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## Bats: Gone With the Wind

By Michael Price  
*ScienceNOW* Daily News  
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Batman has the Joker; real bats have wind turbines. The energy-generating machines kill bats the world over, yet the exact cause has remained as mysterious as the plot of a movie thriller. Now, a new study appears to have solved the riddle.

Wind turbines range in height from 20 to 80 meters and are typically located on hilly plains. For decades, researchers have noticed that mangled birds litter the ground surrounding the machines, and recently they've found that dead bats actually outnumber the birds, by as many as four times in some places. This was a surprise, as bats' sonar should allow them to detect moving objects even better than they do stationary ones.

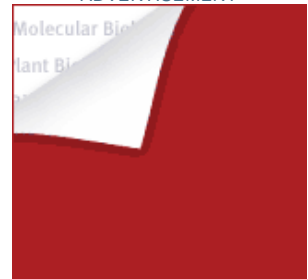
There was another conundrum as well. "While we were picking up carcasses, I noticed that a large number didn't seem to have any external injuries," says Erin Baerwald, an ecology graduate student at the University of Calgary in

Canada. For her recently completed master's thesis, she surveyed dead bats on a wind farm near the campus in Alberta, Canada. Baerwald and her advisers dissected 75 bats in the field and found that 69 of them showed signs of internal hemorrhaging. In contrast, all previous studies on dead birds found around wind turbines have turned up only external injuries caused by turbine blades. The findings suggest a sudden drop in air pressure that ruptures blood vessels in the bats' lungs, Baerwald says. The condition, known as pulmonary barotrauma, resembles the injuries SCUBA divers suffer if they return to the surface too quickly.

As a wind turbine's blades cut through the air, they lower air pressure, especially around the tips of the blades, Baerwald explains. If bats fly within a meter or so of a spinning turbine, they get caught in the depressurized zone and experience barotrauma. Birds don't, she says, because their lungs are more rigid and don't expand the same way mammals' do. The findings appear in the 26 August issue of *Current Biology*.

"This is a very nice advancement in our knowledge," says environmental scientist Virgil Brack of Environmental Solutions & Innovations, an environmental consulting company based in Cincinnati, Ohio. Now that it's clear how wind turbines kill bats, he says, scientists might be able to develop a strategy to keep the animals away from the danger areas around the blades. Baerwald suggests that energy companies shut off turbines in slower winds when bats are

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most active, especially during their autumn migratory season.

Ed Arnett, a conservation scientist with Bat Conservation International, based in Austin, Texas, agrees with Brack that the study is significant but feels that in order to save bats' lives, more focus needs to be placed on understanding the interplay between wind farms and migration paths. Sites built away from known and likely migration paths pose far less of a danger, Arnett says. "At the end of the day, the cause of death is interesting," he says, "but even more important is studying the placement of [wind energy] sites."

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