National Aeronautics and Space Administration

Credit: TROPOMI, ESA, Copernicus, KNMI

Time Series Analysis and Mapping of Aerosol Data

Melanie Follette-Cook and Pawan Gupta

Application of Satellite Observations for Air Quality and Health Exposure, Oct 9 and 11, 2019

APPLIED REMOTE SENSING TRAINING PROGRAM
10 YEARS OF TRAINING
TRAIN - EMPOWER - ADVANCE

Learning Objectives

By the end of this exercise, you will be:

- familiar with the online visualization and access tool, Giovanni

- able create several types of plots for analysis and edit them as needed

- able to download the created plots, as well as the data plotted

NASA Giovanni - The Bridge Between Data and Science

Online Visualization and Analysis Tool - http://giovanni.gsfc.nasa.gov/giovanni/

Visit https://urs.earthdata.nasa.gov/users/new

EARTHDATA LOGIN

Register for an Earthdata Login Profile

Profile Information

Username: •

Password: •

Password Confirmation: •

• Required field

Username must:

- Be a Minimum of 4 characters
- Be a Maximum of 30 characters
- Use letters, numbers, periods and underscores
- Not contain any blank spaces
- Not begin, end or contain two consecutive special characters(. _)

Password must contain:

- Minimum of 8 characters
- One Uppercase letter
- One Lowercase letter
- One Number

NASA Giovanni - The Bridge Between Data and Science

Online Visualization and Analysis Tool - http://giovanni.gsfc.nasa.gov/giovanni/

Using Giovanni, a user can create:
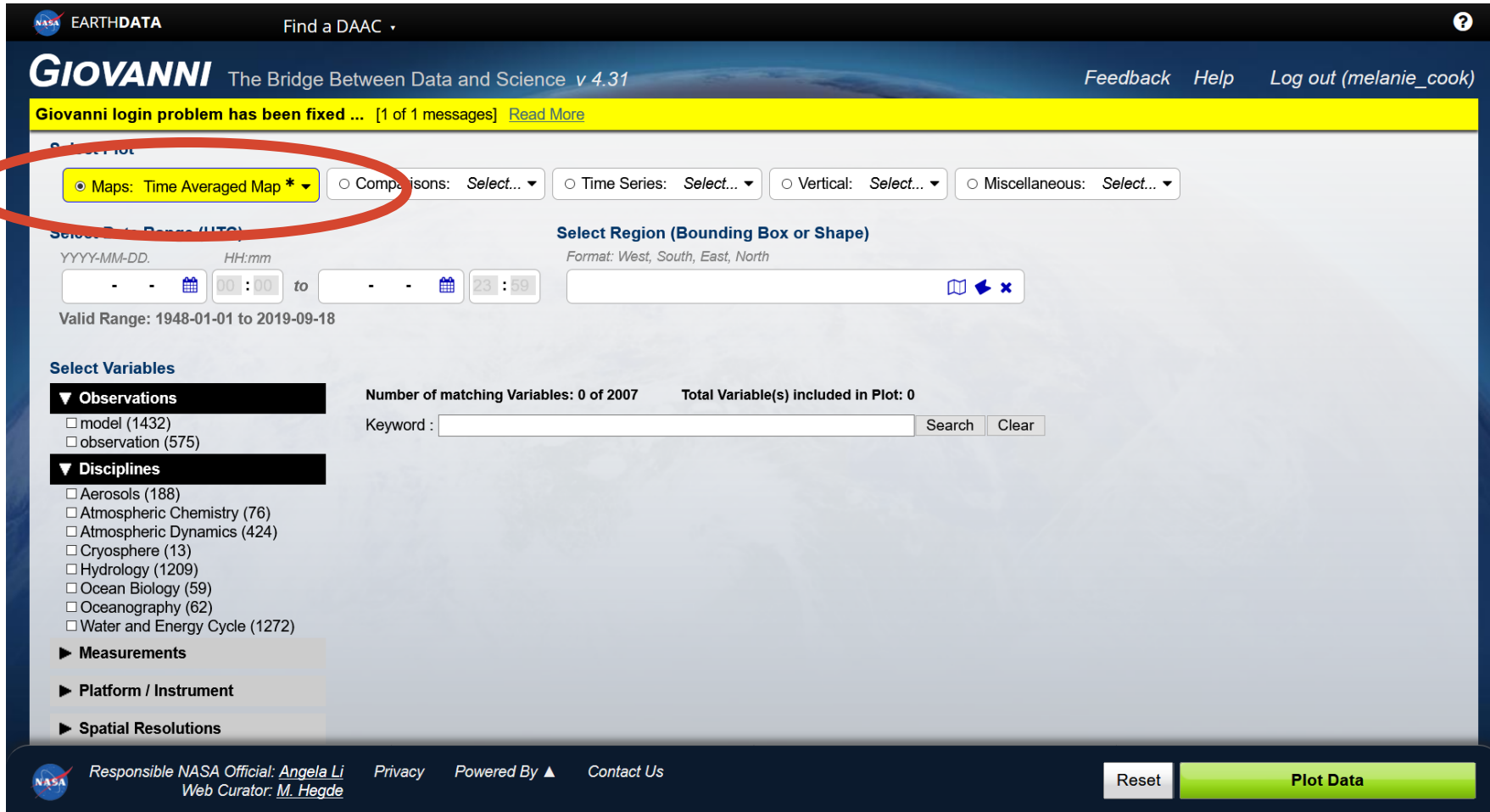
- Time averaged maps
- Compare two different datasets
- Time series
- Vertical profiles
- Histograms

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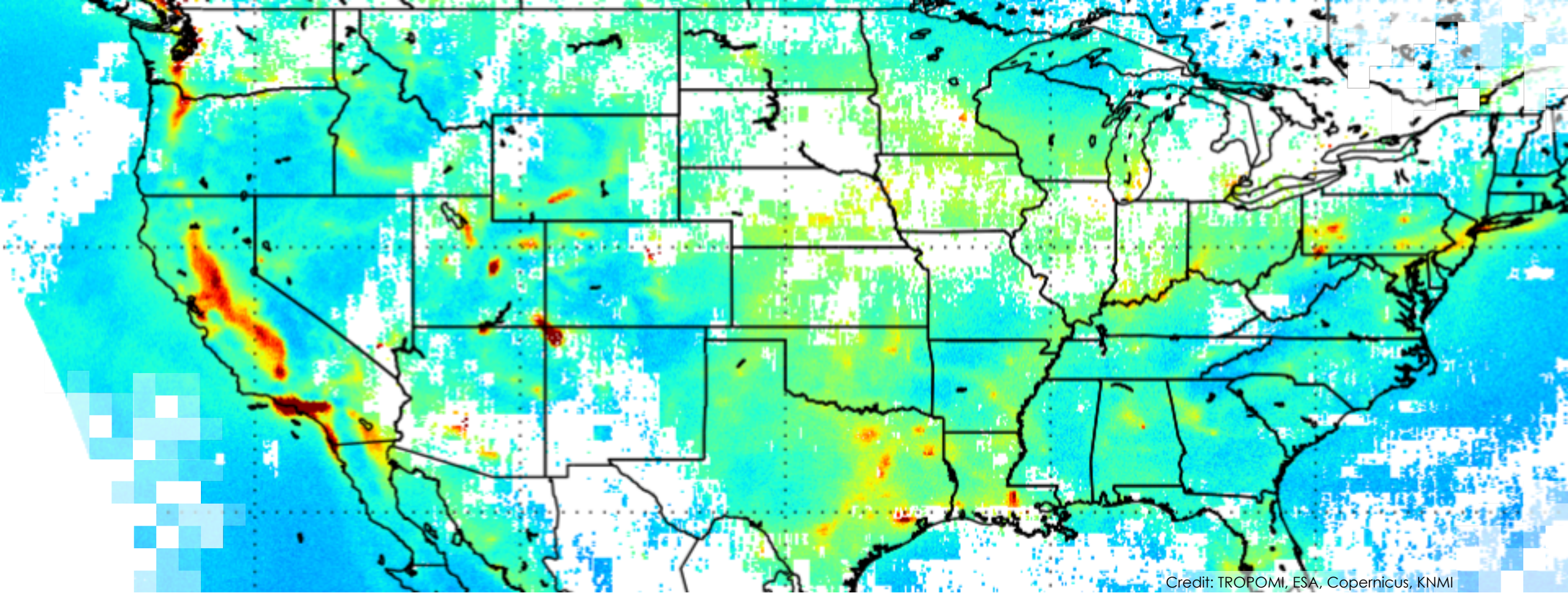
Mapping

Time Averaged Maps: Step 1

- Under **Select Plot**, go to **Maps** and select **Time Averaged Map**

Time Averaged Maps: Step 2

- Select **Measurement** → Aerosol Optical Depth

- **Platform/Instrument** → MODIS-Aqua

Time Averaged Maps: Step 3

- Select **Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean (MYD08_D3 v6.1) (This is a daily value)**

Time Averaged Maps: Step 4

- Set the date range as **Nov 8, 2018** to **Nov 18, 2018** (Camp Fire)

Time Averaged Maps: Step 5

- Select your region either by typing in coordinates, or by clicking **Show Map** and drawing a box (about 10 x 10 degrees) around your area of interest

- If you pick too large of an area or time period, it will take a long time for your image to be created

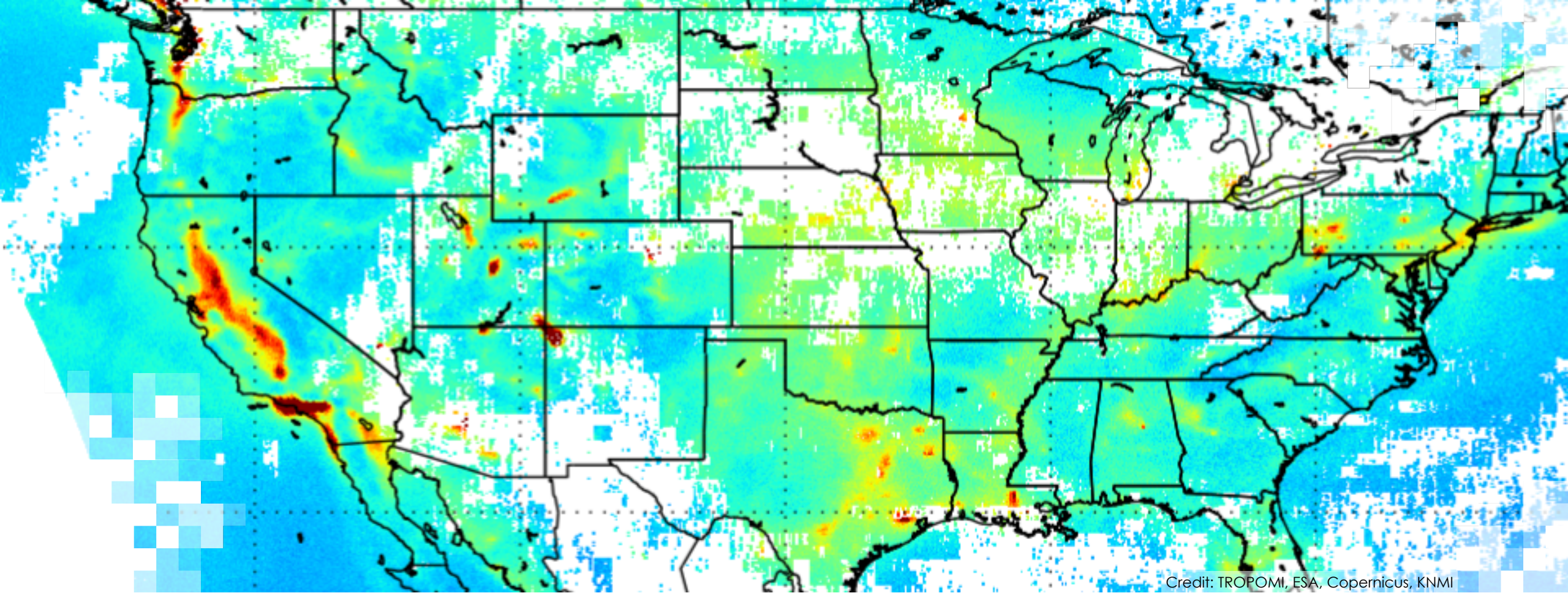- Click on **Plot Data** (green button) in lower right-hand corner

Time Averaged Maps: Step 6

- Scroll down to view the various maps. You can change the color scale, max, and min under the **Options** >> **Options** button on the top right of each map. You can download each image (either as .png, GeoTIFF, or .kmz) under the **Download** link on the left
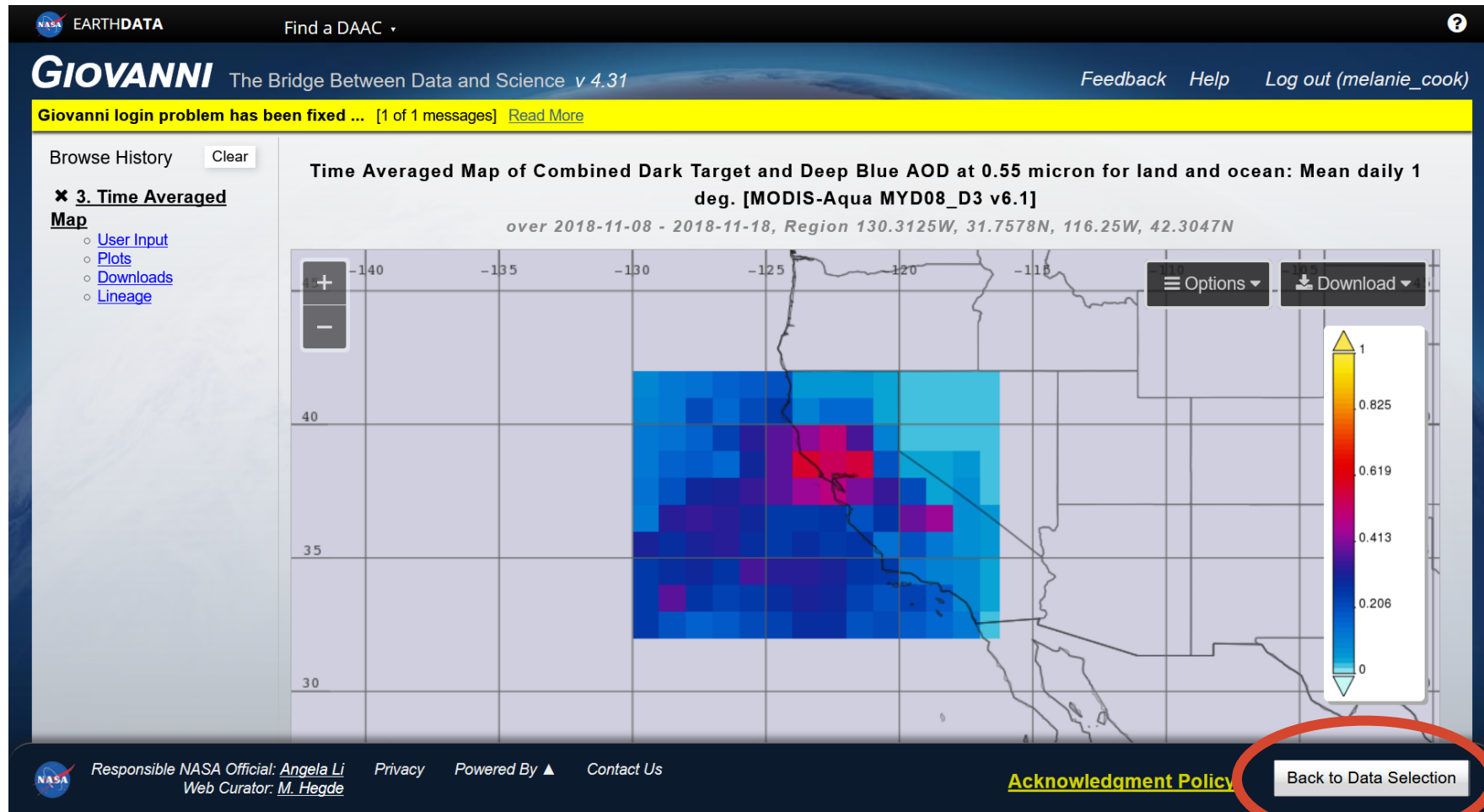
- You can also download the plot data in NetCDF form

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Time Series

Time Series: Step 1

- Click **Back to Data Selection**

Time Series: Step 2

- Choose **Time Series** → **Area-Averaged**

- Change **Date Range** to **Nov 1, 2018** to **Nov 30, 2018**

- **Plot Data**

Time Series: Step 3

- Now you have plotted an area-averaged time series covering the same area as the time-averaged maps

- Using the **Downloads** link on the left, you can download the image as a .png or the data as a .csv

- Using the **Options** pull down menu, you can change the axes range and title