



## "Mucus-Harvesting Drone-Pilot" Sounds Like A Pretty Awesome Job

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[Robbie Gonzalez](#)



Much of the work done to study stress in whales may, paradoxically, be stressful to whales. Ocean Alliance – a research and conservation organization devoted to the development of "benign research techniques" – has designed a possible solution to this problem: a mucus-harvesting drone.

The stuff whales eject from their blow-holes isn't water. It's snot. Contained in that snot is all manner of biological goodness relevant to researchers and organizations who studies whales: [microorganisms, DNA, metabolic byproducts](#), toxins, and – of particular interest to organizations like Ocean Alliance – stress hormones.

In the past, whale stress was commonly assessed by measuring hormones found in fecal samples. But [whale poop can be hard to come by](#). More recently, researchers have been turning to whales' respiratory vapor (aka "blow") in search of hormones. A common technique for collecting blow involves approaching surfacing whales in boats and sampling it with long poles. But for the last few years, students from Olin College of Engineering have been working with Ocean Alliance to develop a less-intrusive sampling method. They call their mucus-harvesting drones "Snot Bots":

Carolyn Y. Jones has a good writeup on the snot bots [in today's Boston Globe](#):

*To get to this point, the researchers have been working on Snot Bot for several years; they are now on version five. Their initial challenge was to figure out how to craft a helicopter drone resistant to harsh conditions, which might include an occasional plunge into salt water. Bennett said they tried to build watertight shields to encase the motors and rotors. The researchers found that it added too much weight to maneuver the robot effectively.*

*Now, they have settled on a simpler solution, based on the realization that it's just cheaper to dunk their robot in distilled water to clean off salt and replace motors when they inevitably rust. Instead of a cup to scoop up the whale blow, they attach a sterilized surgical sponge to their robot.*

*This fall, they are planning to work on algorithms that will give the robot better autopilot capabilities that will make the biological harvesting mechanism fool-proof, even for the seasick biologist with no expertise in robotics.*

To do so, though, they'll need clearance from the Federal Aviation Administration. This summer, the agency published rules that [that prohibit commercial uses of drone, which includes research and teaching at private universities](#).

More on Snot Bots – and the challenges facing their implementation – [in today's Boston Globe](#).  
More on the data hidden in whale blow [at the NYT](#).

H/t Sian!