**News you don’t want to hear about the Arctic – 100% on Tube Buddy**

**All this talk about extreme weather emergencies and looming global warming catastrophe is all a bit wearing don’t you think? As one of the perpetrators of bad tidings about our global climate predicament here on YouTube, I fully accept my share of responsibility for occasionally torpedoing your otherwise bright and breezy day into a downward spiral of despair. I can see how that must be a bit of a bummer for you, and, you know, I can only apologise for any inconvenience caused. I don’t do it just to deliberately hack you off though. I do it because I believe in the old adage that forewarned is forearmed. In other words, if you and I, as ordinary folks going about our daily business of making a living, putting food on the table and paying our monthly bills, are not properly informed about the size of the challenge we all face, then how can we possibly be expected to make the right decisions to do something about it.**

**Not everyone shares my point of view of course, which is just as it should be a in a free and fair democracy. I often get feedback from folks who tell me they just don’t want to hear ANY more calamitous news about the climate. After all, there’s enough crap stuff going on in the world already, isn’t there, without some joker like me banging on about ‘feedback loops’, ‘tipping points’ and ‘existential threats to the very fabric of our civilisation’.**

**So, if you are one of those people, I strongly suggest you switch off now.**

**Hello and welcome to just have a think,**

**Well, you’re still watching, so I imagine you’re asking yourself something along the lines of ‘I wonder what delights he’s got in store for us this week then, the miserable bastar…**

**Arctic… arctic… this week it’s the Arctic. I’m sure you all know the drill by now… the arctic is the air conditioner for the planet and it’s warming up at least three times faster than the rest of the world, and there’s feedback loops and tipping points and everything, and it’s all very terrible and it’s going to be a disaster and don’t tell us any more Dave because you’re really doing our heads in, man!**

**Well [sigh], yeah…**

**yeah…**

**But the problem is those bloody science bods keep doing all this pesky research, and they will insist on publishing it in places where I can see it, which is very irritating. And once I’ve seen it, I kind of feel a bit of an obligation to let YOU know about it too. So, you see I’m doing you a favour really! [fertive look away]**

**A couple of new research papers darkened my desktop in March, the first of which was this one, published on the fifteenth by the United States National Snow & Ice Data Centre or NSIDC.**

**March is the month when, at the end of the cold winter months, the floating ice covering the Arctic Sea reaches its maximum extent in terms of surface area. This year that extent was fourteen point six two million square kilometres or five point six four million square miles.**

**Sound like a lot, doesn’t it? It’s more than a one and a half times the surface area of Canada, so I suppose it is a lot really. But in relative terms it doesn’t stack up quite so well. Here’s a nice confusing spaghetti of lines for you. They’re exactly the sort of thing that happens when you let scientists loose with data points and excel spreadsheets. In this case the data points are the surface areas of Arctic Sea ice throughout the course of a year, for every single year since the first satellite data started in nineteen-seventy-nine. If I take them all away, and then put them back on again one by one starting at nineteen-seventy-nine, you do start to see a bit of a downward trend emerging. This year was the fifth lowest maximum on record. The ACTUAL LOWEST maximum occurred in twenty-seventeen and another five of the lowest maximums have occurred since then. By the way, this dotted red line up here represents the year twenty-twelve, when Arctic Sea ice cover went on to record its lowest ever MINIMUM extent at the end of the summer months in September. If you watched my last video, you’ll know we’ve got some serious heat brewing in our oceans as we move towards a potentially big El Nino event in twenty-twenty-three, so there’s a reasonable chance we might break that very much unwanted record later this year. And if you’re worried that you might miss that news when it happens, then make sure you subscribe to this channel and select ALL NOTIFICATIONS in YouTubes little hidden drop-down box here, because barring abductions or strangely inexplicable freak accidents, I will certainly be reporting on that event.**

**Exactly what specific physical movements are causing this annual decrease is something that is still being researched, but it apparently looks like, as well as a warming atmosphere overhead,** [**warm water**](https://phys.org/tags/warm%2Bwater/)**from the Atlantic is playing a bigger role in ice melt, as ocean circulations start to change in response to global warming.**

**(all very complicated – have a look at this video if you want blow your mind with all that stuff).**

**The NSIDC tells us that an important indicator of sea ice conditions is the age of the ice itself. In recent years, there has been far less of what the science bods call multiyear ice, or ice that has survived at least one summer melt season, which brings me nicely to the second piece of research to trundle over my horizon. This one was published in the online journal Nature, also on the fifteenth of March, by a physical oceanographer called Dr Hiroshi Sumata from the Norwegian Polar Institute. Dr Sumata and his team took a close look at the THICKNESS of the ice rather than its surface area. Arctic sea ice can range from tens of centimetres to several metres thick. The reason we want lots of it is because it’s white, which means it REFLECTS most of the solar radiation that hits it, in stark contrast to dark sea water which is very good at ABSORBING heat from the sun. Less ice means more water, means more warming, means less ice and you get the idea. It’s a feedback loop that can accelerate very quickly.**

**Each bit of sea ice is pushed very slowly across the Arctic Basin by surface wind in a phenomenon the scientists call ‘transpolar sea-ice drift’. After a few years, it eventually reaches the Fram Strait up here between Greenland and Svalbard, from where it wanders off into the wider oceans. That makes THIS a good place to do some observations on the STATE of ice over time. Sumata’s team used subsurface instrumentation that had been deployed in the Fram Strait over the course of more than thirty years to investigate long-term changes in ice thickness from nineteen ninety onwards. What they expected to find was a gradual sort of straight-line change where older, thicker ice became less abundant over the course of the decades. What they actually found was that the decline of the thicker ice hadn’t been a gradual process at all. It happened in a distinct shift around two thousand and seven, as you can clearly see from this chart. The research showed that before that date, much of the ice was thick and deformed with lots of ridges and something called rafted ice which can build up on thicker frozen substrates and get compressed over time to make them even thicker.**

**So, what happened then? Was it yet another reaction to the global financial crisis? Surely, we can’t blame the bankers for this one too can we? At least not directly anyway? Well, no we can’t. Sumata’s team used some smart mathematics to show that there’d been a reduction in the mean amount of time it was taking for the ice to make its way across the Arctic Sea, from the western side over to the Fram Strait in the East. What HAD previously taken on average more than four years was now only taking just over two and a half years. That meant the sea ice had less chance to thicken up as it made its journey. Now I wouldn’t even know how to begin working out why those changes had happened. Which is why I’m not a climate scientist. Luckily Sumata and his team are considerably smarter than me and they DO have a bit of a steer on the whole thing. They say it highlights the importance of interactions between oceans and floating ice in the OUTLYING regions of the Arctic in places like the Beaufort, Chukchi, East Siberian and Laptev seas. Those areas are becoming completely ice-free for longer periods during the summertime, which is causing that heating FEEDBACK loop I mentioned earlier. That delays the refreezing process that starts in the autumn and slows ice growth for the following winter. That means thinner ice that can be melted more easily the following summer and hey presto, you’ve got yourself abrupt environmental changes in the polar regions that Sumata’s team tell us have pushed the Arctic Sea ice into what they describe as a new regime.**

**I imagine the question most of us want answered is why should we care about the loss of Arctic ice? Well I suppose because global** [**weather patterns**](https://phys.org/tags/weather%2Bpatterns/)**are driven LARGELY by the planet's attempt to EQUALIZE temperature DIFFERENCES between higher, colder latitudes like the arctic and the lower warmer latitudes in more tropical regions. If we keep losing sea ice then arctic warming will continue to accelerate. Some regions up there are already warming more than FOUR times faster than the global average and that means a smaller temperature gradient from the middle of the planet to the top. For reasons we examined in this video, that has all sorts of implications, including making the jet stream very lazy and wavy, which means warmer air is being dragged further north more often and colder air is being dragged further south more often, resulting in the extreme weather patterns we’ve seen over North America and Europe in recent years. Warmer, more**[**open waters**](https://phys.org/tags/open%2Bwaters/)**also mean bigger waves that cause thermal and mechanical erosion of coastlines, so according to the director of the NSIDC, Mark Serreze, the question becomes what level of adaptability is there.**

**And that’s really it in a nutshell, isn’t it? It’s not that these planetary conditions are in any way unprecedented in earth’s geological history. It’s just that we humans have never been around when they’ve happened, so we’ve never had to develop ways to cope with them. The systems that run our modern human civilisation only work because of the unusually stable atmospheric conditions we’ve been lucky enough to enjoy in the ten thousand years or so since the last glacial period. We’re now changing those conditions far faster than would normally happen during normal planetary cycles. That means we don’t have time to evolve to cope with the new conditions, and neither do any of the other nine million or so species of plants and animals that we co-exist with. Building out incredibly expensive infrastructure to cope with increasingly frequent and extreme weather events has already become essential, but it won’t happen everywhere, will it? Which means hundreds of millions of the poorest and most vulnerable human beings on the planet will probably lose their homes and livelihoods in the coming decades and many of them will die prematurely as a result, along with billions of ANIMALS that will suffer a similar fate. Adaptation doesn’t cure the root cause of the problem either which, in case you were in any doubt, is the combustion of fossil fuels and the over use of land for animal feed and agriculture to support a species that has managed to convince itself that it can continue to increase its consumption levels at an average of three percent a year, every single year, forever, on a planet with finite and rapidly dwindling resources. If you think that should change, then you need to get involved in the process of replacing the global commercial and political leaders who are currently hurtling all of us towards a very painful brick wall.**

**I’ll leave that with you! That’s it for this week though. Thanks, as always to my amazing Patreon supporters, who keep me just about on the right side of sanity and enable me to keep ads and sponsorship messages out of these videos. And an extra special thank you to the folks whose names are scrolling up the screen beside me here, all of whom celebrate an anniversary of Patreon membership in May.**

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**As always, thanks very much for watching, have a great week, and remember to just have a think. See you next week,**