

Science AMA Series: I'm Bernadette Woods Placky, chief meteorologist at Climate Central who launched WXshift this week. Ask me anything about climate change, how it's affecting your weather!

WXshift ¹ and r/Science AMAs¹

¹Affiliation not available

April 17, 2023

Abstract

Hi everyone, I'm the chief meteorologist for WXshift and Climate Central. I also run our National Science Foundation-funded program with that provides climate information to more than 250 on-air TV meteorologists. In previous lives, I was a meteorologist for Accuweather and on TV in Baltimore. I'm a proud Penn State alum (We are...!) and card-carrying weather geek. I'm part of a team that just launched WXshift, a new weather site, this week. It offers something no other weather site has — relevant, localized trends in rainfall, snowfall, temperatures and drought in the context of your daily forecast. We couldn't be more excited about it and I would love to answer your questions about the site, how we crunched data from 2,000 weather stations, local (or global) climate change, weather or any other burning meteorology questions you have. I've brought along a few friends to join, too. Brian Kahn, a senior science writer here at Climate Central, Eric Holthaus, a writer at Slate and fellow meteorologist, and Deke Arndt, the head of climate monitoring at the National Centers for Environmental Information, are here to chat, too. We'll be back at 2 pm ET (11 am PT, 6 pm UTC) to answer questions, ask us anything! EDIT: Hey Reddit, Bernadette and Brian here! It's 2 p.m. ET, and we're officially jumping in to answer your questions along with Deke and Eric. Look forward to chatting! EDIT #2: Hello everyone! Just wanted to send out a HUGE thank you to all of your for participating and for all of your questions. We are really sorry that we can't answer each and every one of them, but we tried to cover as much as we could today before signing out. Also, a BIG thanks to the other members of this AMA Deke and Eric. Until next time... Bernadette and Brian

[REDDIT](#)

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WXSHIFT [R/SCIENCE](#)

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We always hear about the devastating effects of climate change through droughts, sea level rise, etc. are there any regions where climate change is predicted to improve the region to where it's more habitable and hospitable to people? Will any arid regions become more fertile due to increased rainfall?

[shiny_brine](#)

The winners and losers question is an interesting one. There are some places that could reap some benefits from a longer growing season (though there are some signs that suitable growing days [will decline](#)). Ultimately, the reason there's so much bad news around climate change is because, well, it's a lot of bad news if we continue to emit CO2. More people, particularly those in the poorest areas of the globe, will face more challenges that directly affect their livelihoods and well-being.

EDIT: oh, and this is Brian btw

What's the concensus on how climate change will affect the gulf stream and weather in

this week. Ask me anything about climate change, how it's affecting your weather!, *The Winnower* 2:e144249.91591, 2015, DOI: [10.15200/winn.144249.91591](https://doi.org/10.15200/winn.144249.91591)

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europa?

[TinySamurai](#)

There's also some signs that the [decrease in sea ice in the Arctic](#) has played a role in recent cold winters in the region. So let's call it an active area of research.

-Brian

hi, ,and thank you for taking the time for this AMA. i live in the caribbean and we are seeing fewer tropical storms over the past several years. i am told that this is a result of a very strong el nino event in the pacific. i have also read that the pacific ocean is heating up drastically. can we expect this to be a permanent part of our lives now? is el nino here to stay? what effect will the absence of atlantic tropical storms have elsewhere in the world?

[jest4fun](#)

There are a number of factors that can affect tropical storms, including El Niño like you note. That's definitely a big factor this year since it changes wind patterns that are unfavorable for storms. Dust from the Sahara, ocean temperatures in the Atlantic and how dry (or not) the air is over the ocean all play a role as well.

As for a permanent El Niño, I don't think that's in the cards. However, climate change is projected to double the likelihood of [super El Niños](#) like the current one. That doesn't mean every other year we'll see this [Chris Farley sketch](#) posted everywhere on Twitter, but it does mean folks will have to be more prepared for the consequences in their region.

-Brian

I live in Florida. How long do you think we have before the polar ice caps melt and we'll be under water?

[SkydiverRaul13](#)

All the ice caps? It'll be awhile. But the current sea level rise we've committed ourselves to puts trillions of dollars of property at risk from flooding. Our Climate Central sea level rise gurus made a [pretty neat interactive](#) that shows how our choices today matter for coastal cities of the future so take it for a spin for some perspective.

All that said, there is some pretty interesting research from James Hansen, NASA's former top climate scientist, that makes some dire predictions about sea level rise this century. You can check out [my coverage](#) as well as [Eric's](#) to see how it was received in the scientific community.

-Brian

How much of a role does animal agriculture play in climate change? Is there enough data on this specific cause?

[colbyrabbit](#)

There is a ton of data on this particular cause! Agriculture is a huge driver of climate change. It accounts for 14-18 percent of global greenhouse gas emissions depending your accounting method, including an even larger portion of methane (which is bad news since it's 23x more potent than carbon dioxide).

It's easy to joke about cow farts and such but it's a pretty serious topic when it comes down to it.

-Brian

I live in Ontario, I've noticed over the past few years that fall seems to be a lot warmer and winter seems to get much colder.

How can we expect these extremes to continue to develop over say the next lifetime or 50 years?

Do you think what is happening is Earth's natural cycles (ie. heating and cooling) and we are just speeding up the rate at which they occur or is something else at play?

Based on what you know now, what will be some of the first major changes due to our shifting climate that will affect our lifestyles?

[jbuckfuck](#)

The past two winters were definitely a weird one for me in New York too, as far as the chill goes. But will that be the norm? Not necessarily, though there are some signs that disappearing Arctic sea ice could be behind some of the intrusions of the dreaded polar vortex.

I'm totally ripping off something I heard earlier from Deke today. He likened climate change to a staircase that we just keep walking up. There are still variations year-to-year and place-to-place due to natural variations (hello, El Niño and co.), which essentially mean we're standing on our tippy toes or crouching down a bit, but overall, the trend is up. The planet has hadn't a cooler than normal month in nearly 31 years and 2015 is likely going to be the [hottest year on record](#) (taking over the top spot from 2014 no less).

The first affects are already being felt. You can see it in coastal areas which are seeing more "[sunny day](#)" floods and storm surge is higher than it would be without the extra 8 inches of sea level rise melting glaciers and warming waters have added to the oceans. Ocean acidification caused a big fisheries collapse in the Pacific Northwest. And there are some types of extreme weather, notably heat waves, that have direct climate change ties and are already affecting people around the globe.

-Brian

Based on recent estimates of future projected global temperature averages, do you think we have passed the tipping point?

[circus_snatch](#)

In a sense, yes. We've committed the planet to a certain amount of warming, sea level rise and a host of other changes even if we stopped all greenhouse gas emissions tomorrow. As for abrupt climate change, well, there's a lot of great research on that summarized in this [National Academy of Science report](#). In short, even the gradual changes we've locked in could lead to some unwelcome surprises.

-Brian

Based on recent estimates of future projected global temperature averages, do you think we have passed the tipping point?

[circus_snatch](#)

Hello there.

In some cases, we have passed tipping points. For example, there have been a few studies released this past year that we may have passed a tipping point for melting parts of the Antarctic. That locks us into a lot more slr...but over an extended period of time, like hundreds of years.

However, there's still a lot we can do to ease or avoid the worst impacts of climate change in many

other areas, for example extreme weather, water and food security, and melting sea ice and permafrost to name a few.

Hi Bernadette, I miss you in Baltimore. But thanks for helping to save the world :) WXshift will be helpful as often I bring up climate change on Reddit and people see it as a future event. It's difficult to show current impacts.

[FF00A7](#)

Thanks and glad to hear that you are enjoying WXshift. It's been a loooooong time in the making here at Climate Central. We are really excited about always joining weather and climate together - trying to show, with data, how our changing climate is changing our weather.

What effect does/will climate change have on the world's ability to grow food and sustain its population?

[StrafeTheArrows](#)

Food security is a huge issue in climate change. In fact, there's [a great group devoted to this topic](#) in terms of both identifying impacts and addressing them. (Full disclosure: I used to play soccer with the guy who ran one of their programs) Here's a great look at the [big impacts they've identified](#). -Brian

The Pacific NW saw an unusually dry and warm winter this past year.... should we start getting used to that?

[GoldyGoldy](#)

Warmer? Absolutely. Drier? Not necessarily. Check out this graphic from the [National Climate Assessment](#) for a seasonal breakdown of precipitation in the U.S.

However, warmer also means less snow, more rain, which is no bueno for spring runoff timing and summer when that snowpack comes in handy for all the crops grown in the region. Mmmm, peaches...

-Brian

So Chicago has seen crazy wet and cool weather this year. I know one year doesn't indicate a trend, but seemed to be the same last year. What macro trends should the midwest (and specifically Chicago) be expecting for the next 10/20/50 years?

[5-4-3-2-1-bang](#)

Macro trends, you can expect warmer temperature and a [rise in "danger days"](#) when the heat index is above 105°F and extreme caution days when it's above 90°F.

-Brian

How much are humans to blame for climate change?

[Cmboxing100](#)

They play a huge part in our changing climate.

We all understand the greenhouse effect, and we are adding more greenhouse gases to the atmosphere.

Of course, there always has and always will be natural variation in our weather and climate patterns, but the greenhouse gases we are adding (primarily from burning of fossil fuels...and we know that because we can track the specific kind of increasing carbon in the atmosphere) are magnifying and

increasing those changes.

Are there mechanisms or models that accurately predict shifts in climate that are area specific? For instance can we tell that one region/continent is going to experience more moisture in their atmosphere, while another should expect lower temperatures?

CatchingRays

Hello there. There are a ton of region specific changes already happening, and expected to increase in the future.

We will keep covering these topics through WXshift.com, but you can get a good overview of climate change and how it's affecting YOUR region specifically through the National Climate Assessment. It's a thorough compilation of the state of climate science right here in the U.S. Plus, it's also a great website! <http://nca2014.globalchange.gov/>

For international regions, check out the most recent IPCC (AR5): <http://www.ipcc.ch/>

I live in the midwest. In the last couple of years our summers seem to have become more mild (temperature wise) and our winters seem to have more precipitation. Is this a symptom of something long term like climate change, or is it short term and coincidental/anecdotal?

thread_killer

As luck would have it, there's a way to check. Just went to the [local climate change section of WXshift](#) and can check your zip code or region. I checked the Upper Midwest and definitely warming trends in all seasons for the Upper Midwest, which is what you'd expect due to climate change. As for precip, it's complicated with no clear cut signal. Goes to show that natural variations from year-to-year still play a role in local climate, too. Here's a couple screen shots from the local climate tool we developed:

Summer temperature trends

Winter precipitation trends

-Brian

Is there any possibility of WXshift or similar happening outside the US?

Erroneoust

Great question...and hello! Yes, there is a possibility, but nothing in the works. The next step will be a release of our app, then we'll have to see from there. I can tell you that our crew here at Climate Central would love a global WXshift.

I feel like we are the frog in the slowly boiling water. Reports and forecasts are too abstract. The occasional image of distraught polar bears and bird extinctions have not been enough to incite necessary behavioral change on our part. What will it take, in your opinion?

yourcodesucks

Hello! Such a loaded question. Honestly, I am not sure what it will take.

Climate change is such a large topic, based over a large period of time, with so many layers to it, that it's hard to summarize in a picture or two.

But I am in the hopeful category...there's a growing momentum heading into the international climate change negotiations this December in Paris from all across the globe and all sectors. Let's just hope we can keep this momentum moving forward!

Are there any methods of carbon capture that work on short timescales (less than 1000 years) and can address the 600 Gtons or so CO2 that has been generated by pulling fossil fuels from the earth since the industrial revolution?

[MY IQ IS 83](#)

There's nothing commercially viable at this point but are all sorts efforts looking at this. Hee's one using a certain [type of resin](#), another [using rocks](#) and here's a list of all the [carbon capture and storage projects](#) in the world maintained by MIT.

-Brian

What can we actively do to try to educate people stuck in their ways in believing that climate change isn't a real phenomenon?

[Tony Brown III](#)

Well you could send them over the [WXshift](#) to show them local climate trends in their area. Or you can just talk to them. People trust their [friends and family](#) on climate change according to research that's been going on at Yale for awhile now. (it also blows my mind that people trust their primary care doctor more than the mainstream media when it comes to climate change. I feel like I'm pretty trustworthy!)

-Brian

How hard was it getting the data? and given that gathering the data is a continuous process, can you take us through the processing involved?

[crovalin](#)

Just chatted with Alyson Kenward, our research director, who helped oversee the process. Here's what she had to say:

"The hard part wasn't getting data, it was getting data at the local level that we felt we needed to really make this site great. We curated several different climate data sources from around the country, expanding beyond the standard set of airport weather stations people are most familiar with. But drawing from more stations means we have to vet them for data quality. So we're reviewing the data quality at these stations to make sure it stand up to our standards. We're specifically making sure stations have a complete enough record so that we can say trends are statistically significant or not, and that they go back far enough in time."

-Brian

I am working on a piece of fiction to hopefully bring it home to people in a dramatic way the world we are currently creating. Is there any resource/s that deal specifically with the science behind what is probably going to occur, and the impact on daily life? Like inundated areas, possible unlivable areas etc? Thank you, keep up the good work. California is miserable. I had to listen to a rain recording last night to sleep.

[cdin](#)

If you're interested in sea level rise, you can check out the work our team has done that shows [local impacts](#) sea level rise of 1-10 feet will have on the U.S.

Good luck with the piece and my fingers are crossed for rain out there this winter!

-Brian

how do you explain fro laymen that climate change or global warming doesn't nessecarily mean we just have warmer weather

[rockdude](#)

Hello. I think that you just have to break it down to the basics...that climate change means it changes our entire climate system. If you want to take that to another level, you can get into what the climate system is - that means our atmosphere, the weather that plays out in our atmosphere, our oceans, ecosystems, biodiversity, and the list goes on.

If you want some talking points, you can check out our climate change indicators page at: [WXshift.com](#) (scroll down to the indicators).

I live in Namibia, down here in Southern Africa. We've had 2 poor rainy seasons (our summer time) in a row and are entering a period of serious drought for the first time in about 10-15 years. People are predicting another poor rainy season this summer due to the effect of El Niño.

First, is the El Niño phenomenon we are experiencing now a result of climate change?

Second, is the prediction of another poor season an accurate one?

[Blanketman101](#)

Hmm, good question. Namibia is right on the edge of an area that usually sees warm, dry conditions during El Niño so it's possible it could have an impact.

I used to work at a place called the International Research Institute for Climate and Society that does seasonal forecasting for the globe. I checked their forecast (released today no less) for the rainy season and looks like increased odds for [dry weather](#). So I'd say it's something to be aware of.

-Brian

PS: Incidentally, I've always wanted to visit Namibia.

I've been told that while "global warming" is a term that fits climate change, "global weirding" might be better at describing the change in weather patterns. While there is a general warming trend, it is also causing all sorts of weather patters to become less predictable and more dramatic including extreme cold and blizzards. Does that assessment seem wildly off base to you?

[PhillipBrandon](#)

We're fans of the global weirding term over here. In fact, you could say we...

(•_•)

(•_•)>┌─■-■

(┌─■_■)

[wrote the book on it.](#)

I'll show myself out.

-Brian

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[PhillipBrandon](#)

But seriously, there are some amazing advances in the field of climate science on attributing extreme weather to climate change. We have [a program doing attribution](#) for specific events, but there are plenty of other amazing researchers doing this type of science all over the world. It really is the cutting edge for climate science and I'm excited to see the field progress.

-Brian

With climate change going on as time progresses, what can we expect from Hurricanes in the future?

[Eldresh](#)

There are still a LOT of questions on how hurricanes will ultimately play out in a warmer world, but there are a few things that we do know: -the frequency of hurricanes is uncertain (very active area of research that you can read more on from some brilliant experts like Kerry Emanuel, Tom Knutson, and Gabe Vecchi, among others), but it looks like the intensity will increase for those storms that do form. - hurricanes will produce even more heavy rain -when hurricanes make landfall, they will be more impactful due to sea level rise.

As seas rise around the world, they create a launching pad that is just that much higher for storm surge...allowing water to go just that much farther inland, or that much higher in your house. For example 8" (the global rise since 1900) can be just enough to put the water above the outlet.

Part of the problem with being able to tease the climate change signal out of the bigger record, is that our real solid hurricane record only goes back as far as the satellite era. Before that, unless a ship just so happen to be going by a storm out at sea, there's a lot of tropical systems that went undetected.

If you go to [WXshift.com](#), we have a "weather extremes" section where you can dive in a learn a little more about hurricanes and climate change

Is climate changing or predicting to change ocean currents? Are certain areas of the world predicted to be less effected by climate change? How big of a role does Ocean acidification play in climate change?

Thank you!

[I am Brian NOT](#)

Hello. Climate change is hitting certain areas of the world harder than others, and certain people - like those with fewer resources to recover or less climate change preparedness implemented. But EVERYONE is being impacted in some way, shape or form. That's why we are all in this together...no one is escaping the changing climate.

The world's oceans are absorbing huge amounts of CO2, causing ocean acidification, in turn playing a huge role in our changing climate.

Take a look at our WXshift climate change indicator on the topic. It loaded with info:

<http://wxshift.com/climate-change/climate-indicators/ocean-acidification>

Hi Bernadette! Big fan, any tips on sources I can use that are easy to understand that will

convince my friends global warming is an issue?

[mountkili](#)

Hello. And thanks for the kind words. There are TONS of resources. I would start with [WXshift.com](#). Not only does it connect every weather forecast to a local, relevant climate trend that shows you how the climate is changing right where you live, the site is also loaded with a deeper dive into climate change indicators, as well as timely weather-climate news and videos. We also publish a lot of great content on [climatecentral.org](#) And you can tell your friends to follow news from the other members of the AMA - Eric Holthaus basically doesn't sleep, continually publishing his stories on Slate while Deke Arndt is the data mastermind behind a lot of the temperature record (and also publishes blogs now on [climate.gov](#)).