

D5.1 1st periodical assessment of iMagine VA services

Status: Under EC Review  
Dissemination Level: Public

# Document Description

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| D5.1 1st periodical assessment of iMagine VA services | | | |
| Work Package 5 | | | |
| Document Type | Deliverable | | |
| Document Status | Under EC Review | Version | 1.0 |
| Dissemination level | Public | | |
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| Approved by | Gergely Sipos (EGI Foundation) | | |
| DOI | 10.5281/zenodo.8422210 | | |
| Document link | <https://documents.egi.eu/document/4008> | | |

Description

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| Abstract | The report provides the first year usage statistics and assessment of the 5 thematic, AI-powered image analysis services provided under virtual access in WP5. |
| Keywords | AI, Virtual Access, Infrastructure, Cloud, CPU, GPU, Storage, Services, Installations |

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Issue | Item | Comments | Author/Reviewer |
| V 0.1 | Draft version |  | Dick M.A. Schaap (MARIS) |
| V 0.3 | Revised version | Incorporating comments from reviewers. | Dick M.A. Schaap (MARIS) |
| V 1.0 | Submitted version |  | Hien Bui (EGI Foundation) |

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# Table of content

[Document Description 2](#_Toc147763315)

[Table of content 4](#_Toc147763316)

[Executive summary 5](#_Toc147763317)

[1. Introduction 6](#_Toc147763318)

[1.1 WP4 Installations 6](#_Toc147763319)

[1.2 Metrics 7](#_Toc147763320)

[2. Introduction 8](#_Toc147763321)

[2.1 Marine litter assessment service 8](#_Toc147763322)

[2.1.1 Metrics 9](#_Toc147763323)

[2.1.2 Assessment 9](#_Toc147763324)

[2.2 Zooscan taxonomic identification service 9](#_Toc147763325)

[2.2.1 Metrics 10](#_Toc147763326)

[2.2.2 Assessment 11](#_Toc147763327)

[2.3.1 Metrics 12](#_Toc147763328)

[2.3.2 Assessment 13](#_Toc147763329)

[2.4 Oil spill detection service 13](#_Toc147763330)

[2.4.1 Metrics 14](#_Toc147763331)

[2.4.2 Assessment 14](#_Toc147763332)

[2.5.1 Metrics 15](#_Toc147763333)

[2.5.2 Assessment 16](#_Toc147763334)

## Executive summary

This report should provide an assessment at the end of M12 of the WP5 installations provided by the iMagine project under the Virtual Access (VA) mechanism. Normally, such an assessment should be based on the metrics collected from the WP5 installations during the first two periods of observation, namely M01-M06 and M07-M12.

The WP5 installations concern the Imaging Analysis Services as set up by the 5 mature marine imaging use cases:

* Marine litter assessment service
* Zooscan taxonomic identification service
* Marine ecosystem monitoring service
* Oil spill detection service
* Flowcam phytoplankton identification

However, so far no metrics could be reported for these planned WP5 installations as their Imaging Analysis Services are still under co-development and integration in the Competence Centre (WP3). Therefore, their delivery and start as operational service in WP5 has not been achieved yet.

The challenge for the 5 mature marine imaging use cases is to develop these further and adapt them for deployment at the generic iMagine AI framework, which is set up as part of WP4. The development of the use cases takes place in WP3 and two stages are being undertaken, namely a first stage in which a technical development roadmap has been formulated (see D3.1). This is followed by a second stage, currently ongoing, focusing on the actual adaptation and deployment of the 5 mature use cases at the generic iMagine AI framework.

Following the current developments in WP3, it is expected that the actual delivery and start of operation as WP5 services for all 5 use cases will be around month 22-24 (July-August 2024), while some of these might achieve this status earlier.

## Introduction

Virtual Access (VA) is a financial instrument to reimburse the access provisioning costs to access providers. This instrument is provided by the European Commission to increase the sharing of research infrastructures and services that otherwise would not be available to international user groups.

In VA, the services – also called “installations” – must be made available ‘free of charge at the point of use’ for European or International researchers. VA access is open and free access to services through communication networks to resources needed for research, without selecting the researchers to whom access is provided.

Virtual Access to services of the iMagine catalogue applies to the following 2 categories:

1. AI platform and compute infrastructure services in WP4
2. Imaging data and analysis service in aquatic sciences in WP5

This document provides Virtual Access metrics and assessment for WP5 about the 1st year of the project (Sep 2022 - Aug 2023). However in practice, there are not yet any metrics as the 5 mature mature marine imaging use cases are still under development and their planned Imaging Analysis Services have not yet been deployed at the generic iMagine AI framework.

Following the current developments in WP3, it is expected that the actual delivery and start of operation as WP5 services for all 5 mature use cases will be around month 22-24 (July-August 2024), while some of these might achieve this status earlier.

### 1.1 WP4 Installations

Within iMagine project 5 installations are part of Virtual Access work package 5. These installations support the baseline computing infrastructure of iMagine as part of the following services:

* **Marine litter assessment service** (provided by DFKI with OGS and MARIS).
* **Zooscan taxonomic identification service** (provided by SU)
* **Marine ecosystem monitoring service** (provided by EMSO, UPC, IFREMER, and MI)
* **Oil spill detection service** (provided by CMCC and OrbitalEOS)
* **Flowcam phytoplankton identification** (provided by VLIZ): Metrics definition

### 1.2 Metrics

For each installation several metrics has been defined between the provider and WP5 leader, taking into account following categories:

* Number of users – Number of unique users of the AI image processing service
* Number of images –Number of images processed per year or Names of images ingested
* Number/names of the countries reached – the goal of this metric was to report how broadly the service is used and how the geographical coverage is changing with time.

## Introduction

### Marine litter assessment service

|  |  |
| --- | --- |
| Description | This service will support ingestion, storage, analysis and processing of drone images, observing litter floating at surface waters in seas, rivers and lakes, and lying at beaches and shores, delivering standardised classified data sets, which are fit for purpose of environmental management and indicators. |
| Task | T5.1 |
| URL |  |
| Service Category |  |
| Service Catalogue |  |
| Providers | DFKI, MARIS, OGS |
| Location | Original service at DFKI - Germany |
| Duration | 36 months |
| Modality of access | No remote access currently, but will be once deployed at iMagine platform |
| Support offered | Support of users and operation, including training of users |
| Operational since | Will become operational after the first project year |
| User definition | researchers from academics, monitoring agencies, NGO's, environmental management organisations |

#### Metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric name | Baseline | Define how measurement is done | M1-M6 | M7-M12 |
| Number of unique users of the AI image processing service | 10 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of images processed per year | 1500 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Names of images ingested | 200000 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of countries of users | 7 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Names of countries reached | Germany, Slovakia, BIH, Vietnam, Cambodia, The Philippines, Myanmar | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |

#### Assessment

No usage during the period as the service is still under development.

### Zooscan taxonomic identification service

|  |  |
| --- | --- |
| Description | EcoTaxa is a web application coupling a database with AI tools to accelerate the labelling of large quantities of plankton images by human operators, who are trained biologists but have no AI expertise. It allows importing images and their metadata, extracting features through deep learning networks, training AI classifiers based on the labelled images in the whole database, interacting with users to confirm or correct those labels, and exporting the resulting data. ZooProcess is the image analytics pipeline of EcoTaxa, for plankton images collected with the ZooScan instrument. ZooProcess will be advanced and ported to the iMagine framework. |
| Task | T5.2 |
| URL |  |
| Service Category |  |
| Service Catalogue |  |
| Location | Currently: distributed, Ultimately: EGI + Villefranche-sur-Mer,France |
| Duration | 36 months |
| Modality of access | No remote access currently |
| Support offered | Training of users, assistance for data formating for upload, assistance for data exploitation |
| Operational since | 2010 |
| User definition | scientific research groups (mostly used by technicans) + environment monitoring companies/agencies |

#### Metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric name | Baseline | Define how measurement is done | M1-M6 | M7-M12 |
| Number of unique zooscan+zooprocess users | ~300 / y | no user tracking is available. We estimate >300 persons, from around the world since 150 ZooScans have been sold worldwide, all use ZooProcess, most are used by more than a single operator. | 0 | 0 |
| Number of scans (i.e. images) processed per year | ~10000 / y | 1 scan per working day, 150 zooscans => 10k scans | 0 | 0 |
| Number of countries in which the current version of zooprocess is used | 30 | Number of countries in which a zooscan has been purchased | 0 | 0 |
| Names of countries reached | France, Spain, Italy, Belgium, UK, Germany, etc. in the EU, Brazil, US, Canada, China, Japan, Korea | Countries in which a zooscan has been purchased | 0 | 0 |

#### Assessment

No usage during the period as the service is still under development.

* 1. Marine ecosystem monitoring service

|  |  |
| --- | --- |
| Description | This service will be provided for the processing of video imagery, collected by cameras at EMSO underwater sites, identifying and further analysing interesting images for purposes of ecosystem monitoring. The service will be operated from several EMSO sites where underwater videos are being collected. The three sites of this installation provide complementary capabilities for the whole pipeline of image collection, selection, AI-based analysis and annotation. EMSO-Obsea (UPC - SE) and EMSO-Azores (Ifremer – FR) have experience with using AI for the analysis of selected images for identification of biota. EMSO-SmartBay has experience with preselecting interesting images from the sizable video footage. Ifremer has experience with data management of EMSO raw and annotated imagery. |
| Task | T5.3 |
| URL |  |
| Service Category |  |
| Service Catalogue |  |
| Providers | IFREMER, MI, UPC |
| Location | Vilanova i la Geltru coast (Barcelona, Spain)  Lat. : 41º 10,93' N - Long. : 001º 45,15' E |
| Duration | 36 months |
| Modality of access | Remote or partiallly remote |
| Support offered | support and training |
| Operational since | 0 |
| User definition | Researchers, monitoring agencies, NGOs, environmental management organisations… |

#### Metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric name | Baseline | Define how measurement is done | M1-M6 | M7-M12 |
| Number of  user groups / institutions accessing Obsea data (real time or data bank or images and multiparametric data) | 10 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of images generated and archived per year on the data bank | 3000 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of countries of users | 3 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Names of countries reached | France, Italy, etc | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |

#### Assessment

No usage during the period as the service is still under development.

### Oil spill detection service

|  |  |
| --- | --- |
| Description | The WITOIL (Where Is the Oil) service will be made available to reconstruct and validate real events such as accidents or illegal oil spills. In its forecasting mode it can be used to predict the impact of pollution on marine ecosystems for maritime authorities responsible for contingency planning and response. The service will be augmented by the further development of AI algorithms for oil spill detection, with the use of the iMagine AI framework. The service will also integrate and offer all the scientific products, such as oil spills detected by remote sensing and oil spill model results added value datasets, for further analysis. |
| Task | T5.3 |
| URL |  |
| Service Category |  |
| Service Catalogue |  |
| Providers | CMCC, OrbitalEOS |
| Location | Via Augusto imperatore 16, Leccce (Italy) |
| Duration | 36 months |
| Modality of access | web interface |
| Support offered | Support of users and simulations, including training of users |
| Operational since | 0 |
| User definition | researchers from academics, monitoring agencies, NGO's, environmental management organisations |

#### Metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric name | Baseline | Define how measurement is done | M1-M6 | M7-M12 |
| Number of unique users of the AI image processing service | 100 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of images processed per year | 1000 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of images ingested | 200 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Number of countries of users | 10 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |
| Names of countries reached | France, Italy, etc | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |

#### Assessment

No usage during the period as the service is still under development.

* 1. Flowcam phytoplankton identification

|  |  |
| --- | --- |
| Description | This service will support image-based taxonomic identification of plankton particles in the micro-plankton size range (including photosynthetic plankton or phytoplankton). As part of the service a long-term dataset of over 1.4 million expert validated plankton images is being made available to serve as a high-quality training dataset for new AI supported plankton identification. Enabling access to both the dataset and the analytical algorithms from the iMagine AI framework will support additional users to set up and run their own plankton image recognition pipeline. |
| Task | T5.5 |
| URL |  |
| Service Category |  |
| Service Catalogue |  |
| Location | Original service at VLIZ  - Belgium |
| Duration | 36 months |
| Modality of access | No remote access currently, but will be once deployed at iMagine platform |
| Support offered | Support of users and operation, including training of users |
| Operational since | 0 |
| User definition | Single researchers, environmental management organisations |

#### Metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric name | Baseline | Define how measurement is done | M1-M6 | M7-M12 |
| Number of unique users of the AI image processing service | 5 | Account management of registered users and image processing runs by iMagine platform + internal and affiliated user count | 0 | 0 |
| Number of images processed per year | 300,000 | Account management of registered users and image processing runs by iMagine platform + internal and affiliated user count | 0 | 0 |
| Number of images ingested | 1,400,000 | Account management of registered users and image processing runs by iMagine platform + internal and affiliated user count | 0 | 0 |
| Number of countries of users | 1 | Account management of registered users and image processing runs by iMagine platform | 0 | 0 |

#### Assessment

No usage during the period as the service is still under development.