RADARS EYE ON WILDLIFE

The next time you watch the weather on TV, you should know that you're missing something. The bigger story of life in the air is being ignored — in addition to tracking storms, weather radar picks up aerial wildlife — birds, bats and insects — but meteorologists routinely filter it out or skip over it.

It's all there on radar: Hill Country bats emerging on their nightly feeding forays, flocks of birds migrating across the Gulf of Mexico and hordes of insects being carried on winds high aloft. Even if meteorologists are ignoring it, biologists aren't. They're increasingly using Nexrad weather radar and other radar systems to gain new insight into animal behavior and to observe aerial wildlife in ways that were previously unachievable.

The use of radar to track bird migration and monitor bat movements has deepened our knowledge of wildlife and led to conservation actions such as purchasing bird migration stopover habitat, guiding wind farm locations and calculating bat benefits in agricultural pest control.

Radar works by transmitting a signal into the atmosphere and listening for a returned signal. When the pulse hits a target, a small amount of the pulse is reflected back to the radar. The objects causing the reflection can be raindrops, birds, dust or anything in the atmosphere.

With a trained eye, observers can tell the difference between raindrops and birds on a radar image.

The system of more than 150 Doppler radar stations provides biological and meteorological coverage over the whole country. And the archive of digital radar data goes back 20 years, a true wealth of data.

Scientists at the U.S. Geological Survey are developing artificial intelligence software that will distinguish between birds and precipitation on radar, and they hope to dive into the Nexrad archive to develop models for the timing and routes of bird migration.

Spurred by radar images of bats and migrating moths thousands of feet in the air, Texas researchers, including the Texas Parks and Wildlife Department, showed that Hill Country bats save farmers millions of dollars by gobbling up crop-eating insects, underscoring the need to protect large bat colonies.

The radar research being done on bats, birds and insects is part of an emerging discipline called aeroecology, which aims to unify the study of aerial wildlife the way marine biology did for the sea. Most people think of bat habitat as a cave and bird habitat as a forest or wetland. But birds and bats spend much of their time in the air, and aeroecology blends meteorology and biology to study the near atmosphere as habitat and to look at animal interactions there.

New developments in radar could very well mean major advances in the field. The next generation of weather radar, coming this year, is called dual-polarization, which will transmit waves vertically in addition to horizontally. It'll be like seeing in two dimensions instead of just one. Distinguishing between birds, bats and rain will suddenly get much easier.

Watching wildlife on radar isn't new, but it's gaining momentum. Radar can help bird watchers, too. Several areas of the country have radar watchers who relay their findings to local birders. Daily radar reports on a Texas bird-watching listserv during spring migration help bird watchers plan their outings. They let avid birders know what they are seeing as migrants make their way across the Gulf. They especially alert to weather events that may cause the birds to land, called "fallout." As with bats, bird migration presents particular challenges for study. Many migrating birds travel at night, when the atmosphere is more stable but when direct observation is impractical. And they travel at altitudes where direct observation is challenging.

Researchers are working on direct applications, too — using the knowledge to guide wind farm locations and prevent bird-aircraft collisions. By knowing migration corridors and influences on migration, wind farms can be placed where they will have the least impact on migrating birds, and airports can go on alert when migration is at its peak.

The technology has brought to light that we've got one of the highest migration passage rates in the world here along the Texas coast.

So, the next time you watch the weather on TV — after the city council news and before the nightly basketball scores — be sure to think about the birds and the bats.