BlueBRID/GE

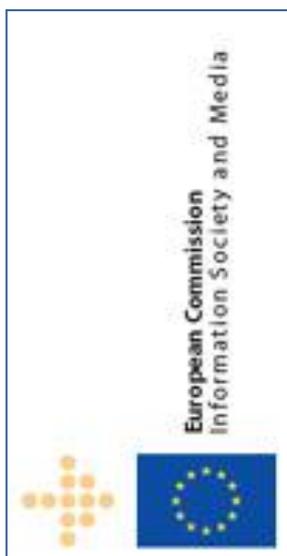| Project Acronym	*BlueBRIDGE*
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DISCLAIMER

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

ABBREVIATION	DEFINITION
BlueBRIDGE	Building Research environments for fostering Innovation, Decision making, Governance and Education to support Blue growth
CNR	Consiglio Nazionale delle Ricerche
FAO	The Food and Agriculture Organisation of the United Nations
ICES	The International Council for the Exploration of the Sea
IRD	Institut de Recherche pour le Developpment
UOA	University of Athens
VRE	Virtual Research Environment

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DELIVERABLE SUMMARY

This deliverable contains an overview of the plan, the progress, and the actions taken to transfer knowledge from the project consortium to the BlueBRIDGE stakeholders and to train potential users. It reports on the outcomes of the local f2f workshops, the courses foreseen in WP8 and an overview of relevant training material developed. It contains an overview of the tools and methodologies used in training and knowledge transfer, the audience reached, and feed-back and results collected.

This deliverable also sets the scope for the final iteration of this document, D3.7 Training and knowledge transfer: Final Report which is due in Month 30.

EXECUTIVE SUMMARY

One of the key objective of BlueBRIDGE is 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. Education in BlueBRIDGE is structured according to two different types of activities: training and knowledge transfer.

Training refers to all the activities that involve the education of the users on the usage of the BlueBRIDGE tools and infrastructure; pre-requisite to classify one activity as a training is the real usage of the BlueBRIDGE capabilities and resources (mainly WP8 activities). Knowledge transfer refers to all the activities that are fundamental to educate the users on the challenges surrounding BlueBRIDGE, on the benefits that they can get from the usage of the BlueBRIDGE services and on the capabilities that the BlueBRIDGE technology can offer them. This kind of activity is in between training (like the one performed in WP8) and communication and its main purpose is to set the basis to stimulate the usage of the BlueBRIDGE services by educating the relevant stakeholders, especially those that are not very familiar with this type of innovative technologies such as small and medium enterprises (SMEs).This deliverable reports on the outcomes of the training courses foreseen in WP8, of the knowledge transfer f2f workshops foreseen in WP3, and provides an overview of the training material developed so far.

Overall in the period:

- **13 WP8 courses have been completed involving more than 150 participants; s**everal VRE's were delivered targeting training courses and a lot of feedback have been collected of which some of them became specifications for the VRE developers;
- **7 main f2f knowledge transfer workshops for Blue Growth and the research sectors have been performed engaging more than 280 participants**
  - a **first workshop to engage the members of the PMBret** was held and **one expression of interest for the BlueBRIDGE call for SMEs has been collected**.
  - the **eTraining section of the BlueBRIDGE website has been setup** and **populated** with a demo, a general intro presentation on BlueBRIDGE, four presentations on how BlueBRIDGE can support stock assessment and one on how can support aquaculture.

For the remaining months of the project activities will focus on:

  - launching the call for SMEs (January 2017) to move the SMEs engagement from a local (France) to a European level;
  - organising knowledge transfer workshops for the research and Blue Growth sectors to promote the BlueBRIDGE opportunities and WP8 courses to support scientific trainings;
  - enriching the eTraining section.

In month 30 (February 2018) the D3.7 Training & Knowledge Transfer: Final Report will be delivered.

1   IDENTIFYING COMMUNITY NEEDS & TARGET TRAINEES

One of the key objective of BlueBRIDGE is 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. Education in BlueBRIDGE is structured according to two different types of activities: training and knowledge transfer.

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The BlueBRIDGE consortium partners identified their training and knowledge transfer needs at a high level in the project proposal. Between M1 and M15 of the BlueBRIDGE project, these needs were further specified within each of the Blue Pillar (WP5 Blue Assessment, WP6 Blue Economy, WP7 Blue Environment and WP8 Blue Skills) capturing those that are most relevant for the stakeholder targeted by BlueBRIDGE.

Training and knowledge transfer topics and methodologies To put in place effective training and knowledge transfer activities, early in project partners agreed on the topics and the different methods that would have been adopted in the project.

For what concerns the topics the list below, already reported in MS12, gives an overview of the different thematic areas that will be in scope for the training and knowledge transfer activities:

- Overview of the BlueBRIDGE project

- The underlying infrastructure of BlueBRIDGE

- Key concepts related to e-infrastructure, data infrastructure and VREs

- How to use BlueBRIDGE Virtual Research Environments (VRE)

- Business benefits of BlueBRIDGE VREs

- Domain specific material related to Blue Growth (coming from the WP8 courses)

- Hands on training & exploitation of the BlueBRIDGE infrastructure (WP8 courses)

Regarding the methodologies to deliver the training, the project partners agreed that the most effective way for them to educate stakeholders is through training workshops and webinars, and through the set up of an e-Training area on the BlueBRIDGE website.

Training workshops & webinars

This set of activities includes the following instruments:

- *WP8 courses*: WP8 courses will be clearly part of the BlueBRIDGE training programme as they are a way to promote the adoption of the BlueBRIDGE technologies and solutions. The purpose of the WP8

courses (often building on outputs from WP5; Support to Stock Assessment) is to provide training on community identified needs based on data and data services made available as VRE's or made available through the BlueBRIDGE infrastructure. Training course can be completely focused on the use and exploitation of infrastructure based services, adapt existing training courses to exploit BlueBRIDGE data services, or use the infrastructure as a support infrastructure. There is a gradual increase of engagement needed for communities, and through using the infrastructure as a support to existing training efforts, the consortium members and the communities can familiarize with BlueBRIDGE concepts and data services and identify specific opportunities based on BlueBRIDGE data services.

- *F2f training workshops:* During the BlueBRIDGE project several training workshops will be organised. The main purpose of these f2f workshops is to engage with a target audience that is not yet fully familiar with the concepts and technologies made available through the BlueBRIDGE project. As special focus is placed on the education of the members of the PMBret Innovation cluster, especially to engage SMEs, specific f2f training workshops with the PMBret members will be also organised.

- *Webinars:* Two webinars will complement the knowledge transfer activity in order to educate a wider audience. Specific media channels (e.g. Channels.org, BrightTalk) will be used.

eTraining

In order to support communities with the exploitation of the infrastructure, training materials are developed that guide the completion of specific tasks using VRE's and data services; a key activity for WP3.

A dedicated area on the BlueBRIDGE website (www.bluebridge-vres.eu/training-material) has been created at the beginning of the project and it is constantly populated with relevant material including presentations, demos and web links to relevant documents.

2   TRAINING AND KNOWLEDGE TRANSFER COURSES

This chapter summarizes the BlueBRIDGE training and knowledge transfer courses between M1 and M15.

2.1   WP8 COMPLETED COURSES

The table below reports all the completed WP8 training courses that were held between M1 and M15. As already specified at the beginning of this document these courses are only those that have really exploited the BlueBRIDGE infrastructure that is a specific VRE has been created.

Training Course	Topic	Organiser	Date & Location	Participants
Data-limited stock assessment training course	Stock assessment	International Council for the Exploration of the Sea(ICES)	12-16 Sep, Reykjavik, Iceland	21 students, 4 instructors
Design and analysis of catch sampling programmes	Design and Analysis of Statistically Sound Catch Sampling Programmes	International Council for the Exploration of the Sea(ICES)	12-16 Sep, Copenhagen, Denmark	10 students, 2 instructors
Ecopath with Ecosim (EwE) webinar by Villy Christensen	Ecological/ecosystem modeling tools	BlueBRIDGE	20 Jun, Webinar @ CNR	10 (5 present, 5 on-line)
PhD Course - "Signal Processing and Mining of Big Data: Biological Data as a Case Study"	Signal processing and mining of big data	Italian National Research Council (ISTI-CNR)	2-6 May, Pisa, Italy	15 students 1 instructor
Course on the BlueBRIDGE e-Infrastructure	e-Infrastructures and Virtual Research Environments; Geospatial data visualization and representation; Accessing to large heterogeneous biodiversity catalogues	Italian National Research Council (ISTI-CNR)	12-13 April, Pisa, Italy	6 students 1 instructor
EwE Course Hobart 2016	Ecopath with Ecosim (EwE) modeling approach, new features of EwE, how BlueBRIDGE can support EwE	Ecopath with Ecosim (EwE)	7-11 Mar, Hobart, Tasmania, Australia	28 participants
Training course in the R environment	R environment	International Council for the Exploration of the Sea(ICES)	29 Feb- 4 Mar, Copenhagen, Denmark	24 students 2 instructors

Analysis and Design of information system	e-infrastructures, VREs in general and on infrastructures' architecture and standards	National Technical University of Athens (NTUA)	25-28 Jan, Athens, Greece	50 students
Course on the BlueBRIDGE e-Infrastructure	Produce species maps; Analyse species observation trends; Inspect occurrences; Geo-spatial data visualization and access; Data mining of occurrence records	Italian National Research Council (ISTI-CNR)	25 Nov 2015, Paris, France	Around 30 students
IOTC WPDCS12 12th Working Party on Data Collection and Statistics	Access Tuna Atlas with VREs, Ichthyop, Stock Assessment ScientistsTuna Atlas & Stock Assessment VRE	IRD	28/11/2016 to 30/11/2016 (Full days), Seychelles	NA
ICCAT BFT-E Stock Assessment Working group	Stock Assessment VRE	IRD	September 2016 Madrid, Spain	30 Scientists
IOTC WPM07Seventh Working Party on Methods	Example of BFT-E, sensitivity test	Victoria, Seychelles	05/11/2016 (All day) to 07/11/2016 (All day)	20 Scientists
EwE Course Barcelona 2016	Capabilities to access biological resources online (FishBase, SeaLifeBase, OBIS, GBIF) in addition to Aquamaps and FAO species distribution maps within the Ecospace spatial-temporal modelling capability of the software.	Ecopath with Ecosim (EwE) / Institute of Marine Sciences, Barcelona, Spain	30th May – 3rd June 2016	~ 20 Students (No VRE, only data and access)
EwE Course Natal 2015	Ecopath with Ecosim (EwE) modeling approach, new features of EwE, how BlueBRIDGE can support EwE	Ecopath with Ecosim (EwE)	14-18 Sep 2015, Brasil	15 students (No VRE used for training, only for illustration)

Table 1: WP8 completed courses (M1-M15)

2.2   IMPACT OF WP8 COURSES AND RECOMMENDATIONS

The common factor of all the WP8 courses was the usage of the BlueBRIDGE VREs by the course instructors, to prepare the training environment, and by the students during the proper training course. To assess the impact of the usage of the BlueBRIDGE VREs and capabilities to support scientific trainings, feedback have been collected by the users and are reported below.

The use of VREs for training is potentially very powerful when managing course materials, trainees, and the course progress. The courses that rely on the material that is already managed in the infrastructure, such as workspace resources, tabular data, and processes that can be demonstrated through dataminer, can already be exploited. The impact of the use of the BlueBRIDGE services in the courses resulted in a reduced processing time for those that were dealing with computing intensive experiments, improved access to on-line resources (workspace and webservices), in the enrichment of the BlueBRIDGE infrastructure with few integrated and thus repeatable models, and in the availability of some course material.

The trainers made the following recommendations that in some cases have been already transformed into development requirements;

- Improve support to trainers in integrating software; a training of trainers is recommended, especially to port existing software (from e.g. github) to a multi-user environment;
- Ensure the required software is available on-line; e.g. in the case of Ecopath, the courses were planned before the BlueBRIDGE project started, and the models were not available during some courses. The trainers had to limit to a show the capabilities of the infrastructure to access resources;
- Develop training materials for trainers; how to organize an on-line course, how to organize materials and invite participants, prepare course data, and make a course repeatable;
- Develop an 'course appraisal' for trainers to track participants progress, and a feed-back survey;
- Provide a clear overview of legal and copyright issues of material that is hosted in BlueBRIDGE;
- Ensure that the computational needs of a training are known before the training starts.

3   KNOWLEDGE TRANSFER F2F MEETINGS

The training activities performed under WP8 "Support Blue Skills: VREs Development" have been complemented by a set of "knowledge transfer" activities performed under WP3 "Communication, Stakeholder Engagement and Knowledge transfer".

The purpose of the "knowledge transfer" activities part of WP3 is to ensure that the key stakeholders of the project are educated on the services and the benefits in using them. This kind of activity is in between training (like the one performed in WP8) and communication and its main purpose is to **set the basis to stimulate the usage of the BlueBRIDGE services by educating the relevant stakeholders**, especially those that are not very familiar with this type of innovative technologies such as small and medium enterprises (SMEs).

During the first fifteen months of the project a series of activities have been performed in the "Knowledge transfer area" including the organisation of face to face workshops targeting stakeholders working on stock assessment, SMEs and researchers; the preparation of demos and other explanatory training material and the setup of the related Training Material area on the BlueBRIDGE site.

The following paragraph summarizes the activities that have been performed between M1 and M15.

3.1   KNOWLEDGE TRANSFER F2F MEETINGS FOR SMES

Aquafarming / fisheries SMEs, environmental consulting SMEs and ICT SMEs serving the aquaculture sector are among the key stakeholders of BlueBRIDGE as highlighted in D3.1. BlueBRIDGE can support them in their daily business and in expanding their service portfolio (See D3.1).

One of the objectives of BlueBRIDGE is to ensure the active engagement of at least 5 SMEs during the project lifetime. To achieve this objective a set of activities have been performed from M1 to M15 especially with the support of one of the BlueBRIDGE partners: the Pôle Mer Bretagne Atlantique (PMBret). PMBret is the French Business and Sea Innovation Clusters with a network of 400 SMEs.

3.1.1   OUTREACHING SMES

The first step towards the active engagement of SMEs in the project was to work on the messaging to translate the BlueBRIDGE offer in a language understandable by SMEs. See below an example of adapted language to describe the purpose of the project:

*"BlueBRIDGE is dealing with innovative technologies for big data management in the fields of fisheries, aquaculture and environment. BlueBRIDGE is developing tailored made data management **services** operated through collaborative web-based research environments. Started in September 2015, BlueBRIDGE makes already available a set of **functionalities** spanning from data analysis, modelling and forecasting to data publication, map production and more generally data management tools. All these functionalities, combined in different environments, will give life to **tailored services** for stock assessment, aquaculture performance evaluation and protected area impact maps production. These services can be easily used by enterprises that do not have the in house resources to implement the data management tools they need and by many other stakeholders operating in the sectors targeted by BlueBRIDGE. "*

This messaging has been used by PMBret to engage with their network and by partners to communicate with SMEs (for example by UOA and I2S, two partners that mainly work in the area of supporting aquafarming SMEs) and to promote the BlueBRIDGE results to the wider audience (for example through press releases).

The second step was to raise awareness about the BlueBRIDGE offer through a survey that also collected feedback from users in terms of needs and expectations. The survey was published on the BlueBRIDGE website and sent to the Pôle Mer Bretagne Atlantique contact database (including 400 SMEs) on February 2016 and closed at the end of March 2016. Over 200 responses were received (The survey database is available on Zenodo[1]). As the major number of participants come from France, the survey results focus on the challenges that French universities, research institutes, private companies, professional organisations, policy makers and intergovernmental organisations operating in the fisheries, aquaculture and environmental sectors, currently face in the data management field. The survey then explores what are the data services adopted by these stakeholders and sounds their interest in the innovative solutions provided by BlueBRIDGE. The Protected Area Impact Maps Production VRE, that is a VRE to support the efficient and effective production of maps of vegetation types and human impacts on them to enable ecosystem degradation analysis, has been selected as the most promising and interesting VREs for the respondents.

 A complete report on the results of the survey is available on the BlueBRIDGE website[2].

Over 60 private companies completed the survey and almost all of them expressed their interest in subscribing to the BlueBRIDGE newsletter to receive updates on the upcoming developments of the project.

After this step a series of dedicated actions were performed mainly leveraging on the network of the PMBret: several face to face meetings have been organised with fisheries and aquaculture professional organisations (See Deliverable D3.4 Events) and dedicated newsletters in French have been circulated as reported below:

PMBret dedicated newsletters[3]	Date
http://www.pole-mer-bretagne-atlantique.com/fr/actualites/17-international/1741-lancement-bluebridge-des-passerelles-entre-donnees-numeriques-et-professionnels-de-la-peche-et-de-l-aquaculture	October 2015 : KickOff Meeting
http://www.pole-mer-bretagne-atlantique.com/fr/actualites/17-international/1794-europe-le-pole-renforce-son-equipe-sur-le-projet-bluebridge	January 2016 : Description and team involved
http://www.pole-mer-bretagne-atlantique.com/fr/actualites/17-international/1824-quels-sont-vos-besoins-sur-la-gestion-de-donnees-par-l-europe-participez-a-l-enquete-en-ligne-du-projet-bluebridge	March 2016 : Needs and expectations survey
http://www.pole-mer-bretagne-atlantique.com/fr/actualites/17-international/1836-le-pole-mer-bretagne-atlantique-present-aux-european-maritime-day	April 2016 : Workshop at the European Maritime Day
http://www.pole-mer-bretagne-atlantique.com/fr/actualites/12-la-vie-du-pole/1878-seatechweek-du-10-au-14-octobre-a-brest-le-pole-mer-bretagne-atlantique-implique-dans-4-ateliers	September 2016 : Promotion of the SeaTechWeek Workshop

Table 2: PMBret newsletters

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[1] https://zenodo.org/record/60006#.WDVHklwsjND

[2]   http://www.bluebridge-vres.eu/publications/press-releases/bluebridge-online-survey-final-statistical-report

[3] PMBret manages a monthly newsletter dedicated to its membership of 350 and to any other person registered on the website. 10 000 copies are sent per month.

3.1.2 BLUEBRIDGE WORKSHOP "HOW BLUEBRIDGE DATA MANAGEMENT SERVICES CAN SUPPORT THE MARINE & MARITIME SECTOR" AT THE SEATECHWEEK, 13 OCTOBER 2016

All the steps mentioned in the paragraph before were fundamental to achieve a first milestone in terms of engagement of SMEs: the organisation of the BlueBRIDGE workshop co-located with the SeaTechWeek conference, 10-14 October 2016, Brest, France. The event was held from the 11th to the 14th of October, 2016, at the Quartz Congress Center in Brest, France. SMEs, innovation clusters, and research institutes were in attendance at the event. This year, the main focus was on Sea and Digital Technologies, such as monitoring (in situ/remote), data acquisition and transmission, robotics, sensors, modelling, big data, electronic navigation systems and human-machine interface.

The scope of the BlueBRIDGE workshop was to showcase SMEs the early achievements of the project in terms of services. Additionally, during the event, a BlueBRIDGE poster entitled "A Web application to publish R scripts as-a-Service on a Cloud computing platform" was on display.

The workshop's target audience was SMEs, scientists, engineers, decision-makers from private and public institutions and others concerned by data management for aquaculture, fisheries and the environment. Several presentations have been carried out during this event. The purpose was to make attendees understand how they could benefit from BlueBRIDGE in a concrete way:

- How BlueBRIDGE data management services can support the marine & maritime sector (Sara Garavelli[4], Trust-IT Services /Pasquale Pagano[5], ISTI-CNR);
- Use of satellite imagery for the generation of an aquaculture atlas: a case study in Greece (Nicolas Longépé[6], CLS)
- Live demo of BlueBRIDGE services[7] (Pasquale Pagano, CNR-IST)
- Ask BlueBRIDGE: Interactive discussion with BlueBRIDGE experts

The event was also the occasion to anticipate the launch of the call for SMEs that BlueBRIDGE is going to officially launch next January 2017. The scope of the call for SMEs is to select five SMEs that can use the BlueBRIDGE resources and services for free until the end of the project (February 2018) and benefit of the complete support of the project partners in terms of training and capacity building. This will be an opportunity for these SMEs to test the BlueBRIDGE services and to understand the real benefits that they can get out of them. This will be also a test for BlueBRIDGE that through the feedback of these SMEs will be able to understand how to shape its offer to SMEs.

34 people registered to the event, 15 attended the workshop and an expression of interest from a SME specialized in GIS and data management for environment (Terra Maris) for the upcoming call for SMEs has been collected.

Additionally, the workshop was a great opportunity to start a discussion with Canadian attendees from RDC –Research and development Corporation- that were interested in the concept of VRE as they would like to implement a similar project in Canada.

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4   http://www.slideshare.net/BlueBridgeVREs/how-bluebridge-data-management-services-can-support-the-marine-maritime-sector
5   http://www.slideshare.net/BlueBridgeVREs/virtual-research-environments-supporting-tailormade-data-management-services-for-marine-maritime-sector
6   http://www.slideshare.net/BlueBridgeVREs/use-of-satellite-imagery-for-the-generation-of-an-aquaculture-atlas-a-case-study-in-greece
7   http://www.bluebridge-vres.eu/bluebridge-demoanalysis-species-distribution

3.2   KNOWLEDGE TRANSFER F2F MEETINGS FOR BLUE GROWTH & RESEARCH SECTORS

Beside SMEs, WP3 has also starting working on knowledge transfer towards the two other major stakeholders of the projects: stakeholders belonging to the Blue Growth area and stakeholders belonging to the research sector. As in the first fifteen months of the project, VREs were under development the focus of the workshops that have been organised in the period was mainly on:

- Training attendees on e-infrastructures and virtual research environments;
- Educating participants on the benefits of using BlueBRIDGE and what are the challenges that the project can help to address;
- Showcasing some of the functionalities that will be part of the VREs.

Table below summarizes the workshops performed between M1 and M15:

Workshops
Analysis and Design of information system[8] - Topic**: e-infrastructures, VREs in general and on infrastructures' architecture and standards** - Organiser: **National Technical University of Athens (NTUA)** - Date & Location: **25-28 January 2016, Athens, Greece** - Participants: **50 students** - Training Material developed: No Impact/Main Results: Based on prof. Y. Vassiliou interview, by the thorough presentation of the project scope as well as the key points for "**e-infrastructures, VREs in general and on infrastructures' architecture and standards**" "I had the opportunity to give my undergraduate students a thorough presentation of the main ideas and concepts behind the VRE environments using the principles and example from the BlueBRIDGE project research. Apart from the lectures in the undergraduate course, I made a shorter overview presentation to graduate students in a course we gave this fall for the first time, named "Advanced Topics in Data Science". This course's **objective is to utilize advanced technologies, environments, and tools in order to educate and train graduate students in emerging areas and applications related to data modeling, and reasoning on Big Data. In this context, we also incorporate in its curriculum advanced technologies and systems provided by the IBM Watson environment – an environment which is delivered in the same philosophy as a Hybrid VRE. The technology of BlueBRIDGE was helpful for the students of my courses to comprehend the necessary tools, so that they can adjust easier to foreseen cooperation within EU projects (e.g. Horizon). The students participate in a series of EU funded projects in ICT that my Institution (ICCS) coordinates or is a member of the consortia."**
The BlueBRIDGE stock assessment VRE workshop – co-located with the ICES Annual Science Conference 2016[9] - Topic: **Stock assessment VRE** - Organiser: **BlueBRIDGE** - Date & Location: **21 September 2016, Riga, Latvia** - Participants: **15 participants**

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[8] http://www.bluebridge-vres.eu/events/analysis-and-design-information-system
[9] http://www.bluebridge-vres.eu/events/bluebridge-workshop-ices-annual-science-conference

- Training Material developed: **What can «blue» do for you: overcoming ICES challenges with BlueBRIDGE tools[10]; The BlueBRIDGE approach to collaborative research[11]; Western horse mackerel Management Strategy Evaluation, Scott Large, ICES[12]; Ensemble Model, Robert Thorpe, CEFAS[13]; Demo[14]**

Impact/Main Results: The workshop was a great opportunity to showcase the functionalities of the Stock assessment VREs to the members of the ICES stock assessment working group and to collect their feedback that have been taken in consideration for the first official release of the VRE.

BlueBRIDGE: Cloud Infrastructure Serving Aquafarms workshop – co-located with the HydroMediT Conference 2016[15]
- **Topic:** Performance evaluation, benchmarking and decision making in aquaculture**,** Strategic Investment Analysis and Scientific Planning/Alerting
- Organiser: **UoA, i2S and CITE in collaboration with ICRE8**
- Date & Location: **10-12 November 2016, Messolonghi, Greece**
- Participants: **120 participants**
- Training Material developed: **BlueBRIDGE: Cloud Infrastructure Serving Aquafarms[16];**

Impact/Main Results: The participants gained insights on the project's work and outcomes. During the workshop the two BlueBRIDGE virtual research environments (VREs) on Performance evaluation, benchmarking and decision making in aquaculture and Strategic Investment Analysis and Scientific Planning/Alerting were showcased.

Innovative IT solutions to support Data needs for Blue Growth – Google and iMarine examples
- Date   Wednesday July 13th, at 12h30 until 14h00
- Meeting room   FAO HQ, Rome, Sheikh Zayed Center
- Format   A COFI side event; Presentation, followed by interactive discussion with the Panel
- Duration   1h30mn
- Participants   +50 from FAO: FI, OPC, CIO, FO
- **Presenters: Google Ocean and Earth Outreach, BlueBRIDGE-FAO**
- Training Material developed: No

Impact: BlueBRIDGE/FAO and google Earth Engine Outreach team both work the understanding of fishing from a spatial perspective, and already share data and services related to vessel registries, spatial analysis. The meeting showcases to internatial staff and country representatives the benefits of using global and open data (satellite and AIS) to improve the visual representation of fishing, and how these can already be used in marine spatial management.

FAO – IRD at ABNJ meeting (GEF Project)
- Topic: presentat the Open database and common toolbox for tuna fisheries
- Date and location, Rome, 6-7-8 th July 2016
- Participants: 18
- Training material developed; slides

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[10]   http://www.slideshare.net/BlueBridgeVREs/what-can-blue-do-for-you-overcoming-ices-challenges-with-bluebridge-tools
[11]   http://www.slideshare.net/BlueBridgeVREs/the-bluebridge-approach-to-collaborative-research
[12]   http://www.slideshare.net/BlueBridgeVREs/management-plan-evaluation-of-western-horse-mackerel
[13]   http://www.slideshare.net/BlueBridgeVREs/ensemble-multispecies-modelling-and-the-bluebridge-initiative
[14] http://www.bluebridge-vres.eu/bluebridge-demoanalysis-species-distribution
[15] http://www.bluebridge-vres.eu/events/bluebridge-hydromedit-2016-messolonghi-greece-10-12-nov
[16]   http://www.slideshare.net/BlueBridgeVREs/bluebridge-cloud-infrastructure-serving-aquafarms?ref=http://www.bluebridge-vres.eu/news/bluebridge-hydromedit-2016

Impact/Main Results:

The participants learned about the BlueBRIDGE project's work and opportunities. During the f2f meetings the BlueBRIDGE Virtual Research Environment (VREs) for FAO Tuna Atlas, the Saradra R scripts for data ingestion, and the OpenCPU web-based indicator dashboard were showcased.

The meeting recommended that BlueBRIDGE services should target fisheries organization's needs, and these data-services should be useable from remote sites. The approach of Tuan Atlas and OpenCPU indicators was welcomed, if these services can be incorporated in websites.

FAO – FIAF on Invasive species and inland species
- **Topic: BlueBRIDGE Data Services in support of machine learning**
- Organiser: **FAO of the UN**
- Date & Location: **Several F2F meetings to promote infra exploitation**
- Participants: **4**
- Training Material developed: **None, resulted in a workplan to exploit BB Data services**
- Training Material developed: No

Impact/Main Results:

The participants learned about the BlueBRIDGE opportunities for machine learning in the biodiversity domain. One visiting scientist of FAO intends to exploit the data (occurrences) and computing (neural networks etc) to analysis invasive species and impact of dams. The activity will start in December 2016.

In Kind contribution: IRD – Visits to regional Fisheries bodies related to Global Tuna Atlas, Stock Assessment

- **Topic: A series of visits to collect global tuna atlas data**
- **Organiser: Tuna Commissions working groups, IRD, ISSF**
- **Date & Location: Several F2F meetings**
- **Participants: 30 contacts (ICCAT, IOTC VRE members)**
- **Training Material developed: Yes, resulted in a set of R-Code for tuna atlas data ingestion, and requirements for shared tools development based on Sardara; hands on materials based on the Tuna Atlas VRE, R code and infrastructure based Blue-fin Tuna Assessment Tools. Another set of R, Fortran, Latex codes for eastern bluefin Tuna Stock assessment. Another set of Java, R codes for Ichthyop model.**

Impact/Main Results:

The participants learned about the BlueBRIDGE project's work and opportunities. During the f2f meetings the BlueBRIDGE Virtual Research Environment (VREs) for FAO Tuna Atlas, the Sardara R scripts for data ingestion, and the OpenCPU web-based indicator dashboard were showcased. The tuna atlas is now enriched with the R-scripts, and the RFMO's have taken an interst in the indicator dashboard. During tuna RFMOs working group (one in ICCAT, 2 in IOTC, one in IATTC) we showcased the BFT-E Stock assessment VRE as well as Ichthyop model deployed on the infra.

Table 3 Knowledge transfer workshops

4   ETRAINING AND TRAINING MATERIAL

The majority of the P1 VREs has only been released in M15, only one demo and few training material could be developed in P1. This training material is available online in the BlueBRIDGE eTraining section http://www.bluebridge-vres.eu/training-material. The table below reports the material that is now available:

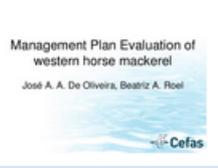| Training Material		topic
	BlueBRIDGE Demo"Analysis of a species distribution" Main topics are: how to generate a species distribution map through species observation data and models, how to create and customize a virtual research environment (VRE) and more.	Demo on the capabilities of the BlueBRIDGE infrastructure to create and customize a VRE; and to generate a species distribution map
	BlueBRIDGE general introduction SlideShare presentation on BlueBRIDGE project: objectives, offers, stakeholder, partners.	BlueBRIDGE general introduction
	Stock Assessment - What can «blue» do for you: overcoming ICES challenges with BlueBRIDGE tools A training presentation by Scott Large, ICES, at BlueBRIDGE workshop on "Data Management services to support stock assessement", held during the Annual ICES Science conference 2016.	BlueBRIDGE solutions supporting stock assessment
	Stock Assessment - The BlueBRIDGE approach to collaborative research Training Presentation given by Gianpaolo Coro, ISTI-CNR, at BlueBRIDGE workshop on "Data Management services to support stock assessement", held during the Annual ICES Science conference 2016.	
	Stock Assessment - Management plan evaluation of western horse mackerel Training presentation given by Scott Large, ICES, at BlueBRIDGE workshop on "Data Management services to support stock assessement", held during the Annual ICES Science conference 2016.	
	Stock Assessment - Ensemble multispecies modelling and the BlueBRIDGE initiative Training presentation given by Robert Thorpe, CEFAS, at BlueBRIDGE workshop on "Data Management services to support stock assessement", held during the Annual ICES Science conference 2016.	
	Aquaculture - BlueBRIDGE: Cloud Infrastructure Serving Aquafarms Training presentation given by Gerasimos Antzoulatos (i2S), Charalampos Dimitrakopoulos (CITE), Eleni Petra (UOA), Stella Tsani (ICRE8) @ 2nd International Congress on Applied Ichthyology and Aquatic Environment "HydroMediT 2016" on 10-12 Nov. 2016 (Mesolonghi, Greece).	BlueBRIDGE solutions supporting aquaculture

Table 4: BlueBRIDGE training material (M1-M15)

5   CONCLUSIONS AND NEXT STEPS

The early results achieved in terms of training and knowledge transfer activities in the first 15 months of the project can be considered quite positive. 13 WP8 courses have been completed involving more than 150 participants and 7 main f2f knowledge transfer workshops for Blue Growth and the research sectors have been performed engaging more than 280 participants. In the period a first workshop to engage the members of the PMBret was held and one expression of interest for the BlueBRIDGE call for SMEs has been collected. As the major part of the VREs has only been released on M15, only one webinar, one demo and few training material has been developed between M1 and M15. In 2017 the eTraining section of the website will be enriched and re-structured in order to provide a comprehensive view of BlueBRIDGE capacity and skills.

For what concerns knowledge transfer the major next steps are related to the launch of the call for SMEs (January 2017) to move the SMEs engagement from a local (France) to a European level and the continuous organisation of training workshops for the research and Blue Growth sectors and to promote the BlueBRIDGE opportunities. The most important will be a working two days hackathon including theoretical approaches on e-infrastructures for marine, fisheries, aquaculture domains that will be organised next year at the University of Athens.

On the other side WP8 courses will continue according to the plan defined by partners in WP8 to support the organisation of scientific training and testing and exploiting the new VREs released on M15.

In month 30 (February 2018) the D3.7 Training & Knowledge Transfer: Final Report will be delivered.

REFERENCES

[1]   FAO's Good Practices Template http://www.fao.org/3/a-as547e.pdf