

## New tools for visual engagement: What the research tells us

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Climate Outreach

12:30pm ET, Thurs., Sept 29, 2022

# Visualizing Climate Change with AI

Erick Lachapelle, Thomas  
Bergeron, Victor Schmidt, Alex  
Hernandez-Garcia & Yoshua  
Bengio

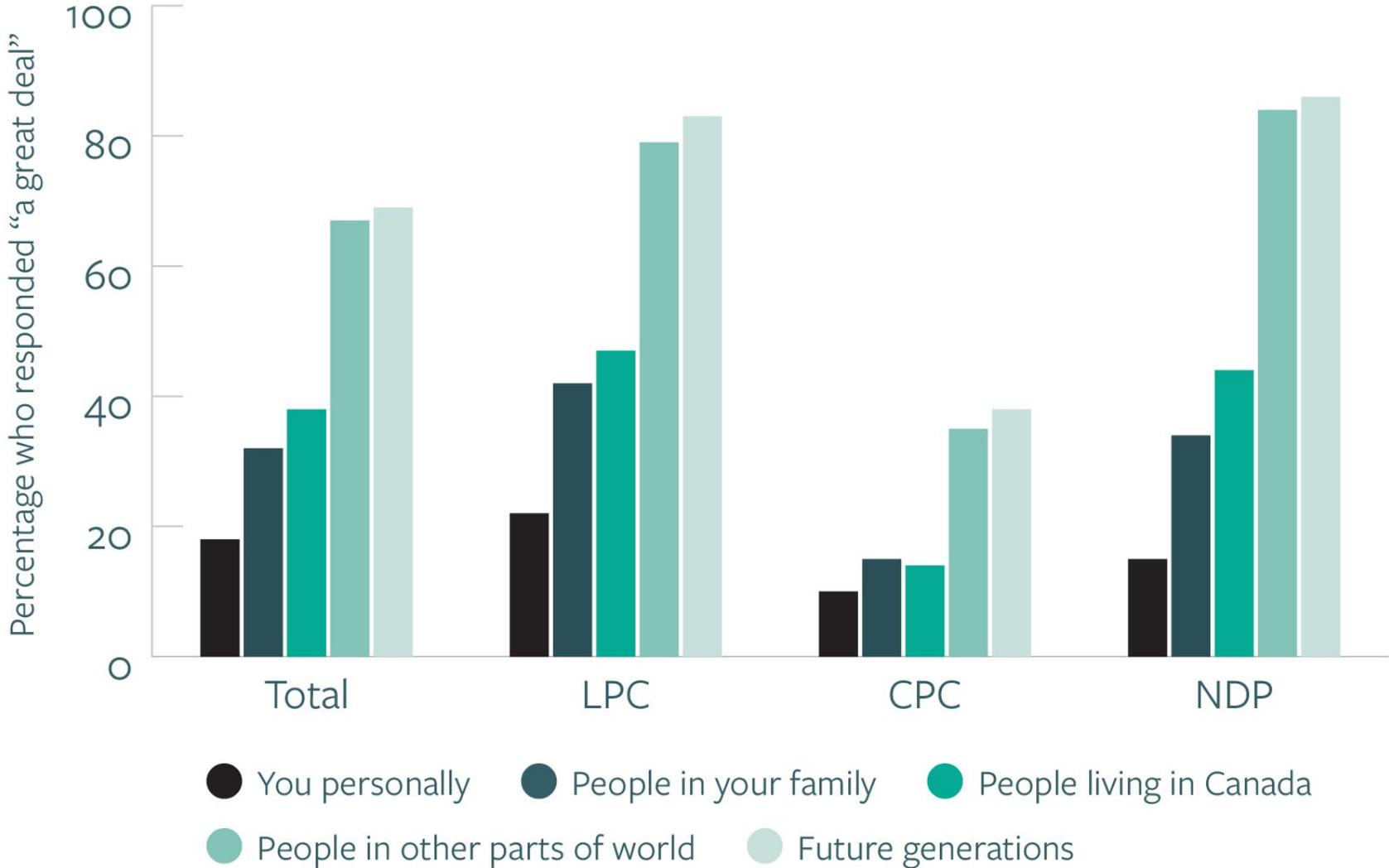
# The plan

- A psychologically distant problem
- A *brief* review of tips and tools to *proximize* climate change
- Deeper dive into new tool to visualize the (hypothetical) impacts of climate change where people live
- Some implications for climate change communication (and your work)

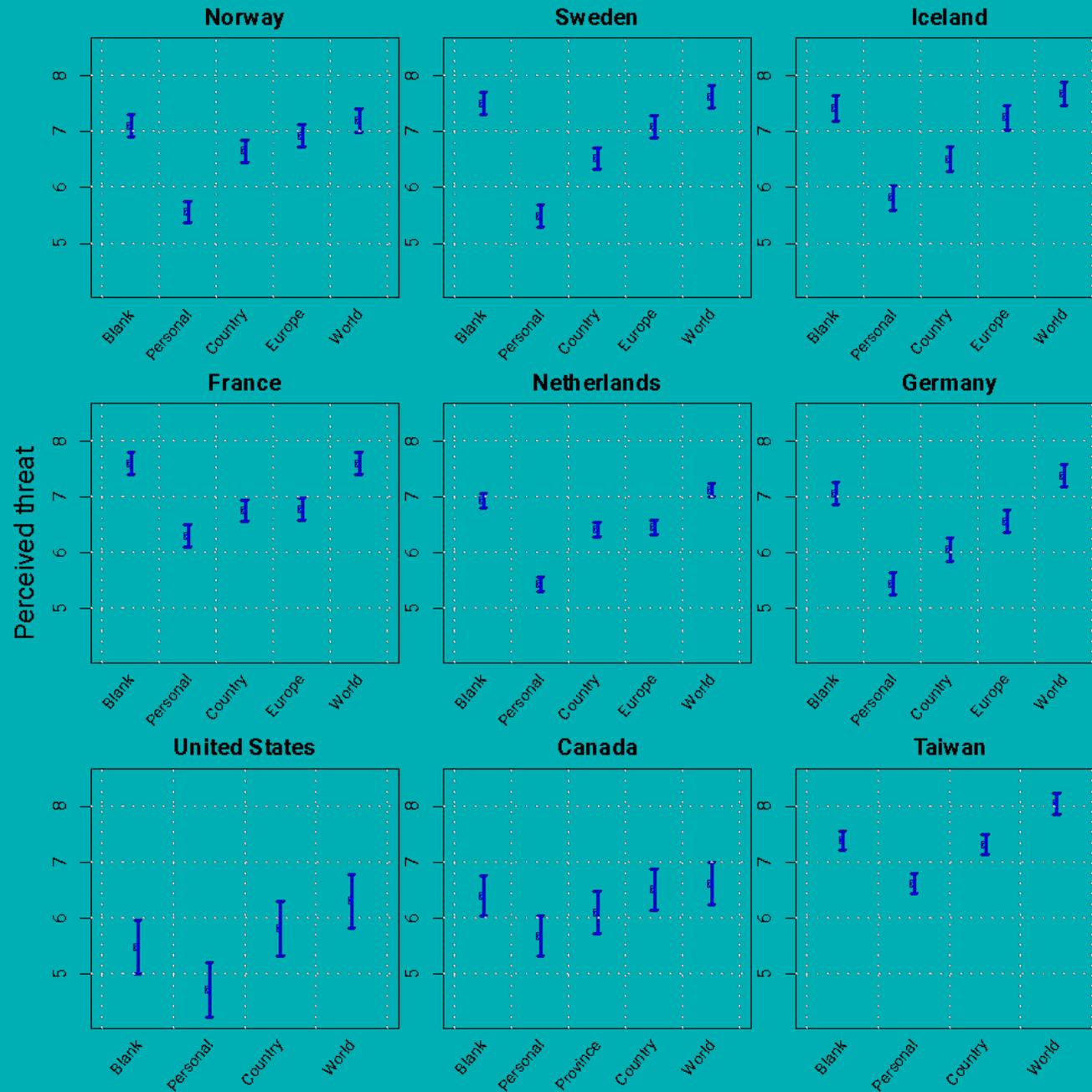
# A psychologically distant threat



How much do you think climate change will harm...

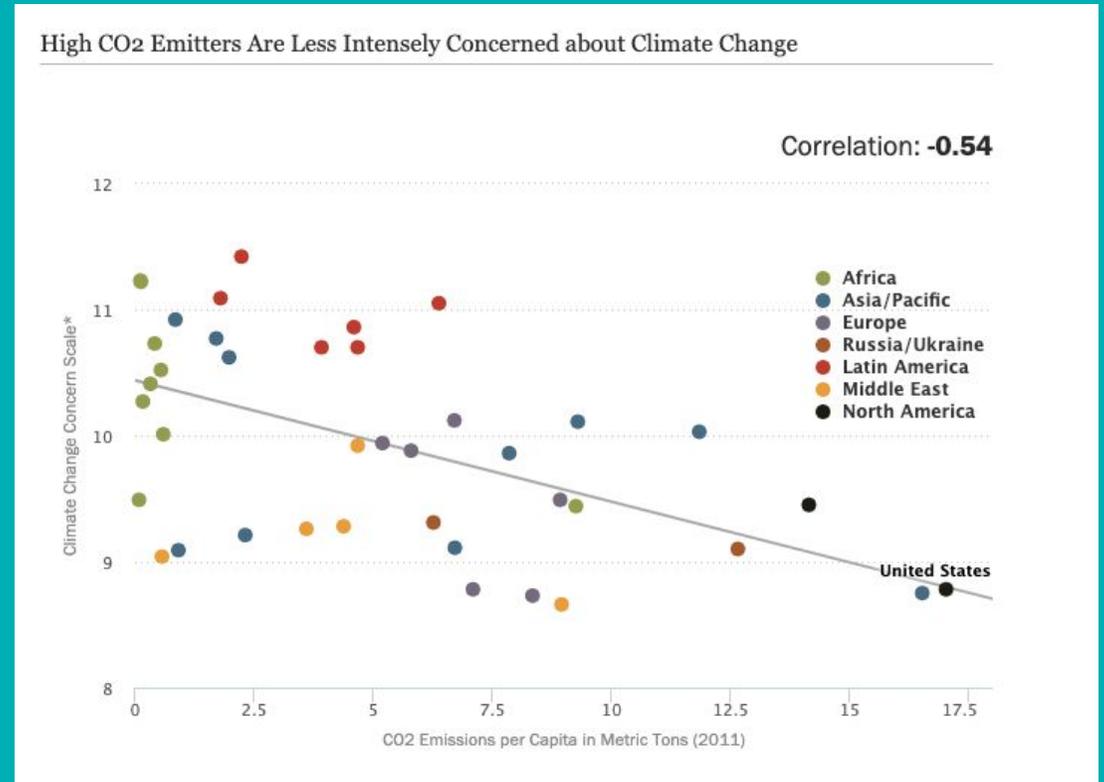


# Experimental evidence from Tvinnereim et al. 2020



# Why is climate change so distant?

- Complex issue, invisible causes, unintended consequences many individual actions, temporal lags, creeping nature of impacts make it largely invisible and abstract
- Potential system justification bias, solution aversion and cognitive dissonance – people are motivated to ignore the problem
- Creates a lack of concern over climate change, especially in developed countries most responsible



# *Proximizing* climate change

- The problem: Despite current and projected impacts, climate change risks not perceived as salient, instead affecting distant populations and future generations as opposed to individuals themselves
- How can we communicate climate change in ways that make the issue personally relevant?
- Scholars and practitioners advocate connecting climate change to things people care about in their everyday lives
  - Jobs, clean air, health, equality/justice, security, local / iconic places
- Increasing calls to proximize climate change
  - Make it concrete, personal, and urgent (Moser, 2011)
  - Emphasize climate change as a present, local and personal risk (van der Linden et al. 2015)
  - Facilitate more experiential, vicarious engagement that connects to people's emotions (Weber, 2006)

# How to make climate change more concrete

- Two potential paths
  - Learning from personal experience (Broomell et al., 2015)
    - Too late!
  - Vicarious learning (Shepphard 2005; Leiserowitz, 2004)
    - Learning from other's experience or simulations promotes holistic, intuitive, affective response
- Growing interest in visual communication of climate change causes, impacts and solutions
  - (Non)Fiction and film (*Inconvenient Truth*, *Day After Tomorrow*)
  - Climate Visuals Project (UK)
  - Climate Central's "Surging Seas" initiative
  - NOAA's Sea level Rise and Coastal Flooding Viewer

# What do we know about visual communication? (1/2)

- Mixed effects of impact images
- Images of climate change impacts more effective than causes and solutions at raising issue salience...
  - ...But, decrease feelings of efficacy
  - ...and vice versa (Chapman et al., 2016; O'Neil and Nicholson-Cole, 2009)
- Local images of climate change impacts increase salience...
  - ...But, dissonance with respect to severity of impacts (Spence and Pidgeon, 2010)



Generic image of flood in USA – Chapman et al. 2016

# What do we know 2/2

## Local is not always better

Local is not always better

At the extreme, some studies find personalizing climate risk impacts can decrease risk concerns among people who believe in climate change

- Suggests believers already perceive some risk, but when treated with objective, personalized information on risk exposure, downgrade these risk perceptions.

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ELSEVIER

Check for updates

### Personalized risk messaging can reduce climate concerns

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**ABSTRACT**

One potential barrier to climate policy action is that individuals view climate change as a problem for people in other parts of the world or for future generations. As some scholars argue, risk messaging strategies that make climate change personally relevant may help overcome this barrier. In this article, we report a large-n survey experiment on San Francisco Bay Area residents to investigate how providing spatially-resolved risk information to individuals shapes their climate risk perceptions in the context of sea-level rise. Our results suggest that personalized risk messaging can sometimes reduce concern about sea-level rise. These experimental effects are limited to respondents who believe that climate change is happening. Further, we do not find an effect of providing local risk messages on an individual's willingness to pay for regional climate adaptation measures. Our results emphasize that local messaging strategies around sea-level rise risks may not have the clear impacts that some advocates and scholars presume.

**1. Introduction**

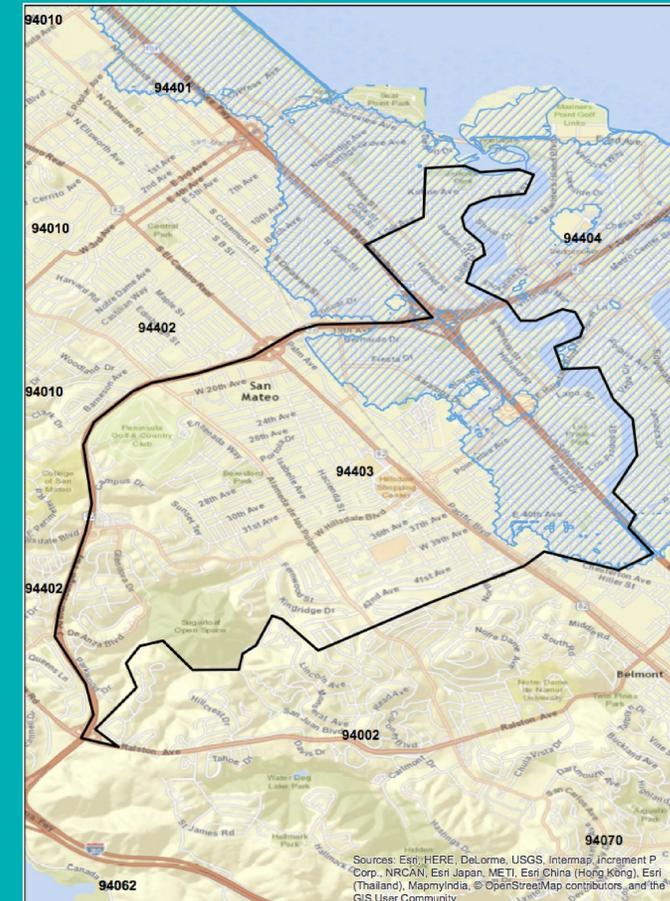
The climate crisis continues to intensify despite growing scientific certainty and capacity to forecast climate risks. Sea-level rise, which is the substantive focus of this paper, provides an illustrative example. The causal processes linking global climate change to sea-level rise are well accepted (IPCC, 2013; Warrick and Oestermann, 1998; Church and White, 2006), and many coastal regions across the world are already experiencing increased flooding during high tides and storm events (Sweet, 2014). Concurrently, bio-physical models have been developed to provide spatially-resolved predictions of coastal flooding from sea-level rise under different climate change and storm scenarios (Barnard et al., 2014; Smith et al., 2010). These models suggest that sea-level rise and associated flooding will result in severe economic, social, and environmental damages (Hinkel et al., 2014) and potentially displace millions of people (Hauer et al., 2016; Meehl et al., 2005; Strauss et al., 2015).

Despite current and predicted impacts, climate change risks such as sea-level rise are often not salient to the public. Instead, many individuals in the global North view climate change as an issue that threatens distant populations and future generations, not their own communities (Leiserowitz, 2006; Lorenzoni et al., 2007; O'Neill and Nicholson-Cole, 2009; Leviston et al., 2014). These citizen risk perceptions are important for issues like sea-level rise, where adaptation may require individual behavior change as well as support for adaptation policies (Lubell, 2017).

One potential strategy to increase the salience of climate risks is to make these risks more personally relevant for individuals (Rayner and Malone, 1997; Weber, 2006; Lorenzoni and Pidgeon, 2006; Lorenzoni et al., 2007; Spence et al., 2012; Scannell and Gifford, 2013). For instance, risk messaging that emphasizes local and concrete climate impacts (e.g., how changes in temperature, precipitation, extreme events, or sea levels will affect a specific individual or community) could potentially increase support for necessary climate risk mitigation. This potential is underscored by research showing how personal experiences with climate-related impacts can change household behaviors and increase support for climate adaptation (Spence et al., 2011).

Yet, despite the ubiquity of this idea in climate advocacy debates, empirical evaluations of “personalized” risk communication strategies have yielded mixed results (Ghwon et al., 2008; Spence and Pidgeon, 2010; Spence et al., 2012; Scannell and Gifford, 2013; Brugger et al., 2015a, 2016; Schoenfeld and McCauley, 2016). At the extreme, some recent research suggests such strategies can decrease individual risk concerns and undermine support for adaptation and mitigation policies

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<sup>1</sup> Thanks to Jennifer Marlon and two anonymous reviewers for comments on earlier drafts of this paper. This study was completed with funding from the National Science Foundation. (Award Abstract #1541056, CRISP Type 2; Collaborative: Multi-scale Infrastructure Interactions with Intermittent Disruptions: Coastal Flood Protection, Transportation and Governance Networks).  
<https://doi.org/10.1016/j.gloenvcha.2019.01.002>  
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Available online 25 January 2019  
0959-3780/© 2019 Elsevier Ltd. All rights reserved.



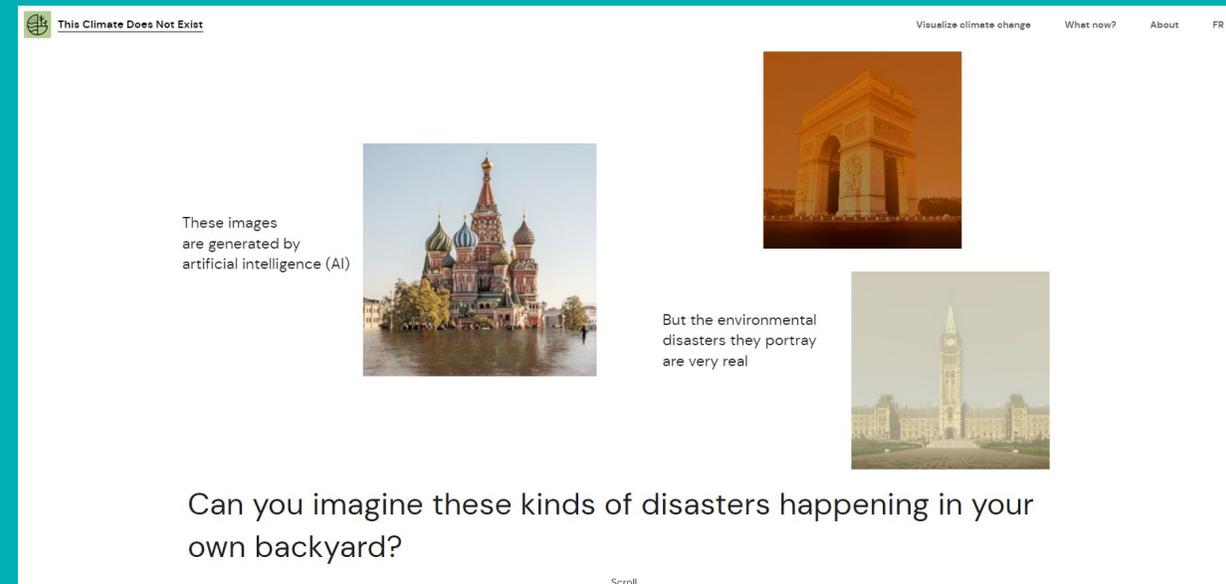
Sources: Esri; HERE; DeLorme; USGS; Intermap; iPlanet; Inramat P Corp.; NRCAN; Esri Japan; METI; Esri China (Hong Kong); Esri (Thailand); MapmyIndia; © OpenStreetMap contributors, and the GIS User Community

# Limits of existing work

- Reliance on generic (non-personalized) climate images does not necessarily speak to or engage people on an emotional level.
- Exposure to personalized, objective risk communication may be too abstract to portray climate change impacts on places people actually care about.
  - Flood risk maps are based on downscaled climate models of uncertain future impacts meaning not everyone is subject to same flood risk.
- Local framing of impacts highlights tension between
  - Salience and severity (Spence and Pidgeon 2010)
  - Risk exposure and perceived harm (Mildenberger et al. 2019)

# Can machine learning help?

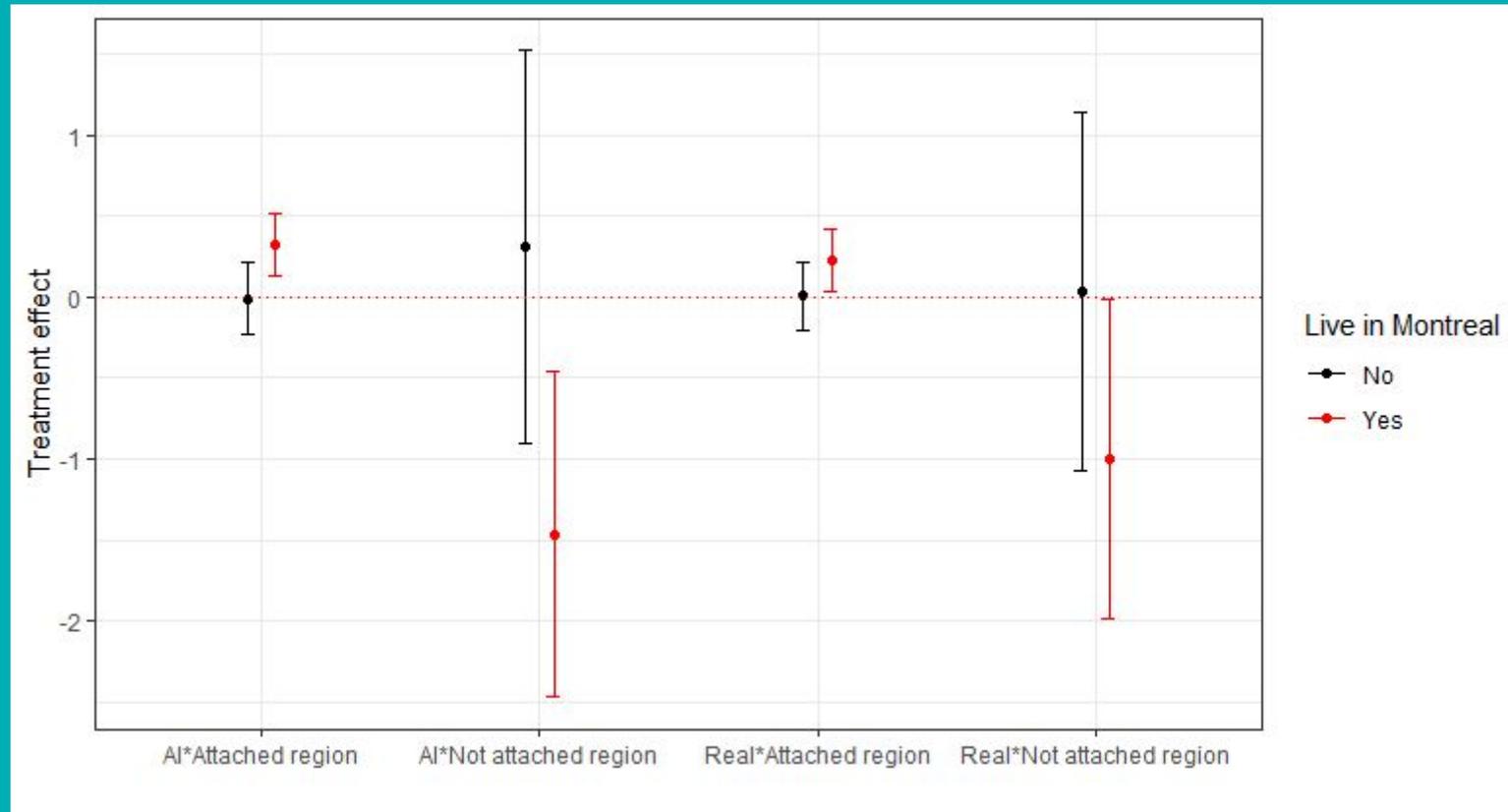
- Existing communications have a difficult time portraying the effects of climate change on specific locations people actually care about
- Colleagues at MILA developed a new website – this climate does not exist that generates personalized images that simulate impacts where people live (Schmidt et al. 2012)
  - Not an exercise in climate prediction, but encourages people to empathize with the victims of climate change
- How do people react to this kind of intervention?



# Study 1 : Do people react differently to AI?



# Result of Study 1: Similar impact of AI as real images of flood



# Study 2 : Does exposure to AI image of personalized image increase engagement?

Please take a moment to read the following carefully before proceeding.

All over the world, people are losing their homes to wildfires and being impacted by floods, as well as suffering the effects of air pollution on their health.

Perhaps you have experienced the odd heatwave or the occasional spring flood, but some of us live through these extreme weather events all too often.

On the next screen, you will be asked to provide your **current home address** so that you can visualize what climate change impacts experienced around the world could look like in your neighbourhood.

The address you provide will be **anonymized**, therefore it will be impossible to link this information to you.

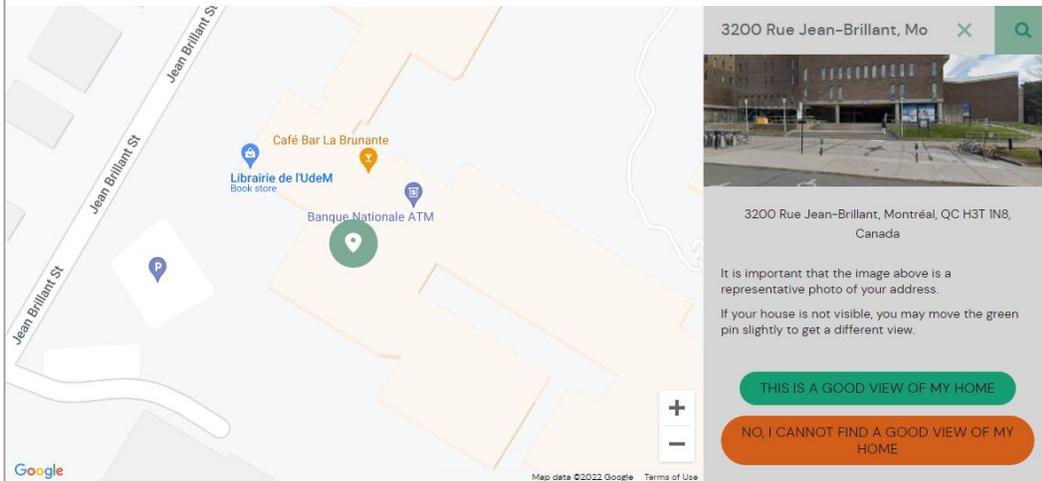
The tool is powered by **Google Maps** – the same one you may have already used in your daily life.

# Study 2 : Treatment

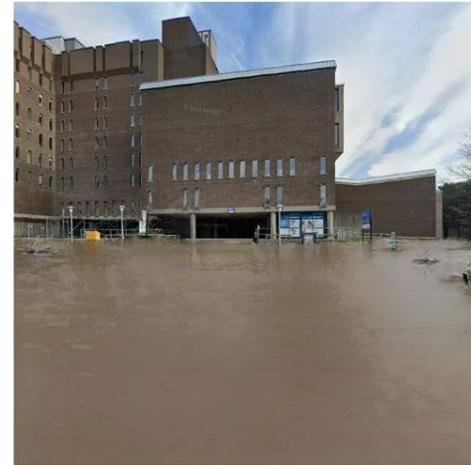
First, look up the address where you are currently living by entering it in the box below.

This tool is powered by **Google Maps** - the same one you may have already used in your daily life.

The address provided on this screen will be **anonymized** and subsequently **deleted**, therefore it will be impossible to link this information to you.



Climate change is causing extreme weather across the world, including in Canada. Here is a visualization of what climate change impacts could look like for you.



Please take a few moments to look at the image and consider the impacts of climate change. When finished, you may scroll down and click on the blue button below to complete the survey.

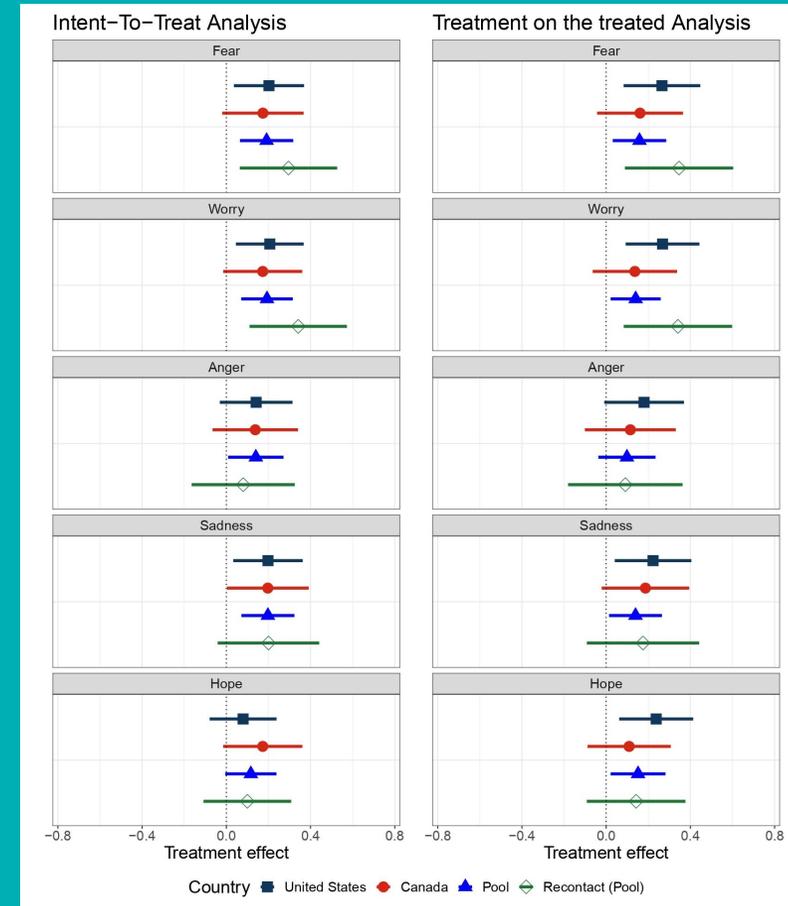
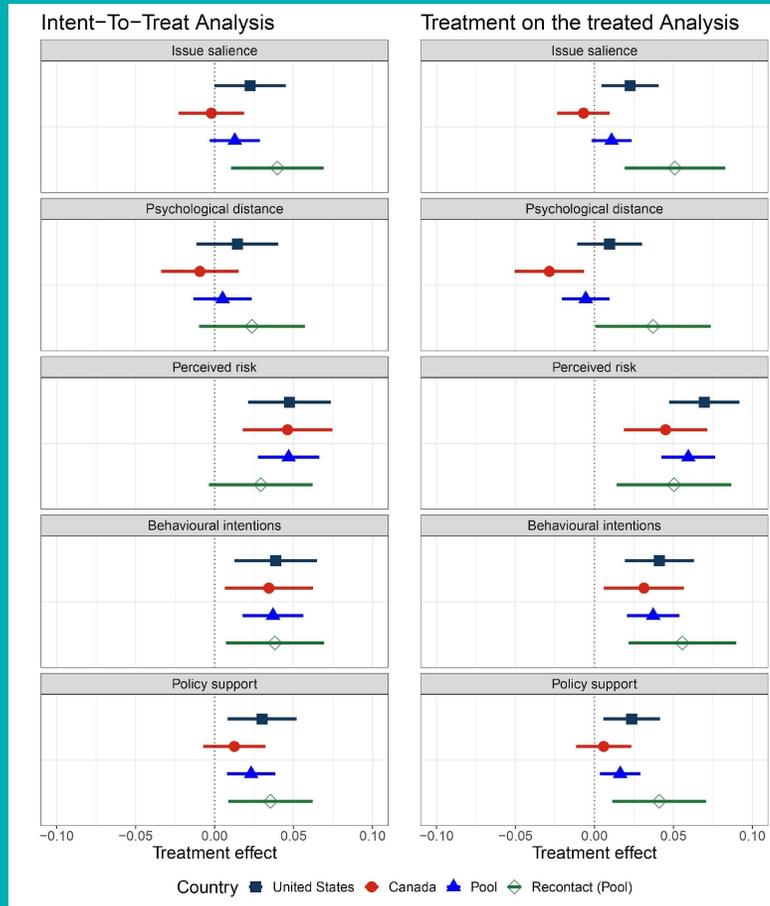
# Study 2 : Dependent variables

- Issue salience: Climate change concern; seriousness of impacts
- Psychological distance: Geographic and temporal proximity
- Perceived risk: Personal harm from climate change; flooding
- Behavioural intentions (Contact public official; Discuss climate change; Seek information on flood prevention; reducing emissions
- Policy support: Tax fossil fuels; Subsidize renewable energy; Invest in flood prevention infrastructure; Compensate flood victims
- Emotions: Worry, anger, fear, sadness, hope

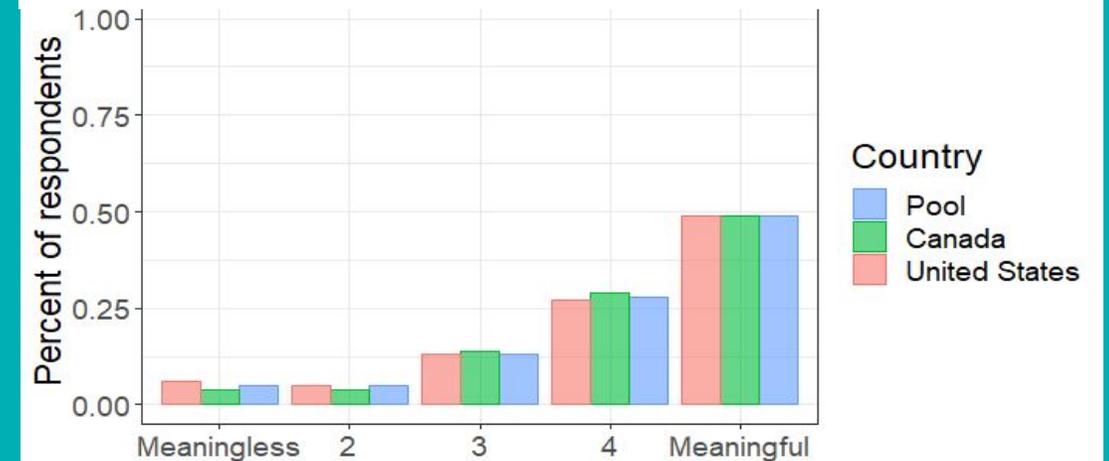
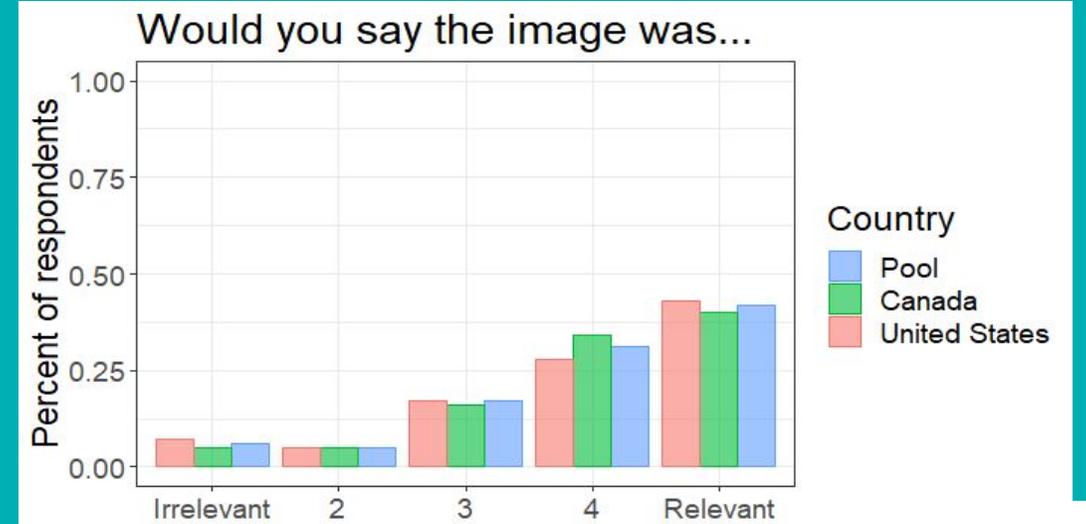
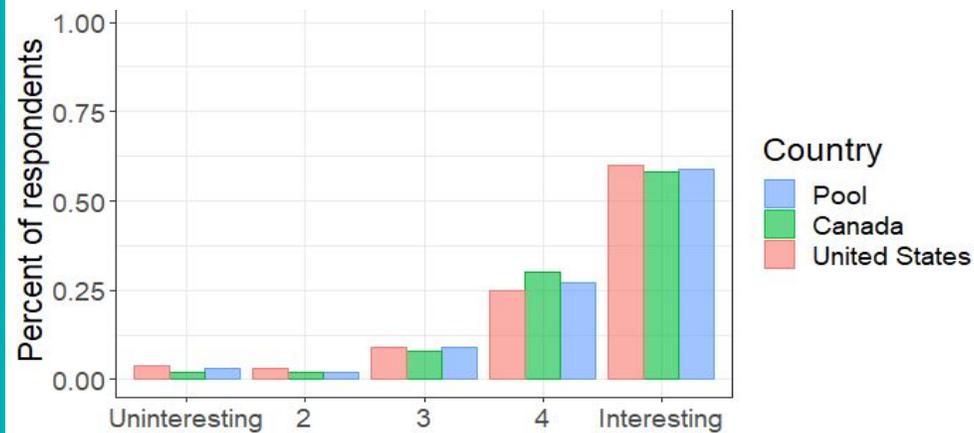
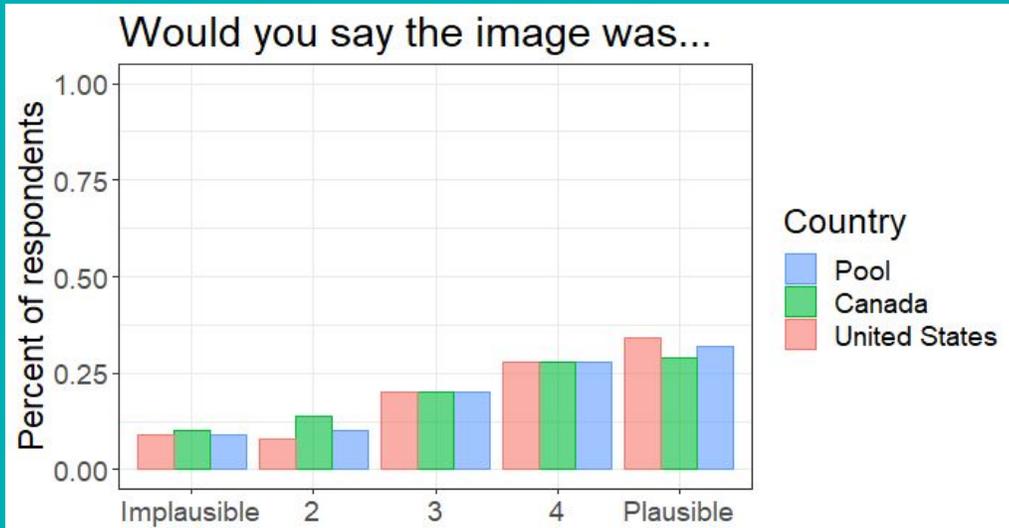
# AI and climate change?

- Exposure to highly personalized images of hypothetical climate change impacts where people live might...
  - Positively increase engagement with climate change (cognitive, affective, behavioural)
  - Backfire due to:
    - Prior negative attitude toward AI
    - Lack of credibility (not based on downscaled climatic data)
    - Be seen as alarmist, manipulative creating distance

# Study 3 : Results



# Study 3 : Results (credibility)



# Best practices in visual communication (Corner et al. 2015)

- Show real people
- Tell new stories
- Show climate causes at scale
- Climate impacts are emotionally powerful (but can be overwhelming)
- Show local (but serious) climate impacts
- Be careful with protest imagery
- Understand your audience

# Implications

→ Not an endorsement, but...

→ Tool exists (so we tested it) and can promote engagement and be of interest to communicators and foundations who support this work

→ For research

→ May help explain mixed findings in existing research (potential improvement on abstract or generic images)

→ Local framing of impacts can work – if concrete, personally relevant impacts on places people care about

→ More research on the mechanism that promote engagement (emotional engagement, empathy) as well as distancing

→ Lessons for your work

→ Engage emotions

→ Leverage experience and stories of local impacts with people's attachment to place

→ Promote empathy with victims of climate change

# Questions?

[erick.lachapelle@umontreal.ca](mailto:erick.lachapelle@umontreal.ca)

# Climate Visuals

Seven principles for visual climate change communication (based on international social research)



Chapman, DA.;  
Corner, A;  
Markowitz, E;  
Webster, R. (2016).

Climate visuals:  
[A mixed methods investigation of public perceptions of climate images in three countries](#)

Global Environmental Change 41, 172–182.



UMassAmherst



▲ A resident of Demak district in central Java makes his way through the inundated streets of his village. Photograph: Aji Styawan/Getty Images Climate Visuals Grant recipient

## Getty Images Climate Visuals photography grant winners

Narratives from 144 grant applicants in more than 40 countries provided a unique insight into the reality of climate change. About 2.4 billion people live within 100km of a coastline and almost two-thirds of cities of 5 million or more are in areas at risk of rising sea levels

| ENVIRONMENT |

## As the tide rises, an Indonesian village fights to save its dead

The cemetery in Timbulsoko, on the north coast of Java, is sinking beneath the waves. Villagers aren't ready to let it go.



## Guardian climate pledge 2019

Environment

### Fiona Shields

Fri 18 Oct 2019 08.00 BST



1,487

## Why we're rethinking the images we use for our climate journalism

Guardian picture editor Fiona Shields explains why we are going to be using fewer polar bears and more people to illustrate our coverage of the climate emergency

- Support Guardian journalism today, by making a **one-off or recurring contribution**, or **subscribing**



▲ A villager shouts for help as a wildfire approaches a house at Casas da Ribeira village in Mação, central Portugal on July 2019. Photograph: Patrícia de Melo Moreira/AFP/Getty Images



# Welcome to Climate Visuals Image Library

The world's only evidence-based climate change photography resource



BROWSE OUR COLLECTIONS

123456

Calling all photographers! We're looking for 100 photos of climate solutions and the effects of climate change. Send us your most compelling snaps that reveal the real impact. (No icebergs or polar bears, please!)



## VISUALIZING CLIMATE CHANGE

OPEN CALL FOR PHOTOGRAPHY  
ENTER NOW THROUGH JUNE 30

COUNTDOWN



ClimateVisuals

If selected, your photo will receive a \$1,000 licensing fee and be showcased at TED Countdown events and social channels. Enter now:

Do you love taking photos? Are you an aspiring or professional photographer? Help us inspire action on climate change! We're seeking 100 images that show how our changing climate is affecting communities all over the planet.



## VISUALIZING CLIMATE CHANGE

OPEN CALL FOR PHOTOGRAPHY  
ENTER NOW THROUGH JUNE 30

COUNTDOWN



ClimateVisuals

The best photos will be on display for the world to see! (Plus, a \$1,000 licensing fee and chance to make a real difference!)

Your creative eye is vital to helping us expose the reality of climate change and how it is affecting the Earth. Your photos can provide visibility for some of the most impacted communities that haven't been shared in global news headlines.



## VISUALIZING CLIMATE CHANGE

OPEN CALL FOR PHOTOGRAPHY  
ENTER NOW THROUGH JUNE 30

COUNTDOWN



ClimateVisuals

The top 100 images will be selected by an expert judging panel and will receive a \$1,000 licensing fee. Enter now:

**Ocean Visuals**  
Preview Images  
30 Items

created: 24/03/2022

0 selected

Clear selection

Select all

Change lightbox

Ocean Visuals Preview Images

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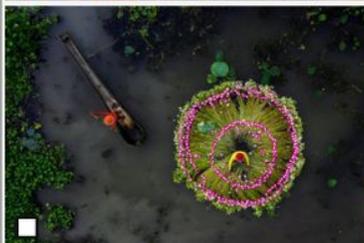
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## **Research -**

**Complete**

- Building evidence base on effective ocean-climate imagery.
- Use research and evidence to develop an ocean-climate photography brief.

## **Open Call for Photography -**

**1 - 14 September**

- Invite photographers (amateur and professional) from across the world to submit ocean-climate photos.
- Independent judges select 100 images of those submitted.
- Each are paid a licensing fee of USD\$1000.

## **Dissemination of image collection -**

**October**

- Available for non-profit organisations, media and educators on library.

An aerial photograph of a coastline with turquoise and purple diagonal stripes overlaid on the left side. The text 'OCEAN VISUALS RESEARCH REPORT 2022' is written in large, bold, white capital letters across the top half of the image.

# OCEAN VISUALS RESEARCH REPORT 2022

JULY  
2022



# 7 core principles for climate change communication



Show real people



Tell new stories



Show climate change causes at scale



Show emotionally powerful impacts



Understand your audience



Show local (but serious) impacts



Be careful with protest imagery

# Indigenous Media Presence

Climate imagery, land use and Indigenous peoples  
in Central and South America



*Photo credits:*

*Claudia Andujar, Claudia Andujar, Mara Bi, Liliana Merizalde*

*Pablo Albarenga, Yanda Twaru, João Paulo Guimarães - Casa NINJA Amazônia, Edgar Xakriabá*

*Edgar Xakriabá, Edgar Xakriabá, Morena Joachin Perez, Pablo Albarenga*



# Nature visuals: Diversity in images of England's green and natural spaces



ClimateVisuals

a Climate Outreach project

NATURAL  
ENGLAND

[Home](#) » [Blog](#)

## Getty Images partners with Climate Visuals to launch guidelines helping brands and businesses use visuals which incite change

By Toby Smith on October 7, 2020



Farmer walking through solar farm

Photo credit: Mike Harrington / Getty Images



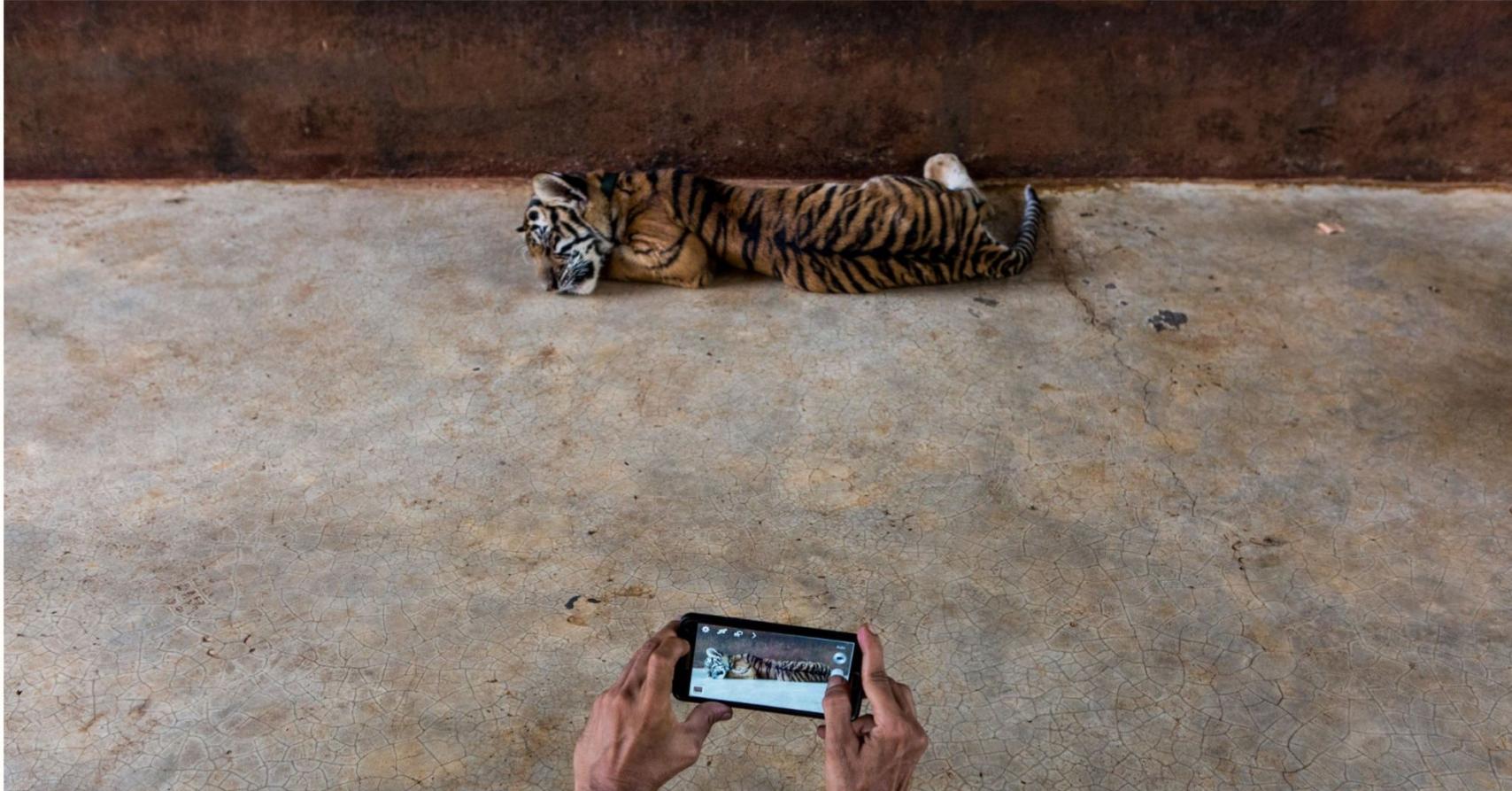
2022 PHOTO CONTEST, WORLD PRESS PHOTO STORY OF THE YEAR

## Saving Forests with Fire

STORY BY



Matthew Abbott



# Welcome to the Photography Ethics Centre

# Full Ocean Visuals Photography Brief [HERE](#)

## Show people in ocean and coastal regions with authenticity

- Always choose real images and people – never staged or manipulated photos
- Authentic images have more impact, especially with an identifiable emotion, familiar scene, geography or concept
- Depict a variety of ocean and coastal regions with novel activities
- Share stories promoting the work of specific people and communities
- Foster a real sense of place – avoid just showing a location



Photo credit: Michael Snyder

## Visualise the diversity of people-and-ocean connections

- Create diverse representation of people - not tokenism
- Avoid abstract photographs of marine life without people, their activities or relationships
- Avoid generic, distant, ocean imagery
- Show the multitude of ways that people connect with or rely on the ocean
- Showcase how people, their values, beliefs and identity are tied to the ocean



Photo credit: Hollie Fernando

## Tell new stories

- Less familiar, more thought-provoking images and narratives can remake and improve the visual representation of the environment
- Familiar, 'classic' images – such as polar bears, melting ice or plastic pollution can cause cynicism and fatigue as they are overused and stereotyped
- Focus on stories of urgency and potency with a depth of feeling and vision



Photo credit: Giacomo d'Orlando

## Find ocean and climate causes, impacts and solutions at scale

- Individual 'causes' of climate change or harm – such as eating fish – may provoke defensive reactions
- People can't always see the links between the ocean, climate change and their daily lives
- When showing 'problematic' behaviours, show subjects at scale  
e.g. a Trawler vessel, rather than a single fisher-person
- Showing positive solutions at scale conveys the potential to effectively tackle ocean and climate issues and helps overcome present day fears



Photo credit: Paul Ellis

## Pair emotionally powerful impacts with positive actions

- Climate impacts can be emotionally powerful and promote a response
- People are moved more by images of impacts – e.g. floods and destruction from extreme weather – than by ‘causes’ or ‘solutions’
- However, climate impacts – because they are so emotionally powerful – can also be overwhelming and leave people feeling hopeless
- Therefore coupling or showing images of climate impacts with a concrete and attainable positive solution for people is very effective



Photo credit: Moniruzzaman Sazal

# Ideas to invite curiosity and foster engagement

- Combine multiple stories and concepts into single images
- Show individuals, communities and businesses who are innovating and collaborating to achieve sustainability
- Clear, concise caption information can summarise the issue and will aid the viewer
- Connect people to the wonderful diversity of natural places beyond their own experiences or knowledge
- Create in-depth, long form and truly lasting content
- Develop a sense of awe and responsibility by showing the wonders of the ocean combined with relevant story and caption information.



Photo credit: Pablo Albarenga

# Prioritise ethics, safety, wellbeing and prevention of harm

- Honouring people who fight or campaign for the environment is vital but anonymity of people and places may be necessary to reduce risks
- Develop informed consent - collaborate, co-create and participate - so communities can take decisions collectively and positively
- Self-interested photography is a serious problem when working in many cultural contexts, Indigenous Territories, marginalised or vulnerable communities
- Be mindful of victimisation and respect the people you work with or photograph, ensuring you deal with everyone as your collaborator and active participant
- Strive to show utmost respect, friendship and appreciation for the support received
- Be mindful not to cause or normalise harming or disturbing wildfires or habitats

Photo credit: Tawna



# Be aware of problem narratives

- Go beyond visual cliches, overused icons and familiar underwater imagery
- Be cautious with protest imagery as the images may only resonate with people who already consider themselves activists, campaigners or environmentalists
- However, protest images clearly involving people directly affected by climate impacts, especially seeking climate justice, are seen as more authentic and therefore more compelling
- Recognise the problems of a saviour complex and avoid victim narratives
- Don't misrepresent heatwaves as 'fun in the sun'
- Be careful illustrating the ocean as 'vast and otherworldly' as it can undermine its real vulnerability and the risks of negative change



Photo credit: Jonne Roriz

# How can I encourage my audiences to participate?

You are the best person to understand how to communicate with and resonate with your audience, but here are some key messages:

- **Take individual action.** Many of us love the ocean, but we don't always know what we can do to better protect it. Participating in the open call for photography is a way to use your skill and passion to achieve better protection for the ocean and climate.
- **Tell your story.** Ocean-climate health impacts everyone, whether they live close to us or on the other side of the world, but we don't necessarily see this diversity of experience in the media or online. Participating in the open call is a chance to show how this issue impacts a community close to you.