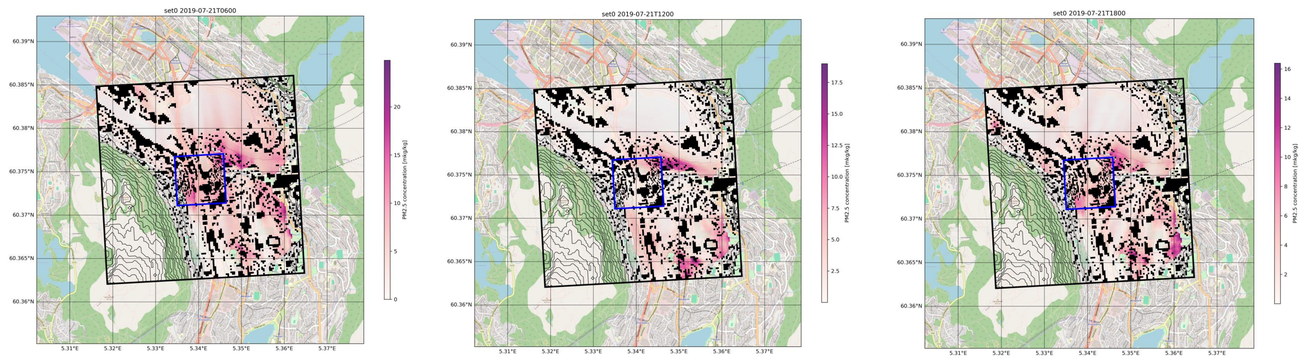
21 July 2019

Sensitivity assessment of the scenario simulations (Bergen)

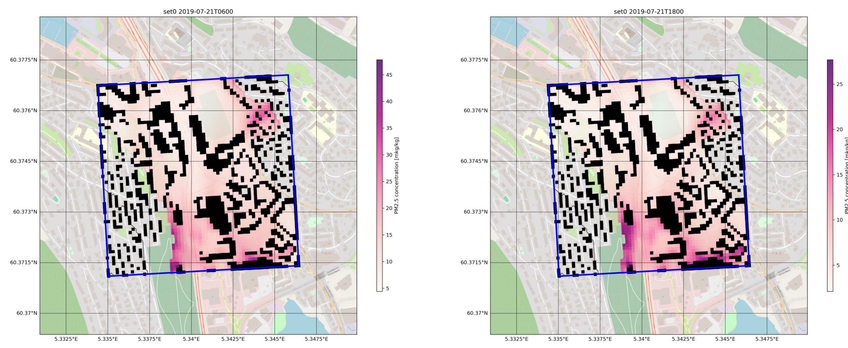
Simulated concentration of PM2.5 in Danmarksplass – Mindemyren areas

(model resolution 20 m)

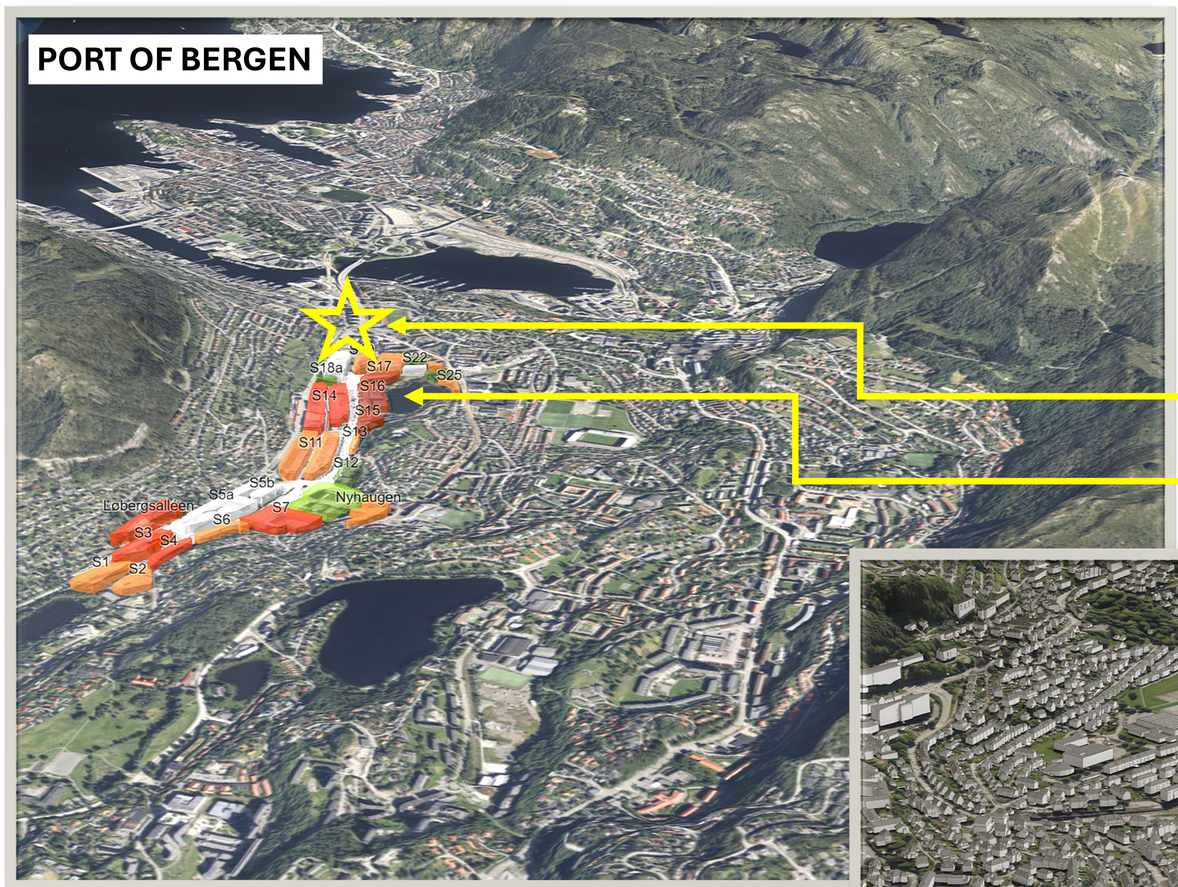


06:00 12:00 18:00

Zoom in with internal nesting (model resolution 10 m)



06:00 18:00



project TURBAN

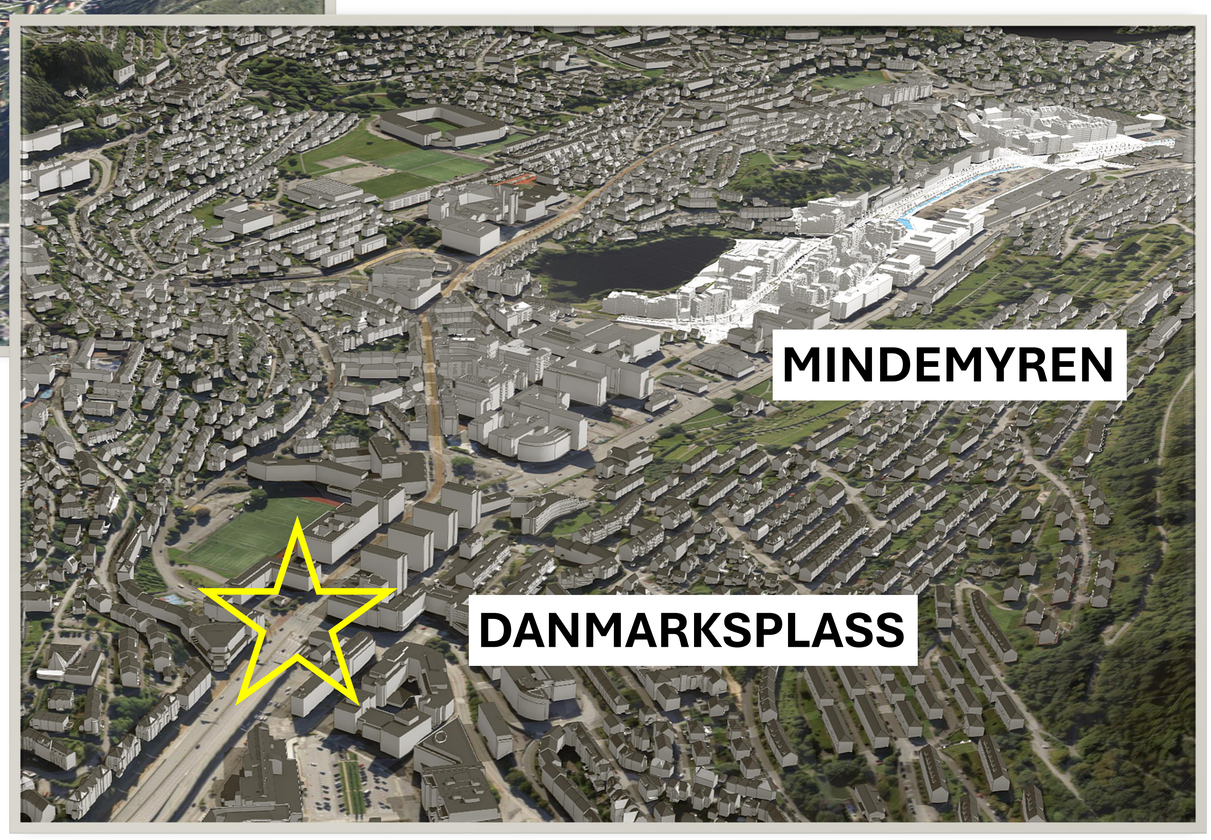
Turbulent-resolving urban modeling of air quality and thermal comfort

Prepared by Igor Esau, NERSC, Bergen, Norway

Map source: https://www.bergenskart.no/portal/apps/sites/

DANMARKSPLASS

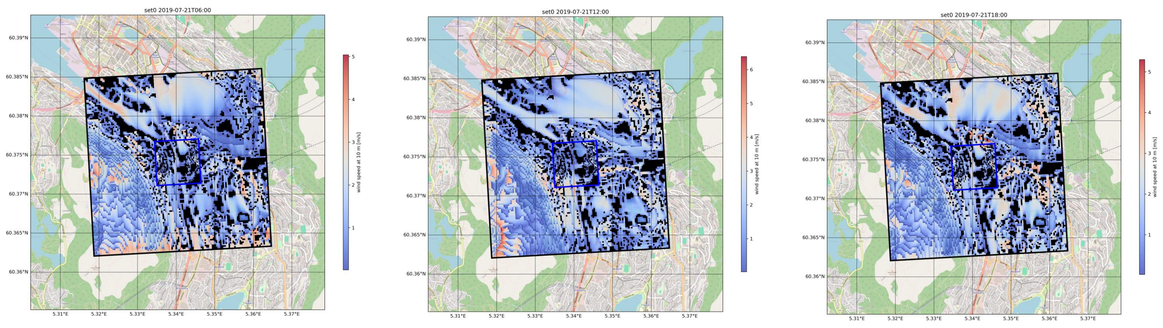
NEW DEVELOPMENT AREA - MINDEMYREN



- All simulation domains are centered on DANMARKSPLASS
- All PALM runs share the same static and dynamic (WRF runs) drivers
- All PAM runs shows weaker winds in the DANMARKPLASS – MINDEMYREN area resulting from wind sheltering by high and dense buildings
- Air pollution increases towards the new development area MINDEMYREN – the result of urban densification along the main transport/ventilation pathway
- PALM domain size effects the wind and hence pollution patterns due to turbulence development over sea surface

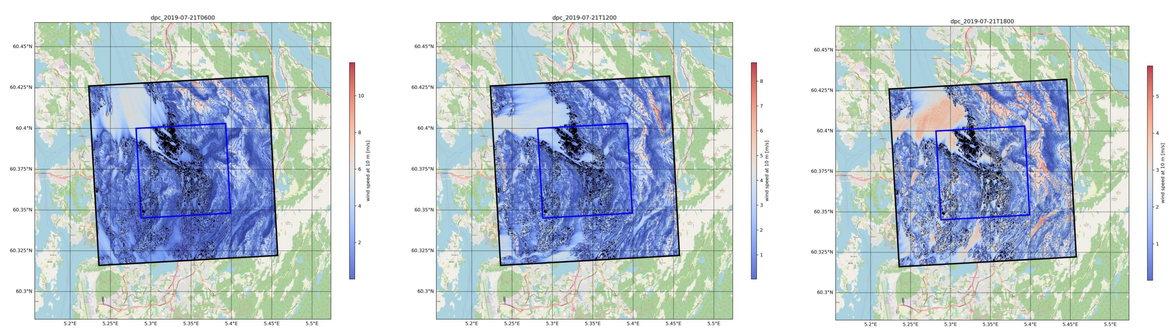
Wind speed sensitivity of simulations to the domain size in Danmarksplass – Mindemyren areas

(small domain – model resolution 20 m; 128 x 128 grid points)



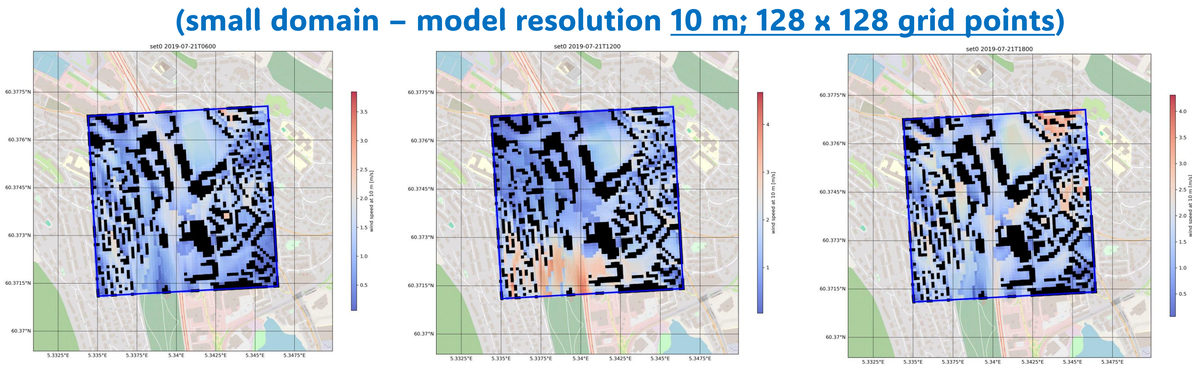
06:00 12:00 18:00

(large domain – model resolution 24 m; 512 x 512 grid points)

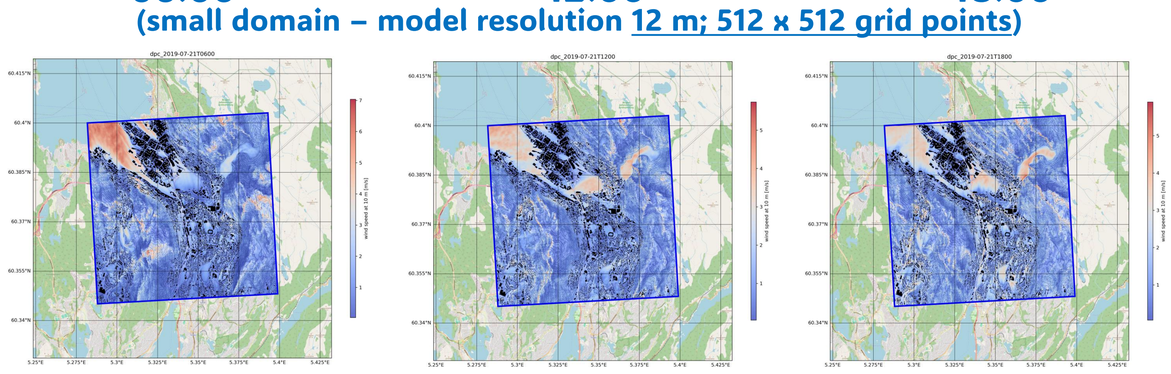


06:00 12:00 18:00

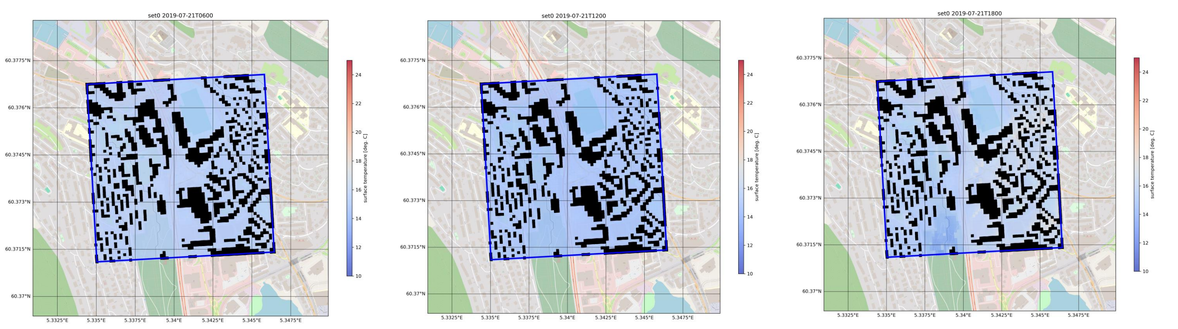
(small domain – model resolution 10 m; 128 x 128 grid points)



(small domain – model resolution 12 m; 512 x 512 grid points)



(temperature at 2 m – small domain – model resolution 10 m)



(temperature at 2 m – small domain – model resolution 12 m)