

## The island biogeography of exotic species

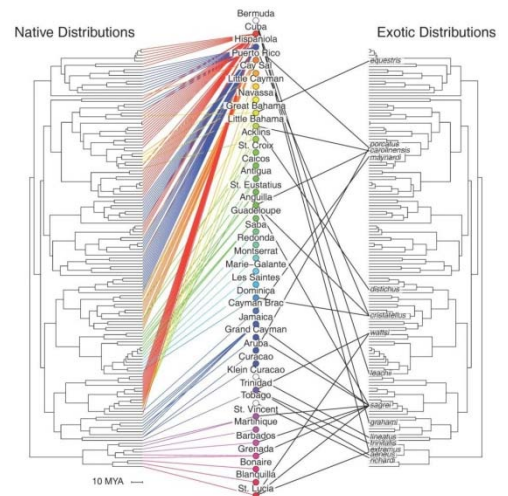
This project provides an opportunity for a student to develop skills that are applicable to a wide variety of careers in the biological and geographic sciences including data science, conservation planning, resource management and geographic information systems.

### Project Description

Humans are greatly impacting Earth by transforming natural landscapes and by spreading species far from their place of origin. These exotic species can impact natural biodiversity and ecosystem functioning. Tools to predict where new exotic species will establish are thus needed.

Simple geographic and land-use principles may explain variation in the rate of establishment of exotic species across islands. Biogeographers have long known that the number of native species on oceanic islands is strongly determined by island size and isolation. For example, across the Caribbean Sea, larger islands have more lizard species than smaller islands, and isolated islands have fewer species than islands close to continents. Thus if area and isolation predict native island biogeography, can they also predict exotic biogeography?

The student would first use GIS/remote sensing tools to calculate the extent that island landscapes have been modified by humans. Islands would be quantified as to the density of urbanization, agriculture, hotels, shipping ports, airports, and roads. The student will next calculate island area and isolation. Finally, we will ask, statistically, if the geographic and land-use variables explain variation in exotic species establishment.



### Project Goals:

- Identify relationships between exotic species establishment and geographic/human factors of islands.
- Construct land-cover maps of human impacts across global islands.
- Link a database of human impacts to an exotic species database for island nations.

### Student Responsibilities

- Use and learn GIS tools and programs to quantify land cover across Earth's islands.
- Create a synthetic framework of the types of exotic species that are spreading across the planet.
- Use and learn basic methods in R statistical programming, database management, and ArcGIS.

### Location

Temple University, Center for Biodiversity, SERC, Main Campus, Philadelphia  
(VU students may choose to work remotely from Amsterdam)

### Supervisor Information

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