Oil Spill Response in the Arctic

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ShipArc 2015

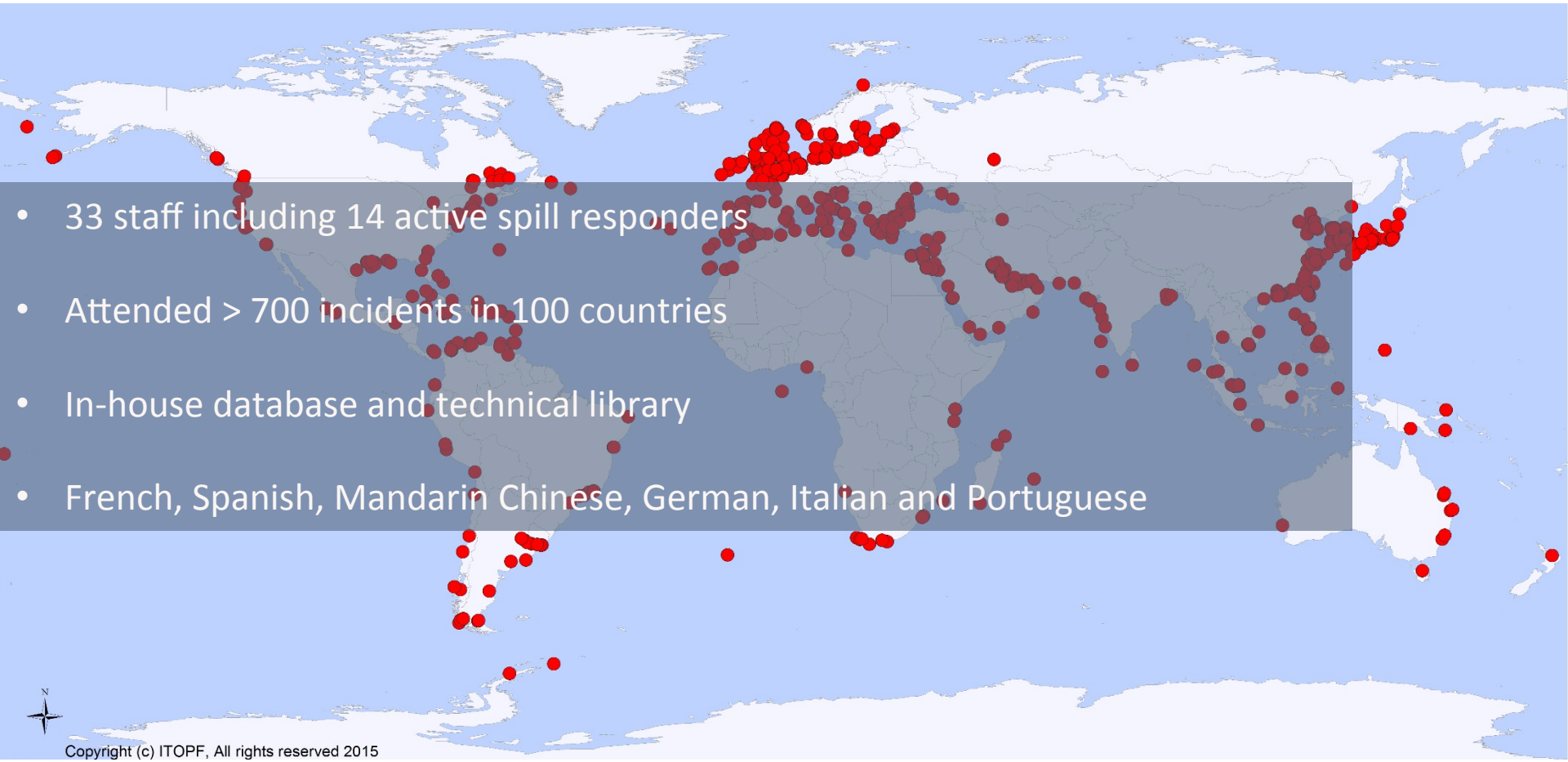
Introduction to ITOPF

- 1969
- Not for profit organisation
- Principal purpose of providing technical advice on marine oils spill response

ITOPF Members & Associates

- Virtually all the world's bulk oil, chemical & gas carrier tonnage
- >90% world fleet of other types of ships (given associate status since 1999)

ITOPF Resources



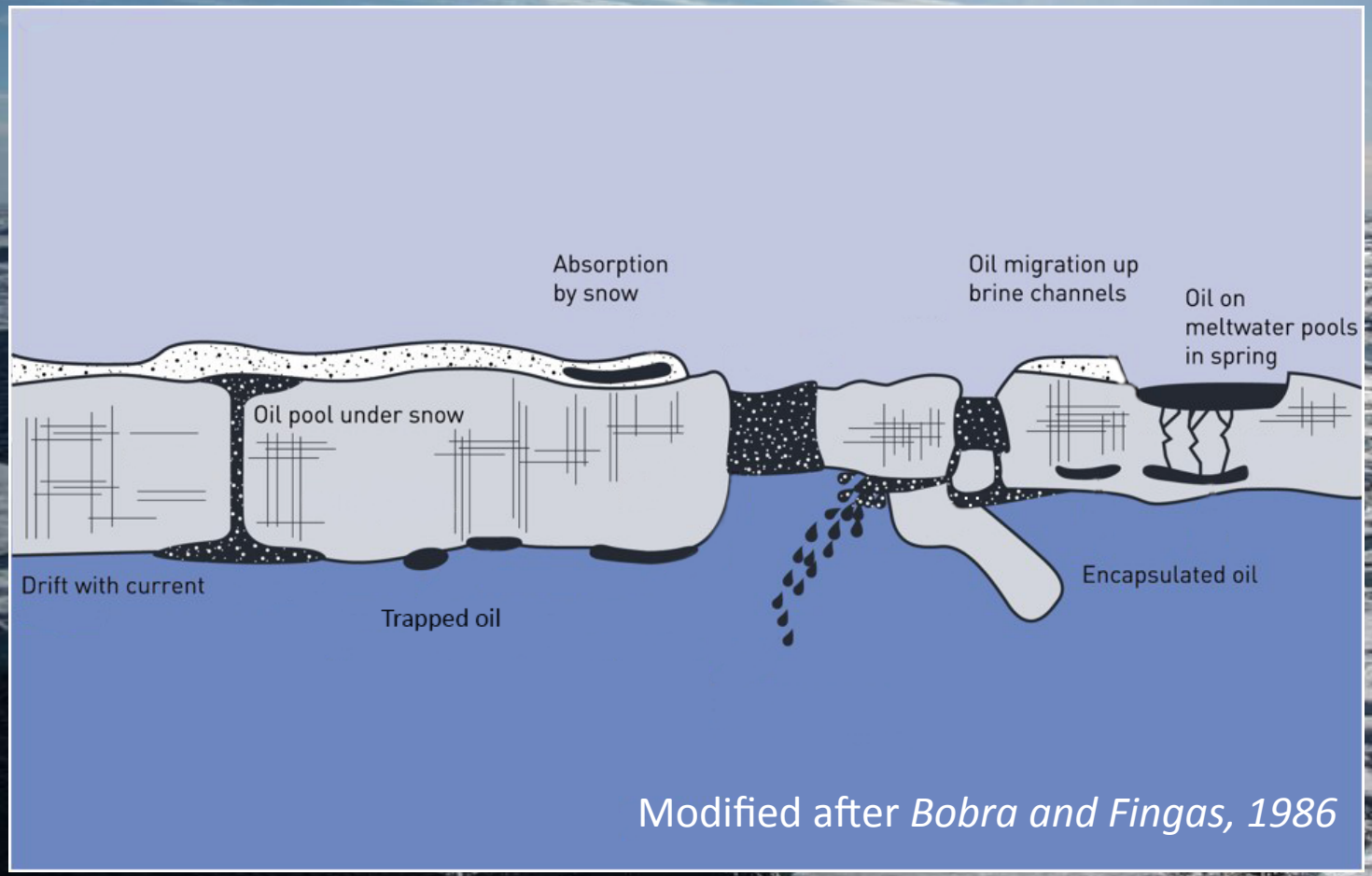
- 33 staff including 14 active spill responders
- Attended > 700 incidents in 100 countries
- In-house database and technical library
- French, Spanish, Mandarin Chinese, German, Italian and Portuguese

Role on Site




- Provide **technical advice** and promote **effective response strategies**
- Assist with securing equipment & organising clean-up
- **Monitor** spill response & investigate damage to resources
- Promote underlying principles of **international compensation regime**

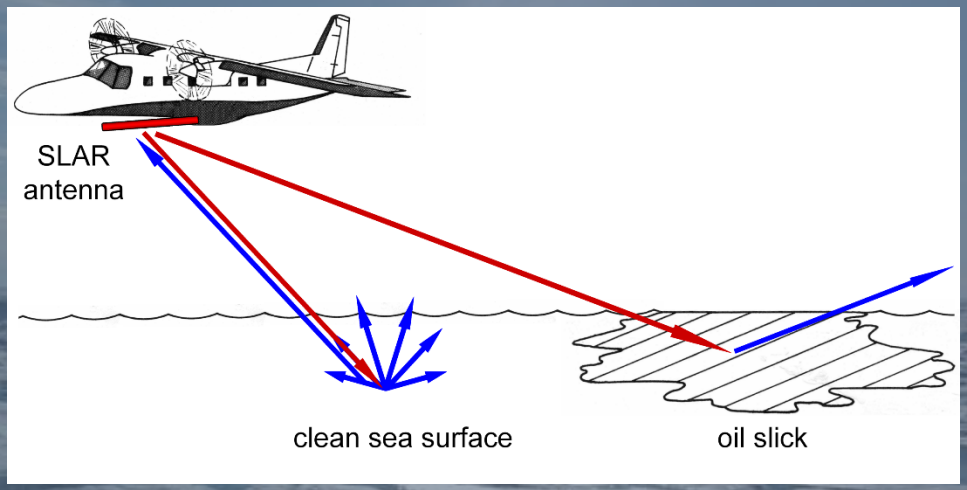
Oil Fade and Behaviour



Modified after *Bobra and Fingas, 1986*

Detection of Oil

Aerial Surveillance



SLAR/SAR

GPR

AUV

Response Operations

- Mechanical recovery
- Dispersion
- *In-situ* burning

Containement, viscosity

Pictures: SINTEF

- Specialized response equipment
- Containment
- Waste storage, treatment and deposition

Response Operations

- Mechanical recovery
- Dispersion
- *In-situ* burning

Turbulence

Picture: SINTEF

- Specialized response equipment
- Window of opportunity
- Oil type

- Regulatory approval
- Mixing energy

Response Operations

- Mechanical recovery
- Dispersion
- *In-situ* burning

> 1-2 mm slick thickness

Picture: SINTEF

- Containment, slick thickness
- Regulatory approval
- Window of opportunity

- Oil type
- Residues
- Smoke plume

Natural Recovery



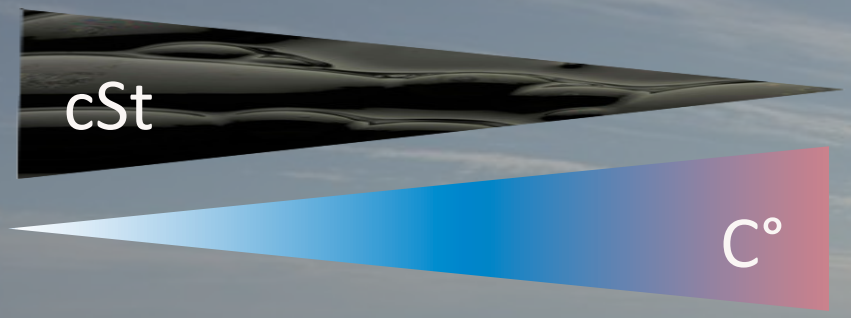
- Oil type volume and persistence
- Trajectory, interaction with ice
- Sensitive resources
- Net environmental benefit analysis
- **May be only practical possibility**

Arctic Features




- Cold temperatures
- Ice cover
- Remoteness
- Unpredictability (Weather/Ice)
- Strong seasonality
- Light conditions

Temperatures



- Slower spreading
- Less evaporation

→ **Wider operational window**

- Impeded mechanical recovery
- reduced effectiveness of dispersants
- Winterization

→ **Restricted operational possibilities**

- PPE (Hypothermia)
- Medical care
- Warm accommodation
- Restricted working hours

→ **Safety, efficiency, costs**

Sea-ice Cover

- Natural containment
- Reduced spreading

→ ***In situ* burning, mechanical recover**

- Dampened waves

→ **No natural dispersion**

- Potentially hazardous
- Unpredictable (depending on location)
- Specialized skills
- Transport
- → **Logistical and safety challange**

Remoteness

- Equipment (ships, skimmer, pumps etc.)
- Transport (safety, time, costs)
- Waste disposal (storage, disposal, treatment)
- Communications

→ **Costs, practicability, logistics**

- Sourcing Manpower (local volounteers)
- Arctic (survival) skills
- Health and Safety
- Accomodation
- Support and subsistence of workers

→ **Costs, risks, logistics**

Key Questions

- Is a response possible?
- Is a response necessary?
- What are the response options?
- What are the operational challenges?

Conclusion

- Prevention
- Preparedness
- Flexibility
- Cooperation
- Technical development
- Risk Assessment procedure

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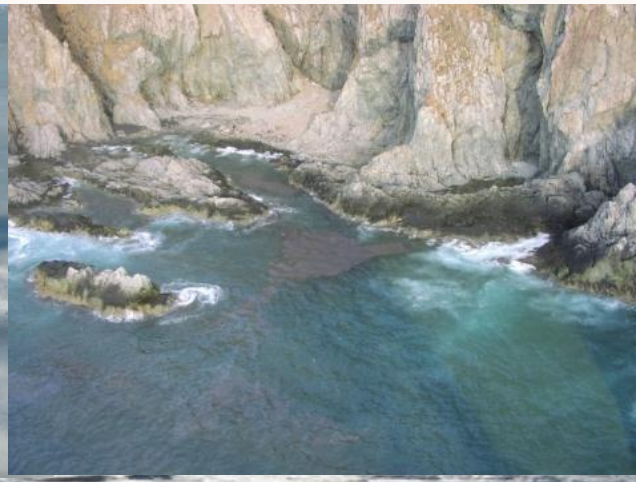
Is a response possible?

- Environmental conditions and season
- Ice cover, mobility and stability
- Logistics of access and waste removal etc.
- Health and Safety (darkness, exposure, wildlife, snow and ice)
- Sources of labour, equipment and supplies
- Accommodation, subsistence, communications, medical cover, etc.
- Relevant permits, pre-approved techniques

Is a response necessary?



- Amount, type and location of oil
- Potential for secondary contamination following remobilisation of oil
- Ecologically and socio-economically sensitive resources
- Indigenous populations and subsistence resources
- Wildlife
- High degree of seasonal variability in resource use, location and sensitivity

Shoreline Clean-up

Picture courtsey: ENTROPI SAS

- Sensitive shoreline types
- Access, equipment/manpower availability, health and safety
- Waste management
- Seasonality