

Climate Change and Public Health

Cheryl L. Holder, M.D.,FACP

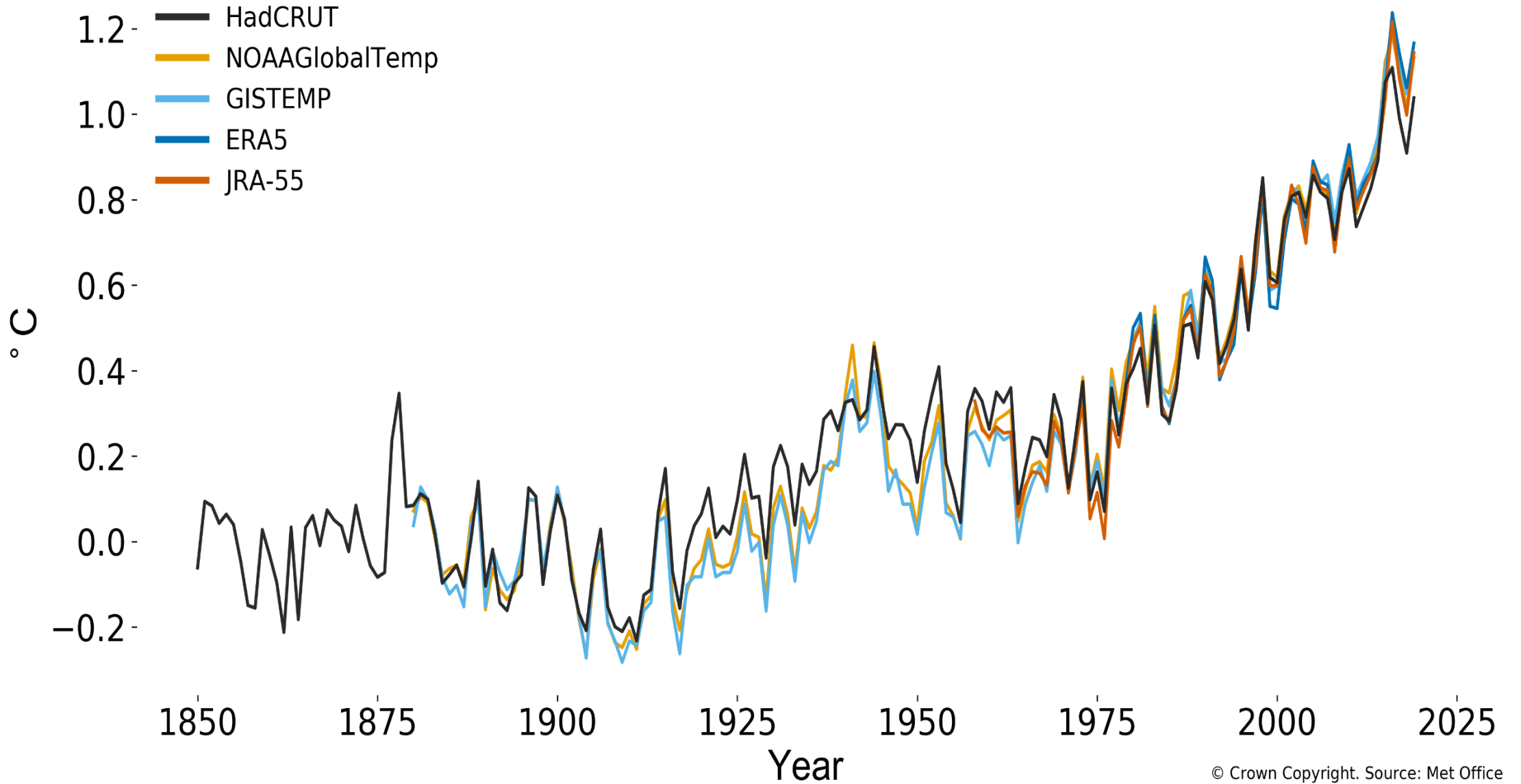
Interim Executive Director

Florida Clinicians for Climate Action

08/03/2023

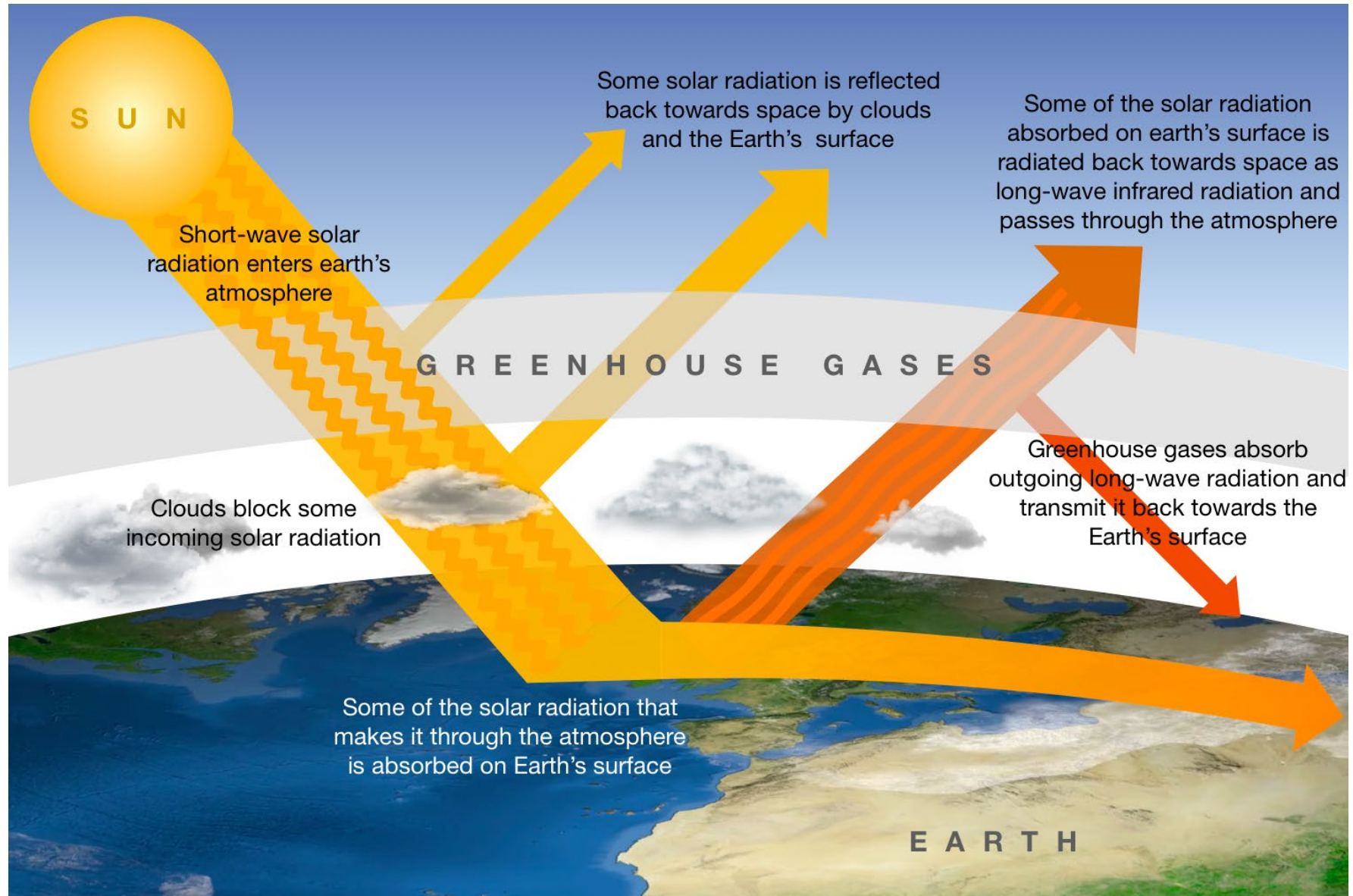
Broward County

Global mean temperature difference from 1850-1900 (° C)



The Earth's Atmosphere

- Carbon Dioxide (CO₂)
- Methane, nitrous oxide, and fluorinated gases are the other main GHG that retain heat
- Greenhouse gases (GHG) usually compared in potency of ability to trap heat to CO₂



Earth's Warming

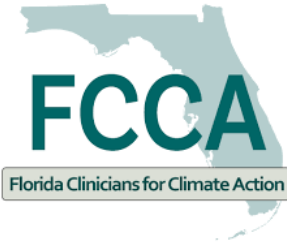
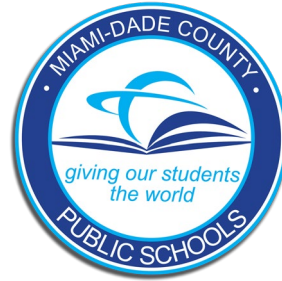
- We are already at 1.01 degree Celcius (2 degrees Fahrenheit) rise since preindustrial time (1880)”
<https://www.ipcc.ch/sr15/chapter/chapter-1/>
- “2 degree Celcius warmer world still represents what scientists characterize as a profoundly disrupted climate with fiercer storms, higher seas, [animal and plant extinctions](#), disappearing coral, [melting ice](#) and more people dying from heat, smog and infectious disease.
Nature. Com 4/2022

Some People Face Greater Risk

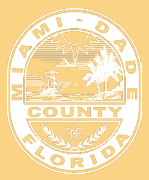
- **All people are at risk. Some face greater risk:**
 - Children
 - Student who play sports
 - Pregnant women
 - Elderly individuals
 - People with chronic illnesses and allergies
 - People with limited resources
 - People who work or play outdoors



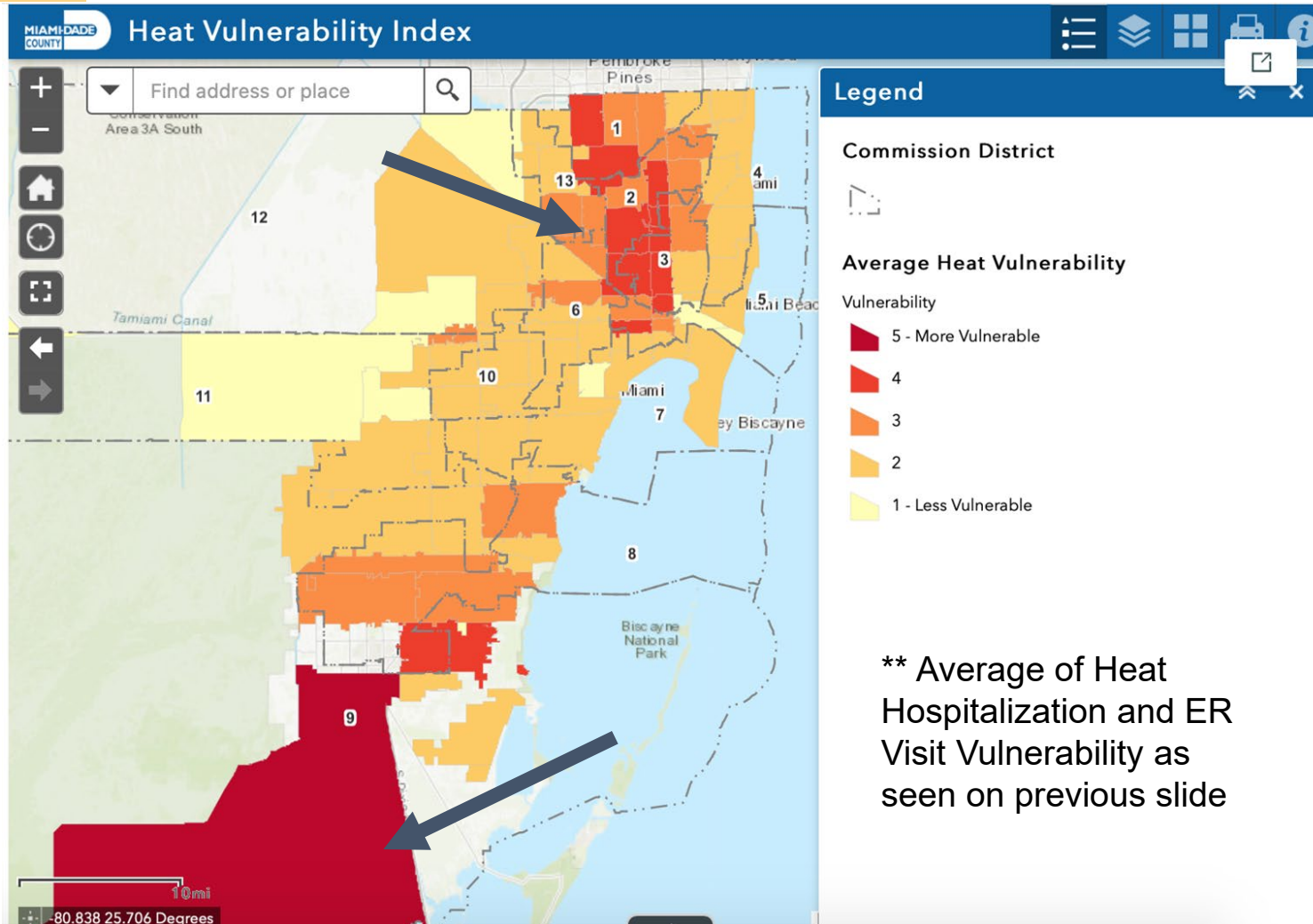
MIAMIBEACH



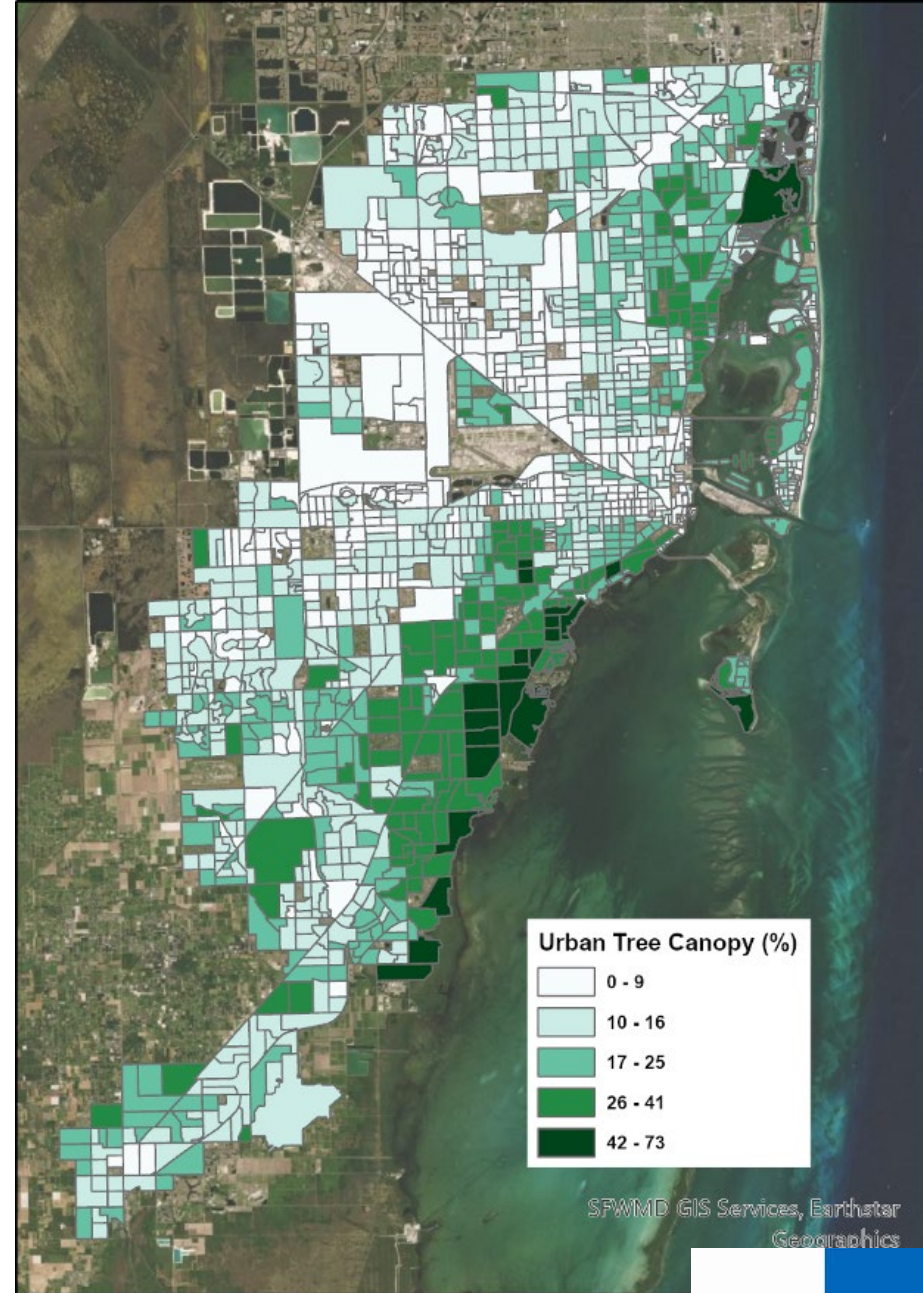
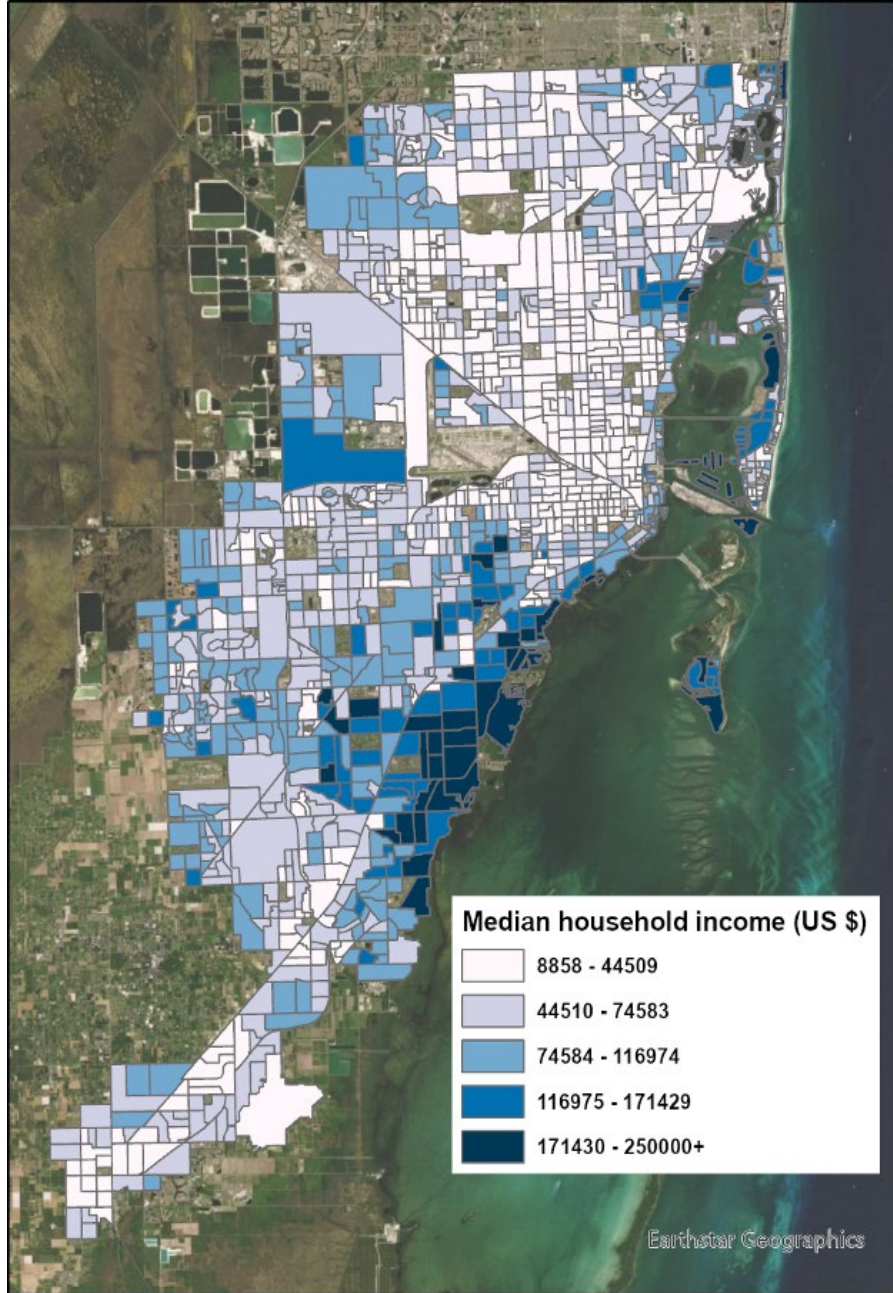
CC Collaboration is a critical asset

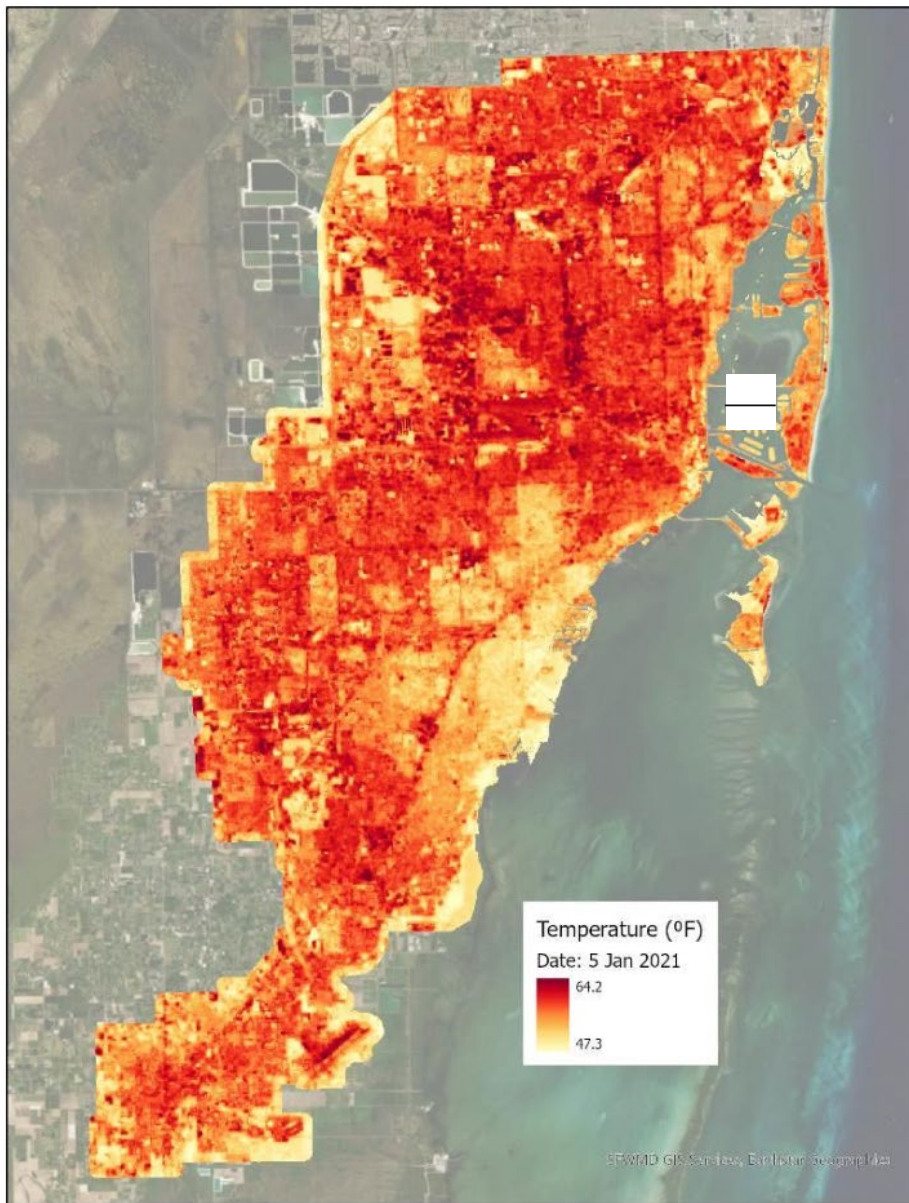


ArcGIS StoryMap: Vulnerability



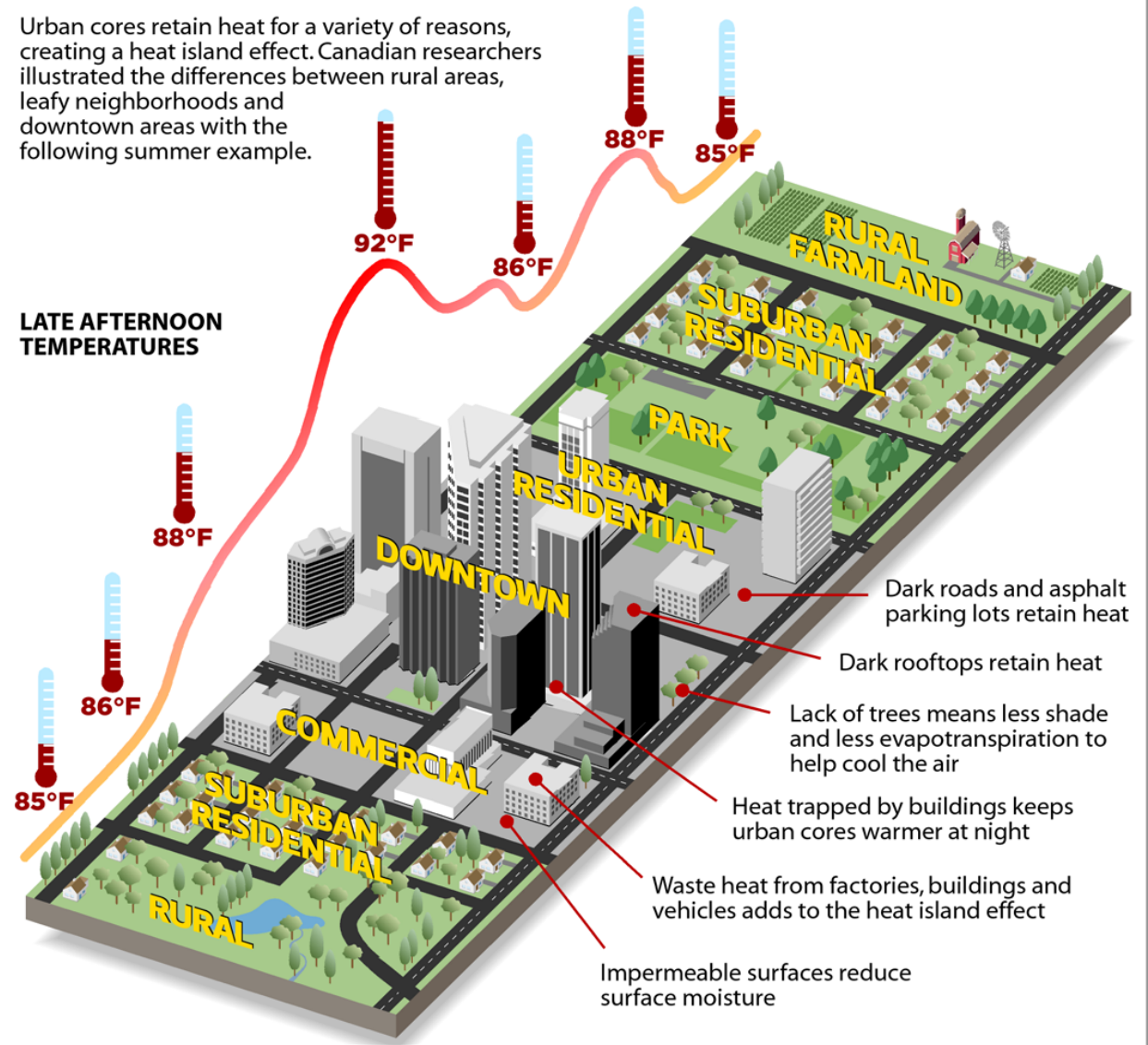
- Interact with the [Heat Vulnerability Index](#) web mapping application to identify vulnerable zip codes in Miami-Dade
- Homestead, Florida City, Hialeah, Miami, Opa-Locka, and Miami Gardens





Urban Heat Island Effect

Urban cores retain heat for a variety of reasons, creating a heat island effect. Canadian researchers illustrated the differences between rural areas, leafy neighborhoods and downtown areas with the following summer example.

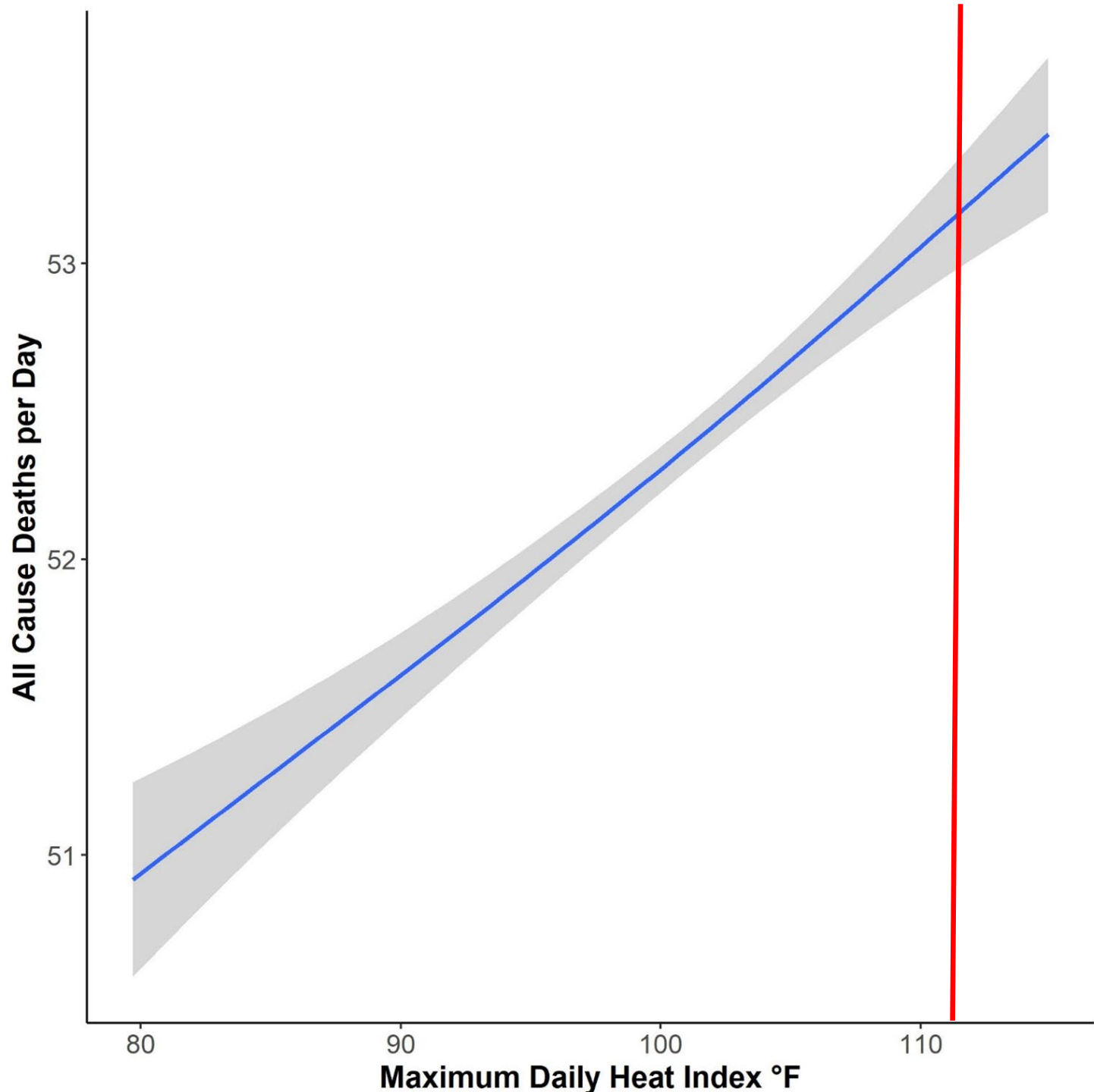


SOURCE: D.S. Lemmen and F.J. Warren, Climate Change Impacts and Adaptation

PAUL HORN / InsideClimate News

MIAMI-DADE COUNTY

Heat Index above	Historical (1971-2000)	By midcentury (2036-2065)	By late century (2070-2099)	By late century, if we limit warming to 2°C (2070-2099)
90°F -----	154 days	187 days	200 days	183 days
100°F -----	41 days	134 days	166 days	115 days
105°F -----	7 days	88 days	138 days	60 days
Off the Charts	0 days	1 days	14 days	0 days



Heat Related Illness Costs

If no action is taken

Hospitalization

- \$5,017 to \$17,047

Emergency Department

- \$3624 to \$5800




Heat Officers








One Billion People More Resilient

RESILIENCE IN ACTION

Chief Heat Officers

Supported by Arsh-Rock and EHRA, Chief Heat Officers are officials focused on delivering a unified response to extreme heat, protecting their constituents.



 <p>Jane Gilbert CHIEF HEAT OFFICER, MIAMI, FLORIDA</p>	 <p>Eleni Myrivili GLOBAL CHIEF HEAT OFFICER, UN HABITAT & ARSHT-ROCK</p>	 <p>Cristina Huidobro Tornvall CHIEF HEAT OFFICER, SANTIAGO DE CHILE</p>	 <p>Eugenia Kargbo CHIEF HEAT OFFICER, FREETOWN, SIERRA LEONE</p>
 <p>Elissavet Bargianni CHIEF HEAT OFFICER, ATHENS, GREECE</p>	 <p>Krista Milne & Tiffany Crawford CHIEF HEAT OFFICERS,</p>	 <p>Bushra Afreen CHIEF HEAT OFFICER, NORTH DHAKA, BANGLADESH</p>	



Climate & Heat Health Task Force

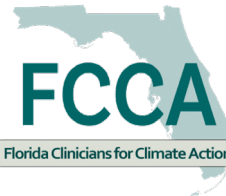
Goals reached:

- Created workshops to gather info from different stakeholders, community priorities and opportunities

The Task Force will be made up of appointed members representing policy makers, scientific experts, and health care professionals as well as two citizen members who will ensure community voices are heard and lifted up in the formation of the heat plan.

Workshops available at:

<https://miamifoundation.org/extremeheat/>



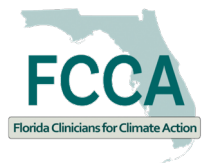


Extreme Heat Action Plan

Goal 1: Inform, Prepare and Protect People

Goal 2: Cool our Homes and Emergency Facilities

Goal 3: Cool our Neighborhoods



Goal 1: Inform, Prepare and Protect People

Foster healthy and resilient communities by bolstering outreach and education efforts, improving extreme heat warning systems and emergency protocols, protecting outdoor workers and building the capacity of healthcare practitioners to identify and respond to heat vulnerability and illness in their patients.



1. **Build on the Success of the Heat Season Campaign**
2. **Enhance Messaging and Protocols**
3. **Engage and Support Employers of Outdoor Workers**
4. **Seek Worker Protections at all Levels of Government**
5. **Engage and Prepare Healthcare Practitioners**
6. **Leverage Urban Heat Research Group for Continued Learning**



Goal 2: Cool our Homes and Emergency Facilities

Improve access to efficient and reliable cooling in homes and to a place to cool off in the event of a power outage.



7. Seek Increased Support for Efficiency and Cooling Upgrades

8. Advocate for Heat Safe and Affordable Housing Policies

9. Improve Coordination and Expand Outreach on Energy Efficiency

10. Invest in Energy Resilience at Evacuation Shelters

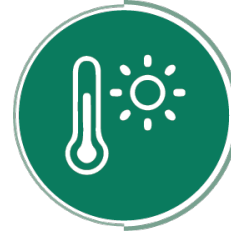
11. Ensure Compliance with Assisted Living/Nursing Home Generator Rule

12. Incorporate Extreme Heat in Countywide Resilience Hub Plan



Goal 3: Cool our Neighborhoods

Reduce the excessive heat burden in urban areas by expanding the tree canopy and vegetation, improving access to water features and shade structures, and cooling our surfaces.



13. Create a Bold Tree Plan

14. Cool our Commutes

15. Cool Our Schools

16. Expand Access to Water and Shade

17. Plant and Protect Trees on County Land

18. Pilot and Scale Cool Pavements

19. Ramp up Engagement and Citizen Science



Florida Clinicians for Climate Action (FCCA) Climate Health Outreach Team (C-HOT)

- \$33 K + Virtual Education Platform Access
- Miami Dade County Mayor and Heat Officer Support
- Educate Clinicians in high vulnerability communities- Project C-HOT
 - Virtual for all MDC Clinicians
 - In-person and virtual at community health centers and hospitals
 - Medical School Practicum (FIU) and Interest Group (UM)
 - Virtual Volunteer training program

Project C-HOT

- Virtual Education- All MDC
 - Continuous Medical Education – nine webinars


Session	Date	Physicians	Nurses	Nurse Practitioners	Pharmacists	Occupational Therapists	Other	Total Participants				
Climate, Heat & Health	13-Sep-22	23	10	7	4	9	9	62	Online Course			
Climate Change & Exertional Heat Illness	18-Oct-22	23	7	3	0	0	8	41	Online Course			
Climate Pollution, Heat Stress & Birth Outcomes	1-Dec-22	8	0	4	2	0	7	21	Online Course			
The Health Impacts of Heat & Ambient Air Pollution	13-Dec-22	21	1	5	5	0	10	42				
Climate, Heat Stress & Mental Health	23-Jan-23	25	10	6	4	0	10	55				
Climate Change, Heat, and Dermatological Health	23-Mar-23	23	1	6	2	0	11	43				
Vector Borne Illness and Climate Change	13-Apr-23	22	2	4	2	0	8	38				
Climate, Heat, and Pharmacological Impacts	24-Apr-23	12	2	2	3	0	3	22				
Climate Change, Heat, and How to Incorporate Sustainability Into Healthcare Practices	25-May-23	19	3	0	2	3	5	32				
								356				

Health Center Training

- 14 Virtual Provider Meetings
- On-site Education for clinicians and patients
 - Brief climate change and heat update
 - Distribute educational materials for clinicians and patients
 - Demonstrate cooling towel use
 - Provide evaluation survey for patients
 - Provide ICD 10 and SDOH Codes

Phase II: Distribute educational brochures in English, Spanish & Creole and survey cards to fifty medical offices and conduct surveys.

BEING SAFE DURING EXTREME HEAT EMERGENCIES



To DO on hot days:

- Take precautions if the temperature might be 90° F (32°C) or warmer, or at lower temperatures if the humidity is high.
- Stay indoors, close the curtains, stay cool with showers or wet towels
- Use fans, but turn them off if the temperature is over 95° F (35°C) because fans may make conditions worse.
- Wear loose clothing, plus a hat if you must go outside.
- Drink lots of water.
- Consider seeking cool shelter: a mall, library, movie theater, or local cooling center.
- Check on your neighbors who may need help.
- Call 911 if you experience weakness, dizziness, shortness of breath, or chest pain, or for advice.

DON'T on hot days:

- Do not do strenuous exercise outside on hot days.
- Do not barbecue, have open fires, or use non-essential machinery on hot days.
- Do not drink alcoholic beverages.
- Never leave children or pets alone inside a vehicle, not even for a minute, even on a cool day.

PROTECTING YOUR COMMUNITY

- Ask your town to plant trees and to create parks and other green spaces that provide shade and will be naturally cool on hot days.
- Ask your schools, parks system, radio stations, and TV stations to have a campaign each Spring to warn people about heat's dangers and how people can protect themselves.
- Ask your health department to create safe, air conditioned shelters where people can go on very hot days, plan a plan to contact and transport the poor, the elderly, or other vulnerable residents during a heat emergency.
- Ask for building codes that require white roofs instead of black, and encourage energy saving designs, use of solar electricity panels, and of low-energy appliances.
- Ask your leaders to create a website and a telephone "hot line" where people can learn what services are available on very hot days.


Thank you to the Climatic Psychiatry Alliance climaticpsychiatry.org and Health Care Without Harm noharm.org for sharing handouts.

Authors: Todd L. Sack MD FACP
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University of North Florida, Jacksonville

climate psychiatry alliance
mygreen

WEATHER ALERT

HEAT WAVE



I am Shining Bright GUYS

Drink Water - Find Shade - Get Rest
Check On Seniors, Babies and Pets

FCCA

Heat Waves are Dangerous

Changing climates can make heat waves more common and temperatures feel hotter in urban environments.

Be careful! Elevated body temperatures can affect vital organs, including the brain. Health conditions such as dehydration, obesity, and heart disease can make it harder for the body to cool down in hot environments.

Include this Pocket Guide and Emergency Plan in your 911 Family Emergency Plan

Cooling Strategies – Preventing Heat-Related Illness

In the event of a heat wave:

- Stay hydrated, don't wait until you're thirsty. Avoid drinking alcohol, caffeine and sugary drinks.
- Seek a cool environment. Find a Cooling Center in Miami-Dade during Heat Season (May - October).
- Cooling Centers may be open to the public to get out of life-threatening heat during a heat wave. There will be limited medical and hydration services available at these sites.
- Avoid strenuous activities and limit time exposed to the sun. Wear sunscreen if you must go outdoors.
- Never leave infants, children or pets in the car. Consider the use of a Back Seat Reminder System such as STEELMATE, Elepho or Ride N Remind, etc.
- Use the Buddy system, check on the health of your family or friends especially if they are children, elderly, or with mental or physical disabilities.
- Wear light colored, lightweight, loose fitting clothing and heat covering
- Use cooling towels.
- Shower or bathe in cold water frequently and cool off with a fan.
- Keep your home cool. Close curtains and avoid cooking during the hottest part of the day.
- For more tips on Preventing Heat-Related Illness, please go to cda.gov/heatstressextrmehat

More info

Pay Extra Attention To Vulnerable Communities

- Infants and children
- Seniors
- People with disabilities
- Pregnant women
- People living alone
- Pets

Recognize The Signs Of Heat Illness – What To Look For

HEAT EXHAUSTION	HEAT STROKE
Faint or dizzy	Throbbing headache, confusion
Excessive sweating	No sweating
Cool, pale, moist skin	Body temperature 104°F or above
Nausea or vomiting	Red, warm, dry skin
Rapid, weak pulse	Nausea or vomiting
Muscle cramps	Rapid, strong pulse
	May lose consciousness

Treatment – What To Do

HEAT EXHAUSTION	HEAT STROKE
Move to a cooler place	Call 911 immediately
Hydrate, sip water	Do not give anything to drink
Use cold compresses or take cool shower	
Call 911 if symptoms worsen or last longer than 1 hour	Move to a cooler place

Staying Safe in Hot Weather

NIH National Institute on Aging

Watch for these signs of hyperthermia:

- Dizziness
- Muscle cramps
- Swelling in your ankles and feet
- Nausea and weakness
- Rapid pulse

Tips to prevent hot-weather illness:

- Drink liquids
- Limit caffeine and alcohol
- Wear light-colored, loose fitting clothes
- If it's too hot, try exercising indoors

HEAT STRESS Overview

Understanding heat stress can help you to stay safe while working in hot environments.

Things you need to know:

- Heat exposure can cause a range of effects on your body, from irritating rashes to heat stroke, which is often fatal.
- Heat exposure can cause confusion and poor judgment—use the buddy system to monitor coworkers for heat illness.
- Drinking enough water is critical to preventing heat illness. Stay hydrated.
- Cooling is the treatment for all heat illness.

Types of Heat Illness

Less Severe

- Heat rash/"prickly heat"**
 - Red cluster of pimples or small blisters, usually on neck, upper chest, groin, under breasts, and in elbow creases
- Heat cramps**
 - Muscle cramps, pain, or spasms in the abdomen, arms, or legs
- Heat syncope (fainting)**
 - Fainting, dizziness, or light-headedness, after prolonged standing or suddenly rising from a sitting or lying position
- Heat exhaustion**
 - Headache
 - Nausea
 - Dizziness, weakness
 - Irritability
 - Thirst
 - Heavy sweating
 - Elevated body temperature, decreased urine output
- Heat stroke**
 - Confusion, altered mental status, slurred speech, loss of consciousness
 - Hot, dry skin or profuse sweating
 - Seizures
 - Very high body temperature
 - Fatal if treatment is delayed

OFTEN FATAL


Factors that Increase Heat Illness Risk

- High humidity
- Lack of wind or breeze to cool the body
- Dehydration
- Lack of acclimatization
- Age over 60 years
- Protective gear, including non-breathable or minimally breathable clothing, respirators, and chemical-resistant apparel
- History of heat illness
- History of recent illness unrelated to heat (especially involving vomiting or diarrhea)
- Certain health conditions²
- Certain medications²
- Physically demanding work
- Recent alcohol use (within previous 24 hours)

When ambient conditions are higher than body temperature, warm airflow can actually increase heat gain. Refer to the Heat Stress: Risk Factors fact sheet [(DHHS) OSHA No. 2017-125] or consult a healthcare provider.

Workers need to look out for each other! a buddy system!

It is a coworker who first sees signs of heat stress in her employee.



Learn more about staying safe in hot weather at www.nia.nih.gov/hot-weather-safety

ICD-10 AND Z CODES

New and Revised SDOH Z Codes for Fiscal Year 2022

ICD-10	Description
Z55.5	Less than a high school diploma
Z58	Problems related to physical environment
Z58.6	Inadequate drinking water supply
Z59.00	Homelessness unspecified
Z59.01	Sheltered homelessness
Z59.02	Unsheltered homelessness
Z59.4	Revised from "Lack of adequate food and safe drinking water" to Z559.4 "Lack of adequate food"
Z59.41	Food insecurity
Z59.48	Other specific lack of adequate food
Z59.81	Housing instability, housed
Z59.811	Housing instability, housed with risk of homelessness
Z59.812	Housing instability, housed, homelessness in past 12 months
Z59.819	Housing instability, housing unspecified
Z59.89	Other problems related to housing and economic circumstances.



HEAT EFFECTIVENESS ICD-10 CODES

Category	Code	Title	Description	Billable	Non Billable
Heat	<u>S00-T67</u>	Effects of Heat and Light	Includes heatsroke and sunstroke	X	
	<u>X30-X39</u>	Exposure to Forces of Nature	Excessive exposure to natural heat and classifies as external cause of morbidity.	X	
	<u>V00-Y99</u>	External Causes of Morbidity	Drowning and submersion in natural water, undetermined intent		
	X14.0XXA	Inhalation of Hot Air and Gases	Initial Encounter	X	
	X14.0XXD	Inhalation of Hot Air and Gases	Subsequent Encounter	X	
	X14.0XXS	Inhalation of Hot Air and Gases	Sequela	X	
	T67.7XXA	Heat Edema	Initial Encounter	X	
	T67.7XXA	Heat Edema	Subsequent Encounter	X	
	T67.7XXS	Heat Edema	Sequela	X	
	L50.2	Urticaria Due to Cold and Heat	Verbatim	X	
	X16	Contact With Hot Heating Appliance, Radiators and Pipes	Initial Encounter	X	
	X16	Contact With Hot Heating Appliance, Radiators and Pipes	Subsequent Encounter	X	

Other Successes



PHOTO BY NICHOLAS REYERO FOR MIAMIHERALD.COM
 Miami-Dade County Mayor Daniella Levine Cava speaks during a press conference outside of Government Center on Monday in downtown Miami. The event was held to announce the start of the heat season throughout Miami-Dade, and officials with the National Weather Service announced they would lower the threshold for heat warnings and advisories in the county.

Weather Service lowers heat warning thresholds for Dade

BY NICHOLAS REYERO
 nre@miamiherald.com

At the urging of Miami-Dade County leaders, the National Weather Service has lowered the bar for extreme heat warnings and advisories in the county. The hope is that the new standards will better protect residents from the rising risks of heat, which the county estimates kills about 14 people and hospitalizes hundreds more each year.

NWS meteorologist Robert Molleda announced the change Monday at a county event marking the start of Miami-Dade County's heat season, which officially runs from May 1 to Oct. 31 each year. The decision has implications beyond Miami-Dade. The county will serve as a test case for the new warning levels, Molleda said. If they

work well, the weather service may make them permanent and export them to other South Florida counties. "The most important thing is that advisories and warnings go out when there is an increased threat to the general population," said Molleda, the warning coordination

meteorologist at the NWS Miami office. "It's about making sure people have the information they need and are receiving weather alerts and notifications that can enable them to take action."

Jane Gilbert, the county's chief heat officer, said the change will help shape the

response of emergency managers and public health agencies. "We'll be able to galvanize our emergency response resources when we get to those truly excessive heat

temperatures and address

SEE HEAT, 3A



MIAMI HERALD
 South Florida's rainy season is starting right on time. What's ahead? 2A
 Miami-Dade County Mayor Daniella Levine Cava, left, and Vice Chairman of the Miami-Dade County Commission Oliver G. Gilbert III hold an informational pamphlet at the press conference.

DeSantis signs 3 bills that bring big change to higher ed in Florida

BY DIVYA KUMAR
 Tampa Bay Times

KARAOHA

Gov. Ron DeSantis on Monday signed into law three controversial bills poised to bring major changes to Florida's college and university systems.

In a ceremony at New College of Florida, he was flanked by a group of supporters including university system Chancellor Ray Rodriguez and Christopher Rufo, an activist known for his opposition to critical race theory and one of six trustees DeSantis appointed to the New College board in January.

DeSantis signed a measure, SB 266, that restricts certain topics from being taught in general education courses, the lower-level classes that all students must take for their degrees. It also expands the hiring and firing powers of university boards and presidents, further tenure protections and prohibits spending related to diversity, equity and inclusion programs beyond what is required by accreditors.

Regarding the restricted topics, the measure borrows language from last year's Individual Freedom Act, also known as the Stop Woke Act. It targets "theories that systemic racism, sexism,

SEE BILLS, 2A

DEBATE
 DeSantis courts donors at secret dinners — using one major law. 2A

DeSantis' political opposition makes more moves ahead of expected 2026 campaign launch. 2A

Miami Herald's Spanish Florida war on water in state colleges rewards a DeSantis crony who has nearly ousted itself. 20A

Gillum can resume 'life and public service' after prosecutors move to drop charges

BY LAWRENCE MOWER
 Miami Herald/Tampa Bay Times

Making History! Heat Standard Passes First Vote



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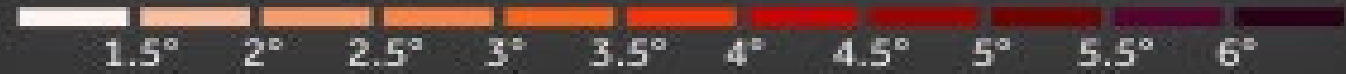


Jorge -Thank You

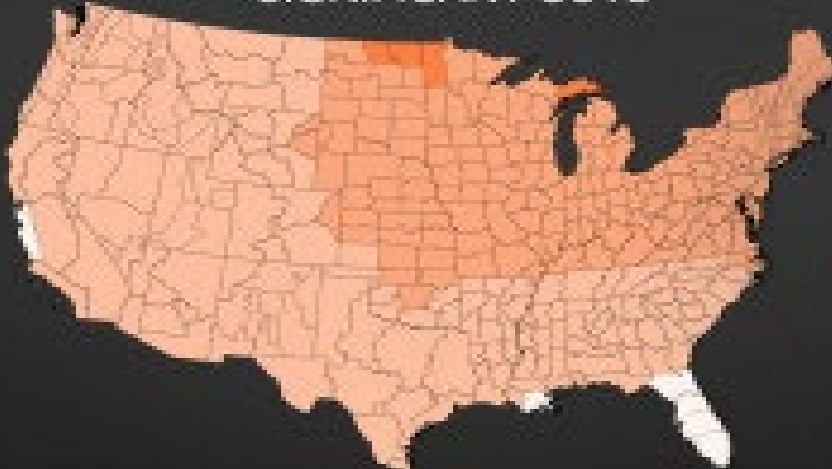


Act Now!

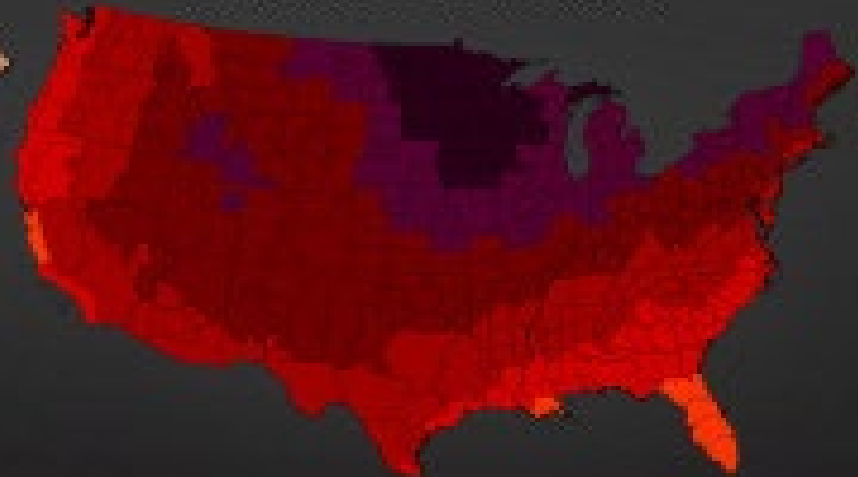
WARMING BY 2100



SIGNIFICANT CUTS



CONTINUED EMISSIONS



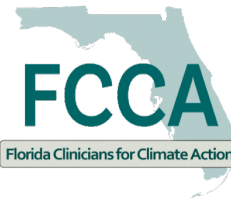
Projections of change in annual average temperature from 1991-2020 period under continued emissions (RCP 8.5) and moderate emissions (RCP 4.5) scenario (CSIRO)

Please follow us on Instagram @flclinicians
Please follow us on Facebook @Florida Clinicians
for Climate Action

Follow me on IG and Tik Tok : @drcherylholder

Thank You

www.floridaclinicians.org



Volunteer Training Program

- Four training sessions
 - Virtual mandatory –one hour climate change 101
 - Self-directed- Three – one hour virtual webinars –heat physiology, MDC specific data
 - Mock site visit video for approval