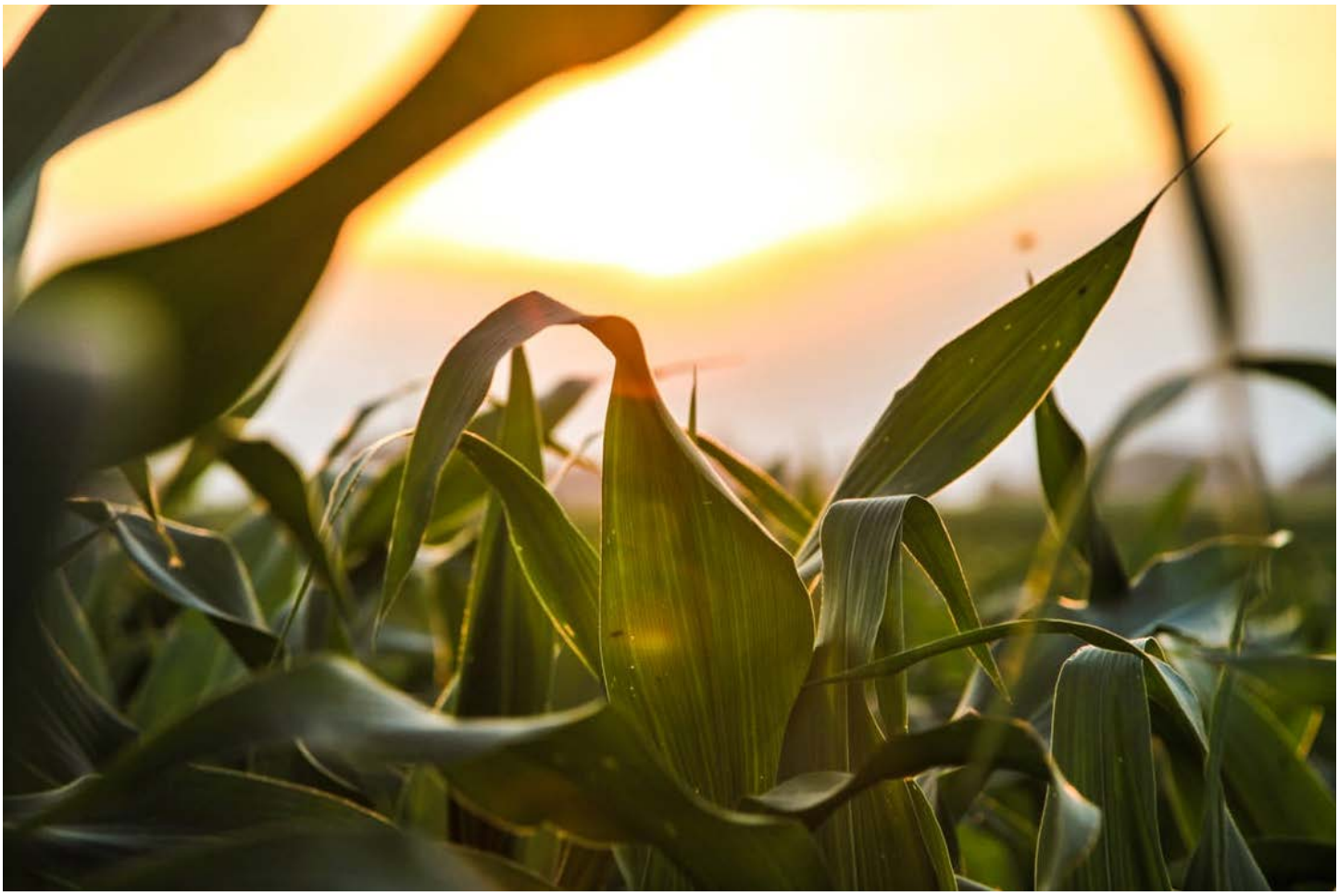

Global Daily Evapotranspiration (GloDET)

Quick Start Guide

Step-by-Step Instructions to Access and Download 375-meter Datasets

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Purpose and Overview

This Quick Start Guide is written for users of the Global Daily Evapotranspiration (GloDET) website. GloDET is a free data portal, hosted by the Daugherty Water for Food Global Institute (DWFI) at the University of Nebraska, to view and download daily evapotranspiration (ET) spatial datasets. The data is calculated by the ALEXI two-source energy balance model, developed by the U.S. Department of Agriculture's Agricultural Research Service. Datasets may be downloaded at 375-m resolution and subsequently disaggregated to 30-m resolution. Applications of this data include estimations of the Evaporative Stress Index (ESI) and Composite Drought Index (CDI), water accounting and availability analysis in watersheds and river basins, and field scale water productivity and crop yield estimates.

This document provides step-by-step instructions for a user to register for an account, select datasets, download data, customize and save user settings, and obtain additional technical assistance. This document is not an overview of the ALEXI model. For more information on ALEXI, please refer to the GloDET About page. For peer-reviewed journal publications detailing the development of the ALEXI model, refer to Anderson, et. al., 2007a and Anderson, et. al., 2007b.

Citation Instructions

When using GloDET datasets in your work and publications, please ensure that you always cite the data as:

> Robert B. Daugherty Water for Food Global Institute. (Year). GloDET: Global daily evapotranspiration. University of Nebraska. Lincoln, NE, USA. <glodet.nebraska.edu>.

Register for a User Account

In order to view high-resolution data images and download GloDET datasets, you must sign-up for a user account. Click the login button at the top right-hand corner of the screen to get started.

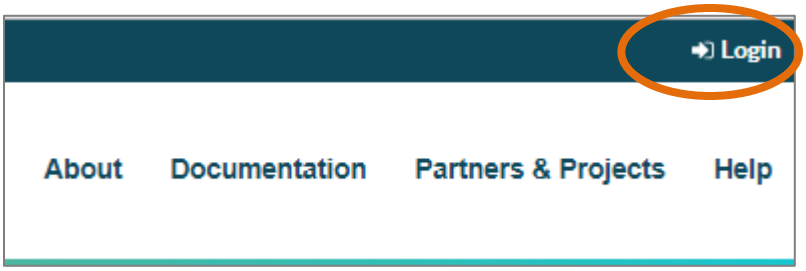


Figure 1: Login Link

If you have already registered for a user account, simply enter your email and password and click "Login." If you check the box next to "Remember me," your browser will store your username and password, so that you will not need to enter them again when logging on from the same computer.

If you have forgotten your password, you may set a new password by clicking the link to "Forgot your password?" The password reset instructions will be sent to the email you used to register your account. You will need to type your email and click the button "Send me reset password instructions." Monitor the email account you entered to find the relevant instructions.

If this is your first time to the GloDET website, or you have not yet signed up for an account, click on one of the two links to "Register a new account."

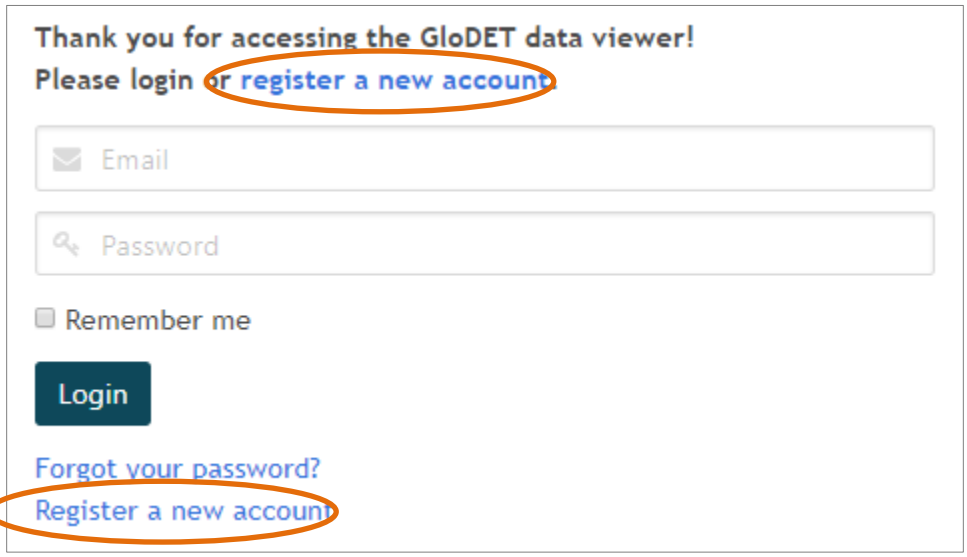


Figure 2: Login/Registration Page

You will be promoted to enter information including your email, password, name, and geographic location. Please select an affiliation to represent your professional or personal interest in the Global Daily ET dataset and specify your employer and job title. Select your primary purpose for accessing GloDET data, and tell us how you heard about this website. *You must read and accept the Terms and Conditions for using GloDET datasets.* Indicate your acceptance by clicking the checkbox. If you work in the water and agricultural sectors, you will likely benefit from information shared through the Daugherty Water for Food Global Institute and the National Drought Mitigation Center. You have to option to click the check boxes to agree to receive emails from these organizations. When you are done, click submit.

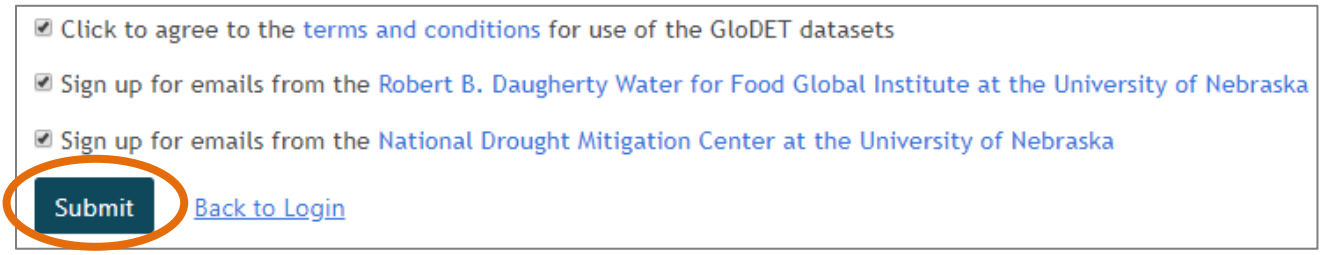


Figure 3: Check Boxes to Complete Registration

DWFI will review your registration information, and respond to your request within 24 hours. Once your registration is approved, you may sign in to view high-resolution data and download datasets.

Select Datasets

Once you are logged in to the data portal, you will have access to many additional features on the data explorer and home screen. You can customize the data explorer based on your viewing preference and to fit your computer screen in several ways.

Map Appearance

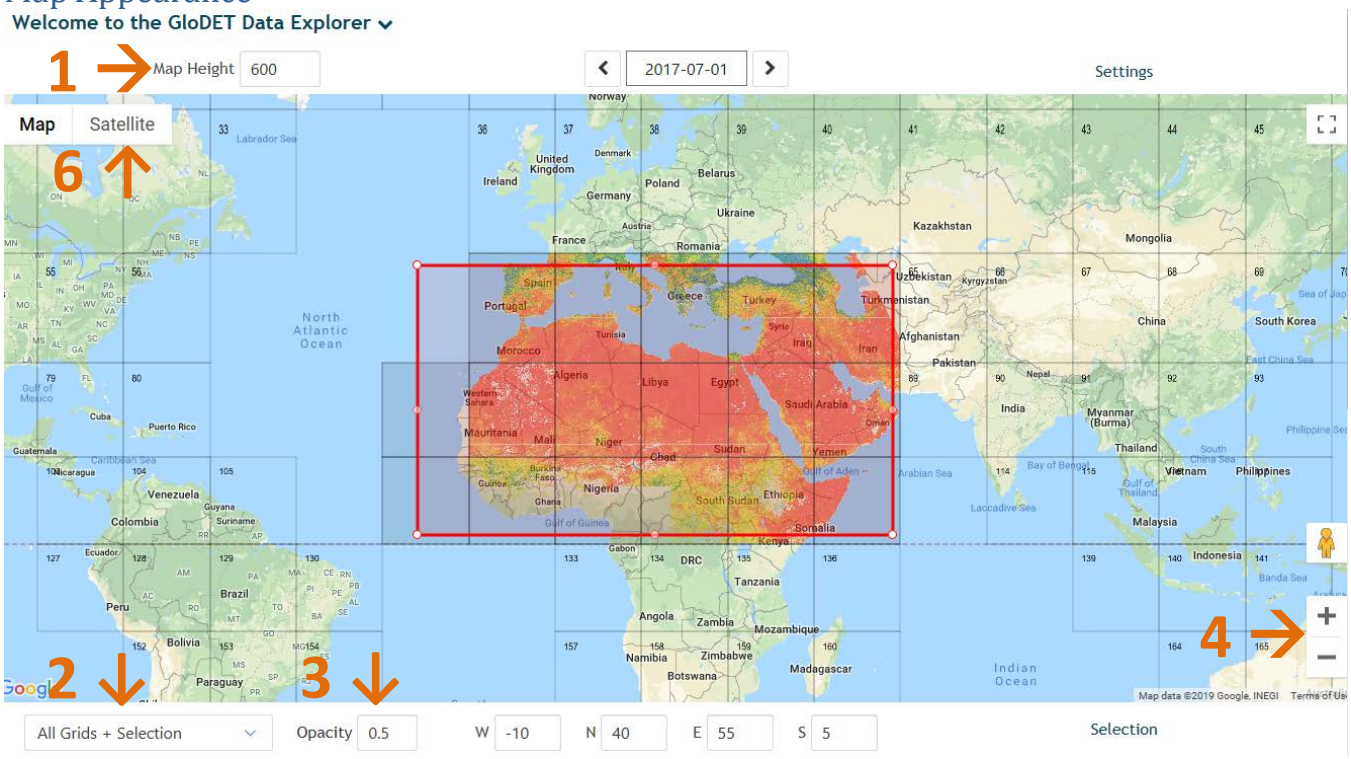
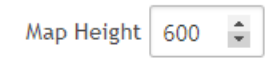
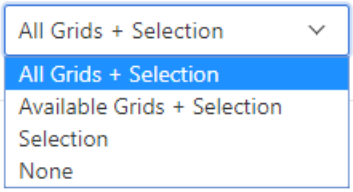


Figure 4: Map Appearance Tools

1. You may increase or decrease the map height in the browser window by entering a new number directly into the text box, or by using the arrows.



2. You can also control which grids and boxes shown on the data explorer. The grids outlined in gray are 15 by 15 degree boxes representing the spatial increments resulting from the ALEXI model. The shaded gray boxes contain available data, and are called Available Grids. The red box represents the user selection, and is called the Selection box. You can choose to show all grids plus selection, available grids plus selection, selection only, or none.



3. Adjusting the opacity allows you to see either the spatial ET data or the underlying map more clearly. By increasing opacity, the ET data appears more saturated and bright. By decreasing opacity, the map features are more visible. This may be useful if you are searching for a particular location visually.

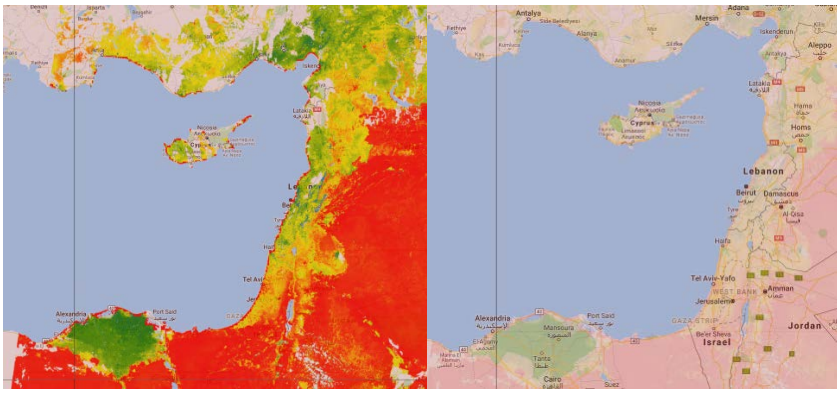


Figure 5: Adjusting Map Opacity

Daily ET map images on May 18, 2018, showing high opacity [left] equal to 0.95, and low opacity [right] equal to 0.15

4. If you are searching visually for a location, you will likely need to zoom in or out and pan across the map. In the bottom right corner of the data explorer, use the + button to zoom in and the - button to zoom out. As you zoom in, additional information such as cities, neighborhoods, road networks, and buildings will appear.

5. To pan the map, place your cursor anywhere in the data explorer **outside** of the red selection box, **left click and hold** (your mouse pointer will change from a pointer finger to a closed fist), and move your mouse to reposition the map. Release the mouse to stop panning.

Mouse icon changes from pointed finger [left] to closed fist [right] when panning the map.

6. You also have the option of switching the map base layer from political boundaries to satellite imagery. This may provide a better view of geographic features, such as rivers and mountains, as well as land use type.

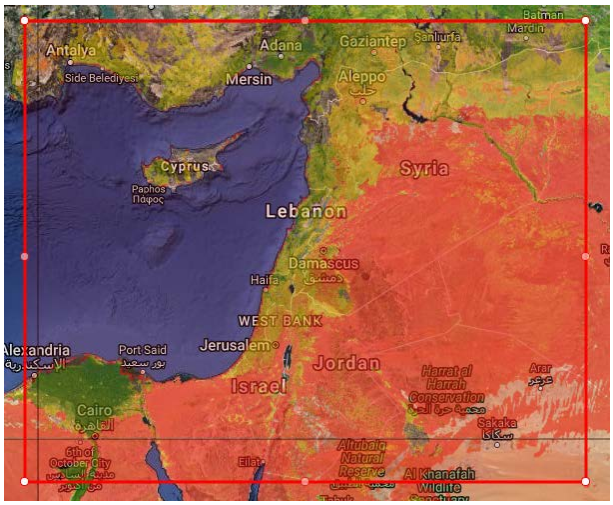


Figure 6: Changing Map Base Layer to Satellite Imagery

Daily ET map images on May 18, 2018, showing satellite imagery as the map bottom layer

Selection Tools

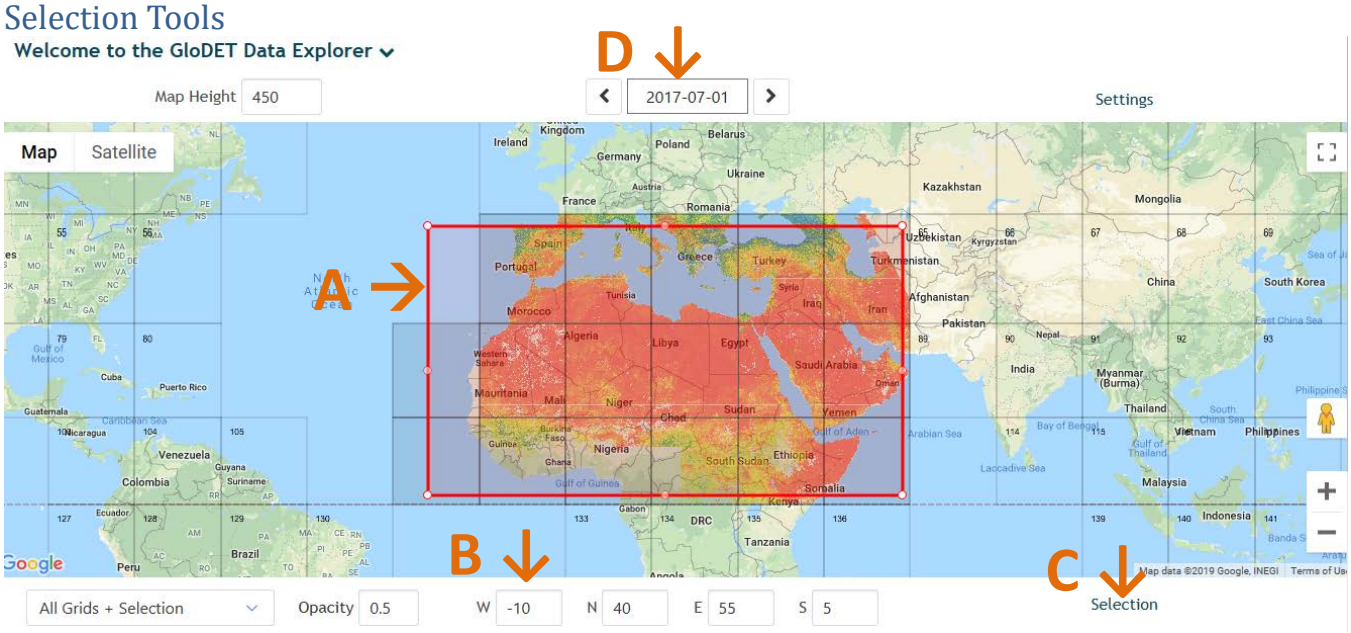


Figure 7: Map Selection Tools

The features discussed so far all control the maps' appearance. We will now discuss how to select data and save selections and map settings.

A. The red selection box determines which data is shown and which data is hidden in the data viewer, as well as which high resolution ET images appear below the map for download. If the red edge of the box is within any part of a grid, even a small portion, all of the data in that grid will be displayed (Figure 8).

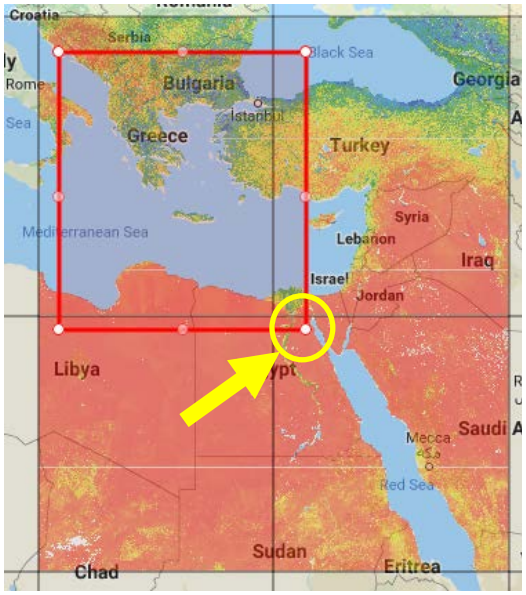
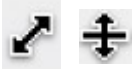


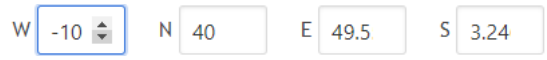
Figure 8: Selection Box

To adjust the size of the box, right click and hold over any of the white circles at the corners or edges, drag the circle to the new position, and release. To move the selection box without changing the size, left click and hold anywhere **inside** the red box, drag to a new position, and release. You will know that you have placed your mouse directly above a white circle when the pointer finger changes to a diagonal arrow or two arrows pointing in opposite directions.

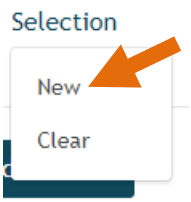


The daily ET data shown on the map will update when the selection box moves into or out of a grid. *Note: This update may take several seconds or longer to appear, depending on the speed of your internet connection. If you ever increase the size of the box to show more data grids, and the grids do not appear, please try to 1) change the position of the box slightly by panning and/or 2) resize your browser window. This should prompt the data viewer to update and trigger the grids to appear.*

B. You can also precisely set the selection box by setting the longitude and latitude of each of the box edges at the bottom of the map.



C. The Selection drop down box enables you to clear the selection, removing the selection box from the screen entirely, or start a new selection. Clicking on "New" in the Selection menu will reposition the selection box to a small size in the center of the map screen (Figure 9). Clicking "Clear" will remove the selection box entirely. Once clicking "Clear," you must click "New" to bring back the selection box.



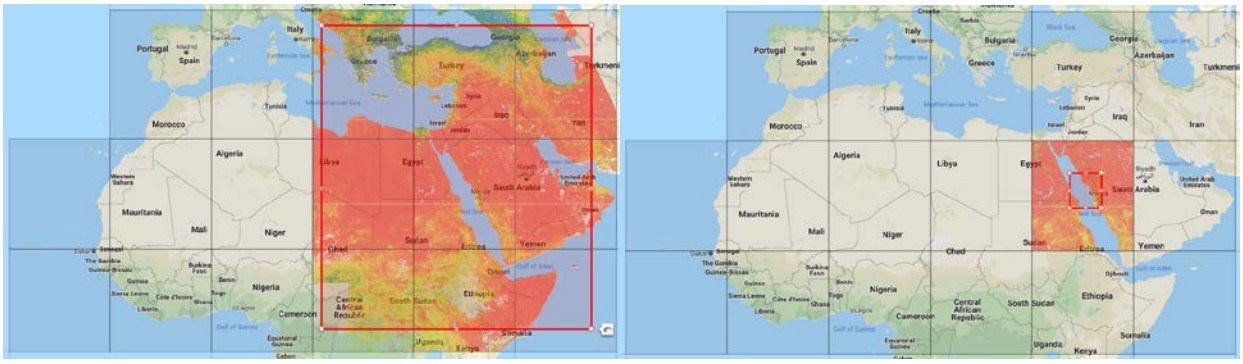


Figure 9: Making a New Selection

D. An additional option to control the data displayed is to adjust the date of the results displayed. ET is calculated on a daily basis. The map automatically loads the most recent daily data. You may view past data by using the arrows, or clicking on the date and selecting a date from the drop down calendar. Left click one time inside the date box (D) to prompt the calendar to appear. Occasionally, no data will be available for a particular day. The days with no data will appear as light gray in the calendar (for example, May 13th and 17th, below). Future days will also appear as light gray (May 24th – 31st, below).

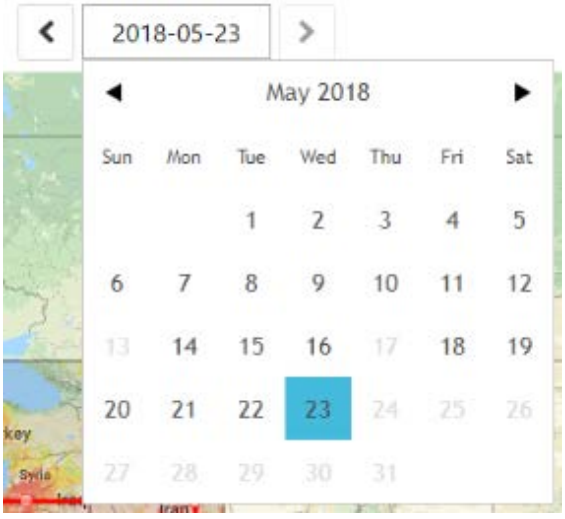


Figure 10: Calendar Selection

It is possible to view multiple days of evapotranspiration at the same time, and to download data, using the viewing boxes below the map. A scale bar is provided to the right side of the selected area. Evapotranspiration results are reported as millimeters per day (mm/day).

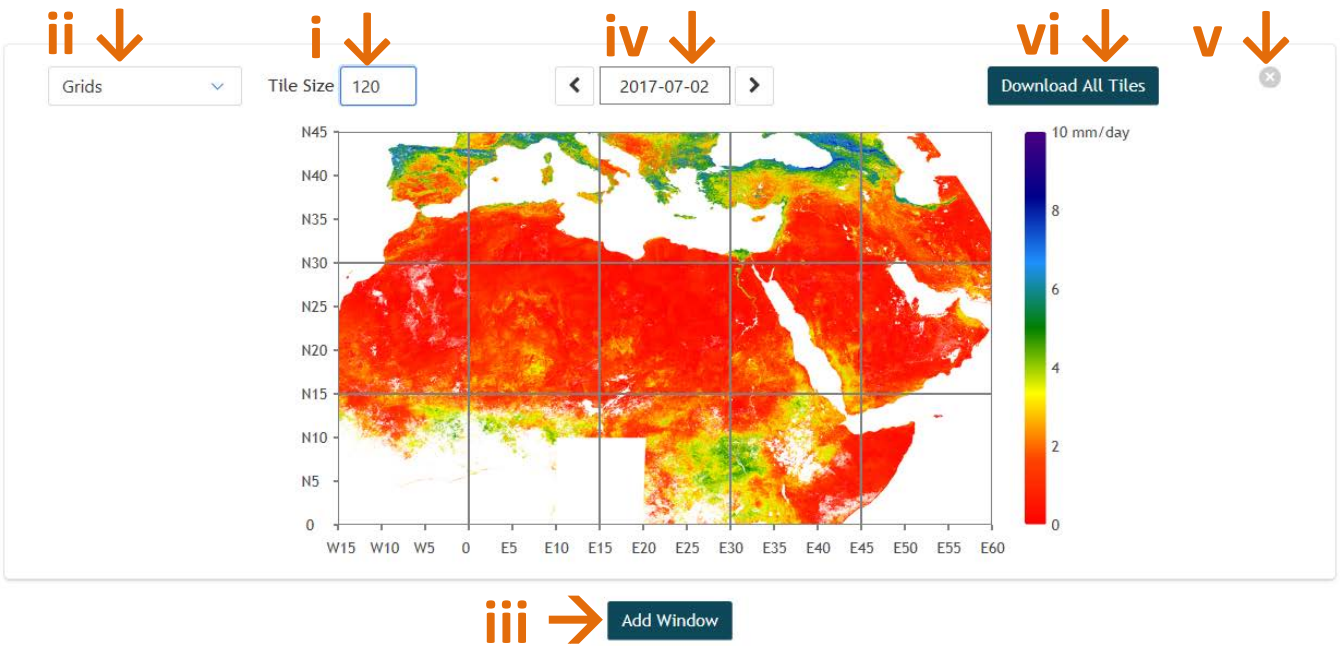


Figure 11: Map Download Tools

i. You can adjust the image size using the Tile Size box. Decreasing the Tile Size makes it easier to look at multiple days of data at the same time.

ii. Just as you can control what grids and boxes shown on the data explorer (see point 2, above) you can add grid lines in the viewing box. The grids outlined in gray are 15 degree by 15 degree boxes representing the spatial increments resulting from the ALEXI model. The shaded gray boxes contain available data, and are called Available Grids. The red box represents the user selection, and is called the Selection box. You can choose to show all grids plus selection, available grids plus selection, selection only, or none.

iii. To view multiple days of data, click “Add Window.” A duplicate viewing box will appear below.

iv. Change the date of the tile using the calendar arrows or drop down box, the same way as you do with the data explorer (see point D above). To view multiple days of data side-by-side, simply add viewing boxes equal to the number of days you want to view, and change the date in each box using the arrows or drop down calendar.

v. To remove a viewing box, simply click on the gray circle with the white X. Note: This X only appears on the additional viewing boxes.

vi. To download every tile that you have selected in the viewing box, click “Download All Tiles.”

Download Data

There are several options to download spatial datasets from the viewing box. To download multiple tiles at once, click "Download All Tiles" (vi in Figure 11). You may see a box pop-up from your internet browser stating: glodet.nebraska.edu wants to download multiple files. You will need to click allow to download more than one tile. If you have a popup blocker on your internet browser, you will need to allow pop-ups from glodet.nebraska.edu. If you are using Chrome, you can do this by going to the address bar and clicking on the Pop-up blocked icon ( ). Select the option to "Always allow pop-ups from glodet.nebraska.edu."

The daily evapotranspiration datasets are provided for download as image files. Each tile will have a matching .tif and a .png image. When downloading items through your web browser, you will have the option to open these files, or save them to a user-specified location (Figure 12).

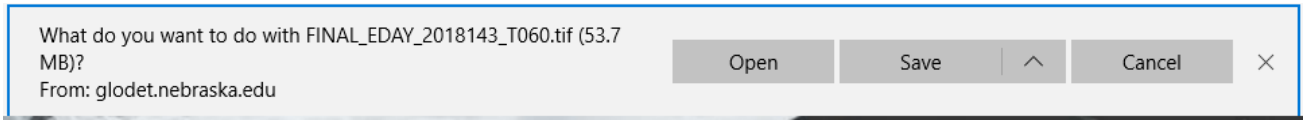


Figure 12: Open or Save ET Image Files

To download an individual tile directly, simply **left** click on the tile in the viewing box. This will download the raw data as a .tif image to your internet browser. If you **right** click on an individual tile and select "Save Image As…" from the context menu, you can also download the .png image directly (Figure 13).

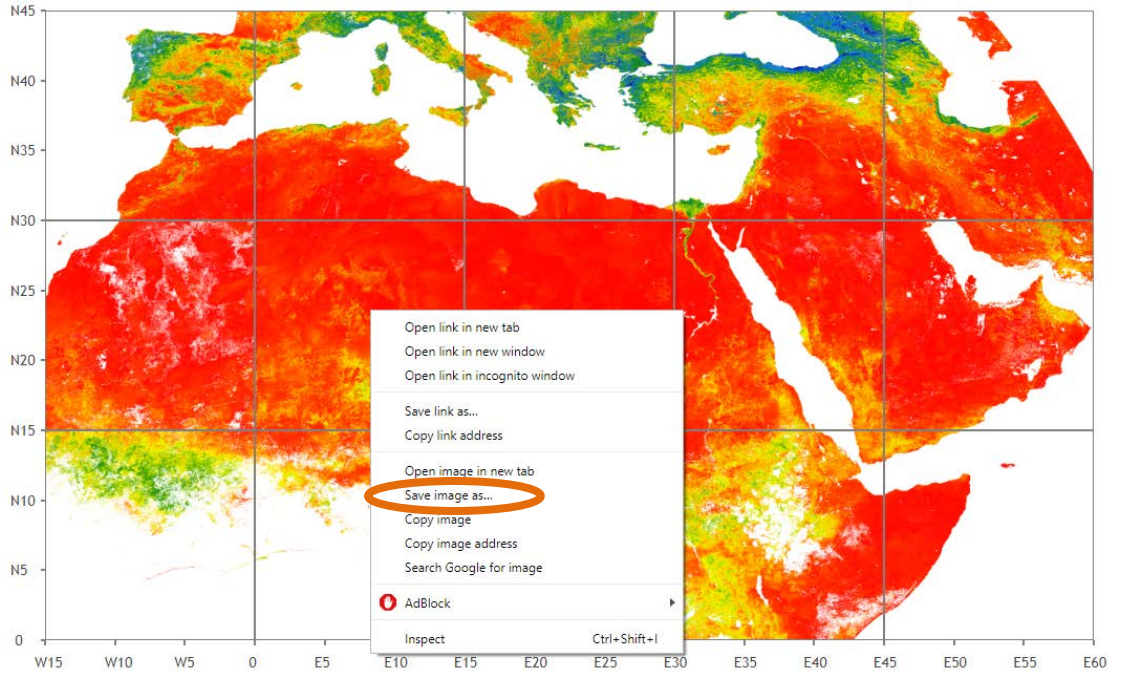


Figure 13: Download Individual Tiles

Customize and Save User Settings

As a registered user, you can save multiple Selections, so that you can quickly and easily return to and monitor the same location over time. You can also save all of the map settings discussed so far, including height, opacity, and map position, to quickly load your preferences when you return to the site. To do this, click on the drop down box for Settings, and click "Save." Once you assign the selection and map properties a name, it will be saved to your account. You can jump to a selection and setting, or change selections and settings easily, by using the drop down list in the Settings tab (Figure 14).

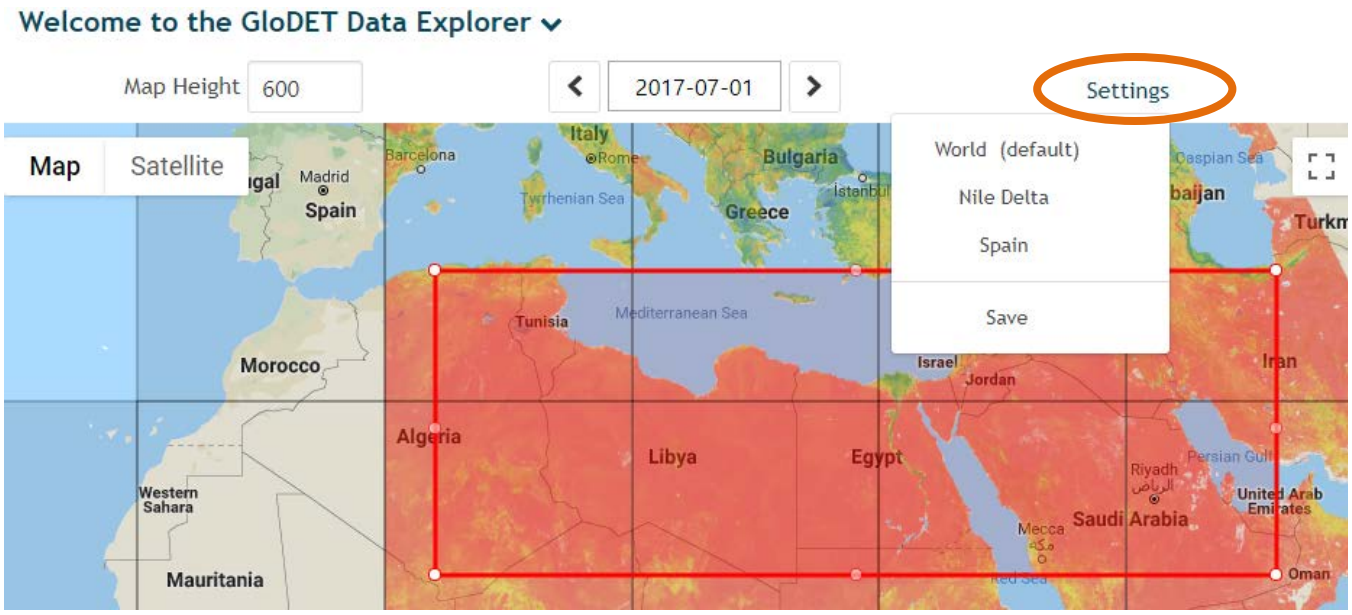
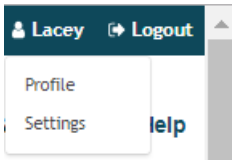


Figure 14: Save and Select Map Settings

Finally, you can access your user profile in the top right hand corner of the screen. You can update your user registration information as needed, and change your password, by selecting "Profile." You can also manage your saved map settings, including renaming the setting, changing the map properties like size, opacity, and selection latitude & longitudes, by choosing "Settings." To change which setting is default, meaning which appears when you first log in to the data explorer, click the "Is Default" box. Be sure to click "Update" to save your changes (Figure 15).



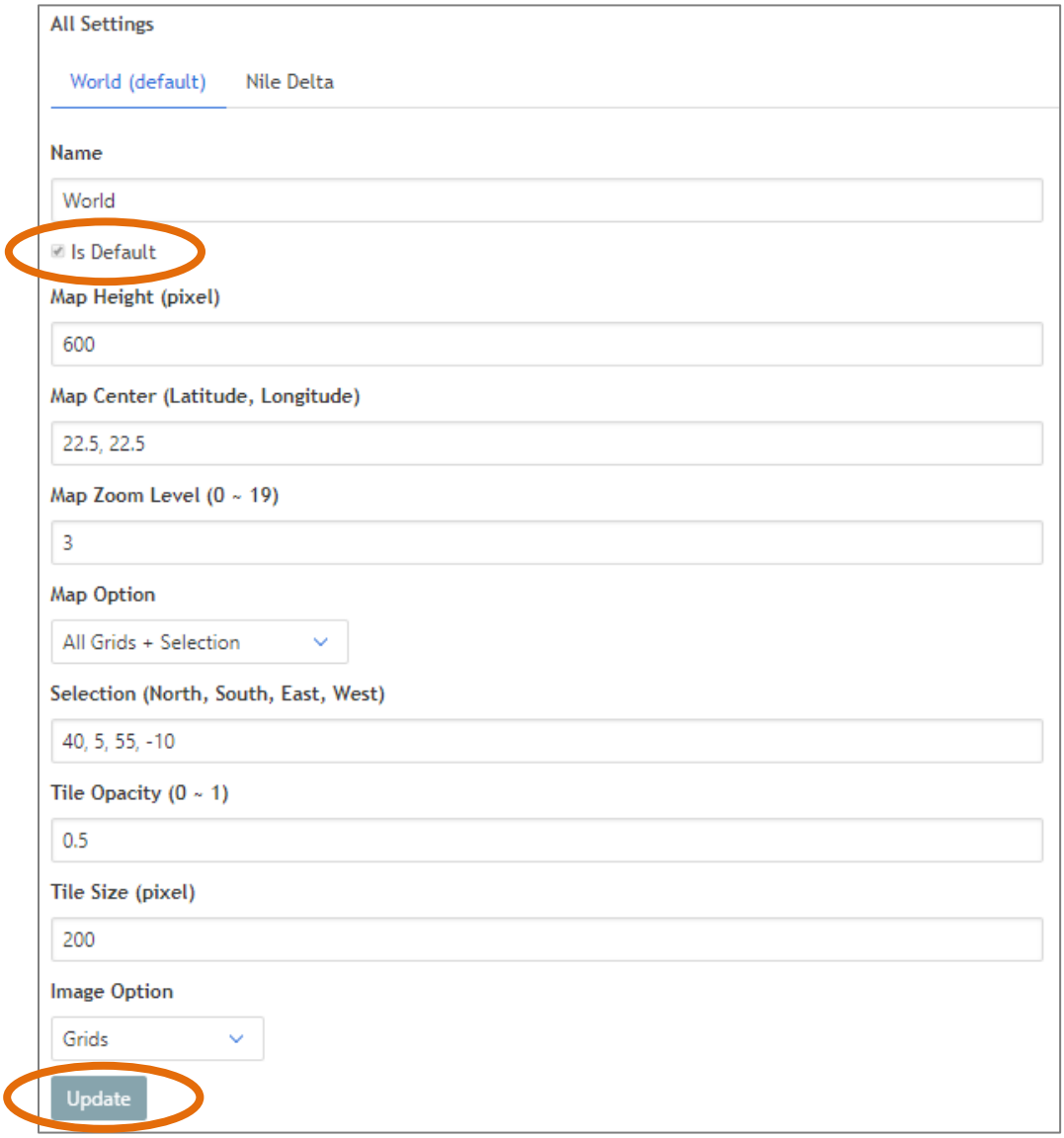


Figure 15: Manage Map Settings

Additional Assistance

Thank you for using the GloDET Data Explorer. For more information on ALEXI model development and citation instruction, please see the About tab. Training videos, informative presentations, and other resources are available in Documentation.

For troubleshooting and to contact the GloDET technical staff directly, use our Help page. General questions and comments may be sent to glodet@nebraska.edu.