

Climate note #4: “Massive die-offs and possible extinction: really?!?”

Thomas Lord February 9, 2019, Berkeley, CA

Why does it matter if warming is limited to 1.5°C above pre-industrial climate? If the planet warms to 2°C or above, how much worse could it be? Or at 3°C?

We would be lucky to stop at 3°C. **If all current climate pledges (including California’s) are fulfilled - and we are not on track for even that much emissions reduction - at least 3°C warming will occur.**

Here are a very few highlights from the IPCC Special Report on Global Warming of 1.5°C¹. Most of these changes will occur within a single lifespan from today.

1. At 1.5°C, global maize crop yields will likely fall by about 10%. At 2.0°C, they will fall by about 15%. At 3°C warming, where we are headed, “**Drastic reductions in maize crop globally and in Africa (*high confidence*) potential tipping point for collapse of maize crop in some regions (*low confidence*)**”.
2. **At 1.5°C: 6% of insects, 4% of vertebrates, and 8% of plants will lose *more than half* of their habitat. A warming of only 2°C will “double or triple” the number of species affected.**
3. Marine food webs are undergoing disruption that will increase as we reach 1.5°C. The risk significantly increases at 2°C. This includes impacts on fisheries. Coral reefs have a 10-30% chance of surviving at 1.5°C and will be wiped out beyond 2°C.
4. At warming of 1.5°C/2°C/3°C, the numbers of people *directly* exposed and vulnerable to existential risks (by virtue of their location):
 - water stress: 496 million / 586 million / 662 million
 - heatwaves: 1,187 million / 1,581 million / 1,707 million
 - crop yield change: 8 million / 81 million / 406 million

These deadly risks multiply. For example food and water shortages increase inter-group conflicts and mass migrations. Hundreds of millions will abruptly migrate out of low-latitude areas in some, likely, 3°C+ scenarios.

Threats to food webs are particularly noteworthy. As species become locally extinct, those that depend on those species for food and other services are threatened. For example, widely reported recent research has found extremely high recent-decades declines in the populations of flying insects in multiple locations. This has led, for example, to sharp reductions in bird and lizard populations. This “domino effect” is believed to be one of the key mechanisms of mass extinctions.

¹The *Intergovernmental Panel on Climate Change* Special Report 15 (“Climate Change of 1.5°C”), chapter 3 (“Impacts of 1.5°C of Global Warming on Natural and Human Systems”).

About this series

This is the first in a series of very short discussions of climate change, meant to be easily understood by a wide audience.

Please let me know if you spot errors, or have suggestions or questions. I will do my best to improve the notes and to issue corrections as necessary. I can be contacted at lord@basiscraft.com. Please put "climate:" at the beginning of the subject line.

Planned topics

- **Climate note #1: "The push for zero"**
The *gravity* of the situation.
- **Climate note #2: "The carbon budget"**
The *scarcity* of resources to solve the problem.
- **Climate note #3: "How soon until zero?"**
The *urgency* of successful action.
- **Climate note #4: "Mass die-offs? Extinction? Really?!?"**
The *importance* of acting.
- **Climate note #5: "Your lifestyle or your life - physical and economic limits"**
The *sacrifice* required (no sugar-coating).
- **Climate note #6: "Can't we just make our infrastructure green?"**
The *denialism* popularized by progressive politics.
- **Climate note #7: "What is to be done?"**
How to act wisely, together, in *solidarity*.
- **Climate note #8: "The genocide problem."**
Are we *monsters*?
- **Climate note #9: "Simple plans of action."**
A little *courage* is all we need to act.
- **Climate note #10: "Rejoice."**
A personal reflection.