

# Building a novel HNS online tool for protocol exercising and training

MARINER



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Hazards  
Public Health England**

**Porto  
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# Public Health England. Who we are?

Formally the Health Protection Agency, PHE is now part of the UK Department of Health leading on the protection and promotion of public health.

The Centre for Radiation, Chemical and Environmental Hazards provides advice on human health effects from chemicals and radiation in the environment.

CRCE is a Category 1 Responder to chemical incidents.

CRCE Wales is based in Cardiff and provides advice to Wales and Ireland. Also acts as a WHO Coordination Centre for chemical incidents worldwide and has been involved in European maritime research for several years.



Public Health  
England

Protecting and improving  
the nation's health



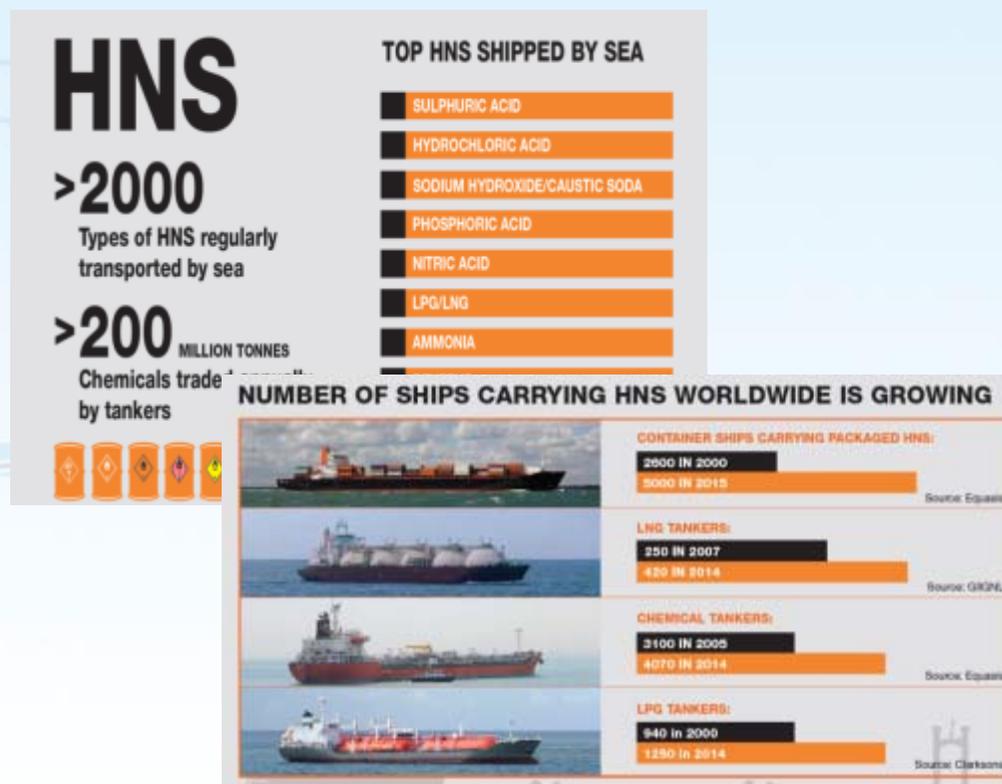
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# HNS - What are they?

**Hazardous and Noxious Substances (HNS) are chemicals which, if introduced into the marine environment pose hazards to health, ecosystems and legitimate uses of the sea. (Typically excludes oil)**

IMO Estimates, 2016

- Approximately 2,000 HNS regularly transported by sea
- In excess of 200 Million tonnes carried annually
- Numbers of ships are increasing
- Ships are getting bigger



[http://www.hnsconvention.org/fileadmin/IOPC\\_Upload/hns/files/HNS\\_Why\\_it\\_is\\_needed\\_brochure.pdf](http://www.hnsconvention.org/fileadmin/IOPC_Upload/hns/files/HNS_Why_it_is_needed_brochure.pdf)

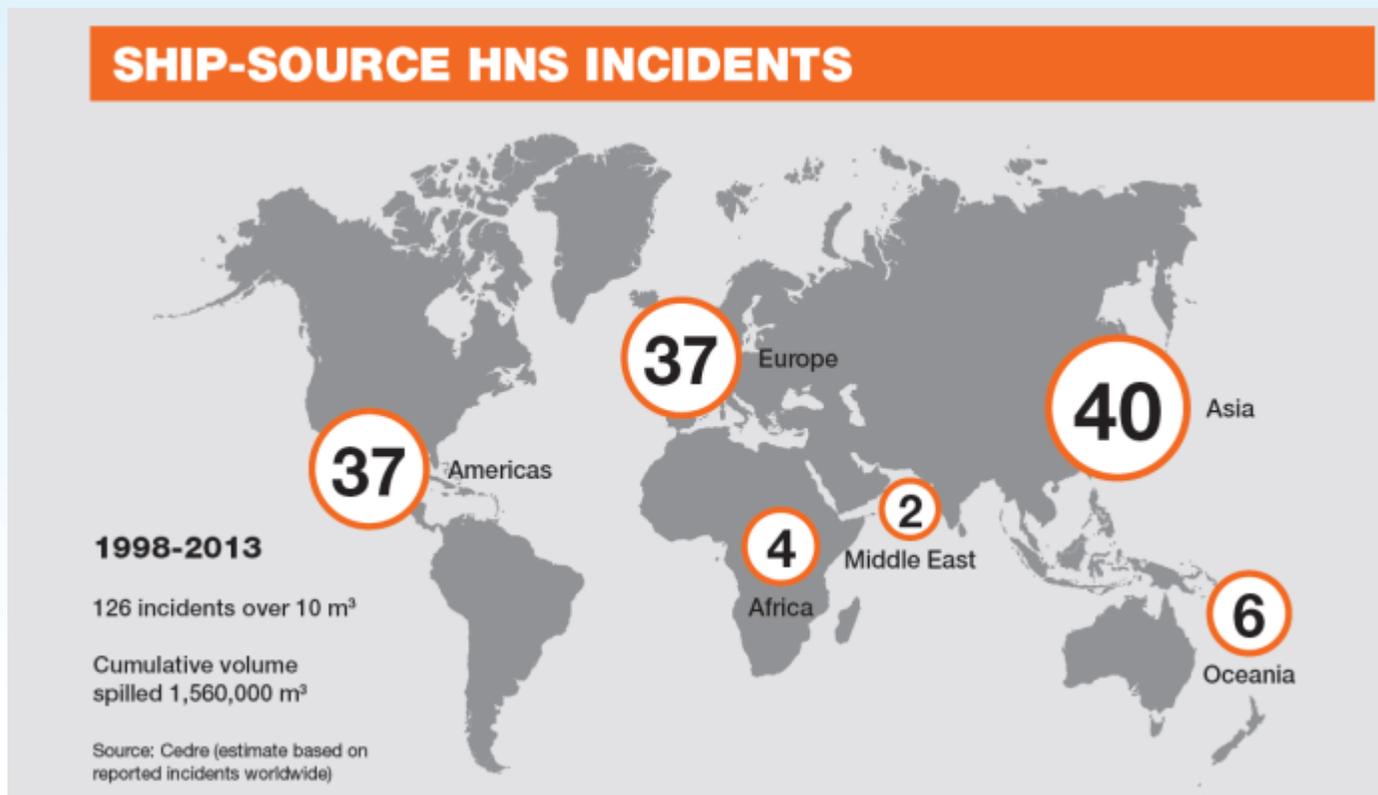


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# HNS incidents

## Incidents Do Occur

- Over 100 incidents reported globally between 1998 and 2013
- Cumulative volume released of 1.5 million m<sup>3</sup>



[http://www.hnsconvention.org/fileadmin/IOPC Upload/hns/files/HNS\\_Why\\_it\\_is\\_needed\\_brochure.pdf](http://www.hnsconvention.org/fileadmin/IOPC Upload/hns/files/HNS_Why_it_is_needed_brochure.pdf)



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# HNS – A problem?

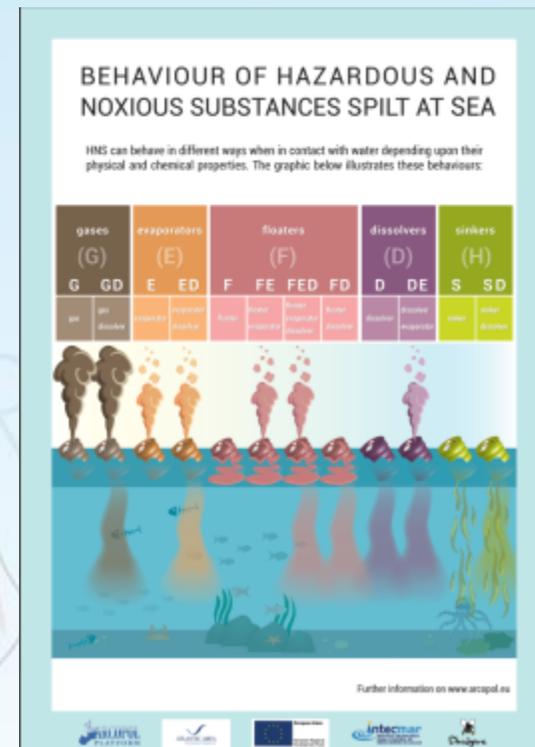
Large maritime incidents involving HNS, whilst rare, have the potential for major impact upon both the environment and human health.

## Why?

Many different kinds of HNS. All hazardous. Different HNS will behave in different ways – evaporate, float, dissolve, sink, react, combust etc.

## So what do we do?

No one stop fits all approach to response  
Need robust planning and preparedness mechanisms which can be readily engaged should the worst happen.



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# Planning and Preparedness

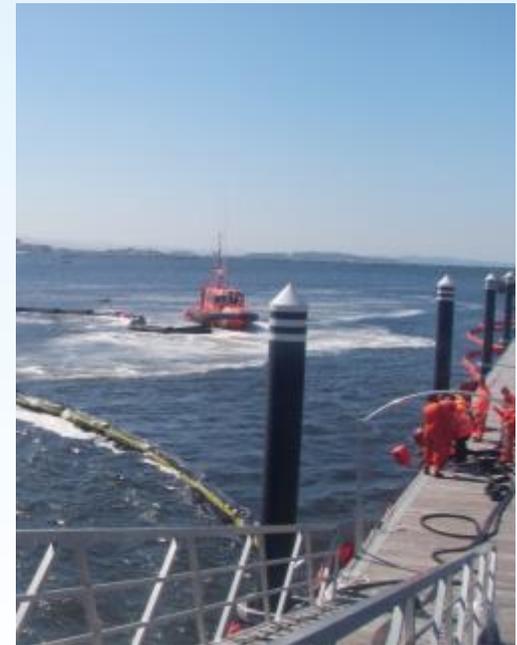
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We have developed an innovative exercise tool for maritime incidents involving HNS.

Exercises contribute to preparedness, enabling plans to be tested, particularly the human elements around capacity and resilience.

This in turn reduces the impact of incidents, thereby protecting public health and the environment.

In contrast, live exercises are rare requiring large amounts of preparation and resources, while simpler “desk-top” options are often generic and can lack realism.



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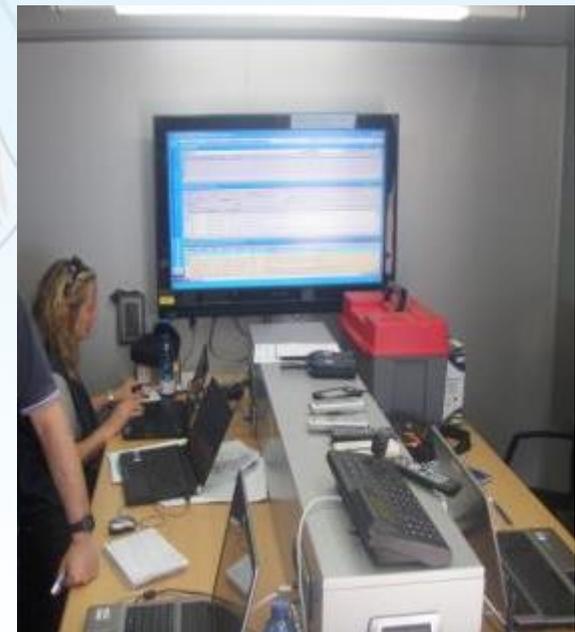
# Exercises? So what's innovative?

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Our tool is able to incorporate local and regional data and information to rapidly produce a wide range of geographical and chemical specific scenarios.

Specifically this tool is

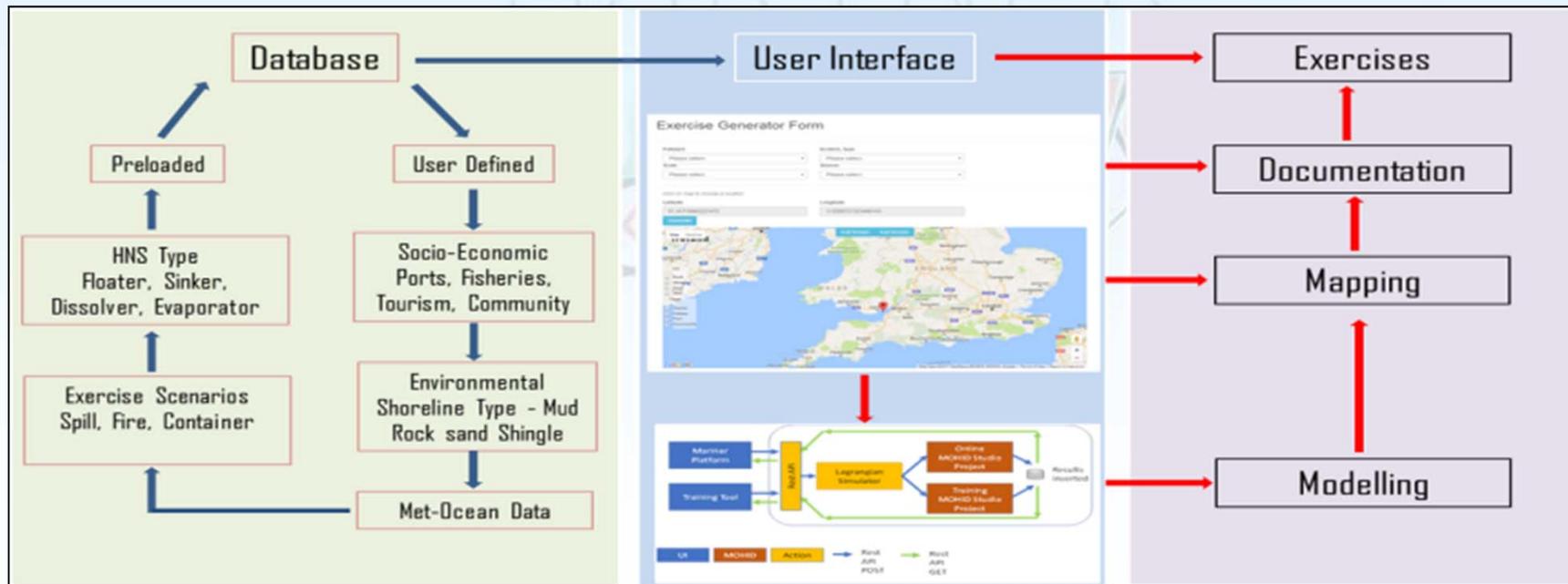
- Adaptable to multiple EU Atlantic regions (and ultimately global).
- Applicable to a range of HNS types and incident sizes.
- Considering of seasonal variations.
- Providing editable scenarios to test local and regional response plans on a site specific basis with options for wider cross border impacts, where applicable.



# Concept

Comprises a database of preloaded information on HNS, a library of exercise materials, and interfaces for mapping and modelling.

Further populated by the user with regional receptor information, combining environmental, health and socio-economic data and uploaded as GIS mapping layers.



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# Region Specific Inputs

**Fate and transport simulations** - Basic oceanographic and meteorological data are required for modelling. Several freely available sources of such data are available although resolution can be low.



**Pollutants** – Preloaded data on HNS classes and datasheets on proxy chemicals for each class. If however other specific HNS are relevant for a region then datasheets can be edited accordingly.



**Coastal data** - Illustrate regional sensitivities with pre-defined shoreline types and coastal anthropogenic activities. Such data are generally readily available from national surveys etc. Data are uploaded onto the mapping section of the tool as .kml files.



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# How it Works

From the Exercise Generator Interface screen

Select the incident location on the base map, the class of HNS required, scale of the incident, the season, and the type of incident.

The tool will populate the exercise materials with the selected parameters; prepare regional mapping and request fate and transport modelling from an external server.

The tool will notify the facilitator when ready, after which the exercise can begin.

The screenshot shows the 'Exercise Generator Form' interface. It features several dropdown menus for 'Incident Type', 'Season', and 'Scale'. Below these is a map of the United Kingdom with a red pin indicating a selected location. The map shows major cities and regions like Wales and England. The form also includes a 'Generate' button and a 'Click on map to choose a location' instruction. The map shows a red pin over the London area.



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# Exercises

Exercise: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Facilitated By: \_\_\_\_\_

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Enhancing HNS preparedness through training and exercises

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THE EUROPEAN

Ecological disaster unfolds from ship wreck chemical leak

By Rob Orford, Chief Environment Reporter

Local authorities are faced with clean up of one of the biggest ecological disasters to hit this part of the country after a chemical tanker collided with a fishing vessel yesterday.

Sources suggest several thousand tonnes of dangerous chemical cargo has escaped into the marine environment as a result of the damage to the ship and is likely to impact shorelines throughout the region.

"It is an absolute disaster if we don't act now," one local authority spokesperson said.

"We know wildlife has already been affected, and this will most certainly also affect our local economy, as fishing and tourism industries are sure to be hit. We are doing all that we can at this time to prevent further damage."

"It is very difficult to say at this point how bad the situation is going to get," Enviro charity spokesman James Smith said.

"Salvage services are working hard to make sure the leak is stopped, but depending on the currents the chemicals could be spread quite widely"

Reports are of uncertainty and confusion amongst residents and tourists — causing traffic chaos throughout the region.

The coastline has many environmentally sensitive areas, which attracts many tourists as well as its historical towns, beautiful beaches and famous market. Local fisheries also make up an important aspect of the local economy

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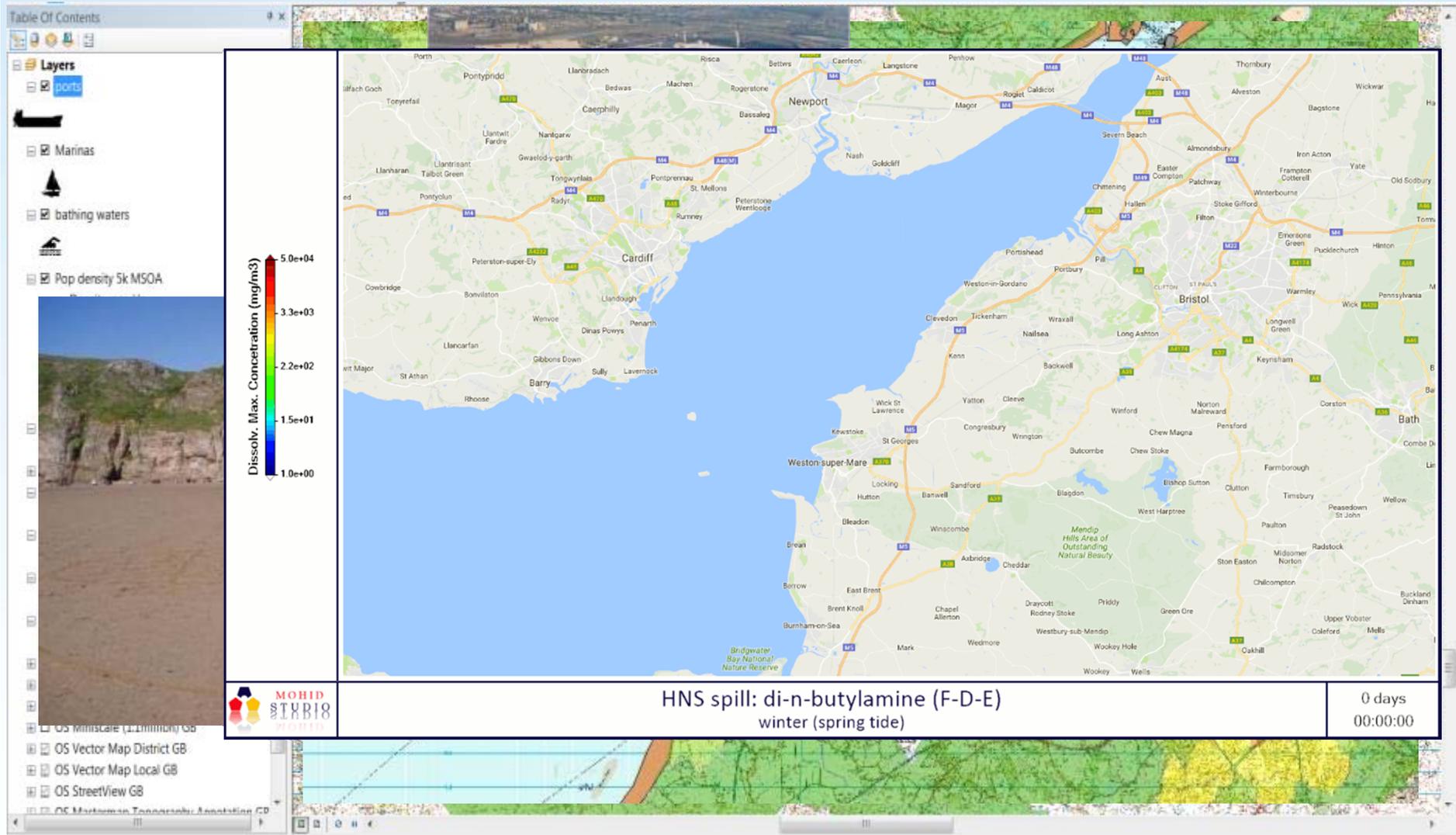
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# Coastal Mapping



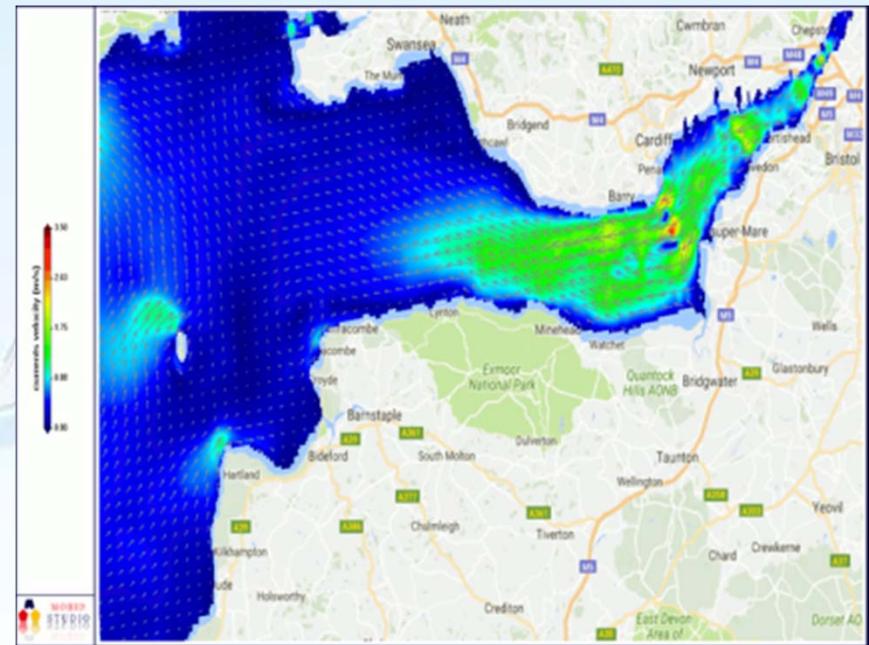
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# Pilot Study: Bristol Channel UK

A large tidal estuary separating South Wales and South West England  
Busy shipping area of the UK Atlantic coast, approximately 160 miles of coastline and challenging met-ocean characteristics.

Piloting has comprised a 3- stage process involving

1. population of the database with regional data,
2. Beta testing of the populated tool for functionality
3. A full live trial with regional responders.



Stages 1 and 2 complete and have confirmed functionality and performance. Stage 3 to be undertaken at workshops in June



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# Next steps

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Feedback from June will be used to finalise the tool for wider use.

Additional EU pilot for Galicia in Northern Spain to appraise applicability to other regions.

Applying the tool to a wider audience will require the provision of met-ocean data for fate and transport modelling. Freely available data are generally low resolution and would need assessment for new regions.

Aim to develop a wider international community database, incorporating global high resolution data, available to all users and stimulating the opportunity for routine multinational training and exercise programmes.



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# Part of a Wider Training Package... E-Learning

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The tool forms part of an innovative training package for HNS response including e-learning modules on the application of International Health Regulations to maritime chemical incidents

The International Health Regulations (2005) (IHR) are a legally binding agreement that provides a unique public health framework in the form of obligations and recommendations that enable State Parties to better prevent, prepare for, and respond to public health emergencies of international concern (PHEIC).

The scope of IHR has been expanded from cholera, plague and yellow fever to cover all events that may constitute a public health emergency of international concern. This includes chemical events such as HNS incidents at sea.



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# IHR e-learning

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The aim is:

“To develop understanding of the key elements of IHR with particular relevance to the risk assessment of maritime events thereby increasing the protection of public health and the environment.”

Three short e-learning modules are being developed.

- Module 1 – Introduction to IHR
- Module 2 – Applying IHR risk assessment criteria to maritime events
- Module 3 – Interactive case study

Will link to other training materials being developed on IHR for the WHO



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# IHR e-learning

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**There are four essential and mandatory criteria under IHR**

- I. Is the public health impact of the event serious? (yes/no)**
- II. Is the event unusual or unexpected? (yes/no)**
- III. Is there any significant risk of international spread? (yes/no)**
- IV. Is there any significant risk of international travel or trade restrictions? (yes/no)**

Countries are required to notify WHO of any event that meets at least two of the four decision criteria.



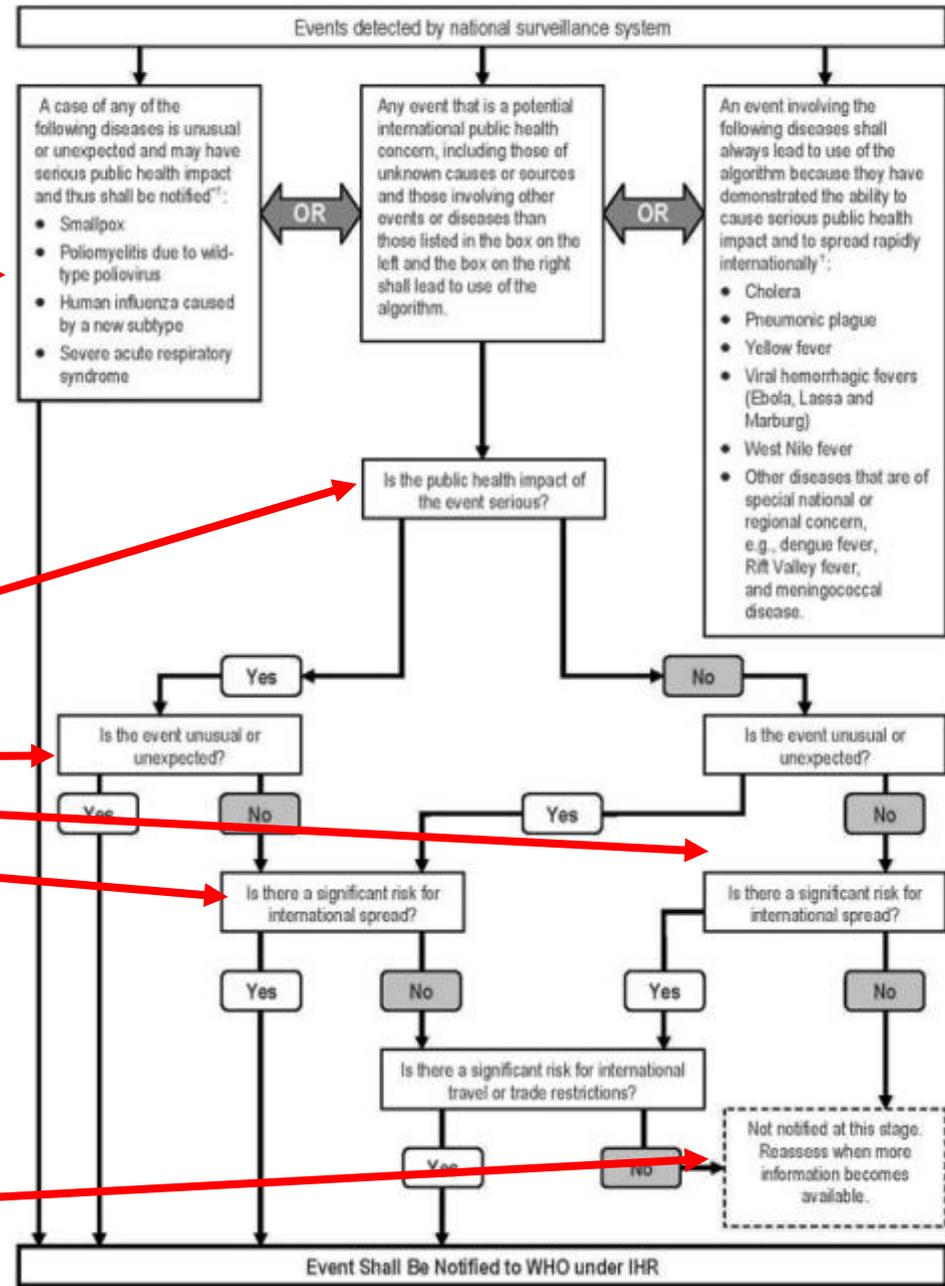
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# IHR risk assessment

4 diseases that require immediate notification

- Criteria
- I. public health impact serious?
  - II. unusual or unexpected?
  - III. risk of international spread?
  - IV. risk of travel/trade restriction?

The risk assessment should be reviewed and updated if there is insufficient information.



# IHR e-learning – interactive case study

E-learning will contain an interactive case study.

Offer an opportunity to apply the IHR risk assessment criteria to a maritime incident.

Case study will be an oil/HNS spill with potential cross border implications.

**Maritime Case Study – MV Nautilus**

Subheader

1 2 3 4 10 11

Tab 3 Incident Day 2

**Oil Spill**

The Coast Guard reports that the ship is breaking apart. Reports suggest 50% of the hold tanks have been ruptured and the tanker has already lost approximately 15,000 tonnes of cargo.

At 12pm on 10 November the ship broke in two and sank in approximately 1000 metres of water. Booms have been deployed but high seas mean that considerable quantities of waste oil and chemicals have been released.



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# IHR e-learning - screenshot

The screenshot shows the Moodle interface for the 'International Health Regulations: Chemical Risk Assessment and Notification' course. The header includes the Cardiff Metropolitan University logo and navigation links for Home, My courses, Calendar, and a user profile for Andrew Kibble. The breadcrumb trail indicates the user is in the Cardiff School of Health Sciences (CSHS) / Public Health / IHR section. A 'Turn editing on' button is visible in the top right.

**Navigation**

- Home
- Dashboard
- Current course
  - IHR
    - Participants
    - Badges
  - My courses

**Administration**

- Course administration
  - Turn editing on
  - Edit settings
  - Users
  - Unenrol me from IHR
  - Filters
    - Reports
    - Grades
    - Gradebook setup
    - Badges
  - Import
  - Question bank
- Switch role to...

## International Health Regulations: Chemical Risk Assessment and Notification

### What are the International Health Regulations?



"In today's connected world, health security is a global issue. We must all protect ourselves, and each other, from threats like infectious diseases, chemical and radiological events. That is why 196 countries have agreed to work together to prevent and respond to public health crises. The agreement is called the **International Health Regulations**, or IHR (2005), and WHO plays the coordinating role. Through the IHR, WHO keeps countries informed about public health risks, and works with partners to help countries build capacity to detect, report and respond to public health events."

World Health Organisation

News forum

Course Structure:

- About
- Module 1: Introduction & Background to IHR
- Module 2: Chemical Risk Assessment under IHR
- Module 3: Interactive Case Studies

Moodle Docs for this page

You are logged in as Andrew Kibble (Log out)  
Home



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# IHR e-learning – screenshot

The screenshot displays the IHR e-learning interface. On the left is a 'Menu' sidebar with a tree view of topics. The main content area is titled 'IHR Risk Assessment' and shows 'Criteria 3' with two questions. Each question has 'Yes' and 'No' response buttons. A 'Submit' button is at the bottom right. Navigation icons (home, back, forward, exit) are visible. A speaker icon is at the bottom left.

**Menu**

- ▶ 1. Introduction
- ▼ 2. Background
  - 2.1. Background
  - 2.2. Background cont...
  - 2.3. Day 1 - Outbreak
  - 2.4. Day 2 - Symptoms
  - 2.5. Day 3 - Investigation
- ▼ 3. Criteria
  - 3.1. Risk Assessment
  - 3.2. Criteria 1
  - 3.3. Criteria 1 - Feedback
  - 3.4. Criteria 2
  - 3.5. Criteria 2 - Feedback
  - 3.6. Criteria 3**
  - 3.7. Criteria 3 - Feedback
  - 3.8. Criteria 4 Part 1
  - 3.9. Criteria 4 Part 2
  - 3.10. Criteria 4 - Feedback
  - 3.11. Expert Feedback

**Risk Assessment**      **Criteria 1**      **Criteria 2**      **Criteria 3**      **Criteria 4**      **EXIT**

## IHR Risk Assessment

**Criteria 3: Is there a significant risk of international spread?**

**?** Is there evidence of an epidemiological link to similar events in other Member States      **Yes**      **No**

**?** Is there any factor that should alert us to the potential for cross border movement of the agent, vehicle or host?      **Yes**      **No**

**Submit**

Speaker icon:

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# Thank You

## MARINER

# Diolch yn Fawr



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