



## Spill impact studies here and there

a P&I Club's perspective

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## Examples from 4 cases

- Spill in **Colombia** from tanker loading crude at near shore terminal – minor quantity through breached ballast tank
- Spill of 240 MT bunkers oil IFO 380 – near shore **Korea**
- Grounding in **Norway** – 500 MT bunkers spilled in exposed costal area
- Grounding and oil spill **Tristan da Cunha** – Atlantic Ocean



# Colombia

## Facts

- Spill in Colombia from tanker loading crude oil at near shore terminal – minor quantity through breached ballast tank
- 2nm off shore
- 2-10 MT spill at oil terminal
- Artisanal fishing in the region
- Popular beaches for recreation in the area
- Occasional spills related to the terminal over several years



# Colombia

## PIA

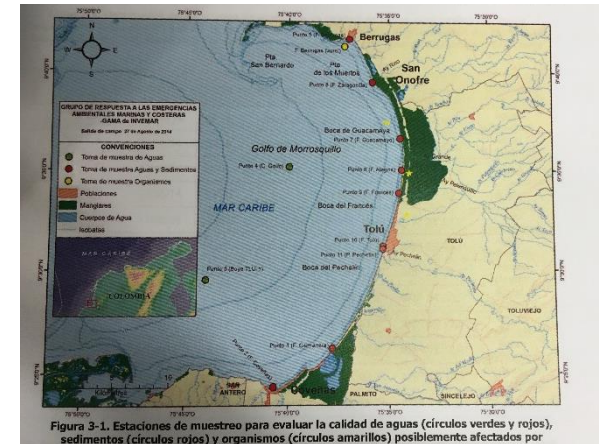
Colombia

Korea

Norway

Tristan da Cunha

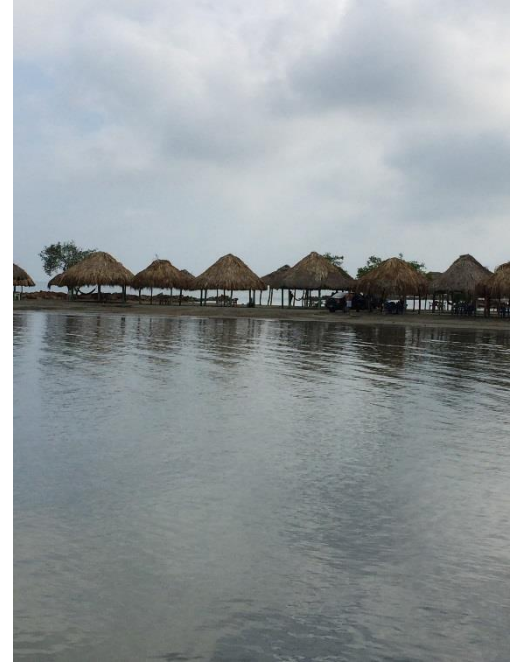
- 2-3 months after the spill
- 18 sampling stations along 50km coastline:
  - Physiochemical parameters
  - Microbiological sampling - coliforms
  - Hydrocarbon concentrations in surface waters
  
- No values deviating from background levels found



# Colombia

## potential problems

- Tourism claims
  - Fisheries claims
  - Aquaculture claim
  - Mangroves
- 
- Alleged
    - oiled beaches,
    - restricted fisheries
    - poor water quality for aquaculture



# Colombia

## PIA vs needs

- PIA confirmed no effects on the coastline could be detected, but no at sea sampling was done and alleged effect on fisheries cannot be confirmed with the investigations undertaken
- Tourism claims and alleged restrictions on the use of beaches addressed in the investigation report, although beach inspections not undertaken until months after the spill
- Aquaculture claims benefit from the investigations in that they can safely reopen water intake and continue production. Earlier intervention would have been useful.

Colombia

Korea

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# Colombia

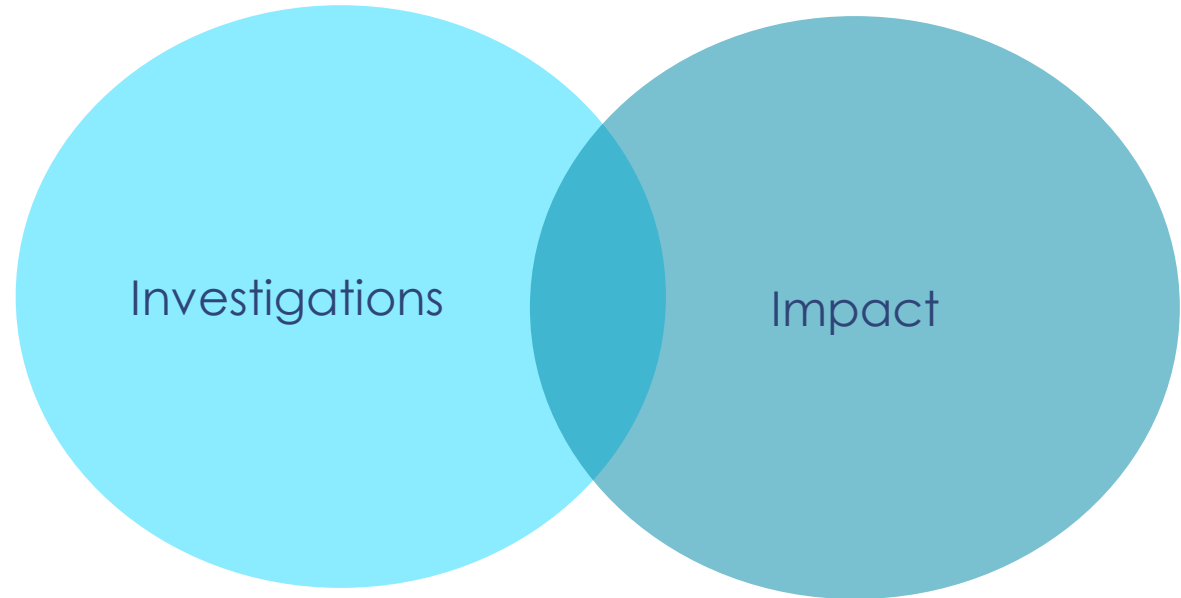
## Tanker spill Covenas

Colombia

Korea

Norway

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# Korea

## Place and circumstances

- Spill at anchorage after bunkering
  - 240 MT spilled
  - More than 100 spill response vessels deployed within 1 day
  - Most oil drifted at sea, some to Japan
  - Some oiled shoreline
- 
- Seaweed farms at risk, fisheries stopped under clean-up operations, nature reserve at risk





# Korea

## PIA – experience from Hebei Spirit



- PIA by law for all spills >100MT
- Natural environment
  - Meteorology, currents and tide, sea bed geology, water quality, marine ecosystem
- Living environment
  - Use of coast and waterways, Safety of fisheries products, Damage due to contamination of public facilities
- Socio economic environment
  - Population, residence, industries, fishery fields
- 5 sampling rounds over a year in 14 sectors; 4-20 months after spill
- 3 public meetings

Colombia

**Korea**

Norway

Tristan da Cunha

# Korea

## Findings

Colombia

**Korea**

Norway

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- Spill occurred in February
- Some elevated values for oil components in shoreline and sediment samples on first sampling in June, reduced to background levels in October.
- Decrease of PAH in fish over 1 year
- New spill in the same area from another vessel in December and remainder of study served to observe this spill.
- 20 persons responded they were affected by the spill – uncertain when this was asked.
- No effects found on seafood, socio economic factors or other environmental parameters.

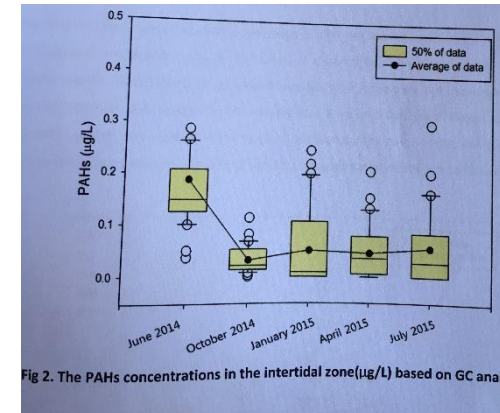


Fig 2. The PAHs concentrations in the intertidal zone(µg/L) based on GC analysis

# Korea

## Disputes

- Seaweed farms
- Fisheries claims
- Time for stop shoreline cleaning
- Duration of at sea response
- No tourism or business interruption claims



# Korea

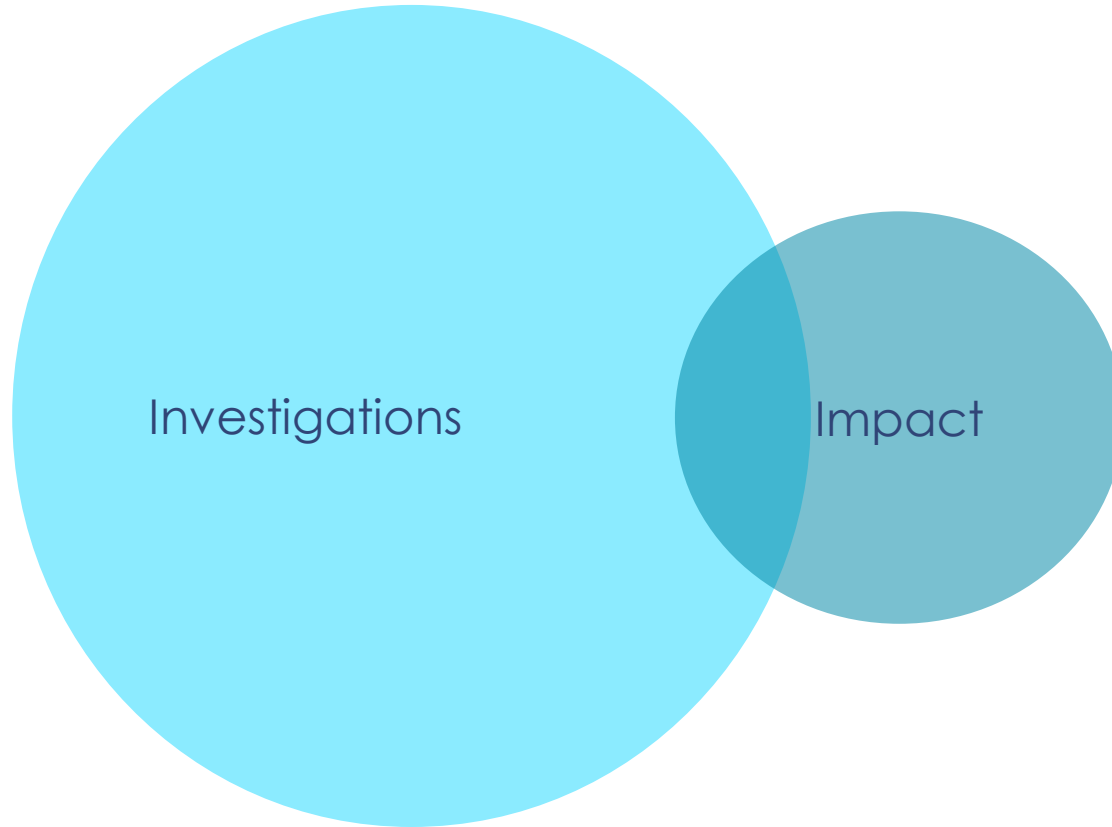
## Bunkers spill Busan

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# Norway

## Events

- Grounding on west coast of bulk carrier in ballast
- Broke in two
- 500MT HFO spilled, substantial shoreline impact – 6 month cleaning operation
- Fore-ship disposed of immediately
- Aft ship hot tapped and remains at the grounding site



# Norway

## Impact studies

Colombia

Korea

**Norway**

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- Spread of oil, modeling
    - Surface, shores, sediments, water column, evaporation
    - Toxicity
  - Water quality and plankton
  - Seafood and wild fish
  - Fish farms
  - Benthic community structure
  - Littoral
  - Otters
  - Birds
- 
- Started 2-3 months after the spill



# Norway

## findings

- None of the investigations revealed effects of the spill that needed further measures to be taken
- No seafood restrictions
- Some elevated PAH in fish trapped in a cage at the grounding site, none in free fish
- Otters proven to have been present in the area and potentially exposed
- Salmon farms took precautions - no contamination of fish

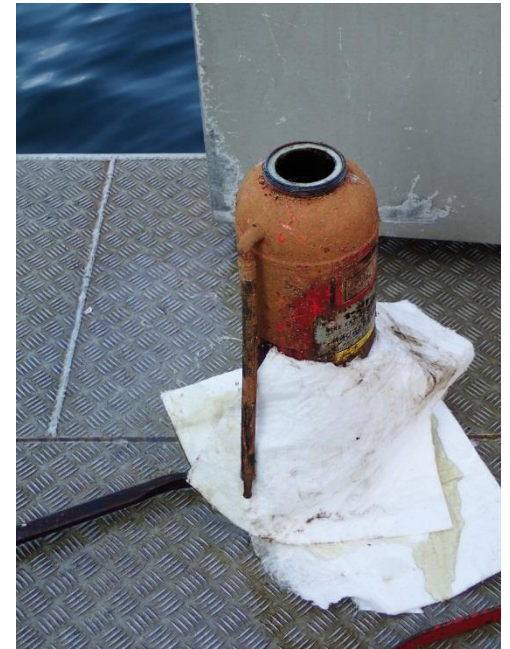




# Norway

## Disputes

- Impact of the remaining wreck after removal of the oil
  - No investigations addressed this in 2007



# Norway

## Bulk carrier grounding

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# Tristan da Cunha

## Event and location

- Vessel with soy bean cargo grounded and broke in two, all bunkers 1,400 MT spilled and beans accumulated on sea floor



Colombia

Korea

Norway

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# Tristan da Cunha

## Facts

- Extremely exposed island mid Atlantic
- Lobster fisheries sole source of income for islanders
- Rock Hopper Penguins unique to this region
- Prestine environment
- Isolated ecosystem with several unique species
- No rodents on the island



# Tristan da Cunha

PIA

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Korea

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- Lobster juvenile counts
- Fisheries reports
- Rodent traps
- Bird counts
- Diversity studies



# Tristan da Cunha

## challenges

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Norway

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- Estimate fisheries losses
  - Lobster Adults – soy beans
  - Recruitment – 7 years delay - modelling
- Invasive species
  - Base line
  - Duration
- Birds
  - Base line
  - Annual observations



# Tristan da Cunha

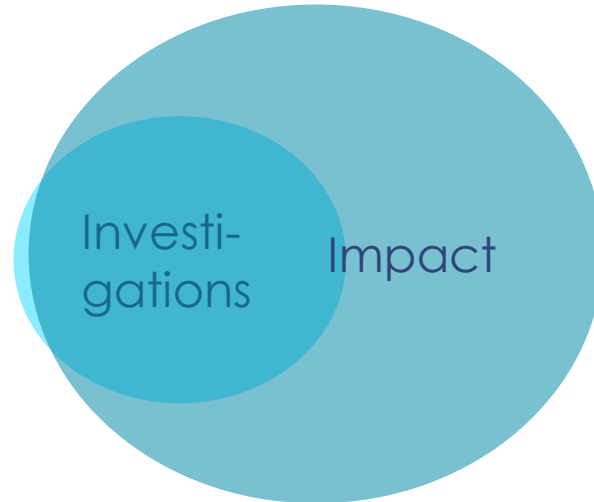
Bulk carrier with soy beans, grounding

Colombia

Korea

Norway

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# Conclusions

## Here and there

- Objectives
  - General knowledge
  - Consider further action
  - Assist claims process
- Target
  - Vulnerable ecosystems
  - Sensitive areas
  - Economically important areas
  - Indicator species
  - Food and safety aspects
  - Both environmental and economic impacts



