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**Opening Remarks for the International Flash Flood Workshop**  
**San Jose, Costa Rica**  
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It is a distinct honor to be here and to welcome each of you. I am Jack Kelly, the U.S. Permanent Representative to the WMO and Deputy Under Secretary for Oceans and Atmosphere.

In the last year across the globe, we have witnessed natural disasters on an unprecedented scale. We come together this week to address the needs for flash flood information systems in our countries and regions.

This International Flash Flood Workshop brings together some of the best in the field—both scientists and policymakers—on a mutual mission to save lives and protect property. NOAA is pleased to work in partnership with the U.S. Agency for International Development, or USAID, and the WMO to sponsor this conference.

Some dedicated people worked hard to make this event possible and I want to thank the WMO Hydrology Secretariat and the WMO Sub-regional office here in Costa Rica for all their efforts. Thank you to Paulo Manso, Permanent Representative to the WMO for Costa Rica and Director of the Met Service for all your help with the local organizing committee.

A special thank you to the USAID Office of Foreign Disaster Assistance for helping fund this workshop and for supporting Flash Flood Warnings and Guidance Systems worldwide.

I would also like to thank Curt Barrett, NOAA's manager for many of the projects implemented in this region, including the Central American Flash Flood Guidance System – which I believe is a prime example of a successful mitigation and forecasting system.

Floods have a major impact on the global economy and public safety. Flooding and flash floods are the single most destructive type of natural disasters that strike humans and their livelihoods across the globe.

The Americas and the Caribbean are still recovering from a record breaking hurricane season. Asia, Europe, and Africa have similarly faced record flooding in recent years. The loss of life and damage to infrastructure has been

staggering. This past summer in India, flooding and landslides killed more than 1,000 people and affected 20 million in Bombay and across the Maharashtra state. A record 37 inches fell in just one day, cutting off the state from the rest of the country.

China's annual cycle of floods causes hundreds of deaths every summer in its south and northeast. This past year, flooding and mudslides killed at least 536 people across China. Some 1.4 million people evacuated from a five-province swath of the densely crowded south, while total economic losses were estimated at \$2.5 billion. The death toll was higher than most of the rainy seasons of the past decade, though still below that of 1998, when 4,150 people were killed in summer flooding in central and northeastern China.

In April of last year, more than 3,700 people were forced to leave their homes across Romania amid widespread flooding.

In the United States, Hurricane Katrina left hundreds of thousands without homes and at least 1,400 people dead. Much of that catastrophe is due to flash floods that followed the storm surge and broken levees.

This month in Australia, flooding has killed scores of people, left thousands without home and food, and destroyed roads and bridges.

In Central America, Hurricane Stan caused flooding and mudslides that led to more than 1,600 fatalities. Up to 3,000 are believed missing and more than 280,000 have been adversely affected.

These events are catastrophic by any standard, but we know their impacts can be lessened with sound investments in flash flood and hurricane warning systems. Our nations all share similar threats. It took a natural disaster in 1998 to spur collaborative efforts in the Americas. One of the most destructive storms in history, Hurricane Mitch, wreaked havoc on the Americas, killing, by some estimates, 11,000 people.

Since then, NOAA, the Regional Committee for Hydrologic Resources, and all 7 of the Central American nations, have worked together to develop an end-to-end warning and guidance system for Central America.

Since the Hurricane Mitch reconstruction effort began in 1998, NOAA has helped improve the capacity of the National Meteorological and Hydrologic Services of all 7 Central American nations to alert and warn for floods and other natural disasters.

NOAA provided the critical infrastructure necessary for these operations through technology transfer initiatives, like the installation of the Central America Flash Flood Guidance System, which was funded through the Office of US Foreign Disaster Assistance's Central American Mitigation Initiative. This system became operational in 2003 for all 7 Central American countries.

We are here because we understand the need to continue and grow that collaborative effort and to grow capacity internationally. We need to work to develop regional partnerships to build capacity in nations where none, or little, exists.

This conference is our opportunity, for us as a hydro-meteorological community, to share knowledge, technology, and lessons learned, and to draw parallels between our individual experiences with flash floods.

Our expert speakers this week are here to offer insights for you and your work. To highlight a few of them:

I noted earlier the Central America Flash Flood Guidance System as a regional success, and Ms. Alfaro, from Costa Rica's National Meteorological Institute, will describe how Costa Rica implemented the System.

Mr. Hidetomi Oi, from Japan International Cooperation Agency (JICA), will discuss the Development of Equipment for a Community-based Flash Flood Early Warning in the Caribbean Region, and

Ms. Cheryl L. Anderson, from the University of Hawaii, will explore what we understand about human behavior, and discuss how to reach users, and what types of information to provide the emergency managers and the public for greatest impact and desired results.

As we move forward in this Century, I believe to succeed, our national meteorological and hydrological services must work closely internationally and regionally on technology and policy to improve our flash flood and all hazard forecasting capabilities. For example:

- The use of satellites with radar data;
- Precipitation and stream gage platforms;
- Telecommunication systems;
- Hydrometeorological models, and

- Close coordination between hydrologists and meteorologists.

This conference offers each of us the opportunity to learn from each other. I encourage you to take advantage of the resources available this week. The conference speakers have valuable lessons to offer. Talk to your international colleagues who join you here and work to develop international or regional project partnerships that leverage existing resources. Develop contacts who can help direct new resources.

Working together, we must learn from past experiences to find the best path forward.