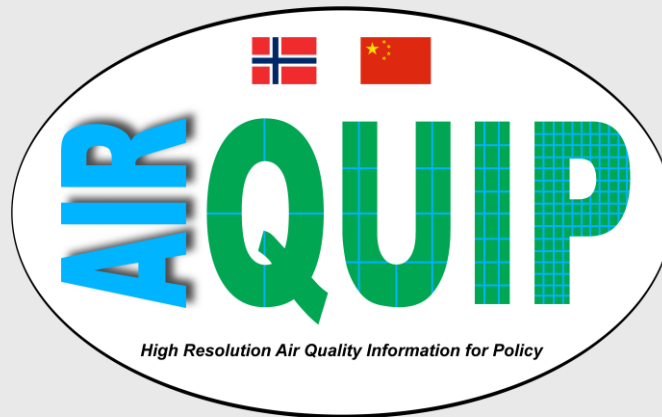




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Overview of the AirQuip project

Michael Gauss and Bruce Rolstad Denby
Norwegian Meteorological Institute

AirQuip Policy user workshop, Guangzhou, China, 26 February 2019

The global context

MAP-AQ

Monitoring, Analysis, and Prediction of Air Quality

- **Main objective:**

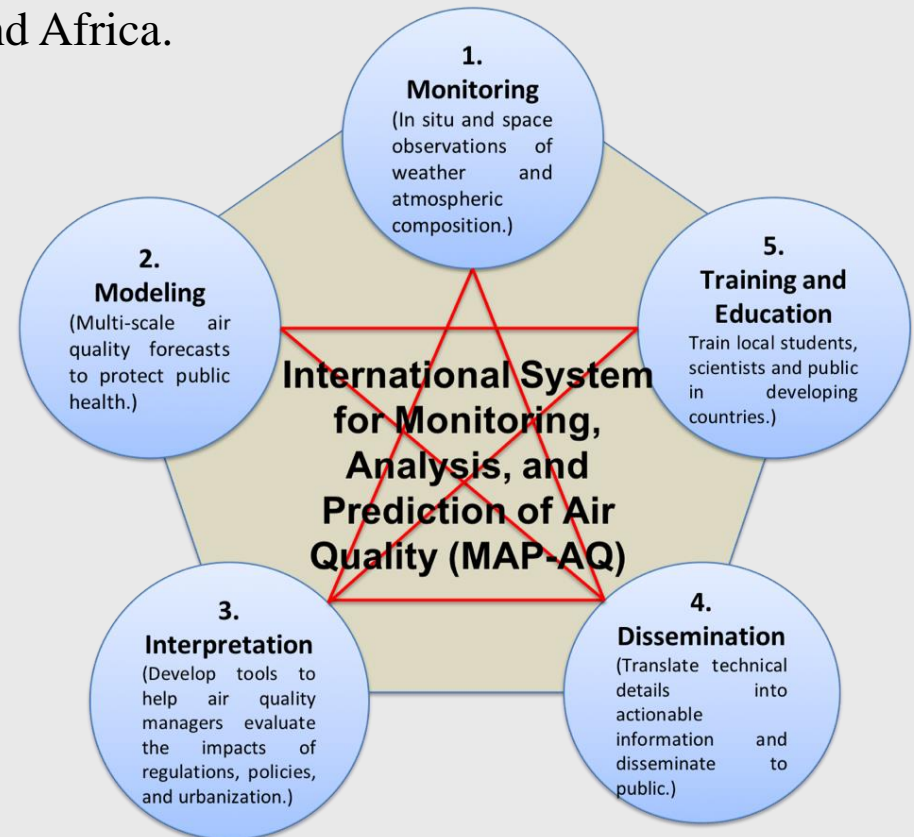
- Develop and implement a global air pollution monitoring, analysis, and prediction system for air quality with downscaling capability in regions of the world affected by high levels of atmospheric pollutants, in particular in Asia, Latin America, and Africa.

- **MAP-AQ co-Chairs:**

- Guy P Brasseur (NCAR/Max Planck Institute for Meteorology)
- Rajesh Kumar (NCAR)

- **MAP-AQ website:**

- <https://www2.acom.ucar.edu/map-aq>



Norwegian-Chinese collaboration

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

- Funding agency:
The Research Council of Norway

- Main subject:
Downscaling of air pollution data



AirQuip – Background

- Air pollution science in Norway
 - Long history in numerical Weather Forecasting
 - Affected by Long-range transport of air pollution
 - Air pollution mainly in cities during winter, but high level of public/policy awareness
- Strong economic growth in China
 - Heavy air pollution in big cities, but also in rural areas
 - High level of public/policy awareness
 - Rapidly growing air pollution research community
- Basis and motivation for AirQuip collaboration
 - MAP-AQ global initiative
 - Previous collaboration in EU-FP7 MarcoPolo and PANDA projects
 - Substantial expertise and increasing need for science-policy contact in China and Norway

AirQuip – Main objectives

- Tool for downscaling of air quality data
 - 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 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 – Envisaged products

- Regional daily Air Quality Forecasts
- Downscaled Air Quality data for selected regions
 - All of Norway
 - Chinese megacities or ‘smaller’ cities
- Population exposure
- Green scenarios

- Website : <https://wiki.met.no/emep/airquip>

EMEP regional modelling and air pollution forecasts for East Asia

The EMEP MSC-W model

- Offline chemical transport model for the troposphere
- >40 years of history, but being updated continuously
- participating in a large number of research and evaluation projects
- very fast!
- *Open Source**
- detailed model description given in Simpson et al. (2012)** and 'Model updates' chapters in annual EMEP status reports***

*) https://wiki.met.no/emep/page1/emepmscw_opensource

***) <http://www.atmos-chem-phys.net/12/7825/2012/>

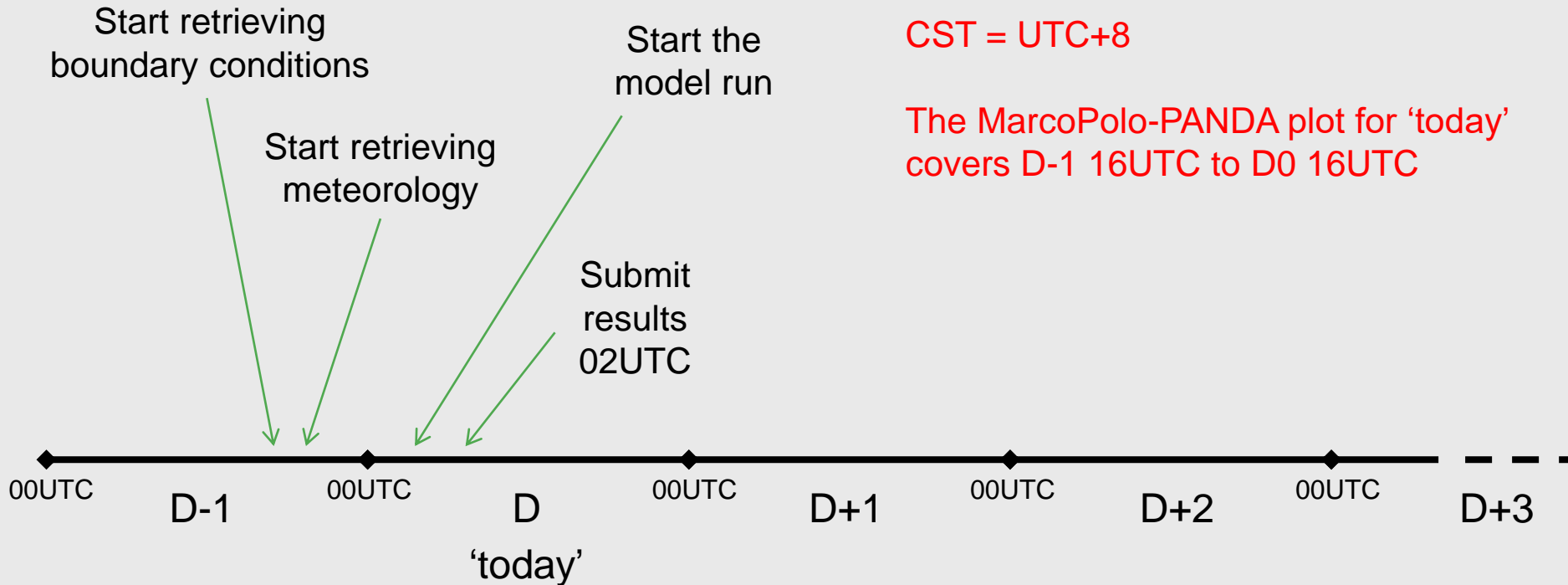
****) http://emep.int/mscw/mscw_publications.html



Operational forecasts for East Asia

- 96-hour forecasts (starting from yesterday 08CST)
- domain [15°N-55°N] x [90°E-135°E]
- horizontal resolution of 0.1° x 0.1° (lon-lat)
- emission data: MEIC 2012 / HTAPv2
- meteorological data: ECMWF

EMEP timing



Link to the MarcoPolo-PANDA forecasts:

- <http://www.marcopolo-panda.eu/forecast/>

Going to local scales: uEMEP

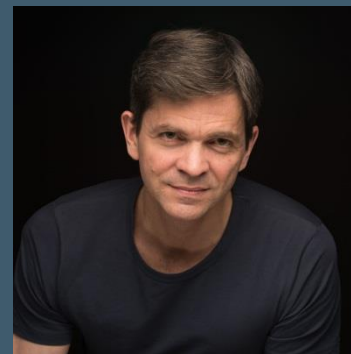
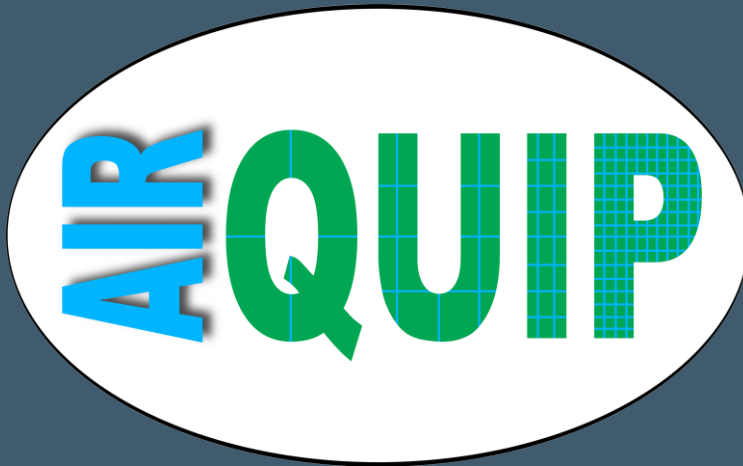
uEMEP

- A module for downscaling EMEP regional model data to the local scale (down to 50 meters resolution).
- Used to calculate the local and imported contributions to local air pollution.
- Developed in the frame of AirQuip and other (Norwegian) projects.
- The air quality forecasting service based on uEMEP went online in Norway in January 2019
- Under development and testing in China (Jinan University)
- More details will be given in Bruce Rolstad Denby's presentation.



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Thank you!



Michael Gauss
michael.gauss@met.no