



IS18/07: Oil Spill Environmental Sensitivity Mapping Project

Atlantic Ireland Conference 2019, Dublin

Ingeborg McNicoll (ERM), Gerry Sutton (MaREI), John Lee (ERM) and Simon Blaen (OSRL)

29th – 30th October 2019

© Copyright 2019 by ERM Worldwide Group Limited and/or its affiliates ('ERM'). All Rights Reserved.
No part of this work may be reproduced or transmitted in any form or by any means, without prior
written permission of ERM.

The business of sustainability



Aims & Objectives of Study

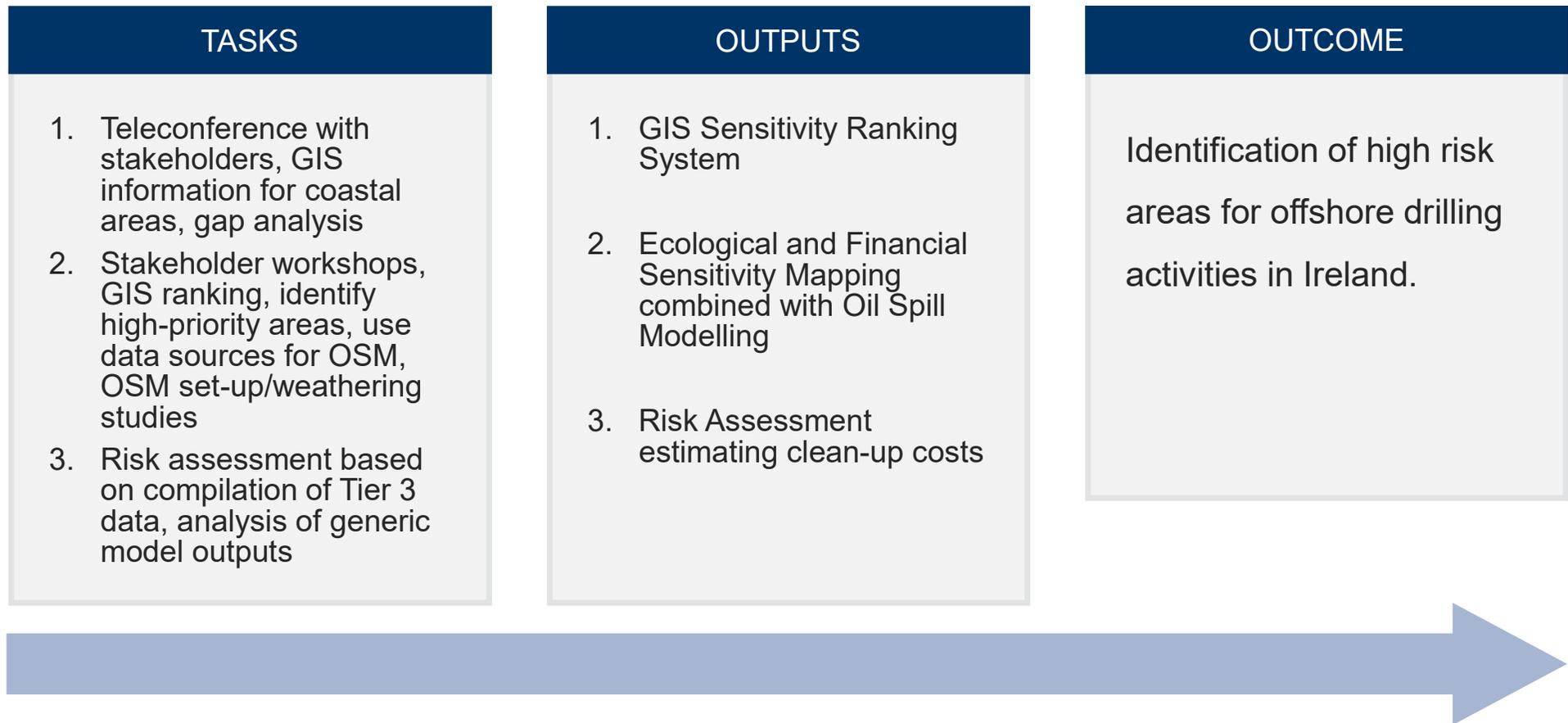
AIM

To provide Geographical Information System (GIS) coastal and marine environmental sensitivity maps to support the development of response strategies for oil spill contingency plans.

OBJECTIVES

- To generate a GIS containing baseline data on all environmental and socio-economic receptors;
- To classify the coast using an industry standard sensitivity ranking system;
- To establish a master list of data to ensure oil spill modelling is repeatable;
- To identify data gaps for future studies; and.
- To foster collaboration of academia, governmental and industry bodies in the area of marine environment.

Project Overview



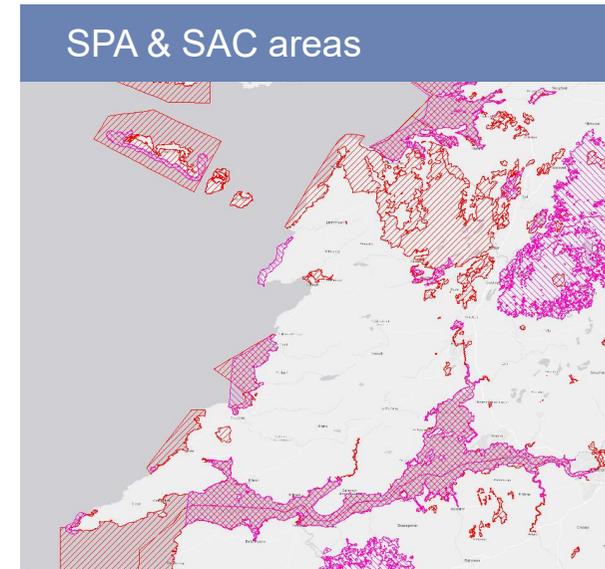
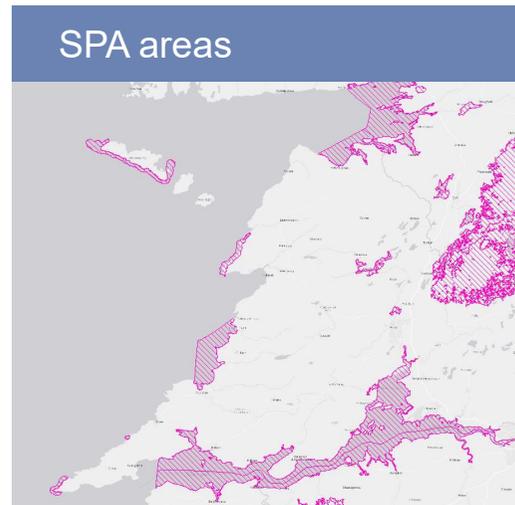
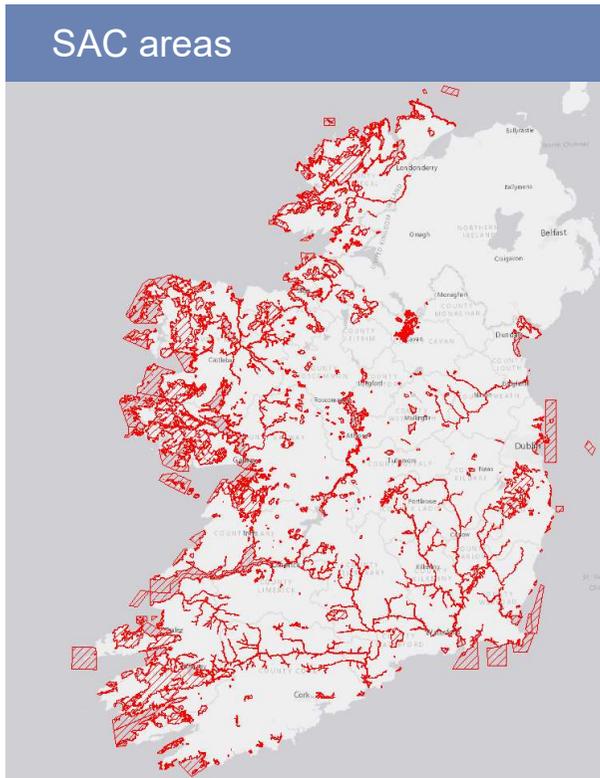
GIS of Sensitivity Inputs

Stakeholder
engagement to
identify critical inputs
and data sources

GIS with shape files
of environmental,
ecological,
commercial,
industrial, agricultural
and recreational
information for
coastal areas

Gap analysis to
determine data gaps

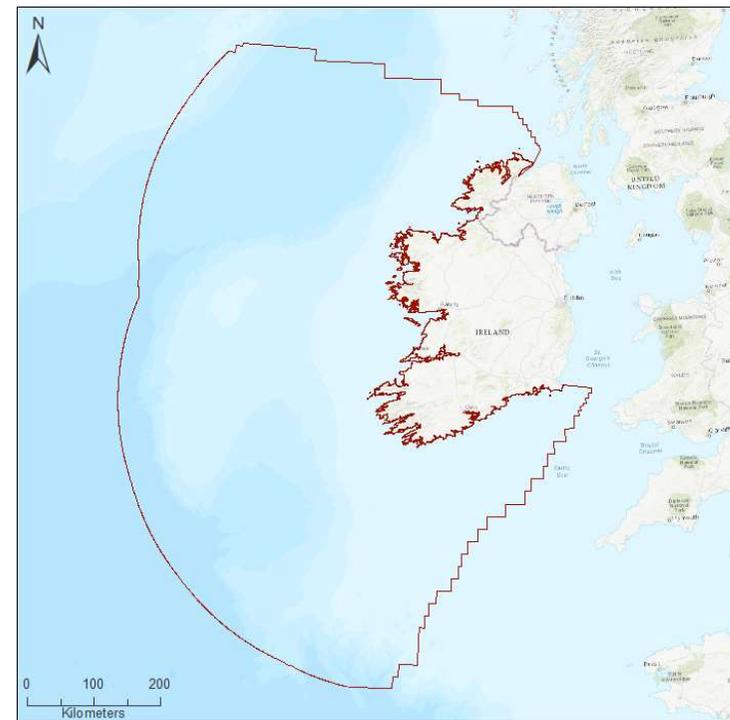
Examples of GIS layers- Environment Theme



Stakeholder engagement to identify critical inputs and data sources

Organised meetings with relevant industry, academic, civil and government stakeholders:

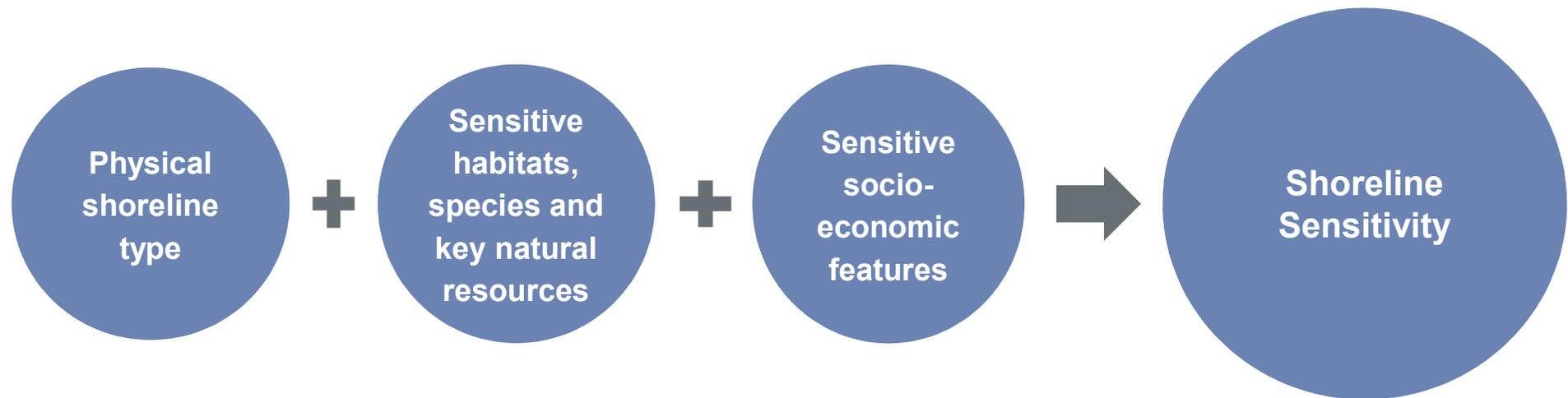
- identifying data;
- discussing their availability with data owners;
- ultimately fostering collaboration with stakeholders.
- following these meetings we have created a master list of environmental, social and economic baseline data to be used in the sensitivity analysis.



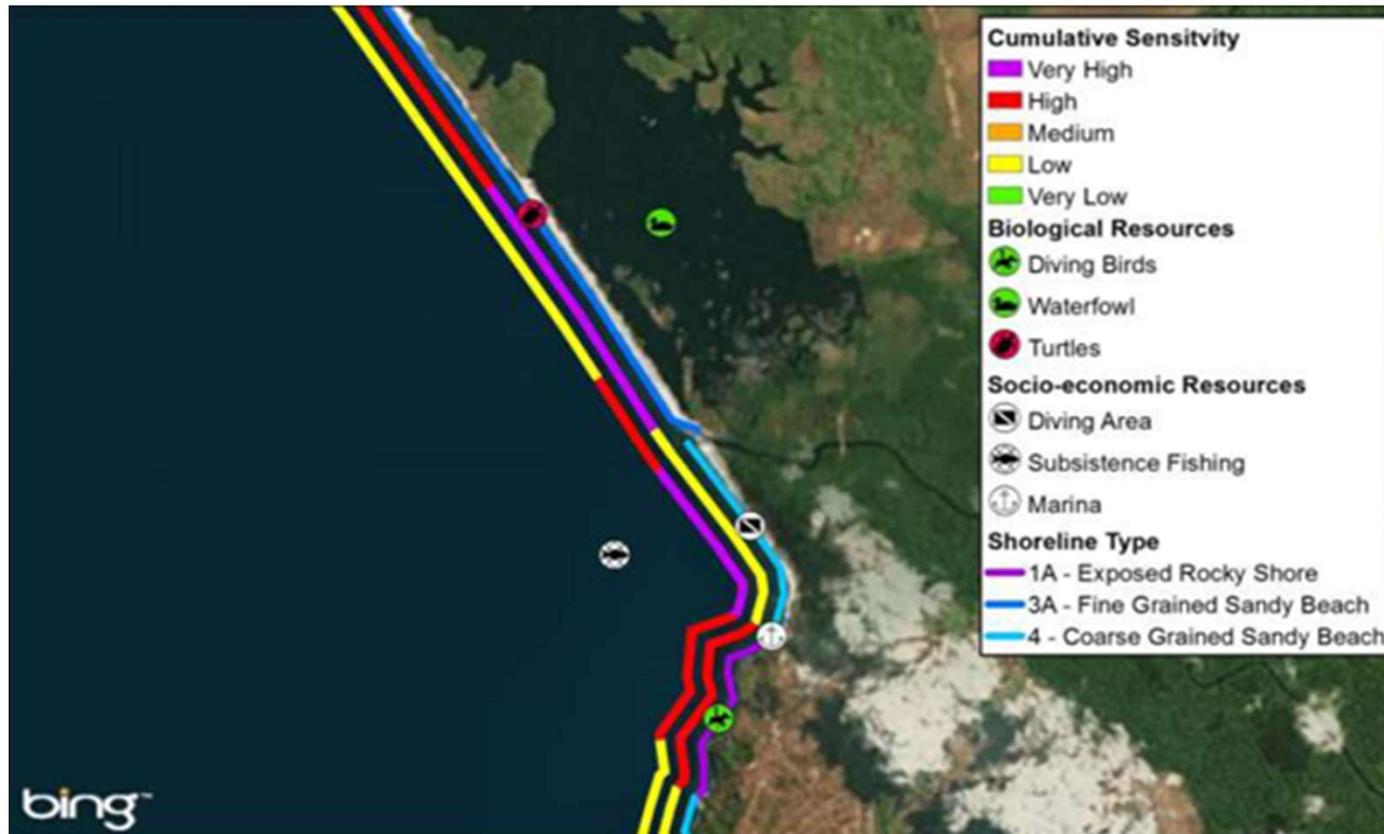
Overview of study area – Land and Sea limits

Sensitivity Mapping – Overview

To establish sensitivity maps for each stretch of shoreline, a general ranking activity was conducted using three resource types:



Shoreline Oil Sensitivity Map - Example



Data Sources for Oil Spill Modelling

Metocean Data

Current, Wind, Temperature, Salinity, Oxygen

Shoreline Characteristics

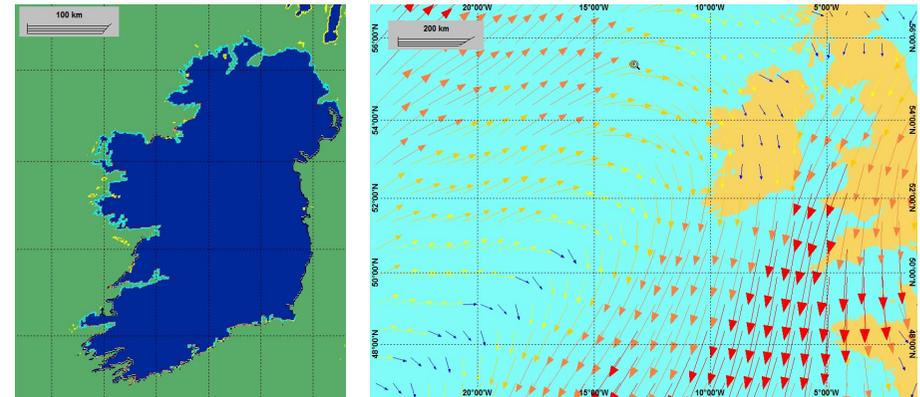
Shoreline position and type

Compatible with OSCAR and OILMAP

Oil Sensitive Receptors

Recommended sensitivities for analysis

Presentation methods and guidance



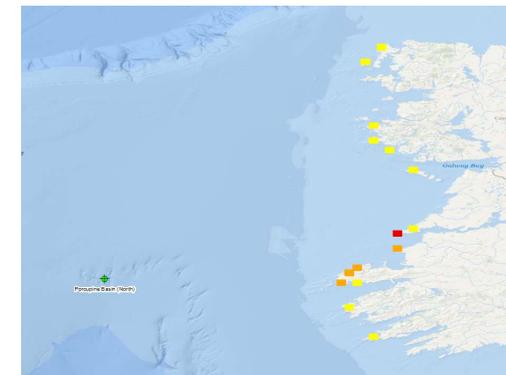
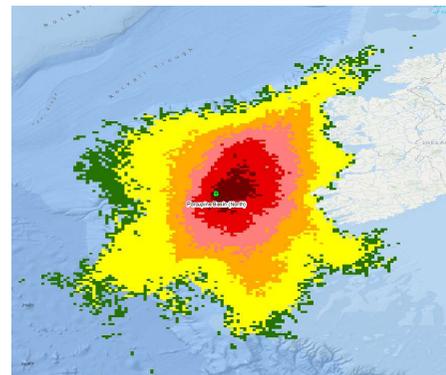
Receptor	Name	Type	Sensitivity	Status	Notes	Spatial			Temporal			Receptor Specific					
						Area (km²)	Length (km)	Depth (m)	Frequency	Duration	Recovery	Impact	Recovery	Impact	Recovery		
Receptor 1
Receptor 2
Receptor 3
Receptor 4
Receptor 5
Receptor 6
Receptor 7
Receptor 8
Receptor 9
Receptor 10

Modelling Simulations

Stochastic modelling for representative scenarios at 6 locations e.g. Porcupine Basin (North) – 890m³/day for 30 days, group 2 oil



Combine results to identify overall risk to the coastline



Oil Spill Modelling – Setup / Weathering Studies

Good practice for set up of OSM

- Simulation length
- Seasons
- Number of particles
- Spatial and temporal resolution

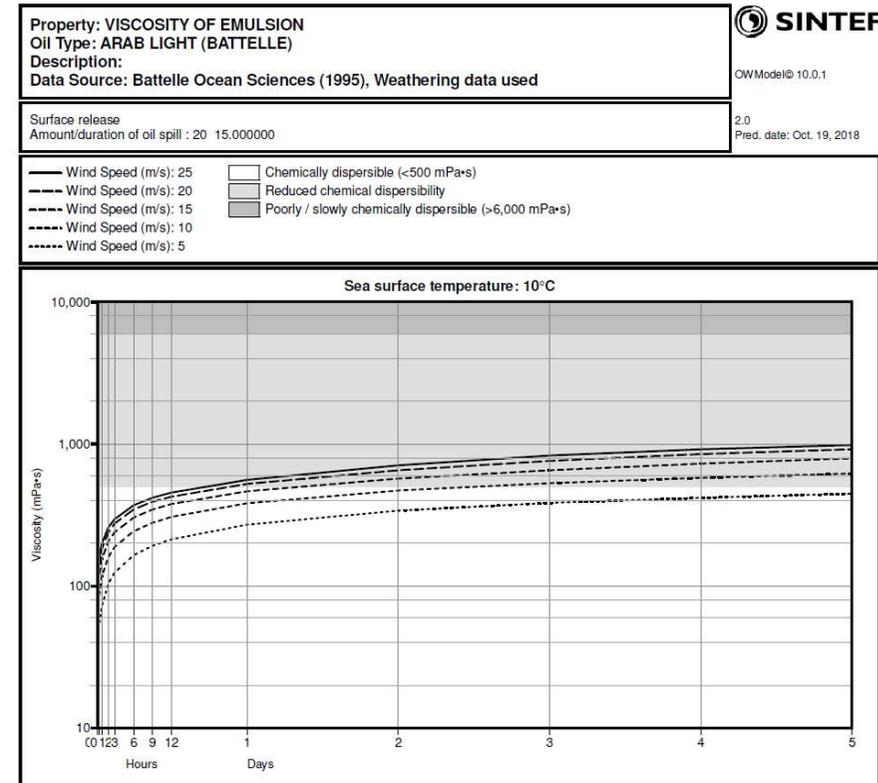
Weathering Studies standardise approach to OSM

Predicted weathering of oil

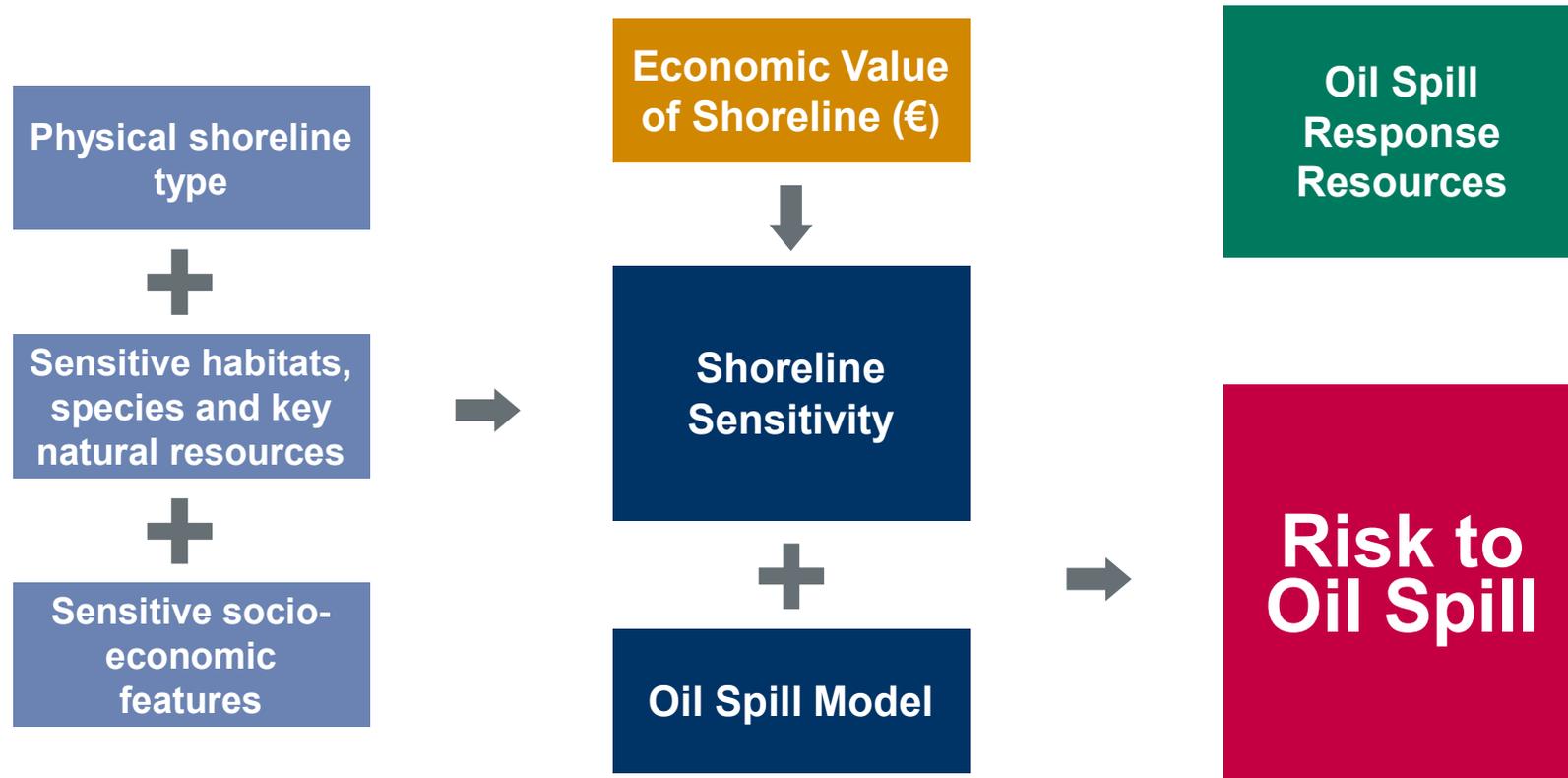
- Evaporation, Dispersion, Flash Point, Pour Point Viscosity, Water Content

Based on laboratory tested oils – 4 oil types

Conducted using SINTEF's OWN – part of OSCAR



Sensitivity Mapping - Risk



Acknowledgements

Birdwatch Ireland
Central Statistics Office
Cork County Council
Department of Agriculture
Food and the Marine
Department of Culture
Heritage and the Gaeltacht
Donegal County Council
Environmental Protection Agency Ireland

Geological Survey Ireland
Irish Coast Guard
ISPSG
Kerry County Council
MaREI
Marine Institute
National Monuments Service
National Parks and Wildlife Service

Oiled Wildlife Response Network
Ordnance Survey Ireland
OSRL
PIPCo
Port of Cork
Port of Waterford
Shannon Foynes Port Company
University College Cork





Thank you

Ingeborg McNicoll

Senior Partner

ingeborg.mcnicoll@erm.com

+441312216806

The business of sustainability

