### Hashtags: #earth, #imagineearth

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### Tags: Data Visualization, Model

What would you build if you had instantaneous imagery data of the Earth from the past decade? Using openly accessible access to Earth imagery from the past and present create new ways to interact with NASA’s Earth imagery.

This challenge asks you to: (1) explore the capabilities of the current Global Imagery Browse Service (GIBS) and Worldview resources, (2) brainstorm and design ways to use those resources, (3) create prototypes, and (4) suggest how this data could be made easier for others to use..

Here are some potential ways to use NASA Earth imagery to get your creative juices flowing.

Informing adventure sports: You want to go backcountry snowshoeing and there are no weather reports for the area. To help you decide whether or not this particular day might have snow based on historical data and trends this time of year; you could look at recent and historical imagery on that day for the last 10 years. Enabling consumer choice: Changing local environments might influence a variety of consumer decisions, such as where to buy a home. How might commercial companies trying to facilitate purchasing decisions that are highly influenced by historical and future environmental conditions leverage Earth imagery? Documenting land cover change: Applications could include documenting large-scale landscape changes through time such as urban growth, riverbed course changes, the extent of flood zones, mountaintop removal mining, and wetlands reconstruction.

NASA maintains and contributes to a collection of hundreds of terabytes of Earth observation imagery from our numerous satellites. NASA makes that imagery available to scientists and the public to help to improve our understanding of Earth systems and climate. The types of imagery provided supports applications in air quality, volcanic ash and smoke plumes, drought, dust storms, fires, floods, severe storms, shipping, and vegetation, among others. Some of this imagery is currently made available in its full, native resolution through NASA’s Global Imagery Browse Service’s (GIBS) public API. GIBS provides daily, global images covering mid-2012 through present for 100+ visualized data parameters, with ongoing activities to expand throughout the entire historical record of each product. Many imagery products are continually updated throughout the current day with the latest imagery (often available within four hours of acquisition from the satellites), providing the capability to address problems that are time-sensitive. The NASA Worldview browsing tool provides an interface to interactively pan and zoom the entire set of imagery available in GIBS. In addition, GIBS and Worldview can view imagery from Arctic and Antarctic perspectives to provide “full Earth” coverage. Here are some current ways these images are being used.Visualizing the changing world: Timelapses are a powerful way to show how change happens visually. Creating a cloud-free digital atlas of the Earth: You can use imagery from GIBS and other satellite resources to find the best-available imagery for every point on the Earth, and then stitch together that imagery to make a beautiful, seamless map. Building a mobile app to explore the Earth: An independent developer built an app to browse NASA satellite imagery from GIBS. Capturing the Earth’s natural beauty: Some online journals have found stunning imagery as captured by NASA satellites and viewable through Worldview. Interactively exploring clouds and severe storms: PBS NOVA Labs has created a citizen science and educational site dedicated to learning about clouds and severe storms, such as “Reconstruct a Storm” and “Open Investigation,” to see how they encourage users to interactively explore storm properties using GIBS.

IMPORTANT NOTES:

GIBS is an image API. NASA does not currently offer data-as-a-service at a single point of access like GIBS (a data API) but will insights generated from this event and other user consultations in the development of the data API in the future. This challenge focuses on innovative uses for imagery, not the underlying data. Imagery available through GIBS and Worldview are historical, not predictions or modeling products. The maximum spatial resolution (detail) currently available in GIBS is 250 meters per pixel from the MODIS instrument. See [here for an example](http://1.usa.gov/1cDzLH4) of the best detail available for the San Francisco Bay area and California’s Central Valley. Move the map a little to the east to see the Yosemite Rim Fire. Other products will eventually be added to GIBS including those that have a spatial resolution around 30 meters per pixel ([e.g., ASTER](http://earthobservatory.nasa.gov/IOTD/view.php?id=42758)). Most of NASA’s Earth observing satellites are in a[polar orbit](http://en.wikipedia.org/wiki/Polar_orbit). This means that imagery is often only captured once per day ([see here](http://www.nasa.gov/topics/earth/features/viirs-globe-east.html) for an illustration and [here](http://en.wikipedia.org/wiki/File:Polar_orbit.ogg) for a movie). There is a tradeoff between the spatial resolution of a satellite instrument and how much it covers the Earth on a given day. It is akin to flying in orbit with a handheld camera: you can either use the zoom lens and get good detail for a small area or a wide angle lens for more coverage - but you can’t have them both. So a satellite product with coarser resolution (e.g., 250m/pixel) will see most of the Earth every day, while a product with a finer resolution (e.g., 30m/pixel) will only see a small portion and only revisit the same place every 16 days.

For your information, here are some future capabilities of GIBS: GIBS is expanding the time range of MODIS products to begin in the year 2000 and continue through the present; and

GIBS is expanding the number of products available including a full resolution, global [Landsat WELD](http://weld.cr.usgs.gov/) product.

**Solution Ideas**

Here are some ways for you to frame this solution

1) Create an overview of the use case to answer the following questions. What is the solution (tool or application) leveraging GIBS or Worldview seeking to do? Who is the user? Why is this use case important? What important existing problem might this use case address?

2) Create a preliminary solution design with a storyboard and wireframe user interface to describe the solution based on GIBS current or planned, future capabilities. See the last section for a list of planned, future capabilities.

3) Suggestions for ways to improve GIBS and/or Worldview. Teams can list specific recommendations for improving usefulness or outline specific hurdles they encountered when trying to build their prototype. Teams can provide a description of the technical requirements that would be needed for the use case to work if it doesn’t already. For instance, how would the imagery need to be made available? How often? In what format? What imagery specifically?

Solutions can contain the following:

A working prototype of the solution; identification of open source tools the prototype builds upon or uses; and a list of other data/ imagery sources.

**Sample Resources** :

* <https://earthdata.nasa.gov/gibs>
* <https://earthdata.nasa.gov/worldview>
* [Global Imagery Browse Services (GIBS)](https://earthdata.nasa.gov/gibs)
* <https://wiki.earthdata.nasa.gov/display/GIBS/GIBS+Available+Imagery+Products>
* <https://wiki.earthdata.nasa.gov/display/GIBS/GIBS+Access+Methods>
* <https://wiki.earthdata.nasa.gov/display/GIBS/GIBS+Supported+Clients>
* <http://modis-atmos.gsfc.nasa.gov/products.html>
* <http://modis-land.gsfc.nasa.gov/>
* <https://earthdata.nasa.gov/labs/worldview/>