

Researching Topic #3 -- SOCIETAL IMPACTS – EXTREME WEATHER EVENTS

[last revised 3/10/2021]

This prompt offers two kinds of help:

- A brief overview of the kinds of questions you might wish to explore as you study how climate change is likely to affect the food supply;
- A suggested strategy for how to search the literature as you prepare to write your paper.

OVERVIEW – CLIMATE AND EXTREME WEATHER EVENTS

Studies say that climate change will cause extreme events to become more intense and more frequent.

Types of extreme event said to be driven by climate change:

- Heat waves, record temperatures
- Heavy rain events; flood
- drought
- Fire, wildfire
- Glacial melt
- Sea level rise
- Hurricanes

CORE ISSUES for research

Predicted changes in frequency and intensity [may have already been addressed in the earlier discussion/lecture on the geophysics of climate change]. These events can include both single-moment “shock” events and changes in chronic conditions that cause accumulating damage over time.

Predicted impacts on aggregate food production

Predicted impacts on specific types of vulnerable communities

- Coastal cities inundated by rising seas
- Communities that lose a core economic activity (farming; fishing; recreation)
- Communities devastated by extreme event (fire; flood; drought; hurricane; etc.)
- Communities downhill from disappearing glaciers (water supply abundant, then dried up)
- Low lying islands

[NOTE: your research should also explore the various “downstream” impacts of extreme climate events: on agriculture; a nation’s or region’s ability to grow food
on public health
the economic costs of recovery
on the community’s and victims’ psychological states
... and other downstream impacts]

SUGGESTED STRATEGY FOR SEARCHING THE LITERATURE

I recommend the following sequence for searching the literature:

- 1 Start with a search of the most recent **reports from top scientific bodies and government agencies**;
- 2 Search **academic articles** using Google Scholar (scholar.google.com);
- 3 Do a **more general search** using Google or another search engine;
- 4 Search the **best newspapers** and **reputable climate websites**.
(NOTE that I do not suggest using Wikipedia.)

1 Search the most recent **reports from top scientific bodies and government agencies**

(NOTE: There are many excellent reports one can consult. You will find a lot of repetition, so you do not need to consult every source. Here I start with a handful of the most recent reports, followed by a more complete list.)

These publications should, in most cases, supply you with all you need:

IPCC's most recent full set of reports:

<https://www.ipcc.ch/report/ar5/>

EPA: <https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-society.html>

U.S. Global Change Research Program:

<https://science2017.globalchange.gov/> (the science)

<https://nca2018.globalchange.gov/> (the impacts)

American Meteorological Society:

www.ametsoc.net/sotc2017/StateoftheClimate2017_lowres.pdf

A more complete list of best scientific and governmental sources:

International

Intergovernmental Panel on Climate Change
United Nations Environmental Programme (UNEP)
World Meteorological Organization

Agencies of the U.S. federal government

Environmental Protection Agency (EPA)
National Oceanographic and Atmospheric Administration (NOAA)
National Aeronautics and Space Administration (NASA)
U.S. Global Change Research Program

Scientific bodies – U.S.

National Academic of Sciences
Climate Change at the National Academies (climatechange@nas.edu)
National Science Foundation

Other professional bodies – American Meteorological Society

2 Search **academic articles** using Google Scholar (scholar.google.com)

(NOTE: Narrow and focus your search by using several phrases in quotes – such as “climate change”. For example, if you are searching for how climate change will increase the frequency of extreme weather events, don’t just enter “climate change,” search, instead for” “climate change” AND “extreme weather events”)

Search terms to use (you may certainly choose others):

“climate change” AND x, where x can be:

Hurricanes
Heat waves, extreme temperatures
Fire, wildfire
Flood
extreme precipitation OR extreme rainfall
Coastal flooding
Drought

(NOTE: For some citations you find on Google Scholar, you can directly download the PDF. For other citations, you may be able to find and download PDFs if your University library offers on line access to academic journals.)

3 Do a **more general search** using Google or another search engine

Use the same search terms to do a general search on Google or another search engine. This will bring up information more recent than you find on scholar.google.com (it takes several years for research to be published in academic journals).

4 Search the **best newspapers** and **reputable climate websites**

New York Times, Washington Post, The Guardian

On line sources

Climate Central
GRIST
Society of Environmental Journalists
The Daily Climate
Climate Nexus
InsideClimate News
DeSmogBlog
Skepticalscience.com
Yale 350

(NOTE about on line sources: You will run into a lot of denialist disinformation on the internet, on websites, on blogs, on youtube. FYI, skepticalscience.com has a comprehensive list of denialist talking points (and refutations of those talking points). See, for example: <https://www.skepticalscience.com/argument.php>)

Finally, here are some good citations to help you get started:

“Wildfires to Hurricanes, 2017’s Year of Disasters Carried Climate Warnings,”
<https://insideclimatenews.org/news/29122017/hurricanes-fires-drought-2017-year-review-climate-change-disasters-new-normal>

“Quantifying the influence of global warming on unprecedented extreme climate events,”
<http://www.pnas.org/content/114/19/4881>

“Climate Change Behind Surge in Western Wildfires,”
www.climatecentral.org/news/climate-change-behind-surge-western-wildfires-20775

“Amplification of flood frequencies with local sea level rise and emerging flood regimes,”
<http://iopscience.iop.org/article/10.1088/1748-9326/aa6cb3#erlaa6cb3s8>

“When Rising Seas Hit Home: Hard Choices Ahead for Hundreds of US Coastal Communities,”
<https://www.ucsusa.org/global-warming/global-warming-impacts/when-rising-seas-hit-home-chronic-inundation-from-sea-level-rise#.W75zOPIRf1I>

An interactive sea level map: <https://seeing.climatecentral.org/#10/40.7301/-74.0067?show=lockinAnimated&level=5&unit=feet&pois=hide>

“Study: Persian Gulf could experience deadly heat,”
<http://news.mit.edu/2015/study-persian-gulf-deadly-heat-1026>

<https://e360.yale.edu/digest/very-hot-and-very-dry-conditions-have-doubled-worldwide-study-finds>

New for 2021 update of the website:

2019

Wildfires in California:

<https://www.theatlantic.com/science/archive/2019/07/climate-change-500-percent-increase-california-wildfires/594016/>

Flooding, U.S. Midwest:

<https://www.theguardian.com/us-news/2019/jun/03/so-much-land-under-so-much-water-extreme-flooding-is-drowning-parts-of-the-midwest>

Extreme weather impacted millions of people

<https://www.usatoday.com/story/news/nation/2019/03/29/extreme-weather-fueled-climate-change-disasters-hit-62-m-last-year/3304707002/>

2020

“Billion-Dollar Weather and Climate Disasters: Overview”

<https://www.ncdc.noaa.gov/billions/>

“2020 U.S. billion-dollar weather and climate disasters in historical context”

<https://www.climate.gov/news-features/blogs/beyond-data/2020-us-billion-dollar-weather-and-climate-disasters-historical>

“Record-breaking Atlantic hurricane season draws to an end”

<https://www.noaa.gov/media-release/record-breaking-atlantic-hurricane-season-draws-to-end>

“A look back at the horrific 2020 Atlantic hurricane season”

<https://yaleclimateconnections.org/2020/12/a-look-back-at-the-horrific-2020-atlantic-hurricane-center/>

California fires 2020

<https://www.fire.ca.gov/incidents/2020/> , <https://www.fire.ca.gov/stats-events/>