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EUROPEAN AND MEDITERRANEAN MAJOR HAZARDS AGREEMENT (EUR-OPA)

## **2012 AUDIT REPORT**

### **Meeting of Permanent Correspondents of the Agreement 4-5 October 2012, Dubrovnik**

*By the Chair of the Audit Sub-Committee  
Jean-Mathias Goerens, Doctor of Law*

In 2012, the Audit Sub-Committee set up under the EUR-OPA Medium-Term Plan carried out audits of the following OPA centres:

- The Higher Institute of Emergency Planning, ISPU, Brussels
- The European Centre on Prevention and Forecasting of Earthquakes ECPFE, Athens,
- the European Centre of New Technologies for the Management of Natural and Technological Major Hazards, ECNTRM, Moscow

The audits focused firstly on the legal and financial aspects of the organisation and management of the centres and the use made of the grants awarded under the Agreement, and secondly on the scientific standard of the centres' work and the degree of compliance with the priorities set in the Agreement's Medium-Term Plan.

The composition of the committee was adapted on a case-by-case basis to fit the needs of the appraisal, according to the scientific fields covered by each individual centre.

The centre audit reports looked firstly at the organisational and managerial aspects and then at the scientific aspects, rounding off with conclusions and suggestions. This report will follow the same pattern.

## **1. Organisation and management**

### Structures

As noted in the previous reports, the legal structure of the centres varies in that some have been set up as private- or public-law entities while others have no legal status of their own but rather form part of administrative or scientific entities operating under the wing of the host state.

Thus, those Centres audited in 2012 are structures which are part of larger entities reporting to Ministries and public authorities with legal personality and independent management, and these manage and make use of the grants paid to the Centres by the Agreement.

As regards the bodies prescribed by the Agreement, i.e. an administrative board and a scientific board, the committee observed, as it had in the past in relation to other centres, that this rule was only partially observed, if not disregarded altogether as far as the actual existence of the bodies and their international make-up were concerned. This latter point, which the committee would like once again to highlight, can be explained by the very high cost of holding international meetings compared with the modest grant from the OPA. Regular or even only annual meetings of the bodies concerned would swallow up a large proportion of the funding allocated, which consequently would not be available for scientific work.

It should nevertheless be added that contacts via correspondence or electronic mail or videoconferencing could usefully, and at little cost, enable this problem to be overcome.

### Staff

It was observed that generally speaking, the centres operate with small groups of scientists who can either bring in externals, when needed, or enlist the help of the host institution's staff. The committee was pleased to note that, with one exception, the host countries cover all or a very substantial share of the staff costs, leaving the bulk of the OPA grant available for programme expenditure.

### Premises and equipment

The above comment also applies to the costs pertaining to the premises and equipment of the centres audited, which are almost entirely borne by the host countries.

### Bookkeeping and use of OPA funds

The committee carried out a detailed inspection of the accounts for the last three financial years. It was established that the four centres audited had made proper use of the OPA grants, as evidenced by supporting documents.

The committee did note, once again, some shortcomings relating not to the expenditure charged to the OPA grant or the supporting documents, but rather to the presentation of the accounts and in particular the way in which the model accounting tables provided by the Agreement were completed. Presentation lacked uniformity and, on more than one occasion, the tables included calculation errors which were rectified at the committee's request. The carry-overs of appropriations and year-end balances clearly caused problems for the accountants.

The committee would also like (*in respect of the Moscow Centre, this year, but this comment applies to some audits in other countries*) to point to the inevitable fact that, on the one hand, expenditure is obviously incurred in the local currency, and, on the other hand, where the Centres which are part of larger entities are concerned, charging and recording on the Agreement's tables take place a posteriori, and often entail a proportionate breaking down of more general expenditure incurred for the host establishment, part of which is charged to the Agreement's grant. Thus one of the Centres visited charged to the Agreement's grant such expenditure on supplies and placed the balance under staffing costs, which it seemed plausible, despite their unidentifiability, to charge to the Agreement.

For details of this criticism, the committee refers to the detailed analyses and comments contained in the three individual audit reports attached.

In conclusion on this point, the committee is duty-bound to reiterate the general comments made in the previous reports, in so far as these referred to the training of the staff required to do accounts work and the need to obtain greater homogeneity in the way in which the Agreement's accounts tables are completed.

### Ratio

Under the rules of the Agreement, the OPA grant must not exceed 60% of the contribution received from the host country.

Services in kind (premises, office technology, telecommunications), sometimes added to staffing costs, result in, notwithstanding the difficulty of actually evaluating these, the desired ratio being achieved for the three Centres audited.

## **2. Scientific aspects**

As in most of the previous audits, the committee's assessment of the standard of the centres' work was, to a very large extent, positive.

The audits concerned the financial years 2008, 2009, 2010 and 2011. The committee also had the centres brief them on projects in progress and those planned for 2013.

The years under review therefore come under the 2007-2011 Medium-Term Plan.

Overall, the committee noted good convergence between the work of the Centres and the Medium-Term Plan, the Moscow Centre also having become involved in the *Extremum* project on early warnings of disasters.

As regards the scientific work of the various centres, the committee noted in particular (see appendices).

## **3. Conclusions and suggestions**

The committee reiterates most of its 2011 conclusions.

The recommendations made by the committee, as in the past, frequently pointed towards greater international co-operation with Centres of the Agreement or with other institutions pursuing similar objectives, although several of the Centres have appreciable networks of scientific contacts.

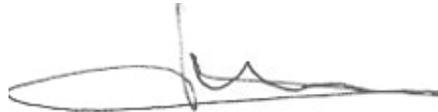
Taking this context into account, and although the financial grants may well suffer as a result, the Centres visited took a positive view of the change to the new system in use since 2012 and are ready to embark on the chosen path of working in synergy with one or more Centres, from which an optimisation of scientific results is expected.

The following experts assisted the sub-committee in carrying out the audits in 2012:

- Centre in Brussels: Prof. Jean Viret, emeritus professor, Faculty of Law Montpellier, France
- Centres in Athens and Moscow :Prof. Stefano Tinti University of Bologna, Italy

Luxembourg, 5 September 2012

The Chair of the Audit Sub-Committee

A handwritten signature in black ink, consisting of a large, sweeping loop on the left and several smaller, connected strokes on the right.

Jean-Mathias Goerens

## ***ISPU, Higher Institute of Emergency Planning, Brussels***

### **The scientific activities of the ISPU**

The attachment of the ISPU to the federal Ministry of the Interior, and more specifically to the Crisis Centre directorate general, explains why the Institute carries out at one and the same time general activities for the Belgian authorities and more specific activities in the framework of the EUR-OPA Major Hazards Agreement.

However, it should be emphasised that the ISPU team is keen to promote complementarity between these two fields of activity, by letting the States Parties to the Agreement benefit from Belgian experience, as attested, for example, by the "good practice" factsheets produced by the ISPU, and by making it possible for local Belgian officials to undergo training in accordance with the logic of the Agreement.

### ***General activities***

These centre on four main lines: research, training, the development of tools and a network of experts.

- **Research:** In this sphere, the ISPU relies on university research teams to deal with the problems associated with the planning and management of emergencies (in 2010, for instance, it took part in the ERGO European research project on mass evacuations, rounded off by the writing of an emergency evacuation guide based on research carried out in 2009 by Namur's Notre Dame de la Paix University; in 2011 two research projects were organised and supported, the first relating to a plan to set up a safety research centre, and the other to the subject of confinement and shelter in Belgium).

- **Training:** In this sphere, the ISPU sets itself two consistent objectives, namely the listing of training opportunities for emergency workers and the development of its own expertise by providing speakers or participants in colloquies or courses in Belgium and abroad (in 2011, 12 days were organised by the ISPU, which also took part in over 20 training courses; also worth emphasising is the production with effect from 2010 of a list of training courses which can be viewed on the federal Crisis Centre website); along the same line of thought, the ISPU organised information sessions, such as one on the emergency flood plan for Belgium.

- **Tools:** The ISPU has, for several years, been producing "emergency planning guides" for the officials in charge of local authorities' emergency planning (in 2010 it published a "local emergency planning guide", of which a second edition has now been produced; another guide has been distributed containing guidelines for the distribution of intervention zones in a nuclear scenario; part of a guide to emergency planning for major industrial hazards was drafted in 2011).

- **Network of experts:** The Crisis Centre uses public or private experts, lists research teams and identifies contact persons with proven experience in their given fields. This work culminated, in 2010, in the creation of a database which is constantly updated.

### ***Activities derived from the Agreement***

The ISPU is one of the 26 Centres to have obtained the EUR-OPA label with a view to study of the legal and organisational aspects of emergency planning.

In October 2006, the representatives of the Agreement's member states met in Marrakech to decide the priorities of the Medium-Term Plan 2007-2011, one of which was the need "to assess whether the role of local and regional authorities is adequately considered, with a view to improving, if necessary, the coordination of national, regional and local authorities in their respective fields of competence" (recommendation in doc. AP/CAT (2006) 24 rev. 2).

In this context, the ISPU was tasked with carrying out a comparative analysis of local and regional authorities' involvement in major hazard management, which is the core part of its work for the Agreement.

As early as 2006, a report providing the outline for the study was drawn up. In 2007, a wide-ranging survey was suggested to the Permanent Correspondents and the Directors of the specialised Centres, and a questionnaire containing 60 questions about every stage of major hazard and emergency management was drawn up. Nine states submitted replies (Algeria, Armenia, Belgium, Croatia, Cyprus, France, Greece, Luxembourg and Monaco), and another two (Azerbaijan and Morocco) intend to do so in 2012-2013.

On the basis of the information collected, the ISPU was the linchpin of three "workshops" attended by the correspondents of the states which had replied to the questionnaire, with the twofold aim of making an in-depth study possible of national hazard and emergency management systems, involving the different tiers of local and regional government on the basis of a model factsheet produced by the ISPU, and identifying the "good practices" capable of being transposed.

. Thus a first workshop was held on 4 and 5 December 2008 in Paris. Several major presentations were made, inter alia by Algeria, Armenia, Belgium and Greece, after which several problems were noted (local authorities' lack of knowledge and inadequate resources, lack of public information, dispersed nature of the law relating to risk management, etc.), and a productive discussion of good practices took place.

. A second workshop was held on 11 and 12 June 2009, also in Paris, focusing on an extremely full report by the ISPU on the role of Belgium's local and regional authorities in two areas: the prevention and the identification of major hazards. A parallel was drawn between the role of local authorities in Belgium and France, in particular.

. A third workshop took place on 21 and 22 November 2011, again in Paris. Several well-documented presentations were given during this workshop by Algeria, Armenia, Belgium (on "good practices"), Croatia, Cyprus and Morocco. On that occasion, a plan for an international course on the management of climate-related risks was presented by the CRSTRA.

If we take stock of ISPU activities initiated through the Agreement, two things are clear:

- The Institute undeniably gets involved and it works consistently, as attested by the preparation and exploitation of the questionnaire on the distribution of tasks between the different local and regional tiers in the sphere of major hazard management, as well as the model factsheet on "good practices". The result is all the more noteworthy for the fact that the ISPU's legal expert with particular responsibility for this matter had to take time off when she had a baby.

- On the other hand, it is regrettable that the States Parties to the Agreement got involved to an inadequate extent on a subject which is nevertheless of concern to them all (probably because the questionnaire was considered too detailed). Similarly, it is regrettable that few of the states which replied to the questionnaire, with the exception of Belgium via the ISPU, tried to systematise their "good practices" on the factsheets provided for this purpose.

### ***Recommendations***

Aware of the difficulties encountered, the ISPU, on the occasion of the final workshop in November 2011, offered to extend the survey to other countries, to update the findings obtained at the beginning of the programme (in 2007), to simplify the questionnaire and the "good practices" factsheet, to design a standard "ID" factsheet giving a summary of each country's particular features, and to encourage the states concerned to add material directly to the lists of good practices, in order to avoid any erroneous analysis.

While the proposed arrangements seem appropriate, further efforts need to be envisaged in three areas. The first relates to the involvement of all the Permanent Correspondents, who could be invited to supply a summary of their national system for the management of major hazards and emergencies, spanning all local and regional tiers, and, at each of their meetings, to take stock of institutional and legal developments within the system. The second concerns a strengthening of the role of workshops based on specific subjects (preventive regulations, emergency planning tools, means of informing the public, training arrangements for elected local representatives, etc.), in relation to which each state could highlight its own arrangements and practices; each correspondent in turn could act as rapporteur. In the third, the aim should be an improvement of the dissemination of the information collected, with the apparently far too limited scope currently offered by the website available to the ISPU being broadened. The reports presented during the workshops should appear on that site.

The new procedure adopted in the context of the Agreement, which meets the concerns expressed at the time of the previous audit, should enable new and broader discussion to take place of local and regional authorities' involvement in major hazard management, about which much more could be said: specific related subjects could be selected every two years, in association on each occasion with a research centre in a country with a particular interest, with the coherence of the system and the exploitation of the findings being a matter for the ISPU.

One condition nevertheless remains: the circle of states concerned needs to expand considerably, for which the initiative lies with the Permanent Correspondents.

***ECPFE, European Centre on Prevention and Forecasting of Earthquakes  
Athens,***

**Scientific aspects**

As explained in the previous sections, only the scientific activities covering the period from 2009 until the audit time have been the object of the auditing analysis. All activities are shortly summarised in the Annex provided by the ECPFE, where they are classified according to four main subjects:

Theme 1: Protection of Cultural heritage Against Earthquakes

Theme 2: Prevention and Forecasting of Earthquakes

Theme 3: Education and e-Learning

Theme 4. Reduction of Vulnerability

The Annex covers a longer period starting from 2006, but only the time interval relevant for the audit, namely since 2009, is considered here.

Year 2009:

Theme 1: A two-day meeting entitled "Strategies towards seismic protection of monuments" was organised in Athens on 26-27 February in conjunction with EPPO and a 141 pp volume was published as a follow-up initiative on March with an extended summary in English jointly with OASP (see action 1.5 in the Annex).

Theme 2: In the framework of a two-day meeting entitled "10 years after the Athens earthquake: lessons learnt" that took place in Athens on 3-4 December 2009 a side event was organised in the form of a workshop on the subject "Code of ethics between scientists and journalists in an event of an earthquake" (see action 2.1 in the Annex)

Year 2010:

Theme 1: A training course was organised in Athens from 6-10 December with the title "Seismic assessment in specific areas with monumental structures". No specific report was prepared for such event (see action 1.6 of the Annex).

Year 2011

*Theme 1:* A training course was organised in Thessaloniki from 3-5 November 2011 with the title "The protection of the integrity of monuments under seismic actions". The programme of the course with the corresponding speakers was made available to the auditors (see action 1.7 of the Annex)

*Theme 1:* A report entitled "Framework regulatory document for structural interventions for seismic protection of monuments" was drafted. Only a draft version of the paper is available with no logo, no authors and no page numbering (see action 1.8 of the Annex)

*Theme 3:* Greek-to-English translation and editing of a technical booklet entitled "Learning about earthquakes and protection measures – guidelines for people with disabilities". The 32 pp. booklet, which appears as an EPPO publication and is available both as a hardcopy and as a pdf file downloadable from the OASP

website, is a second edition of a previous version, published in October 2008 (see action 3.1a of the Annex)

*Theme 3:* Intense involvement in the development of the new ECPFE website (still under construction at the time of the auditing) in a bilingual version (Greek and English) (activity 3.1d of the Annex); design of the relevant platform to publish e-learning material (activity 3.1c of the Annex); and design and editing of the bilingual on-line multiple-choice questionnaire for e-learning based on the publication mentioned in the previous paragraph (see action 3.1b of the Annex)

*Theme 4:* A special Task Group was nominated by ECPFE jointly with EPPO to produce a document where the Eurocode 8 part 3 and the Greek intervention code are *harmonised*. The document is a bilingual publication and ECPFE has taken care of the part written in English. The document is entitled "Code of interventions. Final harmonised text" and was published in 2011 under the name of OASP.

## **Conclusions and proposals**

### Regarding organisational structure and management

It should be reiterated that the Centre's accounting should strictly comply with the Agreement's model accounting schedules and that the practice of allocating lump sums should be kept to a strict minimum and be recorded as such in the presentation.

### Regarding activities

Our examination of the Centre's activities revealed that they only very marginally reflect the purpose suggested in the Centre's name and barely touch upon the 'prevention and forecasting of earthquakes'. The management agreed that this was the case and informed the committee of their intention to change the Centre's name to one including the issues of 'Protection of cultural heritage' and 'Reduction of vulnerability'.

Care must be taken to obviate the risk of duplicating the work of other Centres such as Ravello, Bucharest and Yerevan while bearing in mind the potential for fruitful complementarity from the viewpoint of the Agreement policy to be implemented from 2012 onwards.

A further remark regards the link between OASP, EPPO and the ECPFE. It seems that most of the activities of ECPFE are indeed activities decided in the frame of OASP and of EPPO and that are carried out by ECPFE as an ancillary center. This is probably due to the limited amount of financial support from the Council of Europe that does not allow to develop autonomous relevant initiatives. A consequence of such a strict link is that it is somehow hard to single out the contribution given by each institution to the actions that were carried out during the 3-year time span examined by the auditing team and that have been listed in the previous section.

The final remark concerns the vocation of ECPFE. It is a European centre and therefore it is expected to carry out activities with a European perspective, which

means that initiatives and produced material should be conceived with a view going beyond the national Greek boundaries. One gets the impression that the international dimension is sometimes overlooked: for instance not all documents are bilingual. However, the plan of actions that is foreseen for the coming biennium 2012-2013 seems to fit more closely the international dimension, since it is based on projects that will be carried out jointly with other nodes of the Council of Europe EUR-OPA Major Hazards Agreement network, more precisely with the CUEBEC of Ravello (Italy), the ECRM of Yerevan (Armenia), the ECRP of Sofia (Bulgaria) and the ECBR of Bucharest (Romania).

Regarding the Centre's OPA label

Bearing in mind the above remarks concerning the presentation of the accounts and stressing the need to give the activities a more tangible international dimension, in particular by making the reports available in one of the Council of Europe's official languages, the Committee proposes that the label of specialised centre of the Agreement be maintained.

***ECNTRM, European Centre of New Technologies for the Management of Natural and Technological Major Hazards, Moscow***

The scientific activity of the ECNTRM have been reported by means of four annual reports covering the period 2008-2011, and have been further fully illustrated by a presentation given by Prof. Sergey Kachanov and during the following discussion of Prof.Sergey Kachanov with the audit team.

Since the ENCTRM is well integrated in the EMERCOM, most of the ENCTRM activities are carried out in the frame of the hosting institute EMERCOM, which provides tools, means, instruments and personnel. In the present audit report the ENCTRM activities will be covered following a chronological order starting from 2008.

Year 2008

In 2008, the main ENCTRM attention was devoted to the project EXTREMUM that is a multi-year project started before 2008 and reported also to the previous audit team for years 2006-2007. EXTREMUM is essentially a tool for a rapid estimation of damages produced by an earthquake in quasi real-time (which means in the range from 0.5 to 2 hours). The tool is applicable to any damaging earthquake in any part of the globe, i.e. with no geographical restrictions. However in practice the results of the evaluation analysis depend strongly upon the quantity and quality of data that populate the ARCGIS database used by EXTREMUM. In particular, among key-data that are essential and that require a continuous updating one counts geological data (tectonic setting), geomorphological data (relief features), seismo-engineering data (buildings type, seismic resistance), and demographic data (population).

Among the analysed earthquakes of 2008 there was the 12 May Great Sichuan earthquake ( $M_w=7.9$ ) that occurred in the Sichuan province of China and caused more than 69,000 fatalities. EXTREMUM was able to predict that the number of persons in the hit area was exceeding 10 million, that the number of affected persons would have been in the range between 129,724-290,773 and that the number of fatalities would have been counted between 40,272-85,218.

A further case carefully analysed by EXTREMUM was the  $M_w=5.8$  Chechnya earthquake of 11 October that killed 13 people. EXTREMUM slightly overestimated losses since it predicted fatalities being comprised between 348 and 826, and homeless being about 11000, while only about 500 families were actually reported to need tent shelters.

The  $M_w=6.4$  29 October Pakistan earthquake affecting the Baluchistan province that killed more than 200 people and made more than 120,000 homeless is not treated in the 2008 report and is mentioned in the 2009 report.

In addition to losses to people and buildings, EXTREMUM provides further estimates on building damages, and even predictions on the means and resources that would be required for emergency post-disaster operations, including rescue operations, fire extinguishing, order and law keeping, life-support for homeless people, food-supplies for the first ten days, etc.

Forecasts are disseminated by email to the a list of recipients that includes all the CIS member states as well as the following institutions: European Centre on Prevention and Forecasting of Earthquakes (Greece), Euro-Mediterranean Seismological Centre (France), European Centre for Seismic and Geomorphologic Hazards (France), European Centre for Geodynamics and Seismology (Luxembourg), Euro-Mediterranean Centre for Evaluation and Prevention of Seismic Risk (Morocco), Executive Committee of EUR-OPA Council of Europe, Strasbourg, France.

#### Year 2009

In 2009 the ENCTRM continued the development of the EXTREMUM database and the application of the tool. The main earthquakes of 2009 were the L'Aquila, central Italy, earthquake ( $M_s=6.3$ ) that occurred on 6th April and the Sumatra, Indonesia, earthquake ( $M_w=7.9$ ) that took place on 30th September and killed 1115 people.

The 2009 report focusses on the Italian earthquake for which it provides the EXTREMUM estimates. The official number of victims is 308, which agrees with the fatalities estimated to be in the interval from 211-466. The injured people resulted to be about 1500 against a forecast of 458-1212. Homeless were counted in excess of 65,000 while EXTREMUM estimated them to be about 37,000. The predicted EXTREMUM macroseismic field was in agreement with the one determined after the earthquake. Even the experiences of 2009 confirmed that EXTREMUM has a good prediction power though however the database has to be empowered continuously.

The second project on which the ECNTRM concentrated its efforts was the development and application of a system to evaluate the seismic stability of buildings and constructions by analyzing the response of such objects to seismic shaking produced by known artificial sources. The ENCTRM developed software and hardware components of the system, known as "Tool for on-line automatic tele-monitoring of buildings and engineering constructions". The 32-channel data acquisition module can transmit data on the internet to a remote control center, which means that the object under monitoring can be controlled from every part of the world. The system is portable and can be installed quickly even in areas affected by earthquakes, to monitor the consequence of seismic shaking on critical buildings for population security.

#### Year 2010

In 2010 the ECNTRM activities were essentially the continuation of the projects of 2009.

The tool for remote seismic monitoring of buildings was further developed. In the ECNTRM report of 2010 it is said that such a diagnostic method was applied to the Ice Palace of Moscow, also known as Megasport Arena that was completed in 2006 and has a capacity of more than 14,000 people. Operation and maintenance of the monitoring system is carried out by specialized staff of the Ice Palace.

The system has wide application and as for the end of 2010 it is stated that was used to monitor more than 100 objects (buildings, constructions) in the Russian Federation.

The operative duty EXTREMUM program continued also in 2010. The largest catastrophe was due to the earthquake of 24 January in Haiti that struck Port-au-Prince and caused 230,000 fatalities (or even 316,000 according to Haiti governmental estimates) and left about 1 million people homeless. The 2010 ECNTRM report shows the performance of the EXTREMUM for various earthquakes through maps produced by the EXTREMUM software. An M=7.0 earthquake hypothetically occurring on 30<sup>th</sup> of September 2010 in Haiti with the same hypocentral coordinates of the disastrous 24 January shock was shown to lead to estimation of deaths of less than 1000 people and of losses of less than 4000. On the other hand a simulation of EXTREMUM performance on the Chile earthquake (27 February Mw=8.7) led EXTREMUM to overestimate the effects: The irrevocable person losses ranged between 18,873-38,519 people while the ascertained fatalities were less than 550, including the many killed by the tsunami. This very drastic underestimation or overestimation shows that in some regions of the world the EXTREMUM database needs to be improved.

#### Year 2011

In 2011 the ECNTRM has continued the application of EXTREMUM. In the 11-month period until the end of November, about 400 earthquakes occurred with magnitude exceeding the threshold of 5.5, which is the minimum level selected for the EXTREMUM application. The 2011 report gives the list in chronological order of all such earthquakes with related estimated losses by means of a table that however cannot be read for bad formatting (only date, hypocentral coordinates, magnitudes and location names can be read).

A second line of activities of the ECNTRM is a new program on the Arctic territory that is called "*The Arctic as a weather backroom on a planet scale*" whose main goals are: 1) the elaboration of recommendations and key elements of the emergency risks assessment system and the system for improving safety of potentially hazardous facilities; 2) the elaboration of recommendations for establishing regional centers with international participation that will accumulate monitoring information and manage rapid reaction forces in strategically important areas; 3) considering the possible implementation of an integrated monitoring, prevention and prompt system in the Arctic. This program is still in an initial phase.