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# ”Converting an urban wasteland into a sustainable and educational living-lab, based on a replicable phytomanagement approach” project DMP

Michel Chalot

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# "Converting an urban wasteland into a sustainable and educational living-lab, based on a replicable phytomanagement approach" project DMP

*Plan de gestion de données créé à l'aide de DMP OPIDoR, basé sur le modèle "ANR - DMP template (english)" fourni par Agence nationale de la recherche (ANR).*

## Plan Details

<b>Plan title</b>	"Converting an urban wasteland into a sustainable and educational living-lab, based on a replicable phytomanagement approach" project DMP
<b>Deliverable</b>	Deliverable D1.4
<b>Version</b>	Final version
<b>Plan purpose/scope</b>	The data management activities, based on the 4 foundational FAIR principles - Findability, Accessibility, Interoperability and Reusability - has been fully detailed in the data management plan (DMP, version 1) that has been created with the DMP OPIDOR tool at the onset of the project and delivered to the ANR on June 1st, 2021. The DMP has been updated regularly, with the last version released on November 27, 2024. All data have been described in the dat@UBFC search metadata portal hosted by the coordinating organization UBFC.
<b>Fields of science and technology (from OECD classification)</b>	Environmental biotechnology, Environmental engineering, Biological sciences (Natural sciences), 2.7 Environmental engineering
<b>Language</b>	eng
<b>Creation date</b>	2021-04-16
<b>Last modification date</b>	2024-11-27
<b>Identifier type</b>	DOI
<b>Associated documents (publications, reports, patents, experimental plan...), website</b>	<ul style="list-style-type: none"><li>• Improvement of the phytoextraction of <i>Salix aquatica grandis</i> and <i>Alliaria petiolata</i> to manage the trace element contamination of the Vieux-Charmont industrial wasteland (25). PhD_ : tel-04745265</li><li>• identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. Atlas sites PMA : hal-04749330</li><li>• identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. Atlas site CCST : hal-04768250</li><li>• identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. Atlas sites CCPH : hal-04768244</li><li>• identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. Atlas site C CVS : hal-04768339</li><li>• Cathy Kuhn, Noémie Viovi, José Pereira, Philippe Bozon, Magali Stanojevic, et al.. ECOPOLIS : gérer la pollution par les plantes. 2022. (hal-04745587) : <a href="https://hal.archives-ouvertes.fr/hal-">https://hal.archives-ouvertes.fr/hal-</a></li></ul>

04745587

- Jordan Collot, Philippe Binet, Abdoulaye Mahamat Malabad, Benjamin Pauget, Marie-Laure Toussaint, et al.. Floristic survey, trace element transfers between soil and vegetation and human health risk at an urban industrial wasteland. *Journal of Hazardous Materials*, 2023, 459, (10.1016/j.jhazmat.2023.132169). (hal-04707507) : 10.1016/j.jhazmat.2023.132169
- La valorisation environnementale des fonciers dégradés. Comment passer d'une friche urbaine à un jardin scientifique et pédagogique. *Magazine des professionnels de la dépollution des sites - UPDS Mag*, : hal-04739479

## Project Details

### Project title

Converting an urban wasteland into a sustainable and educational living-lab, based on a replicable phytomanagement approach

### Acronym

ECOPOLIS

### Abstract

The overarching aim of ECOPOLIS is, based on the involvement of the whole urban ecosystem restoration community (site managers, practitioners and academia, urban, regional decision makers, civil society) and on a Living Lab, to develop, test and foster the implementation of economically valuable nature-based solutions to improve the urban environmental quality at the polluted wasteland in Vieux-Charmont (Doubs, France).

The implementation relies on three specific objectives: (1) to fully characterize spatially and quantitatively the site's pollution, mobility, and environmental and human impacts, using innovative methods that will be deployed on site to meet the technological challenges related to the management of polluted sites and soils (2) to set-up a living-lab following the National Methodology for Managing Polluted Sites and Soils and its associated standard (NF X31-620) to bring together local authorities, public and private actors, companies, associations and individual actors in order to test different pollution management scenarios (3) to evaluate the replicability potential on other marginal lands of the territory. The objective, in the longer term, is to capitalize on the method to enable phytomanagement actions to be initiated on part of other marginalized lands in the Nord Franche-Comté.

ECOPOLIS focuses on urban ecosystems because the leverage effect of cities in terms of reducing ecosystem degradation is higher than in rural ecosystems. This is primarily due to the high rates of resource use, consumption of energy and Green House Gas emissions in cities. Urbanisation usually leads to degradation of ecosystems by e.g. soil sealing, soil consumption, air water and soil pollution, human exposure to contaminants and loss of biodiversity. This occurs not only locally, but also at broader scales through long-range transport of air-borne pollutants and contaminants in waterways. These degradations hamper the delivery of ecosystem services such as food and water supply, flood prevention, climate change regulation and recreation. Focusing on urban ecosystems restoration, cities can provide a good leverage effect for improving the delivery of ecosystem services at large scales.

ECOPOLIS will be carried out over 42 months. The work plan will be organized around 6 WPs, to fully address the three objectives described above. WP1, WP5 & WP6 are cross-cutting WPs, and will be

dedicated to the project management & coordination (WP1), dissemination and exploitation (WP6) of result, as well as to the replication potential of the phytomanagement solutions (WP5). The research fields considered in ECOPOLIS are therefore agronomy and ecological sciences (through measurements of the impact of phytomanagement on the biodiversity), engineering sciences (soil engineering, ecological engineering and process engineering through restoration work Environments, environmental applications of wireless sensor network).

The expected benefits of ECOPOLIS are as follows: 1) to demonstrate that it is possible to manage industrial pollution efficiently through phytomanagement; 2) to make the wasteland a laboratory dedicated to scientific and teaching innovation (from Secondary school to doctorate) by implementing relevant and innovative field tools, complementary to laboratory approaches, 3) to develop a pedagogical tool that makes it possible to tackle many themes: environmental awareness, biology, chemistry, geography, industrial history, ecosystem management, urban planning; 4) to bring these degraded spaces back to life in the city without losing their historical trace. Training and dissemination of the ECOPOLIS activities and results will contribute to further involvement of stakeholders and cities, to long-term observation of restoration by nature-based solutions, and to the exporting of best available techniques and businesses within the whole territory.

### **Funding**

- Agence nationale de la recherche (ANR) : ANR-20-CE22-0010-01

### **Start date**

2020-12-01

### **End date**

2024-11-30

### **Partners**

- INSTITUT FRANCHE-COMTE ELECTRONIQUE MECANIQUE THERMIQUE ET OPTIQUE - SCIENCES ET TECHNOLOGIES  
<https://ror.org/004fmxv66>
- TESORA
- Agence de développement et d'urbanisme - PMA
- Pays de Montbéliard Agglomération

### **Research outputs :**

1. Soil analyses performed at the Vieux-Charmont site (Dataset)
2. Plant analyses performed at the Vieux-Charmont site (Dataset)
3. Data obtained through the Wireless Sensor Network (Dataset)
4. List and functional attributes of microbes (Collection)
5. Research output 5 (Audiovisual)
6. Research output 6 (Dataset)
7. identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. 4 maps. (Other)

### **Contributors**

<b>Name</b>	<b>Affiliation</b>	<b>Roles</b>
michel.chalot@univ-fcomte.fr - <a href="https://orcid.org/0000-0001-8614-0917">https://orcid.org/0000-0001-8614-0917</a>		<ul style="list-style-type: none"><li>• Contact Person (RO 6)</li><li>• DMP manager</li><li>• Personne contact pour les données (ECOPOLIS video, RO 7, ECOPOLIS soil data, ECOPOLIS plant data, ECOPOLIS WSN data, ECOPOLIS microbes)</li><li>• Project coordinator</li></ul>

# "Converting an urban wasteland into a sustainable and educational living-lab, based on a replicable phytomanagement approach" project DMP

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## 1. Data description and collection or re-use of existing data

### Soil analyses performed at the Vieux-Charmont site

#### 1a. How will new data be collected or produced and/or how will existing data be re-used?

All sampling and analytical protocols are based on normalized procedures (ISO-referenced) that will be attached to all datasets. Each set of data will be attached to a dedicated form, specifying the location of the sampling site (GPS coordinates). There are no re-use of existing data in the present project

#### 1b. What data (for example the kind, formats, and volumes), will be collected or produced?

The following data will be collected:

- physico-chemical characteristics of the studied soils

The data will be acquired during laboratory and field experiments.

The CSV format, a common [data exchange](#) format that is widely supported by consumer, business, and scientific applications, will be favored for data files.

The PDF format (Portable Document Format (PDF), standardized as ISO 32000) will be preferred for accompanying text files.

### Plant analyses performed at the Vieux-Charmont site

#### 1a. How will new data be collected or produced and/or how will existing data be re-used?

All sampling and analytical protocols are based on normalized procedures (ISO-referenced) that will be attached to all datasets. Each set of data will be attached to a dedicated form, specifying the location of the sampling site (GPS coordinates). There are no re-use of existing data in the present project

#### 1b. What data (for example the kind, formats, and volumes), will be collected or produced?

The following data have been collected:

- complete Plant analyses performed at the Vieux-Charmont site

The data have been acquired during laboratory and field experiments.

The CSV format, a common [data exchange](#) format that is widely supported by consumer, business, and scientific applications, will be favored for data files.

The PDF format (Portable Document Format (PDF), standardized as ISO 32000) will be preferred for accompanying text files.

## Data obtained through the Wireless Sensor Network

### 1a. How will new data be collected or produced and/or how will existing data be re-used?

All sampling and analytical protocols are based on normalized procedures (ISO-referenced) that will be attached to all datasets. Each set of data will be attached to a dedicated form, specifying the location of the sampling site (GPS coordinates). There are no re-use of existing data in the present project

### 1b. What data (for example the kind, formats, and volumes), will be collected or produced?

The following data will be collected:

- Data obtained through the Wireless Sensor Network

The data will be acquired during laboratory and field experiments.

The CSV format, a common [data exchange](#) format that is widely supported by consumer, business, and scientific applications, will be favored for data files.

The PDF format (Portable Document Format (PDF), standardized as ISO 32000) will be preferred for accompanying text files.

## List and functional attributes of microbes

### 1a. How will new data be collected or produced and/or how will existing data be re-used?

All sampling and analytical protocols are based on normalized procedures (ISO-referenced) that will be attached to all datasets. Each set of data will be attached to a dedicated form, specifying the location of the sampling site (GPS coordinates). There are no re-use of existing data in the present project

### 1b. What data (for example the kind, formats, and volumes), will be collected or produced?

The following data will be collected:

- List and functional attributes of microbes

The data will be acquired during laboratory and field experiments.

The CSV format, a common [data exchange](#) format that is widely supported by consumer, business, and scientific applications, will be favored for data files.

The PDF format (Portable Document Format (PDF), standardized as ISO 32000) will be preferred for accompanying text files.

## Research output 5

### 1a. How will new data be collected or produced and/or how will existing data be re-used?

Question sans réponse.

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**1b. What data (for example the kind, formats, and volumes), will be collected or produced?**

Question sans réponse.

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## **Research output 6**

**1a. How will new data be collected or produced and/or how will existing data be re-used?**

Question sans réponse.

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**1b. What data (for example the kind, formats, and volumes), will be collected or produced?**

Question sans réponse.

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## **identification et hiérarchisation de sites propices aux techniques de phytomanagement dans le Nord Franche-Comté. 4 maps.**

**1a. How will new data be collected or produced and/or how will existing data be re-used?**

Question sans réponse.

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**1b. What data (for example the kind, formats, and volumes), will be collected or produced?**

Question sans réponse.



## 2. Documentation and data quality

### 2a. What metadata and documentation (for example the methodology of data collection and way of organising data) will accompany the data?

Within the ECOPOLIS research community, the partners will use specialized databases for e.g. the characterization of microorganisms: Silva (<https://www.arb-silva.de/>), Greengene (<http://greengenes.secondgenome.com/>), Unite (<https://unite.ut.ee/>) and Mothur (<https://www.mothur.org/>) databases that are widely used and recognized by the international scientific community.

The dat@UBFC portal (<https://search-data.ubfc.fr/index.php>), which is online since 2021, displays the research data of the UBFC scientific community. It follows the historical portal of the [OSU THETA](#) : dat@OSU. The dat@UBFC portal gathers all the data described in the catalog, but also sub-portals. These sub-portals are institutional portals (for example dat@UFC, dat@Chrono, dat@OSU, ...) allowing institutions, laboratories and federative structures of UBFC to description of their data on dat@UBFC. Any record in which at least one contributor is affiliated to an institution will appear in the sub-portal of this institution, if it exists. Open to all, it is particularly intended for the scientific community. A large of data are freely available. It lists the research data produced at UBFC and gives access to open data.

It is therefore part of the dynamic of opening up public research data (Open Research Data), promoted at the international, European and French levels.

The portal is interoperable with existing external services ([Isidore](#) and [DataCite](#)) allowing the described data to be re-exposed to the outside world. This interoperability will be extended to other services (Catalog of [Data Gouv search](#)).

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### 2b. What data quality control measures will be used?

All sampling and analytical protocols are based on normalized procedures (ISO-referenced) that will be attached to all datasets. Data have been / will be published only in peer review journals

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## 3. Storage and backup during the research process

### 3a. How will data and metadata be stored and backed up during the research?

Raw data are stored onto personal laptops, and automatically backed-up onto the Chrono-environment data center. Back-up are made daily through the "ATEMPO Live Navigator".

Storage of data for further sharing will be done on secure laboratory servers (backup, secure access (DMZ)). The data will be made accessible through the dat@UBFC portal search metadata portal, once deposited in the established [Data-Chrono repository](#).

Terms of use of Data-chrono are available at

<https://search-data.ubfc.fr/chrono/>

[https://search-data.ubfc.fr/chrono/FR-18008901306731-2021-04-22-02\\_Phytomanagement-Vieux-Charmont-F-25.html](https://search-data.ubfc.fr/chrono/FR-18008901306731-2021-04-22-02_Phytomanagement-Vieux-Charmont-F-25.html)

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### 3b. How will data security and protection of sensitive data be taken care during the research

The partners will not produce sensitive data within ECOPOLIS.

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## 4. Legal and ethical requirements, code of conduct

#### 4a. If personal data are processed, how will compliance with legislation on personal data and on security be ensured?

There are no personal data considerations in the project.

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#### 4b. How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?

The Partners of the ECOPOLIS consortium and legal representative office have prepared and signed a Consortium Agreement (CA) regulating the project management, the rights and duties of the operational bodies responsible for the decision-making, and the future foreground exploitation and intellectual property rights. This CA governs the internal organization of the consortium, the additional rules on dissemination and use including intellectual property rights arrangements, as appropriate, as well as the settlement of internal disputes.

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#### 4c. What ethical issues and codes of conduct are there, and how will they be taken into account?

There are no ethical considerations in the project

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## 5. Data sharing and long-term preservation

#### 5a. How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

Analytical data will be made available after publication in scientific journal of the results.

The data are shared through the search metadata portal: [dat@UBFC](mailto:dat@UBFC) at the following URL :

[https://search-data.ubfc.fr/chrono/FR-18008901306731-2021-04-22-02\\_Phytomanagement-Vieux-Charmont-F-25.html](https://search-data.ubfc.fr/chrono/FR-18008901306731-2021-04-22-02_Phytomanagement-Vieux-Charmont-F-25.html)

Once published, the intended access is restricted access on request via the [dmat@UBFC](mailto:dmat@UBFC) portal. The [dat@UBFC](mailto:dat@UBFC) metadata standard is the Dublin Core and DataCite metadata standard. [dat@UBFC](mailto:dat@UBFC) metadata can be exported to DataCite and assigned to them.

All outcomes of the project have been deposited on the HAL repository.

There will be no exclusive use of the data, nor access restriction to any community.

Data will be kept for as long as possible in order to be accessible to the scientific community.

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#### 5b. How will data for preservation be selected, and where data will be preserved long-term (for example a data repository or archive)?

The resources from the laboratory Chrono-environment (dedicated time from the project responsible) are currently used. Initially, the data will be preserved by the laboratory.

No long-term preservation of the data is foreseen apart from its storage on the data-chrono servers and on the HAL repository

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#### 5c. What methods or software tools are needed to access and use data?

The tools needed to access the data will be described in the [dat@UBFC](mailto:dat@UBFC) portal at the specific URL provided above.

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**5d. How will the application of a unique and persistent identifier (such as a Digital Object Identifier (DOI)) to each data set be ensured?**

A persistent and unique identifier (DOI) have been assigned to all project data through the dat@OSU portal : DOI: [10.25666/DATAOSU-2021-04-22-02](https://doi.org/10.25666/DATAOSU-2021-04-22-02)

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## **6. Data management responsibilities and resources**

**6a. Who (for example role, position, and institution) will be responsible for data management (i.e. the data steward)?**

Each researcher generating data for the project will be responsible for describing their data on [dat@UBFC](mailto:dat@UBFC). This will be part of their researcher time. Access to this interface is reserved for any people registered in the platform. Access to the input interface will be made at the start of the project to all researchers of the ECOPOLIS project on request to the [dat@UBFC](mailto:dat@UBFC) team via the [registration form](#). A visioconference-based workshop has been organized at the start of the project to help the ECOPOLIS partners to appropriate the tool.

Prof M Chalot is responsible for implementing the DMP. The DMP has been updated regularly (at least once a year), after review by the ECOPOLIS consortium committee during project meetings.

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**6b. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

The resources from the laboratory Chrono-environment (dedicated time from the project responsible) are currently used. We will also be assisted in this work by the research data team of the OSU THETA and the members of the dat@UBFC project.