

# Band Combinations



Center for Biodiversity and Conservation

**Biodiversity Informatics Facility**

The mission of the Biodiversity Informatics Facility is to be a leader in the development, application, and promotion of rigorous biodiversity informatics methods and tools to provide new insights in conservation, ecology, and evolution.

The Biodiversity Informatics Facility applies information technologies to collect, organize and analyze biological and environmental data from expeditions, remote sensing, natural history collections, modeling and databases. Through research that applies cutting-edge spatial analysis technologies, we aim to discover new insights and develop new methods in ecology, evolution and conservation biology. Through training initiatives and the development and distribution of software and scripts, we aim to strengthen the capacity of students, educators, researchers, conservation practitioners, and the broader public to study and better understand biodiversity.

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**How to cite this document:**

Author(s). Year. Title. Version. American Museum of Natural History, Center for Biodiversity and Conservation. Available from <http://biodiversityinformatics.amnh.org>. (accessed on date)

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Color satellite images are created by combining different image bands so that each band is illuminated with red, green, or blue light in a computer display. The resulting image is a color composite. Changing the assignment of specific image bands to a color modifies the appearance of a color image. Remote sensing practitioners use specific band combination to highlight features of interest. For example, there are color composites that are well suited for monitoring vegetation health and other that closely replicate what the human eye sees.

The Sentinel Hub Playground (<https://apps.sentinel-hub.com/sentinel-playground>) provides the ability to view preset band combinations or to create your own custom color composite. Click on the "Natural color" preset to see an image that is similar to the way we see a landscape. Click on the "Color infrared (vegetation)" preset to see an image that enhances vegetation (in red). Experiment with the different presets.

You can also create your own color composites by clicking on "Custom". In the Custom view you will see several circles in the upper left of the window that represent image bands and color illumination options. Click on one of the 12 Sentinel bands (circles with numbers) and drag it to the circle to the right of "R:". Select another band and drag that to the circle to the right of "G:" and select another band for "B:".

If you want to see what a single band looks like drag the same band to each of the color (R, G, B) circles. That will produce a gray-scale (black and white) image for that band. For example you can view band 4 (the Sentinel band that measures reflected red light) by dragging "4" into the R, G and B circles. You'll see that vegetation is quite dark and in some cases it's black. Now, drag band 8 (the Sentinel band that measures near-infrared reflected light) into the three color circles and you'll see the image looks much brighter with less contrast although water is black.

You can use this tool to view different areas around the world by panning (left-click and drag) with your mouse and you can select imagery from a specific date using the menu at the top of the page. You can zoom using the "+" and "-" icons or use your mouse wheel. The default image is Sentinel-2 but you can choose to display Landsat 8, MODIS and Sentinel-1 (radar) imagery by clicking on the satellite icon in the upper right corner of the display window. The "DEM" option in the satellite image list is to display a digital elevation model, not a multispectral satellite image.