### Hashtags: #earth, #earthonahike

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### Tags: Citizen Science, Hardware, Platform

**Challenge Description**

Satellites put a ton of data in your hands, but it's hard to access without an Internet connection. Design an app that enables downloads of this data for use in the field. The goal would be to enable people to find specific geographic features, gather data about them using smartphones, and—once they have Internet access—upload them to a database. This might include the location, time the data were collected, descriptions, and other metadata.

The app could allow people to display remote sensing satellite imagery from the field to guide them to interesting features nearby, such as specific trees and shrubs. Field observations of these features add complementary information that cannot be derived from remote sensing data alone, such as close-up pictures of leaves, flowers, and fruits that enable scientists to correctly identify an organism. Additional data on features related to structure, habitat, and phenology are also gathered. These data are archived in the Global Biodiversity Information Facility.

**Background**

Tens of thousands of naturalists share ground-truth remote sensing data by recording research-grade photo-vouchered observations of living things. There are citizen science social networks that provide mobile apps and a Rails web app that they communicate; both are open source projects. To function while offline, the mobile apps allow users to download field guides and other references from the web app when they have cellular connections so that the resources are accessible offline. Likewise, observations made while offline can be synced up to the web app later, once cellular connections are restored. This is a model for how remote sensing data could be downloaded in advance so it is accessible from the field.

**Solution Ideas**

Here are some ways for you to frame this solution:

When the user has network access, the app could allow the user to interact with the existing map user interface to select imagery that can be downloaded and cached for offline use; provide map information within a certain spatial extent; and/or let people gather and record data that can be uploaded to a database afterwards, ideally as a layer on the map.

**Sample Resources**

* iNaturalist website: [https://www.inaturalist.org](https://www.inaturalist.org/)
* iNaturalist research-grade observations: <http://www.gbif.org/dataset/50c9509d-22c7-4a22-a47d-8c48425ef4a7>
* Rails site for sharing code: <https://github.com/inaturalist>