Warming Temperatures, Extreme Heat and Nighttime Warming

Q&A Notes and Resources

Links:

- Explore climate and environmental data:
  - NEMAC Explorer: https://crt-climate-explorer.nemac.org
  - CDC Environmental Tracker: https://ephtracking.cdc.gov
  - NASA Temperatures: https://data.giss.nasa.gov/gistemp/
- Track and identify insects and other biodiversity:
  - BugGuide.net: https://bugguide.net/node/view/15740
  - iNaturalist: https://www.inaturalist.org/home
- About this webinar series:
  - Poultry Extension's web page on the seminar series: https://poultry.ces.ncsu.edu/2020/09/watch-north-carolina-climate-change-webinar-series/

What do you see as the big research questions we need to answer when it comes to climate change and temperatures in NC?

- Climate and "something else" — depending on who you're talking to, that "something else" is really going to vary. Who is most vulnerable to heat?
- Climate change is this apocalyptic doomsday threat that can seem too large to really get your head around, but connecting it with health can make it approachable. Some research areas:
  - Pregnant women are an under-studied and vulnerable population.
  - Interest in mental health impacts.
  - While we can identify vulnerable populations, we also need to consider the challenges of communicating with them in ways that can inspire change. "Are you high enough risk to react"? We've observed that there are decreases in heat-related illness above 100°F, but less extreme temperatures can also be dangerous and may not be warned about as much.
- NC has high biodiversity, and climate change is going to have an impact on our biodiversity, but we don't yet know exactly *how* it's going to have an impact.
  - How to mitigate impacts, preserve biodiversity?

How can we get involved? For example, in citizen science projects or in local research happening in the state, or just to stay connected to work you're doing?

- We could always use more data on phenology of insects. We lock good data on a lot of insects. Individuals could pick particular insects and keep track of when they are seeing them, or use apps designed to help with tracking reporting insects (and other species):

    - https://bugguide.net/node/view/15740 &
    - https://www.inaturalist.org/home
- Take action to reduce warming and improve air quality. On the adaptation side: there are recommendations that OSHA adopt health safety standards:
    - https://www.osha.gov/SLTC/heatstress/standards.html
- Watch for opportunities to provide public comments on National Climate Assessments. These comments are very valuable to the process!
- On vulnerability, we rely on social-demographic data, especially American Community Survey and Census. So fill out your Census!
- Getting involved and taking action can help you feel empowered and improve your own mental health.
    - A quick web search will yield ways that you can become involved, from the national to the local level. Some sites that may be a starting point:
        - National Park Service: https://www.nps.gov/subjects/climatechange/getinvolved.htm
        - Climate Generation: https://www.climategen.org/take-action/act-climate-change/take-action/
        - NC Department of Environmental Quality's climate change webpage: https://deq.nc.gov/energy-climate/climate-change

Chat Questions:

- **Are there not records for the polar regions? Is that why they're gray?**
    - Data is much more limited for the poles, so NOAA maps leave those areas gray areas as there isn't enough data to meet certain criteria NOAA uses. NASA uses satellite data and spatial techniques to measure warming at the poles and fill in the gaps, so their maps do show results for the poles. The data show rapid warming at the poles, particularly in the Arctic.
    - NASA resource: https://data.giss.nasa.gov/gistemp/

- **What is the hypothesis for why heat correlates with increase in mental health issues?**
    - We know that summertime temperatures are not the primary driver, but we can look for signals of temperature effects after accounting for demographics and other population factors.
    - There are many hypotheses, including things like brain physiology, particular sensitivity among adolescents, and impacts on sleep patterns. High temperatures may also affect how people respond to their prescription drugs.
    - This relationship with temperature is a fairly new area that is currently being studied.
- **Is temperature increase the reason fire ants are moving into the northern and western counties?**
    - That is correct! Fire ants are better adapted to warmer regions

- **Is there a possibility that insect resistance to chemicals could increase with increased temperatures?**
    - Some insects may have more generations in a year due to warmer conditions, and may be treated more intensely with pesticides. As a result, there may be more chances for an evolutionary increase in resistance.
    - It's not clear that temperature has a direct physiological effect that would influence resistance.
    - In some cases, because of the 'fitness cost' of carrying resistance genes, higher temperatures could actually reduce development of resistance.