



PRIMROSE

*Predicting Risk and Impact of Harmful Events
on the Aquaculture Sector*

Deliverable 3.1
Exploitation Management Report

WP3: Capitalization



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1 INTRODUCTION AND OBJECTIVES

The project PRIMROSE was approved under the European Territorial Cooperation Program "Atlantic Area". Its main objectives are:

1. to standardise the approach and develop new tools for the forecast and monitoring of HAB's and pathogenic microorganisms across the AA region,
2. to assess the influence of climate change on the ability to forecast HABs and microorganisms for short-term forecasts services and,
3. to assess their impact on shellfish products; a fact that affects the food chain of the shellfish sector, which has a great importance in the project partner regions.

PRIMROSE aims to reduce health risks in the consumption of shellfish products by improving HAB forecast capacity throughout the European Atlantic Arc. The project aims to forecast the risk of HAB events so as to mitigate their impact on public health and the shellfish sector (negative socio-economic impact).

The main benefit from the project will be the development of a meaningful forecast solution for the aquaculture industry to help plan business activities (e.g. harvesting strategies), reduce product loss and ultimately enhance the consumer confidence in the product.

This report aims to identify different ways to successfully capitalize the project outputs and use them as a roadmap for the partners to implement exploitation activities. It will be also essential to ensure that the outputs are transferred to other regions (outside of the Atlantic Arc) and Member States, that they are applied/implement in public policies and presented to decision-makers, beyond project partners.

The INTERREG Program broadly describes Capitalization as an integrated building process that gathers valuable project results within a specific field of regional development policy. This process enables identifying and sharing knowledge, raising awareness (and interest) about the particular achievements of the project (its capital). Accordingly, capital is defined as the results/knowledge of the project used to generate new knowledge to support the development of future policies.

Capitalization is a fundamental principle of the INTERREG Program. In this context, the Capitalization Strategy of INTERREG projects are expected to guarantee the following activities/outcomes:

- Identification and analysis of best practices for capitalization approaches;
- Promotion of their use;
- Facilitation of knowledge management procedures;
- Organization of targeted events;
- Promotion of project achievements/results and expertise available.

The general objective of any Capitalization Strategy is to collect, analyze, organize and enable the uptake of any valuable results produced within the project, so to maximize its impacts.

The present Capitalization Strategy draws on some of the essential elements that have been promoted by the INTERREG program, and sets up a framework to be used as guidelines for the capitalization activities within the PRIMROSE consortium, addressing approaches for the identification and engineering of relevant products and services, as well as the promotion, dissemination and transfer of knowledge.

2 METHODOLOGY

A methodology based on 3 stages is proposed to ensure all possible ways to capitalize the results of this project are analyzed. A pre-selection of capitalization activities for the PRIMROSE project are described below.

2.1 Collection, analysis and summary of data / information / benefits

Analysis of all the information, data and results likely to be capitalized in the project. Although the main outcome of the project is known in advance, the objective of this phase is to ensure the identification of everything that can be capitalized. First, the main products will be classified in a table like Table 1, indicating the source and improvements made. This table will act as a living document during the life of the project for the tasks of evaluation of the capitalization activities (see chapter 3.8) and will be reviewed by that partner who conducts a workshop in their own region. It can also be revised if new outputs are identified. The partners involved in the WP will be responsible for ensuring the revision of the table after each workshop.

Table 1. Main products (e.g), their source and improvements.

Country	Region	Product	Source (ASIMUTH/PRIMROSE)	Features	Improvements from PRIMROSE
Ireland	Case study	Development of Norovirus forecast (with potential trial)	PRIMROSE	Short-term forecast of norovirus concentration in Irish cultivated shellfish	New
Ireland		HAB bulletin	ASIMUTH	Biotoxin and HAB species concentrations in Irish shellfish waters; EO SST & Chl a concentration & Chl a anomaly; Hydrodynamic models for three regions	Standardization of assessment across the AA region with PRIMROSE partners

2.2 Dissemination and reuse of results

Once the products and results to be capitalized have been identified, the capitalization plan that sets out the objectives, ways and deadlines to capitalize each set of outputs, will be designed. The section 3 contains a pre-selection of activities proposed for the capitalization of the project outputs.

2.3 Support to stakeholders in the transfer and reuse of the outputs

The capitalization plan will be designed according to a networking process that will identify the key stakeholders. The project capitalization group will directly carry out the activities proposed in the capitalization plan, with the support of the rest of partners when required. This group will also be responsible for the monitoring and evaluation of the capitalization plan.

3 CAPITALIZATION ACTIVITIES

3.1 Dissemination of the project outputs

The dissemination activities will target 3 key interest groups for the reuse of the project outputs:

- The (aquaculture/shellfish) sector and its professionals;
- The public administration (e.g. food agencies, monitoring agencies);
- European Thematic Networks.

The main objective will be to disseminate the existence and features of the forecast tool and to improve the system through the feedback of users (assessment and improvements questionnaire; source: ASIMUTH project).

Dissemination actions:

- Publication of progresses made and events on PRIMROSE web page and social networks;
- Organization of specific events (workshops) with the 3 key interest groups in order to explain them the functioning and benefits of PRIMROSE forecast tools;
- Publication of the reports of the project outputs in scientific and prestigious journals (according to the guidelines defined by partners concerning the intellectual property rights of the project).

3.1.1 Capitalization through communication

PRIMROSE WP 2 contains the set of Actions dedicated to Project Communication and Dissemination strategy; these aim at efficient broadcasting of all the projects outputs, from social media releases to the forecasts of potentially contaminated aquaculture areas. A significant number of outputs are expected during the lifetime of the project, targeting a fairly diverse audience. Also, the dissemination of the results is likely to continue after the end of the project, as some of the methodologies and tools that will be either developed or improved during the project should become operational tools to be adopted by monitoring agencies and by the aquaculture industry.

For an efficient dissemination strategy, the project must reach a significant professional and general audiences by publishing the outputs of the project through formal and informal channels. The target audience can be described in three main categories: end users (aquaculture/shellfish producers and distributors), experts (academia, food safety authorises, governmental bodies involved in the biomonitoring of shellfish safety for human consumption) and the general public. The type (format and content) of communication must be tailored according to the nature, interest, and needs of each category. Also, it must comply with the outline they are most familiar with (e.g., tweets for the general public, research papers for scientists, etc.).

Within the framework of WP2, Action nr. 5 – Publications is set to last for the entire duration of the project, aiming at a timely and relevant broadcast of the project activities and significant outputs for all audiences. All partners should be actively engaged in the project communication and dissemination of results, thus promoting the overall impact of its activities and achievements. These actions aim to highlight some of the communication products and strategies that can be followed by the partner to ensure a significant impact of PRIMROSE in all sorts of audiences. All types of publications, irrespective of being national or international, should be communicated to the WP leader (SAMS), so that it can

also be announced through the official project lines of communication, via tweets, website, etc. (Figure 1).

Action nr. 5 has the following description:

- 1) Publications in trade press and informal publications in a suite of regional printed, digital and telecommunication media platforms;
- 2) Regular releases to appropriate technical and non-technical press will be distributed;
- 3) Publications to quality, peer reviewed scientific journals;
- 4) The web forecasts published in WP7 will also be quality controlled and branded appropriately.

3.1.1.1 Informal publications

Each partner should lead the project communication and dissemination in their own country, through same language platforms and within the national context and relevance. Partners should promote their work and its significance for their country, but always adequately framed in the PRIMROSE project, so to maximize its visibility.

3.1.1.2 Regular releases

If possible, partners should schedule regular releases addressing the developments of the project and some of the results. Preliminary results (work in progress) may be particularly useful to promote the project and keep it on the “radar” of the aquaculture industry and regional or national agencies. The same applies to more technical audiences, through the participation in conferences, symposia, discussion groups, etc.

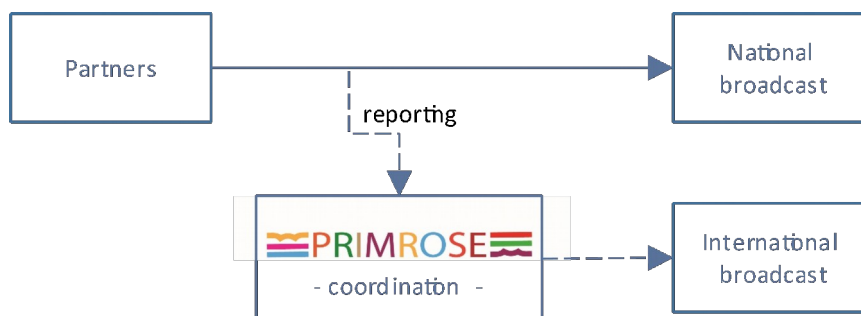


Figure 1. Informal publications and regular releases. All national communications and dissemination activities should be managed by local partners and reported to the Coordination for international broadcast.

3.1.1.3 Scientific publications

The scientific outputs of the project, as described in Action nr. 5 by Publications to quality, peer-reviewed scientific journals, should promote the work and results with a primary focus on the scientific and technological factors, aiming at experts from the academia and R&D groups.

The scientific publication can be promoted and achieved in many ways, all with their advantages and obstacles. However, the publication of papers in the specialized scientific journal seems to be the most far-reaching choice. The consortium should promote discrete publications by the teams throughout the project, to achieve a significant publication record. Also, from the onset of the project, the consortium can decide on the

elaboration of a Special Issue on a journal of choice, as a compilation or summary of its main achievements.

The publication of a SI was successively used in the ASIMUTH project, leading to the publication of 14 papers on the Special Issue Applied Simulations and Integrated Modelling for the Understanding of Toxic and Harmful Algal Blooms (ASIMUTH), on the leading journal Harmful Algae (<https://www.sciencedirect.com/journal/harmful-algae/vol/53>)

Table 2 summarizes a list of journals that fit the scope of PRIMROSE project and can be used to disseminate its different scientific outputs. Figure 2 summarizes the information flow between partners and coordination/editors for scientific publications. Open Access publications should be favoured, to maximise the outreach and impact of PRIMROSE.

Discrete publications

Since individual or team publications are mostly independent of the consortium, they can be submitted at any time, irrespective of the work program and action status and without previous knowledge of other partners (unless they focus on collaborative work). Publications of such nature stand as a convenient way to promote and raise the profile of the project from its start, as well an objective way to highlight the continuous results achieved by the teams or the consortium.

The widespread impact within the scientific community is an advantage of using this method over the Special Issue because the project work can be published in a wide range of journals and in a more dynamic way.

Special Issues / Collection of papers

Publishing the results of project in a Special Issue is a convenient way to summarize and disseminate the main outcomes of the project. Also, it favors collaborative work within the consortium, thus leading to a more focused and representative dissemination of the work.

Since this method relies on a general involvement, should the consortium decide to produce such a volume, there are a number of things that must be decided as soon as possible. These include a tentative title expressing the aim of the volume, choosing the journal, setting a list of editors and a potential alignment of papers. These decisions can be seen as suggestions, as the SI perspective may change throughout the time span of the project.

Table 2. List of potential target journals for PRIMROSE publications (alphabetic order; not exhaustive).

Name	Link
Aquatic Ecosystem Health & Management	https://tandfonline.com/toc/uaem20/current
Aquaculture Economics & Management	http://www.tandfonline.com/toc/uaqm20/current
Aquaculture Environment Interactions	https://www.int-res.com/journals/aei/aei-home/
Frontiers in Marine Science	https://www.frontiersin.org/journals/marine-science
Harmful Algae	https://www.journals.elsevier.com/harmful-algae
Journal of Applied Aquaculture	https://tandfonline.com/toc/wjaa20/current
Journal of Ocean Engineering and Science	https://www.journals.elsevier.com/journal-of-ocean-engineering-and-science

Journal of Marine Systems	https://www.journals.elsevier.com/journal-of-marine-systems
Resources	http://www.mdpi.com/journal/resources
Reviews in Fisheries Science & Aquaculture	https://tandfonline.com/toc/brfs21/current
Science of the Total Environment	https://www.journals.elsevier.com/science-of-the-total-environment
Sustainability	http://www.mdpi.com/journal/sustainability

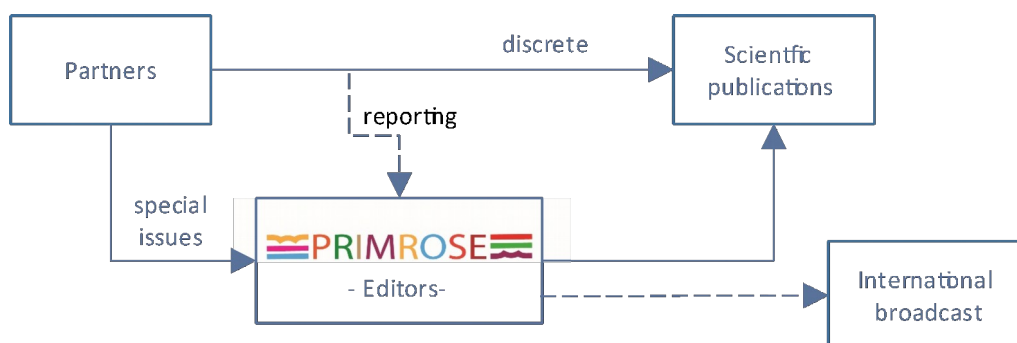


Figure 2. Scientific publications via discrete/individual or special issue submission. Irrespective of the method, project coordination/editors should manage the international broadcast of the scientific work.

3.2 Web forecasts

Continuous generation of bulletins/models forecasts for the studied areas is one of the significant outcomes of the projects, as well as one of the leading indicators of success. While local partners will be responsible by the forecast production for its own country, its content should be reviewed/controlled for quality before posted/published either online on the project website (www.shellfish-safety.eu), on an official national site, project partner’s website? or sent directly to the aquaculture producers (Figure 3). The quality control will focus on the content (information) but will also guarantee proper brand management, ensuring that the PRIMROSE layout is adopted, standardised across the AA region.

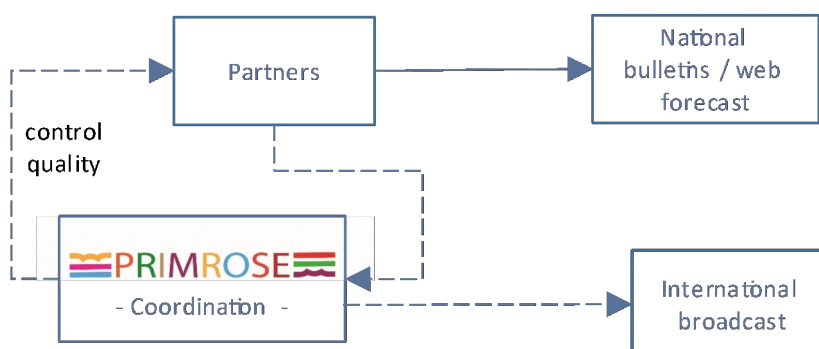


Figure 3. National bulletins/forecast will be issue by partners to their national audience. The coordination involvement in this process will be to assure the quality and compliance with the project guidelines.

3.3 Quantification of benefits

This section addresses the quantification of benefits from the economic (reduction of losses for producers and the sector), social (food security and enhanced consumer confidence) and environmental points of view (algae vs coastal waters, agricultural activity, etc.). It specifies how PRIMROSE products can produce benefits. Taking into account that a first product development was already completed in ASIMUTH project and that PRIMROSE aims to improve and add-on it, this report will include a list of benefits. Each benefit identified will include information on the area where it provides (economic, social or environmental) and the sector that it benefits (public administration, professionals of the sector, citizens, European networks, etc.). Some examples are provided over the next subsections.

3.3.1 List of benefits identified in ASIMUTH:

- The forecast system will enable aquaculture producers to: Optimize growing and harvesting techniques to reduce mortality due to anoxia; allow farmers time to harvest before a prolonged closure; plan husbandry work in relation to future bloom events and, reduce downtime for processors if product can be stockpiled in advance before the onset of a bloom. Given the difference between the moment when samples are taken and the delivery of the results concerning biotoxin levels, the forecast system allows aquaculture producers to have more confidence in decision-making with regards to harvesting, since they will be better informed to predict the outcome of toxins tests.
- Increase aquaculture sales by: Optimizing harvesting schedules.
- Saving money for aquaculture farmers by avoiding such losses.
- Removing the guesswork involved in when bay closures will occur so that farmers can make informed choices.
- Improving the food safety evaluation since it allows the public administration to optimize the sampling plans of the control the biomonitoring programmes by improving efficiency in the early detection of toxicity in shellfish.
- Reducing the risk to endangered and protected species.
- Reducing the potential of collateral damages through audience education.
- Reducing the damage to the quality and welfare of the animals produced by giving more time to the use of mechanical protection strategies to HABs (barriers, ventilation system, boxes transportation, etc.)

3.3.2 List of potential benefits identified in PRIMROSE:

PRIMROSE includes all benefits identified in ASIMUTH and additionally:

- Improving the accuracy of the forecasts developed through the ASIMUTH system. In this way, decision-making by interested parties will be more effective.
- Increasing the regional coverage of the implementation of the forecast system, thus extending the benefits to other production areas in the European Community.
- Increasing the number of controlled parameters, adding possible proliferations of pathogenic microorganisms to the occurrence of HAB's.
- Optimizing the definition and classification of production areas in response to microbiological parameters as set out in Regulation (EC) No 854/2004 of 29 April 2004.
- In order to revise and maintain the classification of production areas, PRIMROSE products will provide valuable information for the risk assessments suggested in

Regulations (EU) No. 2015/2285 of 8 December 2015 and Regulation (EC) No 854/2004 of 29 April 2004.

- It may avoid economic losses in the shellfish sector if, on the basis of an annual catch quota and observing the biological parameters of each species, daily catch quotas were managed according to HAB's forecasts.

3.4 Search and Benchmark of tools and international initiatives for the same or similar purpose

In order to compare, complement and enhance the benefits of PRIMROSE, the tools that are currently used for this or a similar purpose in other parts of the world with the same problem, will be sought and identified.

Ongoing or completed projects that have synergies and complementarities with PRIMROSE, either in the same or in other sectors, will be identified. It will be very important to identify the scalability potential of the project outputs, for example in the field of goods transportation by sea and, specifically, in the case of crude oil and material which may spill. In addition, this activity aims to avoid duplication or conflict with other partnerships or projects in order to report on the marketing possibilities, in the future, of the project outputs by analyzing the cost-benefit ratio.

This task will be based on what was detected in the ASIMUTH project and it will extend and complement the information already available.

3.4.1 Link to other projects

Currently, there are some projects partly or wholly committed to HABs, addressing some of the same themes as PRIMROSE, such as food safety, modeling, forecast and services to the aquaculture sector, to name a few. Eventually, some of these projects may have overlapping goals and aim to produce similar knowledge, products or services. This apparent conflict of interests may hinder the success of some of the project outcomes after the project is over, thus compromising its capital.

But the existence of other projects dealing with the same thematic areas also opens the possibility for cooperation.

A cautious assessment of related projects is essential to maximize the Capitalization potential of PRIMROSE. After all similar activities and goals with other projects have been identified, and adequate actions listed to avoid getting into a future scenario in which PRIMROSE results may compete with other available products and services, it is also necessary to identify ways to promote synergies with other projects.

3.4.1.1 *Conflicting interests*

Facing this possibility, the capitalization strategy in PRIMROSE must ensure minimum risk of redundancy and repetition of products/services with other projects. This will prevent any conflict of interests in partners involved in two or more of these projects. Also, over the long run, will promote the sustainability of the project services, by reducing the risk of having alternatives to it.

Not least important, end-user perception and expectations about the project must be adequately fostered. The promotion of the project is key to the capitalization strategy, since it determines the involvement of end-user during the lifespan of the project and will eventually guarantee that they rely on its products and will keep on doing so after the project has ended. One way to achieve this is by having clear objectives and a distinct work program, creating a unique identity to PRIMROSE and setting the project apart from

others. For that, the consortium must rely on a list of arguments (Table 3) to briefly explain how PRIMROSE differs from other projects.

Table 3. List of projects partly or entirely dedicated to HABs.

<p>AtlantOS – Optimising and Enhancing the Integrated Atlantic Ocean Observing Systems H2020</p>	<p>Webpage: https://www.atlantos-h2020.eu/targeted-product/harmful-algal-blooms/</p> <p>Partners: + 60 partners</p> <p>Goals/Summary: The overarching objective of AtlantOS is to achieve a transition from a loosely-coordinated set of existing ocean observing activities producing fragmented, often monodisciplinary data, to a sustainable, efficient, and fit for-purpose Integrated Atlantic Ocean Observing System (IAOOS). This will be achieved through research and innovation activities focused on: defining requirements and systems design, improving the readiness of observing networks and data systems, engaging stakeholders around the Atlantic, as well as strengthening Europe’s contribution to the Global Ocean Observing System (GOOS), a major component of the Group on Earth Observations (GEO), its Global Earth Observation System of Systems (GEOSS), and specifically on its emerging “Oceans and Society: Blue Planet” initiative. AtlantOS contributes to blue growth by merging new information needs relevant to key sectors such as transport, tourism, fisheries, marine biotech, resource extraction and energy with existing requirements. AtlantOS significantly contributes to trans-Atlantic cooperation by integrating existing observing activities established by European, North and South American, and African countries and by filling existing gaps to reach an agile, flexible IAOOS and associated ocean information systems around the Atlantic.</p> <p>How is it different from PRIMROSE?</p>
<p>CAMPUS – Combining Autonomous observations and Models for Predicting and Understanding Shelf Seas</p>	<p>Webpage: https://pml.ac.uk/Research/Projects/CAMPUS</p> <p>Partners: 7 partners</p> <p>Goals/Summary: CAMPUS is a three-year project (2018–2021), funded by the UK Natural Environment Research Council, combining state-of-the-art computer modelling with innovative observational systems utilising the latest technologies. Seven partner organisations from across the United Kingdom are working together to fulfil two strategic outcomes:</p> <ol style="list-style-type: none"> 1. Deliver an improved evidence-base for ecosystem based marine management, 2. Identify a cost-effective optimised observing network. <p>Shelf seas are of major societal importance as they provide a diverse range of goods (e.g. fisheries, renewable energy, transport) and services (e.g. carbon and nutrient cycling and biodiversity). A key governmental objective in the United Kingdom is managing seas to maintain clean, healthy, safe, productive and biologically diverse oceans and seas, as evidenced by the obligations to obtain Good Environmental Status (GES) under the UK Marine Strategy Framework, the Convention on Biological Diversity and ratification of the Oslo-Paris Convention (OSPAR). The delivery of these obligations requires comprehensive information about the state of our seas which in turn requires a combination of numerical models and observational programmes.</p> <p>Computer modelling of marine ecosystems allows us to explore the recent past and predict future states of physical, chemical and biological properties of the sea, and how they vary in 3D space and time. The quality of these forecasts is improved by using data assimilation; the</p>

process of predicting the most accurate ocean state using observations to nudge model simulations, producing a combined observation and model product.

The project includes a task to develop a model based early warning tool for HABs using

How is it different from PRIMROSE?

CoClime – Co-development of CLimate services for adaptation to changing Marine Ecosystems
JPI Climate / ERA-NET

Webpage:

http://www.jpi-climate.eu/nl/25223446-Co_ClIME.html

Partners:

Daithi O'Murchu Marine Research Station, Alfred Wegener Institut, Consejo Superior de Investigaciones Científicas, Institut Francais de recherche pour l'Exploitation de la Mer, University of Nantes, Université Pierre et Marie Curie, Center for International Climate and Environmental Research – Oslo, Institute of Marine Research, National Institute for Marine Research and Development “Grigore Antipa”, Swedish Meteorological & Hydrological Institute, Stockholm Environment Institute.

Goals/Summary:

European coastal ecosystems are changing as a result of interactions between a number of drivers including overfishing, pollution, and climate change. Changes in marine ecosystems will impact on human health, food safety and the future sustainability of sectors including aquaculture, fisheries and tourism. Climate projection information is plentiful and there is considerable activity in marine ecosystem impact modelling; however, a disconnect remains between delivery of this information and its effective uptake by end users and policy makers. The CoClime project will co-develop and co-produce a set of regionally focused climate services to address key impact areas including human health, aquaculture, fisheries and tourism across the regional seas of Europe. The developed services, and associated decision support tools, will empower and support vulnerable coastal sectors to accelerate adaptive decision-making and feed into key governance mechanisms such as the Marine Strategy Framework Directive, Marine Spatial Planning, and local, national and European adaptation planning. The project team brings together a newly established consortium of boundary organisation experts in co-development of climate services with leaders in marine ecosystem research, regional ocean climate modelers, and, at its heart, a number of targeted users and decision makers in each region. The project will offer an innovative and user-focused approach and the development of a societally relevant climate service framework, in addition to the bespoke climate services, that will be transferable to other regions, impact areas, users and marine ecosystem vulnerabilities. Through a regional case study approach, the specific needs of national and European marine ecosystem impact and adaptation planners and regulatory authorities will be identified and addressed through an evidence-based and iterative process designed to feed into climate adaptation strategies across the EU and beyond.

How is it different from PRIMROSE?

MARBioFEED – Enhanced biorefining methods for the production of marine biotoxins and microalgae fish feed
ERA-Net Marine Biotechnology

Webpage:

<https://www.marine.ie/Home/site-area/research-funding/marine-biotechnology/marbiofeed-project>

Partners:

Marine Institute, Norwegian Veterinary Institute, Instituto Espanol de Oceanografia (IEO), National Research Council Canada, Nealgae Microseaweeds products.

Goals/Summary:

Shellfish production sites in the EU are prone to closures due to the accumulation of biotoxins, with over 26 EU regulated toxins requiring statutory monitoring. Further impacts are exerted on fish farming industries through the production of feed from contaminated shellfish. The focus of this proposal is to isolate large quantities of biotoxins using enhanced biorefining methods for the preparation of reference materials and to allow for research to be conducted on the effects of biotoxins on other important aquaculture industries. Further work will focus on enhanced production of microalgae as fish feed. Biotoxins will be sourced from contaminated shellfish, bulk algal culturing, harvesting of algal blooms in situ and enzymatic conversions. Biorefining processes will be enhanced through optimisation of algal culturing, the development and use of novel immunoaffinity and polymeric columns, reducing cost and increasing economic viability.

How is it different from PRIMROSE?

MaRisk

Webpage:

Partners:

Goals/Summary:

How is it different from PRIMROSE?

Off-Aqua – Evaluating the Environmental Conditions Required for the development of off shore aquaculture

Webpage: <https://www.sams.ac.uk/science/projects/off-aqua/>

Partners: 4

Goals/Summary

Currently most Scottish aquaculture production occurs in fjordic sea lochs that provides relatively sheltered conditions for the farms. The development of aquaculture in offshore environments offers a potential route for the sustainable expansion of the industry. More dispersive open environments offer the potential for larger farms with reduced interconnectivity and lower environmental impact.

However, these more exposed environments carry their own risks, for example in terms of potential storm damage. To proceed with the development of offshore aquaculture a better scientific understanding of its potential benefits is therefore required and the purpose behind the Off-Aqua project.

Project objectives

1. To evaluate experimentally the physical characteristics that distinguish contrasting potential fish farm locations (sheltered/restricted exchange, open sheltered, open exposed)
2. To evaluate the ability of existing regional hydrodynamic models to represent and characterise the differences between sites/conditions
3. To develop higher resolution local hydrodynamic models to better represent processes that cannot be adequately represented by the regional models
4. To incorporate a high-resolution wave model within the above regional model structures
5. To improve existing physical/biological models of sea lice dispersal/behaviour/connectivity and HAB risk and evaluate the impact of these biological challenges in contrasting environments
6. To undertake risk analysis of equipment failure in more exposed locations allowing identification of suitable mitigation measures

- 7. To evaluate the effects of more energetic offshore environments on salmon health, welfare and general performance

Project outputs

- An evaluation of the benefits/risks of developing offshore aquaculture operations on the Scottish west coast.
- Development of modelling tools that allow the management of sea lice, the understanding of sea lice transfer from aquaculture to wild salmonids, and the evaluation of HAB risk.
- Scientific understanding of risks limiting the ability of insurers to set realistic premiums.

How is it different from PRIMROSE?

S-3 EUROHAB – Sentinel-3 satellite products for detecting EUtrophication and Harmful Algal Bloom events in the French-English Channel

Webpage: <https://www.s3eurohab.eu/en/>

Partners:

PML, Ifremer, Univ. Southampton, Environment Agency, Devon & Severn IFCA, Comite Regional des Peches Maritimes, Univ. Bretagne Occidentale.

Goals/Summary:

S-3 EUROHAB will develop a web based Harmful Algal Bloom and Water Quality alert system that uses satellite data to improve the ways in which these parameters / phenomena are monitored. The system is being designed by scientists in collaboration with stakeholders, in particular marine managers and shellfishery end users. The S-3 EUROHAB project will use data from the recently launched European satellite, Copernicus Sentinel 3, to track the biomass and spread of HABs in the Channel. In addition, the system will also be used to monitor water quality. The satellite data will then be used to create a web based alert system, the first of its kind in Europe, to alert marine managers and fishing industries of the growth of potentially damaging algal blooms. Data will also be gathered to help better understand why, how and when HABs occur as well as the economic costs associated with HABs and poor water quality and how the web based alert system may reduce these costs.

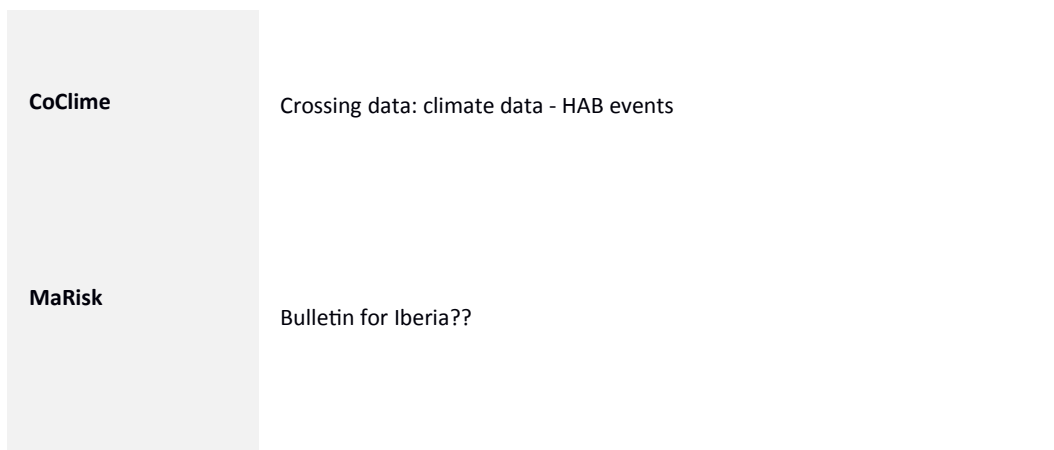
How is it different from PRIMROSE?

3.4.1.2 Synergies

Possible synergies with similar projects are presented in Table 4, exploring reasonable concerted efforts or collaborative products.

Table 4. Projects related to HABs and possible synergies that can explored with PRIMROSE.

Project acronym & financing programme	Project details
AtlantOS	Transatlantic cooperation, feeding Atlantis with PRIMROSE and vice versa.



3.5 Intellectual Property.

With regard to the products and knowledge generated throughout the life of the project and the revenues that may derive from them, in general, the joint ownership and the public use described in the Partnership Agreement, the Programme Manual and the applicable regulations of the EU will be observed. The intellectual property (IP) already attributed to the existing knowledge prior to the implementation of the project which constitute the base of new knowledge will be also observed. In case it is possible to establish the contribution of the partners involved in the generation of new IP, it will be divided on the basis of the proportion of the work carried out by each partner. The mechanisms to legally protect the IP will be studied. In order to safeguard agreements concerning IP, a partnership agreement, which will be outlined in the first face-to-face meeting of the partnership once partners are aware of this issue, will be signed.

3.6 Sustainability and continuity of the project after its completion.

There will be a plan of technical and economic feasibility that will assess the possibilities to market the project outputs. It will be based on the information obtained in stage 3 and on the results of the business plan of the previous project (ASIMUTH).

It will also launch a plan for the creation of demand that will feed the feasibility plan. The creation of demand will take place through the demonstration of the system to end users and stakeholders: policy makers, the sector and international networks during the development of the project. (Point 1)

The feasibility plan shall explore funding options through training needs generated around the forecasts, as the methodology for the forecast of biotoxins and microbiology is incorporated into management and monitoring national programmes. The different funding possibilities, such as rate per user, subscription, etc. will be also analysed.

The development and signing of a Memorandum of Understanding (MOU) between the project partners is proposed in order to establish the relationships and responsibilities of project partners for the future sustainability of the project.

3.6.1 Capitalization essentials

Despite the perceived or accomplished importance of the project results and products to the aquaculture sector or the food industry, commercial products are not expected to come out of PRIMROSE. This much has taken from the previous experience in ASIMUTH;

while there was a general interest in the bulletin produced during ASIMUTH, for many reasons the majority of aquacultures were not prone to have it as a paid service.

Drawing from this previous experience, PRIMROSE must find ways to financially support the functioning of the warning system after the lifetime of the project. Without this assurance, project capitalization is compromised, as the warning systems express most of the knowledge produced during the project. Again, the ASIMITH experience illustrates this concept, providing two distinct examples, a story of success and another of failure to keep up with the early warning service.

3.6.1.1 Success story: the case of Shetland

Over the past few years, Seafood Shetland has maintained a continuous weekly bulletin for the local aquaculture sector. The costs associated with this service have been met by diverse sources of funding, making Seafood Shetland an example on how to achieve financial support to maintain such warning systems.

Seafood Shetland initially came into contact with ASIMUTH project and its bulletins through Keith Davidson at SAMS. After realizing that the warning bulletin was a valuable tool for the local mussel farming sector, and a decision was made to produce such a forecast system, the initial support came via the European Fisheries Fund (EFF) Axis 4 programme, which was administered in Shetland by the local authority, the Shetland Islands Council.

Seafood Shetland applied to the programme for support and was successful, having earned 70% in grant support. The balance was eventually achieved with the contribution from the Shetland Aquaculture Trust, another support mechanism administered locally, supporting the aquaculture sectors in Shetland for many years now, and from self-funding at Seafood Shetland.

Afterwards, profiting from the launch of the new European Maritime and Fisheries Fund 2014-20, Seafood Shetland developed a new project with inclusion of three new features, followed by its submission for funding. Again, they were successful and received 50% support towards a project costing £60k. The remaining 50% was supplied by self-funding.

3.6.1.2 Failure story: the case of Portugal

Unlike the Shetland case, after the ASIMUTH project, there were no funding sources for the weekly early warning bulletin in Portugal. During this period, both IST and IPMA applied for financing under different national-funded project calls. As a result, the service was halted a few months after the project end. Neither IST (university) nor IPMA (the national agency for fisheries) had the human resources for keeping the system running, despite all the attention and interest in the bulletin from the aquaculture sector. The opportunity to resume the service finally come with PRIMROSE.

3.6.2 The capitalization cycle

Knowledge, services, and products are the outputs of PRIMROSE. Besides their intrinsic values, they can end up by generating financial benefits to the aquaculture industry and for the society in general. This, in turn, translates in service to each country (and thus to national governments) by promoting both the economy and citizens wellbeing. Ultimately, federal governments can as beneficiaries of PRIMROSE outputs and play a role in the sustainability of the project services and products, once the project is over.

One can assume that there are two currencies involved in the capitalization of PRIMROSE: money and knowledge (Figure 4). According to this, PRIMROSE (standing for Science)

generates either products or services based on expertise and these, in turn, are used by the producers or related businesses (standing for Economy), transforming knowledge into money. The relationship between Science and Government is rather straightforward, as Governments can benefit from profiting for a boosted economy (money), but also by knowledge produced in the project. It's this twofold gain for Governments that should be explored during the project so that the continuity of PRIMROSE's services can be secure with new funding.

To explore potential sources of financing (agencies, programmes, etc.) and possible ways forward, partners should assess their country circumstances and enroll in creating a list of inherent expected difficulties. The elaboration for a contingency plan must also be evaluated.

The 2014-2020 LEADER Program (https://enrd.ec.europa.eu/leader-clld_en), for instance, was extended under the broader term Community Led Local Development (CLLD) and this involves an element of European Maritime and Fisheries Fund (EMFF) cash administered at local levels. The viability of such Programs should be evaluated for future sources of financing. The Shetland can be used as a model for future funding, as they have a LEADER group in Shetland and also a Fisheries Local Action Group (FLAG) which oversees the local element of EMFF support for the biotoxin bulletin.

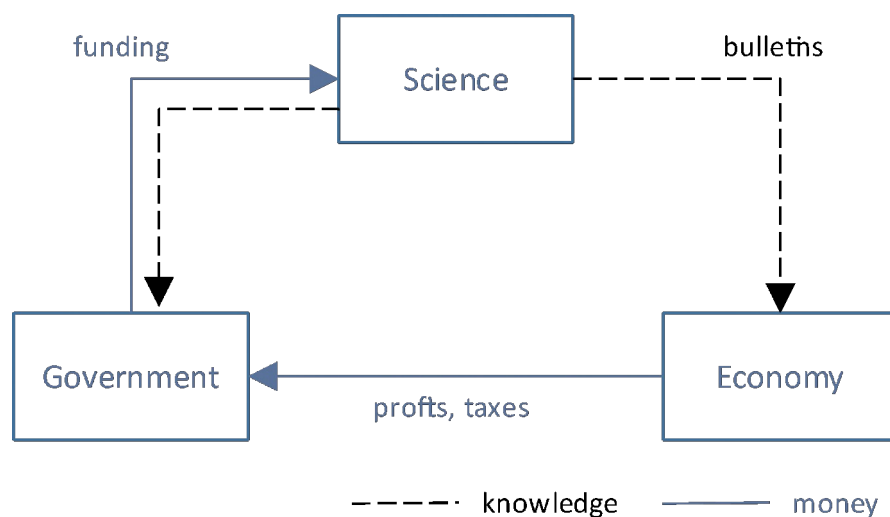


Figure 4. The Capitalization cycle with money and knowledge as currencies.

3.7 Knowledge and technology transfer

Partners must perform an analysis of the possible ways to enable other European regions and Member States (beyond the members of the partnership) to use the products resulting from the project in public policies. All the international networks with strong links with the partnership will be identified and considered, as well as the shellfish industry of countries included or not in the partnership.

Other European partnerships related to this topic or that could be interesting due to their partners will be identified to transmit the project outputs. Some examples are:

- Network of European reference laboratories
- ICES Working Groups (WGHABD)

- Research networks (ERA, SafeFood, ISSHA)
- S3P Thematic partnership on "Traceability and Big Data."

3.8 Evaluation of the capitalization activities. Flexibility

The evaluation plan for the results of the capitalization aims to monitor and analyze the success of the capitalization activities. To do this, a series of performance indicators and results for each group of activities will be defined.

Activities will be measured every 6 months, leading to 2 annual reports (AR), the first one at the end of 2019 and the second one at the end of the project. Also, a report on the final outputs will be developed at the end of the project.

The capitalization group established in action 2 of the WP3 will be responsible for developing and carrying out the plan for monitoring and evaluating the capitalization results.

Based on the results of the evaluations, initiatives will be eliminated or improved or, new capitalization activities will be included. These measures will be also included in the evaluation reports to be distributed to each partner for their information and appropriate effects. Each partner must commit through signing the report to implement each new measure. The table 5 shows the indicators which feed the capitalization evaluation plan.

Table 5. Monitoring table for evaluation of capitalization activities

EVALUATION OF ACTIVITIES								
	2018		2019		2020		Total project / Target	
	Nº Activities	Nº Impacts	Nº Activities	Nº Impacts	Nº Activities	Nº Impacts	Nº Activities	Nº Impacts
DISSEMINATION ACTIVITIES								
Projects reports								
Technical and scientific publications								
Policy, Strategy and operational instruments								
Cross border, transnational/interregional projects								
Workshops								
Web forecast								
Visit to website								
Other dissemination and capitalization actions								
Dissemination and capitalization participants								
ANALYSIS ACTIVITIES	Date of completion				Observations			
Description and quantification of benefits								
Benchmark report								
Analysis of sustainability of the project after its completion								
Analysis of ways of knowledge and technology transfer								

Each partner is responsible to gather information of its activities and communicate the information to the capitalisation group, who will report to leader of the WP and project about the results.

4 BASIC CONSIDERATIONS FOR THE TECHNICAL WORKSHOPS

Capitalization is about managing knowledge to ignite change, putting results into a context and transforming the project achievements into last, sustainable value. Besides focusing on the sustainability of activities and services implemented during the project, capitalization aims at promoting the knowledge and products that lead to those activities and services. Hence, communication and interaction with end-users and stakeholders is a cornerstone of the entire capitalization process.

Five workshops are foreseen, one for each country represented in the consortium. These technical workshops are a significant component of WP3, making up Action nr.2, titled Workshops to maximize exploitation. These events aim to take full advantage of the exploitation of the project results/products, making a proof-of-concept to the industry and regulators of their value and potential uses. Thus, a significant goal of the workshops is showcasing the products and services associated with PRIMROSE.

Target groups for the workshops may include:

- End-users, e.g. shellfish farmers/ producers and processors;
- Policy and decision makers at a national or regional level;
- Stakeholders such public authorities, SMEs, NGOs, civil society, prospective applicants, etc.;
- Multipliers, such as journalists and experts.

Workshops present a good opportunity to raise the awareness and appreciation of the media, and society in general, for the benefits associated with the outcome of the project, inform relevant stakeholders and the community of experts about the consequences of the project and to mobilize them into the further uptake of results. The workshops will also provide the consortium with a valuable opportunity to receive feedback, to identify gaps and to improve available products in an understandable format.

Partners should engage on the technical workshops with a clear idea on their importance, as the direct contact with end-users is the ultimate reality check on the utility of the project outcome, and the best avenue to capitalize on the project results.

The expected results for these meetings are that the users:

- i. Understand the benefits of the system and how to extract the information they need, and
- ii. Provide the consortium with feedback on potential improvements to the system.

A preliminary meeting should be held between the partners organizing the workshops, to agree on a basic outline for all meetings. While each country has its own settings, and these must be considered in the preparation of the meetings, a common approach can be set up, centered on some key issues of the projects.