



Novel data and analytics

Dr Emily Shuckburgh
18 June 2018

Abstract



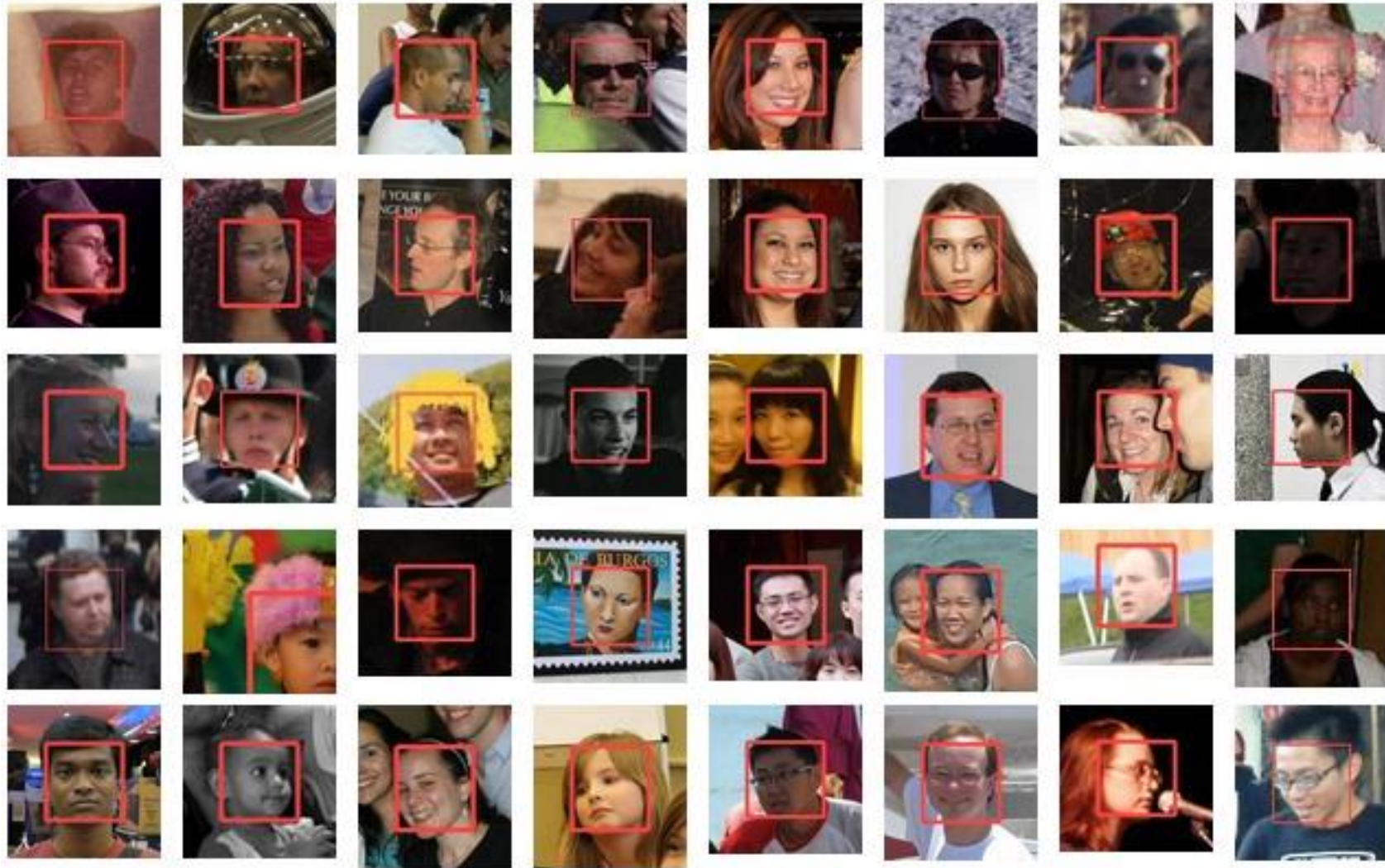
AI tools can transform data into decision-relevant information

Collaboration required to define which questions need addressing to support DRF?

Need on-the-ground data to complement other sources

Section 1 – What is data analytics?

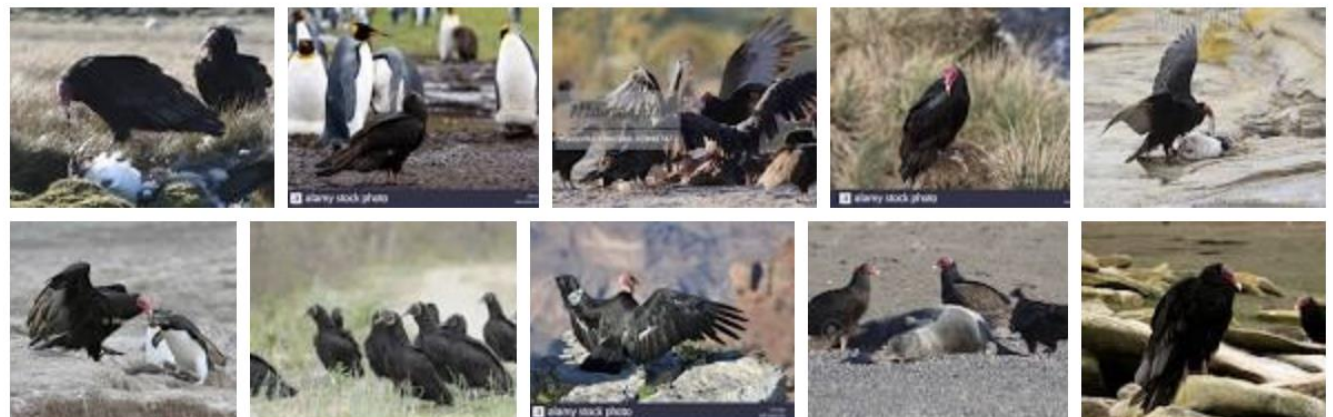
Learn by example



Prediction & extrapolation using machine learning



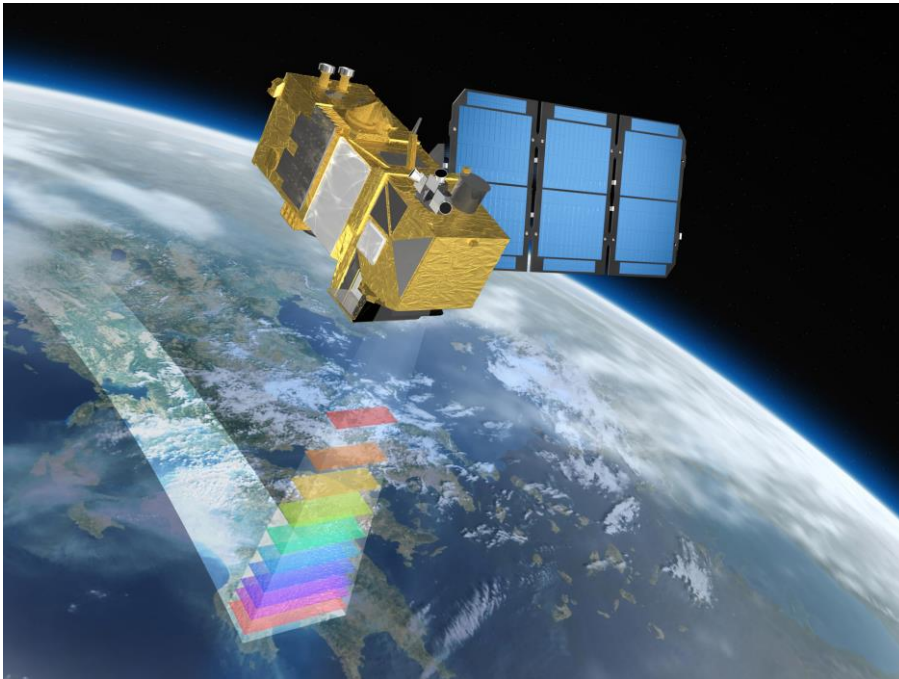
Visually similar images



Best guess for this image: *turkey vulture*

Report images

Big data – from space & other sources

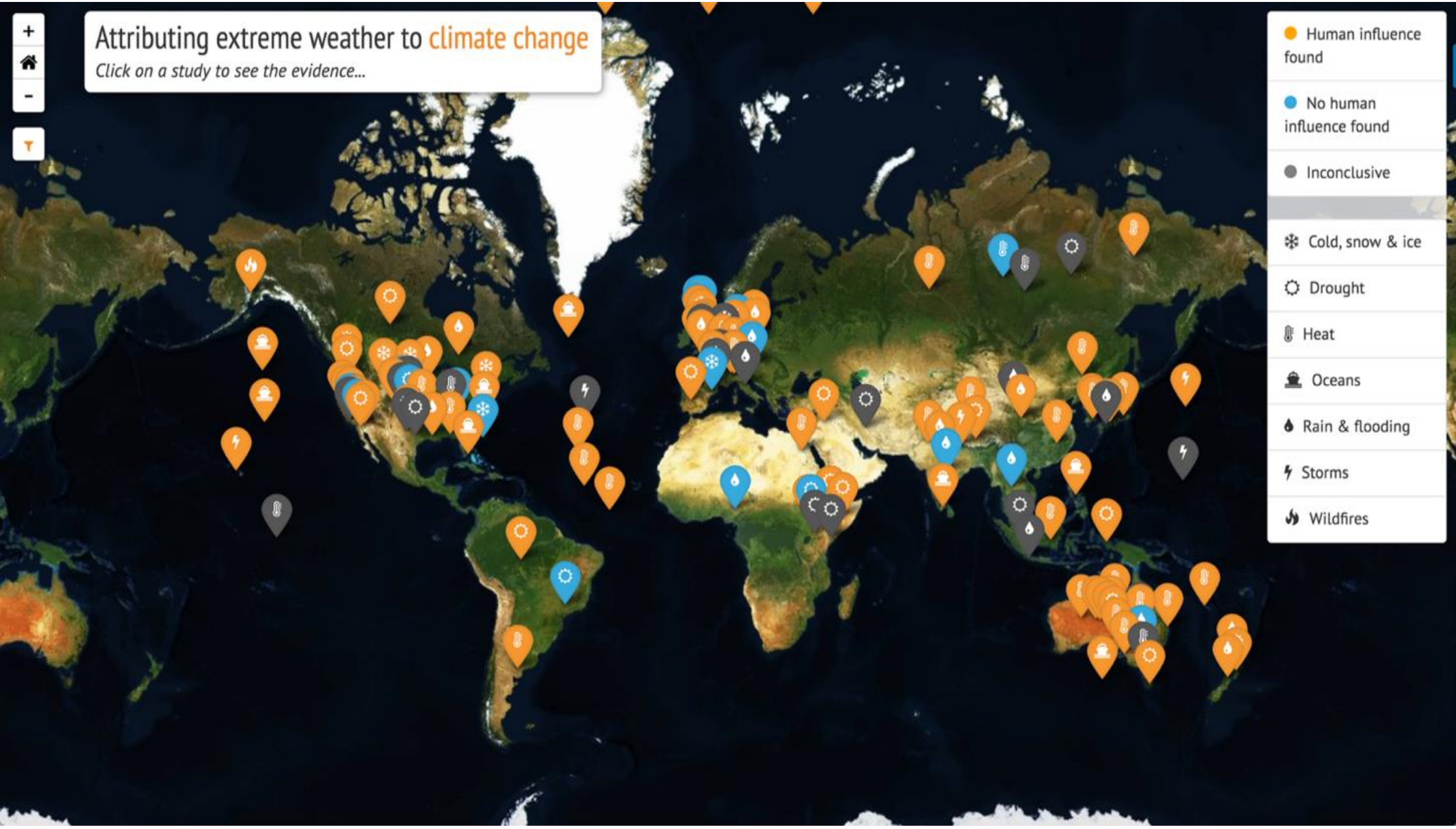


The Majesty's Surveying vessel Porpoise					The Majesty's Surveying vessel Porpoise				
No.	Lat.	Long.	Wind	Remarks	No.	Lat.	Long.	Wind	Remarks
1	4	St. S.	St. S.	At anchor	1	4	St. S.	St. S.	At anchor
2	4			At Day light	2	3			At Day light
3	4			at 8 o'clock	3	3			at 8 o'clock
4	4			at 10 o'clock	4	4			at 10 o'clock
5	4			at 12 o'clock	5	4			at 12 o'clock
6	3			at 2 o'clock	6	3			at 2 o'clock
7	3			at 4 o'clock	7	3			at 4 o'clock
8	3			at 6 o'clock	8	3			at 6 o'clock
9	2			at 8 o'clock	9	2			at 8 o'clock
10	2			at 10 o'clock	10	2			at 10 o'clock
11	1			at 12 o'clock	11	1			at 12 o'clock
12	1			at 2 o'clock	12	1			at 2 o'clock

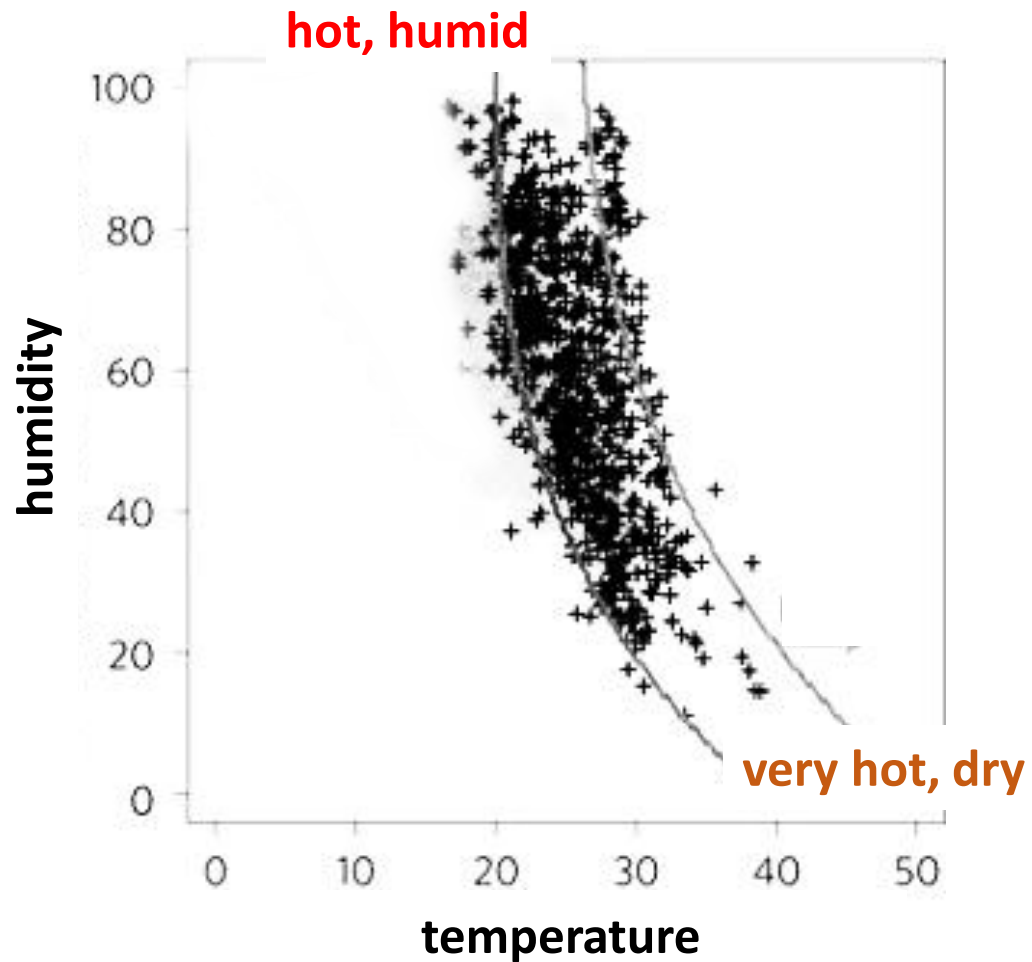


Section 2 – Examples of data analytics disaster risk assessment

Source: CarbonBrief



Example 1: deadly heatwaves



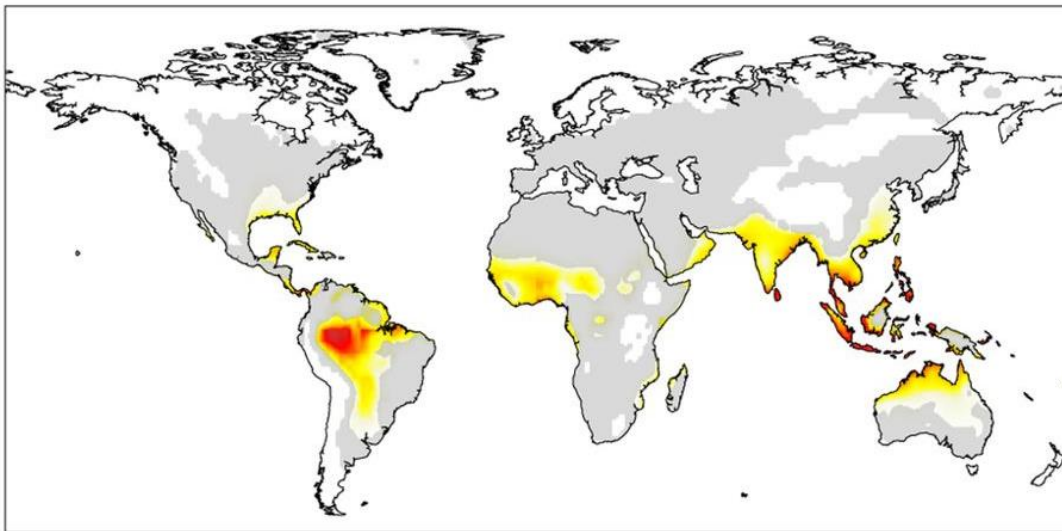
Q. What weather conditions can prove deadly for vulnerable groups?

A. hot & humid or very hot & dry

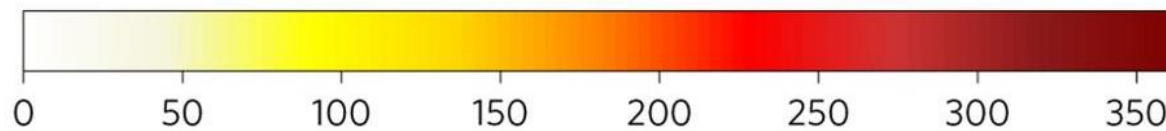
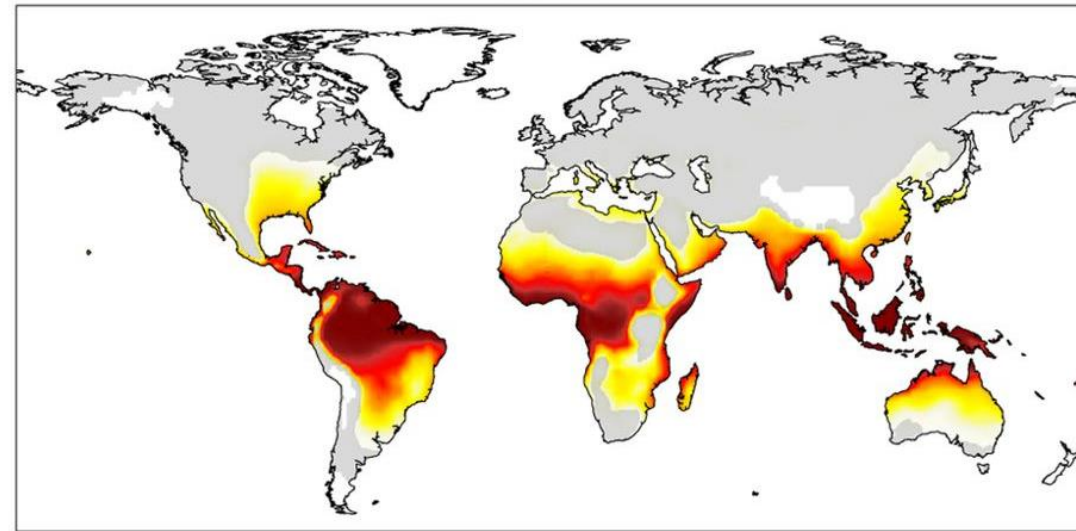
Example 1: deadly heatwaves

Q. How many days per year are expected to exceed deadly threshold?

“Paris Agreement”



Business-as-usual



Number of days per year above deadly threshold

Example 2: resilient infrastructure

Egypt heatwave death toll rises as temperatures reach 46C

More than 60 people have died this week, and another 580 are in hospital for heat exhaustion



Heatwave, Cairo, August 2015: 70% more likely due to climate change – *Mitchell et al, 2016*

Q. What will future demand be for air conditioning?

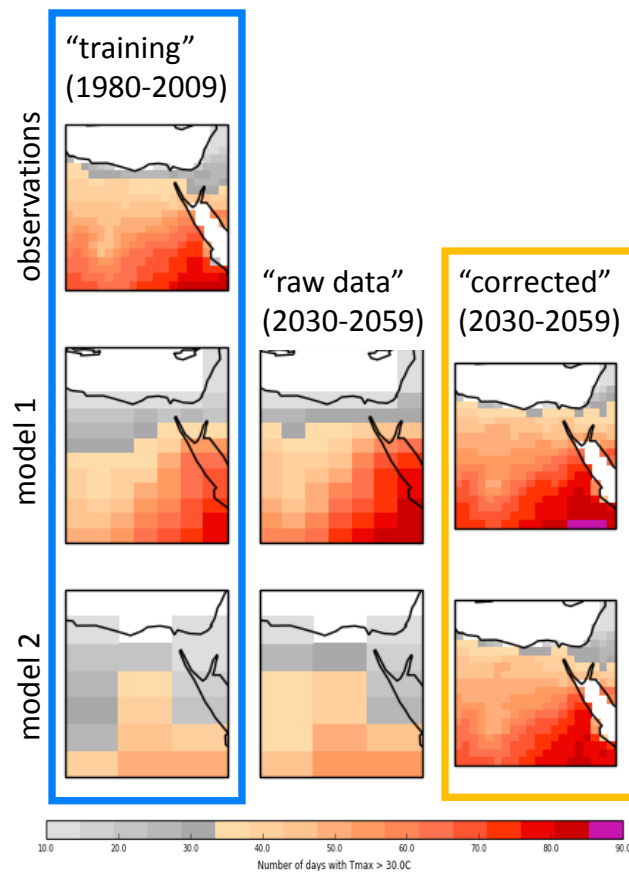
Q. How will this impact the energy network?

- Cairo on verge of an energy crisis
- Population: 8 million (expected to double by 2050)

with Scott Hosking, Ian Leslie, Rich Turner & Will Tebbutt

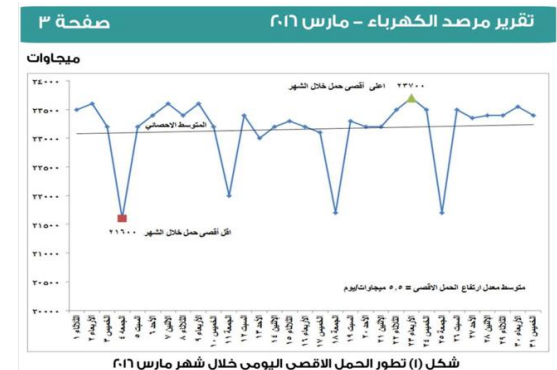
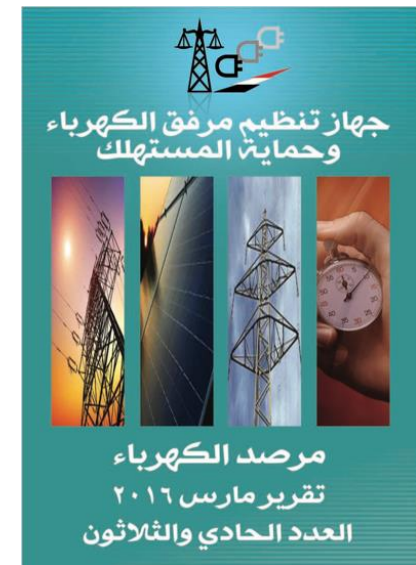
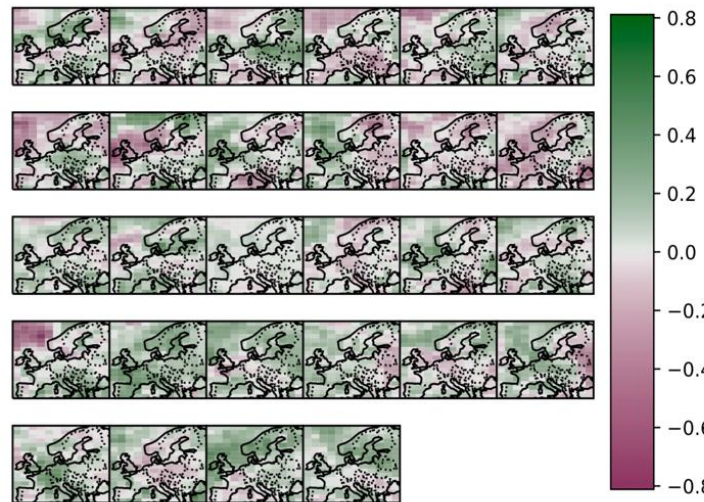
Example 2: resilient infrastructure

Step 1: climate simulation data → local “apparent” temperature



Step 2: weather conditions → energy demand

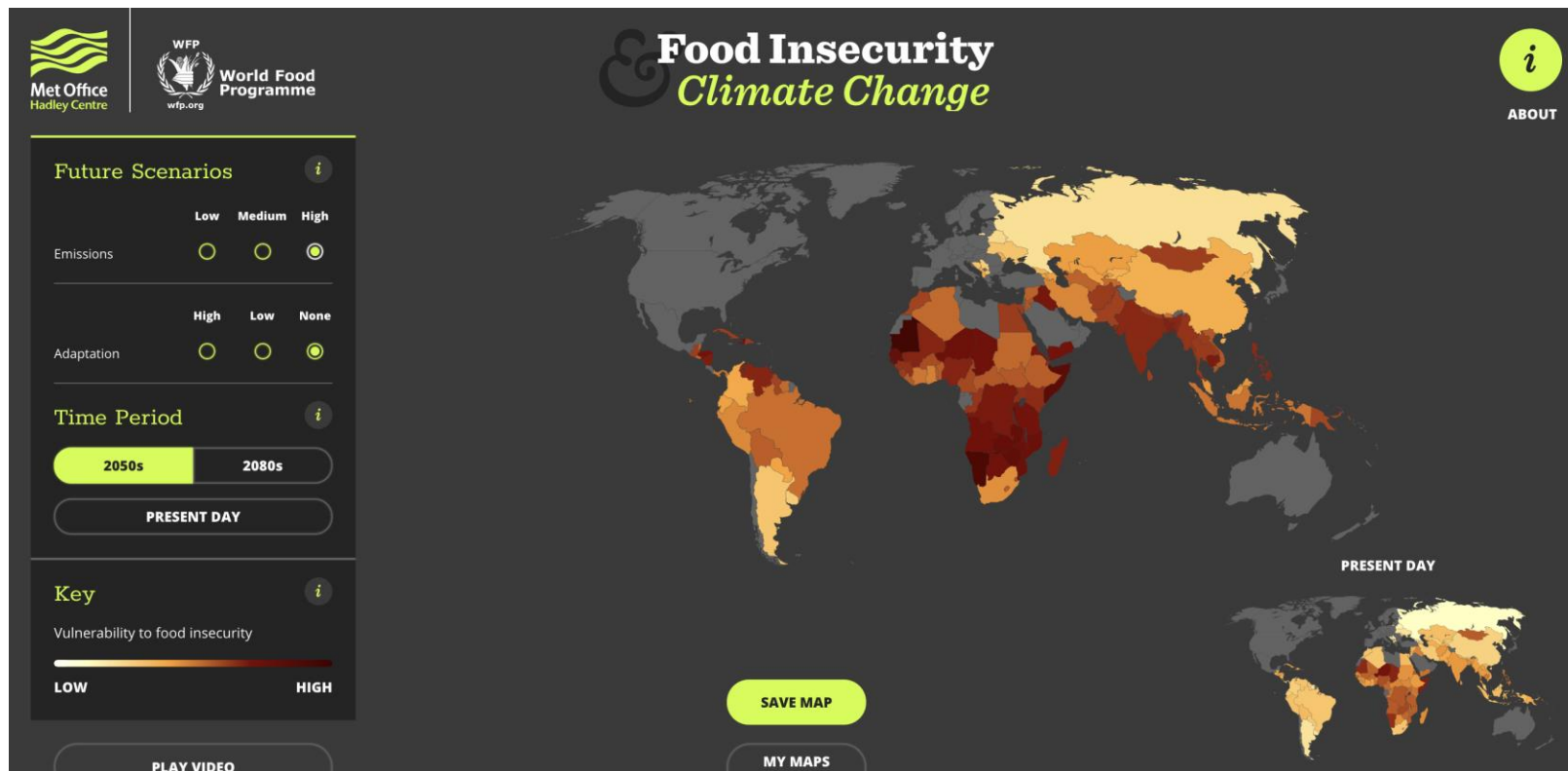
climate model weights



شكل (١) تطور الحمل الأقصى اليومي خلال شهر مارس ٢٠١٦

Example 3: food insecurity & climate change

Q. How vulnerable is a country's food system to disruption as a result of flood and drought events?

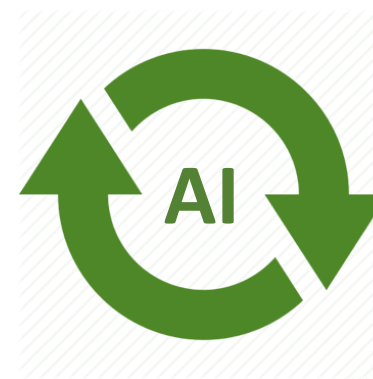


1. exposure to climate-related hazards
2. sensitivity of national agricultural production to climate hazards
3. country capacity to cope with food shocks

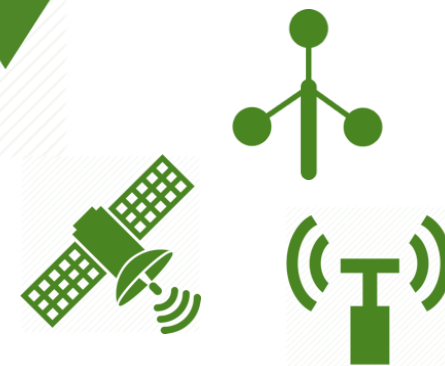
Section 3 – What next?

Transform data into decision-relevant information

environment, health, poverty, business operations data



modelling

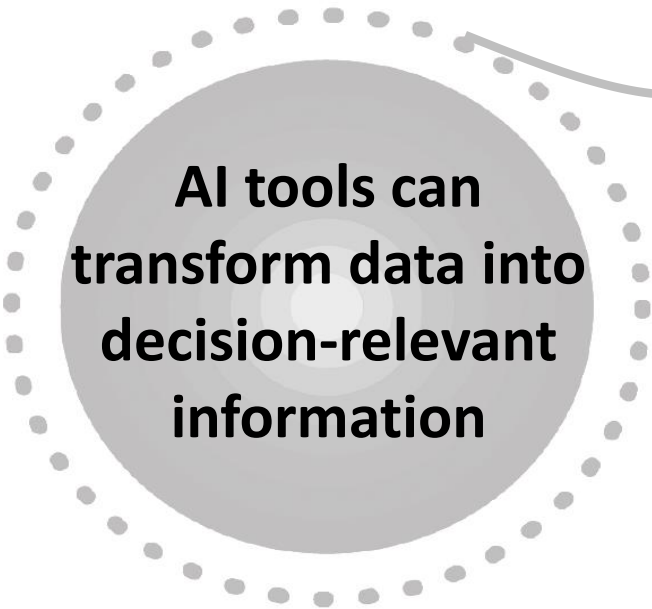


satellite, sensor networks & community participation



Summary

What partnerships do you need to develop to exploit this?



How could you best engage with new Cambridge Centre on AI/environmental risk?

What untapped data might you hold that could be utilized?



**UNIVERSITY OF
CAMBRIDGE**
INSTITUTE FOR
SUSTAINABILITY LEADERSHIP

**Disaster Risk Financing
& Insurance Program**



SUPPORTED BY
WORLD BANK GROUP



CENTRE FOR
GLOBAL
DISASTER
PROTECTION



GFDRR
Global Facility for Disaster Reduction and Recovery

