Behavioral Health Effects of Climate Change: Impact and Solutions

Jose Calderon-Abbo, M.D. FASAM

Med.Dir. UHC C&S LA CEA Optum

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Disclaimers

No conflict of interest to declare.

Helping People Live Healthier Lives

Objectives

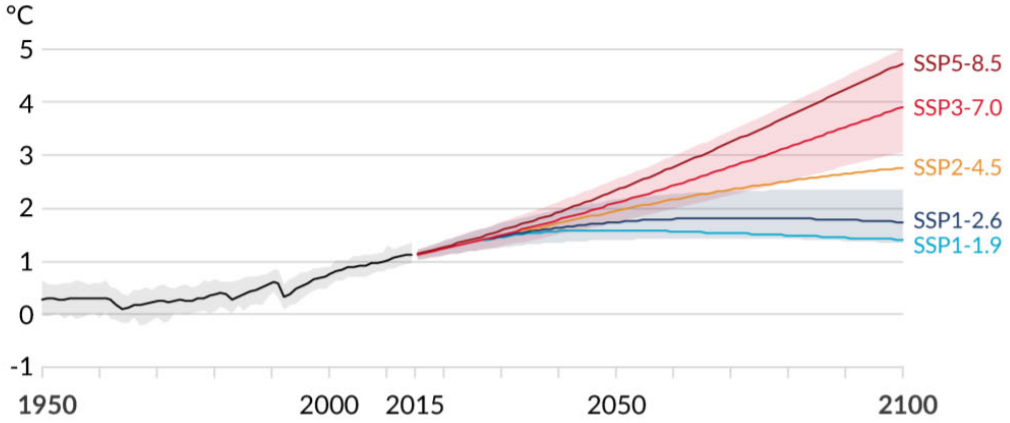
1. Brief overview
2. Behavioral Healthscape
3. BH Impacts
4. BH Opportunities
5. Appendix

Climate Change

The basics

Human activities affect all the major climate system components, with some responding over decades and others over centuries *Figure SPM.8*

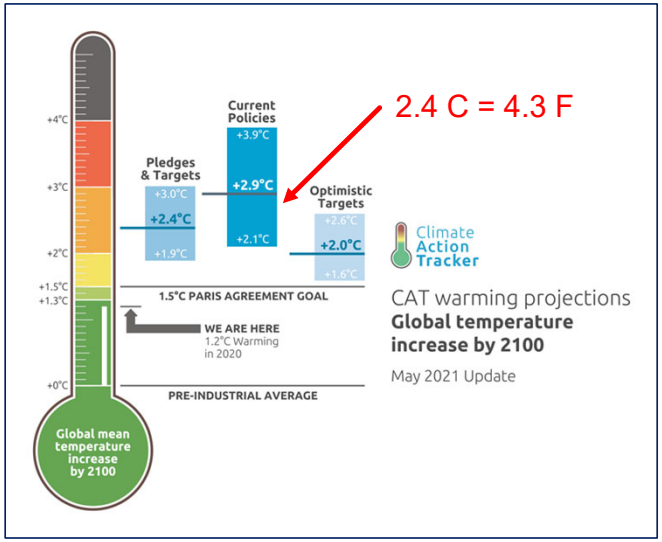
a) Global surface temperature change relative to 1850-1900



SIXTH ASSESSMENT REPORT
Working Group I – The Physical Science Basis

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP



https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

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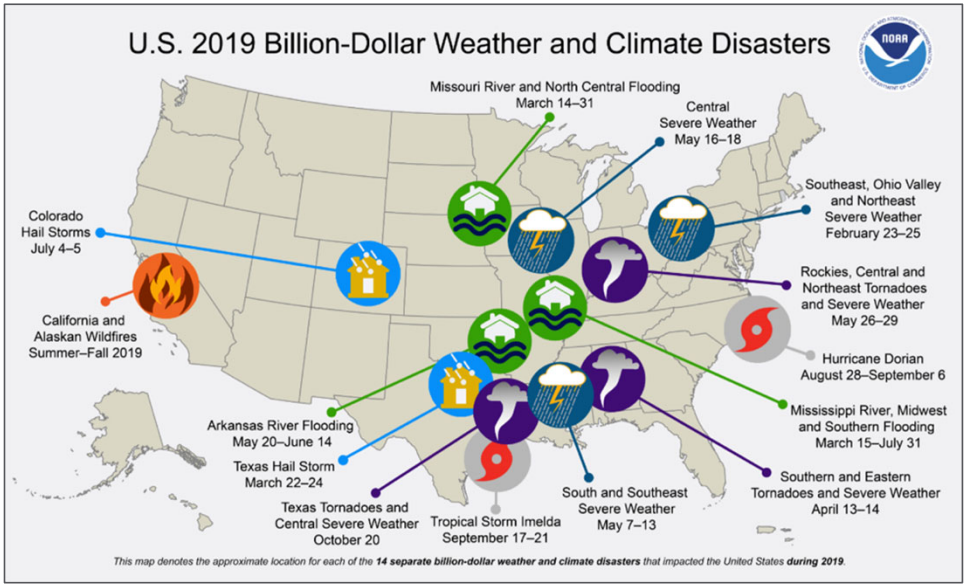
Why now? The Heat of Managing Care



Q1: How is weather affecting
Your life?
Our members?
Our employees?
Our customer's expectations?

How are **Climate Change** trends affecting
Our member's?
Our employees?
Our projections?
Our customers?

Since 1980, the U.S. has sustained 258 weather and climate disasters

Overall costs exceeding $1 billion per event, cumulative cost exceeding $1.75 trillion (NCEI 2020)

SE U.S. sea level rise and more frequent/stronger storms will cost an estimated $4-6 billion/year in property damage. (USGAO 2017)

Multi-layered events:

National Centers for Environmental Information, NOAA 2020. https://www.ncdc.noaa.gov/billions/
United States Government Accountability Office USGAO 2017. Climate change: information on potential economic effects could help guide federal efforts to reduce fiscal exposure. https://www.gao.gov/assets/690/687466.pdf

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"What do you mean you won't paddle any more??!
-I'm surprised Hernandez!!
Are we or are we not in the same boat??"

Quino

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Climate Instability as an Environmental Determinant of Health

- Climate change and extreme weather events are *risk multipliers*
- We are all exposed,…but not equally exposed.
- Vulnerable populations:
  - By geography, and socio-economic status
  - Children
  - +65
  - Women
  - Minorities, racial, ethnic
  - subgroups hard accessing health (migrants, LGBT)
  - Those with chronic relapsing conditions
    - SMI, SUD's, anxiety disorders, PTSD and trauma spectrum, DD, grief
  - By affecting the most vulnerable, climate driven events are magnifiers of existing socio-economic, racial and health inequities. (Watts 2018; Ragavan 2020)
- Health Equity

Photo: Chris Granger / The Times-Picayune / New Orleans Advocate

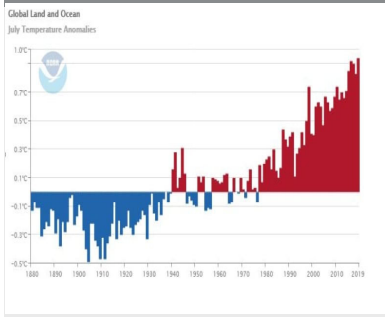
Watts, N., ate al (2018). The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come. Lancet, 392(10163), 2479-2514.
Ragavan, MI et al (2020). Climate Change as a Social Determinant of Health. Pediatrics, 145(5).

Behavioral Health Effects of Climate Change & Opportunities

Direct Effects

Indirect Effects

Overarching Effects



Communications

Predictive Analytics

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Climate Related Health Effects

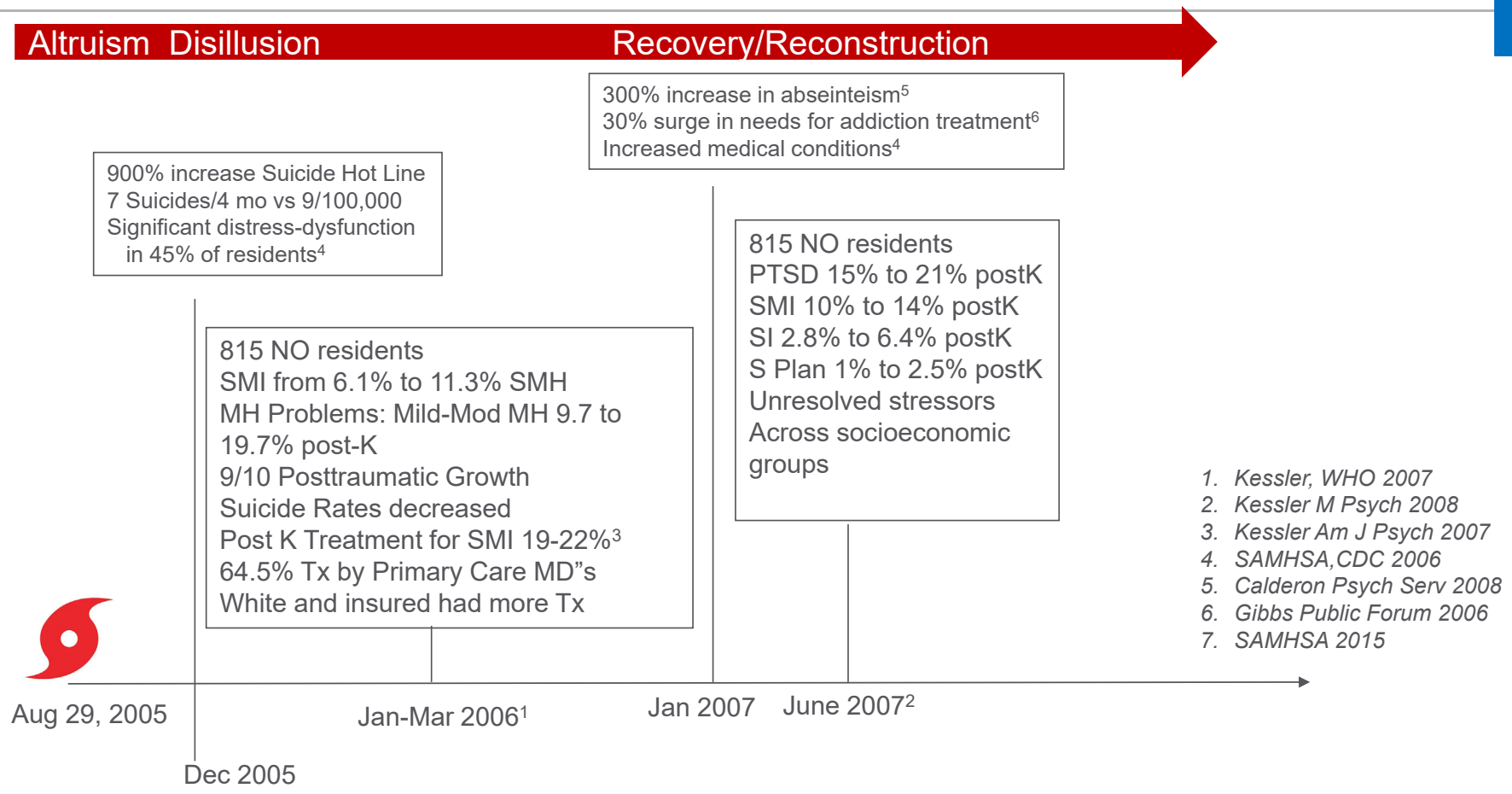
1. Asymptomatic
2. Acute
3. Sub-acute
4. Chronic

Int J Pub Health 2010; 55(2): 123-32
Int J Pub Health Syst 2018(12):28

Direct	Indirect	Overarching
• Heat illness • Dehydration • Injury • Decompensation of medical and BH • Anxiety, stress • Trauma, PTSD • Worsening of medical and BH conditions • Grief (direct losses) • Water/food born disease	• Power loss • Income loss • Potable water • Nutrition • Food production • Wastewater • Depression • Substance use • Despair, suicide • BH access • Response capacity • Altruism, cooperativeness, PT growth • Vector born diseases (Lyme, Zika) • Violence	• Psychotherratic Syndromes • Anticipatory Grief • Ecoanxiety/ eco-distress Ecoparalysis • Denial • Solastalgia & Grief • Migration • Human trafficking/ exploitation • Conflict • Polarization • Action, activism

Berry, HL et al (2010). Climate change and mental health: a causal pathways framework. International journal of public health, 55(2), 123-132.
Hayes K et al (2018). Climate change and mental health: Risks, impacts and priority actions. Int J Mental health sys, 12(1), 1-12.
Centers for Disease Control and Prevention (2014). https://www.cdc.gov/climateandhealth/effects/default htm
Cunsolo A et al Ecological grief as a mental health response to climate change-related loss.
Nat Clim Change. 2018; 8: 275-281

Mental Health Post-Katrina



1. *Kessler, WHO 2007*
2. *Kessler M Psych 2008*
3. *Kessler Am J Psych 2007*
4. *SAMHSA,CDC 2006*
5. *Calderon Psych Serv 2008*
6. *Gibbs Public Forum 2006*
7. *SAMHSA 2015*

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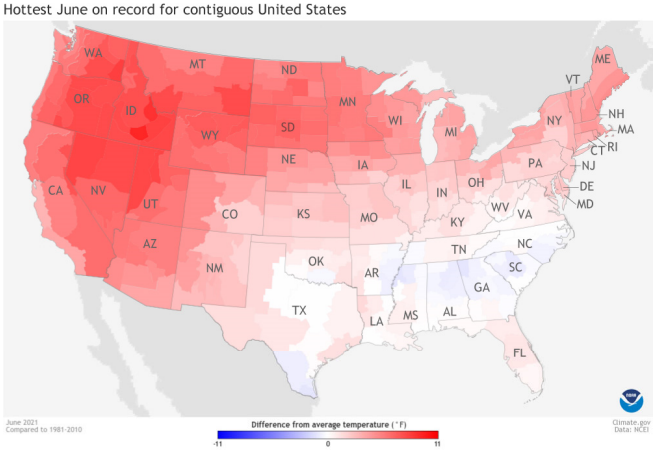
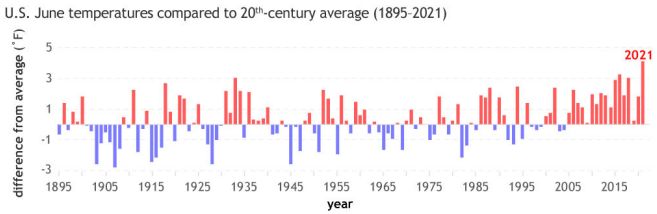
Heat, Heat Waves, Behavioral Health Impact

Heat spikes lasting days above normal average.

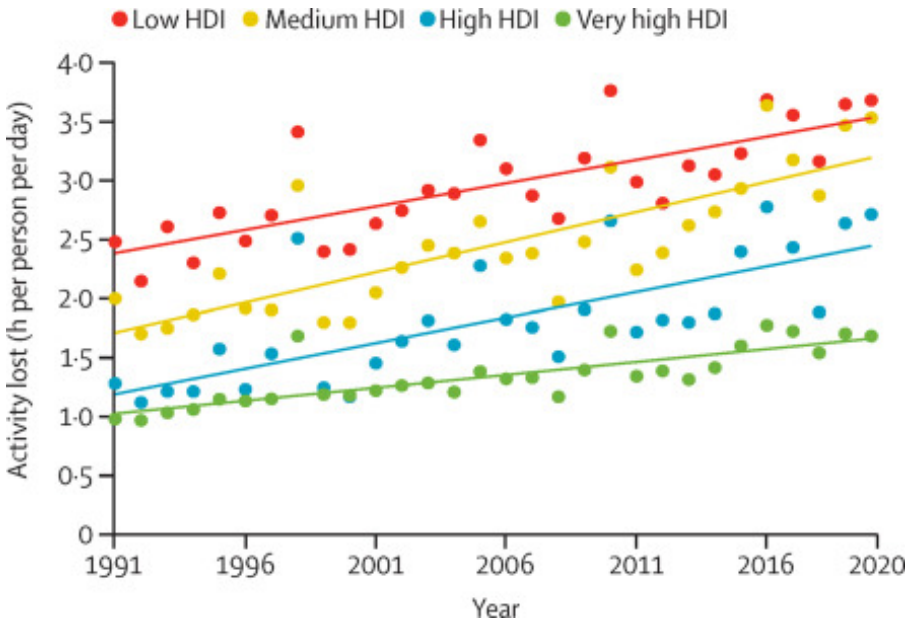




- SMI x3 risk of death during HW
  - Direct exposure, workers (construction and agriculture)
  - Psychotropic medications & drugs
  - Socio-economic status, age, gender, race (work-type)
  - Suicides 0.7% and declining mental wellbeing talk on social media per 1°C above average Nat Climate Change 2018; 8(8): 723-9
  - 4% IT aggression , 14% violence between groups
    Science 2013; 34[6151]: 1235367

APA (2017) Mental Health and Our Changing Climate: Impacts, Implications and Guidance. Washington, DC.

Indirect & Long-Term BH Effects on SDoH



Average hours of safe physical activity lost per person due to high wet bulb globe temperature by 2019 HDI country group (1980–2020)

Work hrs./income loss: 295 billion hrs. of potential work lost across the globe in 2020 due to heat exposure—(i.e., 88 work h per employed person).

Outdoor workers and outdoor recreational activates are most impacted.

Romanello M et al (2021):The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy future. Vol 398 (10311): 1619-1662. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01787-6/fulltext

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Climate Change and Extreme Weather Events

Impact on Behavioral Health

- Extreme weather events increase depression, anxiety, stress, trauma, worsening of medical
  2018)
- Local heatwave exposure found to increase 155% negative expressions on Twitter.
- Baton Rouge, Louisiana–area flood (August 2016) caused a
  - 66% and 44% increase in substance use and depression related health visits
  - BH services residential (+249%), inpatient (+98%), outpatient (+59%)
  - Accruing an 8-10%% increase in payments over a 10-month period. (Phillippi 2
- Elderly survivors of hurricane Katrina who had PTSD, showed a 70% higher risk o
  12-24 months. (Lenane 2019)

Hayes K et al (2018). Climate change and mental health: Risks, impacts and priority actions. Int J Mental health sys,
Phillippi, SW et al (2019). Medicaid utilization before and after a natural disaster in the 2016 baton rouge–area flood. A
Lenane, Z. et al (2019). Association of post-traumatic stress disorder symptoms following Hurricane Katrina with incident
among older adults with hypertension. Am J Psychiatry. 27(3), 310-321.
Romanello M et al (2021):The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy f

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The Discrete and Gradual BH Effects

- historical climatic conditions and the mental health of 2 million randomly sampled US residents (2002 and 2012)
- Center for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) + pairing meteorological data
- "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
- short-run meteorological exposure, multiyear warming, and acute exposure to natural disasters.

Obradovich, N.(2018). Empirical evidence of mental health risks posed by climate change. PNAS, 115(43), 10953-10958.

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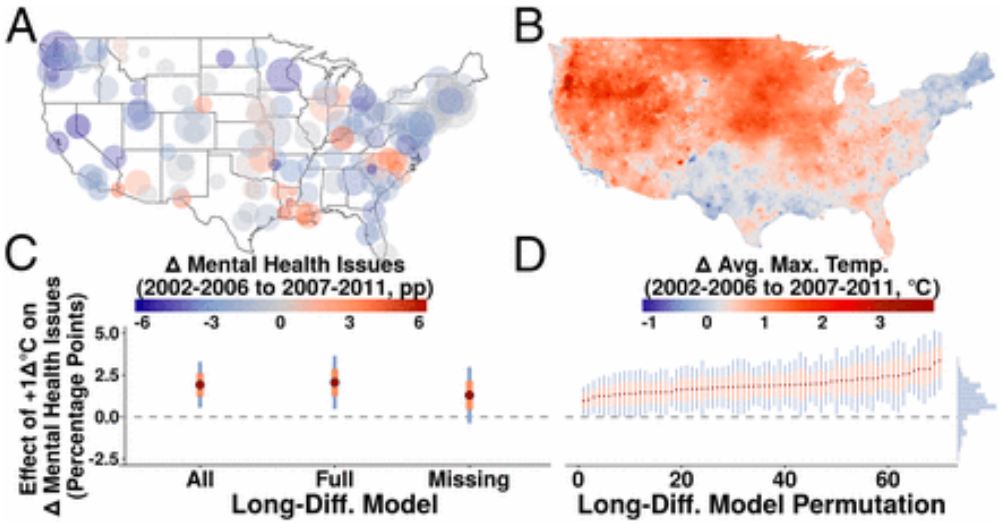
Empirical evidence of mental health risks posed by climate change

- Monthly average max. temp. >30 °C increases probability of mental health issues by over 0.5% ($P < 0.001$)
- 5-year warming of 1 °C above average is associates with 2% increase in prevalence of reported mental health issues ($p = 0.007$).
- Months >25 d of precipitation increase the probability of mental health issues by 2% ($P < 0.001$).



Obradovich, N.(2018). Empirical evidence of mental health risks posed by climate change. PNAS, 115(43), 10953-10958.

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Green Space and positive wellbeing

Wood, L et al (2017). Public green spaces and positive mental health–investigating the relationship between access, quantity and types of parks and mental wellbeing. Health & place, 48, 63-71.
Barton, J. et al (2017). The importance of greenspace for mental health. BJPsych international, 14(4), 79-81.

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Psychoterratic states (mind-earth states)[1] and other.

- Solastalgia[1]: existential and psychological feelings people have when their environment undergoes profound change or degradation.
- Eco-Grief[2], Anticipatory Grief[3] Anticipatory Anxiety, Pre-Traumatic Stress
- Eco-anxiety and Eco-paralysis
- Existential dread (i.e., #Birthstrike)
- Phases of active engagement [4]

  Idealism → guilt → nihilism → self care → hope → efficacy → resilience

1. Wen, Y. et al (2019). Medical empirical research on forest bathing (Shinrin-yoku): A systematic review. Environmental health and preventive medicine, 24(1), 1-21.
2. Albrecht Glenn Earth Emotions: New Words for a New World. Ithaca, NY. Cornell U. Press. 2019.
3. Counselo A, Ellis Neville (2018): Ecological Grief as a mental health response to climate change –related loss. Nat Clim Change. 8: 275-81.
4. Spark Amy (2016): Mourning the Ghost. Ecological Grief in the Ghost River Valley. Master's Thesis . U. Edinburgh.
5. Ray Sarah J (2020): A Field Guide to Climate Anxiety. U. of California Press..

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Supporting Resilient Communities

Photo: Carolyn Van Houten/National Geographic

http://www.isledejeancharles.com/our-resettlement

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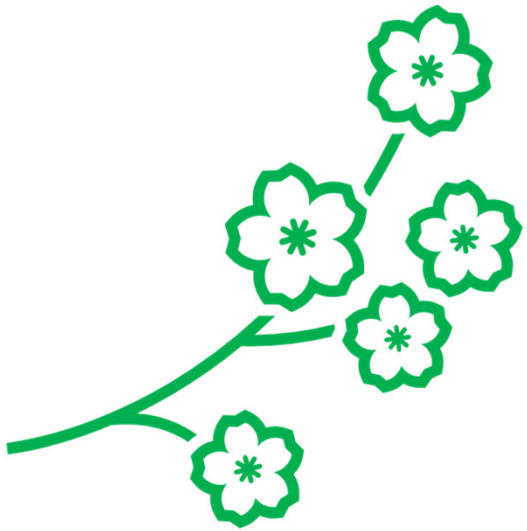
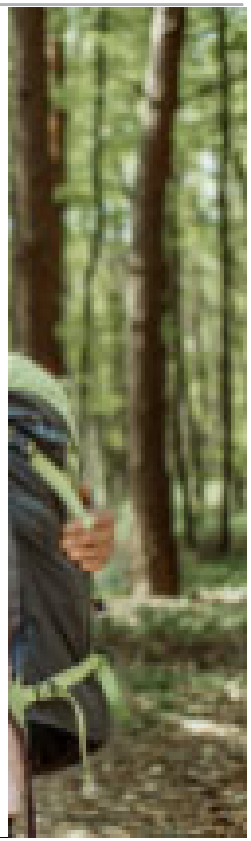


C.C. Behavioral Health

Solutions

Although the wind
blows terribly here,
the moonlight also leaks
between the roof planks
of this ruined house.



Izumi Shikibu, “Although the wind” Trans. Jane Hirshfield and Mariko Aratani. The Ink Dark Moon. Copyright © 1990 Vintage Books 1990.

“If you think you are too small to make a difference, try sleeping with a mosquito”

H.H. Dalai Lama

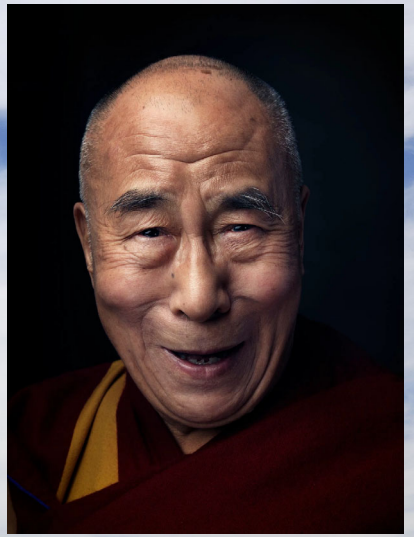


Photo: Marco Grob for TIME , 2014.

Solutions, Mitigation and Resilience

Supporting Individuals and Populations

Build belief in one own's resilience
Practice Gratitude, Distress Tolerance
Disaster Preparedness

Health Behaviors
Maintain practices that provide a sense of meaning

Promote social connection to family, friends, sponsors, peer support, place, culture, food, and community

Cultivate active coping skills for emotional regulation
Mind-Heartfulness ,MBM-Skills Groups
Good Grief Groups
Network for Grateful Living

Volunteerism
Meaningful emotional investments

Behavioral Health Screening
Behavioral Health Access
Equity

1. Clayton, S. et al. (2017). Mental health and our changing climate: Impacts, implications, and guidance. Washington, DC:
2. American Psychological Association and ecoAmerica.
3. Cunsolo A et al (2020) Ecological grief and anxiety: the start of a healthy response to climate change? Lancet Psychiatry 4(7): E261-E263.
4. Jones, L. et el (2020). Mind-Body Skills Groups: A Possible Approach for Addressing Adolescent Depression in Primary Care. J Adolesc Health, 66(2), S5-S6.

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Solutions, Mitigation and Resilience

The Activation Narrative

BARRIER

- "Infowhelms"
- Apocalyptic
- Guilt-Shame
- Binary-polarizing

SOLUTION

- Plain universal language
- is personal and local
- People trust the messenger
- Target audience
- Address concrete
- Learn from HIV/AIDS, Anti-Tobacco movement

TOOLS

- ↑Distress Tolerance
- ↑ Emotional Regulation
- ↑ Health Behaviors
- Critical Thinking
- Resilience awareness
- Person Centered
- Sphere of influence
- Start Small
- Tending and Befriending

1.Funk C., Tyson A. Pew Research Center. https://pewrsr.ch/3p0c7jR
2.Ray SJ A field guide to climate anxiety. U.C Press 2021.
3.John Marshall TED "3 strategies for effectively talking about Climate change".
https://www.ted.com/talks/john_marshall_3_strategies_for_effectively_talking_about_climate_change?language=en

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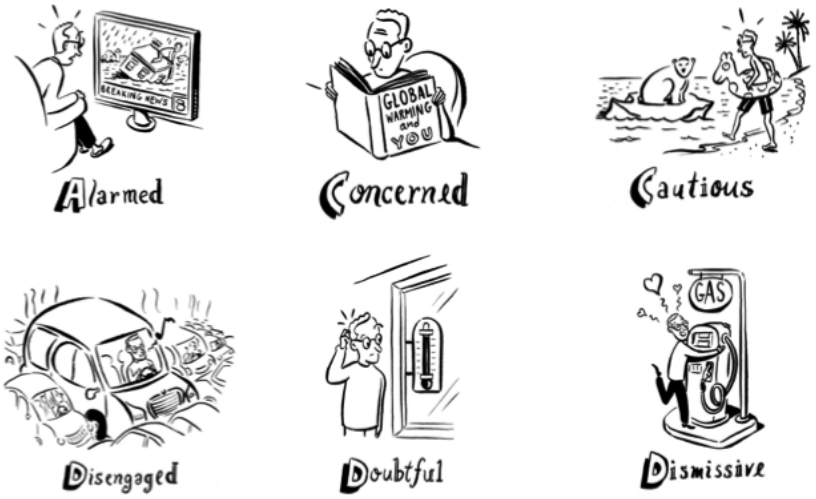
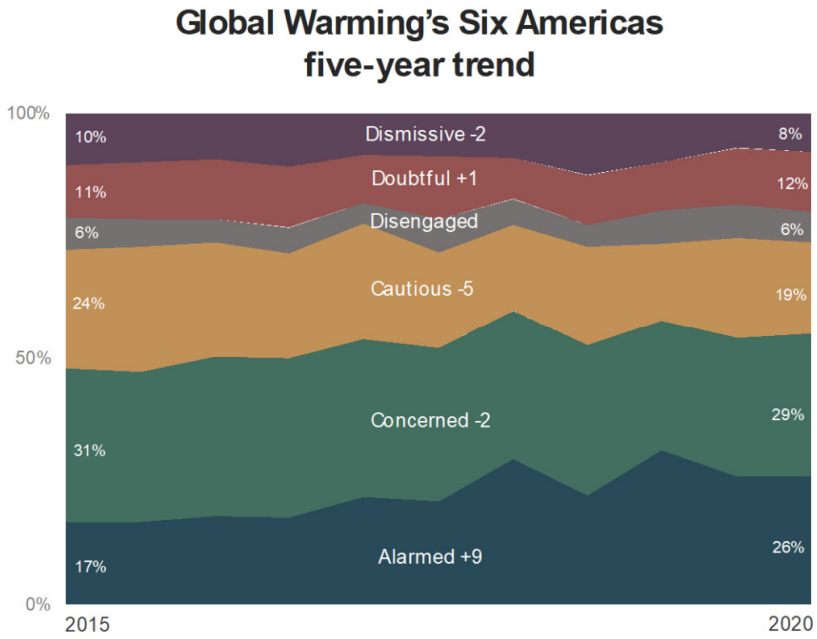
Six America's Project

Yale Program on Climate Change Communication





Data from 11 waves of the *Climate Change in the American Mind* national survey.

Maibach, EW et al. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. PloS one, 6(3), e17571.

https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/

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Solutions, Mitigation and Resilience

What Can Healthcare Professionals Do?

01

Become climate-literate

02

Engage with public and health professionals, build resilient systems

03

Be vocal, cast a shadow, educate, shape narrative, “avoid infowhelming” and catastrophizing

04

Start where you are: Professional organizations. local, national and international climate-health solutions

05

Self Care

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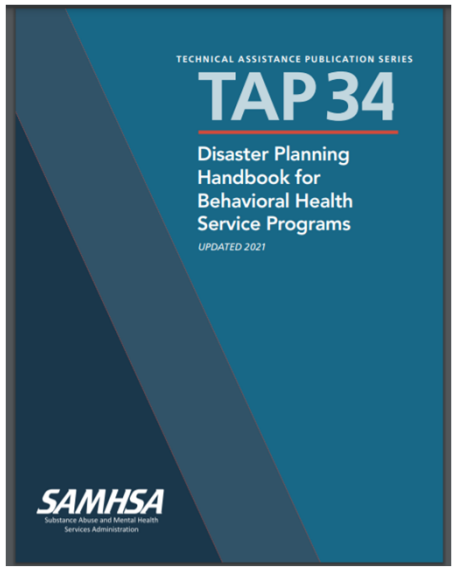
Provider Disaster Planning and Adaptation Tools



Climate Change and Health

Vulnerability and Adaptation

Assessments (CCHVAA) -WHO

Emergency Preparedness Toolkit Primary Care Providers.ashx (diversitypreparedness.org)

- Resources for Emergency Health Professionals|Emergency Preparedness & Response (cdc.gov)
- Public Health Emergency www.phe.gov

SAMHSA Disaster Mobile App. https://store.samhsa.gov/product/samhsa-disaster

https://www.samhsa.gov/dtac/webinars-podcasts/resiliency-in-disaster-behavioral-health

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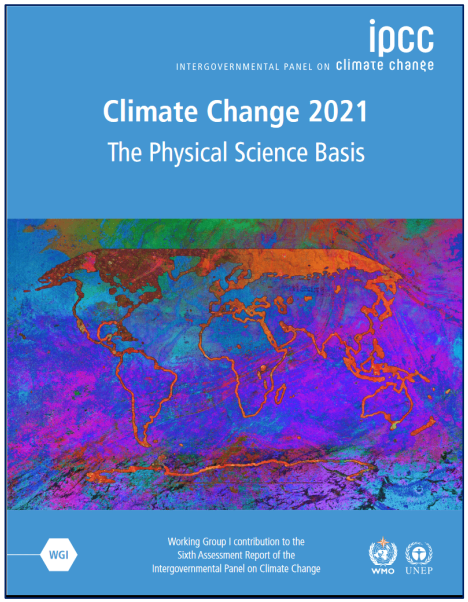
The Latest…

The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future



https://ukcop26.org/

2021 Report - Lancet Countdown

AR6 Climate Change 2021: The Physical Science Basis — IPCC

https://www.who.int/news-room/events/detail/2021/11/06/default-calendar/2021-global-conference-on-health-and-climate-change

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What can we do as an organization?

1. Being curious:
   - Our members
   - Our providers
   - Our customer's expectations
   - Our employees
2. Letting our values lead the way towards solutions

"The journey of a thousand miles starts with one step"

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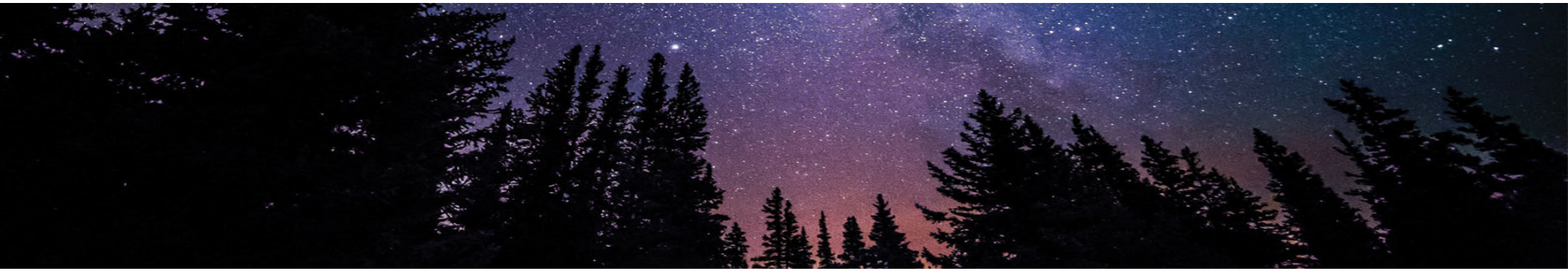

When despair for the world grows in me
and I wake in the night at the least sound
in fear of what my life and my children's lives may be,
I go and lie down where the wood drake
rests in his beauty on the water, and the great heron feeds.
I come into the peace of wild things
who do not tax their lives with forethought
of grief. I come into the presence of still water.
And I feel above me the day-blind stars
waiting with their light. For a time
I rest in the grace of the world, and am free.

The Peace of Wild Things

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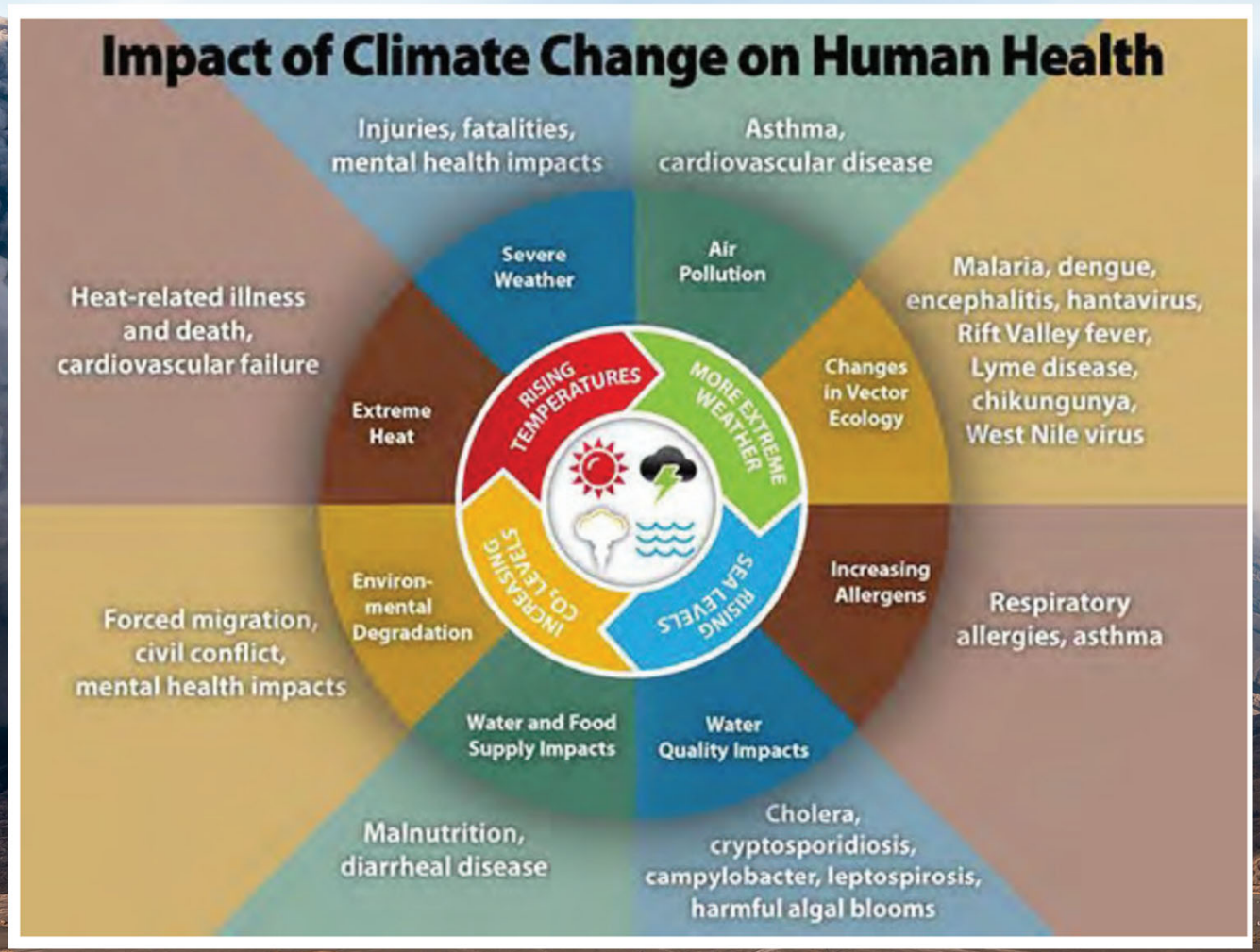
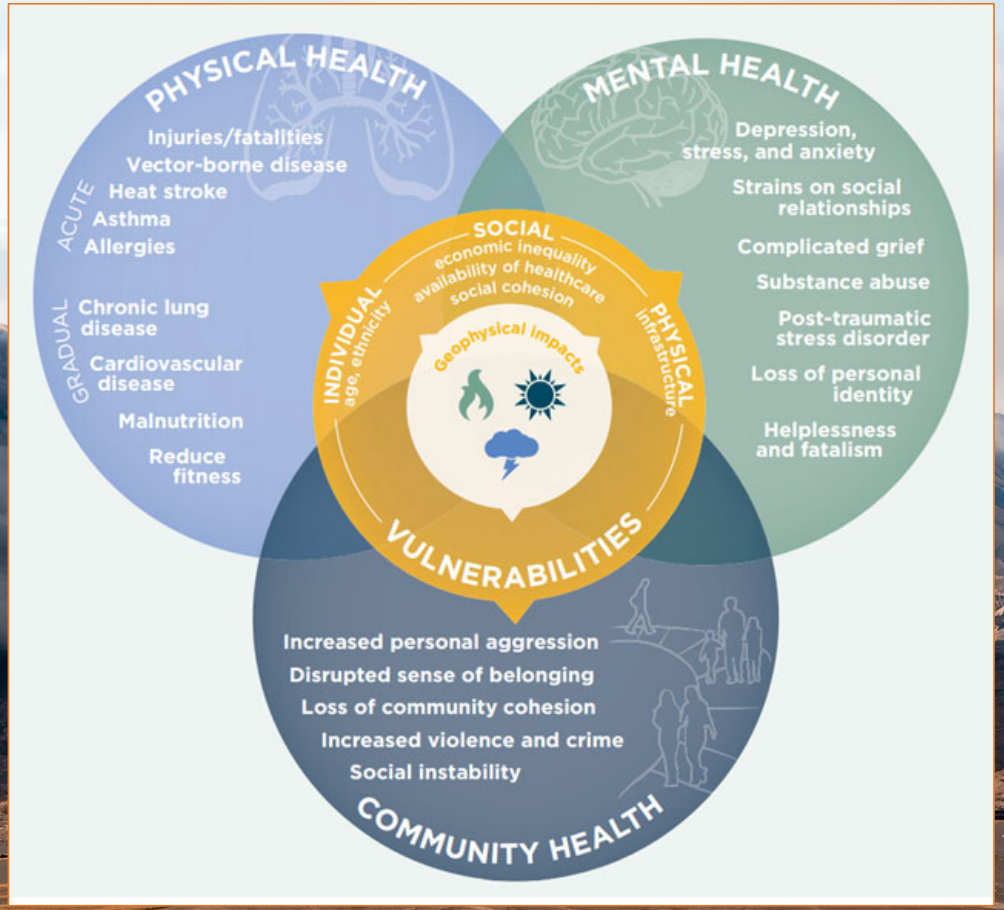
Appendix

1. Health and climate
2. Disaster phases
3. Acute and long-term climate events
4. Professional organizations involved in climate change
5. General resources, organizations



Centers for Disease Control and Prevention (2014). https://www.cdc.gov/climateandhealth/effects/default.htm

Physical Impacts, Mental Health and Community Wellbeing.



Clayton, S. et al. (2017). Mental health and our changing climate: Impacts, implications, and guidance. Washington, DC: American Psychological Association and ecoAmerica.

Phases of Disaster

SAMHSA (2015): Crisis Counseling Assistance and Training Program Guidance. https://www.samhsa.gov/sites/default/files/images/fema-ccp-guidance.pdf

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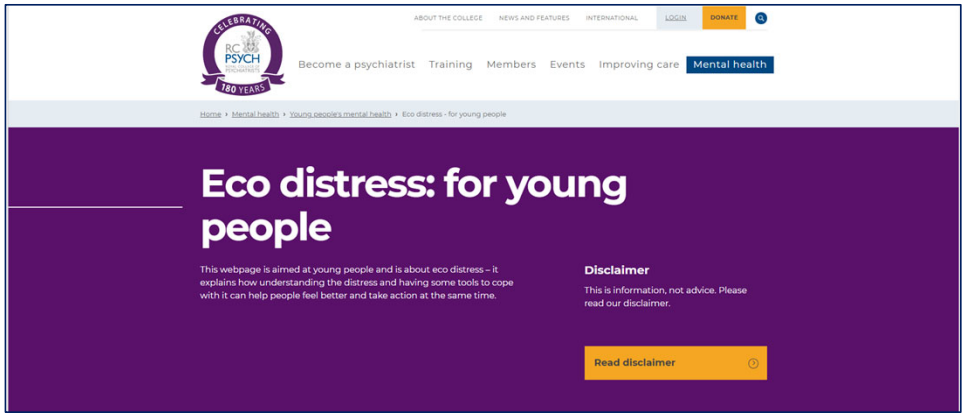
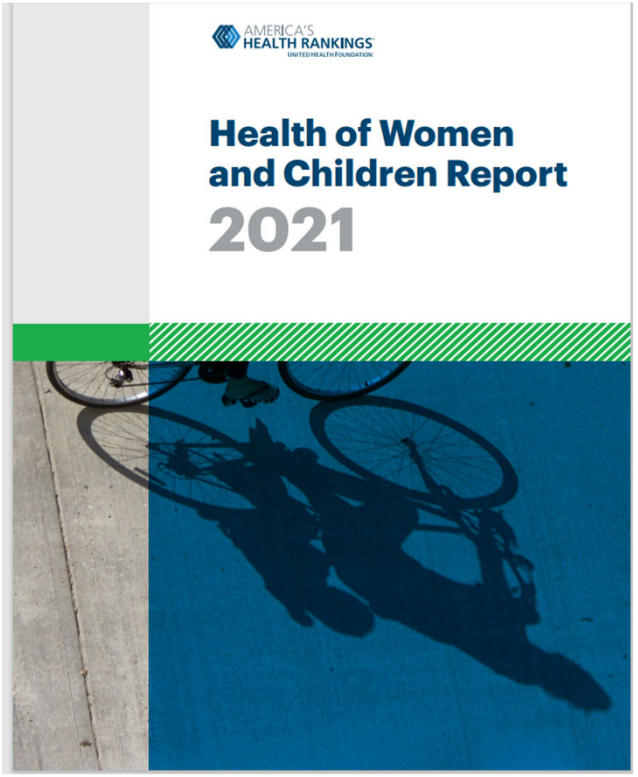
The Latest…





https://www.rcpsych.ac.uk/mental-health/parents-and-young-people/young-people/eco-distress---for-young-people
https://assets.americashealthrankings.org/app/uploads/hwc2021-report.pdf

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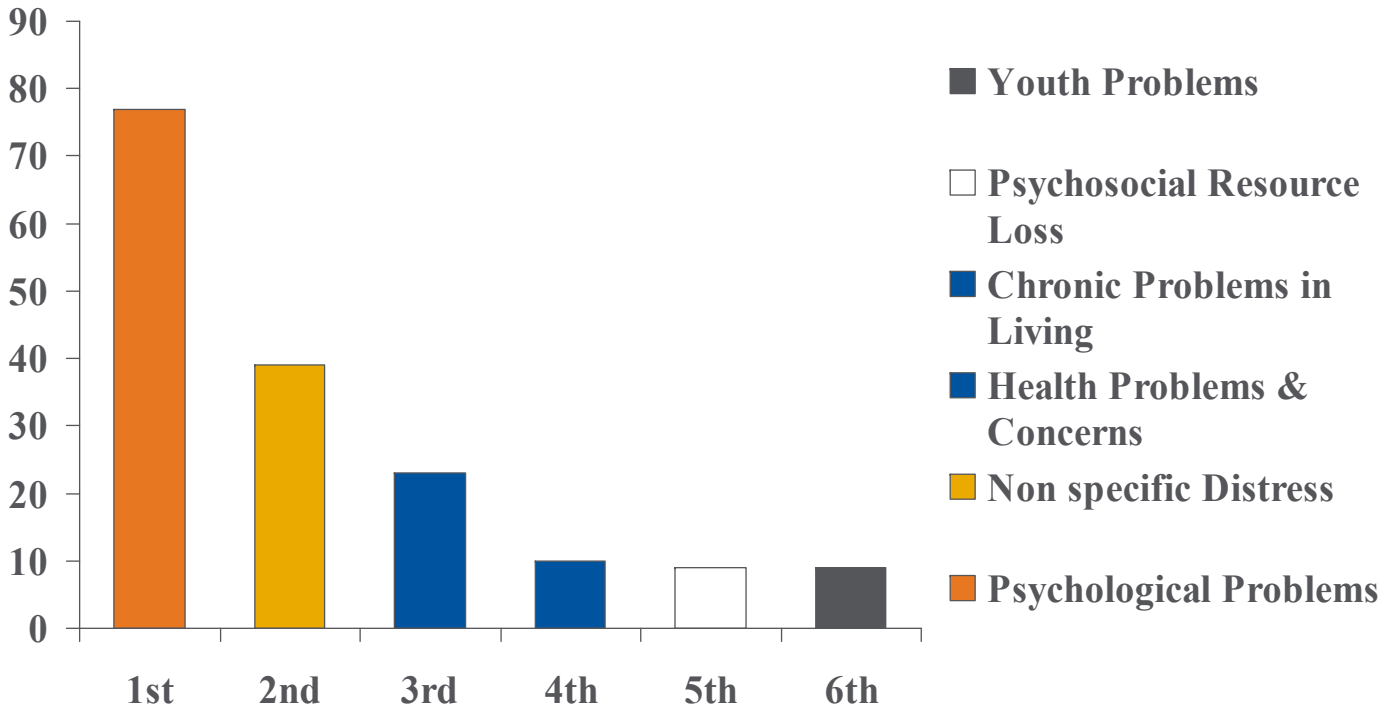
Six most common BH problems after disasters



Norris, FH et al . (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry: Interpersonal and biological processes*, *65*(3), 207-239.

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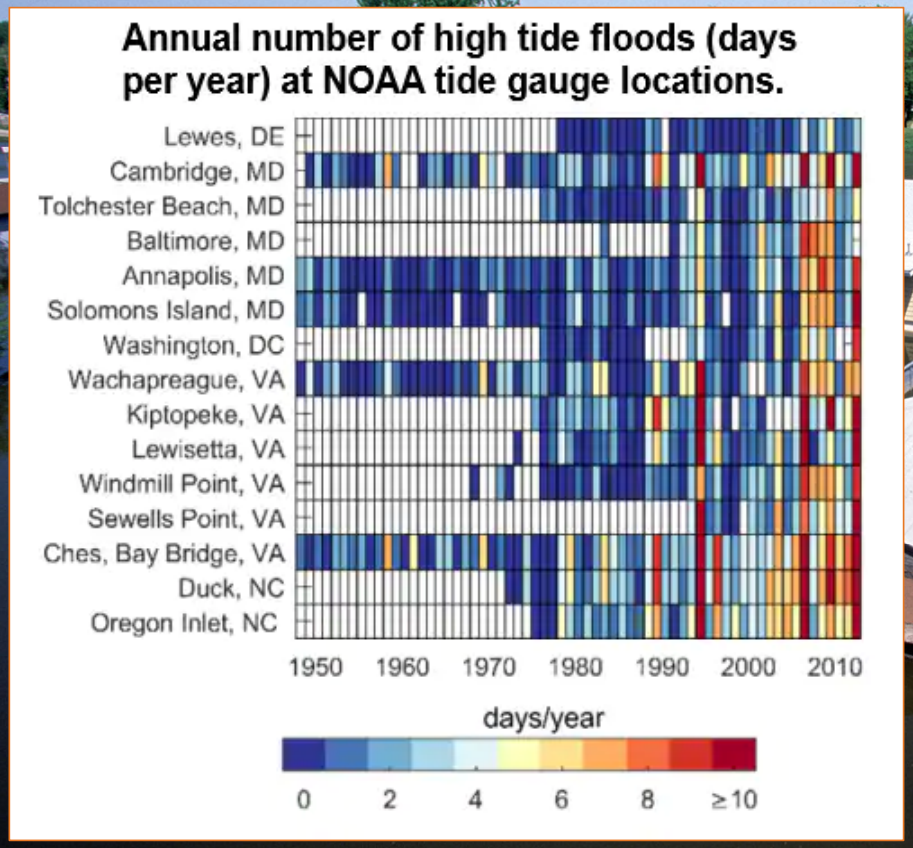
East Coast storm bringing worst coastal flooding since 2003 to parts of Mid-Atlantic

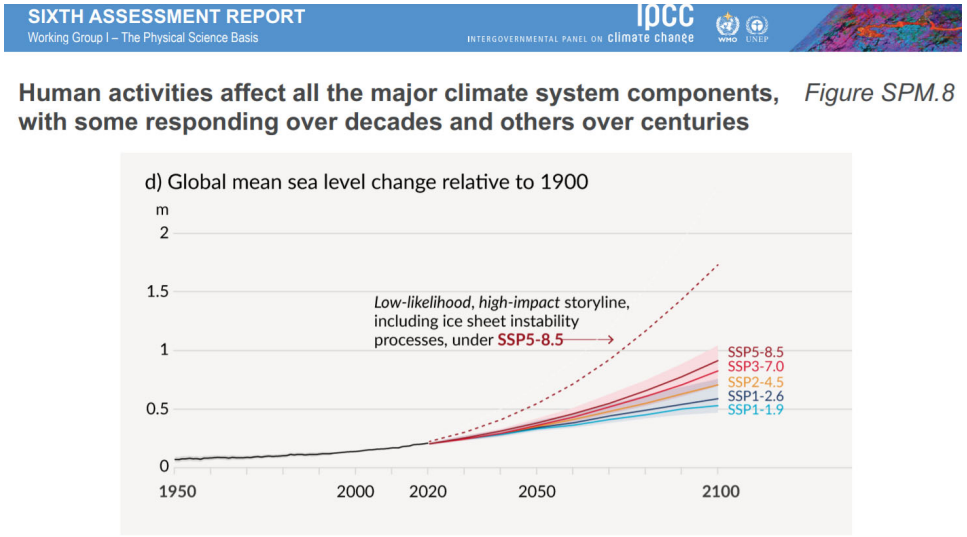
Matthew Cappucci, The Washington Post. Oct 29, 2021

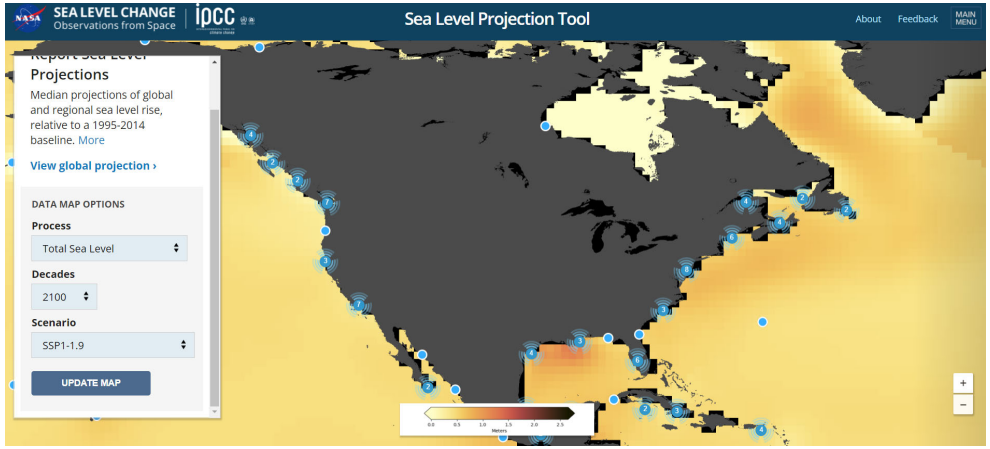


https://www.cleveland.com/news/2021/08/us-army-corps-of-engineers-project-will-prevent-flooding-of-the-cuyahoga-river-in-independence.html

IPCC AR6

Sea Level Rise





IPCC AR6 Report (2021) https://www.ipcc.ch/report/ar6/wg1/#SPM
NASA IPCC AR6 Sea Level Projection Tool (2021) https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool
https://www.fema.gov/flood-insurance/risk-rating

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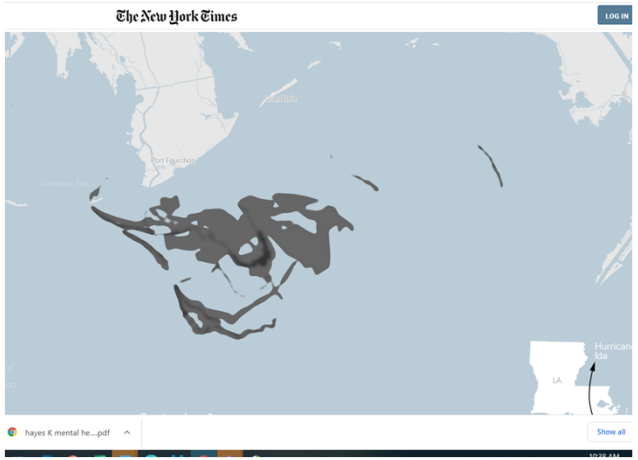
Environmental pollution & Behavioral Health

55 oil spills post Ida.

10 M gallons in the Gulf since 2005 (same as Exxon Valdez)



Deep Water Horizon 120M gallons

Psychological Adversity from:

- Negative media coverage
- Harm to ecosystems/wildlife (fisheries)
- Disruption of local industry (fishing, o9il exploration, tourism)
- Physical health effects
- Previous disasters (Katrina & Rita 2005; Isaac 2008; Ida 2021)

- Deep Water Horizon associated with increased PTSD and depression; both in residents AND cleaning crews.

Osofsky, H. et al (2011). Deepwater Horizon Oil Spill: Mental Health Effects on Residents in Heavily Affected Areas. Disaster Med Public Health Prep 5(4), 280-286.
Kwok, R. K. et al (2017). Mental health indicators associated with oil spill response and clean-up: cross-sectional analysis of the Gulf STUDY cohort. Lancet Pub Health, 2(12), e560-e567.

Air Pollution and COVID-19: A Double Whammy for African American and Impoverished Communities in Cancer Alley

Terrell K; Wesley J 2020.

- PM 2.5 is a leading factor associated with excess deaths. (Cohen 2017; Burnett 2018)
- Higher pollution burdens (PM2.5) highest for African Americans; higher unemployment rates, higher poverty rates, and larger percentages of seniors (aged 65+) living in poverty. Disparities in Cancer Alley.
- Highest covid mortality in 8/10 parishes in Cancer Alley, not driven by diabetes prevalence, obesity prevalence, smoking, age, or socioeconomic factors.

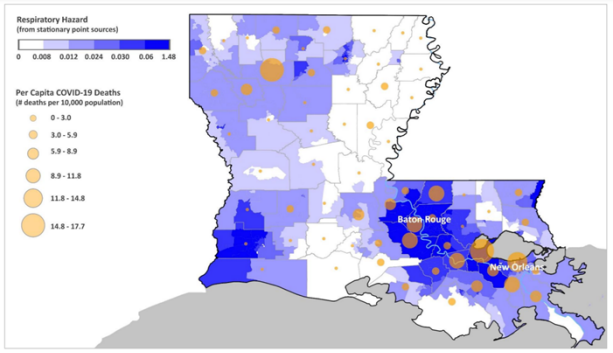


Figure 1. Respiratory Hazard (purple shading) by census tract, relative to parish-level per capita COVID-19 death rates through May 12, 2020 (circles). Hazard values are from stationary point sources of pollution only (i.e. excluding vehicles and other mobile or nonpoint sources). See methods for data sources.

Cohen et al Estimates and 25-year trends of the global burden of disease attributable to ambient air pollution: an analysis of data from the Global Burden of Diseases Study 2015. Lancet 2017;389:1907–1918.

Burnett et al Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter. Proc Natl Acad Sci 2018;115:9592–9597.

Terrell, K. A., & James, W. (2020). Racial Disparities in Air Pollution Burden and COVID-19 Deaths in Louisiana, USA, in the Context of Long-Term Changes in Fine Particulate Pollution. Environmental Justice.

Wu, X., et al , 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science advances, 6(45), p.eabd4049.

Solutions, Mitigation and Resilience

What Healthcare Professionals Can Do

What Healthcare Professionals Can Do

LANCET COUNTDOWN: TRACKING PROGRESS ON HEALTH AND CLIMATE CHANGE

US Climate and Health Alliance

ipcc INTERGOVERNMENTAL PANEL ON climate change

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH | C-CHANGE CENTER FOR CLIMATE, HEALTH, AND THE GLOBAL ENVIRONMENT

https://www.edx.org/course/the-health-effects-of-climate-change

AMA

AMERICAN PSYCHOLOGICAL ASSOCIATION

Center for Climate Change & Health

 # Healthy Climate Prescription
https://healthyclimateletter.net/

Solutions, Mitigation and Resilience

Supporting Individuals

350.org

ACE ALLIANCE FOR CLIMATE EDUCATION

FRIDAYS FOR FUTURE

The Nature Conservancy

Citizens' Climate Lobby

Audubon

ecoAmerica
building climate leadership

Appendix

Getting involved.

Climate Change Action

- 350.org
- Citizens Climate Lobby
- Climate Reality Project
- Climate Solutions
- ConservAmerica
- Earth Justice
- ecoAmerica
- GreenPeace USA
- iMatter
- Moms Clean Air Force
- Mothers Out Front
- NextGen Climate
- Union of Concerned Scientists

Climate Change Education

- ACE – Alliance For Climate Education
- CAMEL Climate Adaption Mitigation E-Learning
- CCEP – Climate Change Education Partnership
- Climate Reality Project – Presentations
- I See Change – Community Climate & Weather

Wildlife/Ecosytem Conservation

- Audubon Society
- Conservation International
- Conservation Land Foundation
- Environmental Defense Fund (EDF)
- Land Trust Alliance
- National Wildlife Federation (NWF)
- Natural Resources Defense Council (NRDC)
- Nature Conservancy
- Polar Bears International
- Rainforest Action Network (RAN)
- Sierra Club
- The Wilderness Society
- World Wildlife Federation (WWF)

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Appendix

Climate and Weather Resources

1. Justice Map: race and income

http://www.justicemap.org/

2. FEMA Flood map service

https://msc.fema.gov/portal/home

3. US Drought Monitor

https://droughtmonitor.unl.edu/

4. World Weather Attribution

https://www.worldweatherattribution.org/

5. . City Heat 20 cities

https://www.geotab.com/heat-in-the-city/#

6.. States at Risk: Climate-driven weather events impact on 50 US cities and projections

https://statesatrisk.org/

7.. Heat Index forecast US

https://www.drought.gov/data-maps-tools/national-weather-service-heat-index-forecasts

8.. NYC Environment Health data portal

https://a816-dohbesp.nyc.gov/IndicatorPublic/Infographic.aspx

9. ProPublica Climate Maps

https://projects.propublica.org/climate-migration/

10. Entergy (Energy vendor) outage map

https://www.entergy.com/view-outages/

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