D1.9 Overall Evaluation report

WP1 – Wildlife scenarios

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EO4wildlife Project Overview

EO4wildlife main objective is to bring large number of multidisciplinary scientists such as biologists, ecologists and ornithologists around the world to collaborate closely together while using European Sentinel Copernicus Earth Observation more heavily and efficiently.

In order to reach such important objective, an open service platform and interoperable toolbox will be designed and developed. It will offer high level services that can be accessed by scientists to perform their respective research. The platform front end will be easy-to-use, access and offer dedicated services that will enable them process their geospatial environmental stimulations using Sentinel Earth Observation data that are intelligently combined with other observation sources.

Specifically, the EO4wildlife platform will enable the integration of Sentinel data, ARGOS archive databases and real time thematic databank portals, including Wildlifetracking.org, Seabirdtracking.org, and other Earth Observation and MetOcean databases; locally or remotely, and simultaneously.

EO4wildlife research specialises in the intelligent management big data, processing, advanced analytics and a Knowledge Base for wildlife migratory behaviour and trends forecast. The research will lead to the development of web-enabled open services using OGC standards for sensor observation and measurements and data processing of heterogeneous geospatial observation data and uncertainties.

EO4wildlife will design, implement and validate various scenarios based on real operational use case requirements in the field of wildlife migrations, habitats and behaviour. These include:

- Management tools for regulatory authorities to achieve real-time advanced decision-making on the protection of protect seabird species;
- Enhancing scientific knowledge of pelagic fish migrations routes, reproduction and feeding behaviours for better species management;
- Enable researchers better understand the movement behaviour of sea turtle populations; and
- Setting up tools to assist marine protected areas and management.

Abbreviations and Glossary

A common glossary of terms for all EO4wildlife deliverables, as well as a list of abbreviations, can be found in the public document "EO4wildlife Glossary" available at EO4wildlife.eu.

Executive Summary

This document describes the strategies undertaken to assess the achievements of the project both in terms of the usability of the platform for end users and its sustainability. It provides detailed descriptions of feedback received by project partners, Advisory Board members and external users. This information will ensure that the final product(s) developed during the project frame is relevant to end users.

This deliverable is complementary to D1.4 "Validation & Evaluation Plan v2" [1] and D1.8 "Validation Test reports v2" [2], which report on the tests performed during the validation campaign of the platform EO4wildlife. This document also relies on information provided by D4.7 "Report on networking and community building v3" [3] that describes the strategies undertaken to establish the user community by facilitating networking activities towards professional and scientific groups and networks. In particular, it provides detailed descriptions of other EU-funded projects liaison activities and advisory board activities. Finally, this document used information provided in D4.10 "Exploitation and business plan v3" [4] which describes the advantages of EO4wildlife, but also some of the main features offered by the platform. It also includes the current status of the platform and the future plans to make EO4wildlife a successful and sustainable product.

1   Introduction

The overall evaluation process provides a general assessment of the project's outputs. This evaluation is done against the end-users needs and the objectives of the project. It assesses its achievements both in terms of the usability of the platform for end users and its sustainability.

The overall evaluation process relied on both internal and external expertise. Internal assessment was carried out throughout the project with two validation phases of test cases (D1.4 "Validation & Evaluation Plan v2" & D1.8 "Validation Test reports v2"). Test cases were crucial to the validation and evaluation process: they identified and communicated the conditions that were implemented by a function of the system and they described the way to verify the successful execution of the function and its acceptance according to the product requirements. All partners also contributed to D4.10 'Exploitation and business plan v3' that presents the expected outcomes of the project.

EO4wildlife also actively involved external researchers and professionals (D4.7 "Report on networking and community building v3") by informing them about the opportunities of the EO4wildlife Platform for their research by:

- identifying the community for collaboration

- gathering feedback from target audience in order to ensure that the final product(s) is widely applicable across many domains

More specifically, external expertise was mainly provided by the Advisory Board members and partners' networks. The External Advisory Board, who played an essential role for the final validation is composed by a number of relevant stakeholders closely related to the case studies proposed in the project, and supported by recognised experts.

2   Overall Evaluation Strategies

2.1   Internal expertise

The requirements related to the four initial use case scenarios were described by the scientific partners of the project, representing themselves large communities of end-users: the *Agence Française pour la Biodiversité* was in charge of describing the requirements for the marine mammals community, Birdlife International was representing the seabirds community, the University of Exeter was representing the sea turtles scientists, and CLS was in charge of representing the pelagic fish pop-up tag users. The platform and services were developed based on these internal end-users requirements. Two rounds of validation were then conducted internally and supported by the project internal expertise.

During the internal validation, the scientific partners were able to conduct a first level of validation of the services and the platform to ensure that the minimum requirements were fulfilled before opening the platform widely to their communities.

2.2   External expertise

The interaction with the community throughout the project fulfilled two main aims. EO4wildlife actively involved researchers and professionals by informing them about the opportunities of the EO4wildlife Platform for their research. On the other hand, the tasks gathered feedback from the target audience for the development team ensuring that the final product(s) is widely applicable across many domains.

The platform services were directly tested by members of the advisory board in 2018 during the third workshop that was held in Paris in May. Between January and May 2018, EO4wildlife partners planned and prepared the evaluation to be carried out by Advisory Board members. A two-step evaluation process was designed following the release of the platform to the Advisory Board in April 2018. First, we selected services to be run and provided a dataset to allow Advisory Board members to familiarize themselves with the platform and its functionalities. Then Advisory Board members were able to start testing the platform with their own data. The 3rd Advisory Board workshop was the opportunity to gather direct feedback on the services and functionalities of the EO4wildlife platform. More details about the Advisory board members and activity are provided in D4.7 "Report on networking and community building v3".

In addition to Advisory Board members, 19 external users were given access to the EO4wildlife platform in September 2018 (see table below for more details). These users were selected by partners of the project and by Advisory Board members.

Name	Company/Institution	Topic of interest
George Balazs	AFB (AB-Cecile)	Sea Turtles
Marc Besson	AFB (AB-Cecile)	Sea Turtles
Margaux Touron	AFB (AB-Cecile)	Sea Turtles
Caitlin Frankish	AFB (AB-Richard)	Sea Birds
Lily Bentley	AFB (AB-Richard)	Sea Birds
Auriane Virgili	AFB (AB-Vincent)	Marine mammals
Charlotte Lambert	AFB (AB-Vincent)	Marine mammals
Matthieu Authier	AFB (AB-Vincent)	Marine mammals
Sophie Laran	AFB (AB-Vincent)	Marine mammals
Lizzie Pearmain	BirdLife	Seabirds

Beth Clark	University of Exeter	Sea Birds
Dom Tilley	University of Exeter	Sea Turtles
Lili Colman	University of Exeter	Sea Turtles
Tom Horton	University of Exeter	Tunafish
Connie Kot	University of Exeter (MiCO project)	top predators
Ellie Heywood	University of Exeter (MiCO project)	top predators
Meredith Whitten	University of Exeter (MiCO project)	top predators
Sarah Poulin	University of Exeter (MiCO project)	top predators
Eduardo Jorge Belda Pérez	Universidad Politécnica de Valencia	Ecologist

Table 1: List of external users

All users (Advisory Board members and external users) had to answer a questionnaire to provide feedback on the usability of the platform (see Annex 1).

2.3   Final event

The EO4wildlife Final Event took place on Friday 23/11/2018 in Toulouse (France) at the *Cité de l'espace* in Toulouse.

The event was organized in two main slots. The first part was devoted to presentations by EO4wildlife members presenting the project results and including a live demonstration of the platform. The second part was more interactive and split in two panel discussions around the usability and sustainability of platforms like EO4wildlife where two advisory board members were invited to participate. Yann Tremblay and Richard Philips took part in the first panel discussion – '*Usability of the platform, end user feedback*' and the second panel discussion – '*Platform sustainability*'.

Find below the agenda and logistic information (pdf file is available here)

Both Bénédicte Madon, from the EU H2020 Ecopotential project, and Yvan Le-Bras that was introduced to the project during the 'Big data for environment' meeting in Brest in 2018 (see D4.7 for more details), attended the EO4wildlife final event. Yvan Le-bras was also invited to join the second panel discussion on 'Platform sustainability'. In total, 52 people took part in the final event of EO4wildlife (see table below) during which a questionnaire on the usability of the platform was distributed (see Annex 1).

First name	Name	Position	Company
veronique	abadie	Analyste marketing	Mercator Ocean
Mohanad	Albughdadi	Expert Engineer in Signal and Image Processing	Terranis
Juan Andrés	Alonso González		Atos
Tonneau	Anne-Sophie		Atos
Jean-Philippe	AUDOIN	Program Manager	Atos
Simon	Baillarin	Head of Earth Observation Ground Segments Office	CNES
Jean-Pierre	Belmonte	Responsible innovation	Atos
Jessica	Bretagne	Java developer	Atos
Ana	Carneiro		birdlife
Fabien	CASTEL	Technical Leader	Atos
Gianluca	Correndo	Research Engineer	University of Southampton
Cédric	Couget	Business Manager	Atos_Mundi
Philippe	de Saint Leger	Applications & Projects Engineer	CLS
Aurore	Dorez	Sales	Atos
Claire	Dufau	Applications & projects /Environnement monitoring	CLS

Sylvie	Duthoit	Head of R&D	TerraNIS
Joanna	Emery	Innovation	Aerospace Valley
MArc	Ferrer	Global Client Executive - Space	Atos
Thomas	Ferrero	CEO	MEOSS
Susan	Gallon	Project Officer	AFB
MARTINOT	GILLES		LaPoste
Mathilde	Gobet	Assistant Marketing	Atos Intégration
Matthieu	JEAN-JACQUES		Atos France
cecile	lacombe	Project manager	Atos
CLERGUE	LAURENT	Solution Manager Space	Atos Mundi
Jean-Baptiste	Lavedrine	Mundi Program Director	Atos
Yvan	Le Bras		Muséum National d'Histoire Naturelle
Jayoung	LEE		
Jose	Lorenzo		Atos Spain
Bénédicte	Madon	Researcher	UBO
Lila	MANGALO		
David	March		socib
Jean-Louis	MAZENS		
Ricard	Mélissandre	Student in Biology	
Richard	Phillips		Advisory Board
Daniel	Rodera Aragoneses	Developer	Atos ES
Angèle	Rolland		
Olivier	RONDEAU	Directeur adjoint Agence Aerospace	Atos
Cathy	SAHUC	Space BU Manager	Atos
Vincent	Saleh	Project Manager	Atos
François-Xavier	Stempfel		Atos
Marion	Sutton	Project manager	CLS
Françoise	TAREL	Directrice de Département	Atos Business Services
Marie	Tourtin		
Yann	Tremblay		Advisory Board
Cassia	Trojahn	Assistant professor	IRIT and University of Toulouse
jean-michel	zigna	WP1 member	CLS
Sophie	Baudel		CLS
Michelle	Aubrun		
Frédérique	Blanc		CLS
Nilüfer	Araç		wwf turkey (http://wwf.org.tr)
Andrés	Troya		TAS FR

Table 2: List of attendees to EO4wildlife final event

3   Validation tests

The results of the validation tests are provided in deliverables D.7 and D1.8. The objective of the internal validation was to validate the platform general functionalities, front-end, and thematic services. The tests were executed using the partners own tracking and observation data. A strong emphasis was done on developing and validating thematic services providing access to earth observation data, as they were identified as the most valuable and innovative services to provide to the future users of the platform. A strong effort was also done on describing very thoroughly the services presented on the platform and making the EO4wildlife service user-friendly.

4   Usability of the platform for end users

4.1   Project partners

EO4wildlife platform's strength and weaknesses were identified by project partners through a SWAT analysis (see D4.9 for more details).

The list of strength identified is:

- Access to a wide variety of EO data

- Multiple marine species for common tools

- Intelligent management and Fast exploration of EO data

- Statistics on large volume of EO data

- Innovative functionalities in the Platform

- Compliance with OGC standards through deployment of web processing services

- Compatibility with geo-referenced database

The weaknesses of the project are:

- Cannot supply **all** the tools that Scientists usually use

- Many competitors from other platforms, groups in EO data processing

- Not all tools / scenarios initially planned for the platform are implemented by the end of the project funding

- Scalability testing using big data not yet reached

4.2   Advisory board members feedback

We had some very positive feedback from the first Advisory Board workshop that was held in Toulouse in 2016:

- "The meeting clarified the framework and objectives of the project. It is still early days and I look forward to seeing how the project develops." *Richard Philips, British Antarctic Survey*

- "Excellent workshop in Toulouse, perfectly organised and help understanding in clear detail the overall concept." *Cécile Gaspar, President te mana o te moana*

- "Partners and resources involved in this project means that easy-access to relevant earth observation data for scientists might be reach." *Lars Boehme, University of St Andrews*

A summary of feedback received from the second Advisory Board workshop held in Brest in 2017 is provided below:

- Importance of easy access to Earth Observation data

- Importance to provide source information (i.e. reference to published paper, software, package)

- Importance to be able to customize the functionalities in work flow and for functionalities to evolve – No black boxes.

- Modelling analyses: need to be careful, need to keep it generic.

The main aim of the 3rd Advisory Board workshop was to gather direct feedback on the services and functionalities of the EO4wildlife platform. Their general comment was POSITIVE: 'Platform really useful for non-computer and non-programmer users'

The main advices, received during the third Advisory Board workshop, were:

- Make the basic work well

- First step need to be easy

- Make extracting tools to share, to disseminate (pdf, jpeg, etc.)

- CAREFULL : Modellisation tools, for example GAMs, are less stable in time as methodology/packages keep evolving

More details about the Advisory board members' activities are provided in D4.7 "Report on networking and community building v3".

4.3 External users

The first panel discussion of the final event, that was held in Toulouse in November 2018 - '*Usability of the platform, end user feedback*', was moderated by Susan Gallon (AFB, France) and 4 experts were invited on the panel:

- *Yann Tremblay* (member of the Advisory Board, IRD, MARBEC)

- *Richard Phillips* (member of the Advisory Board, British Antarctic Survey)

- *Fabien Castel* (ATOS, France)

- *Ana Bertoli* (BirdLife, UK)

The main discussion points were:

- Usability: main achievements and missing steps

- Interoperability: initial idea, achievements, future

- Platform performance: shortcomings already identified

- Dependency on external data sources... future towards integration into DIAS/Mundi

In addition, members of the panels pointed out that only a limited number of users got access to the platform so far and more tests are required to assess and improve the performance of services.

A total of 21 questionnaires were received back from external users and attendees to the final event regarding the usability of the platform. A summary of their answers is provided in the table below.

Questions	Reviewers' scores (1 : poor – 5 : excellent)					Score statistics		
	1	2	3	4	5	Mean	Lowest	Highest
Overall reaction			3	8	5	4,13	3	5
Identity of platform			3	5	7	4,27	3	5
Purpose of platform			4	5	3	3,92	3	5
Intended users identified			2	8	2	4,00	3	5
Description of services		1	2	7	4	4,00	2	5
Description to run services		2	2	7	3	3,79	2	5
Learn basic task			3	7	3	4,00	3	5
Learn advanced tasks		1	5	6	1	3,54	2	5
Visualisation tools		1	5	4	1	3,45	2	5
Understandability			8	10	2	3,70	3	5
Intuitivity			9	6	2	3,59	3	5
Error message	1	1	2			2,25	1	3

Table 3: Users' questionnaire scores and statistic

The overall feedback to the EO4wildlife project was good with an average score of 3.72/5 and some really positive feedback: "it seems to me that your project is a real success" (Yvan Le-Bras, Muséum national d'Histoire naturelle). The lowest scores were obtained for the understandability of error messages and the highest score was obtained for the identity of the platform. The overall consensus was that the platform provides easy access to earth observation data to users, which was the main aim of the platform.

The main recommendations received from users were:

- more detailed description of services

- more end products like maps or video to upload and share from running the services

- video tutorials to run services

- option to add their 'application' on the platform

5   Platform sustainability

5.1   Project partners

The main feedback from project partners gathered through the D4.10 "Exploitation and business plan v3" is that it is still unclear how the platform will be sustained and updated at the end of the project as there will be no further upgrading of the service due to no financial support. In addition, because of a low user uptake of the services at the end of the project, further scalability testing of the platform and service infrastructure is needed.

5.2   Advisory board members feedback

Platform sustainability was brought up by Advisory Board members in the first workshop that was held in Toulouse in 2016. Several members were questioning the availability of the platform at the end of the project. Advisory Board members also agreed that services providing easy access to earth observation data should be available free of charge to end users. More details about the Advisory board members 'activities are provided in D4.7 "Report on networking and community building v3".

5.3   External users

The second panel discussion of the final event, that was held in Toulouse in November 2018 - '*Platform sustainability*', was moderated by Jose Lorenzo (ATOS, Spain) and 4 experts were invited on the panel:

- *Yann Tremblay* (member of the Advisory Board, IRD, MARBEC)

- *Richard Phillips* (member of the Advisory Board, British Antarctic Survey)

- *Yvan Le-Bras* (Muséum national d'Histoire naturelle)

- *Marion Sutton* (CLS, France)

The main discussion points were:

- Availability of services at the end of the project: not ready to be commercial operational > need for extra funding to consolidate the work done

- Apart from new EC funds, which other options do we have?

- Would you be willing to get access on exchange of feedback?

- Feasibility to offer free services to scientists and NGO's… where does the funding could come from?

- Competitor platforms. Do you know about other platforms with similar target?

The main recommendations were:

- disseminate proof of concept

- identify potential sponsors for the platform: national and European entities so services can be available free of charge to scientists and NGOs

6   Conclusion

The Overall evaluation report presents a summary of:

- the internal validation tests process
- the feedback received both from the Advisory Board members and from external users

The overall feedback to the EO4wildlife project was good and some cases collected really positive feedback and considering the project is a real success. Aspects for improvement were related to the understandability of error messages, while the highest score was obtained for the identity of the platform. Overall consensus was that the platform provides easy access to earth observation data to users, which was the main aim of the platform.

This report shows that the EO4wildlife platform has delivered a successful proof of concept for easy access to earth observation data for scientists and managers' community. The remaining challenge is to find a strategy for its sustainability in the long term.

References

[1] E. Lambert and J. Zigna (eds.): D1.4 Validation & Evaluation Plan v4. Deliverable of the EO4wildlife project, 2017

[2] A Carneiro, J. Zigna, M. Sutton, A. Rees, S. Gallon (eds.): D1.8 Validation Test reports v2. Deliverable of the EO4wildlife project, 2018

[3] S. Gallon (eds.): D4.7 Report on networking and community building v3, 2018

[4] J. Alonso, A. Carneiro, A. Rees, M. Sutton, S. Gallon, Z. Sabeur, G. Correndo, F. Castel, J. Lorenzo, E. Vega and D. Rodera (eds.): D4.10 Exploitation and business plan v3. Deliverable of the EO4wildlife project, 2018

Annex 1

EO4wildife External Users Questionnaire
With release of the platform to External Users
Aim: Provide feedback on usability of the platform:

Name:
Occupation:
Field of expertise:

		Poor	Fair	Satisfactory	Good	Excellent	Supporting comments
		1	2	3	4	5	
1	Overall reaction to the EO4wildlife platform	………………	………………	………………	………………	………………	
2	The platform identity is clear and unique	………………	………………	………………	………………	………………	
3	The platform usability is easily understood:						
	a- What the platform will perform and its purpose	………………	………………	………………	………………	………………	
	b- The intended users of the platform	………………	………………	………………	………………	………………	
	c- Description of services is clear	………………	………………	………………	………………	………………	
	d- Description of how the services are run is clear	………………	………………	………………	………………	………………	
4	Platform learnability: how straightforward it is to learn how to achieve :						
	a- Basic functional tasks	………………	………………	………………	………………	………………	
	b- Advanced functional tasks	………………	………………	………………	………………	………………	
5	Visualization tools are clear and intuitive	………………	………………	………………	………………	………………	
6	Platform architecture:						
	a- Understandability	………………	………………	………………	………………	………………	
	b- Intuitivity	………………	………………	………………	………………	………………	
7	Error messages are easily understood	………………	………………	………………	………………	………………	
8	Other comments						

9   Recommendations