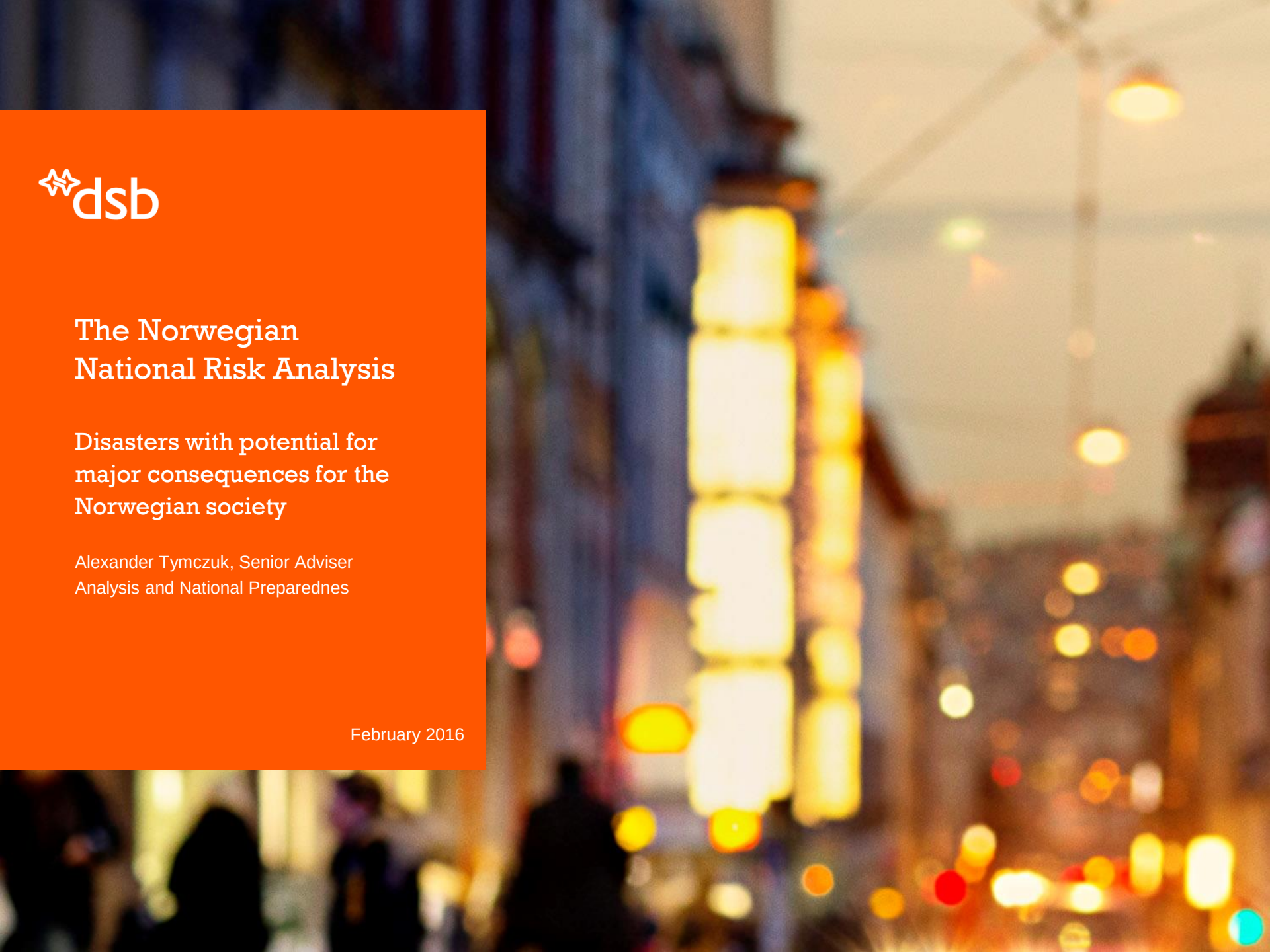


The Norwegian National Risk Analysis

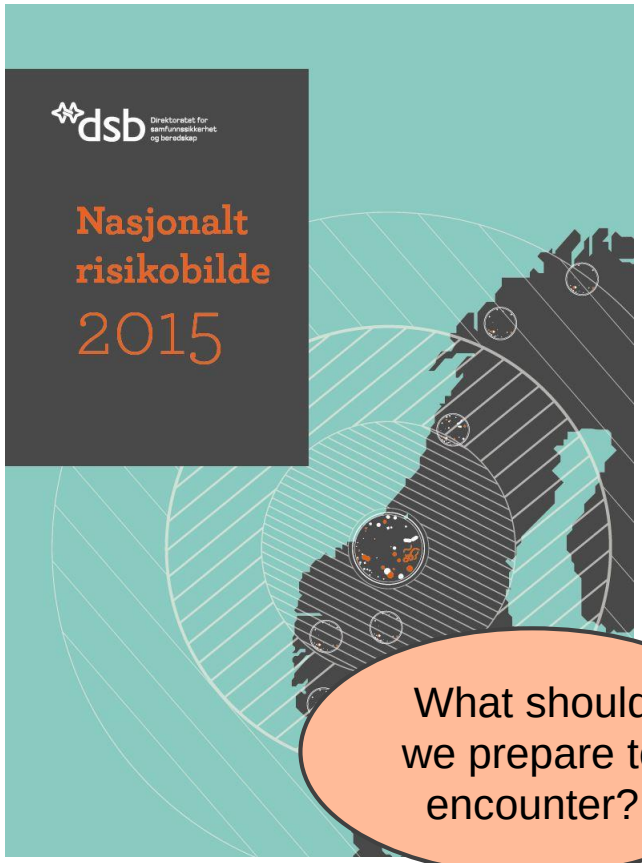
Disasters with potential for major consequences for the Norwegian society

Alexander Tymczuk, Senior Adviser
Analysis and National Preparednes

February 2016

Framework for Risk Governance

What are the core functions of society?



What should we prepare to encounter?

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The Norwegian Risk Analysis (NRA) Annual report 2011-2015

- Disasters with major consequences for the Norwegian society
- Main purpose: Increased risk awareness
- Improvements during the years
- In cooperation with sectoral authorities and experts

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A joint platform for risk governance and contingency planning

- A comparative review of disaster risks in the Norwegian society – all hazards approach
- Methodology close to UK, NL and EU Guidelines, but adapted to a Norwegian context
- Assessment of likelihood, impacts and uncertainties
- Based on best available knowledge and expert judgements
- Transparent process and a public document

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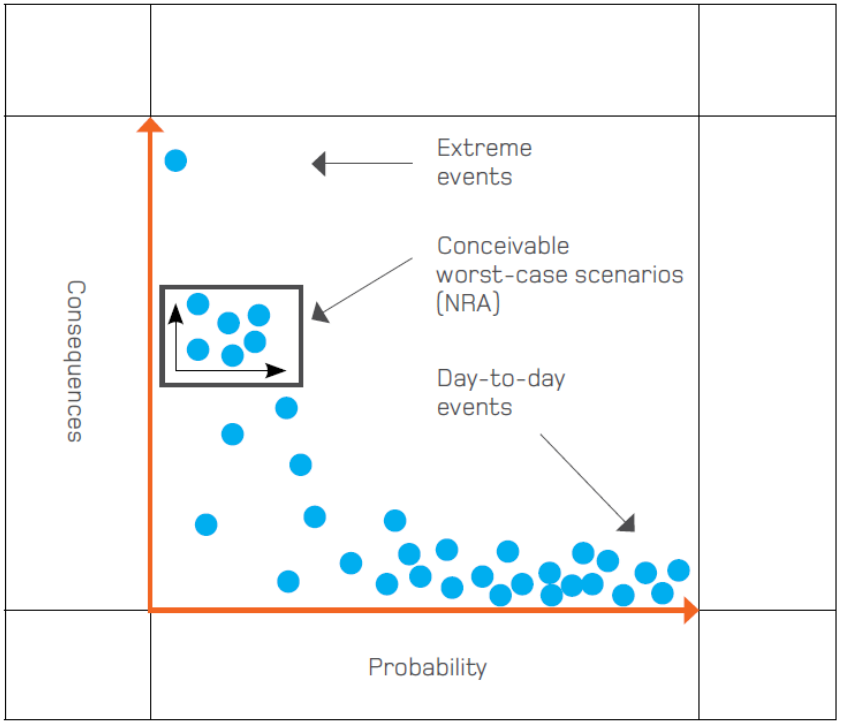
Delimitation



The scenarios analysed in the NRA are ’conceivable worst case scenarios’

– not day-to-day accidents and not the most extreme events conceivable either.

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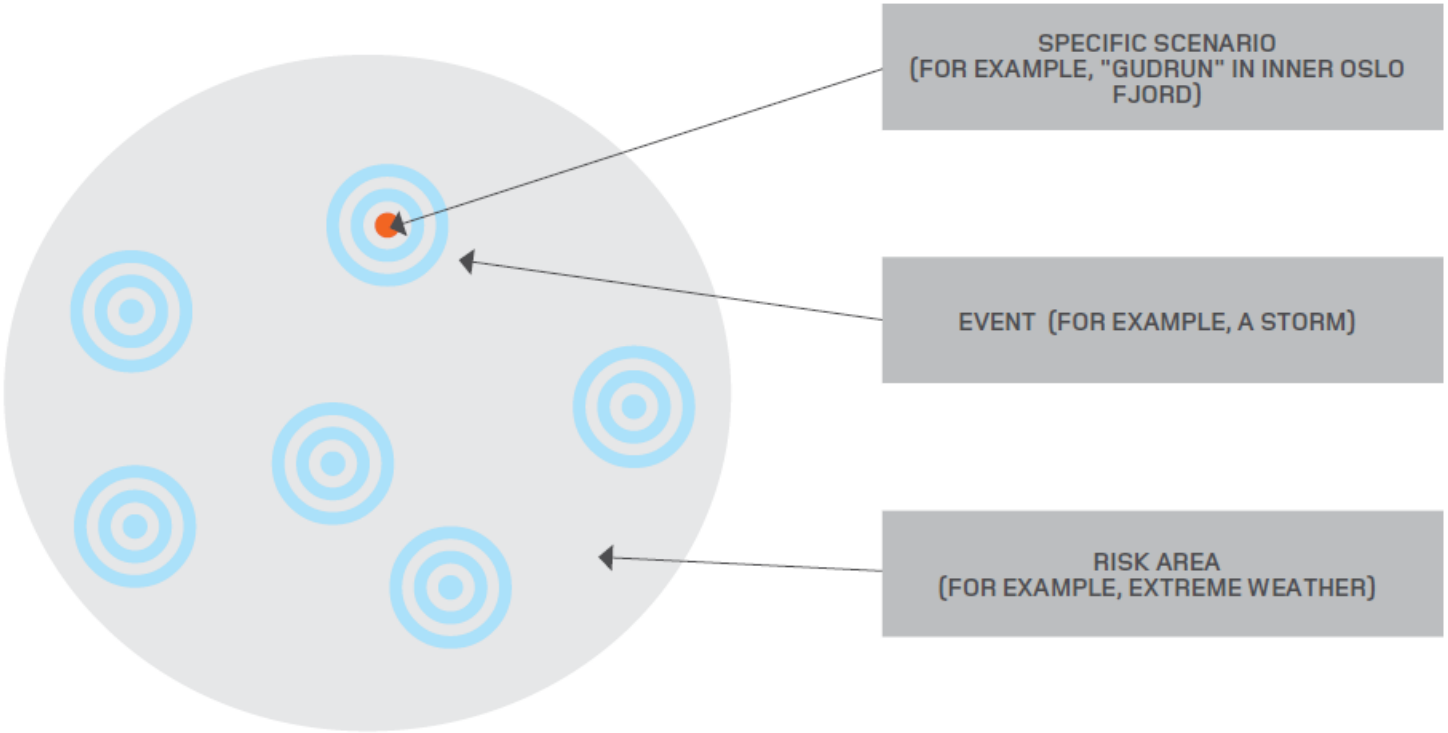
Risk areas, types of events and scenarios



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Scenarios in 2015 Edition

Natural hazards

- Storm & storm surge
- Draught leading to energy shortage
- Rockslide
- Quick clay landslide
- Pandemic influenza
- Solar storm
- Volcanic eruption in Iceland
- Earth quake in a urban area
- Forest fires
- River flooding
- Food borne disease

Major accidents

- Nuclear accident
- Ship collision
- Tunnel fire
- Gas leakage
- Industrial fire
- Gas and oil blowout

Malicious acts

- Terrorist attack in a city
- Terrorist attack on a passenger vessel
- Cyber attack on financial sector
- Cyber attack on ecom infrastructure
- Limited military assault
- School shooting

A Five Step Process

1. Definition of the societal assets that are to be protected.

2. Identification of adverse incidents

- Dialogue with exp
  agencies and aca

3. Delimitation, selection and development of scenarios

- Plausible wor
  developed in c

4. Risk analysis of the scenarios

- Workshop
  and experts covering all aspects of consequences of the scenario

5. Presentation of the results of the analyses

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Risk Analysis - the Three Main Phases

- Knowledge and overview
- System understanding
- Pre-analysis
- Scenario development

- Work shops
- NRA methodology
- Likelihood and consequences

- Follow-up
- Further data collection
- Write up the analysis
- Risk matrix

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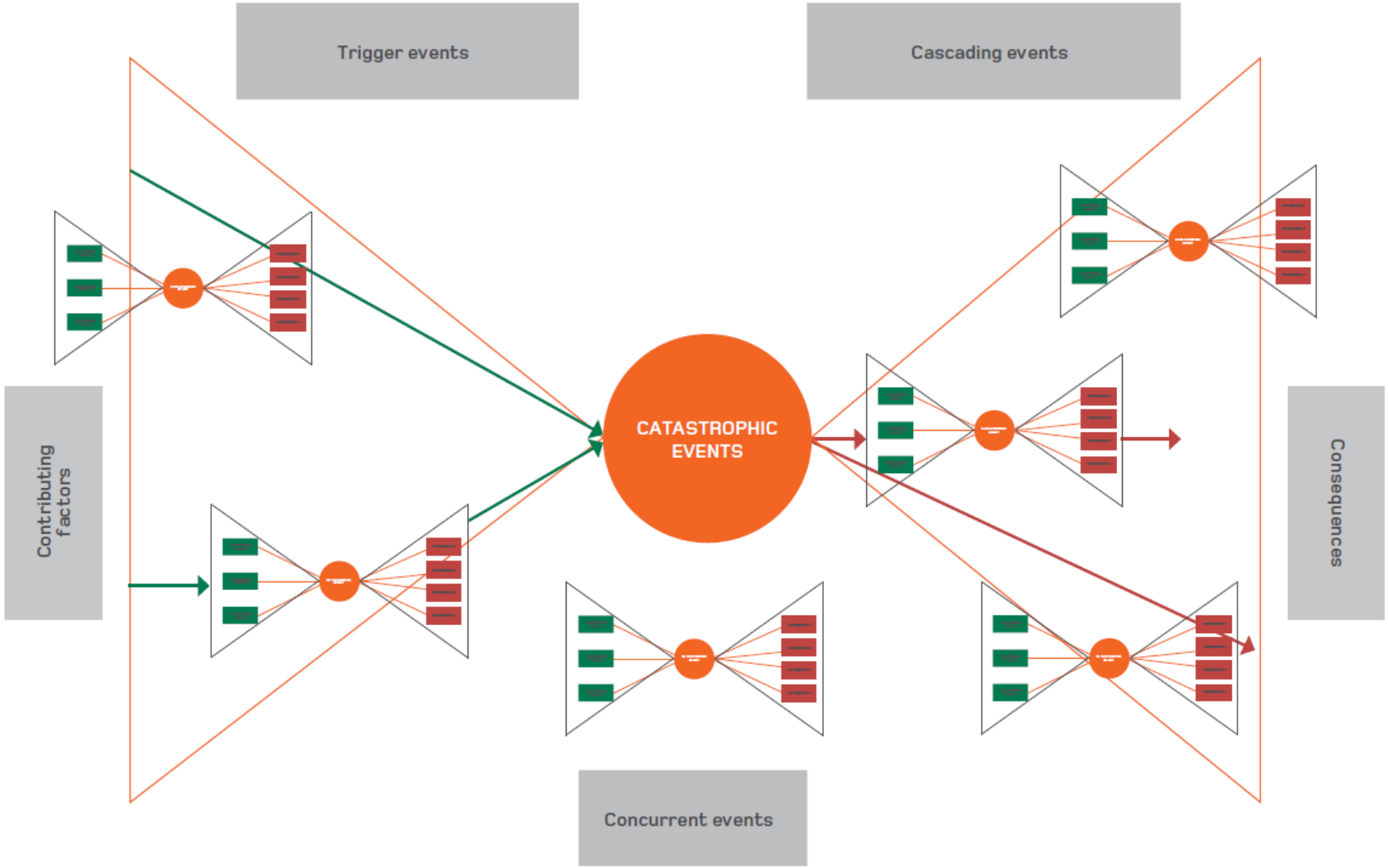

FIGURE 10. Bow tie model illustrating complex courses of events.

If we were sure about what would happen in the future, we would not need to conduct risk analysis

Risk analyses in the NRA are assessments of:

- the probability that an disruptive event will occure
- the consequences that event may have
- Uncenrtainty related to the analysis results (knowledge base and sensitivity)

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Bringing experts together is in itself important to strengthen the understanding of risk.

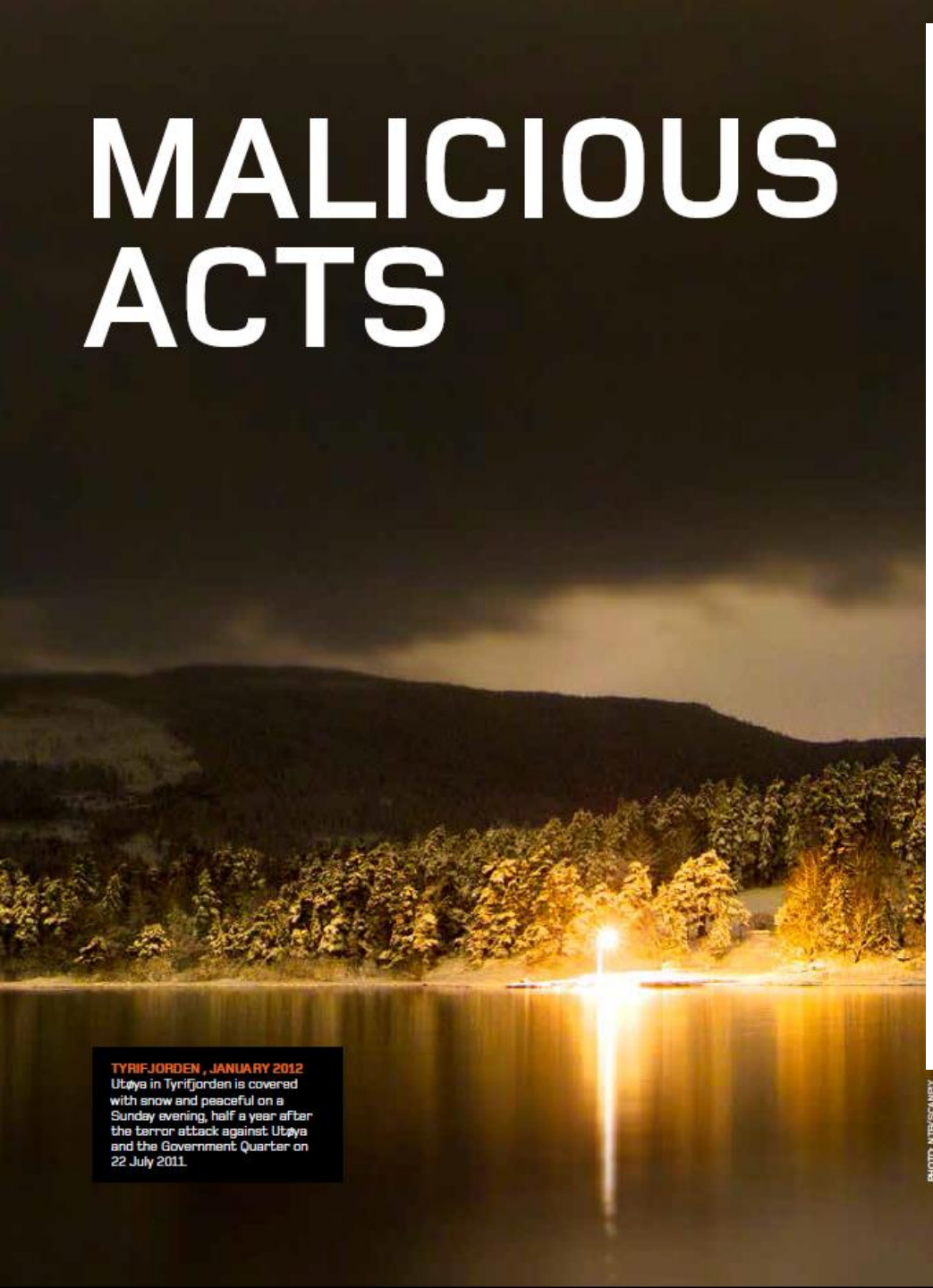
If the society is prepared to meet the disasters which are analysed in the NRA, it is also prepared to meet many others.

MAJOR ACCIDENTS

GULF OF MEXICO, JUNE 2010
The Deepwater Horizon blow-out is considered one of the world's largest oil spills.

RISK AREAS

MALICIOUS ACTS



TYRIFJORDEN , JANUARY 2012
Utøya in Tyrifjorden is covered with snow and peaceful on a Sunday evening, half a year after the terror attack against Utøya and the Government Quarter on 22 July 2011.

PHOTO: NTB/SCANPIX

SCENARIO

15.1 Terrorist Attack in a City

A large terrorist attack in Oslo is an example of a malicious act in the terrorism risk area. To illustrate how serious the consequences of such a malicious act can be, a consequence analysis has been conducted on a serious scenario in which groups of terrorists carry out simultaneous attacks against several targets.[178]

Preconditions for the scenario

Time

A weekday at the end of September, at the end of working hours

Duration

Less than 24 hours

Capacity

Several extremist/militant organisations/groups have access to military resources and equipment.

Intention

- In recent years, the police in several European countries have uncovered plans for terrorist attacks that encompass several mobile attack teams with a high degree of brutality.
- An increasing number of attacks carried out by militant Islamists that have a standing intention to harm the West.

Comparable events

- Attack in Mumbai in 2008, in which more than 170 people lost their lives, and 370 were injured. The attack lasted for three days and was directed at ten different locations.
- Attack on the gas plant in In Amenas, Algeria in 2013, in which 38 employees from a number of countries were killed, including five Norwegians.

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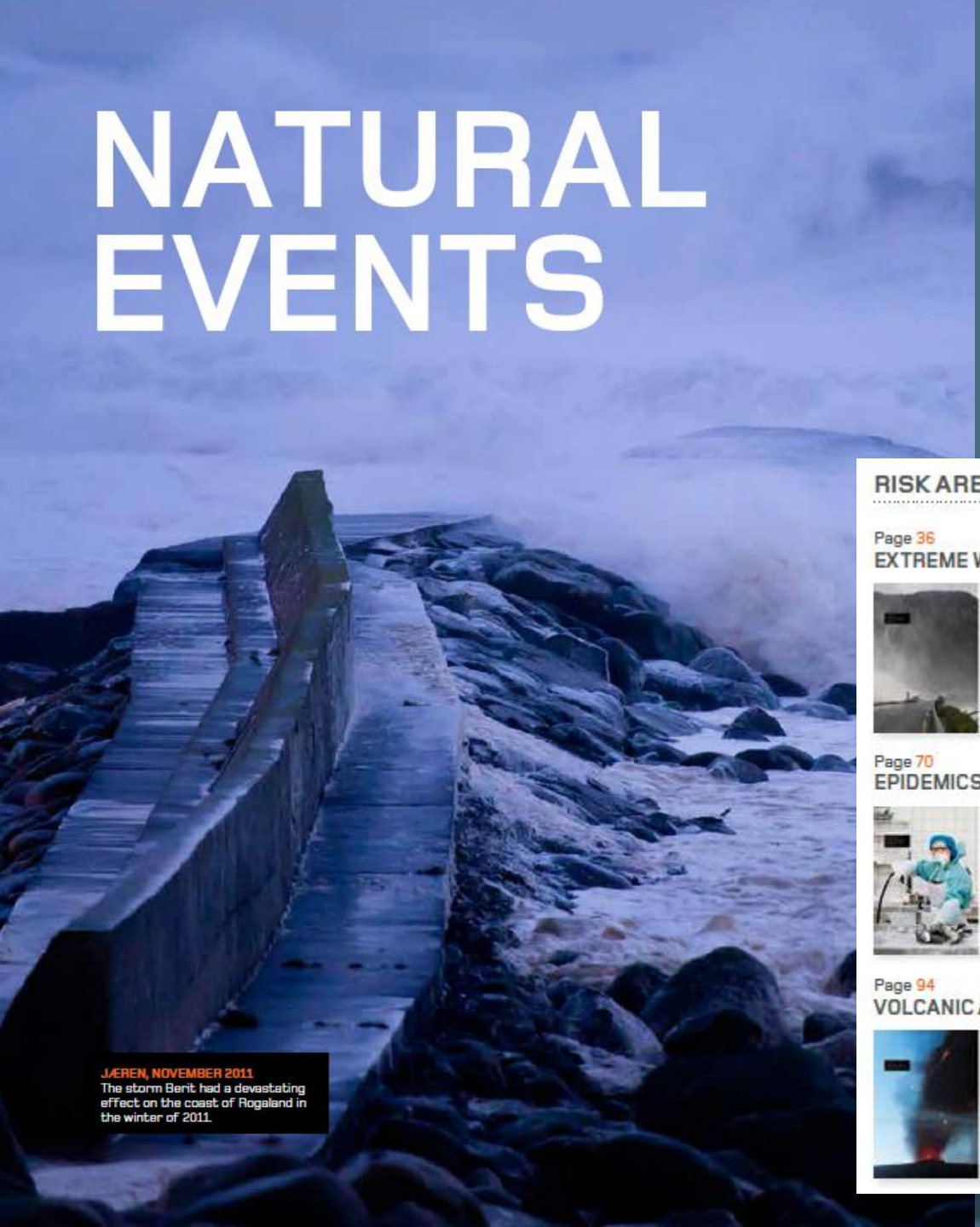
NATURAL EVENTS



JÆREN, NOVEMBER 2011
The storm Berit had a devastating effect on the coast of Rogaland in the winter of 2011.

RISK AREAS

SCENARIO

05.1 Flooding in Eastern Norway

Major flooding in densely populated areas is an undesired natural event. The worst-case scenario that has been analysed is extensive flooding due to a very high rate of water flow in the largest rivers in Eastern Norway.

Preconditions for the scenario

Weather conditions

Large quantities of snow in the mountains and a cold spring. Warm air front from the south-east results in a rapid temperature rise and snowmelt and brings large amounts of precipitation with it.

Duration

Three days in May with an extreme amount of precipitation and an abnormally high rate of water flow for four weeks

Rate of water flow

- 3,500–5,000 m³ per second
- Water level in Mjøsa: Eight metres on the local height scale, (2.75 metres above the highest regulated water level (HRWL)

Consequential events

- Several hundred minor landslides
- Flood defences breached

Comparable events

"500-year floods" like Storofsen in 1789 and Vesleofsen in 1995.

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TABLE 7. Schematic presentation of the results of the risk analysis.

Probability assessment

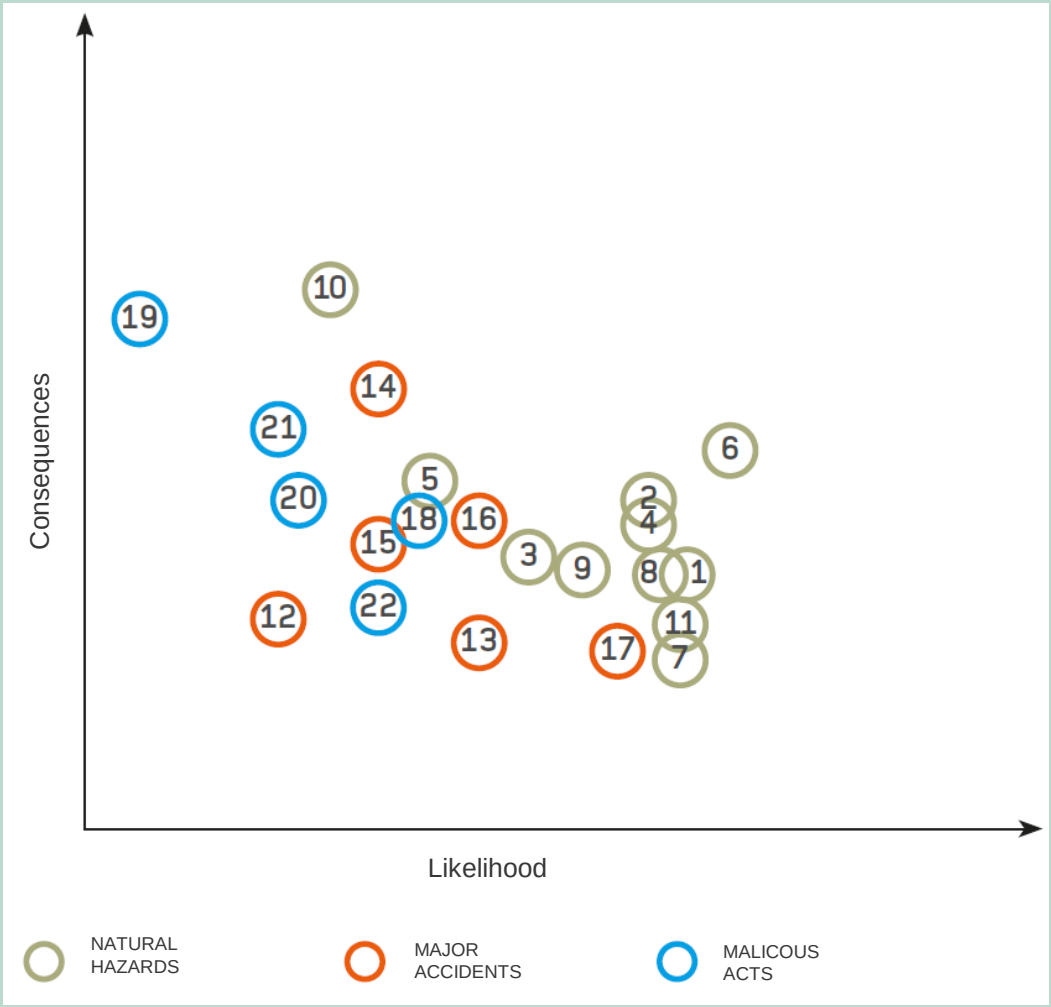
	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH	EXPLANATION
Probability that the event will occur in the course of a year: 0.1–0.2%			◎			Once every 100 to 200 years based on statistical and sectoral analyses.

Consequence assessment

SOCIETAL ASSET	CONSEQUENCE TYPE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH	
Life and health	Death				◎		More than 100 deaths as a consequence of flooding or landslides
	Injuries and illness				◎		500–2,500 injuries or ill people as a direct or indirect consequence
Nature and the environment	Long-term damage	◎					Little permanent damage
Economy	Financial and material losses				◎		NOK 5–10 billion
Societal stability	Social unrest			◎			Inadequate preparedness (underdimensioned flood protection) and difficult rescue work
	Effects on daily life			◎			Approximately 10,000 persons must be evacuated, roads and railways damaged, loss of power
Capacity to govern and control	Weakened national capacity to govern						Not relevant
	Weakened territorial control						Not relevant
OVERALL ASSESSMENT OF CONSEQUENCES				◎			Overall moderate consequences

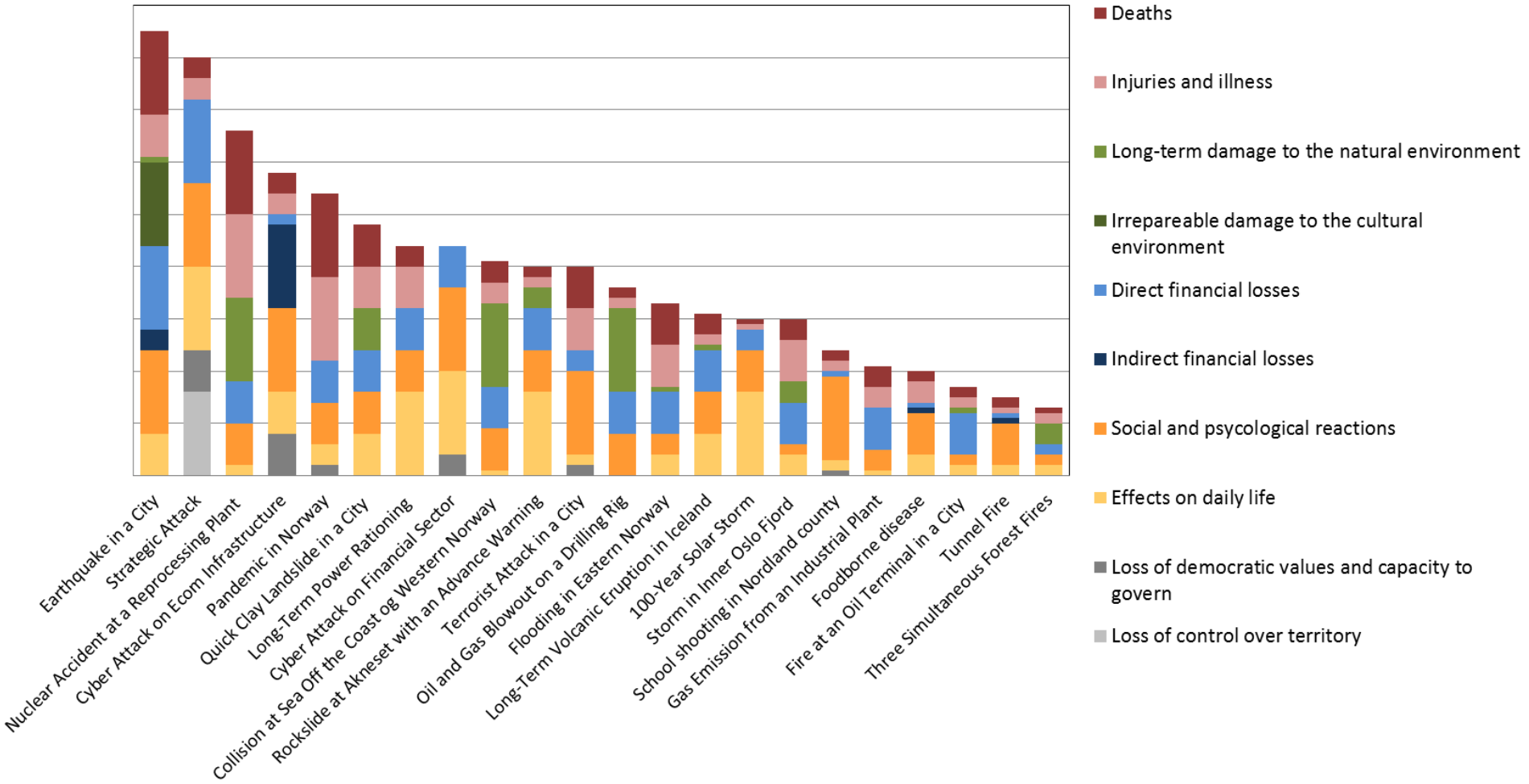
Low uncertainty ◎ Moderate uncertainty ◎ High uncertainty ◎

Scenarios in a risk matrix



1. Storm in Inner Oslo Fjord
2. Long-Term Power Rationing
3. Flooding in Eastern Norway
4. Rockslide at Akneset with an Advance Warning
5. Quick Clay Landslide in a City
6. Pandemic in Norway
7. Three Simultaneous Forest Fires
8. 100-Year Solar Storm
9. Long-Term Volcanic Eruption in Iceland
10. Earthquake in a City
11. Foodborne disease
12. Gas Emission from an Industrial Plant
13. Fire at an Oil Terminal in a City
14. Nuclear Accident at a Reprocessing Plant
15. Oil and Gas Blowout on a Drilling Rig
16. Collision at Sea Off the Coast og Western Norway
17. Tunnel Fire
18. Terrorist Attack in a City
19. Strategic Attack
20. Cyber Attack on Financial Sector
21. Cyber Attack on Ecom Infrastructure
22. School shooting in Nordland county

Overall consequences broken down to the different types of consequences



Macro-Regional Risk Scenarios

- DSB is engaged in flagship projects under the Policy Area Secure of the EU Strategy of the Baltic Sea Region (EUSBSR)
- 2012-13: The 14.3 project
- 2015-2016: From Gaps to Caps
- The *14.3 project* aimed to develop scenarios and identify gaps for all main hazards of the Baltic Sea Region, including winter storms and floods.
- Based on recommendations and result from 14.3, *From Gaps to Caps* will further contribute to strengthening the macro-regional capacities for risk assessment and to establish efficient crisis management schemes in the BSR

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Ministerial audits – civil protection

- Norwegian directorate for Civil Protection (DSB) has been responsible for the implementation of ministerial audits since 2004
  - five to six audits a year
- Documentation of routines, plans, budgets letters and reporting relevant for the topic
- Verified through interviews
- Subordinate agencies are selected based on their essentialness in civil emergency planning
- Documentation and interviews in selected subordinate agencies (same practice and method)

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- http://www.dsb.no/Global/Publikasjoner/2015/Andre/NRB_2014_english.pdf

- http://www.14point3.eu/
- http://www.gapstocaps.eu/