

THE OFFICIAL  
MAGAZINE OF  
THE CENTRE  
FOR STUDIES  
ON HUMAN  
STRESS

The Centre for  
Studies on Human  
Stress is dedicated  
to improving the  
physical and mental  
health of individuals  
by empowering  
them with  
scientifically  
grounded  
information about  
the effects of stress  
on the brain and  
body



## Stress and climate : are we impervious to the effects of nature?

### Editorial

Marie-France Marin, Ph.D.

Sonia Lupien, Ph.D., Director of the Centre for Studies on Human Stress

Dear readers,

We are delighted to welcome you to another issue of the Mammoth Magazine. In the last year, as well as in the last decade, we have been regularly confronted with events linked to climate change. Floods and forest fires are more frequent than ever before. News channels show us frightening images and call for changes in our actions and behaviours. Social and political movements are calling for concrete action in an attempt to turn the tide. And when faced with nature's fury, some people are experiencing psychological distress.

Therefore, we have chosen to dedicate this 27<sup>th</sup> issue of the Mammoth Magazine to the climate and stress. During a laboratory

meeting this summer which some of us attended, we discussed a scientific article on the link between scientific research and the climate. Félix Duplessis-Marcotte and Ariane Paquin, two doctoral students in psychology at the University of Quebec in Montreal, interviewed one of the authors of the article, Dr. Anne Urai. The first article of this issue of the Mammoth Magazine summarizes their exchange with the neuroscience researcher who not only took an interest in climate change but also in the concrete actions that scientists can take to do their part. The second article is co-authored by Audrey-Journault, doctoral student in psychology at the University of Montreal, and Félix Duplessis-Marcotte. They were interested in gaining a better understanding of why people do (or do not)



change their behaviour. After all, the large majority of the population believes that grand actions are needed to counter climate change. However, a minority are ready to make significant changes in their routine. Why? Are there more effective ways of ensuring greater support for pro-environmental movements and changes? This is what the second article will attempt to answer. After, Dr. Sonia Lupien, founder and director of the Centre for Studies on Human Stress, will surprise you with a very interesting article on the stress associated with weather channels. Can listening to weather forecasts make us stressed? You will see that even through a screen, we are not impervious to bad news. Dr. Catherine Raymond kicks off the fourth article on the phenomenon of eco-anxiety. You have probably heard this term in recent years. More and more people are calling themselves eco-anxious. What exactly are they referring to? Is it a disease? This article written by Dr. Raymond will clear up some of these questions on the subject. Next, Dr. Robert-Paul Juster will educate us on the chronic physiological and psychological effects of

natural disasters. Indeed, when faced with life-threatening disasters, the stress system feels like it is face-to-face with a mammoth. He also explains how research on chronic stress could be put to good use during natural disasters. Finally, Alexe Bilodeau-Hole, doctoral student in psychology at the University of Quebec in Montreal, and Clémence Peyrot, doctoral student in biomedical sciences at the University of Montreal, signed the last article. This article talks about the effects of spending time outside in nature or even observing nature scenes. Can nature calm us down?

You'll see from reading this issue that climate change and nature affect our body and brain, and not only in a bad way! We hope that you have a nice view of the great outdoors while reading this issue of the Mammoth Magazine.

Happy reading! 🐾





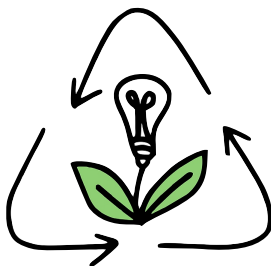


## Researcher profile: Dr. Anne Urai

### You do not need to be a climate scientist to take climate action!

Félix Duplessis-Marcotte, doctoral student in psychology, University of Quebec in Montreal  
Ariane Paquin, doctoral student in psychology, University of Quebec in Montreal

Anne Urai is a cognitive neuroscientist at Leiden University in the Netherlands. Her research in animals and humans aims to better understand decision-making processes in the brain. Although not a climate scientist by training, she has become involved in climate action in academia. On this topic, she authored several research papers, participated in webinars, and appeared on podcasts about the role of scientists in climate change.



During a journal club in the laboratory of Dr. Marin (STEAM Lab), we discussed Dr. Urai's article on why climate change concerns neuroscientists. To better understand how and why researchers should (and can) take action to limit climate change, we decided to meet with Dr. Urai for an interview.



#### How did you become interested in climate change?

Growing up in the Netherlands, the sixth leading country in sustainable development according to the Green Future Index 2023, Dr. Urai has always had an interest in the environment. In 2018, she moved to New York to pursue her post-doctoral studies at Cold Spring Harbour Laboratory, where she experienced somewhat of a culture clash. The marked differences



in pro-environmental behaviours and reading the 2018 Intergovernmental Panel on Climate Change (IPCC) report increased her ecoanxiety (for more information on ecoanxiety, we invite you to read the article by Dr. Catherine Raymond in the current issue of the Mammoth Magazine) and her motivation to act on it. An encounter with researcher Adam Aron, who later left neuroscience to focus on climate action, triggered her involvement in collective action. Since returning to the Netherlands as an adjunct professor in 2020, she has gotten more involved in local, national, and international climate action groups.

### Why should scientists care about climate change?

Her response was: "Because we are human beings living on this planet!". Dr. Urai expressed that doing research is not a right, it is a privilege. She sees research as being part of the larger ecosystem that is just our planet. Indeed, conducting research cannot thrive in an unstable environment where storms and extreme weather conditions are constant threats. She experienced firsthand how climate change can affect research activities. During her post-doctoral studies in New York, a tropical storm caused power outages, which put a halt to research activities for weeks.

Social responsibility is another reason for scientists to speak up about climate change. Researchers are often considered trustworthy experts to address various issues. In fact, regardless of their research field, scientists can interpret scientific data and read graphs. Most importantly, they know the scientific process and they can understand the urgency of climate change. We all know that knowledge is power and that great power comes with great responsibility.

### As scientists, how can we address climate change?

Within the academic community, it may be difficult to know where to start when taking climate action. With her colleagues, Dr. Urai proposed several ways in which academics can lower the impact of their research activities on the environment.



**Quantify the impact.** A first step to lowering the environmental footprints of research activities is to better understand our impact. Several organizations specialize in helping research labs develop strategies to improve their sustainability, such as the non-profit organization My

She sees research as being part of the larger ecosystem that is just our planet. Indeed, conducting research cannot thrive in an unstable environment where storms and extreme weather conditions are constant threats.

Green Lab®. They offer different programs to help laboratories rethink how their scientific methods could be done to lower their environmental impact and provide certifications to evaluate the actions undertaken.



### Reduce academic-related air travel.

International networking is an important part of science: knowledge translation, sharing best methods, and communicating/sharing new results. However, flying comes with a significant carbon footprint, which can be substantial for large conferences. Therefore, we should think about different models of networking, such as hybrid conferences. It is important to balance the pros and cons of travelling to make a well-thought-out (and sustainable) decision.



**Take daily action.** Conducting research inevitably uses energy. Here are small steps that can have large impacts in the long run to mitigate climate change:

- Closing energy-consuming apparel between use (e.g., computers), which can be numerous in research laboratories.



- Using open science repositories that run on renewable energy (e.g., Open Science Framework), considering that data storage centres account for about 2% of worldwide carbon emissions.
- Acquiring specialized recycling bins and opting for reusable materials (e.g., reusable electrodes), considering that single-use items are used in numerous research fields.
- Sharing highly specialized and energy-consuming equipment (e.g., magnetic resonance imaging machines), given that they are not used daily.

To change what we see as ‘normal’, the most important thing is simply to talk about your concerns and share your actions.

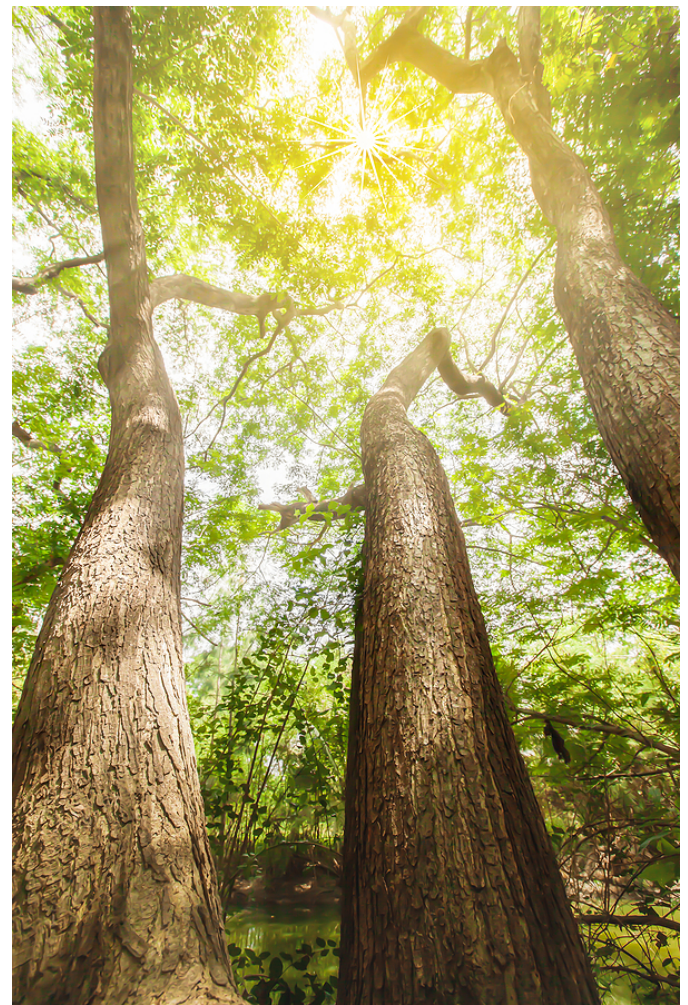


**Teach.** Beyond our carbon footprint, academics may help to establish new norms required for large-scale political and social change. Indeed, scientists often have the opportunity to present their work in front of diverse audiences, such as in schools. Finding a way to incorporate climate change issues is a great way to raise awareness and educate others.

### Why is it difficult to talk about climate change?

Dr. Urai explained that climate change is often addressed as a political topic, rather than a scientific one. Thus, it can be challenging to talk about it without the fear of inducing conflict. However, Dr. Urai’s experience is a rather positive one: she mostly receives either neutral or positive feedback from colleagues when raising questions regarding climate change in the scientific community. She aims to set an example in pro-environmental actions without telling people what to do.


Finally, political action is crucial for people to change their behaviours. She gave the example of smoking, which was deemed an appropriate behaviour in restaurants just a few decades ago but is now seen as odd or even prohibited. To change what we see as ‘normal’, the most important thing is simply to talk about your concerns and share your actions.



### What take-home message would you like to share?

At the end of our interview, we asked Dr. Urai what is the most important advice she had for the scientists of tomorrow, who will work in a world where climate issues are ubiquitous.

- Find allies and people you enjoy working with - whatever you do, don’t do it alone.
- Do not be afraid to pursue the topics you find interesting.
- Talk about it with others!

For more information on Dr. Urai, please visit her [website](#). At Dr. Urai’s request, here is an [article](#) about a researcher who left neuroscience to focus on climate action. 

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## Changing our behaviour to ensure our future: Neuroscience to the rescue

Audrey-Ann Journault, doctoral student in psychology, Centre for Studies on Human Stress, University of Montreal

Félix Duplessis-Marcotte, doctoral student in psychology, University of Quebec in Montreal

The fight against climate change is the greatest challenge that modern humanity will ever have to overcome. To defeat this threat to our survival, we *must* change certain behaviours. The list of these behaviours has already existed for a long time and the implications of these lifestyle changes are far greater than simply stopping the use of plastic water bottles. These behaviours include travelling less by plane, minimizing the number of cars and our use of them, using renewable energy, having fewer children, and the list goes on.

A recent study suggests that it only takes 25% of the members of a group to adopt a new norm to bring about social change, leading the whole group to adopt and adhere to this norm. So, one may believe that if it only takes 25% of the world's population to combat climate change, then we would be set! When framed in this manner, it sounds quite straightforward. However, the last few decades have shown that it is more difficult than expected. Why is it so difficult to change our

routines and behaviours for the greater good of our planet and future generations to come? Neuroscientists and psychologists can provide answers and some solutions to this question.

One possibility is that everyone is less likely to change their behaviour because they assume that others will do it. This social phenomenon is known as **diffusion of responsibility**. Studies in social psychology showed that it is highly likely that all members of the same group believe that the others will act and in turn, lead to total inaction from all members. The larger the group, the greater the diffusion and the less responsibility people feel to take action. The ambiguity of danger is a second factor that might diffuse responsibility. When the dangerous nature of a situation is clear (such as being confronted with a mammoth), people in the situation are less likely to act based on others and are more likely to act directly.



However, for some people, climate change **may not be a sufficiently clear and imminent threat** to motivate major lifestyle changes. Indeed, our stress systems are incredibly efficient in pushing us to take actions that will ensure our survival when the threat is soon approaching. On the other hand, our stress system is probably less suited to fighting climate change as the negative consequences will be felt over several decades. For this same reason, it might be hard for a young adult to completely modify their drinking habits to reduce the risk of developing serious health problems in the latter half of their lives. Drinking alcohol may come with short-term advantages (e.g., pleasure, socialization) that outweigh the perceived long-term health risks.

Government institutions can adopt various strategies to try and influence public behaviour. To simplify the classifications of these measures, the research team led by Christina Xiao at the University of Cambridge in England decided to group them according to their expected function: a benefit, a disadvantage, or a combination of the two. Let's use the example of measures put in place to encourage the use of public transit to get to work, instead of using a car. Certain initiatives involving public loss (e.g., car tolls, increased parking costs) would be classified as disadvantages. Others, such as bike-sharing programs and electric car subsidies would offer benefits. While others combine the two (e.g., repurposing park spots into pedestrian-only zones).



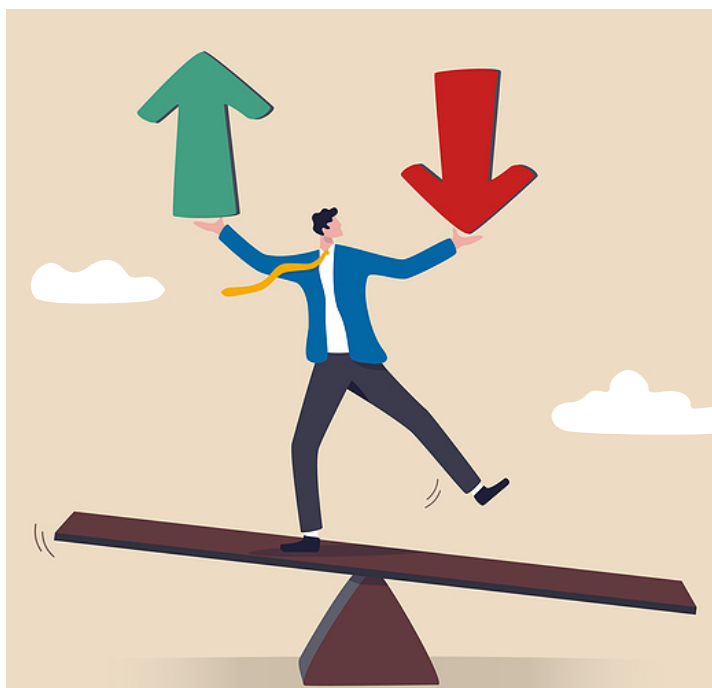
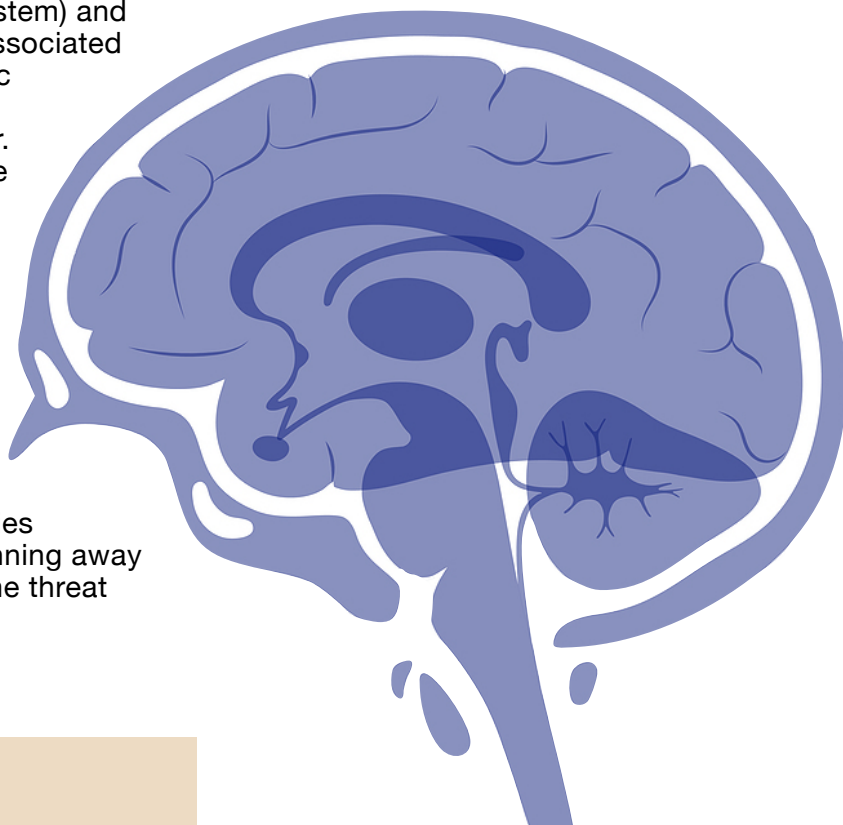
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The British research team wanted to compare the effectiveness of the types of strategies on the adoption of new behaviours. In the past, the effectiveness of initiatives based on a more punishment-based approach had been less studied than that of initiatives involving rewards for the adoption of pro-environmental behaviours. A recent review of these studies suggested that financial incentives and social comparison (e.g., showing the pro-environmental actions that have been adopted by members of your group) are particularly effective in initiating behaviour change. On the other hand, the results of a meta-analysis by Dr. Xiao suggested that initiatives involving punishment (whether they are combined with a reward or not) are more effective than those offering a reward alone in encouraging alternatives to driving your car to work.

These results could be explained by the fact that individuals are generally more motivated to avoid losses than to obtain gains. This concept, known as **loss aversion**, earned behavioural economist Kahneman a Nobel prize for questioning the rationality of humans. To explain this breach in human rationality, neuroscientists have tried to understand the mechanisms underlying loss aversion.



Two critical neural circuits have been identified: the dopaminergic system (reward system) and the threat detection system that is associated with the amygdala. The dopaminergic system is particularly important in motivating reward-seeking behaviour. Whereas the amygdala is responsible for reminding people how uncomfortable (psychological and material belongings) losses can make them feel. Therefore, the amygdala is responsible for the imbalance in the evaluation of gains and losses. From an evolutionary point of view, this imbalance is adaptive: imagine how disastrous it would be if prehistoric man preferred to eat berries (dopaminergic system) instead of running away from the mammoth (amygdala and the threat circuit)!



So, despite measures based on inconvenience being more difficult to implement and may be met with more resistance from certain sub-groups of the population, they may well be part of the solution to securing our future. Moreover, studies suggest that we may be able to increase social acceptability by explaining the expected benefits (or by combining them with reward-type measures) and that their acceptability increases once they have been put in place.

To conclude, although loss aversion and techniques centred on inconveniences may be powerful mechanisms for change, it's important to see what there is to gain. As the Cowboys Fringants (a popular Quebec francophone music group) would say: for as long as we have fresh water and clean air, we'll all be happy. With fresh water and clean air under threat, it's up to us to take action! 🐾

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## The stress of weather forecast channels

Sonia Lupien, Ph.D., director of the Centre for Studies on Human Stress

When my father was young, the weather forecasts were straightforward. What you saw outside was what you got. “It’s nice out” or “it’s going to rain”.

However, since the development of meteorological science that allows us to predict changes in the weather days and sometimes even weeks in advance, we have noticed that more and more weather forecast channels have been adopting an alarming tone when discussing outdoor conditions. For example, during a particularly severe winter storm in Chicago, the weather presenters made extreme alarmist predictions on television, announcing that the wind chill added to the actual temperature (of -15 degrees Fahrenheit or -26 degrees Celsius), that parts of the body could freeze in 5 minutes, and that our eyes could freeze if we stayed outside for more than 5 minutes!

In addition to the windchill, we have also seen the emergence of the humidex. With the humidex, the heat becomes “sweltering” and the cold becomes “freezing”. And more recently, heavy rain or snowfall has become a “weather bomb”. Now, every time we open our mobile weather applications,

we see a red banner (which seems to never leave) flashing “winter storm warning” or “rain warning”.





For many years now, owners of tourist sites and campsites, managers of festivals, and other social events have pointed out the alarmist tone of weather media sources, weather presenters, and various weather information sites. They are criticized for sensationalizing the weather to boost watch rates and for making unrealistic alarmist predictions and scaring away tourists. And they seem to be right; according to a survey conducted in 2014 of 3,000 Quebecers, when weather networks predict bad weather, 80% of tourists consider cancelling their holiday plans.

It is important to remember that when the weather forecast shows a 40% chance of showers, it means that there is a 60% chance that it will not rain. So, why do weather forecast channels choose to solely talk about the 40% chance of rain instead of reporting the 60% chance of having nice weather? According to researchers, one of the reasons is that the brain is a threat detector. Therefore, any negative information attracts the attention of the listeners' brains and increases the ratings of these alarmist news media sources.

We also know that when the brain detects a threat, it activates the biological stress response. We can then ask ourselves the question: can alarmist weather predictions increase stress levels in listeners?

### The stress of weather forecasts

One day, I decided to do a survey (not at all scientific) on my Facebook page "Sonia Lupien chercheure en neurosciences" (or Sonia Lupien

researcher in neuroscience in English). I asked the audience one question: "Do you find weather forecasts to be stressful?"

Within a few hours, I received 115 comments. Many people confirmed that they felt that weather forecasts were very stressful. Here are some of the answers we received:

- "It's not the weather that stresses me, it's the way the media (radio, television, newspapers) present it to us!"
- "Weather media platforms are intense... I look at their page every morning to see how we're going to die today ... In general, it's far from being a peaceful death."
- "Anticipation is what makes us anxious... and the media maintains this anticipation with the weather they can predict. Here is an excerpt from an article in La Presse: motorists who "must" hit the road tonight or early tomorrow morning should take an emergency kit with them including a sleeping bag and warm clothes. Even if you take this with a grain of salt, you're starting to stress!"
- "Yes, it gives me so much anxiety that it keeps me up at night ... I get up and look outside, I look at the weather at nighttime..."

### The stress of weather forecasts

When the owners of tourist sites discussed the excessive sensationalism of weather forecast media sources and its harmful effects on tourism, the people in charge of weather reports stated that they were simply applying the precautionary principle,





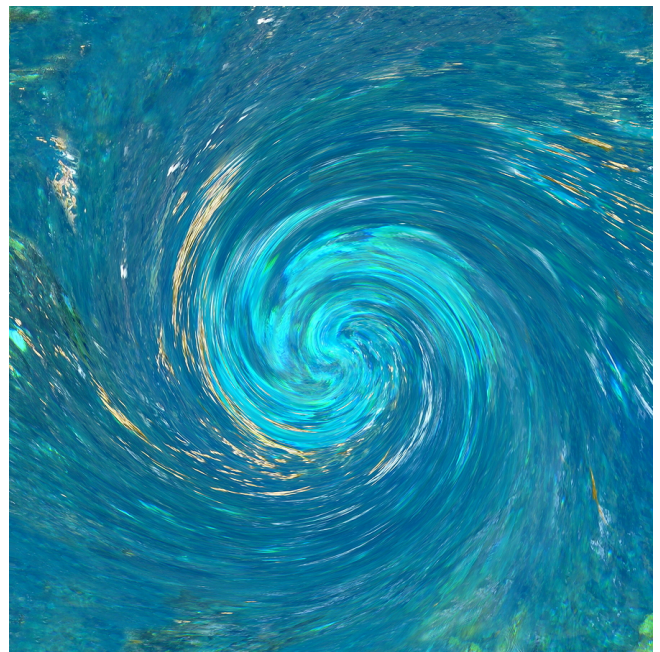
which states that it is better to take more precautions than risks when faced with danger. They responded to the tourist site owners by saying that their aim was not to stress people out but to help them stay organized (and I quote): “Our mission is not to encourage people to hunker down, but to prepare themselves for rain, snowstorms, and other weather hazards”. Here is the [link](#) to the article in question (available in French only).

Therefore, according to weather forecast media sources, they are just doing their job and are not contributing to the increase in the population’s stress. However, a study published on January 4<sup>th</sup>, 2019 says otherwise.

### **The stress of weather forecast media sources**

In an article published in January 2019 in the Journal of the American Medical Association Network Open, a team of researchers in California measured the effect of exposure to weather media among people who experienced Hurricane Irma in Florida. Communities living on the Florida coasts have become accustomed to the hurricanes that hit them almost annually. Studies have shown that 30% of people exposed to Hurricane Katrina developed post-traumatic stress symptoms and 50% of people showed elevated anxiety levels in the many months following the events.

For several years now, researchers have been trying to understand the factors that can lead an individual to experience post-traumatic stress disorder and/or anxiety when exposed to a hurricane, whereas others will not experience these same mental health problems when exposed to the same event. Many factors have already been studied, including the experience of childhood adversity and the presence of mental health problems before the traumatic event.



However, new studies on media sources have led some researchers to wonder whether exposure to weather forecast media sources could be a factor that increases the likelihood of developing severe psychological distress after exposure to a weather event.

**Studies have shown that 30% of people exposed to Hurricane Katrina developed post-traumatic stress symptoms and 50% of people showed elevated anxiety levels in the many months following the events.**





The hypothesis put forward by these researchers is very simple: in general, people living on the coasts of Florida are made aware days in advance that a major hurricane is going to hit. Is it possible that people who consume a lot of weather forecast media sources (which remember, are sensationalist) even before the hurricane hits, develop significant anticipatory anxiety for the upcoming hurricane, which could increase their chances of developing anxiety symptoms and/or post-traumatic stress symptoms after the hurricane hits? In other words, does the anticipation experienced in response to alarmist weather media days *before* the arrival of the hurricane ‘fatigue’ the stress systems and therefore, lead them to be more vulnerable once the hurricane hits?

Therefore, people who had not experienced the hurricane (but had consumed a lot of weather forecast media) showed the same negative symptoms of psychological distress and/or post-traumatic stress symptoms as those who had been in the eye of the hurricane.

To answer this question, researchers started a study several months before Hurricane Irma hit the coasts of Florida. Indeed, meteorologists knew the hurricane would strike in a few weeks. In its initial stages, Irma was a category 5 hurricane until it dropped to a category 3 when it hit the coasts of Florida on September 10<sup>th</sup>, 2017. The hurricane killed 52 people in the United States and 42 in the Caribbean, as well as causing over 50 billion dollars’ worth of damage.

Well before the hurricane struck, weather forecast channels were operating 24/7. When analyzed by researchers, these channels provided highly sensationalist media coverage, announcing “the worst disaster in history” and “a complete destruction of the coastlines”. Some channels even showcased weather reports struggling to stay upright with the strong winds and provided virtual reality video montages showing how it would feel for a human to go head-to-head with the hurricane.





Interestingly, in the days before the hurricane was anticipated to hit the coasts of Florida, its direction changed completely. This sudden change in direction gave researchers an incredible opportunity; in other words, they could study the impact of weather forecasts on people who had previously been in the eye of the hurricane's path (and who had been anticipating it for days when listening to media channels) and those who were not in the eye of the hurricane (but who were nonetheless anticipating the hurricane's arrival by listening to media channels).

Two days before the hurricane hit (September 8<sup>th</sup>, 2017), researchers sent a questionnaire to 2873 people living on the Florida coastlines. The questionnaire asked various questions related to the upcoming hurricane (e.g., did they think they would have to evacuate their home or how they thought they would react to the hurricane). One month after the hurricane, the researchers sent out the same questionnaire to the same individuals, although they added questions to find out whether these individuals were (or not) in the eye of the hurricane and how much weather forecast media sources they had consumed before, during, and after the hurricane. They also measured psychological distress and post-traumatic stress symptoms.

The results showed that the more weather forecast media the participants had listened to before and during the hurricane, the greater their likelihood of experiencing psychological distress and/or post-traumatic stress symptoms after the hurricane. However, the most intriguing part of this study was that the effect remained, even if people had *not*

been in the eye of the hurricane. Therefore, people who had not experienced the hurricane (but had consumed a lot of weather forecast media) showed the same negative symptoms of psychological distress and/or post-traumatic stress symptoms as those who had been in the eye of the hurricane. Finally, the results showed that the more anxious people were before the arrival of Hurricane Irma, the more likely they were to listen to weather forecasts on repeat.

## Conclusion

Based on these results, researchers suggest that a discussion needs to take place to ensure that alarmist weather forecasts do not create pre-disaster stress that could increase the effects of the weather event on mental health.

For some time now, we have seen the emergence of a term called ecoanxiety (which is an anxiety linked to climate change; see the article by Dr. Catherine Raymond on the subject in this issue of the Mammoth Magazine). Some researchers have even begun to suggest that this form of anxiety may be partly rooted in exposure to media.

In conclusion, the results of this study suggest that although weather forecast channels claim to not have an impact on people, current research shows that the sensationalism of weather forecasts can have an impact, particularly on naturally anxious people.

Stay tuned! 🐾



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## Eco-anxiety: A better understanding of our climate distress

Catherine Raymond, Ph.D., postdoctoral fellow, University of Quebec in Montreal

One evening after a long day at work, Daphne slumps down on her sofa to browse her social media. Between the snapshots of her friends and news from her family, a striking image catches her eye: forest fires ravaging a once lush landscape, under a deep red sky. The accompanying headline is equally alarming “Will our planet soon be reduced to ashes?”. Faced with this content that is far more disturbing than anything she could have imagined; she felt a sharp pain in her stomach. She felt oppressed as if an immense weight was pressing down on her chest. Even when trying to focus on something else, the image continued to torment her and kept her up at night. In an era when climate change is an undeniable reality, a term has been coined to define the anxiety that many of us feel about the alarming state of our planet: eco-anxiety.

Eco-anxiety refers to the fear and worry felt by individuals in the face of current and future environmental threats, particularly those associated with climate change. Unlike traditional anxiety disorders, eco-anxiety is a psychological response to a real and objective environmental threat. It is often accompanied by feelings of helplessness, fear for the

future, and sadness for the environmental losses already suffered.

### Normal or pathological?

As of now, eco-anxiety is not recognized as a clinical diagnosis by the DSM-V (Diagnostic and Statistical Manual of Mental Disorders, fifth edition), which is the main reference for classifying mental disorders. In fact, for some, this anxiety is a perfectly normal reaction to the current situation. It may even encourage some to adopt more environmentally friendly behaviours. So, it's not necessarily a sign of a mental health problem. However, for others, eco-anxiety can be so intense that it disrupts their functioning and causes distress that is hard to control. In these cases, it can be similar to an anxiety disorder. If eco-anxiety reaches a level that compromises the quality of daily life, it is essential to seek out support or learn how to manage it.

### Why is eco-anxiety a hot topic?

With the omnipresent media coverage of natural disasters, alarming scientific reports, and climate protests, the environment is at the centre of our collective attention. This combined



(or not) hypervisibility with personal experiences of extreme weather events can make environmental threats more anxiety-provoking for some... but not for all! Clinicians and researchers have identified certain vulnerability markers that may increase the risk of experiencing eco-anxiety.

### The risk factors for eco-anxiety

The risk factors associated with eco-anxiety largely correspond to those of “traditional” anxiety. For example, studies suggest that women are more likely to be affected, although further research is needed to support this hypothesis. As with traditional anxiety, adolescence seems to be a favourable period for the experience of eco-anxiety. Several reasons could explain this tendency among youth:

1. Adolescents are massive consumers of social media. This use frequently exposes them to alarmist content about climate change and is content that does not always benefit from the journalistic rigour of traditional media sources.
2. The developing brain is more sensitive to long-term stress.
3. Adolescence is a decisive stage in the construction of individual identity, rendering young people particularly receptive to questions about their future in an era of climate disruption. With this perspective, some adolescents may feel that the fate of the Earth is in their hands.

### Managing eco-anxiety: Proactive measures

Although distressing, eco-anxiety can be transformed into a motivating force for change and to individuals taking responsibility. Here are some practical ways to deal with this growing anxiety and to use it constructively:

**Active engagement.** A significant source of anxiety can come from the feeling of not having any control over climate change, which can intensify eco-anxiety. Therefore, getting actively involved in the fight can be beneficial.

- **Local initiatives:** Get involved in neighbourhood projects such as community gardens, recycling programs, and environmental awareness workshops.
- **Activism:** Join climate marches, sign petitions, or join activist groups to put pressure on political and economic decision-makers.

- **Consuming responsibly:** Adopting environmentally friendly daily habits, such as reducing your meat consumption, buying locally, or opting for green modes of transport.



In fact, for some, this anxiety is a perfectly normal reaction to the current situation. It may even encourage some to adopt more environmentally friendly behaviours. So, it's not necessarily a sign of a mental health problem. However, for others, eco-anxiety can be so intense that it disrupts their functioning and causes distress that is hard to control.



### Education and Information

Misinformation or lack of knowledge about real climate issues can exacerbate eco-anxiety. Therefore, getting the right information is a crucial step towards taking appropriate action.

- **Reliable information sources:** Consult scientific sources and recognized experts for a balanced view of climate issues. Avoid sensationalist sources that can exacerbate anxiety.
- **Training and workshops:** Attend conferences, webinars, and workshops that offer up-to-date information and concrete solutions.

### Well-being and personal resilience

Managing eco-anxiety also involves taking care of your own mental and emotional health.

- **Meditation and mindfulness:** These practices can help anchor your emotions and keep you centred when faced with challenges.
- **Go to therapy:** Consider cognitive-behavioural therapy, which is effective in managing anxiety disorders.
- **Support groups:** Join groups or discussion forums dedicated to eco-anxiety to share your concerns and benefit from the experiences of others.



### Conclusion

Eco-anxiety is far from being a modern-day buzzword. It reflects a genuine concern shared by a growing number of people in the face of the global climate crisis. When properly managed, this feeling can become a powerful driver for change and proactive action. By combining objective information, personal commitment, and well-being resources, we can transform this anxiety into momentum for ourselves and our planet. As with all forms of anxiety, eco-anxiety can remind us of our responsibility, but also of our potential to innovate, change, and hope. At the heart of this anxiety is also a profound opportunity to join forces to build a more sustainable future for all generations to come. 🐾

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# The absolute stress of natural disasters

Robert-Paul Juster, Ph.D.

Disasters like environmental crises, pandemics, or wars can cause us absolute stress. **Absolute stressors** impact everyone exposed to them and differ from relative stressors, which tend to impact everyone a little differently. Everyone's life is in danger with absolute stressors, such as disasters. Attention: these events are happening more often and could worsen in the future! In 2020 alone, the United States experienced the highest number of environmental disasters in history: 22 in total, costing billions of dollars. In 2021, there were an additional 20 of these disasters. That was just before North America and Europe were struck by major storms, floods, and wildfires in 2021. Globally, natural disasters related to climate change have doubled over the last decade. These disasters have contributed to 1.23 million deaths, over 4 billion people being impacted in some way, and at a cost of about 3,000 billion US dollars. While we are learning to better prepare for future disasters, these events are absolute stressors that can lead to both mental and physical health problems or even the worsening of pre-existing conditions.

Disasters can cause chronic stress that changes how our brains and bodies function. This chronic stress in and of itself is perhaps the most pervasive, pernicious, and persistent adverse health impact of disasters. The **allostatic load model** of chronic stress can help us understand how disasters affect our health. It's a way to

measure the damage these events can cause, both in the short and long term, on the brain and body. Scientists are looking at different ways to use this model to predict and maybe even prevent some of the health issues caused by disasters. At the very minimum, it is important to have people talking and thinking about this global problem to better plan for the future and to keep an eye on people's health and well-being during and after disasters. When we don't have a clear idea of how disasters affect the mental and physical health of people nearby, it leads to a big misunderstanding. People don't realize how much disasters can harm health and local economies, and what's needed to prepare for and deal with disasters.

People have been dealing with disasters for ages, and how we handle them has affected how we've grown and developed as civilizations and societies. But even though disasters have been around for a long time, the science of managing and responding to them is relatively new. Despite the known link between stress and disasters, there hasn't been much research using specific ways to measure physical stress in studies about health after disasters, such as allostatic load.

The Godfather of the allostatic load model, Bruce McEwen, highlighted that when unpredictable events like storms, disease outbreaks, human-caused disturbances, and tense social interactions pile up, it can seriously increase allostatic load.



When this happens, it becomes **allostatic overload**, which makes a person even more likely to get sick and die. McEwen and Tucker suggested that allostatic load could help assess the risks that are associated with harmful disasters. It is also important to consider that some groups of people are also more at risk when disasters happen. Of note, the following groups are more vulnerable during disasters: those who've experienced past traumatic events, women, children, older adults, minorities, and people who are less fortunate or have lower social status.

Experts working on disasters suggest including allostatic load and ways of measuring chronic stress as part of disaster preparation and intervention plans. Given the reality of climate change and the very high probability of other disasters occurring in the future, researchers believe that studies should focus on how disasters affect people's health. They propose that significant attention should be paid to stress and allostatic load in future health studies

during disasters, as well as to look at allostatic load before, during, and after disasters strike.

How exactly would this work? First, regional health systems could create emergency-response teams to quickly find people, gather information, and offer immediate help after a disaster. To do so, we would need a group of trained responders, set plans for collecting data, and supplies ready to go the moment a disaster occurs. It's also crucial to have identified places and tools for medical checks, approvals to speed up research ethics reviews, and to make sure these teams are part of local emergency plans and have permanent support. The biggest problem with preparing and making this all happen is the reality that political climates can change as quickly as the weather. Indeed, the government can deliberately mislead the nation about the importance of climate change and the risk of disasters. For example, the Trump-Pence presidency immediately worked to dismantle the Environmental Protection Agency, an organization dedicated to understanding disasters, pollution, and researching climate change.



**The allostatic load model of chronic stress can help us understand how disasters affect our health. It's a way to measure the damage these events can cause, both in the short and long term, on the brain and body.**



Another example is the COVID-19 pandemic which has given us a unique chance to see how similar stressful situations (e.g., the pandemic itself) impact people all around the world, each facing different political, social, and economic situations. The pandemic's stress affected people most visibly in their mental and emotional well-being. Now, it's crucial to deal with the health and well-being impacts not only from environmental disasters but also the long-lasting effects of COVID-19 and the changing environment worldwide. This means we need a more comprehensive approach to managing health issues while recognizing the impact of chronic stress on health and by including groups that were previously left out.

We also need to better understand the long-term effects of disasters. To do so, we need better health tracking/follow-up systems using longitudinal studies that are representative of the entire population. We also need to measure both mental and physical stress to predict how it might affect health and well-being before, during, and after disasters strike. By teaming up with health experts and community leaders, we can use stress measures to find who might need more support,

**This means we need a more comprehensive approach to managing health issues while recognizing the impact of chronic stress on health and by including groups that were previously left out.**

what situations might cause extra stress in their communities, and how to help reduce chronic stress and health problems. In closing, it is our hope that the science of stress can help inform societies about the very real effects disasters have on health and well-being for years to come. 🙏



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## A real force of nature

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More than 54% of the world's population currently lives in urban areas, where this percentage could rise to 66% by 2050. Canada is no exception, with almost three out of four Canadians living in large urban centres. According to some researchers, this growing urbanization is depriving us of an important element for our health: contact with nature.

Exposure to nature involves observing or interacting with an environment made up of natural elements such as plants, minerals, or flowing water. This exposure stimulates many of our senses (including sight, smell, and touch) and can occur through direct (when we go for a walk in the forest) or indirect exposure (when we look out at nature through a window). These contacts with nature have beneficial effects on our physical and mental health. Of note, it has been described that nature can help reduce psychological symptoms linked to stress and anxiety.

It has largely been Japanese researchers who have explored the effects of direct exposure to nature on mental health by studying a traditional practice called “forest bathing” or “Shinrin-yoku”.

“Shinrin-yoku” involves soaking up the forest environment by walking, observing, listening, and breathing. Through questionnaires, the researchers showed that the practice of “Shinrin-yoku” led to a reduction of stress and symptoms of depression and anxiety. It has also been shown that this practice reduces the physiological manifestations of stress. When we are exposed to events that we perceive as threatening and in which we feel stress, our body triggers a cascade of physiological reactions. First, our sympathetic nervous system activates the sympathetic-adreno-medullar (SAM) axis which produces adrenaline and noradrenaline. Among others, these hormones increase blood pressure, breathing, and sweating which allow the body to face the threat. Second, the hypothalamic-pituitary-adrenal (HPA) axis produces cortisol, a hormone that allows us to mobilize energy for sustained effort. A dysregulation of cortisol secretion can have harmful consequences on physical and mental health.

By studying these systems, the researchers showed the beneficial effects of the practice of “Shinrin-yoku” on the physiological manifestations of stress.



Indeed, it reduces the activity of the SAM and HPA axes, as participants who were exposed to this practice had lower blood pressure, heart rate, and cortisol levels compared to participants who did not benefit from this practice. “Shinrin-yoku” also promoted the activity of the parasympathetic system, which is associated with calmness and rest.

If you live far away from a forest and it is difficult to find time to enjoy nature, there is no need to panic!

We can also enjoy green spaces in the city! Spanish researchers have tested the 3-30-300 green space rule, according to which every citizen should be able to see at least three (decent-sized) trees from their home, have 30% of their neighbourhood populated by trees, and live no more than 300 metres from a park or green space.

The researchers paired the scores from the 3-30-300 rule with variables linked to mental health in 3,145 participants. They showed that the more the 3-30-300 rule was respected, the fewer the participants visited a psychiatrist or psychologist in the last 12 months. Other studies have also shown an association between the percentage of green spaces in a residential area and cortisol secretion. The greater the number of green spaces in a

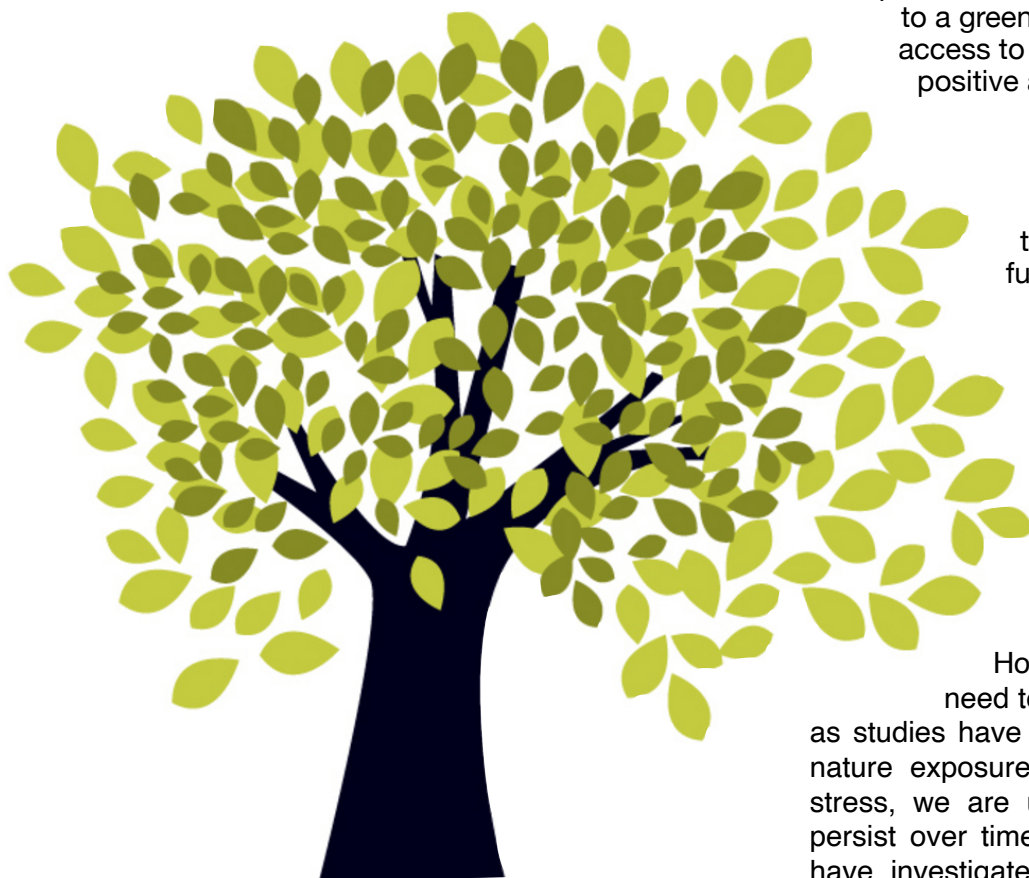
In fact, laboratory studies suggest that simply observing images or videos depicting environments with trees was not only able to reduce perceived stress but also the activity of the SAM and HPA axes, as measured by skin perspiration and cortisol levels, respectively.

neighbourhood, the more normal cortisol secretion was during the day (i.e., cortisol levels were higher in the morning and lower at the end of the day, as typically observed in healthy individuals).

In the workplace, studies have also shown the importance of having visual and physical access to a green space. Women and men who had access to a green space at work had a more positive attitude and the men also reported less perceived stress.

Given the benefits of nature, some researchers are trying to evaluate the possibility of integrating it more fully into psychological interventions aimed at treating mental health disorders. Researchers are currently evaluating whether watching three-dimensional nature videos following therapy sessions could induce relaxation in people living with post-traumatic stress disorder and thus, increase therapy success rates.

However, as with all research, we need to consider certain limitations. First, as studies have explored the short-term effects of nature exposure on subjective and physiological stress, we are unsure if these beneficial effects persist over time. In addition, for the studies that have investigated the beneficial effects of direct exposure to nature (as with “forest bathing” or with






visits to parks or green spaces), it is difficult to distinguish the actual effects of exposure to nature from those due to physical activity (e.g., walking, the other beneficial effects that were discussed in the 21<sup>st</sup> issue of the Mammoth Magazine). Nature walks also encourage social contact, which also has beneficial effects on mental health.

An individual's relationship with nature can also differ greatly according to many factors, including personality and culture. For example, a person who defines themselves as being connected with nature will be more receptive to the benefits of nature. For culture, the benefits of "forest bathing" have been demonstrated mainly in Japan, where the culture is in tune with the curative effects of nature. What about Quebec? Would these "forest baths" be just as beneficial in our culture?

Nature is a true force with which we should perhaps connect more in our day-to-day to feel more fulfilled and ready to face any threats we may encounter along the way. After all, isn't having extraordinary

resilience in the face of all odds the real force of nature?

If you would like to find out more, we recommend you visit the report of the SEPAQ (in French), which is available [here](#). 

Other studies have also shown an association between the percentage of green spaces in a residential area and cortisol secretion. The greater the number of green spaces in a neighbourhood, the more normal cortisol secretion was during the day (i.e., cortisol levels were higher in the morning and lower at the end of the day, as typically observed in healthy individuals).



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## NEXT ISSUE OF THE MAMMOTH MAGAZINE



### Stress and Resilience Among LGBTQIAS+ Communities

Despite progress and increasing celebration of diversity in Canada, lesbian, gay, bisexual, transgender, queer, intersex, asexual, and two-spirit (LGBTQIAS+) people still experience significant stigma, stress, and strain. In our next issue, we will explore how stigma ‘can get under the skin and skull’ of sexual and gender diverse people and the ways in which they demonstrate community resilience and coping in the face of adversity.

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