

**EXECUTIVE SUMMARY:** *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

Earth contains an estimated 10-100 million species, but only a small fraction has been described (Figure 1). Current estimates suggest that many of these species are threatened or facing extinction due to habitat loss, climate change, and environmental pollution. Comprehensive cataloging of California's biodiversity is a necessary step in the preservation and management of these remaining natural resources. Only by describing what species are currently present can we hope to preserve or enhance biodiversity. Here, we propose to start a comprehensive species inventory for San Francisco, focusing initially on arthropod samples collected from the new 'green rooftop' of the California Academy of Sciences in San Francisco (Figure 3). This high-impact project will help to guide other restoration and 'green rooftop' efforts and will be a training tool about urban biodiversity accessible by undergraduate and graduate students as well as the public. This unique collaboration between SFSU and the California Academy will be a model for similar biodiversity studies in the state of California. The creation of a comprehensive, local species databases with traceable genetic barcodes to estimate diversity will be an invaluable tool in planning future restoration projects, monitoring the health of current restoration projects, guiding long-term species management decisions, and measuring effects of global climate change and development on species biodiversity in CA and beyond. While the proposed work focuses on DNA bar coding to catalog diversity, future funding will focus on obtaining genome and transcriptome data for these species.