

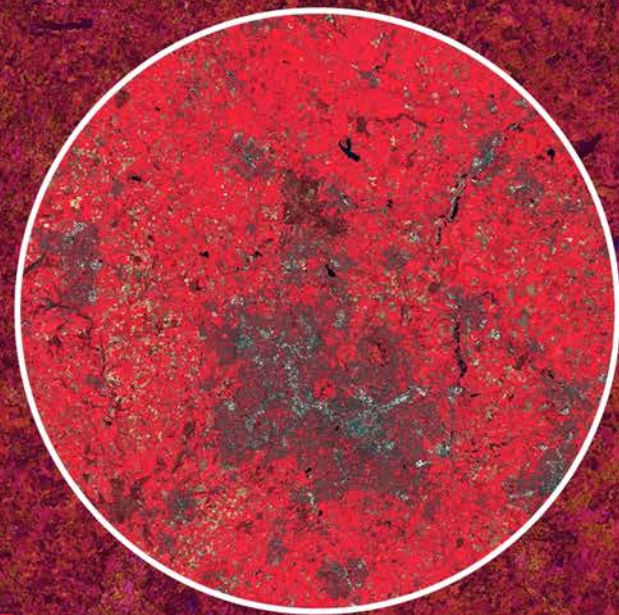
→ 8th ADVANCED TRAINING COURSE ON LAND REMOTE SENSING

10–14 September 2018
University of Leicester | United Kingdom

Urban Mapping - Practical

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Study area

- City of Berlin, Germany
- 891,68 km²
- 3.52 Mio inhabitants
- 52° 31' N, 13° 24' O
- ~ 0.5 Mio street trees
- Extensive park areas and urban forests
- Abundant digital information freely available:
<http://fbinter.stadt-berlin.de/fb/>

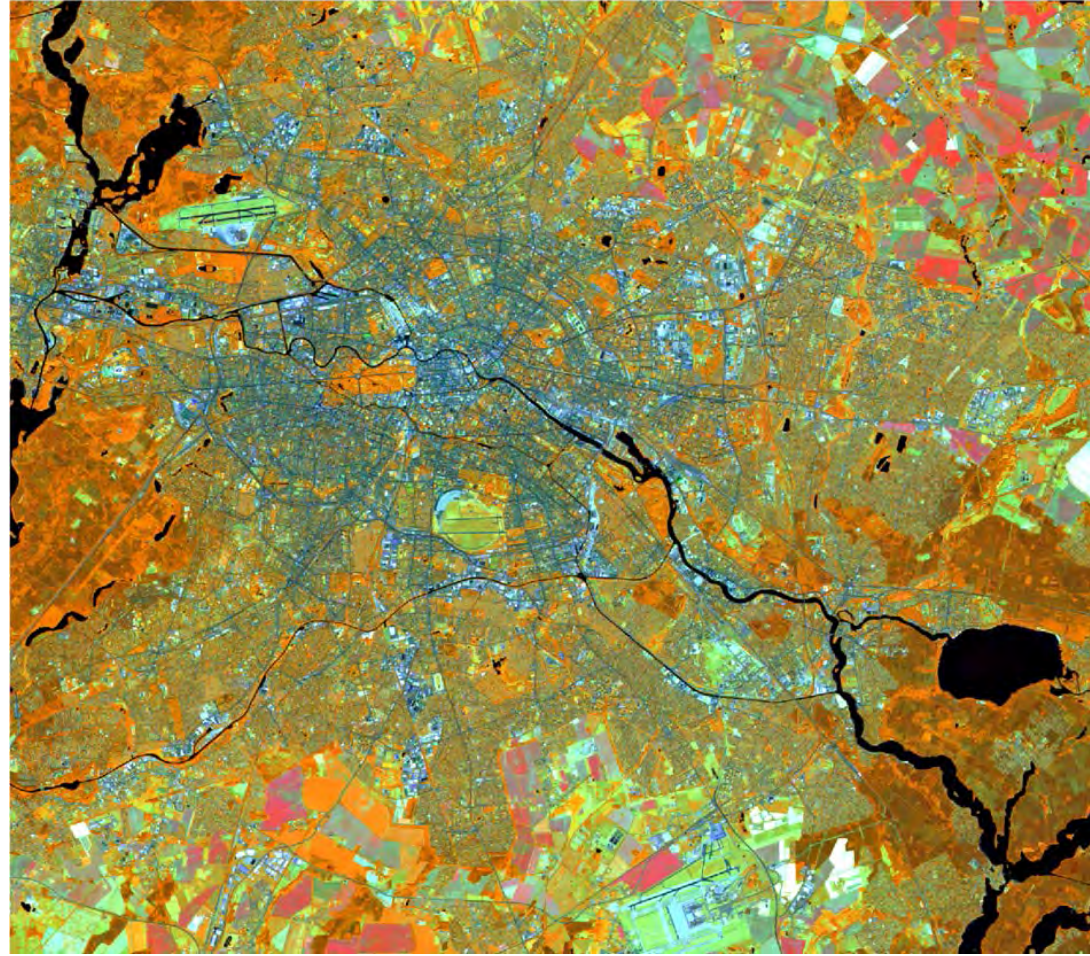
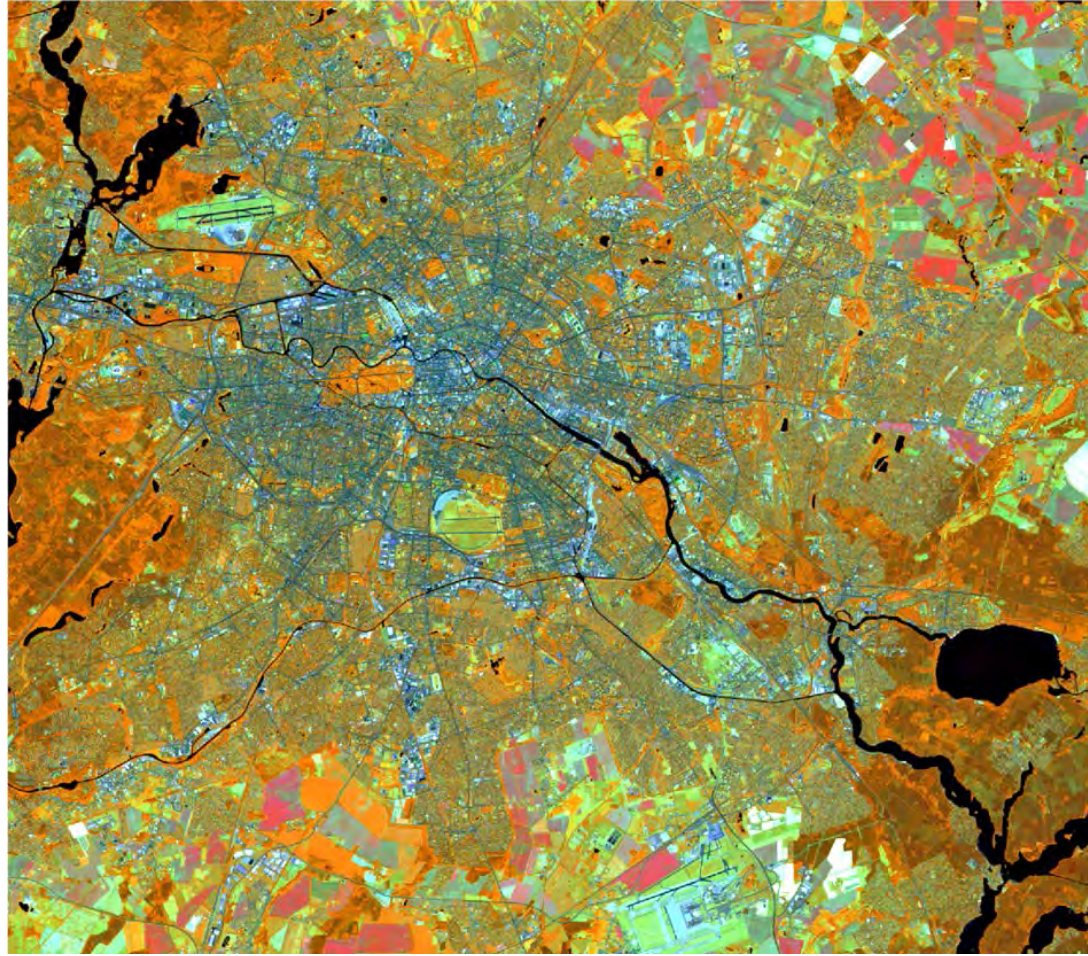


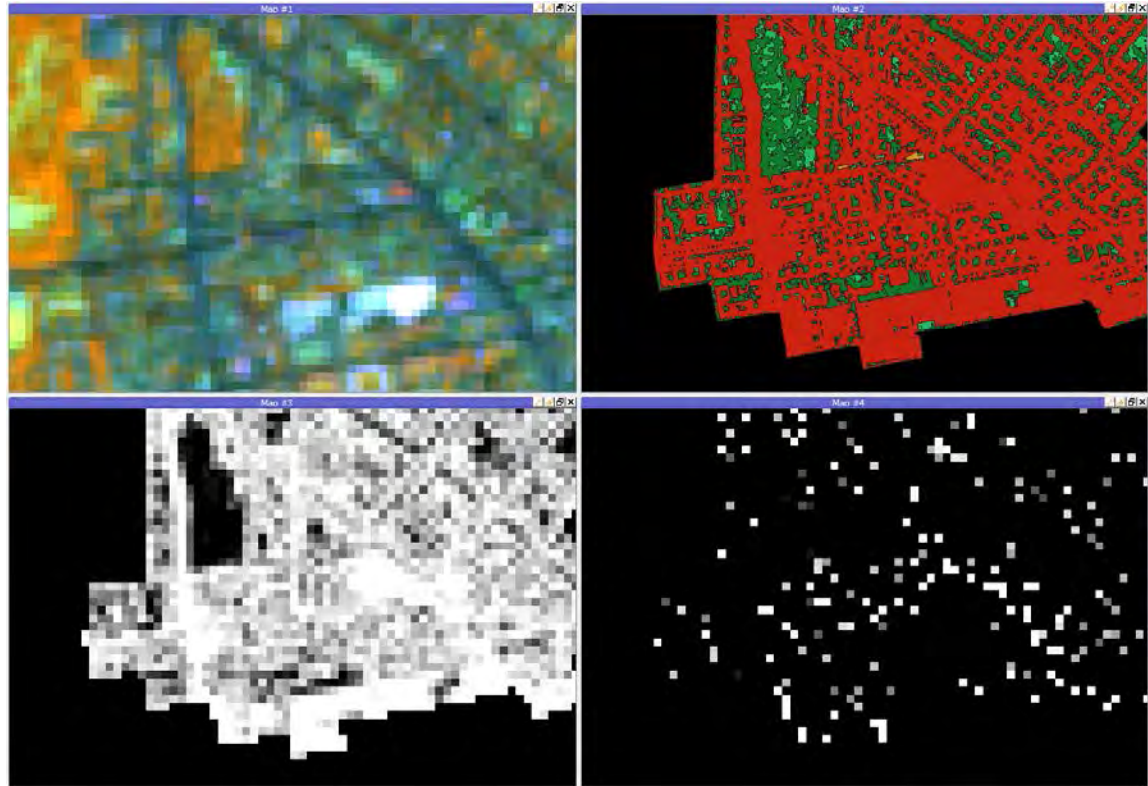
Image data

- Sentinel-2A
- 04 July 2015
- 9 spectral bands at 20 m spatial resolution
- Level 2a after Sen2Cor preprocessing



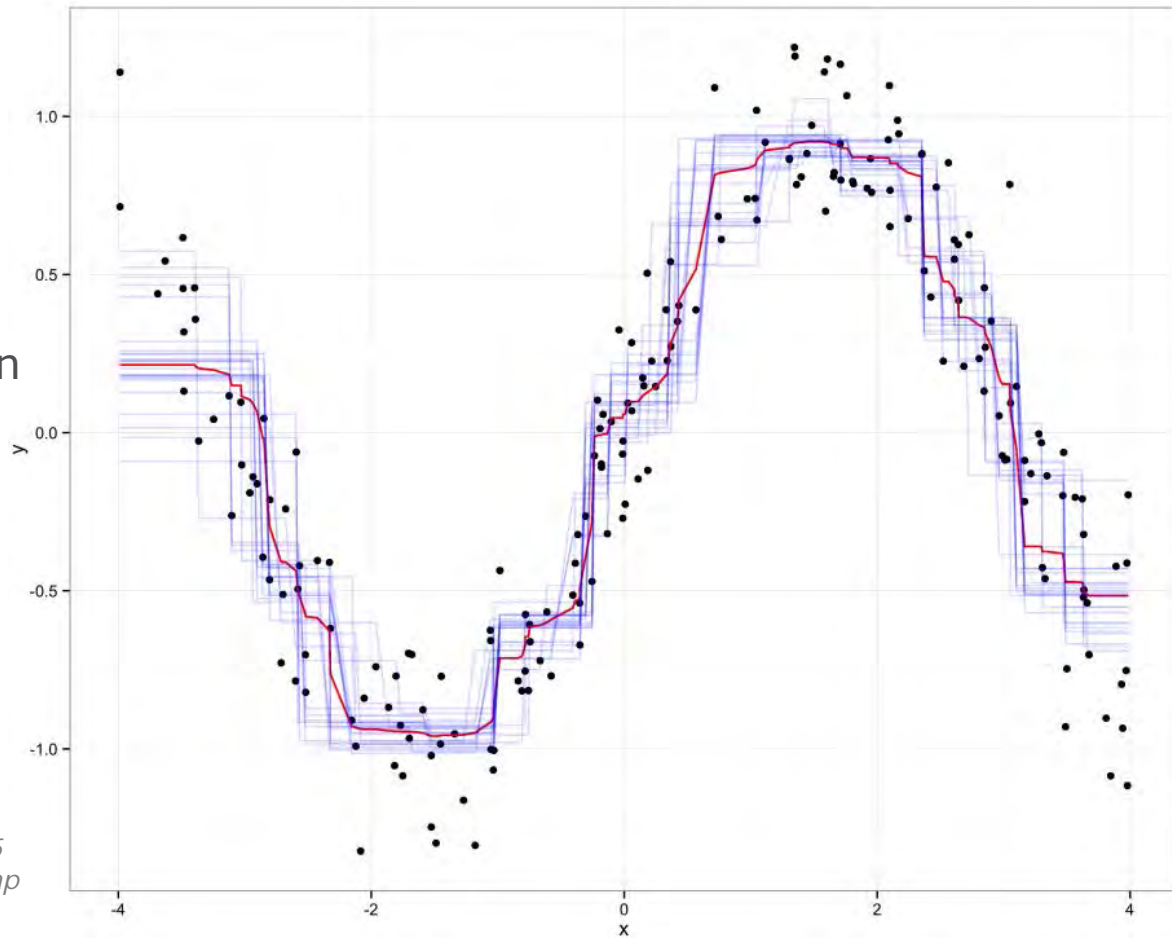
Reference data

- High resolution municipal vector data was overlaid
- Impervious, high/low vegetation, water
- Soils manually assigned
- Fraction impervious cover derived for 10 m raster cells of Sentinel data
- Selection of 1400 training and 700 test pixels (stratified random sampling)



Regression approach

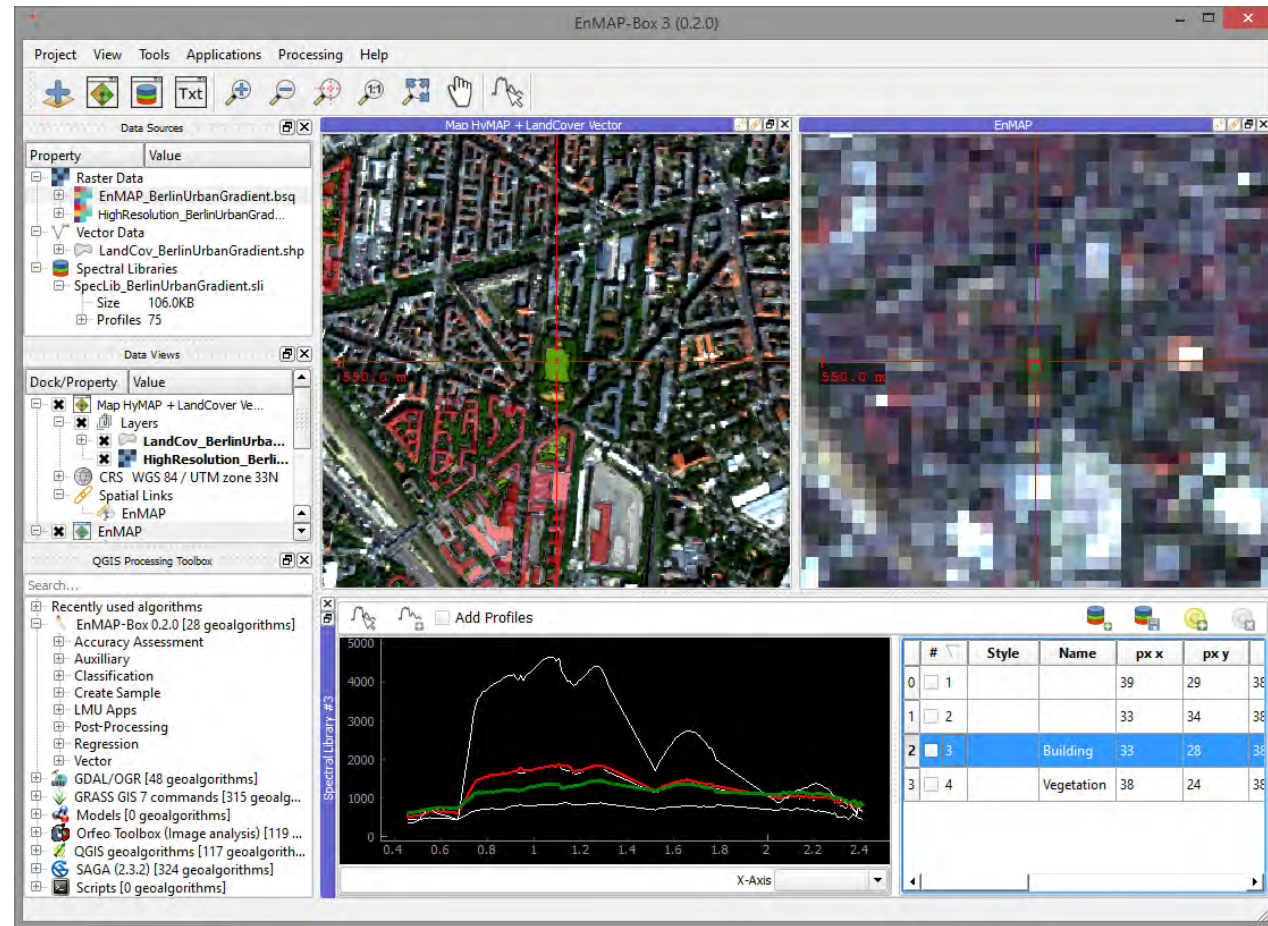
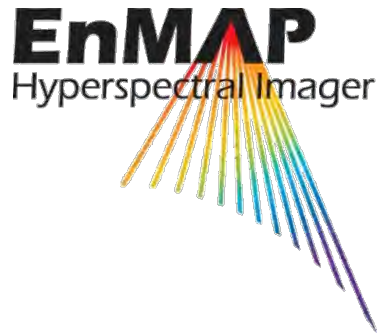
- Linear regression with NDVI as input
- Random Forest Regression with 9 spectral bands as input



Source: Jones & Linder, 2015
http://zmjones.com/static/papers/rfss_manuscript.pdf

Software

- EnMAP-Box 3
- Free and open source software
- www.enmap.org



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Overview

- 1) Explore optical data from urban areas and urban surface materials
- 2) Evaluate inverse relationship between NDVI and impervious surface
- 3) Linear regression based on NDVI
- 4) Random Forest regression using 9 band Sentinel-2A spectrum
- 5) Quantitative accuracy assessment
- 6) Discussion on spatial resolution requirements (10 m vs. 20 m)