Follow up Workshop on a Pilot Design for Air Quality in Africa

Jan. 17 to Jan. 19, 2023
CMU-AFRICA CAMPUS, KIGALI, RWANDA
AGENDA

Day 1: January 17, 2023

Opening Session

10 am ─ 11pm Local time (8:00am ─ 9:00am UTC)

10:00 – 10:20	Opening- **Allen Robinson and Solomon Bililign**
10:20 – 10:25	Dr. **Didier Ntwali**, Chief Scientists -Rwanda Space Agency Introducing Excellency **Mrs. Juliet Kabera** Director General- Rwanda Environmental Management Authority
10:25-10:35	Welcome by Excellency **Mrs. Juliet Kabera** Director General- Rwanda Environmental Management Authority
10-35 – 10:40	Welcome to Africa Prof. **Michael Gatari**, U of Nairobi
10:40 – 11:00-	Break

SESSION I

11am – 1 pm local time (9:00 am – 11:00am UTC)
Chairs: Solomon Bililign and Akua Asa Awuku
Summary and key outcomes of the results of the June 2021 workshop and current challenges and opportunities

11:00 – 11:20   **Vernon Morris**, Arizona State University, USA
Summary of the 2021 Workshop on Air Quality Pilot Study Design in African Megacities

11:20 – 11:40   **Steve Brown**, NOAA, USA
Air Quality Research in North America and NOAA's Interest in Air Quality Research in Africa.

11:40 – 12:00   **Francis Pope**, University of Birmingham
Low-cost source apportionment in African settings

12:00 – 12:20   **Gizaw Mengistu Tsidu,** Botswana International University of Science and Technology and Addis Ababa University
Air pollution monitoring and research in Africa: Challenges and Gaps

12:20 – 12:40   **Guy Brasseur,** ACOM, NCAR, USA
Towards the development of a pan-African system for air quality analysis, forecast and attribution

12:40 – 1:00   **Frank Flocke**, ACOM, NCAR USA (VIRTUAL)
Considerations for requesting NSF Aircraft for a field project located in an African Megacity

1:00 – 2:00   **Lunch**

SESSION II

2 pm – 7:20 pm local time (12 pm – 5:20 pm UTC)
Chairs: *Dan Westervelt and Gizaw Mengistu Tsidu and Francis Pope*
Perspectives, capabilities, and scientific priorities in the African air quality research community.

2:00 – 2:20   **Tibebu Assefa**, C40, - African cities for Clean Air Initiative program
Enhanced Integration of Health, Climate, and Air Quality Management Planning at the Urban Scale'' with emphasis on the Addis Ababa

2:20 – 2:40   **Michael Gatari**, U of Nairobi
Selected Air Quality studies in Kenya: Contribution from the Institute of Nuclear Science and Technology, University of Nairobi.

2:40 – 3:00   **Paul Njogu**, JKUAT, WRI VIRTUAL
PM2.5 Monitoring and Associated Air Quality Indices (AQIs) using Pre-Calibrated Low-Cost Air Monitors based on PMS5003 Laser Counters in Nairobi, Kenya

3: 00 – 3:20   **Victor Nthusi**, Global Health Program Health Effects Institute.
Air pollution and Health in Africa: Perspectives from the State of Global Air Initiative.

3:20 – 3:40   Coffee Break

3:40 – 4:00   **Demba Ndao NIANG,** Cheikh Anta Diop University, Dakar, Senegal (LPAOSF)
Using existing observations of atmospheric composition to characterize urban air quality in Senegal

4:00 – 4:20   **George Mwaniki**, World Resources Institute
Bridging the gap between policy and science in addressing air pollution in African cities; experiences from Nairobi, Kenya.

4: 20 – 4:40   **Rebecca Garland** University of Pretoria (VIRTUAL)
Improving the characterization of urban pollution and its impacts in South Africa.

4:40 – 5:00   **Anteneh Getachew**, AASTU, Ethiopia
Satellite-based assessment of air pollutants in Africa Megacities

5:00 – 5:20   **Araya Asfaw** Addis Ababa University, Ethiopia
State of indoor and ambient air quality in Addis Ababa and interventions to reduce exposure

5:20 – 5:40   Break

*5:40 – 6:00   **Faye** Aissatou Department of Environmental Sciences, University of Virginia, Charlottesville, VA, USA*
High spatial-temporal resolution Land Use Regression models for NO2 concentrations in the West African city Dakar, Senegal

6:00 – 6:20   **Egide Kalisa**, University of Rwanda VIRTUAL
Dirty Drop Off - Children's Exposure to indoor and outdoor Air Pollutants at School in Rwanda

6:20 –6:40   **Kassahun Ture**, Addis Ababa University
Air Quality Status at Selected Congested Road Junctions in Addis Ababa, Ethiopia

6:40 – 7:00   **Cynthia Sitati,** Stockholm Environment Institute,
In-kitchen aerosol exposure in the Informal Settlements of Nairobi

7:00-7:20   **Bertrand Tchanche,** Alioune Diop University, Senegal, VIRTUAL
Design of an Internet of Things Lab for Air Quality Monitoring

9:00 – 10:00 am   <u>**TROPOMI data tutorial session**</u> by Dr. Deborah C Stein Zweers

10 am – 6:40 pm local time (8 am – 4:40 pm UTC)
Chairs: *Egide Kalisa, Michael Gatari and Steve Brown*
Previous field observations and on-going activities in Africa

10:00 – 10:20   <u>**Dan Westervelt**</u>, Columbia University, USA
Source attribution of PM2.5 in Kinshasa, Democratic Republic of Congo.

10:20 – 10:40   <u>**Langley DeWitt,**</u> Director, IGAC
Engaging local scientists and stakeholders in field mission design and execution: Success Stories from IGAC and the Rwanda Climate Observatory.

10:40 –11:00   <u>**Sekou Keita,**</u> Laboratoire d'Aerologie in Toulouse, France and at the University of Korhogo in Ivory Coast
Regional specificities of emissions in Africa: the DACCIWA emissions inventory for air pollutants and greenhouse gases.

11:00 –11:20   <u>**Thierno Doumbia,**</u> Laboratoire d'Aérologie, CNRS, University of Toulouse
The Use of Chemical Reanalyses to Address African Air Pollution Issues.

11:20 – 11:40   <u>**James Lee,**</u> University of York
Air quality in developing megacities: an experience from campaigns in Beijing, Delhi and West Africa.

11:40 – 12:00   <u>**Catherine Liousee**</u>, Laboratoire d'Aérologie, CNRS/Université de Toulouse-VIRTUAL
Air pollution and Health in West Africa: from estimations to mitigation efforts.

12:20 – 12:20   <u>**Christina Isaxon**</u>, Lund University, Sweden
Air Pollution, a serious health and economic hazard suffocating Africa – actions towards better air quality

12:20 – 1:20   **Lunch**

1:20 – 1:40   <u>**Dan Yakir**</u>, Weizmann Institute of Science, Israel
Using a Mobile Lab to assess the implications of land use change for surface energy balance.

1:40 – 2:00   <u>**Mike Giordano,**</u> Carnegie Mellon University / AfriqAir
Utilizing retrospective analyses to increase the performance of low-cost sensors in Africa.

2:00 – 2:20   **Eloise Marais,** UCL, UK -VIRTUAL
Using models and satellite observations to determine the public health burden of rapid air quality degradation in cities in Africa

2:20 – 2:40   **Yinon Rudich**, Weizmann Institute of Science, Israel
Possible effects of transported dust on the local air quality

2:40 – 3:00   **Sina Hasheminassab,** NASA, JPL (VIRTUAL)
NASA's Multi-Angle Imager for Aerosols (MAIA) Investigation in Africa: An Integrated Satellite and Surface Monitoring Approach for Mapping Speciated Particulate Matter Air Pollution

3:00 – 3:20   Coffee Break

3:20 – 3:40   **Dekker, M Leiden,** University, Netherlands.
The Power of TROPOMI to Bridge African Science and Policy: insights from the April 2022 workshop and next steps towards interdisciplinary and transdisciplinary collaboration

3:40 – 4:00   **Sara Martínez-Alonso,** ACOM, NCAR
Emissions from Mining-related Activities in Africa using TROPOMI Satellite Observations

4:00 – 4:20   **Pieternel Levelt,** KNMI, TU Delft and NCAR VIRTUAL
Investigating expanding air pollution and climate change on the African continent using TROPOMI data

4:20 – 4:40   **Wenfu Tang**, ACOM, NCAR
Application of the Multi-Scale Infrastructure for Chemistry and Aerosols (MUSICA) over Africa

4:40 – 5:00   **Rajesh Kumar**, RAL, NCAR, USA.
Development of an air quality forecasting system for eastern and southern Africa

5:00 – 5:20   **Solomon Bililign,** NCAT, USA
Comparisons of laboratory and field studies of chemical and optical properties of emissions from African Biomass Fuels

5:20 – 5:40   **Didier Ntwali**, Rwanda Space Agency
Using ground-based measurements and satellite observations to advise policy makers on air pollution mitigation and adaptation in Rwanda

5:40 – 6:00   **Ben Gaubert,** ACOM, NCAR Virtual
Assessment of CO pollution sources and fates across the African continent using global simulations and satellite observations

6:00 – 6:20   **Ana I. Prados**, University of Maryland Baltimore County-**VIRTUAL**

Use of NASA resources and existing monitor data for air quality monitoring, public communications, and to inform future health data collection efforts in Uganda

6:20 – 6:40 <u>**William Vizuete,**</u> University of North Carolina, Chapel Hill
Aerosol Phase State and Influence on Regional Scale Model Predictions

6:40- 7:40- Dinner
**7:40 pm – 10:00 pm local time (5:40 pm – 8 pm UTC)
POSTER SESSION**

We encourage all presenters to bring printed copies of your slides for a poster display and discussion leading to the final day (Poster printing is also possible at CMU)

POSTER ONLY
<u>**Akua Asa-Awuku,**</u> University of Maryland USA
Hygroscopicity Matters – The role of water-uptake for air quality, climate, and health

<u>**Josephine Ndiangui**</u>- Jomo Kenyatta University of Agriculture and Technology, Kenya
Assessment of diurnal and seasonal variation of ambient particulate matter (pm2.5) in juja, Kenya.

<u>**Kirago Leonard**</u>- Stockholms universitet
Insights into PM2.5 composition and black carbon sources in Nairobi, Kenya

<u>**Mame Diarra Toure**</u>, *Laboratoire de Physique de l'Atmosphère et de l'Océan – Simeon Fongang, Cheikh Anta Diop, Dakar, Senegal*
Relationship between air pollution, meteorological parameters and childhood respiratory diseases in Dakar, Senegal

<u>**Vernon Morris**</u>, Arizona State University, USA
Aerosol Measurements and Characterization in Botswana During Wet Season

DAY 3 January 19

9:00 – 10:00 am-   **TROPOMI data tutorial session** by Dr. Deborah C Stein Zweers

10 am – 11:00am local (8 am – 9 am UTC)

SESSION III-Continued

Chairs:

10:00 – 10:20   **James W. Hannigan**, tropospheric Composition, Observations & Modeling, NCAR, Boulder CO, USA

Ground-based Remote Sensing for Regional Air Quality & Greenhouse Gases: Pilot Project and Engagement

10:20 – 10:40   **Albert Presto**, Carnegie Mellon University/ AfriqAir

Connecting local and regional needs to NSF research

10:40 – 11:00   **Jenny Stavrakou**, BIRA-IASB, Belgium -VIRTUAL

Assessing air composition over Africa over the last two decades using satellite observations and modelling

SESSION IV

11:10 am –12:30 pm local time (9:10 am –10:30 UTC)

Listening from African EPA leaders (city and government level)

Moderators: *Solomon Bililign, Steve Brown, Michael Gatari, Kassahun Ture, Dan Westervelt, William Vizuete, Pieternel Levelt, and Victor Nthusi*

Ethiopia
EPA- Mr. Girma Gemechu
Addis Ababa EPA-Mr. Sisay Getachew (Unconfirmed)

Kenya-NEMA
Dr. John Mumbo
Ms. Sellellah Okoth

Uganda
Dr Alex Ndyabakira
Kampala Capital City Authority

Rwanda
Rwanda Environmental Management Authority (REMA)

SESSION V

1:00 pm – 6:00 pm local time (11 am – 4 pmUTC)
Working Lunch and Discussions

Moderators: *Solomon Bililign, Steve Brown, Michael Gatari, Kassahun Ture, Dan Westervelt, William Vizuete, Pieternel Levelt, and Victor Nthusi*

- General discussions and future planning of action items

- Define a road map, milestones, and planning for the next 3-5 years.

Break out groups will discuss on topics defined by the meeting and join to develop a document for action:
Suggested topics:

- Summarize the situation in Africa- possible coordination with all groups working in the region and data sharing
- Identify funding sources and current and expected NSF (STC, PIRE), NASA, DoE NIH proposals
- Develop a clear timeline- for proposal development
- Form working groups to respond to each agency Groups should include local scientists, social scientists, health scientists and policy makers.
- Develop framework for a series of collaborative proposals:
- Identify key science questions to address

Focus on:

1. Education and training of atmospheric chemists, air quality scientists in the region through collaborations with US and European Universitas
2. Proposals to deploy ground based (mobile and fixed) highly specialized instrumentations for detailed studies of speciated PM, VOC, reactive nitrogen, aerosol optics to compliment a network of LCS and training of local scientists.
3. Leveraging existing activities such as MAIA project etc.
4. Long term proposal for a comprehensive air campaign – select the pilot city.