Birds predict weather change and adjust behaviour by reading barometric pressure

November 20 2013, by Jeff Renaud

(Phys.org) —A new study from Western University's Advanced Facility for Avian Research (AFAR) proves through experimentation that birds can predict changes in the weather by reading the rise and fall of barometric pressure.

AFAR houses the world's first hypobaric climatic wind tunnel for bird flight, which allows research into the physiology and aerodynamics of bird flight in high altitude conditions. Equipped with game-changing experimental and analytical facilities, AFAR is a leading centre for the study of avian neurobiology, physiology and behaviour.

These most recent AFAR-driven research findings, conducted by Scott

MacDougall-Shackleton, Christopher Guglielmo, Jessica Metcalfe, and their colleagues, were published in the journal, *Animal Behaviour*.

"We have now clearly demonstrated that birds, both when wintering and migrating, have their own internal barometer, which helps them make decisions about everything from flight to feeding," says AFAR Acting Director MacDougall-Shackleton, who is also jointly appointment in Western's Faculty of Science and Faculty of Social Science and the senior author of the paper titled *White-throated sparrows adjust behaviour in response to manipulations of barometric pressure and temperature*.

"This has been hypothesized for a long time and there is a large body of evidence that animals in the wild behave differently when weather changes but we now have an experimental demonstration where we held everything else constant except for barometric pressure proving definitively this long-held belief."

This AFAR project, led by Metcalfe while she was an undergraduate student at Western, simulated winter storms and spring migration by manipulating temperature and lighting in the hypobaric climatic wind tunnel.

"For the wintering condition, we would start very early in the morning, before the lights come on, and simulate a storm," explains Guglielmo. "Normally, when a bird wakes up, it preens its feathers and hops around a bit before fueling up for the day. In this study, we dropped the pressure, just before simulated dawn, and as soon as the lights came on, the birds immediately started eating. Similarly, when we simulated high pressure and cold weather associated with winds out of the north in the spring, the birds decreased their nocturnal migratory flight behaviour."

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Provided by University of Western Ontario

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