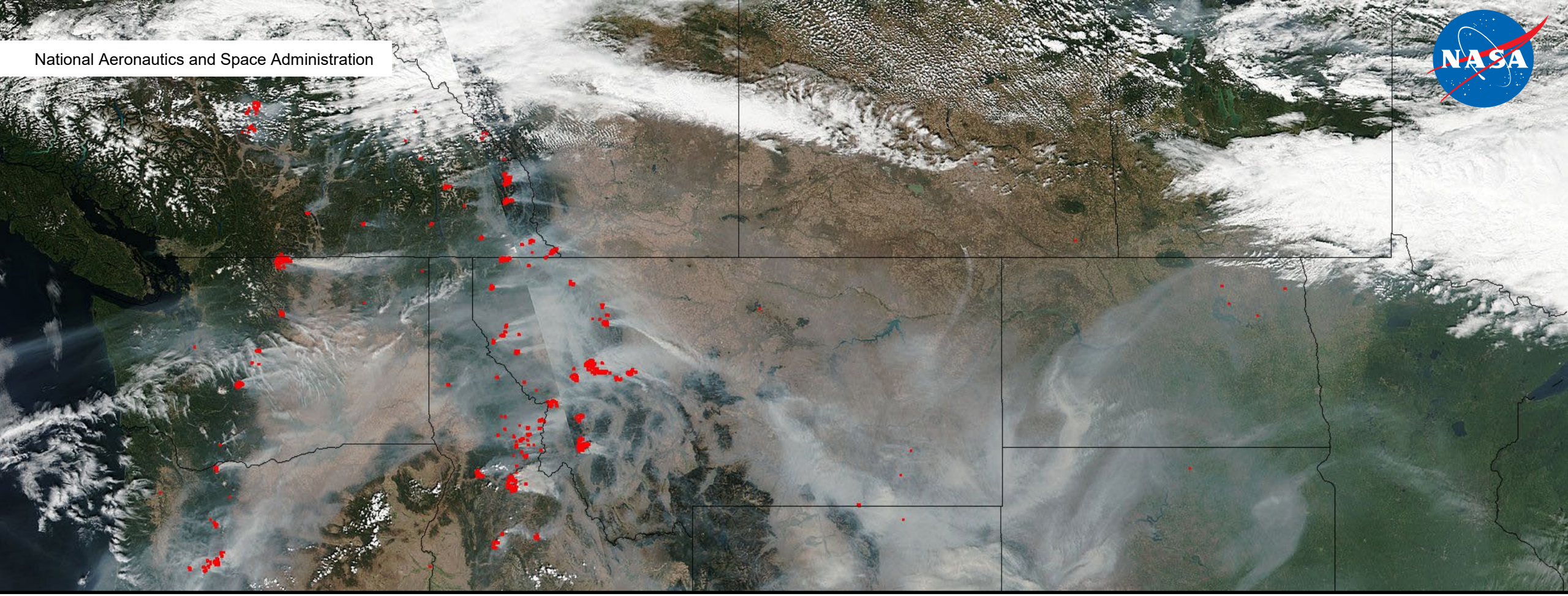
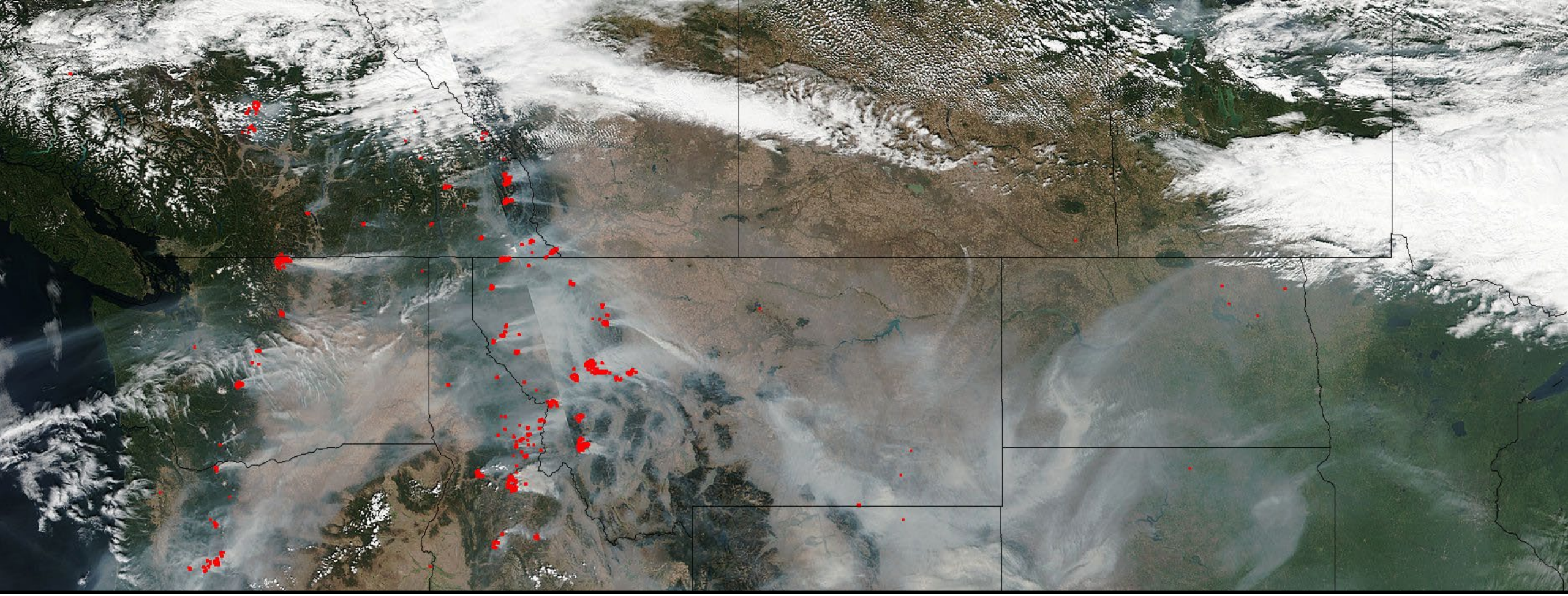
National Aeronautics and Space Administration



NASA Earth Observatory and Worldview

Melanie Follette-Cook and Pawan Gupta

Satellite Remote Sensing of Dust, Fires, Smoke, and Air Quality, July 10-12, 2018



Earth Observatory

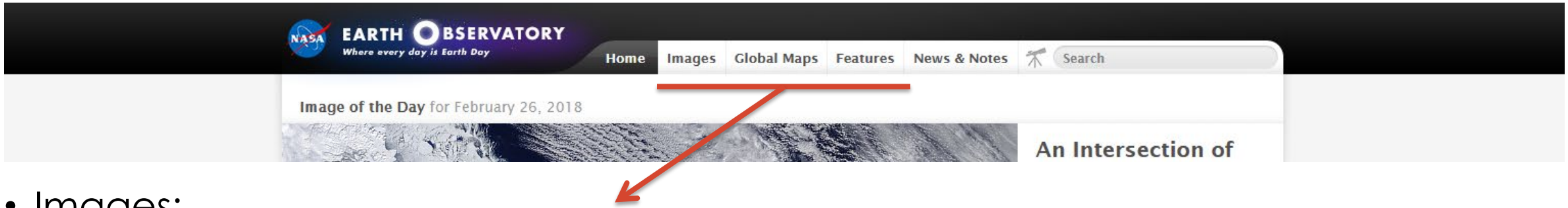
NASA Earth Observatory

https://earthobservatory.nasa.gov/

- Shares images and stories that result from NASA research and satellite missions
- Things you will find:
  - Image of the day
  - Research highlights
  - Blogs
  - Global maps

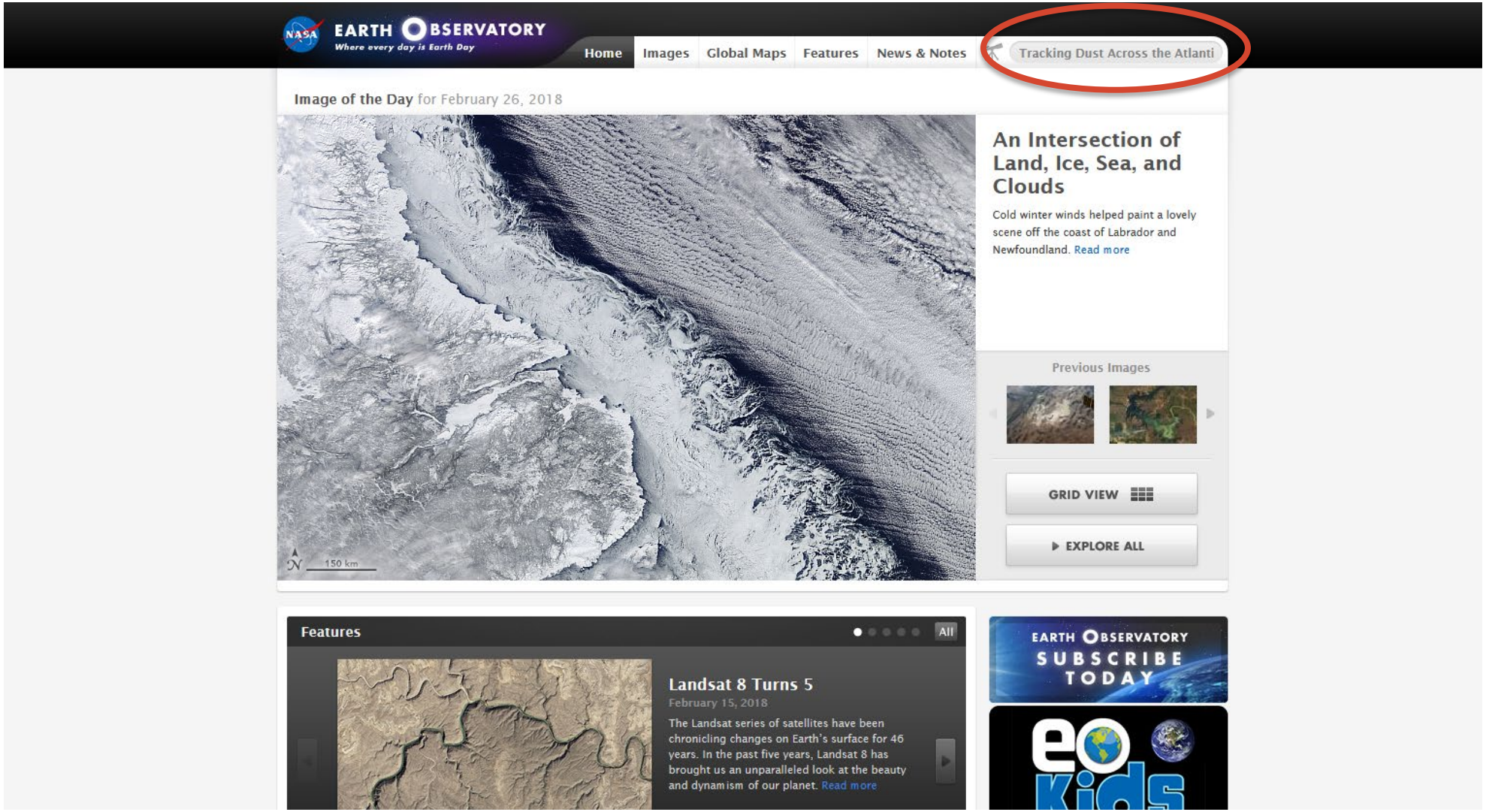
Image of the day: March 7, 2014

Step 1: Go to http://earthobservatory.nasa.gov

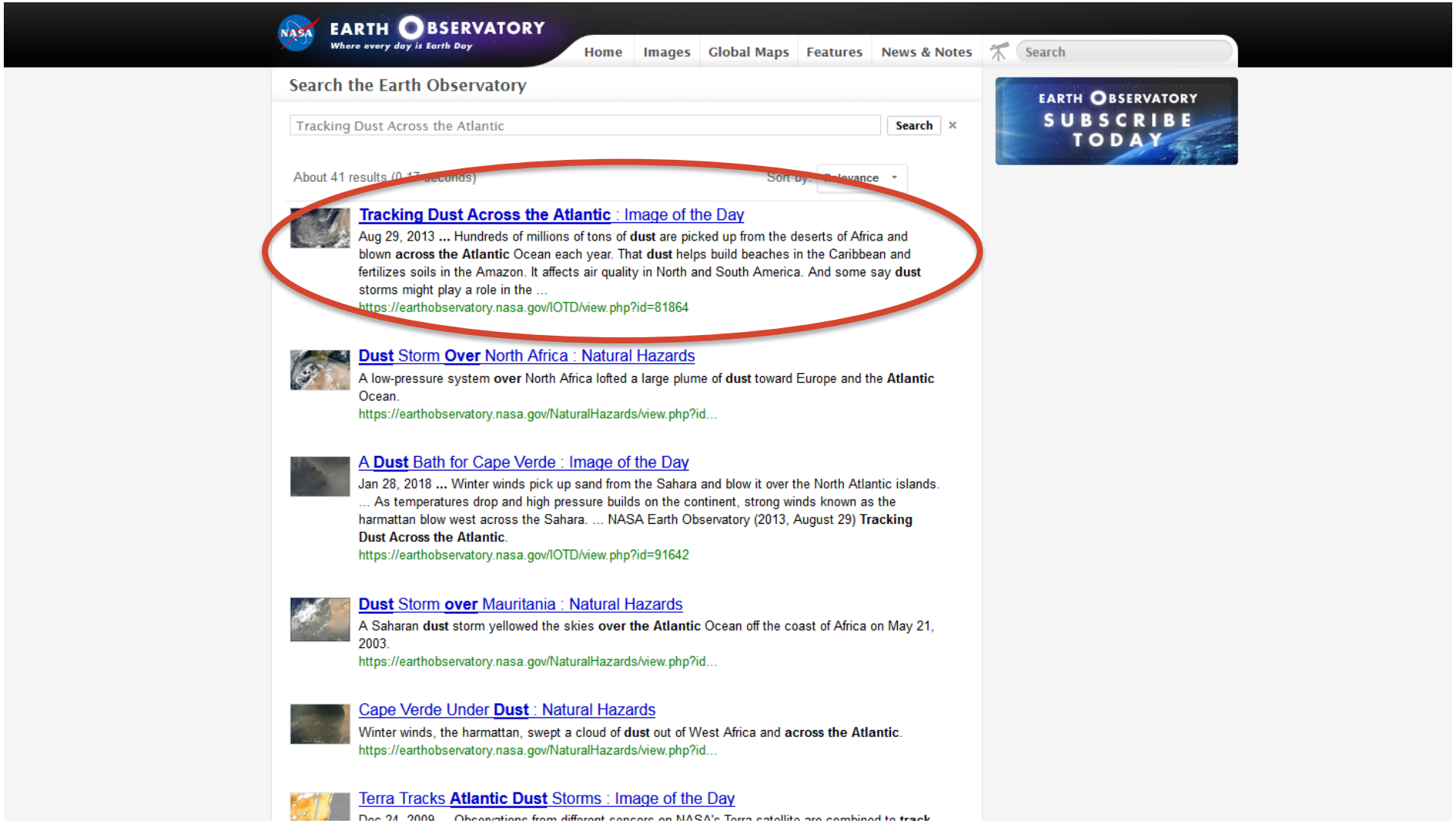


- Images:
  - Image of the day by date and/or topic
- Global Maps:
  - Monthly average maps of land, ocean, and atmosphere
- Features:
  - Notes from field campaigns
  - Sensor highlights
  - Science articles

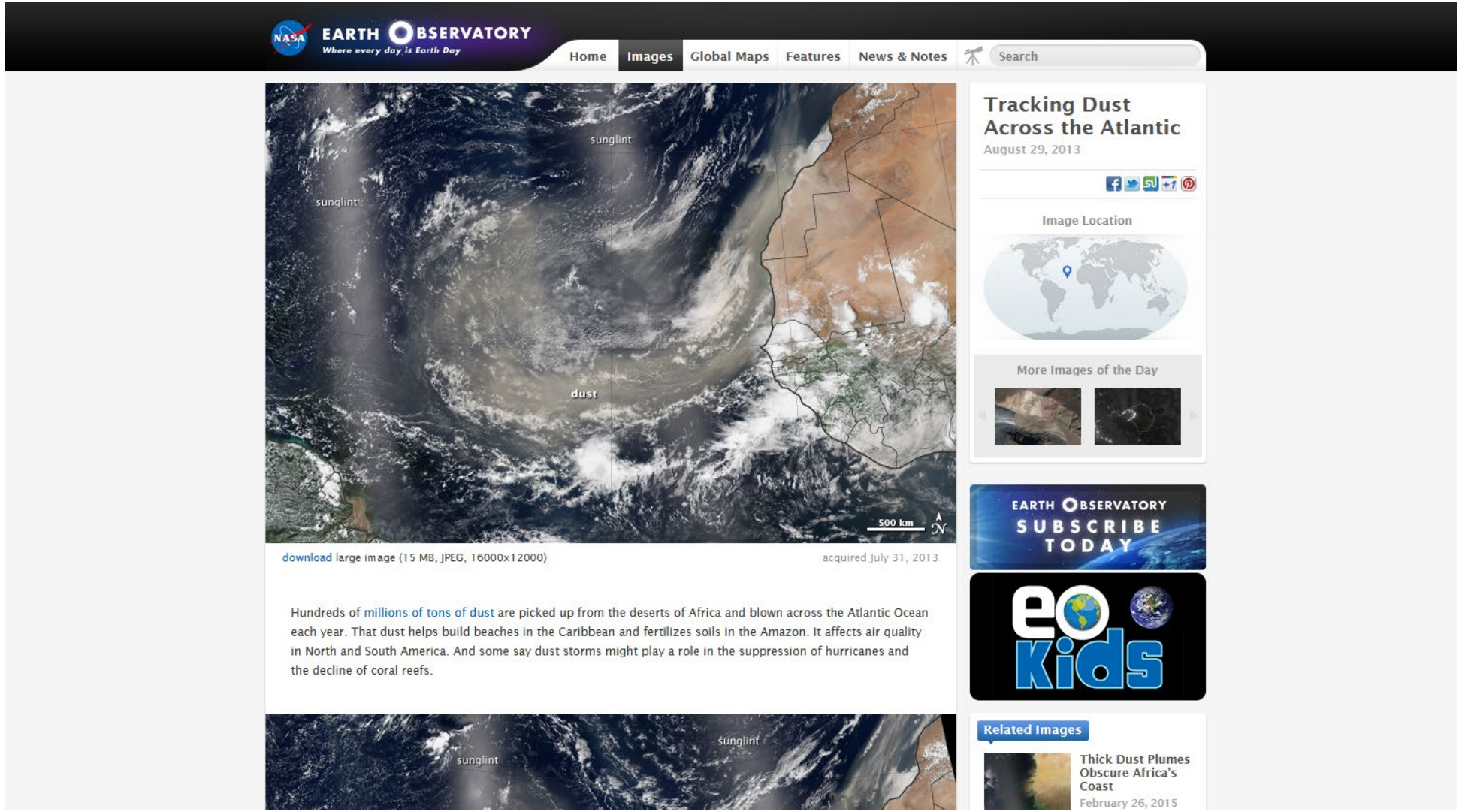
Step 2: Search for “Tracking Dust Across the Atlantic”



Step 3: Click on the Top Result



Step 4: Read Through the Result to See What Information is Available



Exercise:

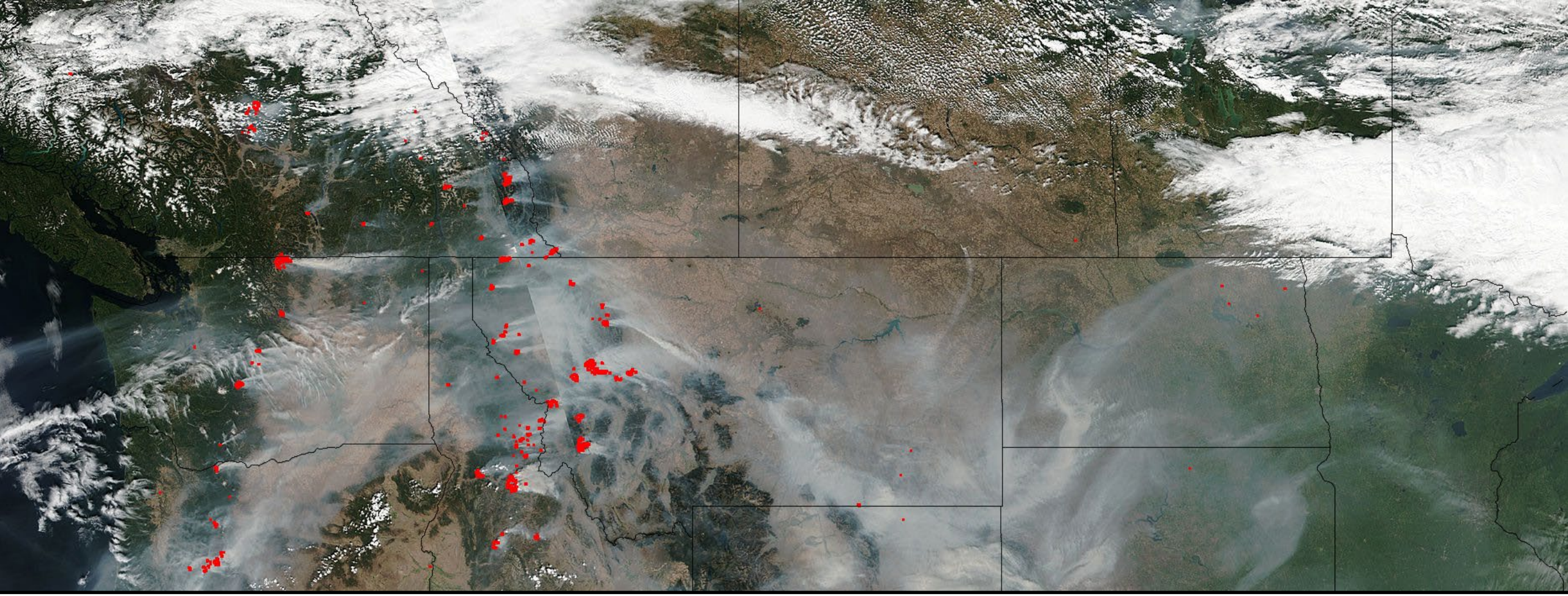
- Explore the Earth Observatory site for about 5 minutes. Specifically these sections:
  - Images
  - Global Maps
  - Features
- Using the search option, search for an air quality event in your area of interest. You can use keywords like smoke, dust, or air pollution, along with the name of a geographical area (for example, "Smoke and Fires in Australia")
  - If you cannot find a relevant event in your region, look in another region
  - Select an event that can affect local or regional air quality
  - Note the date, satellite and sensor, region, event type, parameter displayed, and any other relevant information for your selected air quality event

Exercise Questions:

- Which satellite, sensor, and/or datasets have been used in the Earth Observatory story to highlight the selected air quality event?

- Based on visual inspection of the images in the Earth Observatory story, what type of air quality event (e.g., fire, dust storm, urban pollution, etc.) did you select?

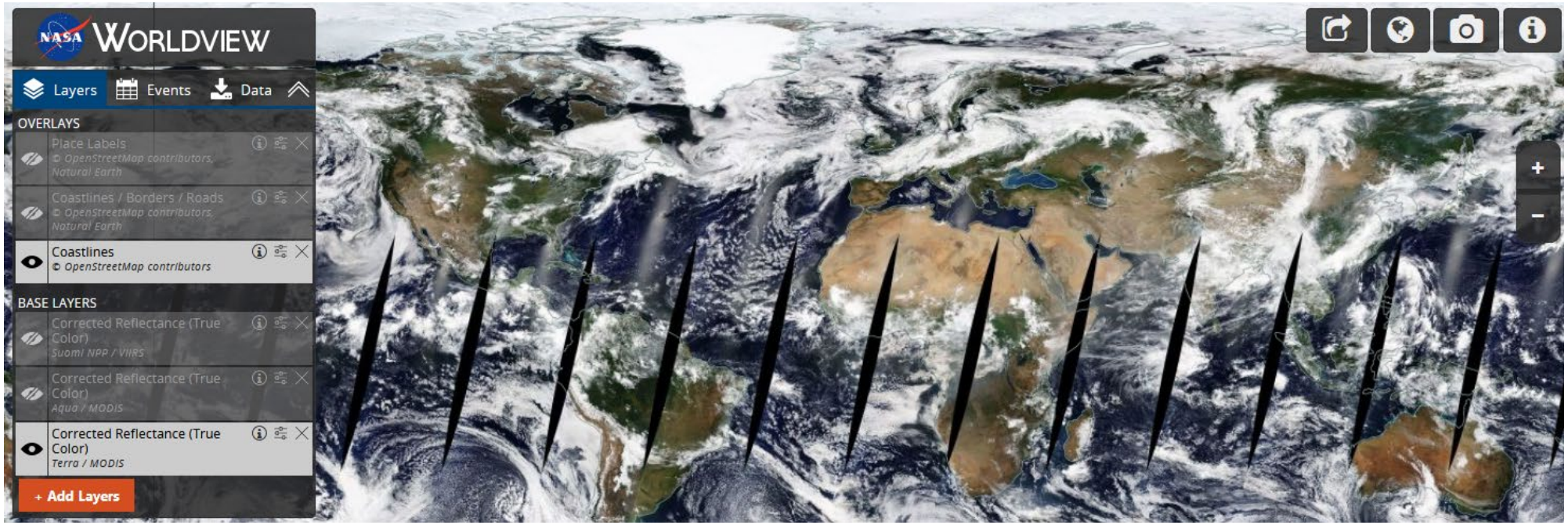
- What are two potential applications of the images found on Earth Observatory?



Worldview

NASA Worldview

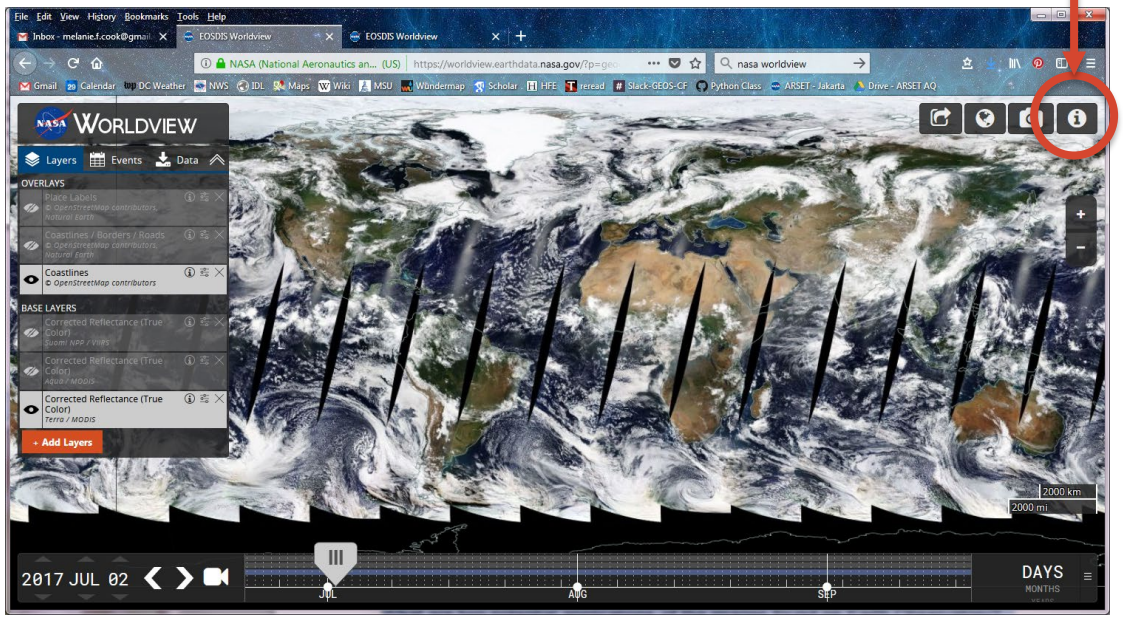
https://worldview.earthdata.nasa.gov/



- Application that allows the user to:
  - interactively browse, save, or share satellite imagery layers
  - download the data
- Some imagery available in near real time (NRT) or within three hours of observation

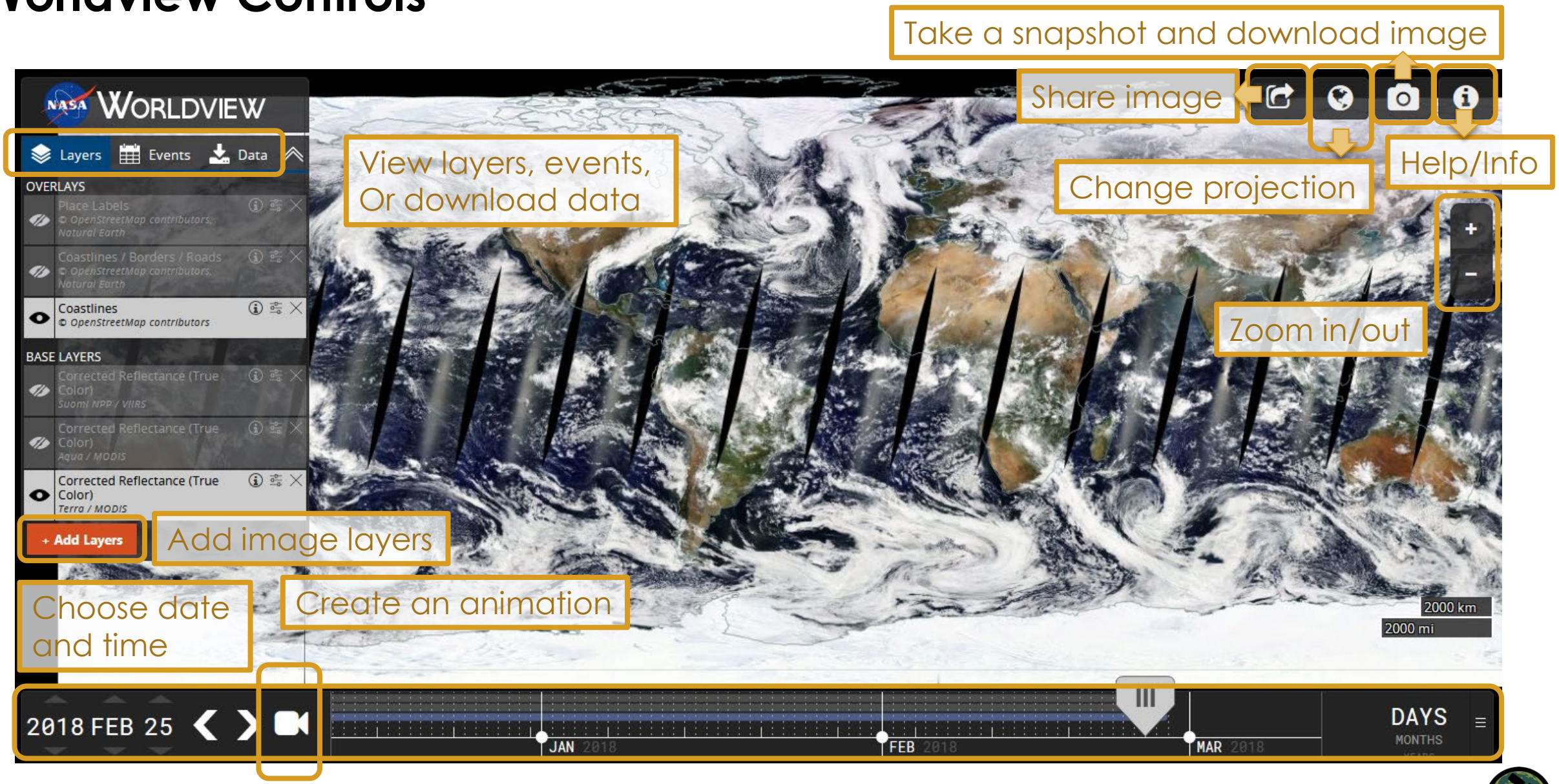
Worldview tutorials

- Worldview tour can be accessed here

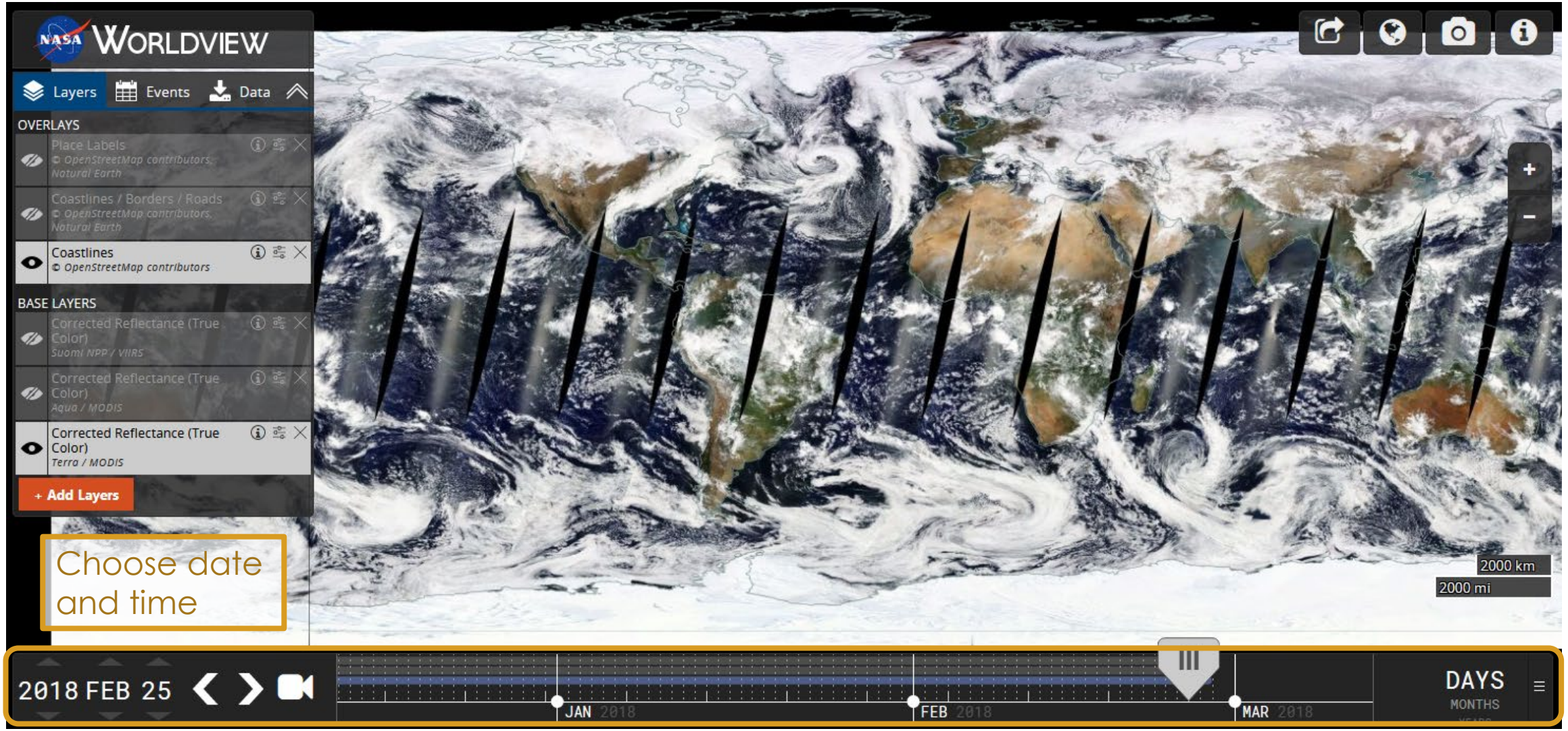


- HAQAST tutorial video, written tutorial (with downloadable pdf)
  - https://haqast.org/nasa-tools/
- Earthdata webinar
  - https://www.youtube.com/watch?v=96Nt36euLJY

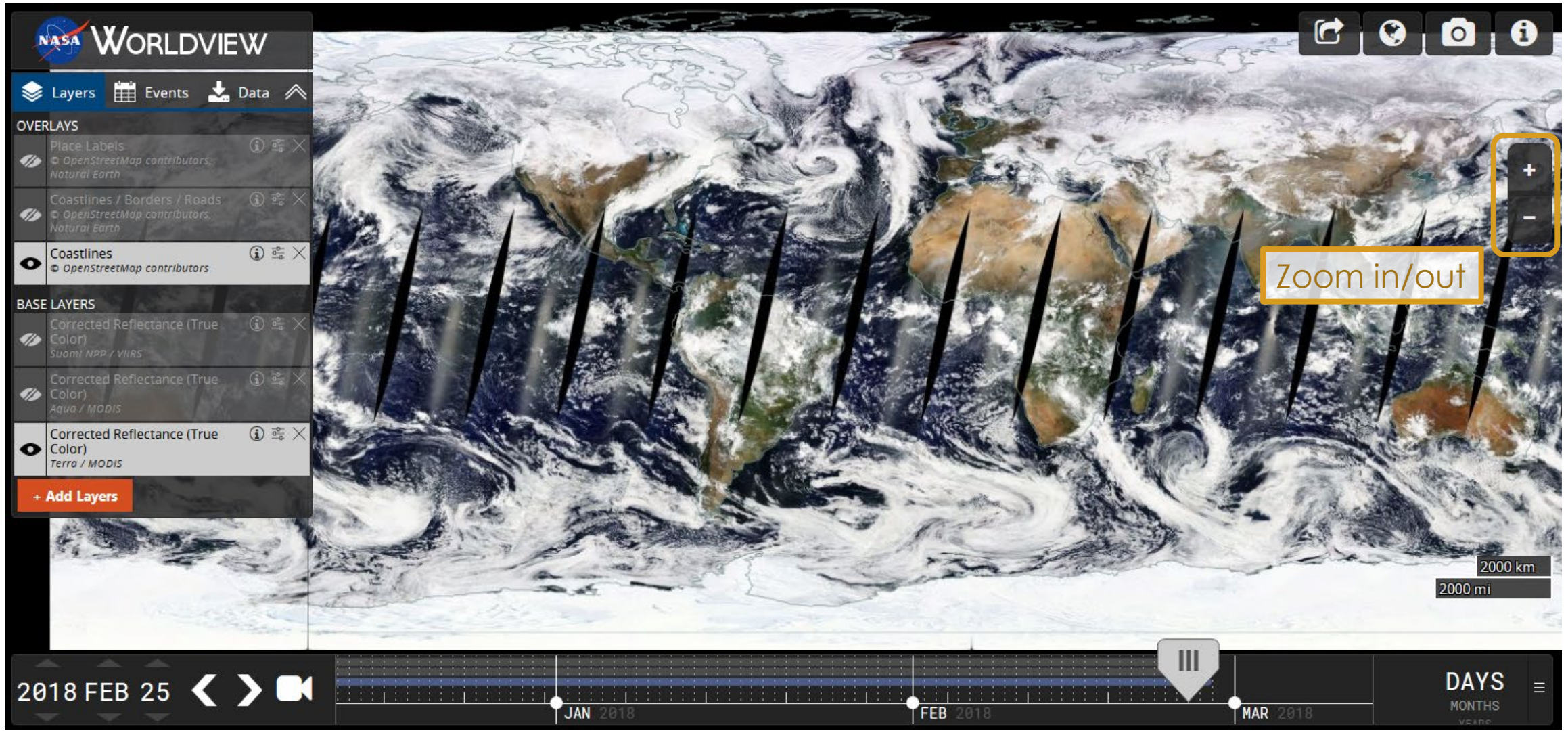
Worldview Controls



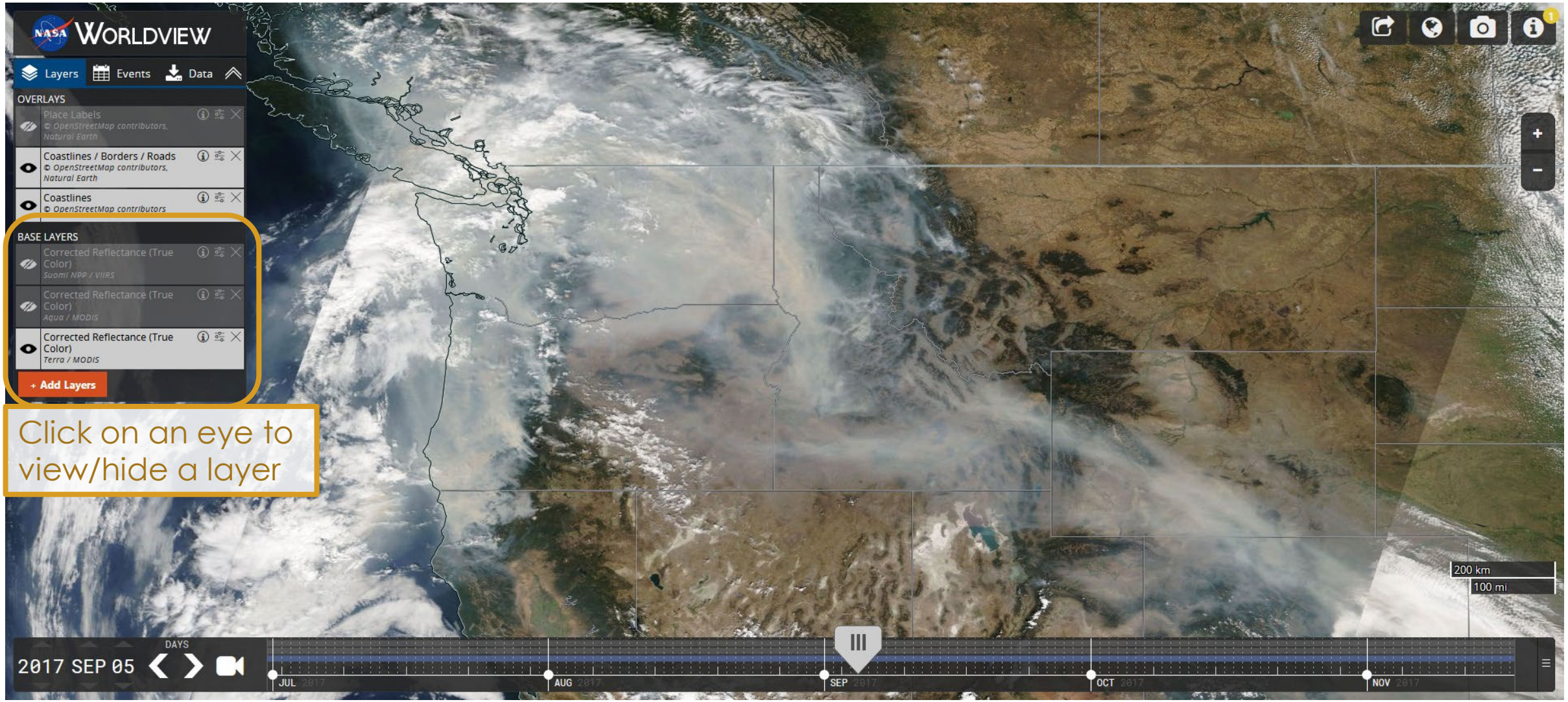
Step 1: Select Date



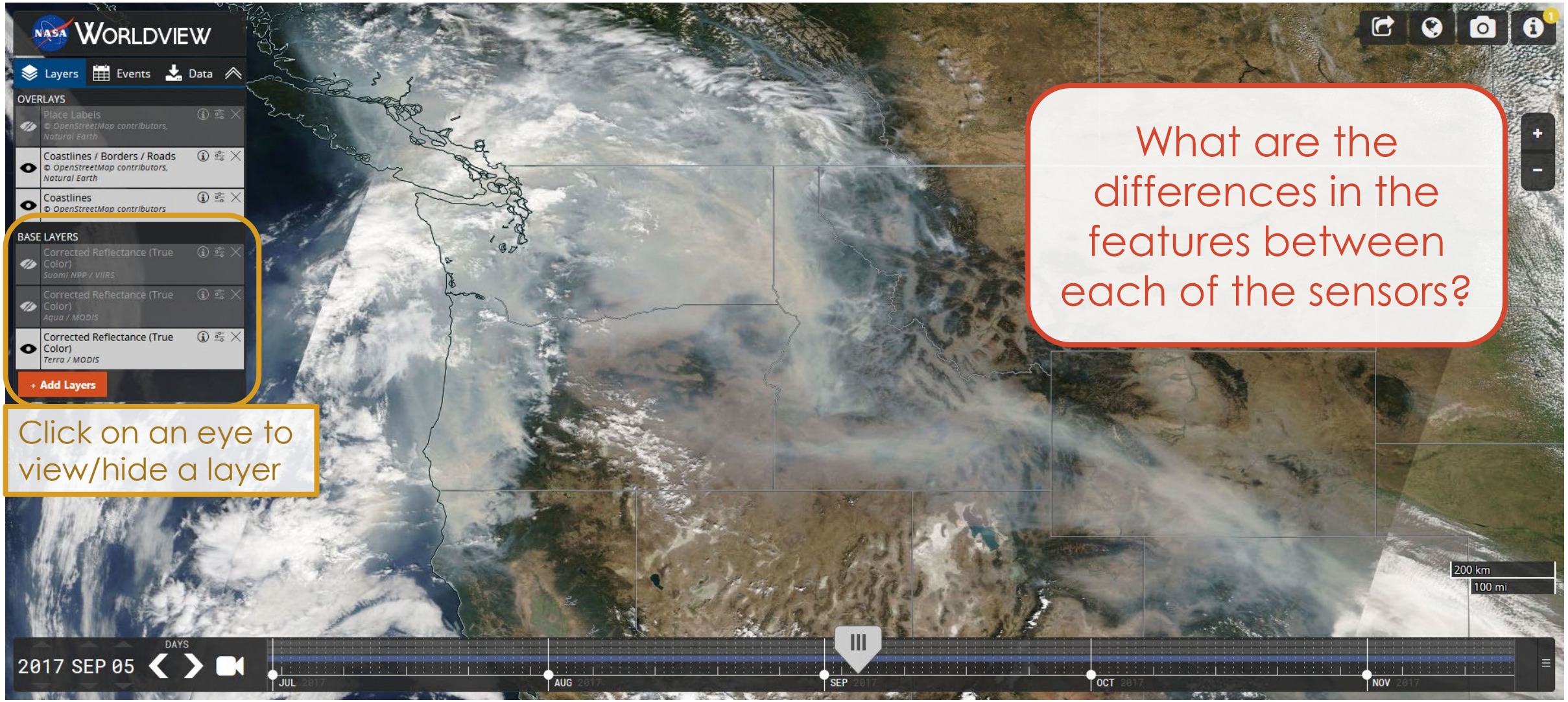
Step 2: Zoom in on the Region of Interest



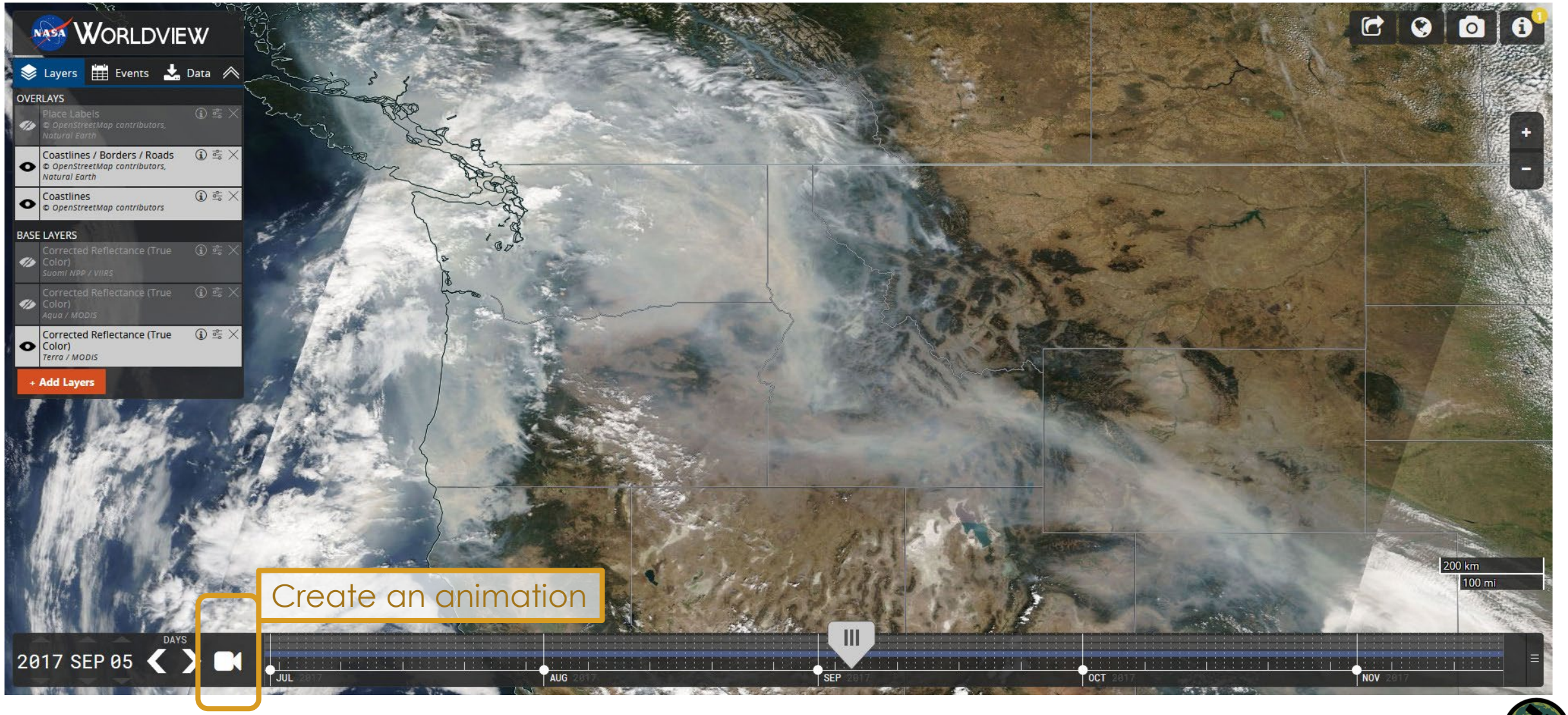
Step 3: Explore the Three Base Layer Options



Step 3: Explore the Three Base Layer Options



Step 3: Explore the Three Base Layer Options



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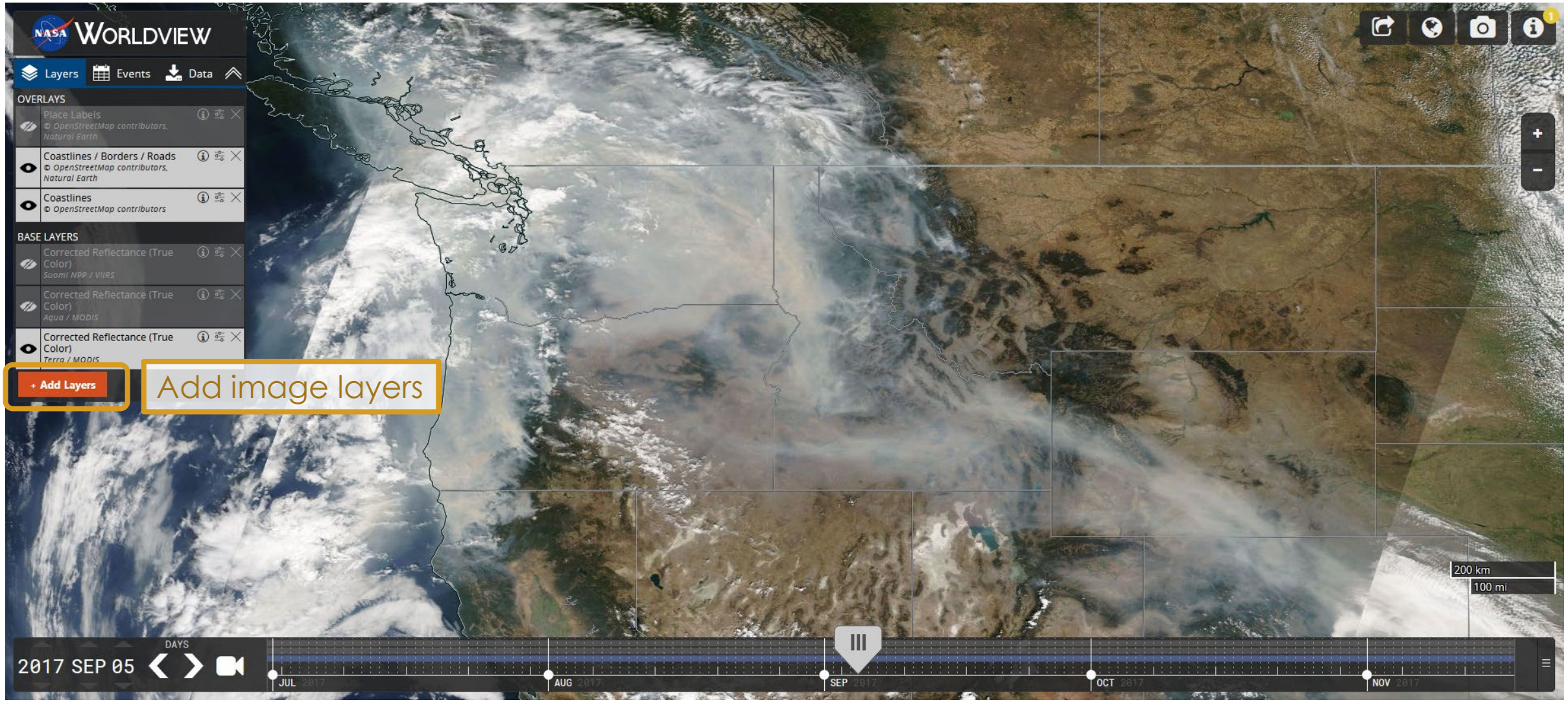
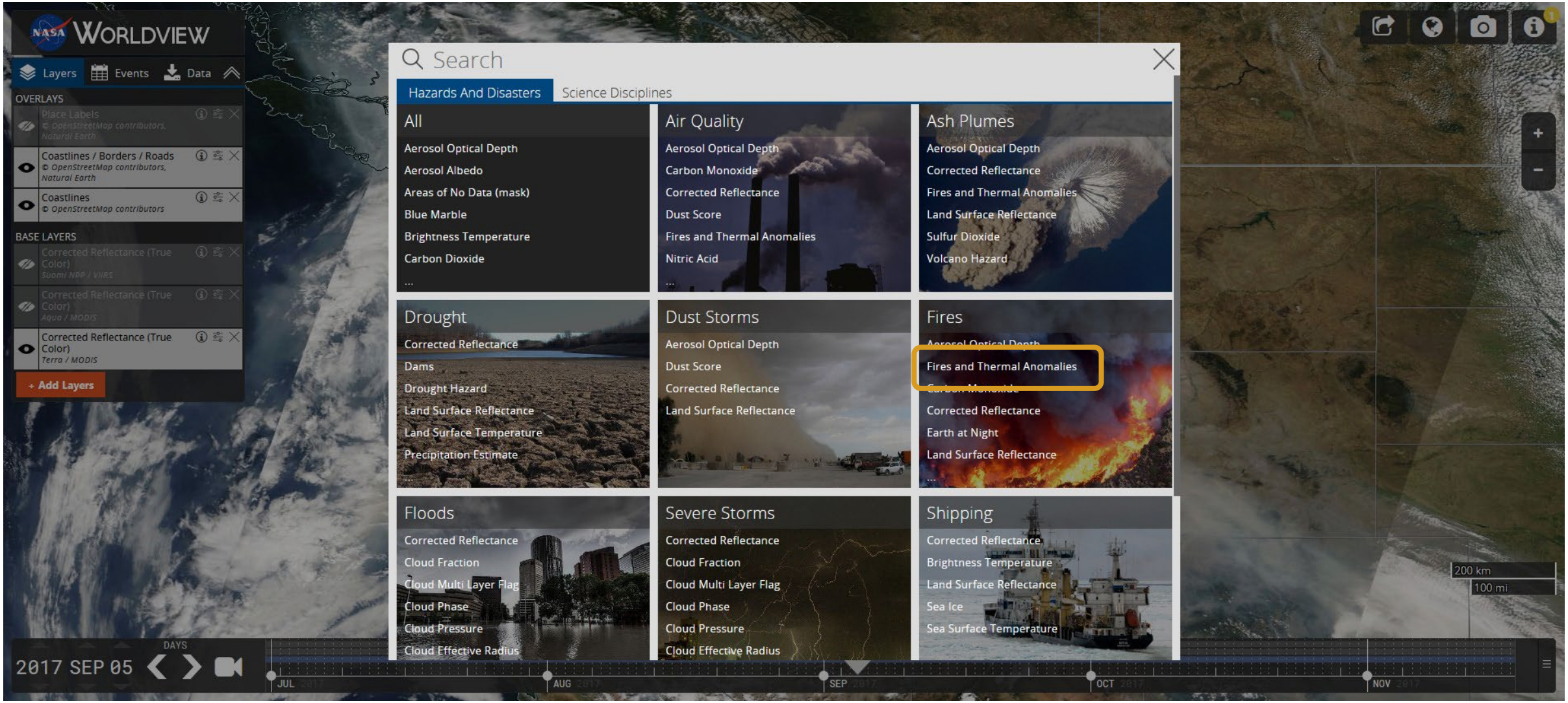
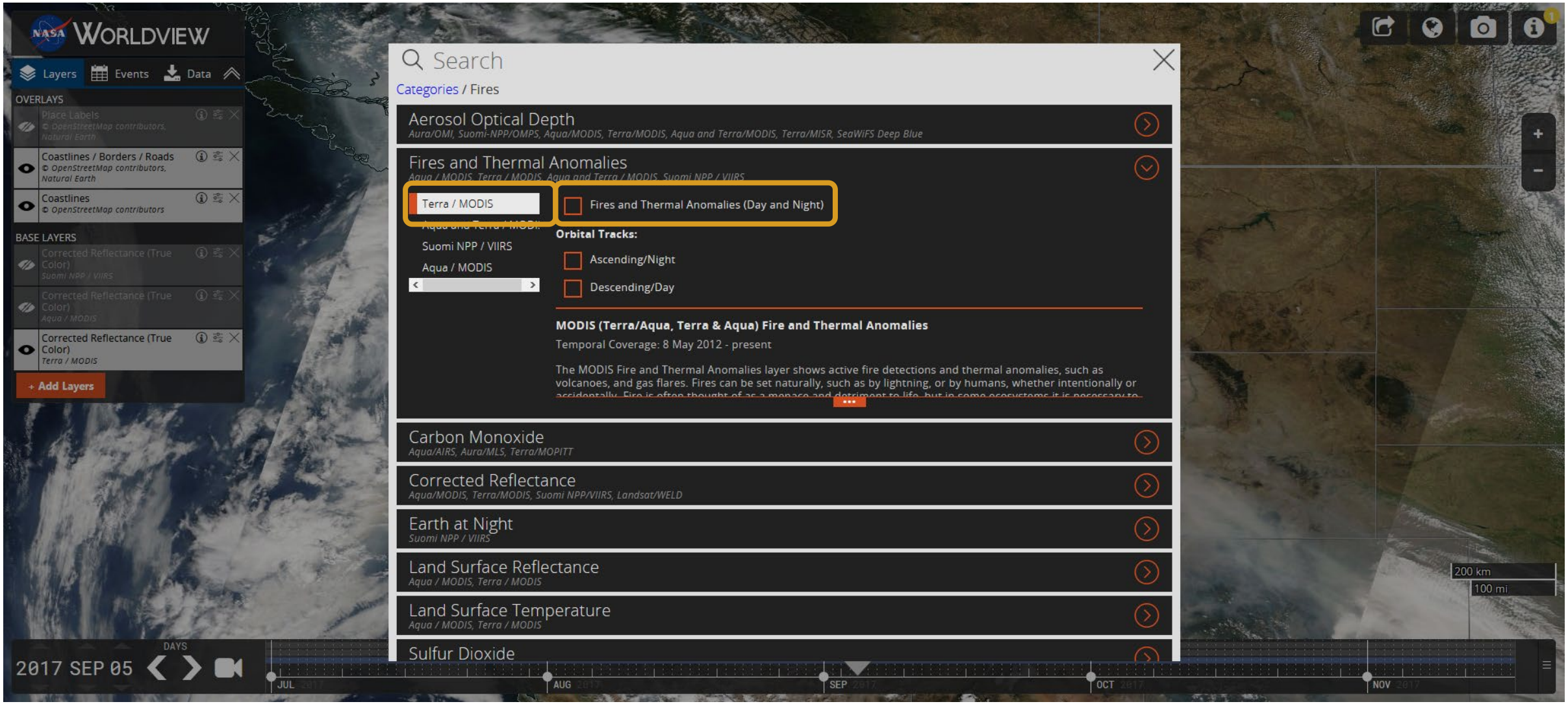


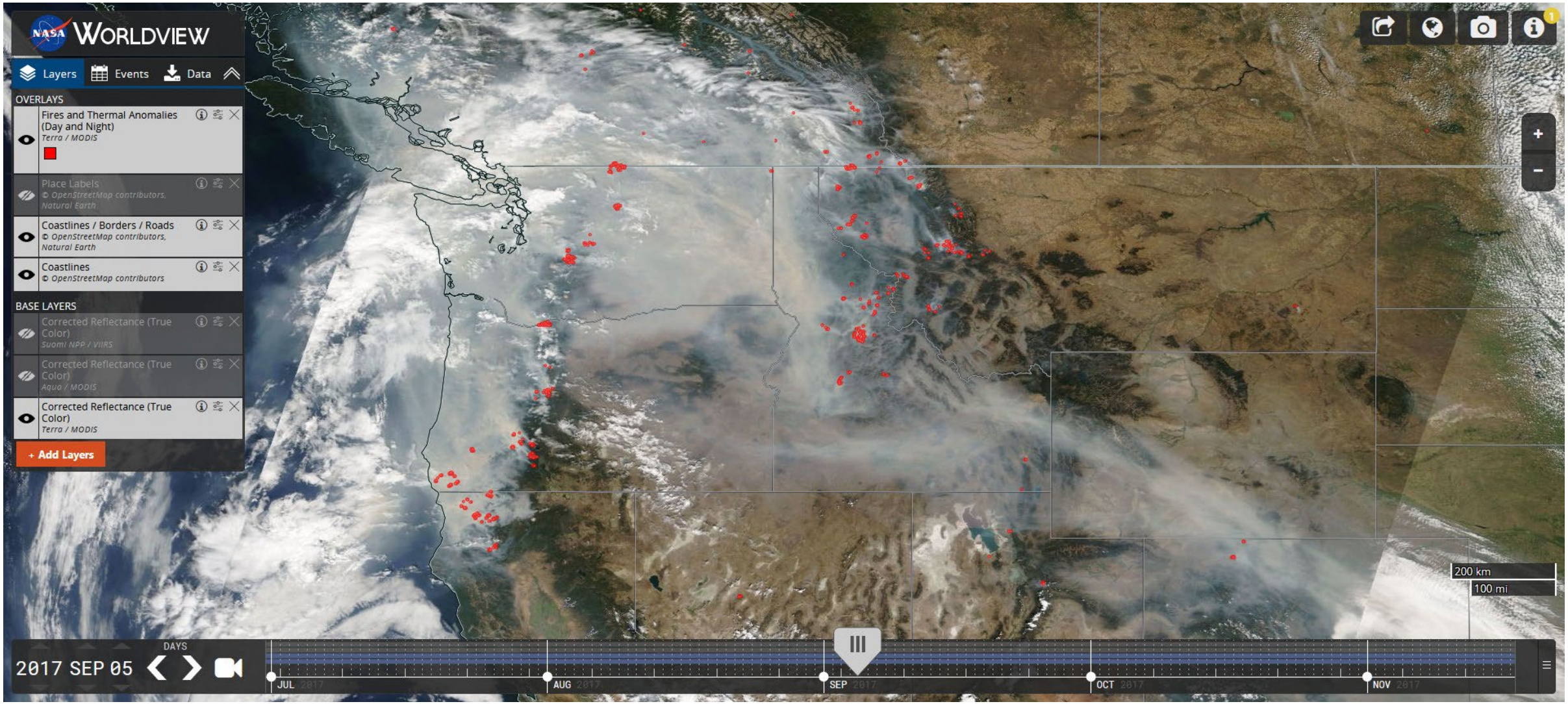
Step 5: Add a Layer



Step 5: Add a Layer



Step 5: Add a Layer



Exercise:

- Explore Worldview for about 10 minutes.
- Use the Date Selection at the bottom of the page
  – Go to the date of the air quality event you selected for Part 1
- Zoom in on the region of the air quality event using the '+' and '-' sign on the top right side of the page
- Explore the base layer options (top, left side of the page) to select images from Aqua/MODIS, Terra/MODIS, and Suomi NPP/VIIRS
- Display each of the layers one by one and write down the difference in the features over the selected region
- Use the date changing arrows to see the progress of the event over several days. Use the animation feature (camera sign on bottom left side) to create an animation
- Add an additional interesting layer

Exercise Questions:

- What additional information did you learn from the Worldview portal that wasn't on the Earth Observatory page?

- What additional satellite layer did you add? What additional information did it provide?

- Use the 'share this map' feature (on the top right corner of the page) to copy the link and paste it here: