Gopher Tortoise Seed Dispersal Monitoring

Gopher tortoises are native to Florida and vital to the ecosystem due to the underground boroughs they build, which provide shelter to other animals, and for their key role in seed dispersion. In order to improve our understanding of the role of gopher tortoises on biodiversity, we aim to investigate digestive track of gopher tortoises. Data on seed dispersion distance and gut retention time are critical to effective and efficient endangered plant species conservation efforts. In a multidisciplinary project between Department of Earth and Environment, College and Engineering, and the Miami Zoo, we are fabricating an ingestible device monitor and map the digestive tract of gopher tortoises.

The device needs to be properly coated to prevent any harm to the animal. Device encapsulation has been developed, but requires extensive validation before deployment. To mimic the passage of the device and the effect of the gut, device encapsulation is tested on small plastic beads. The integrity of the coating is analyzed by measuring the cross-section thickness. The process of measuring the <15μm layer involves casting fluorescent resin and quantitative analysis. In addition, UV-Vis was used to quantify scratches on the beads. Enclosure for the external trackers were designed and 3D printed to hold in place an external device that serves as a logger and aids in data transmission, placed on the tortoise's shell.