The Global Agricultural & Disaster Assessment System (GADAS)

Katie McGaughey
U.S. Department of Agriculture (USDA)
Foreign Agricultural Service (FAS)

Sunflowers and Corn in Ukraine:
Photo Courtesy of Katie McGaughey taken July 2019
Foreign Agricultural Service (FAS)

• FAS is primarily responsible for USDA’s:
  • Overseas activities with attachés located at 93 offices covering 171 countries
  • Market development
  • International trade agreements and negotiations
  • Collection and analysis of statistics and market intelligence information

*Linking U.S. agriculture to the world to enhance export opportunities and global food security...*
Overview

1. Introduction to GADAS

2. Growing Season Scenario: Russia Winter Grains Planting, Establishment and Winterkill for the 2021 crop season
Global Agricultural Disaster Assessment System (GADAS)

Global interactive web Geographic Information System portal combining comprehensive real-time earth observation data and tools

Overview

- Global agricultural monitoring & commodity forecasting
- Comparative climatic & satellite-derived vegetation analysis
- Drought monitoring
- Natural disaster assessment & analysis
- Tracking current & historical disaster events
- Delineation of major land-use categories worldwide
- Regional planning and field-based assessments
- Crop Classification
Growing Season Scenario:

Russia Winter Grain Planting, Establishment and Winterkill for the 2021 crop season
Scenario: Russia winter grain analysis

1. How to find the country’s crop calendar?
2. What were conditions at planting?
3. What were conditions at establishment?
4. Were there many instances of winterkill?
5. Share the map with a colleague
For Russian winter grains, planting typically begins in August and is complete by the end of November.
Winter grains have several critical stages of crop planting and development. The first stage includes weather at planting time.
Rainfall at Planting

Since winter grains are largely planted from August to November, I am interested in compiling the precipitation data for that time period.

1. The calendar feature allows the user to change the date.

2. The date can also be changed by using the date bar and arrow buttons here.
Therefore, I want to select the time series for the three-month period, which will include the majority of planting.
Since I am only interested in Russian crops, I will use the political mask to cover the other countries.

Now, the data on the screen shows the rainfall at planting as compared to normal for the three months of September, October and November.
Rainfall at Planting

To provide some geographic context, I will add the State and Provincial Boundaries layer onto the map so the Russian Federal Districts display.
Rainfall at Planting

Essentially, conditions at planting were very dry in all of the main winter grains growing Districts. This was corroborated by FAS Moscow, FAS’s overseas counterparts in Russia.

To provide some cropped area context, I will add the Non-Cropland Mask layer onto the map so only areas with cropland display the rainfall for the three-month period at planting.
Establishment Conditions

After planting, conditions at establishment are important to monitor. Clearing the map of the rainfall, I will add the MODIS NDVI Anomaly layer to the map.

For establishment, I want to look at conditions in the middle of November, when most of the crop has emerged but not yet entered dormancy.
To provide further geographic context, I will add the major cities to the map as a data layer.

The date has now been changed to the middle of November.
Establishment Conditions

Essentially, establishment conditions, especially in Rostov and Stavropol, for the middle of November, were below-average as compared to the same time period for the last almost 20 years of data.

Finally, I will zoom into the Rostov, Krasnodar and Stavropol, which are three of the main producing areas for winter grains and open the legend.
After monitoring planting and establishment conditions, monitoring winterkill conditions comes next and is typically conducted from December through the break of dormancy in the spring.
Winterkill Assessment: Mid-December Example

First, I will activate the left map and add the extreme minimum temperature WMO layer to the map.
Winterkill Assessment:

Mid-December Example

Next, I will activate the right map and add the USAF Snow Depth layer to the map.
Winterkill Assessment:
Mid-December Example

Now that both maps are loaded, I will use the political mask, so I am only viewing Russia.
Finally, I will add the District boundary file to gain geographic context.
Winterkill Assessment: Mid-December Example

Sustained temperatures of -18 degrees Celsius or below without snow cover can cause winterkill. Reviewing the maps, there is an area in the Southern District that has low temperatures and no snow cover.
Winterkill Assessment: Mid-December Example

Using these layers reveals that this area does not contain many hectares of croplands and is not a concern for winterkill.

However, we want to make sure that those areas contain croplands, so I will add a non-croplands mask, which masks out what is not cropland.
Moving further north, however, in the Central District, there is a wide swath of land with cold temperatures and a lack of snow cover.
Finally, I’d like to share this map with my overseas counterparts in FAS Moscow to corroborate the data with on the ground information.

1. Make a map
2. Click Share: Bookmark Your Page
3. Paste the url in an email to your colleague
4. Your colleague opens the link in Chrome and immediately sees the same map
More information on FAS:

1. Please visit FAS’s virtual exhibit booth to access additional FAS information and data products available to the public.

2. The virtual booth will be accessible during the official program which begins on Thursday, February 18 at 8:10 a.m. ET and ends on Friday, February 19 at 5:00 p.m. ET.

3. All virtual meeting content will also be available on-demand for a minimum period of 12 months following the broadcast.
A few websites:
GADAS: https://geo.fas.usda.gov/GADAS/#
IPAD Homepage: https://ipad.fas.usda.gov/
Crop Explorer: https://ipad.fas.usda.gov/cropexplorer/
IPAD Circular: https://www.fas.usda.gov/data/world-agricultural-production
WASDE: http://www.usda.gov/oce/commodity/wasde/

Thank you!
Katie McGaughey
Katie.McGaughey@usda.gov
GMA.GADAS@usda.gov

Rice in Panama:
Photo Courtesy of Katie McGaughey taken October 2019