Science AMA Series: We're weather and climate experts. Ask us anything about the recent string of global temperature records and what they mean for the world!

Climate-Central-TWC [1] and r/Science AMAs[1]

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April 17, 2023

Abstract

Hi, we're Bernadette Woods Placky and Brian Kahn from Climate Central and Carl Parker, a hurricane specialist from the Weather Channel. The last 11 12 months in a row have been some of the most abnormally warm months the planet has ever experienced and are toeing close to the 1.5°C warming threshold laid out by the United Nations laid out as an important climate milestone. We've been keeping an eye on the record-setting temperatures as well as some of the impacts from record-low sea ice to a sudden April meltdown in Greenland to coral bleaching in the Great Barrier Reef. We're here to answer your questions about the global warming hot streak the planet is currently on, where we're headed in the future and our new Twitter hashtag for why these temperatures are #2hot2ignore. We will be back at 3 pm ET to answer your questions, Ask us anything! UPDATE: The National Oceanic and Atmospheric Administration released their April global temperature data this afternoon. It was the hottest April on record. Despite only being four months into 2016, there's a 99 percent chance this will be the hottest year on record. Some food for thought. UPDATE #2: We've got to head out for now. Thank you all for the amazing questions. This is a wildly important topic and we'd love to come back and chat about it again sometime. We'll also be continuing the conversation on Twitter using the hashtag #2hot2ignore so if we didn't answer your question (or you have other ones), feel free to drop us a line over there. Until next time, Carl, Bernadette and Brian

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CLIMATE-CENTRAL-TWC R/SCIENCE

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CORRESPONDENCE:

DATE RECEIVED:
May 19, 2016

DOI:
10.15200/winn.146357.75861

ARCHIVED:
May 18, 2016

CITATION:
Climate-Central-TWC , r/Science , Science AMA Series: We're weather and climate experts. Ask us anything about the recent string of global temperature records and what they mean for the world!, *The Winnower* 3:e146357.75861 , 2016 , DOI: 10.15200/winn.146357.75861

Australian here. Is the Great Barrier Reef a goner or could we still save it from bleaching? How drastic would we have to go to save it?

Daddingly

A great question and one that has some sad answers. I wouldn't say the GBR is a goner but the prognosis for the future if we keep doing business as usual is not great. For background, coral bleaching hit 93 percent of the GBR this winter (or summer for the southern hemispherites). It's basically unprecedented and was made 175 times more likely because of climate change. Yet it could be a yearly occurrence in as little as two decades if the world keeps warming.

So cutting carbon dioxide emissions dramatic is one global way to ensure some of the reef exists in the future. There are also closer to home solutions including stopping agricultural runoff and other forms of local pollution. Slate had a great piece on this earlier this month. There is also amazing research going on to figure out what make certain corals resilient to warm temperatures and could help reefs adapt to future changes.

It's not a pretty picture but there lots of people attacking coral bleaching from different angles.

-Brian

Do you guys have a time frame for when sea level rise will start to affect major costal cities?

jteach32

Hello - Thanks for the question.

There are already coastal cities being affected by sea level rise in two main ways: 1)Regular, sunny-day high tides are getting higher and higher, interfering with coastal properties and infrastucture. This has been well documented in the counties around Miami, FL, became a big story in coastal South Carolina last year around the king tide, and the science shows a major rise in these sunny-day coastal floods around the Chesapeake, too. You can explore the human influence on these flood days in this interactive and research story: http://www.climatecentral.org/news/the-human-fingerprints-on-coastal-floods-20050#interactive 2)When tropical systems make landfall, sea level rise has already pushed the base water level higher...so the surge is getting higher and going farther inland. We saw this with Sandy in NY and NJ.

There are some conflicting projections on just how high the seas are going to rise and by what year or year because we are still not clear how much of the Greenland and Antarctic ice sheets are going to melt...and how long it will take for that melting. A lot of people are researching this exact topic right now. In fact, last year, two separate papers were released indicating that we may have already passed a tipping point on some of the West Antarctic ice sheet, which would lead to over 10' of sea level rise, although it would take a couple hundred years for that to happen.

If you want to explore different projections right down to your street level with our surging seas tool: www.sealevel.climatecentral.org

Thanks, Bernadette Climate Central

I am a High School science teacher. I also work in a conservative, Oil and Gas Boom town. My fellow science teachers are climate change deniers. What can I tell them to convince them that we need to discuss this in our curriculum? I get shot down whenever I mention it.

LandSurf

Hello there - Thanks for the question.

When I talk to people who question or are not convinced by the clear science of global warming, I usually start with the basics. 1) The greenhouse effect. No one (that I know) questions the well-established science here. One of the main things that differentiates us from other planets is the presence of greenhouse gases in our atmosphere, which create an average temperature that can support life. So, when add more of those ghgs to the mix, you create more warming. The CO2/temp correlation is insanely strong and can be traced back to both the ice ages and hot periods. 2) After establishing that baseline, I would bring in the part that we can actually analyze the isotopes on increasing atmospheric carbon and they come from fossil fuels. 3) Then, if you still have a captive audience, you can get into the major climate change indicators (rising seas, more extreme heat/heavy rain, ocean acidification, etc.) We have a great roundup of them on WXshift.com.

Hope this helps. Bernadette Climate Central

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LandSurf

I might start by asking if it's right to ignore the consistent and overwhelming majorities of scientists who are active in climate research (~97-98%) who support the central tenets of anthropogenic climate change (see Doran 2009, Anderegg 2010 and Cook 2013). I would also ask if all of the major scientific organizations (such as the National Academy of Sciences, and their equivalents around the world) have lost their collective minds.

But your best argument for deniers might be that the US military has moved well past the debate. Here is the DOD's 2014 report on the national security threats that are likely to be posed by the changing climate: http://ppec.asme.org/wp-content/uploads/2014/10/CCARprint.pdf ---Carl

What would you say is the most imminent consequence of reaching this 1.5°C warming threshold?

mackinnollo88

The 1.5°C threshold is something small island states have fought for very hard in part because that's really their safe limit. Warming past that threshold would severely impact those countries, making some islands uninhabitable through a combination of inundation, increasing risk of storm surge and saltwater invading freshwater lenses and aquifers. Here's more on what they're up against and why 1.5°C is so important to them from AOSIS, a coalition of 44 small island countries.

-Brian

I fight wildfires as a summer job and have studied a little about how humans live with and manage wildfire. What does this climate trend mean for wildfire activity? Are governments adapting to any expected changes?

jellyitinthere

There's a lot of research out there on wildfires and climate change and none of it is particularly good news. The annual number of large wildfires have more than doubled since 1970 and wildfire season is now around 70 days longer in the western U.S. Here's some more info on it from our sister site, WXshift. It's a similar story in Alaska. In the southern hemisphere, Australia is dealing with similar increases in fire weather so it's not just a northern hemisphere thing.

Rising temperatures and disappearing spring snowpack have also created ideal conditions for explosive wildfire seasons. There are also management issues at play so it's not just global warming, but it goes to show how global warming is a threat multiplier. As for actions, I don't know of a ton off the top of my head. There's certainly a lot of monitoring in place but how we battle wildfires in the future is definitely an area ripe for discussion.

Stay safe out there this summer and thanks for the hard work you do.

-Brian

Hi! What would you say is the most important change that average person needs to make in order to have a significant impact on the future, assuming that we do shoot past the two degree target, as talked about in recent articles?

Thanks so much for this AMA!

Dirtysunshine29

There are a lot of personal actions to mitigate climate change. One of the biggest ones is eating less meat. The UK government put out a calculator last year that shows how different societal choices can affect the climate. It's pretty fun to play around with and might give you some more insights into what the different actions you (or anyone for that matter) can take.

-Brian

Which countries will be the least affected by climate change in the long term?

StormCrow1770

As a few other folks have mentioned down below, the least affected countries are developed ones. They have the capacity to adapt and have diverse economies that are more resilient to climate shocks. That's not to say they're immune from the impacts of climate change, particularly in a globalized world. And certain sectors and parts of society are more at-risk than others. But the U.S., EU and other developed countries are generally a lot more insulated from the impacts of climate change than ones in sub-Saharan Africa and other developing parts of the world.

-Brian

What's causing so much water to be dumped on Texas and some of the gulf areas right now? Is this a result of rising temps and is El Nino having an effect?

florbagast

Pretty strong El Niño connection as that area is generally wetter during El Niño years. I haven't seen any individual attribution reports on the role of climate change in the crazy winter Texas has had, but in general, heavy downpours are on the rise in Texas and across the U.S. A big driver is a warmer atmosphere, which can hold more water. We did an interactive graphic last year that has state-by-state trends for this exact topic.

-Brian

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florbagast

While a certain amount of extreme weather lies within the bounds of natural variability, which is to say that this kind of thing just happens, we also know that climate change has loaded the dice to increase the likelihood of certain extreme events, and particularly flooding. In fact, Kevin Trenberth, a climate scientist with UCAR, has said that asking which events are caused by climate change is to some extent the wrong question, because all events are affected by climate change---the atmosphere is warmer and moister than it used to be, and that is probably adding about 5 to 10 percent to rainfall in general, but much more in extreme events.

On top of that, there has been a demonstrable change in jet stream patterns, in that we are seeing more a north-south component to the upper winds, which tends to slow weather systems down. This is related to the bubbling of big, warm high-pressure systems, which are increasing, and concordantly with the rising temperatures. Slower weather systems with more moisture are going to dump more rain, and that trend is showing up in the data. ---Carl

Thank you for doing this AMA!

I was wondering, since your work involves an issue that concerns the general public, what do you do to communicate your findings that would be easily understood by laymen apart from using non technical terms?

AudiWanKenobi

As one of Climate Central's writers, I think about this all the time. When I write a story, putting findings in plain language is a high priority. But just as high is considering how to put it in language that will make people perk up and share it with friends on Facebook, Twitter or Reddit. That really helps me focus in on what the core interesting, new finding is and why it's important to people's daily lives (or at least interesting). When in doubt, ask "why would Aunt Joan share this?" :)

-Brian

In your opinion, what is the single biggest factor that contributes to global warming? What do you think is the simplest approach to dealing with it?

Alihandreu

The EPA has a good breakdown of this. Depends on the sector you're talking about, but let's go with electricity and heat production as an example. The simplest solution is switching to renewable or carbon neutral energy. Alas, simple does not mean easy and there are a lot of political, economic and engineering factors that go into making that switch a quick reality.

-Brian

In your opinion, what is the single biggest factor that contributes to global warming? What do you think is the simplest approach to dealing with it?

Alihandreu

Hello - In my opinion, it's our reliance on fossil-based fuels for energy and transportation. Of course, there are other contributors, but those definitely put the most carbon pollution in the atmosphere. It's hard to find a simple approach but it will have to be a mix of top-down political will/decisions and public demand/interest in alternative low or non-carbon based energy and transportation.

Thanks for the question. Bernadette

Hello! In an effort to better educate myself as well as have data at my disposal to share with others - would you recommend me some studies that I could use to reference the effects we are seeing from climate change?

Thanks for your work thus far!

jrblohm

Thanks for the interest.

From the data side, we have a whole website dedicated to local climate data and trends that are

connected to current weather: WXshift.com We also publish tons of stories on new research on our website: www.climatecentral.org

As far as bigger, overview studies on climate change, you might want to peruse the National Climate Assessment: http://nca2014.globalchange.gov/ It's a compilation report of the latest climate science with respect to the United States. They also cite where all their studies come from, so if there's a particular topic you are interested in learning more about, you can look it up. If you want the full global picture, go to the IPCC (although it's a beast of a report).

Hope this helps. Bernadette

Could you discuss your career progression a bit? How did you end up in this position? Was it something you originally set out to do? If a college student was interested in similar things, what would you suggest they do?

nate

I originally wanted to be a basketball player for the Boston Celtics. Still waiting for that call from Danny Ainge. *shakes fist at the sky

What got me jazzed on climate was spending time as a ski bum and Park Ranger in my 20s. I love being outside (ironically I now live in New York) and have always been fascinated by the natural world. One day I was standing there, looking downhill at a fresh untracked field of powder and it just hit me that climate change could alter this thing I loved to do so much. I also honestly didn't know enough to know how severe the change would be or when it would happen. So that's when I said goodbye to my ski bum days (for now) and got a Masters in Climate and Society.

I've always loved writing and communicating (it's what I did with the Park Service) so when the opportunity to do that for a climate journalism outlet came along, well, how could I not take it? I also teach a class about climate communication for the Masters I graduated from so basically I'm livin' the dream.

Advice on how to get there? This sounds so cheesy and I can't believe I'm even writing this but following your passion goes a long way to finding something you care about. Also not being afraid to ask questions or introduce yourself to people in the field you want to work in. It's a great way to find out if something really is right for you and make connections in the field if it is.

-Brian

In regrades to Global Warming, would you consider this trend to be unequivocal proof that global warming is occurring? Also Do you think that we really can keep the average temp from rising above 2 degrees? The deal that was recently reached and signed on earth day seems like to little to late.

Chain_of_Power

Hello - I think that the unequivocal proof of global warming is that we know that carbon dioxide warms the planet and we can clearly track the additional carbon dioxide and other greenhouse gases that we are spewing into the atmosphere. These temperature records, along with a host of other climate indicators (http://wxshift.com/climate-change/climate-indicators/arctic-sea-ice) are the result of global warming.

Your question about keeping warming below 2C is the million dollar question right now. In reality, it's going to be really hard to stay below that limit, let alone the 1.5C ambition. We would physically need to take carbon out of the atmosphere for the latter to occur.

In fact, our organization has been looking at the global temperature anomalies from a new baseline that is closer to pre-industrial (1881-1910) so that we can get a better gauge on how close we are to the COP21 goals. What we are finding is that we are already pushing the 1.5 threshold right now - although we will step off a bit when this big El Nino fades). You can read more about it here: http://www.climatecentral.org/news/world-flirts-with-1.5C-threshold-20260 (this article does not include today's global temp release...yet)

Thanks for the question. Bernadette

Do you anticipate the temperature this year will be a local maximum for the next few years due to the El Nino? The specious use of the temperature of the previous El Nino year always amazes and frustrates me.

OddCarp

Hello - This is a really good question and I think that you are probably right. Clearly, as this crazy El Nino fades, the record anomalies will start to back off. But when people use this spike in heat as an argument against global warming, I always like to point out that temps level out but never drop back down. Our La Nina years now are warmer than our El Ninos from 30 years ago. You might like this graphic:http://ccimgs.s3.amazonaws.com/2016GlobalNumbers/2016GlobalNumbers_ElNino.jpg

Feel free to join us in using the hashtag #hot2ignore

Thanks for the comment. Bernadette Climate Central

What is the effect of climate change on tornado activity?

maingroupelement

Hello - It is not quite clear how climate change will impact tornado activity for a few reasons: 1)the database does go back to 1950s but there have been changes in reporting 2)Tornadoes happen on such a small spatial scale that I think we still struggle to fully understand some of their triggers even with the meteorological modelling let alone the climate modelling

That said, this is what we do know: 1)Both heat and moisture availability are increasing in a warming world. That sets the stage for bigger, stronger tornadoes...but we're not quite sure how the other main element will fair with climate change - shear. Models indicate that it would likely decline in the future, but that's still to be seen. 2)Brooks, Carbin, and Marsh published a paper in 2014 analyzing the trends in the tornado record. They found that we are experiencing fewer tornado days (days with at least 1(e)f1+ tornado) but on those tornado days, there are more happening. We wrote a piece on this last week on WXshift: http://wxshift.com/news/graphics/tornado-days-in-the-us Also on WXshift, you will find a whole page dedicated to tornadoes and climate change for more info (look under "tell me more: weather extremes").

Hope this helps. Thanks for the question. Bernadette Climate Central

Hi Bernadette, Brian and Carl! Thanks for reaching out.

Considering how the Arctic is projected to warm much faster than the rest of the globe, are there any new predictions on what will happen to the Greenland Ice Sheet?

(A complete melt of the ice on Greenland would raise the oceans by about 7.2 meters)

helm

Thanks for having us!

It's extremely unlikely the entire Greenland ice sheet will melt so there's that (yay?). But there are signs its melt could speed up. One interesting recent study is on lakes appearing on the ice sheet and what it means for the interior. There's also concern that melting across the entire could be a yearly occurrence by 2100. That's in part due to warming and in part due to ash from northern wildfires and dust settling on the ice sheet's surface. For reference, there's only one instance of this on record (in 2012). This year's melt season got off to an early start.

-Brian