FOREST FIRES AND THE BAHAMA ORIOLE: DESCRIBING BURN HISTORY WITHIN CARIBBEAN PINE FORESTS

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Background

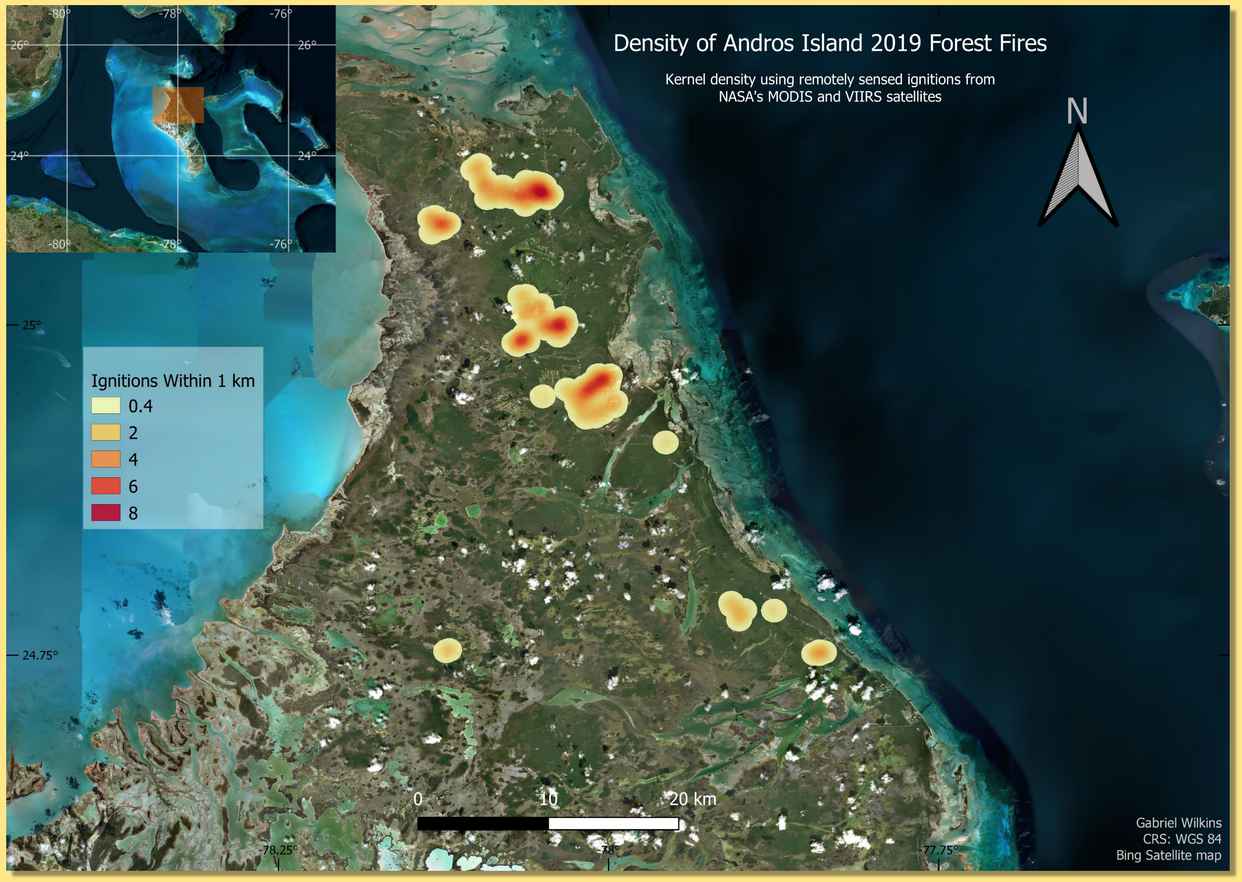
The Bahama Oriole (*Icterus northropi*) is a critically endangered bird now found exclusively on Andros Island, The Bahamas. This species nests in many of the habitats which cover the island, including the extensive forests of Caribbean Pine (*Pinus caribaea*). Thus, these forests represent a vital habitat for a critically endangered species, despite being prone to regular understory fires. Assessing how often the island's forests burn is a critical first step in developing an understanding of the oriole's response to forest fires, and an important task for the conservation of this species.

How do seasonal rainfall and climatic trends predict fire frequency?

No fire in recent dry season

Moderately intense fire in previous dry season

Very intense crown-killing fire in previous dry season



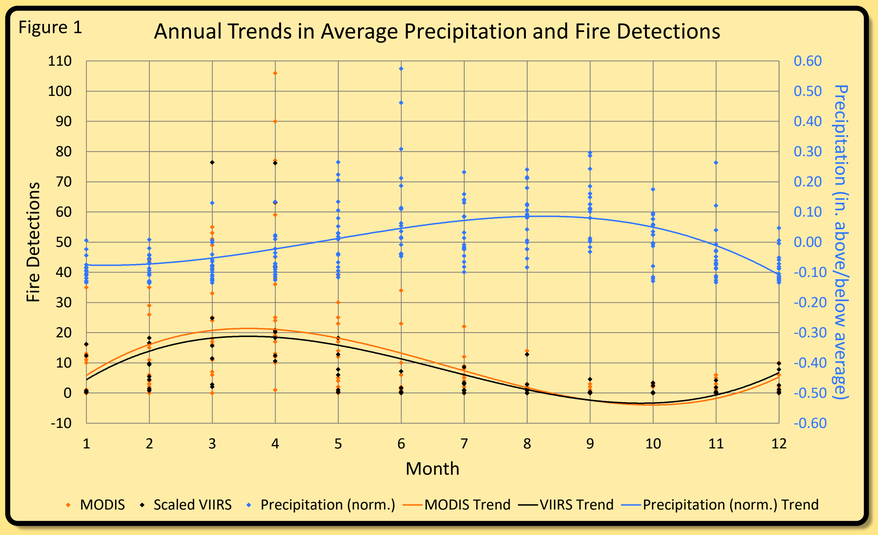
Methods

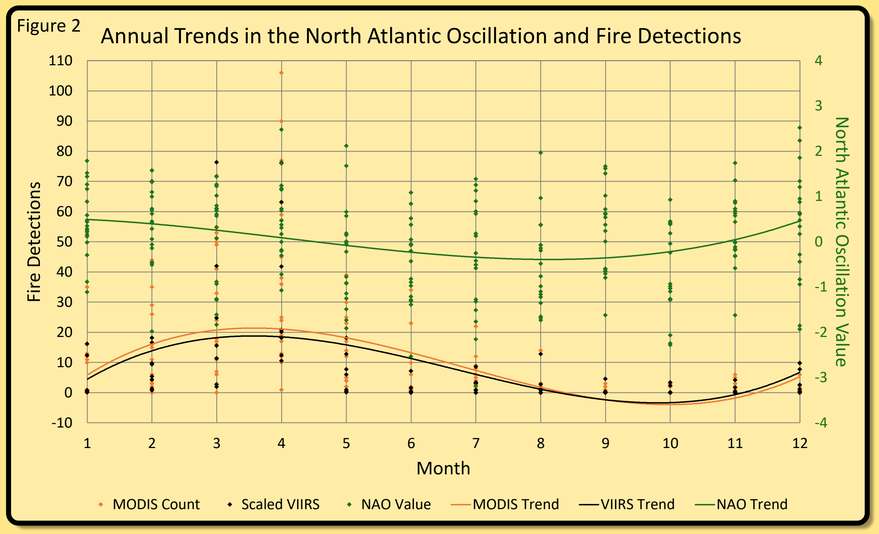
Data Sources:

- NASA, USGS AppEEARS - https://lpdaacsvc.cr.usgs.gov/appeears/
  - Moderate Resolution Imaging Spectoradiometer (MODIS) 2001-2019
  - Visible Infrared Imaging Radiometer Suite (VIIRS) 2012-2019 (scaled to MODIS, r=0.48, p<0.001)
- NOAA National Centers for Environmental Information - https://www.ncdc.noaa.gov/
  - Global Summary of the Day for Nassau Airport 2001-2018
  - Monthly North Atlantic Oscillation (NAO) values 2001-2018

Analysis:

- Calculate monthly average rainfall from daily data
- Calculate total average rainfall and normalize precipitation data
- Calculate correlation between ignition counts and precipitation and NAO values





Findings

- Strong seasonal correlation between fire deetections and average rainfall (Figure 1;r=-0.24, p<0.001)
- Moderate seasonal correlation between fire detections and North Atlantic Oscillation (Figure 2; r=0.15, p<0.027)

Next Steps

- Compare remotely sensed (RS) ignitions to field-gathered burn locations and evaluate RS detection accuracy
- Is burned area increasing over time?
- Analyze other long-term climatic trends to assess factors affecting burns on the island

References

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Acknowledgements

This research was funded by an NSF International Research Experience for Students Grant to Drs. Omland, Studds, Fagan, and Lincove