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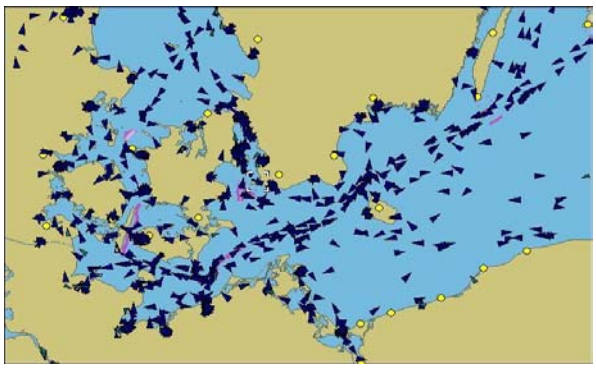
Automatic Identification System (AIS) and risk-based planning of Hydrographic surveys in Swedish waters



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Swedish Maritime Administration

FIG Working Week 2008, Stockholm, 17th of June 2008

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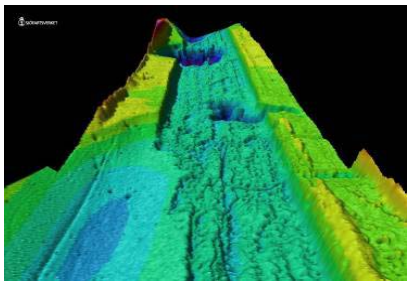
Aims

- to show and discuss how planning of hydrographic surveying can be and has been risk-based by using AIS-data
- to address obstacles to and possibilities with such a risk-based approach



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Questions to be answered

- Where to conduct Hydrographic surveys in order to reduce the grounding risk as much as possible?
- How to use Automatic Information System (AIS)-information in such a risk-based approach?
- What possible pitfalls are there by using AIS-information?

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Shipping in the Baltic Sea

- 2000 vessels (with AIS-transponders) any time
- Tendency of larger and then primarily wider vessels
- Oil transport is increasing rapidly
- Navigation, communication and manoeuvring are more markedly dependent upon technical systems offshore and onshore
- Archipelagos and dense traffic make navigation in some areas difficult
- Fragile area with a unique mix of marine, freshwater and other species specially adapted to its brackish conditions
- Has been classified as Particularly Sensitive Sea Area

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Automatic Identification System

- Originally developed to provide mariners with more information than can be obtained via radar
- By using two VHF radio channels, information about vessels and voyages is transmitted in short data packets at clearly defined and synchronised intervals as messages
- The message consists of static, dynamic and voyage-related information

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AIS- information

Static information	Dynamic information	Voyage related information
Maritime Mobile Service Identity	Ship's position with accuracy indication and integrity status	Ship's draught
Call sign and name	Position Time stamp in UTC	Hazardous cargo (type)
IMO Number	Course over ground (COG)	Destination and Estimated Time of Arrival (ETA)
Length and beam	Speed over ground (SOG)	Route plan (waypoints)
Type of ship	Heading	Number of persons onboard
Location of position fixing antenna	Rate of turn (ROT)	
Height over keel		

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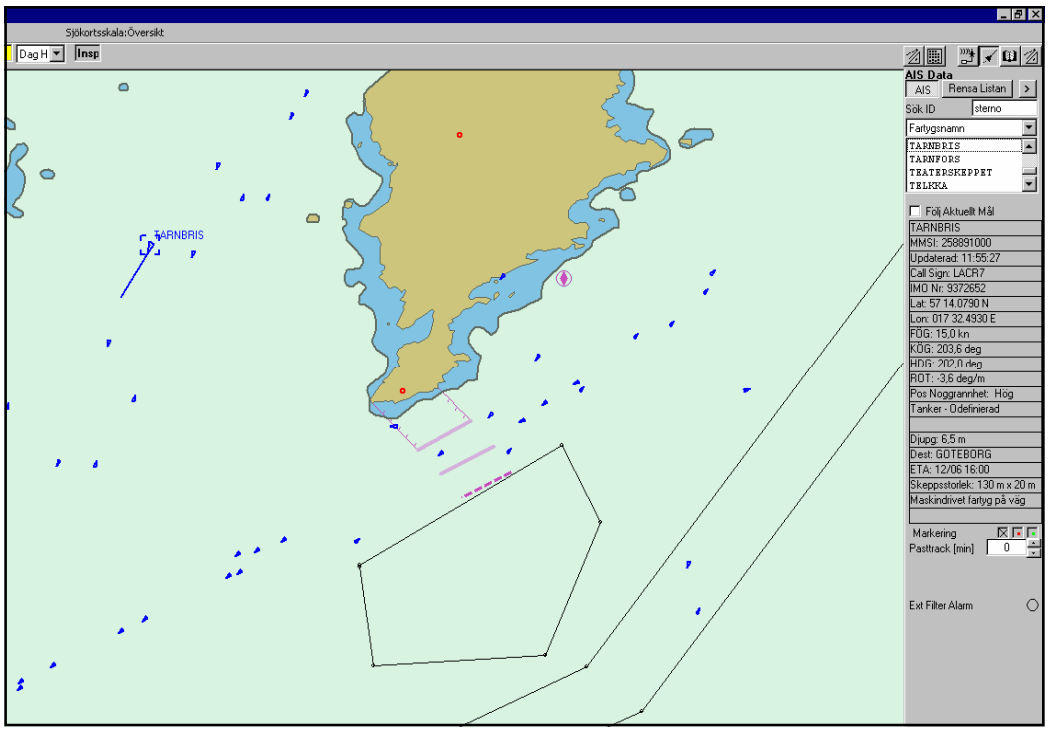
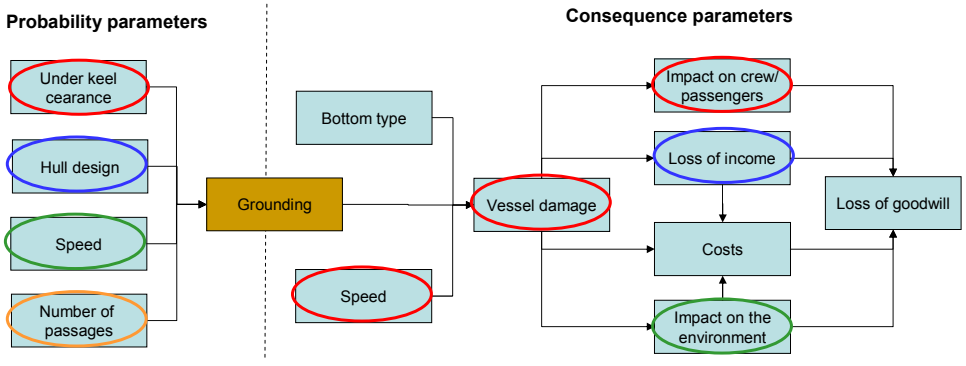


Risk related parameters and AIS-information

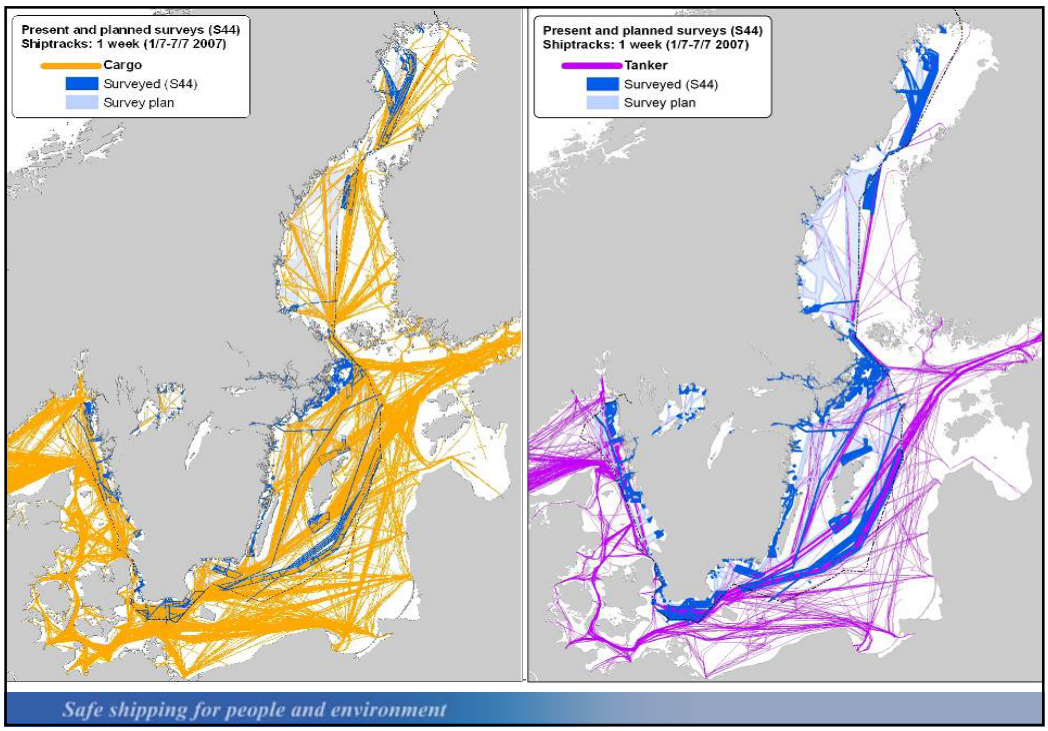


Ship´s draught
Type of ship
Speed over ground
AIS-statistics

Speed over ground

Type of ship

Number of persons onboard
Type of ship
Length and beam
Hazardous cargo


Present and planned surveys (S44)
Shiptracks: 1 week (1/7-7/7 2007)
Cargo
Surveyed (S44)
Survey plan
Present and planned surveys (S44)
Shiptracks: 1 week (1/7-7/7 2007)
Tanker
Surveyed (S44)
Survey plan
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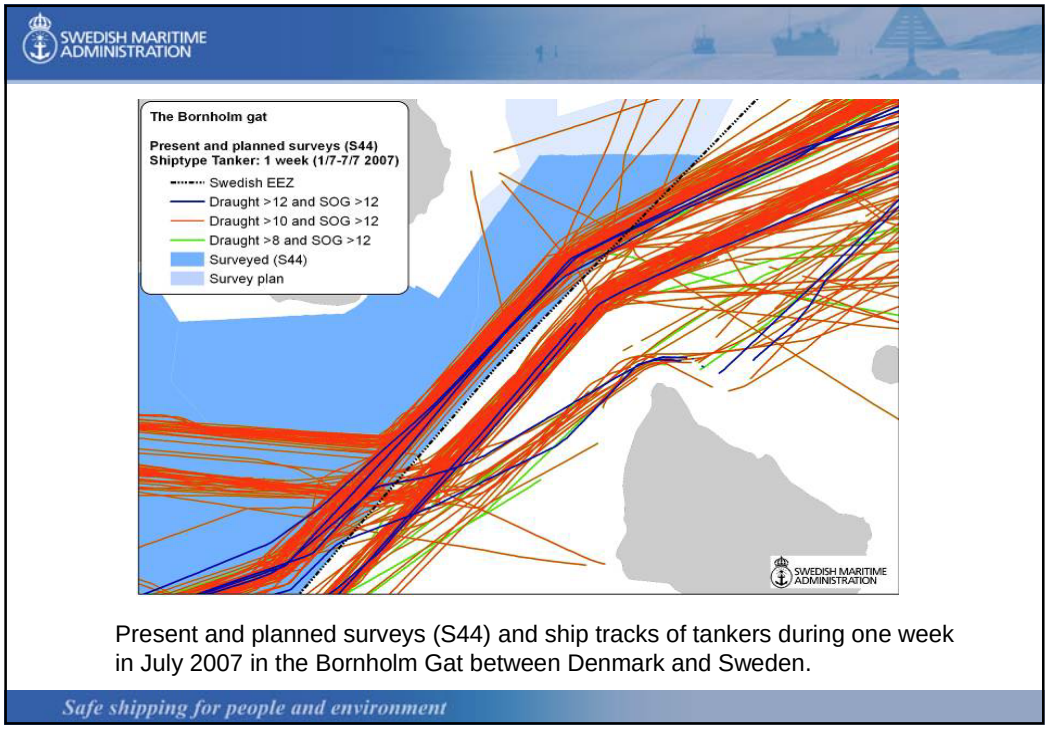
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The Bornholm gat
Present and planned surveys (S44)
Shiptype Tanker: 1 week (1/7-7/7 2007)
Swedish EEZ
Draught >12 and SOG >12
Draught >10 and SOG >12
Draught >8 and SOG >12
Surveyed (S44)
Survey plan
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Present and planned surveys (S44) and ship tracks of tankers during one week in July 2007 in the Bornholm Gat between Denmark and Sweden.
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Pitfalls

- Future needs of surveying might be different than present and historical traffic imply
- Draught data has to be changed by the mariner
- Estimating risk levels by combining various parameters of importance for both grounding probabilities and consequences is not an easy task

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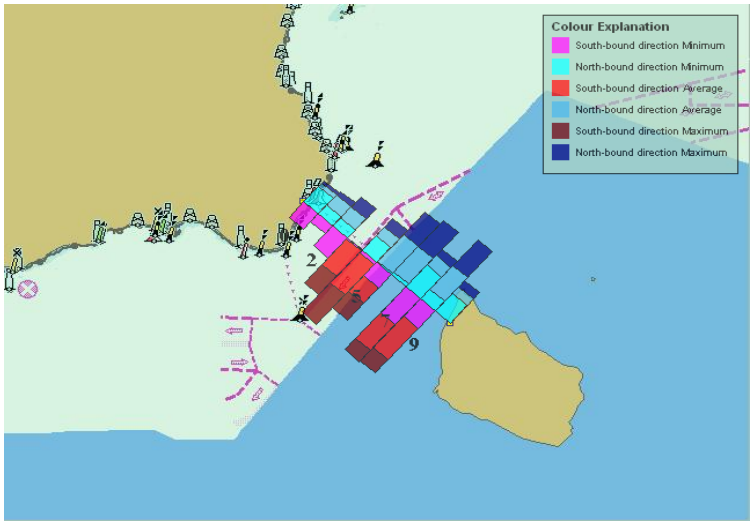

Draught distribution for tankers in the Bornholm Gat between the 1st of July and 31st of December 2007.

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Conclusions

- AIS-data can be used in order to consider the grounding risk as a basis for planning of Hydrographic surveying in Swedish waters
- AIS has so far contributed to the planning of surveying but further development is looked for. *Uncertainty in addressing the future grounding risk can cause either costs for grounding accidents or costs for a non-optimal priority of Hydrographic surveying.*
- There are pitfalls related to the utilisation of historic tracks for future traffic estimation, input of draught data and estimation of risk level by balancing different parameters.

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Thank You for the attention!

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