

# Climate Change 2020: Why we are facing an emergency



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ABC News



# Canberra, Australia's Capital, January 2020



Photo: Brook Mitchell/Stringer/Getty Images



**Estimates of ~12 million ha burnt  
(Area of Colorado is around 27 million ha)**

**33 people killed**

**Bushfire smoke responsible for 417 excess deaths**

**Nearly 3,000 dwellings and other structures destroyed**

**Several villages destroyed**

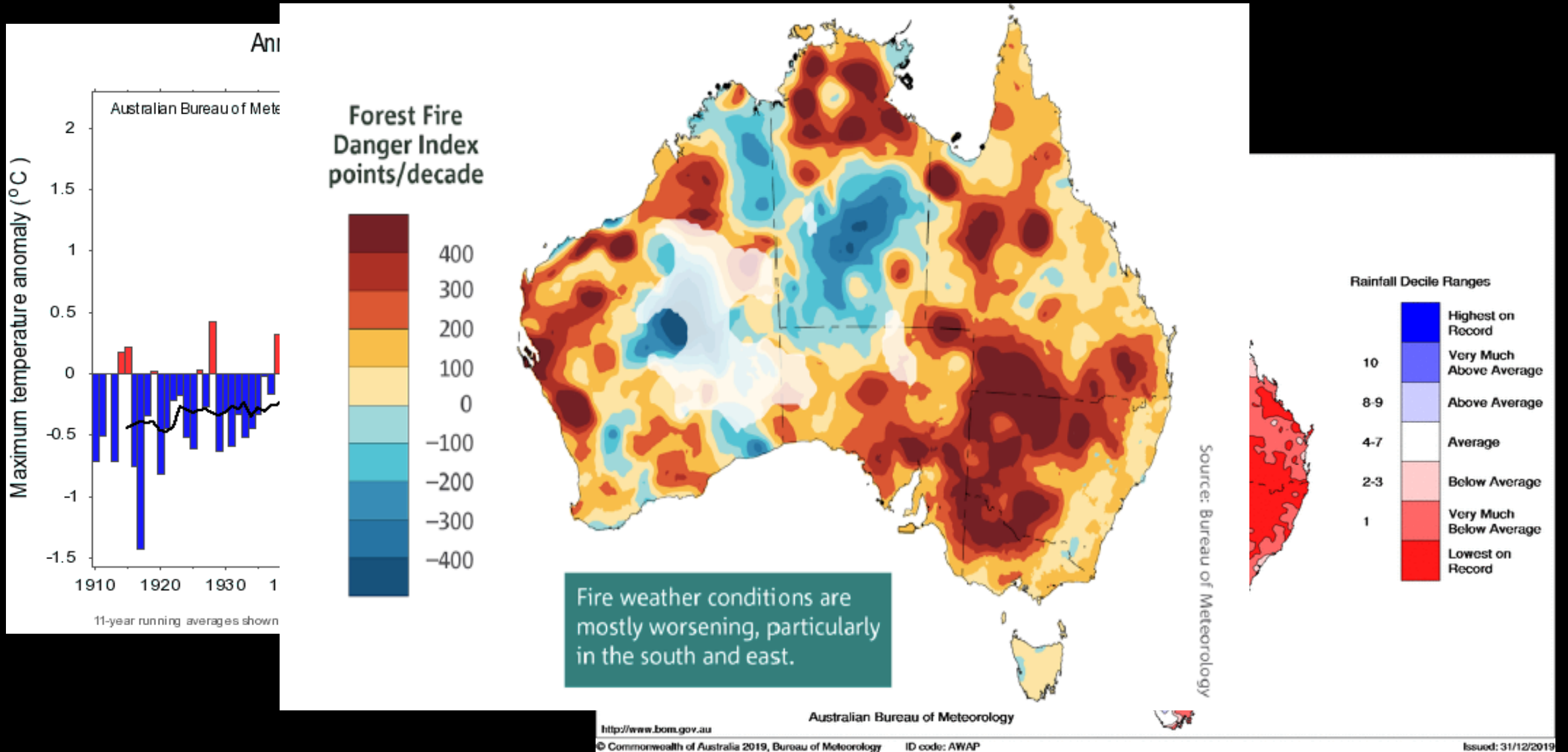
**About 1 billion animals (mammals, birds, reptiles) burnt  
to death**



Photo: Chu Chen/Xinhua via Getty Images



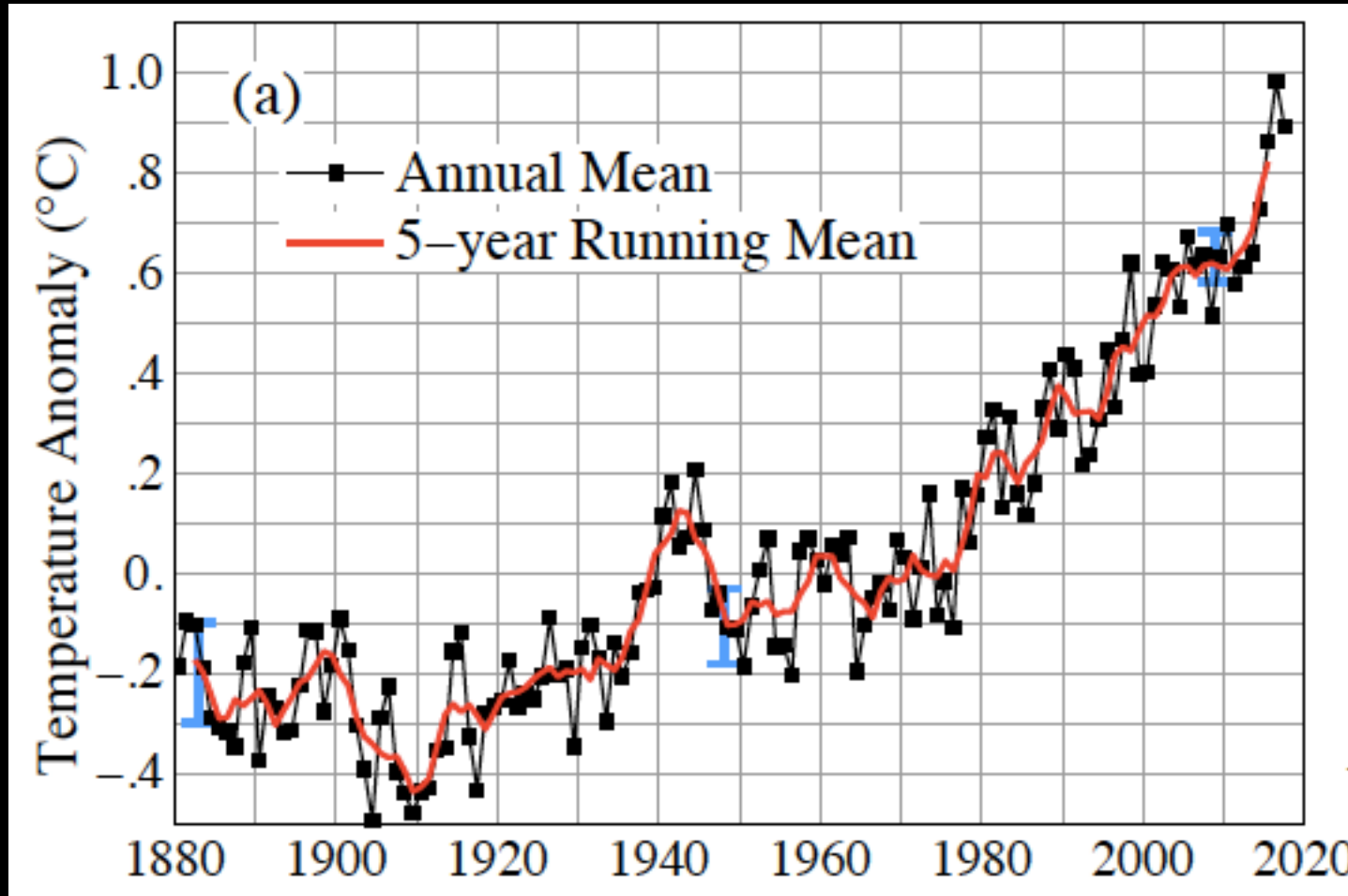
# Climate Change and Australian Disasters



Source: Bureau of Meteorology 2020

# The climate is warming rapidly

Global Average Temperature Anomaly, 1880-2017

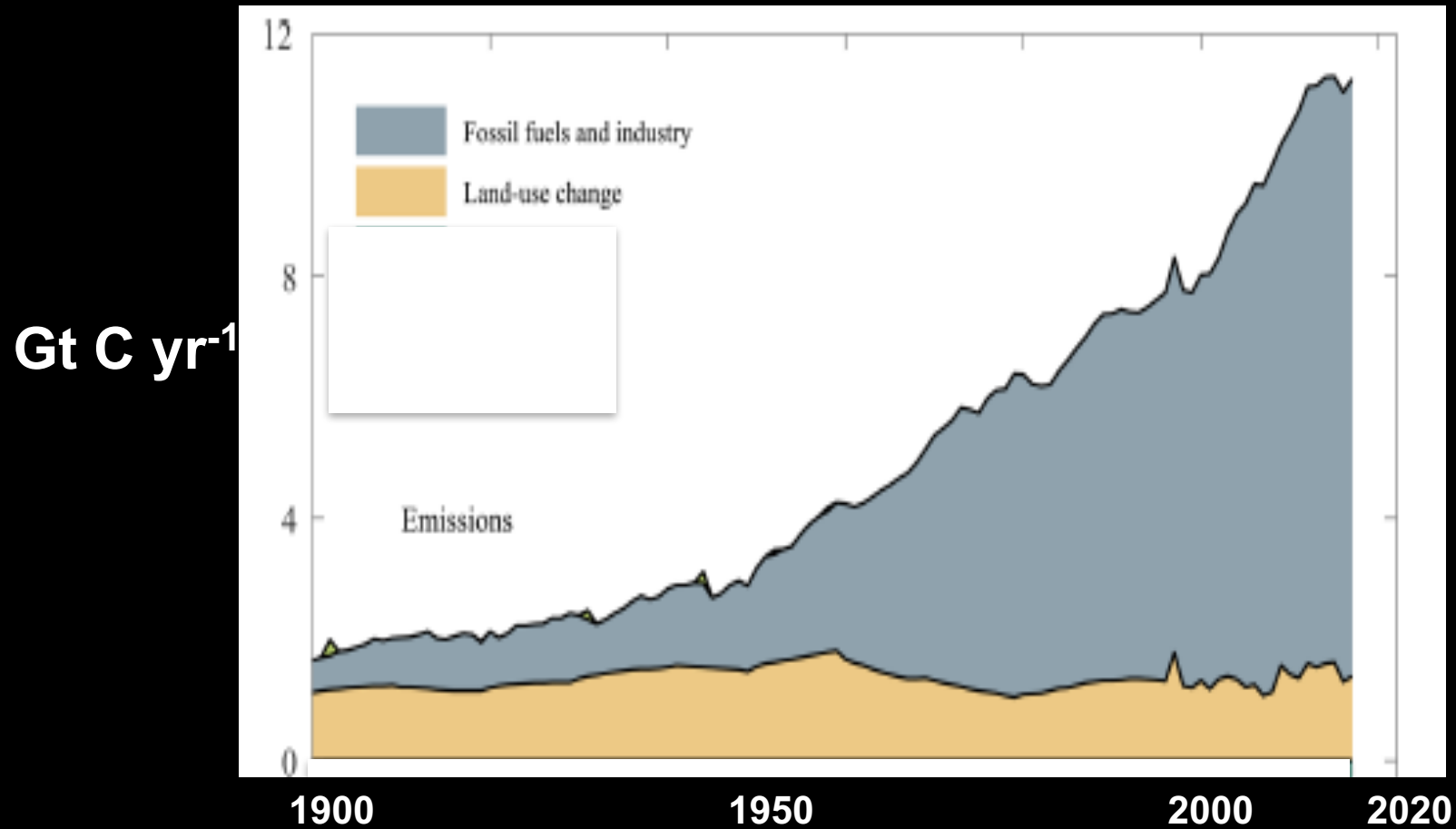


Baseline is 1951-1980

NASA 2018

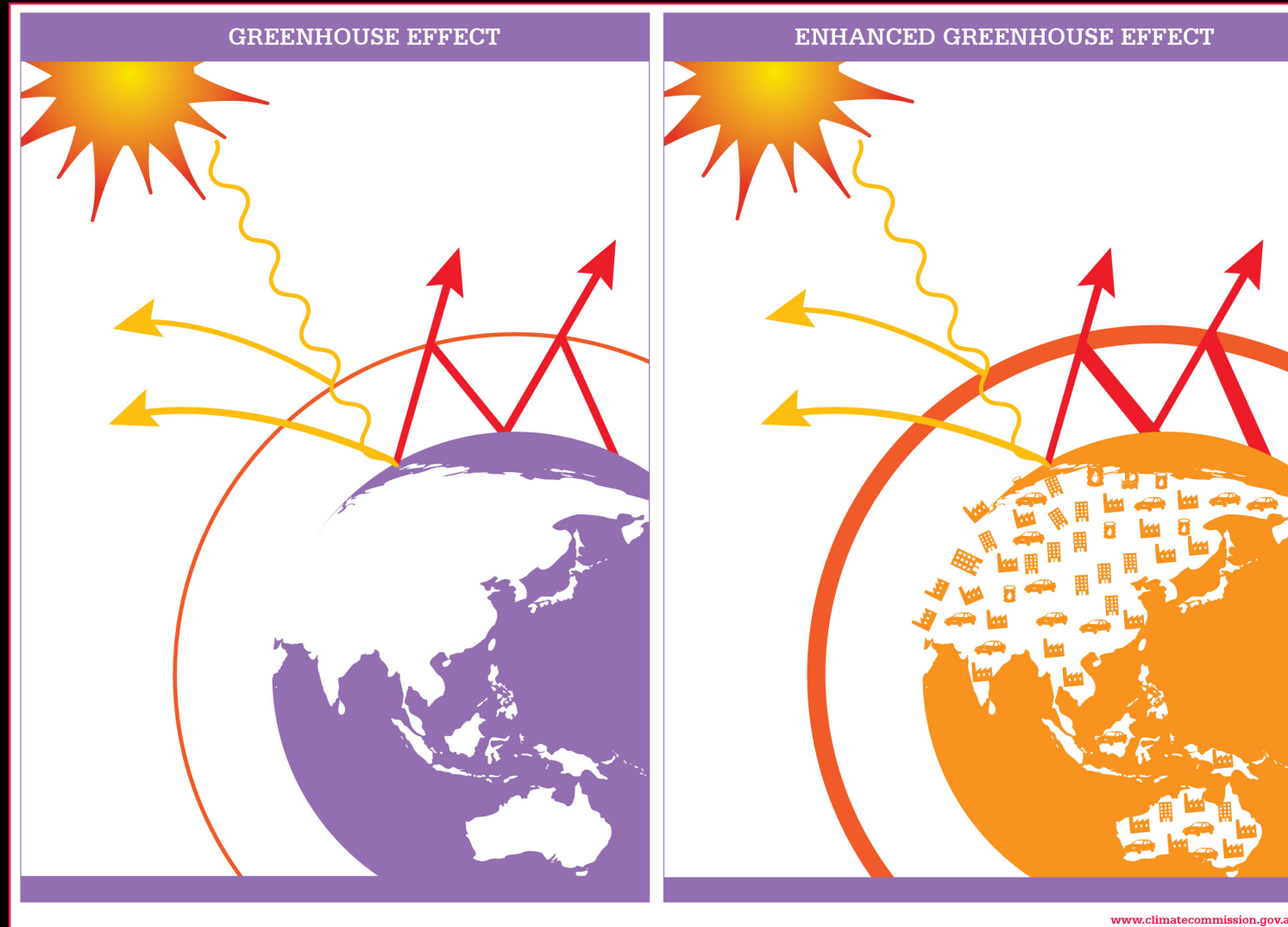


# Global Carbon Dioxide Emissions



Source: Le Quere et al. 2018

# Enhanced Greenhouse Effect





# Human Transformation of the Biosphere

© 2011 Infoterra Ltd & Bluesky  
Image © 2011 The GeoInformation Group

©2010 Google

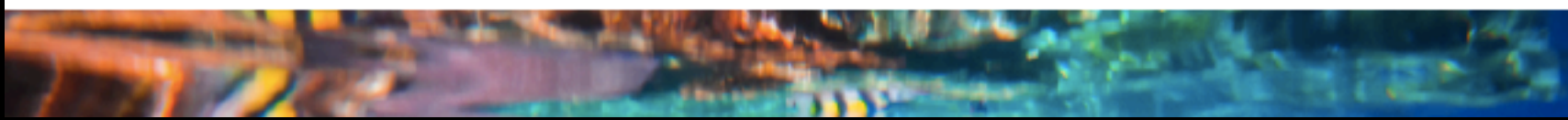
Imagery Date: 5/11/2007 1999

52°22'31.24" N 0°20'12.49" E elev 0 m

Eye alt 3.82 km



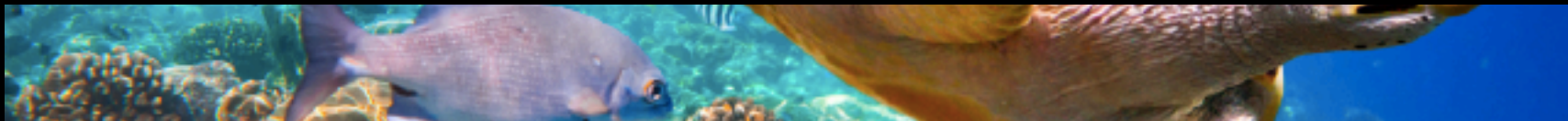
# Nature's Dangerous Decline



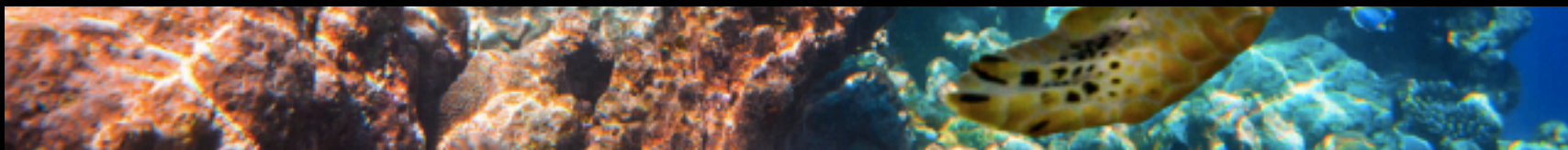
**Nature is declining globally at rates unprecedented  
In human history**



**Around 1 million animal and plant species are now threatened  
with extinction, many within decades.**



**The web of life on Earth is getting smaller and  
increasingly frayed.**

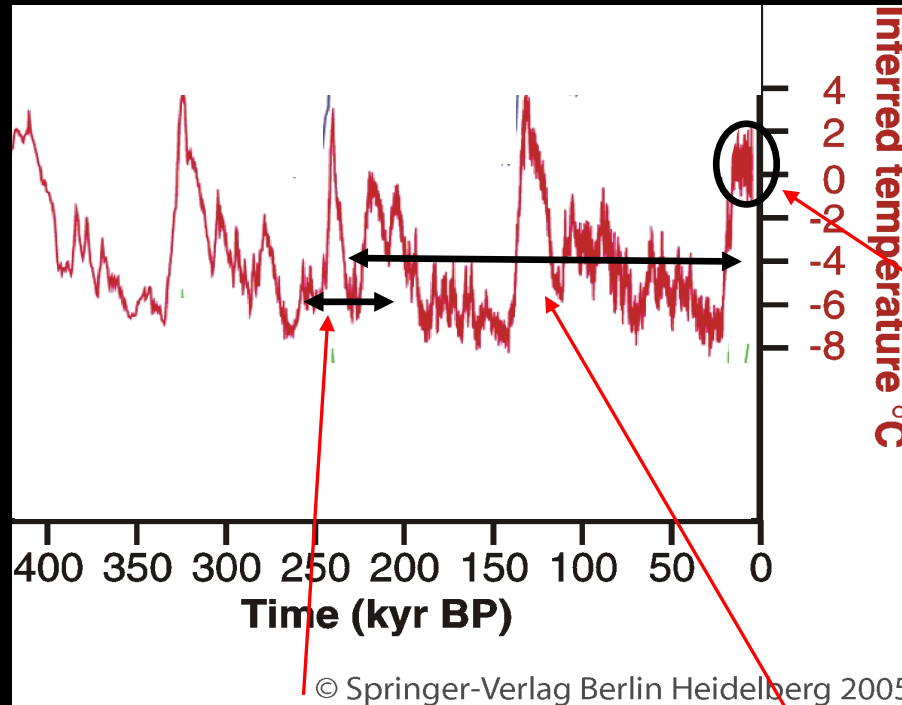
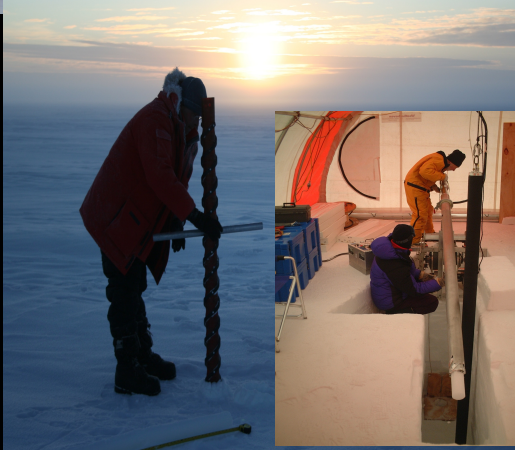




# An Earth System Perspective



# Human Development and the Earth System



**Beginning  
of  
agriculture**

**Evolution of fully  
modern  
humans in Africa**

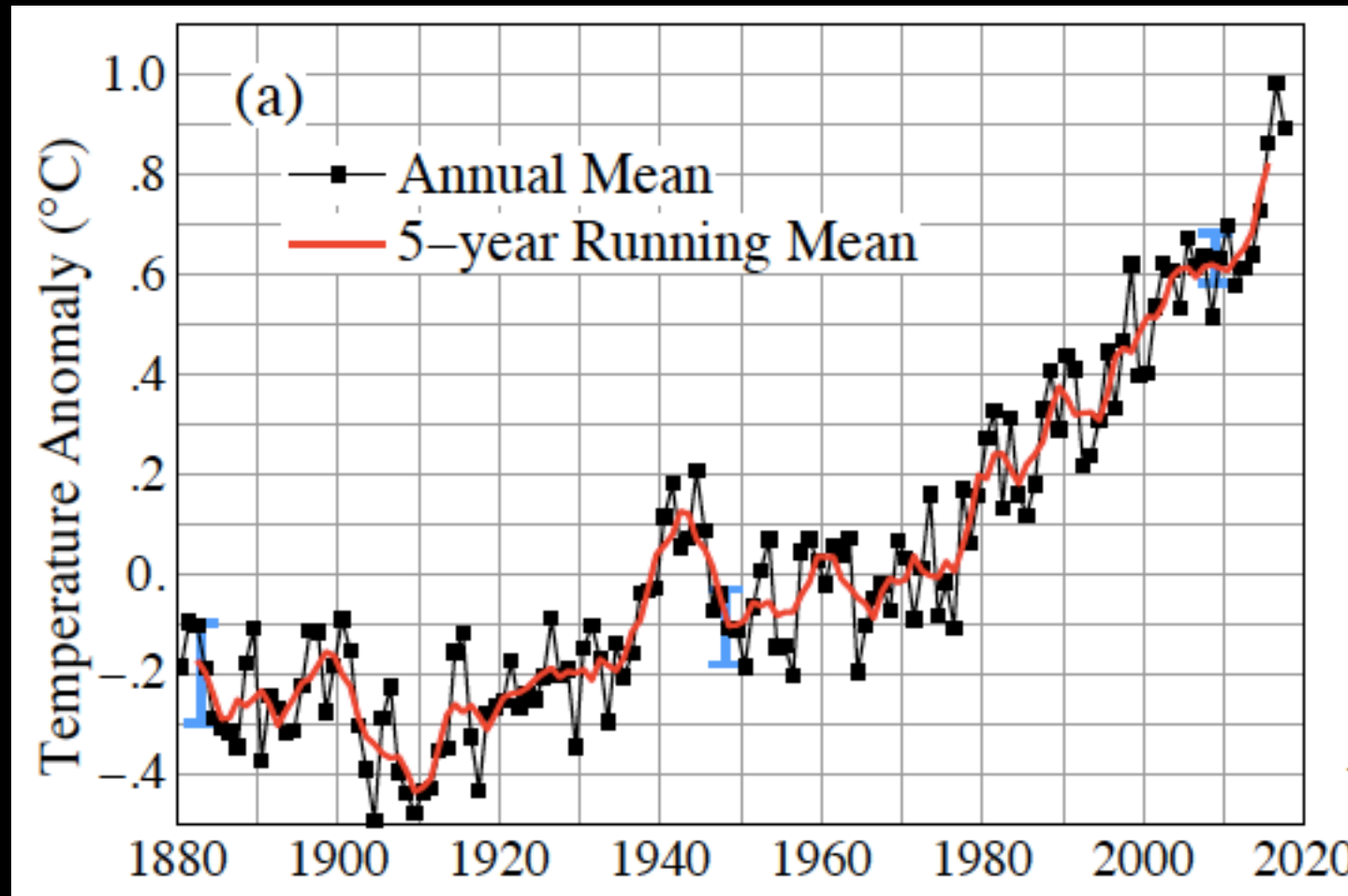
**Hunter-gatherer  
societies only**

Adapted from Steffen et al. 2004; ice core data from Petit et al. 1999



# Climate Change

Global Average Temperature Anomaly, 1880-2017



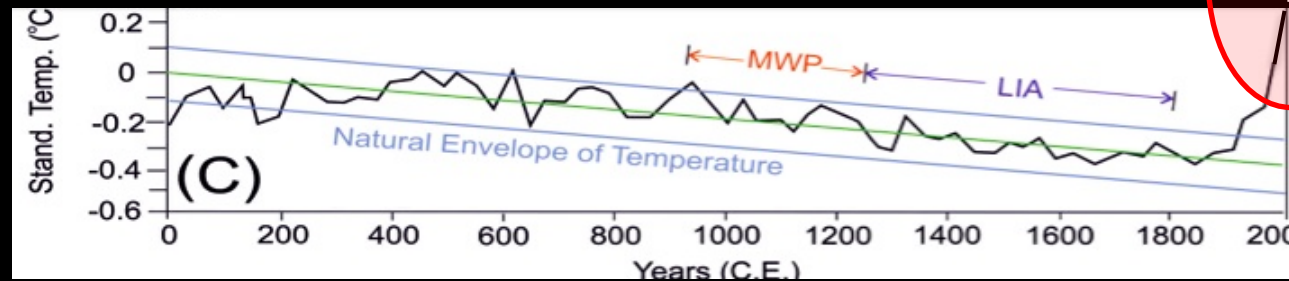
Baseline is 1951-1980

NASA 2018

# An Earth System Perspective

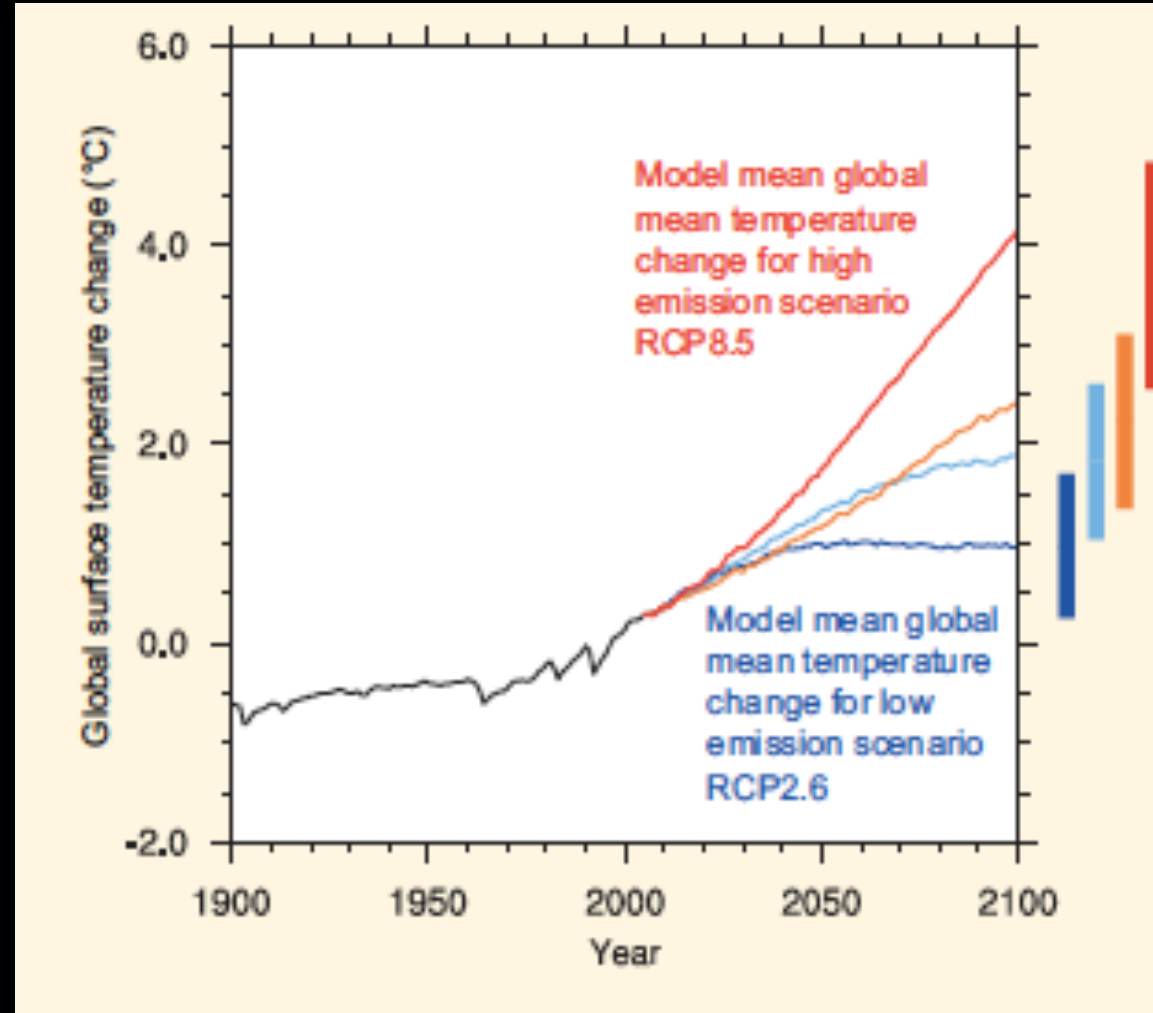
Temperature rise:  
Beyond the envelope of natural variability!

Human influence



Summerhayes 2015

# IPCC temperature projections





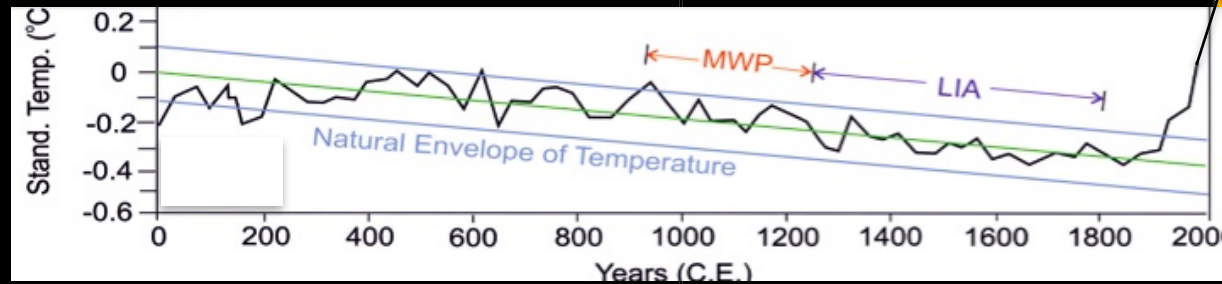
**Earth System moves to a new state? Severe challenge to contemporary civilisation. Possible collapse?**

**IPCC Projections  
2100 AD**

Global Temperature (°C)

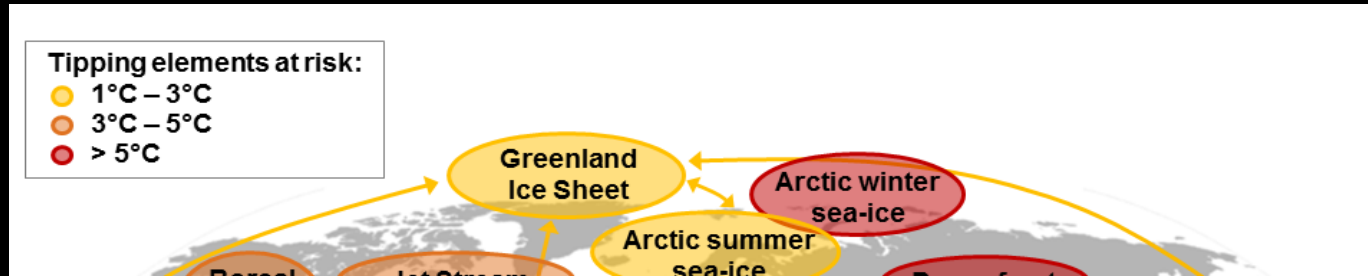
**Tipping Points?**

**Committed**



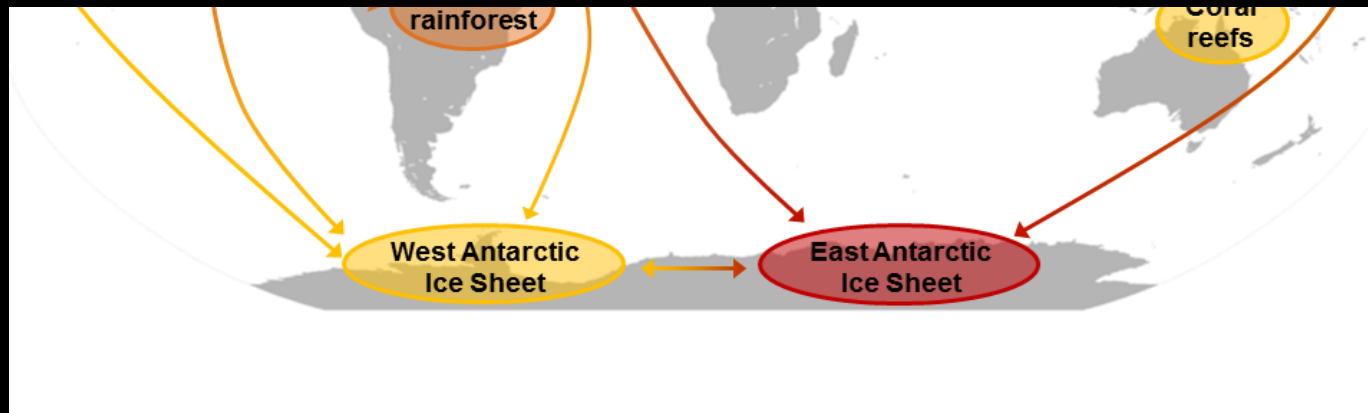
**Summerhayes 2015**

# Tipping Cascades



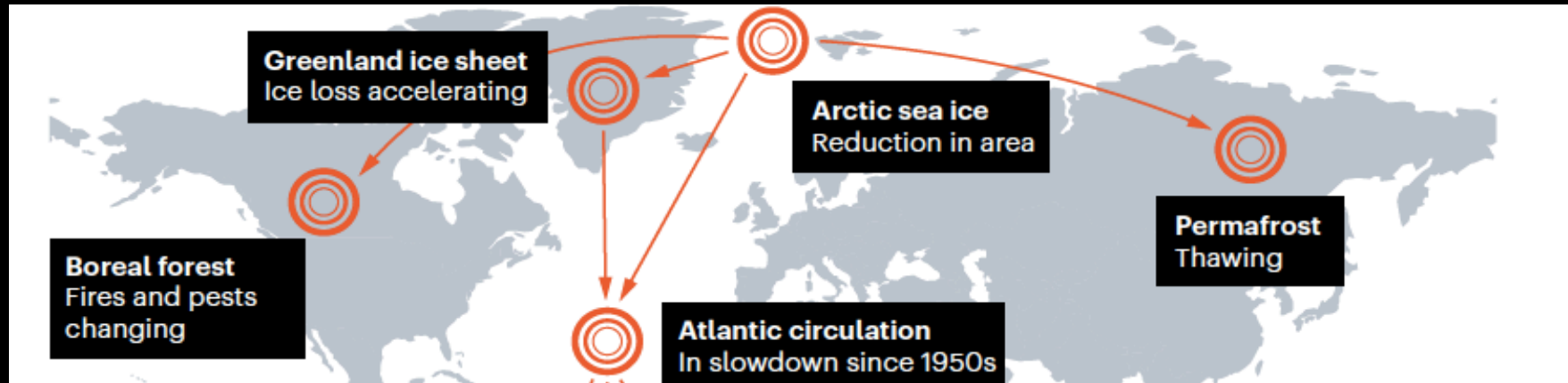
**Moderate risk of ‘large scale singular events’ (e.g., tipping points) at 1°C and high risk at 2.5°C of warming**

IPCC SR1.5 (2018)

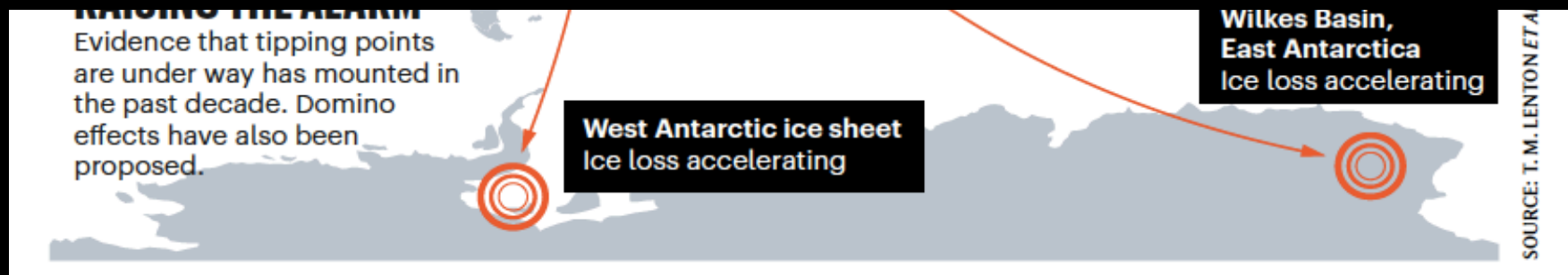


Source: J. Donges and R. Winkelmann  
in Steffen et al. 2018

# Global Tipping Cascade

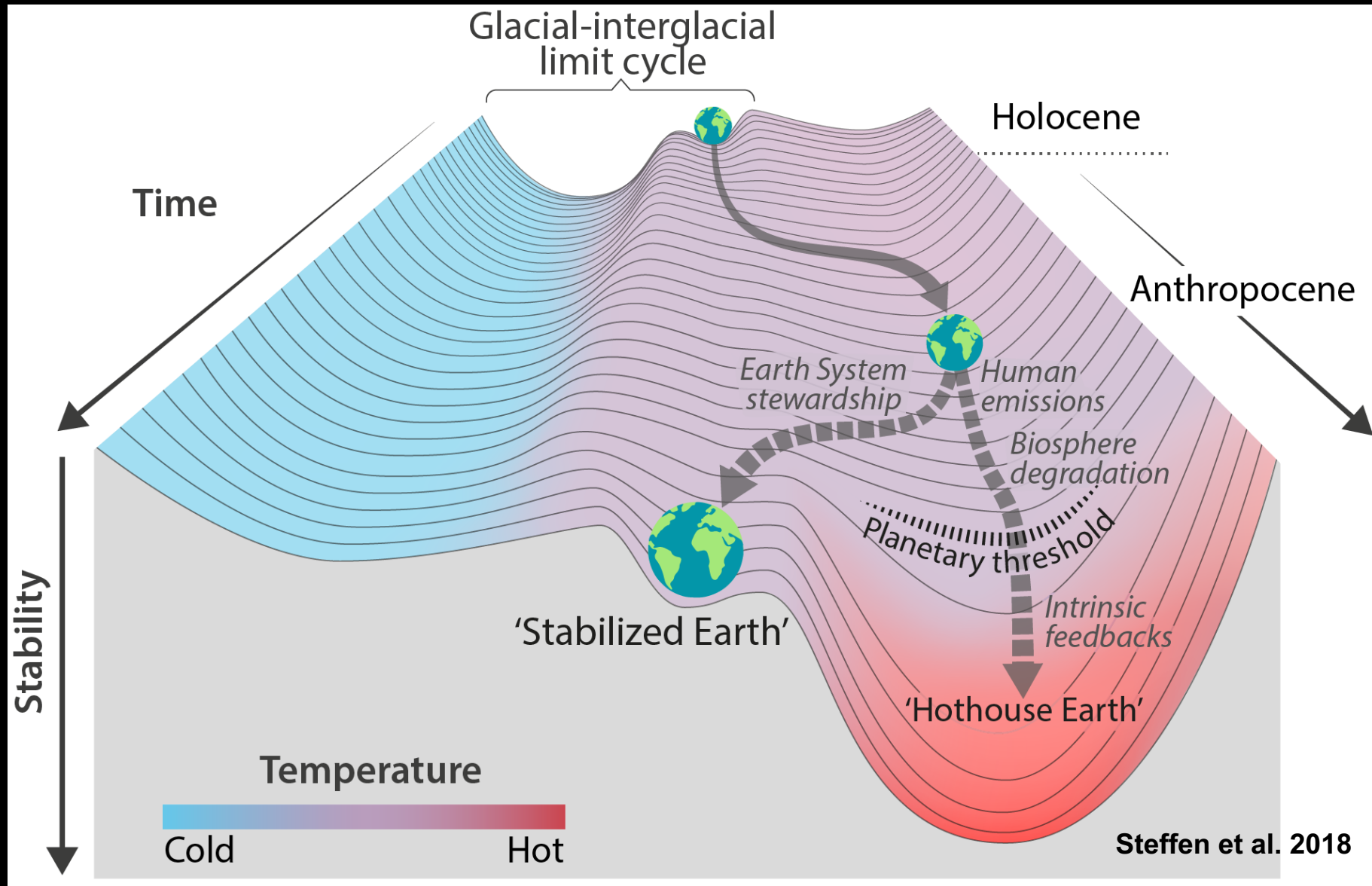


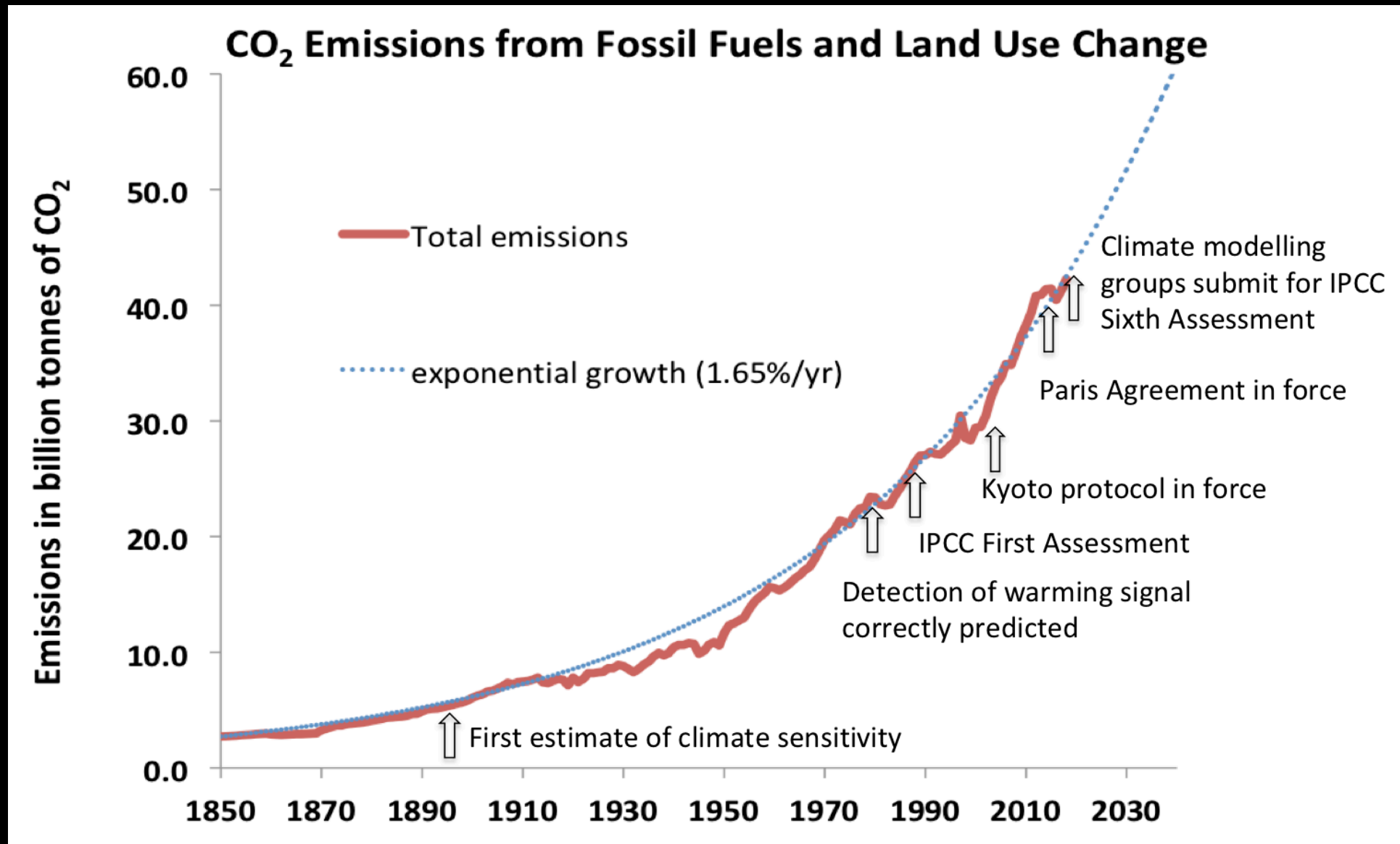
**“If damaging tipping cascades can occur and a global tipping point cannot be ruled out, then this is an existential threat to civilization. No amount of economic cost-benefit analysis is going to help us.”**





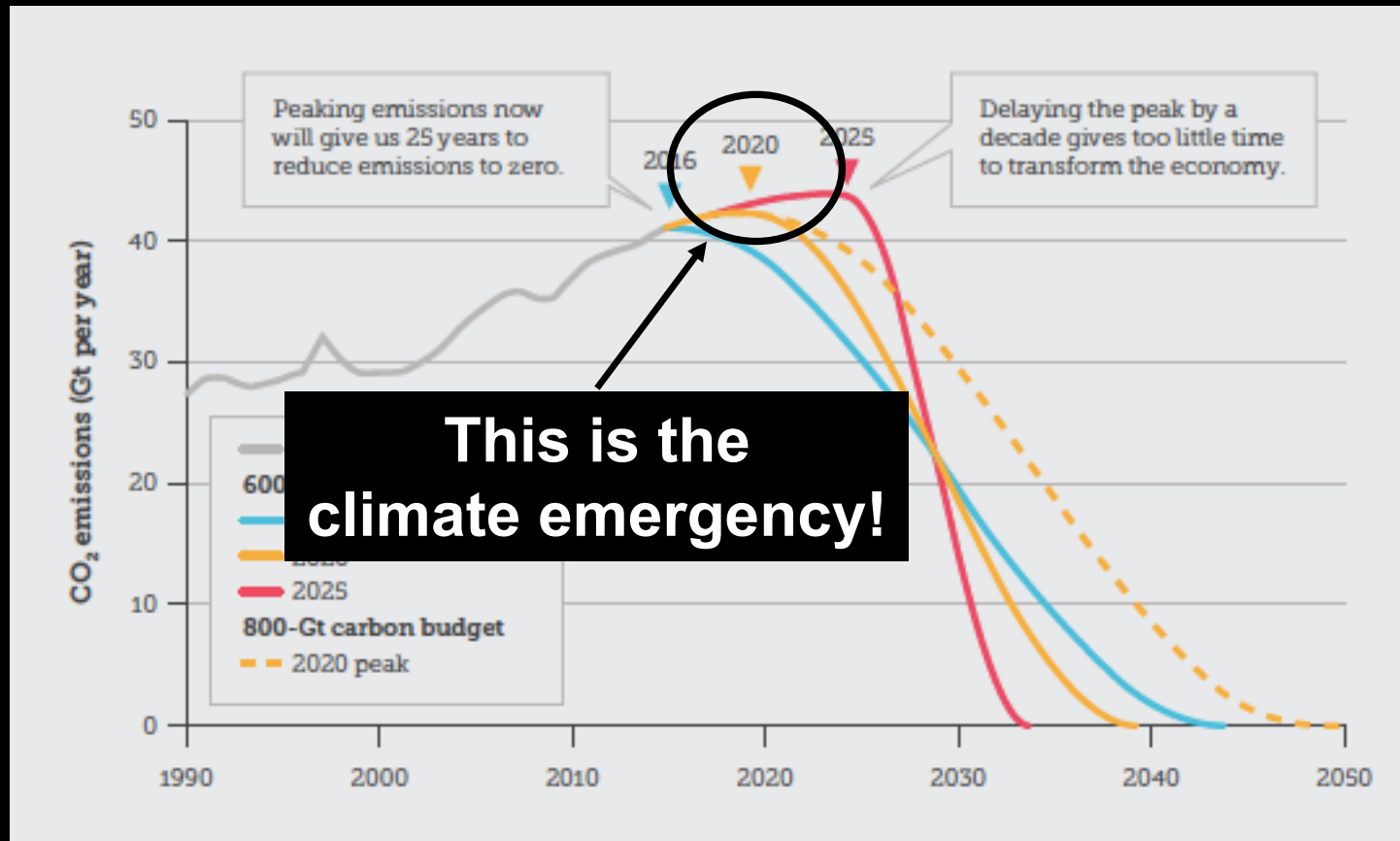
# Earth System Trajectories





Source: W. Knorr, 2019

# Emission Reduction Pathways for Meeting the Paris Target







**Scientifically, the children are right:  
We are facing a climate emergency**

**Studentstrejk, Stockholm 15 mars 2019**

# **Barriers to Climate Action in Australia (and in the USA?)**

**Divisive politics: Lack of bipartisan action**

**Vested interests – e.g., fossil fuel sector**

**Murdoch media – Sky News, The Australian etc.  
(Fox News in the USA)**

**Conservative ideologies**

# Cascading Pressures: Social Tipping Points

## The Case of Coal

- **Extreme weather: Linking coal to climate impacts**
- **Technology/economics: Dramatic cost reductions for renewables**
- **Legal: Rocky Hill Coal Mine case, Gloucester NSW**
- **Investor Pressure: Glencore caps coal production**
- **Social pressure: Students, demonstrations, etc.**

Photo: Mark Cuddy



# Approaching a Social Tipping Point?

**Student strikes and civil disobedience/pressure**

**Divestment from fossil fuels**

**Rapid technological development**

**Increasing political instability – USA, Australia**

**‘Trusted voices’ demanding action – farmers, firies...**

**Corporate sector – from greenwash to real action?**



World: there's no way  
we can shut everything  
down in order to lower  
emissions, slow climate  
change and protect the  
environment.

Mother Nature: here's a  
virus. Practice.





