

a long-term threat to the security of water supplies for billions of people.

The Intergovernmental Panel on Climate Change Special Report on the Ocean and the Cryosphere in a Changing Climate said that smaller glaciers found in Europe, eastern Africa, the tropical Andes, Indonesia and elsewhere are projected to lose more than 80% of their current ice mass by 2100 under high emission scenarios.

The retreat of mountain glaciers alters water availability and quality downstream, with implications for many sectors, such as agriculture and hydropower.

The melting of glaciers and ice sheets contributes to an increasing rate of sea-level rise.

WMO's Global Cryosphere Watch is an international mechanism for supporting all key cryospheric observations. It provides authoritative, clear, and useable data, information, and analyses on the past, current and future state of the cryosphere.

WMO convened a High Mountain Summit in October 2019 to identify priorities to protect high mountains and the cryosphere. The summit led to the planned creation of a new Integrated High Mountain Observation and Prediction Initiative as one of the tools to address the challenges of climate change, melting snow and ice- and water-related hazards and stress.

COUNT EVERY DROP

We cannot manage what we do not measure. Water data collection and sharing underpin hydrological monitoring and forecasting and flood and drought early warning services.

Effective flood and drought policies can be implemented only with data and models for assessing the frequency and magnitude of extreme events. Progress towards goals such as improving water use efficiency cannot be calculated without monitoring surface water, groundwater and reservoirs.

Hydrological information can help answer questions such as:

- What is the quantity, quality and distribution of water resources in our country, river basin and sub-catchment? Can the available resources meet the actual and foreseeable demands including the needs of ecosystems?

- How should we plan, design and operate water projects such as hydroelectric facilities, navigation, irrigation and drainage schemes, domestic and industrial water supply, water sanitation, and river restoration?
- How do our water resource management practices impact the environment, the economy and society?
- How can we protect people, property and ecosystems from water-related hazards?
- How can we allocate water among competing uses, both within the country and across borders?
- How can we develop evidence-based climate change adaptation and mitigation policies? How can we ensure the sustainable use of our water resources?

WMO has assumed the direction of the World Water Data Initiative, which was implemented under the leadership of the Australian government and supports countries in developing water-related policies to improve access to and use of water data by decision-makers.

WMO HydroHub, the Global Hydrometry Support Facility, makes the portfolio of expertise among WMO Members – from science to technology to services – available to end users of hydrometeorological data and services from various economic sectors in the form of tailored services.

HydroSOS, the Global Hydrological Status and Outlook System, will monitor and predict global freshwater hydrological conditions. Once operational, it will regularly report on the current global hydrological status, including groundwater, river flow and soil moisture and provide an appraisal of where the current and potential status is significantly different from 'normal'.

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WORLD
METEOROLOGICAL
ORGANIZATION

CLIMATE & WATER

WORLD METEOROLOGICAL DAY - 23 MARCH 2020

COUNT EVERY DROP



Fresh water is vital for life. On average, a human being cannot survive more than three days without it. Water is essential for the production of our food, virtually all of our goods and services and for the environment.

The world faces increasing challenges posed by water stress, floods and droughts and lack of access to clean supplies. There is an urgent need to improve forecasting, monitoring and management and to tackle the problem of *too much, too little or too polluted* water.

In 2020, World Meteorological Day and World Water Day share the same theme: Climate and Water. They focus on managing climate and water in a coordinated and integrated manner because climate and water are inextricably linked. Both lie at the heart of global goals on sustainable development, climate change and disaster risk reduction.

Water is one of the most precious commodities of the 21st century. National Meteorological and Hydrological Services (NMHSs) will be central to efforts to “count every drop because every drop counts”.

EVERY DROP COUNTS

Water use has been increasing worldwide by about 1% per year since the 1980s due to population growth, more water-intensive patterns of consumption, rainfall variability and pollution. This trend is expected to continue at a similar rate until 2050, accounting for an increase of 20% to 30% above the current level of water use according to the *World Water Development Report 2019*.

Over 2 billion people live in countries experiencing high water stress, and about 4 billion people experience severe water scarcity during at least one month of the year. The pressure on water availability and quality threatens sustainable development, ecosystems and biodiversity worldwide.

Global hydrological conditions of floods and droughts, as well as potential conflicts over water use represent some of the greatest challenges and threats facing the globe.

And yet, the capacity to monitor and manage this vital resource is fragmented and inadequate. The need for strong operational hydrological services and improved monitoring and forecasting has never been greater.

WMO is committed to eight long-term ambitions related to water:

- No one is surprised by a flood
- Everyone is prepared for drought
- Hydro-climate and meteorological data support the food security agenda
- High-quality data supports science
- Science provides a sound basis for operational hydrology
- We have a thorough knowledge of the water resources of our world
- Sustainable development is supported by information covering the full hydrological cycle
- Water quality is known

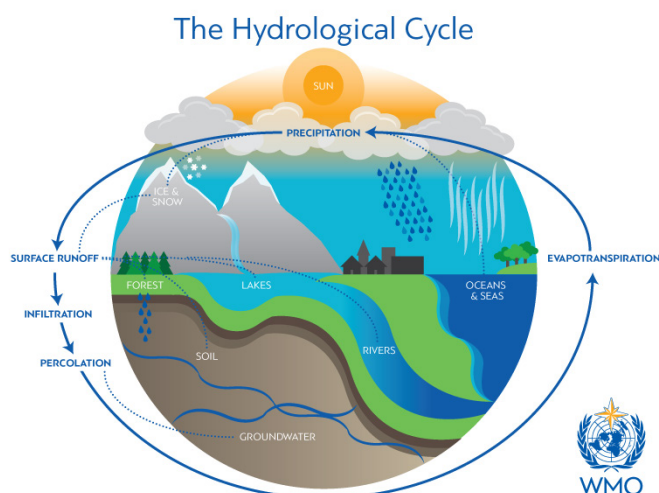
CLIMATE CHANGE AND WATER

Climate change is causing the hydrological cycle to speed up as rising temperatures increase the rate of evaporation. Higher evaporation and precipitation rates are not evenly distributed. Some areas may experience heavier than normal precipitation, whilst others become prone to droughts as the traditional locations of rain belts and deserts shift.

Water-related hazards such as drought and flooding are becoming more serious, and a much greater proportion of annual precipitation is now falling in extreme precipitation events rather than spread more evenly throughout the year.

In many parts of the world, seasonal rainfall patterns are becoming more erratic, affecting agriculture and food security and the livelihoods of millions of people.

Most rivers and freshwater bodies are transboundary, and decisions by one country on water resource management



often have implications for other countries, thus making water a potential source of both peace and conflict.

Climate data and information underpin the management of surface-water supplies and disaster risk reduction. These include calculations of the frequency and duration of heavy rainfall, the probable maximum precipitation and flood forecasting. Such data, on weekly, seasonal and annual timescales and at national, regional and local levels, are now more essential than ever.

The WMO-spearheaded Global Framework for Climate Services has water as one of its top priorities and seeks to promote a holistic integrated water resources management approach as the best way forward for efficient, equitable and sustainable development and management of the world's limited water resources and for coping with conflicting demands.

FLOODS

Floods are the deadliest natural hazards, and the trend in flood damages is growing exponentially. This is a consequence of the increasing frequency of heavy precipitation events and changes in upstream land use and the growth in population and assets in flood-prone areas. Flood damages are often exacerbated by inadequate flood planning and management practices.

Sea-level rise has increased vulnerability to storm surge and related coastal flooding.

Flash floods are complex hydrometeorological events that occur over short timescales – less than 6 hours – and are difficult to predict. This makes them deadly, resulting in significant loss of life while also impacting social, economic and environmental infrastructure.

Flood plains are often attractive areas for human development, and a vast share of the world's population depends on them.

Floods are also an integral part of the natural regime of a river.

The Associated Programme on Flood Management is a joint initiative of WMO and the Global Water Partnership. It advocates a multi-disciplinary approach towards integrated flood management (IFM) that can help to balance flood risk management and development needs.

The Flash Flood Guidance System is designed to provide hydrological and meteorological forecasters with readily accessible observed and forecast data along with other

information to produce timely and accurate flash flood warnings. It currently covers more than 60 countries with a population of about 3 billion people.

DROUGHT

Drought is a prolonged dry period that can occur anywhere in the world. It is a slow onset phenomenon and is compounded by factors such as poverty and inappropriate land use.

It has a major impact on food security, health, population displacement and migration.

Since time immemorial, droughts have been a feature of the natural variability of our climate. But their frequency, intensity, and duration are expected to rise in several parts of the world as a result of climate change, with an increasing human and economic toll.

It has been estimated that droughts are the world's costliest disaster, accounting for between US\$ 6 billion and US\$ 8 billion annually and impacting more people than any other type of disaster. Since 1900, over 11 million people have died as a result of droughts, and 2 billion people have been affected.

Since the 1970s, the land area affected by drought has doubled. Despite this, effective drought management policies are missing in most parts of the world. Response to drought tends to be piecemeal and crisis driven.

The Integrated Drought Management Programme is a joint initiative between WMO and the Global Water Partnership. It provides policy and management guidance and shares best practices and knowledge.

FROZEN WATER

Climate change is impacting mountain regions, which cover about a quarter of the Earth's land surface and are home to around 1.1 billion people. They are called the "water towers of the world" because river basins with headwaters in the mountains supply freshwater to over half of humanity, including those in the Himalaya-Hindu Kush and Tibetan Plateau region, known as the Third Pole.

The cryosphere – or frozen water – is hit hard by global warming. Glaciers are retreating, snow and ice are melting and permafrost is thawing. This translates into a short-term increase in landslides, avalanches and floods and