

CLIMATE CHANGE *and* THE WATER CYCLE:

FOUR BIG QUESTIONS ANSWERED

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When it comes to the consequences of climate change, some have a way of seizing the headlines.



Glaciers calving and collapsing into the sea? Hard to miss. Temperatures rising so steadily that 15 of the 16 hottest years on record have come this century? Front page news almost everywhere.

But others – like the transformation of our planet’s water cycle – can be a little less immediately dramatic but even more profound and far reaching. And sometimes, these consequences can also seem confusing and contradictory. Like how climate change increases our risk of both heavy rains and extreme droughts. But why – and how – is that even possible?

Small changes to our atmosphere can have many different effects. Specifically, as global temperatures have steadily increased at their fastest rates in millions of years, the change has [directly affected things like water vapor concentrations, clouds, and precipitation and stream flow patterns](#). Changes in one area have consequences in another, and the resultant weather can be very different from place to place.

Let’s dive deeper into why this is the case. Check out our answers to four of the most confusing questions about how climate change impacts the water cycle

1. WHY DOES CLIMATE CHANGE INCREASE RAINFALL?



The water vapor that feeds precipitation comes from two sources. [One study concludes that about 60 percent](#) of the rain and snow that falls over land comes from moisture originating from the oceans, and the other 40 percent is “recycled” over the continents. China, for example, gets most of its rain and snow from evaporation over Eurasia.

As the atmosphere gets warmer, it can [hold more moisture](#). The intensity of downpours (and therefore the risk of floods) depends in part on how much water the air can hold at a given time.

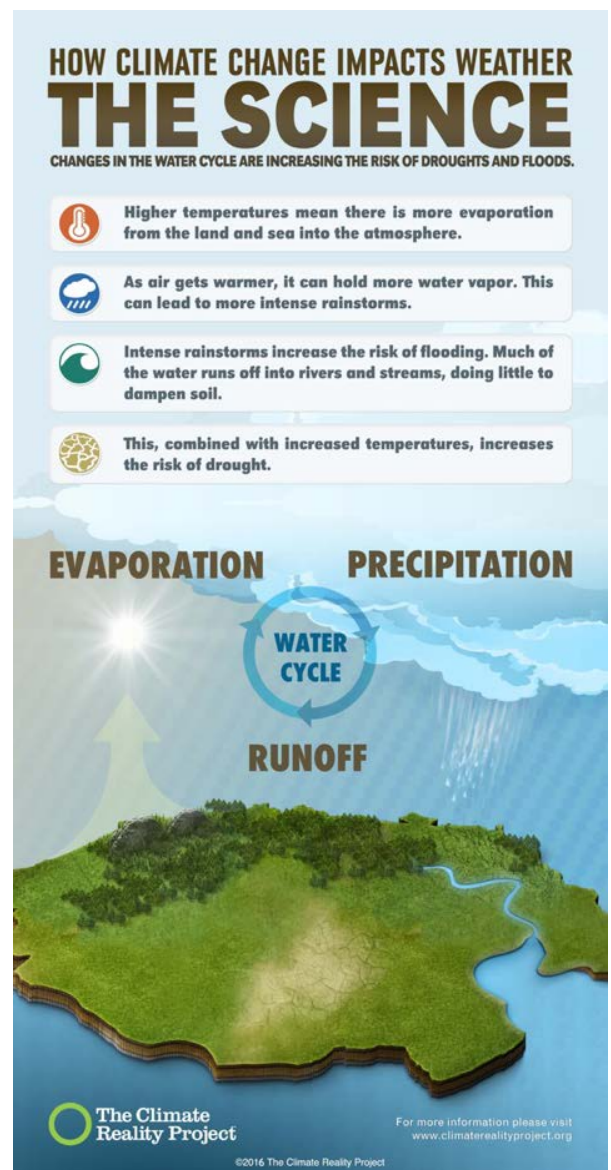
The rate of evaporation from the ocean is increasing as the world warms. Think about heating a large pot of water on your stove – the higher you turn the dial, the faster the water evaporates. Pretty much the same thing happens with the planet, and globally, this higher rate of evaporation contributes to more extreme rain and snow events.

2. SO MORE PRECIPITATION IS FALLING IN HEAVY EVENTS. THEN HOW IS CLIMATE CHANGE BRINGING ABOUT MORE DROUGHTS?

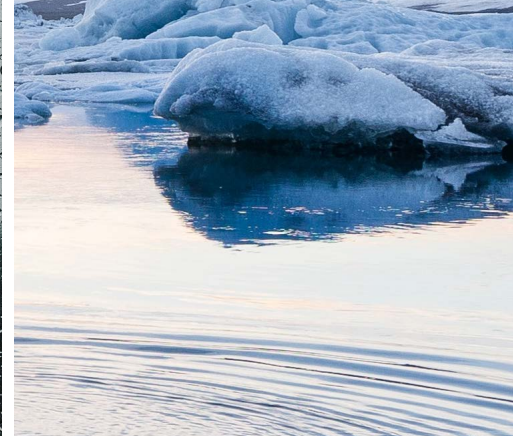
Contrary to what you might expect, more intense rain and snow doesn't necessarily mean wetter, healthier soils.

As temperatures rise, evaporation increases and soils dry out. When rain does come, it often falls as a violent downpour that doesn't do much to help crops or other plants. Instead of gently soaking into the soil, the water hits very hard ground and runs off, often causing disastrous flooding before draining into rivers and being carried back to the sea. The soil remains mostly dry, and the increased global temperature results in still more evaporation and further increased risk of drought.

Here's how it works:



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At the same time, climate change is also shifting our weather patterns, meaning that areas where we used to expect a steady amount of rainfall are now experiencing more unpredictable and extreme precipitation, sometimes with little to no rain between downpours. And two key sources of water for many people worldwide – snowpack and glaciers – are melting faster and not being replaced, in part, because of consistently warmer weather.

3. SPEAKING OF EXTREME WEATHER, WHAT DOES CLIMATE CHANGE HAVE TO DO WITH HURRICANES AND TYPHOONS?

Love the warm water at the beach?
So do hurricanes.



As worldwide temperatures continue to increase, storms are able to absorb more energy from the resultant warmer oceans. Hurricanes and typhoons thus arrive ashore with [intense and damaging winds](#), very heavy rainfall, and higher storm surges, leading to devastating coastal damage and loss of life.

In a nutshell, hurricanes and typhoons are expected to become more intense and likely more damaging thanks to climate change. In the northwestern Pacific Ocean alone, typhoons have become about [10 percent more damaging since the 1970s](#), with even stronger storms expected in the future.

Meteorologically speaking, hurricanes and typhoons are largely one in the same phenomenon, but are given different names depending [where in the world they occur](#). Both hurricanes and typhoons are [strong tropical cyclones](#), which are storms that form over warm ocean waters, have a well-defined center of circulation and feed off of heat energy from the ocean.

Of course, no discussion of tropical cyclones and the world's oceans can be had without mentioning one of the most foreboding consequences of climate change: sea-level rise. [Rising oceans around the world](#) further increase the risk for even higher storm surge from hurricanes and typhoons that travels further inland with more severe flooding likely to occur.

Now is probably a good time to remind you that eight of the 10 largest cities in the world are near a coast.

4. WHAT DOES THAT HAVE TO DO WITH WILDFIRES?



Once you start hearing about drought conditions, wildfires typically are not far behind. That's because droughts create a perfect situation for a hungry wildfire to thrive by drying out the land and killing plant life, turning the affected area into a tinderbox. Now, with precipitation less predictable than ever, as explained above, it's become even more challenging to stop these fires once they begin.

Thanks to rising temperatures, shorter winters, and longer summers, western US wildfire frequency has increased by [400 percent since 1970](#). Damaging wildfires have occurred in recent years in places like California, Colorado, Arizona, and New Mexico, leaving communities and governments with millions of dollars in damages, in addition to the incalculable cost of lost plant, animal, and even human life.

Sadly, disasters are bound to occur – that's Mother Nature at work. But scientists tell us that human activity, particularly the burning of fossil fuels, caused the increase in atmospheric temperatures that's impacting the global water cycle today to devastating effect.

It's up to each and everyone one of us to do our part and help spread truthful information about climate change to our networks of friends, peers, and family members. We have the practical, clean-energy solutions to make a complete transition to a renewable energy economy and ease the burden on our world's oceans, coastal communities, drought-prone areas, and much more.

[Now, let's get to work.](#)

ABOUT THE CLIMATE REALITY PROJECT



Founded and chaired by former US Vice President and Nobel Laureate Al Gore, The Climate Reality Project is dedicated to catalyzing a global solution to the climate crisis by making urgent action a necessity across every level of society.

Today, climate change is standing in the way of a healthy tomorrow for all of us. But we know that practical solutions are right in front of us. We can create a healthy, sustainable, and prosperous future by making a planet-wide shift from dirty fossil fuels to clean, reliable, and affordable renewable energy. At Climate Reality, we combine digital media initiatives, global organizing events, and peer-to-peer outreach programs to share this good news with citizens everywhere and build overwhelming popular support for policies that accelerate the global transition to a clean energy economy.