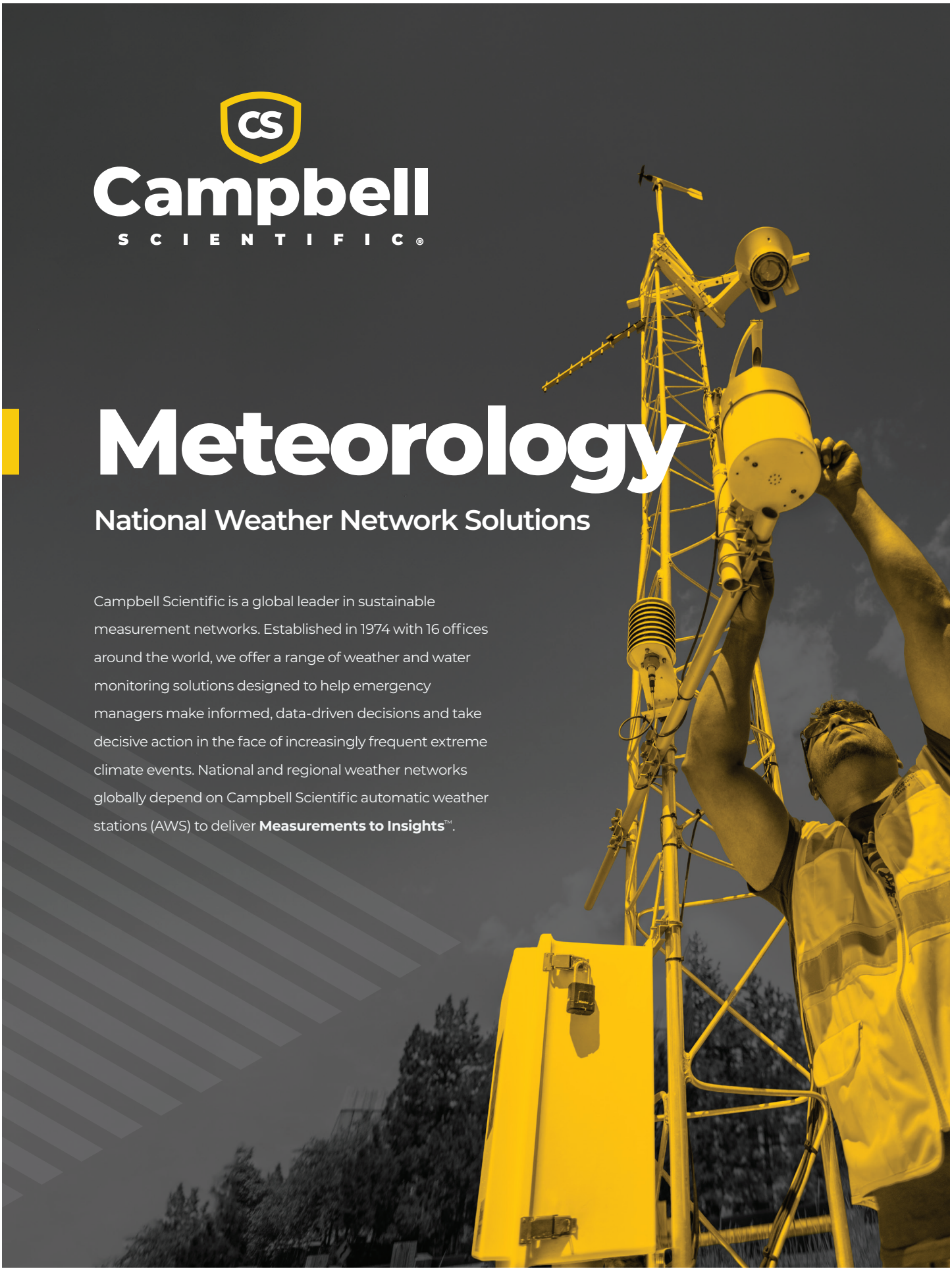
Campbell SCIENTIFIC®

Meteorology

National Weather Network Solutions

Campbell Scientific is a global leader in sustainable measurement networks. Established in 1974 with 16 offices around the world, we offer a range of weather and water monitoring solutions designed to help emergency managers make informed, data-driven decisions and take decisive action in the face of increasingly frequent extreme climate events. National and regional weather networks globally depend on Campbell Scientific automatic weather stations (AWS) to deliver **Measurements to Insights**™.



Global Initiatives

The United Nations (UN) and World Meteorological Organization (WMO) are working to ensure every country operates an early warning system (EWS) to help save lives and infrastructure. The Early Warnings for All Initiative (EW4All) is being funded to focus on early hazard warning and climate adaptation for Earth's most vulnerable populations.

Combined with EW4All, the WMO is ramping up a mission to improve its Global Basic Observing Network (GBON) by offering continued operational funding for Small Island Developing States (SIDS) and Least Developed Countries (LDC) through the Systematic Observations Financing Facility (SOFF).

SOFF funding will allow many National Meteorological and Hydrological Services (NMHS) managers to alleviate several operational challenges in providing better data for improved early warnings.

*UN EARLY WARNINGS FOR ALL Executive Action Plan 2023–2027

Network Challenges

Inadequate Capacity Building

When capacity building isn't a focus, the continued successful operation of weather networks may be undermined. AWS networks often require a team of highly skilled technicians who benefit from a regular training regimen. High personnel turnover driven by budgetary constraints is amplified when system solutions are complex and require specialized skills. Closed ecosystem solutions also limit the ability for organizations to build in-house, long-term expertise.

Limited Budgets

Many surface weather networks struggle to continually produce high-quality data due to budget limitations on operations and maintenance. Although new funding mechanisms like SOFF are beginning to address long-term funding issues, networks need to find long-lasting solutions that have a high return on investment over the life span of the equipment.

Environmental Complications

Operations and maintenance challenges are often compounded by difficult environmental conditions out of the weather network operator's control. Equipment needs to be durable to withstand hazardous or extreme weather, interactions with wildlife and insects, security concerns, and unreliable remote communications infrastructure.

MetPRO Station

Research-grade, flexible, reliable systems for years of dependable service

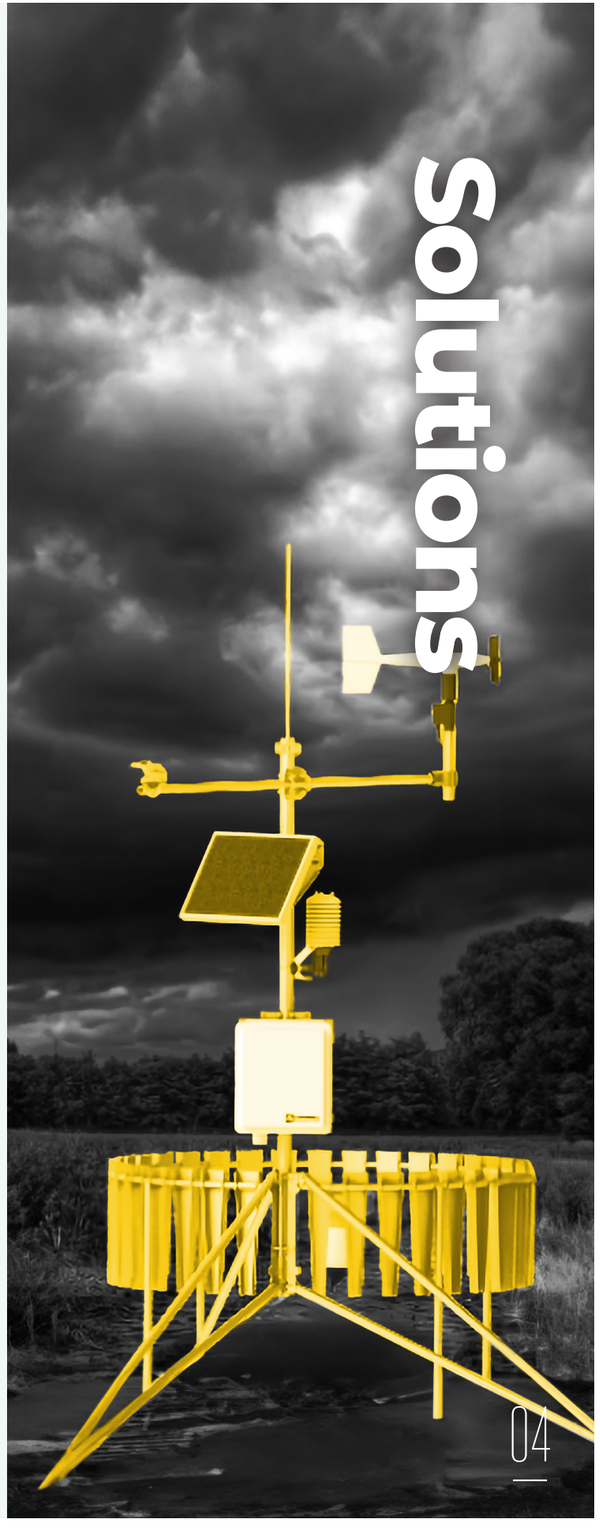
The Campbell Scientific MetPRO AWS offers a comprehensive range of environmental measurements for budget-conscious applications that may not require strict adherence to WMO standards. The three-meter tripod platform is ideal for temporary installations or locations with restrictions from comprehensive civil works.

Durable and long-lasting systems and sensors are vetted by weather networks globally and return high-quality data suitable for environmental research, general purpose weather monitoring, and agricultural mesonets.

Campbell Scientific systems represent a tremendous lifetime value proposition as a sensor-agnostic, future-proof, and open-platform solution—ideal for projects with changing requirements and as a base for future expansion.

Key benefits:

- **Flexible design for a wide range of environmental applications**
- **Ideal platform for temporary installations or locations with restrictions from comprehensive civil works**
- **High-quality sensors for defensible data in research and critical operations**



Solutions

WMO Complete Station

Feature-rich, high-quality, reliable, open-platform systems for years of dependable service

Campbell Scientific's WMO-compliant, complete AWS offers a comprehensive range of environmental measurements designed as permanent installations for NMHS organizations and mesonets serving a diverse set of stakeholders.

Durable and long-lasting systems and sensors are vetted by weather networks globally and field-tested for durability in extreme environments. Our stations consistently return high-quality data suitable for numerical weather prediction, EWS, and climate science.

Campbell Scientific systems offer a tremendous lifetime value proposition as a sensor-agnostic, future-proof, and open-platform solution—ideal for both modernizing legacy AWS networks and implementing new stations. Our AWS are GBON ready and implement WMO information systems (WIS) 2.0.

Key benefits:

- Reliable equipment is field-tested for durability in extreme environments.
- Flexible and innovative solutions incorporate a customized "fit-for-purpose" design.
- Using low power, modular devices allows for capacity building and simplifies maintenance.

WMO Basic (GBON) Station

Robust, high-quality, simple, upgradeable systems for years of dependable service

Campbell Scientific WMO-compliant, basic AWS offers a select range of environmental measurements designed as permanent installations for NMHS organizations to meet minimum standards for conformance to GBON requirements.

Durable and long-lasting systems and sensors are vetted by weather networks globally and are field-tested for durability in extreme environments. Our AWS use low power, modular devices in a design that promotes capacity building and simplifies maintenance.

Campbell Scientific GBON-ready stations are intended specifically for SIDS and LDC weather networks seeking SOFF funds and implement WIS 2.0. Campbell Scientific systems are ideal for both modernizing legacy AWS networks and implementing new stations.

Key benefits:

- Complete solution for SIDS and LDC weather networks seeking SOFF funds
- Surface wind, air temperature, relative humidity, precipitation, atmospheric pressure, and snow depth measurements where applicable
- Sensor-agnostic, future-proof, and open-platform system design

Solutions

Professional Services

For any AWS network project, professional services can be just as important as choosing the correct data loggers and sensors. Campbell Scientific offers an extensive menu of professional services to ensure our clients' success, including end-to-end project management, service life cycles, and global technical support. We also offer a comprehensive training program to build local knowledge and empower our clients.

Our attention to detail ensures successful deployments for our customers, and we stand behind our work as an ISO-certified organization.

Key benefits:

- Project services delivered by industry experts
- Global project team able to support and train across time zones
- High degree of technical and field experience
- Calibration services to ensure accurate and reliable system performance in the toughest of environments

Flood/Early Warning Systems

In addition to meteorological monitoring, Campbell Scientific offers complete surface water measurement systems with a broad and comprehensive portfolio for hydrometeorological applications.

NMHS organizations can take advantage of our cohesive product offering across the weather and water enterprise to simplify EWS that are linked to multiple government agencies or ministries.

Campbell Scientific also specializes in ALERT and ALERT2 flood warning applications, delivering insights and early warnings to communities and nations vulnerable to extreme weather hazards.

Hydrologic monitoring stakeholders around the globe rely on our robust data collection, communications, and software platforms to deliver on-time, high-quality data when it matters most.

Case Studies

SHOM Coastal Hydrologic EWS Modernization

Campbell Scientific recently completed a systemwide modernization of weather and water monitoring instrumentation and supporting software for SHOM, the Naval Hydrographic and Oceanographic Service of France. SHOM produces reference maritime and coastal geographic information used to generate national hydrography data, provide defense support, and exact public sea and coastal policies. MESSIR-NEO software controls data acquisition by satellite and cellular modem technology, providing SHOM with remote data collection, visualization, quality checking, analysis, and alarms. The high-quality data from these stations aid in SHOM's mission to analyze and disseminate coastal weather and water information to varied stakeholders. These stations function as a coastal early warning mechanism for emergency managers.

Malawi Meteorological Services Network Modernization

Campbell Scientific is completing an end-to-end network addition of 35 stations for Malawi's Meteorological Services, including design, installation, commissioning, and software services. The project scope also includes a modernization of data delivery for Malawi's entire weather network to be fully GBON compliant. Malawi's data transfer method represents the world's first implementation of the new WIS 2.0 protocol, which will aid neighboring Zambia's upcoming data-delivery upgrade and serve as a model for global GBON implementation.

Met Éirann (Irish Meteorological Service) Modernization

From 2017 to 2020, Campbell Scientific fully modernized the existing climate network of Ireland through the provision of 60 stations, including installation, commissioning, maintenance, and data-collection facilities. Campbell Scientific's robust hardware and software solution enables Met Éirann to easily operate and maintain their own network to continually deliver high-quality data for weather and climate forecasting.

#1 US Federal Weather Networks | Statewide Mesonets

Overview

Campbell Scientific equipment is at the center of every major US federal AWS network, including the National Oceanic and Atmospheric Administration (NOAA) Automatic Surface Observing System (ASOS), Climate Reference Network (CRN), and the National Weather Service's (NWS) National Mesonet Program (NMP).

For decades, Campbell Scientific has been a preferred solutions provider to meet diverse stakeholder needs for US statewide mesonets, including the gold standard of state networks: the Oklahoma Mesonet. Mesonets deliver data products to clients in support of weather forecasting, early warning, environmental research, agriculture, climate science, and educational purposes. Statewide mesonets also participate in a multi-functional, multi-faceted observational weather "network of networks," delivering high-quality weather data to the NWS.

Solution

Thousands of AWS across the US are outfitted with Campbell Scientific hardware and software, predominantly featuring core data-acquisition technology that records measurements, controls processes, and delivers data to central systems.

Mesonets choose Campbell Scientific because of the performance, durability, and flexibility of our equipment, turning each station into a lasting investment with significant long-term value. Campbell Scientific support services fuel mesonet capacity building as a dependable resource for helping with operations and maintenance.

Benefits

Campbell Scientific weather stations are designed as "**fit-for-purpose**" solutions. The open-platform and modular design mean that each network can control how their equipment functions and own their weather data.

Using low-power devices from Campbell Scientific reduces network overhead and eases the burden of managing significant power infrastructure.

(Photo courtesy of Dr. Christopher A. Fiebrich, Executive Director, Oklahoma Mesonet)

Campbell SCIENTIFIC®

As a trusted provider of measurement solutions since 1974, Campbell Scientific has delivered the information that helps mitigate severe weather casualties; aids scientists in gathering data to assist in the understanding of climate change and other human-made environmental impacts; and supports countless organizations, institutions, and national agencies in providing more efficient services to their people. Our instrumentation hardware is known to be the best in the business. Our software services provide an unrivaled level of insight. Our project delivery expertise combines both to deliver a unique end-to-end solution capable of changing the world.

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