



## Project summary

Title	<b>Socioeconomic impacts of major oil spills - prediction methods and scenario studies</b>	Project No	<b>2007 4478</b>
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This document summarizes the methodology applied in a project conducted for the Swedish Rescue Services Agency and for the Interreg project Baltic Master with the aim to predict an estimate potential socioeconomic impact from major marine oil spills. The methodology is based on available regional statistics on the economic value of different business and industry sectors potentially affected by coastal oil pollution and large scale clean up operations. Oil spill scenario cases with tanker accidents off the Swedish coast, have been used for illustrative purposes and for comparative studies. The results highlight the importance of taking also the socioeconomic impact into account, in addition to ecological damage and response cost, in the preparedness planning process.

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## **Risk-based oil spill preparedness**

Statistically processed AIS recordings offer new opportunities for accurate spill risk assessment and identification of high risk areas. Ecological impact, response costs and socioeconomic impact are three important aspects of accident consequences to be considered in risk-based preparedness planning and to be balanced versus the probability of accidents in order to reach an acceptable risk level. Traditionally, ecological impact and sensitivity has been the overriding concern in the preparedness planning and response strategies but the result of this project demonstrate that socioeconomic impact and sensitivity aspects also need to be considered carefully in the planning process. To be able to do such considerations, methodologies for impact sensitivity mapping and tools for cost estimations are needed. In this project public available statistics and an accident scenario were used to elaborate a simple method of reasonable accuracy.

## **Socioeconomic impacts and sensitivity**

Based on a scenario with a tanker collision resulting in a total spill of 20 000 tonnes of oil outside Göteborg, SSPA conducted a case study, estimating the potential socioeconomic damages and associated costs, for the Swedish Rescue Services Agency. The investigation showed that the socioeconomic damage cost could be expected to be several times higher than the direct response and clean up costs. The situation of course differs from region to region and a model for socioeconomic sensitive mapping – by analogy with established ecological sensitivity mapping for prioritisation of preparedness and response efforts – was also developed as part of the study.

## **Socioeconomic sensitivity index**

Previously presented spill cost prediction models usually use the spilled quantity as the basis for total cost estimation. Experience from Swedish spill and clean up cases, however, show that the total damage and clean up costs correlate better with the total length of the polluted shoreline than with the total spill volume. From the first case study it was further concluded that tourism and fishery sectors generally represent the sectors suffering the highest economic losses due to the spill.

In order to estimate the possible losses within the tourism sector, regional statistics on the total consumption value minus production costs was compiled from official Tourism Satellite Accounts (TSA) published by Nutek (the Swedish Agency for Economic and Regional Growth) and SCB (Statistics Sweden). The figures were then distributed to county or municipal level by using regional or local accommodation statistics as weighting factor. The derived figures for each county or coastal municipality were then divided by the total coast length to form a local sensitivity index. The index multiplied by a relative damage rate and by the contaminated beach length given by the scenario case, then represents the estimated socioeconomic damage cost in the tourist sector of the community.

A similar approach was used to formulate a socioeconomic sensitivity index for fishery. In this case the regional indexes are divided in three components; sea fishing, aquaculture and angling by using different statistics published by National Board of Fisheries and SCB.

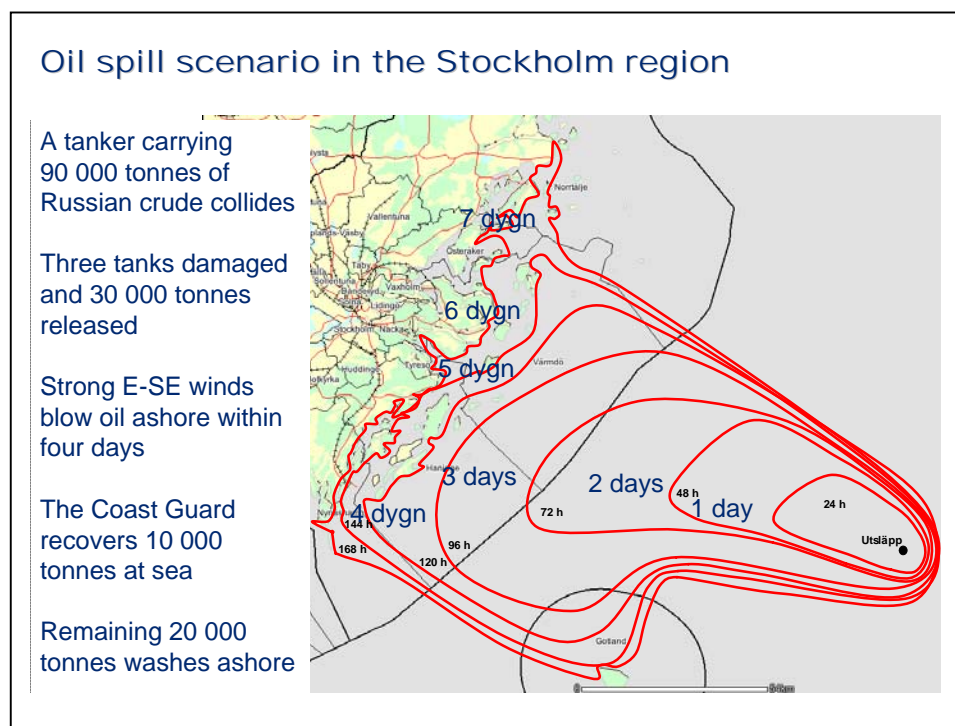
### Un-quantified socioeconomic impact

A number of additional society sectors that also will suffer impact of major oil spill were also identified but found difficult to quantify in monetary terms. For example public cleansing, garbage collection and other municipal services may be affected, the roads and infrastructure will be exposed to tough wear by waste transport vehicles and the quality of life will be reduced for people living close to the polluted area.

### Scenario applications for different regions

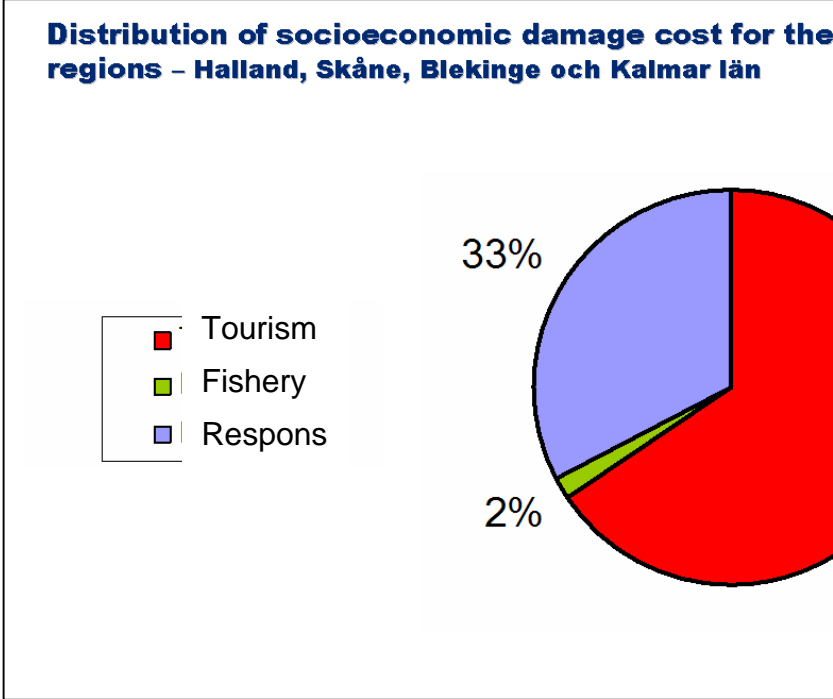
The calculation model has been applied for a number of tanker collision scenarios at various places along the Swedish coast. The results show that the distribution between the three main damage cost components; ecological damage, response cost and socioeconomic impact, vary significantly for different regions but in particular, socioeconomic impact on the tourism sector often represents a major component. For some risk exposed regions the results may suggest that alternative response strategies could be considered.

The figures below illustrate some examples of the calculation methods and the model output.



**Fördelning:**  
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 - Scenario Stock

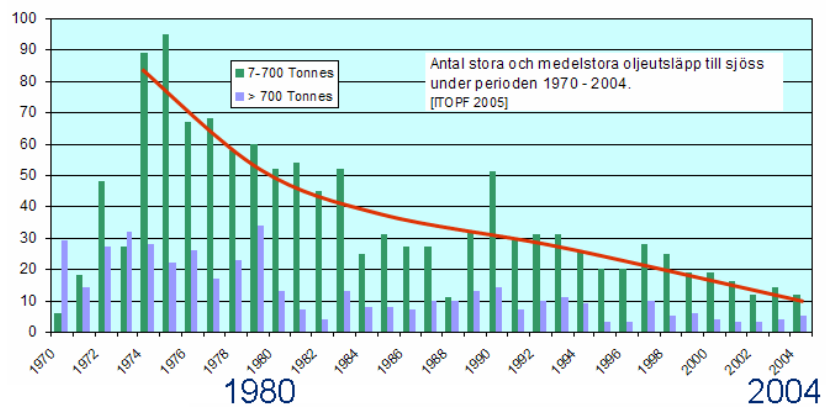
The response cost is for the  
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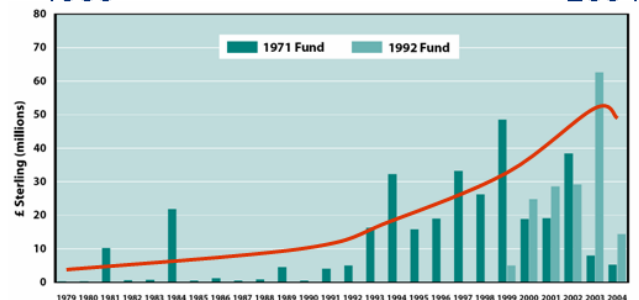
### International trends - comparison

**Statistics 1970/1979 – 2004**

The number of large spills decrease but the amount of money claimed for compensation from the fund increases.



The awareness of the importance of the socioeconomic impact increases and hence also the claims



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