



Eastern Fox Squirrel (*Sciurus niger*)
Photo by Alan Muchlinski

Distribution of Introduced Tree Squirrels in California

A Citizen Science Approach to Gathering Data

R. Garcia^[1], I. Alexanian^[2], C. Sun^[2], H. Qiu^[3], and A. Muchlinski^[1]

^[1]Department of Biological Sciences, ^[2]Department of Computer Science, ^[3]Department of Geosciences and Environment, California State University, Los Angeles, Los Angeles, CA 90032



Eastern Grey Squirrel (*Sciurus carolinensis*)
Photo by Tom Friedel

Background

- Providing an accurate description of the distribution of a species is difficult.
- Previous studies on species distributions have used location data from specimens maintained in collections at universities or museums.
- Past practice is not useful when working with introduced species because few specimens are present in managed collections.
- In this study we describe a new method for establishing the current and historical range of two species of introduced tree squirrels in California.

Goals

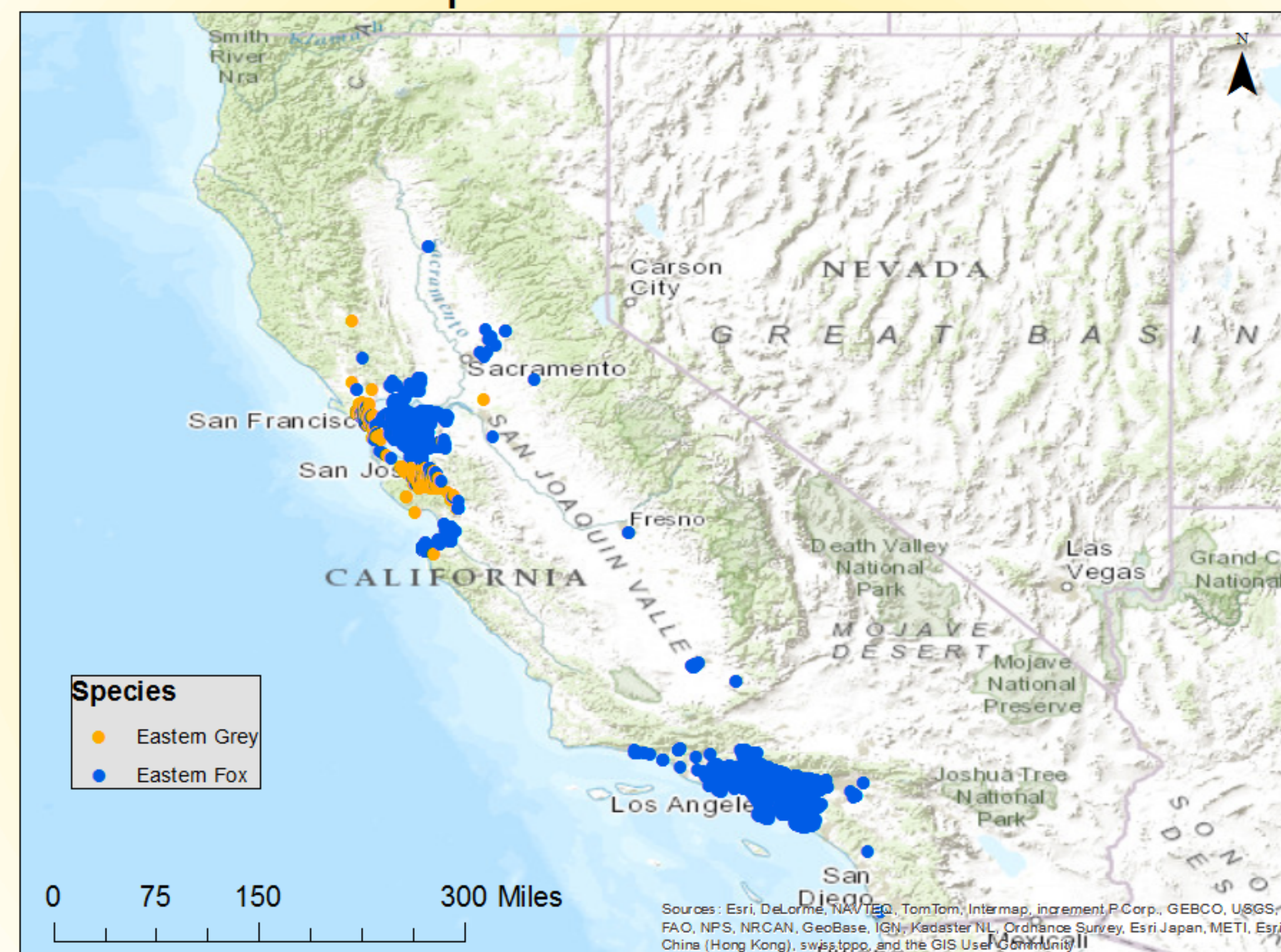
- Document the current geographic range of two species of diurnally active tree squirrels in California.
- Use GIS and remote sensing techniques to hypothesize future range expansion of introduced species.
- Utilize a citizen science approach to the collection of data.

Methods

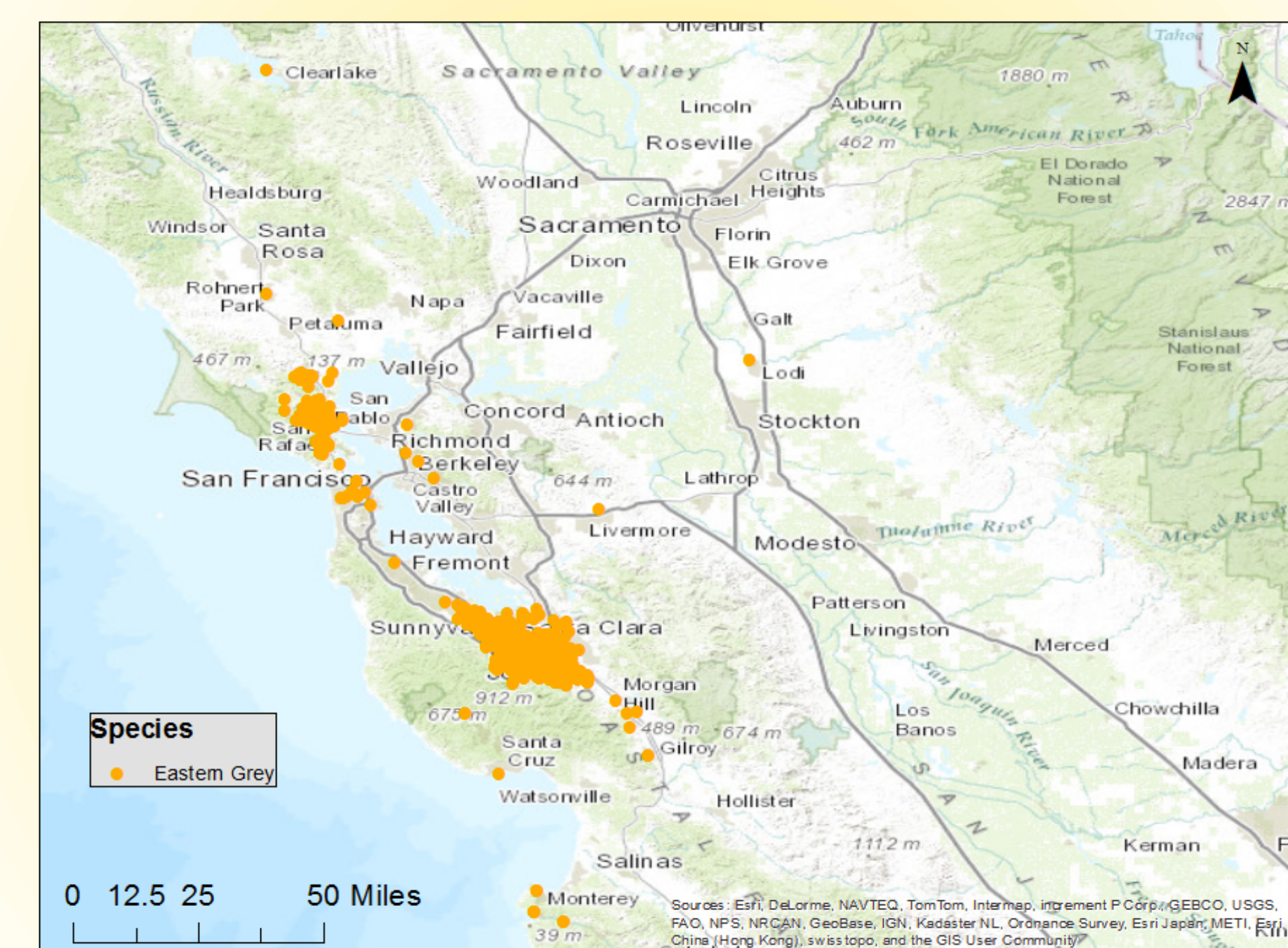
- Location data were collected from wildlife rehabilitation facilities, a smart phone application (CaliTreeSquirrels), past graduate thesis records and email submissions.
- Geolocation of data was done through Google Maps, unless geographic coordinates were already provided.
- Points were mapped with ArcGIS 10.2 in NAD1984, California Teale Albers projection.

Maps

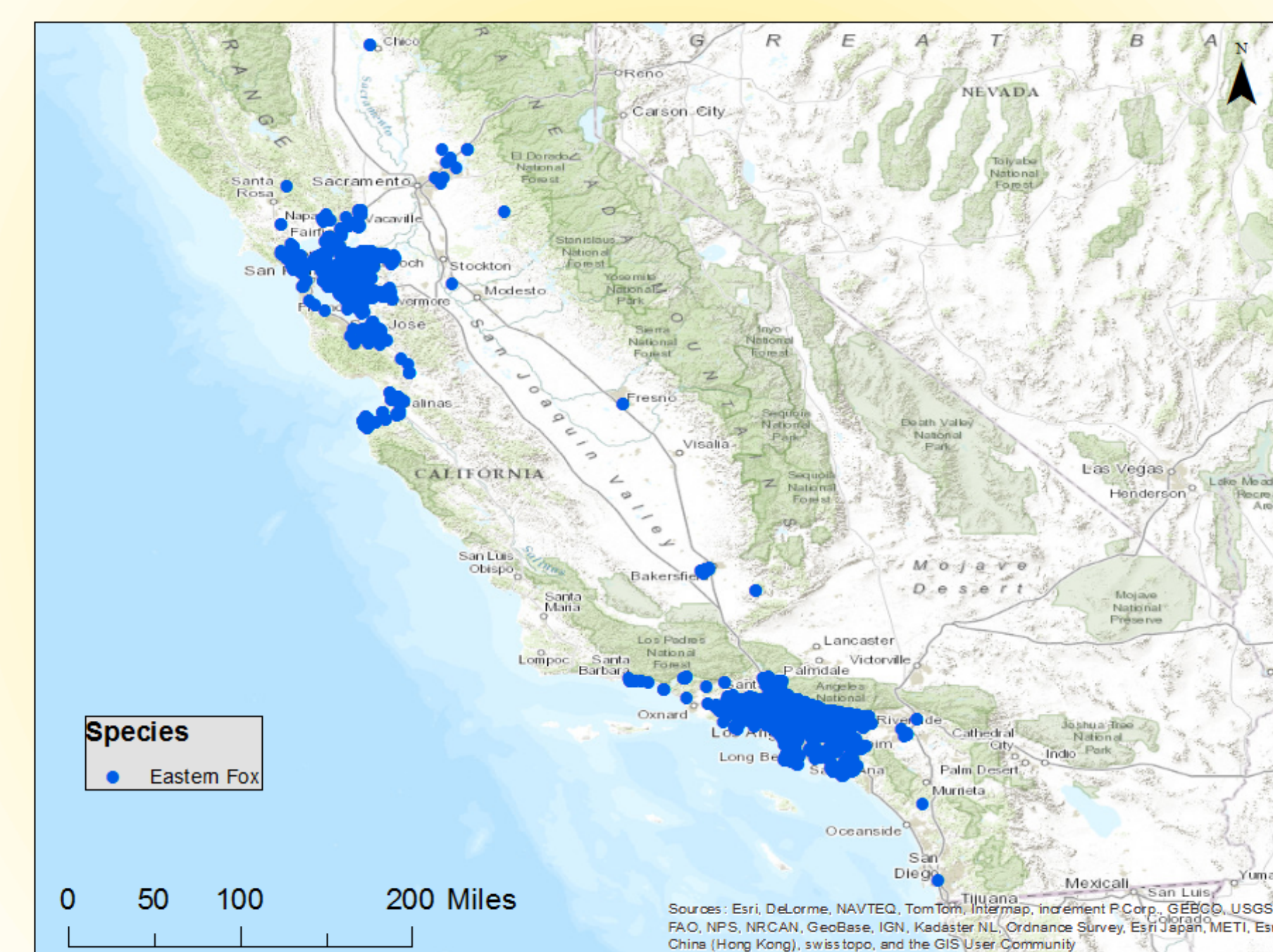
Distribution of the Eastern Fox and Eastern Grey Squirrels in California



Distribution of the Eastern Grey Squirrel in California



Distribution of the Eastern Fox Squirrel in California



Results

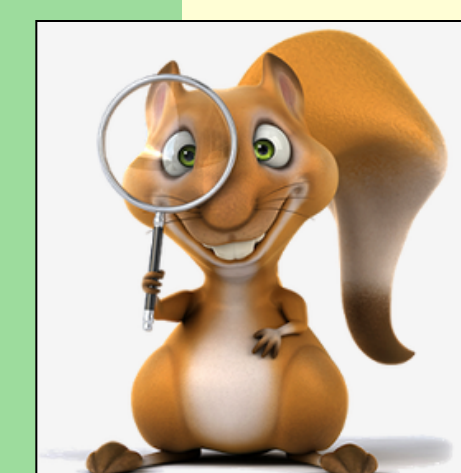
- Current data show two large populations of *S. niger* within California. The first population extends north, south and east of San Francisco while the second population extends north, south and east of Los Angeles.
- A continuous geographic range for *S. carolinensis* extends from Monterey northward to Sonoma and Rohnert Park.

Future Work

- Use of location data from rehabilitation facilities and from citizens using smartphones may be useful in studying many species.
- We will continue collecting data from citizens and organizations in California, as well as mapping the distribution of all four species of diurnally active tree squirrels.
- Assess where the invasive species may impact the native species.
- Use remote sensing techniques to hypothesize future range expansion of the introduced species.

Acknowledgements

Data sources include: Bidwell Rehabilitation Center, California Living Museum, California Wildlife Center, Gold Country Wildlife Rescue, Lindsey Wildlife Center, Peninsula Humane Society, Shasta Wildlife Rescue and Rehabilitation, Sonoma County Wildlife Rescue, SPCA Monterey County, Squirrelmender Wildlife Rehabilitation, Suisun Wildlife, Sulphur Creek Nature Center, Tehama Wild Care, Wetlands & Wildlife Care Center, WildCare and Wildlife Center Silicon Valley.
Other data sources: Julie King and Sharon Baird.



Participate in a real scientific research project that will map the current distribution of 4 squirrel species throughout California. Download 'CaliTreeSquirrels' through Google Play on Android, or visit directly at <http://goo.gl/QYtyBZ>. More information available on [facebook.com/californiatreesquirrels](https://www.facebook.com/californiatreesquirrels).

