### Understanding

# Chemical Pollution at Sea

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### ntroduction

The chemical industry is today at the hub of the global economy and must often overcome vast distances between production and consumption areas. These geographical constraints require large volumes of hazardous substances to be transported, often by sea.

Shipping generates risks which are steadily rising, due to the

It is therefore essential to have concise, comprehensive and educational information on

In 2008, a learning package entitled "Understanding Black Tides" about

n 2012, a learning guide on chemical pollution at sea was released by Cedre and

general public.

Canadi ....

Chemical incidents

Transport Canada. "Understanding Chemical Pollution at Sea" consists

Understanding
Chemical Pollution at Sea
www.chemical-pollution.com
Transport Transports
Canada Transports

this issue. Today, very few documents on this subject exist worldwide.

oil spills was produced by Cedre and funded by Total.

ever-increasing size of vessels, together with the pressure of world markets.

In the event of an incident, these risks lead to different problems to those encountered in the case of oil spills. The threat of a chemical spill is a concern for many stakeholders (industry leaders, politicians, environmentalists and citizer,

## www.chemical-pollution.com



Today, the internet has become a key method of communication. Young generations, as well as the wider public, now use smartphones and tablets on a daily basis to find information and gain understanding in different fields. With this as a backdrop, the Centre of Documentation, Research and Experimentation on Accidental Water Pollution health, the environment and the economy. (Cedre) and Transport Canada naturally decided to pursue their collaboration by developing a website devoted to the issue of chemical pollution at sea. In 2011, a learning guide was released on chemical pollution at sea composed of 2 posters and a booklet. This learning package is intended for bulk cargo. A quiz, with different levels of difficulty, offers 12 to 18-year-olds and their teachers, but also for journalists, users the chance to test their knowledge on this theme. A those potentially involved in spill response and the general character named Phosphacola accompanies younger users

This website (www.chemical-pollution.com) is divided into six major sections: an introduction to chemistry and a few

examples of its uses; different aspects of shipping, such as the types of ships used and regulations; the main sources of chemical pollution at sea; spill prevention and preparedness; the different response techniques, systematically illustrated with examples of past incidents; the impact on human This interactive website features a series of original animations. Users can, for instance, discover the organization of a port terminal, view the behavior of different chemicals, and understand techniques used to respond to a spill of on a journey to follow a chemical from its extraction to its

end use, presenting its transport across the world's oceans

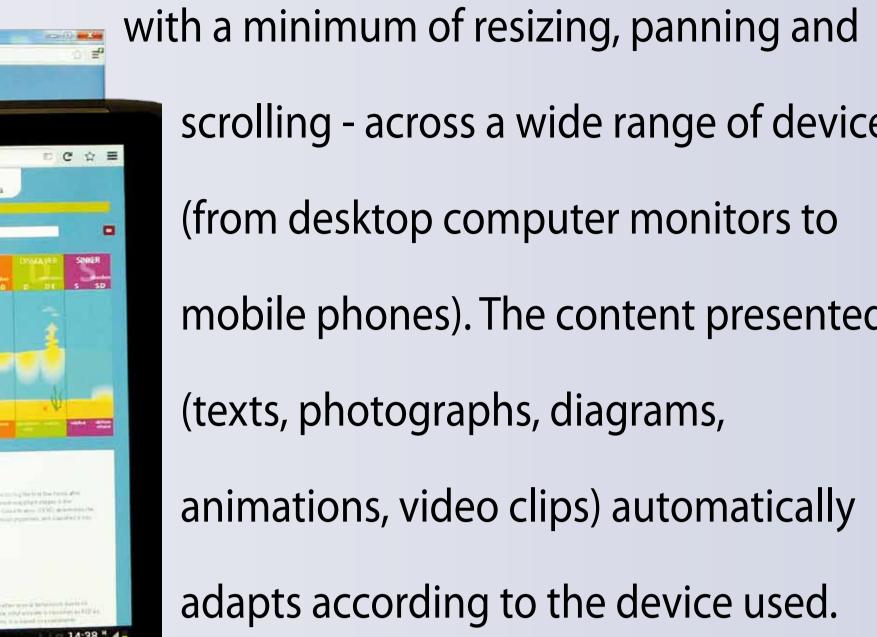
when spilt in water

and the spill risks to which it may be exposed.

How does a substance behave

A particular effort has been made to make the site compatible to smartphones and tablets. Responsive web design (RWD) is a web approach aimed at

crafting sites to provide an optimal viewing experience - easy reading and navigation



### scrolling - across a wide range of devices (from desktop computer monitors to mobile phones). The content presented animations, video clips) automatically adapts according to the device used.

It was felt by Transport Canada and Hazardous and Noxious Substances (HNS) at sea, the organisation in place to respond to a spill,

and the medium- and long-

spill for the environment

as well as maritime

activities. Today, the internet is a rapidly expanding medium, very well known project was to create a responsive web to the many devices that can be used

# onclusion

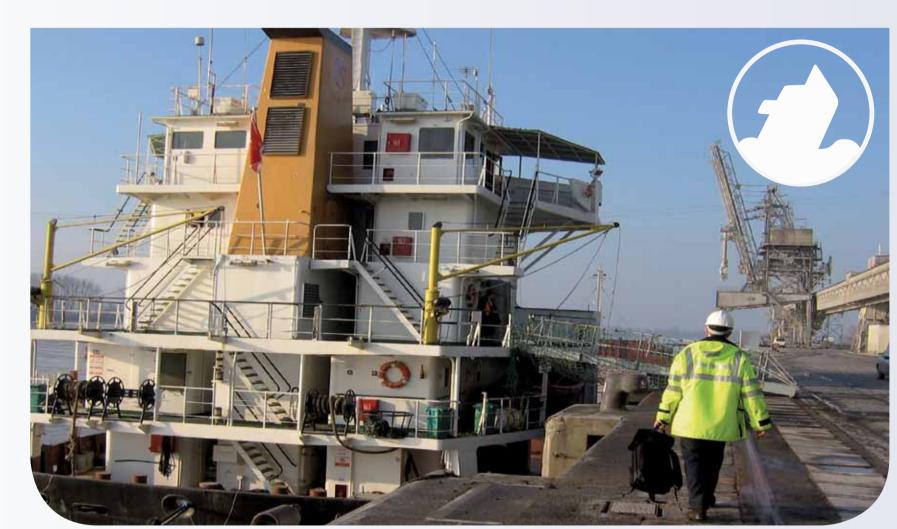
Cedre the importance to explain objectively to young generations the realities and challenges of HNS spills and their consequences. It is important to present the facts of the matter clearly and simply. The resulting websites present current knowledge of the behaviour of

to young people, which can be used to communicate important messages. One of the main challenges of this design in order to adapt the content to surf the web today. In the wake of "Understanding Black Tides" and "Understanding Chemical Pollution response methods and resources at Sea", new documents on Debris at Sea or Spill in Cold Area could be an term consequences of an HNS interesting addition to this collection...

and economic

# esults









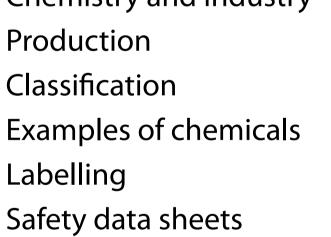


#### Chemistry and industry Classification **Examples of chemical**

Prevention and

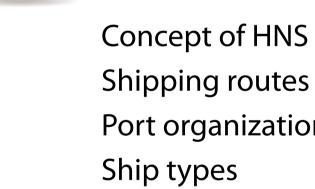
Protective equipmer

Ship inspection





preparedness Organization framework Contingency planning Operator training



Shipping

Shipping routes

General methodology

Situation assessment

**Emergency measures** 

Bulk cargos onboard

Waste management

Bulk cargoes released

Response to container and

Decision-making



Sources of pollution

Chronic pollution

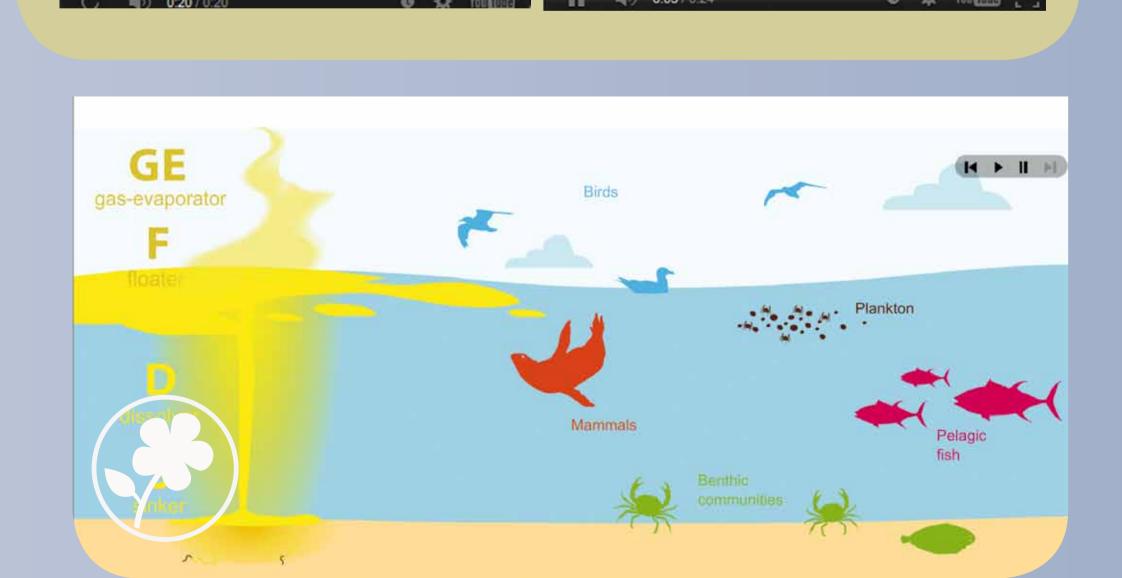
Substances spilt

Reactivity = danger

Accidental pollution



Health impact Environmental impact **Economic impact** 



# eterences

[1] Cashmore, Pete (Dec 11, 2012). Why 2013 Is the Year of Responsive Web Design.

Retrieved March, 2013 from <a href="http://mashable.com/2012/12/11/responsive-web-design/">http://mashable.com/2012/12/11/responsive-web-design/</a> [2] CEDRE, Understanding Chemical Pollution at Sea. Learning Package, Brest: Cedre, 93 p., 2012

Retrieved March, 2013 from <u>www.chemical-pollution.com</u> [3] CEDRE, Understanding Black Tides. Learning Package, Brest: Cedre, 118 p., 2007

Retrieved March, 2013 from <a href="https://www.black-tides.com">www.black-tides.com</a> [4] Environment Canada, Environmental Damages Fund.

Retrieved March, 2013 from <a href="https://www.ec.gc.ca/edf-fde/Default.asp?lang=En&n=BD1220D8-1">www.ec.gc.ca/edf-fde/Default.asp?lang=En&n=BD1220D8-1</a>

[5] Kremer X., Conteneurs et colis perdus en mer, Brest: Cedre, 73 p., 2011.

Retrieved March, 2013 from <a href="https://www.cedre.fr/fr/publication/guide-operationnel/conteneur-colis/conteneur-colis.php">www.cedre.fr/fr/publication/guide-operationnel/conteneur-colis/conteneur-colis.php</a> [6] Le Floch S., Etude du comportement de produits chimiques déversés en mer, R.06.63.C., Brest : Cedre, 32 p., 2006.

[7] Marcotte, E. (May 25, 2010). Responsive Web Design.

Retrieved March, 2013 from A List Apart at <a href="http://alistapart.com/article/responsive-web-design">http://alistapart.com/article/responsive-web-design</a>

[8] Marcotte E., (October 11, 2011), Ethan Marcotte's 20 favourite responsive sites.

Retrieved March, 2013 from .net magazine at <a href="https://www.netmagazine.com/features/ethan-marcottes-20-favourite-responsive-sites">www.netmagazine.com/features/ethan-marcottes-20-favourite-responsive-sites</a> [9] Rousseau R. and Gaillard M., «Accidentologie et risque chimique en mer», Bulletin d'information du Cedre, 27 : 4-9, 2010.

[10] Struski N. and X. Kremer, Etat de l'art des techniques et procédures utilisées pour lutter contre les pollutions accidentelles par substances dangereuses zones portuaires et littorales, R.03.34.C., Brest: Cedre, 79 p., 2003.



of a learning guide of more than 90 pages with two posters and

is intended for 12 to 18-year-olds and their teachers, but also for

journalists, those potentially involved in spill response and the

