

Report on dissemination and communication

Deliverable D5.2

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Deliverable abstract	Deliverable 5.2 outlines the dissemination strategy applied by OVERWATCH Consortium based upon the activities that have so far taken place, either online, or physically. This report provides the reader with some insights of the communication goals achieved and the target audiences intended. It is a collection of the Consortium's main contribution efforts to the scientific field of Disaster Risk Management, but also of its dissemination actions to spread the word and inform external stakeholders in all partner countries.
Keywords	OVERWATCH, Communication, Dissemination, Stakeholders, social media, Emergency, Crisis Management, Floods, Wildfires, Sustainability, Climate Change, Disaster Management, AI, Artificial Intelligence, AR, Augmented Reality, Drones

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¹ Dissemination level: **PU** = Public, **PP** = Restricted to other programme participants (including the JU), **RE** = Restricted to a group specified by the consortium, **CO** = Confidential, only for members of the consortium

² Nature of the deliverable: **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

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Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
CERIS	Community for European Research and Innovation for Security
DCP	Dissemination and Communication Plan
EC	European Commission
EO	Earth Observation
EU	European Union
FIRELOGUE	Cross-sector dialogue for Wildfire Risk Management
GDPR	General Data Protection Regulation
ICT	Information Communications Technology
KPI	Key Performance Indicator
SAFERS	Structured Approaches for Forest fire Emergencies in Resilient Societies
TREEADS	A Holistic Fire Management Ecosystem for Prevention, Detection, and Restoration of Environmental Disasters

UN	United Nations
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Executive Summary

The objective of OVERWATCH is to develop an integrated holographic management system for response, recovery and mitigation of emergencies and disasters, by enabling the authorities to quickly deploy and manage air, water and ground assets and personnel through decision support tools integrated in an immersive and decentralized command platform. The afore mentioned objective is achieved through the maximization of the project's social, economic, and environmental impact, after engaging with all relevant stakeholders, as a crucial factor that can be highly supported by effective dissemination and communication actions.

The objective of this document is to present the communication materials which are used to attract, inform, and engage with the stakeholders of OVERWATCH on project services, activities, progresses and results. These materials include the coordinated brand identity which has been used in the design of all the communication supports, the website structure and its content, brochures, publications, newsletters, videos, and social media posts. This Deliverable presents the actual implementation of the methodology applied in the dissemination of the scientific activities that OVERWATCH project foresaw, and their contribution to the fulfilment of its goals. It covers all scientific areas in which the project partners have represented the project's results thus far, and reveals the cooperation developed within OVERWATCH consortium and beyond, with external stakeholders and other EU funded projects. In this sense, inputs have been gathered from partners in terms of participation in events, conferences, workshops, and submission of articles to scientific journals. These activities have been monitored by asking partners to provide feedback to maximize media coverage of the OVERWATCH project through dissemination across all available communication channels, starting from social media and the exploitation of the official website, as well as through the distribution of informative newsletters.

As a result, readers of this deliverable have access to all publications and presentations made by the OVERWATCH Consortium, as well as all the close collaborations with other projects, through direct links and screenshots documenting the communication and dissemination activities carried out to date. Moreover, the Deliverable outlines the impact of the communication and dissemination activities, in the social media of the project, by highlighting the progress made in the number of followers reached. It shows the engagement of OVERWATCH with other projects, by providing evidence with screenshots and URL links to the actual online feature of the project's logo into the social media or the websites of other projects, such as that of SAFERS, FIRELOGUE and TREEADS.

1. Introduction

1.1. OVERWATCH project overview

Climate change is fuelling an alarming rise in natural disasters. The need for a higher performance crisis planning&command tools and new methodologies arises from the increasing frequency and impact of a variety of natural hazards, including floods, earthquakes, droughts, landslides, and wildfires that are responsible for dead, wounded, or displaced people and severe destruction and disruption of property and industry with clear impact on economy for years after the event. Natural disasters, which can be related with the 1,672 recorded disasters (Floods, storms, wildfires, heatwaves) in Europe between 1970 and 2019 that took 159,438 lives and impacted the economy more than 420M€ [\[RD01\]](#).

The OVERWATCH project leverages innovative technologies to collect, process, and visualize real-time data, ultimately empowering authorities to make faster, more informed decisions in the face of critical situations (flooding and wildfires).

This system functions through the synergistic integration of established emergency management services (EGNSS, Copernicus) with cutting-edge technologies. Artificial intelligence (AI) empowers real-time data analysis from Earth Observation (EO) and various sources (drones, existing digital cartography) to extract critical information for informed decision-making. Drones facilitate high-resolution data acquisition for terrain mapping and visualization, with EGNSS-based High Accuracy Service (HAS) ensuring precise data positioning. 5G communication enables rapid data transmission and communication between drones, ground assets, and the control centre. And an immersive 3D holographic map overlays real-time data onto the operational environment, providing superior situational awareness for informed decision-making.

The OVERWATCH system architecture comprises four critical modules. The Mapping Module seamlessly combines EO data with drone acquisitions processed by AI algorithms. The consolidated data is then stored within a dedicated geospatial repository. To guarantee uninterrupted communication, particularly in areas with disrupted infrastructure, a fallback communication network is established. This network leverages both satellite backhubs and tethered drone motherships. The backend management system serves as the central data repository, capable of storing geospatial data in various formats. It facilitates the creation of map layers and provides decision support tools to empower informed decision-making. This module directly links to the backend data repository and presents a dynamic 3D visualization of the terrain, natural hazards, and deployed assets. This immersive AR interface fosters situational awareness for critical decision-making during emergencies.

The OVERWATCH system offers a multitude of benefits. Real-time and accurate data acquired from EO, drones, and AI analysis significantly improves situational awareness for emergency response teams. Immersive AR visualization alongside AI-driven insights empowers authorities to make well-informed decisions during critical situations. The system facilitates the deployment and coordination of personnel and assets (air, water, ground), optimizing resource allocation during emergencies. The backup network ensures reliable communication during emergencies, even in areas with disrupted infrastructure. OVERWATCH fosters improved collaboration between first responders, public authorities, and emergency management professionals, leading to a more coordinated and efficient response.

1.1. Purpose of the document

The current report is an analysis of the documented approach that was adopted by OVERWATCH partners in their effort to scout high impact conferences, workshops, events, and journals that are aligned with the project scopes. More specifically, D5.2 presents a list of papers' publications in relevant open access international conferences as well as current and planned publications in scientific journals. Additionally, the document covers the organization and the participation of

partners in international workshops around the topics addressed within OVERWATCH. This deliverable also covers the joint dissemination activities that OVERWATCH partners have organized with other EU funded projects in the domain of, Natural Disasters, Crisis Management and Civil Protection. In this direction, this report will showcase the target groups that have been identified throughout the project cycle until April 2024, as well as the interaction achieved with those groups. If the outcomes of these activities can be characterized as successful, then some of the actions taken by OVERWATCH Consortium can become replicable.

1.2. Structure of the document

The structure of D5.2 represents a step-by-step analysis of the project's Communication Plan. In particular, the report outlines the usage of the project's website, promotional material (brochures, posters, etc.) as well as its social media accounts, in favour of the academic partners of OVERWATCH. Moreover, it reveals the effectiveness of the Plan in terms of defining appropriate channels for dissemination, e.g., with networks of relevant stakeholders, but also the capacity of the project's outlook to spread online news, scientific data, and potential solutions to emergency cases.

This document is organized as follows:

- **Chapter 1** describes the overall outline of the document, its goal and recaps the OVERWATCH communication plan and the stakeholder groups;
- **Chapter 2** describes the communication actions that have been performed on social media;
- **Chapter 3** provides an overview related to the audio/visual materials;
- **Chapter 4** provides an overview related to the traditional media;
- **Chapter 5** provides an overview related to the participation at events and workshops, providing the plan for upcoming events;
- **Chapter 6** report about joint communication activities;
- **Chapter 7** report about the OVERWATCH website
- **Chapter 8** contains the full list of scientific publications achieved;
- **Chapter 9** Summary and comment on communication and dissemination KPIs
- **Chapter 10** outlines some intermediate conclusions.

1.3. Communication target audience

The Dissemination and Communication Plan D5.1 [\[RD02\]](#) of OVERWATCH project has set the working structure of the project's website (<https://overwatchproject.eu>), its social media accounts, and it has formulated the key messages to be shared with external stakeholders and the beneficiary groups. Given the variety of the project partners' status, OVERWATCH is provided with a multi-angle compliance with the European principles of emergency management. This variety also proves the impact of the project in multiple policy frameworks, from both a vertical dimension via the European policy framework on Crisis Management and Artificial Intelligence, but also horizontally across different European countries and their academic infrastructure.

The communication and dissemination project outcomes [\[RD03\]](#) are not limited to publications but also include the participation at conferences and workshops with peer Universities and public entities, for the purposes of raising awareness and motivating first responders, public authorities, and emergency management professionals, to act towards empowering civil protection from natural disasters (flooding and wildfires).

Scientific publications and peer reviews will enable policymakers, first responders, and citizens to generate new and more accurate information, enhancing society's resilience against natural disasters (floods and wildfires). In this direction, the EU-funded OVERWATCH project develops a

comprehensive emergency management system capable of acting along the entire emergency management cycle, thanks to the coupled use of AI, AR, EO, and drones. Copernicus Earth observation data will be the primary data source, which will be combined with data from ground assets and the control centre [\[RD01\]](#).

Target Audience	Description	Example of relevant bodies for OVERWATCH
Policy Makers	Local, National, and international entities devoted to the disaster prevention and mitigation measures, that should be updated about the latest prevention and management methodologies and technological developments.	<ul style="list-style-type: none"> • Governments/Institutions at European and International level • Agencies involved in the policy design • National Authorities • Local Authorities
EO and EGNSS Programmes	EO and EGNSS programmes devoted to the disaster monitoring, prevention, and mitigation, that are interested in collaboration or use of the OVERWATCH outcomes.	<ul style="list-style-type: none"> • Copernicus • Galileo • EGNOS
Industry	Industry solution providers and companies involved in the emergency management, that are interested in collaboration or use of OVERWATCH outcomes.	<ul style="list-style-type: none"> • Emergency response solutions providers • Other potential industries • Insurance companies
Scientific community	Projects and researchers focused on the emergency management solutions available for collaboration/cooperation.	<ul style="list-style-type: none"> • Universities • Research centres • NGOs working in emergency management development
Civilian Security	Potential end-users and pilot users; They are main actors in the emergency management phase, so they could be involved also in the project activities and project business development (e.g., market assessment, cost-benefit presentation)	<ul style="list-style-type: none"> • Civil protection • Fire fighter operation units • Regional and local authorities • NGOs working in emergency management development

Table 1 OVERWATCH Stakeholders

OVERWATCH will combine numerous dissemination and communication [\[RD03\]](#) actions to achieve its expected impacts and maximise its societal, scientific, and technological repercussions. These actions will target the main stakeholder clusters of the project. Stakeholders are grouped into five main categories [\[RD02\]](#).

Policymakers: Emergency management policies are defined at local, regional, national and EU level. The adoption of novel emergency management systems also depends on policy compliance as well on their compatibility with the operational procedures in force within emergency practitioners. Therefore, establishing effective communication with policymakers is of paramount importance for the successful exploitation of the OVERWATCH derived solutions.

Earth Observation community: OVERWATCH will fetch data from the Copernicus services, developing modular intelligent services whose outcomes will be published in open EO catalogues (e.g. *GEOSS*, *nextGEOSS*) to maximize the reach, significantly increasing their impact worldwide. Earth Observation community will be targeted to exchange information and make synergies.

Banking, Financial Services and Insurance (BFSI) industry: OVERWATCH will develop innovative solutions for disaster risk reduction and will collect and classify valuable information that could be valuable for the Banking, Financial Services, and Insurance (BFSI) industry. These stakeholders can leverage on the OVERWATCH outcomes for making their products and services more competitive.

Other private and public industries: Other private and public industries that could benefit from novel disaster risk reduction products and service are *ICT*, *real estate*, *public utilities (critical infrastructure)*, and *agriculture*. Such a wide stakeholder cluster will be targeted via tailored communication activities.

Scientific Community: The development and implementation of new solutions for disaster risk management will encourage international collaborations among experts of different research fields while fostering scientific dissemination and knowledge exchange within Europe and beyond. As part of the dissemination and communication activities, OVERWATCH partners will participate in important events targeting the scientific community and publish scientific articles in high impact factor venues to ensure that scientific knowledge sharing will be achieved.

Civilian security - This cluster group is divided into two main sub-groups:

In-field first responders: all the stakeholders at the forefront of the fight against disasters including among others, *first responders*, *civil protection*, and *civil society organizations*. They will be key players for the success of OVERWATCH, sharing experiences, knowledge and best practices with the consortium and being the main end-user of the project outcomes. Their contribution revolves around the definition of end-user requirements, the co-design OVERWATCH solutions, the realization of pilots for testing, demonstrating, and validating such solutions, and the provision of feedbacks aimed at improving their effectiveness.

Commanders/Decision-makers: They are security practitioners working at command centres, knowledge as well as regional and local authorities who support the first responders in fighting against disasters by providing them with essential information. They include *municipalities*, *prefectures*, *local or regional governments*, *ministries (regional and central)*, *authorities or offices of those governments* and the *central governments*. Just like the in-field first responders, their contribution revolves around the definition of end-user requirements, the co-design OVERWATCH solutions, the realization of pilots for testing, demonstrating, and validating such solutions, and the provision of feedback aimed at improving their effectiveness.

OTHER POTENTIAL STAKEHOLDERS IDENTIFIED

Citizens: OVERWATCH aims at enhancing the resilience of the European society and thus all citizens are one of the main stakeholder clusters. Citizens will be engaged in the project from the beginning through interaction in social media to provide them with valuable information that will raise their awareness about the risk posed by natural and technological hazards and about self-protection behaviours with a specific focus on wildfires and flooding, thus improving their risk perception and increasing their resilience against future emergencies.

Media and networks: media and networks, including *journalists*, *TV respondents* and *networking clusters*, are the dissemination channels which will support the project in reaching end-users and all other beneficiaries. Therefore, they will be targeted when performing important dissemination activities by sending them articles, press releases and promotional materials, which will be conceived to have a very coherent language and interesting messages both for the specific target clusters as well as for the general public.

2. Social media channels

The social media accounts of OVERWATCH project, as shown in figure 1, have mainly contributed to sharing research outputs via four channels: [LinkedIn](#), [Facebook X \(Twitter\)](#) and [YouTube](#).

We view social media platforms as more than just a means of solidifying our online presence and building a stronger brand identity; they are an open communication line to customers and future customers. One significant benefit of using social media for business communication is its cost-effectiveness when compared to traditional marketing forms.

Social media platforms have billions of active users, providing an extensive audience reach. By leveraging social media, we can connect with potential customers, partners, and stakeholders from around the world. It allows us to tap into a diverse and global audience that **may not be accessible through traditional communication channels**.

By sharing content, updates, and engaging with our audience, we can increase brand visibility and create awareness, amplifying our message, values, and offerings. This ensures that our project remains top-of-mind among our target audience and enables us to actively engage with our audience, respond to inquiries (FAQ), address concerns, and build relationships. The real-time nature of social media promotes a sense of connection and fosters "user loyalty".

Social media are a convenient way to distribute and promote our content. We can share blog posts, videos, infographics, product updates, and other relevant information. By creating engaging and shareable content, we can increase our reach as our audience shares our content with their own networks. Social media platforms offer powerful targeting capabilities for advertising. This allows us to tailor our messaging to a specific segment, ensuring that our communication efforts reach the right people at the right time. Social media provides important marketing data and consumer feedback. By monitoring conversations, comments, and engagements, we can gain insights into customer preferences, trends, and sentiments. These data are extremely valuable for building and defining user personas in a more precise and effective manner.

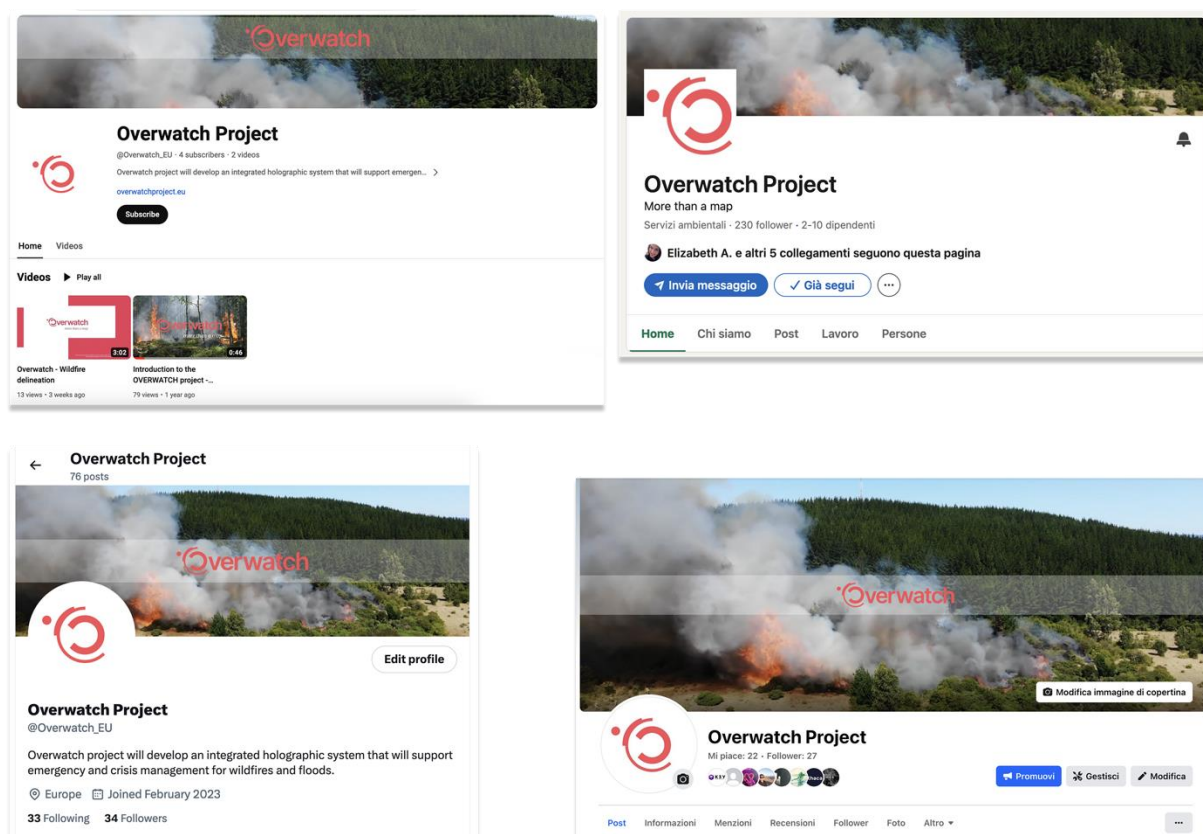


Figure 1 OVERWATCH social media accounts – [YouTube](#), [LinkedIn](#), [X](#), [Facebook](#)

2.1. Operational dimensions of social media and link with other content

Social media profiles serve as containers and launchpads for other selected forms of communication, such as sharing documents, videos, events, photos, links to websites to generate organic traffic, and more. They also act as showcases to present all available information to a wide audience and as a cohesive platform connected with other media. In this way, we are creating a “communication ecosystem” (figure 2) where all media, traditional and non-traditional, are interconnected, ensuring users do not miss any information. **This “reuse” extends the lifespan of other forms of**

communication.

“COMM. ECOSYSTEM”



Figure 2 Communication Ecosystem simplified scheme

By employing this technique, the project has reached a broader audience across various media channels, optimizing the content creation and communication process. **By tagging and mentioning partners, involved individuals, organizations, etc., and leveraging their user networks, we also facilitate reposts and shares, thereby directing traffic to our page and optimizing the reach of our communications (figure 3).**

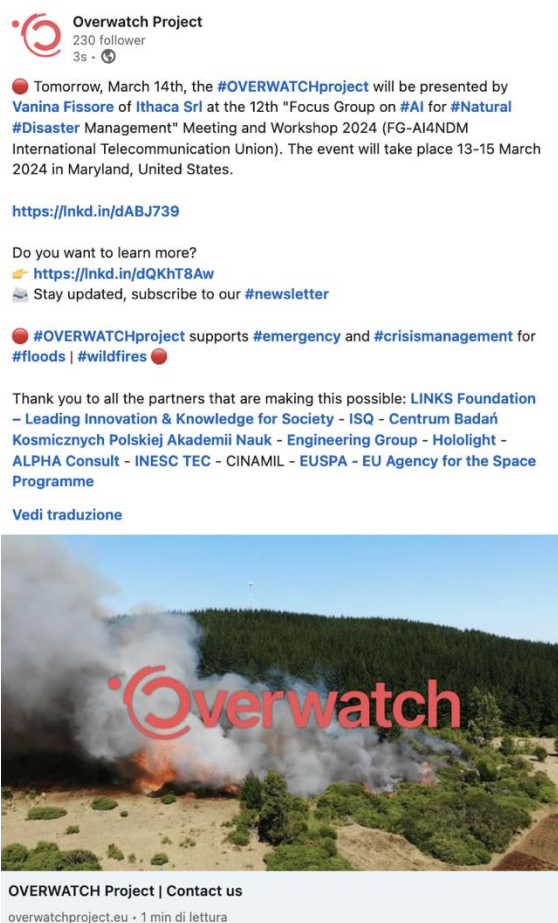


Figure 3 Post with example of a correct use of tag and hashtags

Through social media, we will promote various news and events (content lifespan extension) and drive users to the website. From the website, we will aim to generate conversions to increase contacts in the mailing list. News and updates will also be featured in the proper section on the website. Through the newsletter, we will reiterate links to social media and contact information, providing content (more traditional media such as brochures, flyers, etc., can also be shared in digital format.) that can be shared on profiles external to ours (tag and reposts but also upload to external websites or newsletter).

This way, the end user will easily find all the necessary information about the OVERWATCH project wherever they are, whether they land on the website, social media, or elsewhere.

The operational activities related to social media communication consist in delivering regular posts on the project social media channels.

The current strategy to post content consists of:

- (i) Extracting [information from public deliverables](#) that are suitable for social media;
- (ii) Specific posts on [international days](#) (e.g. Earth Day, International Firefighters Day, etc.);
- (iii) [Informative posts](#) in a "tips & tricks" style with useful information about flooding and wildfires. Posts of this kind tend to be highly "shareable" and engaging for a broader audience compared to more technical ones. They significantly help increase shares and interaction;

- (iv) Content related to climate change regarding relevant current events, such as fires and floods, for example, the wildfires in [Greece](#) or the floods in [Italy \(Emilia Romagna\)](#), to raise awareness and underline the need to take action regarding increasingly frequent catastrophic events;
- (v) News, updates, relevant events and demos ([link 1](#), [link 2](#)) for the project. Such content is also suggested by various partners and produced "live" during events and demos to facilitate the promotion of the key exploitable results (e.g., shareable materials like photos and short videos). Highlighting ongoing activities and project developments is crucial.

The types of online posts hosted by the social media accounts of the OVERWATCH project so far include:

- News and updates: project activities and meetings, EU policies adopted regarding the European Green Deal, current news related to natural disasters.
- Posts illustrating various key elements of the project: detailed explanations and benefits of the technologies used within the OVERWATCH project.
- Posts aiding in the dissemination of scientific articles and publications through public sharing.
- Info "tips&tricks"

The chart below reflects the dissemination trends across the four existing social media accounts in the OVERWATCH project, based on the nature of the created posts. In this awareness phase, posts illustrating news and updates (conferences and public events and news related to project advancements) account for most of the content, followed by informative posts and key elements of the project.

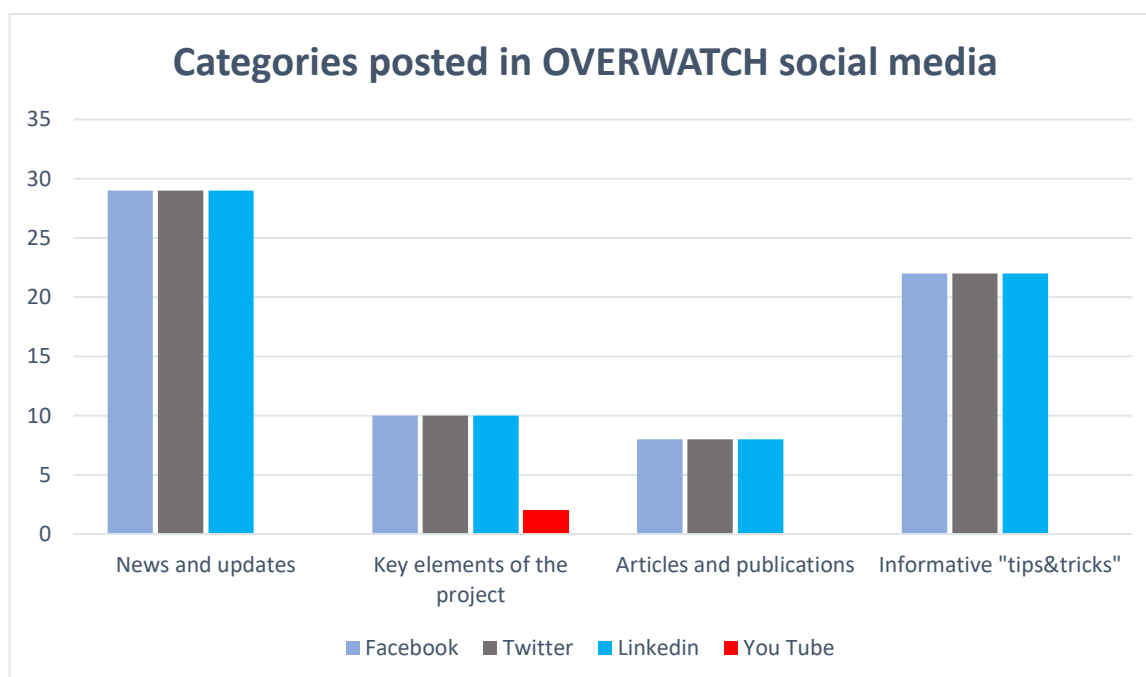


Figure 4 Categories of social media posts in OVERWATCH project

Some examples of how social media has contributed to the dissemination of events.

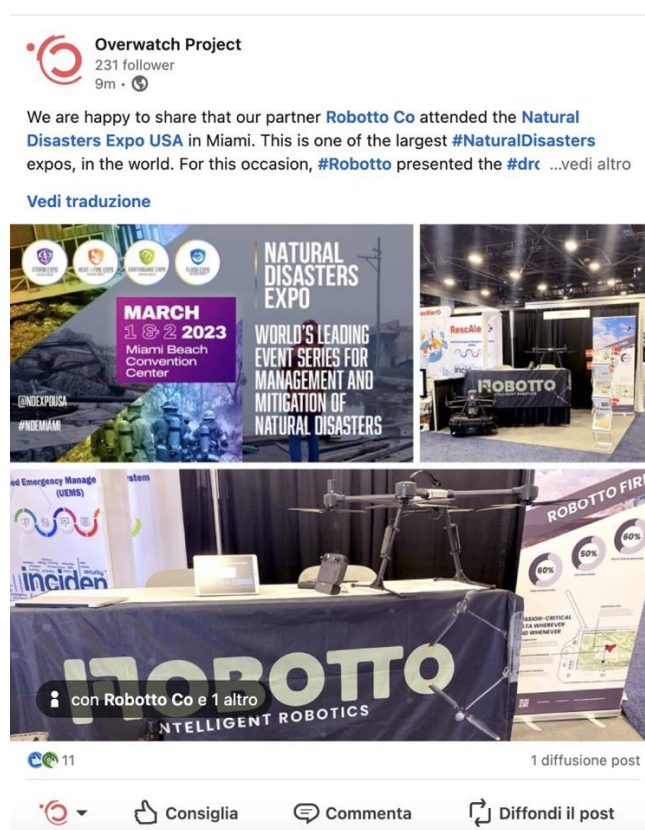


Figure 5 [LinkedIn post about Disasters Expo USA](#)

Our partner ROBOTTO Co attended the Natural Disasters Expo USA in Miami. One of the largest Natural Disasters expos, in the world. For this occasion, ROBOTTO presented the drones as well as how the technology will work in collaboration with the OVERWATCH Project. The event was a great opportunity to network with other professionals in the field and learn about the latest advancements in Public Safety and Emergency Response Technology. The event was also featured in the project's website in the [UPDATES](#) page suggesting the reader and the potential stakeholders to read the news.

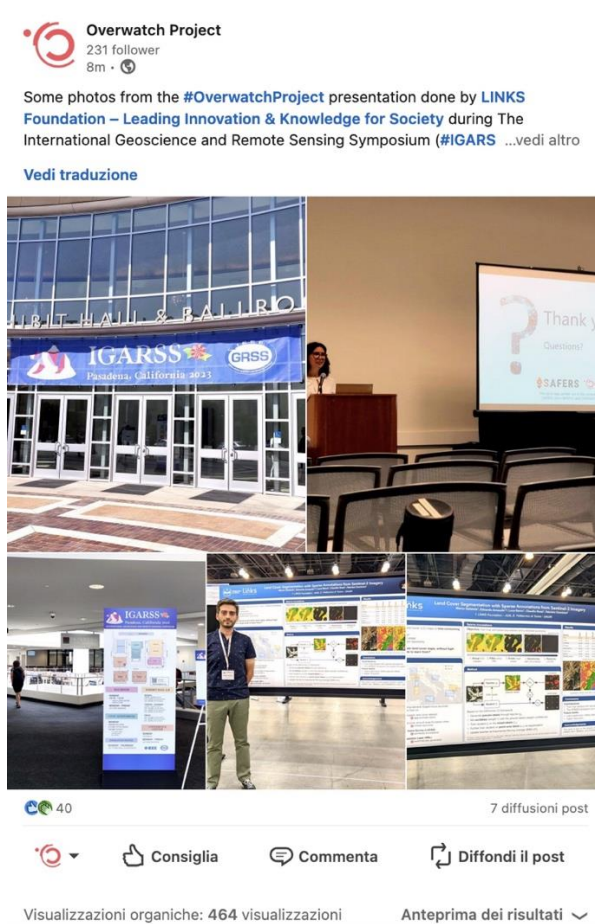


Figure 6 [LinkedIn post Geoscience and Remote Sensing Symposium \(IGARSS\)](#)

OVERWATCH project was presented by LINKS Foundation during The International Geoscience and Remote Sensing Symposium (IGARSS) in Pasadena CA.



Figure 7 [LinkedIn post 1st National Conference on Public Policies in Civil Protection](#)

The OVERWATCH project was presented at the 1st National Conference on Public Policies in Civil Protection 2024 which took place in Palmela, Portugal.

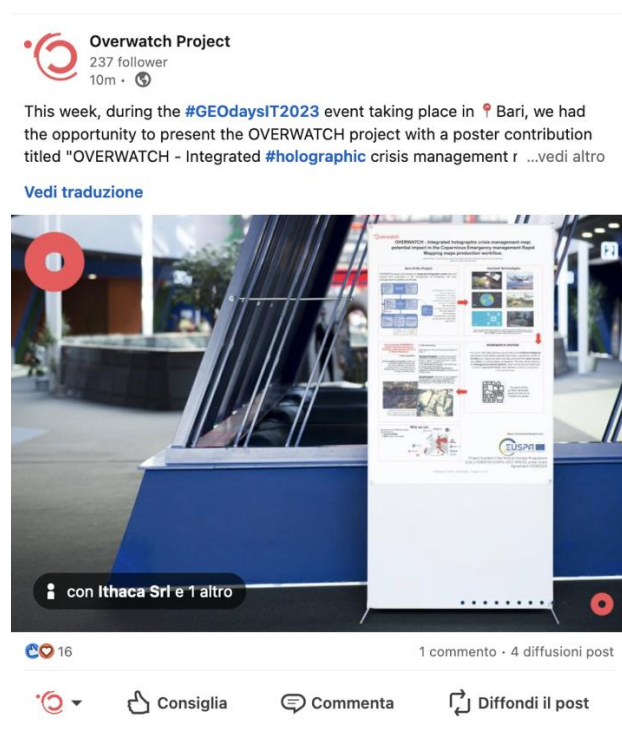


Figure 8 [LinkedIn post GEO days IT 2023](#)

During the GEOdaysIT2023 the OVERWATCH project was presented with a poster contribution titled "OVERWATCH - Integrated holographic crisis management map: potential impact in the Copernicus Emergency Management Rapid Mapping maps production workflow."



Figure 9 LinkedIn post [Innovation and Technological Modernization in the Army \(CEMTEEx\)](#)

The OVERWATCH project was presented at the "Innovation and Technological Modernization in the Army (CEMTEEx)" event as a resource for civil protection and firefighting agencies, which, in the case of Portugal, also benefit from the valuable assistance of the armed forces.

2.1. The use of OVERWATCH social media accounts for research outcomes spread

OVERWATCH project social media channels are an effective tool to reach and influence the scientific community interested in the OVERWATCH services and solutions, and it has been used as a vital communication means for networking with other professionals. It is obvious, thus, that the scientific OVERWATCH partners can make use of such online channels to promote their publications. As said before this activity not only extends the lifespan of other media but also increase their impacts in terms of views and citations.

For example, OVERWATCH made use of its social media accounts to communicate various scientific publications such:

230 follower

9m ·

Generating accurate LC maps (land cover) is a complex and time consuming task that requires the expertise of multiple annotators and regular updates to account for environmental changes.

...vedi altro

Vedi traduzione

LAND COVER SEGMENTATION · 4 pagine

LAND COVER SEGMENTATION WITH SPARSE ANNOTATIONS FROM SENTINEL-2 IMAGERY

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ABSTRACT

Land cover (LC) segmentation plays a critical role in various applications, including environmental analysis and natural disaster management. However, generating accurate LC maps is a complex and time-consuming task that requires the expertise of multiple annotators and regular updates to account for environmental changes. In this work, we introduce SPADA, a framework for fast map delineation that addresses the challenges associated with LC segmentation using sparse annotations. To cope with the sparse ground truth, we propose a novel framework called Sparse Annotations with Domain Adaptation (SPADA). Leveraging Unsupervised Domain Adaptation (UDA) techniques, we propose a teacher-student framework, where the teacher model generates robust pseudo-labels to expand the annotation across the full input space. Similarly, we introduce SPADA, which uses the pseudo-labels, filtered and weighted by their predictive confidence, with the proposed sparse ground truth to overcome limited labeled data and improve the model's performance. We compare our results with standard supervised approaches and third-party products, including the Sentinel-2 Global Land Cover (GLC) and the Copernicus Sentinel-2 Data. Experimental results demonstrate the effectiveness of our approach in the task of LC segmentation.

Index Terms— machine learning, computer vision.

1. INTRODUCTION

Land cover (LC) segmentation plays a critical role in various applications, including urban analysis and natural disaster management [1]. However, the manual production of accurate maps is a time-consuming activity that often requires several expert annotators. Additionally, regular updates are necessary to account for environmental changes. In natural disaster management, such information is critical for studying the propagation and impact of disasters such as wildfires and floods, requiring the differentiation of flammable areas (forests, shrubs) from urban bodies (buildings, roads). However, generating efficient and reliable LC maps involves several unique challenges that must be addressed to achieve accurate results. Existing LC maps often suffer from several limitations, including the high number of input bands, the large size, the high data volume, and the limited ground truth availability. To increase the segmentation performance, one approach is to compress the input data [2], while the other is to reduce the number of input bands [3], while the third is to use a smaller number of input bands [4].

ABSTRACT

Land cover (LC) segmentation plays a critical role in various applications, including environmental analysis and natural disaster management. However, generating accurate LC maps is a complex and time-consuming task that requires the expertise of multiple annotators and regular updates to account for environmental changes. In this work, we introduce SPADA, a framework for fast map delineation that addresses the challenges associated with LC segmentation using sparse annotations and domain adaptation techniques for remote sensing. Performance evaluation using reliable ground truth, including Sentinel-2, and third-party products, including the Sentinel-2 Global Land Cover (GLC) and the Copernicus Sentinel-2 Data. Experimental results demonstrate the effectiveness of our approach in the task of LC segmentation.

Index Terms— machine learning, computer vision, earth observation, remote sensing.

1. INTRODUCTION

The world is experiencing a surge in catastrophic natural events, including wildfires, floods, and storms. The frequency and magnitude of such events are increasing due to climate change. The rising global average temperature is expected to increase the risk of fires across a wide range of latitudes, leading to more frequent and impacting events and consequently the release of a significant amount of carbon dioxide into the atmosphere, which further drives up climate change [1]. Automated wildfire detection systems are crucial to identify fires in their early stage, allowing a prompt response and a consequent reduction of the impacts on human ecosystems, especially in remote areas that are sparsely populated and monitored.

ABSTRACT

Land cover (LC) segmentation plays a critical role in various applications, including environmental analysis and natural disaster management. However, generating accurate LC maps is a complex and time-consuming task that requires the expertise of multiple annotators and regular updates to account for environmental changes. In this work, we introduce SPADA, a framework for fast map delineation that addresses the challenges associated with LC segmentation using sparse annotations and domain adaptation techniques for remote sensing. Performance evaluation using reliable ground truth, including Sentinel-2, and third-party products, including the Sentinel-2 Global Land Cover (GLC) and the Copernicus Sentinel-2 Data. Experimental results demonstrate the effectiveness of our approach in the task of LC segmentation.

Index Terms— machine learning, computer vision.

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Index Terms— machine learning, computer vision.

2. RELATED WORK

In the context of remote sensing, satellite imagery is typically used to monitor environmental changes. In this work, we focus on the task of LC segmentation. Existing LC maps often suffer from several limitations, including the high number of input bands, the large size, the high data volume, and the limited ground truth availability. To increase the segmentation performance, one approach is to compress the input data [2], while the other is to reduce the number of input bands [3], while the third is to use a smaller number of input bands [4].

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Figure 10 Examples of scientific publications shared on social media platforms

3.OVERWATCH videos

Videos tend to capture users' attention more effectively than static images or text, many social media platforms prioritize video content in their algorithms, meaning your videos are more likely to reach a larger audience compared to other types of content. We have optimized our video production process by creating outputs suitable for use on the relevant social networks. Our strategy involves creating high-quality videos as shareable content across all compatible social channels, ensuring they have the appropriate characteristics such as length, colours, tone of voice, and aspect ratio. These videos effectively explain the projects' achieved results and their societal benefits using simple and easy-to-understand language (when possible). Each content piece is tailored to suit the specific requirements of the social media platform on which it will be shared.

Recognizing the dynamics of social media and the platform requirements, we have ensured that our videos are subtitled in English (or in the project's required language).

This decision is based on several factors:

- Subtitles make the videos accessible to a broader audience, including individuals with hearing impairments, thus promoting inclusivity, and ensuring that everyone can understand and engage with the content.
- Studies show that 90% of the time, regular social media users scroll through their feeds with the sound off. By providing subtitles, we increase the likelihood of users watching the video till the end as they can easily understand the content without sound.
- Social media platforms have a global audience, and subtitles can bridge language barriers, enabling non-native speakers to understand the video's message. Accessible content tends to be shared more frequently, enhancing reach and engagement.
- Subtitles provide text content to accompany the video, which search engines can index. This improves the video's visibility in search results and social media algorithms, enhancing its overall reach and impact.
- Additionally, in some regions or for certain types of content, adding subtitles might be legally required to comply with accessibility regulations, ensuring compliance and avoiding potential issues.

A [presentation video](#) was prepared to introduce the OVERWATCH project, the short video is available on the project's YouTube Official Channel and integrated in the website homepage to optimize views. A second, more technical video regarding the "Overwatch - Wildfire Delineation Process" was created using the material provided by Ithaca and uploaded to the YouTube channel. Both videos, following a communication strategy aimed at optimizing all content to maximize views, were disseminated, and sponsored through all available digital communication channels via posts and newsletters.

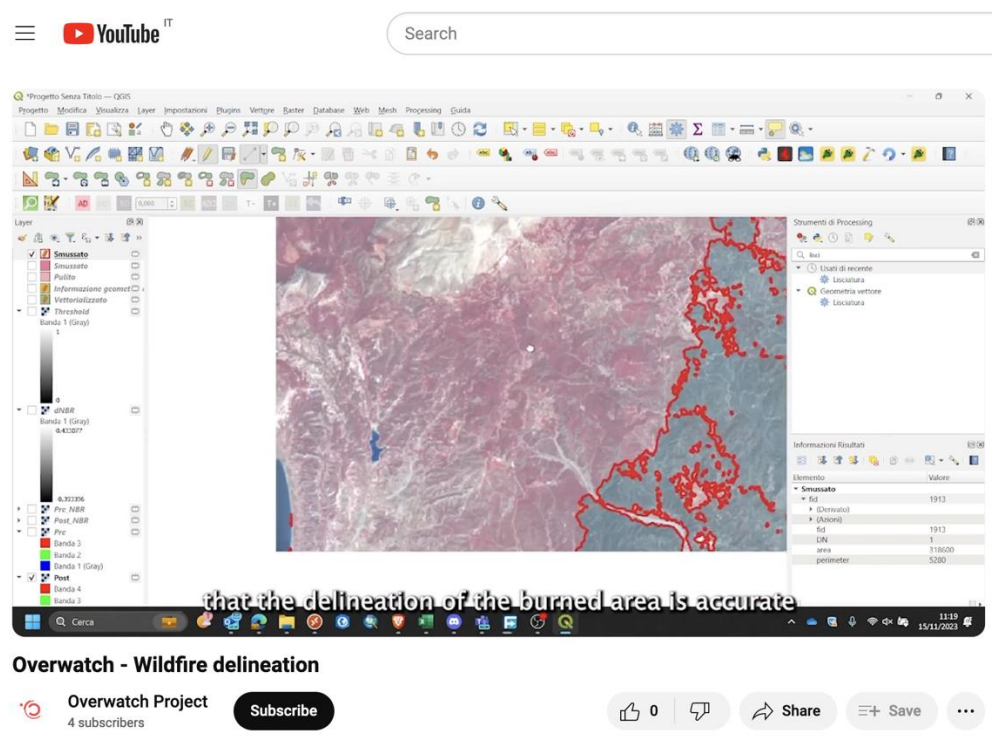


Figure 11 OVERWATCH [wildfire delineation video on YouTube](#)

4.OVERWATCH traditional printings

A brochure to present the project in brief, as well as the list of the OVERWATCH main components. Also, links to the website and social media are provided. The brochure is available online and it is used in different conferences, networking, and awareness campaigns.

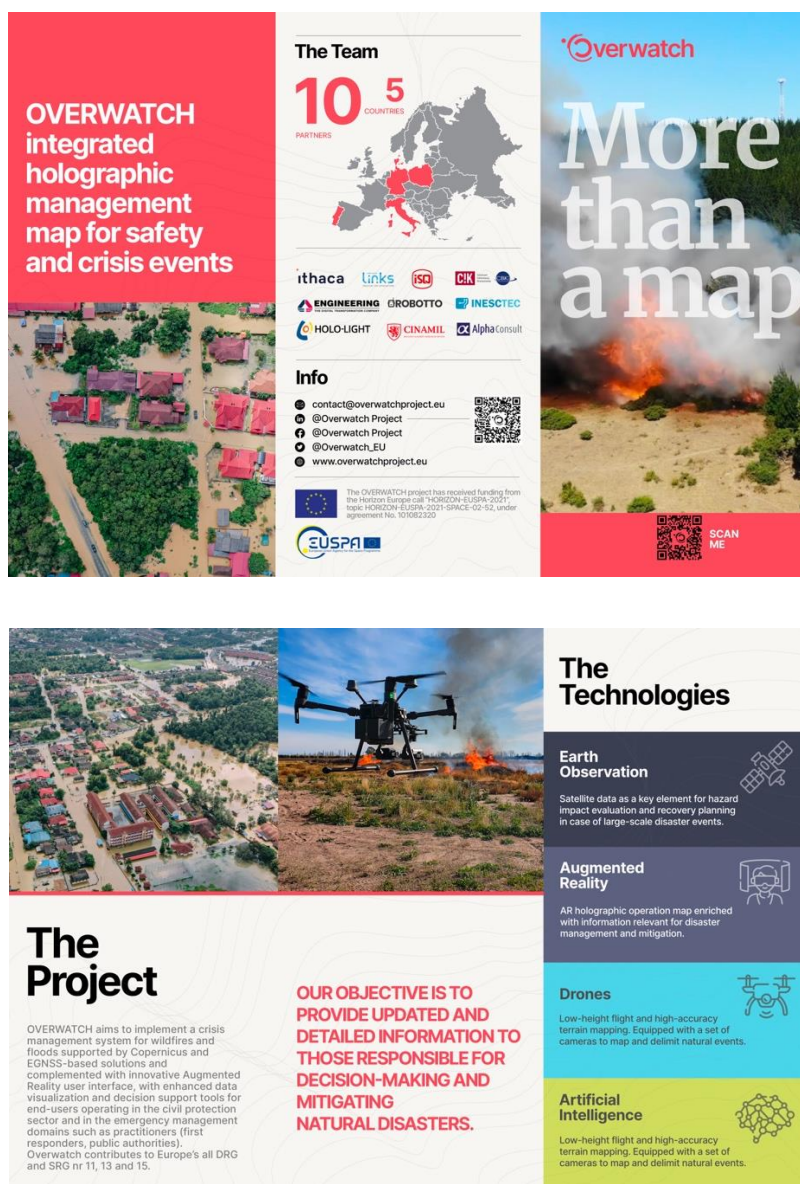


Figure 12 OVERWATCH brochure

5.Participation at events and workshops

Since the beginning of the project, the partners have been engaged in various events, as presented in table 2, below. Indeed, OVERWATCH Consortium had a fruitful involvement in a series of Conferences from which they gained helpful insights, to be able to interact with audience in a cohesive manner, rather than raising just awareness about the existence of the project itself.

5.1. Participation at events, including physical and virtual workshops

The following table offers the main outcomes of each event:

NAME OF THE EVENT	DESCRIPTION	PARTNER
Natural Disasters Expo USA	One of the largest Natural Disasters expos, in the world, a hub of innovation and collaboration for solutions to manage the devastating impact of natural disasters and save lives.	ROBOTTO
BALTinnoSEC Pilot Forum	First cross-sectorial, multi-disciplinary innovation forum for societal security experts in the Baltic Sea Region	CBK
Innovation in disaster prevention	Event held by Norwegian Directorate for Civil Protection, Polish Government Center for Security, Space Research Centre of Polish Academy of Sciences; high-level networking conference oriented on challenges, solutions and opportunities.	CBK
GEOdaysIT 2023	Event organized by the Italian Association of Remote Sensing (AIT), the Italian Association for Free Geographic Information GFOSS.it APS, and Wikimedia Italia, is the result of a shared vision for the communication and dissemination of territorial themes related to the use of Remote Sensing, geographic data, and free geographic software.	ITHACA
International Geoscience and Remote Sensing Symposium (IGARSS)	The International Geoscience and Remote Sensing Symposium (IGARSS) is the flagship conference of the IEEE Geoscience and Remote Sensing Society (GRSS). It is aimed at providing a platform for sharing knowledge and experience on recent developments and advancements in geoscience and remote sensing technologies, particularly in	LINKS Foundation

	the context of earth observation, disaster monitoring and risk assessment.	
SAFERS cross-project peer learning webinar		CINAMIL ROBOTTO HOLO LIGHT
CEMTEEx	Organized by the Army's Center for Experimentation and Technological Modernization (CEMTEEx), this initiative welcomes companies and institutions belonging to the Defense Technological and Industrial Base, including research centers of the National Scientific and Technological System, with the aim of showcasing initiatives and research, development, and innovation projects relevant to the Defense and Security sector.	ISQ
FG-AI4NDM, ITU/WMO/UNEP	12th "Focus Group on AI for Natural Disaster Management" Meeting and Workshop 2024 (FG-AI4NDM, ITU/WMO/UNEP). OVERWATCH has been selected as a use case in the Topic Group on "AI for Multi-hazard Communications Technologies".	ITHACA

Table 2 List of events

5.2. Upcoming participation to events

The partners have initially drafted a list of upcoming events taking place in 2024 that might suit the needs of the project's goals, for the purposes of creating an information base. The consortium is monitoring all events of interest that have been mentioned in the D&C plan.

The OVERWATCH project will participate in IGARSS 2024 (International Geoscience and Remote Sensing Symposium). The 44th annual gathering organized by the IEEE Geoscience and Remote Sensing Society, is the largest technical professional organization in the field. It will be held in **Athens, Greece, from July 7th to 12th, 2024**, at the Megaron Athens International Conference Center. This event brings together over 2,500 scientists and professionals from around the world in the remote sensing field. The theme for IGARSS 2024 is "Acting for Sustainability and Resilience." The conference aims to foster discussions on science and innovation to create solutions for societal benefit, particularly focusing on sustainable development aligned with the United Nations 2030 Agenda. IGARSS 2024 offers us the opportunity to engage with the latest research and technological advancements in remote sensing.

6. Joint communication and dissemination activities

The Horizon Result Booster facilitated the organization of two webinars by the SAFERS project, held on November 6th and 8th. These webinars brought together various wildfire emergency and risk management projects, including FIRELOGUE, TREEADS, and OVERWATCH.

In the first webinar, OVERWATCH consortium member CINAMIL presented on the challenges of wildfires in Portugal and the critical role of Civil Protection. Highlighting the Copernicus Service's snapshot of Portugal's forest and wildland fire situation as of October 2023, CINAMIL emphasized the National Authority for Emergency and Civil Protection's efforts in planning and implementing emergency policies. CINAMIL also discussed Portugal's Forest Safeguard Network and ongoing research and development initiatives, underscoring **the importance of the OVERWATCH project** in addressing specific gaps in wildfire management. The project focuses on enhancing situational awareness, operational planning, and decision-making processes, aiming to strengthen Portugal's capabilities in combating wildfires and ensuring a more resilient response to future challenges.

During the second webinar, the OVERWATCH project was represented by HOLO LIGHT, who provided insights into **Augmented Reality and Emergency Management**. HOLO LIGHT discussed the project's core technology, "Holo Light STREAM", which offers a framework for remote Application Rendering to support emergency and crisis management for wildfires and floods. The platform visualizes map data, metadata, and weather information, enhancing situational awareness during emergencies and supporting multiplayer interaction. **While still in its early stages, the OVERWATCH project shows significant potential for improving on-site risk assessment and preparedness, offering a glimpse into potential scenarios, and facilitating better organization and emergency preparedness.**

During these webinars, OVERWATCH had the opportunity to present its contributions, particularly focusing on the role of civil protection during wildfire emergencies and citizen engagement. The project showcased its innovative technical results, such as AR and drone technology, aimed at enhancing wildfire risk management among different stakeholders, particularly end-users. This event fostered collaboration and synergies among EU-funded projects.

The involvement of OVERWATCH in these webinars provided an opportunity to showcase its technical advancements. Additionally, it facilitated knowledge exchange and collaboration among stakeholders. One of the key benefits of joint communication activities with other projects, such as sharing post on other social media, and tagging the other projects is enhanced visibility and reach. By collaborating with other projects involved in similar domains, the OVERWATCH project can tap into the existing networks and audiences of these projects.

Here are some specific benefits:

Expanded Reach: Collaborating with other projects allows OVERWATCH project to reach a broader audience than it might on its own. Each project brings its own followers, stakeholders, and networks to the table, increasing the collective reach of communication efforts.

Amplified Message: As said before, sharing post, and content from other projects amplifies the message and visibility of all participating projects. When projects **tag each other** on social media or collaborate on joint campaigns, they leverage each other's audiences and increase the likelihood of their content being seen and shared.

SAFERS peer learning webinars |Day 1|

<https://www.youtube.com/watch?v=Q5faod7f2iU>

The video player shows a webinar titled "Webinar ACTIVATING CITIZENS PARTICIPATION IN WILDFIRE RISK MANAGEMENT" scheduled for 10:00 CET on 8 November 2023. The main visual is a slide with the word "WELCOME" in a yellow box. The background of the slide features a photograph of firefighters in orange gear battling a wildfire in a wooded area. The video is organized by SAFERS, Firelogue, Overwatch, and TREADS. A small inset in the top right corner shows a participant named Najla Kamerg. The video player interface includes a play button, a progress bar at 0:07 / 1:57:13, and a volume icon. Below the video, the title "SAFERS peer learning webinars |Day 1| Activating Citizens Participation in Wildfire Risk Management" is displayed, along with the SAFERS Project logo (25 subscribers) and a "Subscribe" button. Interaction buttons for likes (1), comments, shares, and saves are also visible.

SAFERS peer learning webinars |Day 2|

<https://www.youtube.com/watch?v=4MmrQBJ9jf0>

The video player shows a webinar titled "Webinar INNOVATIONS IN WILDFIRE RISK MANAGEMENT" scheduled for 10:00 CET on 8 November 2023. The main visual is a slide with the word "WELCOME" in a green box. The background of the slide features a photograph of a firefighting aircraft dropping a large volume of orange fire retardant over a forest. The video is organized by SAFERS, Firelogue, Overwatch, and TREADS. A small inset in the top right corner shows a participant named Rob Carroll. The video player interface includes a play button, a progress bar at 0:07 / 1:57:13, and a volume icon. Below the video, the title "SAFERS peer learning webinars |Day 2| Innovations in Wildfire Risk Management" is displayed, along with the SAFERS Project logo (25 subscribers) and a "Subscribe" button. Interaction buttons for likes (0), comments, shares, and saves are also visible.

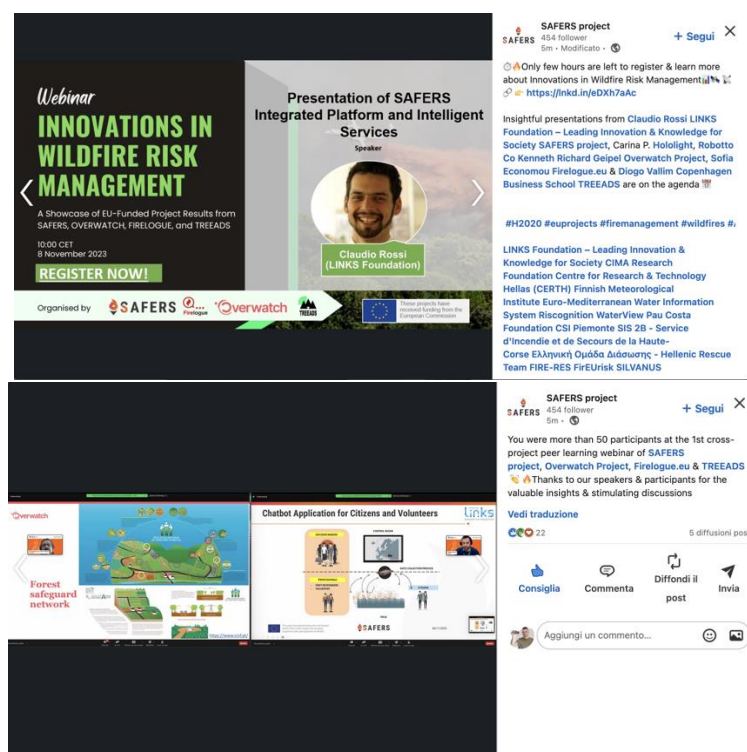


Figure 13 Example of shared content from the SAFERS account

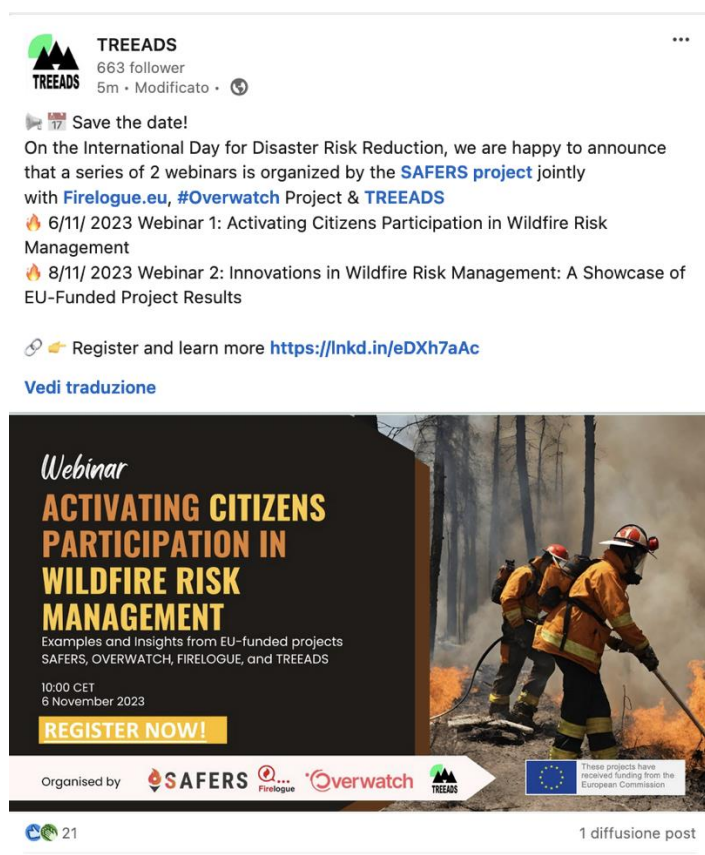


Figure 14 Example of shared content from the TREEADS account

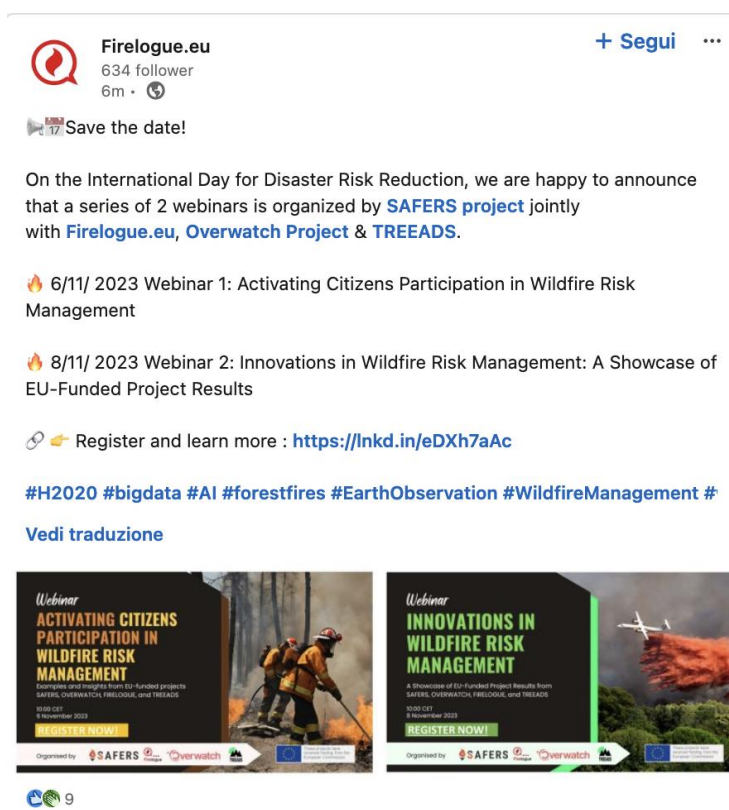


Figure 15 Example of shared content from the FIRELOGUE account

7. Website and Newsletter

The website has been updated with all the project information and developments. In the "Outcomes" section, all publicly available communication materials such as brochures, newsletters, papers, articles, and events have been uploaded. In the "Updates" section all the relevant events are listed and highlighted. The project presentation video has been integrated into the homepage to maximize views. As discussed in the previous section, the exploitation of results and initial promotion activities primarily focus on the website, where the most detailed and comprehensive explanation of the project can be found, along with all the results presented to the public.

The OVERWATCH website will also be leveraged as a tool not only for project dissemination, but also for project promotion, for example through the:

- Websites cross-linking to exchange site links and increase Google rank/positioning, providing a mutual advantage to both the OVERWATCH and the partners' websites.
- Publication on the OVERWATCH website of external press releases that are relevant to the project and/ or the work of the consortium members.
- Website ads campaigns: OVERWATCH banner could be shown on related websites.

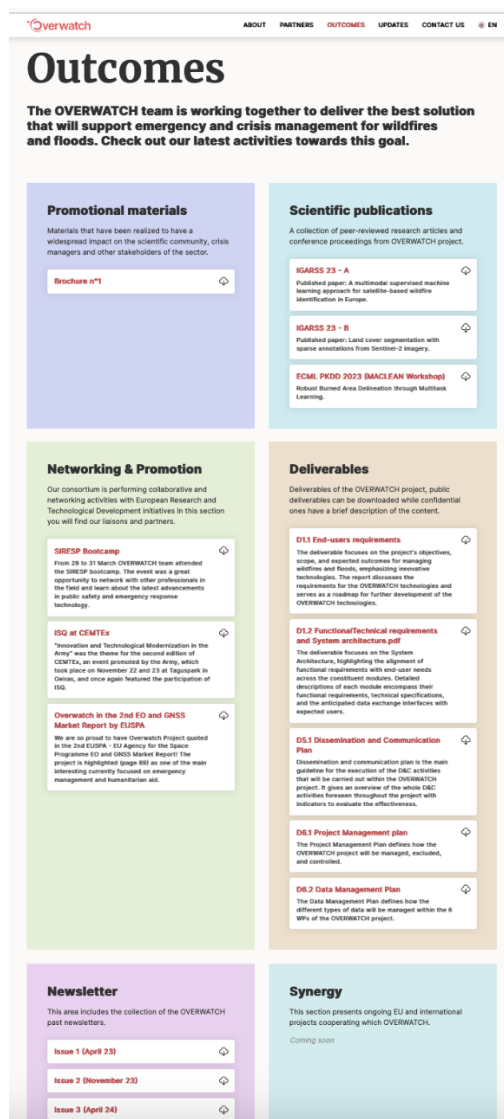


Figure 16 [Outcomes section on the website](#)

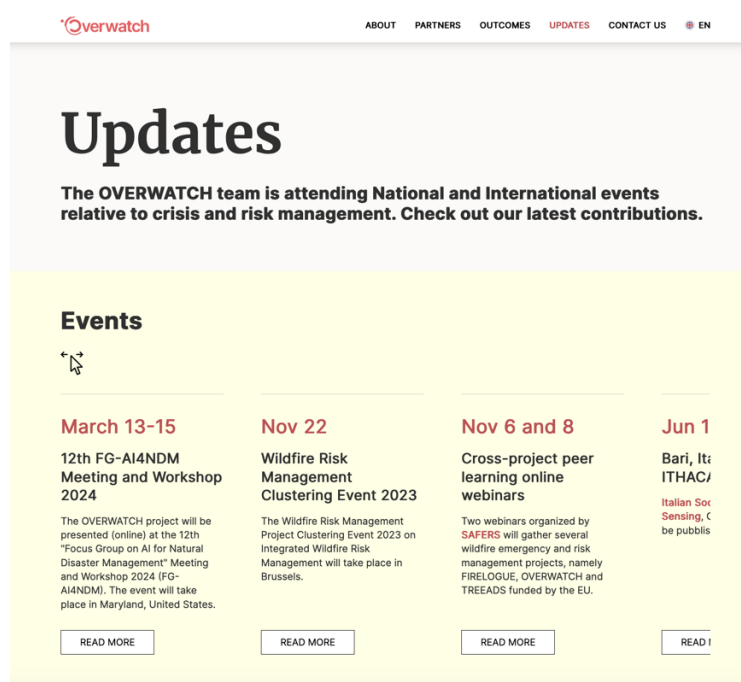


Figure 17 [Updates section on the website](#)

Following an editorial plan, news will be regularly updated and published, along with other information, which will also be included in a monthly newsletter. The Newsletter allows us to build relationships with a specific / targeted / interested audience and to segment it. They are cost and time effective and can be useful to measure (the project) awareness. Other types of content can be shared, e.g., videos, infographics, papers etc. It will primarily serve to introduce the project in all its phases. We will keep users informed about new updates, industry news, events, and the progress of the project. When it has reached a substantial number of valuable contacts, the mailing list could be segmented into categories, allowing to send the right communication to the appropriate target audience while tracking feedback and maximizing the reach of the message. The mailing list will also serve as a database to collect user information in compliance with GDPR regulations.

The text will always feature short paragraphs and use clear, concise language suitable for the target audience. There will always be a CTA (Call To Action) included so that users know what to do after reading the newsletter (e.g., 'Click here to learn more' or 'Follow us on our social pages').

We will closely monitor metrics such as open rate, click-through rate, conversion rate, etc. These data will help us evaluate the effectiveness of the newsletter and make any necessary improvements in future editions.



Figure 18 [OVERWATCH Newsletter Issue N°3](#)

8. Publications in journals, conferences, and workshops

In this chapter, we highlight publications in journals, conferences, and workshops. These publications have been utilized through effective communication strategies to present the project, gain recognition within the scientific community, and maximize the dissemination of results. By using relevant keywords and clear titles, online presence has been enhanced. This type of media is crucial for establishing the legitimacy, credibility, and quality of the project. Through our available social media channels, publications have been promoted through posts and sharing of materials, by targeting specific scientific fields, it ensures that the project reaches the most interested stakeholders. This focused content facilitates sharing within the scientific community and may trigger collaborations with projects possessing complementary expertise. Using targeted tags, colleagues, collaborators, and partners have been encouraged to share content within their networks, thus maximizing message reach. As highlighted in previous chapters, this method extends the lifespan of this form of communication and reaches a broader audience.

Title/Topic of the publication	Involved partners	Published/To be published	Where?	LINK
OVERWATCH - Integrated holographic crisis management map: potential impact in the Copernicus Emergency Management Rapid Mapping maps production workflow.	ITHACA	Published	AIT, Bari, Italy	link
A multimodal supervised machine learning approach for satellite-based wildfire identification in Europe	LINKS	Published	IGARSS, California, USA	link
Land cover segmentation with sparse annotations from Sentinel-2 imagery	LINKS	Published	IGARSS, California, USA	link
Robust Burned Area Delineation through Multitask Learning	LINKS	Accepted for publication	ECML PKDD 2023 (MACLEAN Workshop)	link
FMARS: Annotating Remote Sensing Images for Disaster Management using Foundation Models	LINKS, ITHACA	Awaiting approval	IGARSS, 2024	

Table 3 List of publications in journals, conferences and workshops

9. Summary and comment on communication and dissemination KPIs

Item	Goal	Quantity	KPI	Status
Logo	Diffusion to the widest audience	1	Logo ready	OK
Website	Create a user-friendly website	1	50 000+ visits updated regularly	56.674+

Project brochure	To reach large audience	2+	200+ readers	1 done
Press references	Diffusion to widest audience by general non-scientific means by Consortium	20+	1 000+ readers	5 EUSPA market report 2024; UCP; Interview; The EU Space Programme enabling innovation in disaster prevention; EUSPA Administrative Board Workshop on EU Space for Emergency Management & Humanitarian Aid
Short video	Short video explaining key research outputs	10	5 000+ views	2 done
Demonstration video	Videos from demonstration	2		/
Final video	Final video of the project with an overview of the product and results obtained	1		/
International conferences and events	Participation to a key event and publication to peer-reviewed scientific journals	3+ presentations 5 journals 10 conference papers	200+ people per event	8 conference/events 4 publications
Trainings	Trainings for professionals during the project, mostly linked with technical application works performed at the case studies	2+	150 people	/
Newsletter	Engagement with target groups	6	1 every 6 months	3 done
Contact Database	Key Contact database	1	Updated regularly	OK
Demonstration	Demonstration with advisory group, stakeholders and first responders	2 events In 2 different countries	25 + organisations involved	/
Clustering activities	Promotion of networks and active	3+	3+ EU organizations,	/

	cluster with other H2020 European ongoing related projects, European and National Technology Platforms (e.g., CERIS)		clusters or working groups engaged for user needs definition and results dissemination	
Synergies	Increase value and performance of the project (e.g., joint dissemination and synergy to support the technological evolution)	2+ 2+	2+ EGNOS initiatives 2+ H2020/HE projects	SAFERS, FIRELOGUE, TREEADS joint communication
Social media	Spreading the project achievements to a wider audience	3 accounts (LinkedIn, Twitter, Facebook) 300+ posts	5 000+ followers 10 000+ interactions	3 accounts up and running. 225+ post 1.400+ interactions

Table 4 Summary and comment on communication and dissemination KPIs

10. Conclusion

This document illustrates and explain the use of OVERWATCH website, social media pages and communication materials (brochures, newsletters, and videos) to promote the project, build a storyline a visual/brand identity and raise awareness around the OVERWATCH project as well as to show how European collaborations promote the development of technological innovations that can build more resilient societies against natural disasters. Future communication actions will aim to promote the OVERWATCH project and support its visibility and competitiveness at both European and international levels. In the coming months, the consortium's goal will be to increase publications and participation in major reference events, and the research of other joint communication and collaborations with other relevant projects as well as the exploitation of project results with all the media at our disposal. The official OVERWATCH website will be updated with all news related to project advancements to showcase the achieved results. All relevant news will also be disseminated through planned informative newsletters and dedicated social media posts. During the Mid-Term Review meeting in Turin on May 16-17, 2024, video and photographic content will be created and utilized across all communication channels to promote the project advancements. The official OVERWATCH social media channels will continue to be leveraged to maintain an active "communication ecosystem", keep user engagement high, and further increase interest and engagement from the project's target audience and stakeholders.

References

ID	Title	Access Date
[RD01]	Link - Integrated holographic management map for safety and crisis events	2024
[RD02]	Link - D5.1 Dissemination and Communication Plan	2024
[RD03]	Link - EC Funding & tender opportunities SEDIA: what is the difference between dissemination, exploitation, and communication	2024