Norwegian Meteorological Institute

AIRQUIP

High Resolution Air Quality Information for Policy

Forskningsrådet

Overview of the AIRQUIP project

Michael Gauss and the AIRQUIP team

Norwegian Meteorological Institute

19 April 2017

AIRQUIP – Key info

- High Resolution Air Quality Information for Policy
- Duration: **1 March 2017 – 29 February 2020**
- Partners: Norwegian Meteorological Institute, Norwegian Computing Center, Jinan University, Tsinghua University

- Funded by:

  The Research Council of Norway
- Total budget: ~8 million NOK

- Main subject:

  Downscaling of air pollution data

AIRQUIP – Background

- Atmospheric Science in Norway
  - Long history in numerical Weather Forecasting
  - Environment: Long-range transport of air pollution → Acid rain problem and Eutrophication
  - Climate change: Arctic amplification
  - Local air pollution: mainly in cities, high level of public awareness
- Strong economic growth in China
  - Heavy air pollution in big cities but also in rural areas
  - High level of public and also policy awareness
  - Rapidly growing air pollution research community
- Basis for AIRQUIP collaboration
  - UN LRTAP and EU CAMS projects
  - EU FP7 MarcoPolo and PANDA projects
  - Substantial expertise and increasing need for science-policy contact in China and Norway

AIRQUIP – Main objectives

- Downscaling air quality information in Norway (and Europe)
  - close the gap between regional modelling and local scale applications, e.g. population exposure studies and source allocation
- Apply the tool in China
  - …for a selection of populated areas
- Promote its use in Norway (and Europe) and in China
  - support policy decisions on emission reduction measures
  - increase the dialogue between scientists, health experts and policy makers
- Strengthen collaboration between Norwegian and Chinese air pollution scientists

AIRQUIP – Work packages

WP 1: Data acquisition
(Lead: Arnt-Børre Salberg / Qiang Zhang)

WP 2: Improvement of regional Air quality forecasts
(Lead: Hilde Fagerli / Xuemei Wang)

WP 3: Development of downscaling method for EMEP
(Lead: Bruce Denby)

WP 4: Operational downscaling of regional air quality data
(Lead: Matthieu Pommier)

WP 5: Population exposure and Scenario calculations
(Lead: Hilde Fagerli)

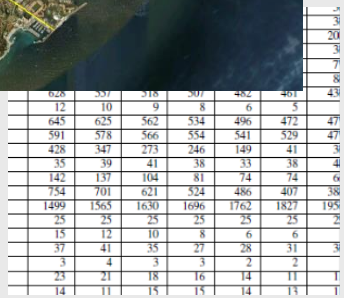
WP 6: Outreach
(Lead: Michael Gauss / Xuemei Wang)

WP1 : Data acquisition

Lead: Arnt-Børre Salberg / Qiang Zhang

Acquire available datasets (road network, factory positions, …)
→ Proxy emission data → aggregate to 0.1° x 0.1° grids

Acquire satellite imagery → derive traffic density data

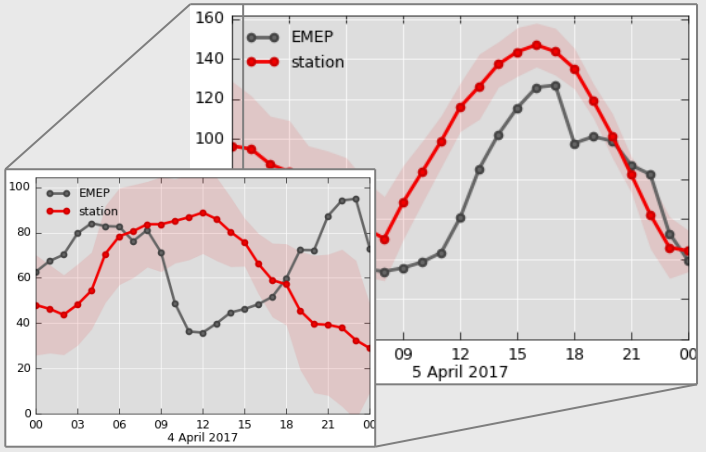


Pseudo emission data on ~50 m resolution will be generated for use in WPs 3-5.

WP2 : Improvement of regional Air quality forecasts

Lead: Hilde Fagerli / Xuemei Wang

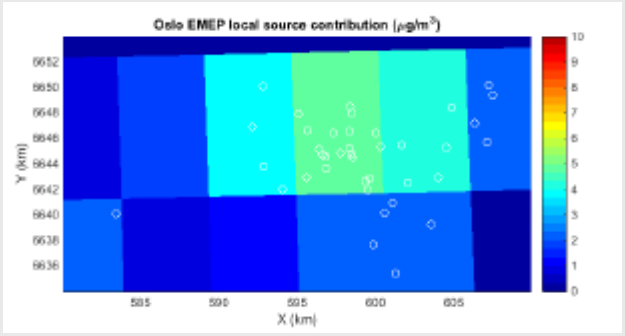
- Continuation of daily air quality forecasts ('PANDA')
- Improvement of diurnal variation of NO_2 using improved diurnal emission profiles
- Improvement of the chemical scheme with respect to PM

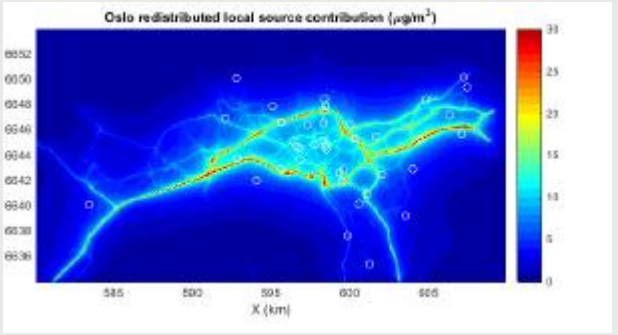


WP3 : Development of downscaling method for EMEP

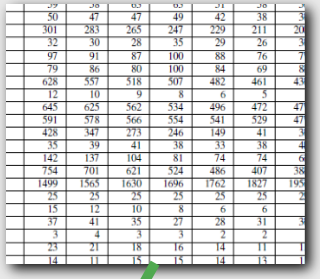
Lead: Bruce Denby

- uEMEP model development: local source contribution methodology, implementation of ‘online’ redistribution method.
- Further development of the redistribution methodology: range of technical issues, see Bruce Denby’s presentation later.
- Evaluation of the methodology in Norway and selected regions of China against measurements, and comparison with other methods.





WP4 : Operational downscaling of regional air quality data



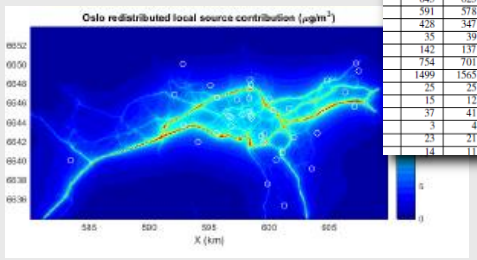
Lead: Matthieu Pommier

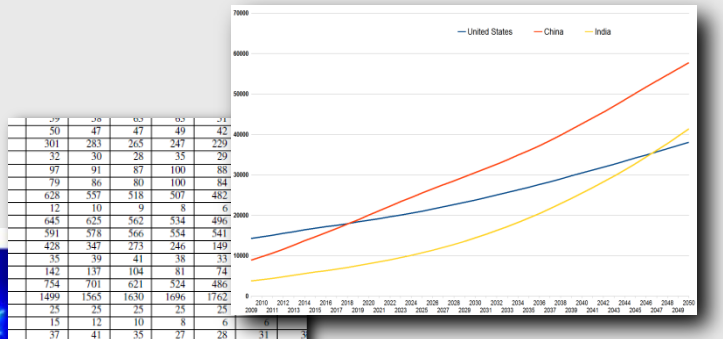
- Apply the new downscaling method to the daily EMEP forecasts provided daily in the framework of CAMS for Norway.
- Apply the new downscaling method to the daily EMEP forecasts provided daily (previously PANDA) for selected regions in China.

WP5 : Population exposure and Scenario calculations

Lead: Hilde Fagerli

- Calculate population exposure based on fine scale air pollution data, also for future scenarios
- Determine source contributions for the exposure
- Reanalyze selected air pollution episodes (in terms of exposure and source allocation) and compare with traditional methods
- Inclusion of green scenarios in the forecasts





WP6 : Outreach

Lead: Michael Gauss / Xuemei Wang

- Establishment and maintenance of webpage, including operational products
- Organization of user workshops, one in Norway and one in China (including user reference group)
- Reporting: presentations (e.g. LRTAP), peer-reviewed papers, maps to www.geonorge.no

AIRQUIP – Envisaged products

- Regional Air Quality Forecasts (continuation of PANDA)
- Downscaled Air Quality data for selected regions
  - Norway
  - Netherlands, …
  - Chinese megacities or ‘smaller’ cities
- Source allocation
- Population exposure
- Green scenarios

- Website : https://wiki.met.no/emep/airquip
  - (to be moved to a dedicated website soon!)

AIRQUIP – Get to know each other

闫柳

Susanne Lützenkirchen

王雪梅

Arnt-Børre Salberg

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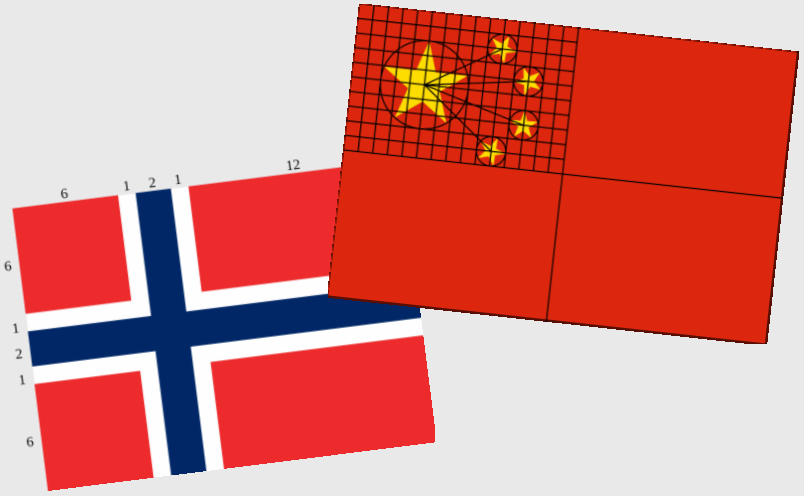

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Thank you!

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