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KEYNOTE “**The Role of Meteorologists:
Science, Trust and Communication**”

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THE ROLE OF METEOROLOGISTS: SCIENCE, TRUST AND COMMUNICATION

Media Workshop: Understanding Earth from Space: Data,
AI and Communication for Climate Adaptation

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FRAMING THE MODERN ROLE OF METEOROL OGISTS



INTRODUCTION: WHY THE ROLE OF METEOROLOGISTS IS CHANGING



Technology Transformation

Meteorology is evolving due to improved science, accelerating technology, and expanding sources of information.

Challenges in Communication

Extreme weather and diverse users increase the need for clear, credible, and trusted information.

Supporting Decision Making

Meteorologists support decisions by connecting data with user needs and societal impacts.

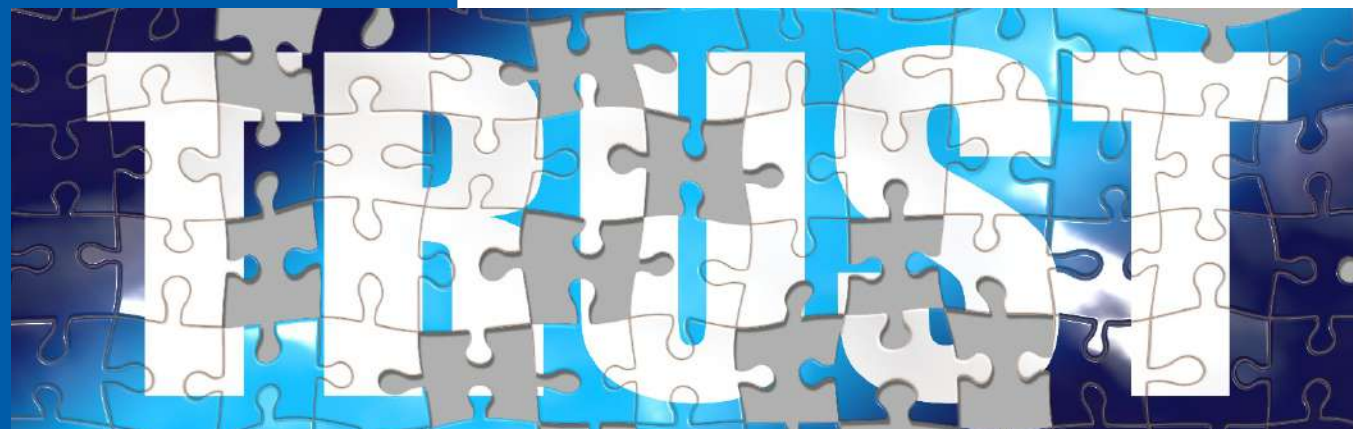
Societal Expectations

Consumers expect weather information that is accurate, localized and tailored to their individual context.

Contested Space

Meteorologists are increasingly competing with other voices for attention and barriers to entry are lowering.

TRUST AS A CENTRAL CONCEPT



What Trust Means in Meteorology

Role of Trust in Action

Trust determines if meteorological data leads to meaningful public actions during weather events.

Earning and Losing Trust

Trust is earned through transparency and accuracy but can be lost by errors or miscommunication.

Trust as an Evolving Concept

Trust evolves over time through repeated interactions and communication clarity in forecasts.

Importance in Severe Weather

In severe weather, trust strongly influences whether people heed warnings and take protective measures.





Trust Built Through Relationships

Building Trust Over Time

Regular engagement with users builds familiarity and credibility, fostering long-term trust.

Importance of Foundational Activities

Establishing trust during peaceful times increases the impact of warnings during crises.

Mutual Understanding

Ongoing dialogue helps meteorologists understand user needs for more effective communication.



Trust in a Contested Information Environment

Contested Information Environment

Weather and climate information is widely shared but often politicized, creating challenges for clear communication.

Trust Challenges

Misinformation and competing voices can undermine public trust in scientific climate communication.

Effective Communication Strategies

Meteorologists need clarity, consistency, and courage to maintain trust and engage in difficult conversations.

Importance of Credibility

Legitimate voices and institutional credibility are essential amid growing information noise.

TRUST IN PRACTICE: EARLY WARNINGS AND

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TRUST AND EARLY WARNING SYSTEMS

Importance of Trust

Trust is vital in early warning systems to ensure warnings are heeded and acted upon effectively during emergencies.

Effective Communication

Clear, consistent, and repeated messaging aligned with observed conditions strengthens trust in warnings.

Trusted Channels

Regularly visited websites or mobile apps can provide an important channel for delivering trusted and timely information, improving warning effectiveness.

SCIENCE AS THE FOUNDATION

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Nature of Scientific Uncertainty

Meteorological predictions are inherently probabilistic due to model and observational limitations.

Communication Challenges

Users often expect definitive answers, causing frustration when uncertainty is not clearly explained.

Building Trust through Clarity

Clear and honest explanation of uncertainty enhances credibility and supports informed decisions.

Role in High-Stakes Contexts

Understanding uncertainty is vital for responsible use in early warnings and climate adaptation planning.

COMMUNICATING CLIMATE CHANGE AS A TRUSTED EXPERT



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Role of Meteorologists

Meteorologists leverage their expertise and relationships to communicate climate change effectively and build trust.

Challenges Faced

Climate change skepticism and politicization expose meteorologists to attacks, requiring resilience and neutrality.

Effective Communication Strategies

Clear explanations, attribution of extremes, and honest discussion of uncertainties are vital for credibility.

Building Public Understanding

Respectful engagement and evidence-based information help bridge divides and inform public about climate risks.



DATA ACCESSIBILITY AND TRUST

Open Data Enhances Trust

Open data enables interested persons to engage directly with the science and inform themselves.

Open Data Builds Consensus

Providing data openly helps build a broader community of experts who can reinforce the messaging of meteorologists.

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AUTOMATION AND THE EVOLVING ROLE OF HUMANS



Automation in Weather Forecasting

Automation produces many weather forecasts automatically and delivers them via digital platforms efficiently. Many countries are increasing the level of automation along the value chain.



Shifting Human Roles

Meteorologists now focus more on interpreting data, quality control, and communicating forecasts effectively.



Importance of Human Expertise

Human judgment remains crucial in complex or high-impact weather events requiring experience and insight.

METEOROLOGISTS IN THE DEVELOPMENT CONTEXT

Building Capability

Many countries are still trying to catch up in terms of developing an operational meteorological capability.

Two Speeds in the Global Environment

Whilst some countries are already transforming the roles of meteorologists due to the drivers already mentioned, in least developed countries we are still building up basic capabilities.

Leapfrogging Technology

Some countries may be able to accelerate the transition, building the capabilities for the future rather than developing skills that might be soon superseded.



ARTIFICIAL INTELLIGENCE AS A DRIVER FOR CHANGE

AI-based Forecasts

Forecasting systems built on AI are dramatically changing the ability of smaller meteorological services to generate their own forecasts. On the other hand, the barriers to entry for other players are being significantly reduced.

AI in the Value Chain

AI is demonstrating benefits along the value chain, in post-processing, automated warnings and interpretation of outputs to generate text-based bulletins and warnings.

Role of Meteorologists

Meteorologists safeguard data standards, validate AI-driven products, and communicate proper use to ensure trust.



LOOKING AHEAD



FROM FORECASTS TO DECISIONS: SHIFTING RESPONSIBILITIES

From Forecast Generation to Interpretation

As we see more parts of the forecast chain being automated, the role of meteorologists is shifting to the interpretation of forecast outputs and the communication of impacts.

New Skills

In addition to science and mathematics, meteorologists increasingly need to be trained in soft skills – communication and outreach, stakeholder engagement.

AI Application and Implementation

To avoid being left behind, it is critical that meteorologists engage with AI to understand its application and limitations, to make the best possible use of the technology without being a simple user.



METEOROLOGICAL INTELLIGENCE AS A STRATEGIC ADVANTAGE

Strategic Value of Meteorological Data

Meteorological intelligence offers a competitive edge by informing both short-term operations and long-term planning across industries.

Cost of Ignoring Meteorological Science

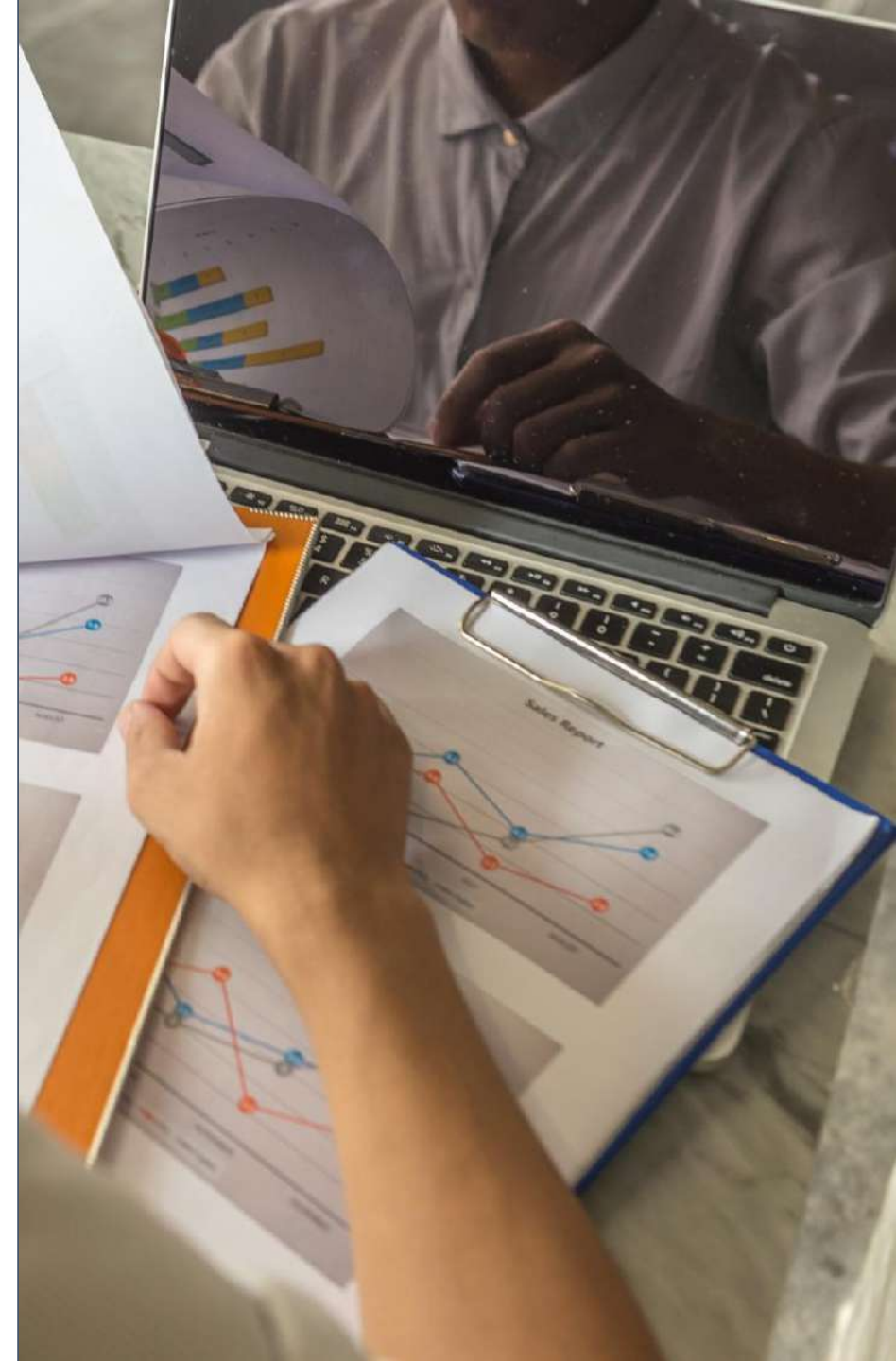
Organizations that overlook meteorological insights face higher risks from extreme weather and missed opportunities for optimization.

Applications in Key Sectors

Meteorological intelligence enhances decision-making in energy markets, agriculture, transport, and financial risk management.

Evolving Role of Meteorologists

Meteorologists are becoming trusted advisors providing insights that support strategic business choices rather than just raw data.





CHANGING USER HABITS AND INFORMATION ACCESS

Shift in Access Methods

Users increasingly access weather information via AI agents and conversational interfaces instead of traditional apps and websites.

Trust and Information Source

Mediated AI systems reduce user awareness of data origins, increasing the need for trusted and validated weather information.

Role of Meteorologists

Meteorologists become less visible but remain crucial contributors behind AI-powered weather information systems.

CONCLUSION: THE FUTURE METEOROLOGIST



Evolving Role

Meteorologists' roles are shifting rapidly with advancements in science, technology, and societal needs.

Importance of Trust

Trust and clear communication are essential for meteorologists to ensure information is believed and acted upon.

Human-AI Collaboration

Human meteorologists must serve as designers, validators and interpreters alongside AI and automated tools.

Guiding Society

Future meteorologists guide society through risk and uncertainty with integrity and relationship-building.

Thank you.



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