GEOHIVE CROWDSOURCING

DATA SHEET

GeoHIVE Crowdsourcing

Maxar's Geospatial Human Imagery Verification Effort, or GeoHIVE, is a team of geospatial analysts, geospatial developers, and imagery analysts who interact with a vetted crowd of online users to validate, discover, or annotate features of interest in satellite imagery. GeoHIVE hosts campaigns on a website where members of the crowd get paid for answering a simple question about a satellite image, tagging a feature of interest, or drawing a bounding box around a feature of interest.

Features and benefits

GeoHIVE provides the custom insights you need to use geospatial intelligence

to the fullest.

- **Enrich datasets.** Discover a huge range of on-ground features, including aircraft, smoke plumes, construction sites, sports facilities, religious sites, buildings, military objects, vehicles and many more.

- **Validate datasets.** Confirm that identified features are valid as of the date of image collect.

- **Spatio-temporal analysis.** Look at the same area—be it a dock, airfield, parking lot or anything else—at different times or on different dates.

- **Complex questions.** Need to locate all of the paths and roads that cross an administrative border? Want to find all of the new buildings in an area of interest? GeoHIVE can do it.

Unlock the power of the crowd

Discover

When finding all of the features in an AOI is a top priority, GeoHIVE discovery campaigns harness the collective wisdom of the crowd to quickly search through satellite imagery and place points on features of interest. We achieve rapid, high-quality results by providing crowd members with a few image chips at a time. Each image chip is seen by multiple members to increase the likelihood all features will be found and provides a consensus for members' tags. When the crowd has completed the campaign, CrowdRank® conflates the tags and assigns confidence scores to each user and feature before the results are processed by our GeoHIVE geospatial analysts for quality assurance (QA).
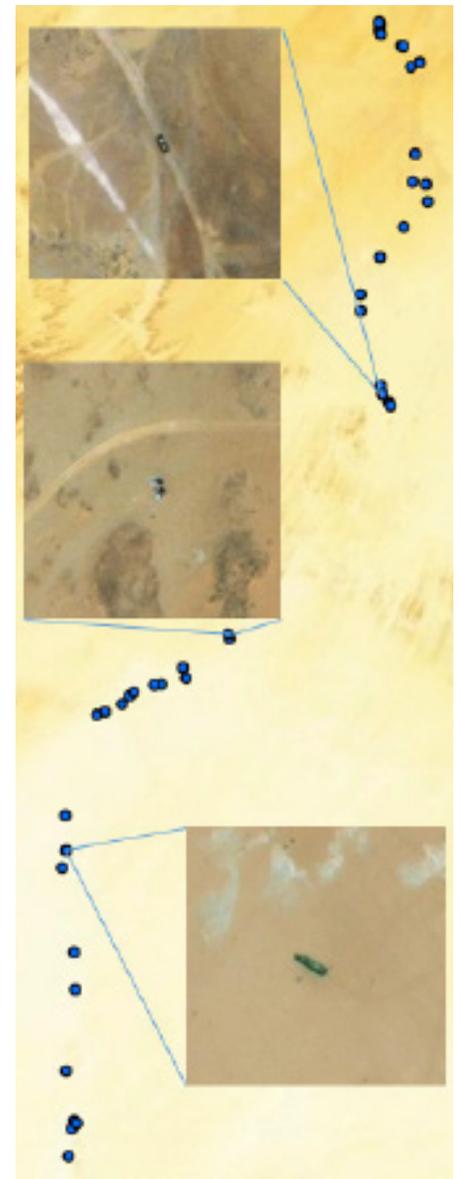
Vehicles along a smuggling route discovered by GeoHIVE.

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Validate

When clients need to confirm the presence of a feature or features, GeoHIVE validation campaigns utilize the skills of the crowd to quickly assess the presence or attributes of a feature within a specified polygon. These campaigns can ask the crowd to confirm or deny the presence of a bridge within a circle or to appropriately label a recreational point of interest as a swimming pool, park, or soccer field. We attain high-quality results by asking several crowd members to vote on each feature. When the crowd has completed the campaign, CrowdRank® calculates the most likely classification and confidence score of each user and feature before our GeoHIVE analysts perform the final QC checks.

Create

When clients are interested in mapping an area, our GeoHIVE Editor campaigns are ideal for accurately digitizing and mapping an AOI in a short time frame. First, we divide the AOI into many rectangular sections, then make sure each section is viewed by one or more crowd members. Users then create point, line, and polygon features, as well as assign attributes such as land use or name. Once an image is digitized, it is sent to another user to validate and approve the bounded/attributed feature(s). This capability is typically reserved for university outreach or internal dataset enrichment.GeoHIVE Editor campaigns are recorded on a proprietary server, allowing the crowd to digitize temporary features and events, making it one of the most powerful crowdsourcing platforms in the world.

GeoHIVE in action: Functional map of the world

In 2017, Maxar was part of a revolutionary machine learning dataset project called Functional Map of the World. It is comprised of 1,000,000 labeled satellite image chips within 85 distinct object types. GeoHIVE supported the effort by validating over 450,000 points of interest from open source data and creating a feature bounding box for each image chip.
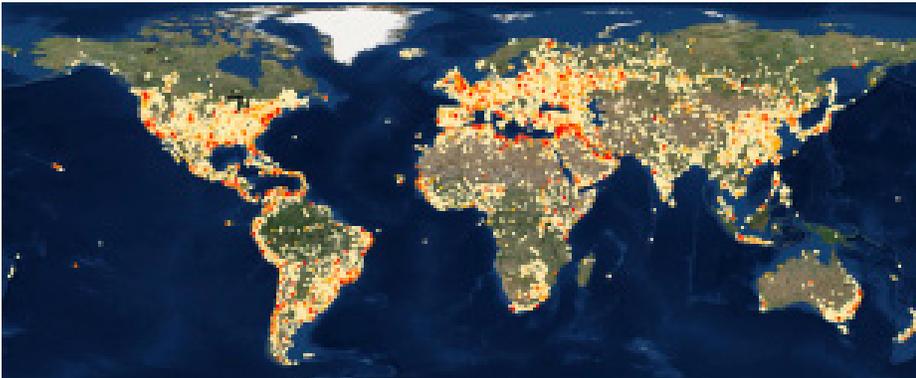
Captions map showing density of features validated by GeoHIVE in support of the functional map of the world challenge.

Labeled satellite image chip with a soccer field bounding box drawn by the GeoHIVE crowd in support of the Functional Map of the World challenge

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