



Weather, Water, and Climate Priorities

A Policy Statement of the American Meteorological Society
(Adopted by the AMS Council 26 May 2016)

Understanding how the Earth system works and transforming this knowledge into action will allow our nation and the global community to effectively respond and adapt to changing weather, water, and climate conditions. National investment and leadership combined with enhanced partnerships across the public, private, academic, and nongovernmental organization sectors are necessary to make this vision a reality.

Introduction. Access to reliable, accurate, timely, and understandable weather, water, and climate (WWC) information is vital for the safety and well-being of society. Decision-makers at all levels need this information to formulate and implement effective strategic, tactical, and policy decisions across all interconnected sectors of society, including health, energy, food, water, infrastructure, transportation, and national security. Extreme weather events like hurricanes, tornadoes, blizzards, floods, wildfires, severe coastal storms, and heat waves, and the impacts of longer-term climate changes such as droughts, changing snowpack, and sea level rise threaten the social and economic security of our nation and society as a whole. While these challenges pose serious risks, they also offer a remarkable national opportunity for enhanced knowledge, advanced tools, leadership, and actionable information.

WWC observations, science, and services are critical national infrastructure essential for meeting human needs. They have led to technological innovations, fueled economic growth, stimulated social prosperity, and mitigated potential WWC-related disasters. AMS public, private, and academic-sector members acknowledge the ongoing vital commitment and support of the American public and its leaders to the advancement of WWC observations, science, and services. This support improves forecasts, makes new information products possible, trains the next generation of scientists and decision-makers, and enables more effective communication. As a result, people have been better prepared for disruptive WWC events, and many lives have been saved.

The value of WWC tools and information to economic growth is increasing as is the cost of WWC-related disasters [1]. Individuals and business and government leaders are shaping decisions and actions based on detailed knowledge of meteorological, hydrological, oceanographic, geophysical, and ecological conditions, and on an understanding of how society responds. As society responds to the increasing frequency and severity of extreme WWC events, it needs and expects ever more reliable and actionable information to deal with pressing local, regional, national, and global economic and societal challenges that can range in time scales from minutes to centuries.

Recommendations. Economic and social prosperity belong to a society that understands and effectively responds to Earth's changing WWC conditions. To meet this challenge the following actions are required:

1. **Develop the Next Generation of WWC Experts.** To ensure we have a diverse workforce equipped to communicate uncertainties and inform WWC decisions, investments must continue to: (i) educate and train students for careers in science, technology, engineering, and mathematics; and (ii) develop the next generation of WWC researchers that can advance the science and its applications to meet society's evolving information needs.

2. **Invest in Research Critical to Innovation and Advanced Services.** To ensure continued leadership in understanding our complex and changing planet and application of this understanding for the benefit of society, increased investments are needed to support new discoveries, innovation, applications, and model development in the geosciences, engineering, and relevant social sciences.
3. **Invest in Critical Observations and Computing Infrastructure.** To ensure advances in scientific knowledge and more accurate and timely delivery of WWC products and support services at scales useful to decision-makers, and to preserve national security, targeted investments are required for: (i) atmosphere–ocean–land–ice observational infrastructure, (ii) techniques to translate the resulting large data sets into forms suitable for information services and prediction models, and (iii) leading-edge high-performance computers and software.
4. **Create Services that Harness Scientific Advances for Societal Benefit.** To ensure society’s most pressing needs are met and its capabilities are optimally utilized, mechanisms for engaging users and moving research into practical applications in a timely and effective fashion must be encouraged, developed, and implemented.
5. **Prepare Informed WWC Information Users.** To ensure we have informed users who can take full advantage of advanced WWC information and tools, education and communication programs must continue to focus on enhancing WWC skills and understanding by both decision-makers and society at large.
6. **Build Strong Partnerships Among WWC Public, Private, and Academic Sectors.** These sectors have always worked together to meet America’s WWC challenges. As the job grows more consequential, urgent, and complex, a coordinated Federal effort is needed to support, strengthen, and encourage strategic inter-sector partnerships, including efforts to increase the global suite of Earth observations, advance long-term stewardship of environmental data, and improve national and international community-level resilience to climate change and variability.
7. **Implement Effective Leadership and Management.** To ensure that WWC investments are made in the best interests of the nation, effective leadership and management approaches will be needed, including: (i) appointing strong, qualified, and diverse leaders to top WWC policy positions in the White House and Federal agencies, and (ii) implementing management structures that support integrated WWC research and services planning and budgeting across Federal agencies and the Congress. These structures should proactively engage the academic and private sectors.

Expected Outcomes and Conclusion. Implementing these recommendations will better enable individuals, communities, businesses, and governments to manage risks and explore opportunities associated with changing WWC conditions. Economic and social prosperity will be enhanced, and further progress will be made toward saving lives, enhancing commerce, protecting property, and adapting to a changing world. In so doing, our nation will advance its leadership in promoting technological innovations that are critical to the success and well-being of a global society.

[1] <http://www.esa.doc.gov/economic-briefings/value-government-weather-and-climate-data>

[This statement is considered in force until May 2021 unless superseded by a new statement issued by the AMS Council before this date]