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DISCLAIMER

BlueBRIDGE (675680) is a Research and Innovation Action (RIA) co-funded by the European Commission under the Horizon 2020 research and innovation programme.

The goal of BlueBRIDGE, Building Research environments for fostering Innovation, Decision making, Governance and Education to support Blue growth, is to support capacity building in interdisciplinary research communities actively involved in increasing the scientific knowledge of the marine environment, its living resources, and its economy with the aim of providing a better ground for informed advice to competent authorities and to enlarge the spectrum of growth opportunities as addressed by the Blue Growth societal challenge.

This document contains information on BlueBRIDGE core activities, findings and outcomes and it may also contain contributions from distinguished experts who contribute as BlueBRIDGE Board members. Any reference to content in this document should clearly indicate the authors, source, organisation and publication date.

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# Glossary

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<td>CNR</td>
<td>Consiglio Nazionale delle Ricerche</td>
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<td>FAO</td>
<td>The Food and Agriculture Organisation of the United Nations</td>
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<td>ICES</td>
<td>The International Council for the Exploration of the Sea</td>
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<td>IRD</td>
<td>Institut de Recherche pour le Developpment</td>
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<td>UOA</td>
<td>University of Athens</td>
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<td>VRE</td>
<td>Virtual Research Environment</td>
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DELIVERABLE SUMMARY

This deliverable reports on the outcomes related to the activities performed by BlueBRIDGE WP3 to transfer knowledge to the community from M16 to M36 (All the activities performed between M1 and M15 are reported in the deliverable D3.3 Training and knowledge transfer: Interim Report submitted to the European Commission in November 2016).

These activities include the organisation of webinars and the production of training material, the launch of the Call for SMEs and the organisation of the BlueBRIDGE-RDA Datathon.
EXECUTIVE SUMMARY

One of the key objectives of BlueBRIDGE was to ensure the uptake of the BlueBRIDGE tools and services among key stakeholders and one of the most effective means to achieve this overarching objective is the education of these stakeholders. Training in BlueBRIDGE has two different meanings:

1. **Support to new forms of education in the domain areas addressed by the project**, e.g. stock assessment. This is the objective of WP8 that aims at offering new environments and technological instruments to teachers and students of domain specific courses.

2. **Training on the use of the BlueBRIDGE solutions**, both technological and thematic. This training (WP3 training) concerned the production of training material aimed to educate the BlueBRIDGE users on what are VREs and what are the benefits in adopting them. The training material was disseminated via webinars and workshops. In addition, as SMEs have been identified as a potential target user of the BlueBRIDGE solutions, the activities related to the engagement of them are also part of this type of training.

Overall in the period:

- 8 BlueBRIDGE webinars have been organised attracting overall 300 relevant stakeholders;
- the eTraining section of the BlueBRIDGE website ([http://www.bluebridge-vres.eu/training-material](http://www.bluebridge-vres.eu/training-material)) has been revamped and populated with the following tutorials:
  - BlueBRIDGE Demo "Analysis of a species distribution"
  - Using e-infrastructures for Biodiversity Conservation
  - Semantic Integration of Marine Data
  - BlueBRIDGE general introduction
  - PAIM: the Protected Area Impact Maps Virtual Research Environment
  - New generation tools for Aquaculture
  - Managing tuna fisheries data at a global scale: the Tuna Atlas VRE
  - Innovative services to monitor the spatial distribution of human activities
  - GRSF
  - New technologies facilitating the management and assessment of data-limited fisheries
  - Introduction to VREs for training courses
- 5 SMEs have been engaged through the call for SMEs and have used the BlueBRIDGE VREs in the period
- A successful datathon has been organised mobilising over 70 students, data managers, researchers, data enthusiasts.

The webinars are considered by the BlueBRIDGE consortium a best practice for boosting knowledge transfer in an innovative way (as reported in D3.5 Best Practices: final report). The webinars allowed the project to engage around 300 international stakeholders in a cost-effective way. Many of the attendees to the webinars registered to the BlueBRIDGE VREs right after the session becoming users of the BlueBRIDGE infrastructure. All the recordings of the webinars have become part of the “Tutorials” section of the BlueBRIDGE website.

The call for SMEs demonstrated that VREs are valuable tools for SMEs and that SMEs are interested in these kind of tools. The call for SMEs required a huge dissemination and management effort. In the future it would be good to include such process as a part of the workplan and allocate some financial resources to
the winning SMEs. This will facilitate their participation. The call needs also to be planned from a consortium perspective as in many cases SMEs are not familiar with e-infrastructures and considerable time has been spent by the consortium in understanding the requirements of the companies and in explaining how to address them with the e-infrastructure resources. In many cases ad hoc implementations have been requested but unfortunately the project could not implement them with the existing financial resources.

A Datathon is an excellent opportunity to meet people, projects, results (data and services) from different domains and provide promising outcomes for further development. It additionally provides the framework for combining the needs and answers in a very cooperative environment. New technologies become familiar to a wider audience of varying expertise and backgrounds and new synergies evolve.

The Datathon proved to be an innovative, interactive and user-friendly approach to convince students, researchers and managers from thematic areas unfamiliar with ICT, to use and exploit the up-to-date data models and services made available by BlueBRIDGE for their needs.
INTRODUCTION

"Is face to face training better than e-training, webinars and open educational resources? In a similar vein, attracting users from outside the consortia might be easier if training material are easily available anywhere and anytime and possibly free of charge."

This was one of the recommendations that the BlueBRIDGE reviewers gave at the first interim review. The WP3 partners carefully thought about this recommendation and re-thought the methods adopted for knowledge transfer always keeping in mind that “Training” in BlueBRIDGE has two different meanings:

1. **Support to new forms of education in the domain areas addressed by the project, e.g. stock assessment.** This is the objective of WP8 that aims at offering new environments and technological instruments to teachers and students of domain specific courses. WP8 aims at injecting the new technological environments (i.e. VREs and e-Infrastructure capabilities) in the context of existing thematic courses, like those periodically organised by ICES, IRD and FAO. The new technologies replace the ones traditionally used by teacher and students. The overall aim is: (i) to simplify the task of the teachers in preparing the hands-on-environment; (ii) to enable them to focus their course on the scientific aspects omitting the explanation on how to set up the technological environment that is now transparently set up and (iii) to educate the students to better exploit the innovative capabilities made available by the e-Infrastructure to achieve a better scientific performance (the results of this activity are reported in D8.2 Blue Skills Activity: Final Report).

2. **Training on the use of the BlueBRIDGE solutions to stimulate uptake of the results and explain how to use them.** This is the objective of WP3. This training concerns the production of training material aimed to educate the BlueBRIDGE users on what are VREs, and the infrastructure behind them, and how they can access and use VREs, highlighting what are the benefits in adopting them and the delivery of training such as webinars and workshops. In addition, as SMEs have been identified as a potential target user of the BlueBRIDGE solutions, the activities related to the engagement of the SMEs are also part of this type of training.

The BlueBRIDGE partners agreed that e-training could have been more effective that physical meetings and it could have allowed potential users to save money. This is why the activities from M16 to M36 focused on:

- The organisation of webinars
- The production of training material
- The launch and implementation of the call for SMEs
- The organisation of an RDA-BlueBRIDGE datathon

The following chapters summarise the activities that have been performed by BlueBRIDGE between M16 and M27 and the related results and lessons learnt.
In the period, 8 BlueBRIDGE webinars have been organised\(^1\). Each webinar consisted of one hour session composed by a 40-minute live presentation/demo and by 20 minutes dedicated to questions and answers. The formula worked very well as at the end of the live presentation/demo, many questions were asked and interesting discussions took place. The discussions were useful for BlueBRIDGE to collect feedback on the services and to engage more users (At the end of each webinar new registrations and accesses to the VREs were recorded).

Overall the webinars attracted around 300 relevant stakeholders.

### 2.1 WEBINAR OVERVIEW

#### 2.1.1 USING E-INFRASTRUCTURES FOR BIODIVERSITY CONSERVATION

**When:** 30 May 2017

**BlueBRIDGE partners involved:** CNR & TRUST-IT

**Webinar description:** An e-Infrastructure is a distributed network of service nodes, residing on multiple sites and managed by one or more organizations. E-Infrastructures allow scientists residing at distant places to collaborate. They offer a multiplicity of facilities as-a-service, supporting data sharing and usage at different levels of abstraction, e.g. data transfer, data harmonization, data processing workflows etc. E-Infrastructures are gaining an important place in the field of biodiversity conservation. Their computational capabilities help scientists to reuse models, obtain results in shorter time and share these results with other colleagues. They are also used to access several and heterogeneous biodiversity catalogues. This webinar focused on how the BlueBRIDGE e-Infrastructures and Virtual Research Environments can enable data sharing and experiments reproducibility and repeatability in the biodiversity conservation field. Examples of tools that can be adopted by the audience were also showcased. Webinar contents in brief:

- e-Infrastructures and Virtual Research Environments
- Geospatial data visualization and representation
- Statistical models for species distribution modelling
- Accessing large heterogeneous biodiversity data catalogues
- Signal processing of biodiversity-related observations
- Machine Learning applied to species observation records
- Lexical search in large taxonomic trees
- Cloud computing applied to biodiversity analyses

**Outcomes:** Around 70 participants attended the webinar.


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\(^1\) [http://www.bluebridge-vres.eu/webinars](http://www.bluebridge-vres.eu/webinars)
2.1.2 SEMANTIC INTEGRATION OF MARINE DATA

When: 28 June 2017

BlueBRIDGE partners involved: FORTH & TRUST-IT

Webinar description: Every day we produce huge amounts of data of various types and purposes, however these data are not integrated. Data integration aims at combining data residing in different sources and providing users with a unified view of these data. The unified view enables answering queries and discovering insights which are not possible to obtain from individual sources. Data integration is significant in a variety of situations and of paramount importance for e-science especially for large-scale scientific questions such as global warming, invasive species spread, and resource depletion.

This webinar described the motivation for semantic integration of data, its difficulties, the related requirements and tasks, the main approaches for integration, and then it focused on case studies of marine data coming from the ongoing BlueBRIDGE project as well as from previous projects in the same area (the completed EU research infrastructure project iMarine). A process for constructing semantic warehouses of marine data was introduced, a process that comprises various steps including ontology-engineering, schema mapping, entity matching, provenance management, and quality testing. Finally, the webinar discussed the exploitation of such semantic warehouses, as well as future steps and open challenges.

Outcomes: Around 40 participants attended the webinar.


2.1.3 NEW TECHNOLOGIES FACILITATING THE MANAGEMENT AND ASSESSMENT OF DATA-LIMITED FISHERIES

When: 18 October 2017

BlueBRIDGE partners involved: FAO

Webinar description: The webinar highlighted what are the growing need for data-limited methods and the limitations of currently available tools and then explored the iMarine/BlueBRIDGE solutions as a unifying framework for reproducibility. A specific focus was put on CMSY and the DLMtoolkit.

Outcomes: The webinar was delivered internally at FAO and attended by around 20 participants.

More information: http://www.bluebridge-vres.eu/training-material#576

2.1.4 A WEB-APPLICATION TO UNDERSTAND ECOLOGICALLY IMPORTANT SEAFLOOR FEATURES IN MARINE PROTECTED AREAS

When: 9 November 2017

BlueBRIDGE partners involved: GRID-Arendal & TRUST-IT

Webinar description: The protection of the marine environment is important to ensure that there are marine resources for future generations. Marine Protected Areas (MPAs) are a key management tool to support the conservation of marine resources. The Convention of Biological Diversity Aichi target 11 states that by 2020, at least 10 per cent of coastal and marine areas, especially areas of particular importance for
biodiversity and ecosystem services, are conserved through ecologically representative and well-connected systems of protected areas.

To assist managers to understand the ecologically important seafloor features represented within their MPAs and to plan for the development of future MPAs, BlueBRIDGE has released the Protected Area Impact Maps Virtual Research Environment (PAIM VRE), a VRE developed with GRID-Arendal and FAO of UN to improve the understanding of the spatial distribution of existing and planned MPA’s and their coverage of seafloor features. The PAIM VRE lets users analyze global data on marine protected areas in relation to important seafloor features such as seamounts, canyons, seagrass and mangroves.

In this webinar, GRID-Arendal introduced the PAIM VRE, how it was built, and how it can be used to support the development of marine protected areas. The webinar also discussed the underlying data used by the VRE and explained how open source software and the BlueBRIDGE e-infrastructure have been used to develop spatial analytical algorithms and the PAIM VRE reporting interface.

**Outcomes:** Over 50 participants attended the webinar.


### 2.1.5 NEW GENERATION TOOLS FOR AQUACULTURE

**When:** 22 November 2017

**BlueBRIDGE partners involved:** I2S, UOA & TRUST-IT

**Webinar description:** Aquaculture is the fastest growing animal food production sector in the world with continuously and rapid increase global production. However, the environment in which the aquaculture companies operate is highly competitive with limited margin for profit. All aquaculture producers have to face specific challenges concerning the improvement of the performance of their companies in terms of cost, feed conversion, growth rate and mortality. Simultaneously, their decisions should be sustainable and environmental friendly. Small mistakes can make the difference from profit to loss. Using the services provided by BlueBRIDGE, aquafarmers can estimate the performance of their production exploiting state of the art Machine Learning methods based on the real historical production data. Furthermore, they are able to make accurate production plans, future investment plans by exploiting the geoanalytics platform and techno-economic analysis combining production, financial and environmental data. In this way, they can make correct and timely decisions strengthen their aquaculture's position against competition.

The webinar gave an overview of the BlueBRIDGE services supporting aquaculture.

**Outcomes:** Over 50 participants from around Europe attended the webinar.

2.1.6 MANAGING TUNA FISHERIES DATA AT A GLOBAL SCALE: THE TUNA ATLAS VRE

When: 18 January 2018

BlueBRIDGE partners involved: IRD & TRUST-IT

Webinar description: Good management of fisheries stocks relies on good scientific advice. Assessing the status of the stocks requires the analysis of multiple data, often produced or collated by various organizations. In absence of efficient ways to locate, access and combine these datasets, their use might be limited to only few scientists. However, the more scientists use the data, the better the scientific advice is likely to be.

How to enable scientists locate and access the relevant data? How to help them crossing and analyzing the data that comes from various sources? How can they share the results of their work in efficient, transparent and reproducible ways?

Tuna fisheries are a good case study: though global, they are managed at regional scale - and so are the associated data with different data structures. We have collated, harmonized and stored within a single database the multiple public domain datasets coming from the various organisations that manage the fisheries. In this webinar, BlueBRIDGE presented the Tuna Atlas VRE that uses the example of the Tuna fisheries to answer these questions related to open science and reproducibility. It was presented how, through the VRE, users can easily produce their own datasets of tuna fisheries at regional, multi-regional or global scale. It also showcased how the VRE can enable the sharing of datasets in ways that allow other users to access, process and visualize them efficiently. Last but not least: because new data are always produced - as long as there will be fisheries, there will be data - it is crucial to be able to update the database periodically. BlueBRIDGE demonstrated how the reproducibility of the work can be ensured.

Outcomes: The webinar was successful with 46 attendees from around Europe.


2.1.7 THE GLOBAL RECORD OF STOCKS AND FISHERIES

When: 25 January 2018

BlueBRIDGE partners involved: FAO & TRUST-IT

Webinar description: The Global Record of Stocks and Fisheries (GRSF) was created as part of the BlueBRIDGE project by FAO and partners as a key collaborative instrument to collectively support the global monitoring of fish stocks and fisheries status. It has been established as a Virtual Research Environment (VRE) for fish stock and fisheries information, metadata, and related-tools in the iMarine e-infrastructure, which FAO has been co-developing in partnership for 10 years. GRSF relies on a robust IT platform (D4Science) that offers a great potential for future evolutions and functionalities development, beyond the main features that were implemented during the lifetime of BlueBRIDGE.

GRSF is designed to handle the information on stock monitoring that countries perform directly or through the Regional Fishery Bodies (RFBs). GRSF contributes to enhance the global monitoring by i) collating records from either national or regional sources, ii) organizing and storing stock information according to specific data standards and protocols which allow comparability between records and consistency of the database, and iii) assigning and publishing Global Unique Identifier for single stock standard identification.
GRSF has already gathered and organized about 3,000 stock records from 3 participating partners’ data sources. The quality control and information cleaning work is in progress (e.g., identifying/connecting duplicates), and about 2,000 records for unique stocks are expected at the end of that process.

Many stakeholders from industry, NGOs, technology companies, etc. believe the success of technology companies to develop seafood traceability solutions to meet the future global demand is based on standardized fishery identifiers. To this end, about 9,000 fishery records (fishing operations) have been also gathered through the collation, processing and harmonization of source records. Likewise for Stocks, the final published number of fishery records is expected to be lower.

The GRSF proposes a global standard for Unique Identifiers of stocks and fisheries: i) a Universally Unique Identifier, machine readable code to respond to whatever global IT standard, and ii) a Semantic Identifier, human readable code with standard codes and labels.

A standardized and globally-accepted identifier system that could be used by managers, scientists, the seafood industry, and will help support (and evolve with) increasing demands and trends towards traceability, including a database of machine-readable unique identifiers for individual fisheries that other systems can pull from. The main technical challenge is the harmonization of the different existing standards (international, regional and national) from different data sources.

This comprehensive and transparent inventory of stocks and fisheries records across multiple data providers is expected to boost stocks and fisheries status and trend monitoring and promises to stimulate responsible consumer practices.

FAO with the GRSF partners is currently working on sustainable aspects to further develop the GRSF after the end of the BlueBRIDGE project.

This webinar presented the online catalogue of stocks and fisheries and focus on the methodology used to build the database (selection of data standards, unique identifiers logic, associated information to stock and fisheries).

**Outcomes:** The webinar was attended by 46 participants.


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**2.1.8 INNOVATIVE SERVICES TO MONITOR THE SPATIAL DISTRIBUTION OF HUMAN ACTIVITIES**

**When:** 2 February 2018

**BlueBRIDGE partners involved:** CLS & TRUST-IT

**Webinar description:** In the context of the Blue Growth strategy, the need for services that collect and combine Environmental Observation (EO) data with aquaculture data has been identified by the EU. In this context, fundamental services are needed to monitor the spatial distribution of human activities including aquaculture and fishing, allowing for performance analysis based on environmental and socio-economic indicators. This webinar highlighted three VREs developed by BlueBRIDGE that support a computing intensive ontology driven feature analysis of Synthetic Aperture Radar (SAR) and multispectral optical imagery (using Sentinel-1 and -2 data, and Very High Resolution optical imagery), where the results are displayed on maps for human reviewers. The first two VREs are specialised in recognizing offshore fish
farming in Greece and Malta, whilst the second is specialized in identifying coastal aquaculture ponds in Indonesia.

**Outcomes:** The webinar was attended by around 50 participants.


### 2.2 LESSONS LEARNT

The webinars are considered by the BlueBRIDGE consortium a best practice for boosting knowledge transfer in an innovative way (as reported in D3.5 Best Practices: final report). The webinars allowed the project to engage around 300 international stakeholders in a cost-effective way. Many of the attendees to the webinars registered to the BlueBRIDGE VREs right after the session becoming users of the BlueBRIDGE infrastructure.
3 PRODUCTION OF TRAINING MATERIAL

Between M16 and M36 the project worked to make available training material aimed at educating the BlueBRIDGE users on what are VREs, and the infrastructure behind them, and how they can access and use VREs, highlighting what are the benefits in adopting them.

The “Tutorials” section available on the BlueBRIDGE website (http://www.bluebridge-vres.eu/training-material) collects all the training material for the BlueBRIDGE users. Specifically it includes:

- BlueBRIDGE Demo "Analysis of a species distribution"
- Using e-infrastructures for Biodiversity Conservation
- Semantic Integration of Marine Data
- BlueBRIDGE general introduction
- PAIM: the Protected Area Impact Maps Virtual Research Environment
- New generation tools for Aquaculture
- Managing tuna fisheries data at a global scale: the Tuna Atlas VRE
- Innovative services to monitor the spatial distribution of human activities
- GRSF
- New technologies facilitating the management and assessment of data-limited fisheries
- Introduction to VREs for training courses

In addition to the above mentioned material, ICES, in collaboration with DTU, the Danish Technical University a renowned international university, leading in technical and natural sciences, produced an online training course as an introduction to oceanography. The course has been produced leveraging on the functionalities of the BlueBRIDGE VREs and has been co-funded by DTU. The collaboration entailed the generation of the online course from scratch, from identifying a curricula, instructors, modules and the practicalities of putting the course together.

This course is primarily aimed to be used by DTU students, especially those on a bachelor level, as an introduction to the topic of oceanography. The course will also be used by the ICES community, and the general public, as it will be openly available for all. The course is a recording, so it can be played at any time, and in any time zone. As such it is potentially a very long-lived product of the BlueBRIDGE project.

The course is currently under approval from the ICES science committee (SCICOM). Once the course is approved it will become part of the BlueBRIDGE training repository.

3.1 LESSONS LEARNT

The webinars were a really cost-effective way to produce online training materials. All the recordings of the webinars have become part of the “Tutorials” section of the BlueBRIDGE website.
One of the objectives of BlueBRIDGE WP3 was to ensure the active engagement of at least 5 SMEs during the project lifetime. The importance of engaging the private sector was also remarked by the reviewers at the first BlueBRIDGE interim review. To achieve this objective in March the BlueBRIDGE WP3 launched a Competitive Call for SMEs (www.bluebridge-vres.eu/call4smes). The scope of the call was to concretely support 5 European SMEs in addressing data management challenges that required collaboration between different actors (e.g. data providers, customers of the SMEs, external experts, scientists or consultants) and integrated data management solutions which combined different technologies and resources.

As this activity was not originally planned no funding were available to support the work of SMEs making this call very challenging.

The results of the call were very positive as 5 SMEs were selected.

- **AquaBioTech Group**, an international research and development, engineering, technology provider and consulting company located in Malta. The AquaBioTech Group undertakes a variety of aquaculture, fisheries, marine surveying, aquarium and aquatic environmental projects through its regional offices and partners throughout the world. The vast majority of the company’s work is related to the marine or aquatic environment, encompassing aquaculture developments, market research / intelligence, through to project feasibility assessments, finance acquisition, project management, technology sourcing and technical support and training.

- **Flyby**, an independent Italian company, specialized in the development of Decision Support Systems exploiting edge technologies in the field of Remote Sensing, Signal Processing and Big Data Analytics. The company has been founded in 2001 with the aim to develop innovative solutions exploiting data analytics. Flyby operates in five different business sectors (Defence, Space, Health, Maritime & Fishing, Energy).

- **Kamahu**, a French start-up created at the beginning of 2017 in order to conceive and market farm control SAAS solutions for the aquaculture industry wanting to offer benchmarking services to its clients.

- **Sinay**, a French Environmental Consulting company specialised in underwater acoustics, maritime surveillance and fishery science. Founded in 2008, the company provides a wide range of services such as environmental impact and risk studies related to human activities in the oceans, marine wildlife population surveys and fish stock assessments.

- **StatnMap**, a French micro-enterprise providing tutorials and expertise in statistics, modelling, spatial data analyses and mapping for beginners or advanced users from universities, research laboratories and companies. The main field of expertise is marine and aquatic ecology.

The BlueBRIDGE partners collected and analysed their requirements and created a virtual research environment that the SMEs have used for the full duration of the BlueBRIDGE project (until Feb 2018). In this period the SMEs were able to learn how to use VREs, test their functionalities and therefore understand the benefits that they can get.

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2 the number has been chosen on the basis of the effort that the project has available - the call was originally not planned in the DoA
To engage SMEs the project did a huge effort in promotional and stakeholder engagement activities leveraging on the European Marine & Maritime Business & Innovation Clusters network (beside the Pole Mer Bretagne, which is a partner in the project, BlueBRIDGE established synergies with the UK Marine South East cluster and the Portugal Association of the Sea Economy).

The SMEs were interested in exploiting the VREs mainly for two different purposes: (i) they wanted to use the data, the models and the resources made available by BlueBRIDGE and (ii) they were interested in BlueBRIDGE to enhance their new commercial solutions.

The results of the pilot were overall positive: the companies aiming at exploiting the existing BlueBRIDGE resources (data, models and computing resources) were able to do that and provided positive feedback as they were able to access resources in an easy and quick way. They used BlueBRIDGE to support their daily work. The companies that were aiming at more customised solutions had to reach a compromise as the effort required for the customisation (for example the creation of new models with the support of BlueBRIDGE) was not affordable for the BlueBRIDGE partners. In this case they were simply trained on the potential of the BlueBRIDGE platform.

4.1 LESSONS LEARNT

The call for SMEs demonstrated that VREs are valuable tools for SMEs and SMEs are interested in these kinds of tools. The call for SMEs required a huge dissemination and management (after the selection of the SMEs) effort. In the future it would be good to include such process as a part of the workplan and allocate some financial resources to the winning SMEs. This will facilitate their participation. As a matter of fact one of the main barrier emerged during the numerous phone calls that the consortium had with candidate SMEs during the call promotion period was that SMEs do not have resources to allocate to run these pilots. The call needs also to be planned from a consortium perspective as in many cases SMEs are not familiar with e-infrastructures. Considerable time was spent by the consortium in understanding the requirements of the companies and in explaining how to address them with the e-infrastructure resources. In many cases ad hoc implementations were requested but unfortunately the project could not implement them with the existing financial resources.
On 15 and 16 June 2017, more than 70 data enthusiasts came to Heraklion, Crete, to participate in the RDA Europe-BlueBRIDGE datathon for fisheries and aquaculture. The event was kindly hosted by the Institute of Marine Biology, Biotechnology and Aquaculture of the Hellenic Centre for Marine Research (IMBBC/HCMR) and allowed participants to brainstorm on three main challenges:

- Developing a holistic approach to spatial planning for marine protected areas based on knowledge transfer and integration
- Assessing new fisheries and aquaculture activities and mainstreaming environmental and socio-economic indicators
- Incorporating socio-economic and environmental data in aquaculture assessment, strategic planning and performance analysis

After a first introductory session chaired by Yannis Ioannidis, President and Gen. Director, Athena RIC, and Professor of Informatics at the National and Kapodistrian University of Athens, six initiatives, including EMODnet, the RDA Geospatial Interest Group and Fisheries Data Interoperability Working Group, LifeWatchGreece, the PHYSIS project and BlueBRIDGE presented their tools and datasets. All the presentations are available here.

Copernicus, EMODnet, BlueBRIDGE, FAO, Eurostat, Natura2000 were among the relevant datasets that were made accessible through the BlueBRIDGE e-infrastructure. The participants formed eight working teams, registered to the Virtual Research Environment set up by BlueBRIDGE for the datathon and started brainstorming how to exploit the datasets and the provided tools.

On the second day, the working teams presented their idea to the Datathon evaluation committee. Three teams were awarded.

The Datathon was a unique occasion to stimulate an interesting debate on the different datasets and to fuel new thinking in the holistic analysis of satellite, environmental, biological and socio-economic data and the interactions between fisheries, aquaculture and the marine spatial planning.

But it doesn’t stop there: the datathon allowed BlueBRIDGE to strengthen the collaboration with the Research Data Alliance initiative and with EMODnet, the European Marine Observation and Data Network and to establish new synergies with LifeWatchGreece and the Physis project.

The collaboration went a lot beyond as during the datathon preparation phase the different initiatives worked together to integrate their datasets in the BlueBRIDGE infrastructure. This work allowed BlueBRIDGE to enhance its offer and helped all the other initiatives to raise awareness to their data and services offer attracting new users.

As a result of this work chemical and physical observed ocean variables (e.g. apparent and dissolved oxygen, chlorophyll, mole concentration, salinity, silicate, and many more) from the Copernicus Marine Environmental Monitoring System, the World Ocean Atlas, and other international initiatives are now easily accessible.

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accessible, either via standard protocols or via a portal. These variables are accessible with a unique account together with biological and ecological datasets distributed by the Global Biogeographic Information System and the Global Biodiversity Facility, scientific and technical information about the status of fish stocks and fisheries (covering more than 90% of the global fisheries activities world-wide), anonymised information about production and productivity of aquaculture companies. The spectrum of the datasets accessible is even larger thanks to the collaboration with EMODnet (bathymetric survey data, digital terrain model for European sea regions), FAOStat service (food and agriculture data for over 245 countries from 1961 to the most recent years), Eurostat (agricultural and economical indicators), Natura2000 (protected areas and habitats), EMODNET Seabed Habitat (classified habitat descriptors), World Database of Protected Areas (global spatial dataset of terrestrial and marine protected areas), and many others.

Figure 1: Datathon participants

5.1 LESSONS LEARNT

A Datathon is an excellent opportunity to meet people, projects, results (data and services) from different domains and provide promising outcomes for further development. It additionally provides the framework for combining the needs and answers in a very cooperative environment. New technologies become familiar to a wider audience of varying expertise and backgrounds and new synergies evolve.

The Datathon proved to be an innovative, interactive and user-friendly approach to convince students, researchers and managers from thematic areas unfamiliar with ICT, to use and exploit the up-to-date data models and services made available by BlueBRIDGE for their needs.
6 CONCLUSIONS

The knowledge transfer task in the first period of the project primarily focused on the “knowledge transfer” towards the member of the PMBret network, which represents a good sample of the BlueBRIDGE stakeholders, and on the organisation and promotion of university training courses to raise awareness about the BlueBRIDGE infrastructure and capabilities (see the list of performed courses at the following webpage http://www.bluebridge-vres.eu/training-courses). The second period was dedicated to extend the knowledge transfer activities to the widest number of relevant stakeholders mainly via the delivery of online trainings. This choice was successful as a high number of stakeholders have been engaged and the online material produced will be useful to further disseminate the project after the end of the project. The tutorials and the demos made available constitute the BlueBRIDGE legacy for future potential users. The collaboration with the Business and Innovation clusters was very fruitful in terms of engagement of SMEs and the call for SMEs can be considered a successful pilot to be replicated in new projects.