PHISHES

PHysically-based Integrated Soil HEalth Simulation platform

Predicting soil health to protect ecosystems

Exploitation Strategy

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Executive summary

This document constitutes the initial exploitation strategy for the results and tools produced under the EU Horizon Mission Soil project: Physically based Integrated Soil HEalth Simulation platform (PHISHES). The strategy is based on plans and findings developed during the initial phase of the project, before the final specification and development of tools and platform facilities and before production of results from any of the technical work packages. The exploitation strategy outlined here should therefore be considered preliminary and will be updated later in the project in the planned deliverable D6.8 when the project tools have been developed and tested on practical applications and when the project task, specifically targeting the result exploitation, has been completed.

PHISHES aims to showcase the strength and importance of applying predictive capability regarding the effect of soil management practices on the fate of soil contaminants and on soil and ecosystem functions and services. An initial plan for exploitation of the developed tools is presented here and will be further defined during the project.

Through workshops and meetings, potential stakeholders and users have been involved from the very beginning of the project to ensure that the developed technology targets and solves real environmental challenges and promotes the uptake of the project's tools and results by a larger group of professionals, scientists and water and environmental managers.

Further exploitation of the project's results is strongly supported by its focus on developing quantitative tools for simulation of soil health and its environmental effects, testing these tools on real cases and facilitating the access to the developed tools and results through a digital platform.

Keywords

Result exploitation, soil health simulation, vegetation growth modelling, soil chemistry modelling.

List of acronyms and abbreviations

GA	Grant Agreement
CA	Consortium Agreement
EAB	External Advisory Board
GLA	General Assembly
EC	European Commission
EUSO	EU Soil Observatory, a platform for soil data and policy support in the European Union
IPR	Intellectual Property Rights
JRC	Joint Research Centre, the European Commission's science and knowledge service
KER	Key Exploitable Results
NGO	Non-Governmental Organisation
PO	Project Officer

PC	Project Coordinator
UNEP	United Nations Environmental Programme
WP	Work Package
PMC	Project Management Committee

Exploitation Strategy (Deliverable 6.4)

1 How our general approach supports result exploitation beyond the project activities

The general approach aims at further exploitation of the results and tools beyond the project.

PHISHES aims to develop a deeper understanding of the potential impacts of soil pollution, climate change and agricultural management practices on soil functions, agriculture, ecosystems and drinking water supply. Through demonstration of the potential of the developed integrated simulation models and science-based decision support tools on practical and relevant case studies, PHISHES will support policy makers and authorities in the decisions associated with improving soil health in their area. The practical applications built on top of the developed scientific developments will pave the way for widespread adoption of integrated soil-air-water modeling tools at other European sites and for absorption of the technology in environmental policymaking and management.

In addition to the publication of results of the research and developments through scientific papers and presentations, the majority of the model outputs will be made available through the PHISHES Digital Platform (PDP). Any restrictions to datasets' availability in the PDP is to be addressed in the Data Management Plans D7.2, D7.3, and D7.4. The platform will also hold links to the commercial and free modelling packages applied in the project and to generally accessible input data sources to facilitate the application of the developed technology by other scientists and professionals at other European sites beyond the scope of PHISHES. The selected approach of building the research as further development on top of existing and well-proven simulation packages or combinations of such packages, facilitates the exploitation of the project's results and developments by well-established user groups of these software packages; groups that are already active in the environmental and agricultural sectors.

2 Stakeholder involvement from the start of the project

Through workshops, interviews with relevant experts, and meetings, potential stakeholders and end users have been involved from the very beginning to ensure that developed technology is targeting and solving real environmental challenges and promoting the uptake of the project's tools and results.

To further strengthen the ties to the potential end users and broaden the exploitation of the project outcomes an External Advisory Board (EAB) has been established with members being environmental managers and advisors with hands-on experience of soil-health related challenges presently faced by the environmental administrations. The EAB will advise the General Assembly, constituting the project leadership, on the applicability and relevance of the developed technology.

As also described below, initial information meetings and workshops have already been held with:

- The user communities of some of the applied software packages (such as MIKE SHE) where users have expressed a great interest in applying the planned new facilities, once these have been developed, tested and implemented in the software packages.
- Local stakeholders at some of the PHISHES case studies who have shown dedication and strong support to the model approach and the types of obtainable results. In detail, local stakeholders that have been engaged already include the following entities:
    - October 2024 – Municipality of Rotterdam, NL
    - January 2025 – Municipality of Rotterdam, NL
    - March 2025 – Ministry of Agriculture, CZ, Vltava River Basin Authority, CZ

- March 2025 – Uppsala University, SE
- December 2025 – Vltava River Basin Authority, CZ
- February 2026 – Vltava River Basin Authority, CZ, Vysocina Region, CZ
- April 2026 – Municipality of Rotterdam, NL
- July 2026 – Vltava River Basin Authority, CZ

3 Key exploitable results

The results of PHISHES, in terms of the developed methodologies, the modeling concepts and facilities as well as the results of the demonstration scenario cases, can all be exploited to solve soil pollution challenges faced in Europe. The beneficiaries of such exploitation include both authorities (managers, planners and policymakers), operators, NGOs and not least private consultants servicing these stakeholders.

A first, non-exhaustive list of key exploitable results and how partners intend to exploit them is summarized in Table 1 below. The table will be updated during the project when more details become available on the developments and the achieved results.

Table 1 Key exploitable results and potential users

Key exploitable results	**Potential users**	**Partner/s**	**Routes to exploitation**	**IPR strategy**
Soil-water pollution data requirements and model trains/concepts from local to catchment scale (guidelines, know-how)	Authorities, scientific communities, soil and pollution control managers, private consultant companies.	BRGM, UCPH, DHI, CG, SGI	Publications	*Know-how*
Scenario results covering a range of soil pollutants and sites across Europe (range of site model results available)	Authorities, scientific communities, soil and pollution control managers, policy makers	DHI, UCPH, Deltares, BRGM, SGI, UBA, SGGW, CG	Publications	*Know-how*
Digital platform to display data and key results for support to decision-making (web interface to explore results)	Information managers (EUSO and JRC), authorities, scientific communities, soil and pollution control managers, policy makers	DHI	Technology	*Copyright, know-how*
Definition of management scenarios and impacts on soil and water (catalogue of measures, impacts and effects)	Soil and pollution control managers, policymakers	Deltares, UCPH, BRGM, UBA	Non-scientific publications	*Know-how*
Download and processing of climate change data (data prepared for the modeling)	Authorities, scientific communities, soil and water managers	CG, DHI	Publications, technology	*Copyright and know-how*
Scenario results of soil-water pollution, soil services and soil health and their implication on	Authorities, scientific communities, soil and pollution control	All	Non-scientific and	*Know-how*

Key exploitable results	Potential users	Partner/s	Routes to exploitation	IPR strategy
policymaking (project results, conclusions and recommendations)	managers, policy makers		scientific publications	
Vegetation module within the MIKE SHE software	Authorities, scientific communities, soil and pollution control managers, policy makers, private consultants, NGOs, multilateral development agencies (e.g. UNEP, World Bank)	DHI, UCPH	Commercial software	*Copyright owned by DHI*
Developments of DAISY software	Authorities, scientific communities, soil and pollution control managers, policy-makers	UCPH	Open source software	*Copyright owned by UCPH*

4 Who can exploit the results

The exploitation of PHISHES aims to ensure that project results and outputs are available and accessible, not only to scientists within our field of research, but also to various other stakeholders – e.g. relevant local agencies, local administration and dedicated sectoral bodies, local planners working with soil and water management, policymakers at different levels, environmental ecologists, NGOs, private associations and not least, private consultancy companies servicing such entities. A more exhaustive list of potential users is included in Table 1.

PHISHES will come into contact with these potential users through various channels. A primary avenue for stakeholder engagement is through the workshops and events planned during the project. A full list of the workshops and events during the project are described in the Communication and Dissemination Strategy, D6.1. The workshops that could be particularly relevant for uptake of the technical and policy-relevant aspects of the PDP are those targeting a scientific audience and those targeting the stakeholders of the PHISHES test cases. These include:

- Two scientific events organized by PHISHES, a mid-term event and a final conference. The mid-term event is scheduled to take place at REMTECH-Europe, in September 2026.
- Workshops for the test cases. The list of stakeholder institutions that have been engaged via meetings and workshops through the test sites are listed in Section 2.Policy-level workshops targeting co-design of elements of the PHISHES Digital Platform.

5 How the results can be exploited

The overall objective is to provide an open dissemination and use of project data and results, e.g. with respect to scientific exploitation, while upholding commercial rights associated mainly with software. A range of licensed or non-licensed modeling software will be applied and demonstrated in the project.

The sustainability of the project outputs beyond the project period depends on maintainability. The majority of the model outputs will be available through the PHISHES Digital Platform (PDP). It is important to explore options for continuation of the digital platform and associated services beyond

the project period which may require transfer, hosting arrangements or costs agreements. The next version of the exploitation plan will outline possible, viable solutions for long term maintenance and accessibility to PHISHES key results.

The web-based DSS developed within the project as part of the PDP will be publicly accessible without any license fee and will include:

- Descriptions of the environmental challenges addressed in the various test cases.
- Description of the model trains applied and links to the individual software modelling packages (open source as well as commercial).
- Enabling interaction with precalculated simulation results from the five case studies.
- Links and descriptions to various publicly available data sources used for modelling. Such sources may contain relevant topographical, climate/meteorological as well as soil and land use characteristics; data that may be useful for the application of the developed technologies elsewhere in Europe.

Applying the DSS to other studies would require a configuration effort which would be offered on a commercial basis. Likewise, access to simulation engines needed to develop similar studies at other sites will be possible based on commercial or freeware license agreements.

The output of PHISHES activities will be exploited directly by several existing routes:

- Direct dialogue throughout the project with the key stakeholder networks for regulators, industry, business and science involved in remediation and risk management.
- Exposure and information of project development and findings through publication scientific peer reviewed papers and participation and presentation on relevant scientific conferences and fora, such as AquaConSoil and EU Mission Soil Clusters.
- Delivery of content and data for major EU long-term platforms: EU Soil Observatory (EUSO), the JRC Soil - EU Science Hub, projects resulting from the current EU Mission Soil knowledge repository call, and CORDIS.
- Direct exploitation of the developed reactive-chemistry and advanced vegetation modules and facilities by user communities of the commercial and open software packages applied by the partners in the project (MIKE SHE, Daisy, Hydrus/Hydrus-PHREEQC, MT3DMS, MODFLOW and Water Tools Portal).

6 Intellectual Property Rights

It is envisaged that through the planned networking and clustering activities, synergies between emerging tools, methods, models and technologies across projects funded under this and other Horizon Europe Calls may lead to joint publications in high impact journals or even materialize in joined patents and joint public-private commercial ventures, which may require a new form of IPR agreement between the parties concerned.

In the Consortium Agreement, a preliminary agreement has therefore been made between the partners regarding the indirect and direct utilization of results, access to background and exploitable result rights, distribution agreements as well as the primary routes for exploitation. Here, Intellectual Property Rights (IPRs) have been defined with the purpose of identifying and protecting IPR for the project as a whole and for each of the collaboration partners in particular. By addressing IPR issues early in the project, any disagreements hindering collaboration during the project is prevented.

The guiding principles for this agreement are that:

- Each partner withholds existing IPR upon start of the project.

- The licensing model for new software & models developed within the project has been established in the Consortium Agreement; nevertheless, we envision that each partner will claim the IPR for tools developed by them within the project.

IPR considerations will be considered in detail in Task 7.2 and detailed in the iterations of the Data Management Plan developed in the course of the project.

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For More Information

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  www.phishes-project.eu
- Follow PHISHES on LinkedIn:
  www.linkedin.com/company/phishes-project

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