HOW DO YOU USE RADAR TO STUDY BATS?

Millions of Mexican Free-tailed Bats summer in Texas!

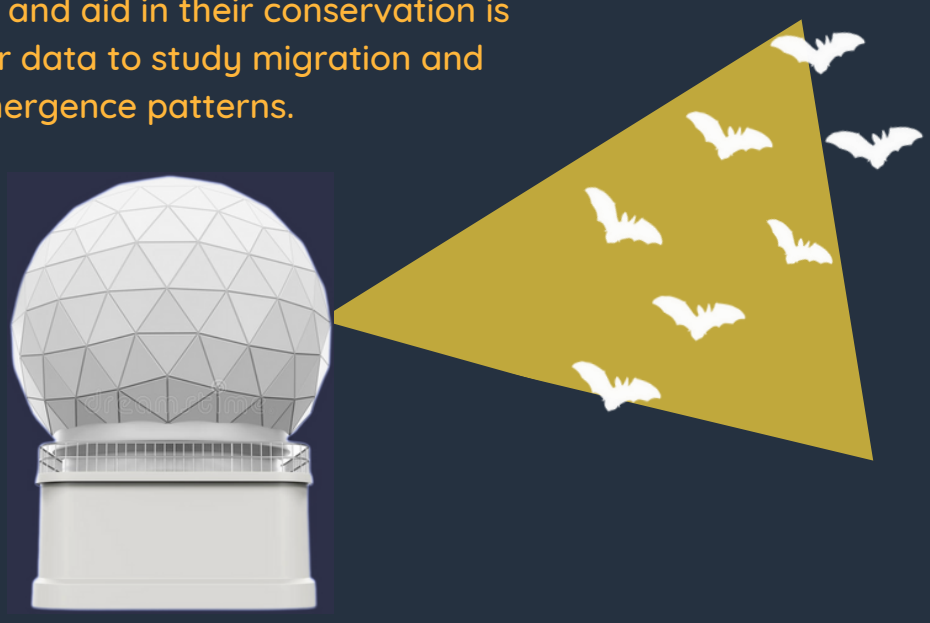
Mexican Free-tailed Bats are a species of bat found in the Western and Midwestern US and throughout Mexico. Every summer, millions of Free-tailed bats roost in South-central Texas. They play an important role in their ecosystem as a predator for beetles and seed bugs, but are also essential for agriculture in this region.

They save farmers around $3 million as pest control every year (Wiederholt et al. 2013). Free-tailed bats are also of cultural value, as large roosts like Bracken Cave near San Antonio and Congress Bridge in Austin attract visitors from around the country to view their emergences.

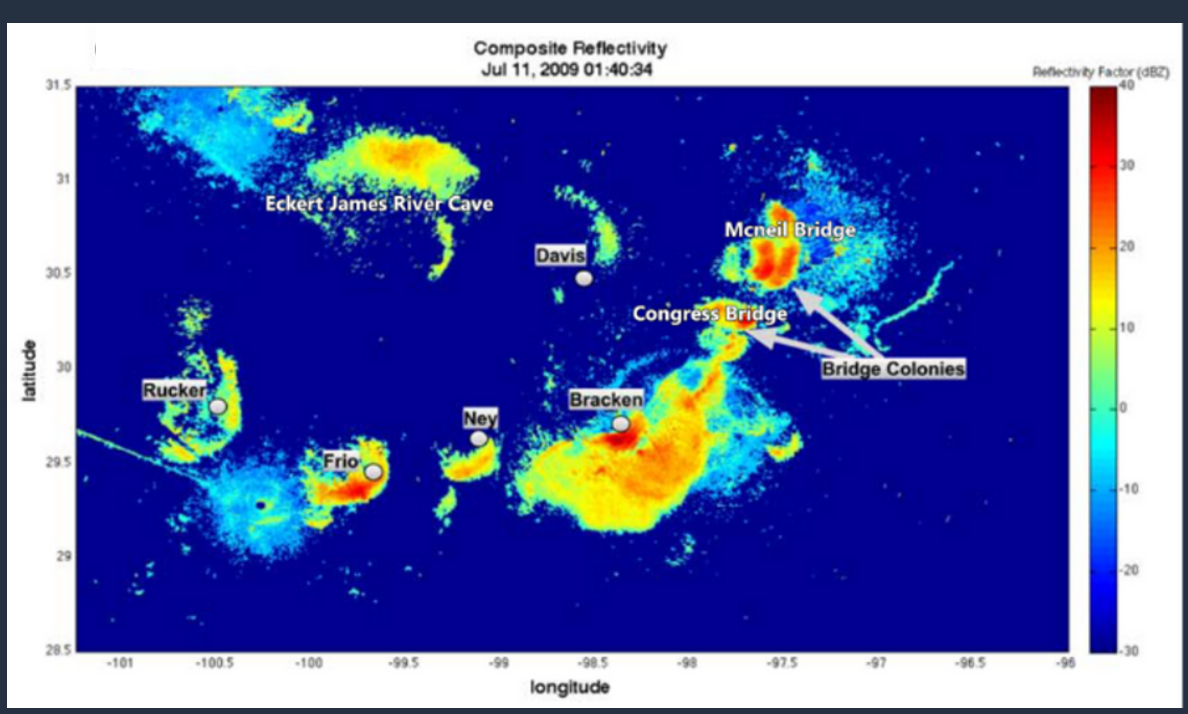
These bats are important for their ecosystem, for the farmers that depend upon them, and for the people who find them fascinating and the ecotourism sector dependent on them.

However, we know very little about the Mexican Free-tailed Bats who summer in Texas!

One way that we can learn more about Mexican Free-tailed Bats and aid in their conservation is by using Radar data to study migration and emergence patterns.



Radar data used to predict weather usually filters out biological noise. This data can be processed to instead turn the focus to this 'noise': large congregations of flying animals like birds, bats, and insects.



The image above shows what this data looks like post-processing. Eight large Mexican free-tailed bat roosts have been identified, seen emerging at night to feed on insects.

Information collected using Radar data can include emergence time and GPS location. Further analysis of reflectivity can even allow scientists to estimate density of bats in a given roost. This can allow scientists to learn about migratory patterns (phenology), emergence patterns, and could be used to learn about how Free-tailed bat behavior is changing due to climate change.

Citations:

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MacEwan, M. One big cave and a lot of Mexican free-tailed bats. (2015, September 17). Mark MacEwen. http://www.markmacewen.co.uk/blog/2015/9/17/one-big-cave-and-a-lot-of-mexican-free-tailed-bats

Wiederholt, R., López-Hoffman, L., Cline, J., Medellín, R. A., Cryan, P., Russell, A., McCracken, G., Diffendorfer, J., & Semmens, D. (2013). Moving across the border: Modeling migratory bat populations. Ecosphere, 4(9), art114. https://doi.org/10.1890/ES13-00023.1