From Gases and Evaporators risk assessmeNt towards an Integrated management of sea and land pollution incidentS

MANIFESTS is a project co-funded by the European Union Civil Protection - DG-ECHO, developed in cooperation with RBINS, CETMAR, IMT Mines Alés, INTECMAR, IST, the UK Security Agency as associated partner and coordinated by Cedre.

Co-funded by the European Union

intecmar INSTITUTO TECNOLOXICO PARA O CONTROL DO MEDIO MARIÑO DE GALICIA

Cedre

TÉCNICO LISBOA

natural sciences .be

CETMAR CENTRO TECNOLÓGICO DEL MAR

IMT Mines Alès École Mines-Télécom

UK Health Security Agency

Deliverable 4.1. Catalogue of resources and educational materials

WP4. Transfer and capitalization of knowledge to target end-users

CENTRO TECNOLÓGICO DEL MAR – FUNDACIÓN CETMAR

Co-funded by the European Union

Deliverable 4.1. Catalogue of resources and Educational materials

Work Package	4
Task	4.1
Date	16 / 03 / 26
Version	1
Author/s	
Partners	CETMAR

Co-funded by the European Union

Table of contents

Co-funded by
the European Union

1.Introduction

The MANIFESTS *Genius* (From Gases and Evaporators risk assessmeNt towards an Integrated management of sea and land pollution incidentS) aims to strengthen preparedness and response capabilities for integrated management of coastal water pollution. The main focus of the project in on the release of HNS, including alternative fuels such as ammonia, methanol and LNG, which could form a toxic gas cloud and potentially drift towards the shoreline and impact local communities. Two scenarios are considered: 1) a subsurface leak from a pipeline and 2) a leak at water surface from a coastal facility.

As part of the transfer and capitalisation activities of the project (WP4), CETMAR carried out two tasks:

1) Development of virtual catalogues of projects, organisations and resources dealing with HNS, by updating and upgrading the MANIFESTS Knowledge Tool.

2) Creation of training materials for wider disseminate the outputs of the MANIFESTS and MANIFESTS *Genius* projects.

2.Virtual catalogues

The MARINER-MANIFESTS Knowledge Tool (https://knowledgetool.mariner-project.eu/) is an online repository that includes a comprehensive compilation of marine research and technical resources specifically focused on the preparedness and response to HNS spills.

One of the activities planned in WP4 of the MANIFESTS *Genius* project was the update and upgrade of the Knowledge Tool to improve knowledge management, dissemination and transfer to end-users.

2.1. Update of the database

The database is organised in three types of contents: projects (relevant European and national projects dealing with HNS), organisations (European and international

organisations working in the field of marine pollution) and resources produced both by these projects and organisations. Updates of this database include adding new records, reviewing and updating those already stored in the database and removing outdated information.

During the MANIFESTS Genius project, a continuous update of the database was performed, basing on the review of ongoing or new projects, identifying new resources and adding/updating the inventory of organisations and their resources.

The first task performed in the database was a complete and deep verification of all links stored in the database to check that URLs in the database are still working and were not broken or mal functioning. The database currently stores 1025 URLs that point to websites or to specific documents/outputs. To avoid broken links, the database counts on a link-verification tool that reports any issues in the administration panel of the database. Once the verification tool was run, the list of broken links was reported and reviewed. Links were restored when possible or removed when their landing pages no longer exist. The link verification tool also ensures the creation of backups for all links pointing to documents.

After the verification of links, projects and organisations already available in the database were reviewed to update their data. Projects that were ongoing since 2022 or finished in the past 3-4 years, were reviewed and updated or completed with the last outputs available on their websites or with information from European repositories (such as UCP Knowledge Network, Keep database, CORDIS, etc.). Regarding organisations, the websites of all entities in the database were revisited to check for any new updates that could be included in the database.

Once the database and existing projects and organisations were updated, European repositories were searched for new projects related with HNS. As a result of the searches performed, a total of 15 new projects and 7 new organisations were identified. These were included in the database and explored to extract their outputs and resources produced. New 146 resources dealing with HNS were identified and stored in the database, most of them in the form of reports and mainly related to the new alternative fuels (methanol, ammonia, hydrogen, LNG, etc.) in the marine environment.

Currently the database includes information about **145 projects**, **78 international and European organisations** and **888 resources** produced by these projects and organisations.

Most projects included in the database were funded by the Union Civil protection Mechanism of the DG ECHO (22%). The database also contains European projects funded by the European Framework programmes, H2020, INTERREG, LIFE, etc. and some national projects are also included (Fig. 1).

Union Civil Protection Mechanism (UCPM) - DG ECHO	**22.39%**	30
FP7	**10.45%**	14
FP6	**9.7%**	13
Norway - National programme	**5.22%**	7
IPA-ENP funding	**3.73%**	5
France - National programme	**3.73%**	5
H2020	**3.73%**	5
INTERREG Baltic Sea Region	**3.73%**	5
Portugal - National programme	**2.99%**	4
INTERREG IV - Atlantic Area	**2.99%**	4
FP5	**2.24%**	3
Finland - National programme	**2.24%**	3
LIFE	**2.24%**	3
Latvia-Lithuania-Belarus ENPI CBC 2007 - 2013	**1.49%**	2
Greece - National programme	**1.49%**	2
Others	**21.64%**	29

Fig. 1. Percentage of projects in the database classified by funding programmes

Resources are classified according to 12 areas of knowledge: Case studies, contingency planning, environmental monitoring and impact, exercising, harbour shipping and industrial facilities, HNS characterisation, human health, liability and compensation, modelling, response protocols and equipment, risk analysis and training. Figure 2 below shows the number of resources contained in each area of knowledge.

Fig. 2. Number of resources per area of knowledge

Co-funded by
the European Union

Resources are also classified by the type of resource considering 12 categories: books, reports, guidelines and standards, multimedia, training activities, dissemination materials, scientific publications, services / tools, database, software / modelling tool, prototype and others. Figure 3 shows the number of resources grouped by type.

More than half of the resources stored in the database are reports and guidelines; however, learning materials, scientific publications and dissemination materials are also commonly included.

Report	**39.93%**	339
Guidelines/Standards	**19.79%**	168
Multimedia	**9.89%**	84
Training Activity/Learning Module	**7.42%**	63
Scientific publication	**5.65%**	48
Dissemination materials	**4.95%**	42
Services/Tools	**3.65%**	31
Book/Review	**3.18%**	27
Database	**2%**	17
Software/Modelling tool	**1.65%**	14
Other	**1.3%**	11
Prototype	**0.59%**	5

Fig. 3. Number of resources per type

Most resources collected are related to marine and coastal environments (Fig. 4) however, resources focused on human health protection, fluvial ecosystems, air pollution and continental ecosystems can also be found in the database.

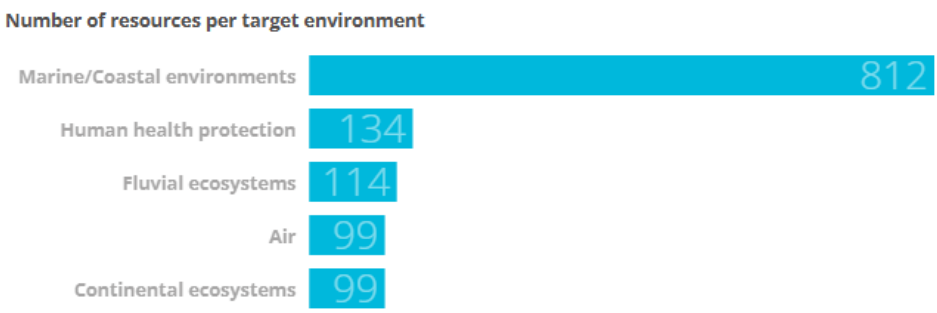


Fig. 4. Number of resources per type

2.2. Upgrade of the knowledge tool: virtual catalogues

In addition to the update of the database contents, the knowledge tool was upgraded to enhance its capabilities to generate more accessible and organised information. To achieve this, a new functionality was created to improve the exporting of information from the KT to create customised catalogues (Fig. 5).

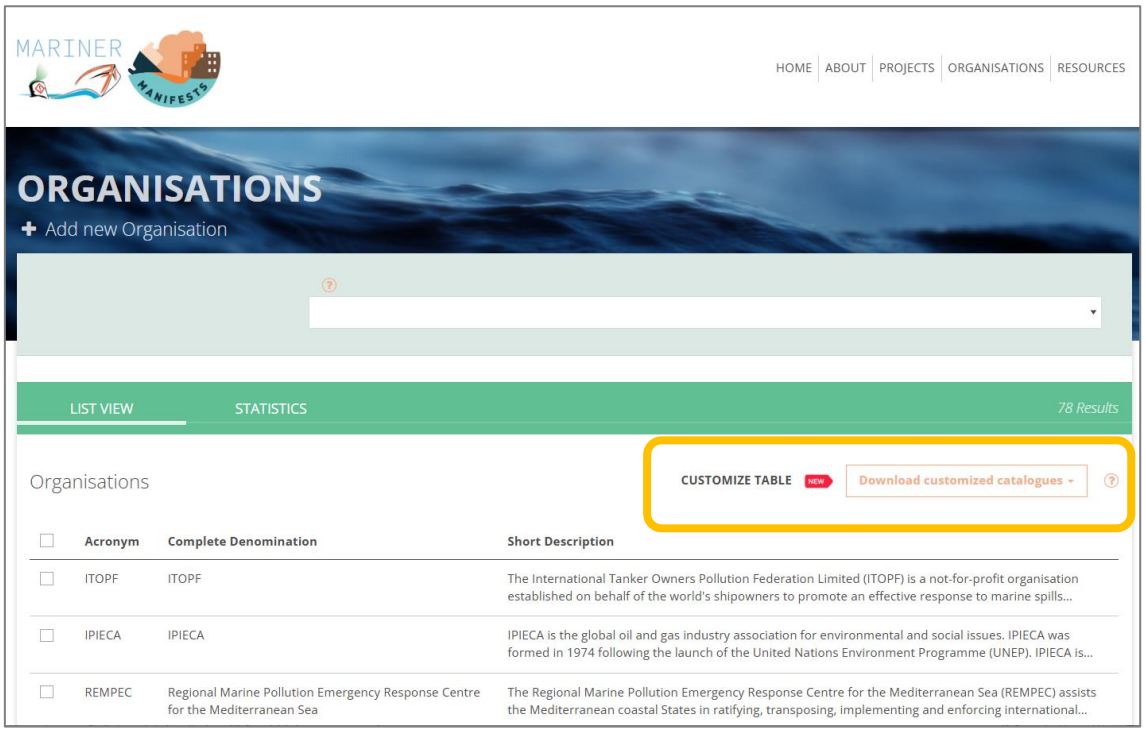


Fig. 5. New functionality that allows users to download virtual catalogues

The knowledge tool now allows users to generate tailored catalogues of projects, organisations or resources through their respective sections. This functionality enables users to extract all records contained in the database in a customised format.

Catalogues can be created by applying filters within each section of the website. To generate virtual catalogues of resources, users can apply multiple filters such as performing simple queries or filtering by area of knowledge, type of resource, project or organisation, geographic area or language.

For project catalogues, users can search for specific projects by entering keywords in the simple or advanced search engine or apply filters to select projects of a specific funding programme, by start or end year, or by the country of the project coordinator.

After applying filters, catalogues can be exported in several formats, including XLS, CSV, RTF and PDF formats. These formats facilitate both data analysis in spreadsheets (XLS and CSV) and the creation of editable documents in enriched text format (RTF) and in the portable document format PDF (Fig. 6).

For editable documents, a tailor-made template was created that includes the logos of the MARINER and MANIFESTS projects, under which the database was created, and the logo of the funding programme. The document layout follows the colours and fonts defined for the MANIFESTS Genius project corporate image. The template includes a cover page where users can insert a document title, followed by individual pages for each project, organisation or resources displaying the main fields:

- For projects:
  - RTF and PDF: fields acronym, title, start year, end year, funding programme, coordinator institution, summary, website, and list of resources with links
  - XLS and CSV: all fields
- For organisations:
  - RTF and PDF: acronym, complete denomination, short description, website, resources with links
  - XLS and CSV: all fields
- For resources:
  - RTF and PDF: title, summary, project, acronym, resource type, areas of knowledge, language and links
  - XLS and CSV: all fields

Co-funded by
the European Union

List of Resources

Title
Regional Resource Database

Summary
A database of regional information on traffic, cargoes, maritime uses, future developments and risk-reduction measures to undertake the risk assessment for marine pollution (mineral oil and HNS)

Project
Bonn Agreement: Area-wide Assessment of Risk Evaluations

Acronym
BE-AWARE I

Publication year
2012

Resource type
Database

Areas of knowledge
- Environmental monitoring, impact & recovery
- Harbour, shipping & industrial facilities
- Risk analysis

Language
English

Page 2

Fig. 6. Example of resource included in a virtual catalogue exported in RTF format

2.3. How to create virtual catalogues

The knowledge tool allows users to create virtual catalogues of projects, organisations or resources.

The process to create catalogues is similar in the three sections of the website: users can export data by using filters and by adjusting table fields, then download catalogues in different file formats.

Before exporting, users can **filter** projects / organisations / resources that will appear in the catalogue, using the following filters:

a) For resources:

1. Area of Knowledge — Choose the thematic topics of interest.
2. Type of Resource — Select the resource types from a list of 9 types (Book/review, Database, Reports, etc.)
3. Geographic Area — Choose the region (e.g., Europe, Mediterranean Sea).
4. Use other filters in the “Advanced search”:
    - Target environment – select one or more relevant types of environment
    - Project / Organisation – view the resources produced by a specific project / organisation
    - Language — Select one or more languages

Co-funded by the European Union

b) For projects:

1. Basic Search: entering keywords to search in project Acronym, Title, or Summary fields.
2. Advanced Search Filters: the following filters are available:
    - Funding Programme – select one or multiple funding programmes.
    - Project Coordinator – filter by the leading institution.
    - Country Coordinator – filter by country of coordinating institution.
    - Project Duration – enter start and end years.

Once the table displays the list of records of interest, users can **export data to create catalogues**:

1. Click Download customized catalogues
2. Click on the desired format:
    - **Export as XLS** — Excel spreadsheet format.
    - **Export as CSV** — Comma-separated values file.
    - **Export as RTF** — Rich Text Format (editable text documents).
    - **Export as PDF** — Portable Document Format (print-ready).

3. Educational materials

The objective of this task was to develop training materials that demonstrate the use of tools and results of the MANIFESTS and MANIFESTS Genius projects. These materials were presented in two formats (factsheets and power point presentations) and illustrate the tools application facilitating their understanding and providing opportunities for practice and feedback. These materials were designed to be engaging and well-structured in formats that facilitate their usability and were tailored to align with the learning objectives of the target audience.

The materials were designed following the steps below:

3.1. Selection of the key tools and outputs

In collaboration with project partners, 12 key tools and outputs developed by both projects were selected with the aim of facilitating their dissemination and transfer to end users. The list of tools and outputs is as follows:

- HNS Data Base
- MOHID model
- OSERIT model
- Fire model
- Explosion model
- Rising underwater gas plume model
- Niovelius serious game
- Operational field guide: Shelter and evacuations decision tool
- COP tool
- Mariner-Manifests knowledge tool
- Exercise tool
- Exercise tool lite

3.2. Development of a questionnaire

The questionnaire contains key questions addressed to the authors of the selected tools/outputs, in order to collect essential information about their functionalities and applications (see Annex I).

More specifically, it covers several key aspects starting with a general overview, including its name, authorship, state of development and access details. It then focuses on the tools/outputs' objective, applications, functionalities, and practical use cases, followed

Co-funded by the European Union

by technical requirements (hardware and software needs, integration with other tools) allowing a clear understanding of how each tool can be applied.

Finally, the questionnaire also identifies the target audience, and further information on guidance support, access permissions and feedback mechanisms.

Partners completed one questionnaire for each tool/output with as much information as possible to describe them.

3.3. Design and development of standardized templates

A professional designer was subcontracted for the design and development of a template for a 2-pages factsheet and a PowerPoint presentation (2-3 slides) to ensure consistency in the description of tools and clarity.

These templates can be provided to support the dissemination of any additional materials, in case they are required.

3.4. Preparation of factsheets and PowerPoint presentations

Based on the information gathered through the questionnaires, a factsheet and PowerPoint presentation were elaborated for each tool/output.

Factsheets and presentations were translated to the four languages of the project (French, English, Portuguese and Spanish) to facilitate its usability and dissemination and are available both in PPTX and PDF formats.

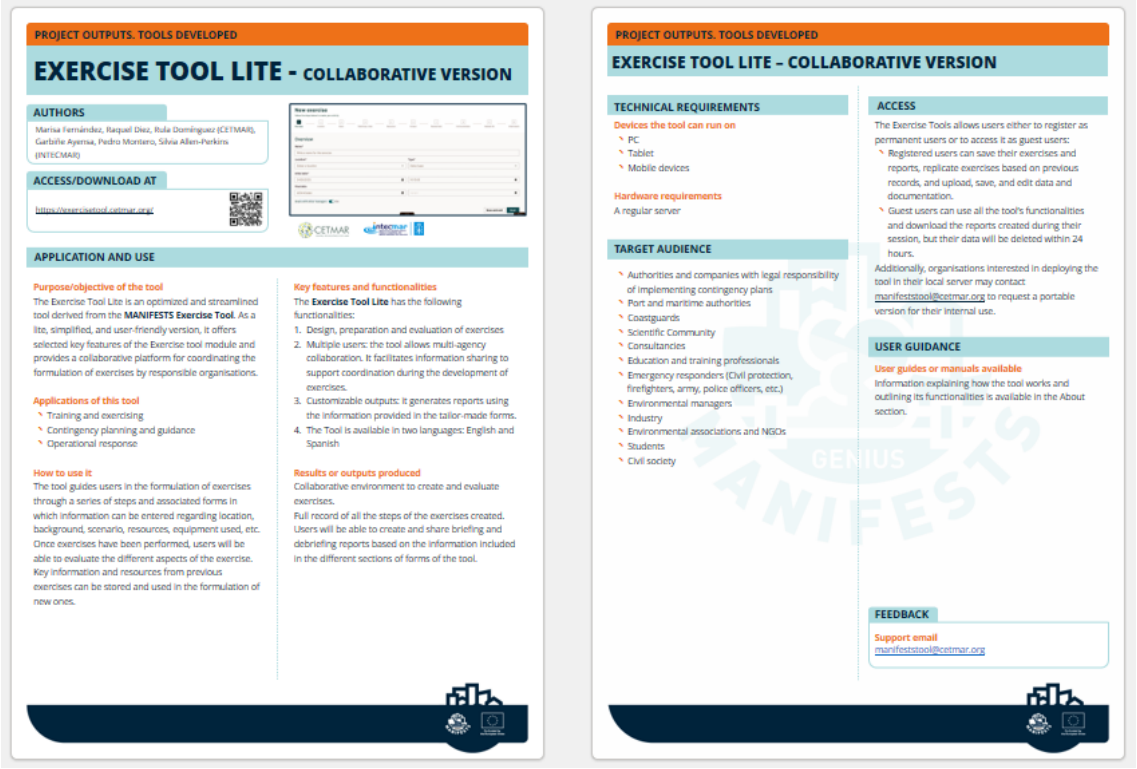


Fig. 7. Example of factsheet

Fig. 8. Example of PowerPoint presentation

The developed PowerPoint presentations are attached in Annex II, while the corresponding Factsheets are included in the project Booklet presented in Annex III.

1. Compilation of factsheets into a booklet

The English versions of the 12 factsheets were compiled into a booklet, together with an introduction to the MANIFESTS projects and to the associated training activities.

The booklet was designed in digital and paper formats, offering a structured, clear and easily accessible overview of the selected tools and outputs (see Annex III).

Co-funded by
the European Union

Annex I. Questionnaires

Questionnaire for the development of the MANIFESTS Training materials

This questionnaire aims to gather information for developing training and dissemination materials that showcase the tools produced by the MANIFESTS projects. These resources will provide guidance on using the MANIFESTS tools and will facilitate user engagement, and feedback opportunities.

Please take a moment to answer the following questions regarding the functionalities and applications of the tools and outputs produced by your organisation within the project.

1. Tool/Output overview

1. Name of the tool/output:

2. Authors (name and organisation):

3. State of development:

☐ Under development. Please specify the date when it is expected to be finished

☐ Being updated. Please specify the date when it is expected to be finished:

☐ Completed

Co-funded by the European Union

4. Link to download/access the tool/output (if available):

2. Application and use

5. Please describe the purpose/objective of the tool/output (max. 500 characters including spaces).

6. What are the applications of this tool? Please select one or more answers from the list below.

- ☐ Characterisation and knowledge of HNS
- ☐ Management of crisis and decision making
- ☐ Contingency planning and guidance
- ☐ Operational response
- ☐ Modelling
- ☐ Risk assessment
- ☐ Training and exercising
- ☐ Communication

7. What are its key features and functionalities? (max. 500 characters including spaces).

8. Please describe briefly how to use it (max 500 characters).

9. What kind of results or outputs it produce: e.g., graphs, maps, numerical data, reports, etc.? (max. 500 characters including spaces).

Co-funded by the European Union

10. Please describe practical examples or real cases where this tool can be used. (max. 500 characters including spaces).

3. Technical Requirements

11. Can this tool be integrated with other software / systems / project tools? Please specify which ones (max. 500 characters including spaces).

12. Please select the operating system/s required for using this tool (if any):

- ☐ Apple macOS
- ☐ Microsoft Windows
- ☐ Linux OS
- ☐ Android OS
- ☐ Apple iOS
- ☐ Other, please specify

13. Please specify which devices the tool can run on:

- ☐ PC
- ☐ Mobile devices
- ☐ Tablet
- ☐ Other, please specify

14. Please specify the hardware requirements: include details such as processing power, memory, etc. (max. 500 characters including spaces)

Co-funded by the European Union

4. Target audience

15. Who is the target audience of this tool? Please select one or more end-users from the list below:

- ☐ Authorithies and companies with the legal responsibility of implementing contingency plans
- ☐ Port and maritime authorities
- ☐ Coastguards
- ☐ Scientific Community
- ☐ Consultancies
- ☐ Education and training profesionals
- ☐ Emergency responders (Civil protection, firefighters, army, police officers, etc)
- ☐ Environmental managers
- ☐ Industry
- ☐ Environmental associations and NGOs
- ☐ Students
- ☐ Civil society
- ☐ Others, please specify

16. Please explain the type of knowledge background required to use this tool/output (max. 500 characters including spaces).

5. User guidance

17. Are there any user guides or manuals available for this tool? Please list references to manuals and user guides.

18. Is there any other support documentation (e.g. reports, publications, videos, etc.)?

Co-funded by the European Union

19. Are there any dissemination materials available for this tool, or materials in which this tool is featured? E.g. power point presentations, infographs, etc.

20. Please write a minimum of 5 Frequent Asked Questions and a brief response for each of them. Example: “how can I create a new simulation? – to create a new simulation please introduce the following variables / … You have more details in the manual (link to user manual)”

6. Permissions and access restrictions

21. Is this tool open to the public, or are there any permissions required?

22. If so, could you please specify what permissions are needed and how to obtain them? (max. 500 characters including spaces).

7. Updates

23. Is there any update planned for this tool in the framework of the MANIFESTS Genius project? What are the new functionalities that will be implemented? (max. 500 characters including spaces).

8. Feedback and testing

24. Are there any contact forms, support emails or similar for users to provide feedback on the tool or to report problems when using it?

Co-funded by the European Union

Annex II. PowerPoint presentations

Co-funded by
the European Union

Co-funded by
the European Union

TRAINING SLIDES

NIOVELIUS SERIOUS GAME

IMT Mines Alès
École Mines-Télécom

IMT Mines Alès
École Mines-Télécom

GENIUS MANIFESTS

Co-funded by the European Union

1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

Accidental release of volatile HNS at sea can lead to the formation of toxic, flammable or even explosive gas clouds potentially hazardous for nearby populations, first responders or the environment.

Crisis managers of accidental pollution at sea are not always specialists of this kind of events. Therefore, they need to understand the main behaviour of pollutants and the steps on crisis management of accidental pollution at sea. This serious game is an introduction to a detailed training session on crisis management of accidental pollution at sea.

OBJECTIVE

Niovelius serious game aims to support the training of professionals who are not experts in accidental pollution at sea by :

- Giving them a better understanding of the behaviour of chemicals released at sea (HNS)
- Making them discover the crisis management of these events.

HOW IT WORKS

The game is a hybrid investigation game made up of physical elements (maps, frieze, padlocks) and of a digital tool. It is designed to be played by 4 players. Players are guided by the digital tool, which helps them validate the answers they give to the puzzles, allowing them to play the game independently.

A facilitator accompanies the training session during the briefing and debriefing (and can supervise several teams playing simultaneously).

Co-funded by
the European Union

TRAINING SLIDES

MARINER-MANIFESTS KNOWLEDGE TOOL (MMKT)

Co-funded by the European Union

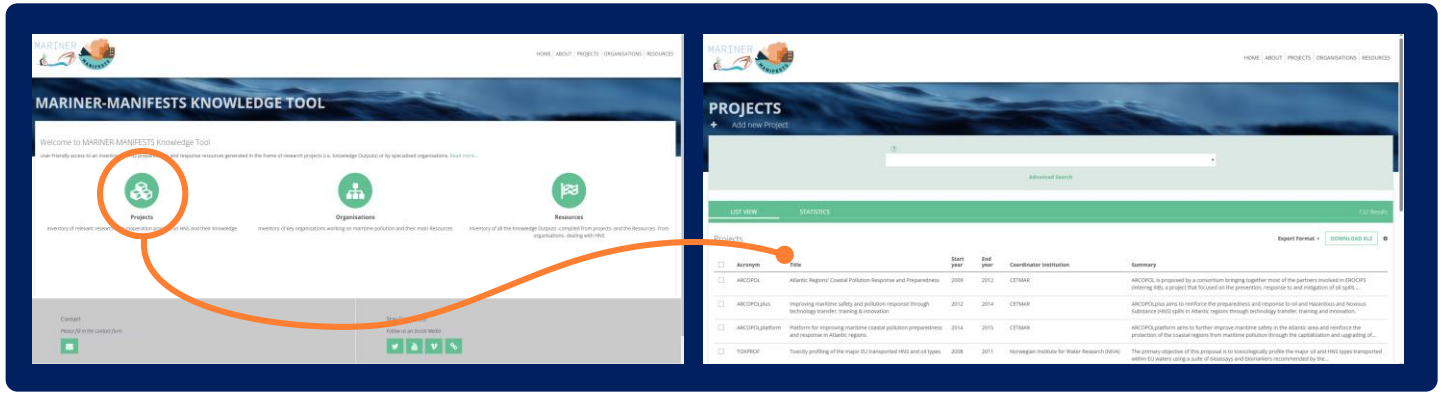
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

HNS relevant outputs form EU R&D projects and expert organizations are often dispersed and not easily accessible. Facilitating the availability and the dissemination of these resources can improve our capabilities to cope with HNS spills. The MMKT intends to address this issue by providing user-friendly access to this information.

OBJECTIVE

The MMKT is an online repository that allows access to a comprehensive compilation of marine research and technical resources specifically focused on the preparedness and response to HNS spills.



DATA USED

- EU and national projects dealing with HNStaken from major online research repositories.
- Organisations dealing with HNS pollution and on response to emergencies.

HOW IT WORKS

- Search functions help browsing the lists by clicking on “Projects”, “Organisations” or “Resources".
- By selecting a project, organization or resource, users can access a list of related resources.
- The selected information is downloadable.
- Any user can add new resources, that will be approved before being published.

Co-funded by the European Union

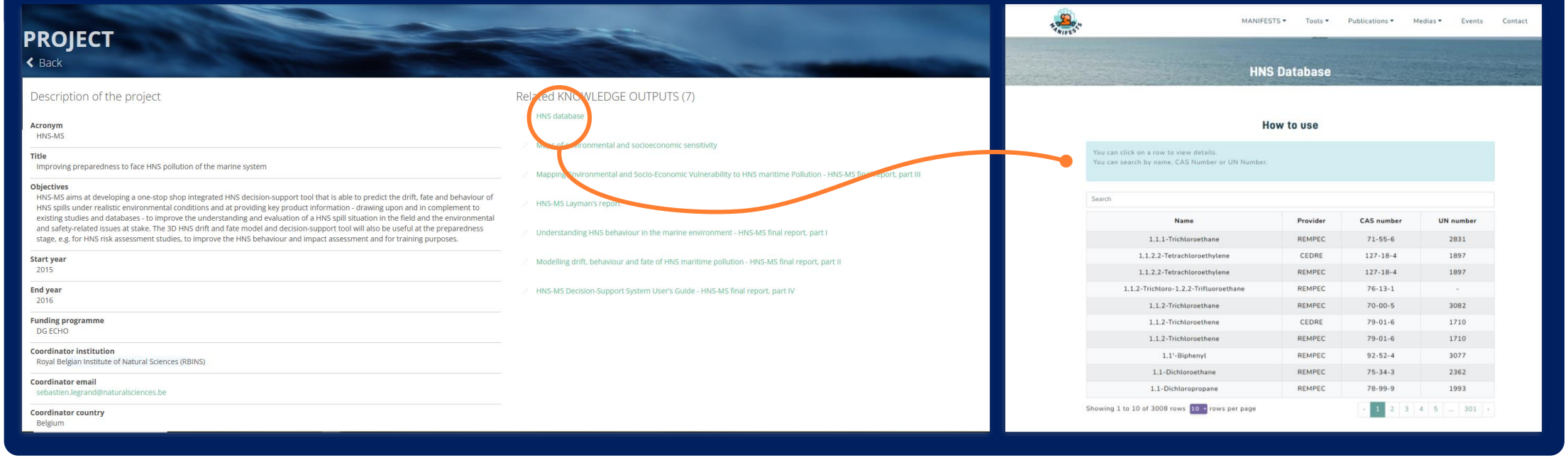
2 HOW IT WORKS & KEY RESULTS

USE CASE

To answer key questions and/or gather information at contingency planning phase or during training.

eg: *How to deal with an HNS spill? Are there databases on chemical behaviour?, impacts?, …*

OUTPUT EXAMPLE



Co-funded by
the European Union

TRAINING SLIDES

EXERCISE TOOL

Co-funded by the European Union

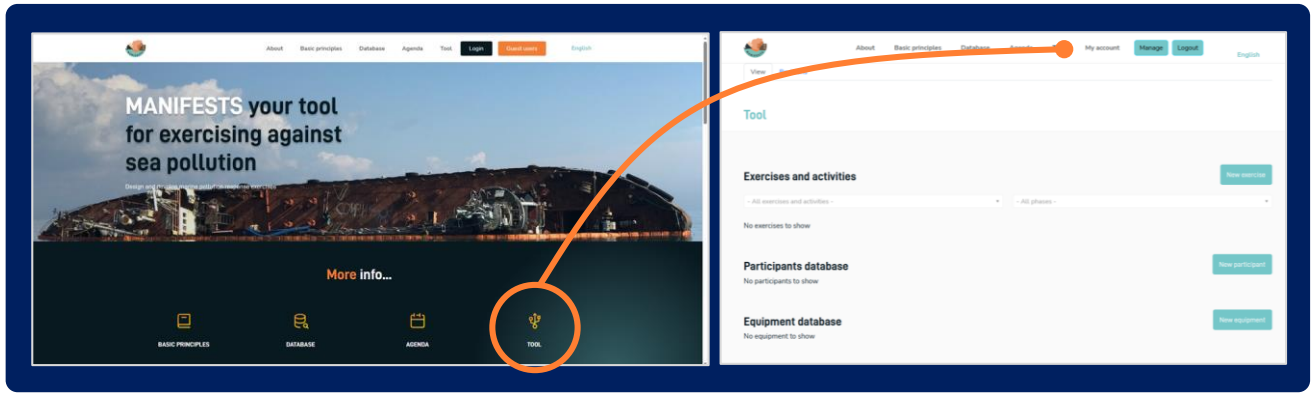
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

Organizations dealing with marine pollution that conduct training exercises often face a lack of harmonization and standardization in the documentation produced during exercises, as well as limited tools for replicating and evaluating them.

OBJECTIVE

To strengthen training and exercise capacities of response organisations by providing knowledge, guidance and resources to prepare, develop and evaluate marine pollution response exercises. It will also facilitate the creation of an exercise program, enabling replication, lessons learning and collaboration with other organisations.



DATA USED

Exercise reports and supplementary documentation from organisations dealing with HNS pollution and on response to emergencies.

HOW IT WORKS

The exercise tool consists of four functionalities:

- Basic principles of exercising, describe the fundamentals and other support information based on a desktop study.
- Exercises database, an online repository of more than 150 exercises and associated documentation. Related to MMKT.
- Agenda to plan exercises program.
- The Exercise Tool, where the user can produce customised documentation as checklists, formularies briefing and debriefing reports, etc.

Co-funded by the European Union

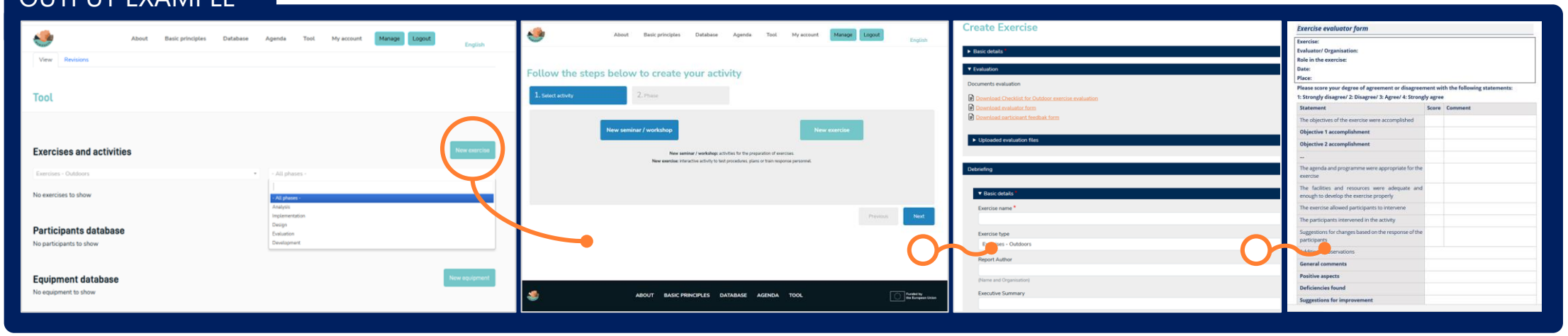
2 HOW IT WORKS & KEY RESULTS

USE CASE

To plan training activities such as exercises.

eg: *How to produce documents (e.g. briefing reports) for the exercise plan of my organisation.*

OUTPUT EXAMPLE



Co-funded by
the European Union

TRAINING SLIDES

MANIFESTS DSS: COPTool

intecmar
INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

Co-funded by the European Union

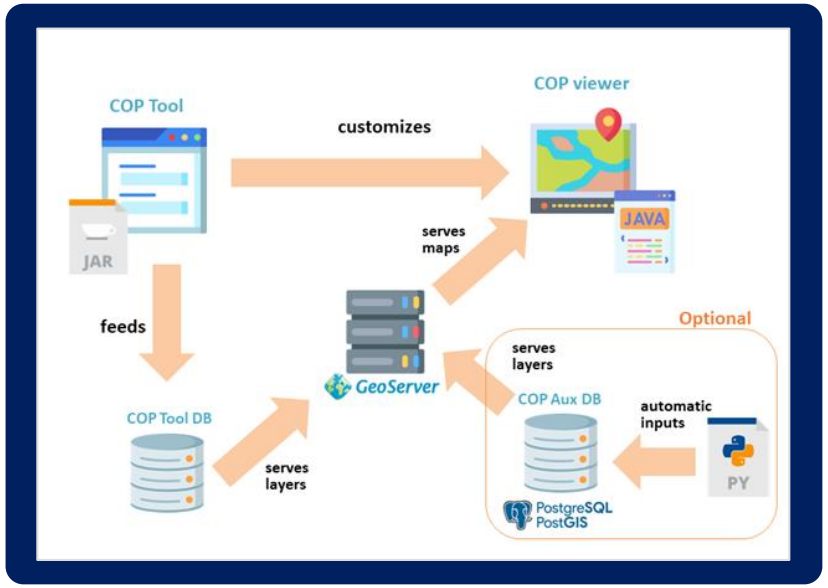
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

During a contingency, the relevant information to support the fight against the pollution varies and is dispersed. The purpose of this tool is to ensure that all actors involved in crisis management have access to the same data, including standard reports, images, satellite observations, model simulations, and other georeferenced data collected by response teams.

OBJECTIVE

Web-based platform that creates and manages Common Operational Pictures (COPs) during maritime pollution events, particularly those involving Harmful and Noxious Substances (HNS).



DATA USED

Geographical layers shared using WMS, WFS or GeoJSON with information about the contingency: coastline, bathymetry, environmental resources, pictures, POLREP reports, etc.

HOW IT WORKS

COPTool centralizes information from various sources and distributes it to different users based on their roles and security clearance. There are two interfaces:

1. **COPTool:** The core application for user management and information control.
2. **COP Viewer:** The interface for exploring maps and data related to contingencies.

Co-funded by the European Union

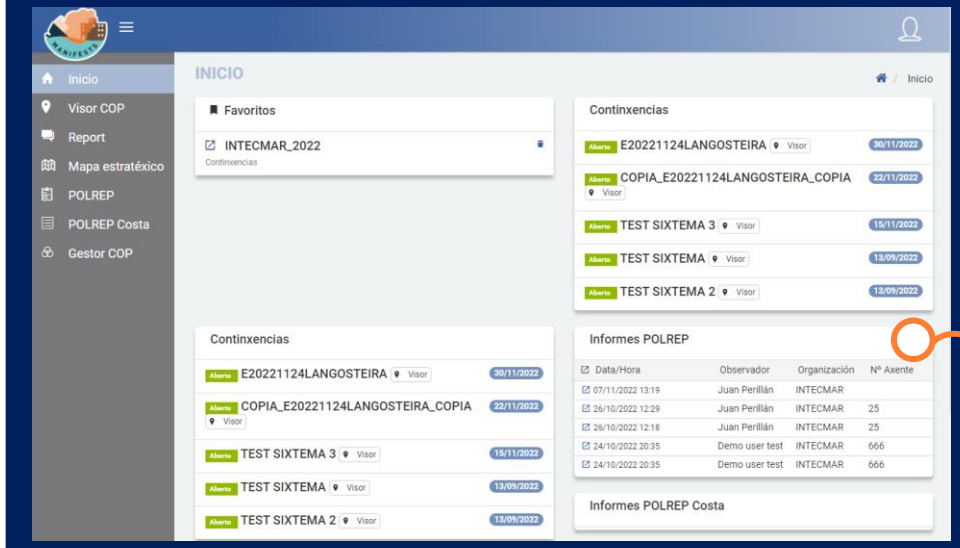
2 HOW IT WORKS & KEY RESULTS

USE CASE

During an exercise of HNS contingency, several information is shared along the participants: HNS cloud forecast, boom locations, response ship's locations, spill oil forecast, etc. All the user can access to an initial web app to chose the available COPs. Then, they can explore in a map viewer the different shared information of the exercise.

OUTPUT EXAMPLE

COPtool initial screenshot after user validation.



COP Viewer showing different information of a contingency: dispersion of a simulated cloud, boom locations, means positions, etc

Co-funded by
the European Union

TRAINING SLIDES

MOHID MODEL – CHEMICAL SPILL MODULE

Co-funded by the European Union

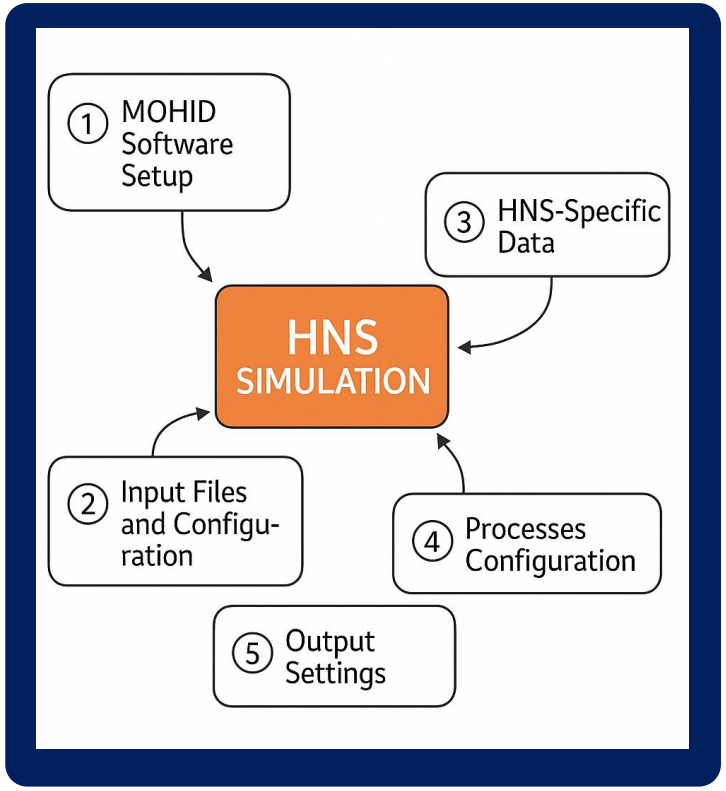
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an incident and a spill in the environment, information on the fate of the chemical involved is essential to better anticipate the risks incurred by responders and populations, the impacts on the environment as well as the appropriate response techniques. MOHID HNS model can provide valuable insights on how pollutants behaviour.

OBJECTIVE

MOHID HNS is a numerical model able to predict and analyze the behavior of hazardous and noxious substances (HNS) in aquatic and atmospheric environments.



DATA USED

- Spill details (location, chemical type, volume).
- Environmental data (currents, winds, bathymetry).

HOW IT WORKS

To perform a simulation, it is necessary to:

- gather spill details (location, chemical type, volume) and environmental data.
- define model domain, resolution and configure the MOHID model files.
- execute the simulation with hydrodynamic forcing.

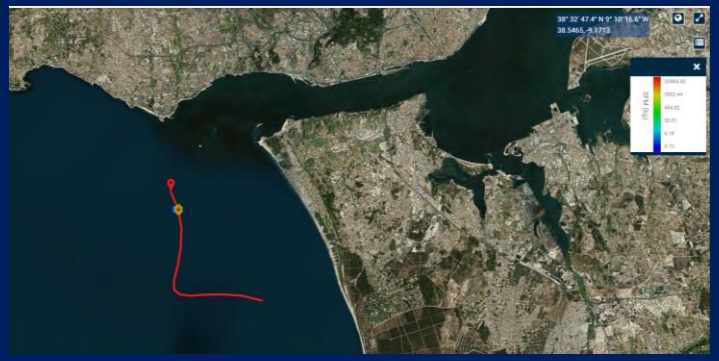
Co-funded by the European Union

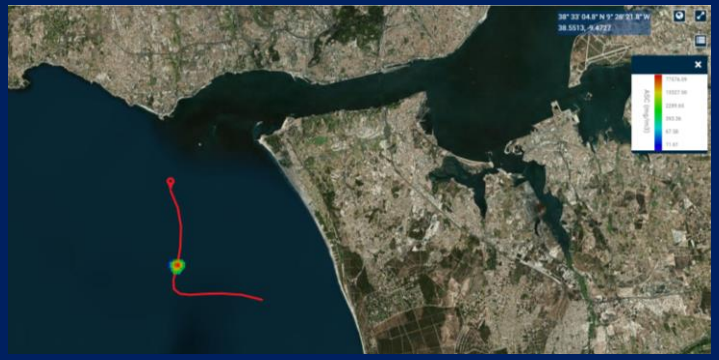
2 HOW IT WORKS & KEY RESULTS

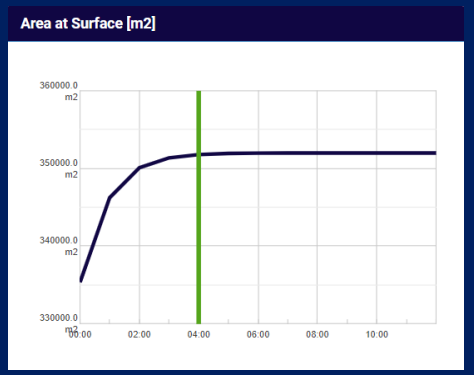
USE CASE

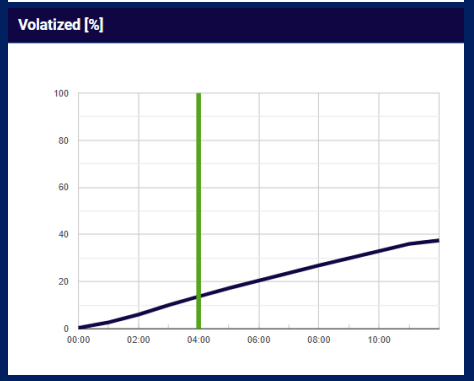
Simulation of an instantaneous spill of an HNS near the Tagus river mouth (Portugal).
Realease of 100m3 of N – Butyl Acetate.

OUTPUT EXAMPLE









Co-funded by
the European Union

TRAINING SLIDES

EXPLOSION MODEL

Co-funded by the European Union

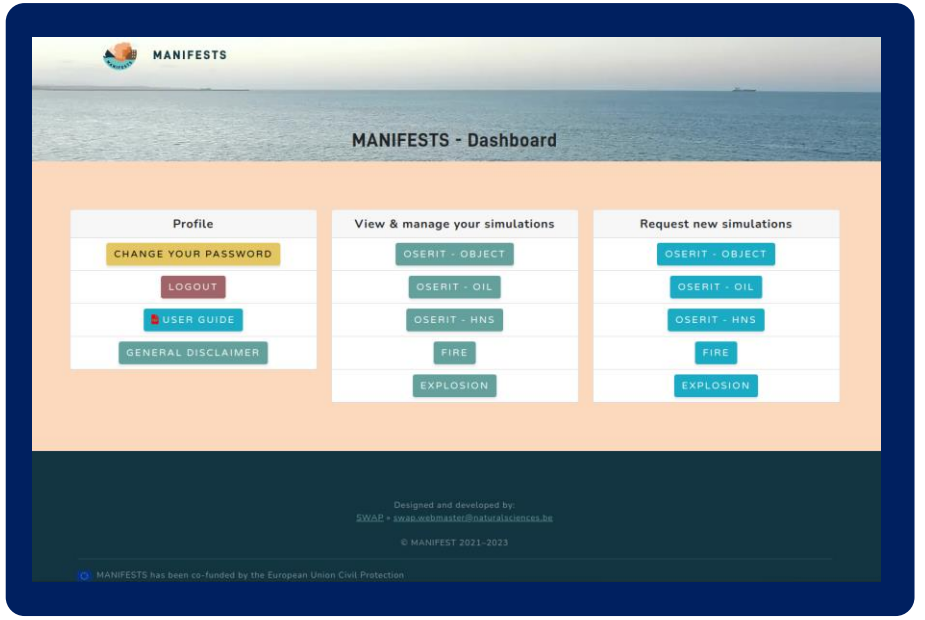
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an HNS gas cloud explosion, the consequences for humans and structures can be devastating. Developing a tool that quickly estimates the potential impact of such phenomena can aid responsible authorities in reacting swiftly and implementing measures to mitigate the impact, such as maintaining an appropriate safety distance for responders.

OBJECTIVE

The explosion model aims to predict the effects of the explosion of an HNS gas cloud in an open environment.



DATA USED

- Position of the gas cloud.
- Quantity in the gas cloud.
- Properties of the chemical (auto filled from the HNS database).

HOW IT WORKS

The web interface enables users to perform simulations directly online. By filling out a form with event-related information, users can obtain simulation results within seconds.

Both the form and simulation results are available from a web browser.

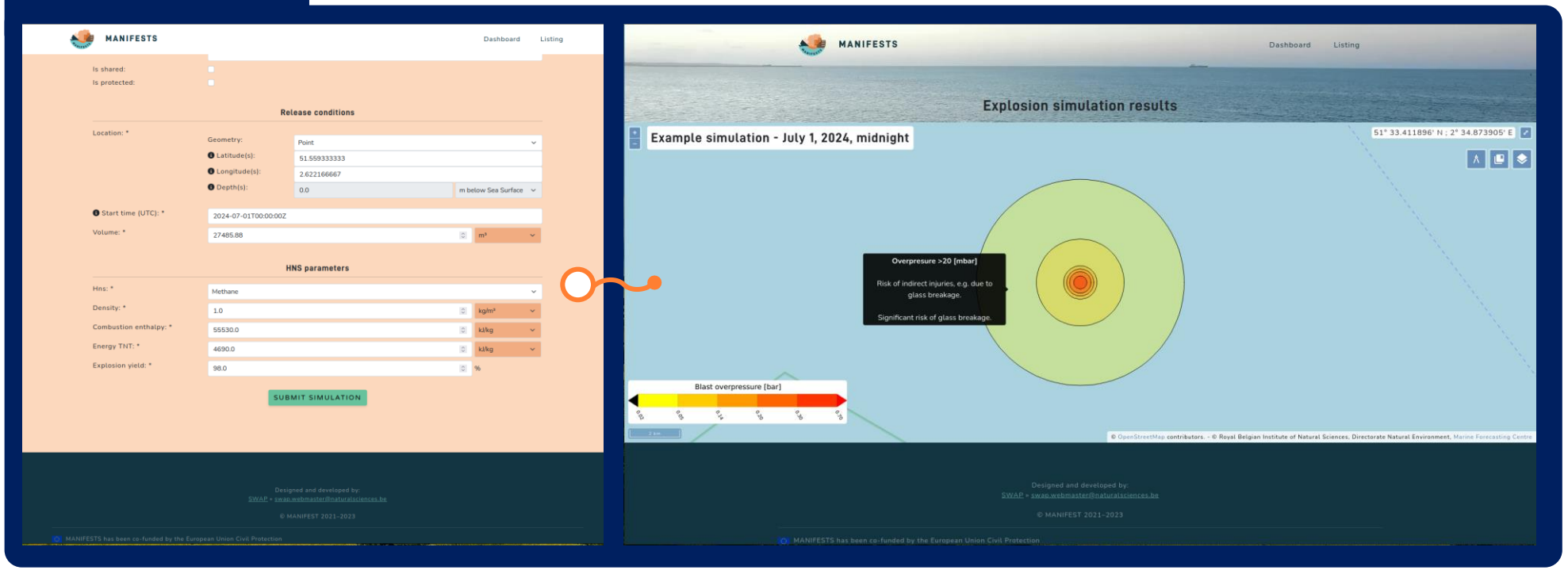
Co-funded by the European Union

2 HOW IT WORKS & KEY RESULTS

USE CASE

To assess the impact of an HNS gas cloud explosion. It can be used to compute safety distances from a vessel in distress, a gas cloud formed by a ruptured pipeline. It therefore helps to avoid exposure to the overpressure effects generated by the explosion, which may cause damage to people and infrastructure.

OUTPUT EXAMPLE



Co-funded by
the European Union

TRAINING SLIDES

FIRE MODEL

Co-funded by the European Union

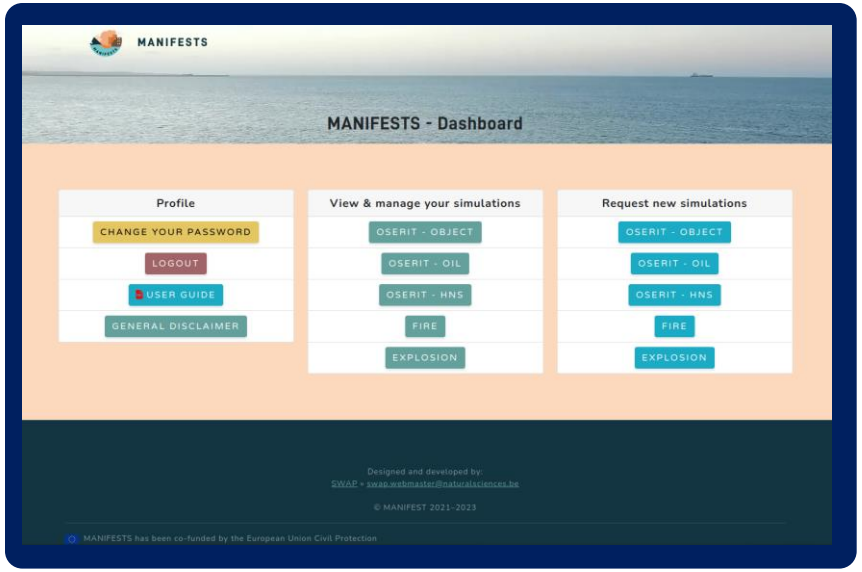
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an HNS slick catching fire, the consequences for humans and structures can be devastating. Developing a tool that quickly estimates the potential impact of such phenomena can aid responsible authorities in reacting swiftly and implementing measures to mitigate the impact, such as maintaining an appropriate safety distance for responders.

OBJECTIVE

The fire model aims to predict the effects of the fire of an HNS slick spilled on the water in an open environment.



DATA USED

- Wind speed, ambient temperature.
- Quantity release and area of the slick.
- Properties of the chemical (auto filled from the HNS database).

HOW IT WORKS

The web interface enables users to perform simulations directly online. By filling out a form with event-related information, users can obtain simulation results within seconds.

Both the form and simulation results are available from a web browser.

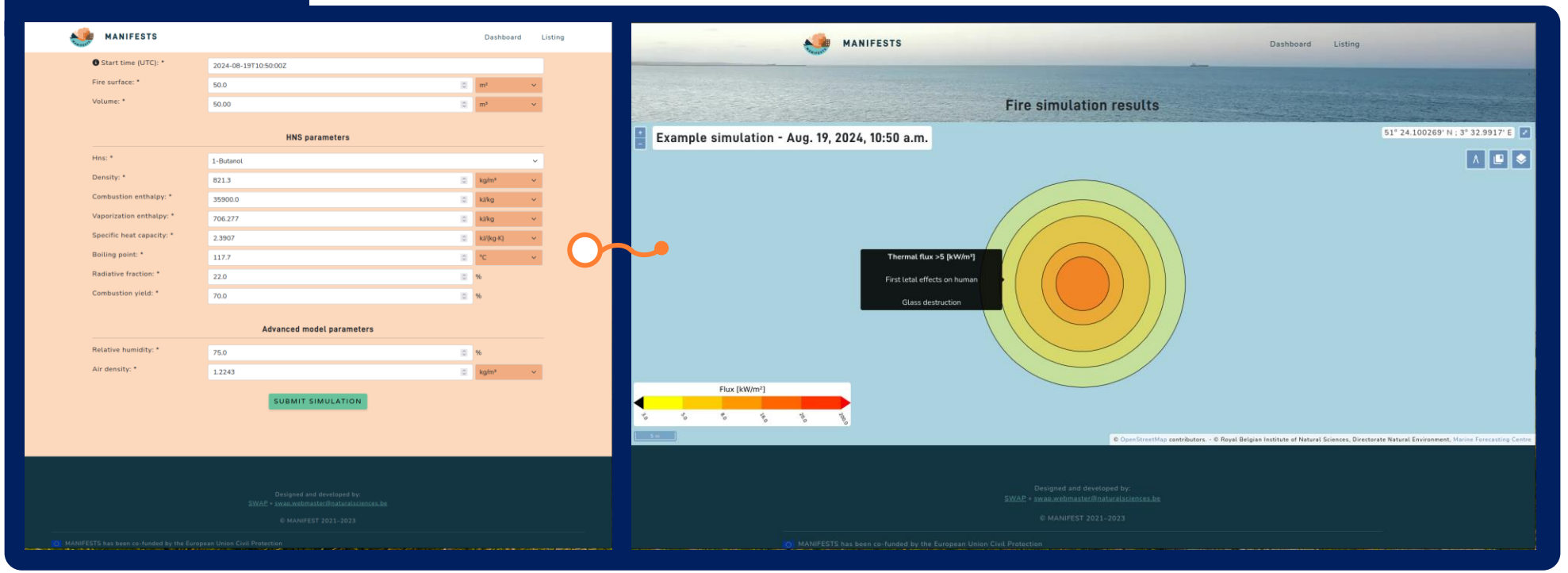
Co-funded by the European Union

2 HOW IT WORKS & KEY RESULTS

USE CASE

To assess the impact of an HNS slick on fire. Responders can use it to assess a minimum safety distance to keep from a burning slick to not be exposed to the thermal fluxes that could harm them.

OUTPUT EXAMPLE



Co-funded by
the European Union

TRAINING SLIDES

HNS DATABASE

Co-funded by the European Union

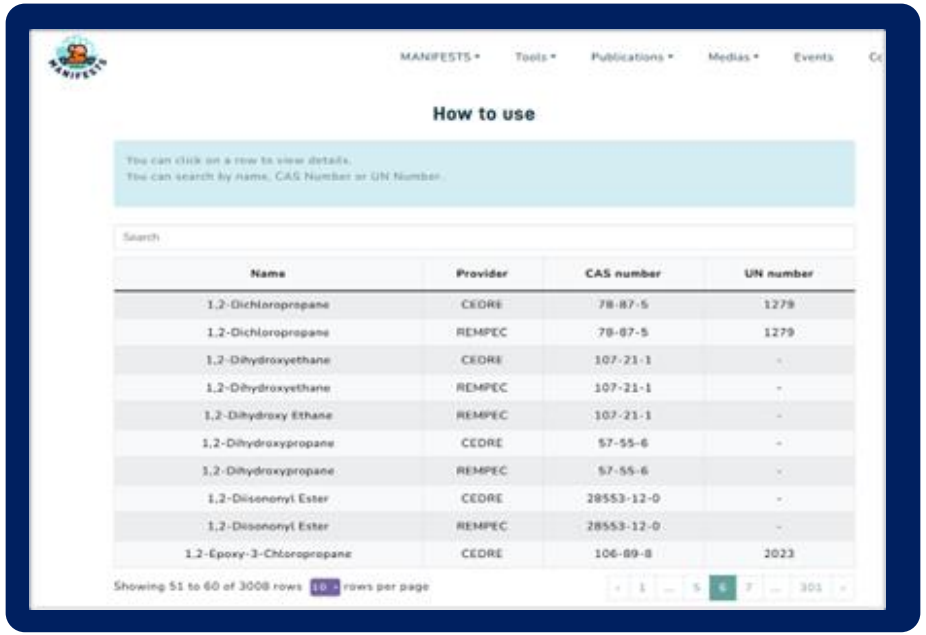
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an HNS pollution event, or for a training session or counter-pollution exercise, this online database offers quick and easy access to useful, updated and complete information in form of downloadable datasheets.

OBJECTIVE

The HNS Database aims to provide access to useful information to over 600 chemicals identified as HNS.



DATA USED

- Ecotoxicity.
- Description (CAS number, UN number).
- Physico-chemical properties.
- Behaviour at sea.
- Hazards.
- GESAMP profile.

HOW IT WORKS

The online database is an alphabetical list of chemicals with detailed information in a technical datasheet for each chemical. The user can access this information by clicking on a row to view details or search by name, CAS Number or UN Number.

Each datasheet is available to download in json format.

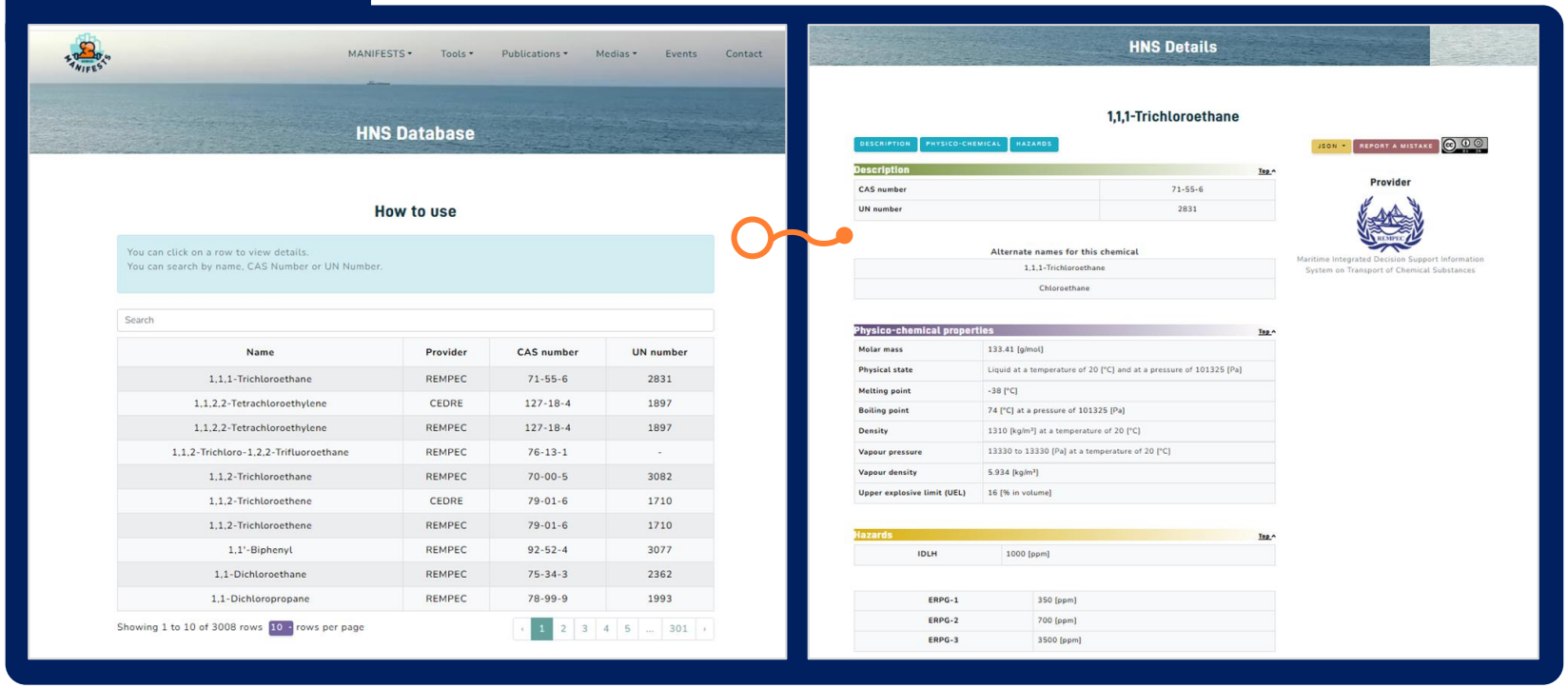
Co-funded by the European Union

2 HOW IT WORKS & KEY RESULTS

USE CASE

To look for detalied information about a particular chemical involved in an accident, so the responders can have relevant information about its properties, behaviour at sea, ecotoxicity, etc.

OUTPUT EXAMPLE



Co-funded by
the European Union

TRAINING SLIDES

OSERIT HNS

Co-funded by the European Union

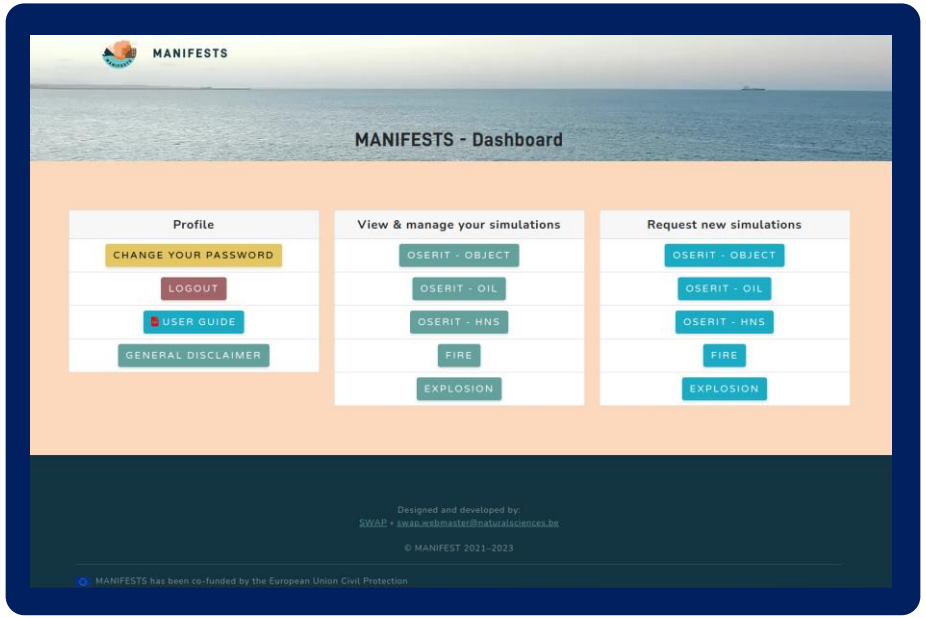
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an HNS spill at sea, understanding the chemical's drift, dissolution, and evaporation is crucial for organizing an appropriate response. Knowing the expected air and water concentrations and the time spent above thresholds is vital for the safety of responders, the population, and the environment.

OBJECTIVE

Assess the drift and fate of an HNS spilled at sea by simulating its movement underwater and in the air, using current and wind predictions, and evaluating phase transfer.



DATA USED

- Position, radius, quantity and duration of the release.
- Properties of the chemical (auto filled from the HNS database).
- The model will use data from ECMWF, CMEMS and the Belgian Marine Forecasting Center for the current, wind and waves.

HOW IT WORKS

The web interface enables users to perform simulations directly online. By filling out a form with event-related information, users can obtain simulation results within minutes.

Both the form and simulation results are available from a web browser.

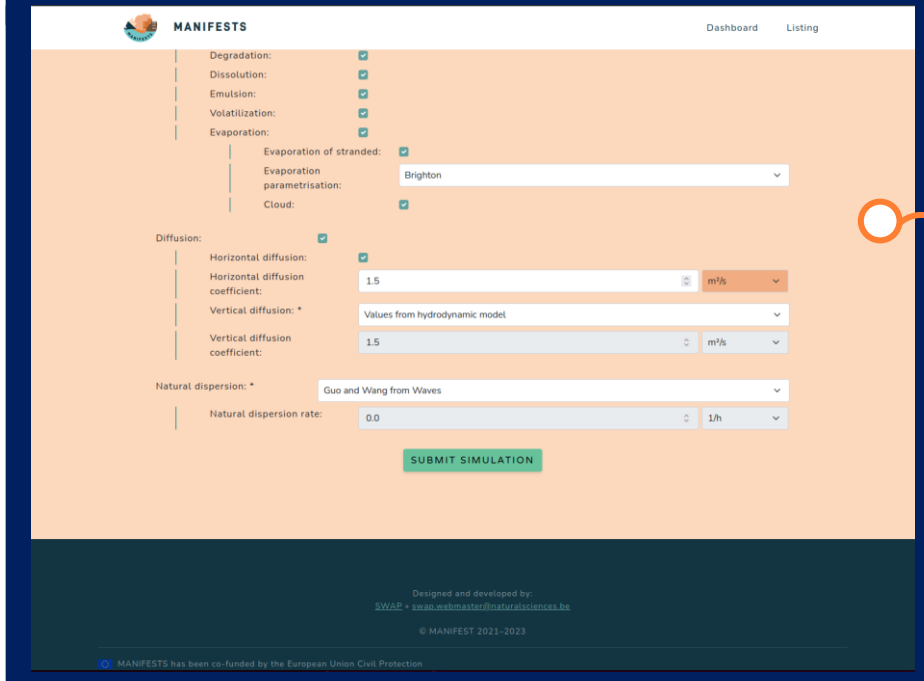
Co-funded by the European Union

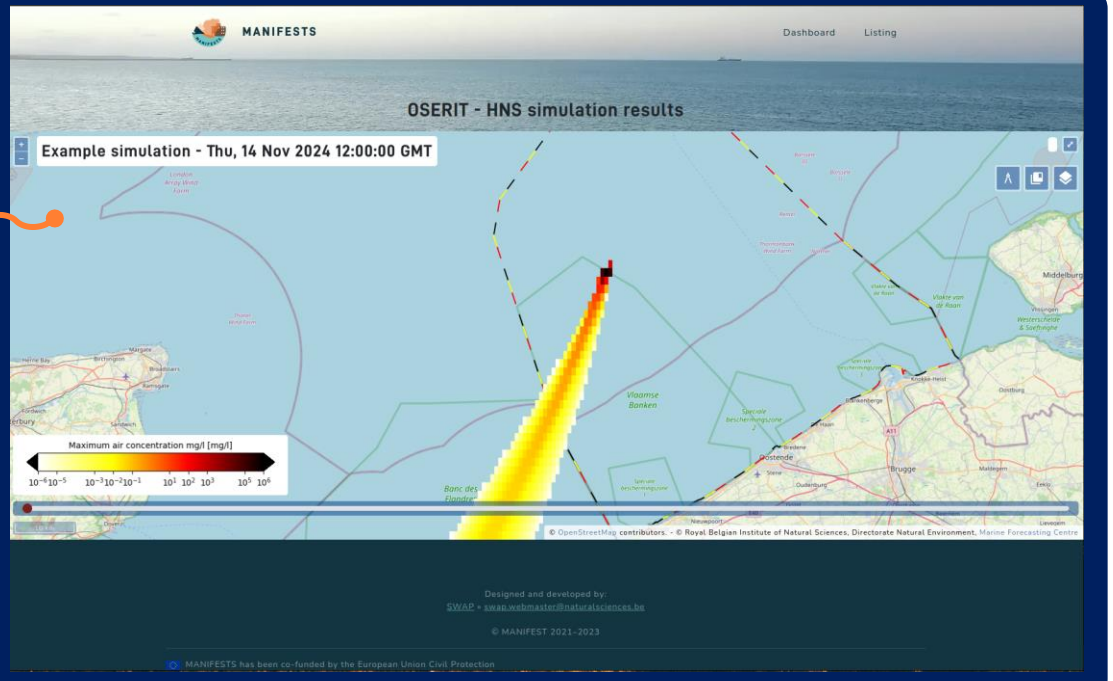
2 HOW IT WORKS & KEY RESULTS

USE CASE

To understand the drift of the slick, dissolved, and gaseous HNS. For instance, to assess the environmental impact or identify coastal areas that will be affected.

OUTPUT EXAMPLE





Co-funded by
the European Union

TRAINING SLIDES

SubSeaGasLeak

Co-funded by the European Union

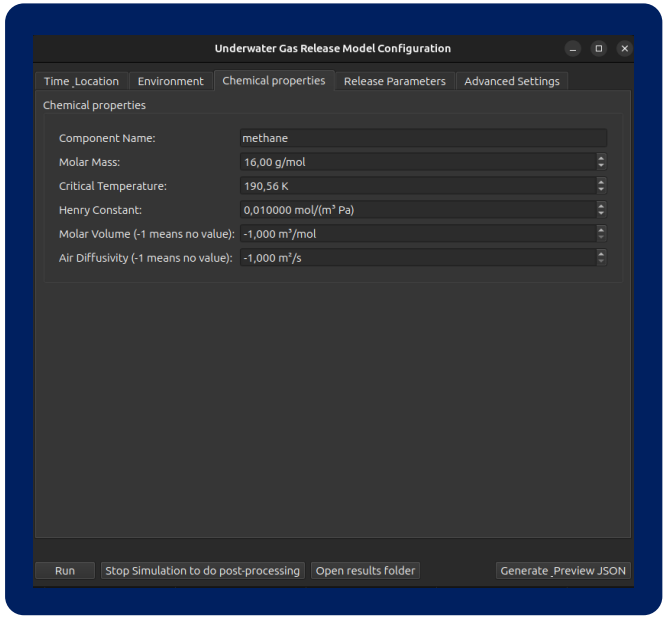
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

In the event of an undersea release of gaseous HNS, such as from a pipeline, understanding the fate of the rising gas is crucial for responders. It is important to determine whether the gas will reach the surface or dissolve before doing so, as each scenario requires a very different response.

OBJECTIVE

The SubSeaGasLeak model simulates the rise of gases through the water column and estimates the exchange of matter between the gas bubble and the surrounding water.



DATA USED

- Environmental data (current, wind, temperature...).
- Release conditions (flow rate, depth...).
- Properties of the HNS (can be found in the HNS database).

HOW IT WORKS

Users can run the software directly on their own computers. After entering all the required information about the event to be simulated, they can start a simulation that runs for a few seconds to minutes. Once completed, various result figures become available for interpretation.

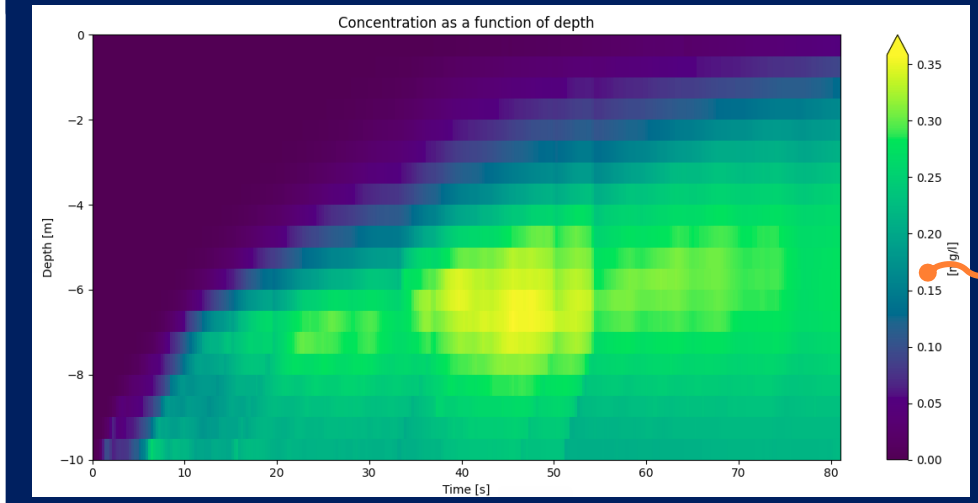
Co-funded by the European Union

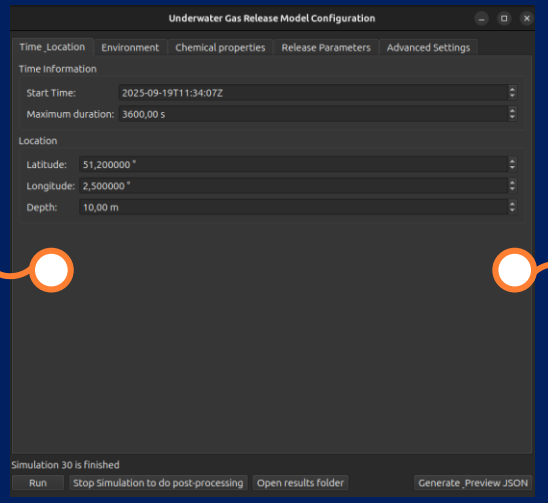
2 HOW IT WORKS & KEY RESULTS

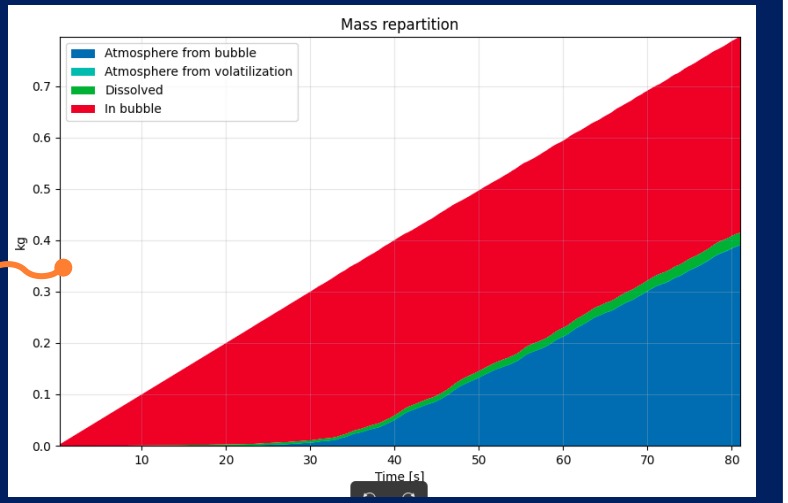
USE CASE

The model is used to assess the amount of gas reaching the surface in the event of an underwater release of gaseous HNS. It can also be run in advance to support preparedness.

OUTPUT EXAMPLE







Co-funded by
the European Union

TRAINING SLIDES

OPERATIONAL FIELD GUIDE - PROTECTING COMMUNITIES FROM MARITIME INCIDENTS INVOLVING AIRBORNE POLLUTANTS

UK Health Security Agency

UK Health Security Agency

GENIUS MANIFESTS

Co-funded by the European Union

1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

Maritime incidents involving release of gaseous or volatile hazardous and noxious substances (HNS) can quickly have implications for wider communities beyond the incident scene. As such rapid decisions may need to be made to protect the public.

OBJECTIVE

Aid decision making in the immediate aftermath of a gas or vapour release, prior to receipt of detailed monitoring and modelling data.

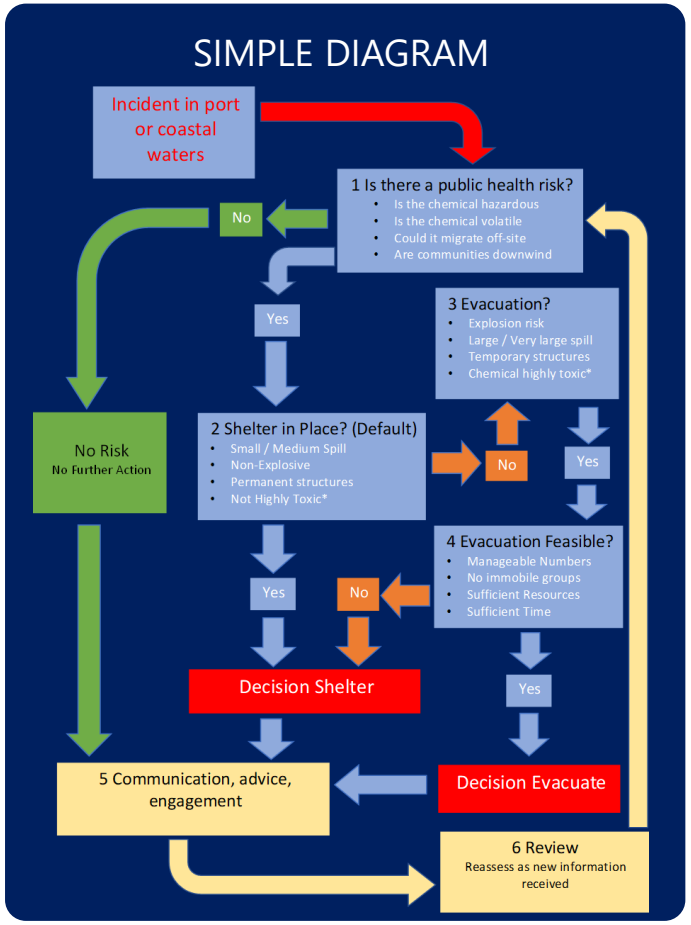
DATA USED

- Protection of wider communities will require rapid collection of information.
- Key data will include knowledge of the chemical(s) involved, estimates of the scale and likely duration of the incident, basic weather conditions, and the types of receptors that may be impacted.

HOW IT WORKS

- Protection of wider communities will be essentially between 2 options: Shelter in Place, or Evacuation.
- The tool uses the source-pathway-receptor approach to assess risk, guiding users through data collection and decision making via a simple decision algorithm as illustrated to select the best option.

SIMPLE DIAGRAM



* Highly Toxic - PAC2 less than 2 ppm (Appendix 2) / Seek specialist chemical advice

UK Health Security Agency

GENIUS MANIFESTS

Co-funded by the European Union

2 HOW IT WORKS & KEY RESULTS

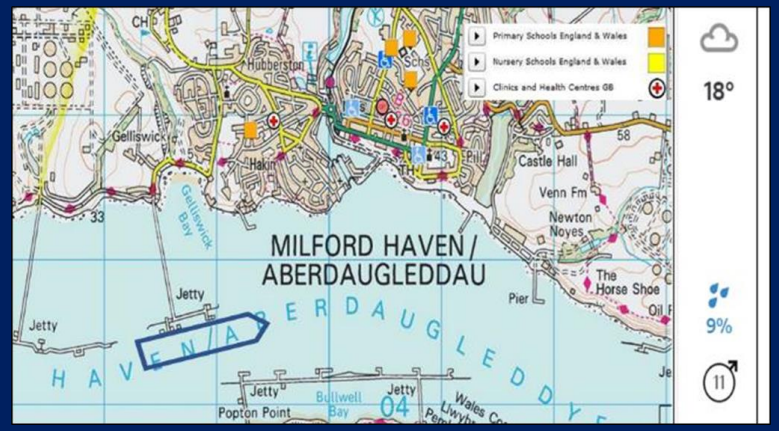
USE CASE

The guide is primarily intended for training of responders but can aid response during an incident. The guide can also aid planning by "gaming" incident scenarios.

OUTPUT EXAMPLE

The guide is primarily intended for A separate guidance document provides illustrative case studies which show users each step in the decision process. For example:

LNG tanker in distress. Captain has reported engine failure. Requested towing to place of refuge. Potential Risk of Over-pressure Venting.



Decision
Shelter in place for wider community. The immediate port area should be evacuated.

ASSESSMENT

Is there a public health risk? – Yes

- Is the chemical hazardous – Methane - Flammable/explosive / low toxicity PAC>2
- Is the chemical volatile – yes buoyant gas
- Could it migrate off-site – yes potential large release. Wind to NE
- Are communities downwind – yes – town of milford downwind

Challenges to default advice? - See challenges in field guide

Evacuation?

- Explosion risk? – **Gas is explosive at 5 to 15%** - Unlikely beyond port
- Chemical highly toxic* - No PAC >2ppm
- Large / Very large spill – Possible – large volume of gas venting – **may be >2hours**
- Temporary structures – No – adequate protection for sheltering

Is Evacuation Feasible? - See field guide

Evacuation Feasible?

- Manageable Numbers? – Whole Town - unlikely
- No immobile groups - potential immobile groups (medical facilities)
- Sufficient Resources? - Whole Town - unlikely
- Sufficient Time? – Whole Town - unlikely
- Acceptable Exposure? – Gas likely to reach town before evacuation possible

Answer – Wider evacuation not likely to be feasible.

Co-funded by
the European Union

TRAINING SLIDES

EXERCISE TOOL LITE
Collaborative version

Co-funded by the European Union

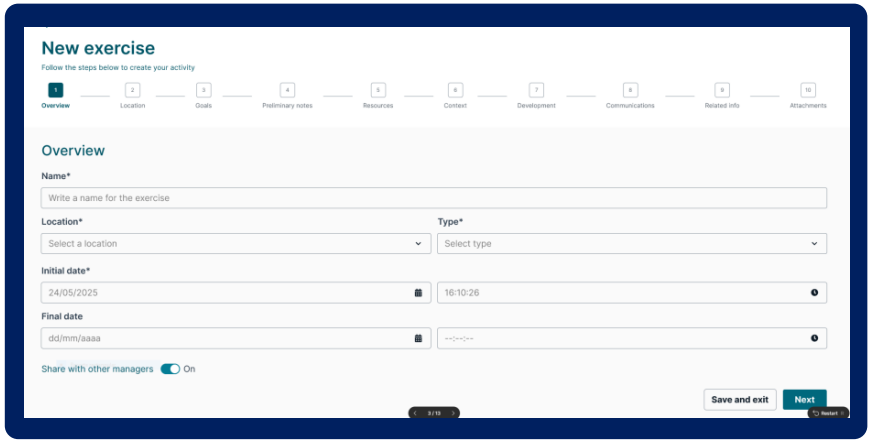
1 OVERVIEW OF THE TOOL

PROBLEM STATEMENT

Organisations responsible for designing training exercises often face significant challenges due to the large volume of documentation associated with these activities, which is frequently dispersed and presented in different formats. In addition, the lack of harmonized and standardized documentation hinders coordination among organisations and limits the ability to conduct evaluations and replication of exercises.

OBJECTIVE

The Exercise Tool Lite is an optimized and streamlined tool derived from the MANIFESTS Exercise Tool. As a lite, simplified, and user-friendly version, it offers selected key features of the Exercise tool module and provides a collaborative platform for coordinating the formulation of exercises by responsible organisations.



DATA USED

Exercise reports and supplementary documentation from organisations dealing with HNS pollution and on response to emergencies.

HOW IT WORKS

The tool guides users in the formulation of exercises providing step-by-step forms to enter key information such as location, background, scenario, resources, equipment and more. Once exercises have been performed, users can assess and evaluate the different aspects of the exercise. The tool enables the creation and sharing of briefing and debriefing reports based on the information included in the different sections of the tool.

CETMAR
CENTRO TECNOLÓXICO DO MAR

GENIUS MANIFESTS

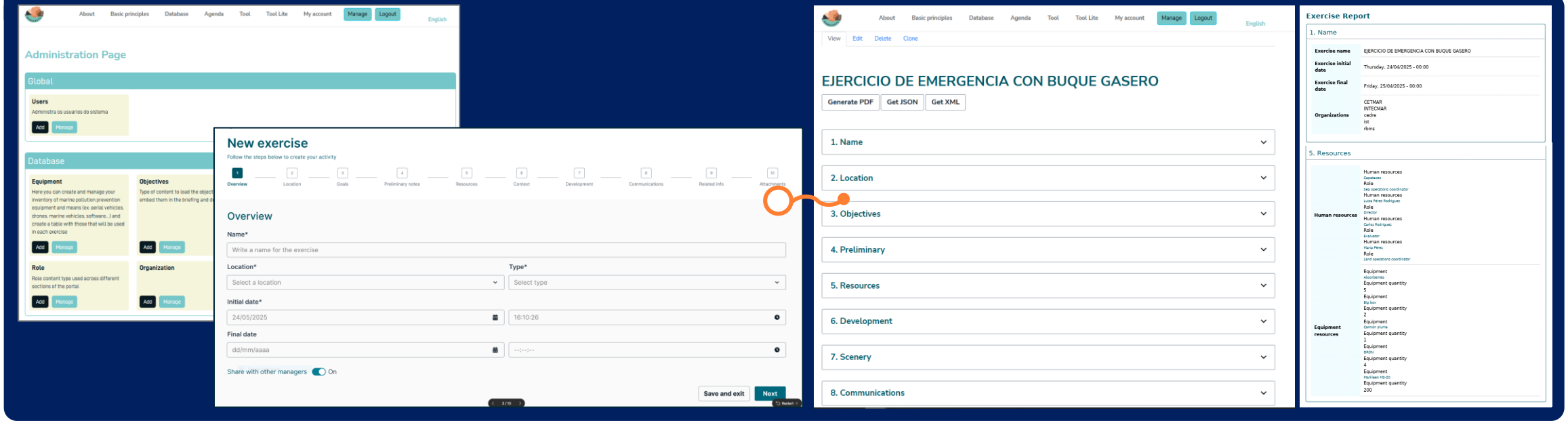
Co-funded by the European Union

2 HOW IT WORKS & KEY RESULTS

USE CASE

Planning training exercises in collaboration with multiple organisations
eg: *Create a briefing report for circulating it to exercise participants.*

OUTPUT EXAMPLE



Annex III. The MANIFESTS project Booklet

Co-funded by
the European Union

GENIUS MANIFESTS

FROM GASES AND EVAPORATORS RISK ASSESSMENT
TOWARDS AN INTEGRATED MANAGEMENT OF SEA
AND LAND POLLUTION INCIDENTS

PROJECT TOOLS

Co-funded by
the European Union

Co-funded by
the European Union

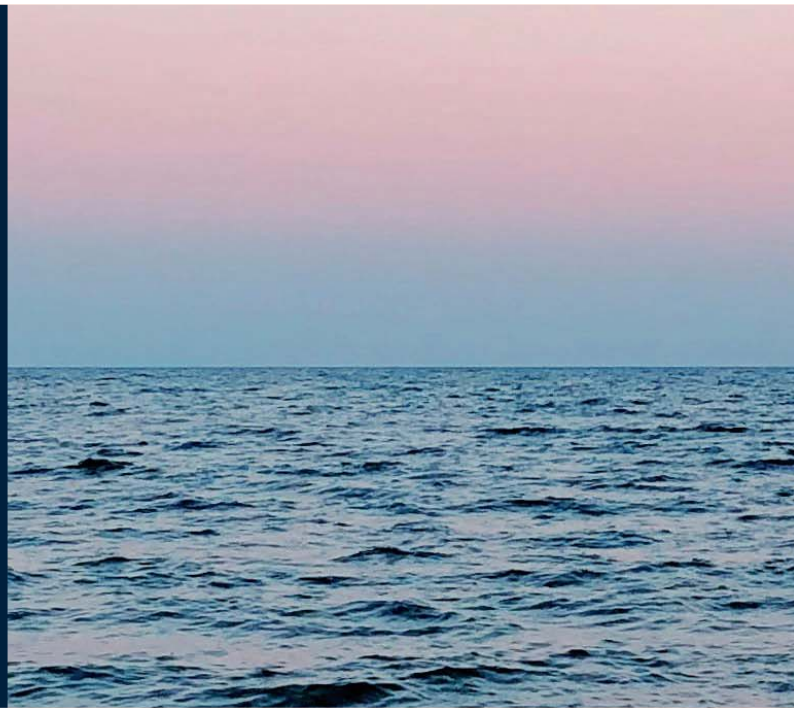
MANIFEST Genius

PROJECT TOOLS

INDEX

GENIUS MANIFESTS

FROM GASES AND EVAPORATORS RISK ASSESSMENT TOWARDS AN INTEGRATED MANAGEMENT OF SEA AND LAND POLLUTION INCIDENTS



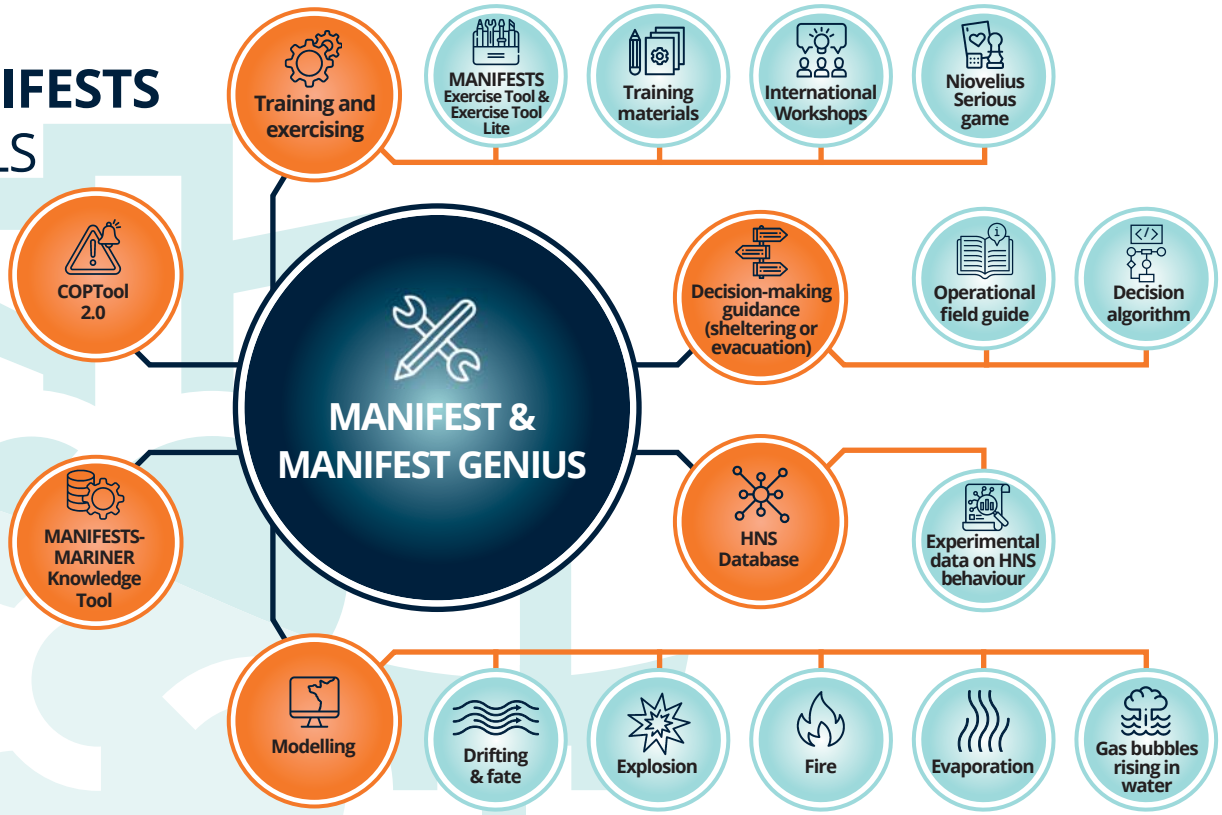
MANIFESTS GENIUS IN A NUTSHELL

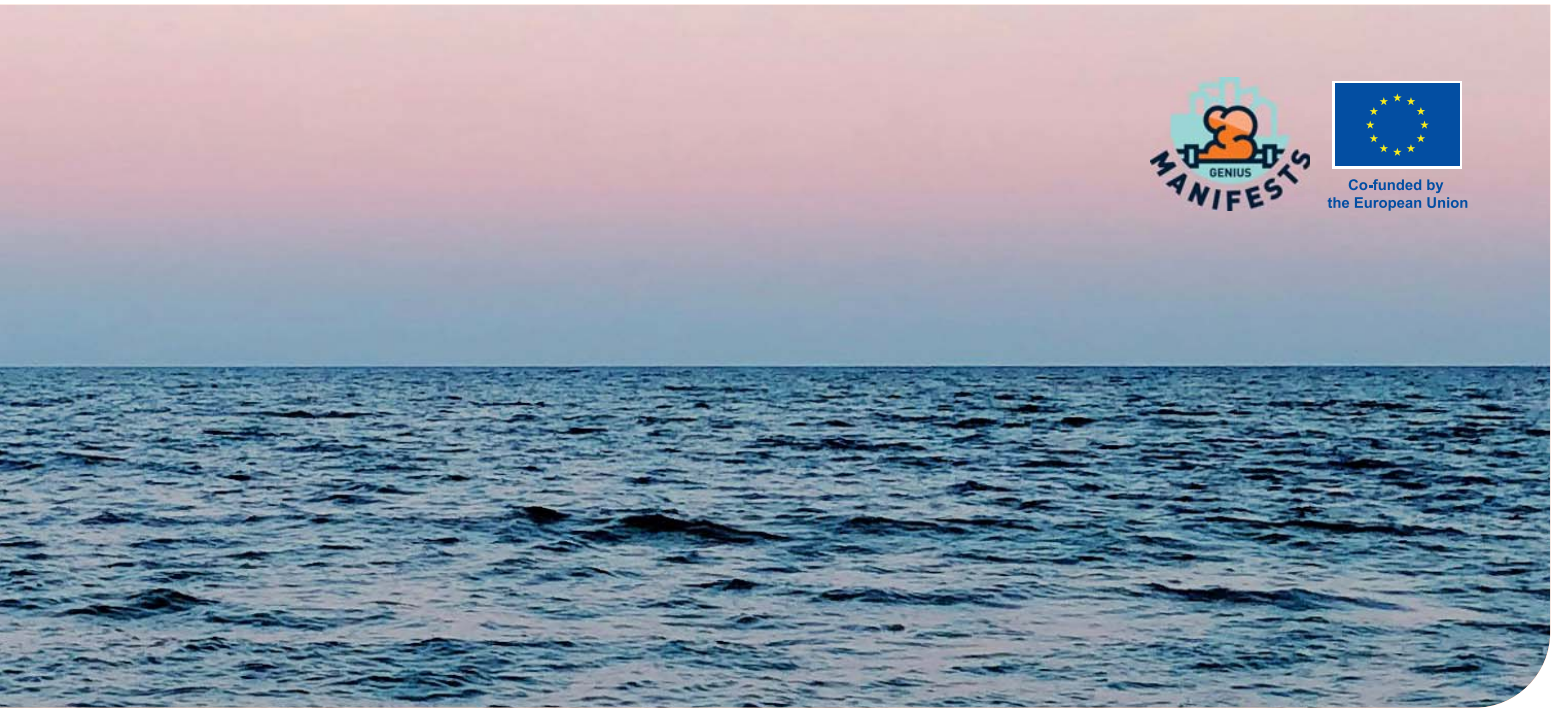
Building on the MANIFESTS project outcomes, the MANIFESTS Genius project (Dec 2023 - Nov 2025) aims to strengthen preparedness and response capabilities for integrated management of coastal water pollution.

The main focus is on the release of Hazardous & Noxious Substances (HNS), including alternative fuels such as ammonia, methanol and Liquefied Natural Gas (LNG), and lithium-ion batteries, as they have the potential to form a toxic gas cloud, which could potentially drift towards the shoreline and impact local communities. It considers two scenarios: subsurface pipeline leaks and surface leaks from coastal facilities.

This document highlights the project outputs available publicly. To learn more about the project please visit the project website.

THE **MANIFESTS** TOOLS





Co-funded by the European Union

Over the years, numerous decision-support tools—such as prediction models, decision charts, and data platforms—have been developed to assist Pollution response Authorities in managing marine pollution incidents. However, these tools often risk being underused or forgotten after a project ends due to information overload, lack of awareness about their existence, or uncertainty about how to access and apply them effectively in real-world situations.

This is why training is crucial. It ensures that users not only know where to find these tools but also understand how to extract meaningful, operational information from them. To address this, dedicated training and dissemination materials that clearly demonstrate the practical use of the MANIFESTS Genius decision-making tools were developed. These resources are designed to guide users, promote active engagement, and encourage feedback.

As part of each training session or workshop, participants will receive this booklet containing concise factsheets that describe each tool of the MANIFESTS Genius Decision Support System (DSS). The aim is to ensure the tools are clearly understood, widely promoted, and confidently used by stakeholders well beyond the duration of the project.

THE **SPECIFIC OBJECTIVES** OF THE MANIFESTS GENIUS PROJECT ARE:

01. Assess the behaviour and impacts of gaseous HNS released in coastal waters and in a subsurface leak.

02. Provide information to assist stakeholders in developing emergency plans for pipelines ammonia-based refrigeration systems.

03. Strengthen information sharing for coordinated land-sea responses.

04. Train stakeholders on decision-making tools from MANIFESTS Genius and related projects.

NIOVELIUS – Serious Game

AUTHORS

Bony-Dandrieux Aurélia, Bouillet Philippe, Tixier Jérôme, Secheppet Mélanie

ACCESS/DOWNLOAD AT

https://github.com/MANIFESTS-SG-Niovelius/1.0/

IMT Mines Alès
École Mines-Télécom

APPLICATION AND USE

Purpose/objective of the tool

The **Niovelius serious game** has been developed to help crisis managers deal with accidental HNS pollution. Trainees apply to become investigators in a team specialised in the fight against pollu-criminals responsible for serious crimes against the seas and oceans. The aim is to understand the issues related to pollutants spilled in the maritime environment and to learn the different phases of crisis management, by working in a collaborative manner.

Applications of this tool

- Characterisation and knowledge of HNS
- Management of crisis and decision making
- Contingency planning and guidance
- Training and exercising

Key features and functionalities

Niovelius is a serious game to help crisis managers deal with accidental HNS pollution (develop knowledge on the behavior of HNS accidentally spilled at sea, discover phases of marine pollution management and its main actors). Niovelius is an hybrid game based on both physical elements and a digital application designed to multiply learning methods and encourage playfulness.

Results or outputs produced

The Niovielus tool is a serious training game for managing pollution at sea.

Co-funded by the European Union

NIOVELIUS – Serious Game

TECHNICAL REQUIREMENTS

Operating system required

Microsoft Windows

Devices the tool can run on

- PC
- Tablet

Hardware requirements

Basic computer

TARGET AUDIENCE

End-users

- Authorities and companies with the legal responsibility of implementing contingency plans
- Port and maritime authorities
- Consultancies
- Education and training professionals
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Students
- Civil society

Knowledge background required

The game is aimed at people who are interested in accidental releases of chemicals at sea (HNS) and who want to gain a better understanding of the operational and crisis management of such events. Few prerequisites are required. The aim is to gain a better understanding of the behaviour of products accidentally discharged at sea and to identify the different phases in the management of this type of event.

ACCESS

Permissions required

The tool is open to the public.

USER GUIDANCE

User guides or manuals available

All information concerning use of the game and installation of the Niovelius software in the «Facilitation Booklet» file (https://github.com/MANIFESTS-SG-Niovelius/1.0/).
Printable documents in different files: Printable materials, SEBC, Hazards pictograms, Timeline, badge documents.
The facilitator is supported in organising the game with the Facilitation booklet, the Solutions Booklet and the Briefing documents.

FEEDBACK

Support email

aurelia.bony-dandrieux@mines-ales.fr
Philippe.bouillet@mines-ales.fr

EXERCISE TOOL

AUTHORS

Marisa Fernández, Raquel Diez, Rula Domínguez (CETMAR), Garbiñe Ayensa, Pedro Montero, Silvia Allen-Perkins (INTECMAR), Centro Jovellanos

ACCESS/DOWNLOAD AT

https://exercisetool.cetmar.org

APPLICATION AND USE

Purpose/objective of the tool

The main objective of the **MANIFESTS Exercise Tool** is to strengthen training and exercise capacities of response organisations by providing knowledge, guidance and resources to prepare, develop and evaluate marine pollution response exercises. It also facilitates the creation of exercise programs, enabling replication, lesson learning and collaboration with other organisations.

Applications of this tool

- Contingency planning and guidance
- Operational response
- Training and exercising

How to use it

Each function is accessible on the website from its specific section.

While the Basic principles and Database are completely open and downloadable, the Exercise formulation tools and Agenda are available under three modalities:

1. Create user account: you will be able to create, save and manage your exercises and upload related documentation.
2. Enter as guest user: you will be able to use all functionalities of the tool and download reports created during the session, but data will be deleted within the next 24 hours.
3. Set-up the tool in a local server: contact **manifeststool@cetmar.org**. In this case the user would not receive the updates made in the Database or any other section.

Key features and functionalities

The exercise tool consists of four functionalities:

1. Basic principles of exercising, describing the fundamentals of this topic and other support information, including definition of terms, exercise typology and classifications proposed by relevant organizations in the field of marine pollution. It also contains checklists, templates and examples of the documents required for formulation of exercises, as well as links to reference manuals and relevant information on HNS.
2. The Exercises Database, an online repository providing easy access to information from more than 150 exercises and to the associated documentation extracted from international, EU and national organisations working in the field of maritime pollution and chemical spills.
3. An Agenda, for users to plan their programme of exercises and create customized alerts for each task.
4. The Exercise Formulation Tools, where the user can produce customised documentation including checklists, formularies for injects, briefing and debriefing reports, and evaluation forms that can be downloaded.

The Tool is available in four languages: English, French, Portuguese and Spanish.

Results or outputs produced

The user can produce, store, send or download their own exercise reports, checklists, feedback forms, and any other exercise documentation with private information as material lists, pictures, etc.

Co-funded by the European Union

EXERCISE TOOL

TECHNICAL REQUIREMENTS

Devices the tool can run on

- PC
- Tablet
- Mobile devices

Hardware requirements

A regular server

TARGET AUDIENCE

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Scientific Community
- Consultancies
- Education and training professionals
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Environmental managers
- Industry
- Environmental associations and NGOs
- Students
- Civil society

ACCESS

Permissions required

The tool is open to the public.

The **MANIFESTS Exercise Tool** offers the possibility to be registered as permanent user or not.

- Registered users will be able to create a program of exercises in the AGENDA, set-up alarms that will be received by email, develop new exercises using the online TOOL, and save their data so they can retrieve it to create new exercises. Besides, they will be able to upload, save and edit data and documentation.
- Unregistered users will be able to use all functionalities of the TOOL and download reports created during the session; however, their data will be deleted within the next 24 hours.

Both types of users and the general public can access the BASIC PRINCIPLES and DATABASE without any restriction.

On the website, when accessing the TOOL or AGENDA, the user has the option to log in as guest user or to create a permanent user account, related to an email address.

UPDATES AND NEW FUNCTIONALITIES

Updates of information in the DATABASE section are periodically conducted.

USER GUIDANCE

User guides or manuals available

Each section on the website has explanatory text for the users.

FEEDBACK

Support email

manifeststool@cetmar.org

EXERCISE TOOL LITE - COLLABORATIVE VERSION

AUTHORS

Marisa Fernández, Raquel Diez, Rula Domínguez (CETMAR), Garbiñe Ayensa, Pedro Montero, Silvia Allen-Perkins (INTECMAR)

ACCESS/DOWNLOAD AT

https://exercisetool.cetmar.org/

APPLICATION AND USE

Purpose/objective of the tool

The Exercise Tool Lite is an optimized and streamlined tool derived from the **MANIFESTS Exercise Tool**. As a lite, simplified, and user-friendly version, it offers selected key features of the Exercise tool module and provides a collaborative platform for coordinating the formulation of exercises by responsible organisations.

Applications of this tool

- Training and exercising
- Contingency planning and guidance
- Operational response

How to use it

The tool guides users in the formulation of exercises through a series of steps and associated forms in which information can be entered regarding location, background, scenario, resources, equipment used, etc. Once exercises have been performed, users will be able to evaluate the different aspects of the exercise. Key information and resources from previous exercises can be stored and used in the formulation of new ones.

Key features and functionalities

The **Exercise Tool Lite** has the following functionalities:

1. Design, preparation and evaluation of exercises
2. Multiple users: the tool allows multi-agency collaboration. It facilitates information sharing to support coordination during the development of exercises.
3. Customizable outputs: it generates reports using the information provided in the tailor-made forms.
4. The Tool is available in two languages: English and Spanish

Results or outputs produced

Collaborative environment to create and evaluate exercises.
Full record of all the steps of the exercises created.
Users will be able to create and share briefing and debriefing reports based on the information included in the different sections of forms of the tool.

Co-funded by the European Union

EXERCISE TOOL LITE – COLLABORATIVE VERSION

TECHNICAL REQUIREMENTS

Devices the tool can run on

- PC
- Tablet
- Mobile devices

Hardware requirements

A regular server

TARGET AUDIENCE

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Scientific Community
- Consultancies
- Education and training professionals
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Environmental managers
- Industry
- Environmental associations and NGOs
- Students
- Civil society

ACCESS

The Exercise Tools allows users either to register as permanent users or to access it as guest users:

- Registered users can save their exercises and reports, replicate exercises based on previous records, and upload, save, and edit data and documentation.
- Guest users can use all the tool's functionalities and download the reports created during their session, but their data will be deleted within 24 hours.

Additionally, organisations interested in deploying the tool in their local server may contact manifeststool@cetmar.org to request a portable version for their internal use.

USER GUIDANCE

User guides or manuals available

Information explaining how the tool works and outlining its functionalities is available in the About section.

FEEDBACK

Support email

manifeststool@cetmar.org

MARINER-MANIFESTS KNOWLEDGE TOOL

AUTHORS

Marisa Fernández, Raquel Diez (CETMAR)

ACCESS/DOWNLOAD AT

https://knowledgetool.mariner-project.eu/

CETMAR

APPLICATION AND USE

Purpose/objective of the tool

The **MMKT** is an online repository that allows access to a comprehensive compilation of marine research and technical resources specifically focused on the preparedness and response to HNS spills.

Applications of this tool

- Characterisation and knowledge of HNS
- Management of crisis and decision making
- Contingency planning and guidance
- Operational response
- Modelling
- Risk assessment
- Training and exercising

How to use it

This online database can be accessed by using tailor-made search engines that help browsing the list of projects and organisations considered during the collection process (click on “Projects” or on “Organisations”) or selecting the resources of interest from a list of more than 800 records (click on “Resources").

To download the list of searched results the user can select the formats (XLS, CSV, RTF, PDF) and the fields to be shown. Some and statistics are also downloadable as PNG file.

Besides, in each section, the user can add a new resource, which will be validated by the administrators.

Key features and functionalities

User-friendly online database with search functions to access an inventory of HNS preparedness and response resources generated in the frame of research projects (i.e. Knowledge Outputs) or by specialised organisations.

List of searched results can be downloaded in different formats (XLS, CSV, RTF, PDF), with the possibility to select the fields to be shown. Also, some and statistics are downloadable as PNG file.

Function for the user to add new resources.

Co-funded by the European Union

MARINER-MANIFESTS KNOWLEDGE TOOL

TECHNICAL REQUIREMENTS

Devices the tool can run on

- PC
- Tablet
- Mobile devices

TARGET AUDIENCE

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Scientific Community
- Consultancies
- Education and training professionals
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Environmental managers
- Industry
- Environmental associations and NGOs
- Students
- Civil society

ACCESS

Permissions required

The tool is open to the public.

UPDATES AND NEW FUNCTIONALITIES

Updates of information about ORGANIZATIONS, PROJECTS or RESOURCES are periodically conducted by two means. One is active search for new information published online, and the other is the review of information sent by users using the functionality "+Add new" in the web, which is validated and published.

FEEDBACK

Support email

manifeststool@cetmar.org

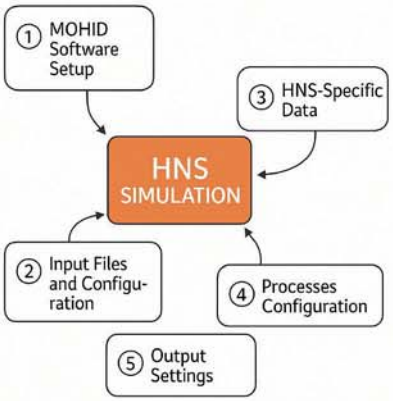
MOHID MODEL – HNS MODULE

AUTHORS

Ligia Pinto e Ramiro Neves (MARETEC)

ACCESS/DOWNLOAD AT

https://github.com/Mohid-Water-Modelling-System/Mohid



APPLICATION AND USE

Purpose/objective of the tool

Predict and analyze the behavior of hazardous and noxious substances (HNS) in aquatic and atmospheric environments.

Applications of this tool

- Operational response
- Modelling
- Training and exercising

How to use it

1. Input Prep: Gather spill details (location, chemical type, volume) and environmental data (currents, winds, bathymetry).
2. Model Setup: Configure in Mohid - select HNS module, define domain & resolution.
3. Substance Properties: Choose from database or input custom chemical parameters.
4. Run Simulation: Execute with hydrodynamic forcing (waves/currents).

Key features and functionalities

Mohid HNS simulates chemical spills (oils, dissolved/sinking substances) using Lagrangian particle tracking. It models advection, diffusion, evaporation, dissolution, emulsification, and sedimentation. Integrates with 3D hydrodynamics (currents, wind, waves) for accurate spill behavior.

Practical examples where this tool can be used

Simulation of toxic cloud generation in ports due to atmospheric releases of HNS (e.g. methanol, methane, ammonia)

Results or outputs produced

Numerical data with information about particles position over time; concentration fields (pollutant levels in water column; mass balance (% evaporated/dissolved/sedimented).

MOHID MODEL – HNS MODULE

TECHNICAL REQUIREMENTS

Operating system required

- Microsoft Windows
- Linux OS
- Android OS
- Apple iOS

Devices the tool can run on

- PC
- Tablet
- Mobile devices

Hardware requirements

A regular server

Integration with other software / systems / project tools

This tool integrates seamlessly with other project components such as the Knowledge Tool and the Exercise Tool. It has also demonstrated its ability to exchange information with external systems like Cedre's ARGEPOL, ensuring interoperability and enhancing coordination across platforms during contingency planning and response operations.

TARGET AUDIENCE

Target audience

- Scientific Community
- Consultancies
- Education and training professionals
- Environmental managers
- Students

Type of knowledge background required to use this tool/output

Some experience in using numerical models

ACCESS

Permissions required

The tool is open to the public.

USER GUIDANCE

User guides or manuals available

https://www.mohid.com/

Support documentation

Publications can be found at:
https://wiki.mohid.com/index.php?title=Mohid_Bibliography

Dissemination materials available for this tool, or materials in which this tool is featured

User manuals & technical guides on
https://mohid.com/

FREQUENTLY ASKED QUESTIONS

What types of chemicals can MOHID HNS simulate?

It models oils, dissolved toxics (e.g., ammonia), and sinking chemicals (e.g., heavy metals).

How accurate are the spill predictions?

Accuracy depends on input data quality (currents, wind, chemical properties) and model calibration.

Can it run real-time spill forecasts?

Yes, if linked to real-time hydrodynamic data (e.g., from sensors or operational ocean models).

Is coding expertise required to use it?

Basic runs need no coding, but advanced users can modify Fortran scripts. Python/MATLAB helps post-process results.

FEEDBACK

Support email

support@mohid.com (or check **mohid.com** for updated contacts).

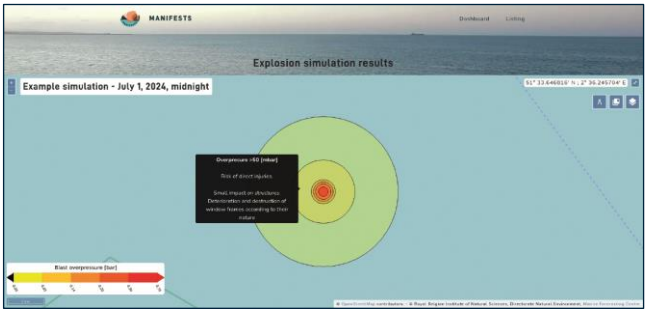
EXPLOSION MODEL

AUTHORS

Ludovic Lepers (RBINS), Samuël Orsi (RBINS),
Laurent Aprin (IMT Mines Alès), Sébastien Legrand (RBINS)

ACCESS/DOWNLOAD AT

https://odnature.naturalsciences.be/oserit/



natural sciences .be

IMT Mines Alès
École Mines-Télécom

APPLICATION AND USE

Purpose/objective of the tool

Estimate the effects at various distances in the event of an explosion of an HNS gas cloud in an open environment.

Applications of this tool

- Contingency planning and guidance
- Modelling
- Risk assessment

How to use it

The user fills out an online form with simulation metadata, event location and time, environmental data, and HNS properties (can be auto-filled from the HNS database). After waiting a few seconds, the simulation results are displayed in the online web interface.

Key features and functionalities

The model estimates overpressure as a function of distance in case of the explosion of an HNS gas cloud and assesses its impact on humans and buildings.

Practical examples where this tool can be used

In the event of a vessel transporting explosive HNS in distress, the tool can provide a safety radius for coastguard operations following the vessel.

Results or outputs produced

The interface provides a map with ellipses indicating the expected impact on responders or structures within the ellipses.

Co-funded by the European Union

EXPLOSION MODEL

TECHNICAL REQUIREMENTS

Operating system required

- Apple macOS
- Microsoft Windows
- Linux OS

Devices the tool can run on

- PC

Hardware requirements

An internet connection and a computer capable of running a recent version of a modern web browser.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)

Type of knowledge background required to use this tool

Users should have completed a training session on the tool.

ACCESS

Permissions required

The tool requires a login and is not open to the public.

Obtain permissions

https://odnature.naturalsciences.be/oserit/

USER GUIDANCE

User guides or manuals available

MANIFESTS DSS User guides: https://manifests-project.eu/documents/27/D5.3_-_MANIFESTS_DSS_-_User_guides.pdf

Support documentation

A PowerPoint presentation is provided during the training session.

UPDATES AND NEW FUNCTIONALITIES

Update planned for this tool in the framework of the MANIFESTS Genius project.

The multi-energy model for explosions will improve overpressure predictions in environments other than open sea.

FEEDBACK

Support email

marine-forecasting-officer@naturalsciences.be

Co-funded by the European Union

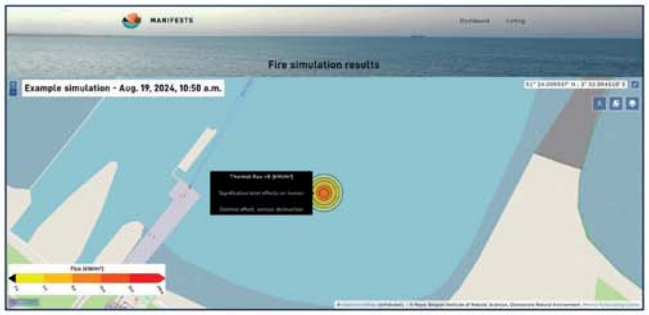
FIRE MODEL

AUTHORS

Ludovic Lepers (RBINS), Samuël Orsi (RBINS),
Laurent Aprin (IMT Mines Alès), Sébastien Legrand (RBINS)

ACCESS/DOWNLOAD AT

https://odnature.naturalsciences.be/oserit/



natural sciences .be

IMT Mines Alès
École Mines-Télécom

APPLICATION AND USE

Purpose/objective of the tool

Estimate the safety distances at which responders can safely approach a burning HNS slick on the surface of seawater in an open environment.

Applications of this tool

- Contingency planning and guidance
- Operational response
- Modelling
- Risk assessment

How to use it

The user fills out an online form with simulation metadata, event location and time, environmental data, and HNS properties (can be auto-filled from the HNS database). After waiting a few seconds, the simulation results are displayed in the online web interface.

Key features and functionalities

The model estimates thermal fluxes as a function of distance from a burning slick and assesses the expected impact on humans and structures. It also estimates the burning rate and burning time.

Practical examples where this tool can be used

Simulate the potential impact of a burning oil slick to determine how close responders can safely approach it.

Results or outputs produced

The interface provides a numerical value for the burning rate, a plot of the remaining amount in the slick over time, and a map with ellipses indicating the expected impact on responders or structures within the ellipses.

Co-funded by the European Union

FIRE MODEL

TECHNICAL REQUIREMENTS

Operating system required

- Apple macOS
- Microsoft Windows
- Linux OS

Devices the tool can run on

- PC

Hardware requirements

An internet connection and a computer capable of running a recent version of a modern web browser.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)

Type of knowledge background required to use this tool

Users should have completed a training session on the tool.

ACCESS

Permissions required

This tool requires a login and is not open to the public.

Obtain permissions

https://odnature.naturalsciences.be/oserit/

USER GUIDANCE

User guides or manuals available

MANIFESTS DSS User guides: https://manifests-project.eu/documents/27/D5.3_-_MANIFESTS_DSS_-_User_guides.pdf

Support documentation

A PowerPoint presentation is provided during the training session.

FEEDBACK

Support email

marine-forecasting-officer@naturalsciences.be

HNS DATABASE

AUTHORS

Ludovic Lepers (RBINS), Samuël Orsi (RBINS), Sébastien Legrand (RBINS)

ACCESS/DOWNLOAD AT

https://manifests-project.eu/hns-database/

APPLICATION AND USE

Purpose/objective of the tool

An online chemical database providing access to over 600 chemicals, each with up to 100 physical and chemical parameters.

Applications of this tool

- Characterisation and knowledge of HNS
- Contingency planning and guidance
- Modelling
- Risk assessment
- Training and exercising

How to use it

On the main page, users can click any HNS for details or search by name, CAS or UN numbers using the 'Search' field. The provider refers to the source of the chemical information. Users can navigate pages using the bottom-right controls. HNS entries are listed alphabetically, with some repeated due to the two data providers. Users can indeed choose data from either Cedre (lab-measured or collected through European projects like HNS-MS) or REMPEC (literature-based data from MIDSIS-TROCS).

Key features and functionalities

The chemicals available are from the MIDSIS-TROCS database (from REMPEC) and from the HNS-MS database (from Cedre). It can be used easily by a user looking to retrieve data for a chemical or can be accessed from an API.

Results or outputs produced

- General description of the substance (CAS and UN numbers, Gesamp profile, MARPOL Classification, etc.)
- Physico-chemical properties (density, hydrosolubility, vapour pressure, etc.)
- Behaviour at sea
- Ecotoxicity
- Hazards
- Gesamp Hazard profile

Co-funded by the European Union

HNS DATABASE

TECHNICAL REQUIREMENTS

Devices the tool can run on

- PC
- Mobile devices
- Tablet

Integration with other software/systems/tools

The database is linked with the modelling app of the MANIFESTS DSS.

TARGET AUDIENCE

Target audience

- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc)

Type of knowledge background required to use this tool

Users should be able to interpret key parameters to extract relevant information for emergency response.

ACCESS

Permissions required

The tool is open to the public.

USER GUIDANCE

User guides or manuals available

MANIFESTS DSS User guides: https://manifests-project.eu/documents/27/D5.3_-_MANIFESTS_DSS_-_User_guides.pdf

Dissemination materials

A PowerPoint presentation is provided during the training session.

UPDATES AND NEW FUNCTIONALITIES

Update planned for this tool in the framework of the MANIFESTS Genius project

The database will be updated with experimental data from Cedre collected at various environmental conditions (e.g. hydrosolubility, evaporation rates).

FEEDBACK

Support email

For each chemical entry, users may click on 'Report a Mistake' to indicate any inaccuracies in the information provided.

OSERIT HNS

AUTHORS

Ludovic Lepers (RBINS), Samuël Orsi (RBINS), Sébastien Legrand (RBINS)

ACCESS/DOWNLOAD AT

https://odnature.naturalsciences.be/oserit/

natural sciences .be

APPLICATION AND USE

Purpose/objective of the tool

Simulate the 3D drift of HNS spilled at sea, considering sea and atmospheric conditions, and track the HNS state over time using an online web interface.

Applications of this tool

- Management of crisis and decision making
- Operational response
- Modelling
- Risk assessment

How to use it

The user fills out an online form with simulation metadata, event location and time, release conditions, and HNS properties (can be auto-filled from the HNS database). After waiting a few minutes, the simulation results are displayed in the online web interface.

Key features and functionalities

Estimate the location over time of HNS spilled at sea, including concentration in the water column and air for volatile HNS, and predict potential beaching locations and times. The model uses daily updated forcings to enable simulations for both past event and future evolution of current situations. It supports forward simulations to assess the impact of a release and backward simulations to determine the origin of pollution.

Practical examples where this tool can be used

In the event of a collision involving a vessel transporting HNS, the tool assesses the drift direction of the spill over time. It estimates air concentration to evaluate responder risk and underwater concentration to assess ecosystem impact.

Results or outputs produced

The model provides the location of HNS over time on a map, categorized by surface slick, atmosphere, etc. It estimates the thickness of the surface slick, concentration in air and water, and exposure time above thresholds among others. Time series data includes the mass balance of HNS in different phases and distance travelled.

Co-funded by the European Union

OSERIT HNS

TECHNICAL REQUIREMENTS

Operating system required

- Apple macOS
- Microsoft Windows
- Linux OS

Devices the tool can run on

- PC

Hardware requirements

An internet connection and a computer capable of running a recent version of a modern web browser.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)

Type of knowledge background required to use this tool

Users should have completed a training session on the tool.

ACCESS

Permissions required

This tool requires a login and is not open to the public.

Obtain permissions

https://odnature.naturalsciences.be/oserit/

USER GUIDANCE

User guides or manuals available

MANIFESTS DSS User guides:
https://manifests-project.eu/documents/27/D5.3_-_MANIFESTS_DSS_-_User_guides.pdf

Support documentation

A PowerPoint presentation is provided during the training session.

FREQUENTLY ASKED QUESTIONS

Why aren't particles moving when I do a backward simulation?

The release time should be set at the start of the simulation, not the end.

FEEDBACK

Support email

marine-forecasting-officer@naturalsciences.be

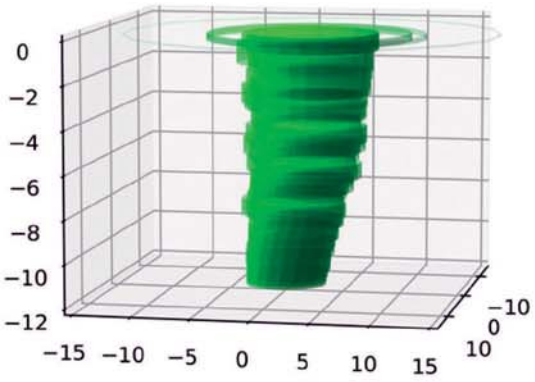
RISING UNDERWATER GAS PLUME MODEL

AUTHORS

Ludovic Lepers (RBINS), Samuël Orsi (RBINS), Chistophe Bastin (RBINS)

ACCESS/DOWNLOAD AT

https://odnature.naturalsciences.be/oserit/



APPLICATION AND USE

Purpose/objective of the tool

Model the rise of a gas plume from an underwater release to the water surface.

Applications of this tool

- Contingency planning and guidance
- Operational response
- Modelling
- Risk assessment

How to use it

The user fills out an online form with simulation metadata, event location and time, environmental data, and HNS properties (can be auto-filled from the HNS database). After waiting for the computations to be done, the simulation results are displayed in the online web interface.

Key features and functionalities

The model estimates the flow rate of gas reaching the surface and the amount dissolving in the water column.

Practical examples where this tool can be used

Assess the impact of a gas leak from an underwater pipeline or a sunken vessel carrying gaseous HNS. Users can estimate the quantity of gas reaching the surface.

Results or outputs produced

A map showing where the gas is expected to reach the surface, along with plots comparing the quantity released into the atmosphere versus dissolved in the water column.

RISING UNDERWATER GAS PLUME MODEL

TECHNICAL REQUIREMENTS

Operating system required

- Apple macOS
- Microsoft Windows
- Linux OS

Devices the tool can run on

- PC

Hardware requirements

An internet connection and a computer capable of running a recent version of a modern web browser.

Integration with other software / systems / project tools

The output flow rate can be used as initial conditions for consequence models.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)

Type of knowledge background required to use this tool

Users should have completed a training session on the tool.

ACCESS

Permissions required

This tool requires a login and is not open to the public.

Obtain permissions

https://odnature.naturalsciences.be/oserit/

FEEDBACK

Support email

marine-forecasting-officer@naturalsciences.be

OPERATIONAL FIELD GUIDE - PROTECTING COMMUNITIES FROM MARITIME INCIDENTS INVOLVING AIRBORNE POLLUTANTS

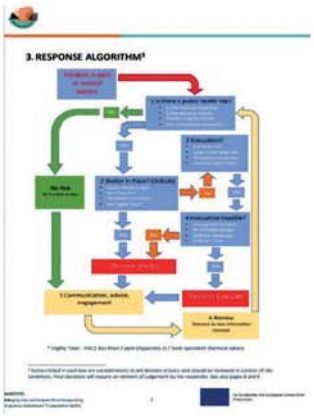
AUTHORS

Paul Harold and Andrew Kibble (UKHSA)

ACCESS/DOWNLOAD AT

https://manifests-project.eu/documents/31/Deliverable_D3.2_Decision_making_Guidance_Field_Guide_UKHSA_Final_V1.pdf

UK Health Security Agency



APPLICATION AND USE

Purpose/objective of the tool

The aim of this guide is to aid decision making in the immediate aftermath of an incident, prior to receipt of detailed monitoring and modelling data.
The guide is aimed at those involved in managing initial response as well as those with emergency planning roles.
The guide is targeted at protection of the public and not response personnel located within the immediate source of the incident.

Applications of this tool

- Management of crisis and decision making
- Contingency planning and guidance
- Risk assessment
- Training and exercising

How to use it

The Tool Requires users to collect basic information immediately following report of an incident. Using the source-pathway-receptor approach data required are – type and quantity of gas / evaporator released, hazards for that chemical, weather conditions, local receptors. This information can then be used to follow the decision-making algorithm and establish immediate best actions.

Key features and functionalities

The guide provides an approach for decision making and is primarily designed to be used during training of responders or for resilience planning.
It comprises a decision algorithm based upon a source-pathway-receptor approach, a range of prompts and considerations to be made at key points during the assessment process, key information resources and summaries of key hazard data for multiple gaseous and volatile HNS.
A separate detailed guidance document details the development of the approach and should be read before using the operational guide.

Practical examples where this tool can be used

The tool is specifically designed for use during training exercises so that responders can be given a scenario involving a gas or vapour release and then use the algorithm to decide best public protection. The tool has been workshopped in MANIFESTS Project and 2 worked examples are provided in the supporting technical report (See Section 5 Q17 for link).

Results or outputs produced

The Tool does not produce specific outputs but is aimed at planners and responders to become familiar with the considerations when deciding protective actions for communities during gas or vapour releases from ports or near shore.

Co-funded by the European Union

OPERATIONAL FIELD GUIDE - PROTECTING COMMUNITIES FROM MARITIME INCIDENTS INVOLVING AIRBORNE POLLUTANTS

TECHNICAL REQUIREMENTS

Operating system required

Paper copy

Integration with other software / systems / project tools

It can be used in conjunction with exercise materials such as chemical datasheets, atmospheric model outputs, maps and monitoring data.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Environmental managers

Type of knowledge background required to use this tool/output

Users need a basic understanding of chemical incident response and risk assessment.

ACCESS

Permissions required

This tool is open.

USER GUIDANCE

User guides or manuals available for this tool

Supporting technical guidance and illustrative examples https://manifestsproject.eu/documents/18/Deliverable_D3.2_Decision_making_Guidance_UKHSA_Final_V1.pdf

FREQUENTLY ASKED QUESTIONS

How do I use the guidance for planning and preparedness?

Identify the types and quantities of gases or evaporators handled at your port or along your coastal waters, review potential communities that could be affected. Use the algorithm to identify likely best protective options. This can be done for multiple chemicals at varying quantities of release and can be used to identify where to establish monitors and resources, inform training exercises and develop pre-prepared risk messaging for communities.

How do I use the guidance for Training?

Choose a realistic scenario for your region. Use injects for delegates to request information and populate the algorithm. The Technical Report provides 2 illustrative examples of a desk top scenario.

Can I use the tool in a real incident?

The tool can be applied in a real incident however, application should be mindful of any other operational procedures and site specific factors relevant to the incident e.g Site emergency plans, SEVESSO / COMAH plans, real-time monitors etc.

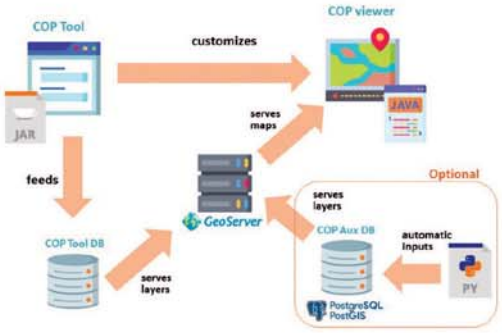
COP TOOL 2.0

AUTHORS

Silvia Allen-Perkings, Garbiñe Ayensa, Silvia Calvo & Pedro Montero

ACCESS/DOWNLOAD AT

https://github.com/MANIFESTS-DSS/



APPLICATION AND USE

Purpose/objective of the tool

COPTool helps manage marine pollution incidents by integrating and organizing key data from multiple sources. It lets managers quickly create tailored COPs, showing only relevant info to each user. New features include a tactical GIS module, dashboard, info sheet generator, and integration with Exercise and Knowledge tools. The system is containerized with Docker for easy deployment.

Applications of this tool

- Crisis management and decision making
- Operational response
- Training and exercising
- Communication

How to use it

Before a contingency, managers upload WMS layers and set user roles (viewers, contributors, managers). During an incident, a COP is created with selected layers and linked reports. Viewers access only authorized data; contributors upload new info (e.g., POLREP, SCAT). External systems (e.g., models, drifters) also feed data. A tailored COP can be deployed in minutes for efficient, role-based response.

Key features and functionalities

The system allows contingency managers to share critical info with key stakeholders, showing each user only data relevant to their role. It supports user management, SCAT and POLREP forms, alerts, photos, tactical GIS, and integration with Exercise and Knowledge tools. All features enable efficient, secure, and coordinated crisis response in a clear and user-friendly environment.

Practical examples where this tool can be used

COPTool has been implemented as an operational tool by the Galician Coast Guard. It has been used in dozens of drills and real incidents in recent years, enabling information sharing between the Coast Guard and other agencies such as Puertos del Estado and Sasemar. Additionally, it has demonstrated interoperability by exchanging data with external systems like Cedre's ARGEPOL, ensuring coordinated multi-agency response capabilities.

Results or outputs produced

The system is a web-based contingency manager supported by databases and map servers. These feed both data entry/management web apps and a web viewer, which is the main interface for end users. In short, it includes web apps for data input and management, a viewer for accessing information, and the necessary backend infrastructure to support both.

Co-funded by the European Union

COP TOOL 2.0

TECHNICAL REQUIREMENTS

Operating system required

- Microsoft Windows
- Linux OS
- Android OS
- Apple iOS

Devices the tool can run on

- PC
- Tablet
- Mobile devices

Hardware requirements

A regular server

Integration with other software / systems / project tools

This tool integrates seamlessly with other project components such as the Knowledge Tool and the Exercise Tool. It has also demonstrated its ability to exchange information with external systems like Cedre's ARGEPOL, ensuring interoperability and enhancing coordination across platforms during contingency planning and response operations.

TARGET AUDIENCE

Target audience

- Authorities and companies with legal responsibility of implementing contingency plans
- Port and maritime authorities
- Coastguards
- Emergency responders (Civil protection, firefighters, army, police officers, etc.)
- Environmental managers

Knowledge background required

Users don't need extensive technical knowledge, but they should be individuals with responsibilities in crisis management.

ACCESS

Permissions required

The tool is open to the public.

USER GUIDANCE

User guides or manuals available

https://github.com/MANIFESTS-DSS/DOCUMENTS

Dissemination materials available, or materials in which this tool is featured

https://github.com/MANIFESTS-DSS/DOCUMENTS

UPDATES AND NEW FUNCTIONALITIES

In this new version, several enhancements are included: a new tactical GIS module for adding crisis response information, a new dashboard module, a new module for generating specific information sheets, and the integration of other tools such as the Exercise Tool and the Knowledge Tool. Additionally, the entire system will be containerized using Docker to facilitate easier installation and integration.

FEEDBACK

Support email

pmontero@intecmar.gal

COP TOOL 2.0

FREQUENTLY ASKED QUESTIONS

How does the user management system work in COPtool and what are the different types of user permissions?

The COPtool has two main user types: Administrator and User. Administrators have access to all modules and can manage users and information layers. Regular users have access only to specific modules assigned by the administrator. Various permissions can be granted, including COP Manager (managing information during contingencies), POLREP Reports Manager, SCAT Manager, Observer (for inspections), Strategy Map creator, and COP Viewer (with different confidentiality levels: low, intermediate, and high). Each permission grants access to specific functionalities within the system.

What are POLREP and SCAT reports, and how are they created and managed in the COPtool?

POLREP (Pollution Report) is a standardized report model used to collect initial information about marine pollution events. In the COPtool, users can create new POLREPs by filling in forms about observer data, meteorological conditions, pollution information (spills, sources, photos, comments), and geographical locations. SCAT (Shoreline Cleanup Assessment Technique) reports are used to document coastal contamination details. These reports include information about the coastal segment, inspection team, types of coastlines, operational characteristics, surface and subsurface hydrocarbon presence, and other contaminating substances. Both report types can include geolocated photos and comments, and once created, they're stored in the database for access by authorized users.

What are the main modules available in the COPtool system and what functions do they perform?

The COPtool includes several modules: Management Module (for user and geographic information management), COP Management Module (for handling information distributed during contingencies), POLREP Module (for standard pollution observation reports), SCAT Module (for coastal contamination assessment), Reports Module (for communications from response teams including photos and videos), and COP Viewer (for visualizing all geographic information). Each module serves a specific purpose in managing different aspects of maritime emergency response.

How can I share information during an emergency using the Reports Module?

The Reports Module allows quick communication between field teams and the coordination center. To create a new report, click the "+" button and complete the form with an optional title, message text, and attached files (photos, videos, PDFs). You can tag communications as "Alarm," "News," or "General" to help managers filter information. If you've been linked to a specific contingency by the COP manager, all your reports will automatically be visible to members at the coordination center. You can also geotag your reports by providing coordinates manually, using your current location, or marking a position on the map.

What steps should I follow to create a new COP during an emergency situation?

To create a new COP, access the COP Management module and click the "+" button. You'll need to complete several screens: first enter contingency details (name, start date, description), define the affected geographical area on a map, select relevant information layers, choose which users should have access, and set confidentiality rules. Once created, you can manage the COP by linking POLREP reports, SCAT assessments, photos, and strategic maps to provide a comprehensive view of the emergency situation.

How can I add geographic information and manage layers in the COPtool?

To add geographic information, you must have administrator privileges. The system uses Web Map Service (WMS) and organizes layers hierarchically into groups and panels. You can create new panels (via the panel menu), add groups to panels (using the group menu), and then add layers to groups. When adding a layer, you'll need to provide details like name, URL, projection, and boundary coordinates. These layers become available to COP managers who can select them during contingency management.

How do I navigate between different modules and features in the COPtool interface?

Navigation within the COPtool is done through the menu on the left side, which provides access to all modules you have permission to use. Common navigation elements include the "+" button to create new elements, search fields to find records, summary bars at the top to access different sections of forms and edit/delete options to modify or remove records. You can also use the "Next" buttons to progress through multi-step forms and return to the main dashboard to see your most recent data.

Co-funded by
the European Union

manifests-project.eu

COORDINATED BY

Cedre

PARTNERS

CETMAR
CENTRO TECNOLÓXICO DO MAR

Cedre

GOBIERNO DE ESPAÑA
MINISTERIO DE TRANSPORTES Y MOVILIDAD SOSTENIBLE

IMT Mines Alès
École Mines-Télécom

intecmar
INSTITUTO TECNOLOXICO PARA O CONTROL DO MEDIO MARIÑO DE GALICIA

natural sciences .be

ISTID

UK Health Security Agency