CONSERVANCY of Southwest Florida
OUR WATER, LAND, WILDLIFE, FUTURE
PRESERVING OUR PARADISE FOR 60 YEARS

A Changing Climate in SWFL: Other Impacts

The following are not exhaustive but briefly introduce some additional impacts associated with a changing climate.

High Heat Days

In recent years, a lot of attention has been focused on flooding issues within the state, but high heat days are equally important (and are a key cause of increased flooding). Starting in 2023, the globe has been experiencing an especially sustained amount of record-breaking heat for more than a year affecting both air, land, and ocean. This has implications for humans and our natural environment.

For instance, we have a significant number of outdoor workers – contractors, landscapers, farmers and farmhands, environmental professionals, etc. – that are exposed to conditions that can result in heat-related illness. Older and younger community members, especially those without adequate access to air conditioning, are also at elevated risk.

Our corals in particular have been a key example of how heat stress can affect ocean life and other wildlife. During the summer of 2023, many corals around the Florida Keys expelled their zooxanthellae – tiny photosynthetic organisms that live inside the corals' bodies benefitting from protection while providing helpful nutrients. We call these expulsion events "coral bleaching." Protected species elkhorn and staghorn coral were particularly impacted. Visit this FWC page to see how the prevalence of bleaching events has increased over time.

Bleached Corals.

Image Credits: Coral Restoration Foundation, Florida Fish and Wildlife Conservation Commission

A tool developed by the Union of Concerned Scientists shows predictions for high heat index days for different areas. Heat index refers to how hot a day actually "feels" to us, based on a combination of factors like temperature and humidity. The following are predictions for Florida's 19th Congressional District which contains portions of Lee and Collier Counties. You can read more about ways to address heat on our climate page.

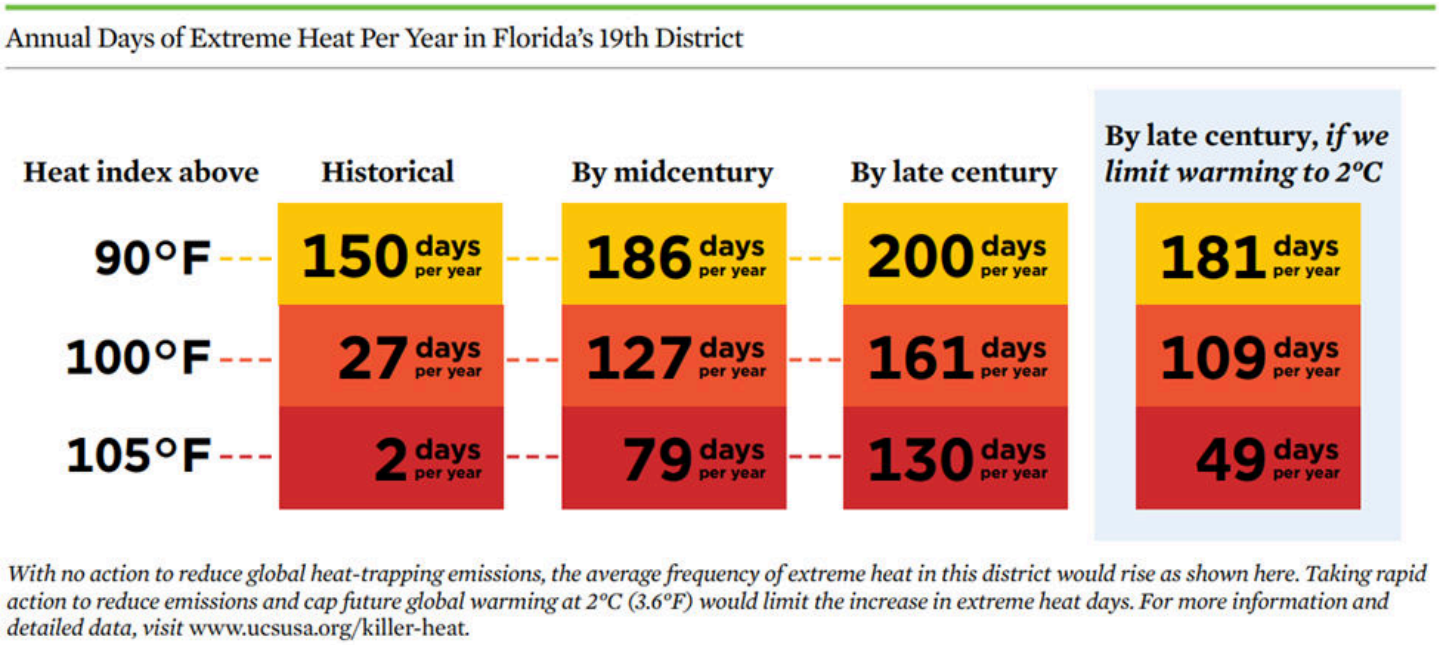
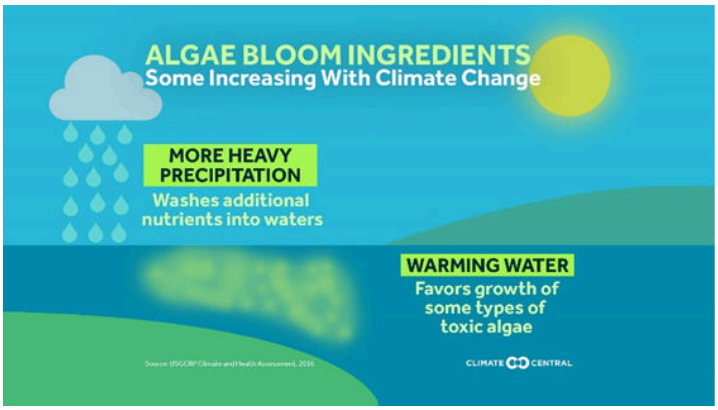


Image Credit: Union of Concerned Scientists

Worsened Water Quality

The health of our local waters is intimately connected to our changing climate in multiple ways. Gases do not dissolve as readily into warmer waters. This can translate into lower amounts of available dissolved oxygen which makes it harder for aquatic wildlife to breathe.

The increase in events that bring heavy rain can introduce more stormwater runoff along with extra nutrients into water bodies that often are already experiencing degraded water quality. More nutrients paired with warmer water act as fuel that can combine with other factors to amplify, or change the persistence or timing of, naturally occurring periods of rapid growth ("blooms") of macroalgae (seaweed) like Sargassum or smaller free-living species of phytoplankton (microscopic plant-like organisms that drift with water currents). When these naturally occurring blooms experience overgrowth that causes significant negative impacts to their surroundings, we often call them "harmful algal blooms" (HABs).



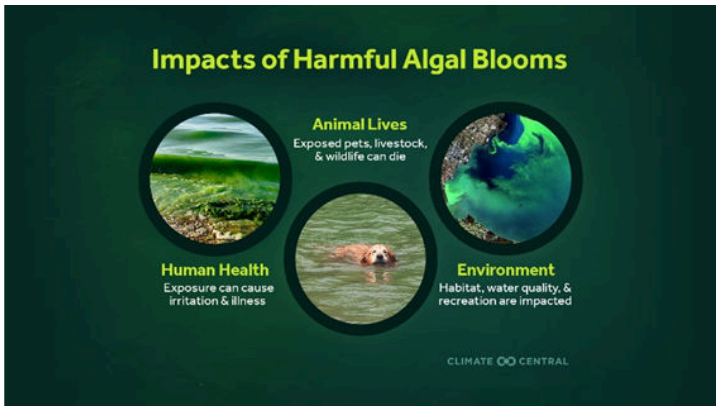


Image Credits: Climate Central

When there's too much algae in a system and it can't all be eaten by its natural grazers, it often dies and then may be broken down by bacteria that use up oxygen. This is another pathway leading to low dissolved oxygen in surrounding waters.

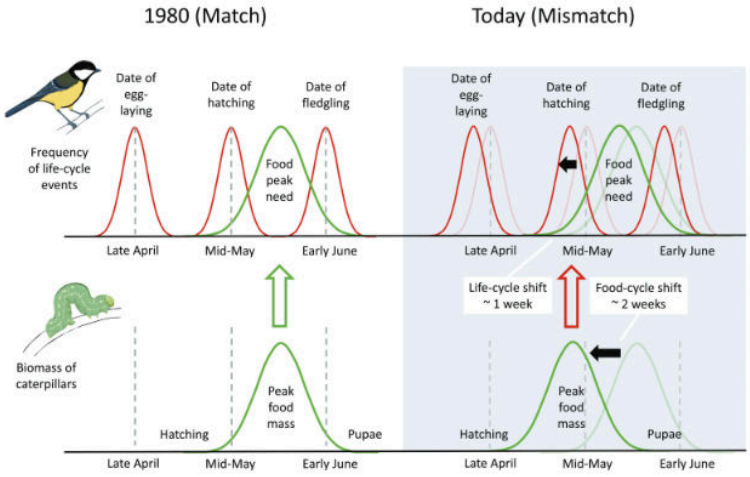
Under the right conditions, some species of algae can also produce toxins. In freshwater, this is often associated with types of blue-green algae. In the local coastal waters of SWFL, toxins from a type of phyto-plankton called *Karenia brevis* is responsible for the airborne respiratory irritation and other symptoms associated with red tide in our region. These and other algal toxins can have severe consequences for both wildlife and humans.

Additional Effects on Habitat and Wildlife

Rising seas can introduce saltwater into areas that had predominately been exposed to freshwater. Multiple sources of flooding can introduce lots of water into habitats that used to be mostly dry. The plants and animals in these situations need to find ways to adapt or will be replaced by others that are better able to tolerate the new conditions. Some of our important local coastal habitats like mangrove forest and oyster reefs can, under the right conditions, increase their elevation and keep up with some sea level rise. But, in other instances, they will migrate inland to places with more favorable conditions. Less hard freezes have also resulted in mangroves expanding their range further north in Florida, sometimes overtaking the salt marshes that were there before.

Mangroves have taken over in some areas previously dominated by salt marsh in Ten Thousand Islands National Wildlife Refuge. Image credits: National Park Service

Earlier arrival of warm temperatures has started to shift parts of some organism's biological cycles to earlier in the year. For instance, the Conservancy's vonArx Wildlife Hospital has been recording earlier admission of baby birds than when the hospital was first established. This can become a problem for wildlife if these changes create a mismatch in the timing of when a resource they need – perhaps a food source – is available.



Example of mismatch that has been documented (Visser et al., various studies) between the hatching of great tit chicks in the Netherlands and the availability of the caterpillars they eat. Image Credit: Barbara Mizumo Tomotani, 2017

Heat can also have some less expected influences on wildlife. For some animals like sea turtles, nest temperature will determine if hatchlings are male or female. Incubation temperatures above 88 °F result in females, and temperatures below 81 °F mean males. A nest experiencing temperatures between that range will produce a mix of males and females. But as temperatures have been rising, more female sea turtles have been born, and there are a lot fewer male sea turtles to go around as mates. Researchers are still exploring the implications, but reduced genetic diversity and health of sea turtle populations could be an effect.

Example of news headlines in recent years around the prevalence of female sea turtles being born in Florida.