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Dissemination and Exploitation Plan Draft 1

D6.6

WP6: Management, dissemination and communication



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Executive Summary

The dissemination and exploitation plan contains a first draft of planned publications, participation in conferences and other outreaching activities. It also contains an overview of the products to be developed in GRACE and the plan for commercialization of these.

The potential end users have been identified to belong to a) The private sector, b) Public sector national oil spill response authorities and their subcontractors, 3) Public sector (cross boarder associations and their working groups), 4) Scientific community. An e-mailing list with contacts to private and public stakeholders and NGOs will be produced at the beginning of the project and a notification about the GRACE project and the GRACE project web pages will be made.

So far 5 abstracts have been prepared for three different conferences in 2016 and spring 2017. At this stage 18 scientific articles have been planned. They are all still with tentative titles. The members of the consortium are planning to attend 25 different conferences during the course the project in Europe and also some outside Europe.

A list of planned products has been elaborated with a timetable for commercialization. 12 different products are listed of which 9 are of commercial interest. The companies involved in the project are playing a large role in the commercialization plan.

The project has so far made two press releases on the progress and is planning to continue this when relevant. The web-pages of GRACE serve a source of information of the outcomes of the project.

Identification of potential end users

The potential end users of the innovation and research results in GRACE includes:

The private sector

- Oil exploration companies
- Shipping companies including ice breakers
- Sensor developers
- Commercial laboratories performing oil impact research
- IT companies developing data transfer and data visualization
- Biotechnological companies for microbial inoculants and natural degradation assessments
- Consulting companies providing assessment of risks for the oil industry
- Ports
- Oil spill responders such e.g. Oil spill response limited (OSRL), The international tanker owners pollution federation limited (ITOPF)

Public sector national oil spill response authorities and their subcontractors

- National Oil Spill Response Authorities
- Coast Guards
- Defence forces

Public sector (cross boarder associations and their working groups)

- Environmental authorities
- EMSA
- HELCOM Response
- IMO HNS
- Copenhagen agreement (oil spill response in the Nordic Countries)
- Arctic council EPPR
- Central Command for Maritime Emergencies, Germany
- Federal Institute for Risk Assessment (BfR), Germany
- WWF

Scientific community

- On-line oil sensing
- Biotechnology
- Ecotoxicology
- Higher education

An e-mailing list with contacts to private and public stakeholders and NGOs will be produced at the beginning of the project and a notification about the GRACE project and the GRACE project web pages will be made. Representatives from these stakeholder groups will also be invited to the final seminar.

Publication plan

The contacts to the scientific community will be ensured through publication in high level international journals preferably with free access. Furthermore, the participation in international conferences will ensure information to the scientific community. We will also propose to conference organizers to include special sessions on oil contamination topic.

So far the following abstracts have been submitted:

Johann, S. et al. 2016. Determination of oil spill and response impacts on biota using effect-based tools and ecological risk assessment – GRACE project WP3 SETAC GLB conference 2016 in Tübingen, Germany Sept 5-8, 2016.

Leonie Nuesser, Sarah Johann, Elad Salomons, Olya Skulovich, Sarah Hartmann, Caroline Ganal, Catrina Cofalla, Holger Schuettrumpf, Avi Ostfeld, Kirsten Jørgensen, Tarmo Kõuts, Henner Hollert and Thomas-Benjamin Seiler. Zebrafish larvae behaviour as a biological early warning system for aquatic systems. Extended and short abstract for SETAC Europe, Brussels May 2017.

T.-B. Seiler, S. Johann, L. Nüßer, K. Lehtonen, A. Ahvo, R. Turja, A. Reunamo, J. Nuutinen, I. Marigómez, M. Soto, N. Etxebarria, U. Izagirre, A. Orbea, X. Lekube, E. Gil-Uriarte, A.J. Olsen, B.M. Jenssen, I. Salaberria, T.M. Ciesielski, D. Altin, T. Kõuts, S. Pärt, M. Duchemin, K. Jørgensen & H. Hollert. Oil spill and response impacts on biota in cold climates – effect-based tools and ecological risk assessment. Abstract for SETAC Europe, Brussels May 2017.

X. Lekube, A. Ahvo, D. Altin, T.M. Ciesielski, E. Gil-Uriarte, U. Izagirre, K.S. Jørgensen, I. Marigómez, J. Nuutinen, M. Soto, R. Turja, K.K. Lehtonen. EU H2020 project GRACE: Experimental design for assessing the impact of oil and oil-dispersant exposure on Norwegian Sea and Baltic Sea mussels (*Mytilus* spp.) under "natural" conditions. Abstract for SETAC Europe, Brussels May 2017.

Real time in situ oil-spill monitoring using FerryBox system equipped with UV-fluorometer Siim Pärt*, Tarmo Kõuts, Kaimo Vahter, Abstract for Baltic Sea Science Congress, Warnemünde, June 2017.

The following scientific articles are planned at this stage:

Introduction article of GRACE in 2017 SPRINGER OPEN (Environmental Sciences Europe; Henner Hollert RWTH). The information should be kept on a general level per WP.

WP1

Development of on-line in situ methods for oil spill detection at open sea, review of WP1 results, Kõuts, Pärt, SmartBuoy team etc, peer review article

WP3

Monitoring of biological effects of oil spills and oil spill responses in the northern Atlantic and Baltic Sea. Review article to be based on the deliverable 3.1. 2017. Marigomez, Seiler, Lehtonen, et al. Suggested journal: *Environmental Reviews*

NTNU

Effect of crude oil water accommodated fraction on survival, physiological and oxidative stress biomarkers in the North Atlantic copepod *Calanus finmarchicus*. Suggested journal: *Aquatic Toxicology*.

Genotoxic effects of crude oil water accommodated fraction in in the North Atlantic copepod *Calanus finmarchicus*. Suggested journal: *Aquatic Toxicology*.

Effect of refined marine-oil pollution on survival, physiological and oxidative stress, and genotoxic biomarkers in the North Atlantic copepod *Calanus finmarchicus*. Suggested journal: *Chemosphere*.

Effect of marine diesel pollution on oxidative stress and genotoxic biomarkers in the North Atlantic copepod *Calanus finmarchicus*. Suggested journal: *Marine Pollution Bulletin*.

Effects of chemically dispersed crude oil on survival, physiological and oxidative stress, and genotoxic biomarkers in the North Atlantic copepod *Calanus finmarchicus*. Suggested journal: *Marine Pollution Bulletin*.

Using transcriptional responses to raw oil and dispersed oil in zebrafish embryos to aid biomarker discovery. Nüßer et al. Suggested journal: *Environmental Science and Technology*

Innate immune gene expression in zebrafish embryos after multistressor interactions of bacterial infection and PAH exposure. Johann et al. Suggested journal: *Molecular Immunology* or *Environmental Science and Pollution Research*

Mobile zebrafish behavior-triggered biosensor system for oil spill monitoring and detection directly in a flow-through system. Nüßer et al. Suggested journal: *Journal of Environmental Monitoring*. Article based on deliverable D 1.11

Effect-based assessment of biodegradation and remediation success after oil spill scenarios in a cold climate. Seiler et al. Suggested journal: *Science of the Total Environment*. Article based on deliverable D 2.4

Definition of an effect-based bioassay toolbox for high-throughput cost-effective investigation and fingerprinting of oil contamination and environmental risk assessment. Johann and Nüßer et al. Suggested journal: *Aquatic Toxicology*. Article based on deliverable D 3.9

Adverse outcome links during early development of zebrafish in response to crude oil and dispersant contamination. Johann et al. Suggested journal: *Environmental Toxicology and Chemistry*. Article based on deliverable D 3.12

Seasonal variability in biomarkers of pollution effects in mussels (*Mytilus trossulus*) in the Baltic Sea: a baseline study. Ahvo, Turja, Uriarte, Brenner, Lehtonen, et al. Suggested journal: *Marine Pollution Bulletin*

Biological effects of water-accommodated fractions of North Sea crude oil on mussels (*Mytilus trossulus*) from the Baltic Sea under different salinity and temperature conditions. Ahvo, Turja, Uriarte, Reunamo, Lehtonen, Jörgensen, et al. Suggested journal: *Aquatic Toxicology*

Biological effects of water-accommodated fractions of North Sea crude oil on the copepod *Limnocalanus macrurus* from the Baltic Sea. Turja, Lehtiniemi, Vuori, Kanerva, Ahvo, Lehtonen, et al. Suggested journal: *Chemosphere*

Effects of exposure to water-accommodated fractions of North Sea crude oil on the transcriptome of the mussel *Mytilus trossulus* from the Baltic Sea. Turja, et al. Suggested journal: *Environmental Pollution*

The following actions for special journal issues are planned:

Special issue on Grace research in *Environmental Science and Pollution Research* (with option for Open Access). Timetable: late 2017-early 2018 for submission of papers, then peer-review process. WP1 and microbiological tasks might be better suited in other journals, so not all WPs need to submit for the special issue. As an editor Henner Hollert/RWTH AACHEN to invite Grace consortium for a special issue in *ESPR*, if the General Assembly agrees to it in Spring 2017.

Participation in conferences

Participation in the following conferences is planned.

What conference?	Where?	When?	Partner attending
AGU	San Francisco, USA	December 2017	13/MICB
AMOP	Canada	June 2018	02/AU
AMOP 2018	Canada	Unknown	08/GOSR
Arctic Frontier	Tromsa, Norway	year 2017	09/LAMOR
Arctic Frontiers	Tromsoe, Norway	January 2018	02/AU
Arctic Oil Spill Conference 2018	Unknown	year 2018	08/GOSR
Arctic Technology Conference	Canada	Year 2018	12/NORUT
BSSC'2017	Warnemünde, Germany	June 2017	04/TUT
EGU 2018	Vienna, Austria	April 2018	13/MICB
EGU'2017	Vienna, Austria	April 2017	04/TUT
FEMS 2017	Valencia, Spain	June 2017	03/UTARTU
ICMBE 2017	Paris, France	May 2017	03/UTARTU
IEEE conference	not known	year 2018	04/TUT
INTERSPILL'2018	London, UK	March 2018	04/TUT
IOSC	Long Beach, USA	year 2017	09/LAMOR
ISME 2018	Leipzig, Germany	Year 2018	01/SYKE
ISME 2018	Leipzig, Germany	Year 2018	03/UTARTU
ISME 2018	Leipzig, Germany	Year 2018	12/NORUT
Norwegian. Env. Tox. Symposium	Svalbard, Norway	March 2018	07/NTNU
Norwegian. Env. Tox. Symposium	Possibly Bergen, Norway	Year 2020	07/NTNU
Oil spill conf.	unknown, outside Europe	unknown	04/TUT
Oil spill conf.	unknown, outside Europe	unknown	01/SYKE
Oil spill conf.	unknown, outside Europe	unknown	02/AU
Oil spill conf.	unknown, outside Europe	unknown	03/UTARTU
Oil spill conf.	unknown, outside Europe	unknown	10/MTOY
Ocean Business'2017	Southhampton, GB	April 2017	04/TUT
SETAC 2017	Brussels, Belgium	May 2017	04/TUT
SETAC 2017	BRUSSELS, Belgium	year 2017	06/UPV-EHU
SETAC 2018	Rome, Italy	May 2018	07/NTNU
SETAC 2018	Rome, Italy	May 2018	02/AU
SETAC 2018	Rome, Italy	May 2018	01/SYKE
SETAC 2019	Helsinki, Finland	year 2019	06/UPV-EHU
SETAC 2019	Helsinki, Finland	May 2018	07/NTNU
SETAC EU 2017	Brussels, Belgium	May 2017	05/RWTH
SETAC EU 2018	Rome, Italy	May 2018	05/RWTH
SETAC NA 2019	Toronto, Canada	Nov 2019	05/RWTH
SETAC-Europe 2016	Nantes, France	May 2016	13/MICB
SICTA 2017	MADRID, Spain	year 2017	06/UPV-EHU
SICTA 2019	MEXICO DF	year 2019	06/UPV-EHU

The SETAC EU 2019 has very recently been confirmed to be held in Helsinki Finland. We will suggest a special session on GRACE related topics at this conference. Kari Lehtonen from SYKE is in the organizing committee.

The Finnish Environmental Pollution Prevention Group headed by J. Rytönen is planning the Full Scale Arctic Exercise and a 2 day seminar in Finland to be held just prior the Interspill 2018 conference in London, or just after it, in order not to have the parallel event with Interspill. Idea is also to have overseas visitors for our event and they might have interest to stay in EU longer. The 2018 event would probably be scheduled for week 10 in 2018, and the site is Oulu or Kemi, Northern Baltic coast in Finland. This Full Scale Arctic event would be run on the basis of the Copenhagen agreement and MOSPA, the Oil Combating Agreement of the Arctic Nations under the Arctic Council (E.P.P.R is coordinating work). J. Rytönen is running the operational plan for this event with SAR demonstration and oil combating in ice conditions. Some of the GRACE specific items could possibly be taken on board to be used in that exercise. J. Rytönen could arrange room for 3..6. presentations making by GRACE people and related experts in the GRACE network at the symposium. Thus this event would be a good opportunity for GRACE to be highlighted with observers and overseas visitors.

Products and business plans to obtain the expected impact

The companies involved in the project are already strong players on the market and they have their own routes of promoting new products to their customers through existing contacts. Furthermore company web-pages, and participation in exhibitions in this field will enhance the way to the right market. The companies in GRACE already have some business plans for this market. In the GRACE project the Innovation Management Board is coordinating the status of innovation and planned new products.

"Product"	Time schedule	Partner in charge	Exploitation (commercial potential)
Oil detecting smart navigation buoy	By the end of 2016/2017	Meritaito	YES
Zebrafish behavior online biunit as a ferrybox	2019	RWTH	YES
Service to investigate oil impact in any laboratory breeding zebrafish (no need of endemic species)	2019	RWTH	YES
Biotest batteries (including SOPs etc.) for cost-effective high-throughput environmental assessment of oil contaminations	2019	RWTH	YES
Clean up of oil-contaminated shore areas and bottom sediments	2017	Lamor	YES

Horizontal rope mop under ice	2018	Lamor	YES
Test tank in Porvoo	2017	Lamor	YES
ROV nozzle, under ice brush unit	2018	Lamor	YES
Oil recovery bucket skimmer	2019	Lamor	YES
Strategic Net Environmental Benefit Analysis(sNEBA) tool report	2019	AU	To be public available
Oil in ice code	2017	SSPA	Limited
Matrix for operational requirements Selection matrix to define adequate response strategies in relation to prevailing ice and oil spill conditions	2018	SSPA	Limited direct commercial value.

Outreach to international working groups

As the GRACE project partners include the Finnish Environmental Pollution Response group, a direct contact to the public bodies working groups is ensured. Currently Ms. Heli Haapasaari from SYKE is the Chairman of the HELCOM RESPONSE group, and she is also the Finnish representative of the EMSA Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR) together with Mr Jani Häkkinen, who is also a member of the OPRC-HNS (Oil Pollution Preparedness, Response and Co-operation - hazardous and noxious substances) Technical Group under the IMO. This group is currently finalizing the update of the guidelines for the use of dispersants. The Finnish Environmental Pollution Response Group also has a representative in the HELCOM working group on aerial surveillance and European Maritime Safety Agency (EMSA) CleanSeaNet satellite service User Group. Mr. Markus Santasalo is the member of the Copenhagen agreement group, which is a Nordic collaboration group for all the Nordic Countries, including the non-EU states with activities in the Arctic such as Norway and Iceland. Furthermore an advisory board will be nominated to give advice to the project management. The advisory board will have members from both the public and the private sector.

So far the GRACE project has been presented shortly at the

- Copenhagen agreement (Nordic countries) Oct 2016
- HELCOM response meeting autumn 2016
- Arctic Council EPPR (Emergency, Preparedness, Prevention, Response) working group meeting Dec. 2016

These working groups will be informed on progress throughout the project.

Data management plan

The right for the results produced in the project and the rights to exploit the knowledge commercially will be settled in the consortium agreement between all the partners. The data produced in the project will be available to the project participants during the project. Data that can be directly published will be published in open access peer-reviewed international journal. Sequence data obtained in wp2 will be deposited to international databases with free access. Data from Greenland will be submitted to the environmental databases maintained by DCE for the Greenland authorities. During the project a joint digital space for the project results will be made available to all the project partners. Some results of the on-line monitoring e.g. from ferrybox data will be made available on the BOOS/EMODnet systems

Strategy for knowledge management and protection

Before publication of results from the project it must be checked that there is no conflict with e.g. patenting of certain application. This is set down in the consortium agreement, and the GRACE Innovation Management Board is assisting and facilitating this. By reserving money in the budget for publishing in open access international journals of high quality, open access-publishing can be ensured.

Other communication activities

The project has produced web pages www.grace-oil-project.eu at the start of the project. The web pages will be updated with news from the project and with some basic information for different target groups. Furthermore, a project brochure was printed at the beginning of the project. A big part of the communication will take part directly within the work packages. E.g. a PhD. course on the sNEBA will be developed in WP5. The members of the Finnish pollution response group, which are member of international groups will be invited to talk about the group's work to the research personnel in GRACE. Later on these members will be encouraged to inform about the GRACE activities in group meetings. Furthermore the project personnel will attend scientific meetings in their field throughout the project, and they will offer presentations on the results obtained. The coordinator or work package members will present the idea and results of the whole project at relevant conferences and exhibitions. Press releases will be produced at the beginning of the project and at the end, and in context of the field work in Greenland, or at other stages in the project if relevant and of interest to the public. Some university-based scientists from GRACE will aim to give public lectures at their home university, reporting in an easy comprehensible manner about the work and findings within the project, and seeking to better make aware of the problem of oil contamination in general and in particular in cold climates. Some partners will organise an open day to inform the public on-site about GRACE and allow people to experience hands-on research for fighting oil contaminants.

Planned and published press releases:

- Project assembled by SYKE granted EU funding for the development of Arctic oil spill response (SYKE 16.2.2016)
- Smart Buoy will bring real time measurement of oil in Arctic area conditions to oil spill response (SYKE 15.11.2016)

In situ burning work Summer 2017

Project final seminar Summer 2019