

Towards the Monitoring of Dumped Munitions Threat (MODUM)

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Towards the Monitoring of Dumped Munitions Threat (MODUM)

A Study of Chemical Munitions Dumpsites in the Baltic Sea

edited by

Jacek Bełdowski

Department Marine Chemistry & Geochemistry, Institute of Oceanology PAS
Sopot, Poland

and

Robert Been

Centre for Maritime Research and Experimentation (STO - CMRE), Science and
Technology Organisation, La Spezia, Italy

and

Eyup Kuntay Turmus

Emerging Security Challenges Division, Science for Peace & Security (SPS)
Programme, Brussels, Brussels Hoofdst.ge., Belgium



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MODUM

TOWARDS THE MONITORING
OF DUMPED MUNITIONS THREAT



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The NATO **Science for Peace**
and **Security** Programme

Preface: The NATO Science for Peace and Security Perspective

The Science for Peace and Security (SPS) Programme is an established brand for NATO based on three pillars – science, partnership and security – and has been contributing to the core goals of the Alliance for many decades. In the spirit of cooperative security, SPS provides concrete, practical opportunities for cooperation to NATO’s wide network of partner countries based on security-related civil science, technology and innovation. The origins of the SPS Programme date back to the 1950s, and its outlook has been adapted to the changing security environment over the decades. The programme provides funding and expert advice for security-relevant activities in the form of workshops, training courses or multi-year research projects and thus promotes dialogue among partners.

All activities funded under the SPS Programme address one or more of the programme’s key priorities and have a link to security. The SPS key priorities are based on NATO’s Strategic Concept, agreed by Allies in the 2010 Lisbon Summit, and the strategic objectives of NATO’s partner relations agreed in Berlin in 2011. According to these priorities, the programme promotes cooperation, scientific research and innovation to address contemporary security challenges, including terrorism; defence against chemical, biological, radiological and nuclear agents; cyber defence; energy security; and environmental concerns, as well as human and social aspects of security such as the implementation of United Nations Security Council Resolution 1325 on Women, Peace and Security.

Dumped chemical weapons pose an actual environmental and security hazard in the Baltic Sea Region. Official and unofficial dumpsites cover vast areas of the Baltic Sea bottom, with at least 50,000 tons of CW having been dumped, containing approximately 15,000 tons of CWA. Their actual position is unknown, and pollution originating from corroded munitions is only roughly estimated. The risk created by the dumpsites is twofold: They pose important risks for users, such as fishermen and maritime entrepreneurs, and they create a diffuse source of contaminants to surrounding sediments and near bottom waters, hence threatening marine biota. With more and more activities being performed in the Baltic Sea area, the threat level rises constantly and could potentially create chemical weapon danger for the Baltic States population. In this regard, the multi-year NATO SPS project *Towards the*

Monitoring of Dumped Munitions Threat (MODUM) was initiated in 2013 in order to address environmental and security challenge created by dumping operations. Building on the studies of two EU projects, *Modelling of Ecological Risks Related to Sea-Dumped Chemical Weapons (MERCW)* and *Chemical Munitions Search and Assessment (CHEMSEA)*, dealing especially with the dumpsites located in the Bornholm and Gotland Deep, the SPS project complemented EU efforts and actively included specialized EU agencies. While abovementioned projects depended on ship-based measurement platforms for detection of dumped munitions, supplemented by ship-based samplers for sediment collection video identification by remotely operated vehicles, NATO activities complemented EU research and focused on the broadening of knowledge about the risks posed by sea-dumped munitions and the creation of monitoring guidelines for the dumpsite areas using autonomous underwater vehicles (AUVs) and remotely operated underwater vehicles (ROVs) and utilizing existing research vessels of partner institutions as launching platforms. The project thereby concentrated on three representative areas: habitat status evaluation, fish health studies and modelling of possible threats to adjacent areas and performed field measurement campaigns.

The SPS project established standard operational procedures to monitor the breakdown of munitions and release of agents into sediments and water, to be able to spot a mass breakout, potentially creating chemical weapon danger for the Baltic States population, in advance. These procedures include a continuous survey procedure, based on the best available technology, a procedure for the identification of dumped munitions, based on ROV video and acoustic camera imagery, and a procedure for establishing continuous risk assessment, including sediment pollution, effect on biota and habitat damage. The success of the project provides a scalable solution for the monitoring of Baltic Sea chemical weapon dumpsites, and information contained will enable states to proclaim potentially dangerous areas for fishermen and offshore industry. Capacity for the creation of permanent monitoring of the dumpsites, including equipment and human potential, is built in the Baltic Sea area and is currently used as a basis for the Baltic Sea Region EU project Decision Aid for Marine Munitions (DAIMON). Project DAIMON aims at creating decision support tool for maritime administration of Baltic countries, in regard to munition dumpsite management. It develops further risk assessment methods created during the MODUM project and prepares algorithms for their interpretation.

By connecting scientists, experts, government representatives and civil society on key issues of security, the SPS Programme is able to make a significant positive impact upon society and achieve tangible and lasting results. The aim of SPS activities is to set a working model often by providing an initial operational capability that could then be expanded through national and/or other resources. Under the umbrella of the MODUM project, young scientists training in summer schools in Canada and the United States, as well as publications and conference presentations, successfully achieved a knowledge transfer to the global scientific community, with this book providing another valuable contribution to the research on dumped munition. The selection of NATO and partner countries represented a regional approach, and the linkage with the International Dialogue on Underwater Munitions (IDUM) ensured

the global dimension, making a transfer of project results to other affected areas possible, to increase human security worldwide.

The programme further looks at engaging partners in civil science, technology, innovation and beyond. Interested parties are therefore encouraged to submit an application for funding. Proposed projects must be led by project directors from at least one Allied and one partner country as well as address the SPS key priorities that have a clear link to security. The developed collaborative activity must fit within one of the SPS grant mechanisms, that is, multi-year projects, training courses or workshops, as mentioned above. Applications received by the SPS Programme will undergo a comprehensive evaluation and approval process, taking into account expert, scientific and political guidance. For more information and the latest news about the SPS Programme, please visit our website (www.nato.int/science) where you will also be able to find detailed application guidelines and forms. Alternatively, you can e-mail us under sps.info@hq.nato.int.

Science for Peace & Security (SPS) Programme,
Emerging Security Challenges Division
J-202, NATO Headquarters CB, 1700,
Brussels, Belgium
turmus.eyup@hq.nato.int

Eyup Kuntay Turmus

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Editors and Contributors

Editors

Jacek Beldowski Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Robert Been Science and Technology Organisation – Centre for Maritime Research and Experimentation (STO - CMRE), La Spezia, SP, Italy

Eyup Kuntay Turmus Science for Peace & Security (SPS) Programme, Emerging Security Challenges Division, Brussels, Belgium

Contributors

Robert Been Science and Technology Organisation – Centre for Maritime Research and Experimentation (STO - CMRE), La Spezia, SP, Italy

Jacek Beldowski Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Federico Cernich Science and Technology Organisation – Centre for Maritime Research and Experimentation, La Spezia, SP, Italy

Ilias Christensen Department of Environmental Science, Aarhus University, Roskilde, Denmark

Department of Environmental Engineering, Technical University of Denmark, Lyngby, Denmark

Michal Czub Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Patrik Fauser Department of Environmental Science, Aarhus University, Roskilde, Denmark

Stefano Fioravanti Science and Technology Organisation – Centre for Maritime Research and Experimentation, La Spezia, SP, Italy

Maria Golenko Atlantic Branch of the P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Kaliningrad, Russian Federation

Miłosz Grabowski Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Katarzyna Grzelak Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Jaromir Jakacki Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Piia Jõul Tallinn University of Technology, Tallin, Estonia

Mihkel Kaljurand Tallinn University of Technology, Tallin, Estonia

Zygmunt Klusek Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Lech Kotwicki Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Thomas Lang Thünen-Institut für Fischereiökologie, Cuxhaven, Germany

Heidi Lees Tallinn University of Technology, Tallin, Estonia

Terrence Long International Dialogue of Underwater Munitions, Leitches Creek, NS, Canada

Roger Magnusson Swedish Defence Research Agency, Umeå, Sweden

Vitalijus Malejevas The Environmental Protection Agency, Vilnius, Lithuania

Anders Östin Swedish Defence Research Agency, Umeå, Sweden

Vadim Paka Atlantic Branch of the P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Kaliningrad, Russian Federation

Erik Amos Pedersen Department of Environmental Science, Aarhus University, Roskilde, Denmark

Department of Environmental Engineering, University of Southern Denmark, Odense, Denmark

Johanna Qvarnström Swedish Defence Research Agency, Umeå, Sweden

Daniel Rak Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Jenny Rattfelt-Nyholm Swedish Defence Research Agency, Umeå, Sweden

Hans Sanderson Department of Environmental Science, Aarhus University, Roskilde, Denmark

Martin Söderström Finnish Institute for Verification of the Chemical Weapons Convention, University of Helsinki Finland, Helsinki, Finland

Morten Swayne Storgaard Department of Environmental Science, Aarhus University, Roskilde, Denmark

Katharina Straumer Thünen-Institut für Fischereiökologie, Cuxhaven, Germany

Marta Szubska Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

Eyup Kuntay Turmus Science for Peace & Security (SPS) Programme, Emerging Security Challenges Division, Brussels, Belgium

Merike Vaher Tallinn University of Technology, Tallin, Estonia

Paula Vanninen Finnish Institute for Verification of the Chemical Weapons Convention, University of Helsinki, Helsinki, Finland

Kela Weber Environmental Sciences Group, Department of Chemistry and Chemical Engineering, Royal Military College of Canada, Kingston, Ontario

Lina Weirup Thünen-Institut für Fischereiökologie, Cuxhaven, Germany

Victor Zhurbas Atlantic Branch of the P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Kaliningrad, Russian Federation