



Risk and vulnerability mapping

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Plan- og
bygningsetaten







Risk and vulnerability assessments

- The risk and vulnerability assessments analysis is a systematic procedure to describe / estimate the risk of "adverse events" that comes suddenly and unexpectedly, in terms of measures to eliminate or reduce risk
- A Norwegian standard:
(NS5814:2008)



Lom og Vågå sommeren 2006. Foto: NGI

The maps of the risk and vulnerability assessments analysis have two main purposes

1. To provide a basis for the risk and vulnerability assessments analysis and selection of the zones requiring special consideration (“faresoner”) and associated regulations and guidelines to the municipal master plan.

Good thematic maps will reduce the need for additional risk and vulnerability assessments maps for the zoning plan, particularly in areas that is not exposed to danger.



Foto: Lars Erik Skjærseth

The maps of the risk and vulnerability assessments analysis have two main purposes

2. To provide a basis for early identification of the risk and vulnerability assessments factors that should or will be required further explored or analyzed in the zoning plan proposal. That will also include the assessment program in cases that require Impact assessments (“KU”) after the new Planning and Building Act.

Good thematic maps will help to ensure the quality and efficiency of the Planning and Building Administration's handling of submitted plans.

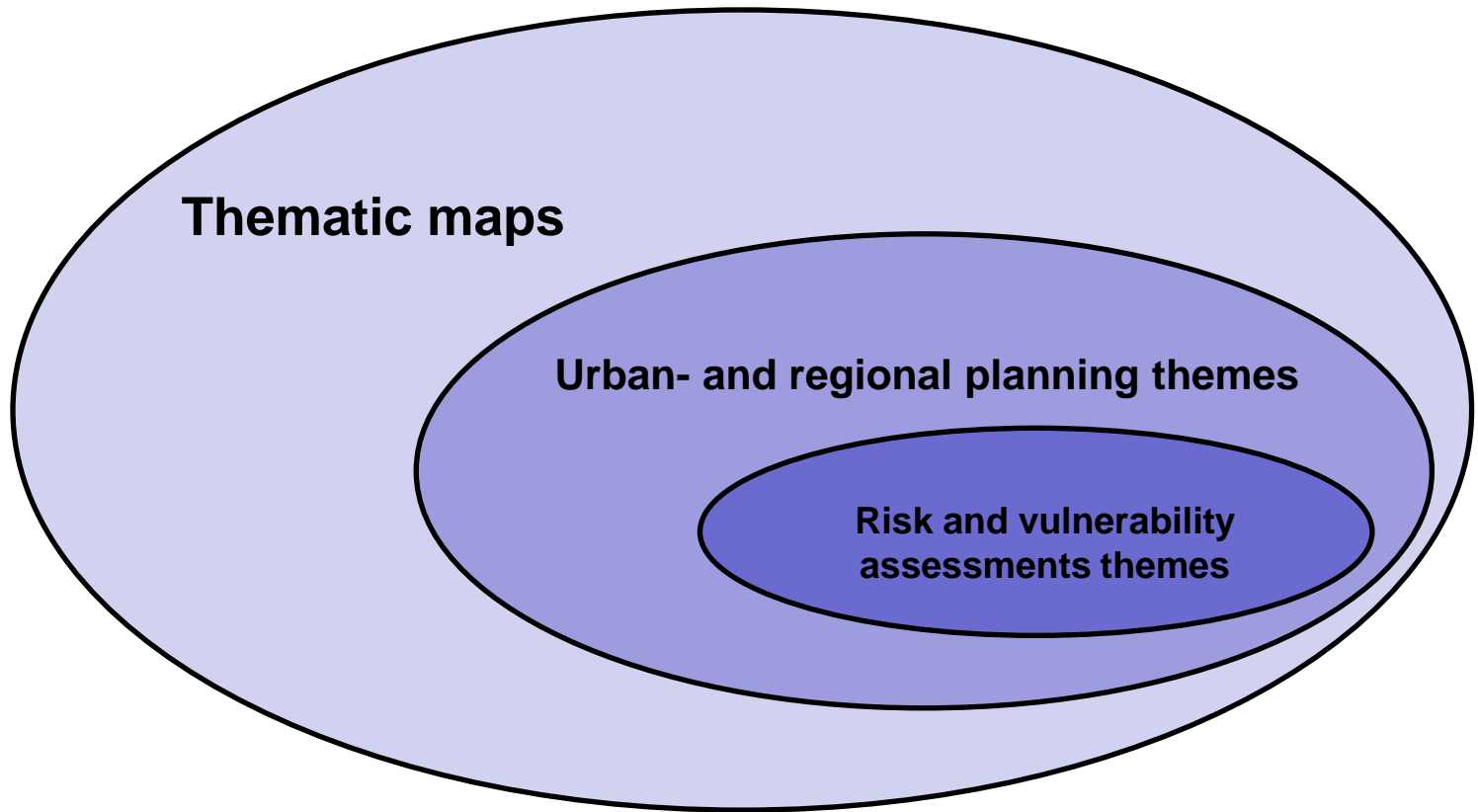


Municipal mapping responsibilities

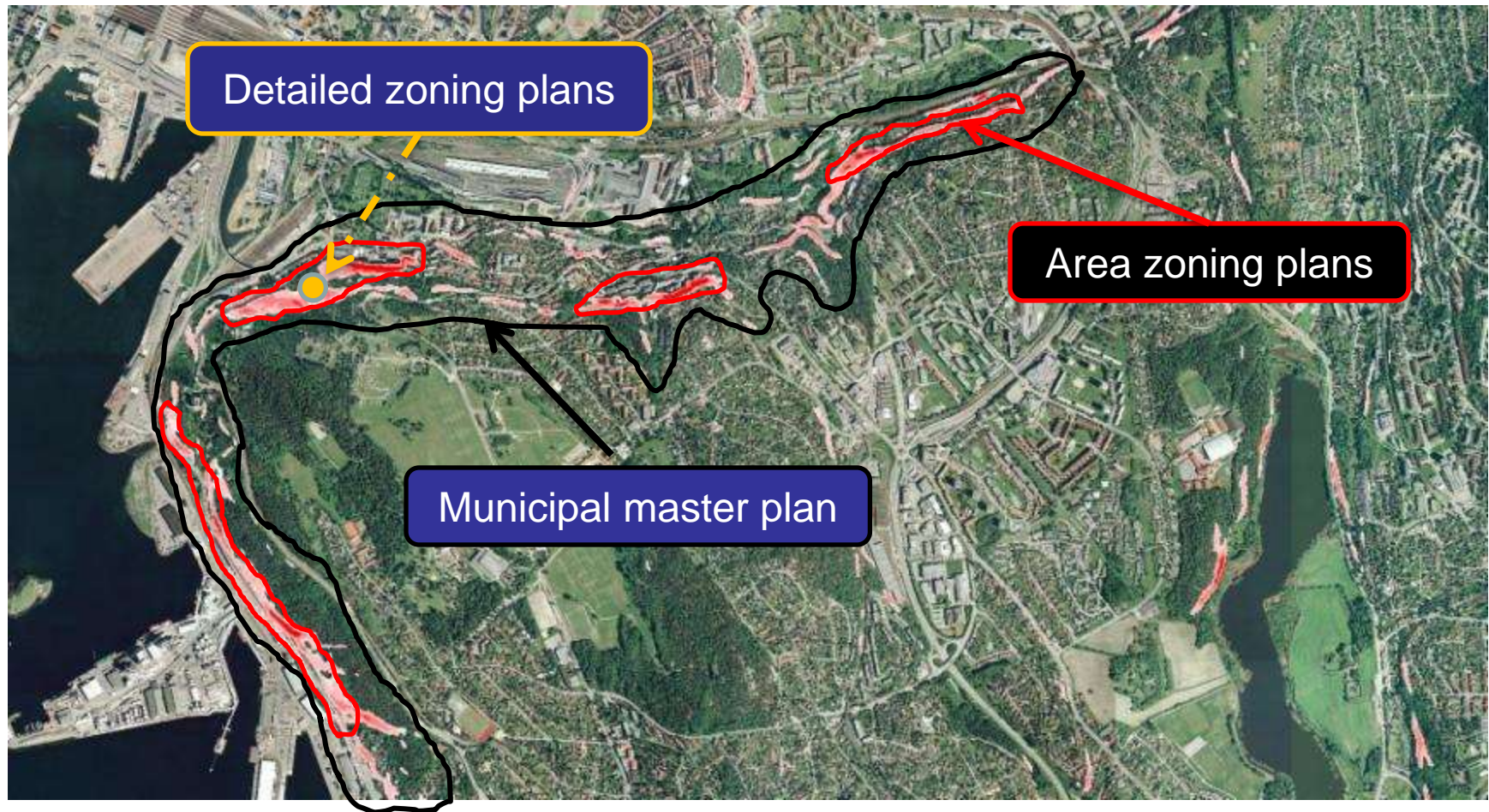
- Municipal risk and vulnerability assessments mapping should therefore be so detailed that in zoning plan cases, where it is not any real risk, it should be enough to show to the **consideration zones** in the municipal master plan.

. *Its here the **main key** to saving efforts both for the developer and the planning authority.*

What shall we map ?



Municipal mapping responsibilities



2010

The municipal master plan



Prevent new vulnerability

- Incremental mapping with increasing levels of detail

Municipal master plan

- Consideration zones – areas with potential hazard

Zoning plan

- ROS analysis / risk assessment documenting that safety regulations (TEK 10) can be fulfilled

Building application

- Documentation is required that buildings are located, designed or secured so that the requirements of technical construction regulations (TEK 10) are satisfied



hazards identified in municipal master plan

- Storm surge level in 2100
- River flooding
- Rock falls
- Quick clay landslides
- Risk enterprises
- surface flooding

Consideration zones

land use category and
thematic maps

General regulations

Storm surge in 2100



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Aktusomhetssoner

Kilde: Plan- og temakartenheten
Dato: 24.03.2014

Tegnforklaring

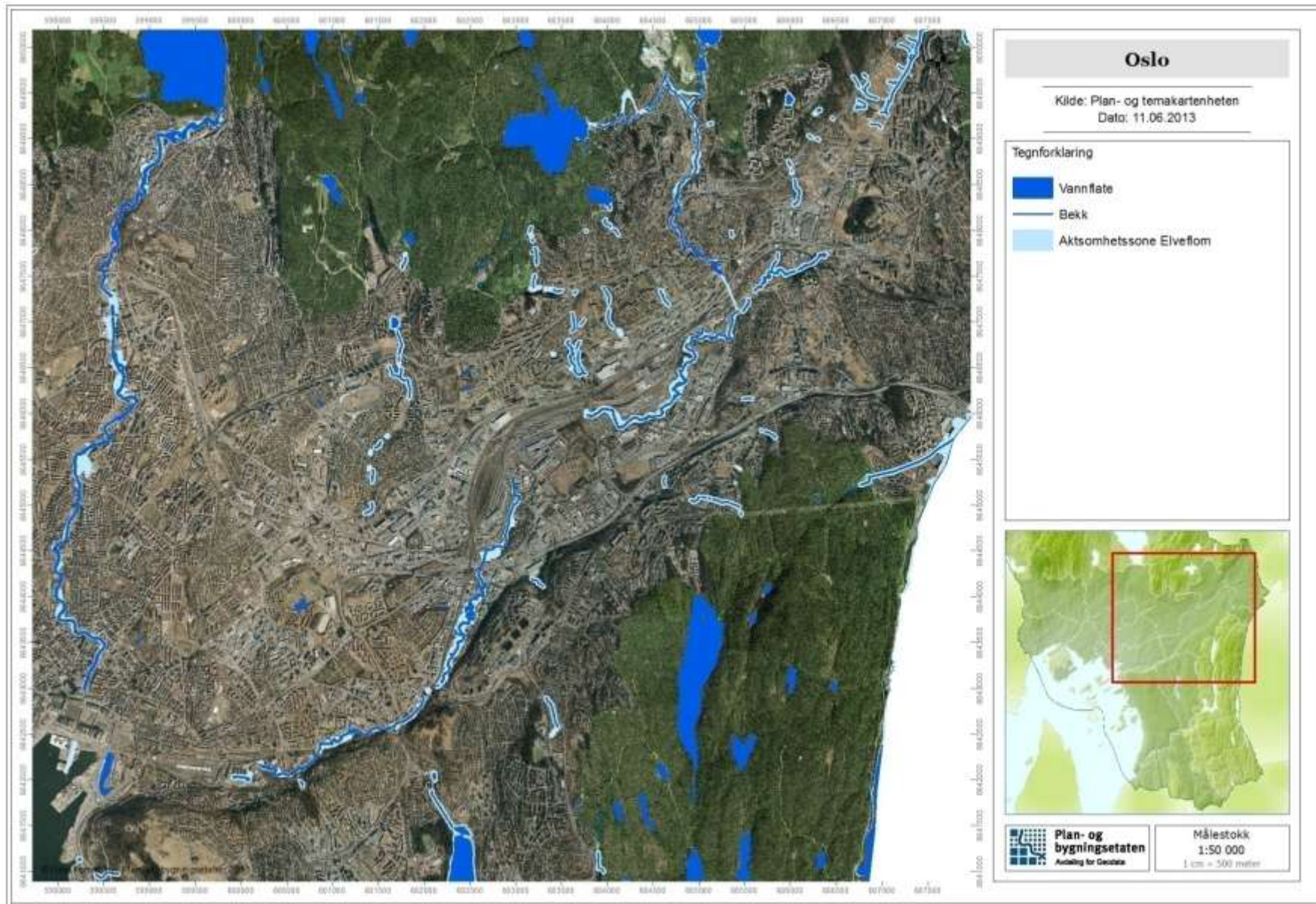
Stormflo år 2100 - 290cm



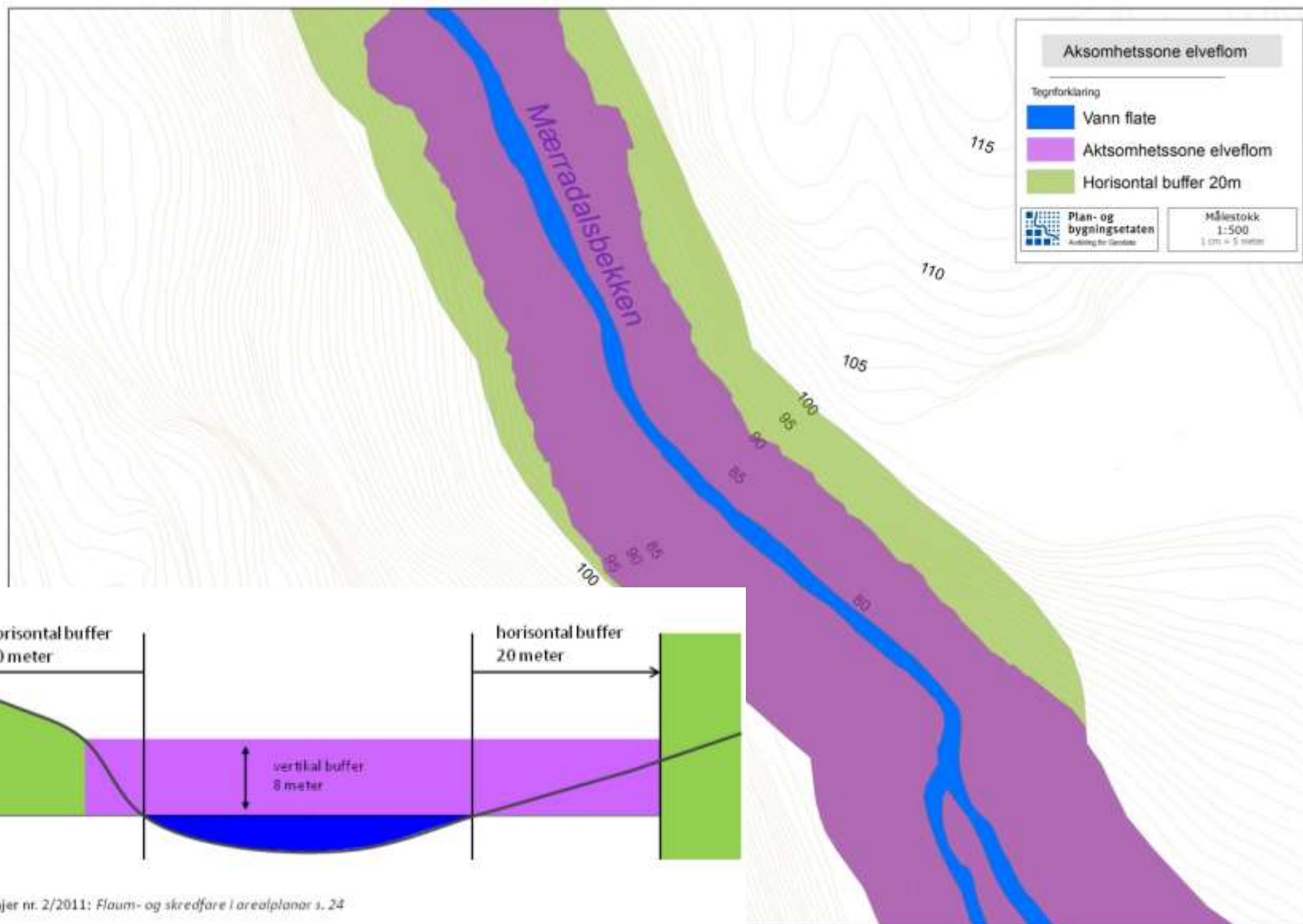
Plan- og
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Avdeling for Geodata

Målestokk:
1:25 000
1 cm = 250 meter

River flooding



Buffer Analysis - Horizontal and Vertical



Rock falls



Consideration zones – rock falls

-

- Rough analysis of the entire Oslo
 - Helning over 30 grader
 - Større enn 200 m²
 - Buffer på 25 m rundt polygonene
- Detailed mapping of vulnerable areas
 - Multiconsult AS
 - NGI
 - Informasjon om eventuell detaljkartlegging finnes på hvert enkelt område (polygon)

Quick clay landslides



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Tegnforklaring

Kvikkleire

Skredfareklasse

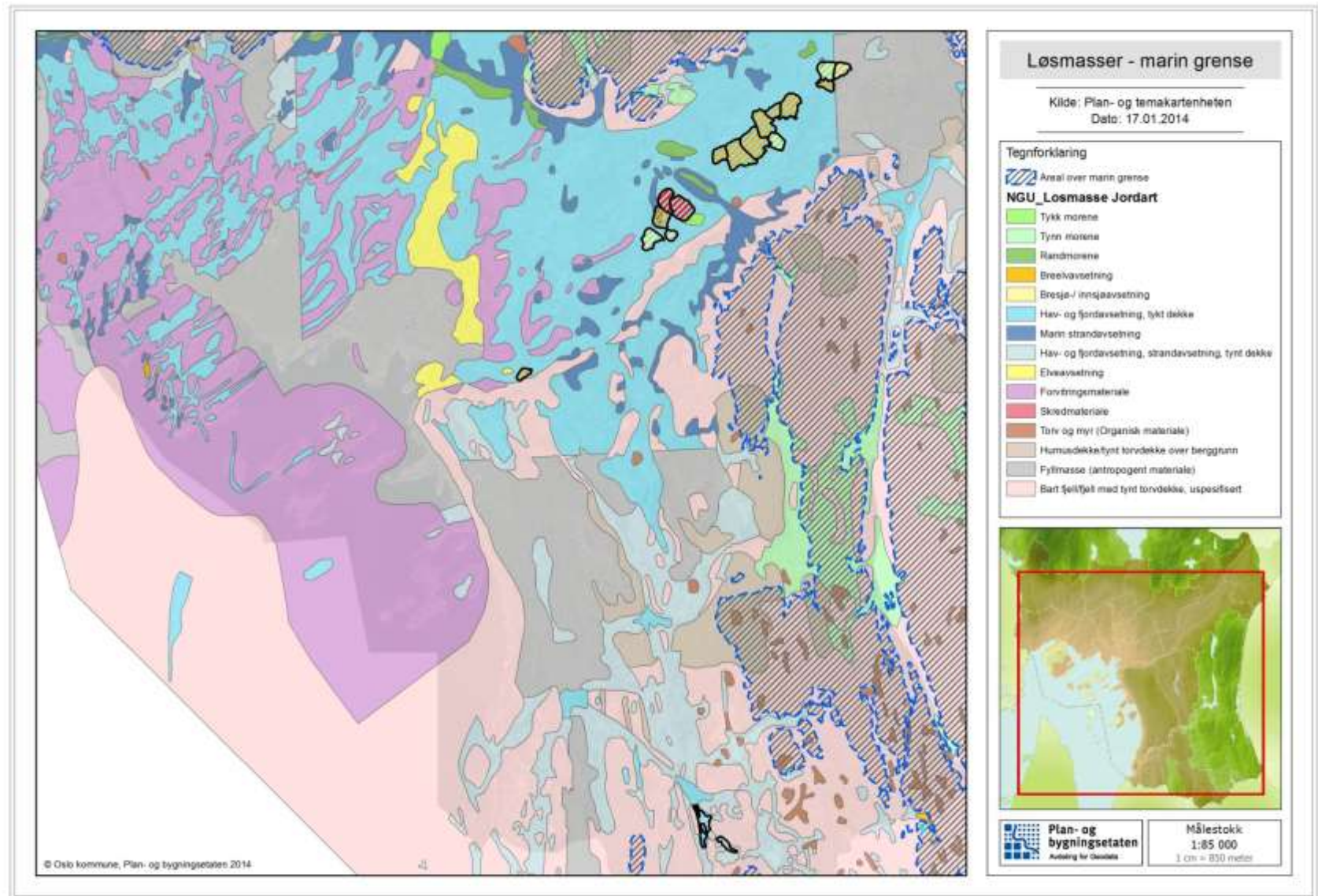
-  Høy
-  Middels
-  Lav
-  Ikke klassifisert



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Avdeling for Geodata

Målestokk
1:75 000
1 cm = 750 meter

Soils - marine limit - Quick clay



Consideration zones – MA establishments



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Tegnforklaring

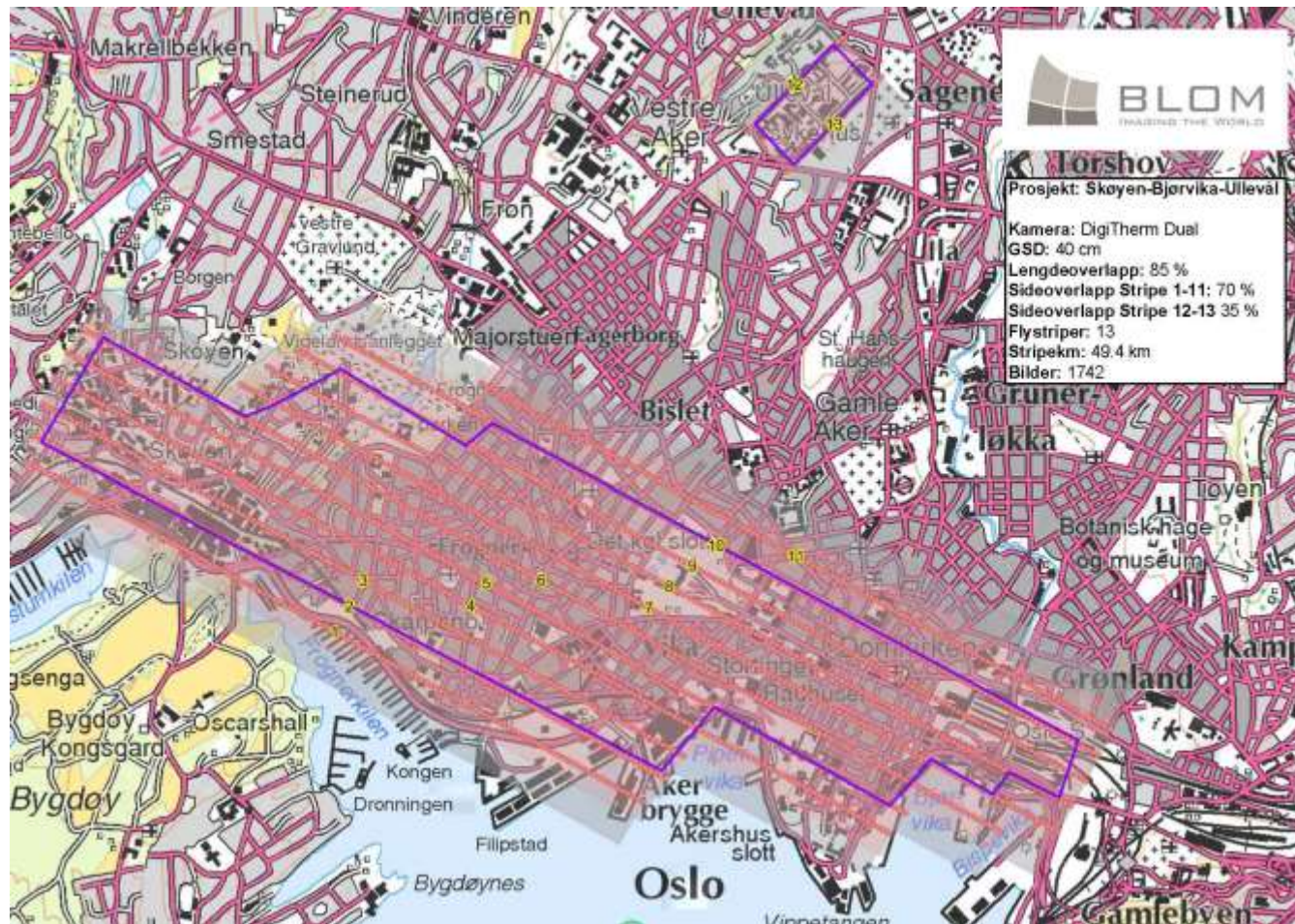
 Storulykke



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Avdeling for Osvolda

Målestokk
1:50 000
1 cm = 500 meter

Test Area heat mapping in 2011



Heated road

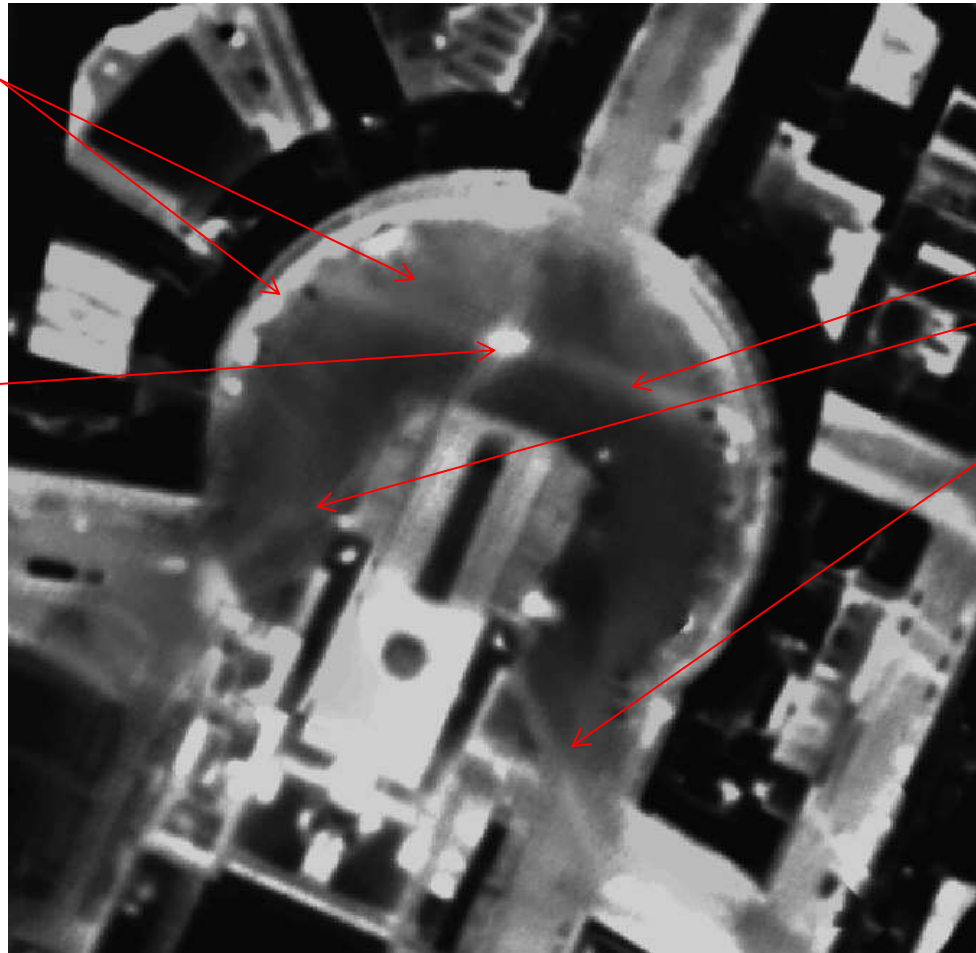


Varm vei

footprint

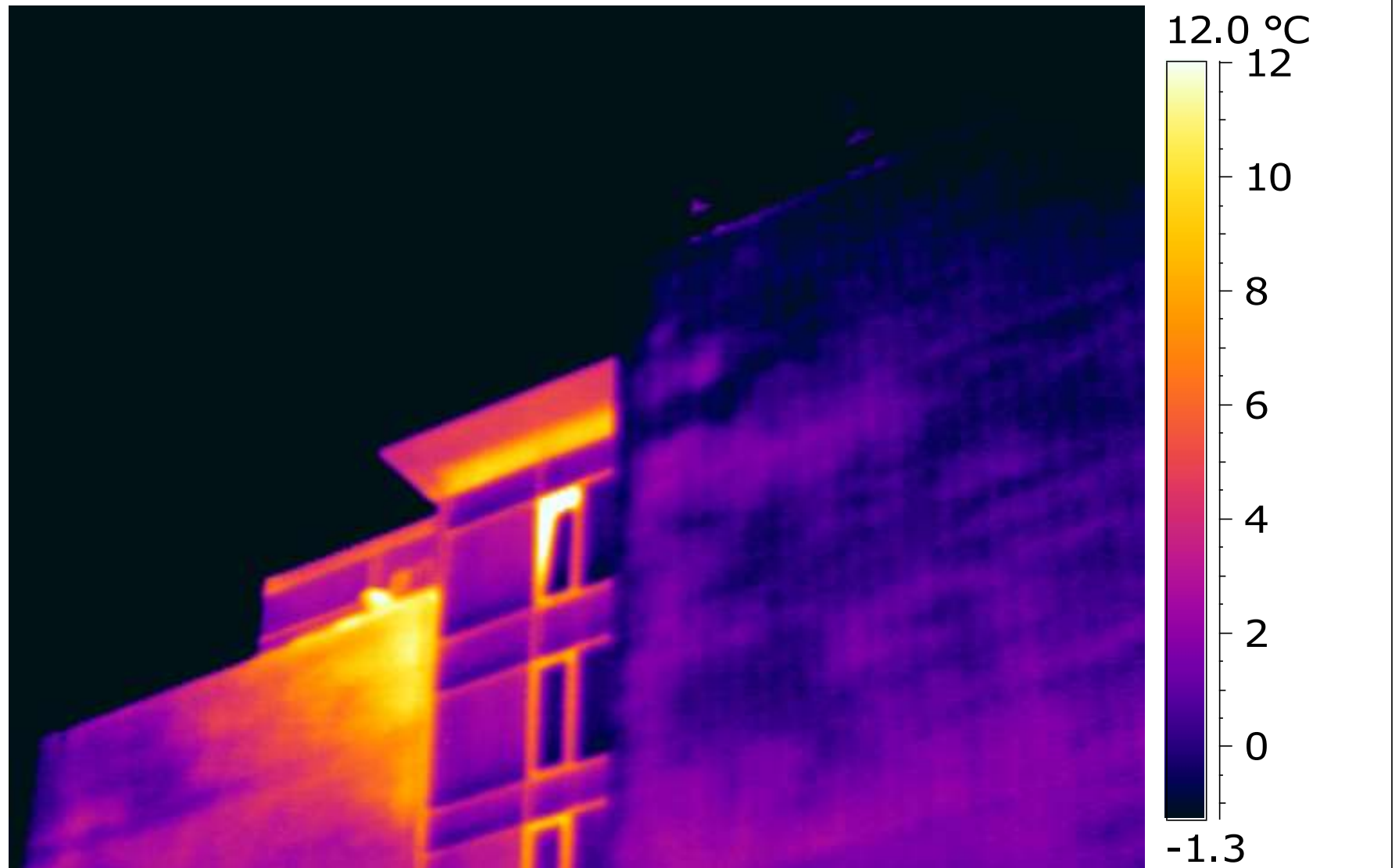
Heat stir
in the ground

manhole covers



Heat stir
in the ground

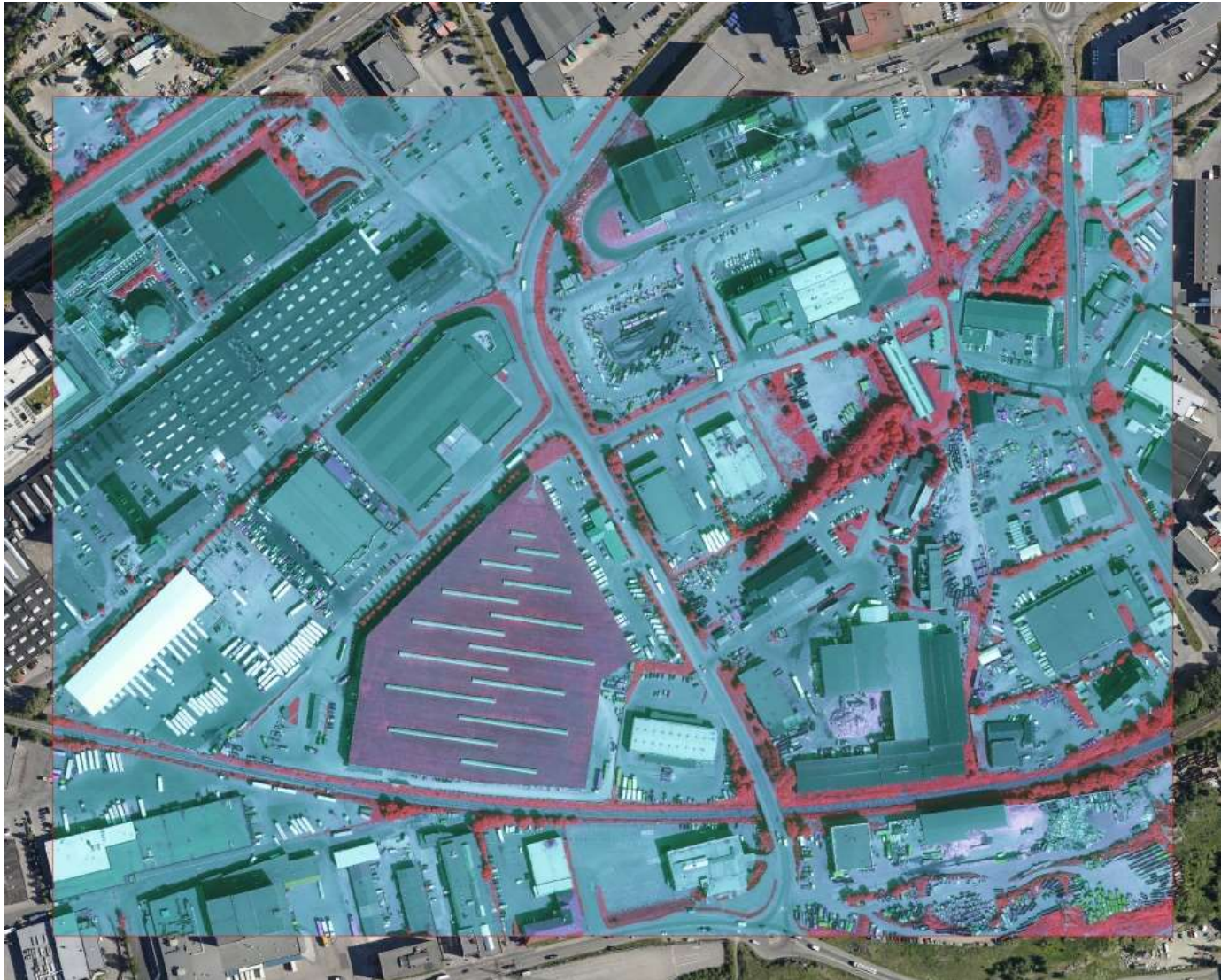
Et vindu er åpent (delvis) og det slipper ut mye varme i forbindelse med ventilasjonsanlegg litt til venstre på bildet. Dette er tatt fra bakken med et FLIR P65 med oppløsning 320 x 240 Pixler.



Green roofs - Haraldrud recycling plant



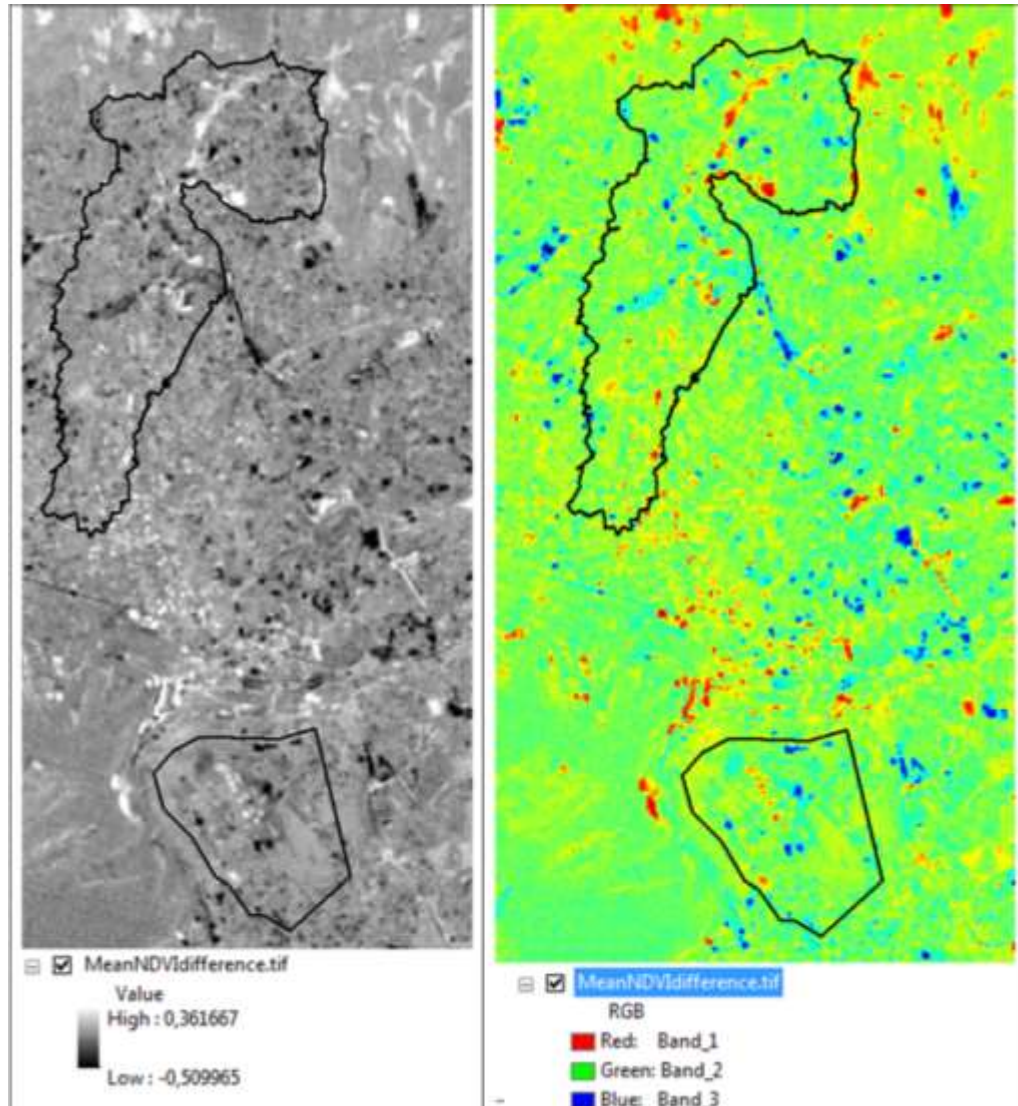
RGB – IR ortophoto



Result



Mapping green spaces from satellite (WW2) - NDVI



Thanks for your attention



3. Juli 2009



7. Juni 2011



3. Oktober 2012



2. Juni 2013