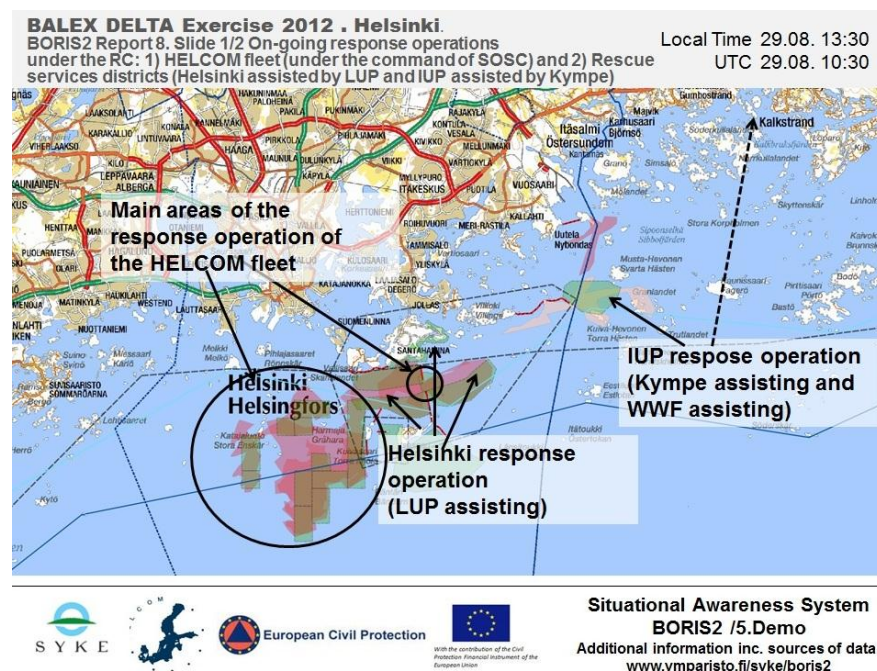


## BORIS

### A Common Situation Awareness System for Finnish Authorities Participating in Oil Spill Response

#### Test results from BALEX DELTA 2012 exercise



**Figure 1. Copy of one of the Situation awareness reports distributed by SYKE during the BALEX DELTA 2012**

BORIS 2.0 is an internet based GIS-system for Finnish authorities participating the oil response operation. BORIS 2.0 was developed under a project called BORIS2.

During BALEX DELTA 2012 exercise BORIS was at pre-operational stage and SYKE jointly with other national authorities used the system first time for sharing and communicating the situational awareness picture among each other. After the exercise BORIS development continued and at the beginning of 2013 BORIS was officially taken into service. The development of the system is still ongoing.

There were two main reasons why SYKE decided to use the BORIS system at BALEX DELTA 2012 exercise: First one was to test the system and another one was to utilize BORIS to provide best available situational awareness information for the oil response organization and for the observers of the BALEX DELTA 2012.

BORIS development team knew that during an oil spill response operation many different authorities would update BORIS with information through many kinds of data connections simultaneously. Consequently BORIS was to be under heavy user load during a major oil spill which BALEX DELTA 2012 exercise was simulating. Thus SYKE considered the exercise a good opportunity to gain experiences on the usability and stability of the BORIS system under simulated conditions.

SYKE prepared a BORIS testing plan for the BALEX DELTA 2012 and trained about 50 officials from Rescue Services Districts, Navy, Finnish Border Guard, Vessel Traffic Services, Finnish Meteorological Institute and SYKE to feed information to the BORIS system during BALEX DELTA 2012. During the exercise several authorities fed information to BORIS according to the testing plan:

Authority commanding the BORIS-user	BORIS-user	Information fed to BORIS
RC and SYKE's duty officer	SYKE's Pollution Response Unit	- General information about the operation and the BD 2012 response organization - Location and estimated drifting of the simulated oil slicks
SOSC (under RC)	Navy Officer on board of the ORV Louhi	Response areas of national and international strike teams at open sea
Strike teams, ORVs (under SOSC)	Officers on board of the ORVs Louhi, Hylje and Merikarhu and YAG Halli	Situation reports in text format and photographs on the response measures
Rescue Services Districts operating nearby island Isosaari (under the command of Helsinki City Rescue Department)	Officers of the Rescue Services Districts operating nearby island Isosaari	Response areas of the strike teams near the coastline and at coastline
Helsinki City Rescue Department (under RC)	Officer of the Helsinki City Rescue Department	Planned boomings - to steer the oil to recovery sites - to protect sensitive areas
Finnish Border Guard (under RC)	Officers of the MRSC Helsinki and MRCC Turku	Aerial surveillance information, simulated oil slicks
Finnish Meteorological Institute (under RC)	Meteorologists on duty	Drifting calculations for the simulated oil slicks (even if there were some technical problems with BORIS)

Due to some (below described) technical problems the BORIS-users on board of the oil response vessels and boats couldn't feed all the planned information to BORIS.

On the bases of the BORIS situational awareness reports and other sources SYKE's Pollution Response Unit prepared eight situational awareness picture reports during the BALEX DELTA 2012 exercise and distributed the reports in pdf-form by email to BALEX DELTA 2012 oil response organization, to some main stakeholders and to observers:

- Balex Delta 2012 Exercise Leader
- Response Commander (RC) and SYKE duty officer
- Commanders and the HELCOM fleet of the Open Sea Operation (SOSC, NOSCS, Masters of the Vessels of the HELCOM fleet)
- SYKE Crisis Ad hoc Group
- SYKE Communications Unit
- Professional Secretary of the HELCOM Response Group, Exercise Evaluation Team
- Observer's vessel

## Lessons learnt

BALEX DELTA 2012 was a good opportunity to test the pre-operational system BORIS. BORIS development team gained important information on the usability and stability of the system and has according to this information continued BORIS development. The main findings related to the BORIS system were:

1. It turned out, that until the third exercise day the BALEX DELTA 2012 -data amount at BORIS got so huge, that the 3G data bandwidth was not large enough. Because of this the vessels at sea were not able to view the data anymore during the third exercise day. It is assumed, that the 3G link tower that was assembled on one of the islands prior the exercise reached its maximum data through put capability.
  - ⇒ After the exercise the way BORIS delivers the datasets to users has been redesigned and the amount of data transferred (in bytes) is currently only 10% of the data amount

- delivered during the exercise. It is assumed, that the 3G link tower's capacity would be enough for the current BORIS.
- ⇒ SYKE jointly with other governmental authorities has taken an initiative to develop data connections at sea through the lead vessel of the oil recovery fleet. This would improve internet connections and thus also BORIS connections of the whole recovery fleet.
2. During BALEX DELTA 2012 some elementary features were still lacking from BORIS pre-operational version. This demanded extra patience from the BORIS-users. The co-operation between different authorities was anyway really good and BORIS-users came up with good workarounds to utilize BORIS.
    - ⇒ Since BALEX DELTA 2012 BORIS-development team has improved BORIS in many ways and during 2013 still new features will be add to BORIS
  3. The BORIS-user feedback indicated that to utilize BORIS in a most efficient way there is a need to develop common procedures for example to nominate the BORIS data in a coherent way
    - ⇒ In 2013 SYKE has invited more authorities to BORIS training and will probably arrange also BORIS workshop and table-top exercises.
  4. BORIS users were highly motivated and innovative to utilize BORIS and It was recognized that BORIS will be an effective tool for the oil spill countermeasure management in the future.
  5. Co-operation with Finnish Meteorological Institute (FMI) worked well. Timely weather forecasts and drift calculations delivered by the BORIS will at real case help the recovery fleet and the Command Centres. (During BALEX DELTA 2012 the real weather differed from the exercise scenario. To avoid confusion, SYKE didn't distribute the results and products of FMI to other authorities as it would do during a real case.)
  6. SYKE Crisis Ad hoc Group formed from the top management gave criticism on the BORIS pdf pictures. As the crisis team members are not operational responders they had difficulties to interpret the BORIS maps.
  7. HELCOM Expert Evaluation Team (EET) noted in it's evaluation report that "To take proper responsibility of the existing international compensation regime, comprehensive logging of decisions and activities is required. It would appear that BORIS[2] has great potential in this regard."
  8. EU Civil Protection team of DG ECHO (CP-team) noted that "The suitability and usability of BORIS 2 has clearly made it invaluable in a response to a marine pollution emergency." but also reminded SYKE that "..., the focus given to training by the Finnish authorities should guard against any loss of knowledge due to long periods between activations of BORIS[2]."

Additional information on:

- Environmental Emergency Response in Finland <http://www.environment.fi/oil>
- BALEX DELTA 2012 exercise <http://www.syke.fi/balexdelta2012>
- BORIS2 project and BORIS 2.0 Situation awareness system [http://www.syke.fi/en-US/Services\\_\\_Data/Research\\_and\\_development\\_projects/Projects/Situation\\_awareness\\_system\\_for\\_environmental\\_emergency\\_response\\_BORIS\\_2](http://www.syke.fi/en-US/Services__Data/Research_and_development_projects/Projects/Situation_awareness_system_for_environmental_emergency_response_BORIS_2)

Attachments

Annex 1 Reconstruction of BALEX DELTA 2012 operation through BORIS views

## Reconstruction of BALEX DELTA 2012 operation through BORIS views

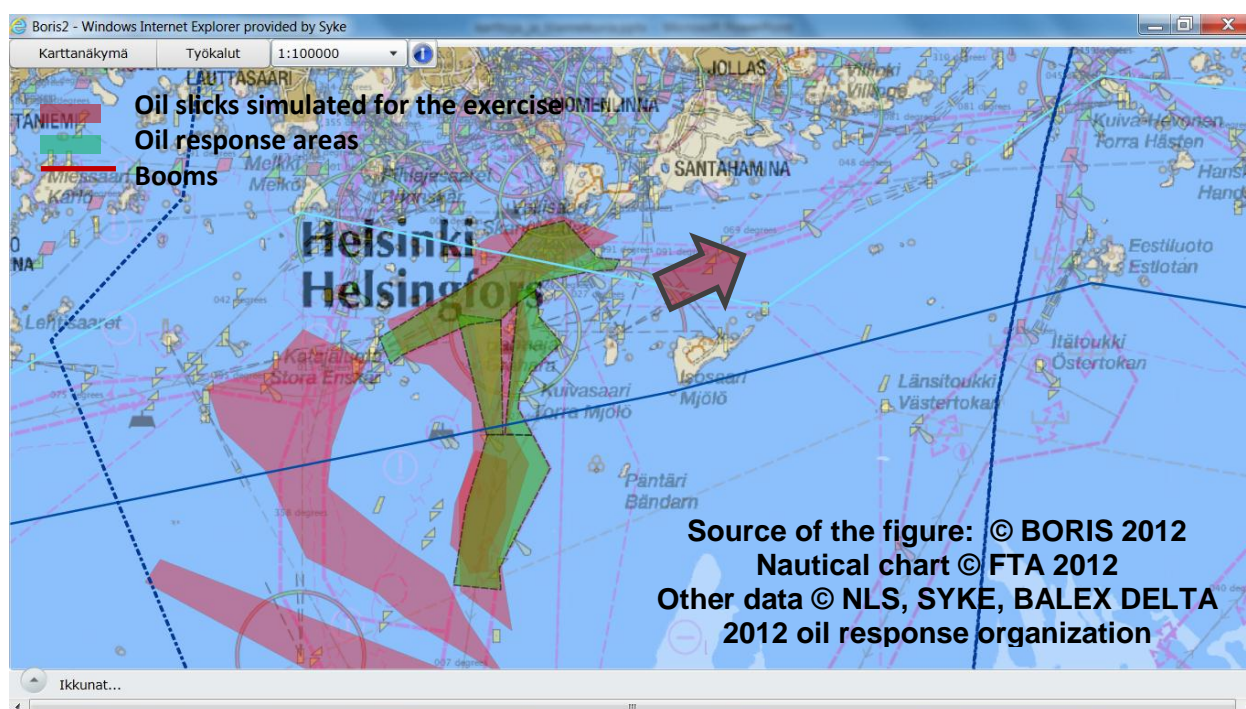


Figure. 1.

### National at sea exercise 28.8.2013: Starting the oil recovery under the command of SOSC at sea

The alerts were conducted and the RC and SOSC nominated. SYKE informed the RC and the other oil response organization about the oil drifting scenario and requested aerial surveillance from Finnish Border Guard and oil drifting forecasts from Finnish Meteorological Institute.

SYKE alerted nine Finnish oil response vessels which arrived to the exercise area. The SOSC in cooperation with RC formed strike teams from the oil response vessels and commanded a response area for each of the strike teams. (At the figure from the BORIS -system the simulated oil slicks are illustrated with red color and the response areas with green color.) The four national strike teams and their response areas from SSW towards NNE were 1) ORV Louhi and YAG Halli. 2) ORV Uisko. 3) ORV Merikarhu. 4) ORVs Seili, Linja, Oili 1 ja Oili 3.

Finnish Meteorological Institute calculated oil drifting forecasts with real weather forcing for BORIS but the results of the drifting forecasts were not illustrated at BORIS during BALEX DELTA 2012. The main reason for this was that the real weather forcing made the results of drifting calculations inconsistent with the exercise scenario. To underline the exercise scenario SYKE fed BORIS simulated drifting forecasts and forced the simulated oil slicks towards NE (the red arrow at the figure).



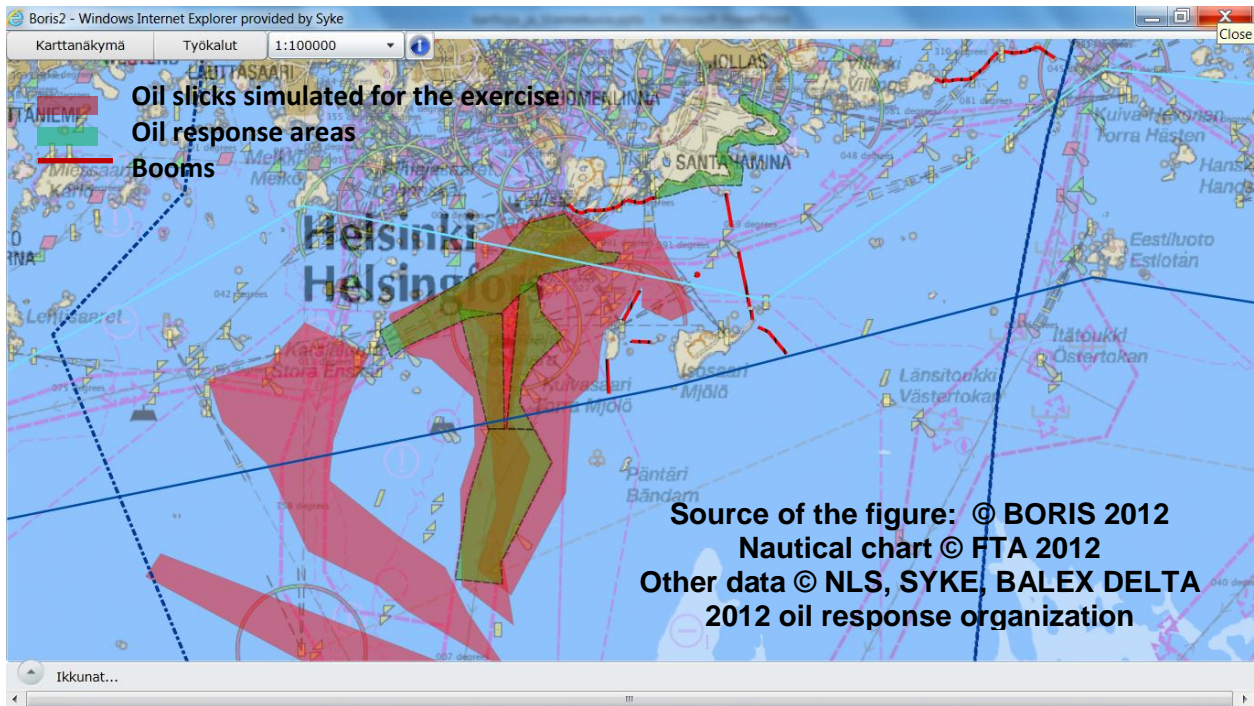


Figure 2.

**National exercise at coastal and onshore areas 28.8.2012: Rescue Services Districts were conducting boomings and starting onshore activities**

According to the exercise scenario the vessel "POOR LUCK" was towed from open sea towards the sheltering coastline and archipelago and finally anchored between Santahamina and Isosaari. At the beginning of the national exercise the MIRG team circulated the vessel by booms. (a red dot at the figure).

Helsinki City Rescue Department (assisted by Länsi-Uusimaa Department for Rescue Services) planned and conducted boomings to steer the oil between Santahamina and Isosaari and to protect the sensitive areas. (the red lines at the figure).

Itä-Uusimaa Emergency Services (with the assistance of Kymenlaakso Rescue Department) conducted boomings eastward from the islands Kuivahevonon. Due to some technical problems these boomings were not fed into the BORIS-system.

Onshore Santahamina the beach cleaning units carried out their activities under the command of Helsinki City Rescue Department. (also this response area is illustrated with green color at BORIS).

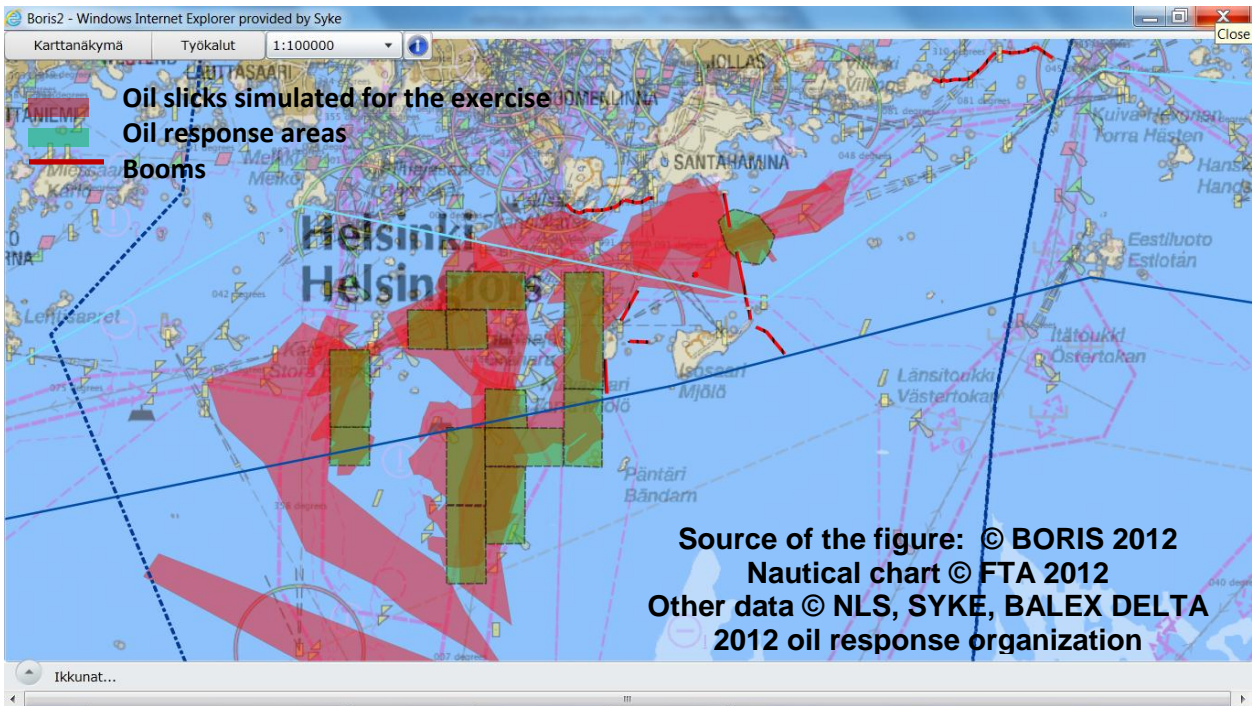


Figure 3.  
**International BALEX DELTA exercise 29.8.2012: At sea oil recovery operation under the command of SOSC.**

HELCOM fleet arrived. The SOSC in co-operation with RC formed strike teams from the oil response vessels and commanded a response area for each of the strike teams. The eleven international strike teams and their response areas from SSW towards NNE were 1) Arkona, 2) Sakiai, 3) Louhi, 4) Varonis, 5) Uisko, 6) KBV302 assisted by the trawling vessels Hjorto and Asko, 7) Hylje assisted by the trawling vessels Vaarlahti and Veto, 8) Seili, 9) Kati, 10) Merikarhu and 11) Kontio. (the green areas at the figure)

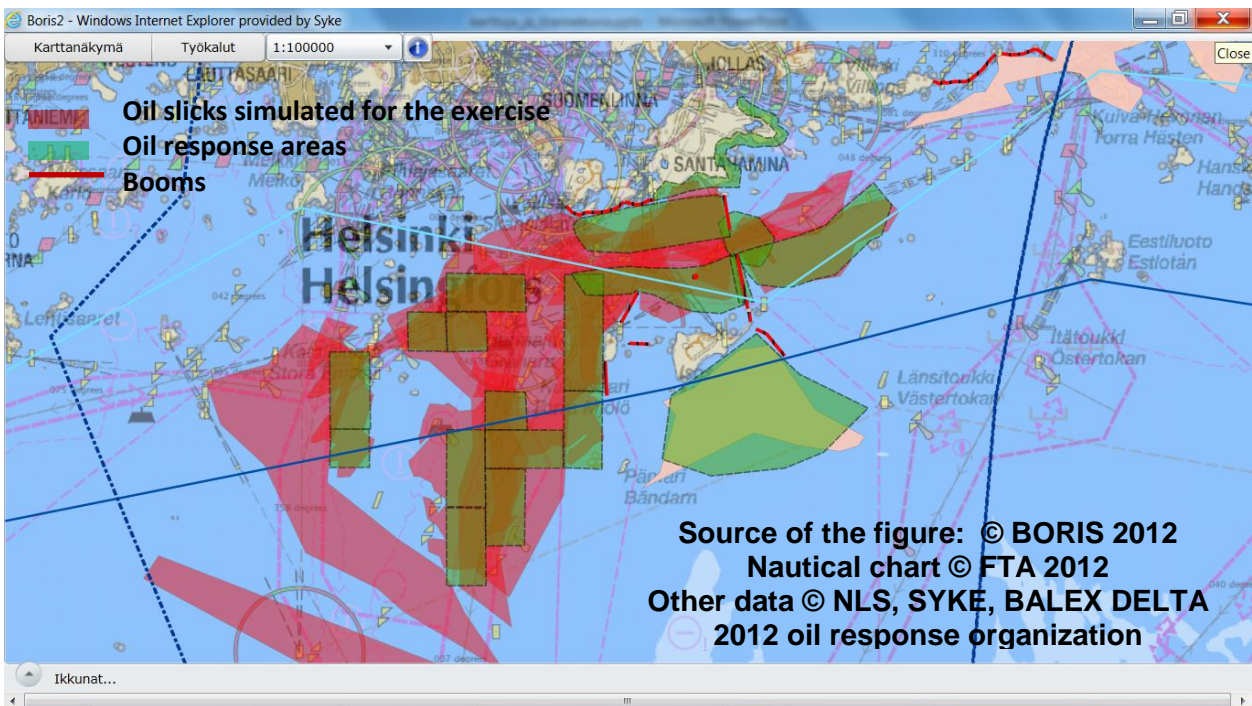


Figure 4.  
**National exercise at coastal and onshore areas 29.8.2012: Oil recovery operation at coastal areas and onshore was continuing under the command of Rescue Services Districts.**

At figure the response areas for both the boats recovering oil from the boomings and beach cleaning units recovering oil from the shoreline are illustrated with green color.