



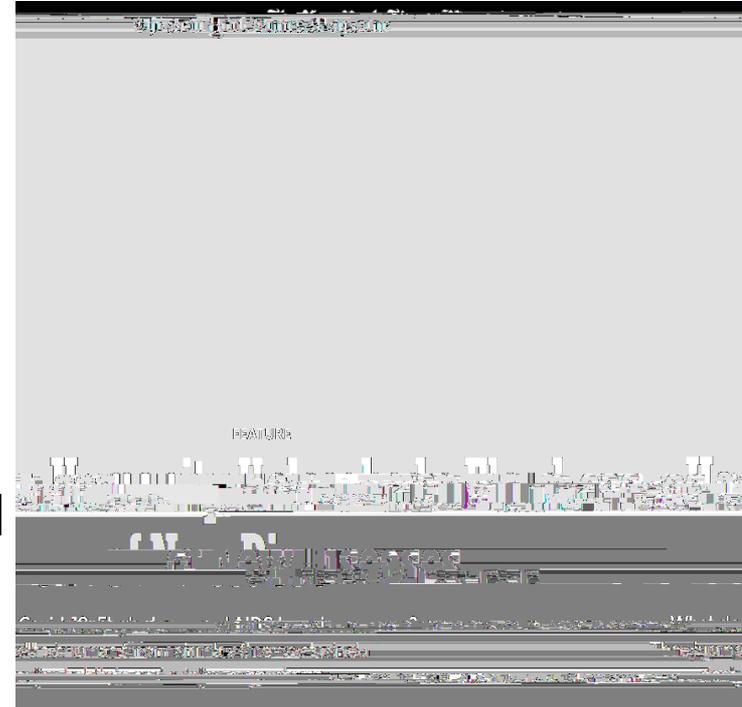
Report from AgMIP8: COVID-19, Climate Change, and Food Security



Cynthia Rosenzweig
NASA GISS
UN Expert Meeting on Population and Food
October 29, 2020

COVID-19 links to Food System (1)

- SARS-CoV-2 infected people through zoonotic spillover event, most likely from bat, although another animal may have been involved.
- Case trace back from the December outbreak in Wuhan, China implicated a **seafood wet food market**.
- COVID-19 is a zoonosis, a disease that jumped from animals to humans.
- **Food and agriculture have a big part in the rise of zoonotic disease.** Animals in close proximity to humans; natural habitat shrunk, destroyed

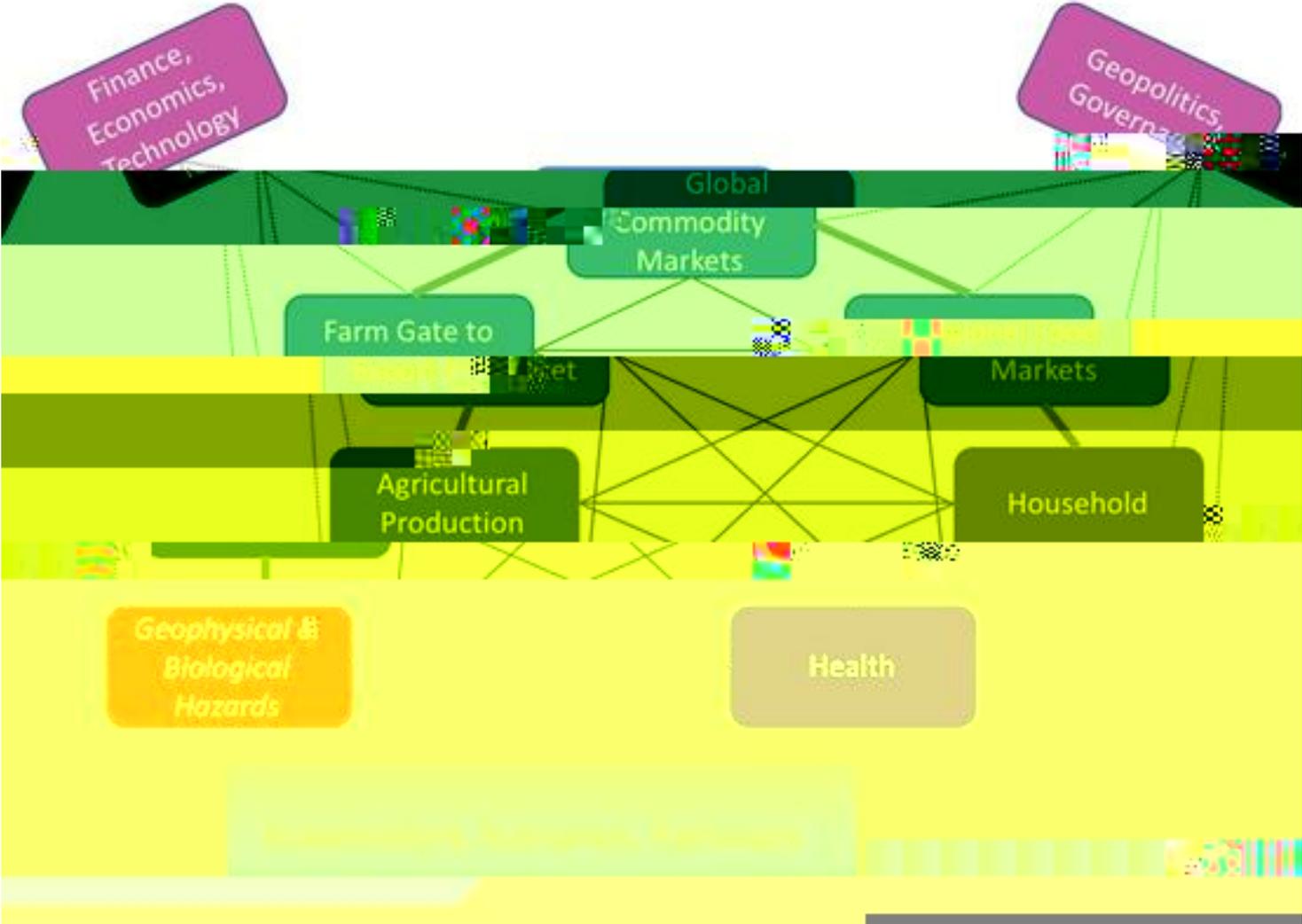




Consequences on food systems and food security

- Supply chain disruption in food industry
- Depressed demand

AgMIP Food Shock Protocols





Climate Change Food System Impacts are Already Here

~45 million people in southern Africa are food-insecure as a result of drought, floods and COVID-19

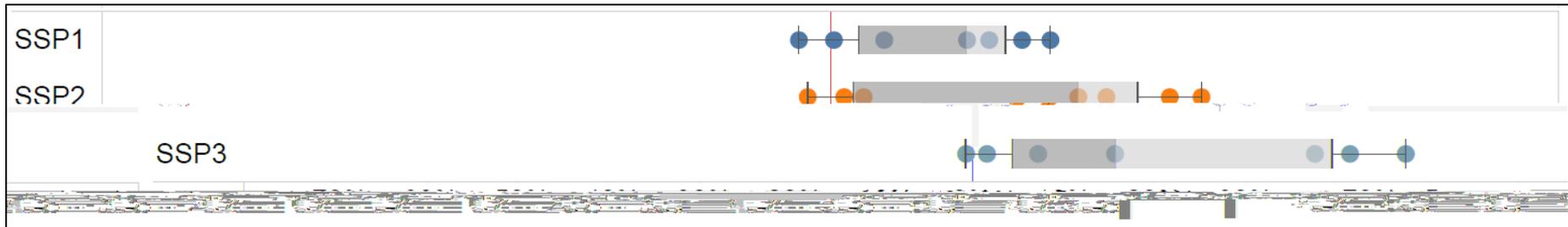
Aljazeera, 2020. Image: Rogan Ward/Reuters

Observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events

Risk of Hunger

Food security will be increasingly affected by
projected future climate change
()

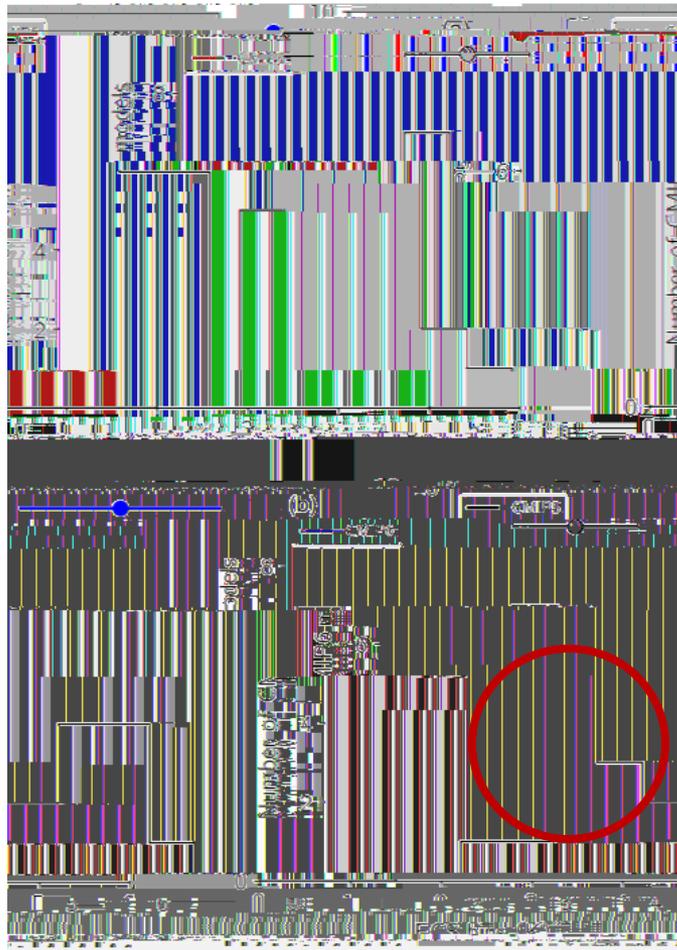
Percent change in population at risk of hunger by 2050



SSPs = Shared Socio-economic Pathways

1 Green Road; 2 Middle-of-the Road; 3 Rocky Road

Climate Sensitivity



Flynn and Mauritsen, 2020

Higher overall ECS in CMIP6, divergence in ESM ensemble

Table 2. List of CMIP6 models and their parameters.

Model	ECS	TGR	F _{2.0}
CMIP6-ESM	2.6	1.6	1.6

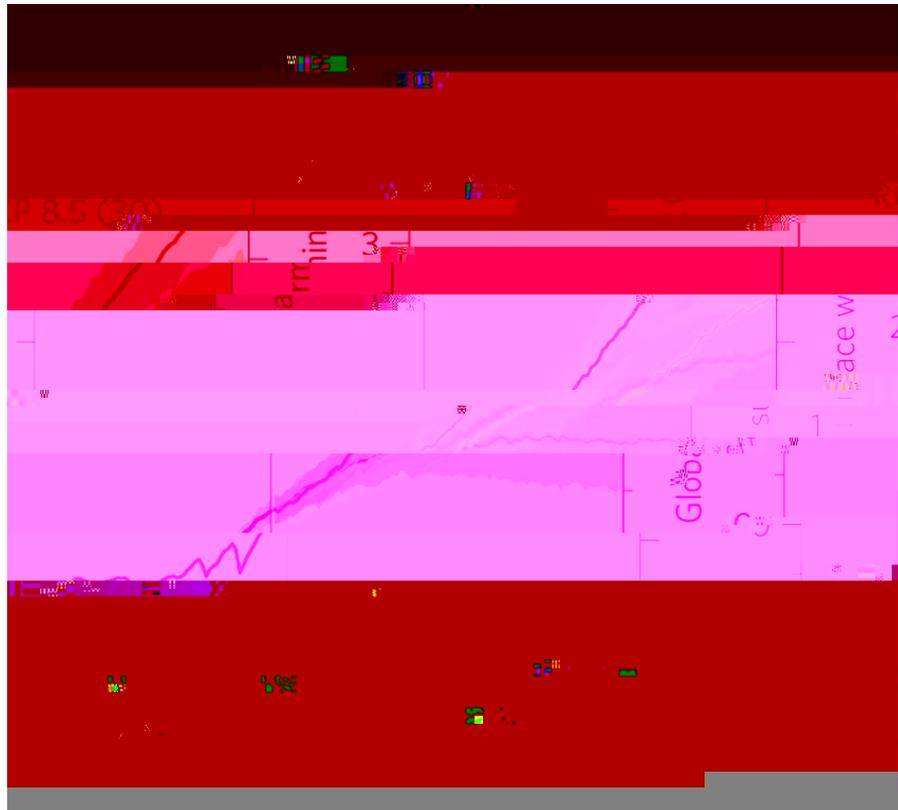
Table 2. List of CMIP6 models and their parameters.

Model	ECS	TGR	F _{2.0}
HadGEM	5.0	3.0	3.0
UKESM	5.0	3.0	3.0
CESM	5.0	3.0	3.0
CanESM	5.0	3.0	3.0
E3SM	5.0	3.0	3.0

Equilibrium Climate Sensitivity >5C → HadGEM, UKESM, CESM, CanESM, E3SM

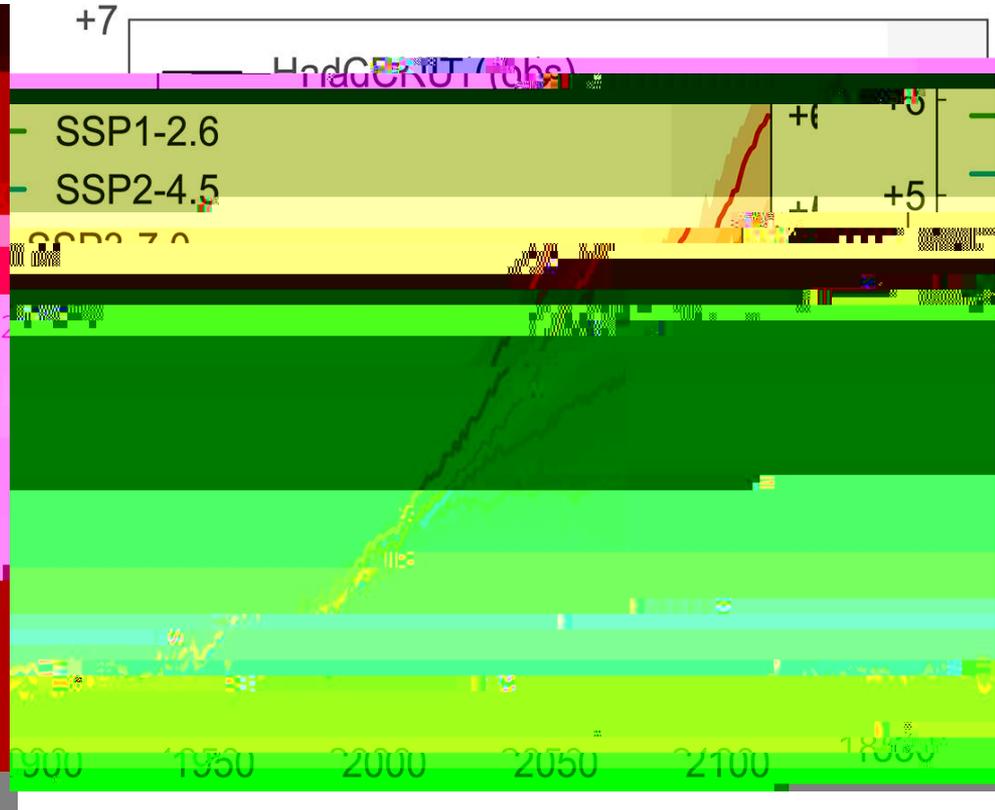
Temperature Anomalies

CMIP5



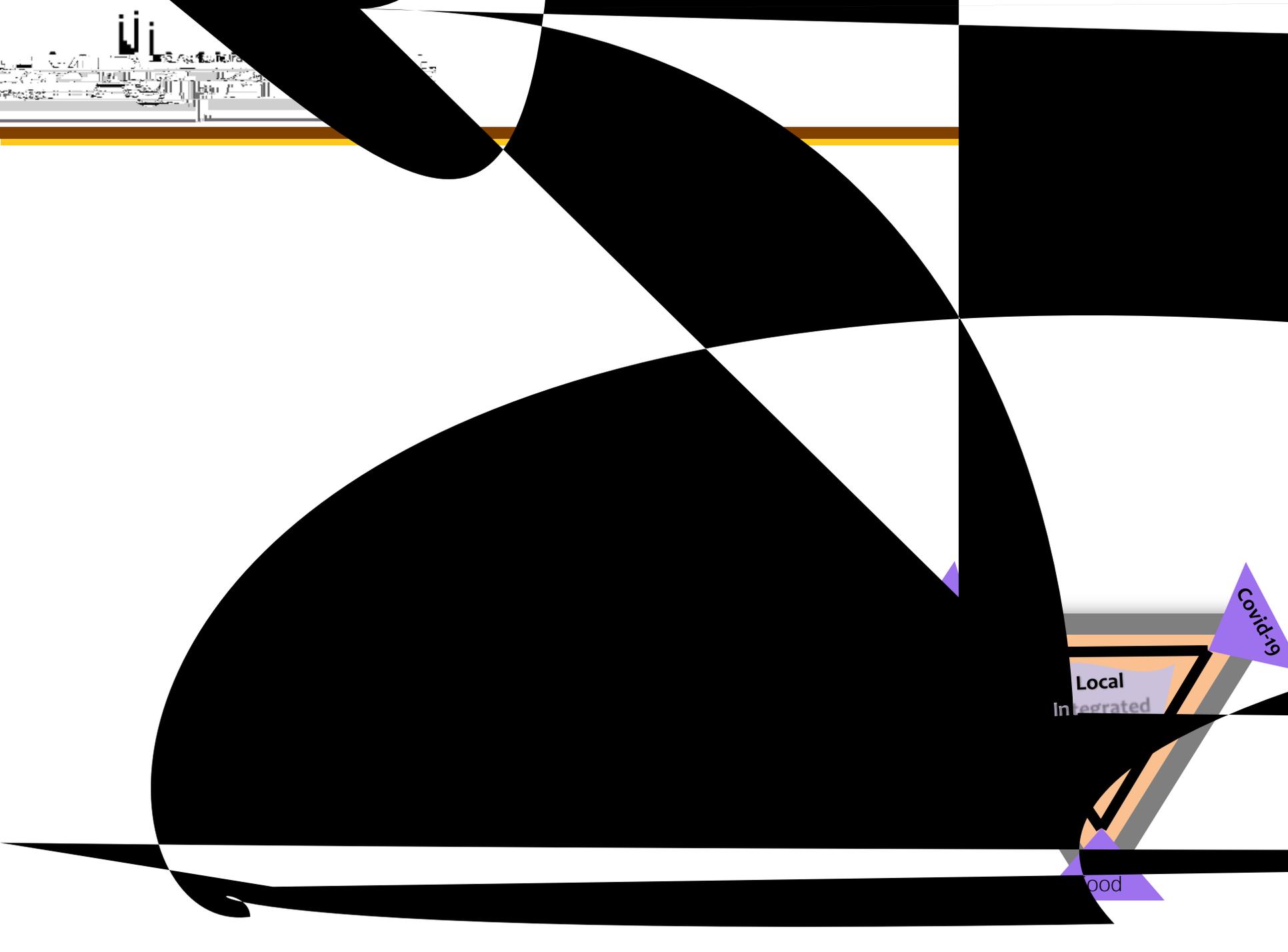
Knutti & ... , 2013, Nature Climate Change

CMIP6



Cook et al. 2020. Earth's Future





Local
Integrated

Covid-19

ood