

Horizon 2020 GRACE project: Integrated oil spill response actions and environmental effects



Invitation to the GRACE final conference, Tallinn 23.-24.5.2019



Place: ORIGINAL SOKOS HOTEL VIRU, Viru Väljak 4, EE-10111, Tallinn, Estonia

Programme

Wednesday 22.5.2019 (GRACE internal meetings during daytime)

Public programme

19:00 Icebreaker – get together

Thursday 23.5.2019

8:30 - 9:00 Registration

9:00 - 9:30 Welcome

Welcoming words

Renno Veinthal, ProRector. Tallinn University of Technology, TalTech, Estonia

Introduction to the GRACE project

Kirsten S. Jørgensen,

Co-ordinator of the GRACE Project, Finnish Environment Institute SYKE, Finland

9:30 – 10:30 Plenary session

Oil spill response preparedness in the Baltic Sea

Ismo Siikaluoma (Finnish Border Guard, SAR and Maritime Safety Unit, Head of Unit)

Marine Oil Spill Research in Canada

Feiyue Wang, Professor (Centre for Earth Observation Science (CEOS) & Department of Environment and Geography, University of Manitoba, Canada)

10:30 – 10:50 Coffee break

10:50 – 12:10 Plenary session cont.

EPPR/GRACE work on oil spills

Jens Peter Holst-Andersen (Commander, Danish Ministry of Defence, Denmark), Chair of the Arctic Council working group on Emergency, Prevention, Preparedness and Response, EPPR)

Tests with in situ burning in Norway

Hilde Dolva (Senior Advisor, Norwegian Coastal Administration, Norway)

Multi-compartment modelling - a tool to assess exposure of different organism groups to oil components

Matthias Grote (Researcher, Federal Institute for Risk Assessment, Germany)

12:10 – 13:00 Lunch

13:00 – 14:30 Session I

Oil spill detection, monitoring, fate and distribution

Sensors for in situ oil spill detection – problems and outlook

Harri Kankaanpää, (Finnish Environment Institute, SYKE, Finland), Siim Pärt (Tallinn University of Technology, TalTech, Estonia) and Leonie Nüßer (RWTH Aachen University, Germany)

Operational oil spill detection and monitoring on fairways using FerryBox and SmartBuoy technologies

Siim Pärt, Tarmo Kõuts, Kaimo Vahter (Tallinn University of Technology, TalTech, Estonia) and Seppo Virtanen (MeriTaito/SeaHow, Finland)

Local scale oil spill modelling and risk assessment in seasonally ice covered seas

Urmas Raudsepp, Ilja Maljutenko, Tarmo Kõuts (Tallinn University of Technology, TalTech, Estonia) and Nelly Forsman (SSPA, Sweden)

Strategic view on oil spill response support using in situ and remote sensing data tools

Jorma Rytönen (Finnish Environment Institute, SYKE, Finland), Tarmo Kõuts and Siim Pärt (Tallinn University of Technology, TalTech, Estonia)

14:30 – 15:00 Coffee break

15:00 – 16:30 Session II

Oil biodegradation and bioremediation

New results on biodegradation of oil and dispersed oil in cold marine environment

Ossi Tonteri (Finnish Environment Institute, SYKE, Finland)

Biodegradation of crude oil in seawater and ice-water interface

Nga Dang, M. O' Sadnick, C. Petrich (NORUT Northern Research Institute, Norway), J. Truu, K. Oopkaup, M. Truu (Tartu University, Estonia)

Marine microbial community taxonomic and functional structure and its association with oil exposure and oil biodegradation activity

Jaak Truu, Kristjan Oopkaup, Marika Truu (Tartu University, Estonia), Nga P. Dang (NORUT Northern Research Institute, Norway), Ossi Tonteri, Anna Reunamo, Kirsten S. Jørgensen (Finnish Environment Institute, Finland)

16:30 – 17:00 Coffee break

17:00 – 18:30 Session III

Oil impacts on biota using biomarkers and ecological risks assessment

Assessment of effects of oil contaminants in vivo - natural variability, controlled exposure, and the impact of an artificial oil spill

Denis Benito, University of the Basque Country, Bilbao, Spain

Linking molecular event and apical effect to assess oil toxicity in mussels, copepods and zebrafish

Aino Ahvo, Finnish Environment Institute SYKE, Helsinki, Finland

An effect-based toolbox for the rapid and cost-effective investigation and fingerprinting of oil contamination

Sarah Johann, RWTH Aachen University, Aachen, Germany

Three years research into environmental effects of oil spills and response actions - a wrap-up.

Thomas-Benjamin Seiler, RWTH Aachen University, Aachen, Germany

19:30 Conference dinner

Friday 24.5.2019

9:00 – 10:30 Session IV

Combat of oil spill in coastal arctic water - effectiveness and environmental effects

Burning oil on ice

Christian Petrich (NORUT Northern Research Institute, Norway) and Janne Fritt-Rasmussen (Department of Bioscience, Aarhus University, Denmark)

Mechanical removal of oil under ice - concepts and equipment development

Rune Högström (Lamor, Finland)

In situ burning and effects from oil spills on Arctic shorelines

Kim Gustavson, Susse Wegeberg and Janne Fritt-Rasmussen (Department of Bioscience, Aarhus University, Denmark)

10:30 – 11:00 Coffee break

11:00 – 12:30 Session V

Environment & Oil Spill Response (EOS) - an analytic tool for environmental assessments to support oil spill response design

Environment & Oil Spill Response (EOS) - an analytic tool for environmental assessments to support oil spill response design I. Framework and decision trees

Susse Wegeberg, Janne Fritt-Rasmussen and Kim Gustavson (Department of Bioscience, Aarhus University, Denmark)

Environment & Oil Spill Response (EOS) - an analytic tool for environmental assessments to support oil spill response design II. Interactive component

Janne Fritt-Rasmussen, Susse Wegeberg and Kim Gustavson (Department of Bioscience, Aarhus University, Denmark)

Operational add-ons to the EOS tool

Biørn Forsman and Nelly Forsman (SSPA, Sweden)

12:30 – 13:30 Lunch

13:30 – 14:00 Poster Session

14:00 – 15:00 Closing session

Industry efforts in Arctic spill response technology development

M. Smit (Chair Environmental Effects Technical Working Group, Arctic Response Technology JIP, International Association of Oil and Gas Producers (IOGP))

Using NEBA and Environmental Risk Methods for Oil Spill Response Planning and Preparedness

Richard Wenning (Ramboll US, USA)

15:00 End of conference

Registration:

Registration by Tuesday 7.5.2019 to GRACEconference@taltech.ee

Registration fee 125€. The fee can be paid by invoice or by credit card. Please indicate if how you would like to pay.

Poster presentation:

As oral presentations are limited, 3-4 per WP, then you are welcome to present posters (size of poster boards is A0, portrait). Please send an abstract (max 1/2 page) to GRACEconference@taltech.ee by 13.5.2019.

Accommodation:

ORIGINAL SOKOS HOTEL VIRU, Viru Väljak 4, EE-10111, Tallinn, Estonia see the attachment for details. There are also many other hotels in the center of Tallinn.

Travel:

Tallinn can be reached by air from many European major airports or by ferry from Helsinki (2 or 2 1/2h) and Stockholm (16h overnight). <https://www.tallink.com/>, <https://www.vikingline.com/>

GRACE Final Conference poster presentations

1. Oil spill risk assessment methodology for ice covered waters and Arctic conditions.

Nelly Forsman and Björn Forsman

SSPA Sweden AB, Chalmers Tvärgata 10, SE-412 58, Göteborg, Sweden.

E-mail contact: nelly.forsman@sspa.se

2. Zebrafish embryo behaviour-triggered biosensor system for oil spill monitoring and detection directly in flow-through system.

Leonie Nuesser¹, Eric M. Wielhouwer², Christian Neuser¹, Tarmo Kõuts³, Henner Hollert¹ and Thomas-Benjamin Seiler¹

¹Institute of Environmental Research, RWTH Aachen University, Aachen, Germany

²Syntecnos Screening Technologies BV, Rotterdam, Netherlands

³Tallinn University of Technology, Tallinn, Estonia

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3. Use of different autonomous platforms for oil spill detection and monitoring.

Siim Pärt and Tarmo Kõuts

Tallinn University of Technology, Department of Marine Systems, Akadeemia 15A, EE-12618 Tallinn, Estonia

E-mail contact: siim.part@taltech.ee

4. Smart Buoy technology for remote Oil Spill Monitoring

Seppo Virtanen

Meritaito Ltd (SeaHow), Porkkalankatu 5, FIN-00180, Helsinki, Finland

E-mail contact: seppo.virtanen@meritaito.fi

5. In situ electrokinetic treatment pilot test of petroleum hydrocarbon contaminated marine sediment.

Ossi Tonteri¹, Miikka Tunturi², Emil Vahtera³, Laura Hoikkala¹, Kaarina Lukkari¹, Miira Jääskeläinen⁴ and Kirsten S. Jørgensen¹

¹Finnish Environment Institute, Marine Research Centre, P.O.Box 140, 00251 Helsinki, Finland

²Lamor Corporation, Rihkamatori 2, 06100 Porvoo, Finland

³City of Helsinki, Urban Environment Division, Environmental Protection, Viikinkaari 2a, 00790 Helsinki, Finland

⁴Eko Harden Technologies Oy, Huopalahdentie 24, 00350 Helsinki, Finland

E-mail contact: ossi.tonteri@ymparisto.fi

6. Impact of dispersants on petroleum hydrocarbon biodegradation and degradation gene abundances in the Baltic Sea.

Ossi Tonteri¹, Aura Nousiainen¹, Anna Reunamo¹, Jari Nuutinen¹, Jaak Truu² and Kirsten S. Jørgensen¹

¹Finnish Environment Institute, Marine Research Centre, P.O.Box 140, 00251 Helsinki, Finland

²Institute of Molecular and Cell Biology, University of Tartu, Estonia

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7. Application of genome-resolved metagenomics for study of oil-degrading sea-ice microbial community

Angela Peeb¹, Jaak Truu¹, Kristjan Oopkaup¹, Marika Truu¹, Nga Phuong Dang²

¹Institute of Molecular and Cell Biology, University of Tartu, Estonia

²Northern Research Institute Narvik, Narvik, Norway

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8. Cell and tissue-level biomarkers in Atlantic mussels (*Mytilus edulis*) exposed to crude oil and oil+dispersant WAFs at various low temperatures

J. Aguirre-Rubí, D. Benito¹, L. De Miguel, U. Izagirre, X. Lekube¹, M. Soto, I. Marigomez

Department of Zoology and Animal Cell Biology, Research Centre for Experimental Marine Biology and Biotechnology (Plentzia Marine Station, PiE-UPV/EHU), University of the Basque Country, Bilbao and Areatza z/g, (48620) Plentzia, Bizkaia, Spain.

E-mail contact: ionan.marigomez@ehu.eus

9. Can zebrafish larvae be used as a biosensor for contaminant detection in the Baltic Sea?

Sarah Johann, Leonie Nüßer, Henner Hollert & Thomas-Benjamin Seiler

Institute for Environmental Research (Biology V), RWTH Aachen University, DE-52074 Aachen, Germany

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10. Toxicity assessment of a naphthenic North Sea crude oil using multi-level endpoints in zebrafish early live stages

Sarah Johann, Leonie Nüßer, Henner Hollert & Thomas-Benjamin Seiler

Institute of for Environmental Research, RWTH Aachen University, DE-52074 Aachen, Germany

E-mail contact: sarah.johann@bio5.rwth-aachen.de

11. Oil spill and response impacts on biota in cold climates – effect-based tools and ecological risk assessment

T.-B. Seiler¹, S. Johann¹, L. Nüßer¹, K. Lehtonen², A. Ahvo², R. Turja², A. Reunamo², J. Nuutinen³, I. Marigómez⁴, M. Soto⁴, N. Etxebarria⁴, U. Izagirre⁴, A. Orbea⁴, X. Lekube⁴, E. Gil-Uriarte⁴, A.J. Olsen⁵, B.M. Jenssen⁵, I. Salaberria⁵, T.M. Ciesielski⁵, D. Altin⁶, T. Kõuts⁷, S. Pärt⁷, M. Duchemin⁸, K. Jörgensen² & H. Hollert¹

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⁶BioTrix, Finn Bergs Veg 3, 7022 Trondheim, Norway

⁷Tallinn University of Technology, Marine System Institute, Akadeemia tee 15a, Estonia

⁸DM Conseil, 7, Allee du Bois Rond 69360 Serewin du Rhone, France

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12. Interspecies comparison of lysosomal responses of mussel exposed to water accommodated fraction (WAF) of oil and dispersed oil

V. de Konick, D. Benito, U. Izagirre, X. Lekube, M. Soto and I. Marigómez

CBET Research Group, Department of Zoology and Cell Biology, Faculty of Science and Technology and Research Center for Marine Biology and Biotechnology (PiE-UPV/EHU), University of the Basque Country, Plentzia, Basque Country (Spain)

13. Biomarker and metabolom responses in *Calanus finmarchicus* exposed to the water accommodated fraction of North Sea crude oil

Tomasz Maciej Ciesielski¹, Sofia Soloperto¹, Ewa Agnieszka Cichosz¹, Dag Altin², Anna Hallmann³, Elise Skottene¹, Trond Størseth⁴, Bjørn Henrik Hansen⁴, Bjørn Munro Jenssen¹

¹Norwegian University of Science and Technology, NTNU NO-7491, Trondheim, Norway

²BioTrix, Trondheim, Norway

³Department of Pharmaceutical Biochemistry, Medical University of Gdańsk, Gdańsk, Poland

⁴SINTEF Ocean AS, Environment and New Resources, Trondheim, Norway

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14. Comparative temperature-dependant toxicity of light oil, intermediate oil and diesel oil WAFs alone and mixed with dispersant: sea urchin bioassays

L. de Miguel-Jiménez¹, D. Bilbao², N. Etxebarria², X. Lekube¹, U. Izagirre¹ and I. Marigómez¹

¹CBET Research Group, Department of Zoology and Cell Biology;

²Department of Analytical Chemistry, Faculty of Science and Technology and Research Center for Marine Biology and Biotechnology (PiE-UPV/EHU), University of the Basque Country, Basque Country (Spain)

15. Cellular and tissue-level biomarkers in mussels (*Mytilus edulis*) sampled in two different study areas in the Northern Atlantic

D. Benito, U. Izagirre, X. Lekube, I. Marigomez, B Zaldibar and M. Soto

CBET Research Group, Department of Zoology and Cell Biology, Faculty of Science and Technology and Research Center for Marine Biology and Biotechnology (PiE-UPV/EHU), University of the Basque Country, Plentzia, Basque Country (Spain)

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16. Toxicity of crude oil WAF assessed by bioassays in *Hediste diversicolor*

S. Blanco, L. de Miguel, X. Lekube, I. Marigómez, M. Soto and U. Izagirre

¹CBET Research Group, Department of Zoology and Cell Biology, Faculty of Science and Technology and Research Center for Marine Biology and Biotechnology (PiE-UPV/EHU), University of the Basque Country, Basque Country (Spain)

17. The use of Precision cut liver slices (PCLS) to assess the toxic effects of Oil Water Accommodated Fractions (WAF) in *Solea senegalensis*.

T. Hafez¹, R. Duran² and M. Ortiz-Zarragoitia¹

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²Équipe Environnement et Microbiologie UMR IPREM5254, Université de Pau et des Pays de l'Adour (UPPA), Pau (France)

18. Effects of oil spill on coastal seaweed in the Arctic

Susse Wegeberg, Janne Fritt-Rasmussen and Kim Gustavson

Aarhus University, Nordre Ringgade 1, 8000 Aarhus, Denmark

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19. Plugging in a fuzzy logic model to an interactive 'Environment & Oil Spill Response' tool.

Madis-Jaak Lilover

Tallinn University of Technology, Department of Marine Systems, Akadeemia 15A, EE-12618 Tallinn, Estonia

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20. Effect of oil exposure on the Baltic Sea mussel *Mytilus trossulus* microbiome

Anna Reunamo¹, Raisa Turja¹, Aino Ahvo¹, Jari Nuutinen¹, Kari K. Lehtonen¹, Kristjan Oopkaup¹, Jaak Truu², Kirsten S. Jørgensen¹

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