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Cedre Information Day
1st April 2014, Karen Quintin

Spill data and chemical risks

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Context

Monitoring of technological developments in the response to accidental pollution of marine and inland waters:

- incidents having occurred worldwide
- response to spills (oil and HNS):
 - ✓ spill data
 - ✓ response (strategies, issues, lessons)
 - ✓ new response equipment and techniques
 - ✓ R&D
 - ✓ preparedness
 - ✓ ...

Sources of information

- Print

- **Weekly newsletters (specialised):**
International Spill Control Organization (ISCO) Newsletter, Oil Spill Intelligence Report (OSIR)
- **Conference/colloquium proceedings:**
AMOP, IOSC, Spillcon, TSOCS, Interspill etc.
- **Annual reports and assessments:**
IOPC Funds annual report, Canadian compensation fund etc.
- **Reports and studies:**
Coast Guards (US, UK, Norway)
- **Various periodicals:**
Marine Pollution Bulletin, Hazardous Cargo Bulletin, *Préventique* etc.



Sources of information

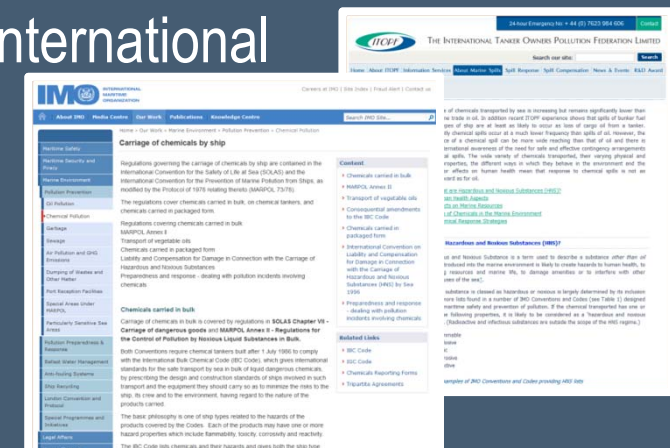
- Internet

In the event of an **incident**:

- information on the ship, circumstances, products, geographic area etc. (**press** or **specialised sites**)

As **routine** activity:

- equipment **manufacturers** / service **providers**
- national & foreign operational **organisations** (NOAA, CG, AMSA), expert organisations (ITOPF), international organisations (IMO, EMSA)
- international **events** sites



Sources of information

- Participation in workshops, colloquia, conferences

International conferences 2013:

- **ICOPCE** (International Chemical & Oil Pollution Conference and Exhibition), Singapore
- **Spillcon**, Australia
- **AMOP** (Arctic Marine Oilspill Programme), Canada
- etc.



Sources of information

- Observations/feelings on sources:
 - Whatever the medium:
 - Few exclusively HNS
 - Often derived from the field of oil spills (e.g. ISCO, OSIR etc.)
 - A few specialised newsletters (e.g. Hazardous Cargo Bulletin) but sparse when it comes to response and case studies
 - Specialised sessions during international conferences:
 - Interspill 2009: 1st IMO R&D forum entirely dedicated to HNS
 - AMOP
 - IOSC / Interspill / Spillcon cycle

Statistics

- Varying availability of information

- Different reasons:

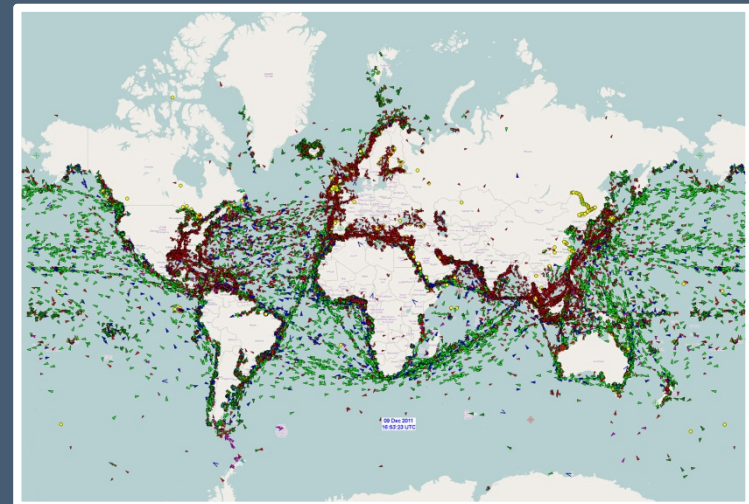
- as the **magnitude** of the incident decreases, so does the diffusion of information
- differences according to **geographic area**
- **less documented** domains
 - e.g. rivers << port, coastal or marine domains
 - » High number... but often minor (a few m³)
 - » Lack of centralisation of information → limitations of reporting.

- Less feedback available for spills:

- of small size
- in inland waters...
- ... but **potentially with many lessons to be learnt**

Statistics

- 134 million chemical substances listed in the CAS database
- 2,000 regularly transported by sea
- Transport of chemical products by sea is growing rapidly:
 - in 20 years: shipping increased 3.5 fold
 - 11% of the value of shipping worldwide
- 2009: 165 million tonnes
 - 46% = liquid cargo (methanol)
 - 29% = vegetable oils (palm)
- projections for 2015 = 215 million tonnes



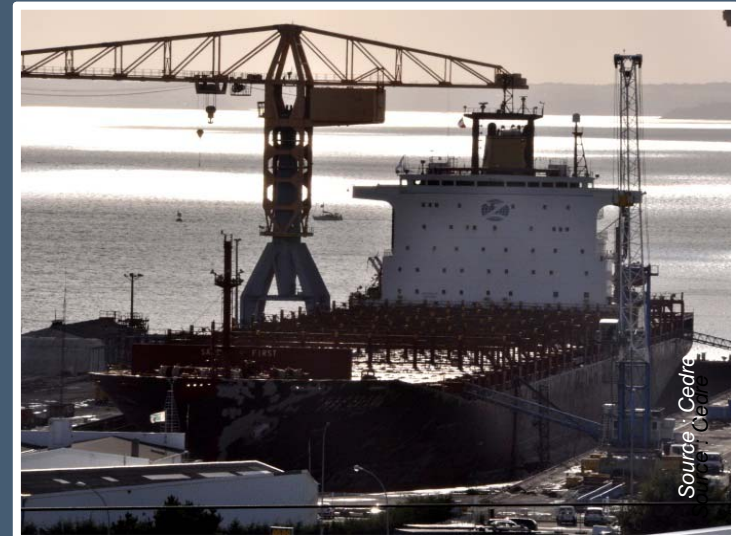
Source : ExactEarth

Statistics

- Risks linked to:
 - **Intrinsic qualities** of the product:
 - toxicity
 - flammability
 - corrosivity
 - reactivity with other substances (water, metal, adjacent cargo)
 - auto-reactivity
 - **Quantity** (e.g. vegetable oils, organic products, food products):
strictly speaking outside the scope of the chemical industry

Statistics

- 1998-2013
- Worldwide
- Sea, coast and inland waters
- Spills
- Magnitude of pollution $> 10 \text{ m}^3$

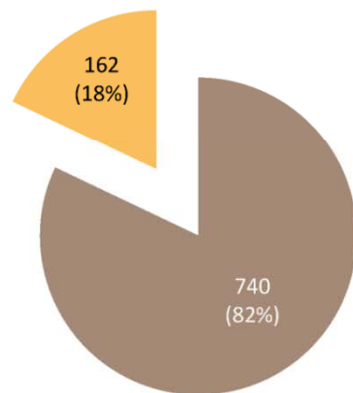


Statistics

(1) Relative importance

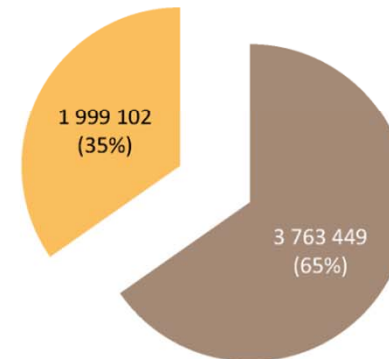
Significant spills (> 10 m³) reported in surface waters; 1998-2013

Number;
relative frequency (%)



■ Oil
■ Chemical

Cumulated volume (m³);
percentage of total (%)

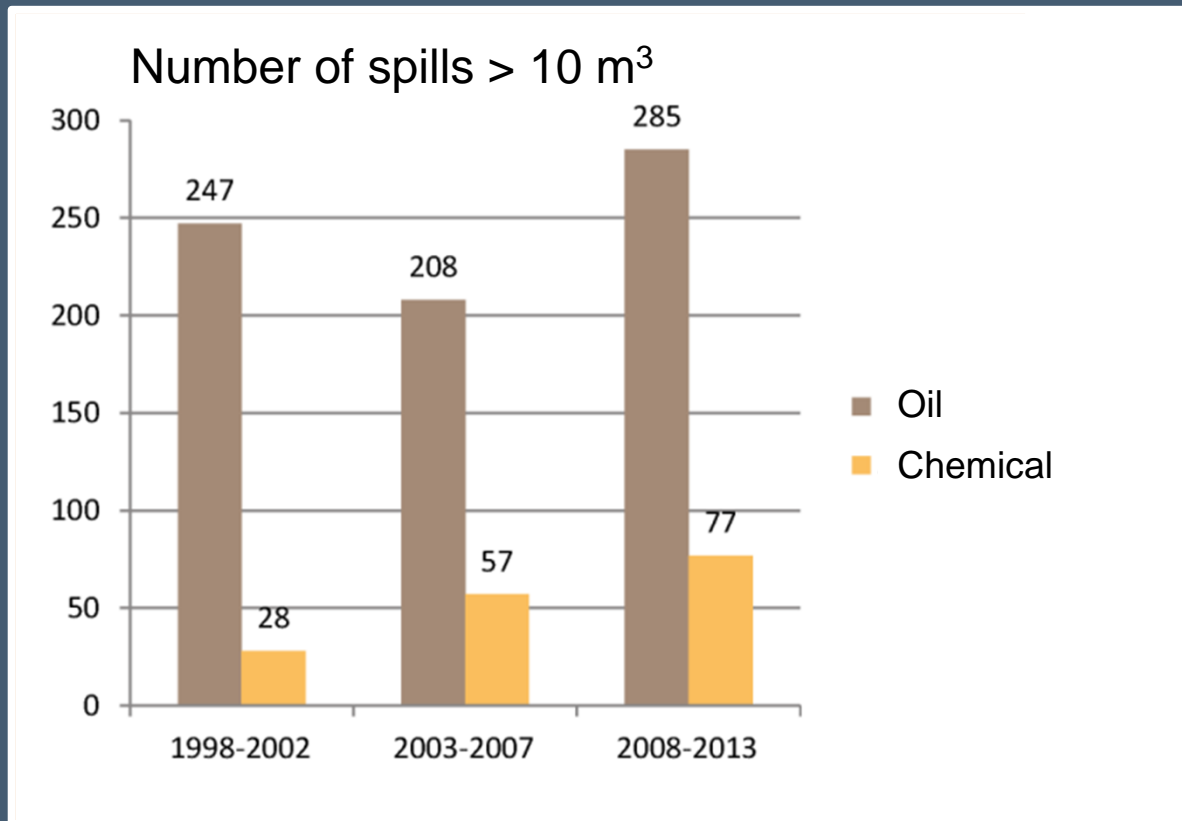


HNS spills 5 times less represented in relation to oil spills

Make up around 1/3 of global reports

Statistics

(1) Relative importance - trends



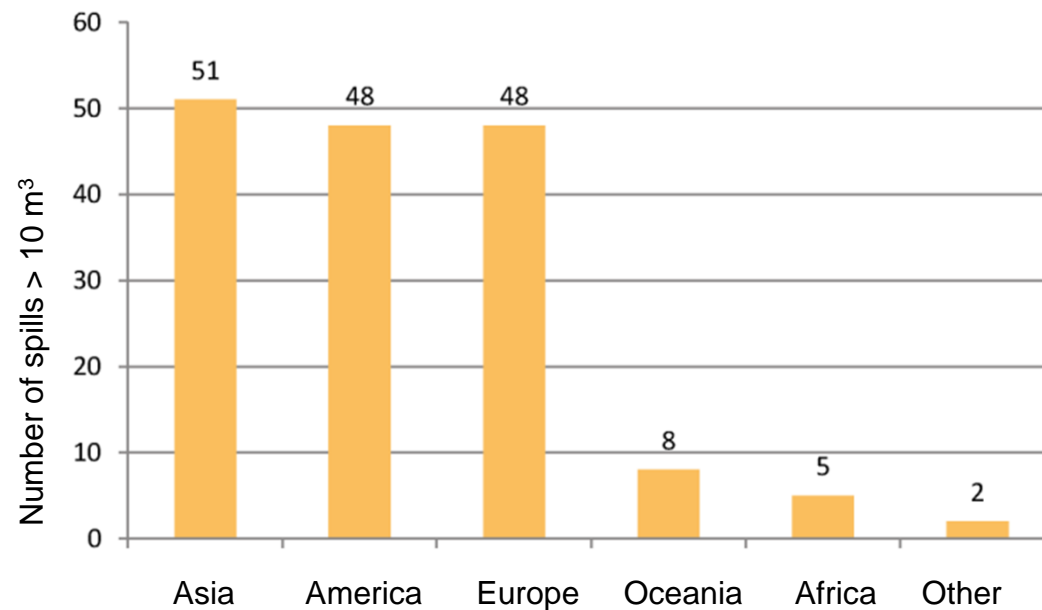
Reports of pollution > 10 m³ per HNS: growing
Relative frequency of HNS spills: ~20% of cases

Statistics

(2) Which geographic regions?

On a global scale

Distribution between continents of spills identified (> 10 m³)



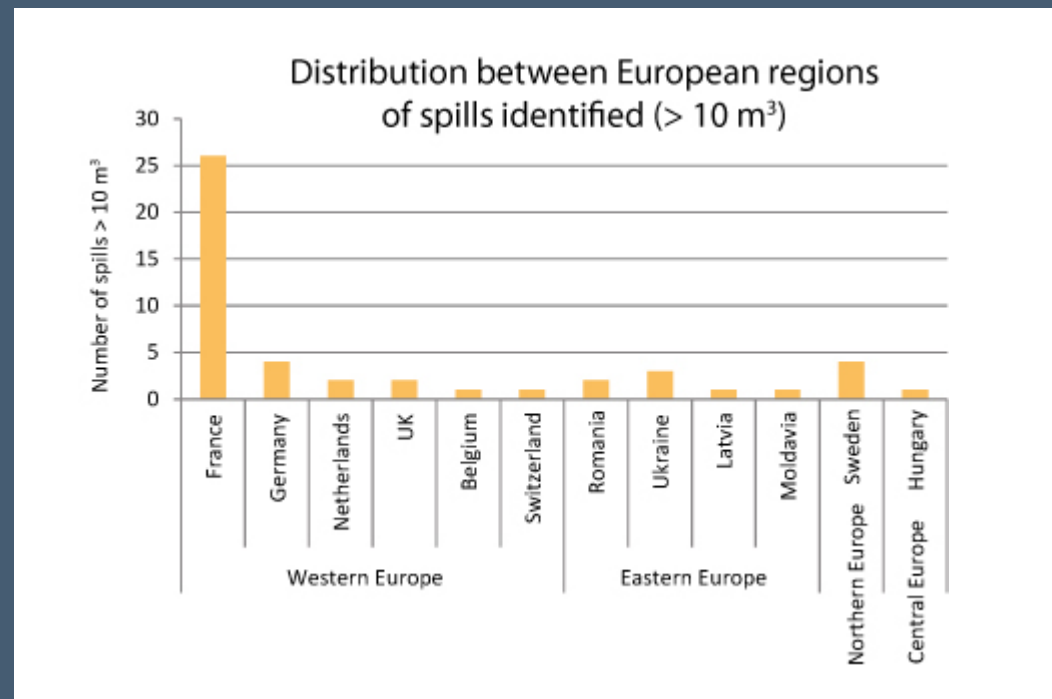
Spills mostly reported: in Asia (80% in the east/south-east), America (90% in the north) and Europe (75 % in the west)

Under-representation of the African continent (communicating information?)

Statistics

(2) Which geographic regions?

On a European scale

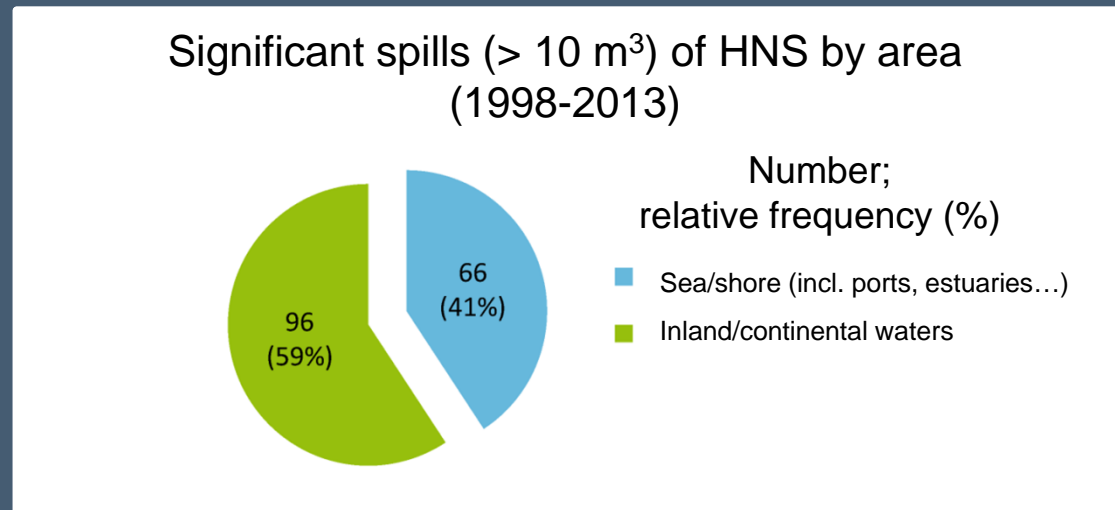


Spread of information? → limited information available on HNS case studies

Statistics

(3) Domains affected by accidental water pollution

Frequency: → inland waters

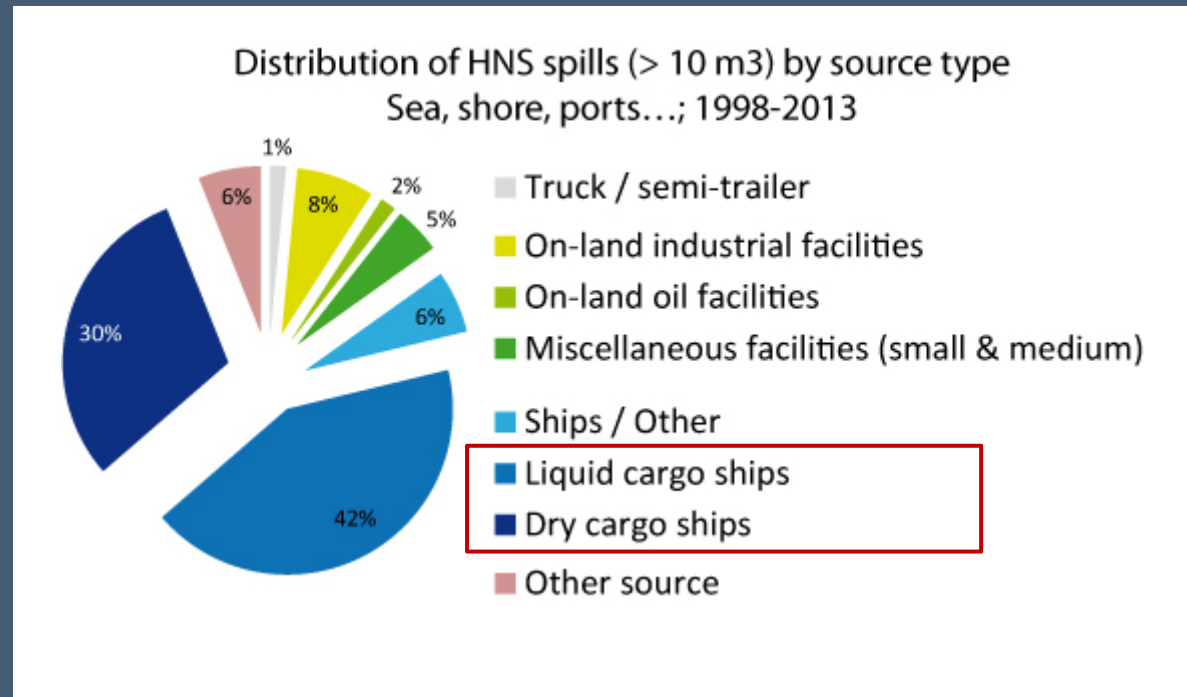


Magnitude: → marine and coastal waters

Medial volume (m ³)	1998-2013
Sea and coast	500
Inland waters	40

Statistics

(4) Which structures? Sea, coast, ports...



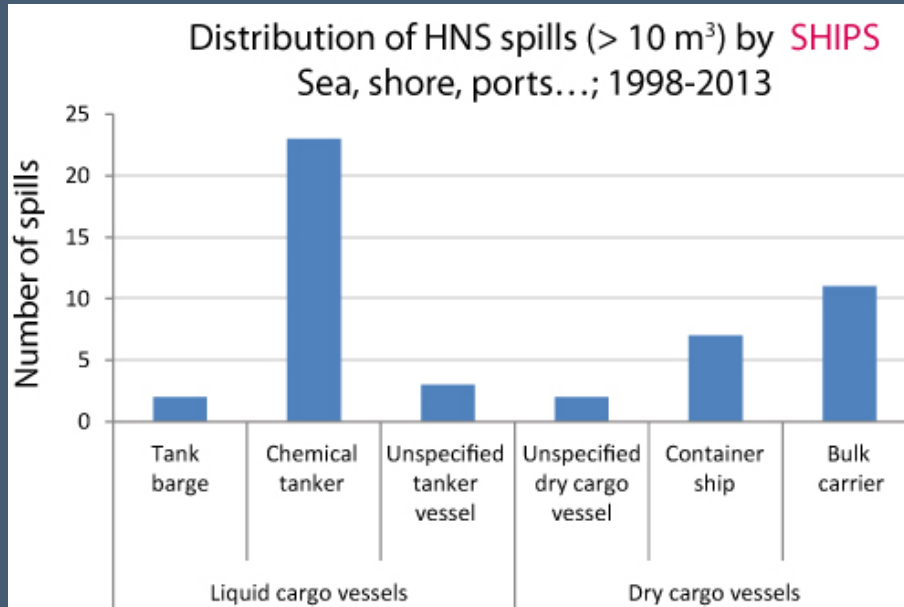
$\frac{3}{4}$ of HNS incidents in maritime transport

- ships carrying **liquid cargo** (tanks)
- ships carrying **dry cargo**



Statistics

(4) Which structures? Sea, coast, ports...

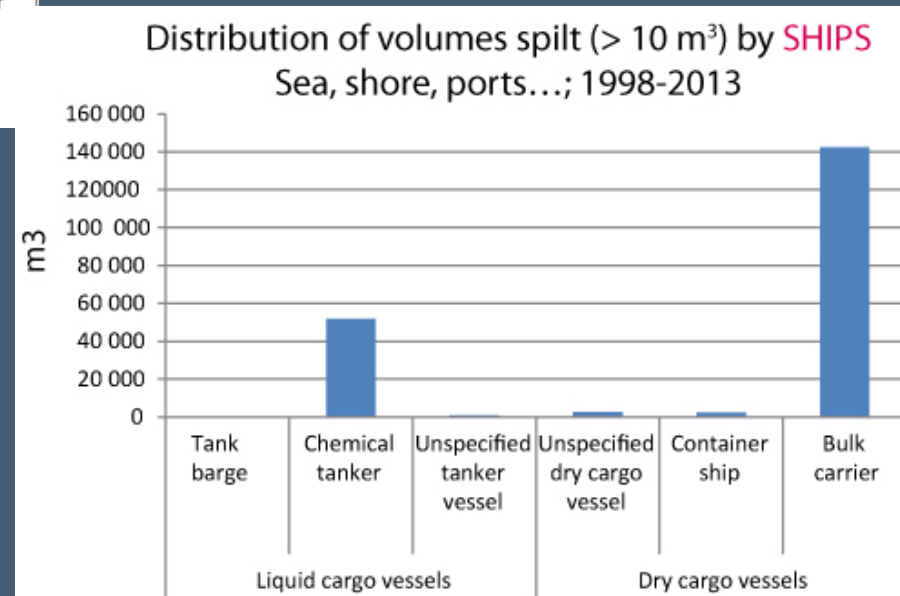


Frequency:

- Chemical tankers
- Bulk carriers and container ships

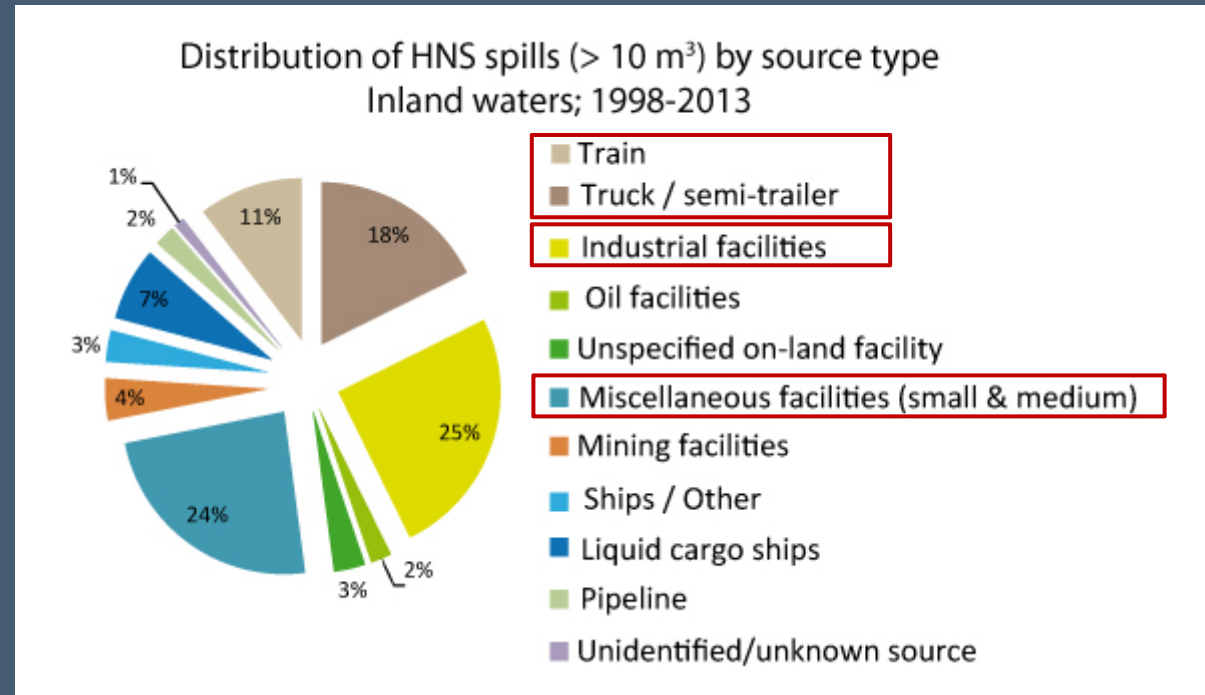
Magnitude:

- Bulk carriers
- Container ship representation modest



Statistics

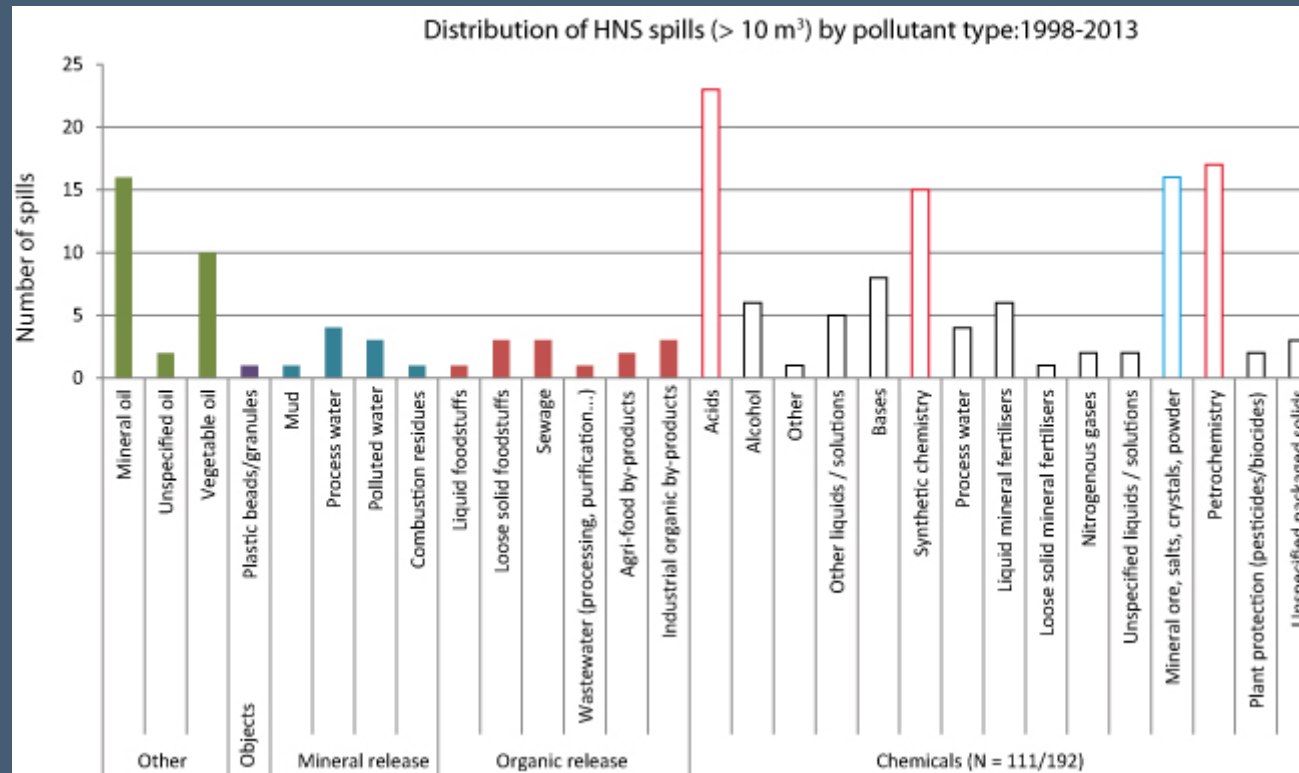
(4) Which structures? Inland waters



- Land transport: 30%
- Industrial installations: 25% (*chemical/petrochemical factories, power plants*)
- Factories, various companies: 24%

Statistics

(5) Which products?

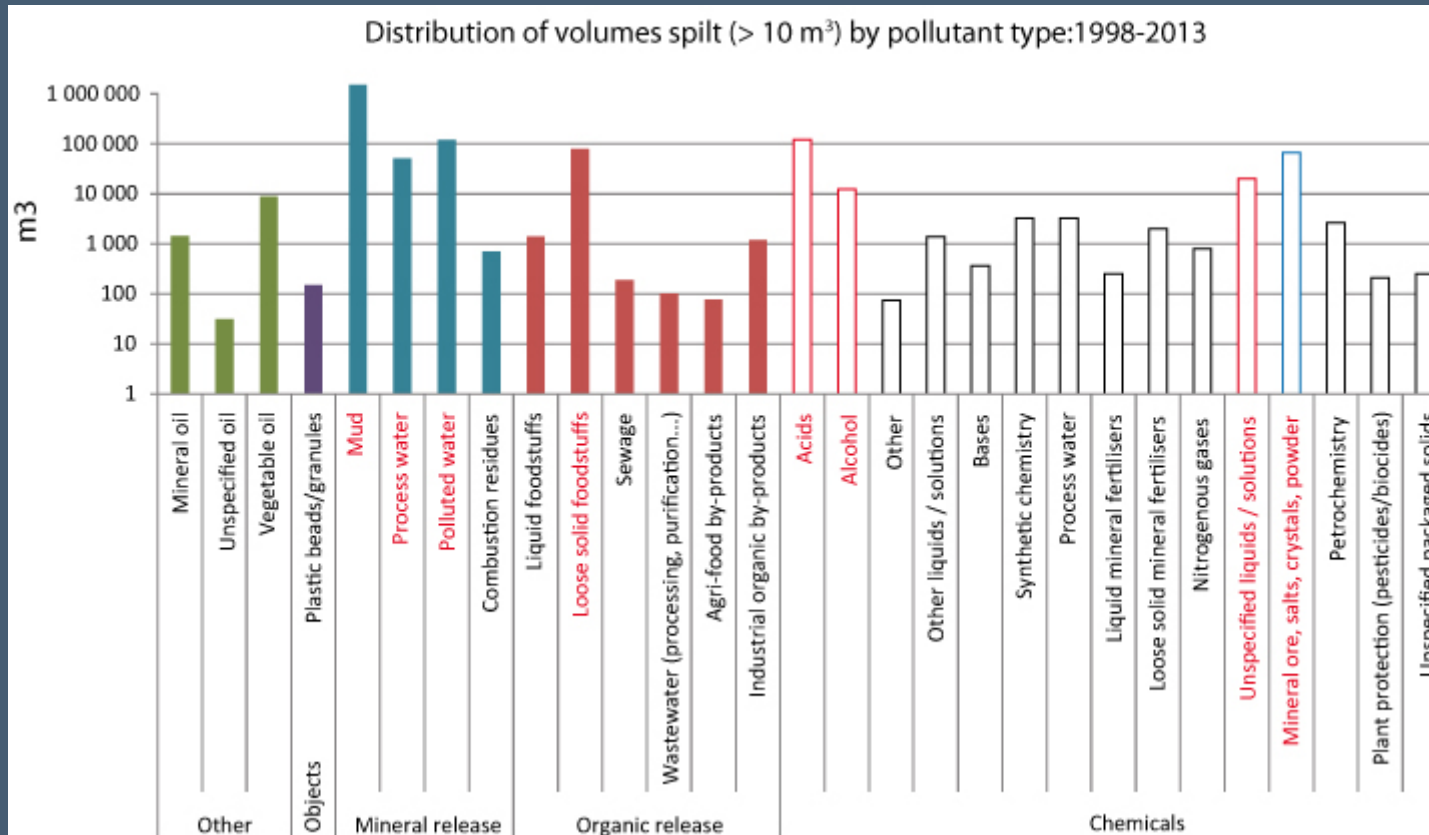


Frequency:

- Liquids/solutions: acids, petrochemical (xylenes, benzene), synthetic products (phenol)
- Solids: various minerals, salts, crystals etc.

Statistics

(5) Which products?



Volume:

- Mud/water loaded with various mineral pollutants
- Acids (e.g. sulphuric), alcohols (ethanol) etc.
- Solids: minerals/salts/crystals and loose foodstuffs (e.g. cereals, soya etc.)

Conclusion

Significant HNS spills with a frequency inferior to oil spills:

- ✓ but an increasing number of reported cases
- ✓ comparable spill volumes (magnitude of pollution)
- ✓ non negligible contribution to total volume (HNS/oil)
- ✓ inland waters (frequency), marine waters (magnitude)

Conclusion

Where to find statistical analyses?

Sea and Shore Technical Newsletters

and Inland Waters Technical Newsletters!

Newsletters have been available in English since 2011
www.cedre.fr, "Publications" section

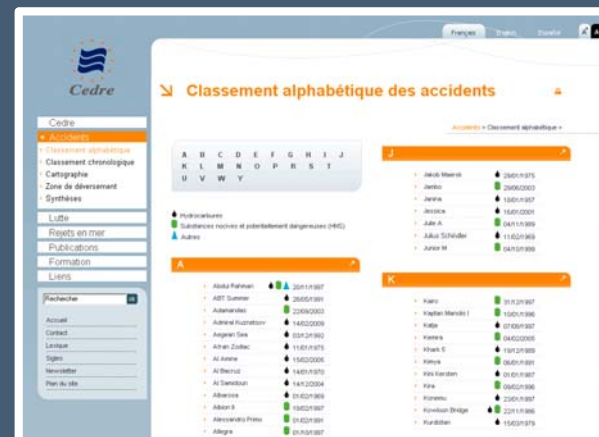
Further information

Chemical Response Guide

Operational Guides (containers and packages)

Website www.cedre.fr, "Spills" section

"Understanding Chemical Pollution at Sea"



Thank you for your attention!



Source: Cedre