WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

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Annexes: 3 (available in English only)

Subject: WMO, the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) and the Global Atmospheric Watch (GAW) Hands-on Training on Greenhouse Gas Measurements

Action required: For information and action as appropriate

Dear Sir/Madam,

In support of capacity development in terms of Air Quality Services in National Meteorological and Hydrological Services (NMHSs), the WMO Education and Training Office has designed, in collaboration with the WMO Science and Innovation Department, and with the kind support of the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), a training course for the implementation of the WMO competency approach in Greenhouse Gases (GHG) Measurements.

The training course will enable operators of the Global Atmospheric Watch (GAW) Stations, and early-career scientists, researchers, and professionals who are passionate about climate change and GHG monitoring from the WMO Regional Association II (Asia) (RA II) and RA V (South-West Pacific) to have practical skills and knowledge enabling them to operate and maintain the GHG measurement instruments as well as to collect, submit and analyse data to better address the challenges of climate change, in line with the GAW best practices.

Blended learning will be used as the learning method, and it will combine two phases: the online phase and the in-person phase (for selected participants). The online phase will run for a duration of three weeks, from **25 June to 11 July 2024**. Selected participants will continue their learning in the in-person phase which will be conducted in GAW Station Bukit Kototabang, Bukitting, West Sumatra, Indonesia, in one week, from **30 September to 4 October 2024**. Annexes I and II to this circular letter briefly describe the course, its format, expected learning outcomes, and qualifications to be attained.

You are invited to submit an application form (Annex III) of an interested and qualified candidate for consideration. All applications will be jointly reviewed by the WMO Science and Innovation Department and the Education and Training Office. While the online phase will welcome many applicants for wider participation in the Region, selection for the in-person phase will be made on a competitive basis, with priority to the participants working in a GAW Station.

Any interested candidate from countries in RA II and RA V should first apply by sending a duly completed application form (Annex III) with the relevant attachments to the WMO Science and Innovation Department (smoreno@wmo.int) copied to the Education and Training Office (tra@wmo.int) no later than **10 June 2024**. Any applications after this date will not be considered.

To: Permanent Representatives of Members of Regional Association II and V with WMO

cc: Hydrological Advisers

For the in-person phase, the selected successful participants from the online phase will be notified and contacted by WMO for the preparation of the travel logistics. Thereafter, the selected candidates will receive a Request for Financial Assistance (RFA) form to complete and send back to WMO along with the admission letter and a copy of the selected candidate's passport, no later than **1 August 2024.** Any RFAs received after this date will not be considered.

Please note that while Members are encouraged to cover the expenses of their participants to attend the in-person phase in Bukit Kototabang – Indonesia, WMO is prepared to support one participant from selected Members of RA II and RA V with priority to the ones working in the operation of GHG Measurements.

May I take this opportunity to assure you of my unwavering commitment to capacity development-related activities in support of competency development and to thank you for your continued cooperation in this endeavour.

Yours faithfully,

Prof. Celeste Saulo
Secretary-General

THE INDONESIAN AGENCY FOR METEOROLOGY, CLIMATOLOGY AND GEOPHYSICS (BMKG)

1	Host Member	Indonesia
2	Host institution(s)	The Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG)
3	Website	www.bmkg.go.id
4	Location(city) of institution(s)	Jakarta, Indonesia
5	Address of institution	Jl. Angkasa I No. 2 Kemayoran, Jakarta Pusat, DKI Jakarta, Indonesia 10720
7	Course type	Blended Learning: - Online phase - In-person phase (for selected participants)
8	Main course content	For the online programme: • Understand the principles of the greenhouse effect, the significance and importance of measuring GHGs, and the factors driving climate change; • Understand the stages of the WMO GAW programme, traceability and calibration scales, data treatment and data submission to the World Data Centre on Greenhouse Gases (WDCGG) and other initiatives like IG3IS and G3W for comprehensive GHG monitoring awareness; • Understand measurement techniques for GHGs (CO_2, CH_4, N_2O), as well as the calibration and maintenance; • Understand the importance of quality assurance and quality control in GHG monitoring; • Apply the GAWSIS/OSCAR metadata update; • Demonstrate GHG basic data processing, analyse, and visualization. For the in-person programme • Apply the GHG measurement principles (including spectroscopic and remote sensing techniques), calibration and maintenance, ensuring traceability, safety in field measurements, and the application of GAW quality assurance and quality control (QA/QC) protocols; • Apply GHG data processing and analysis, data visualization, and presentation under the QA/QC procedures; • Apply the data treatment, as well as timely and accurate data submission to WDCGG (and other initiatives like IG3IS and G3W) for comprehensive GHG monitoring awareness.
9	Duration of study	- Online phase: 3 weeks (25 June to 11 July 2024) - In-person phase: 1 week (30 September to 4 October 2024)

10	Course start date	- Online phase: 25 June 2024 - In-person phase: 30 September 2024
11	Target Region and Members	English speaking countries among RA II and RA V
12	Basic requirements	Relevant areas of competence: • Climate science, environmental science, geography, Earth sciences, or a related field (such as chemistry and physics); • Basic skills of data, methods, and tools/ instruments for GHG operation; • Basic Skills of computer programming languages (particularly R) and Geographic Information Systems (GIS); • Good skills in English reading, written and spoken (language comprehension).
13	Language	English
14	Number of awards	- Online phase: Up to 50 participants - In-person phase: Up to 15 selected participants
15	Application form	Mandatory
16	Admission from institution	Mandatory
17	Application closing date	WMO: For the online course selection 10 June 2024 For the in-person course: 1 August 2024, For the completion of documents: 15 August 2024
18	Document to send to WMO after selection process	Request for Financial Assistance (RFA)
19	Contact information	smoreno@wmo.int copy to tra@wmo.int

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THE INDONESIAN AGENCY FOR METEOROLOGY, CLIMATOLOGY AND GEOPHYSICS

WMO-BMKG-GAW HANDS-ON TRAINING ON GREENHOUSE GAS MEASUREMENTS

Course description

The WMO-BMKG-GAW Hands-on Training in Greenhouse Gases Measurement is a blended course that is organized by the WMO Education and Training Office in collaboration with the WMO Science and Innovation Department, and with the kind support of the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG). The online phase will be conducted in the WMO ETRP Moodle platform, while the in-person programme will take place in the mountainous area of GAW Station in Bukit Kototabang, Bukittingi, West Sumatra in Indonesia.

The course is organized to provide participants with the comprehensive understanding about the greenhouse effect, the significance and importance of measuring GHGs and the WMO Programme in GHG measurement as well as calibration, and maintenance principles. Participants will also learn how to apply basic GHG data processing, analysis, and visualization for effective data presentation. Moreover, the in-person phase aims to provide participants with the practical skills in how to measure safely and accurately GHG in a GAW station, following GAW QA/QC procedures and timely submitting the data to the World Data Centre on Greenhouse Gases (WDCGG).

In addition, the training programme will include:

(1) Hands-on training of GHG monitoring which will equip participants with practical skills and knowledge enabling them to operate and maintain the GHG measurement instruments as well as to collect, submit and analyse data to better address the challenges of climate change;

(2) The action plan activities (to ensuring the application of the knowledge and skills resulted from the training in their home country).

Course format

This will be a blended learning course. The online course will run from 25 June to 11 July 2024 in the WMO ETRP Moodle platform. The in-person programme will be delivered in the classroom in the BMKG GAW Station in Kototabang, Bukittinggi, West Sumatra Indonesia, from 30 September to 4 October 2024, for selected participants.

For best results, students must show satisfactory attendance, progress, and timely and satisfactory completion of online tasks/quizzes as per submission deadlines. Only up to 15 successful participants from the previous online course who working in a GAW Station or are involved in GHG measurement operation could be selected. They are recommended to bring their own laptop and prepare the identification of the challenges of GHG measurement in their country.

Expected Learning outcomes

By the end of the course, the students will have successfully achieved the following outcomes:

A. For the online programme:

1. Understand the principles of the greenhouse effect, the significance and importance of measuring GHGs, and the factors driving climate change.
2. Understand the stages of the WMO GAW programme, traceability and calibration scales, data treatment and data submission to WDCGG and other initiatives like IG3IS and G3W for comprehensive GHG monitoring awareness.
3. Understand measurement techniques for GHGs (CO_2, CH_4, N_2O), as well as the calibration and maintenance.
4. Understand the importance of quality assurance and quality control in GHG monitoring.
5. Apply the GAWSIS/OSCAR metadata update.
6. Demonstrate GHG basic data processing, analysis, and visualization.

B. For the in-person programme

1. Apply the GHG measurement principles (including spectroscopic and remote sensing techniques), calibration and maintenance, ensuring traceability, safety in field measurements, and the application of GAW quality assurance and quality control (QA/QC) protocols.
2. Apply GHG data processing and analysis, data visualization, and presentation under the QA/QC procedures.
3. Apply the data treatment, as well as timely and accurate data submission to WDCGG (and other initiatives like IG3IS and G3W) for comprehensive GHG monitoring awareness.

Competencies attained and certificates issued

After successful completion of the course, the candidates will receive a certificate stating the underpinning skills that support the WMO competency implementation in GHG measurement.

Target audience

Operators of Global Atmospheric Watch (GAW) Stations, and early-career scientists, researchers, and professionals who are passionate about climate change and GHG monitoring from RA II (Asia) and RA V (South-West Pacific).

Instructors

Trainers from WMO, BMKG, and the World Calibration Centre for Surface Ozone, Carbon Monoxide, Methane and Carbon Dioxide (WCC-Empa) will be the instructors for the course. Additional content experts will be brought in for specific portions/subjects of the course.

Working language

The course will be conducted in English. No translation in other languages is offered.

Entry requirements

- Involvement in GHG Measurements operation
- Having relevant background such as climate science, environmental science, geography, Earth sciences, or a related field (such as chemistry and physics)
- Basic skills of data, methods, and tools/ instrument for GHG operation
- Basic Skills of computer programming languages (particularly R) and Geographic Information Systems (GIS)
- Good skills in English reading, written and spoken (language comprehension)

All this needs to be verified by proof of CV and qualifications.

Work experience: relevant work experience in GHG measurement is preferred in face-to-face phase.

Useful resources in preparing for the course

A laptop or desktop computer with Microsoft Office or equivalent (Word processor, PowerPoint Presentation etc.) good memory capacity and storage (an external storage is advised). A good and stable connection with sufficient bandwidth. A laptop would be preferable as it can be used during the face-to-face phase.

Procedure for application

The application must include:

- A letter of motivation in English limited to 200 words;
- A CV;
- Relevant certified qualifications;
- Signed nomination letter from relevant the Permanent Representatives.

All applications will be handled according to the protection of private information requirements.

Application for consideration should be sent to: smoreno@wmo.int and tra@wmo.int

Clearly mark the subject of the email as: ***GAW Hands-on Training on Greenhouse Gas Measurements***.

Deadline for application: **10 June 2024**

Deadline for submission of the Request for Financial Assistance (RFA) form with a copy of the admission letter and passport is **1 August 2024**

Only successful applications will be notified by email by WMO.

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APPLICATION FORM

WMO-BMKG-GAW HANDS-ON TRAINING ON GREENHOUSE GAS MEASUREMENTS

ONLINE AND IN-PERSON, BUKIT KOTOTABANG, INDONESIA

25 June to 11 July 2024 (online) and 30 September to 4 October 2024 (in-person)

Note: Please read the notes and instructions on the last page before completing this application form

A. PERSONAL	
1. First name	
2. Surname	
3. Country	
4. Date of birth *(DD/MM/YYYY)*	
5. Gender	M / F
6. Passport number	
7. Passport validity	
8. Do you have a disability	Yes / No
If yes, please specify	
9. Permanent home address	
(number, street, postal code, town)	
10. Telephone *(mobile)*	
11. Email	
12. Professional contact	
Name	
Telephone *(office)*	
Professional links	
13. If you are selected for the in-person phase, would you request financial assistance to participate in the course? Yes / No	

B. GENERAL

1. Give details of working experience in GHG Measurement Operation

Name of organization	Starting and end date	Brief description of role and responsibilities	Reason for leaving

2. Write a brief statement setting out clearly why you have chosen this course and how you intend to use it after graduation

I declare that to the best of my knowledge all the information in this form is true and correct.

Signature _____ Date _____

C. PERMANENT REPRESENTATIVE ENDORSEMENT

Signature _____ Date _____

Notes and instructions

Please read these notes and instructions carefully before completing this application form. Be sure to read every section and that the information you provide is accurate.

1. Applications received after the date of **10 June 2024** will not be considered;

2. Applications received without the endorsement of the Permanent Representative will not be considered;

3. Incomplete application forms will not be considered;

4. Closing dates for the application dates are published and will be strictly adhered to;

5. A copy of the passport must be included in the application for the in-person phase;

6. Successful candidates will be contacted by email. Please ensure that your contact details are correct and clearly written.