SECURE AND SUSTAINABLE SUPPLY OF RAW MATERIALS FOR EU INDUSTRY

Rendicontazione

Informazioni relative al progetto

S34I

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Periodic Reporting for period 1 - S34I (SECURE AND SUSTAINABLE SUPPLY OF RAW MATERIALS FOR EU INDUSTRY)

Periodo di rendicontazione: 2023-01-01 al 2024-06-30

Sintesi del contesto e degli obiettivi generali del progetto

S34I is researching and innovate new data-driven methods to analyze Earth Observation (EO) data, supporting systematic mineral exploration and continuous monitoring of extraction, closure and post-closure activities with the aim to increase European knowledge and autonomy on raw materials resources. S34I uses EO not only for the management of technical and environmental issues for a green transition but also to support mining's public awareness and better legislation. Innovative EO-

based products/services will provide new or more accurate RM mineral mapping/exploration, environmental and mine monitoring and mine safety, at different phases of the mine life cycle. S34I will exploit Copernicus and other satellite sensors (optical and radar), while other platforms as airborne, low altitude platforms, ground-based, in-situ techniques/methods, and fieldwork will serve either for calibration, validation, or to complement Copernicus data, especially at the very high scale spatial or spectral resolution. S34I will provide 6 new open high-added value datasets, 14 new methods to analyze EO data using Artificial Intelligence being utilized at different phases of the mining life cycle, 3 new prototyped EO-based services for mining stakeholders, 1 research and innovation agenda on EO for mining, a set of recommendations for better policy, and guidelines for EO uptake by the mining industry.
S34I results will be validated at six different locations in different phases of the mining life-cycle: land exploration in Spain; coastal exploration at the Iberian Peninsula Atlantic coast; extraction phase in Austria and; closure/post-closure phase in Finland and Germany. S34I is an EU-wide interdisciplinary and complementary team embracing partners from 12 countries and with a 50/50 balance between industrial and research profiles. S34I mining stakeholders will lead the path towards mining decarbonization while creating social and economic impact through EO uptake.

Lavoro eseguito dall'inizio del progetto fino alla fine del periodo coperto dalla relazione e principali risultati finora ottenuti

Scientific-Technical
The processing infrastructure was prepared to be used by all partners. In the first 18 months, WP3 has been committed to explore methods at different spatial scales and spectral and spatial resolutions and revisiting frequency by combining different satellite-based existing datasets with other data, including historical data.
Deliverable D2.1: Strategic Planning Requirements for Modern Mining Ensuring Compliance with Sustainable Development at Regional and Local Scales, submitted on 23/11/2023, related to Social, Environment Issues & Circular Economy and the accomplishments obtained in the scope of WP3 contributed to the definition of the project's service portfolio in support of enhanced mining decision-making, primarily based in the exploitation of EO data, GNSS monitoring and Unmaned Aerial Vehicle (UAV) acquisitions. All partners in WP4 iterated on the services portfolios of WP4 for each service category, from Raw Materials Deposits Mapping to Early Warning and Environmental Monitoring, defining the catalogues' components, their products, products' versions and characteristics.
Special attention was given to data harmonization with D3.1: Technical requirements for data harmonization and data infrastructures interoperability prepared and submitted on 31st of October 2023.
Economical
WP3 and WP4 are working towards developing new methods and services to contribute to the economic objectives. A new phase of the project, the field validation, will start under the responsibility of WP5 to validate the economic objectives, where the feasibility, added value, and outcomes of the various prototyped services must be demonstrated. It will involve conducting field trials to showcase how EO analysis-based services can effectively address challenges across different mining phases/sites.

Societal-Policy
WP6 is contributing to these objectives by communicating and disseminating S34I activities and results, engaging the stakeholders with the cooperation of WP5 and WP2.
The preliminary version of D6.2: Communication and Dissemination Materials was completed and submitted on the 23/11/2023, contributing as validation for KPIs regarding SP1 and SP2.
The first S34I Workshop entitled “Implementation of Earth Observation Technologies in the Raw Materials Industry” was held on the 26/11/2023 in Helsinki. This workshop aimed to develop digital expertise and advanced skills for mining stakeholders, promote both digital transition and sustainable mining in Europe, stimulate new interregional synergy activities, share experiences, and disseminate project ideas among the participants.
WP2 conveyed stakeholders requirements, providing recommendations for the systematic use and updating the existing policies on EO data and remote sensing applications in the extractive sector.
The results obtained in the scope of WP2 can be used to improve the EU mining industry, the mining stakeholders, and the consortium, providing useful insights to policymakers. The social engagement actions raised the public's awareness of non-invasive tools used in the mining industry, promoting collaboration between stakeholders, and increasing information and awareness among society and public activists (D2.1).

Progressi oltre lo stato dell’arte e potenziale impatto previsto (incluso l’impatto socioeconomico e le implicazioni sociali più ampie del progetto fino ad ora)

This project is still in early stages, no results beyond the state of the art were achieved yet.
S34I will develop an innovative multi-method and multi-scale approach for land Co exploration. It will integrate airborne hyperspectral data with LiDAR for lithological/alteration mapping. It will explore the connection between land/seashore using multi/hyperspectral EO data aided by a new Underwater Hyperspectral Imaging (UHI) system.
The project will also create new stockpile/mining waste volume estimation methods, leveraging superresolution techniques time series. S34I will integrate EO data and UAV imagery for mapping acid mine drainage (AMD) in water bodies through an AI-based approach.

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