



MAPWORMS

Mimicking Adaptation
and Plasticity in
WORMS

D1.4 DISSEMINATION, COMMUNICATION AND EXPLOITATION PLAN

Deliverable Number	D1.4
Work package Number and Title	WP1 Management
Lead Beneficiary	SSSA
Version - Status	V5 - Final
Due Date	31 October, 2022
Deliverable Type	Report
Dissemination Level	PU
Internal Reviewer	Jussi-Pekka Penttinen (VEXLUM)
Filename	MAPWORMS_D1.4_DisseminationCommunicationExploitationPlan_v05_20221031



Funded by
the European Union

European
Innovation
Council



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N° 101046846

DOCUMENT INFO

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DOCUMENT HISTORY

Date	Version	Editor	Change	Status
3.10.2022	0	Selene Tognarelli	Structure definition	Draft
11.10.2022	1	Selene Tognarelli	First draft	Draft
12.10.2022	1	Selene Tognarelli	Contributions request	Draft
21.10.2022	2	Niki Keklikoglou	HCMR contribution	Draft
25.10.2022	2	Joachim Langeneck and Luigi Musco	CoNISMa contribution	Draft

25.10.2022	2	Gilad Davidson-Rozenfeld	HUJI contribution	Draft
25.10.2022	2	Lazlo Jakska and Gernot Kronreif	ACMIT contribution	Draft
27.10.2022	3	Selene Tognarelli	Contributions integration	Draft
28.10.2022	4	Selene Tognarelli	Final revision and document sharing for internal review	Draft
31.10.2022	4	Jussi-Pekka Penttinen	Internal revision	Draft
31.10.2022	5	Arianna Menciassi, Selene Tognarelli	Document approval and submission	Final

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1 INTRODUCTION

Planned dissemination, communication and exploitation actions will be here described starting from the proposal information and properly updating them. This deliverable represents a guidance for the entire project activities, even if regular updates of the reported information will be included in the project periodic reports.

An overview table reporting all the planned dissemination activities has been completed by the Consortium (see Sec. 5 - Dissemination events at conferences, workshops etc) and will be updated during all the project lifetime.

The list of the papers produced by the Consortium will be managed by the leader of Task 1.2: Dissemination and communication activities, i.e., SSSA. A dedicated section for the partners' publications will be integrated in the project periodic reports in order to continuously update the MAPWORMS references of journal and conferences publications. Moreover, SSSA will be responsible for the project citation map, pointing out the published papers that cite MAPWORMS project in its overall or single results. Obviously, the whole Consortium will contribute in the updating of the project references/citations, for covering all the research fields involved in the project (e.g. biology, soft robotics, chemistry, active soft actuators, DNA-hydrogels and mathematical modelling).

1.1 MAPWORMS DISSEMINATION AND COMMUNICATION PLAN FROM GA

The MAPWORMS dissemination and communication plan aims at sharing research and pilot experiences throughout the EU and beyond. The Consortium believes in the importance to foster research and entrepreneurship interest in new generations. MAPWORMS aims to show to young people how science and engineering studies can allow to positively impact the society at large.

DISSEMINATION MEANS

The MAPWORMS means of **dissemination** are the following:

1. Project Website.

An interactive, dynamic website for the MAPWORMS project (<https://www.mapworms.eu/>) has been created for sharing - both with the general public and the Consortium members - information about project results, public presentations and upcoming dissemination events. In terms of data sharing, we will follow the FAIR Data Principles (by Wilkinson 2016).

2. Social media networks.

MAPWORMS profiles on popular communication channels and Social Networks (Twitter®, Facebook®, and LinkedIn) to share with a wide audience interviews to the main actors involved, non-confidential project demos, events, etc.

3. Educational events for primary and secondary school students.

The research concept and its results will be presented to high-school students to attract their interest to science and research topics at the edge of science. For example, The BioRobotics Institute at SSSA is already active in several initiatives focused on “educational robotics” and will take advantage of this network.

4. Dissemination events at conferences, workshops.

Active dissemination of the research results will be pursued at several high-level scientific worldwide conferences, covering the disciplines involved in the project. Two workshops and two focused sessions (one event per year) on the project topics will be organized at one of the mentioned conferences.

5. Publications in high impact factor scientific journals and magazines.

MAPWORMS achievements will be published on national and international magazines, in order to disseminate project results at a broad level and also to policy-makers in the network of the different partners. Scientific/technological progresses will be published (at least 2 high-level papers per year) in selected high impact journals. “Gold” open access publishing will be targeted whenever possible to favour large diffusion of MAPWORMS findings within the international scientific community. In the case the gold open access is not available (e.g. conference proceedings or abstract), the green open access will be adopted where authors make pre-prints available to the wider community. All the published contributions will be also archived in institutional or public repositories.

6. Informative material such as leaflets, internal reports, newsletters, fact sheets, user guides, etc. will support and enhance the project dissemination.

7. Public divulgation events for the community.

MAPWORMS partners will participate in periodical open-days as well as to high-impact divulgation opportunities (e.g., European Researchers Night events) showcasing the project results and bringing researchers closer to the public.

8. Virtual galleries of the Voucher Specimens Collection.

A new virtual session of the virtual microCTlab - <https://microct.portal.lifewatchgreece.eu/> - available for any potential user will be developed and it will host annotated data and 3D models of all scanned specimens.

9. Museum exhibitions.

Annelida specimens collected in the framework of MAPWORMS will be permanently exposed in the Museum of Marine Biology of the University of Salento (ca. 10.000-13.000 visitors/year + on line tours

availability) and multimedia panels will be used to describe annelid evolution, biology, ecology and to explain their potential as models for robotic applications profiting from MAPWORMS's results. Dissemination material with the MAPWORMS results can be also exposed in the CretAquarium (<https://www.cretaquarium.gr/en>) which is located in Crete Island (Greece).

COMMUNICATION MEANS

Regarding **communication activities**, Task 1.2 leader, i.e., SSSA, will coordinate timely press releases and informational programs, for a general audience. Dissemination in this form will be targeted through popular scientific magazines, newspapers, radios and local/global television channels, in order to reach a significant audience of people worldwide. While targeting a non-technical audience, communication activities will raise awareness in the industrial and scientific community as well. Messages toward the general public will focus on the impact of the achieved results on innovative smart actuation as well as microrobotics, explained in a clear and understandable way. However, communication will include aspects such as:

- i. the importance of international cooperation between different institution to achieve better results,
- ii. the importance of research and scientific excellence with a focus on younger generations, and
- iii. how scientific excellence, fostered by European funding, can contribute to meet societal challenges (e.g., sustainable robotics, healthcare, EU market competitiveness). Special attention will be given to rightfully credit the Funding Agency.

MAPWORMS **Communication Channels** are reported here:

Press release of the MAPWORMS overall vision and objectives. Countries: Europe, USA, Japan. Estimated Audience Size (EAud): > 10,000,000 (through popular newspapers, websites, TVs, radios and social networks)

Press release of the MAPWORMS preliminary activities. Countries: Italy, Greece, Austria, Finland, Israel. EAud: > 2,000,000 (through local newspapers, websites TVs and social networks)

University lectures on MAPWORMS themes. Countries: Italy, Greek, Austria, Finland, Israel; EAud: ~ 3,500

Focused conferences, congresses and symposia. Countries: Worldwide. EAud: > 1,000 (each event)

Project Conference to present final project results, as well as involve all relevant stakeholders (EU decision makers, Governments, Industry, scientific community, SMEs, citizens and associations). EAud: > 1,500.

It is important to highlight that MAPWORMS aims to have a recognizable style, such as **logo**, **fonts**, **templates**, that will be used for all communication materials.

Communication objectives and timeline are sketched in Figure 1.

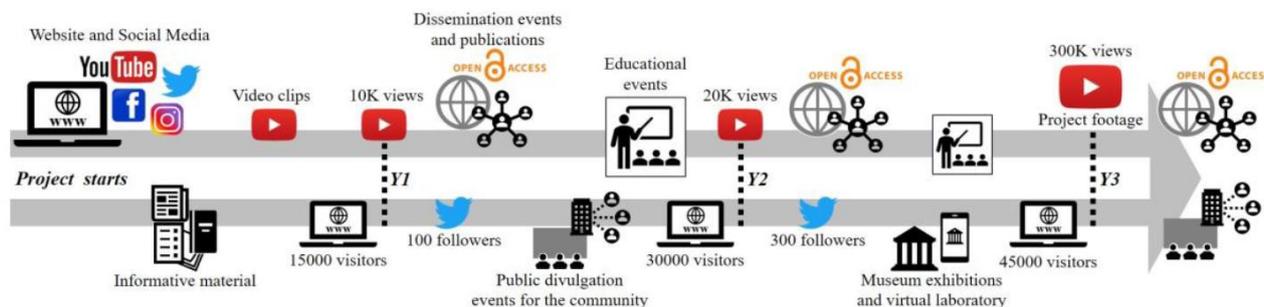


Figure 1 . Communication and Dissemination plan from GA

2. MAPWORMS PROJECT WEBSITE

A dedicated MAPWORMS public website was developed by SSSA. The website is the main front-end for reaching the different target groups and the main hub for communication activities. The website provides information on project objectives, achievements, progress, results, and scientific outcomes; users can access multimedia and other dissemination contents by the website. The style of the website was designed according to the MAPWORMS aims to show how science and engineering studies can positively impact the society at large.

The project website was created in the “mapworms.eu” domain. Considering future exploitation of results and sustainability of the project, the following additional domain(s) have been acquired:

- i. *mapworms.com*;
- ii. *mapworms.it*.

These domains are redirected in the principal **mapworms.eu**. The email address info@mapworms.eu associated to the main domain, was created to reinforce the brand and engagement with the project; moreover, this “official” email address allows to interact with other organisations, entities, and the general public. The emails received at this address will be read and managed by the coordination team of the project.

The website was also implemented with a SEO strategy in order to bring organic traffic to the website. SEO stands for **search engine optimization** and it is known as a digital technique – even though the ones who work with it use to considers SEO more as a scientific matter – used to naturally improve the organic traffic driven on a website, on a landing page, on an e-commerce, or also on social media.

Basically, SEO creates an invisible structure for human eyes, that helps Google's bots analysing each part of each page of the website and having a better orientation through all the information that it may contain. This is crucial for Google (and the other search engines in general) to value the authority of a website and to decide the position it should take on the SERP, i.e., the page where all the results of a research on the website are displayed.

With MAPWORMS, the main aim of implementing the SEO on the website is to drive more users naturally to find it while navigating the internet and using the targeted keywords, such as "robots", "robotics", "biorobotics", "smart materials", "smart technologies", "marine Annelida", "shape morphing robots" and whatsoever.

3. MAPWORMS SOCIAL MEDIA NETWORKS

MAPWORMS profiles on popular communication channels and Social Networks, i.e., Twitter® (<https://twitter.com/mapworms>), Facebook® (<https://www.facebook.com/mapworms>), and LinkedIn (<https://www.linkedin.com/company/mapworms/>), were created during the first months of the project and constantly updated.

Behind the creation of each social media profile, there was an intense study on the social media platform and its potential related to the MAPWORMS project. It was immediately evident that not every channel was suitable to pursue the objectives we wanted to achieve with our communication strategies. Therefore, we chose LinkedIn, Facebook and Twitter to start because we could see that a scientific community interested in the same subjects touched with MAPWORMS was active. In particular, this meant that there was a chance to:

- i. solicit a targeted audience's interest;
- ii. start a conversation that could reach a non-scientific audience;
- iii. bring more people closer to MAPWORMS and to the scientific field.

With this aim, it was chosen to adopt a friendly language to send the message in a simpler and more effective way (Figure 2).



Figure 2 . MAPWORMS LinkedIn (on the left) and Facebook® (on the right) profiles

3.1 MAPWORMS SOCIAL MEDIA CONTRIBUTION PLAN

In order to guarantee active profiles and a constant traffic of users around our project, weekly contributions have been planned. The Social Manager is responsible for social messages, contributions optimization and news planning.

A weekly contribution calendar was shared with the Consortium and here reported as reference (Figure 3). By considering a constant rotation within the Partners, a new “post”/Twitter or notice is planned for each project week. The Partners rotation assures variety in contributions and maintain the multidisciplinary approach of the project also in the Social channels.

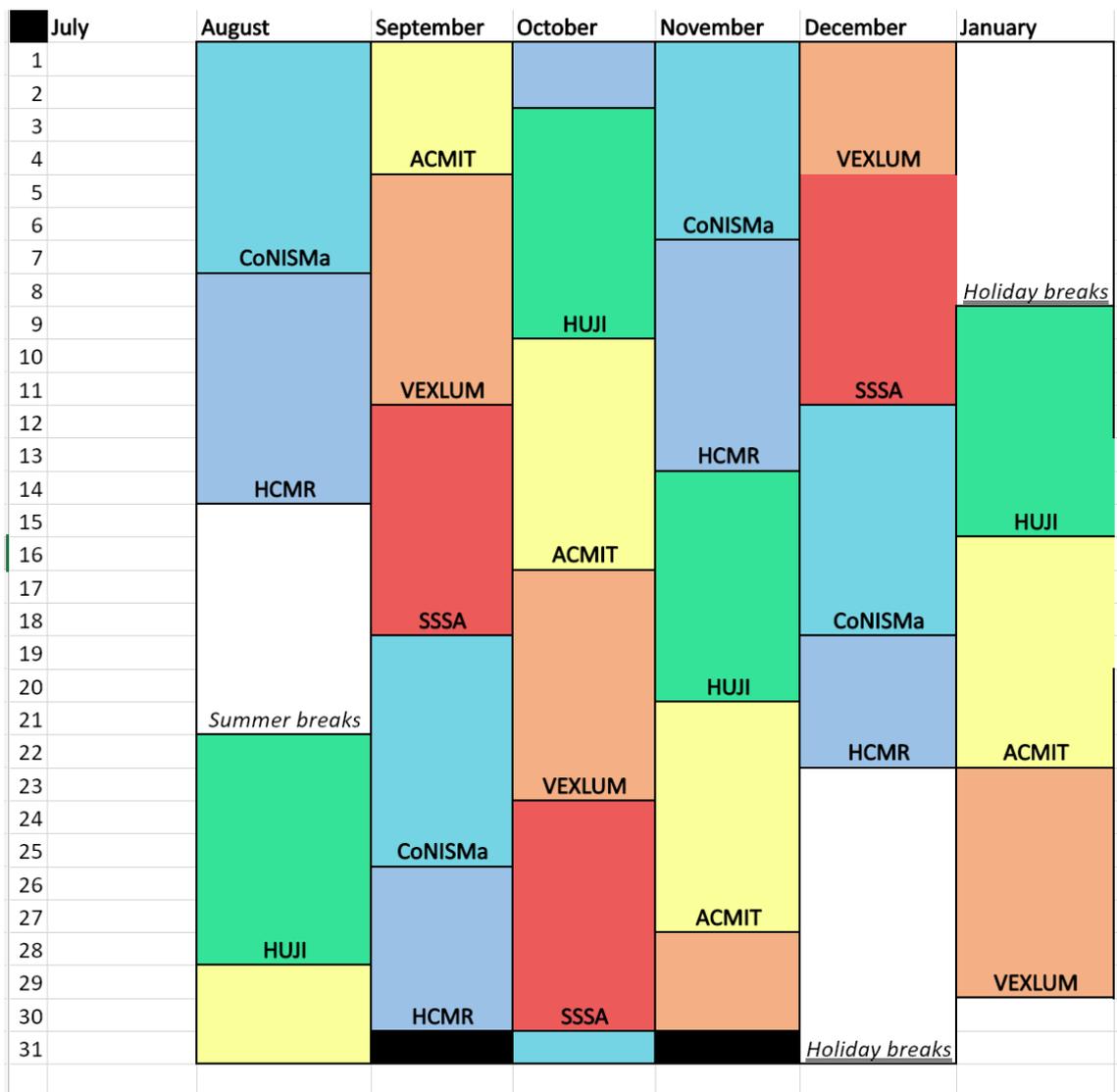


Figure 3 . MAPWORMS weekly contribution calendar

4. VIRTUAL GALLERIES OF THE VOUCHER SPECIMENS COLLECTION

An open virtual collection (Voucher Specimens Collection) will be available in an online repository (MicroCTvlab @ <https://microct.portal.lifewatchgreece.eu/>) for any potential user (including academics, scientists, students, artists and animators and everyone who is interested in microCT data).

It will host annotated data and 3D models of all scanned specimens. This Voucher Specimens Collection will be uploaded in a web-based virtual lab (Micro-CTvlab) and a mobile application which will present virtual galleries of 3D micro-CT datasets of the annelid

specimens and online tools for their manipulation and exploration (details will be reported in D1.10).

Figure 1 shows the microCTvlab web interface. Details about the functionalities of this virtual lab can be found in Keklikoglou et al. (2016)¹

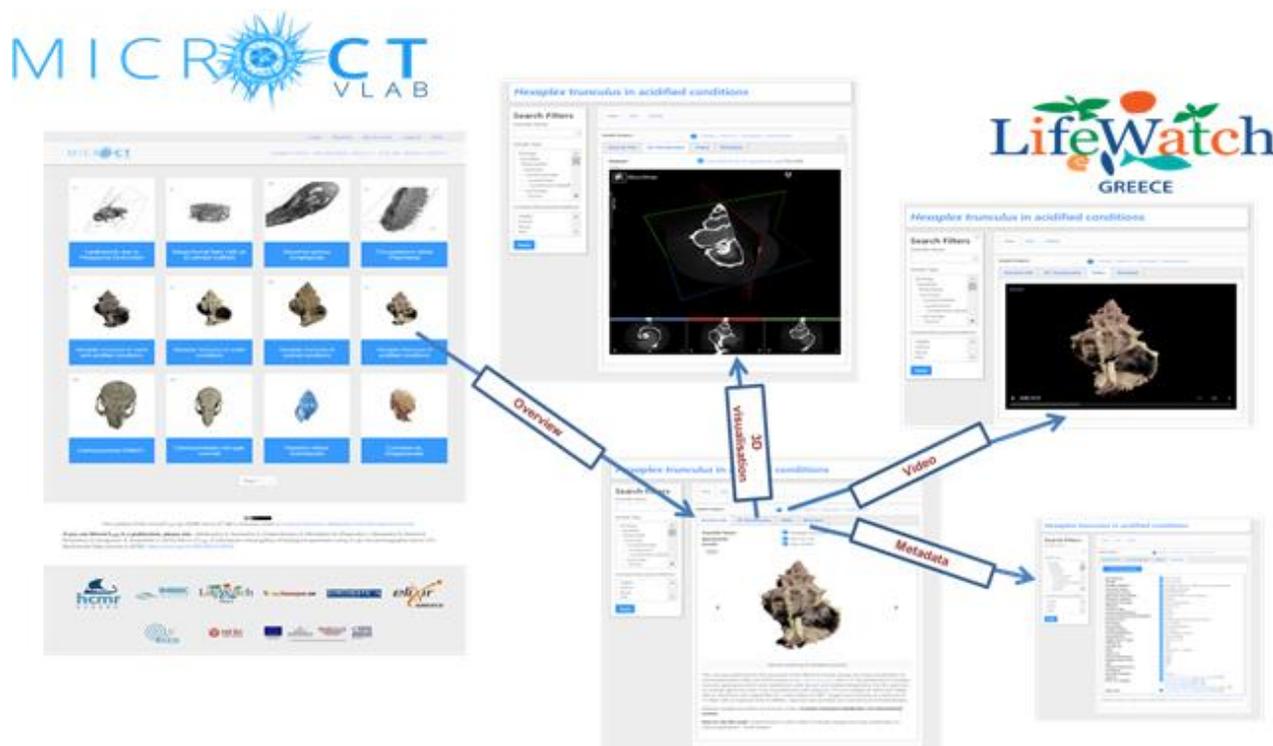


Figure 4 . The micro-CTvlab interface

5. DISSEMINATION EVENTS AT CONFERENCES, WORKSHOPS ETC.

In order to give an exhaustive overview of the dissemination events planned for the MAPWORMS project, we are reporting the most suitable events that will be considered during the first year of the project. The plan will be properly updated every year, taking into consideration the obtained results and the concrete potentialities of the project.

¹ Keklikoglou K, Faulwetter S, Chatzinikolaou E, Michalakis N, Filiopoulou I, Minadakis N, Panteri E, Perantinos G, Gougousis A, Arvanitidis C (2016) Micro-CT : A web based virtual gallery of biological specimens using X-ray microtomography (micro-CT). Biodiversity Data Journal 4: e8740. <https://doi.org/10.3897/BDJ.4.e8740>

Dissemination channel type		Audience type		
PRESENTATION, PUBLICATIONS, SPECIAL SECTIONS AND WORKSHOPS AT INTERNATIONAL CONFERENCES AND WORKSHOPS		RESEARCH		
Plan. Date	Description	Countries	Audience size	Partner(s)
3-7 April 2023	6th IEEE-RAS International Conference on Soft Robotics (RoboSoft 2023) https://softroboticsconference.org/	Singapore	>2000	SSSA
Tentative 10-13 July	Living Machines (https://livingmachinesconference.eu)	Genova (IT)	>1000	SSSA
April 2023	Materials Research Society (MRS) - https://www.mrs.org/meetings-events/spring-meetings-exhibits/2023-mrs-spring-meeting	San Francisco (California)	>2000	SSSA
March 2023	American Physical Society (APS) meetings https://march.aps.org/	The in-person March Meeting will be held in Las Vegas from March 5–10 2023. The virtual 2023 March Meeting takes place online from March 20–22, 2023.	>1000	SSSA
19 – 23 September 2022.	European Marine Biology Symposium https://embs55.ug.edu.pl/	Poland	>1000	SSSA, CoNISMa, HCMR

9-13 October, 2023	International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS) https://marss-conference.org/	Adu Dhabi	>250	SSSA
May 29- June 2, 2023	IEEE International Conference on Robotics and Automation (ICRA 2023) https://www.icra2023.org/	London (UK)	>2000	SSSA
26 – 29 June 2023	The Hamlin Symposium on Medical Robotics 2023 https://hamlynsymposium.org/	London, United Kingdom	>100	SSSA
To be defined	IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob 2023)	To be defined	>2000	SSSA
24– 28 July 2023	36 th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2023) https://embc.embs.org/2023/ <i>Relevant date: Deadline for papers and workshop and tutorial proposals HAS to be defined</i>	Sydney Australia	>2000	SSSA
Sep 29, Oct 6, 2023	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023) <i>Relevant date: Deadline for papers and workshop and tutorial proposals HAS to be defined</i>	Detroit	>1500	SSSA
13-14 March, 2023	International conference and exhibition on material science and chemistry	Frankfurt, Germany	60-300	HUJI

22-24 March 2023	Twenty-Seventh Session of the IOC Committee on International Oceanographic Data and Information Exchange	Paris, France	>150	HCMR
To be defined	16 th ICZEGAR-International Congress on the Zoogeography and Ecology of Greece and Adjacent Regions	Greece	>150	HCMR
20-23 September 2022	81 st Congress of the Italian Zoological Union (UZI) Poster presentation (http://www.uzionlus.it/81-congresso-uzi-2022/)	Trieste, Italy	>100	CoNISMα, HCMR
3-7 July 2023	14 th International Polychaete Conference <i>Relevant data:</i> Abstract submission deadline	Stellenbosch, South Africa	>300	CoNISMα

MAPWORMS leaflets will be distributed by the Partners during all the conferences mentioned in the above table and during any visit, workshop and talk. Just as an example, MAPWORMS leaflets have been already distributed during the 2022 MARSS conference in Canada (July 2022) and during the European Researchers Night events in Pisa (September 2022). In addition, based on the structure of the scheduled events, posters could be used as a valid dissemination mean for presenting the projects objectives, Consortium structures and obtained results.

POSTERS		
Description	Countries	Partner(s)
A1 and A0 posters presenting the MAPWORMS project to be used at the main public events	International	ALL

LEAFLETS		
<i>Description</i>	<i>Countries</i>	<i>Partner(s)</i>
Definition of the MAPWORMS objectives and main features	International	SSSA as Coordinator but distributed to the entire Consortium for combined dissemination actions

6. PUBLICATIONS IN HIGH IMPACT FACTOR SCIENTIFIC JOURNALS AND MAGAZINES

MAPWORMS achievements will be published on national and international journal, in order to disseminate project results at a broad level and also to policy-makers in the network of the different partners. Scientific/technological progresses will be published (at least 2 high-level papers per year) in selected high impact journals reported – in not an exhaustive way – in the table below.

It is worth to mention that all the project beneficiaries are putting in place actions to better comply with the Open Science Practice (e.g. subscribing transformative agreements with publishers, creating public data and metadata trusted repository), thus the list of the selected journal will be properly updated in the periodic progress report for better mapping the project opportunities.

Dissemination channel type		Audience type	
PUBLICATIONS, ABSTRACT, International CONFERENCE CONTRIBUTIONS - Scientific ISI journals		RESEARCH	
<i>Plan. Date</i>	<i>Scientific ISI journals</i>	<i>Countries</i>	<i>Partner(s)</i>
2022-2026	IEEE Transactions on Robotics (T-RO)	International	ALL
2022-2026	IEEE Transactions on Biomedical Engineering (T-BME)	International	ALL
2022-2026	IEEE Robotics and Automation Magazine	International	ALL

2022-2026	IEEE Engineering in Medicine and Biology Magazine	International	ALL
2022-2026	International Journal of Robotics Research (SAGE Publications)	International	ALL
2022-2026	The Journal of Intelligent & Robotic Systems (Springer)	International	ALL
2022-2026	Soft Robotics (Mary Ann Liebert, Inc)	International	ALL
2022-2026	Computers in Biology and Medicine (Elsevier)	International	ALL
2022-2026	International Journal of Medical Informatics, official journal of the European Federation of Medical Informatics (Elsevier)	International	ALL
2022-2026	Journal of the American Association of Medical Informatics (Elsevier)	International	ALL
2022-2026	Physics in Medicine and Biology (IOP Science)	International	ALL
2022-2026	International Journal of Medical Robotics and Computer Assisted Surgery (John Wiley & Sons)	International	ALL
2022-2026	Advanced Functional Materials	International	ALL
2022-2026	Chemical Science	International	ALL
2022-2026	Polymer Chemistry	International	ALL
2022-2026	A.C.S Nano	International	ALL

2022-2026	Marine Ecology Progress Series (Inter-Research Science Publisher)	International	ALL
2022-2026	Marine Biology (Springer)	International	ALL
2023-2026	Bioinspiration & Biomimetics	International	ALL
2023-2026	Journal Of Experimental Biology	International	ALL

7. EXPLOITATION PLAN

In a timeframe of 4 years of R&D activity, MAPWORMS aims to move from TRL 2 (concept and application scenario) to TRL 3/4 (proof of concept demonstration) by pushing discoveries in materials science and observations in biology to a higher level of technology readiness, not yet achieved. To generate impact, we intend to develop key enabling technologies, namely smart shape memory hydrogels and actuation units, and make it ready for integration (TRL 3). These technologies finally will be modularly combined into a morphing robot (TRL 4). Application scenarios and dedicated test-beds will be devised and employed in the course of the project.

In order to support exploitation measures, a variety of concept devices and prototypes will be developed and presented at both scientific and industry-focused conferences/fairs.

A list of possible interesting fairs is reported here:

Dissemination channel type		Audience type		
EXHIBITIONS, FAIRS		INDUSTRY		
<i>Plan. Date</i>	<i>Description</i>	<i>Countries</i>	<i>Audience size</i>	<i>Partner(s)</i>
14-17 November, 2022	MEDICA 2022 https://www.medica-tradefair.com/	Dusseldorf (Germany)	>1000	SSSA

June 27–30, 2023	AUTOMATICA, The Leading Exhibition for Smart Automation and Robotics https://automatica-munich.com/en/	Trade Fair Center Messe München, Germany	>5000	SSSA, ACMIT, VEXLUM
29-31 March 2023	MECSPE, The international reference fair for the manufacturing industry	Bologna, Italy	>1000	SSSA, ACMIT, VEXLUM
7 - 8 June 2023	Med-Tech Innovation Expo https://med-techexpo.com/	Birmingham	>1000	SSSA, ACMIT, VEXLUM
10-12 September 2024.	AUTOMATIK, Expo and conferences https://www.automatikexpo.com/	BRØNDBY HALLEN	>1000	SSSA, ACMIT, VEXLUM
4 - 6 June 2024	International Trade Fair for Laser Material Processing https://www.messe-stuttgart.de/lasys/en	Stuttgart (Germany)	>300	ACMIT, VEXLUM
24-26 May 2023	SPS Italy	Parma (Italy)	>300	SSSA
3-7 June 2024	BIEMH - technology, solutions and exhibiting area https://biemh.bilbaoexhibitioncentre.com/en/#	Bilbao	>1000	SSSA, ACMIT, VEXLUM

8. DISSEMINATION AND COMMUNICATION EVENTS ALREADY CARRIED OUT BY THE CONSORTIUM WITHIN THE FIRST 6 MONTHS OF THE PROJECT

An overview table will be completed and updated with all the information regarding the dissemination activities during all the project lifetime. The following list presents the dissemination activities already performed during the first 6 months of the project:

- MARSS conference 2022, July 2022 – Dr. Veronica Iacovacci presented the MAPWORMS project idea during the plenary talk of the conferences in Toronto, Canada. Leaflets have been distributed.
- Luigi Musco from CoNISMa presented an overview of the project to the general public during the 6th edition of the communication event “*Prof alla Torre, I giovedì della Biologia Marina, la scienza che non ti aspetti*” organized by the Museum of Marine Biology “Pietro Parenzan”, held in Porto Cesareo (Italy) on August 4th 2022
- The European Researchers Night 2022 – SSSA presented the project objectives and main contributions during the European Researchers Night in Pisa, 30th of September 2022. Young people, researchers but also general public was informed about the project, by using leaflets and posters.
- Linda Paternò from SSSA was invited to the “Festival del Pensare in Montescudaio” where she presented the MAPWORMS project.
- Open day at the BioRobotics Institute of the SSSA, the 13th of October, 2022: the MAPWORMS team presented the project idea to the general public. Leaflet and gadgets (i.e. MAPWORMS pencils) have been distributed.

CONCLUSIONS

This deliverable presents the preliminary dissemination, communication and exploitation plan of the project and reports the dissemination/communication activities carried out by the Consortium since the starting of the MAPWORMS project.

Overview tables reporting all the most interesting dissemination activities, fairs and planned publications for the first year of the project have been completed and they will be updated during all the project lifetime.