

Using iNaturalist to engage the public and learn more about echinoderms

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Introduction

Echinoderms are among the most conspicuous and abundant marine invertebrates. Several species of echinoderms undergo important demographic fluctuations for reasons that are not always well understood (e.g., crown-of-thorns outbreaks, *Diadema antillarum* die-off, starfish-wasting-syndrome), with important ecological consequences. In addition, many species are targeted by unregulated fisheries.

Despite these factors, echinoderms have not received a lot of taxonomic attention, and many large species remain undescribed and/or poorly known. Regularly, field guides illustrate undescribed species.

With recent technological advances, it has become increasingly easier to document species encountered in nature. For instance, smartphones can, with the single touch of the screen, take a picture while associating the exact geographical location and time of the observation. Digital cameras have made underwater photography much more accessible, and many divers now document the species they encounter by sharing their pictures on social media websites.

Our knowledge of echinoderms could therefore be improved by aggregating user observations of these organisms, while potentially documenting changes in abundance or geographical range through time.

Number of observations per class

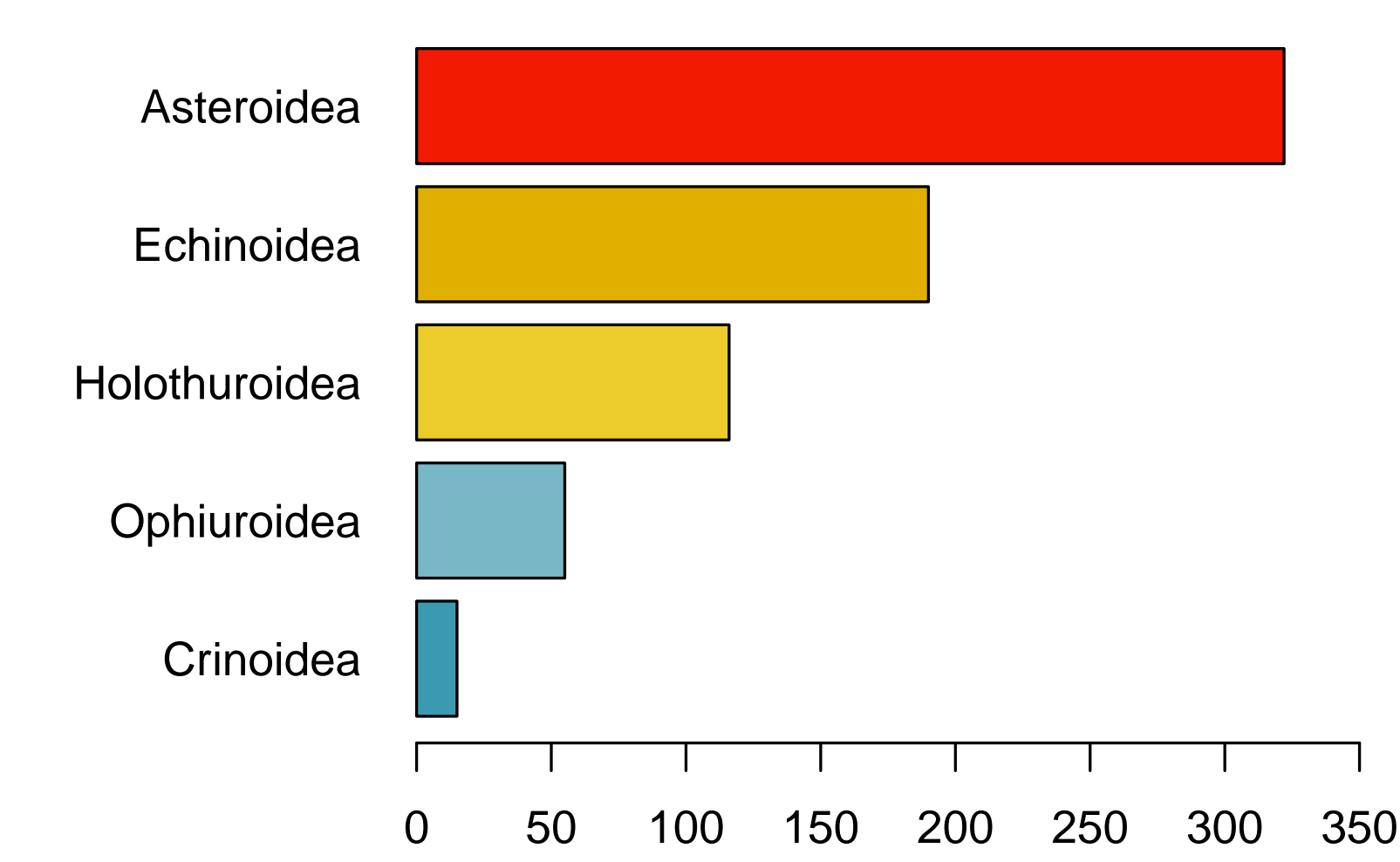


Figure 1: Number of observations per class

Large and abundant species found on the intertidal of the Western United States dominate the observations. However, observations of species encountered while snorkeling and SCUBA diving in the Caribbean and the Indo-West Pacific represent a large proportion of the observations.

One hundred users have already contributed over 700 observations. We will advertise the project more widely to the SCUBA diving community and through citizen science initiatives.

Most recorded species

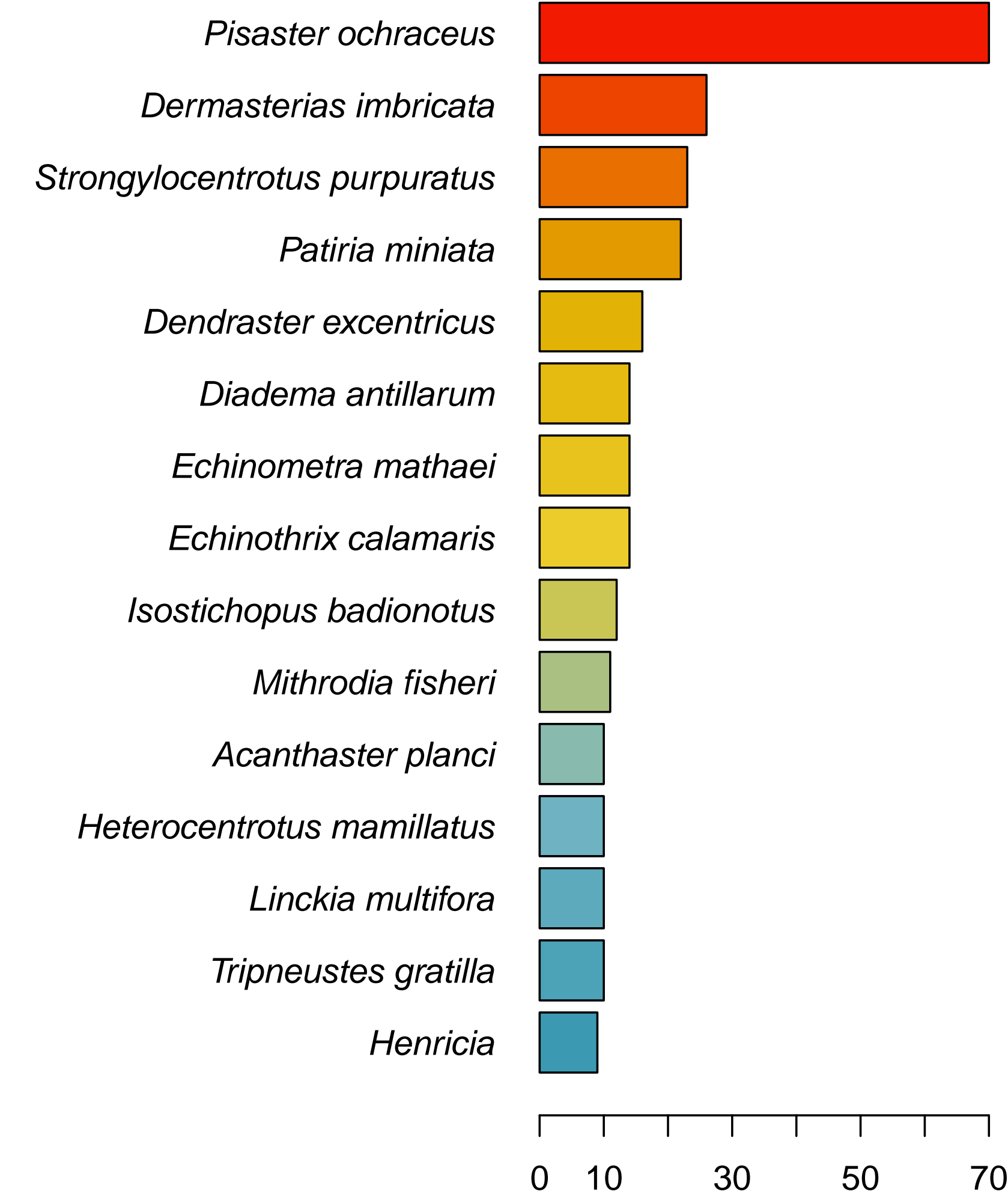


Figure 2: List of the 20 species the most observed on iNaturalist

What is iNaturalist?

iNaturalist (<http://inaturalist.org>) is a website that allows users to submit their species observations alongside with images, GPS coordinates and any other information about the habitat or the natural history of the species they encounter. Once submitted the observations can be identified by the community and validated by "curators". This mechanism provides a tool for users to hone their identification skills, and for scientists to validate species occurrences.

We started a project on Echinoderms (<http://inaturalist.org/projects/echinoderms>) to gather observations worldwide, and across taxa. Our goal is to improve our knowledge of species distributions, and educate the public about the diversity of Echinoderms. This platform provides a great outreach tool to facilitate communication between scientists and naturalists. Because iNaturalist is easy to use and has applications for mobile devices, it could be used during citizen science initiatives (e.g., bioblitz) or during class field trips.

We welcome everyone to submit observations or help curating the observations submitted to the project. Don't hesitate to get in touch with us!

Echinoderms on iNaturalist

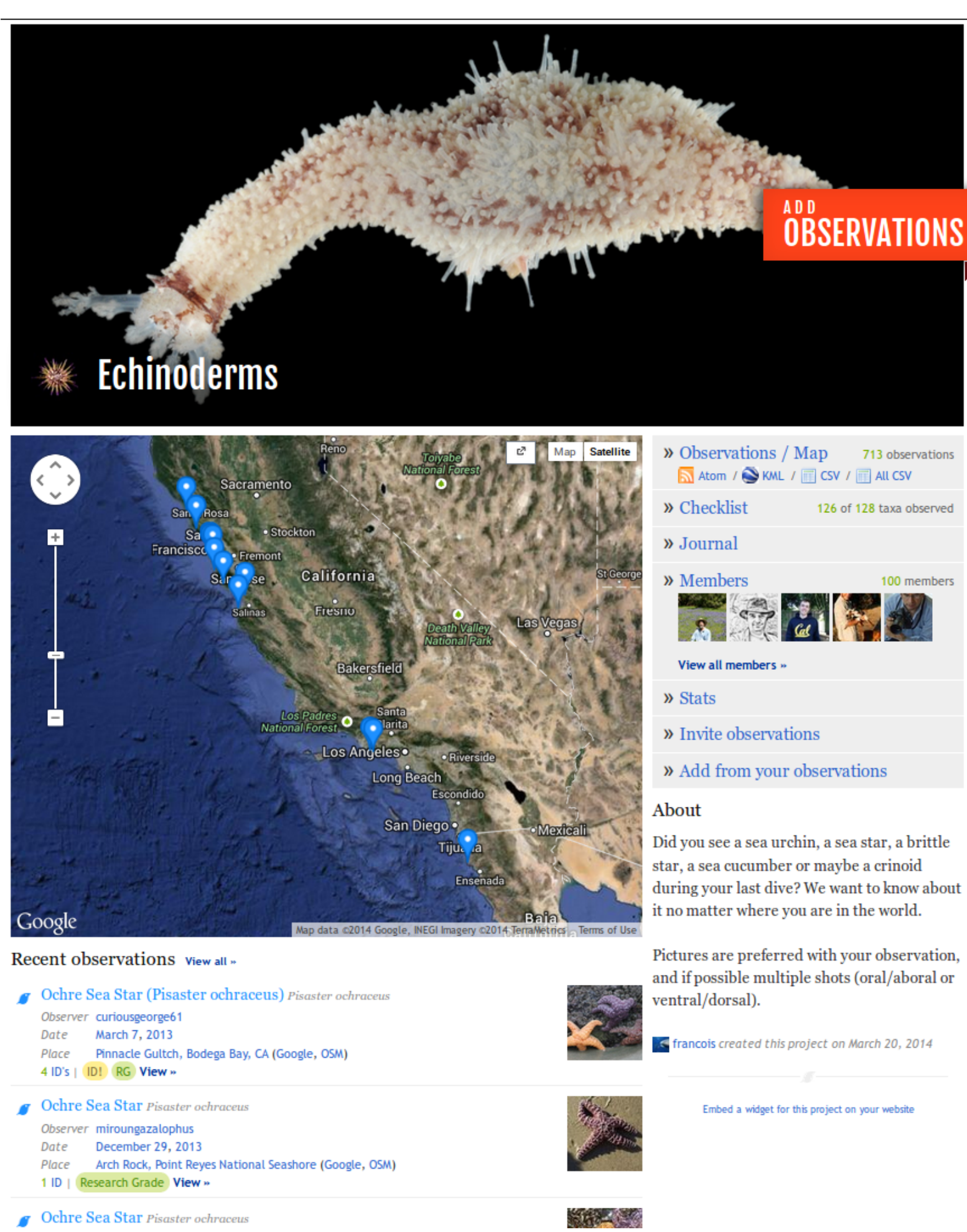


Figure 3: The Echinoderm project on iNaturalist

User observation

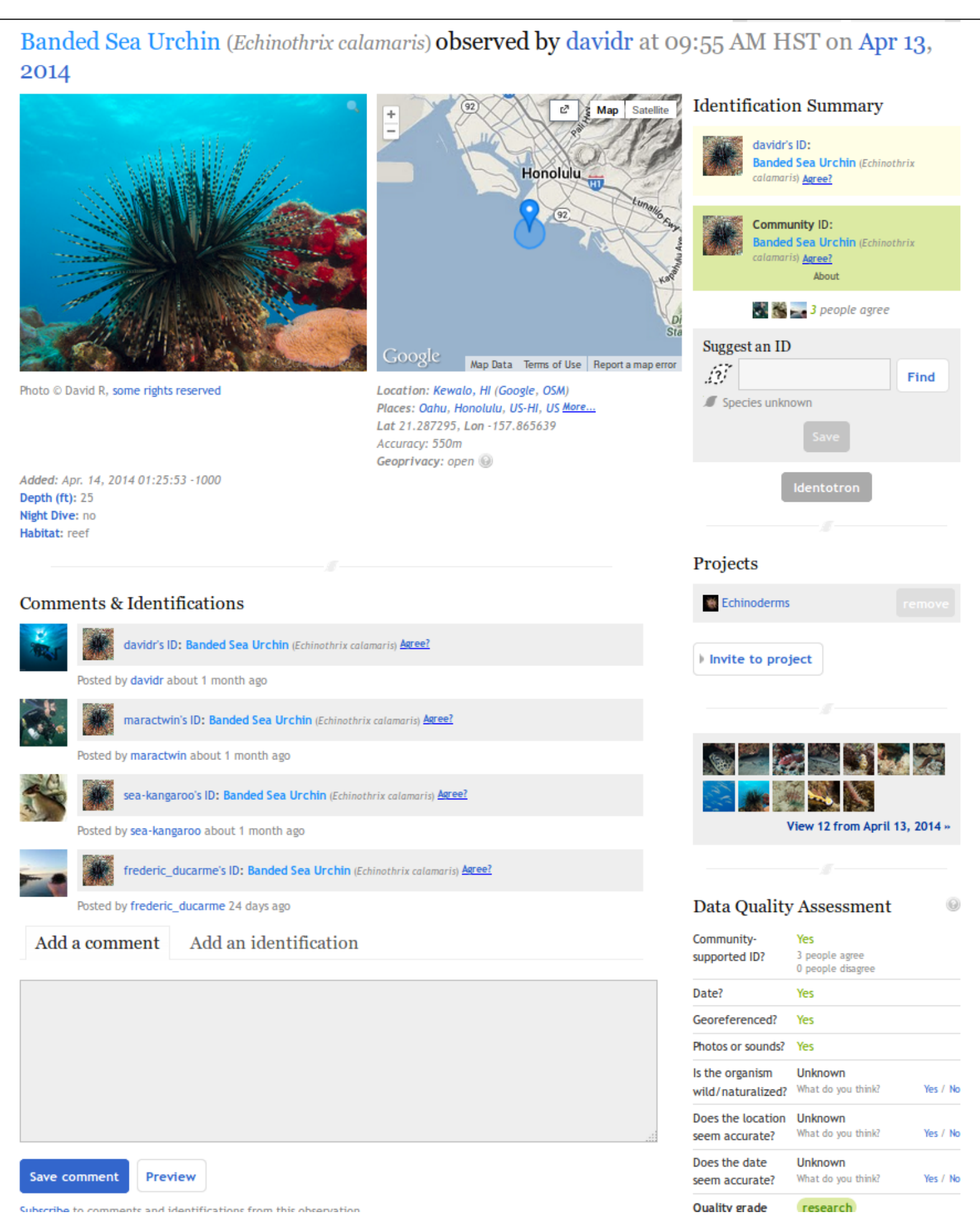


Figure 4: Example of a user-submitted observation

Map of recorded observations



Figure 5: Global distribution of observations recorded by iNaturalist users

Distribution maps

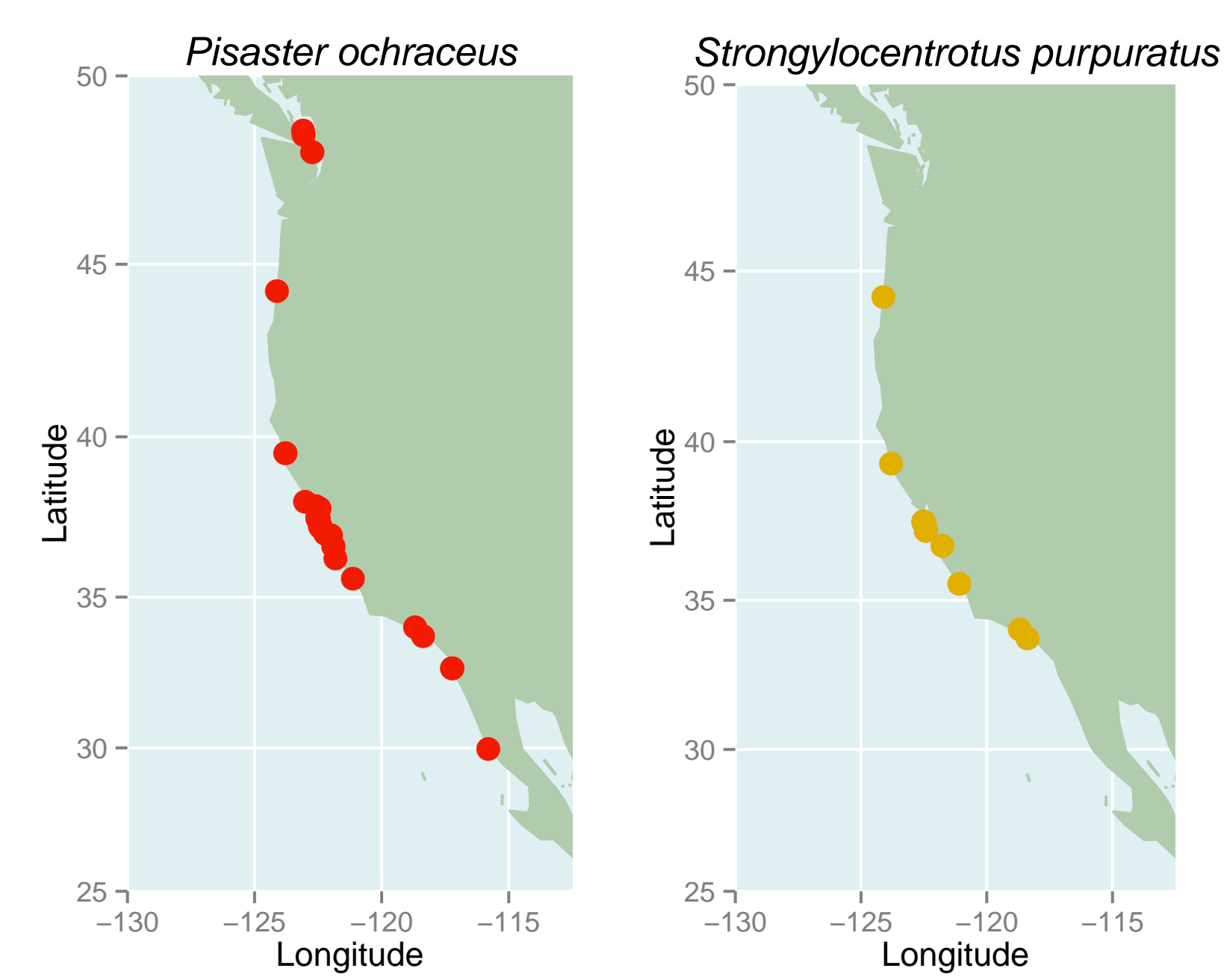


Figure 6: Distribution map for two highly observed species generated from user observations