Engineering Weighted 3D Printed Vests for Sea Turtles with Bubble Butt Syndrome

Queiroz Miranda, Gabriela (School: Minnetonka High School)

Buoyancy issues as a result of a boat crash are called Bubble Butt Syndrome (“Sea Turtle Injuries”). There are no means of getting the trapped air out of the turtle without further injuring the animal, and approaches taken by caretakers in aquariums further increase the stress the animals undergo as fiberglassed weights slide off the carapace of the turtle with scude shedding. However, no research has explored alternative methods. This research will focus on the development of a weighted 3D printed vest to counter the effects of the air trapped inside the shell. The vest will allow the turtle to swim and will not interrupt the shedding of the sea turtle’s scuds and will be a simple solution that can be replicated in any care facility. This will be achieved is by using Fusion 360 to design the vest and 3D print it. Weights will be added to the vest in a pouch according to the turtle’s needs, separately from the shell to allow for scude shedding. Prior to the design of the vest, a 3D scanning device will be used to get a better understanding of the sea turtle’s overall anatomy- after the initial design, only measurements will need to be taken instead of 3D scanning. If the design of the vest is successful, the turtle will be able to engage in natural activities which include but are not limited to diving for feeding and swimming in regular patterns. It would also mean reduced stress for the turtle in the rehabilitation center, since the vest would be a more permanent solution than the fiberglassed and epoxied weights. If successful, future research trials can be done to study the possibility of releasing turtles affected by Bubble Butt Syndrome to the wild.

Awards Won: