

**WMO OMM**

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
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Annex: 1 (available in English only)

Subject: Invitation to provide financial support for the work of the WWRP Expert Team on Weather Modification (WxMOD)

Dear Sir/Madam,

I am pleased to convey the appreciation of the World Weather Research Programme (WWRP) for the continued engagement of Members in advancing scientific understanding and responsible practices in weather modification through membership of the Expert Team on Weather Modification.

Weather modification is of global significance due to intensifying water scarcity, increasing climate-related extremes, rapid technological advances, and the expanding number of countries engaged in operational or research-based activities. As many countries conduct some form of weather modification—ranging from precipitation enhancement to hail suppression—the need for sound scientific principles, transparency, and responsible governance is ongoing. At the same time, the rapid evolution of technologies such as AI-supported decision systems, advanced numerical models, and new airborne observation platforms is reshaping both the possibilities and the risks associated with atmospheric interventions.

As the authoritative voice for weather, climate, and water, WMO carries a unique responsibility to guide the international community toward scientifically robust, ethically sound, and transparent practices in this sensitive field. Through its WWRP and the Expert Team on Weather Modification (ET WxMOD), WMO provides the essential mechanisms for global coordination, peer-reviewed scientific assessment, and the development of guidance that protects public trust and supports informed national decision-making.

The Fifteenth World Meteorological Congress (Cg-15, 2007) urged the Secretariat to establish a Trust Fund to support the quadrennial WMO Scientific Conference on Weather Modification and the WMO Expert Team on Weather Modification, to provide training and guidelines for sound scientific practices in weather modification and operations. Following the successful convening of the Eleventh WMO Scientific Conference on Weather Modification (November 2025), the community has reiterated the need for strengthened coordination, impartial scientific assessment, and enhanced global visibility of current research and operational activities. In particular, the experts highlighted the importance of an updated, consolidated scientific review on hail suppression, an area with significant societal and economic impacts across many regions. This echoes the Seventy-ninth session of the Executive Council's (EC-79, 2025) request that the Expert Team should provide regular updates on weather modification-related topics.

To meet these needs, the WWRP Expert Team respectfully invites WMO Members to contribute financial support to the WMO Weather Modification Trust Fund. These contributions will enable the Expert Team to implement its 2026–2029 workplan, including:

To: Permanent Representatives of Australia, Brazil, China, Indonesia, Japan, Russian Federation, Saudi Arabia, South Africa, Switzerland, United Arab Emirates and United States of America with WMO (limited distribution)

- (1) Preparation of a peer-reviewed scientific review on hail suppression, addressing physical principles, methods, historical experience, evaluation approaches, uncertainties, and global practices;
- (2) Coordination of international Expert Team meetings to maintain scientific oversight, develop guidance, and support community-building;
- (3) Development of a global directory of weather modification programmes, supporting transparency and information sharing;
- (4) Strengthening of weather modification-related scientific sessions at major international conferences, ensuring visibility and alignment with broader atmospheric sciences;
- (5) Expansion and translation of educational and outreach materials supporting capacity development and good scientific practice.

All contributions will directly support the global knowledge base and assist Members in making informed, evidence-based decisions in areas where weather modification practices are considered or implemented. Funds will be administered transparently through the existing WMO Trust Fund, in accordance with the United Nations financial regulations.

Contributing Members will receive regular progress updates and will have opportunities to engage national experts in consultations, workshops, and review processes. A detailed workplan and budget are provided in the [annex](#).

The WWRP supporting Secretariat members and the Expert Team remain at your full disposal to provide any further information, including administrative procedures for Trust Fund contributions. For any inquiries, please contact WMO Staff member Dr Estelle de Coning, Chief of the Weather and Societal Impact Research Section, at edeconing@wmo.int, which supports the WWRP.

I would like to take this opportunity to express my sincere appreciation for your continued support of WMO activities.

Yours faithfully,



Ms Ko Barrett
for the Secretary-General

BACKGROUND, ACTIVITIES, AND BUDGET OVERVIEW

(1) Background and mandate

- **Cg-15 (2007)** urged the establishment of a Trust Fund to support the quadrennial WMO Scientific Conference on Weather Modification and the Expert Team.
- **EC-60 (2008)** requested regular updates from the Expert Team on Weather Modification.
- **Cg-18 (2019)** instructed the Research Board to ensure coherent planning and implementation of WMO research activities within the WWRP.
- **EC-79 (2025)** adopted an updated WMO Statement on Weather Modification, with cognizance that WMO maintains a neutral position on weather modification, emphasizing scientific expertise, good practice, and transparency. It also requested the Expert Team to provide regular updates on weather modification-related topics.

(2) Need for a Scientific Review of Hail Suppression

- Hailstorms cause severe damage to agriculture, infrastructure, aviation, and public safety.
- The 2018 WMO review on precipitation enhancement specifically excluded hail suppression, thus there is no WMO endorsed global scientific assessment.
- The proposed review will:
 - Summarize physical understanding of hail processes
 - Evaluate scientific methods and operational practices
 - Review global experience and uncertainties
 - Provide neutral, peer-reviewed guidance for Members.

(3) Planned activities of the Expert Team (2026–2029)

- A peer-reviewed scientific review on Hail Suppression
- Update a directory of global weather modification activities
- Promotion of WM sessions at major conferences (for example ICCP, AGU, EGU, IAMAS, AMS and so forth)
- Planning for the twelfth WMO Scientific Conference on Weather Modification (2029)
- Educational and outreach materials.

(4) Scope of the Review on Hail Suppression

The review will focus on five major themes:

- Physical understanding of hail
 - Microphysical processes leading to hail initiation, growth, and fallout within convective systems

- Role of aerosols, updraft dynamics, storm evolution, and atmospheric thermodynamics.
- Scientific theories and methods of hail suppression
 - Glaciogenic and hygroscopic methods, selective triggering and storm modification strategies
 - Physical pathways through which seeding might influence hailstone formation.
- Evaluation methods
 - Observational requirements (in situ, radar, satellite), statistical and randomized trial design, and model integration
 - Metrics to quantify hail modification versus natural variability.
- Historic hail suppression research and trial experience
 - Lessons learned from major trials worldwide, including both successes and inconclusive outcomes
 - Environmental and societal considerations.
- Current global activities and future research priorities
 - Summary of active national programmes and emerging technologies
 - Recommendations for improving scientific rigor, transparency, and international collaboration.

Expected outcomes

The review will:

- Provide an authoritative scientific resource for WMO Members and the broader research community
- Clarify the conditions under which hail suppression may or may not be scientifically feasible
- Support evidence-based policies, capacity development, and responsible implementation
- Identify high-priority research needs to accelerate progress in the field.

Project leadership and peer review

The review will be led by the Expert Team on Weather Modification (WxMOD) of the World Weather Research Programme, drawing on international peer reviewers to ensure scientific neutrality and global representation.

(5) Budget requirements (2026–2029)

Expert Team meetings

Function	Estimated Cost (USD)
3-day ET meeting (11 members), aligned with WWRP 2027 conference	35 000
5-day ET meeting, aligned with twelfth Conference (2029)	60 000
Translation of existing COMET modules into more languages (Arabic, Russian and Chinese) (2026–2027)	45 000

Scientific Review on Hail Suppression

Function	Estimated Cost (USD)
Preparation, coordination, peer review, editing, publication (2026–2028)	60 000 (over three years)
TOTAL	200 000 (over 4 years)
