

BSSb1194

Food, water and weather

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Easter Island

- relatively advanced, isolated society
- became unsustainable
- last tree cut down around 1650
- collapse from 12000 to <100 people
 - food, building material, rats
 - wars, disease, slavery, ...



Famine

- often caused by combination of causes:
 - droughts, diseases, pests, overpopulation
 - almost always mismanagement

Irish Potato Famine (1845)

- primarily caused by blight + overspecialization
- 1 million dead + emigration wave

Great Leap Forward (1960)

- primarily caused by policy + poor weather
- 30-60 million dead

Natural (mostly) famines

- multiple famines with up to 10 million dead

- India 1770, 1783, 1790, 1877, 1943
- China 1860s, 1876, 1907, 1929, 1936
- France 1693
- Iran 1917

Maya civilization in 11th century?

- deforestation and drought

Intentional famines?

Holodomor (1932)

- caused by collectivization policies and repression
- 4-5 million dead, possibly genocide

Yemen (2016-)

- primarily caused by blockade and bombing
- combined with cholera + khat farming
- ongoing, death toll unknown

As conflict triggers

- adverse natural conditions can trigger conflicts
- Somalia
 - escalating cycle of droughts and mismanagement
 - failure of the state lead to collapse of fishing too
- Syria
 - population explosion and urbanization
 - droughts, poor harvest, unemployment, rising prices
 - lots of angry, young men

Floods

- caused by abnormal weather
 - too much snow melting or too much rain
 - complicated by poor policies, infrastructure, deforestation, intensive farming, etc.
- secondary effects:
 - crop failures, spread of disease, damaged buildings
- Huang He floods (1887, 1931, 1938) 5 mil. dead
- Czech floods (worst in 2002)



August 14, 2000



August 20, 2002







Non-natural floods?

- dams can fail
 - Vajont, Italy (1963) – erosion and landslide, 2000 dead
 - Ru, China (1975) – extreme rainfall, 2 dams, 200 000 dead
- or be destroyed intentionally
 - Operation Chastise (1943), RAF bombing German dams



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Weather...

- deadliest hurricanes are SE Asia
 - 1839, 1881, 1970, 1975, 2008 (hundreds of thousands)
- costliest hurricanes are in mid-Atlantic/Gulf coast
 - 1992, 2005, 2008, 2012, 2017 (up to over \$100 billions)
- tornados are not so bad, comparatively
- lightning strikes – around 0.1 micromort
 - depends where you live

Loss of species

- bees

- “colony collapse disorder”
- important pollinators, up to 10% of crops

- fisheries

- depletion by overfishing

- corals

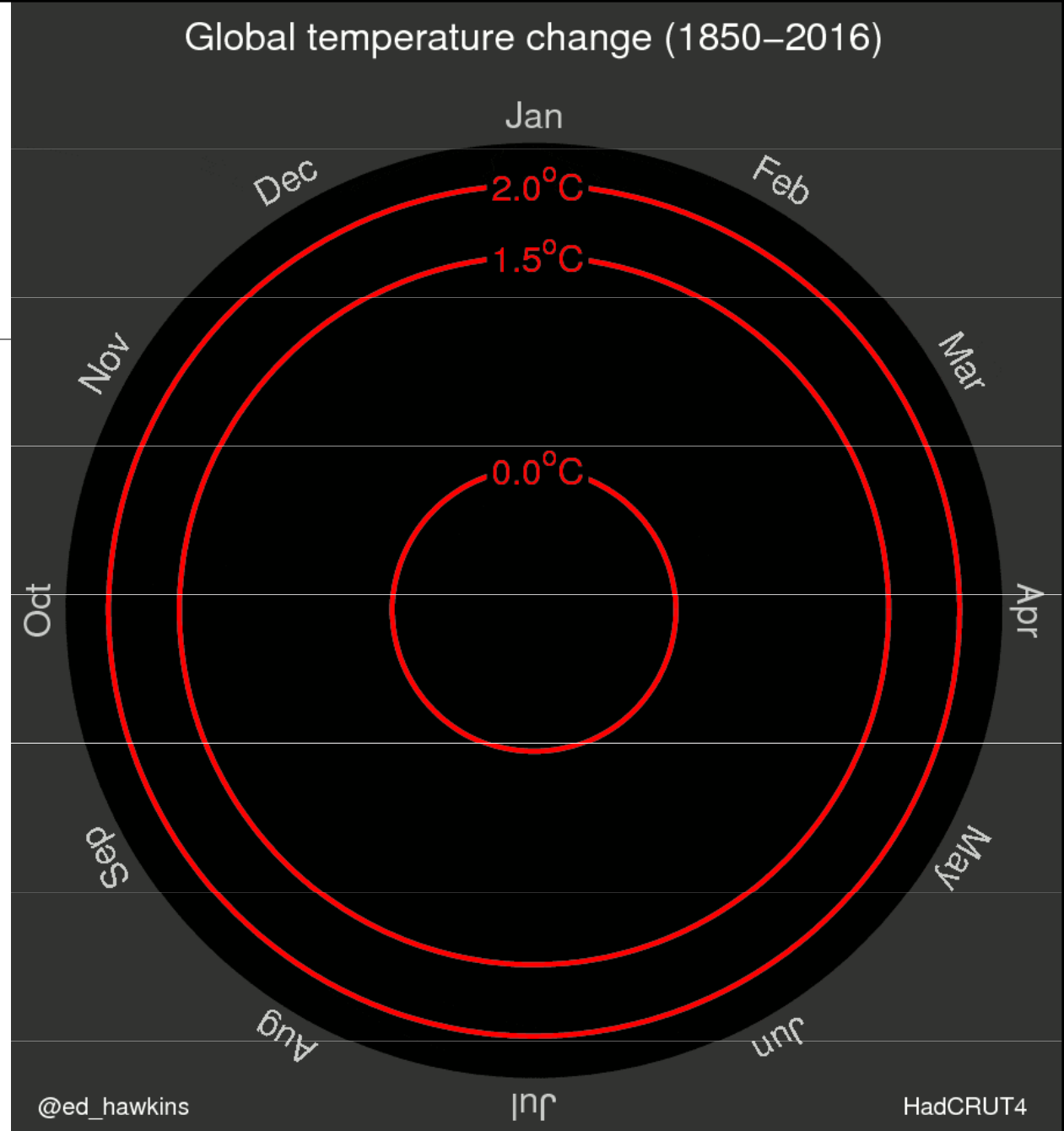
- coastline protection and fish breeding

- loss of medical research opportunities

- any plants, fungi, animals

Climate change ?

- makes everything above worse and more frequent
- instability and unpredictability of the environment increases
 - which is bad for us
- some areas are more vulnerable than others



Lessons to be learned

- collapse or conflict often preceded by population boom, which then meets drop in productivity
 - but also cuts the other way
- human societies fail at understanding and mitigating consequences distant in time and space from their causes
- dependent on speed and direction of feedback (positive/negative)
- tragedy of commons