

FISCAL YEAR (FY) 2018

# HYDROMETEOROLOGICAL HAZARDS SECTOR UPDATE



With USAID/OFDA support, forecasters from Costa Rica, El Salvador, and Guatemala learn to produce and assemble 3-D printed weather stations, which regularly transmit meteorological data, allowing local authorities to monitor conditions, provide early warning, and prepare for severe weather events. Photo courtesy of Martin Steinson/University Corporation for Atmospheric Research.

## An Introduction to Hydrometeorological Hazards

*The UN defines hydrometeorological hazards as processes or phenomena of atmospheric, hydrological, or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Hydrometeorological hazards include cyclones, drought, floods, heatwaves, heavy snowfall, storms, and storm surges, but can also influence other hazards, such as epidemics, landslides, locust plagues, and wildfires.*

## Ready, Responsible, and Resilient: Weather Ready Nations

The Weather Ready Nations (WRN) program strengthens countries' preparedness for extreme climate, water, and weather-related events. WRN builds the capacity of national meteorological and hydrological services (NMHSs) and national disaster management agencies to improve the use of weather and hydrology information, shifting the focus of weather services from providing numerical weather forecasts to describing the potential impacts of the predicted weather. With improved and actionable information, emergency managers, first responders, government officials, businesses, and the public are able to make informed, timely, and appropriate decisions to save lives and property and preserve livelihoods.

## USAID/OFDA Hydrometeorological Hazards Activities

### FY 2018 FUNDING

Standalone Global and Regional Hydrometeorological Hazards Programs	<b>\$5,898,401</b>
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Hydrometeorological Hazards Interventions Worldwide	<b>\$5,160,348</b>
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<b>\$11,058,749</b>
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## Sector Overview

Hydrometeorological disasters—such as cyclones, droughts, and floods—account for the largest number of natural disasters worldwide and affect more people than any other type of natural disaster. Between 1999 and 2018, more than 90 percent of all recorded natural disasters were due to hydrometeorological hazards, impacting over 4 billion people, causing more than 500,000 deaths, and resulting in an estimated \$2.2 trillion in economic damages. USAID's Office of U.S. Foreign Disaster Assistance (USAID/OFDA) supports programs to reduce the adverse impacts of hydrometeorological events through disaster risk reduction (DRR) activities designed to strengthen readiness, response, and resilience before hydrometeorological disasters occur. USAID/OFDA-supported DRR initiatives emphasize locally sustainable and environmentally sensitive measures coordinated with vulnerable communities and local and national stakeholders.

USAID/OFDA, the U.S. National Weather Service, and the UN World Meteorological Organization (WMO) are collaborating with partner NMHSs in Barbados, Costa Rica, El Salvador, Guatemala, Indonesia, and South Africa to implement WRN, with expansion to additional countries planned for FY 2019.

## Enhancing Flash Flood Guidance and Early Warning Systems

Each year, flash floods result in an estimated 5,000 deaths globally. In an effort to reduce loss of life and the economic impact of floods, USAID/OFDA partners with the U.S.-based Hydrologic Research Center, the U.S. National Oceanic and Atmospheric Administration (NOAA), WMO, and host country NMHSs to support disaster managers, local governments, and humanitarian practitioners to monitor flash flood risks, thereby improving early warnings of these events and enabling rapid response mechanisms. Through the implementation of new technologies, forecaster trainings, and technical assistance, USAID/OFDA and its partners aim to advance flash flood early warning systems in countries where no such capacity exists. In FY 2018, USAID/OFDA continued supporting global activities to enhance flash flood guidance and early warning systems, with systems either operational or in development in over 60 countries in Africa, Asia, Europe, Latin America and the Caribbean, and the Middle East.

## Improving Delivery of Meteorological Service in Afghanistan

In partnership with USAID/Afghanistan, the Turkish State Meteorological Service, and WMO, USAID/OFDA continued to support the Government of Afghanistan Meteorological Department (AMD) in FY 2018 to establish an operational hydrometeorological service that provides forecasts and early warnings of extreme weather events, such as flash floods. AMD now produces and disseminates weather forecasts through radio, social media, television, and web portals. The World Bank and WMO are building upon these efforts to support additional service modernization and design future AMD climate, water, and weather services for Afghanistan.

## Building Capacity on Climate Prediction

USAID/OFDA and NOAA, in partnership with WMO and NMHSs, organize workshops around the world to support national and regional climate prediction capacity and preparedness for hydrometeorological events. In FY 2018, 25 climate forecasters from 15 countries in Central and South America gathered at the Center for El Niño Research in Guayaquil city, Ecuador, for an annual workshop and training on operational climate monitoring; the El Niño and La Niña phenomena; and the use of global forecasts in seasonal predictions and agriculture, disaster, health, and water resource management. Participants also received training on the use of geographic information systems to better visualize and communicate forecasts to users.

## Strengthening Resilience to Climate-Related Disasters in Asia

USAID/OFDA supports the American Red Cross to strengthen disaster preparedness and resilience in coastal cities in Indonesia and other Southeast Asian countries through improved public engagement on DRR and disaster resilience. With USAID/OFDA support, the American Red Cross and Red Cross and Red Crescent National Societies in Burma, Indonesia, and Vanuatu plan to design and pilot a model for civic coalitions to guide and support community analysis, decision-making, and problem-solving on climate-related risks and resilience in Burma, Indonesia, and Vanuatu.

## Increasing Capacity for Weather Observations Using Low-Cost, Sustainable Technology

Actionable and informed weather observations are critical for providing early warning of hydrometeorological hazards. Many countries around the world lack adequate hydrological and meteorological networks due to the high costs associated with monitoring equipment, as well as ongoing operational and maintenance expenses. In response, USAID/OFDA, NOAA, the University Corporation for Atmospheric Research, and several NMHSs have developed 3-D printed automated weather stations (3D-PAWS), a low-cost and sustainable automated weather station model to improve weather observation capacity in countries with limited meteorological networks. The 3D-PAWS have the capacity to simplify and expedite meteorological equipment repairs, increasing the scale and sustainability of meteorological networks. NMHSs can utilize the automated weather stations to operate meteorological networks—including communication tools, stream gauges, and weather observation stations—that are consistent with local capabilities and needs. In FY 2018, USAID/OFDA and NOAA, in partnership with the El Salvador Meteorological Service, trained meteorologists from Barbados, Costa Rica, El Salvador, and Guatemala to manufacture 3D-PAWS to improve weather observations.

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