POPCORN
Preventing Oil and Plastics Contamination of Ocean Regions of the North

Northern Periphery and Arctic Programme
2014–2020

EUROPEAN UNION
Investing in your future
European Regional Development Fund

OIL SPILL RESPONSE
IN THE ARCTIC AND IN ICY CONDITIONS

7 April 2022 at 13.00–15.00 (EEST/UTC+3)

https://popcorn.interreg-npa.eu/

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Challenges in Arctic OSR

Victor Pavlov, University of Oulu

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Three primary OSR technologies:

- **Mechanical method:** application of **booms** and **skimmers**
- **Chemical method:** application of **oil dispersing agents**
- **Thermal method:** application of **fire starters**

MECHANICAL RECOVERY

Two vessels with boom

Single vessel with outrigger

Three vessels of opportunity (VOO) with boom

Single vessel in ice

DISPERSANTS

Vessel application

Flxed-wing aircraft application

Helicopter application

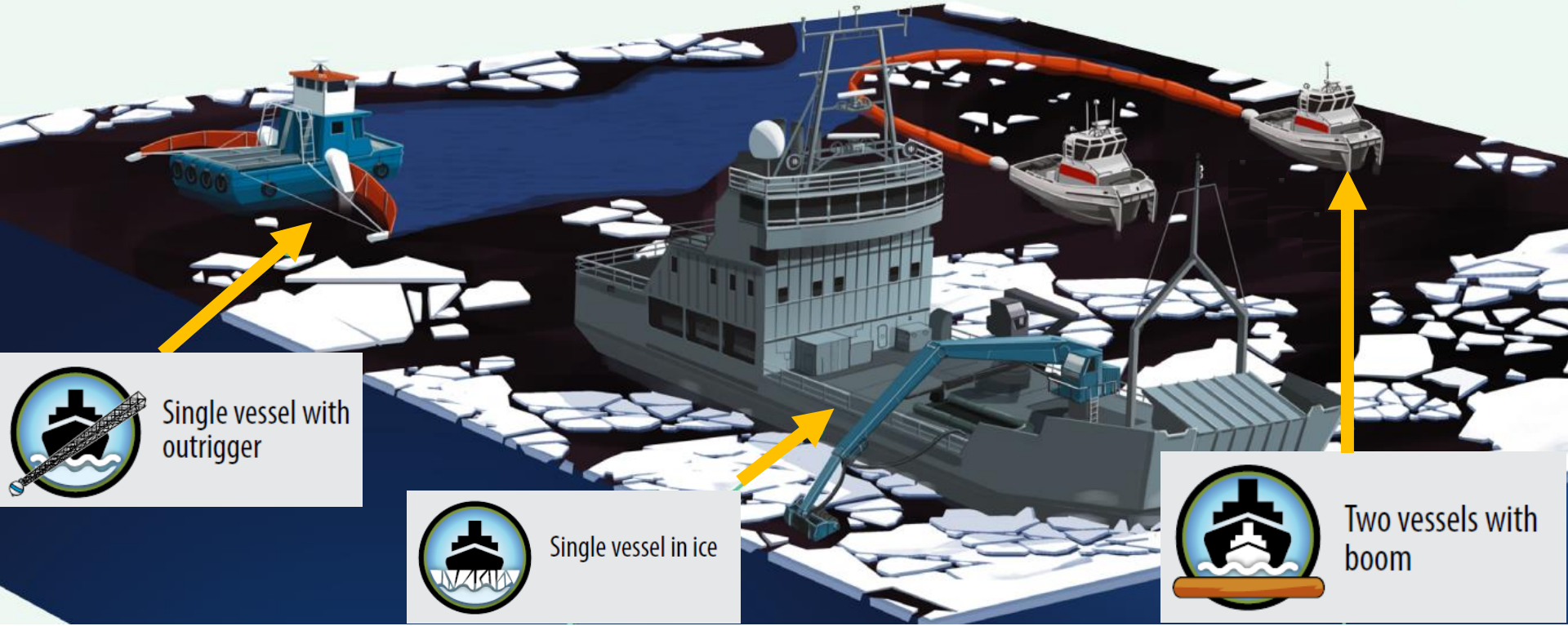
IN-SITU BURNING

Vessels with fire boom

Helicopter with ice containment

Helicopter with herders

PICTURE SOURCE: https://www.arcticresponsetechnology.org/wp-content/uploads/2017/08/JIP-IG-Mechanical-Rec.pdf

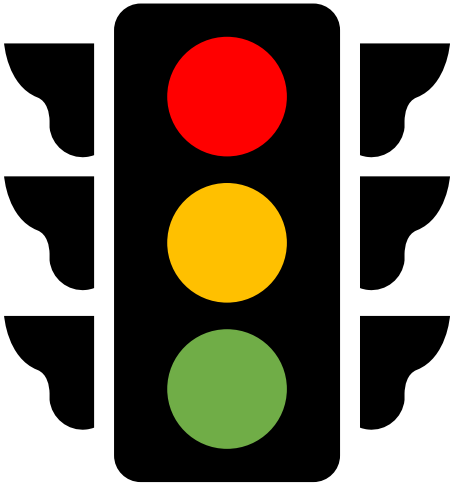



Flxed-wing aircraft application
PICTURE SOURCE: https://www.arcticresponsetechnology.org/wp-content/uploads/2017/08/jip-ig-dispersants.pdf
Helicopter application
Vessel application

PICTURE SOURCE: https://www.arcticresponsetechnology.org/wp-content/uploads/2017/08/jip-ig-insitu.pdf

Conditions for OSR:

Favourable Marginal Not favourable

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“Deepwater Horizon”, 2010


FE HI 179A

“Northguider”, 2018

Case comparison: warm & cold climate

MECHANICAL RECOVERY

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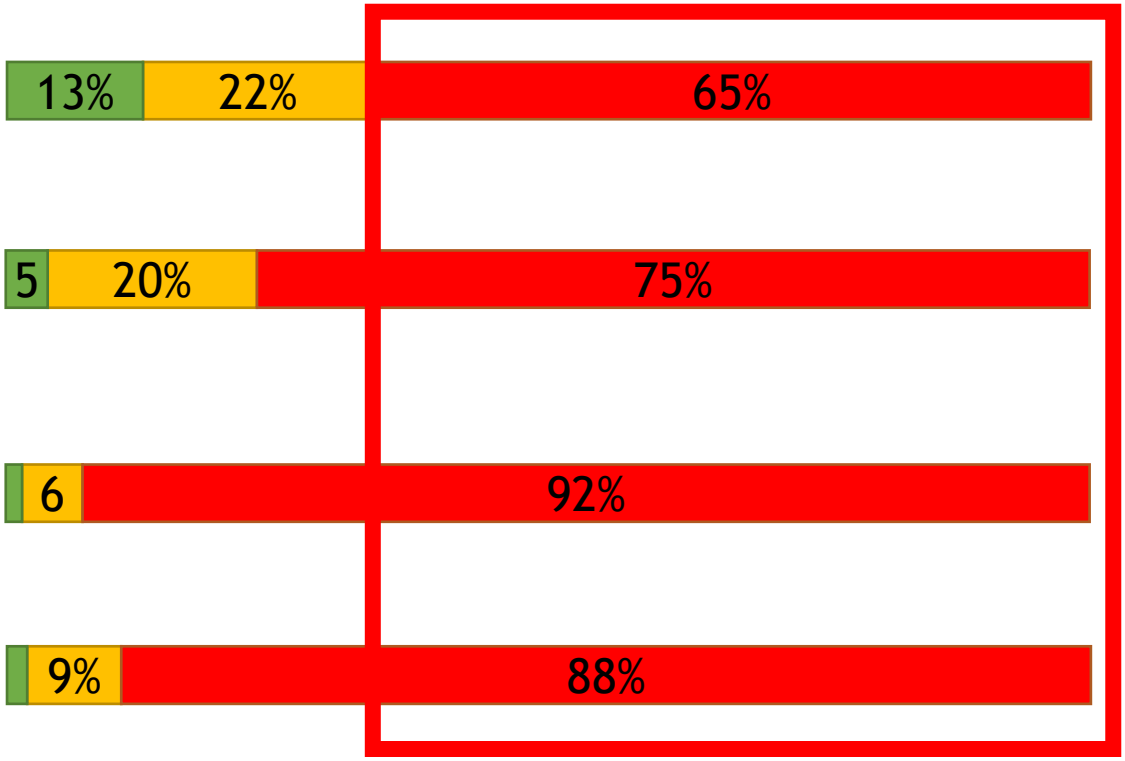
Single vessel in ice

SOURCE: https://oaarchive.arctic-council.org/handle/11374/1928



DISPERSANTS

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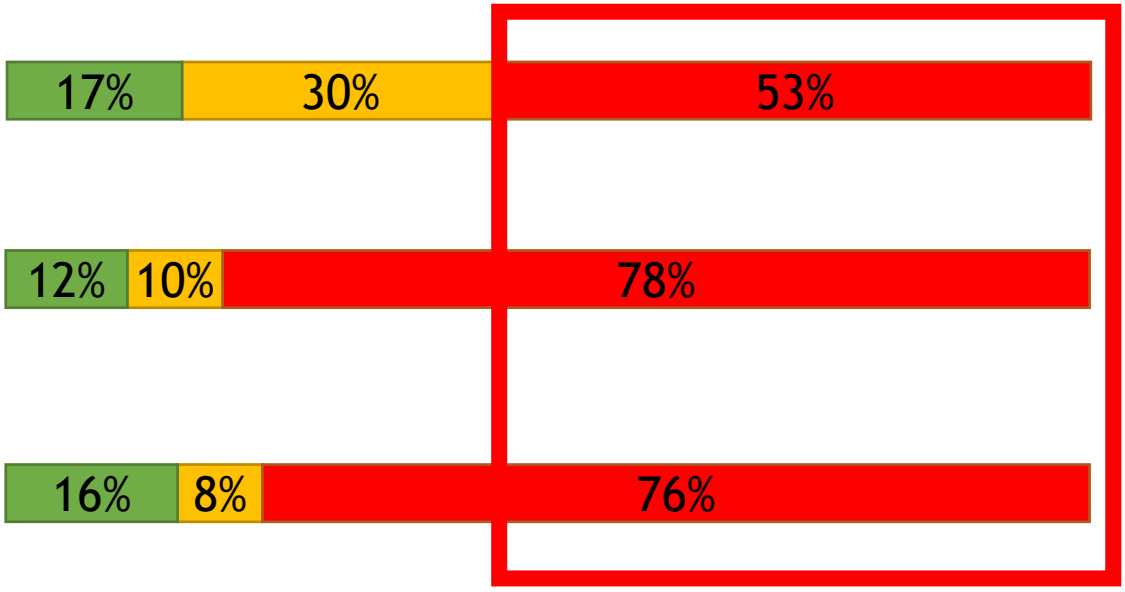

IN-SITU BURNING

Vessels with fire boom

Helicopter with ice containment

Helicopter with herders

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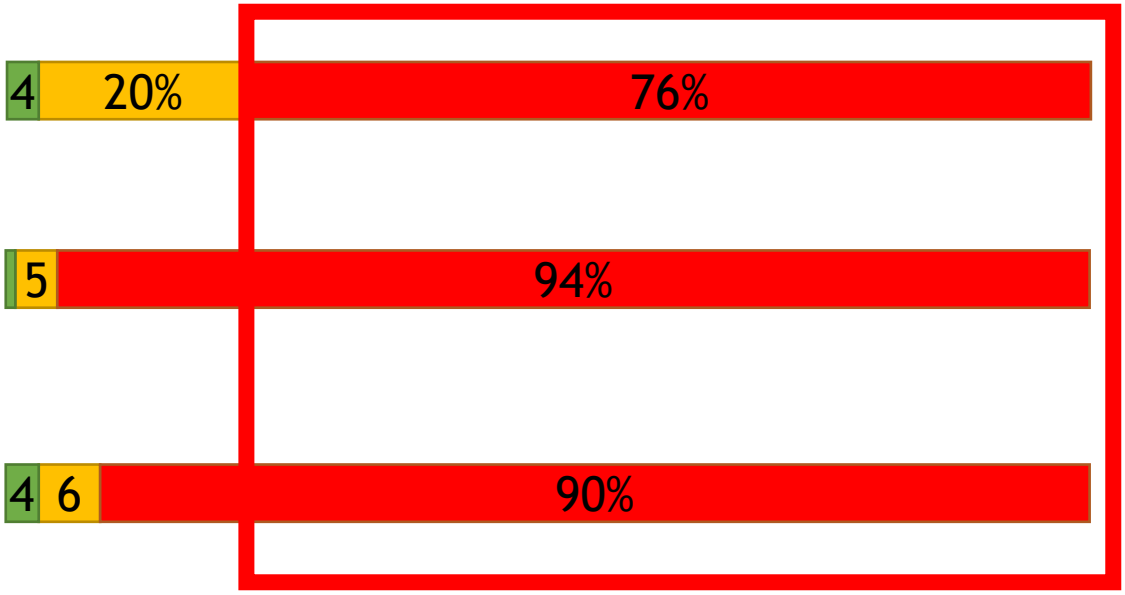

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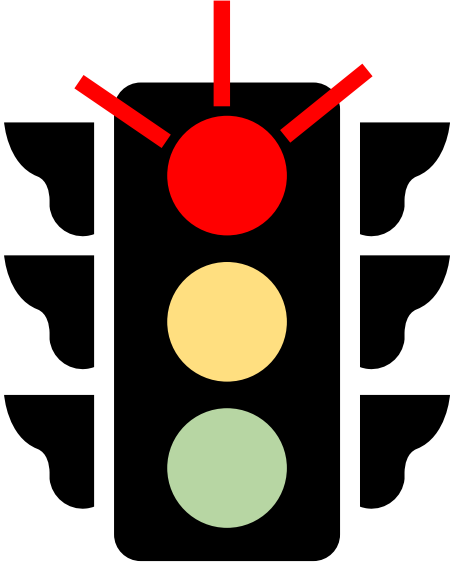
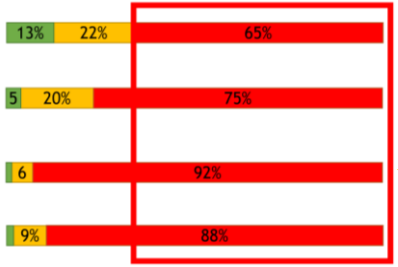
ALL OSR METHODS ARE **NOT** APPLICABLE IN

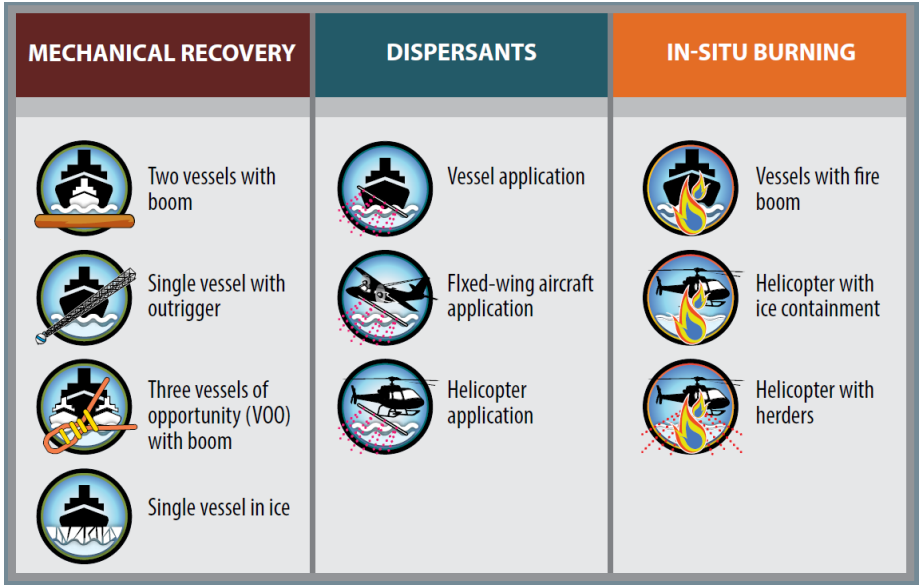


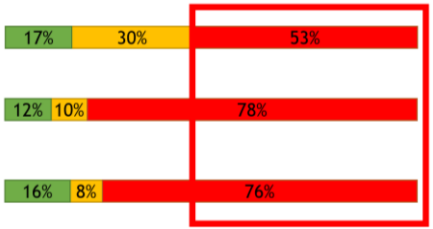
- air temperature: BELOW **−18 °C**
- wind: STRONGER **15 m/s**
- wave height: HIGHER **4 m**
- light availability: POLAR NIGHT **darkness**
- visibility: LESS **4,0 km (air) & 0,3 km (water)**

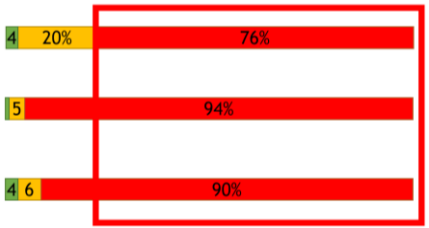


Summary

- air temperature: **−18 °C**
- wind: **15 m/s**
- wave height: **4 m**
- light availability: **darkness**
- visibility: **4,0 km (air) & 0,3 km (water)**







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Thank you!

Victor Pavlov, victor.pavlov@oulu.fi

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