia are assessed.*
- *Upon of the International bidding call procurement of the instruments is done; some of the instruments already installed; for the instruments that are not delivered yet the site preparations are ongoing.*

**Payments through NATO Funds: 195,832 EUR**

## Milestones for the Next Six Months

- *Within next six-month period it is planed to finalize the compilation of unified earthquake catalogue for the entire region. The missing (revised) earthquake catalogue for Serbia will be integrated.*
- *Various GMP models will be investigated for their applicability to the region. Decision making about the applicable GMP should be conducted.*
- *The zones of the region where sufficient information on seismotectoncs are available will be delineated and accordingly defined.*
- *The preparation of sites for the deployment of seismic instruments will commence. This process includes the site investigation, signal-to-noise ratio studies (ambient vibration) and the legislative issues about the property owner rights. Upon the acquiring of procured instrument the final installation should take place.*
- *The GIS software will be purchased and training in GIS realized in coordination with project partner from Serbia. Compiled earthquake catalogues and the seismotectonic information will be implemented to the GIS software*
- *The planned software for the seismic hazard will be purchased and tested.*
- *The above results will be published on regular basis on the project Web page.*

## Implementation of Results

*The Civil Engineering Faculties/Departments of the regional universities as well as the concerned Ministries and Engineering Chambers are the major civil entities that will make use of the outcomes of this project to upgrade the national seismic provisions for their further adoption to EUROCODE 8 standards.*

## Other Collaborating Institutions

- *Environmental Agency of Republic of Slovenia, Ljubljana, Slovenia*

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### Intellectual Property (IP) Rights

*Participating institutions made an agreement to exchange the earthquake catalogue information for the scientific purposes of the Project.*

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Abbreviations:

ARSO	<i>Environmental Agency of Republic of Slovenia</i>
B&H	<i>Bosnia and Herzegovina</i>
IZIIS	<i>Institute for Earthquake Engineering And Engineering Seismology of University of "St Cyril And Methodius", Skopje, Macedonia</i>
GMP	<i>Ground motion prediction</i>
IGEO	<i>Institute of Geosciences, Tirana, Albania</i>
METU	<i>Middle East Technical University, Ankara, Turkey</i>
MSO	<i>Montenegro Seismological Observatory</i>