MARINER

Enhancing HNS preparedness through training and exercising

RESPONSE PROTOCOLS

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intecmar
INSTITUTO TECNOLOXICO PARA O CONTROL DO MEDIO MARIÑO DE GALICIA

Final Conference
21st November 2017. Vigo (Spain)

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1. Objective

1. Identification of existing expertise from **land** incidents and their main response protocols and equipment to be adapted for marine events.

2. Development of guidance documents for good practices and training for specialized antipollution vessels operating in **coastal** areas.

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2. Overview

1. Contact to key groups involved in the response an training for land incidents
2. Adaptation of selected response protocols to marine environment
3. Training on board of specialized vessels

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3. Contact to key experts

Public institutions

Private companies

Training centres

SCOPE 2017 Skagerrak Chemical Oilspill Pollution Exercise

MINISTERIO DE FOMENTO
DIRECCIÓN GENERAL DE LA MARINA MERCANTE

Simulacrum

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DIRECCIÓN GENERAL
DE **PROTECCIÓN CIVIL** Y **EMERGENCIAS**

CURIUM
TO CURE YOUR ENVIRONMENT

MARINE NATIONALE

ACADEMIA GALEGA
DE SEGURIDADE PÚBLICA

SOBEGI

SARP
Centre Ouest

HAVARIEKOMMANDO
Central Command for Maritime Emergencies Germany

Dräger

Canada

Séché Urgences Interventions

LOS ANGELES FIRE DEPARTMENT
FOUNDED 1886

lyondellbasell

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3. Contact to key experts

GIETMA

Group of Intervention in Technological and Environmental Emergencies

Military Unit of Emergencies (Spanish Army)

- ✓ Qualified group that is ready to act in the focus of the emergency
- ✓ Capacity of detection, sampling and initial identification of agents CBRN
- ✓ Decontamination Unit for personnel, materials, installations, terrain and water
- ✓ Laboratory of Fast Identification

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3. Contact to key experts

HUELVA 2017: UME GIETMA Group

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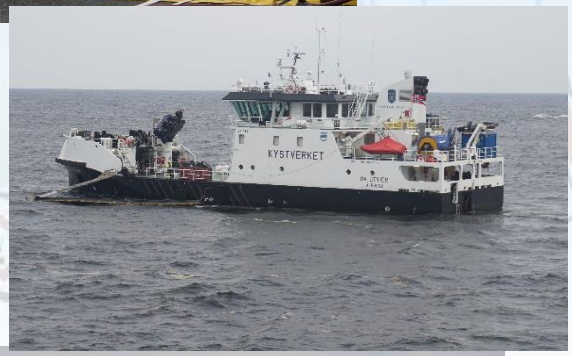
3. Contact to key experts

SCOPE 2017 Skagerrak Chemical Oilspill Pollution Exercise



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3. Contact to key experts

SCOPE 2017- Chemland

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4. Adaptation of response protocols

R/S "SEBASTIÁN DE OCAMPO"

- Length: 41 m
- Tanks R: 118 m^3
- Floating tanks: 6 x 25 m^3
- Boom 300 m
- 2 skimmers
- FLIR system

B/S "IRMÁNS GARCÍA NODAL"

- Length : 39 m
- Tanks R: 72 m^3
- Floating tanks: 6 x 25 m^3
- Boom 300 m
- 2 skimmers
- FLIR system

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4. Adaptation of response protocols

Evaluation of the antipollution vessels equipment

Containment & recovery

Detection & Analysis

FIFI System

Communications

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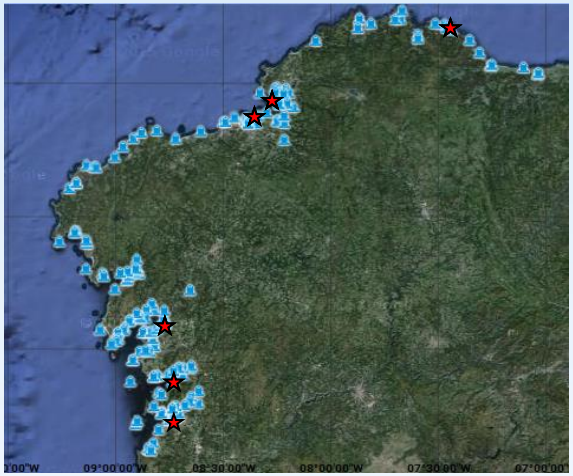
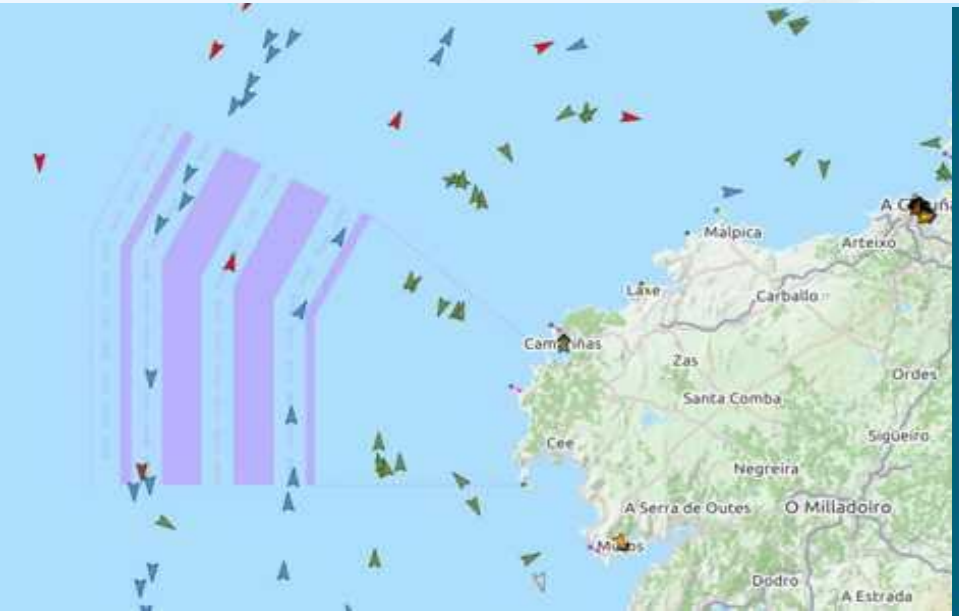
4. Adaptation of response protocols

Most transported HNS in GALICIA



- **PNI**: Vigo, Marín, Vilagarcía de Arousa, A Coruña & Ferrol-San Cibrao
- **PG**: 133 ports
- **Traffic Separation Scheme**



Top 10 substances spilt

Rank	Substance
1	Iron ore
2	Sulphuric acid
3	Caustic soda
4	Fertilisers
5	Cereals
6	Ammonium nitrate
7	Phosphate
8	Coal
9	Sulphur
10	Vegetable oils

(Source: IMO)

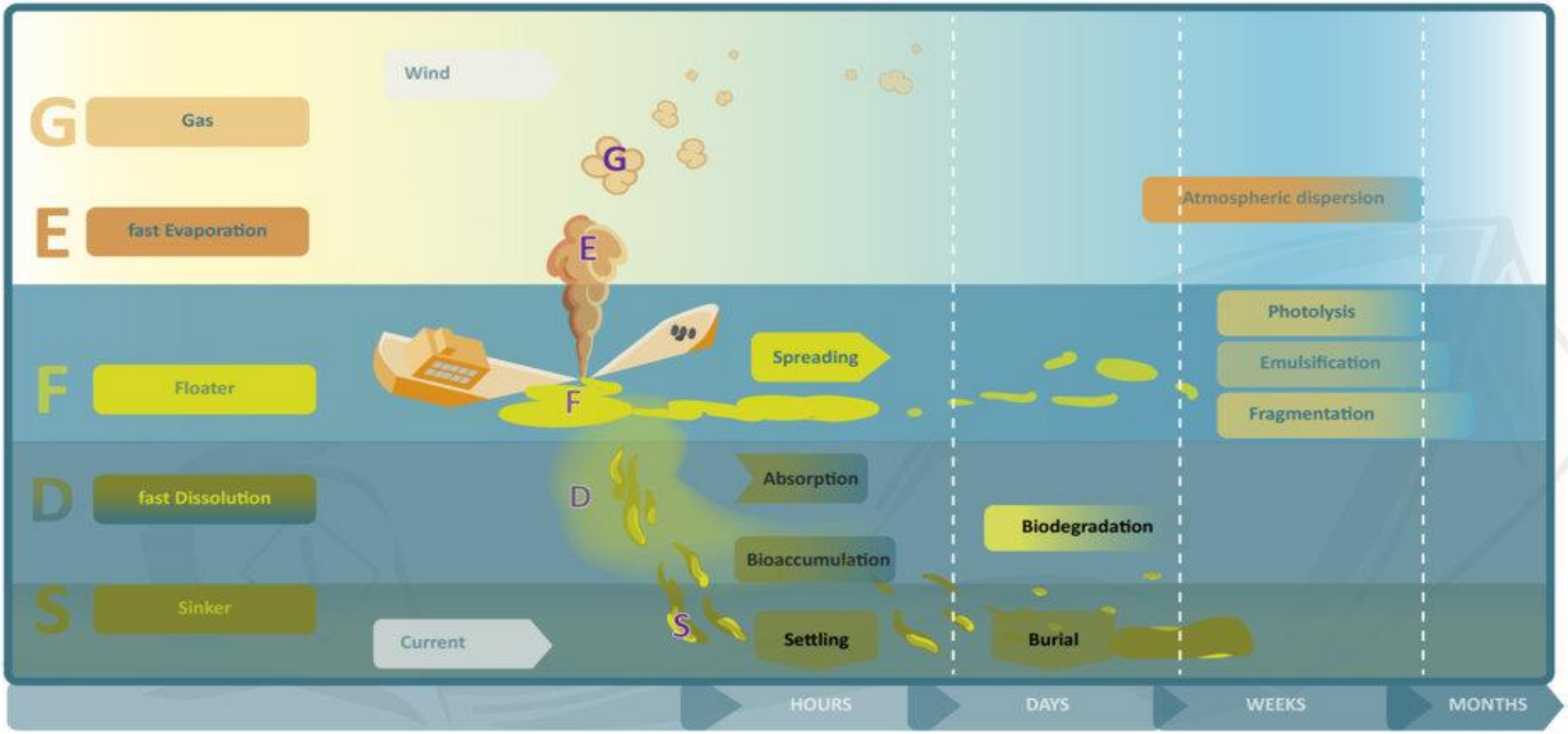
Top 20 substances at risk*

Rank	Substance	Rank	Substance
1	sulphuric acid	11	styrene
2	hydrochloric acid	12	methanol
3	sodium hydroxide /caustic soda	13	ethylene glycol
4	phosphoric acid	14	Chlorine
5	nitric acid	15	Acetone
6	LPG/LNG	16	ammonium nitrate
7	ammonia	17	urea
8	benzene	18	toluene
9	Xylene	19	acrylonitrile
10	phenol	20	vinyl acetate

*Excluding crude oil, derivatives and vegetable oils

4. Adaptation of response protocols

The best option: response based on behaviour in the water



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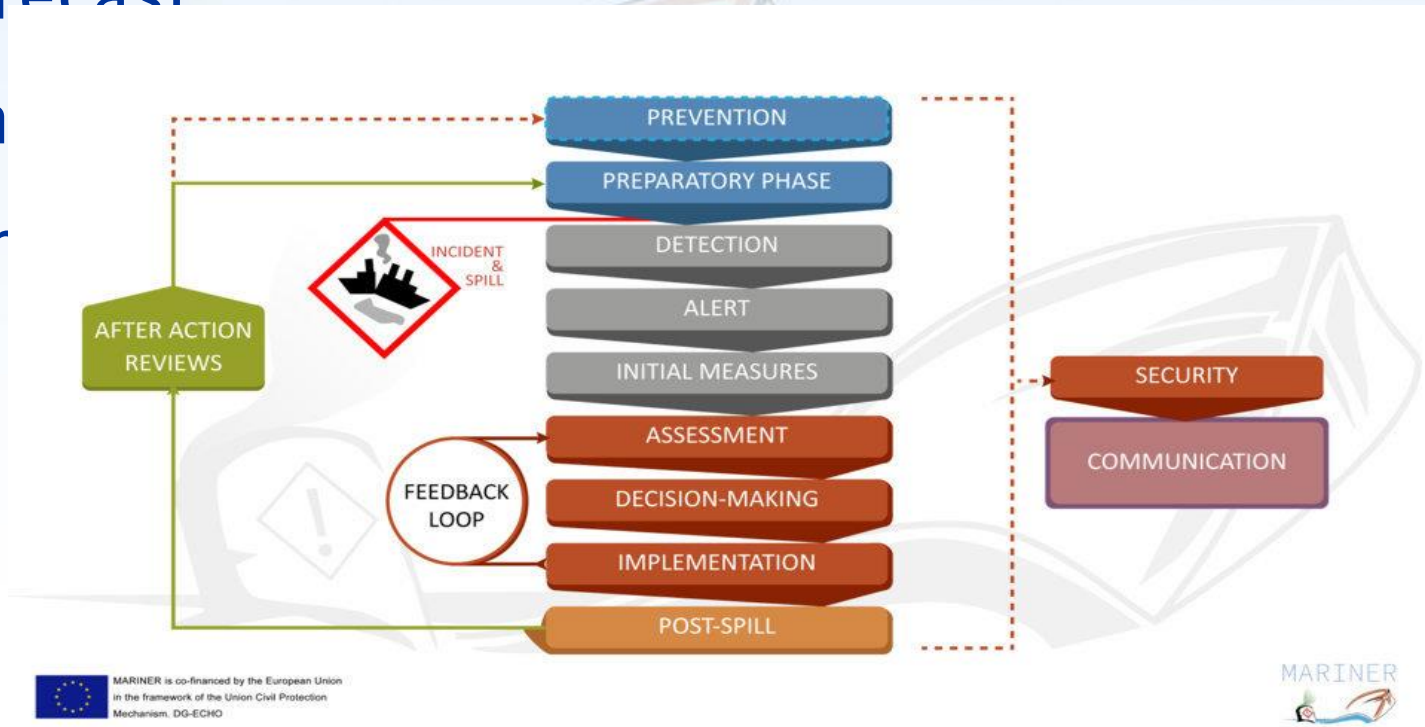
5. Protocols for response to HNS incidents

- First steps
- Personal Protection Equipment
- HNS behaviour
- Monitoring & Forecast
- Response option
- Decontamination



5. Protocols for response to HNS incidents

First steps: "*Think before you act*"

- ✓Get as much **information** as possible about the situation
- ✓ **Inform** appropriate authorities (Plan Camgal)
- ✓**Identify** all the involved chemicals, volume and size of spill
- ✓Ask for the assessment of the **risk** of fire, explosion and health risk; as well as the restriction areas distances & the drift, spread and evaporation **forecast**
- ✓ **Rescue** operations
- ✓Make **preparation** for procedures regarding personnel of response, PPE, decontamination, relieving and replacement of personnel, materials and equipment. Continuously **monitor** the situation
- ✓**Response** options to stop or reduce damage to environment and property

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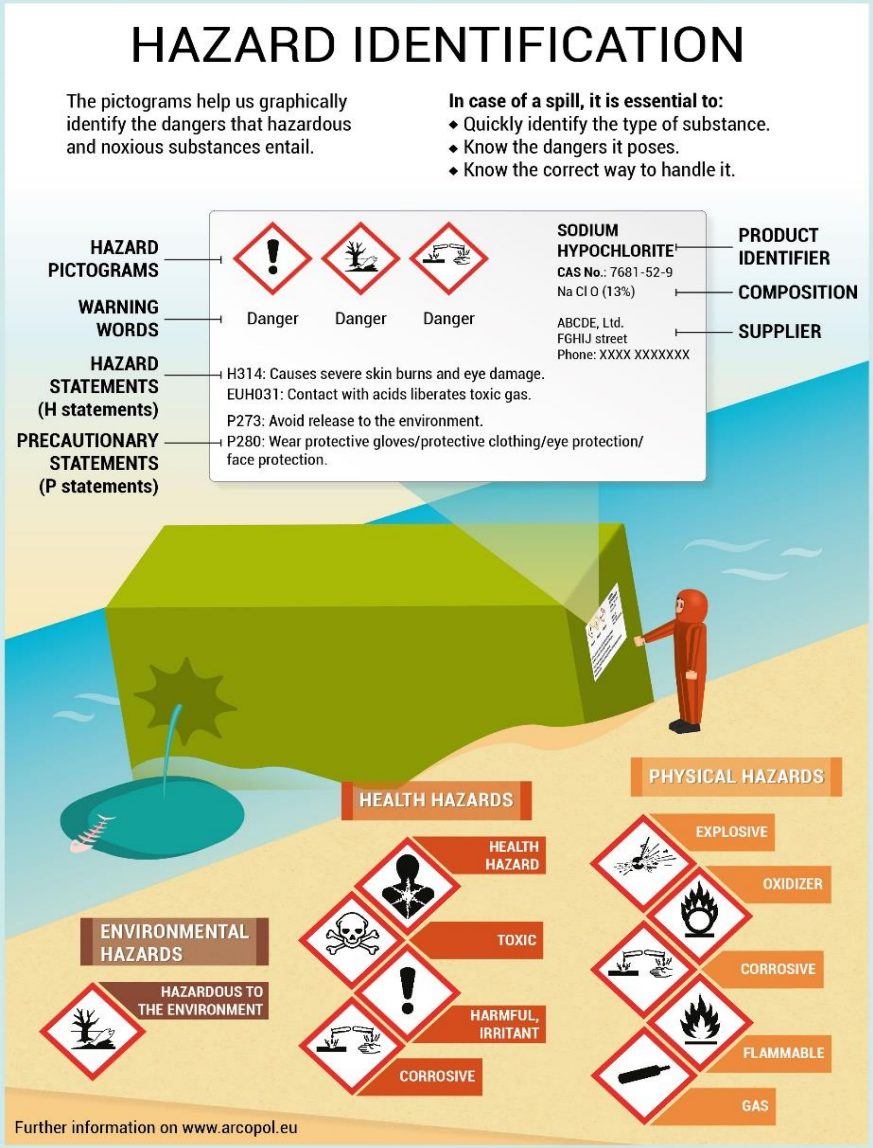
5. Protocols for response to HNS incidents



Identify HNS

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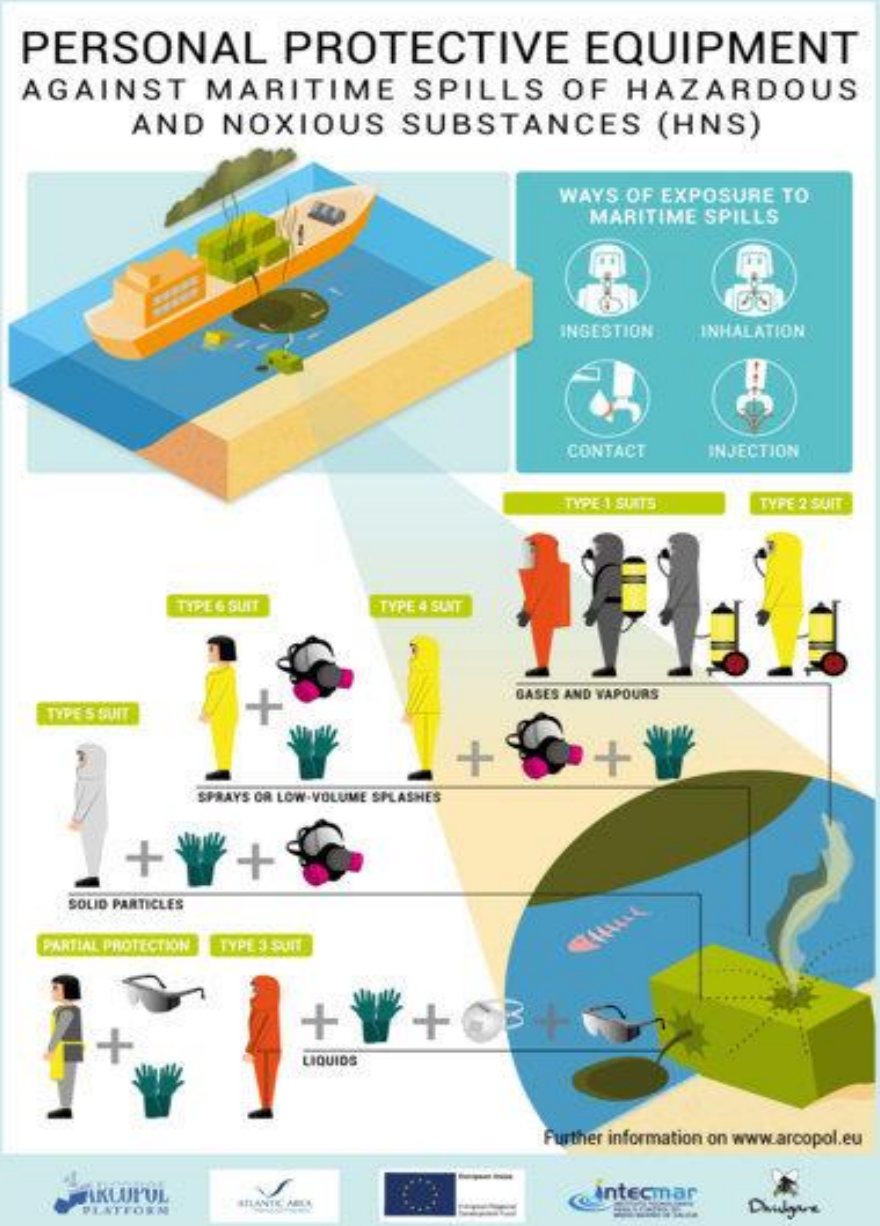
5. Protocols for response to HNS incidents



Identify adequate PPE

5. Protocols for response to HNS incidents

Dräger CPS 7900

- Tailor-made for use under extreme conditions
- Gastight, reusable protective suit
- Excellent protection from industrial chemicals, chemical warfare agent and other toxic substances
- Suitable for use with cryogenic substances down to -80°C and in explosive zones
- Flame retardant and self-extinguishing

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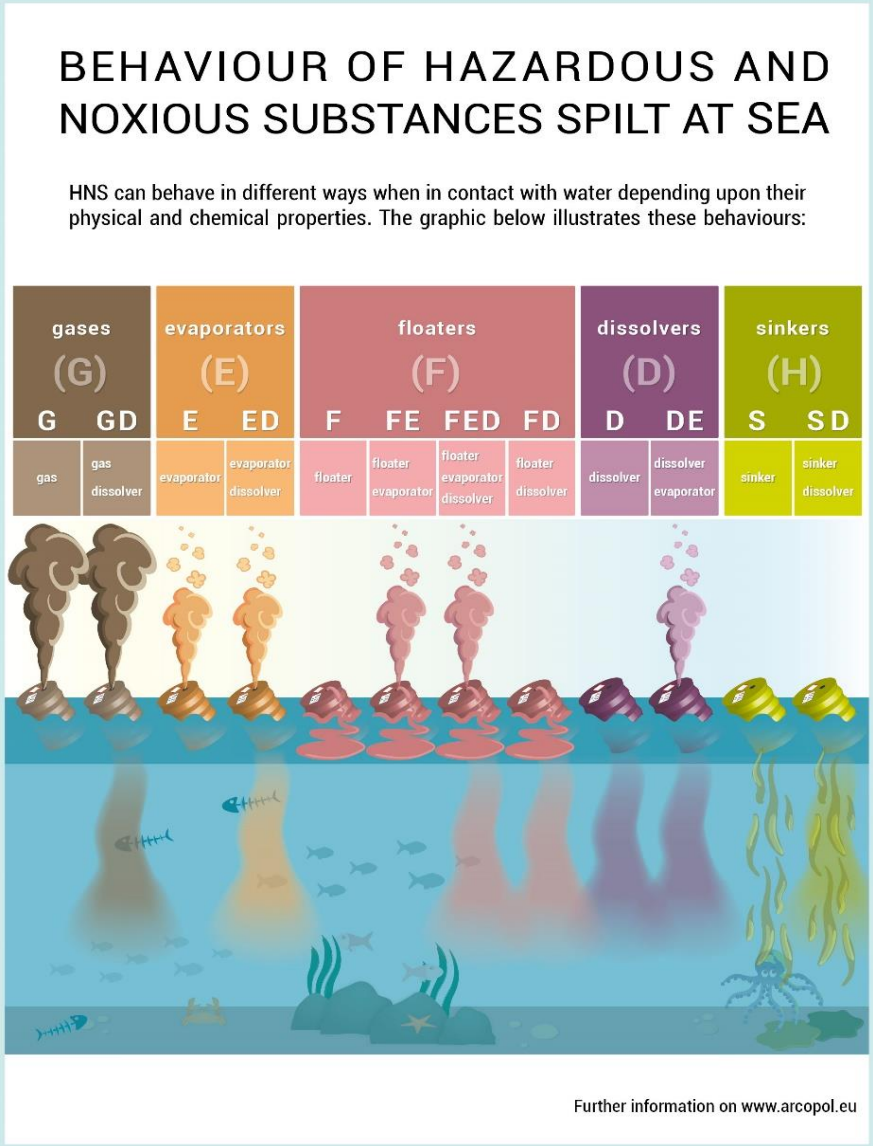
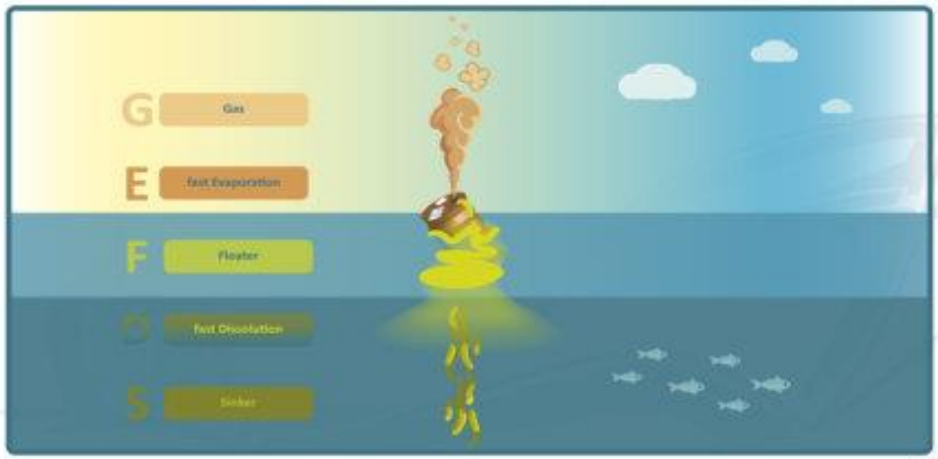
5. Protocols for response to HNS incidents



Identify behaviour of HNS



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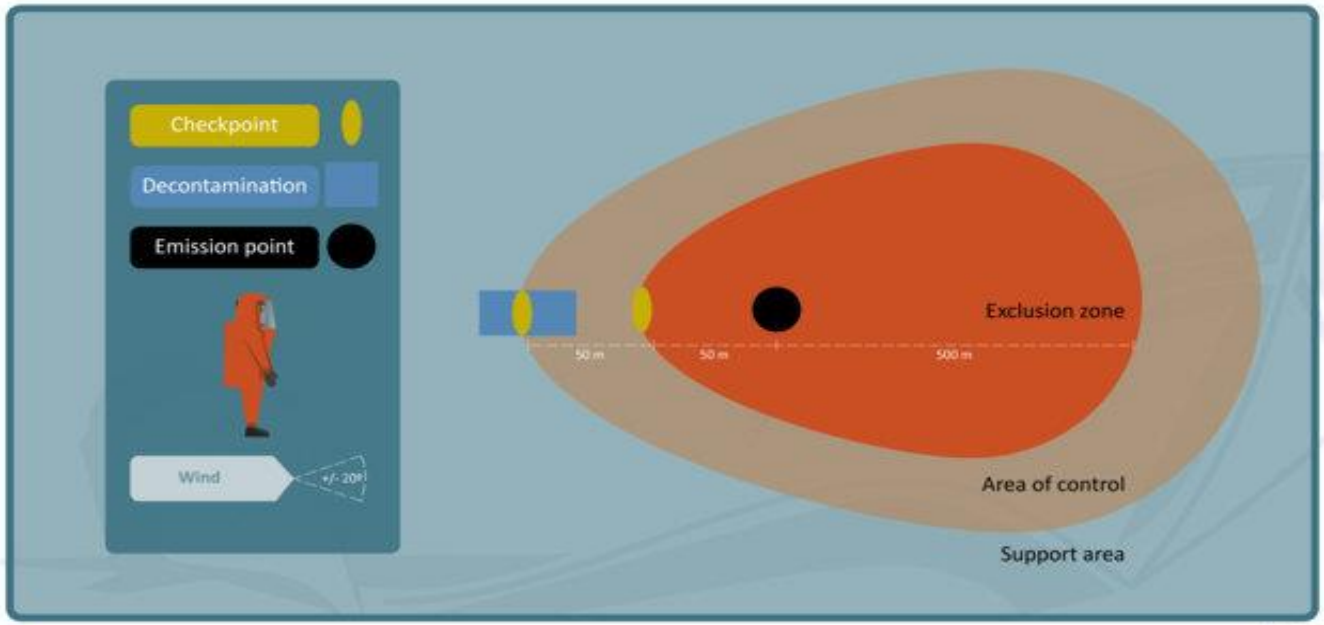
5. Protocols for response to HNS incidents



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Identify risk areas

Main problems

- Spill source in movement
- Approach to explosive atmospheres
- Boarding with PPE in rough weather conditions

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5. Protocols for response to HNS incidents

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5. Protocols for response to HNS incidents

Detection & Analysis

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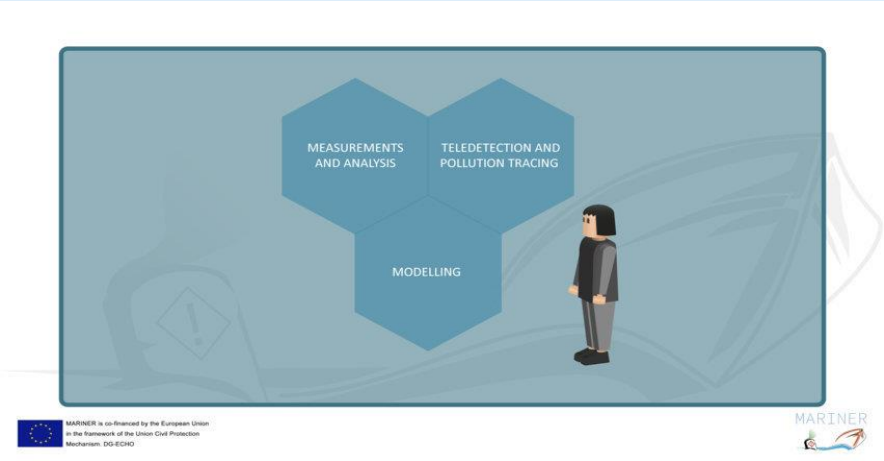
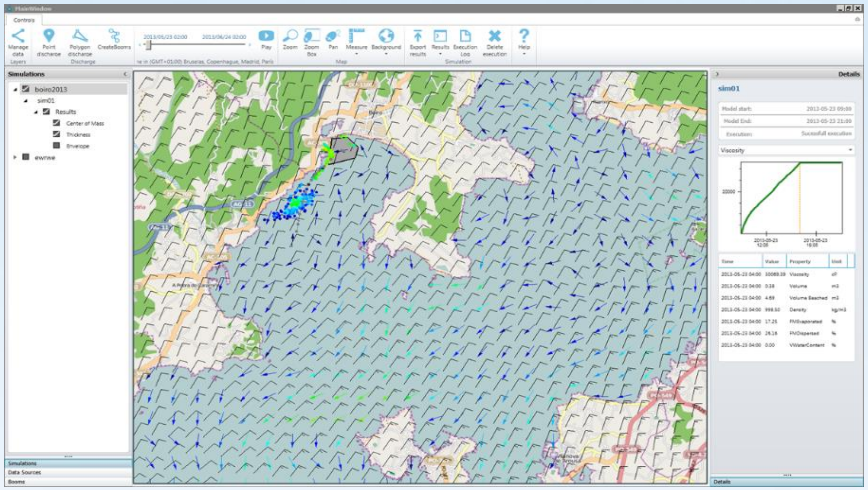
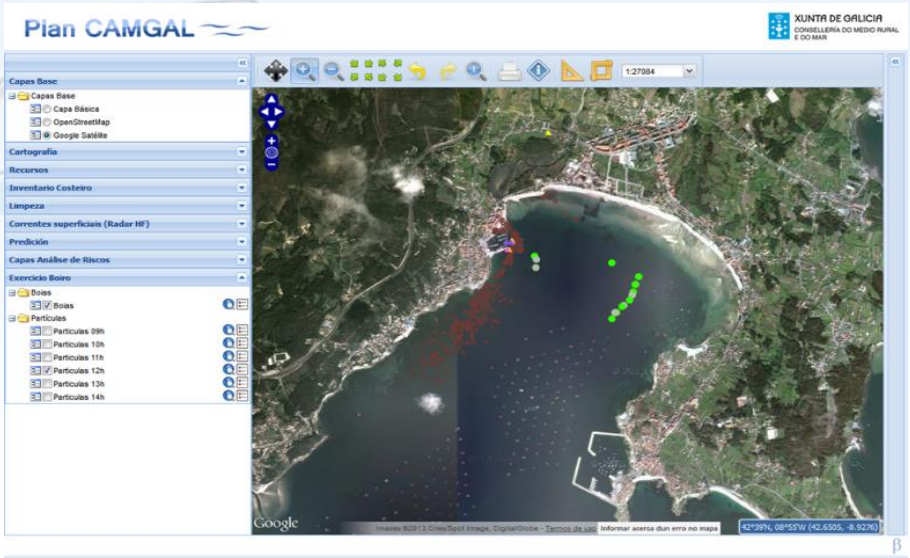
5. Protocols for response to HNS incidents

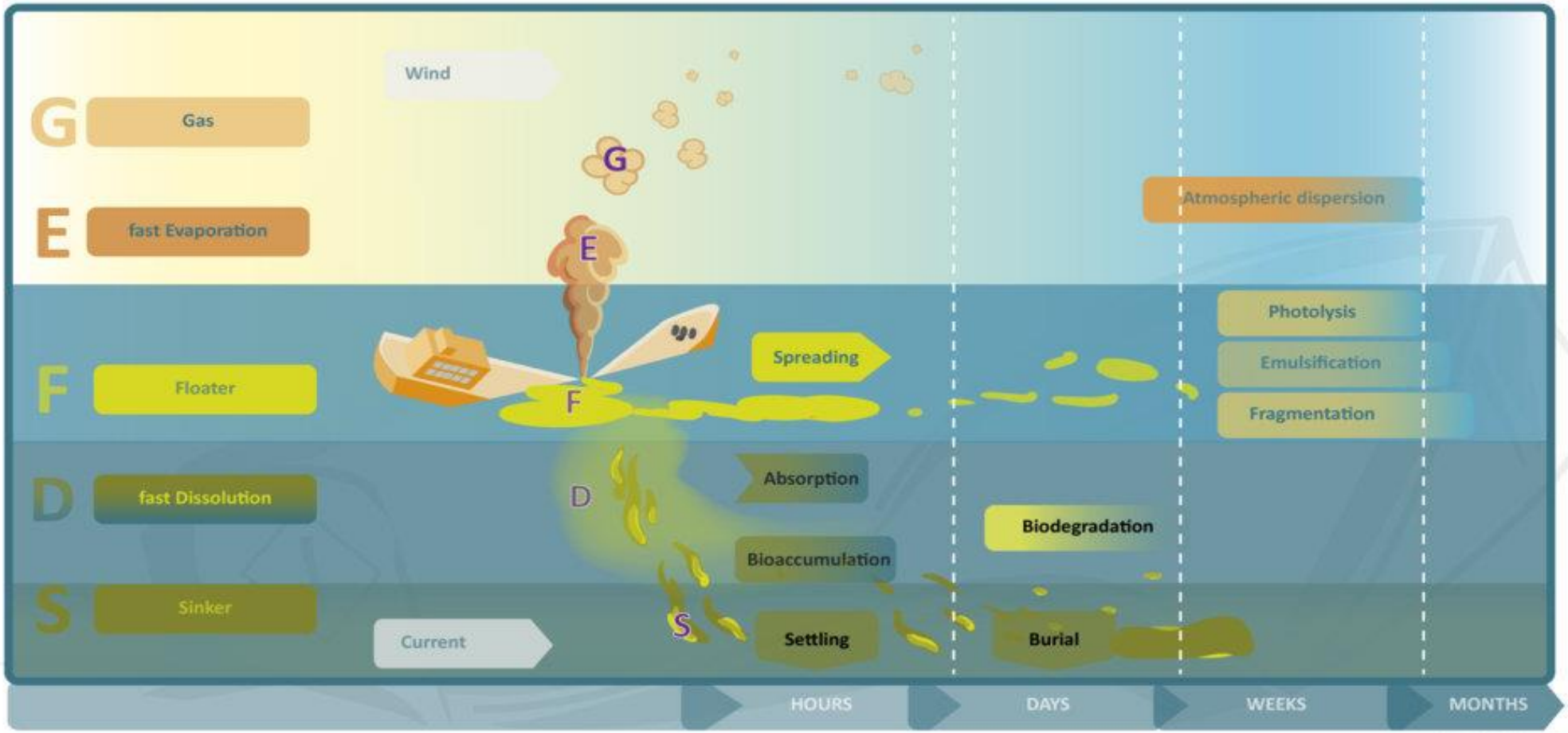






Plan Camgal – UMO Unit: use of drifters, hydrodynamic modelling, atmospheric modelling (ALOHA)

5. Protocols for response to HNS incidents



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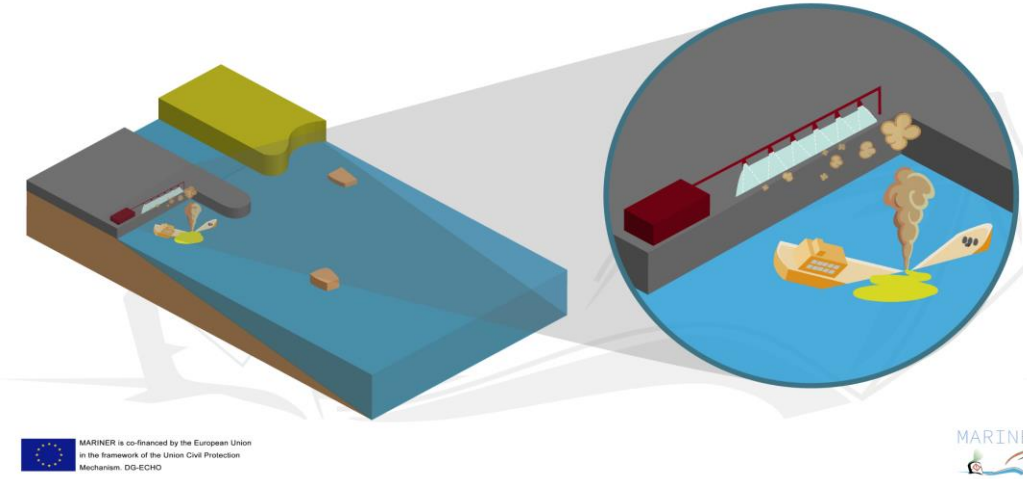
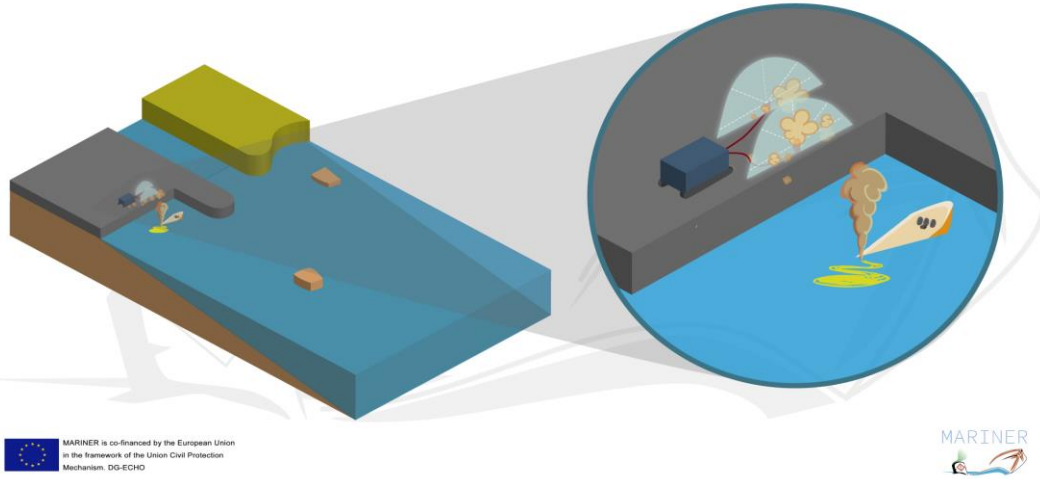
5. Protocols for response to HNS incidents

Evaporators

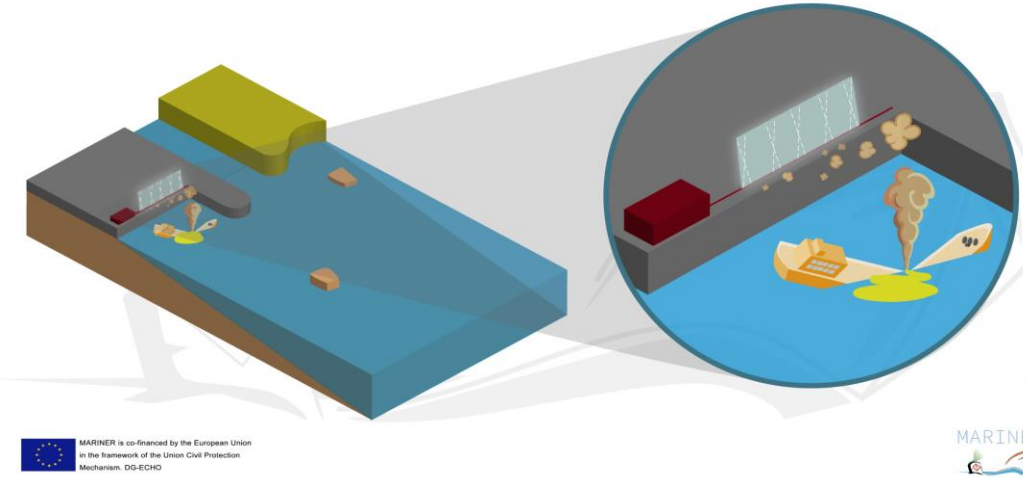
Water curtain regularly distributed



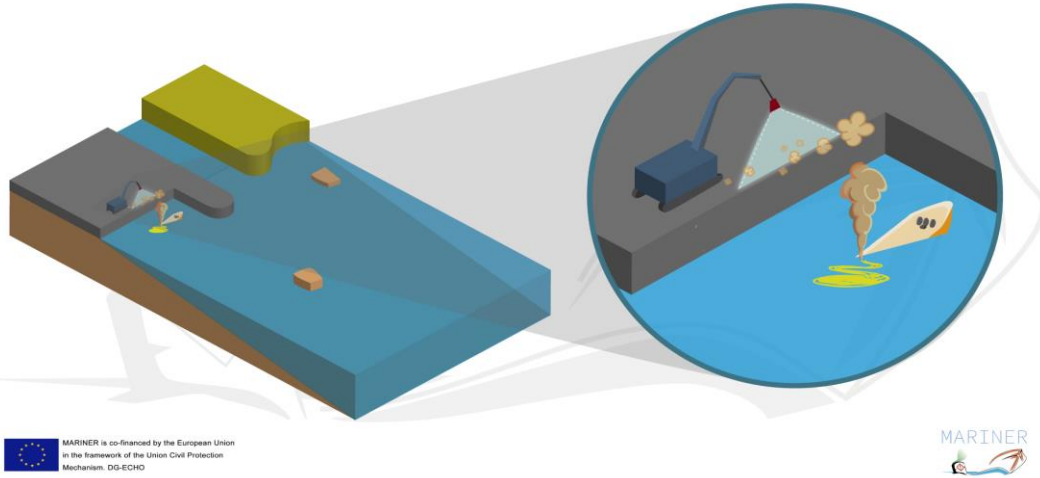
Water fog from nozzles row



Water curtain from single nozzle

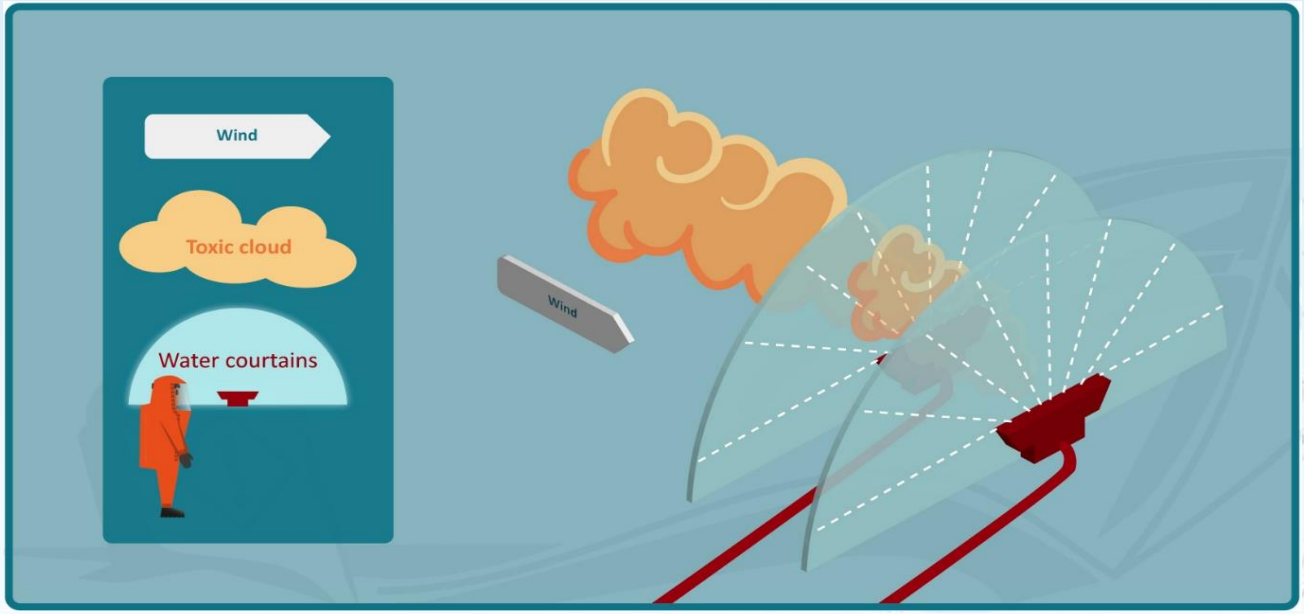


Mobile water curtain from single nozzle



5. Protocols for response to HNS incidents

Evaporators



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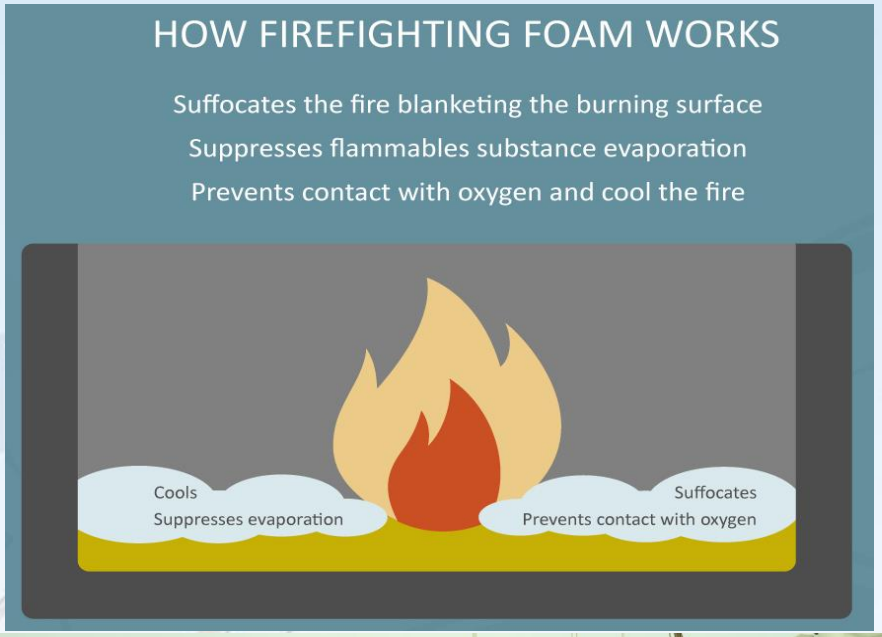
5. Protocols for response to HNS incidents

Floaters

The foam forms a film on the substance, which can temporarily reduce the concentration of vapor on the surface, decreasing the evaporation rate and acting as a barrier against the incidence of the sun's rays



5. Protocols for response to HNS incidents

Floaters

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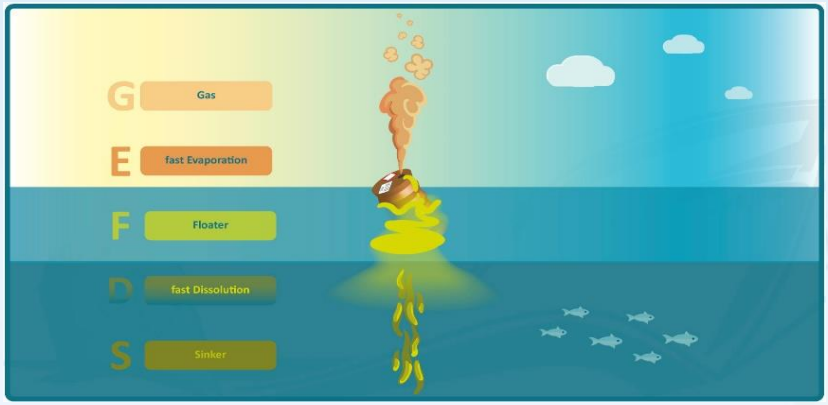
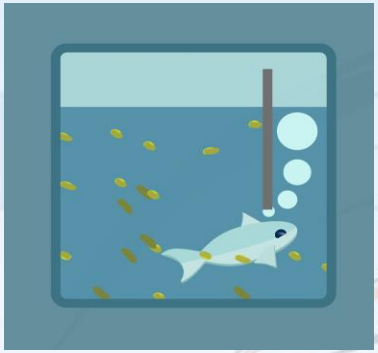
5. Protocols for response to HNS incidents

Dissolvers





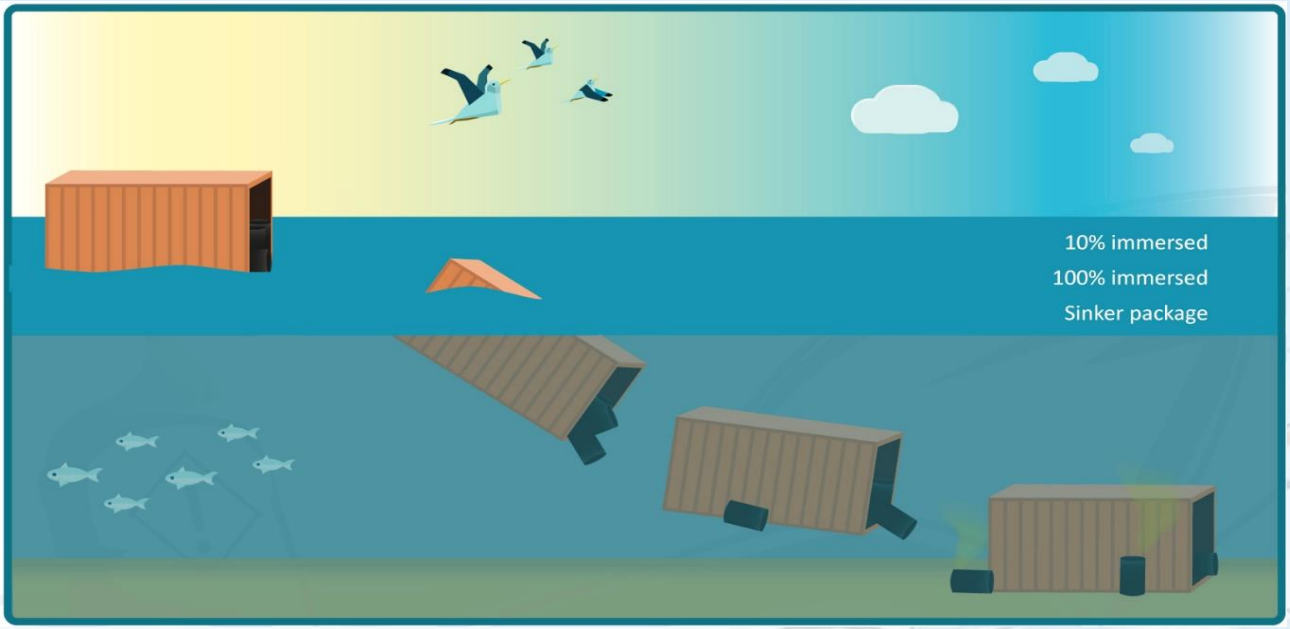
Monitor water quality (*in situ* sensors):

- Oxygen
- pH
- CTD

Marking by drugged buoys or colorant

5. Protocols for response to HNS incidents

Sinkers



Unpacking and first contact with CPS 7900

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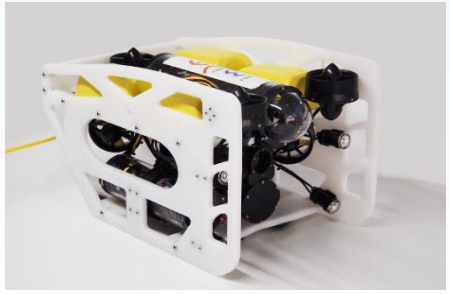
4. Protocols for response to HNS incidents

Sinkers

Inspection by ROV

Acoustic imaging



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5. Protocols for response to HNS incidents

Decontamination

DECONTAMINATION SHOWER ADQUIRED

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5. Protocols for response to HNS incidents

Decontamination

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5. Protocols for response to HNS incidents

Training

5. Protocols for response to HNS incidents

Training

6. Simulacrum

GOBIERNO DE ESPAÑA | MINISTERIO DE FOMENTO

Porto de Vilagarcía
Autoridade Portuaria de Vilagarcía de Arousa

✓**Location**:

Vilagarcía de Arousa

Latitud: 42º 36´ N
Longitud: 8º 46´ W

✓**Date**:

23/11/2017

✓**HNS**:

Ammonia

✓**Vessel involved**:

"Sebastián de Ocampo"

"Irmáns García Nodal"

✓**Special vulnerability**

City population

National Park & Marine resources

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Summary

- ✓ The characteristics of the **marine environment** make response options very **difficult**
- ✓ The **high number of substances** and their combinations increases the number of scenarios that have to be faced
- ✓ Among the different behaviours, the HNS that **float** allow the best adaptation of the response techniques used for oil spills
- ✓ The need to use **chemical PPE** greatly hinders response times
- ✓ There is still a **long way to go in adapting** the spill response techniques to HNS
- ✓ Sometimes the **best action is not to act**

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Grazas
Gracias
Merci beaucoup
Thank you
diolch yn fawr iawn
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