Observing the Earth from afar with NASA's Worldview

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AGU Fall Meeting 2017: IN31C-0096

NASA's Worldview interactive web map application delivers global, near real-time imagery from NASA's fleet of Earth Observing System (EOS) satellites. Within hours of satellite overpass, discover where the latest wildfires, severe storms, volcanic eruptions, dust and haze, ice shelves calving as well as many other events are occurring around the world. Near real-time imagery is made available in Worldview through the Land, Atmosphere Near real-time Capability for EOS (LANCE) via the Global Imagery Browse Services (GIBS). This poster will explore new near real-time imagery available in Worldview, the current ways in which the imagery is used in research, the news and social media and future improvements to Worldview that will enhance the availability and viewing of NASA EOS imagery.

Observing Earth from Space

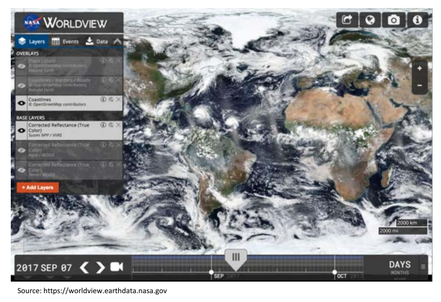
- NASA's constellation of satellites orbit the Earth and many satellites provide data and images in near real-time.
- The Land, Atmosphere Near real-time Capability for EOS (LANCE) provides near real-time imagery (within three hours of satellite overpass) from NASA's Earth Observing System (EOS) satellites to support application users interested in monitoring a wide variety of natural and man-made phenomena.

Source: https://www.nasa.gov/content/esd-nasas-eyes-on-earth

https://worldview.earthdata.nasa.gov

Worldview

- Visually explore the Earth as it is "right now" using the Worldview web application.
- Users can visualize and download near real-time imagery from LANCE and other sources, non near real-time and historical imagery.
- The imagery is served by the Global Imagery Browse Services (GIBS) (https://earthdata.nasa.gov/gibs) standards based web services with open access to full resolution LANCE and other NASA imagery.
- Explore current natural events with information from the NASA Earth Observatory Natural Event Tracker (EONet) API (https://eonet.sci.gsfc.nasa.gov/).
- Animate imagery over time.
- Explore remote polar regions with the Arctic and Antarctic views.



Source: https://worldview.earthdata.nasa.gov

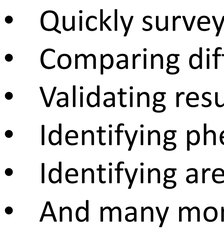
Worldview in the News…

NASA's Adopt the Planet Campaign for Earth Day

Source: https://climate.nasa.gov/adopt-the-planet

Release of VIIRS "Earth at Night"

http://www.dailymail.co.uk/sciencetech/article-4409248/Nasa-releases-stunning-new-global-maps-Earth-night.html



Source: https://twitter.com/NASA_Roman/status/822179647349805058

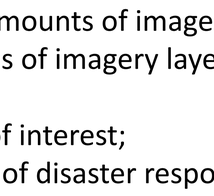
Fires near Pedrógão Grande, central Portugal
Began on 18 June 2017; there was a heatwave and appeared to be caused by dry thunderstorms.

Source: http://rr.sapo.pt/extralarge/86536/o_incendio_de_pedrogao_grande_visto_do_espaco

Source: https://www.noticiasaominuto.com/tech/816434/nasa-divulga-imagens-de-pedrogao-grande-visto-do-espaco

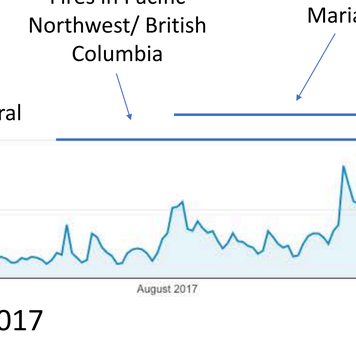
Source: http://sicnoticias.sapo.pt/especiais/tragedia-em-pedrogao-grande/2017-06-19-O-fumo-do-incendio-de-Pedrogao-Grande-visto-do-espaco

Source: http://visao.sapo.pt/actualidade/portugal/2017-06-18-O-fogo-que-veio-do-nada

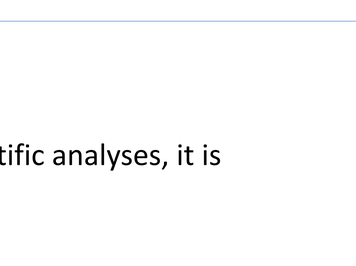


Source: https://twitter.com/FrisoVosdeWael/status/879778969461108737

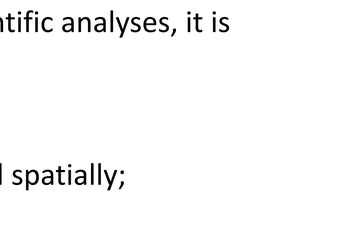
Fires in British Columbia, Canada & Oregon and Washington, USA
July – October 2017; some caused by lightning, some human induced.



Source: https://globalnews.ca/news/3585284/b-c-wildfires-map-2017-current-location-of-wildfires-around-the-province/



Source: http://www.metronews.ca/news/vancouver/2017/07/17/photos-bcs-wildfires-as-from-space.html



Source: http://www.oregonlive.com/wildfires/index.ssf/2017/09/eagle_creek_fire_rages_in_colu.html

Source: https://twitter.com/ccdacre/status/887148058428948480

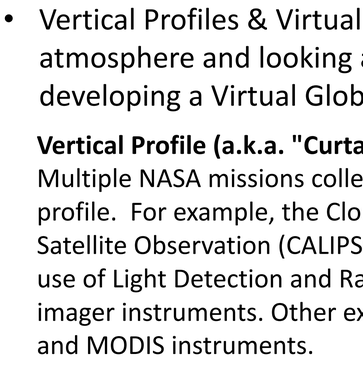
Hurricane Harvey
Category 4 Atlantic hurricane that formed 17 Aug and dissipated 3 Sept 2017.

Source: http://blogs.discovermagazine.com/images/2017/08/31/views-from-space-reveal-the-staggering-extent-of-flooding-from-harvey/

Source: https://twitter.com/ZLabe/status/902985466080661504

Source: https://twitter.com/NASA_SPoRT/status/903326789912715264

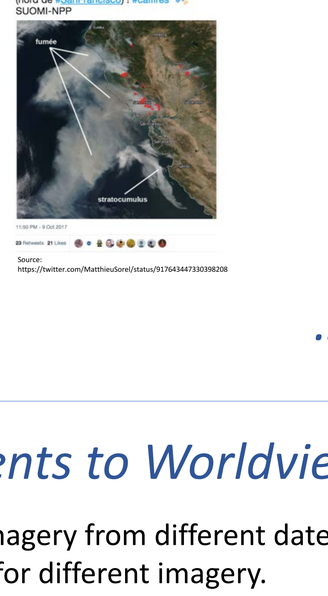
Hurricane Maria
Category 5 Atlantic hurricane that formed 16 Sept and dissipated 3 Oct 2017



Source: https://nltimes.nl/2017/09/20/hurricane-marias-damages-limited-dutch-islands

Source: https://twitter.com/InfoEmerg/status/909905408915050496

Hurricane Irma
Category 5 Atlantic hurricane that formed 30 Aug and dissipated 16 Sept 2017.

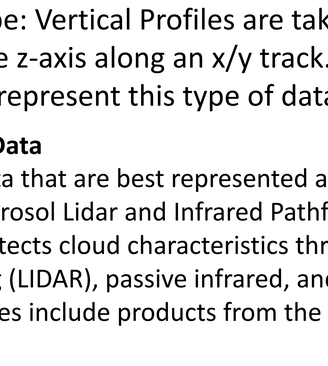


Source: https://www.consumeraffairs.com/news/hurricane-irma-likely-to-affect-consumers-in-several-states-091117.html

Source: https://twitter.com/AndreaButera/status/907008569534492672

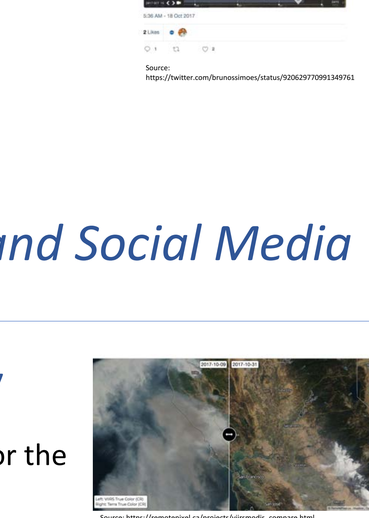
Source: https://twitter.com/weatherdak/status/907400126083219456

Fires in Northern CA
Early October 2017



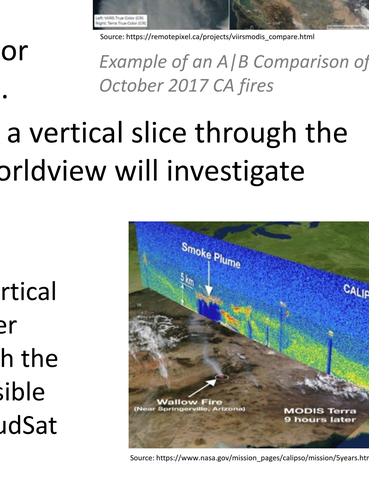
Source: https://twitter.com/MatthieuSorel/status/917643447330398208

Fires in Portugal and Northern Spain
Mid October 2017; many fires were human induced, but also affected by drought conditions, low humidity and unusually high temperatures.



Source: https://www.noticiasaominuto.com/tech/882761/imagens-da-nasa-mostram-tragedia-dos-incendios-em-portugal

Source: http://rr.sapo.pt/noticia/95879/o-pior-dia-de-incendios-do-ano-visto-do-espaco



Source: http://www.bbc.com/news/world-europe-41634125

Source: https://twitter.com/brunossimoes/status/920629770991349761

Worldview Daily Users between January 2017 and November 2017

Graph of daily users to Worldview (January – November 2017) from the Google Analytics 360 Suite

…and Social Media

Worldview for Research

While Worldview is not recommended as a tool for doing scientific analyses, it is beneficial for:

- Identifying study areas;
- Scientific orientation;
- Quickly surveying large amounts of imagery, temporally and spatially;
- Comparing different types of imagery layers;
- Validating results;
- Identifying phenomena of interest;
- Identifying areas in need of disaster response and hazard management;
- And many more…!

- 23 scientific journal articles published in 2017 used Worldview as part of the research/illustration of study area.

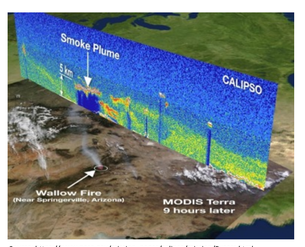
Future Enhancements to Worldview

Source: https://remotepixel.ca/projects/viirsmodis_compare.html

Example of an A|B Comparison of the October 2017 CA fires

- A|B Comparison: Compare imagery from different dates for the same imagery, or same dates for different imagery.
- Vector Support – Be able to pull in vector tiles, change vector colors and symbology, add animated effects on vectors, etc.
- Vertical Profiles & Virtual Globe: Vertical Profiles are taking a vertical slice through the atmosphere and looking at the z-axis along an x/y track. Worldview will investigate developing a Virtual Globe to represent this type of data.

Vertical Profile (a.k.a. "Curtain") Data
Multiple NASA missions collect data that are best represented as vertical profile. For example, the Cloud Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) detects cloud characteristics through the use of Light Detection and Ranging (LIDAR), passive infrared, and visible imager instruments. Other examples include products from the CloudSat and MODIS instruments.



Source: https://www.nasa.gov/mission_pages/calipso/mission/5years.html