The International Emergency Management Society

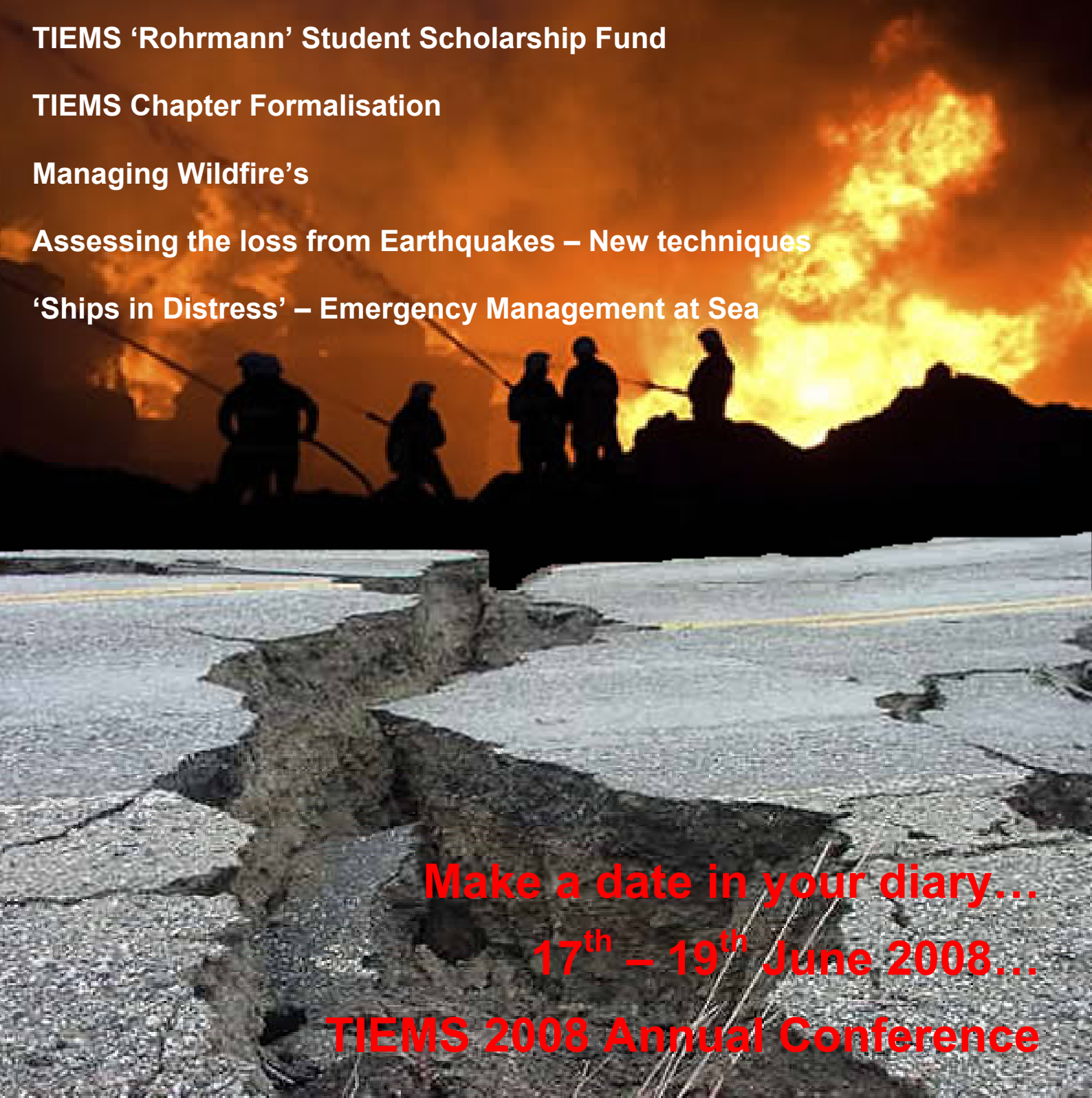# Featured in this issue:

TIEMS Conference & Events Update

TIEMS 'Rohrmann' Student Scholarship Fund

TIEMS Chapter Formalisation

Managing Wildfire's

Assessing the loss from Earthquakes – New techniques

'Ships in Distress' – Emergency Management at Sea

Make a date in your diary…
17th – 19th June 2008…
TIEMS 2008 Annual Conference

Message from the President

I am pleased to welcome our new editor for the TIEMS newsletter, Snjezana Kenzic. A newcomer to the TIEMS Board of Directors after the elections last year, where the board got 6 new directors, Snjezana who has taken the post of TIEMS Director for Chapters and Affiliates, is also a professor at Split University in Split, Croatia. An introduction to all the new and existing board members, alongside the structure can be found on TIEMS web-site www.tiems.org

In order to integrate the new directors and to form a leading team for TIEMS into the future, we have undertaken the task of developing a joint vision statement for TIEMS, which can be found on TIEMS web-site www.tiems.org. In this statement the TIEMS Board sets out the vision and action plan for TIEMS for the period 2008 – 2012, which serves as a guide for board members work and will be reviewed and reported against annually in the TIEMS report, and the vision statement revised accordingly, to become a living document driving the development of TIEMS. This work has been a major undertaking, and will assure that the board work as a first-class team, know their duties and having a shared vision for the future of TIEMS.

Last year was also used to update the TIEMS website with information of the background and history of TIEMS, and to further formalize the different functions of the society and provide a channel to communicate its activities.

Special achievements to be mentioned are:

- Establishment of TIEMS Rohrmann Student Scholarship Fund
- The first TIEMS chapter was formalized – The Romanian Chapter of TIEMS
- TIEMS Code of Conduct approved by the board
- New chair of TIEMS International Program Committee (IPC), Teodora Ivanusa from Slovenia has revitalized the IPC and is active in recruiting new members globally
- A sponsorship and partnership concept was introduced
- A TIEMS emergency / disaster management expert pool is under consideration by the board
- A new TIEMS functional structure has been established see diagram on the TIEMS website www.tiems.org

In the last year TIEMS have also arranged three workshops in cooperation with local and international organisations. In addition to the Annual Conference held in Split, Croatia events include:

- TEMS 2007 Workshop in Beijing, China, 22nd - 24th September 2007
- TIEMS 2007 4th Workshop in Cavtat, Croatia, 29th - 31st October 2007
- TIEMS 2007 10th Workshop in Prague, Czech Republic, 26th - 27th November 2007

This year has started with a TIEMS workshop already arranged by the TIEMS Korean Chapter in Seoul in February, and further TIEMS workshops are being planned in cooperation with local organisations and TIEMS chapters in Russia, Romania, China, Croatia and Czech Republic for the coming year.

It is also important to mention that the upcoming annual conference in Prague in June 2008, has an increased number of presentations, close to 100 from 25 countries, and seems to be the best program ever. I am sure this excellent and comprehensive program will draw a lot of participants from all over the world.

It is with great pleasure I observe the increased global activity of TIEMS and in order to stimulate and follow up this, the TIEMS board will focus in the following year on:

- Recruitment of new members
- Build Sponsorships and Partnerships
- Realize the World Wide Emergency and Disaster Management Expert Pool
- Formalization of new Chapters
- Extend TIEMS International Program Committee with new members globally
- Extend TIEMS Workshop program to include more events around the world

I welcome all readers of this newsletter to join TIEMS, and take active part in our activities for developing a safer world.

K Harald Drager

Editors Welcome

Dear members and supporters, welcome to the latest edition of the TIEMS newsletter. It has been long time since the last issue but the nevertheless I hope you will enjoy this current issue. Inside this we have articles on major TIEMS events that have occurred in the last year, as well as on forthcoming events such as our annual conference in Prague, and several short articles from some of our members and supporters, covering subjects such as earthquakes, wildfires and emergency procedures for vessels in distress. We hope this issue will motivate other members to contribute to the future issues, which we hope to publish twice a year.

At the last TIEMS annual conference in Trogir we succeeded in established formal procedure for Chapter recognition, amongst other things and short report from the conference is also included in this newsletter. We hope you enjoy reading this issue, and as always your comments, suggestions and contributions to improve the newsletter are always welcome.

Snjezana Knezic

Alan Jones
Technical / Sub Editor

Annual TIEMS 14th conference
5th – 8th June, Trogir, Croatia 2007
Disaster Recovery and Relief: Current and Future Approaches

TIEMS 2007 ANNUAL CONFERENCE
Trogir, Croatia

The 15th TIEMS annual conference was held in Trogir, Croatia, a picturesque medieval town on the Dalmatian Coast, hosted by the Regional Centre for Assistance and Disaster Relief (RCADR).

RCADR and specifically Ranko Britvic and Stiven Vladislavic and their staff supported the Conference preparing the practical details and social events, and our thanks go to them all for their efforts.

The Conference provided as always a perfect forum supporting the TIEMS mission to provide an ongoing international dialogue and debate on emergency management, and we hope the broad international perspective and range of issues covered help the emergency management community to be more prepared and efficient in dealing with all kinds of disasters. The published proceedings totaled seventy papers covering subjects ranging from business continuity, risk management emergency management, and several case studies on emergency responses during the previous year. All of which were peer reviewed from a total of one hundred and twenty papers initially submitted, and published in the book of proceedings edited by Alan Jones.

Unsurprisingly, one key feature of many of papers was the importance placed on effective information and communication management. And the papers as always conveyed what had become a hallmark of the TIEMS conference over the past years, to provide an interchange between theory and practice with papers from practitioners, researches, industry and policy makers, providing readers with a balanced and objective view.

Due to the number of outstanding papers three papers received an award, decided by a special awards committee, and we have pleasure in publishing that the following were picked for this acknowledgment:

1. Andrew May - "Opportunities And Challenges For Configurable Sensor Networks For Enabling Effective Fire-Intunnel Response"

2. Verner Andersen - "Avoidance Of Hazardous Traffic Situations Caused By Reduced Visibility In Inclement Weather Conditions"

3. Marcel van Berlo - "Learning To Evaluate Multidisciplinary Crisis Management Team Exercises"

Around two hundred delegates representing around thirty different countries attended the conference, again demonstrating the international foundation for TIEMS. We are hopeful of equally representative events in the future, and encourage you all to support the TIEMS 2008 conference in Prague.

TIEMS Annual 15th conference
17th – 19th June, Prague, Czech Republic 2008

We are fast approaching the TIEMS 2008 annual conference and as preparations for the event are being finalised, we are pleased to confirm that the conference is to be held in the beautiful city of Prague at the congress centre at hotel Tristar-Olympik. The theme for this year's conference is "Global Cooperation in Emergency and Disaster Management"

TIEMS 2008 preliminary program together with information on travel, registration, and local sights is all accessible via our website www.tiems.org and the conference this year includes a speakers corner session for posters, sponsors and exhibitors.

As TIEMS grows, our member base is contributing greatly to an increasing diversity of papers, from an ever-expanding number of countries. This year the 82 submitted paper proposals reflect all aspects of emergency / disaster management, addressing areas such as earthquakes, health concerns, flooding, typhoons, maritime issues, transportation, terrorism, and a variety of other contemporary issues facing our profession. Couple a wide array of presenters and attendees with a venue in one of the most historic, beautiful, and visited cities in Europe, and you have a recipe for a rewarding conference experience. Please join us in the "City of a Hundred Spires" in June.

If you have any further queries or questions in relation to the conference or are interested in participating or sponsorship opportunities please do not hesitate to contact us. Further details of the event are available from our website: www.tiems.org
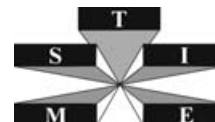
XIII International Scientific and Practical Conference on Protection of Population and Territories against Emergencies

"CULTURE OF PUBLIC SAFETY: THE STATE OF THE ART AND CHALLENGES"

May 15-16, 2008, Moscow, Russia

Organized by EMERCOM of Russia, Russian Academy of Sciences together with TIEMS and Russian Society on Risk Analysis, this conference brings together a series of main topics including; Scientific and methodological background of development of public safety culture; Philosophy and sociology of safety; Pedagogic of safety; Psychology of safety; Tools of mass communication in the field of public safety; Information and telecommunication technology for development the public safety culture

International Workshop on Open Data and Knowledge Environments (ODKE) for Innovative Research and Development A Decentralized Network of Networks in/for/with Developing Countries

Shanghai International Convention Center
Shanghai, China, 24-26 May 2008

Organizers:
UNDESA, UN GAID Asia Secretariat, UN GAID e-SDDC, UNPAN Asia-Pacific Center, Chinese Academy of Sciences (CAS), Committee on Data for Science and Technology, Task Group on Preservation of and Access to Scientific Data in Developing Countries (CODATA/TGDC), Center of International Earth Science Information Network (CIESIN), Columbia University, USA Chinese Association for Science and Technology, Consultant Committee for UN on ICT (CAST/CCIT), Internet Society of China (ISC)

Co-Organizers:
International Society of Digital Earth (ISDE), Inter Academy Panel on International Issues (IAP), The International Emergency Management Society (TIEMS), Committee on Earth Observation Satellites, Working Group of Information Systems and Services (CEOS/WGISS)

The 7th Forum on City Informatization in the Asia-Pacific Region (CIAPR VII)

United Nations

The Regional Cooperation Office for City Informatization

"ICT for Better City"
Shanghai International Convention Center
Shanghai, People's Republic of China
26-27 May 2008

To assist government decision-makers in articulating visions, identifying directions, and making right decisions on ICT for development;

To assist ICT entrepreneurs in identifying business opportunities, exploring potential markets, and understanding emerging needs, while efforts will be made to build up a harmonious, inclusive and coexistent information society;

To assist technical professionals, in particular, of developing countries, in recognizing the trends, finding best practices and solutions, and identifying business partners, to promote information network construction; while strengthening the networking and information security and make own contribution to the building of information society.

CIAPR would bring the advanced technologies of ICT for development worldwide to the targeted audiences, covering the aspects of technical, industrial and application development. The Forum will also provide a platform for government officials, entrepreneurs and experts to discuss and address various topics in relation to ICT for development. The ultimate goal is to make the annual forum a "one-stop shop" on all the major issues with respect to ICT for development for government decision-makers, entrepreneurs and technical professionals.

www.apcity.org/english/index.asp

For more information about these and other events sponsored, supported and endorsed by TIEMS visit our new and improved website and explore some of it new and ever expanding features including details of the many worldwide TIEMS projects.

www.tiems.org

2007 International Workshop - Natural Disasters & Emergency Management – Event Report

The International Workshop on Natural Disasters & Emergency Management" was held in Beijing on September 22-24, 2007.

More than 130 experts from 22 countries and regions including the UN, China, USA, Norway, South Korea, France, Russia, Sweden, Belgium, Croatia, Turkey, Japan, Cuba, Pakistan, Bangladesh, Australia, Nepal, Nigeria, Cameron, UK and Hong Kong presented joined to discuss international natural and other unexpected incidents, emergency management, risk assessment, early warning and disaster relief.

Opening Ceremony

Dr. K. Harald Drager (President of International Emergency Management Society - TIEMS) said that disaster risk reduction, protection of social, economic and environmental development is the common challenge faced by all countries. "The concept of universal disaster reduction and mitigation measures will be an improvement in world safety." Knowing the experience and expertise in China, handling natural disasters, it is very important that this knowledge is shared with others and TIEMS invites Chinese experts to use the

TIEMS network for distributing this information, and likewise receive information from other countries.

Mr. QU Guosheng, Welcome Remarks

Prof. QU Guosheng, (Deputy Director and Chief Engineer of National Earthquake Response Support Service, China Earthquake Administration (NERSS/CEA), TIEMS Director of Asia) said that this workshop provides a platform for the world wide multi-stakeholders, including scientists, engineers, enterprises and decision makers, to further strengthen the ability of China and the developing countries faced major disaster, by exchanging new achievements and knowledge.

During the workshop, experts from the various countries represented shared the information and experience in emergency management and rescue operation, in particular those aimed at improving the international and regional scale cooperation among countries in earthquake, flood, drought, typhoon, storm management et al.

TIEMS Rohrmann Student Scholarship Fund

The Fund initiated by Bernd Rohrmann, who donated the establisment funds during 15th TIEMS Conference in Trogir, Croatia, was established to support students conducting research relevant to the aims of TIEMS and wishing to present their research in the annual TIEMS conference.

Bernd Rohrmann initiator of the TIEMS Rohrmann Student Scohlarship Fund.

Students are a precious asset for the future and should be encouraged to join the TIEMS framework as early as viable, and this scholarship shall make possible such participation for students lacking the necessary financial resources to do so.

This fund will financially support two students this year, and students are encouraged to submit their paper proposals and applications for financial support by filling in the application form according the Rules and Procedures for the Fund. At the time the Fund is being established (2007), funds available allow the provision of two scholarships for each of the TIEMS Annual Conferences in 2008, 2009 and 2010 at an initial total annual amount of €600.00 plus the registration fee. Depending on additional donations to the Fund, the Committee will decide on a possible increase of the amount or the number of scholarships awarded for each conference, and the TIEMS Board encourages others, where they can to help build this fund to benefit students in the field of emergency management in future years.

A special TIEMS Rohrmann Student Scholarship Fund Committee has been formed and will select who will be supported, under a set of established rules and Procedures which are available along with an application form at www.tiems.org

First formal TIEMS Chapter - Romanian Chapter

Following discussions of the Board at the 2007 TIEMS Annual Conference as well as Board meetings in Prague in November, TIEMS established new and more precise procedure for Chapters and Special Interest Groups.

The TIEMS Romanian Chapter is the first TIEMS chapter formally approved according to these new procedures for Chapter approval, and the board congratulates the chapter and all those involved in its formation and wish them good luck. The board are also hopeful to welcome other chapters to build TIEMS activities globally! The chapters next in line for formal approval are South Korea, Russia, Croatia, Turkey, North America, Australia and China. The Chapters will be responsible for the local TIEMS activity like workshops, supported by TIEMS International.

Thanks go to Giedo Van pellicom, TIEMS Principal Administration Officer, who did a great job during formal establishment of Romanian Chapter, and established the official documentation for recognition of these chapters.

New TIEMS Board & Structure

Following the TIEMS 14th Annual Conference, and annual general meeting where a number of issues where discussed including:

1. TIEMS 2007 Annual report
2. PSC Project / Future Projects
3. TIEMS 2007/8 Budget
4. TIEMS Elections
5. TIEMS Board Term Limits
6. Code of Conduct / Ethical Behaviour
7. Board Registration Fees

A new TIEMS board was established following a number of elections, and we are pleased to introduce to you the new board structure (detailed below). A biography of each of the members is available on the TIEMS website alongside the TIEMS vision statement which sets out the objectives of the board for the coming four years.

Please do not hesitate to contact any member of the board with any queries / suggestions you may have for the development of the society.
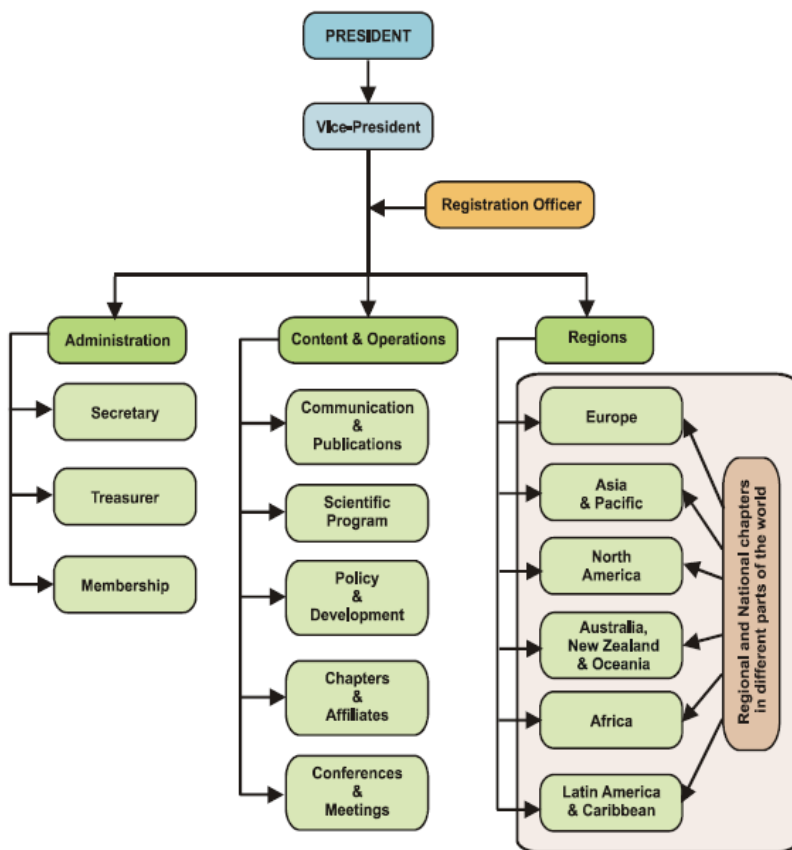
- K. Harald Drager, TIEMS President (Norway)
- Young-Jai Lee, Vice President (Korea)
- Alan Jones, Secretary (UK)
- Charles Kelly, Treasurer (USA)
- Kerstin Eriksson, Director for Membership (Sweden)
- Ulrich Raape, Director for Communication and Publications (Germany)
- Jaroslav Pejcoch, Director for Scientific Program (Czech Republic)
- Hans Zimmermann, Director for Policy and Development (France)
- Snjezana Knezic, Director for Chapters and Special Interest Groups (Croatia)
- Audrey Heffron-Casserleigh, Director for Conferences and Meetings (USA)
- Nina I. Frolova, Regional Director Europe (Russia)
- Qu Guosheng, Regional Director Asia & Pacific (China)
- James Hagen, Regional Director North America (USA)
- Desmond Pyle, Regional Director Africa (South Africa)
- Stephen Jenkins, Regional Director Australia, New Zealand & Oceania (Australia)
- Boba Boja Ostojic, Regional Director Latin America & Caribbean (Croatia)
- Giedo Van pellicom, Principal Administration Officer (Belgium)

Loss Assessment due to Earthquakes with web Based System Application

By Dr. Nina Frolova
(Senior research scientist, Russia Academy of Sciences)

Earthquake disasters are becoming more frequent and devastating. Social and economic losses due to seismic events also increase annually, which is definitely linked with evolution of society. The lessons of the past events all over the world have shown that at present the preventive measures are often insufficient as not all countries can afford expensive earthquake-resistant constructions and / or strengthening of existing buildings. In order to save lives and protect property against future events urgent measures should be taken. Disaster preparedness of population and Civil defence professionals, development of preventive measures plans, as well as rapid response systems should be improved.

Timely and correct action just after an event can result in significant benefits in saving lives and prompt rehabilitation. Information about possible damage and expected number of casualties is very critical for taking decision about search and rescue operations, as well as offering humanitarian assistance. Such information may be provided by near real time systems.

After the 1995 Kobe earthquakes efforts have been made to develop near real time systems at different levels. At present the near real time systems for loss assessment due to strong earthquakes at facility, city and country levels exist in Japan, USA, Italy, Spain, Canada, Russia, Taiwan, China, Turkey and other countries. The end of 2010 should see the development of the unified regional system for near real time loss assessment due to earthquakes in Europe. There are three global systems that are under continuous development. These are:

1. Russian System "EXTREMUM" and its versions, which allow to simulate the distribution of seismic intensity, damage to buildings of different types, number of casualties in damaged and destroyed buildings;

2. System "DMA Earthquake Alert Tool" of Joint Research Center under European Commission, which allows near real time monitoring of the seismic situation and provide estimation of expected population in the affected area by using the information on population density; from January of 2007 the Tool has been integrated in Global Disaster Alert Coordination System;

3. System "Prompt Assessment of Global Earthquakes for Response" (PAGER) of US Geological Survey, allows simulation of expected shaking intensity and estimation of expected number of inhabitants in zones of different intensity by using population density information.

The existing Systems are designed and developed for a definite end-user. The objective of the study within the current NATO – Russia project "Analysis and Synthesis of Loss Estimation and Risk Assessment Methodologies for Prediction and Prevention of Catastrophes" (Project SfP-981416) is to develop the web-based tool which may be accessible for all interested end users in different earthquake-prone countries for loss assessment due to strong earthquake just occurred or / and scenario events.

The new web-based tool will make use of verified mathematical models and databases on population and building stock distribution developed for the previous versions of the System "EXTREMUM", the first version of which was created in 1990's by joint efforts of "Extreme Situations Research Center" Ltd. and organizations belonging to Russian Academy of Sciences and Russian Ministry of Emergency Situations.

One of the characteristic features of the developed software is its "three chains" architecture. It includes three types of software: that of client working place, server applications, data base server (fig.1).
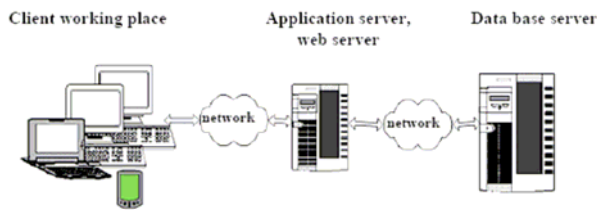

Figure 1: Conceptual scheme of web-based and GIS-based tool for seismic intensity, damage to buildings and loss computations due to strong earthquakes

This set of software called "thin client" allows the input of earthquake parameters (date, time, coordinates, magnitude and source depth) at the client computer and to perform loss computation at the developer server, providing the data base on population and built environment distribution is allocated at the server as well. Results of computations of expected shaking intensity and damage distribution are presented by static maps and tables at the client computer.

Within the third stage of the subcontract the mathematical models for simulation social losses due to strong earthquakes will be verified and adapted to the software for the visualization and publication the results of computation in Internet.

During the first year of the NATO-Russia project the mathematical models for simulation shaking intensity distribution, damage to buildings and structures, number of casualties due to earthquakes were verified and adapted to the software for the visualization and publishing the results of computation on the internet.

Data about earthquake source parameters are input for computation of probable shaking field, in terms of "intensity". The equation (1) is used for simulation circular isoseists:

$$I = BM - C \lg \sqrt{\Delta^2 + h^2} + E,$$

where Δ — epicentral distance, km; h — source depth, km; M — magnitude.

In order to take into account the anisotropy of the medium and source line extension the obtained circular isoseists are stretched along the active tectonic faults or in the direction, which is typical for the region under consideration and may be manually chosen by end user. When simulating theoretical isoseismal maps different orientation of ellipse axis may be taken into account through orientation of ellipse large axis (angle of inclination) and according to source mechanism. Figures 2-3 show examples of theoretical macroseismic fields for the past events occurred in 1966 and 2002 in the Krasnodar area, Russian Federation. The figures on the maps are expected intensity values. The settlements in the stricken areas are shown as circles of different size and colour. Circle size depends on the number of inhabitants; its colour stands for the average damage states of existing building stock in the settlement under consideration. Black color means total collapse (d=5), brown color – partial collapse (d=4), red – heavy damage (d=3), yellow – moderate damage (d=2), green – light damage (d=1), blue – no damage.
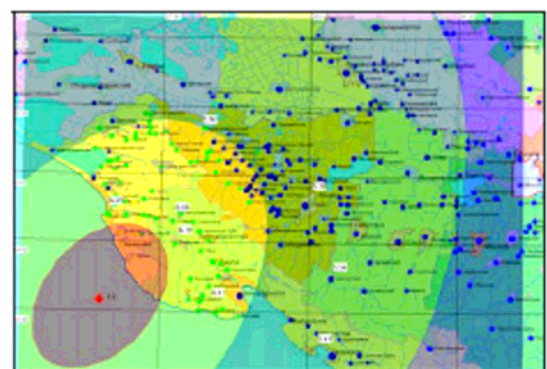

Figure 2. Results of shaking intensity simulation due to scenario earthquake on July 12, 1966 in the Anapa zone; M=5.5; h=11 km;
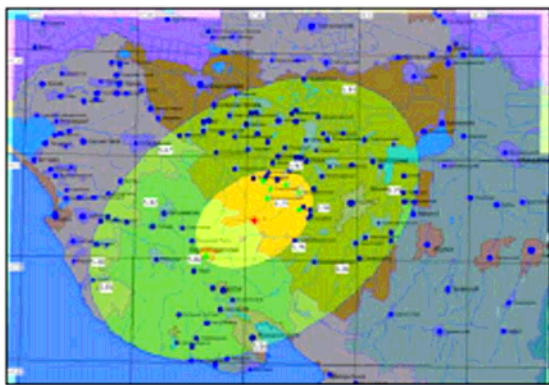
Figure 3. Results of shaking intensity simulation due to Nizhnekubanskoe earthquake on November 9, 2002; *M*=5; *h*=14 km;

Black colour -total collapse, brown - partial collapse, red - heavy, yellow -moderate, green - slight damage, blue - no damage

The coefficients in the equation (1) are estimated taking into account the empirical data about historical events. If there is not enough statistical data in the area under consideration the following coefficients b =1.5; v= 3.5; c=3.0 are used as default.

Data about earthquake shaking intensity are used for computation of expected damage to buildings and structures. In the web-based system under construction the fragility laws are used for different building types classified according to MMSK-86 scale:

- buildings' types A1, A2 (from local materials);

- buildings' types Б, Б1, Б2 (brick, hewn stone or concrete blocks);

- buildings' types B, B1, B2 (reinforced concrete, frame, large panel and wooden);

- buildings' types C7, C8, C9 (designed and constructed to withstand the earthquakes with intensity 7, 8, 9).

The fragility laws are understood as the dependence-ships between the probability of buildings belonging to different types to be damaged and the intensity of shaking in grades of seismic scales. The laws are constructed on the basis of statistical analysis of strong earthquakes engineering consequences. There are two types of laws: the probability PAi (I) of damage state not less than given value and probability PBi (I) of definite damage state. The normal law is used for construction of the curve approximating the probability PAi (I). Figure 4 shows an example of the fragility laws for the buildings of B type.
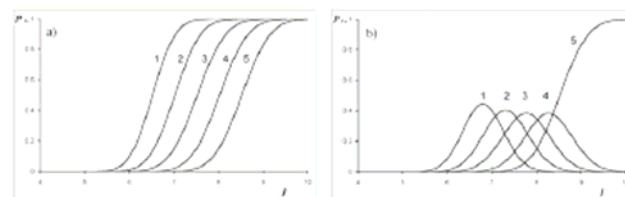

Figure 4. Fragility laws for B type buildings (MMSK-86); a – probability of damage state not less than given value; b – probability of definite damage state; 1, 2, 3, 4, 5 – buildings damage states

At the next stage the parametric laws of earthquake impact on people inside buildings constructed on the basis of analysis of empirical data about social losses during past strong earthquakes are used to estimate the expected number of casualties. Number of fatalities and injuries of different level is computed according to

$$P_{Ck}(I) = \sum_{i=1}^{5} P_{Bi}(I) \cdot P(C_k | B_i)$$

where $P_{Ck}(I)$ — probability of people to be impacted during the earthquake with intensity I; $P_{Bi}(I)$ — probability of definite i damage state of buildings providing the given value of earthquake intensity; $P(C_k | B_i)$ — probability of people to survive k level of impact under the condition that the building survived the damage state i. The examples of laws of earthquake impact on population inside buildings of A and B types (according to MMSK-86 scale of seismic intensity) are shown in fig. 1.
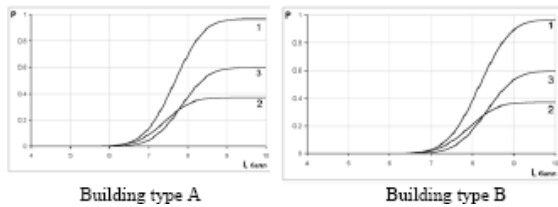
Fig.5. Laws of earthquake impact on people inside B type buildings: 1-total social losses (total number of casualties); 2- sanitary losses (injuries); 3- irrevocable losses (fatalities)

The reliability of near real time expected loss computations with application of the web-version of EXTREMUM family system will depend, first of all, on the input event parameters determined by Seismological Surveys in "emergency" mode. Figure 6 and 7 show the patterns of expected damage distribution in the case of the earthquakes occurred in Indonesia on May 26, 2006 and in Iran on December 26, 2003, which were obtained using different events' parameters determined by various Seismological Surveys (tables 1 and 2).

Figure 6a. Results of possible losses assessment due to May 26, 2006 earthquake in Indonesia with usage of GS RAS event parameters

Figure 6b. Results of possible losses assessment due to May 26, 2006 earthquake in Indonesia with usage of NEIC event parameters

dots are settlements in the stricken area; colour of dots stands for the average damage state of building stock: black -total collapse, brown - partial collapse, red - heavy, yellow -moderate, green - slight damage, blue - no damage

Table 1: Expected consequences due to the earthquake on May 26, 2006 in Indonesia

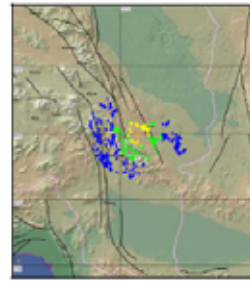| No.	Longi- tude	Lati- tude	h,km	M	Killed		Injured		Source
					Reported	Expected	Reported	Expected	
1	110.25	-8.11	15	6.2	5,770	3 - 57	13,883	25 - 414	GS RAS
2	110.4	-7.96	10	6.2	5,770	503 - 4,274	13,883	1,634 - 16,371	GS RAS
3	110.31 8	-7.977	25	6.3	5,770	0	13,883	0	NEIC
4	110.31 8	-7.977	17.1	6.3	5,770	60 - 679	13,883	253 - 3,348	NEIC
5	110.39	-8.04	10	6.4	5,770	936 - 6,059	13,883	2,357 - 19,790	EMSC
6	110.3	-8	10	6.3	5,770	17 - 194	13,883	76 - 1,279	ERI
7	110.3	-8	10	6.3	5,770	1,572 - 9,130	13,883	3,534 - 26,015	ERI
8	110.31	-8.26	13	5.9	5,770	0	13,883	0	BMG

Figure 7a. Results of possible losses assessment due to December 26, 2003 earthquake in Iran with usage of NEIC event parameters
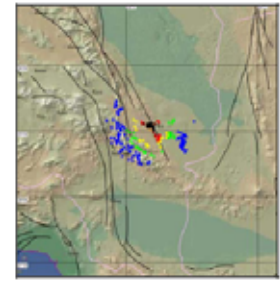
Figure 7b. Results of possible losses assessment due to December 26, 2003 earthquake in Iran with usage of IIEES event parameters

dots are settlements in the stricken area; colour of dots stands for the average damage state of building stock: black -total collapse, brown - partial collapse, red - heavy, yellow -moderate, green - slight damage, blue - no damage

Survey	Coordinates	M	h, km	Expected fatalities	Expected injuries
NEIC	58.27 N; 29.01 E	6.7	33	18-221	110-1,008
NEIC, Significant Earthquakes	58.311 N; 28.995E	6.6	10	5,538-22,337	14,933-40,904
EMSC	58.34 N; 29.05 E	6.8	30	1,201-6,939	2,751-18,661
GS RAS	58.38 N; 29.24 E	6.8	33	417-3,168	1,247-10,776
IIEES	58.38 N; 29.08 E	6.5	13.2	6,795-25,035	19,085-38,122
IIEES	58.38 N; 29.08 E	6.5	8?	11,022-35,394	33,067-40,831

According to the information published on July 22, 2004 at the ReliefWeb site the Iranian authorities revised to 26,271 the number of dead from the December 26 earthquake, which Bam officials had earlier said killed 43,000.

Besides the errors in event parameters determinations by Seismological Surveys, there are other factors that influence the reliability of expected damage and loss assessment both in "emergency" mode and due to scenario events with the Extremum System application. Between them the main factors are the following:

- Completeness and reliability of databases on elements at risk (population and built environment) and hazard sources;
- Reliability of vulnerability functions for different elements at risk due to earthquakes and other secondary hazards;
- Lack of access to confidential sources of information.

Some of these factors may be taken into account at the expense of the web-based System version calibration with usage of a knowledge base about well documented

past strong earthquakes and high-resolution space images application in order to verify the data on buildings' inventory in earthquake prone areas. The descriptions in the knowledge base have been used as reference points. They allowed the parameters of mathematical models to be determined by minimizing the functional

$$\Omega = \sum_{i=1...n} W_i \left(F_{ci}(p_1,...,p_n) - F_{ri} \right)^2 \Rightarrow \min(p_1,...,p_n)$$

where W_i – weights of events; F_{ci} – computed number of fatalities; F_{ri} – reported number of fatalities; $p_1,..., p_n$ - free models parameters, used in the System.

In 2008 the web-based version will be tested and calibrated with application of the impact knowledge base about past events.

The principle advantage of the web-based tool under construction is usage of common databases on population and building stock distribution, as well as unified simulation models. It is intended that the regional models' parameters and databases will be updated by joint efforts of the tool end-users from different earthquake-prone countries.

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Wildfires in karst regions

By Prof. Dr. Ognjen Bonacci - Split University, vice chairperson of the Bureau of IHP (international Hydrological Program) of UNESCO

Wildfire hazard increased over the last decades at the whole Dinaric karst region of Croatia. Wildfire can have a significant effect on some hydrological and landscape parameters. Destruction of the forested ecosystem of a basin has direct and strong consequences for its behaviour. At the same time wildfires can affect eco-hydrological processes indirectly, but profoundly, altering the physical and chemical properties of the soil, converting organic ground cover to soluble ash, modifying the microclimate etc.

In way of commitment to the agreement Marg Verbeek (President of IAEM) again attended the TIEMS annual conference, in Croatia in 2007 discussion were furthered at this time.

Figures 2 to 5: Deserted areas affected by a wildfire on 30th July 2003

Figure 6: Recovered nature
(from figures 2 to 5)
on 18th November 2007

Figure 1: HVAR, typical karst island, A = 297 km2 area, L = 270 km coastline length

Table1: damage due to wildfires

YEAR	AREA - A (ha)	DAMAGE - G (1000 €)	∑ A	∑ G
1994	56	4.2	56	4.2
1995	9	25.1	65	29.3
1996	128	4.6	193	33.9
1997	3000	60452.9	3193	60486.8
1998	5	24.3	3198	60511.1
1999	25	45.4	3223	60556.5
2000	416	3509.2	3639	64065.7
2001	130	2425.3	3769	66491.0
2002	80	2375.1	3849	68866.1
2003	5004	47112.0	8853	115978.1
2004	35	73.2	8888	116051.3
2005	14	23.0	8902	116074.3
2006	7	39.3	8909	116113.6
2007	1323	1157.9	10232	117271.5
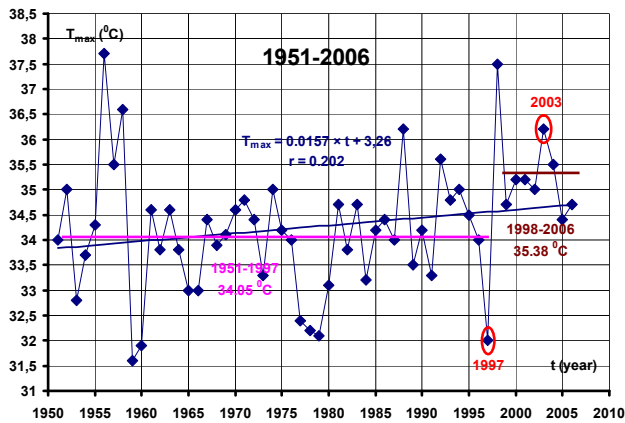
Figure 7: Maximal summer temperatures on the island of Hvar

Figure 8: Draystone walls

Drystone walls are commonly used as field boundaries. It should be stressed that they play very important role in prevention of wildfire spreading. At the same time their ecological role is very important but till now insufficiently explored. A highly degree of division into parcels, physically delimited by a very developed network of drystone walls, represented the most important feature of the whole Dinaric karst region, as well as the island of Hvar landscape. East of the small town Stari Grad the Greek (from 4th to 2nd century B.C.) drystone walls parcelling of the fields can still be found.

Wildfire can affect hydrological processes indirectly, but profoundly, altering the physical and chemical properties of the soil, converting organic ground cover to soluble ash, and modifying the microclimate through removal foliage.
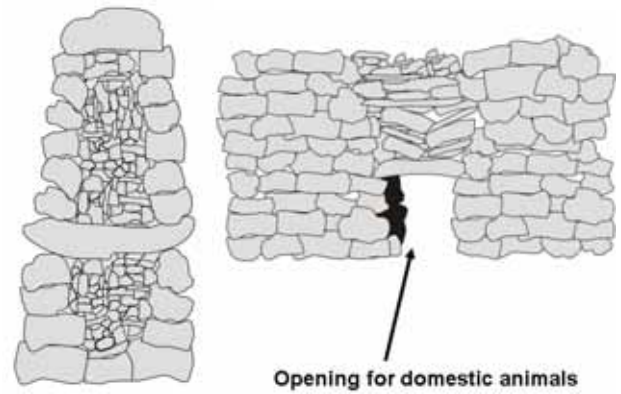
It is found that there is a 20 to 30 % increase in the annual runoff yield related to the reduction in evapo-transpiration due to the destruction of the vegetation cover. On the other hand, there are pronounced changes in the shape of flood hydrographs, and the flood frequency is greatly increased, which increased soil erosion. In the Mediterranean region, wildfires have devastating effects on flora and fauna.

Some authors consider (http://www-ppwpp.org/eco.html) that ecosystems depend on wildfire. They quote: "Wildfires are burning in the forest again, just as they have for millions of years. Many plants and animals actually need frequent fires to survive.

Emergency Management on the Sea - Accommodation of Ships in Distress

By Nenad Mladineo and Snjezana Knezic
University of Split, Faculty of Civil Engineering and Architecture, Croatia

When defining its future development, the Republic of Croatia has been harmonizing its legal system with the legislation of the European Union. Among other things, working procedures of the Ministry of the Sea, Tourism, Transport and Development and its respective services be harmonized with the provisions of certain directives of the European Community relating to the safety of maritime traffic. Therefore, Directive 2002/59/EC[1] of the European Parliament and of the Council is binding on all member states of the European Community to establish (and communicate to the European Community) the places of refuge for ships in need of assistance off their coasts, or to develop techniques for providing assistance to such ships. Consequently, the Ministry of the Sea, Tourism, Transport and Development (MMTPR) has initiated the procedure of harmonizing its working procedures and the respective executive organization to meet the requirements provided for in the Directive. In this connection, a study has been initiated aiming to:

1. Examine the conditions of maritime traffic in the Adriatic, especially off its eastern coasts;

2. Show characteristics and assess the possibilities of action in case of maritime accidents or other emergency or threat to the safety of ships or environment in the area within jurisdiction of the Republic of Croatia;

3. Develop working procedures for providing assistance to ships in distress in the area within jurisdiction of the Republic of Croatia;

4. Make preliminary selection of the places of refuge, in accordance with the experience and established working procedures in the European Community countries;

5. Create a DSS with GIS database of the relevant layers for the places of refuge.

One-year work on the project resulted in a study treating the issue of places of refuge (PoR) in a both scientific and professional manner. The study involves evaluation of natural, socio-economic and bio-ecological characteristics, maritime traffic situation and analysis of possible threats to the environment, and finally the principle of preliminary selection of places of refuge and their description. Relevant characteristics have been included in the GIS application called GIS ADRIA. Additional result achieved by this project is drafting the concept of Decision Support System (DSS) for deciding on the requests for places of refuge, presented through the pilot project of three coastal counties. This very concept is presented in this paper, and its development as provided for project approved by the Ministry of the Sea, Tourism, Transport and Development would significantly improve the decision-making processes in emergency situations at sea.

Two modules of DSS were conceived and built in the first stage of the project:

- GIS support with problem oriented extensions, and over 30 thematic layers for subordinating characteristics of places of refuge

- MCA (Multicriteria analysis) for valuation of each potential shelter

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[1] DIRECTIVE 2002/59/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC

according to the relevant criteria with direct interface towards GIS application.

Conceptual scheme of DSS for a strategic level, namely DSS that support functions of "Maritime Rescue Coordination Centre" and supporting organizations of MMTPR, which are focused on support to the activities connected to:

Segment A: planning and preparing for interventions on sea;

Segment B: response;

Segment C: relief and remediation planning.

The function of the main module (multicriteria models) is the evaluation of the suitability of each of the three hundred and eighty potential locations for places of refuge (PoR) designated in the official navigational pilot book for each category of the vessels and each type of maritime accident. For the suitability valuation of each PoR, relevant criteria are defined as well as their ranges and weights that define the importance of criteria.

A mathematical programme of MCA adapted to the criteria values and connected to ADRIA GIS database performs selection or ranking of a certain number of places of refuge within a pre-defined radius around the position of a ship sending a request (Figures 1 and 2). For criteria that cannot be spatially presented using GIS analysis, specific numerical values, as the input for multicriteria analysis, are evaluated by expert teams.

Figure 1. *GIS + additional extension -* Searching potential places of refuge according to defined radius

To facilitate and automate the process of decision making in an emergency, and consequently reduce the possibility of subjective error, the expert team develops "designated scenarios", in which criteria weights are changed to adapt the *decision making process* to the characteristics of "incident", i.e. ship damage.

Table 2. Example of designated scenarios

Scenario No.	Scenario Description
Scenario 1	General criteria weights - places of refuge with no specific purpose
Scenario 2	Ship category (large) - no risk of oil spill
Scenario 3	Ship category (large) - risk of sinking and oil spill
Scenario 4	Ship category (large) - risk of fire and many casualties
Scenario 5	Ship category (large) passenger - evacuation and care of many casualties needed
Scenario 6	Ship category (smaller) - no risk of oil spill
Scenario 7	Ship category (smaller) - risk of sinking and oil spill
Scenario 8	Ship category (smaller) - fire risk
Scenario 9	Ship category (smaller) passenger - evacuation and care of casualties needed
Scenario 10	…………………………………….

The presented DSS, based on GIS in conjunction with multicriteria analysis, is found to be a powerful tool for spatial decision-making. Figure 2 shows calculated rank of potential places of refuge using MCA.
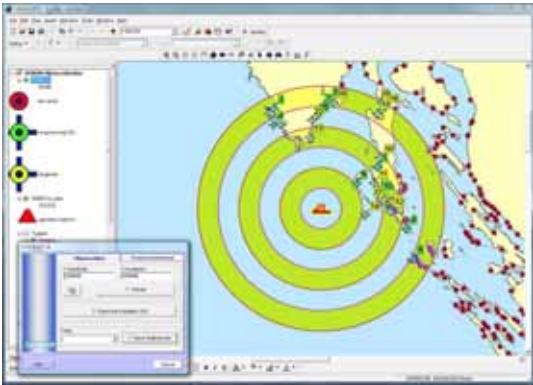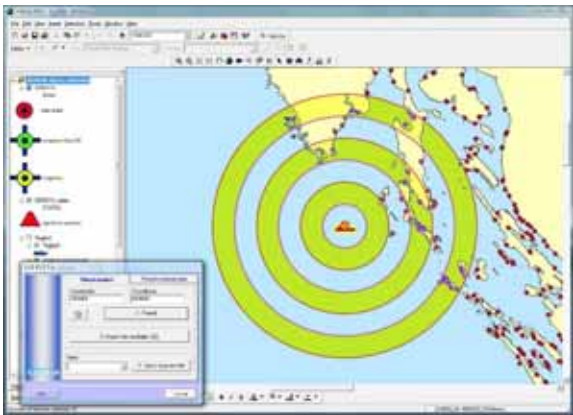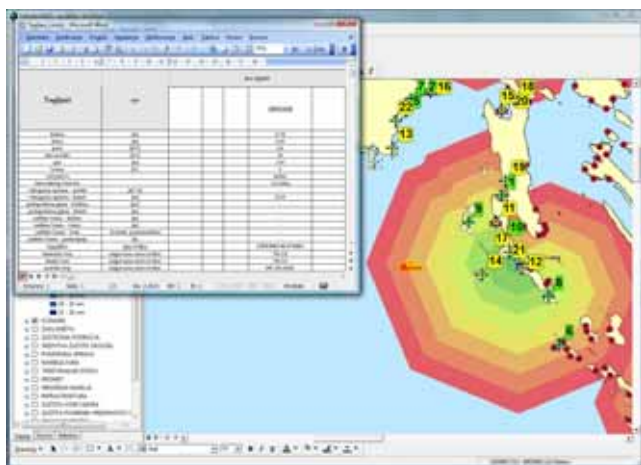

Figure 2. *GIS + additional extension*: Display of calculated rank of potential places of refuge using MCA

Conceptualized DSS is divided in a number of segments (modules), some of them will be additionally built in the further phases. Using GIS and other GIS-based tools the scope of the emergency services action is visualized. For example, it's possible to visualize a tug response time from the nearest location (Figure 3). This figure shows a color ramp where every color represents 3 nautical miles. This is used for a quick estimation of response time, taking into account that an average speed of tug is approximately 12 nautical miles per hour. At the same time, the characteristics of the tug, such as its dimensions, speed, pulling power, available counter-fire equipment, equipment for oil spill relief, etc. could be easily retrieved from the data base and displayed on the screen. While developing of DSS it has been thinking about introduction of dynamic aspects of the system, such as "wind" which is very important during maritime accidents because it influences emergency management actions.

Figure 3. Display of tug response time from the nearest location with basic information about tug

Supporting complex and sensitive decision-making processes such as selection of places of refuge for ships in distress cannot be seen without using DSS principles of connection of appropriate methods and data. International regulatory rules and guidelines for defining places of refuge for ships was a good starting point for considering such methodological approach and solution concept. Decision support system, presented in this paper, is unique system of the safety of navigation at sea conceptualized as a conjunction of operational models and GIS spatial functions. Applied to the pilot counties it seems to function well. However, the system depends upon availability of relevant thematic layers (system parameters) in GIS, which calls for the defining, collecting and editing of data in a suitable format and place to be the basis for necessary analyses.

Forthcoming Events / Conferences

TIEMS is dedicated to highlighting to its members events and conferences, which we feel may benefit your professional development in forthcoming months.

TIEMS members and friends are encouraged to submit information about forthcoming events that may be of interest for the TIEMS community to info@tiems.org and we will endeavour to publish it in the most appropriate issues.

April 2008

Public Private Partnerships in Disaster Management
16th – 18th April 2008
New Delhi, India

This conference brings together government, relief organizations, companies and academia to focus on emergency management, disaster recovery and business continuity. Perhaps the most important outcome will be the relationships developed among professionals in India and Asia who have not previously had an opportunity to learn from each other.

www.responsenet.org/show.detail.asp?id=8021

May 2008

Risk Analysis 2008: 6th International Conference on Computer Simulation Risk Analysis and Hazard Mitigation
5th – 6th May 2008
Cephalonia, Greece

Covering a series of topics and current research interest with practical applications, the conference is concerned with all aspects of risk analysis and hazard mitigation, ranging from specific assessment of risk to mitigation associated with both natural and anthropogenic hazards

www.wessex.ac.uk/conferences/2008/

3rd Annual Infrastructure Protection & Security Forum - "Advancing your emergency and business continuity plans towards dynamic business resilience"
22nd – 23rd May 2008
Melbourne, Australia

Following the success of 2006 and 2007, the 3rd Annual Infrastructure Protection and Security Forum will take you one step ahead towards the importance of the growing need of organisational resilience and continuity for a secure Australia.

www.marcusevans.com/html/eventdetail.asp?eventID=13869&SectorID=33&divisionID
CindyC@marcusevanskl.com

13th International Scientific Conference on Crises Situations Solution in Specific Environment
28th – 29th May 2008
Zilina, Slovakia

Presented by the University of Zilina Faculty of Special Engineering and the Ministry of Economy of the Slovak Republic, Department of Crisis Management, the goal of the conference is to exchange the latest findings and practical experience of crisis management, persons and property protection and the tasks of human factors in crises situations.

http://fsi.uniza.sk/kkm/konferencie/konferencie_en.html

June 2008

International Joint Operations Command Conference - IJOCC 2008 - "Managing Major Emergencies"
4th – 5th June 2008
London, England

IJOCC is targeted toward senior commanders from the police, fire, ambulance and other emergency services; emergency managers and planners; senior commanders from public

safety organisations; community protection professionals; homeland defence professionals; risk managers; public health professionals; and critical infrastructure stakeholders. The conference raises and sets strategic and tactical command standards, as well as providing an international multi-agency networking opportunity.

www.ijocc.eu/index.html

WCDM 2008 - "Resilience - Individual, Community, Business"
15th –18th June 2008
Toronto, Ontario, Canada

This event addresses issues common to all aspects of disaster and emergency management and provides excellent opportunities for training and networking.

www.wcdm.org

15th Annual Conference – The International Emergency Management Society
17th – 19th June 2008
Prague, Czech Republic

The leading theme for this years conference is "Global Co-operation in Emergency and Disaster Management", although a wide array of subjects will be addressed covering emergency, risk and business continuity management.

www.tiems.org
tiems2008@carolina.cz

July 2008

Prague 2008: "Prepare to Respond" - Chemical Biological Radiological Nuclear Explosives
15th – 16th July 2008
Corinthia Towers Hotel, Prague

The seminar will be presented by experienced emergency responders, who are recognised by the UN (IAEA) as experts in their field. They will speak from personal experience of involvement in real life CBRN-E incidents and have designed, developed and implemented

UN-approved emergency response training worldwide.

www.bppprofessionaldevelopment.com/documents/brochures/Prague%202008.pdf

2nd Australasian Hazards Management Conference
28-31 July 2008
Wellington, New Zealand

The conference will provide a forum to discuss the integration of hazard information into effective risk management, including:
- Applying hazard information to best practice planning
- Developing effective warning systems
- Improved response and recovery from events
- Creating resilient communities through integrating science into practice

www.hazards-education.org/ahmc/2008/2008index.php
ahmc@hazards-education.org

International Disaster and Risk Conference: IDRC Davos 2008
Aug. 25-29, 2008
Davos, Switzerland

IDRC Davos 2008 is expected to bring together more than 1,300 interested individuals, policy makers, risk managers, scientists and other risk experts from politics, governments, science, the private and civil sector, NGOs, etc. to focus on the array of risks facing society today and on effective strategies to manage and reduce these risks and disasters. The conference will continue the dialogue between the different risk areas and their stakeholders, but also serve as a bridge between science, risk governance, technology perspectives, problem solving and capacity building.

MORE EVENTS AND INFORMATION ON THE TIEMS CALENDER WWW.TIEMS.ORG

If you would like to publicise your event please email details to:
alan_jones_tiems@hotmail.co.uk