

Theme 2: Advancing GURME objectives through pilots and demonstrations

General updates for pilot/demonstrations activities

WMO priorities, HABITAT-III, WB PMEH, CCAC, WHO, World Bank, MacArtur, GCF initiatives



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

Alexander Baklanov, WMO

GURME SAG Meeting, WMO, 7-8 April 2017



WMO Priority: Urbanization - Research and services for megacities and large urban complexes

Goal: Integrated Urban Weather, Water, Environment and Climate Services to address Urban Hazards and Risks.

- **Focus** on impact-based forecast and risk-based warnings
- **Addressing key Scientific issues:**
Requirements for observations;
Near-real-time data assimilation;
Coupling of air quality, meteorological, surface, hydrological processes;
Seamless approach: scale interaction;
High-resolution modelling: 'grey zone'
- **Through research to service actions** across WMO (GAW, WWRP, WCRP) and beyond



Best Practise / Guidelines for UAQIFS/UMHEWS

Methodological part (recommendations and gaps/research needs):

- Key hazards in focus and purposes of the system
- Urban morphology and input data (WUDAPT? etc)
- Emission inventories and parameterisations
- Observation system
- Integration with urban NWP
- Downscaling from global to urban (B.C.)
- Data assimilation
- Impact based forecast
- User oriented tools and services

Demonstration cities (chapters with examples for key cities)



- Malaysia GURME training workshop provides a good example and a step forward to such recommendations to build UAQIFSs and UMHEWSs
- Shanghai MHEWS and Integrated Urban Weather and Climate Service Demonstration Project (WMO-Shanghai-IUWCS)
- SAFAR+
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Specific recommendations:

- (1) development of high-resolution coupled environmental prediction models that include realistic city specific processes, boundary conditions, and fluxes of energy and physical properties;
- (2) enhanced urban observational systems to determine unknown processes and to force these models to provide high quality forecasts to be used in new urban climate services;
- (3) understanding of the critical limit values for meteorological and atmospheric composition variables with respect to human health and environmental protection;
- (4) new, targeted and customized delivery platforms using an array of modern communication techniques, developed in close consultation with users to ensure that services, advice and warnings result in appropriate action and in turn inform how best to improve the services;
- (5) the development of new skill and capacity to make best use of technologies to produce and deliver new services in complex, challenging and evolving city environments.



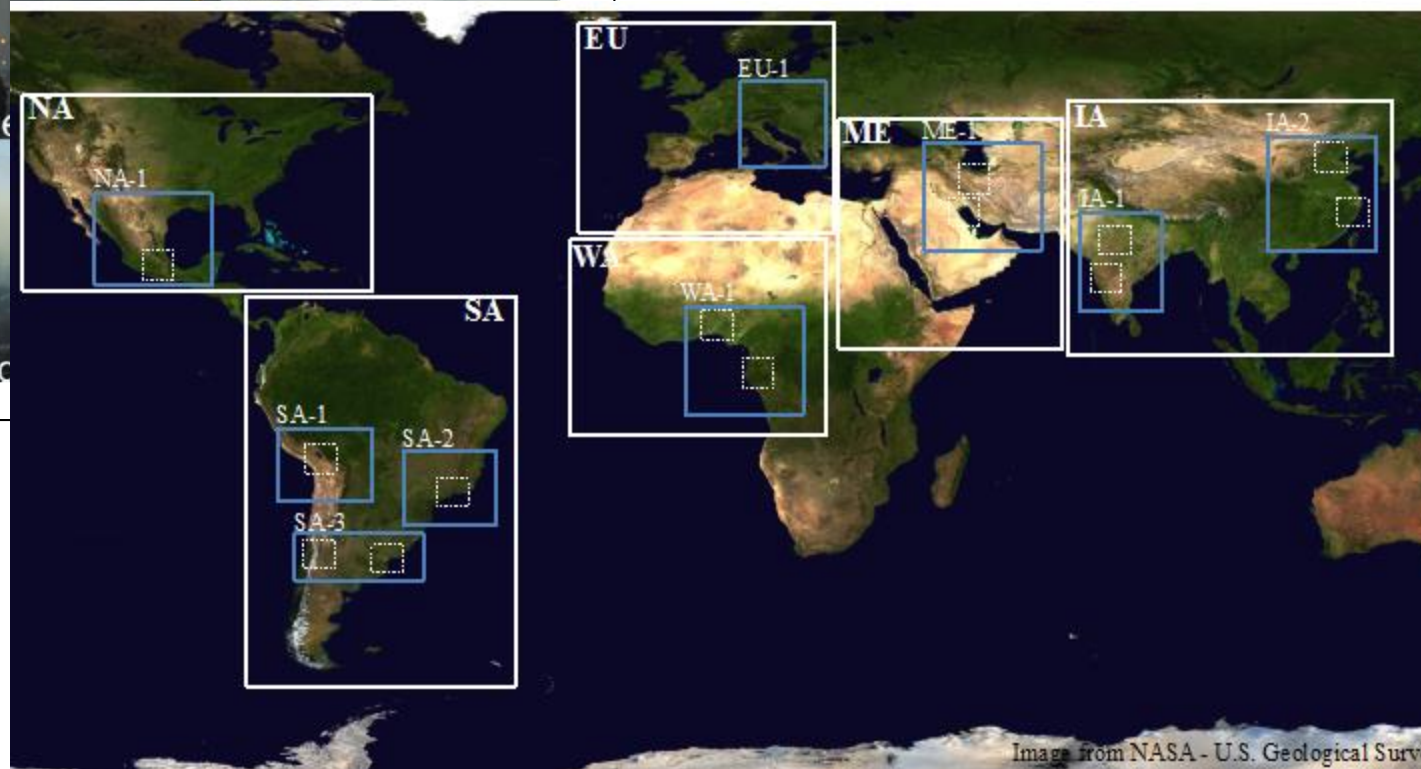
An International Consortium for the

Monitoring, Analysis and Prediction of Air Quality

MAP-AQ

White Paper
Draft number 8
May 25, 2016

Agreed to consider
MAP-AQ as a key
project of WMO GAW
SAG-APP



WMO for Integrated Urban Services

Welcome to WMO Events on HABITAT-III Conference at One UN Pavilion:

- «Meetings with WMO» on 18 Oct 14:30; 19 Oct 17:00; 20 Oct 12:00, “Talk with the United Nations” Room
- Side Event “Climate change and urban disaster resilience” on 20 Oct at 8:30 -11:30, Room B
 - Exhibition & Urban Library
 - E-Game ‘Be an Urban Climate Architect’



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Post-HABITAT3: Initiatives

- “Climate change and urban disaster resilience”
- Implementation of New Urban Agenda - open
- Suggestions from GURME to UN NUA ?
- U4SSC: Smart Sustainable Cities: Collection Methodology for Key Performance Indicators
- WMO view and GURME contribution to KPIs
- Next step: suggest one of our demonstration city – a chapter to report



WMO-WHO-UNEP cooperation in AQR

10 work areas identified:

- Acute air pollution episodes: communicating and acting
- Harmonised air quality information (data)
- Estimated/actual economic impacts of air pollution.
- Legislative and regulatory support
- Awareness-raising and Communication e.g. Scale up delivery of the “Breathe life” campaign
- Deployment of sectoral solutions, e.g. transport
- Local government action
- Capacity strengthening activities targeting the environment, health as well as other critical sectors of interventions
- Sand and dust storms
- Biomass burning including peat fires/haze



Possible role of WMO GAW in PMEH

- GAW observations and requirements: urban vs rural, source apportionment, aerosol chemical composition, calibration, ...
- GAW Urban Research Meteorology & Environment (GURME) Program and Modelling Application SAG
- Dust storms and wild fires pollution: SDS-WAS System is available online
- MEGAPOLI and CEEH experience: optimization => min health impact
- Integrated urban services: cooperation of different agencies
- GURME Pilot studies and demonstrations: realisation of UAQIF/MHEW system for JJJ, other Indian cities, Accra, Lagos, etc.
- Capacity building: join training workshops etc.
- Joint training workshop for urban AQ for African cities, e.g. Lagos, Accra, S.Africa, Cairo



Possible contribution to World Bank PMEH Program:

Pollution Management and Environment Health

Possible enhancing the PMEH AQ monitoring program by utilizing equipment that support a forecasting capability.

GURME is asked to prepare a Briefing Note to cover:

- 1) What are the elements of such a system and how does it fit into what is currently designed as a monitoring approach as part of the PMEH AQM framework
- 2) The modeling required to utilize this capability
- 3) The underlying rationale for a forecasting capability particularly as it relates to informing the public and decisions makers.
- 4) The necessary equipment that would be required, cost comparisons versus the equipment currently envisioned for the PMEH program.
- 5) The likely benefits associated with the reduction in O&M costs over time and any associated QA benefits to the overall process.

Responsible GURME SAG members: Gufran Beig and Luisa Molina

Enhancing urban services capabilities to build Jakarta as climate smart city - A proposal to the Green Climate Fund -

Goal of the project and overarching objective

To contribute to build urban resilience to the impacts of climate change and variability and associated weather and environmental threats by enhancing the capabilities of the city for the provision of weather, climate and air quality information to support urban short to long term response to the impacts of climate change and associated weather and environmental threats

Project overview

- Small-size, international project
- Application area:
«Most vulnerable people and communities»
- 5 year project



Six major components

1: Integrated Urban Information – Urban Analytics

Create an information layer of the relationship between the unique socio-economic nature of the urban physical and built environment and population, and the needs for integrated weather-related environmental services

2: Multi-level urban monitoring and Data Integration

Enhancing observational capabilities, monitoring and understanding of the unique urban physical processes, including dynamical, chemical and hydrological.

3: Development of urban predictive capabilities, including demonstration & validation

This output aims at building urban environment integrated prediction systems to support decision making for different applications

4: Establish a urban early warning system

This output aims at making the best use of integrated information, monitoring and predictive capabilities for establishing an urban early warning system and for developing relevant tomorrow's city case studies.

5: Strengthening urban community-based preparedness and response capabilities

This output aims at strengthening the engagement of the Jakarta population and at developing multi-level training activities.

6: Project management, monitoring and evaluation

Oversight, coordination, monitoring, financial management and evaluation

MULTI-HAZARD EARLY WARNING CONFERENCE

CANCÚN, MEXICO, 22-23 MAY 2017



Saving Lives,
Reducing Losses

WMO Side Event on: Urban resilience and disaster risk reduction: environmental hazards early warning systems

In exploring how the meteorological, public health, environmental, civil protection, urban planning and other communities can work together to create healthy, climate-smart and sustainable cities, the event will:

- Raise awareness about specific value and research needs on weather and environmental information to specified purposes of urban management;
- Explore aspects of communication on such information that determine whether forecasts & warnings will be received, trusted, understood and acted on.
- Build a common strategy and directions toward sustainable and resilient cities among UN agencies and city stakeholders, and establish partnerships for action;
- Demonstrate research achievements and best practices for building urban multi-hazard early-warning systems;
- Identify candidate cities for implementing urban integrated services, especially in Africa, Asia and Latin America.



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WMO for Integrated Urban Services

**Success
Requires
Collaboration
Beyond Our
Boundaries!**

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

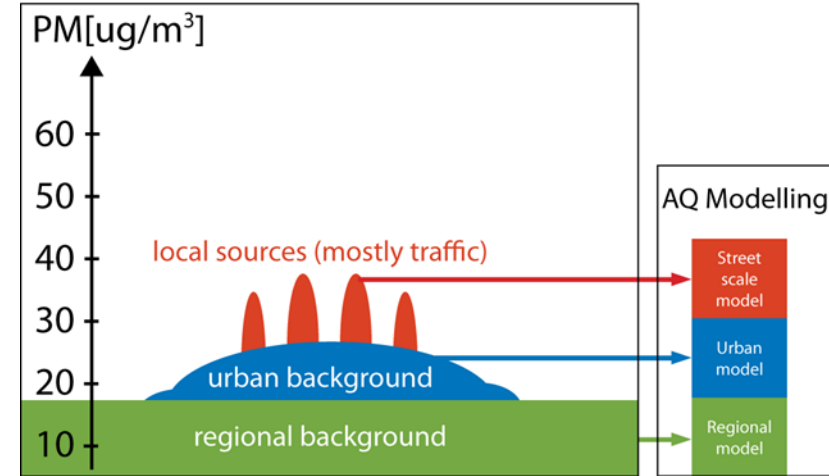
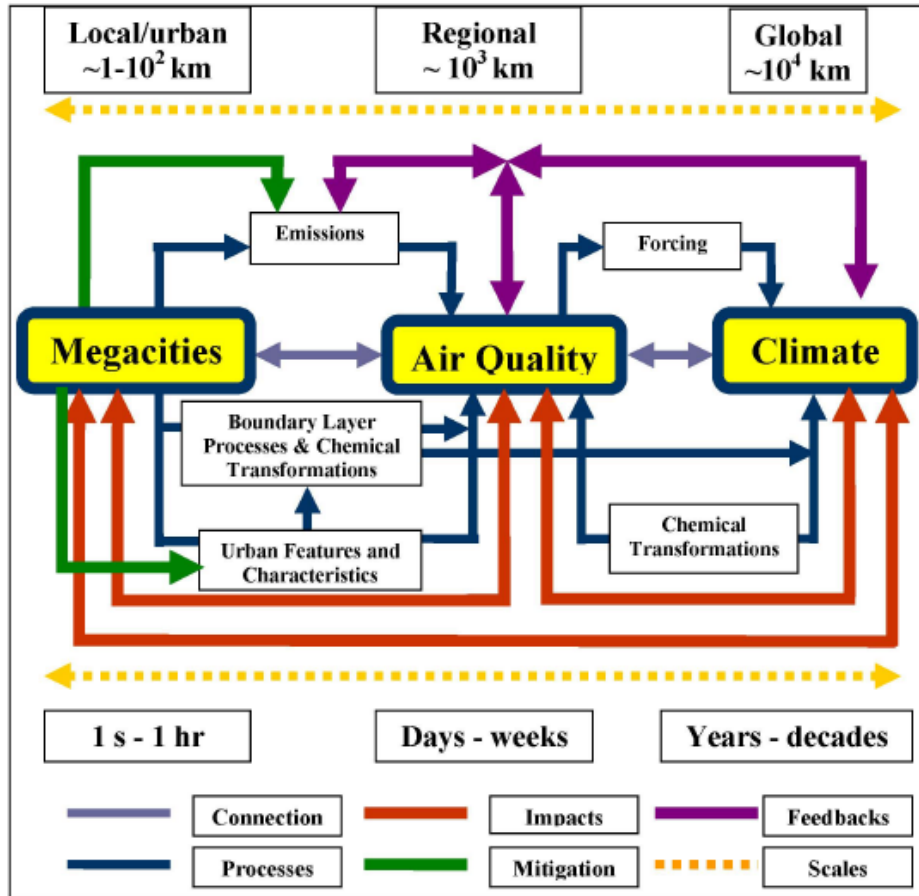


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The complexity of the urban setting



Main Linkages
between Megacities,
Air Quality and
Climate

A. Baklanov et al.: Concept of multi-scale modelling of megacity impact on air quality and climate

FUMAPEX: Exposure Modelling

