

Blue Baltic 2017- 2020

BONUS SEAMOUNT

New surveillance tools for remote sea monitoring and their application on SGD and seabed surveys



CONSORTIUM AGREEMENT

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Between:

- 1 EvoLogics GmbH, Germany – EVO (Project Coordinator)
- 2 NOA, Poland - NOA
- 3 Christian-Albrechts-University Kiel, Institute of Geosciences, Germany - CAU
- 4 Geological Survey of Denmark and Greenland, Denmark - GEUS
- 5 Leibniz Institute for Baltic Sea Research, Germany - IOW
- 6 Geologian tutkimuskeskus - Geological Survey of Finland, Finland - GTK
- 7 Maritime Institute in Gdansk, Poland - MIG

Hereafter, jointly or individually, referred "Parties" or "Party"

PREAMBLE

WHEREAS, The Parties enter into this Consortium Agreement with the purpose to jointly execute a research and development project entitled "New surveillance tools for remote sea monitoring and their application on SGD and seabed surveys" (Project acronym: BONUS SEAMOUNT), hereafter referred to as 'The Project' or 'SEAMOUNT', within the framework of the BONUS JOINT BALTIC SEA RESEARCH AND DEVELOPMENT PROGRAMME, co-financed by the European Union's Seventh Framework Programme (2007-2013).

WHEREAS, The Project Proposal submitted to the BONUS-Baltic Organisations' Network for Funding Science EEIG (hereafter referred to as "the BONUS EEIG") under the BONUS - Blue Baltic call2015-133 has been approved for funding, and the Parties have formally concluded a legal arrangement with a National Funding Institutions from their Participating State to provide the matched national contributions over the life time of the project.

NOW THEREFORE IT IS HEREBY AGREED AS FOLLOWS

The Consortium is established with the purpose of implementation of the project mentioned above. The project is subject to contract with the national funding institutions, to be signed by each Consortium member according to the funding conditions specific to his country of origin, and with the BONUS EEIG (according to the BONUS Grant Agreement).

This Consortium Agreement sets forth the rules for cooperation between the Parties towards a successful completion of the Project. In particular this Consortium Agreement sets forth the rules regarding:

- the implementation of the BONUS SEAMOUNT project
- the internal organisation of the Consortium including the decision making procedures;
- rules on dissemination and use, and access rights;
- the distribution of the financial contribution of the National Funding Institutions and BONUS EEIG in compliance with the BONUS Grant Agreement (Art II.6);
- the settlement of internal disputes, including cases of abuse of power;
- liability, indemnification and confidentiality arrangements between the Parties.

The Consortium Agreement includes the following Annexes:

- Annex I Description of work (DoW)
- Annex II Schedule of deliverables (SoD)
- Annex III Global project budget and financial breakdown
- Annex IV Form A - Accession of a new Party to the Consortium Agreement

ARTICLE 1 - DEFINITIONS

Words beginning with a capital letter shall have the meaning defined either herein or in the Rules or in the Grant Agreement including its Annexes.

Access Rights means non-exclusive licenses and user rights in respect of Foreground and Background, which rights shall not include the right to sublicense

Background shall have the meaning expressed in the terminology of this CA: "information which is held by Parties prior to their accession to the CA, as well as copyrights or other IPRs pertaining to such information, the application for which has been filed before their accession to the CA, and which is needed to carry out the Project or for using the Foreground".

Beneficiary means a legal entity within the consortium concerned with the BONUS Grant Agreement who may or not receive a financial contribution from the BONUS EEIG;

BONUS Grant Agreement means, after its signature by the Project Coordinator and the BONUS EEIG, the agreement, including its Annexes, concluded between the BONUS EEIG and the Parties for the undertaking by the Parties of the Project. Grant Agreement also means, as applicable, any Grant Agreement amendment.

Commercial means indirect or direct utilization for developing, creating and marketing a product or process, or for creating and providing a service.

Consortium means the collaborative research grouping in relation to the Project that is constituted by this CA.

Consortium Agreement or CA means this agreement.

Controlled Licence Terms means terms in any licence that require that the use, copying, modification and/or distribution of Software or another copyright work ("Work") and/or of any copyright work that is a modified version of or is a derivative work of such Work (in each case, "Derivative Work") be subject, in whole or in part, to one or more of the following:

(a) (where the Work or Derivative Work is Software) that the Source Code be made available as of right to any third party on request, whether royalty-free or not;

(b) that permission to create modified versions or derivative works of the Work or Derivative Work be granted to any third party;

(c) that a royalty-free licence relating to the Work or Derivative Work be granted to any third party.

For the avoidance of doubt, terms in any licence that merely permit (but do not require any of) these things are not Controlled Licence Terms.

Defaulting Party means a Party which the Project Management Board has identified to be in breach of this Consortium Agreement and/or the BONUS Grant Agreement as specified in Article 3.4. of this Consortium Agreement.

Dissemination means the disclosure of Foreground by any appropriate means other than that resulting from the formalities for protecting it, and including the publication of Foreground in any medium;

Effective Date means the start date of the Project as defined in the Grant Agreement, 1st of June 2017.

Experimental Development: The acquiring, combining, shaping and using of existing scientific, technological, business and other relevant knowledge and skills for the purpose of producing plans and arrangements or designs for new, altered or improved products, processes or services (including the creation of a commercially usable prototype or pilot projects under certain conditions);

European Grand Operator means BONUS EEIG

Fair and Reasonable Conditions means appropriate conditions including possible financial terms taking into account the specific circumstances of the request for access, for example the actual or potential value of

the Foreground or Background to which access is requested and/or the scope, duration or other characteristics of the use envisaged;

Force Majeure means any one or more events beyond the control of the relevant Party which occur after the date of signing of this CA, were not reasonably foreseeable at the time of signing of this CA, and the effects of which are not capable of being overcome without unreasonable expense and/or unreasonable loss of time to the Party concerned. Events of Force Majeure shall include (without limitation) war, civil unrest, acts of government, natural disasters, exceptional weather conditions, breakdown or general unavailability of transport facilities, accidents, fire, explosions, and general shortages of energy.

Foreground shall have the meaning expressed in the terminology of this CA: "the results, including information, whether or not they can be protected, which are generated under the Project. Such results include rights related to copyright; design rights; patent rights; or similar forms of protection".

Fundamental Research means experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any direct practical application or use in view;

Grant Operators – the entities to which the Proposal is submitted.

Held or held: references in this CA to Background or Sideground being "Held" or "held" by a Party mean that such party can legally grant, or require someone other than any of the other Parties to grant, Access Rights under and/or to such Background or Sideground without the consent of, and without being obliged to account to or make any payment to, any third party.

Industrial Research: Planned research or critical investigation aimed at the acquisition of new knowledge or skills for developing new products, processes or services or bringing about a significant improvement in existing products, processes or services;

Intellectual Property Rights or IPR means: patent, patent applications and other statutory rights in inventions; copyrights (including without limitation copyrights in Software); registered design rights, applications for registered design rights, unregistered design rights and other statutory rights in designs; and other similar or equivalent forms of statutory protection, wherever in the world arising or available; but excluding rights in Confidential Information or trade secrets.

Limited Source Code Access means

- (a) access to Object Code; or, where normal use of such Object Code requires an API, access to such Object Code and such API; or
- (b) if (a) is not available, access to Source Code, after approval of the Source Code's owner (the relevant Party).

National Funding Institution means an institution providing national contribution to the BONUS calls;

Needed means: For the implementation of the Project: Access Rights are Needed if, without the grant of such Access Rights, carrying out the tasks assigned to the recipient Party would be impossible, significantly delayed or require significant additional financial or human resources.

For Use the Foreground: Access Rights are Needed if, without the grant such Access Rights, the use of foreground would be technically or legally impossible

Object Code means Software in machine-readable compiled and/or executable form including, but not limited to, byte code form and in form of machine-readable libraries used for linking procedures and functions to other Software.

Participating States means the BONUS member states: Denmark, Germany, Estonia, Latvia, Lithuania, Poland, Finland and Sweden;

Party or Parties means a party or the parties identified as such in, and having signed, this CA.

Project means the project BONUS SEAMOUNT, presented in the Preamble to this CA.

Proposal means the proposal for the Project submitted or intended to be submitted (as the case may be) by the Parties to the Grant Operators. Proposal shall, as applicable, also mean any amendment to a Proposal submitted to the Grant Operator by or on behalf of all the Parties.

Research Organisation means a legal entity established as a non-profit organisation which carries out research or technological development as one of its main objectives;

Sideground means information other than Foreground developed or acquired by a Party after entering into the CA, as well as copyright or other IPRs pertaining to such information.

SME means Small and Medium sizes Enterprises defined as enterprises which employ fewer than 250 persons and whose annual turnover does not exceed EUR 50 million, or an annual balance sheet total not exceeding EUR 43 million.;

Software means a software program being sequences of instructions to carry out a process in, or convertible into, a form executable by a computer, and fixed in any tangible medium of expression.

Source Code means Software in human-readable form normally used to make modifications to it, including but not limited to comments and procedural code such as job control language and scripts to control compilation and installation.

Source Code Access means access to Source Code as Necessary for a Party for execution of its part of the Project or for a Party's Use of Foreground.

Subcontractor means any third party engaged by a Party to carry out any of that Party's tasks in relation to the Project.

Use means the direct or indirect utilisation of Foreground in further research activities other than those covered by the project, or for developing, creating and marketing a product or process, or for creating and providing a service.

Voting by means of electronic communication means that anyone allowed to cast a vote, can exercise this voting right by means of electronic communication when this is announced in accordance with this Agreement. In this respect it is required that the voter can be identified through the means of electronic communication, can observe the meetings discourse, can cast his vote by means of electronic communication and can participate in the discussion. If, in accordance with the above, it has been decided that those allowed to vote may cast their votes by means of electronic communication, votes cast preceding the meeting by means of electronic communication, yet no longer than fourteen [14] days before that meeting, shall be equated with votes cast at the time of the meeting.

ARTICLE 2 - IMPLEMENTATION OF THE BONUS SEAMOUNT PROJECT

2.1 BONUS SEAMOUNT project description

The BONUS SEAMOUNT project has two main objectives:

- To develop innovative remote sensing technologies for complex real-time sea survey, analysis and monitoring. These technologies integrate and optimize sensors in underwater vehicles of versatile character, adaptable to the objectives and characteristics of each mission. Vehicles will count with efficient bionic communication system for remote transmission of the collected data. This new technology will be efficient, of easy use and optimal for data acquisition. It will require minimum time effort and be easy to deploy and retrieve from the sea.
- To test and deploy this technology in a complex Baltic Sea survey project for the detection and monitoring of submarine groundwater discharges (SGD) and studying the seabed integrity. Simultaneous inspection of the seabed and the water column will be performed in order to obtain complex data, relevant for the understanding of the implications of the seabed morphology and geological characteristics on the occurrence of SGD. Most relevant detected SGD will be continuously monitored to determinate nutrient and pollutant fluxes, study their importance for the Baltic Sea nutrient balance and ecological status, and understand the influence of human activities. Integrated hydrological modeling will be done in coastal catchments. Collected data will be made available to the scientific population and policy makers for a better understanding of the Baltic Sea, and for maritime spatial planning.

The Project will be completed over a period of 36 months by 7 Parties from 4 BONUS Participating States:

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1. EvoLogics GmbH, Germany (EVO)
2. NOA, Poland (NOA)
3. Christian-Albrechts-University Kiel, Institute of Geosciences, Germany (CAU)
4. Geological Survey of Denmark and Greenland, Denmark (GEUS)
5. Leibniz Institute for Baltic Sea Research, Germany (IOW)
6. Geologian tutkimuskeskus - Geological Survey of Finland, Finland (GTK)
7. Maritime Institute in Gdansk, Poland (MIG)

The work plan comprises 7 work packages:

Work package No	Work package title	Type of activity	Lead Partner No	Lead Partner abbreviation	Start month	End month
WP1	System architecture and specifications	Industrial research	1	EVO	1	6
WP2	Mobile sensor platform development	Industrial research	1	EVO	1	19
WP3	Design, development and optimization of a squid drive system, integration on the ROV and testing	Industrial research	2	NOA	1	36
WP4	Autonomous Subsea Monitoring Network	Industrial research	1	EVO	13	25
WP5	Field surveys for the detection and quantification of SGD and associated solute fluxes	Fundamental research	3	CAU	4	36
WP6	Design and development of data management, dissemination and information platform	Dissemination	4	GEUS	1	36
WP7	Project coordination and dissemination	Dissemination	1	EVO	1	36

A detailed description of work (DoW) is given in Annex I.

In the course of the Project, the following milestones shall be achieved:

Milestone number	Milestone name	Work package(s) involved	Expected date	Means of verification
M1	Project kick-off	Project as a whole	month 1	Related work packages successfully launched RTD and management procedures set up and explained
M2	System specification	WP1	month 6	Application scenarios completed Technical documentation completed and accepted Network architecture designed and accepted
M3	Mobile sensor platform	WP2	month 13	Relevant sensors selected and successfully adjusted Basic carrier platform designed and prototyped
M4	Squid drive system	WP3	month 19	Squid drive system architecture and specification ready Drive system developed and tested in the lab settings
M5	Subsea monitoring network	WP4	month 25	Intelligent Subsea Network with integrated AUV designed, constructed and field-tested
M6	Field surveys	WP5	month 30	Meteoric waters from relevant areas sampled and analyzed Field surveys in Eckernforde Bay and in Horsens Fjord completed
M7	Data publication and technological release	Project as a whole	month 36	Project deliverables completed Technological components ready for release and scientific data completed and released

2.2 Project outcome

SEAMOUNT will accomplish a joint, interdisciplinary effort in order to elaborate appropriate tools to enable more efficient SGD studies with comprehensive data acquisition, and to validate those tools in a complex SGD study. The key **outcomes** of this work will be:

Innovative remote sensing technologies comprising:

- A set of sensors customized for complex SGD detection and monitoring
- Specialized underwater vehicles (SEAMOUNT-ROV and SEAMOUNT-AUV), containing SGD- and other sensors, cameras, side scan sonar and an innovative bionic underwater positioning and data transmission system, being in practical intelligent diving laboratories, highly adaptable to the mission characteristics. The AUV will also be one of the modules of the iSMN-A.
- A unique bionic drive system that allows the propulsion of the AUV on a gentle, energy-wise, non-invasive way that doesn't introduce turbulences and, hence, interfere on the measurements.
- A set of autonomous subsea monitoring stations for stationary long-term monitoring of SGD fluxes in selected coastal catchments. These stations can be used individually or collectively as modules of the iSMN-A.
- An intelligent Subsea Monitoring Network combining several autonomous bottom stations with an integrated AUV (iSMN-A) for complex observations and analysis in remote underwater environments, including short and long-term observations, with operation control from land via Radio or satellite link. It will be formed by a set of interacting modules.

Scientific results:

- Detection of SGD sites in Eckernforde Bay, Horsens Fjord, Gulf of Finland and the Gulf of Bothnia.
- Understanding of the implications of the seabed morphology and the seabed subsurface geological characteristics on the occurrence of SGD in the research areas.
- Understanding the origin of SGD located on Eckernforde Bay and Horsens Fjord through characterization of the meteoric waters in the catchment area.
- Hydrological modeling for estimating SGD in the Horsens Fjord estuary.
- A Web Based interactive Geoscience Information Platform

The complete schedule of deliverables (SoD) is given in Annex II.

Results will be disseminated to decision makers and to the scientific community through cross linking with similar ongoing and new projects of paired objectives through seminars and workshops, scientific publications, conferences and sharing measurement data on EDGI database.

2.3 Responsibilities and contribution of Parties

SEAMOUNT Project will be executed in a joint effort undertaken by the 7 Parties listed in Article 2.1.

2.3.1 General principles

Each Party undertakes to take part in the efficient implementation of the Project, and to cooperate, perform and fulfil, promptly and on time, all of its obligations under the Grant Agreement and this Consortium Agreement as may be reasonably required from it and in a manner of good faith as prescribed by Belgian law (European Court of Arbitration).

Each Party undertakes to notify promptly, in accordance with the governance structure of the Project, any significant information, fact, problem or delay likely to affect the Project.

Each Party shall promptly provide all information reasonably required by a Consortium Body or by the Coordinator to carry out its tasks.

Each Party shall take reasonable measures to ensure the accuracy of any information or materials it supplies to the other Parties. Any errors found must be reported immediately.

Each Party shall ensure that its work on the Project complies fully with all applicable local, government and international laws, regulations and guidelines which are effective during the period of this Consortium Agreement and the Grant Agreement, including those governing health and safety, data protection.

2.3.2 SEMOUNT specific contribution of Parties

All Parties will actively collaborate to determine the applications scenarios and boundary conditions and to compile the necessary specifications for the design of the SGD monitoring equipment.

CAU will lead the customisation of Radon sensors for mobile underwater applications and their evaluation, in subsequent field tests. EVO will assist with the hardware adaptation and experimental field work.

The two SME partners (EVO and NOA) will focus on Industrial Research and jointly conduct the Experimental Development of the remote sensing technology. EVO will be the main responsible for the design and testing of the whole underwater monitoring system, including sensor integration, design and manufacturing of the ROV and AUV carrier platforms, autonomous bottom stations and surface control units plus software development for the entire underwater navigation, communication and monitoring network system (iSMN-A setup). NOA will be main responsible for the design and development of the unique squid drive system module to be integrated in the SEAMOUNT ROV and AUV. The bidirectional know-how and technology transfer will result in mutual benefits related to the mutual exploitation of final results (foreground) as well as developing the approved concept further beyond the project.

The technology to be developed has been conceived to serve the research needs of the scientific partners. For this reason, scientific partners will actively participate in several steps of the design process and in the testing of the technology on the sea. Particularly IOW and MIG will assist with the technology development by providing expertise, consultancy as well as equipment and logistics, helping with evaluation, etc. Both institutions are interested in SGD studies and have a vital interest the forthcoming of the RTD as potential end-users.

The remaining scientific partners will also provide input, share practical experiences, evaluate drafts and developments, and they will apply the technology to perform periodic test-missions with pilot data collection, case studies completed with data processing and modeling to close the value chain. The SGD field surveys will be combined with complementary studies on the geological characteristics and seabed morphology in the relevant coastal catchments. Thus, the work of the scientific partners will be focused on comprehensive Fundamental Research, whereby CAU, GEUS, IOW, GTK and MIG will actively collaborate to make the scientific results available to the entire scientific community.

ARTICLE 3 - PROJECT MANAGEMENT

3.1 Project management structure; roles and responsibilities

The project management structure will include the following roles and responsibilities (whereby one person can fill more than one role):

Work Package Leader – a person keeping track of the activities and the timely progress of the work package, supervising and assisting the deliverable editors in the work package.

Partner Project Manager – appointed by each party to make sure that the partner best utilizes its resources to achieve committed results on the project within the available budget. He will monitor the effort and progress of own staff on a daily basis. The Partner Managers will also represent their organizations on the Project Management Board.

Project Coordinator - a project manager named by the coordinating organization (Rudolf Bannasch) and serving as the unique contact point for the Project with the BONUS EEIG. The Coordinator will also chair the Project Management Board and be responsible for the daily administrative running of the project. He will also be responsible for following up the work and progress in the work packages, and mitigating deviations from the project plans. He will appoint peer reviewers and approve the final deliverables.

Project Management Board (PMB)

The Project Management Board (PMB) will be the ultimate decision body of the consortium. It is responsible

for the overall management of the project. It consists of one delegate from each partner (Partner Project Managers), including the Project Coordinator. The delegates will be granted the necessary authority to make legally binding decisions. For efficiency reasons, the PMB will operate in a continuous way deliberating decisions in phone conferences and recording them in writing. PCB will be responsible for the overall management of the project including: ensuring the progress is maintained according to the plan, reviewing and approving deliverables and project risk assessment, providing strategic guidance related to IPR management, resolving disputes between participants not resolved at lower level and governing the Consortium Agreement.

Decision making

The Project Management Board chaired by the Project Coordinator will be responsible for making high-level project decisions. The Board members will meet personally at least once a year and hold video conferences every 3 months. They will also operate in a continuous way deliberating decisions in ad hoc phone conferences between the meetings.

After an issue has been raised, the PMB will have 14 working days to reach a decision and a quorum of 3/4 of the partners will be required for the decision to be valid. Voting by means of electronic communication will be possible.

The PMB will work on the consensus principle in the interest of all partners. In the unlikely event that consensus cannot be reached and a decision is necessary to ensure proper project progress, a simple majority vote may take place. In this case, each Party will have one vote, and in the case of a tie, the Project Coordinator's vote will be a casting vote.

3.2 Project communication and meetings

Formal communication channels will be established through a project web-based virtual collaboration space to ensure fluent transfer of information, results, data, dialogue or reports between the Parties. For efficient day-to-day information exchange, partners will use e-mail, written communications, reports and telephone conferences arranged according to need. PMB meetings will be held every 6 months and a kick-off meeting at the beginning of the project. These management meetings will be focused on taking strategic decisions and keeping managing boards informed about the overall project status. There will also be technical meetings held on a quarterly basis involving PMB and work package leaders. These are critical for day to day project monitoring and detailed planning. Technical meetings at the end of the reporting periods will be co-located with PMB meetings.

Communication within the consortium and with the BONUS EEIG

The Project Coordinator will be responsible for establishing effective interaction within the project and towards the Bonus EEIG. The actions that will be taken in this aspect are a part of WP 7 Project coordination and technical project management. The Project Coordinator will define and implement methodologies and tools facilitating the working collaboration between the partners. He will deploy, operate and maintain the web-based collaborative environment for internal communication and storing the project documentation.

The communication strategy will be based on day-to-day communication, regular status calls of the key partner teams and physical meetings of the consortium held every 6 months and chaired by the Project Coordinator. A typical agenda of the consortium meeting will include monitoring the progress of work under individual work packages, verification of milestones and preparing detailed work plan for the upcoming periods.

In day-to-day collaboration, face-to-face interaction, telephone, e-mails and Skype will be used in a way and with frequency decided by the team members involved in specific work packages and tasks.

The Project Coordinator will also act as the contact point between the project and the BONUS EEIG as well as the national funding bodies. He will be responsible for fulfilling any obligations set by the BONUS EEIG (including progress reports).

Communication with end users, stakeholders and general public

The main objectives of communication measures are:

- Explain to the general public what is the goal, expected results of SEAMOUNT and how the Baltic Sea region will benefit from the impacts achieved by the project
- Attract attention from the end users, i.e. marine researchers and explain them how SEAMOUNT can support the needs related to the effectiveness of the maritime research

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- Build the awareness about SEAMOUNT among the community gathered around marine environment, safety and security in the Baltic Sea
- Share and exchange knowledge among the BONUS projects

Communication with end users, stakeholders and general public will be a part of WP 7 Project coordination and technical project management. The work will include designing visual identity of the project; creating the presentation with basic information about the project scope and the partners as well as setting up a dedicated website with internal project work space and information videos describing the objectives and technical developments of SEAMOUNT.

Additionally, a social media coverage plan will be elaborated for the project lifetime and beyond and a seminar with other BONUS projects and observers from the European Commission representing units responsible for creating the policies related to the marine environment protection will be conducted in one of the SEAMOUNT countries.

The communication with end users and stakeholders undertaken in this WP is aimed to make the SEAMOUNT maritime data and technology reusable for the benefit of the whole Baltic Sea region, to lay the groundwork for larger survey programmes and future commercial exploitation, making sure the high usability of results and setting the rules for exploiting the results within and outside the consortium.

3.3. Subcontracting

Each Party is allowed to subcontract activities for which it is responsible provided that it is in line with the provisions of the legal arrangement with their National Funding Institutions, without prejudice to provisions on liability under this CA.

A Party that enters into a subcontract or otherwise involves third parties (including but not limited to Affiliated Entities) in the Project remains responsible for carrying out its relevant part of the Project and for such third party's compliance with the provisions of this Consortium Agreement and of the BONUS Grant Agreement. It has to ensure that the involvement of third parties does not affect the rights and obligations of the other Parties under this Consortium Agreement and the BONUS Grant Agreement.

3.4. Breach

In the event that the Project Management Board identifies a breach by a Party of its obligations under this Consortium Agreement or the Grant Agreement (e.g. improper implementation of the project), the Coordinator or, if the Coordinator is in breach of its obligations, the Party appointed by the Project Management Board, will give formal notice to such Party requiring that such breach will be remedied within 30 calendar days.

If such breach is substantial and is not remedied within that period or is not capable of remedy, the Project Management Board may decide to declare the Party to be a Defaulting Party and to decide on the consequences thereof which may include termination of its participation in this Consortium Agreement and, consequently, also in the BONUS Grant Agreement following the roles defined in § II.33.5. of the Model BONUS Grant agreement.

Unless otherwise agreed with the BONUS EEIG and the National Funding Institutions, all the tasks of the Party whose participation is terminated must be reallocated within the Consortium. Such rearrangement shall take into consideration the legitimate commitments taken prior to the decisions, which cannot be cancelled.

3.5. Accession of a new Party

Requests for the addition of a new Party shall include a complete Form A (Annex IV), duly signed by such new entry, and need to be approved by the Project Management Board, the National Funding Institution and BONUS EEIG. Such additional entity shall assume the rights and obligations of Parties as established by the Consortium Agreement with effect from the date of its accession specified in the signed Form A.

ARTICLE 4 - FINANCIAL ISSUES

The project is co-financed by the National Funding Institutions and the BONUS EEIG. The financial contribution from the BONUS EEIG is a contribution from the European Union research budget with the aim to implement the 7th Research Framework Programme (FP7).

4.1. Global budget of the BONUS project and the planned expenditure for each beneficiary

See Annex III

4.2. National Funding

Any financial reporting and management resulting from obligations under contract signed by each Party with a National Funding Institution shall be a sole responsibility of each Party concerned. Neither Party is liable for any financial problems or difficulties encountered by another Party at national level, including delays, insolvencies; cost claims rejections or any other, unless these are directly caused by this another Party.

4.3. Funding from BONUS EEIG

According to Part A, Section 1, § II.2 of the Model BONUS Grant Agreement, the financial contribution of the BONUS EEIG to the project shall be paid to the Coordinator who receives it on behalf of the Beneficiaries entitled to receive a financial contribution. The payment of the financial contribution of the BONUS EEIG to the Coordinator discharges the BONUS EEIG from its obligation on payments to the Beneficiaries.

4.3.1. Obligations of the Coordinator

The Coordinator shall:

- a) administer the financial contribution of the BONUS EEIG regarding its allocation between Beneficiaries entitled to receive a financial contribution, in accordance with the BONUS Grant Agreement. The Coordinator shall ensure that all the appropriate payments are made to the Beneficiaries without unjustified delay;
- b) keep the records and financial accounts making it possible to determine at any time what portion of the financial contribution of the BONUS EEIG has been paid to each Beneficiary for the purposes of the project;
- c) hold all payments received from the BONUS EEIG within an interest-bearing Euro account exclusively for handling the project. These funds shall not be disbursed for use within the project until the conditions defined in point d) have been met. Any interest accrued in the account of the Coordinator shall be assigned to the project within the ceiling of the amount of the total BONUS EEIG contribution;
- d) disburse the funds received from the BONUS EEIG to a Beneficiary for use within the project (including by the Coordinator) on the cumulative fulfillment of the conditions defined in the Model BONUS Grant Agreement, whereby
 - The amount released towards a Beneficiary (including the Coordinator) in a Participating State does not exceed the proportion of the BONUS EEIG and national contributions laid down in Article 5 of the BONUS Grant Agreement.
 - The national cash contribution is proven (via copies of bank statements) to have been paid by the National Funding Institutions or via the BONUS EEIG to the Beneficiary concerned. National cash contributions that have been made in currencies other than Euros shall be calculated in Euros on the basis of the exchange rate published by the European Central Bank on the date the national contribution was received by the Beneficiary.
- e) provide the BONUS EEIG with reasonable assurance on the correctness of the distribution of funding to the Beneficiaries;
- f) inform the BONUS EEIG of the distribution of the financial contribution of the BONUS EEIG and the date of transfers to the Beneficiaries, when required by this Grant Agreement or by the BONUS EEIG;
- g) review the reports to verify consistency with the project tasks before transmitting them to the BONUS EEIG;
- h) monitor the compliance by Beneficiaries with their obligations under this Grant Agreement; The Coordinator shall notify immediately the BONUS EEIG on any case of non-compliance.

The Coordinator is not allowed to subcontract the above-mentioned tasks.

4.3.2. Obligations of the Beneficiaries

Beneficiaries shall fulfill the following obligations as a Consortium:

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- a) provide all detailed data requested by the National Funding Institution and BONUS EEIG for the purposes of the proper administration of this project;
- b) carry out the project jointly and severally vis-à-vis the BONUS EEIG and taking all necessary and reasonable measures to ensure that the project is carried out in accordance with the terms and conditions of the Grant Agreement;
- c) make appropriate internal arrangements consistent with the provisions of the BONUS Grant Agreement and the Consortium Agreement to ensure the efficient implementation of the project.
- d) engage, whenever appropriate, with actors beyond the research community and with the public in order to foster dialogue and debate on the research agenda, on research results and on related scientific issues with policy makers and civil society; create synergies with education at all levels and conduct activities promoting the socioeconomic impact of the research;
- e) allow the representatives of the BONUS EEIG and/or National Funding Institutions to take part in meetings concerning the project.

ARTICLE 5 - INTELLECTUAL PROPERTY RIGHTS

5.1. Ownership of Background

Each Party is and shall remain owner of its Background used for the performance of the Project. No other rights than the Access Rights set forth in Article 5.2 are granted under the Background.

5.2. Access Rights

The Background and the Sideground will continue being a property of respective Parties and only they will be able to be used by the other part in the area of the Project, in the terms foreseen in this CA.

5.2.1 General principles relating to Access Rights

5.2.1.1 All Access Rights needed for the execution of the Project and for Use are granted on a non-exclusive basis and are worldwide.

5.2.1.2 No transfer costs shall be charged for the granting of Access Rights.

5.2.1.3 Any Access Rights granted expressly exclude any rights to sublicense unless expressly stated otherwise.

5.2.1.4 Acting in good faith, when a Party believes that for carrying out the Project or Use of Foreground from the Project:

- (a) it might require Access Rights to another Party's Background, or
 - (b) another Party might need Access Rights to that Party's Background,
- it will promptly notify such other Party of the Background Needed. Failure so to notify another Party shall not be a breach of this CA unless such failure is due to an action in bad faith. Access Rights request shall be made in writing and the Party requiring such Access Rights must show that they are needed.

5.2.1.5 Each Party shall implement its tasks and shall bear sole responsibility for ensuring that its acts within the Project do not infringe third party property rights.

5.2.1.6 Parties shall inform the Project Coordinator and the Project Management Board as soon as possible of any limitation to the granting of Access Rights to Background or of any other restriction which might substantially affect the granting of Access Rights.

5.2.1.7 Foreground and Background shall be used only for the purposes for which Access Rights to it have been granted.

5.2.1.8 The obligation to grant and the right to receive Access Rights other than those deemed granted under this CA, unless terminated earlier or agreed otherwise by the Parties, expires 2 years after the end of the Project. However, in the case of earlier termination the provisions of Section 9.2 shall apply.

5.2.2 Access Rights Needed for the execution of the Project

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Access Rights to Foreground, Background and Sideground needed for the execution of the Project are hereby requested and shall be deemed granted, as of the date of the CA entering into force, on a royalty-free basis to and by all Parties.

5.2.3 Access Rights for Use

Access Rights to Foreground needed for Use of a Party's own Foreground, shall be granted under the following conditions, on fair, reasonable and non commercial research activities on a royalty- free basis Access Rights to Background and Sideground Needed for the Use of own Foreground shall be granted on fair and reasonable and no discriminatory conditions. Any granting of Access Rights for Use shall be subject to the following:

- (a) The Party requiring the granting of such Access Rights (the Requesting Party) shall make a written request to the Party (the Granting Party) from which it requires the Access Rights.
- (b) The written request shall identify the Foreground concerned and shall provide reasons why Access Rights to such Background and/or Sideground are needed for the Use of such Foreground.
- (c) Any Access Rights shall only be granted upon the signature of a written agreement between the Granting Party and the Receiving Party and shall not be deemed granted.
- (d) Any Access Rights granted shall be limited to those strictly needed for the Use of the relevant Foreground as such.

5.2.4 Special provisions concerning Access Rights to Software

5.2.4.1 General principles

- (a) All of the provisions in this CA concerning Access Rights apply to Software that is Background, Sideground or Foreground as they apply to any other Background, Sideground or Foreground, but in the case of inconsistency this Section 5.2.4 shall prevail.
- (b) Access Rights to Software do not include any right to require creation and delivery of Object Code or Source Code ported to any particular hardware platform or any right to require Software documentation in any particular form or detail, but only as the item is available from the Party granting the Access Rights. Transfer costs shall only be charged in exceptional circumstances.
- (c) Save as expressly provided in this Section 5.2.4, no Party shall be obliged to grant Access Rights to Source Code.

All Access Rights to Software that is Foreground, whether for execution of the Project or for Use, shall be in the form of Limited Source Code Access.

All Access Rights to Software that is Background, whether for execution of the Project or for Use, shall be in the form of Limited Source Code Access, save that no Party shall be obliged to grant for Use any Access Rights to Source Code that is Background.

All Access Rights to Software that is Sideground, whether for execution of the Project or for Use, shall be in the form of Limited Source Code Access, save that no Party shall be obliged to grant for Use any Access Rights to Source Code that is Sideground.

5.2.4.2 Software licence and sublicensing rights

- (a) Access Rights to Object Code and/or an API Needed for Use of Foreground shall, unless the granting and receiving Parties agree in writing to the contrary, comprise the worldwide right:
 - (i) to use them in research, to use them to create/market any product/process, and to use them to create/provide any service;
 - (ii) to distribute, make available, market, sell and offer for sale (including by using the services of a third party) such Object Code and/or API alone or as part of or in connection with any products or services of the Party having the Access Rights;
 - (iii) to grant to each end-user customer buying/using such products/services a perpetual, irrevocable, worldwide licence:

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- to use such Object Code and/or API alone or as part of or in connection with any products/services of the Party having the Access Rights;
- to use such Object Code and/or API to maintain such products/services;

(iv) in the course of and for the purpose of exercising the rights described in (i) to (iii) above, to make and have made an unlimited number of copies of such Object Code and/or API.

Nothing in this Section 5.2.4.2 shall entitle any Party not to comply with Section 5.2.4.1 and if there is any inconsistency between such Section and this Section then such Section shall prevail.

(b) Where a Party has access to Source Code for Use of Foreground, Access Rights to such Source Code shall, unless the granting and receiving Parties agree in writing to the contrary, comprise a worldwide right to copy, use and modify such Source Code as required to support the exercise of the Access Rights granted to such Party in respect of corresponding Object Code, but, unless the granting and receiving Parties agree in writing to the contrary, such Party shall not sublicense such Source Code or make it available to any third party in whole or in part.

(c) Each sublicense granted according to the provisions of this Section 5.2.4.2 shall if practical be made by a traceable agreement specifying and protecting the proprietary rights of the Party granting the Access Rights.

5.2.5 Have made rights

Access Rights for Use include the right of "indirect utilisation" as such term is defined in this CA.

5.2.6 Access Rights for Parties joining and leaving the Project

5.2.6.1 For each Party in respect of whom this CA is terminated in accordance with the provisions of Section 9.2, the following will apply:

(a) Except in cases where the participation of a Defaulting Party is terminated, the Access Rights granted and the obligations to grant Access Rights pursuant to the this CA shall continue in full force and effect, provided that the Access Rights shall only be granted with respect to Foreground, Sideground and Background existing at the time of such termination.

(b) Defaulting Parties are obliged to continue to grant Access Rights pursuant to this CA in respect of Foreground, Sideground and Background existing at the time of such termination, but the Access Rights granted to the Defaulting Party pursuant to this CA shall cease immediately upon termination of this CA.

5.2.6.2 Termination of this CA in respect of, and/or cessation of licences granted to, the Defaulting Party in accordance with Sections 5.2.6.1 and/or 9.2 shall not terminate any sublicense properly granted or agreed to be granted or offered by the Defaulting Party in accordance with Section 5.2.6.1 or prior to the date on which such termination of this CA and/or cessation of licences becomes effective, [provided that any Party which owns the Foreground or Background so sublicensed shall have the right to have an assignment of the Defaulting Party's rights under such sublicenses].

5.3. Ownership of Foreground

5.3.1 Ownership of Foreground: general principle

Foreground shall be owned by the Party who carried out the work generating the Foreground, or on whose behalf such work was carried out.

Jointly generated Foreground

If, in the course of carrying out work on the Project, Foreground is generated and 2 or more Parties (the "**Contributors**") contributed to it, and if the contributions to or features of such Foreground form an indivisible part thereof, such that under applicable law it is not possible to separate them for the purpose of applying for, obtaining and/or maintaining and/or owning the relevant patent protection or any other IPR protecting or available to protect such Foreground, the Contributors agree that all patents and other registered IPRs issued thereon, and any other IPRs protecting such Foreground, shall be jointly owned by the Contributors.

The Contributors may jointly apply for the relevant patent or other property rights. The arrangements for

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applying for and maintaining such patent or other property rights shall be agreed between the Parties (contributors) concerned on a case-by-case basis.

(a) Each Contributor shall have the perpetual and irrevocable right, without territorial or other restriction, to Use the joint Foreground and resulting patents, patent applications and other IPRs protecting such Foreground on a royalty-free basis, and to grant non-exclusive licenses with the right to grant sublicenses under the jointly owned Foreground and under any IPRs protecting such Foreground, without obtaining any consent from, subject to the following conditions:

- at least 45 days prior notice must be given to the other co-ownership(s); and
- fair and reasonable financial compensation must be provided to the other co ownership(s)

(b) Within a reasonable period following creation of any jointly owned Foreground, the Contributors shall enter into good faith discussions in order to agree on an appropriate course of action for filing applications for patent protection or other protection, including the decision as to which Contributor is to be entrusted with the preparation, filing and prosecution of such applications and in which countries or territories such applications are to be filed. Except for any priority applications, the filing of any applications for patents or other IPRs on joint Foreground shall require mutual agreement between the Contributors (but excluding any Contributors who choose pursuant to paragraph (d) below not to contribute to the cost of such application). All external costs related to applications for patent protection or other protection resulting from such applications and the fees for maintaining such protection shall be shared equally between the Contributors, subject to paragraph (d) below.

(c) If and when a Contributor decides not to contribute, or not to continue its contribution, as the case may be, to the costs of application for or maintenance of patent or other IPR protection for the jointly owned Foreground, for one or more countries or territories, it shall be entitled not to contribute, or to discontinue its contribution, provided however that:

- (i) it shall promptly notify the other Contributor(s) in writing of its decision;
- (ii) it shall forthwith relinquish all its title to and interest in such jointly owned patents, patent applications or other registered IPRs protecting such Foreground for the countries or territories concerned to the other owner(s) who contribute or continue their contribution, as the case may be, to such costs in accordance with paragraph (c) above; and
- (iii) it shall lose its rights under paragraph (a) above with respect to such jointly owned patents, patent applications or other registered IPRs for the countries or territories concerned as of the moment of notification, but subject, however, to the retention of a non-transferable, non-exclusive, royalty-free and fully paid-up licence, without the right to grant sublicences, for the lifetime of such jointly owned patents, patent applications or other registered IPRs for the countries or territories concerned in favour of, and for the Use by, the relinquishing Contributor.

(d) Each of joint owners of patents or patent applications or other IPRs protecting such jointly owned Foreground shall have the right to bring an action for infringement of any such jointly owned IPRs only with the consent of the other owner(s). Such consent may only be withheld by another co-ownership who demonstrates that the proposed infringement action would be prejudicial to its commercial interests.

5.3.2 Assigning ownership of Foreground

Each Party may assign ownership of its own Foreground (including without limitation its share in Foreground that it owns jointly with another Party or Parties, and all rights and obligations attaching to it) to any assignee of the assignor's relevant business or a substantial part thereof and in case of jointly owned Foreground, and subject to confidential or other legal obligations, with 45 days prior notice to the other parties (contributors) concerned

The assignor warrants that such assignment does not prejudice the Access Rights of the other Parties to such Foreground Information.

However:

- (a) any such assignment shall be made subject to the Access Rights, the rights to obtain Access Rights and the right to disseminate Foreground that are granted to the other Parties as in this CA. Therefore, each assignor shall ensure that such assignment does not prejudice such rights of the other Parties

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- This may be done, for example, (i) by effecting such assignment subject to a license back to the assigning Party that is sufficient for the assigning Party to grant to the other Parties such Access Rights, or (ii) by the assigning Party obtaining from the assignee of the Foreground legally binding undertakings (that can be enforced by the other Parties and their Affiliates) to grant such Access Rights; and
- (b) the assignor shall pass on its obligations regarding the assigned Foreground to the assignee, including the obligation to pass them on to any subsequent assignee

5.3.3 Employees' rights

In addition to the obligations pursuant to this CA, each Party shall, to the fullest extent it can lawfully do so, ensure that it can grant Access Rights and fulfil the obligations under this CA notwithstanding any rights of its employees or Subcontractors in the Foreground or Sideground they create.

ARTICLE 6 - CONFIDENTIALITY

All information in whatever form or mode of transmission, which is disclosed by a Party (the "Disclosing Party") to any other Party (the "Recipient") in connection with the Project during its implementation and which has been explicitly marked as "confidential", or when disclosed orally, has been identified as confidential at the time of disclosure and has been confirmed and designated in writing within 15 days at the latest as confidential information by the Disclosing Party, is "Confidential Information".

The Recipients hereby undertake, for a period of 5 years after the end of the Project:

- ✓ not to use Confidential Information other than for the purpose for which it was disclosed;
- ✓ not to disclose Confidential Information to any third party without the prior written consent by the Disclosing Party;
- ✓ to ensure that internal distribution of Confidential Information by a Recipient shall take place on a strict need-to-know basis; and
- ✓ to return to the Disclosing Party on demand all Confidential Information which has been supplied to or acquired by the Recipients including all copies thereof and to delete all information stored in a machine readable form. If needed for the recording of ongoing obligations, the Recipients may however request to keep a copy for archival purposes only; and
- ✓ neither to copy Confidential Information, nor reproduce nor duplicate in whole or in part where such copying, reproduction or duplication have not been specifically authorised in writing by the Disclosing Party.

The Recipients shall be responsible for the fulfilment of the above obligations on the part of their employees and shall ensure that their employees remain so obliged, as far as legally possible, during and after the end of the Project and/or after the termination of employment.

The above shall not apply for disclosure or use of Confidential Information, if and in so far as the Recipient can show that:

- ✓ the Confidential Information becomes publicly available by means other than a breach of the Recipient's confidentiality obligations;
- ✓ the Disclosing Party subsequently informs the Recipient that the Confidential Information is no longer confidential;
- ✓ the Confidential Information is communicated to the Recipient without any obligation of confidence by a third party who is in lawful possession thereof and under no obligation of confidence to the Disclosing Party;
- ✓ the Confidential Information, at any time, was developed by the Recipient completely independently of any such disclosure by the Disclosing Party; or the Confidential Information was already known to the Recipient prior to disclosure.

The Recipient shall apply the same degree of care with regard to the Confidential Information disclosed within the scope of the Project as with its own confidential and/or proprietary information, but in no case less than reasonable care. The Contractors shall impose the same obligations on their Affiliates and subcontractors.

Each Party shall promptly advise the other Party in writing of any unauthorised disclosure, misappropriation

or misuse by any person of Confidential Information as soon as practicable after it becomes aware of such unauthorised disclosure, misappropriation or misuse.

If any Party becomes aware that it will be required, or is likely to be required, to disclose Confidential Information in order to comply with applicable laws or regulations or with a court or administrative order, it shall, to the extent it is lawfully able to do so, prior to any such disclosure notify the Disclosing Party, and comply with the Disclosing Party's reasonable instructions to protect the confidentiality of the information.

ARTICLE 7 – DISSEMINATION

7.1. Dissemination of own Results

7.1.1. During the Project and for a period of 1 year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article II.28. of the Model BONUS Grant Agreement subject to the following provisions:

Prior notice of any planned publication shall be given to the other Parties at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the Coordinator and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

7.1.2. An objection is justified if

- (a) the publication contains Confidential Information belonging to the objecting Party or the protection of the objecting Party's Results or Background would be adversely affected
- (b) the objecting Party's legitimate academic or commercial interests in relation to the Results or Background would be significantly harmed.

The objection has to include a precise request for necessary modifications.

7.1.3. If an objection has been raised the involved Parties shall discuss how to overcome the justified grounds for the objection on a timely basis (for example by amendment to the planned publication and/or by protecting information before publication) and the objecting Party shall not unreasonably continue the opposition if appropriate measures are taken following the discussion.

The objecting Party can request a publication delay of not more than 90 calendar days from the time it raises such an objection. After 90 calendar days the publication is permitted, provided that Confidential Information of the objecting Party has been removed from the Publication as indicated by the objecting Party. This shall not apply to such Results or Background mentioned in Article 5 of this Consortium Agreement.

7.2. Dissemination of another Party's unpublished Results or Background, Confidential Information or unpublished Results.

A Party shall not include in any dissemination activity Background or Confidential Information of another Party, nor shall a Party publish Results solely generated by another Party without obtaining the owning Party's prior written approval, unless they are already published. For the avoidance of doubt, the mere absence of an objection according to 7.1.2 is not considered as an approval of the owning Party.

7.3. Cooperation obligations

The Parties undertake to cooperate to allow the timely submission, examination, publication and defence of any dissertation or thesis for a degree which includes their Results or Background subject to the confidentiality and publication provisions agreed in this Consortium Agreement.

7.4. Use of names, logos or trademarks

Nothing in this Consortium Agreement shall be construed as conferring rights to use in advertising, publicity or otherwise the name of the Parties or any of their logos or trademarks without their prior written approval.

7.5. Commercial Exploitation of Results

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The SME parties shall carry out a joint commercial exploitation of the results, in accordance with the terms and provisions they agree on with a minimum duration of 5 years.

The commercial agreement shall entitle each co-owner to exclusively exploit the Project's result in his market of origin. In return, the other co-owners shall receive a compensation for marketing the product to be determined by a percentage profit basis.

The parties agree to carry out a non-exclusive exploitation in other markets, concurring therein in free competition. In return, the other co-owners shall receive a compensation for marketing the product to be determined by a percentage profit basis.

Each Party can individually commercially exploit the results of the project that are subject of the Foreground owned by this Party.

7.5. Exclusive licenses

Where a Party wishes to grant an exclusive licence to its Results and seeks the written waiver of the other Parties pursuant to Model BONUS Grant Agreement, Article II.28, the other Parties shall respond to the requesting Party within 45 calendar days of the request. Any Party's failure to respond (whether in the negative or the positive) to the request within such 45 calendar days shall be deemed to constitute written approval of the waiver by the non-responding Party.

ARTICLE 8 - LIABILITY

8.1 Liability

8.1.1 Liability towards each other

In respect of information or materials supplied by one Party to another under this CA, the supplying Party shall be under no obligation or liability (other than as expressly stated in this CA), and no warranty condition or representation of any kind is made by, given by or to be implied against the supplying Party as to the sufficiency, accuracy or fitness for purpose of such information or materials, or, subject to the obligations expressly stated in this CA, the absence of any infringement of any proprietary right (including, without limitation, IPRs, trade secret rights and right over confidential information) of third parties by the use of such information and materials, and the recipient Party shall in any case bear the entire risk of any consequences that may arise from the use to which it, or to which any person that it directly or indirectly permits or allows to use such information or materials, puts such information and materials.

No Party shall have any liability in respect of the infringement of any patent or other right of any third party resulting from any other Party (or any of its Affiliates) exercising any of the Access Rights granted under this CA.

No Party makes any representation or warranty, express or implied, other than as expressly stated in this CA.

8.1.2 Liability towards third parties

Subject to such other undertakings and warranties as are provided for in this CA, each Party shall be solely liable for any loss, damage or injury to third parties resulting from the carrying out by it or on its behalf of its parts of the Project and/or from its Use of Foreground and/or Background.

8.1.3 Liability for Subcontractors

8.1.3.1 Each Party shall be fully liable for the performance of any part of its share of the Project, in respect of which it enters into any contract with a Subcontractor.

8.1.3.2 Each Party engaging any Subcontractor shall be solely responsible for all obligations incurred in relation to that Subcontractor. The other Parties shall have no obligation whatsoever to any such Subcontractor, save to the extent that they separately agree any such obligation in writing.

8.2 Claims between the Parties

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The following provisions of this Section 8.2, excluding and limiting liability, shall apply not only to the Parties, but also to those of their Affiliates which properly participate as Subcontractors in the Project, each of which is an intended beneficiary of this Section 8.2.

8.2.1 Liability: general

Subject to the following provisions of this Section 8.2, the general provisions of Belgium law governing liability (including both contractual and non-contractual liability) shall apply to any claim between the Parties for loss or damage caused by a Party, its employees, agents and Subcontractors and arising in connection with the Project.

8.2.2 Excluded liabilities

To the extent permissible under applicable law and except as provided specifically below in this Section 8.2, in no event shall any Party be liable in connection with this CA for any of the following, however caused or arising, on any theory of liability, and even if such Party was informed or aware of the possibility thereof:

- (a) loss of profits, revenue, income, interest, savings, shelf-space, production and business opportunities;
- (b) lost contracts, goodwill, and anticipated savings;
- (c) loss of or damage to reputation or to data;
- (d) costs of recall of products; or
- (e) any type of indirect, incidental, punitive, special or consequential loss or damage.

8.2.3 Financial limit on liability

8.2.3.1 Subject to the provisions of Sections 8.2.4 below, the aggregate liability of each Party under the provisions of Section 8.2.1 to all of the other Parties collectively in respect of any and all such claims shall not exceed the greater of:

- (a) once that Party's Project Share,

8.2.3.2 The financial limitation of liability specified in Section 8.2.3.1 shall be doubled in the case of any breach by a Party of its obligations under:

- (a) Article 6 (Confidentiality), or
- (b) Section 5.3.2 (Assigning ownership of Foreground).

8.2.4 Exceptions

The exclusions and limitations stated in Sections 8.2.2 and 8.2.3 above shall not apply in respect of any:

- (a) fraud;
- (b) death, injury to natural persons or damage to real or immovable property caused by the gross negligence or wilful act of such Party, its directors, employees, agents and Subcontractors; or
- (c) wilful breach by a Party of any obligation accepted under this CA.

8.3 Force Majeure

Notwithstanding any provision on Force Majeure, no failure in the performance of this CA can be imputed or assumed to a Party, to the extent that such failure is due to Force Majeure.

Each affected Party will notify the other Parties in writing of any event of Force Majeure as soon as possible. The Parties shall discuss in good faith the possibilities of a transfer of tasks affected by the event. Such discussions shall commence as soon as reasonably possible. If such Force Majeure event is not overcome within 12 weeks after such notification, the transfer of tasks – if any - shall be decided by the Project Management Board.

ARTICLE 9 – FINAL CLAUSES

9.1. Entry into force

An entity becomes a Party to this Consortium Agreement upon signature of this Consortium Agreement by a duly authorised representative.

This Consortium Agreement shall come into force on 1st June 2017 and shall continue in full force and effect until complete discharge of all obligations for the carrying out of the Project undertaken by the Parties under this Consortium Agreement.

An entity becomes a Party to the Consortium Agreement upon signature of the accession document (Annex IV) by the new Party and the Coordinator and confirmed by the National Funding Institution and the BONUS EEIG in accordance with Article II.33 of the Grant BONUS Agreement. Such accession shall have effect from the date identified in the accession document.

9.2. Termination

This Consortium Agreement or the participation of one or more Parties to it may be terminated in accordance with the terms of this Consortium Agreement.

If the Grant Agreement

- is not signed by the National Funding Institution or BONUS EEIG or a Party, or
- is terminated,

or if a Party's participation in the Grant Agreement is terminated,

this Consortium Agreement shall automatically terminate in respect of the affected Party/ies, subject to the provisions surviving the expiration or termination under Section 3.3 of this Consortium Agreement.

9.3. Survival of rights and obligations

The provisions relating to Access Rights and Confidentiality, for the time period mentioned therein, as well as for Liability, Applicable law and Settlement of disputes shall survive the expiration or termination of this Consortium Agreement.

Termination shall not affect any rights or obligations of a Party leaving the Consortium incurred prior to the date of termination, unless otherwise agreed between the Scientific Board and the leaving Party. This includes the obligation to provide all input, deliverables and documents for the period of its participation.

The provision of IPR, confidentiality, publication, liability, no partnership, termination, governing law and competent court shall survive the expiration or termination of this CA to the extent needed to enable the Parties to pursue the remedies and benefits provided for in those Clauses

For the avoidance of doubt, termination or withdrawal shall not affect any right or obligation incurred prior to the date of the termination or withdrawal, unless otherwise provided in this CA

9.4 No partnership, or agency or implied license; enforcement of IPR

9.4.1. No partnership or agency

Nothing in this CA shall create a legal entity, partnership or agency between the Parties or any of them.

9.4.2 No implied licence

Except as explicitly granted in this CA, no licence, immunity, or other right is granted or assigned under this CA, either directly or indirectly, by implication, to any Party with respect to any IPR of the other Parties.

9.4.3 Enforcement of Intellectual Property Rights

No Party shall have any obligation under this CA to institute any action or suit against any third party for infringement of any IPR to which it has granted a licence hereunder, or to defend any action or suit brought by any third party which challenges or concerns the validity of any such IPR. In addition, no Party to which any other Party has granted such an IPR licence under this CA shall have any right to institute any action or suit against third parties for infringement of any such IPR.

9.4.4 Assignment of employees

Unless specifically agreed in writing, no provision in this CA will limit any of the Parties' rights to assign and/or re-assign, in any way they may choose, those of their employees who participate in the Project.

9.4.5 Assignment of rights and obligations

Except as provided under this CA, no Party shall, without the prior written consent of the other Parties, assign or transfer partially or totally any of its rights and obligations under this CA. Such consent shall not be unreasonably conditioned, withheld or delayed when such assignment or transfer is in favour of another Party or one of the other Parties. Any Party may require reasonable conditions for giving such consent to prevent such transfer from adversely affecting its Access Rights

9.5 Entire agreement. Amendment. Severability

This CA constitutes the entire agreement between the Parties in respect of the Project, and supersede all previous negotiations, commitments and writings concerning the Project, including any prior memorandum of understanding or letter of intent between the Parties (whether or not with others) which relate to the Project Amendments or changes to this CA shall be valid only if made in writing and signed by an authorised representative of each of the Parties.

If one or more of the provisions contained in this CA or any documents executed in connection herewith are found by a competent court or authority to be invalid, illegal, or unenforceable in any respect under any applicable law, including competition law, the validity, legality, and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired, provided that in such case the Parties oblige themselves to use all commercially reasonable efforts to achieve the purpose of the invalid provision by a new legally valid

9.6 Language

This Consortium Agreement is drawn up in English, which language shall govern all documents, notices, meetings and processes relative thereto.

9.7 Governing law and competent court

The Parties shall try to resolve amicably any dispute between the Parties with respect to the interpretation or execution of any provision of this CA. In this sense the Parties shall meet as often as they deem necessary during a period of 60 days (or any other period agreed the parties). The parties shall discuss the problem and negotiate in good faith in an effort to resolve the dispute without the necessity of any formal proceeding. All disputes or differences arising in connection with this Consortium Agreement which cannot be settled amicably shall be finally settled by arbitration in Brussels under the rules of arbitration of the European Court of Arbitration by three arbitrators, or such lower number of arbitrators as the Parties concerned may agree upon in writing, to be appointed under the terms of those rules. In any arbitration in which there are three arbitrators, the chairperson shall be of juridical education. The arbitration shall be conducted in English. The award of the arbitration will be final and binding upon the Parties concerned. The loser in the conflict will pay the cost of the process and the costs caused to the Consortium.

Disputes related to the infringement and /or validity of IPR shall be finally settled by the competent Courts and /or patent and trademarks offices. This will also apply in the event that the national law of the party prevents it to submit the relevant dispute to arbitration procedures.

9.8 Signatures

EvoLogics GmbH, Germany – EVO (Project Coordinator)

date

[authorised signature]

9.8 Signatures

NOA, Poland - NOA

date

[authorised signature]

9.8 Signatures

Christian-Albrechts-University Kiel, Institute of Geosciences, Germany – CAU

date

[authorised signature]

9.8 Signatures

Geological Survey of Denmark and Greenland, Denmark – GEUS

date

[authorised signature]

9.8 Signatures

Leibniz Institute for Baltic Sea Research, Germany – IOW

date

[authorised signature]

9.8 Signatures

Geologian tutkimuskeskus - Geological Survey of Finland, Finland – GTK

date

[authorised signature]

9.8 Signatures

Maritime Institute in Gdansk, Poland – MIG

date

[authorised signature]

List of work packages

Work package No	Work package title	Type of activity	Lead Applicant No	Lead applicant abbreviation	Start month	End month
WP1	System architecture and specifications	Industrial research	1	EvoLogics	1	6
WP2	Mobile sensor platform development	Industrial research	1	EvoLogics	1	19
WP3	Design, development and optimization of a squid drive system, integration on the ROV and testing	Industrial research	2	NOA	1	36
WP4	Autonomous Subsea Monitoring Network	Industrial research	1	EvoLogics	13	25
WP5	Field surveys for the detection and quantification of SGD and associated solute fluxes	Fundamental research	3	CAU	12	36
WP6	Design and development of data management, dissemination and information platform	Dissemination	4	GEUS	1	36
WP7	Project coordination and dissemination	Dissemination	1	EvoLogics	1	36

Detailed description of work

Work package number	1	Start month (or starting event):					Month 1
Work package title	System architecture and specification						
Activity type	RTD						
Applicant number	1	2	3	4	5	6	7
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG
Person months per applicant:	2,1	2	3,75	1,5	1,5	1	1,5

Objectives: the objective of this work package is to compile the necessary specifications and use cases for the design the iSMN-A (intelligent Subsea Monitoring Network with integrated AUV) system. The work will be a collective effort of all consortium partners.

Description of workTask 1.1 Application scenarios and boundary conditions

The objective of this task is: to jointly review the existing knowledge and practical experiences from previous SGD studies, to evaluate the data and measurement procedures from different scientific and technical prospects: usability and efficiency of data acquisition (including also difficulties, time and costs), completeness, significance and quality of the results, identification of possible improvements, common interests and further needs, discuss new technical approaches including preliminary SWOT analysis from various viewpoints as well as to describe, discuss and compare the individual application scenarios and specific boundary conditions involved.

Under this task, a public workshop will also be organized with the participation of relevant experts from science, industry and public authorities. EvoLogics, leader of this task, will perform the technical

analysis of practical experiences obtained from previous SGD studies, help to identify possible improvements and to specify the needs and desires in terms of engineering, provide, explain and discuss innovative ideas and concepts, conduct preliminary SWOT analysis with the project partners (experts from different fields of science), discuss the intended application scenarios and compile a catalogue of the technical requirements and boundary conditions and generate a matrix out of it to identify common aspects and individual peculiarities, to scrutinize essentials and “nice to have” features – to be agreed with all partners. Thereafter the document will serve as the guideline for subsequent technology developments. NOA will provide and discuss innovative ideas and concepts, bringing value to the discussion of mechanical part of the project. CAU, GEUS, GTK and MIG will prepare the literature review Eckernförde Bay, Horsens Bay, the Gulf of Bothnia, Gulf of Finland and Gulf of Gdansk and define survey areas. IOW will be responsible for defining requirements on survey area, endurance, payload power; describing application scenarios for the different phases and end product; stating boundary conditions such as hydrographic conditions and max. depths.

Task 1.2 Sensor configurations, operation requirements and measurement procedures

The objective of this task is: to prepare the specification of the required sensor types and sensor configurations needed for search and monitoring of SGD occurrence and related environmental parameters, clarification of individual operation requirements and complex measurement procedures; to prepare the technical specification relevant for system integration including size, weight (dry/wet), voltage, energy consumption, type of interface and data rate at the output; to identify, discuss and specify the special customization requirements for special sensors e.g. re-design of Radon sensors for mobile applications on Tow fish, ROV, AUV etc.; to determine the data formats, capacities for pre-processing, data compression, storage and transmission procedures, system requirements for integration and synchronization with additional sensors (depth, altimeter, gyro etc.) and the hydroacoustic positioning system; to estimate overall energy consumption and processing requirements.

CAU will be responsible for defining the requirements for radon sensors and will advise in adaptation of radon sensors to in situ use. GEUS will contribute its expertise by advising on data formats for EGD development planned in WP6. IOW will define the requirements for payload logging, vehicle handling on launch and recovery. GTK will handle the identification of sensors relevant for SGD.

MIG will define the requirements for vehicle handling on launch and recovery system and payload logging.

Task 1.3 Draft elaboration: system architecture (carrier and support systems)

The objective of this task is: to elaborate the network architecture with stationary nodes, mobile platform and surface control station including communication and navigation schemes; to draft the individual architecture of the subsystems: construction scheme - mechanical design with the physical arrangement of the sensors and other components, power supply and electrical connection diagram with interfaces, in- and outputs, and system architecture of the network software; to discuss and implement additional desires and/or changes and jointly refine the respective work plans, deliverables, exchange procedures and time plans.

EvoLogics will be the leader of this task, responsible for drafting the network configuration and component design, mechanical construction, electrical block diagrams and software architecture for components and network.

NOA will contribute by providing and discussing innovative ideas and concepts, bringing value to the discussion of mechanical part of the project. IOW and MIG will contribute their expertise by offering advice on the system architecture.

Work package number	2	Start month (or starting event):	Month 1
Work package title	Mobile sensor platform development		
Activity type	RTD		

Applicant number	1	2	3	4	5	6	7
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG
Person months per applicant:	45	10	7	0	9	0,5	1

Objectives: the objective of this work package is to prototype the AUV that will be used as a mobile diving laboratory, and that will be afterwards interlinked with the whole iSMN-A for autonomy and data transmission. The design of this vehicle will be done in sequential stages, being the result of each one an unmanned underwater vehicle that will constitute an upgrading of the previous version with improved features, but without missing its previous features.

Description of work

Task 2.1 Sensor optimization and adaptation to be used in mobile vehicles The objective of this task is to acquire the selected sensors, optimize their performance and adjust the measurement protocols in order to adapt them to be used in an AUV. EvoLogics will provide technical assistance to the task leader (CAU), and check possibilities for sensor miniaturisation and software optimisation. IOW and GTK will handle the selection of CTD/multiparameter sonde, nutrient sensor, testing under lab conditions and optimizing measurement protocols to be used in an AUV. CAU will be a leader of this task, responsible for optimisation of the radon sensor for the AUV/ROV application. This requires adaption of the radon monitor and its components for the specific requirements of the AUV/ROV. This adapted system will be tested in the laboratory.

Task 2.2 Cable-operated measurement platform: SEAMOUNT Towfish / ROV design

During this task mechanics design and prototyping of the basic carrier platform, with a ROV configuration and usability, will be done. The work to be accomplished will include the elaboration of the basic carrier hull, the preparation and optimization of the different modules that will give allow the desired behaviour and characteristics, the design of the software support system and the integration of all of the elements on a previous model platform with towfish characteristics. Towfish will be mechanically improved until a ROV is delivered. The towfish will have the following features: hydrodynamic control surfaces; Electronics design with CPU, Interfaces, datalogger, actuators, motor controllers, batteries and power-management system, on-board sensors (AHRS, altimeter and depth sensor, plus acoustic S2C transponder) and variable sensors: sidescan sonar, UW-video camera, multiparameter probe (CTD, turbidity, PH, oxygen, Chlorophyll and/or others), Radon sensor. The Support System will include surface control center with USBL / LBL transceiver, cables, connectors and cable management system, Software design, programming, testing & optimization.

After operational tests and adjustments of the given platform further work will concentrate on the improvement of its mechanical properties, to make it self-propelled and remotely 3D steerable via cable. This will include the design, and integration of thrusters and motor controllers, power system; programming and implementation of the control functions.

ROV and surface station (GUI), will be tested in the lab for operational performance and optimization. EvoLogics will design of the sensor platform - jointly with NOA, IOW and other partners, construction and manufacturing, hard- and software integration with power supply, host processor, sensors and propulsion system, design and construction of surface control station (ship based) with umbilical to subsea platform and acoustic positioning via USBL transceiver, and to make that all operational. NOA role will be: Taking a part of mechanical design process (hull design, power system package itc, mass distribution) - NOA will make small design activities. IOW role will be: Input on integration of sensors and data logging, Input on the architecture of payload software, development of modules for the data processing of CTD/multiparameter and nutrient sensors. CAO role will be: testing radon sensors in ROV/AUV in seawater; quality assurance and quality control of radon data.

Task 2.3 Autonomous measurement platform: SEAMOUNT AUV design

The objective of this task is to perform further developments to the ROV platform qualification to achieve autonomy. The work undertaken on this task will be focused on:

- Implementation of new functionalities and subsystems for autonomous navigation and communication: autopilot, DVL, INS, USBL/LBL transceiver/modem, GPS + WLAN and front-looking sonar for obstacle avoidance;
- Development and implementation of algorithms for intelligent utilization of the new sensor function and autonomous measurement procedures: data management pre-processing, storage and transmission;
- Development and implementation of AUV control functions in the surface station (GUI), laboratory and field tests as well as development of manoeuvres (intelligent sensor control), software development for complex mission planning and mission control.

NOA will offer its assistance on the design of different parts, most relevant of which are the docking station and the system mechanical integration. IOW will offer its input on modification of integration of sensors and data logging, modification of payload software, modification of modules for the data processing of CTD/multiparameter and nutrient sensors as well as modification of mechanical and hydro-physical fitting of sensors.

Task 2.4 Field test and prototype optimization

Field testing will be done in order to determinate mobile platform and sensor performance, and to gather information for subsequent tuning and optimization of the equipment installed in the measurement platform. Two field testing have been designed, one at the end for task T.2.2 and the second one at the end of task T.2.3. For field testing ships will be provided for IOW for testing on the German coast. Scientific partners implicated in optimization of sensors and field surveys will participate. Field testing of the ROV will include 5 day sea incursions on selected locations in which the existence of SGD has been suspected or confirmed. During sea incursions, scientific partners will collect data, verify its validity and identify possible system malfunctions. Simultaneously, data on sea column and seabed monitoring will be collected for further analysis.

Dates for the field testing:

1st measurement platform field testing with the ROV and data collection: 12th month – duration: several days

2nd measurement platform field testing with the AUV and data collection: 16th month – duration: several days.

NOA will be responsible for testing of the squid propulsion system performance in field conditions. CAU will participate in the sea incursions, testing of the performance of the radon sensors in field conditions and handling the adjustments and tuning of the sensory systems if needed. CAU will also be responsible for collecting the data regarding chemical composition of the detected/selected SGD. IOW will provide the technical support including ship time (3 days Elisabeth Mann Borgese each for ROV and AUV testing) and will handle testing the performance of CTD/multiparameter probe, nutrient sensor and CH₄ sensors. It will also handle the analysis of sensor data/performance. MIG will be responsible for testing the performance of AUV and collecting data for further analysis. MIG will provide DP1 vessel IMOR for ROV and AUV tests make by IOW and NOA.

Work package number	3	Start month (or starting event):					Month 1	
Work package title	Design, development and optimization of a squid drive system, integration on the ROV and testing							
Activity type	RTD							
Applicant number	1	2	3	4	5	6	7	
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG	
Person months per applicant:	1,2	102	3,75	0	0	0	1,3	

Objectives: the objective of this work package is to design, develop, optimize, integrate and test in the field the innovative squid drive system. This system function imitates the movement of cephalopodes in the sea and allows gentle propulsion of the AUV with an optimum energy consumption and payload. Its particular characteristics include also the minimal introduction of noise and turbulences on the surroundings of the vehicle, what is paramount for field measurements that require minimum disturbances of the sea conditions. These include turbulence analysis, and analysis of certain parameters in a certain point.

Description of work

Task 3.1 Squid drive system architecture and specification

At this task NOA will participate in setting the project boundary conditions impacting NOA squid drive system to be designed during the project. Partners will settle together the boundary parameters and the way the drive should work and be designed in terms of its mechanical and physical properties required by the SEAMOUNT AUV application such as wave propellers dimensions, thrust forces required and vehicle's desired operating speed and manoeuvrability. These settlements will impact the whole design process. At this stage all of the collaborative consortium's work plans will be arranged and settled. EvoLogics will bring technical support and consultancy.

Task 3.2 Drive system development and lab tests

This task is dedicated to designing and lab testing a single wave propeller along with its retraction mechanism. Our preliminary studies suggest that the best propeller configuration for improved manoeuvrability and performance in terms of changing the vehicle axis in 3D space is the usage of 3 independently controlled propellers placed around the AUV hull in a symmetric triangle configuration. At this task a single wave propeller will be designed and tested along with the electrical motors and power transfer and distribution mechanism. The materials experiments will be held to meet the requirements of AUV operation (for instance required depth the AUV should go and operate on). Also the experiments will concentrate on designing the optimal propeller geometry meaning: amplitudes, overall width and length of the propeller and amplitude propagation inside the propeller waveform to achieve the best possible energy consumption to thrust ratio in terms of boundary conditions settled under task 1.1 (such as desired speed of the vessel etc.). Under this task, a ROV's "dummy" hull will be created for making simultaneous work in EVO and NOA possible. The dummy hull will have the same shape and mass distribution as the hull developed in Berlin at EvoLogics. This approach will provide NOA with comfort that developed mechanisms will fit in the host vehicle in a proper way. In this task NOA will put effort in designing and modelling of the propeller's retraction/folding mechanism which is planned to be further used pull all three the propellers inside the AUV hull when squid drive usage will not be necessary. Further, propeller performance pool test will be carried including thrust measurements and propeller design optimization along with folding/retracting mechanism optimization and propeller unit integration. EvoLogics will bring technical support and consultancy.

Task 3.3 NOA drive system integration with a cabled ROV hull

Under this task NOA will be focused on designing and generating the set of propellers and retraction mechanism for the propellers placed in the dummy hull in a symmetric "triangle" configuration. Also under this task design and generation of the power system will take place. The dummy hull will be equipped with functional buoyancy system for making the manoeuvrings tests carried in the test pool. The control functions are planned to be designed and furthermore tested and optimized in the pool to achieve desired manoeuvrability of the dummy vehicle using independently operated set of squid wave propellers. Control patterns are to be designed and tested. Subsequently it is planned to perform the field test of the cabled dummy vehicle in marine conditions together with MIG (overall field test costs are to be taken by MIG). Fields tests will serve also as a source of knowledge and know-how to be utilized in the following task. MIG will support EvoLogics during sea trial. EvoLogics will bring technical support and consultancy.

Task 3.4 NOA drive development for ROV AUV

Under this task NOA will be focused on prototyping and integrating the propulsion mechanism into the target AUV hull (it is to be settled if this process will take place in EvoLogics facility in Berlin or the AUV will be delivered to NOA facility). It is planned that tech partners will come up with this decision during the design process at the beginning of this Task. At present, it is assumed that the AUV will be delivered to NOA facility. After the successful squid drive integration with fully functional vehicle - field tests are to be taken (final pool tests and next the final approving test in the Baltic sea). Sea tests are to be carried in Poland together with EvoLogics and MIG onboard MIG vessel. The tests will consist of two phases: Under phase 1 the cabled version of vehicle will be tested at full depth and after the successful trial phase 2 will be realized on which the AUV version will be introduced to the water and perform a full-scale test missions comprising of long dives. The scenarios of test missions will be developed together with partners MIG and EvoLogics at the beginning of this Task. Once the test missions in Poland are successfully completed, the fully functional AUV vessel with squid drive will be available to scientific partners to perform long term test missions. MIG will contribute with a vessel and mechatronic group during the sea tests. EvoLogics will bring technical support and consultancy.

Task 3.5 Field testing

Field testing will be done in two moments of the project development. Firstly at the end of T.3.3, for the assessment of the performance of the drive system on the dummy vehicle. The second field testing will be done at the end of the developmental phase (T.4.4.) for performance with the whole prototype.

Work package number	4	Start month (or starting event):					Month 13	
Work package title	Autonomous Subsea Monitoring Network							
Activity type	RTD							
Applicant number	1	2	3	4	5	6	7	
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG	
Person months per applicant:	34,57	7	0,75	0	4	0	0,75	

Objectives: during this work package, it will be designed the autonomous subsea monitoring network and all of its components. This network will ensure autonomous work and communication between each one of the measurement modules and be responsible for data transmission to the land.

Description of workTask 4.1 Intelligent Subsea Monitoring Network with integrated AUV (iSMN-A)

The objective of this task is: to design and construct 4 autonomous bottom stations with integrated multi-parameter probes, datalogger, LBL modem and acoustic releaser; to develop and implement algorithms for synchronized monitoring and communication networking with collaborative localisation, intelligent network co-operation with AUV, autonomous operations with advanced data telemetry and LBL/USBL navigation, ship-based mission planning and remote control: 3D scans based on geo-coordinates + depth; to perform field tests and test-mission with scientific partners. IOW will cooperate with EvoLogics by being responsible for purchasing and adapting sensor suites (modems, CTD/multiparameter probe, depth sensor, UV nitrate sensor) for deployment on the bottom station.

Task 4.2 Autonomous long-term deployable iSMN-A

The objective of this task is: to further enhance the system to facilitate long-term applications without permanent ship presence however remotely controllable from land: construction of a

surface buoy with LBL/USBL modem + Radio link, D-GPS, AHRS and of an UW docking station with power reservoir for wireless AUV recharging and high-speed data transmission at short distance (further via DSL and cable to Buoy), UW lights and video camera for visual control, implementation of corresponding docking mechanism, power and data transfer modules at AUV, training of autonomous docking manoeuvres under variable conditions. EvoLogics will be leader of this task. NOA will contribute to design and development planned in this task (docking station, power and data transfer modules). IOW will assist in development of protocols and adaptation of instruments.

Task 4.3 Field testing with scientific partners

The complete iSMN-A experimental setup will be deployed at the sea and tested for performance and identification of needs for improvement.

Work package number	5	Start month (or starting event):					Month 12	
Work package title	Field surveys for the detection and quantification of SGD and associated solute fluxes							
Activity type	RTD							
Applicant number	1	2	3	4	5	6	7	
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG	
Person months per applicant:	0	0	53	18	2	22,5	0,5	

Objectives: the objective of this work package is to collect all the necessary data on land and sea (provided by the new technologies) to quantify possible SGD fluxes and associated solute fluxes in the Eckernförde Bay and Horsens Fjord, and to determine the influence between seabed morphology, geology and SGD.

Description of work

Task 5.1 Sampling of meteoric waters in the catchment areas of the Eckernförde Bay and Horsens Fjord

The objective of this task is to characterize the meteoric waters in the catchment areas by analyzing their chemical composition. This characterization will enable to identify the origin of SGD waters and mixing pathways of meteoric with seawater. The water samples will be obtained from wells and push-point piezometers located in the vicinity of the Eckernförde Bay and Horsens Fjord. The water samples will be analysed for conductivity, temperature, radon, nutrients, stable isotopes, major anions, tritium/helium (selected samples). CAU will lead this task with support from GEUS in completing the field survey and preparing the data report.

Task 5.2 AUV/ROV field surveys in Eckernförde Bay and in Horsens Fjord

The objective of this task is the preparation of the SGD field surveys, the deployment and re-collecting of ROV/AUV, and supervision of the ROV/AUV surveys in the Eckernförde Bay and Horsens Fjord. In the Eckernförde Bay SGD has already been located. In Horsens Fjord hydrological modelling suggests the occurrence of SGD. The field surveys are necessary to collect sensor data that will be assessed in Task 5.3. They will be performed by CAU with support from GEUS.

Task 5.3 Evaluation of ROV/AUV sensor data in combination with terrestrial water parameters

The first objective of this task is to evaluate the sensor data obtained during the field surveys. Based on concentration gradients of parameters (radon, salinity, temperature, nitrate) possible SGD locations will be identified. The second objective is to assess the parameters of both, terrestrial and marine waters, in order to locate the source water of SGD as well as to quantify SGD and associated nutrient loads. Quantification of SGD will be based on radon mass balance model. The results will be

compared to those obtained by hydrological modelling (T.5.4). Data will be analysed by CAU and IOW.

Task 5.4 Hydrological modelling

The objective of this task is: to estimate SGD by hydrological modelling of the catchment to Horsens estuary. During SEAMOUNT we will compare the model estimates with the ROV/AUV/Radon SGD measurements and assess the validity and uncertainties of both types of estimates. To do so it is expected to modify and adapt a model for the catchment to the Horsens Fjord estuary improved by e.g. the results from the high resolution seismic surveys conducted in task 5.6 that have been developed and applied recently by GEUS in studies of nutrient loads to the Horsens Fjord estuary (Hinsby et al., 2012). The GEUS Department of Hydrology is a Task leader, responsible for the on-shore field work in the catchments to the Horsens and Eckernförde bay as well as coordination meetings on AUV surveys.

Task 5.5 Installation of 4 permanent monitoring stations at three SGD sites (Eckernförde Bay, Horsens Fjord, Finland) for monitoring temporal variations of SGD (parameters: salinity, temperature, nitrate).

The objective of this task is to establish 4 permanent seabed monitoring stations at 3 selected SGD sites for continuous monitoring of variations of the quantity and quality of the SGD at fixed locations primarily with focus on seasonal variations in temperature, Ra?, nitrate and salinity and the estimation of total annual and seasonal nitrogen loadings to the investigated coastal waters. The task will be carried out by the partners collaboratively. CAU will be responsible for selecting a permanent monitoring station at Eckernförde Bay based on literature data; organizing deployment and re-collection of monitoring system as well as assessing and evaluating the sensor data. GTK will handle the deployment and retrieval of a monitoring station at a SGD hot spot in Finland. IOW will be responsible for the retrieval and analysis of sensor data (multi-parameter and nitrate UV).

Task 5.6 High-resolution seismic surveys of the seabed subsurface, geological structures and location of potential SGD hot spots in the Horsen Fjord estuary

The objective of this task is to acquire geological seabed information by using multibeam echosounder, side scan sonar and high-resolution 2D seismic tools, to demonstrate the relevance of understanding how the seabed morphology and the seabed subsurface geological characteristics influence the occurrence of SGD in the Horsens Fjord estuary. We will apply 2D seismic surveys as a tool for investigating how SGD sites are linked to the subsurface geology and associated to the aquifers below the seafloor. Likewise, the mapping of seabed morphological structures will demonstrate how SGD sites can be traced from high-resolution acoustic data. During the SEAMOUNT project, GEUS will explore the potential in using a 3D seismic system based on a low-energy source (sparker), which has not yet been applied for such a purpose. The outcome of the study is geological models presented as (pseudo)-3D models of the subsurface geology showing where the potential aquifers are present and by relating structural features demonstrating potential links between the aquifer and SGD sites at the seabed. Furthermore, by a high-resolution characterization and mapping of the seabed morphology and seabed structures GEUS will demonstrate how the presence of SGD sites might be expressed at the seabed.

This activity is relevant for the understanding of the implications of the seabed morphology and the subsurface geological characteristics on the occurrence of SGD in the Horsens Fjord estuary and by that feed into the modification of the hydrological model developed for the catchment of the estuary.

Task 5.7 High-resolution seismic surveys of the seabed subsurface, geological structures and location of potential SGD hot spots in the Gulf of Bothnia and the Gulf of Finland

The objective of this task is to characterize the subsurface geological structure of SGD hot spots in the Gulf of Finland and the Gulf of Bothnia for hydrodynamic modeling (T5.8) and detailed AUV surveys (T5.9). A 5-day cruise will take place during the first and second project years. The high-

resolution seismic surveys will be run along predetermined transect lines, permitting full multibeam seafloor coverage, using novel, low-to-high frequency, single and multibeam equipment onboard the research vessel Geomari of GTK (Massa TR-61A 3.5–8 kHz chirp subbottom profiler, Meridata 28 kHz pinger sub-bottom profiler, 200 kHz Atlas Fansweep 20 multibeam sonar, 100 and 500 kHz Klein 3000 sidescan sonar, ELMA 250–1300 Hz reflection seismic profiler). The survey data will be ground-truthed by sediment coring and underwater video, and by CTD casts for the water column temperature and salinity. The survey data will be processed and visualised by Medidata post-processing software. SGD will be confirmed by collecting water samples. The sediment samples will be classified visually and analysed for water and organic contents. The water samples will be analysed for $\delta^{18}\text{O}$ and $\delta^2\text{H}$ isotope ratios by laser-based cavity ring-down spectroscopy (CRDS), using a Picarro isotopic water analyser at the GTK Research Laboratory to confirm the groundwater origin. The task will be led by GTK.

Task 5.8 Hydrological modeling of aquifers connected to SGD hot spots in the Gulf of Bothnia and Gulf of Finland

The objective of this task is to estimate SGD at the sites selected in T5.7 by hydrological modeling of the coastal aquifers. The model estimates will help validating and expanding the results of the AUV surveys (T5.9). The task will be led by GTK.

Task 5.9 AUV surveys in the Gulf of Bothnia and Gulf of Finland

The objective of this task is the preparation of the field surveys, deployment and re-collecting of AUV and supervision of the AUV surveys in selected SGD hot spots (T5.7) in the Gulf of Bothnia and the Gulf of Finland. The task will be led by GTK. IOW will be responsible for the data analysis of CTD/multiparameter and nitrate sensors.

Work package number	6	Start month (or starting event):					Month 1	
Work package title	Design and development of data management, dissemination and information platform							
Activity type	OTHER							
Applicant number	1	2	3	4	5	6	7	
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG	
Person months per applicant:	0	0	2	8	0	0	0,5	

Objectives: the objective of this packaged is to create a data storage for data collected during the project. This data storage is to be used during the project as a shared data repository and for data analysis and as a mean to make data publicly available both during and after the project.

Description of work

Task 6.1 Data collection, storage and securing

The objective of this task is

- to establish a data model to hold the data collected during the project
- to define exchange formats to allow the collected data to be uploaded into the database make data available for other

To ensure that data will be available after the project the database work will be coordinated with the EGDI Portal project. To ensure an easy import of data all data producing partners must be involved in defining which data to collect, describe the data, adding metadata and agree on a common exchange format for the project. To ensure an effective user interface the partners must take part in description of use cases to describe the user interface.

Task 6.2 INSPIRE compliant database and Geoscience Information Platform

The objective of this task is to develop data handling, visualisation and sustained database for offshore geoscientific data for decision and policy support. Data will be made available through a web GIS interface from where the user can browse, select, view details and download data. As some of the data are scientific data only metadata will be available for these until the data are released. This interface will be integrated into the EGDI Portal and data can be displayed on other platforms like the EMODnet. The data collecting partners must add metadata for their data sets. GEUS will develop a web map interface to display data and a set of WMS/WFS services. This will be based on the EGDI infrastructure. Other partners will participate in defining the use cases the platform must satisfy.

Work package number	7	Start month (or starting event):					Month 1	
Work package title	Project coordination and dissemination							
Activity type	OTHER							
Applicant number	1	2	3	4	5	6	7	
Applicant abbreviation	EvoLogics	NOA	CAU	GEUS	IOW	GTK	MIG	
Person months per applicant:	7,5	3	2	6	2	2	2	

Objectives: the objective of this work-package is to monitor project progress, control project budget, coordinate collaborative work, manage risks, manage IPRs, manage strategic business issues at the partnership level, report results. Methodologies for this WP are presented in 2.3 and 2.5.

Description of work

Task 7.1 Project coordination and technical project management

This task involves administrative management incl. fulfilment of the obligations towards BONUS Secretariat; facilitation of information interchange amongst partners and the BONUS Secretariat, incl. preparation and submission of project reports; tracking overall project progress, costs and compliance with the contracts with national funding bodies; maintaining the Consortium Agreement; project strategic management. Furthermore, it involves coordination of activities oriented at technical progress monitoring, assessment, the interchange of technical information amongst partners, the generation and submission of deliverables, risk assessment and management. Under this task a web-based collaborative environment with access control will be set up for code repository and version control, document sharing & archiving, email voice and video communication, etc. Under this task working meetings will be scheduled, organised and minuted. PMC responsibilities will be addressed here (operational management, risk management, contingency plans and activities, low-level dispute solving).

Task 7.2 Quality assurance

This task comprises any issue related to the final objectives of the project to assure the success of the whole project looking forward the consecution of the expected results in terms of quality, costs and time. Under this task overall project quality standards will be set and enforced, project documents will be reviewed and progress in all work packages will be monitored in terms of project plans and quality measures. The quality plans and guidelines will be written down in an internal document taking form of a Project Quality Manual (PQM). GEUS could be task leader but this would require additional funding of 1 pm for GEUS.

Task 7.3 Exploitation

This task is about ensuring the successful exploitation of results generated by the project. It deals with the formal management of the knowledge within the project, both background brought into the project by partners and foreground. It aims to enforce high usability and market attractiveness standards for the developed solution to ensure successful future commercial exploitation as well as

setting the rules on the exploitation of the results, including facilitation negotiations of business strategies within and outside the consortium.

Task 7.4 Website and videos

Development of a project website including internal project work space and information videos describing the objectives and technical developments of the SEAMOUNT project.

Task 7.5 Seminar with related BONUS projects

The BONUS programme has several on-going projects for which SEAMOUNT developments are relevant and where knowledge sharing and exchange is relevant among the different projects. This task identifies the related BONUS projects and clusters and main institutes involved in studies on e.g. nutrient cycles in the land-sea continuum and organises a common seminar between the interested and relevant BONUS "sister" projects within the project clusters: 1) Sustainable ecosystems, 2) Viable ecosystems and 3) Innovation. Examples of projects benefitting from a better location and understanding of SGDs and their nutrient discharge to coastal waters are: "BONUS Soils2Sea" and "BONUS Cocoa" of the viable ecosystem projects cluster.

Annex II BONUS SEAMOUNT - Schedule of Deliverables (SoD)

Del. No.	Deliverable name	Nature	Diss emi nation level	WP no.	Deli very month
D1.1.1	Document containing background data and possible scenarios, boundary conditions and requirements, to be used for the iSMN-A design	DB	CO	1	6
D1.1.2	Public workshop	TE	PP	1	6
D1.2.1.	Technical documentation including specifications of the iSMN-A, sensor characteristics and data formats	DB	RE	1	6
D1.3.1.	System architecture document	DB	CO	1	6
D2.1.1	Radon sensor customized and ready to work on ROV/AUV	MO	CO	2	5
D2.1.2	Two radon sensors purchased and ready to be mounted in ROV/AUV	MO	CO	2	5
D2.1.3	Sensors and comms instruments purchased and ready to be mounted in ROV/AUV	MO	CO	2	5
D2.2.1	ROV model with acoustic positioning and surface control station tested in the laboratory and ready for field surveys	PT	RE	2	13
D2.2.2	Test report CAU - Performance review of Towfish/ROV with respect to sensor measurements in different water depths and cruising speed	RE	RE	2	18
D2.2.3	Comparison of radon measurements obtained by AUV/ROV with measurements obtained by conventional sampling	RE	RE	2	23
D2.3.1	Autonomous sensor platform: SEAMOUNT- AUV experimental system	PT	RE	2	20
D2.3.2	Test report	RE	RE	2	26
D2.4.1	Experimental version of the AUV to be used for field surveys	PT	RE	2	25
D2.4.2	Report summarizing the data obtained during the field test	RE	RE	2	27
D3.1.1	Report containing the boundary conditions for the squid drive and desired system configuration settled together with SEAMOUNT partners	RE	RE	3	6
D3.2.1	Single wave propeller module along with the bill of material	MO	CO	3	12
D3.2.2	Empty ROV's dummy hull for installation and testing of wave propeller	MO	CO	3	7
D3.2.3	Physical mechanism for flap retraction	MO	CO	3	18
D3.3.1	Design of the dummy hull	RE	CO	3	26
D3.3.2	Design of a multi wave propeller system with the bill of material along with its integration design with dummy hull and retraction/ folding mechanism	MO	CO	3	22
D3.4.1	Report on sea test trials	RE	RE	3	36
D3.5.1	Report on sea trials of cabled dummy vehicle	RE	RE	3	26
D3.5.2	Report on scientific mission results and conclusions utilizing AUV platform with wave propellers	RE	RE	3	29
D4.1.1	Intelligent Subsea Network with integrated AUV (iSMN-A) and ship-based control	MO	RE	4	23
D4.1.2	Test report	RE	RE	4	24
D4.2.1	Intelligent Subsea Monitoring Network with integrated AUV - for complex long-term observations in remote underwater environments with operation control from land	PT	RE	4	26
D4.2.2	Test report	RE	RE	4	27
D4.3.1	Test report	RE	RE	4	35
D5.1.1	Data report with results of data analyses offering information on the composition of waters in the aquifers flowing towards Eckernförde Bay and Hoersen Fjord	RE	RE	5	24
D5.2.1	Report with results of sensor data obtained from the field surveys	RE	RE	5	30

D5.3.1	Scientific publication on SGD in Eckernförde Bay and Horsens Fjord	SP	PU	5	36
D5.4.1	Scientific publication integrating and comparing results from the integrated groundwater-surface water model with results from Radon/AUV surveys and newly acquired 3D high resolution seismics	SP	PU	5	32
D5.5.1	Data report containing sensor data	RE	RE	5	24
D5.6.1	Database holding seismic and acoustic data	DB	CO	5	24
D5.6.2	Cruise Report with evaluation of the technology	RE	PU	5	30
D5.6.3	3D-geological models integrated with the hydrogeological models of the catchment area	SP	PU	5	30
D5.7.1	Report on the geological characteristics and analysis results of the studied SGD locations	RE	RE	5	12
D5.7.2	Report on the geological characteristics and analysis results of the studied SGD locations	RE	RE	5	24
D5.7.3	Scientific report integrating and comparing results from the field surveys and laboratory analyses (T5.7), hydrological modelling (T5.8) with results from AUV surveys (T5.9)	RE	RE	5	36
D5.8.1	Report on the hydrological modelling of the selected coastal aquifers	RE	RE	5	30
D5.9.1	Report on the AUV surveys and data interpretation	RE	RE	5	34
D6.1.1	Datamodel	RE	RE	6	16
D6.1.2	Dataformat definitions	RE	RE	6	16
D6.1.3	Database	DB	PU	6	16
D6.1.4	Import tools	RE	RE	6	16
D6.2.1	Web Based interactive Geoscience Information Platform and publication in policy related journal	SC	PU	6	36
D7.1.1	Project presentation - This deliverable is a document containing visual identification and basic information on the project and the partners	RE	RE	7	2
D7.1.2	First report to be submitted to the BONUS Secretariat	RE/PR	RE	7	6
D7.1.3	Second report to be submitted to the BONUS Secretariat	RE/PR	RE	7	12
D7.1.4	Third report to be submitted to the BONUS Secretariat	RE/PR	RE	7	18
D7.1.5	Fourth report to be submitted to the BONUS Secretariat	RE/PR	RE	7	24
D7.1.6	Fifth report to be submitted to the BONUS Secretariat	RE/PR	RE	7	30
D7.1.7	Finalh report to be submitted to the BONUS Secretariat	RE/FR	RE	7	36
D7.2.1	Project Quality Manual - a document containing a set of procedures that will permit the timely and quality delivery of expected project results	RE	RE	7	2
D7.3.1	Plan for Exploitation of Results	RE	RE	7	23
D7.4.1	Website	PP	PU	7	18
D7.4.2	2-3 information videos of 3-5 minutes	PP	PU	7	24
D7.5.1	Seminar	TE	PP	7	18

Annex III

**Global budget of the BONUS project and
planned expenditure for each beneficiary**

Budget of the project

RTD activities	Evologics	NOA	CAU	GEUS	IOW	GTK	MIG	TOTAL
Personnel	569591	297173	169513	226800	0	175542	18737	1457356
Period 1	216613	133605	53804	73998	0	42123	5643	525786
Period 2	216546	89398	57231	88300	0	49433	5952	506860
Period 3	136432	74170	58478	64502	0	83986	7142	424710
Period 4	0	0	0	0	0	0	0	0
Other direct costs	321434	255116	46877	10800	0	84801	106260	825288
Period 1	297934	89047	22259	2700	0	23801	1260	437001
Period 2	12200	78086	12850	5400	0	27600	2500	138636
Period 3	11300	87983	11768	2700	0	33400	102500	249651
Period 4	0	0	0	0	0	0	0	0
Subcontracting	0	34385	0	0	0	0	0	34385
Period 1	0	0	0	0	0	0	0	0
Period 2	0	19648	0	0	0	0	0	19648
Period 3	0	14737	0	0	0	0	0	14737
Period 4	0	0	0	0	0	0	0	0
Indirect costs	178207	110459	43280	47521	0	52070	25001	456538
Period 1	102910	44531	15213	15340	0	13185	1381	192560
Period 2	45750	33497	14017	18740	0	15407	1691	129102
Period 3	29547	32431	14050	13441	0	23478	21929	134876
Period 4	0	0	0	0	0	0	0	0
TOTAL	1069232	697133	259670	285121	0	312413	149998	2773567
Period 1	617457	267183	91276	92038	0	79109	8284	1155347
Period 2	274496	220629	84098	112440	0	92440	10143	794246
Period 3	177279	209321	84296	80643	0	140864	131571	823974
Period 4	0	0	0	0	0	0	0	0
Funding rate	70.00	68.00	100.00	100.00	100.00	100.00	100.00	
Own funding	320769	223082	0	0	0	0	0	543851
Requested funding	748463	474051	259670	285121	0	312413	149998	2229716

MANAGEMENT	Evologics	NOA	CAU	GEUS	IOW	GTK	MIG	TOTAL
Personnel	94249	7368	0	22680	9308	14619	5798	154022
Period 1	31417	2456	0	8100	4654	4873	4464	55964
Period 2	31416	2456	0	10530	4654	4873	667	54596
Period 3	31416	2456	0	4050	0	4873	667	43462
Period 4	0	0	0	0	0	0	0	0
Other direct costs	14000	9822	0	12543	2500	0	3334	42199
Period 1	4000	3274	0	3510	1000	0	2000	13784
Period 2	4000	3274	0	3510	700	0	667	12151
Period 3	6000	3274	0	5523	800	0	667	16264
Period 4	0	0	0	0	0	0	0	0
Subcontracting	0	0	0	0	0	0	0	0
Period 1	0	0	0	0	0	0	0	0
Period 2	0	0	0	0	0	0	0	0
Period 3	0	0	0	0	0	0	0	0
Period 4	0	0	0	0	0	0	0	0
Indirect costs	21652	3438	0	7045	0	2925	1827	36887
Period 1	7084	1146	0	2322	0	975	1293	12820
Period 2	7084	1146	0	2808	0	975	267	12280
Period 3	7484	1146	0	1915	0	975	267	11787
Period 4	0	0	0	0	0	0	0	0
TOTAL	129901	20628	0	42268	11808	17544	10959	233108
Period 1	42501	6876	0	13932	5654	5848	7757	82568
Period 2	42500	6876	0	16848	5354	5848	1601	79027
Period 3	44900	6876	0	11488	800	5848	1601	71513
Period 4	0	0	0	0	0	0	0	0
Funding rate	70.00	68.00	100.00	100.00	100.00	100.00	100.00	
Own funding	38970	6600	0	0	0	0	0	45570
Requested funding	90931	14028	0	42268	11808	17544	10959	187538

OTHER activities	Evologics	NOA	CAU	GEUS	IOW	GTK	MIG	TOTAL
Personnel	0	0	0	0	74471	0	0	74471
Period 1	0	0	0	0	23002	0	0	23002
Period 2	0	0	0	0	23130	0	0	23130
Period 3	0	0	0	0	28339	0	0	28339
Period 4	0	0	0	0	0	0	0	0
Other direct costs	0	0	0	0	378284	0	0	378284
Period 1	0	0	0	0	366434	0	0	366434
Period 2	0	0	0	0	8500	0	0	8500
Period 3	0	0	0	0	3350	0	0	3350
Period 4	0	0	0	0	0	0	0	0
Subcontracting	0	0	0	0	0	0	0	0
Period 1	0	0	0	0	0	0	0	0
Period 2	0	0	0	0	0	0	0	0
Period 3	0	0	0	0	0	0	0	0
Period 4	0	0	0	0	0	0	0	0
Indirect costs	0	0	0	0	0	0	0	0
Period 1	0	0	0	0	0	0	0	0
Period 2	0	0	0	0	0	0	0	0
Period 3	0	0	0	0	0	0	0	0
Period 4	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	452755	0	0	452755
Period 1	0	0	0	0	389436	0	0	389436
Period 2	0	0	0	0	31630	0	0	31630
Period 3	0	0	0	0	31689	0	0	31689
Period 4	0	0	0	0	0	0	0	0
Funding rate	70.00	68.00	100.00	100.00	100.00	100.00	100.00	
Own funding	0	0	0	0	0	0	0	0
Requested funding	0	0	0	0	452755	0	0	452755

TOTAL BUDGET	Evologics	NOA	CAU	GEUS	IOW	GTK	MIG	TOTAL
Personnel	663840	304541	169513	249480	83779	190161	24535	1685849
Period 1	248030	136061	53804	82098	27656	46996	10107	604752
Period 2	247962	91854	57231	98830	27784	54306	6619	584586
Period 3	167848	76626	58478	68552	28339	88859	7809	496511
Period 4	0	0	0	0	0	0	0	0
Other direct costs	335434	264938	46877	23343	380784	84801	109594	1245771
Period 1	301934	92321	22259	6210	367434	23801	3260	817219
Period 2	16200	81360	12850	8910	9200	27600	3167	159287
Period 3	17300	91257	11768	8223	4150	33400	103167	269265
Period 4	0	0	0	0	0	0	0	0
Subcontracting	0	34385	0	0	0	0	0	34385
Period 1	0	0	0	0	0	0	0	0
Period 2	0	19648	0	0	0	0	0	19648
Period 3	0	14737	0	0	0	0	0	14737
Period 4	0	0	0	0	0	0	0	0
Indirect costs	199856	113897	43280	54565	0	54994	26828	493420
Period 1	109993	45677	15213	17662	0	14160	2674	205379
Period 2	52833	34643	14017	21548	0	16382	1958	141381
Period 3	37030	33577	14050	15355	0	24452	22196	146660
Period 4	0	0	0	0	0	0	0	0
TOTAL	1199130	717761	259670	327388	464563	329956	160957	3459425
Period 1	659957	274059	91276	105970	395090	84957	16041	1627350
Period 2	316995	227505	84098	129288	36984	98288	11744	904902
Period 3	222178	216197	84296	92130	32489	146711	133172	927173
Period 4	0	0	0	0	0	0	0	0
Funding rate	70.00	68.00	100.00	100.00	100.00	100.00	100.00	
Own funding	359739	229683	0	0	0	0	0	589422
Requested funding	839391	488078	259670	327388	464563	329956	160957	2870003

Annex IV: Form A - Accession document

ACCESSION

of a new Party to

BONUS SEAMOUNT Consortium Agreement,

[OFFICIAL NAME OF THE NEW PARTY AS IDENTIFIED IN THE Grant Agreement]

hereby consents to become a Party to the Consortium Agreement identified above and accepts all the rights and obligations of a Party starting [date].

[OFFICIAL NAME OF THE COORDINATOR AS IDENTIFIED IN THE BONUS Grant Agreement]

hereby certifies that the consortium has accepted in the meeting held on [date] the accession of [the name of the new Party] to the consortium starting [date].

This Accession document has been done in 2 originals to be duly signed by the undersigned authorised representatives.

[Date and Place]

[INSERT NAME OF THE NEW PARTY]

Signature(s)

Name(s)

Title(s)

[Date and Place]

[INSERT NAME OF THE COORDINATOR]

Signature(s)

Name(s)

Title(s)