

Climate and Cancer Health Disparities

IN PURSUIT OF *YOUR CURE*.™

Cancer Control Research Program Mission:
Reduce the burden of cancer and cancer disparities across the cancer control continuum

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A Cancer Center Designated by the
National Cancer Institute

Forward Thinking: Climate Change and Cancer

Intergovernmental Panel on Climate Change: Extreme Events

Regional changes in the intensity and frequency of climate extremes generally scale with global warming.

Even small incremental increases in global warming (+0.5°C) cause statistically significant changes in extremes on the global scale and for large regions (*high confidence*).

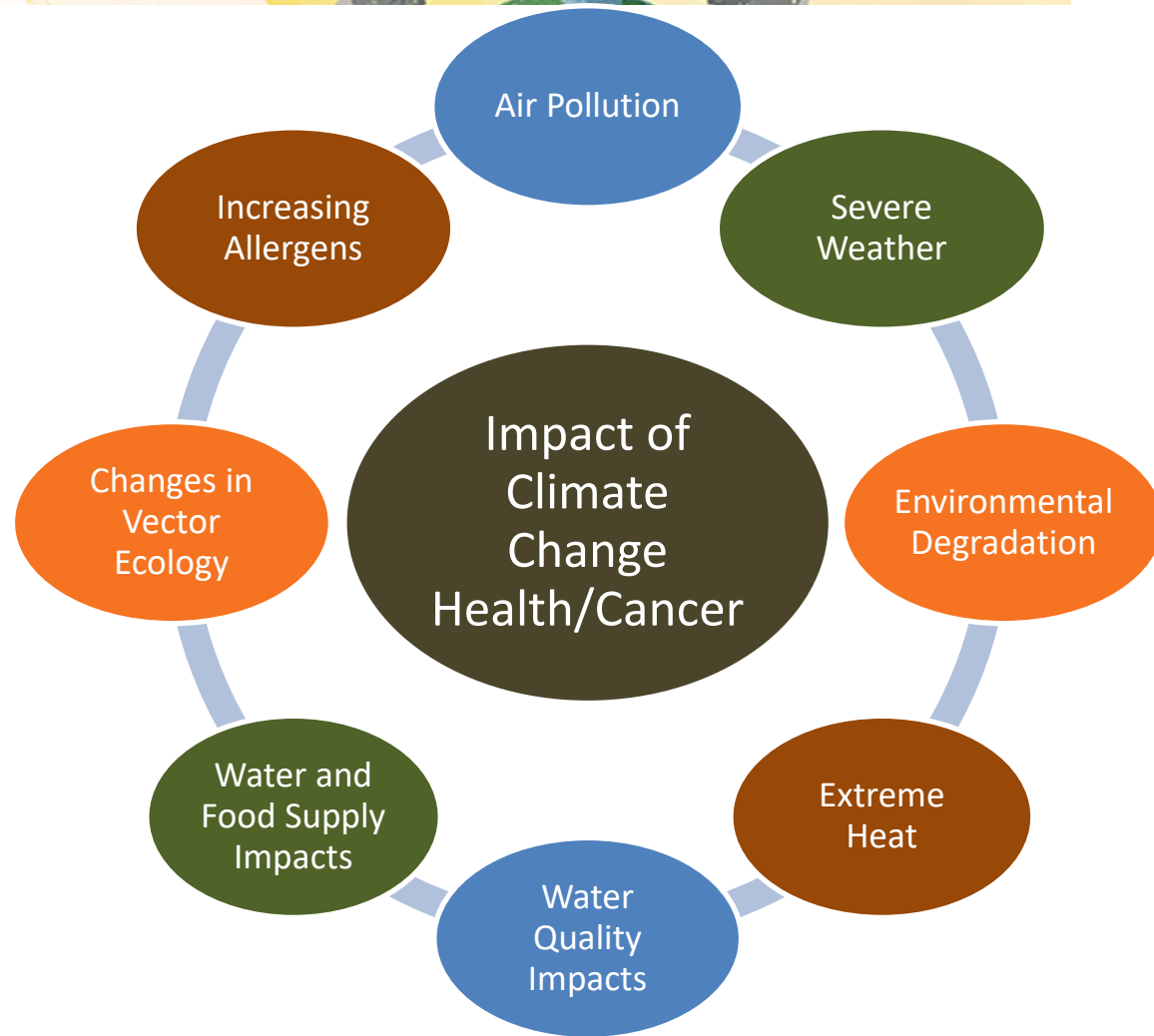
This is the case for:

- temperature extremes (*very likely*)

- the intensification of heavy precipitation (*high confidence*)

 - including that associated with tropical cyclones (*medium confidence*)

- the worsening of droughts in some regions (*high confidence*).



During COVID-19
See page 1402

adjuvant nivolumab versus ipilimumab
in resected melanoma
See page 1465

in pancreatic and extrapancreatic
neuroendocrine tumours
See pages 1489 and 1500

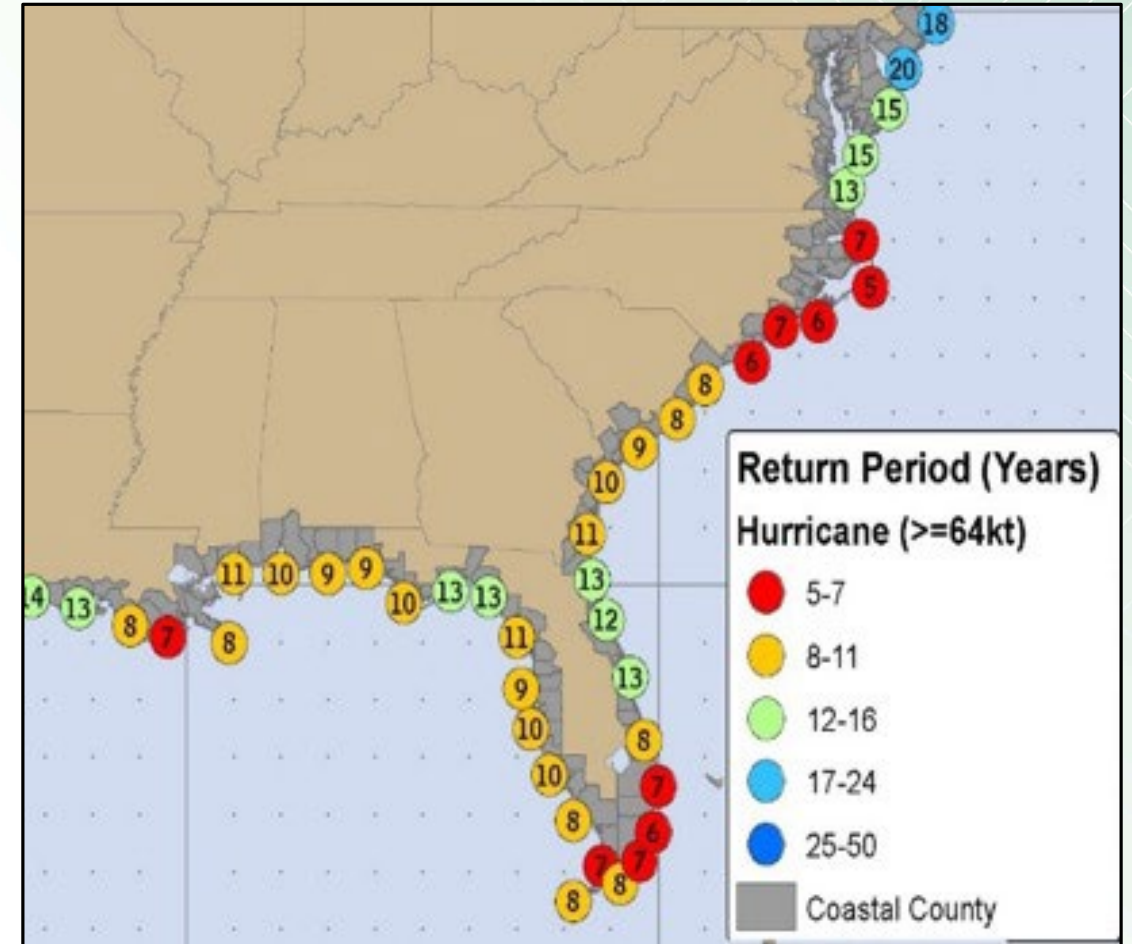
Severe
Weather

Water
Quality
Impacts

Environmental
Degradation

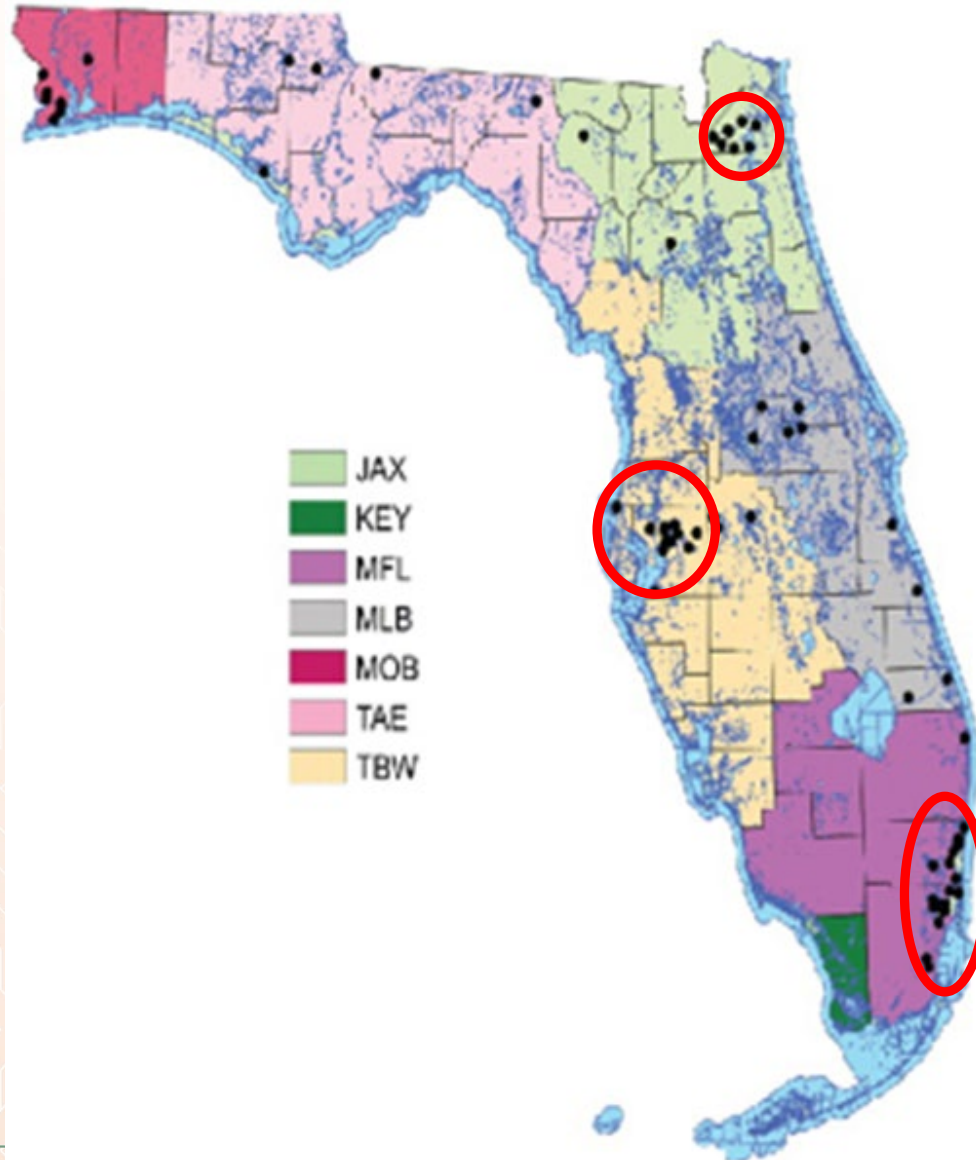


Florida readily experiences severe weather



- Florida is in the direct path of Atlantic hurricanes and experiences the highest incidents of hurricanes passing within 50 miles of the US Coast.
- The coastal location of the major Florida Superfund sites places them frequently on the path of hurricanes, and makes them exceedingly vulnerable to hurricanes, storm surges, and/or flooding.

SUPERFUND SITES ARE VULNERABLE TO NATURAL DISASTERS



- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980.
- CERCLA is informally called Superfund. It allows EPA to clean up contaminated sites.
- Florida has 53 Superfund sites paced on the National Priority List located primarily in the regions of highest population density on the coastal areas

SIGNIFICANCE: ENVIRONMENTAL PROBLEMS RELATED TO NATURAL DISASTERS ARE LIKELY TO INCREASE IN THE FUTURE

- Heavy rainfall and flooding from hurricanes disturb Superfund sites and release chemicals, contaminating the Floridan aquifer system, groundwaters, and spreading into the communities.
- Floods from hurricanes are dangerous. Florence (2018) released coal ash containing toxic heavy metals from waste pits.
- Homestead Air Force Base is the lowest lying of all the Superfund sites in the US, and can be flooded by only ~ 1 foot of water.
- Much of the Superfund sites in Atlantic and Gulf Coast coastlines lie less than 10 feet above the sea level. The coastal Superfund sites are frequently protected by seawalls that make them highly vulnerable to storm surge.

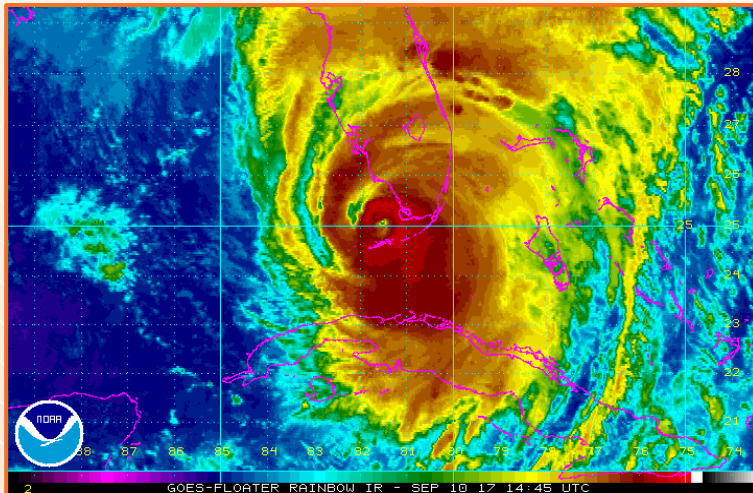


SUPERFUND HAZARDOUS SUBSTANCE RESEARCH AND TRAINING PROGRAM PROPOSAL

NATURAL DISASTERS AND REDISTRIBUTION OF SUPERFUND CHEMICALS: IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT

CENTRAL HYPOTHESIS:

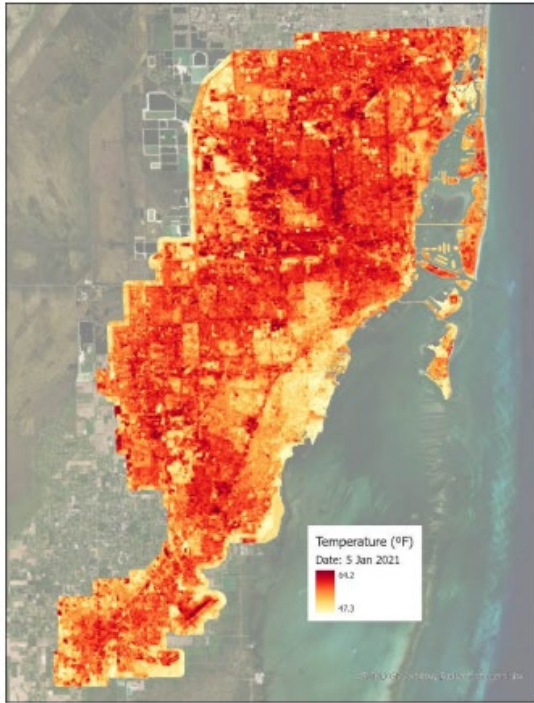
The Central Hypothesis of UM-SPIRIT is that natural disasters modify the transport and distribution of Superfund chemicals leading to enhanced exposure, adverse human health effects, and disastrous impact on the environment. By focusing on this central hypothesis, our program responds to real-life environmental threats. We believe that natural disaster imposes high risk and need to be considered in risk assessment, which presently are typically not substantially considered.



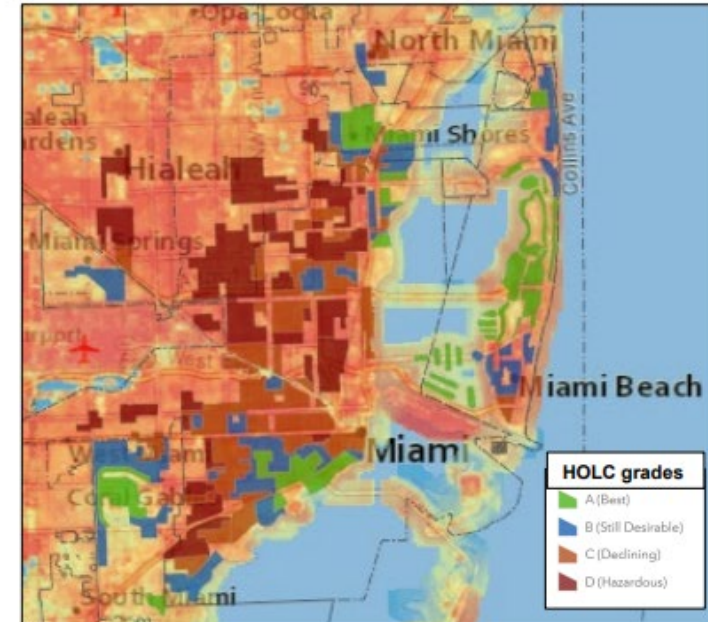
**Cancer Control and
Tumor Biology**

Rising Surface Temperature

Surface Temperature (°F)
01/05/21



Home Owners' Loan Corporation
Neighborhood Grading Map



- Extreme heat has severe consequences on human health.
 - Extreme heat (heat waves) can trigger a variety of heat stress conditions, respiratory conditions, and increase mortality.
 - In Miami-Dade County, it is well established that these consequences are exacerbated among those who lack the proper means to adapt to rising temperatures

Forward Thinking: Climate Change and Cancer



- The ways that we measure extreme heat for practical intervention are not fully informed by the variety of ways that climate change can influence heat and heat experiences (e.g., chronic heat, geographic heterogeneity).
 - Impacts are more pronounced for communities that experience systematic disinvestment, as that relates to building construction, green space, and energy insecurity.
 - Impacts may be more pronounced for those with multiple comorbidities – indicators of structural vulnerabilities, like what we have seen with COVID-19 – which are socially and geographically patterned.
- Using historic heatwave and emergency response data this team will evaluate the geographic distribution of heat-related morbidity and mortality.
- Examine the impact of heatwaves on access to healthcare services including preventive cancer screening among high-risk populations and adherence to treatment among cancer patients.
 - Heat may act as a barrier for traveling to access preventive cancer screening and cancer treatment.
 - Exposure to heat may impact treatment trajectories, including meeting criteria for obtaining scheduled services (e.g., physical temperature, hydration, etc.)



Zinzi Bailey ScD, MSPH



Kilan Ashad-Bishop, PhD

“Those at the bottom of the socioeconomic ladder sustain the worst effects from any threat – whether it be COVID-19, food and housing shortages or climate change.”

-R. Hiatt, MD, PhD

Thank you!

