

APEC PPSTI SYMPOSIUM 2026

Technological Innovation
for Managing Extreme Weather Risks
in the APEC Region



Program Book

Welcome Message

On behalf of the organizers, the APEC Climate Center (APCC) warmly welcome you to Dalian, China for the APEC PPSTI Symposium 2026. Co-hosted with the APEC Center for Technology Transfer (APCTT), we are proud to convene this key event under the theme, **“Technological Innovation for Managing Extreme Weather Risks in the APEC Region.”**

The Asia-Pacific region is experiencing an unprecedented rise in the frequency and intensity of extreme weather events, posing severe challenges to our communities, economies, and resilient developments. To effectively mitigate these growing risks, it is imperative that we harness science, technology, innovation, and policy integration to strengthen our collective response and build climate-resilient future.

This year’s symposium serves as an important platform to connect scientific discoveries with practical policy solutions. Across our Keynote, Technical, and Panel sessions, we will explore recent advancements from AI-driven digital technologies to integrated early warning systems for wildfire and severe weather preparedness. By bringing together leading scientists, policymakers, and international experts from organizations such as WMO, UNEP CTCN, and UNDRR, we aim to translate cutting-edge scientific innovation into actionable strategies for extreme risks management.

This symposium would not be possible without the dedication and valuable support of our valuable partner institutions, distinguished speakers, and panelists. I extend my deepest gratitude to the APEC Secretariat, APEC China, our co-hosts, and all delegates for your active participation and valuable contributions to making this symposium a successful and impactful endeavor. We wish you an engaging, insightful, and memorable experience in Dalian.

Dr. Kyung-Ja Ha
Executive Director
APEC Climate Center

Organizers

APEC Climate Center

The APEC Climate Center (APCC) was established in 2005 with the unanimous endorsement of the Asia-Pacific Economic Cooperation (APEC) senior officials and leaders at the first APEC Senior Officials Meeting in Seoul, Korea, to enhance the socio-economic well-being of APEC member economies by utilizing up to date scientific knowledge and applying innovative climate prediction techniques. Since then, APCC has provided value-added, reliable, and timely climate prediction to nations in the APEC region and beyond, while serving as a key climate information center to distribute climate data, prediction and related tools. APCC is a unique organization that catalyzes climate information based solutions through three interconnected pillars of work: climate prediction and information services; climate information application and climate change response; and capacity building. APCC hosts the annual APEC Climate Symposium, which provides a forum for various scientists, academics, policy-makers and other stakeholders to share the latest science innovations in climate prediction and explore climate information applications.

APEC Center for Technology Transfer (APCTT)

The APEC Center for Technology Transfer (APCTT) is a non-profit international scientific and technological intermediary organization engaged in promoting technology transfer and innovation cooperation in the Asia-Pacific region. Approved at the 22nd APEC Industrial Science and Technology Working Group (ISTWG) Meeting held in Singapore in 2002, APCTT was established with the support of the Ministry of Science and Technology of China, the Department of Science and Technology of Jiangsu Province, and the People's Government of Suzhou Municipality. APCTT is recognized as a Specialized APEC Center operating under the Policy Partnership on Science, Technology and Innovation (PPSTI), serving as an institutional platform that supports APEC's science, technology, and innovation agenda. The Center is committed to exploring and disseminating advanced concepts and models of technology transfer across APEC member economies, while promoting cooperation through science and technology communication, policy dialogue, pilot implementation, and capacity building. Through its activities, APCTT facilitates information exchange and collaboration among APEC economies, analyzes and shares effective technology transfer outcomes with enterprises, and strengthens human capacity by organizing training programs for technology managers.

**APEC PPSTI
SYMPOSIUM 2026**

Technological Innovation
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Overview

APEC PPSTI Symposium 2026

The APEC PPSTI Symposium is an annual event, held since 2005, dedicated to advancing knowledge exchange on the latest climate prediction techniques and their application within the APEC region and beyond. The Symposium serves as a vital platform for building capacity in climate change adaptation while fostering collaboration among the world's leading scientists, researchers, meteorological services, policy-makers, and other key stakeholders. Through a series of themed sessions developed each year, this facilitates the sharing of scientific innovations, supports capacity building for climate adaptation, and promotes interaction among stakeholders in the Asia-Pacific region.

As the APEC region faces increasing frequency and intensity of extreme weather events, traditional risk management approaches are no longer sufficient. While the 21 APEC member economies represent a powerhouse of global GDP, the escalating climate uncertainties pose a direct and significant threat to regional human security and economic stability. To build a climate-resilient and future-ready Asia-Pacific, it is imperative to move beyond conventional methods and embrace **technological innovation** as the primary driver for disaster risk reduction. The Symposium will shift the focus **toward the cutting-edge frontiers of forecasting science, early warning systems (EWS), and digital decision-making tools**. By bridging the gap between advanced scientific R&D and practical policy implementation, APEC can transform theoretical innovation into actionable climate resilience.

The overarching goals of this event are to identify technologies currently available for resilience on responding extreme weather events within APEC region; to explore pathways for transferring these technologies to APEC member economies through locally tailored information services; and to strengthen the capacity of each economy to apply innovative technologies tailored to their specific socio-economic and environmental contexts, thereby enhancing their ability for emergency preparedness and to adapt more effectively to environmental risks.



Program

DATE AUG 18TH (THU), 2026

Time	Activity & Presentation	
	Opening Session	
09:30-10:00	Opening Remarks	Dr. Kyung-Ja Ha, Executive Director, APEC Climate Center (APCC)
	Congratulatory Remarks	Dr. Hwanil Park, PPSTI Chair
	Welcome Remarks	Ms. Yang Xuemei, PPSTI Vice Chair
	Group Photo	
10:00-11:00	[Keynote Session] Technological Innovation for a Climate-Resilient and Future-ready APEC <i>chaired by Dr. Suyeon Moon, Research Fellow, APCC</i>	
	Zero Carbon Prosperity for Climate Adaptivity: A New Narrative for Climate Actions	Prof. Jiahua Pan, Professor, Hong Kong University of Science and Technology
	Leveraging Digital and AI Technologies for Climate Resilience in APEC Economies: Emerging Risks, Opportunities, and Challenge	Mr. Aslam Perwaiz, Executive Director, Asian Disaster Preparedness Center (ADPC)
11:00-11:40	[Session I] Strengthening Extreme Weather Preparedness : Advanced Forecasting and Early Warning Systems <i>chaired by Dr. Suyeon Moon, Research Fellow, APCC</i>	
	Integrated Technologies for Wildfire Preparedness and Early Detection	Prof. Marta Yebra, Director, Bushfire Research Centre of Excellence, Australian National University
	China Intelligent Meteorological Early Warning Solution	Dr. Wenli Hua, Scientific Officer, China Meteorological Administration
11:40~11:50	Coffee Break	
11:50~12:50	[Panel Discussion] From Technological Innovation to Policy : Translating Science into Action for Enhanced Extreme Risk Management <i>chaired by Dr. Miae Kim, Research Fellow, APCC</i>	
	▶ Panelists	
	• Mr. Jun Yu, Regional Officer, WMO Regional Office for Asia and the Pacific	
	• Dr. Suil Kang, Coordination Officer, Partnership and Liaison Office, UNEP CTCN	
	• Ms. Diana Patricia Mosquera Calle, Deputy Chief, UNDRR Regional Office for Asia and the Pacific	
12:50~13:50	Lunch	





APEC PPSTI SYMPOSIUM 2026

Keynote Session

**Technological Innovation
for a Climate-Resilient and Future-ready APEC**



Jiahua Pan

Professor, Hong Kong University of Science and Technology

PAN Jiahua, Professor, Hong Kong University of Science & Technology (GuangZhou), and Special Advisor to the President of HKUSTGZ; Vice chair, China's Expert Panel on Climate Change. Lead author, IPCC Working Group III on Mitigation (AR6, 2021), Member, Independent Group of Scientists (appointed by UN Secretary General) for preparation of Global Sustainable Development Report 2023. Former director-general, Institute of Eco-civilization Studies, Chinese Academy of Social Sciences (2008-2020); director, Institute of Eco-civilization Studies, Beijing University of Technology (2021-2025); member of Foreign Policy Advisory Committee (2010-2014), Ministry of Foreign Affairs; President, Chinese Society of Urban Economists (2018-2023). Research areas including sustainable development economics, energy & climate policy studies, and new thinking in ecological economics. 16 books and over 300 papers published in both English and Chinese. As a member of the IPCC awarded the Nobel Peace Prize 2007, Sun Yefang Prize of Economic Science (2010).

Zero Carbon Prosperity for Climate Adaptivity: A New Narrative for Climate Actions

Climate sciences informs decision-makers that both mitigation and adaptation actions must be taken in addressing climate challenges. However, the conventional narrative under the North-South divide normally suggests that the developed countries should take the lead and demonstrate to mitigate while the developing countries are vulnerable to climate change and adaptation should be considered a priority. However, in an emerging era of zero carbon prosperity based on an energy system dominated by solar and wind renewables, a new narrative indicates that mitigation and adaptation should not be simply understood as mutually independent for integration but more climate adaptivity relies on the development of zero carbon renewables.

First of all, there is an ethical paradox for climate finance. Climate ethics requires that resources be spent on mitigation so that temperature rising can be brought under control. In the meantime, losses and damages caused by global warming should be compensated as the vulnerable developing countries are not responsible for historical emissions but bear the adverse impacts. However, if more resources are spent on climate adaptation, emissions would continue to rise and more global warming leading to higher levels of losses and damages. So in this regard, mitigation actions should both reduce emissions and enhance adaptivity.

Then there is a need for assessing how to effectively mitigate emissions and their implications for climate adaptivity: decarbonizing fossil fuel or going zero carbon renewables? Fossil fuels are capital intensive and their technological improvement can go lower carbon but they can never go zero carbon. For instance, it is impossible to generate electricity without carbon emissions from coal fired power plant no matter how efficient a coal combustion system can reach. But renewables in particular distributed solar can be small in size, affordable and manageable by small economic entities. Solar panels are friendly to the poor and can help with ecological conditions and building adaptive capability when properly planned and implemented.

There is sufficient evidence that many developing countries are doing more and better than some developed rich economies in deploying zero carbon renewable technologies. The reason behind lies in that purely climate adaptation is more on the defensive side, highly expensive and uncertain with the outcome, while zero carbon renewables are proactively expansive actions, which can bring about immediate benefits and upgrade climate adaptivity. With solar panels installed, low income households and communities can have access to internet such that early warning signals of extreme climate events can reach them and their ability to respond to climate disasters can be increased. For instance, with solar electricity, irrigation can be possible when drought occurs.

While fossil fuels are highly insecure and prices volatile, the supply and cost of renewables are highly secure and certain. In arid or semi-arid region, solar panels reduce water evaporation and generate electricity, and thus create new employment and development opportunities. On the contrary, continued increase in surface temperature can accelerate desertification in semi-arid areas and thus cause climate migration.

In conclusion, renewables-based solutions to climate resilience are development oriented and sustainable in the longer run. Zero carbon renewables are not only compatible with end use equipment more energy efficient and cost saving, but also essential for responding to climate risks.



Aslam Perwaiz

Executive Director, Asian Disaster Preparedness Center (ADPC)

Mr. Aslam Perwaiz is a global disaster risk reduction strategist with a mix of leadership and technical expertise in developing, managing and delivering high-impact programs related to development economics, sustainable development, environment, disaster risk reduction and climate resilience.

He has substantive fieldwork experience from more than 25 countries (Asia, Pacific, and Africa) with domestic and local work program development and implementation in emergency preparedness planning, risk management systems, post-disaster damage and loss assessment, recovery planning, and private sector resilience.

Since 2011, Mr. has been involved in various initiatives of APEC through the Emergency Preparedness Working Group (EPWG), Small Medium Enterprise Working Group (SMEWG) and the Transportation Working Group (TPTWG). He has served as an expert and resource person for the SME disaster resilience, business continuity planning and SME digital resilience projects.

Mr. Aslam Perwaiz has known the APEC Climate Centre since early 2015 and has contributed to the ASEAN Science-Based Disaster Management Platform Project a decade ago.

Mr. Aslam brings with him extensive experience of disaster risk management in member economies. Among other notable initiatives, he initiated the ADPC's private sector engagement "iPrepare Business" facility and post-disaster needs assessment initiative "Ready4Recovery".

Leveraging Digital and AI Technologies for Climate Resilience in APEC Economies: Emerging Risks, Opportunities, and Challenge

Climate change-induced disasters pose a growing threat to APEC economies where increasingly frequent and intense hazards such as floods, cyclones, heatwaves, droughts, and earthquakes, are disrupting livelihoods, food and energy systems, while emerging hotspots create complex, cascading risks.

The Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018– 2030), a regional blueprint by the United Nations ESCAP provides a regionally-coordinated framework for promoting the use of space and digital innovations for disaster risk management while supporting inclusive capacity development.

The Asian Disaster Preparedness Centre (ADPC) supports the efforts of the APEC Climate Centre (APCC) in the region to harness space-based and geospatial technologies to advance the Sustainable Development Goals (SDGs) and strengthen climate resilience. These frameworks underscore the growing importance of integrating AI, Earth observation data, and digital tools into climate and climate risk services to boost economic growth and regional trade in the APEC region.

Beyond the economic benefits of AI, there is the potential to focus complex issues, including poverty, inequality, and climate change. AI-enabled systems can support both climate change adaptation and mitigation action, ranging from early warning systems for natural disasters to optimizing agri-food production and improving the efficiency of energy systems. However, the deployment of AI can also pose challenges and risks such as widening of the digital divide, data security and transparency issues, reinforcing bias including gender bias, facilitating the spread of disinformation and misinformation, and increasing energy and water consumption.

Building on the APEC Policy Partnership on Science, Technology and Innovation (PPSTI), the keynote session will address how technological innovation, including AI and high-resolution modeling, etc. can contribute to making the APEC region more climate resilient and future ready in response to extreme risks management.

The keynote address will highlight the importance of climate resilience and regional cooperation by which economies withstand environmental shocks through smart infrastructure, green supply chains, and strong cross-border cooperation. It will share examples of digital and AI technologies for evidence-based risk assessments and risk-informed decision for climate-smart farming, and financial systems that fund disaster recovery and adaptation for vulnerable communities.





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Session I

**Strengthening Extreme Weather Preparedness :
Advanced Forecasting and Early Warning Systems**



Marta Yebra

Director, Bushfire Research Centre of Excellence, Australian National University

Professor Marta Yebra is a Professor at the Australian National University (ANU) and Director of the Bushfire Research Centre of Excellence. Her research focuses on developing and translating Earth observation and emerging technologies to improve wildfire preparedness, early detection and management.

She leads interdisciplinary research integrating satellite remote sensing, artificial intelligence, ground-based sensors, camera networks and autonomous systems to monitor vegetation flammability, assess wildfire risk and enable earlier fire detection. Her work has contributed to the development of operational satellite-based fuel moisture monitoring in Australia, novel approaches to lightning ignition assessment, AI-enabled smoke detection, and the use of long-range drones for wildfire monitoring and response.

Professor Yebra works closely with government agencies, emergency services, industry and international partners to translate scientific advances into operational capabilities and serves in government advisory roles, including the Australian Space Agency's Earth Observation Technical Advisory Group. She co-leads the Committee on Earth Observation Satellites (CEOS) Wildfire Preparedness Pilot and is a Corresponding Member of the International Academy of Astronautics. Most recently, she was recognised in 2025 among the Top 100 global researchers in AI for Good for her work applying artificial intelligence to environmental and societal challenges.

Integrated Technologies for Wildfire Preparedness and Early Detection

Wildfires are an increasing threat across the APEC region, creating a growing need for technologies that can support decision-making before ignition and enable rapid detection once fires begin. Rapid advances in Earth observation, artificial intelligence, lightning detection, autonomous systems and environmental sensing are creating new opportunities across this continuum. However, their greatest value lies not in individual technologies, but in their integration into trusted and operationally useful systems. This presentation will explore an integrated approach to wildfire preparedness and early detection, drawing on research and operational initiatives developed in Australia and through international collaborations. It will examine how satellite Earth observation can provide spatially explicit information on vegetation condition and fuel moisture to identify where landscapes are becoming increasingly available to burn, and how emerging satellite capabilities could further improve the monitoring of vegetation flammability. The presentation will also explore how lightning detection and ignition modelling can help identify where and when natural ignitions are most likely to occur. Combining information on lightning characteristics with fuel condition, weather and environmental factors offers opportunities to move beyond simply locating lightning strikes towards identifying and prioritising those most likely to result in wildfire ignition. Once a fire starts, rapid detection becomes critical. Artificial intelligence applied to ground-based camera networks can enable early smoke detection, while drones and in-situ sensors provide complementary capabilities for detection, confirmation, monitoring and situational awareness. Together, these technologies can provide a more complete picture of evolving wildfire risk and support decision-making from preparedness through to the earliest stages of response. Drawing on experience working with fire and emergency management agencies, the presentation will also discuss what is required to translate technological innovation into operational capability. This includes co-design with end-users, rigorous validation, interoperability, effective communication of uncertainty, and sustained collaboration between researchers, governments and industry. The Australian experience provides lessons relevant across the diverse environmental, technological and institutional contexts of APEC economies. Integrating complementary technologies, while adapting their implementation to local needs and capabilities, can strengthen wildfire preparedness and enable earlier, more informed action as fire risk increases across the region.



Wenli Hua

Scientific Officer, China Meteorological Administration

Dr HUA Wenli is a Scientific Officer at the World Meteorological Centre Beijing (WMC-BJ) Office within the China Meteorological Administration (CMA). With a PhD in Science and extensive international experience, including serving as a former Junior Professional Officer (JPO) at the World Meteorological Organization (WMO), her work centers on the research and practice of global meteorological governance and international meteorological cooperation.

At CMA, Dr Hua plays a leading role in advancing and scaling up MAZU (Multi-hazard, Alert, Zero-gap, Universal), China's flagship intelligent meteorological early warning solution.

China Intelligent Meteorological Early Warning Solution

MAZU: China's Solutions to Early Warnings for All

In 2022, the United Nations (UN) launched the Early Warnings for All (EW4All) initiative, aiming to ensure that everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of 2027. In response, the China Meteorological Administration (CMA) proposed MAZU (Multi-hazard, Alert, Zero-gap, Universal) — China's solution for EW4All. MAZU integrates disaster risk knowledge, cutting-edge technologies, products, operational systems, service tools, equipment, and proven practices and experience in disaster prevention and mitigation. This presentation is structured into four parts to illustrate the system comprehensively. It firstly interprets the basic concept and core connotation of MAZU. Secondly, it introduces the AI engine that drives intelligent and accurate forecasting products. Thirdly, it demonstrates the core component of MAZU, the Cloud-Based Early Warning System. Lastly, it explores the project's open global collaboration strategies and future development prospects.





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Panel Discussion

**From Technological Innovation to Policy :
Translating Science into Action
for Enhanced Extreme Risk Management**



Jun Yu

Regional Officer, WMO Regional Office for Asia and the Pacific

Mr. Jun YU is a Regional Officer at the World Meteorological Organization (WMO) Regional Office for Asia and the Pacific (RAP), based in Singapore. He is responsible for supporting the work of WMO Regional Association II (Asia) and promoting regional cooperation among National Meteorological and Hydrological Services (NMHSs). His portfolio includes infrastructure development, capacity building, early warning systems, climate services, observation networks, and partnerships to enhance resilience to weather-, climate-, and water-related hazards. Before joining the WMO Secretariat, Mr. Yu served in the China Meteorological Administration, including as Director of the International Cooperation Division, where he led international partnerships and multilateral cooperation. He holds a Master's degree in Meteorology from Peking University and has more than two decades of experience in international meteorological cooperation and the implementation of WMO programmes and long-term engagement with APEC activities.



Suil Kang

Coordination Officer, Partnership and Liaison Office, UNEP CTCN

Suil Kang is currently working as a Coordination Officer at UNEP Climate Technology Centre & Network (CTCN) Partnership and Liaison Office (PALO) based in Songdo, Incheon, Korea. Since September 2004, Suil has worked at the international Environmental Research Institute (IERI), Gwangju Institute of Science and Technology (GIST), Korea. Suil was on secondment to the Climate Technology Cooperation Team in the Ministry of Science and ICT (MSIT) as an expert advisor from July 2016 to December 2018 and contributed to the collaboration with CTCN and facilitation of domestic climate technology cooperation. Suil was also on secondment to the National Institute of Green Technology Center (NIGT) as a Director of the International Strategy Division in 2019. Suil served as a Technology Executive Committee (TEC) member under the UNFCCC from 2018 to 2022. Suil holds a bachelor, master, and Ph.D. in Agricultural Chemistry from Seoul National University, Republic of Korea, and had post-doctoral experience at Michigan State University, USA from 2000 to 2004.



Diana Patricia

Mosquera Calle, Deputy Chief, UNDRR Regional Office for Asia and the Pacific

Diana Patricia is the Deputy Chief of UNDRR Regional Office for Asia and the Pacific since 2021. She leads the risk knowledge team to design and implement programmes aiming at enhancing risk understanding and disaster risk governance to contribute to risk-informed development at domestic and local level.

Previously, she worked at the UNDRR Regional Office for Africa supporting governments in Sub Saharan Africa in the development of disaster risk reduction strategies, enhancing availability and quality of disaster loss data, promoting policy coherence between disaster risk reduction and climate change adaptation, and supporting the reinforcement of early warning systems.

Before joining UNDRR, Diana Patricia worked in UNESCO and UNDP in Haiti managing disaster risk reduction programmes. She contributed, through technical support, to enhance the capacities of the Haitian Civil Protection and the Disaster Management System in Haiti in a context of post-disaster recovery after the 12 January Earthquake (2010). She managed programmes that aimed at reinforcing disaster preparedness, evacuation planning, early warning systems, volunteer management, risk communication and public awareness.

She also worked at the IOC-UNESCO in Paris in a regional tsunami early warning programme in the Caribbean supporting the nexus between science, disaster preparedness and participation.

Prior to joining the United Nations, Diana Patricia worked in an intergovernmental organization in environmental protection projects in Latin America (focused on Panama, Colombia, Ecuador, Peru and Chile). She started her professional career in the private sector, in a chemical company.

She holds a Master of Arts in International Management from the University of Applied Sciences in Münster, Germany and a Master of Science in Geographic Information Systems from the University of Salzburg, Austria. She is a Colombian-Ecuadorian citizen and is fluent in Spanish, French and English and has knowledge of German, Portuguese and Italian.