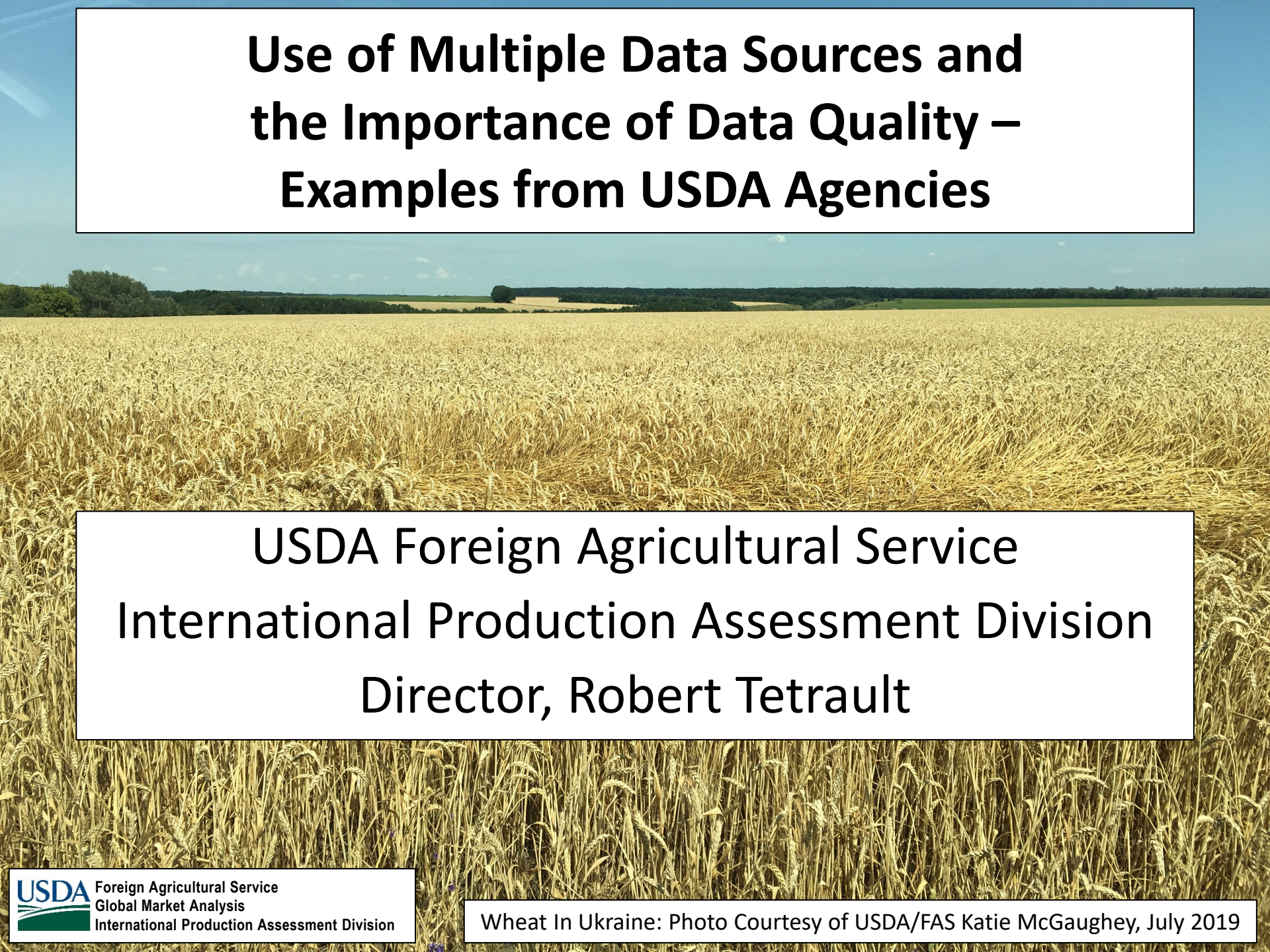
Use of Multiple Data Sources and the Importance of Data Quality – Examples from USDA Agencies



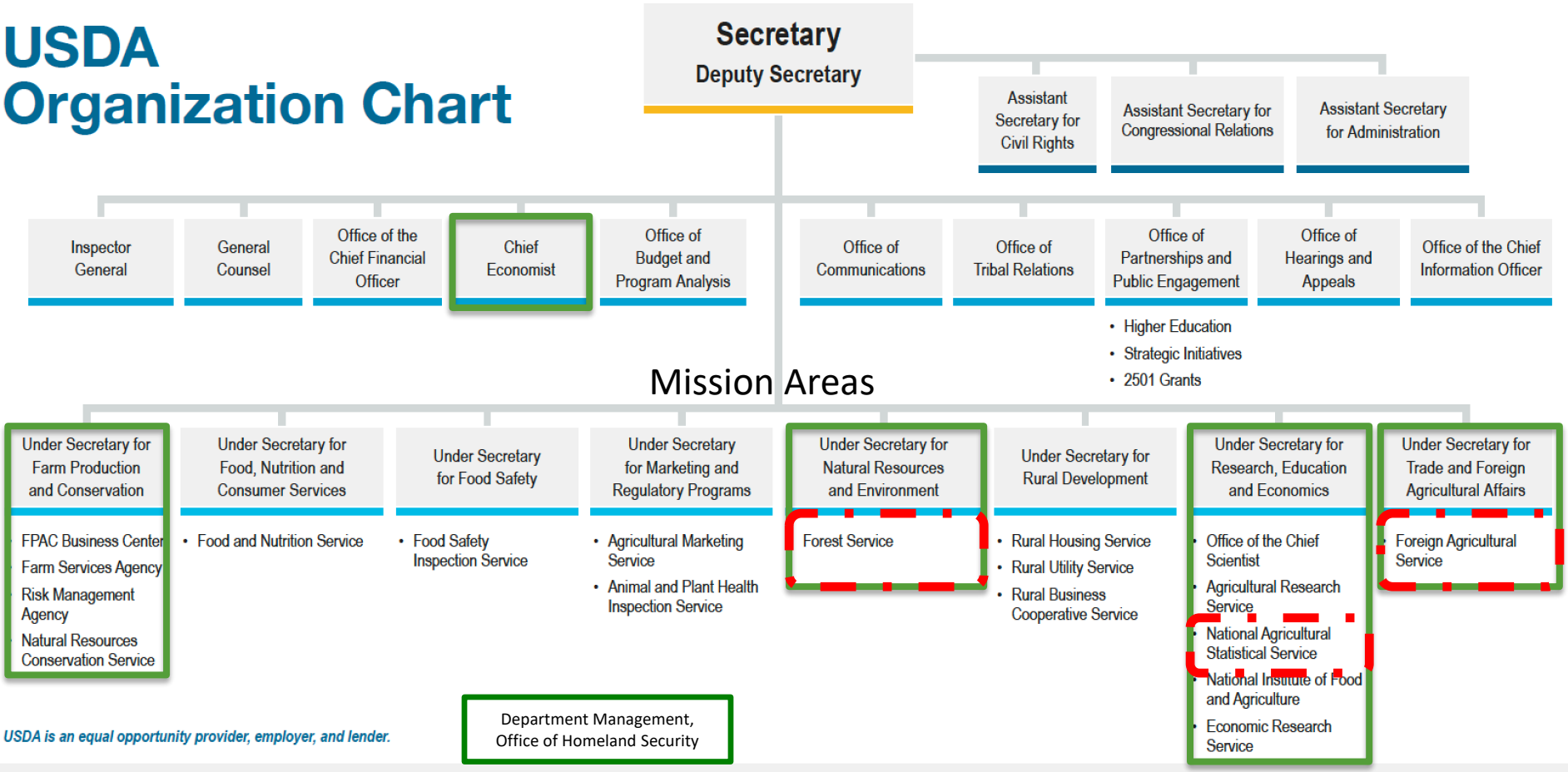
USDA Foreign Agricultural Service
International Production Assessment Division
Director, Robert Tetrault

USDA Foreign Agricultural Service
Global Market Analysis
International Production Assessment Division

Wheat In Ukraine: Photo Courtesy of USDA/FAS Katie McGaughey, July 2019

USDA
U.S. DEPARTMENT OF AGRICULTURE

USDA Organization Chart



USDA is an equal opportunity provider, employer, and lender.

UPDATED 08/31/20 This organization chart displays the names of USDA offices, agencies, and mission areas. Each office, agency, and mission area is placed within a cell connected by lines to show the structure and hierarchy (Under Secretary, Deputy Secretary, or Secretary) for which they fall under. An HTML version that lists USDA Agencies and Offices and USDA Mission Areas is also available on usda.gov. The Secretary's Memorandum 1076-031 was signed August 12, 2019 effectuating a change to Rural Development.

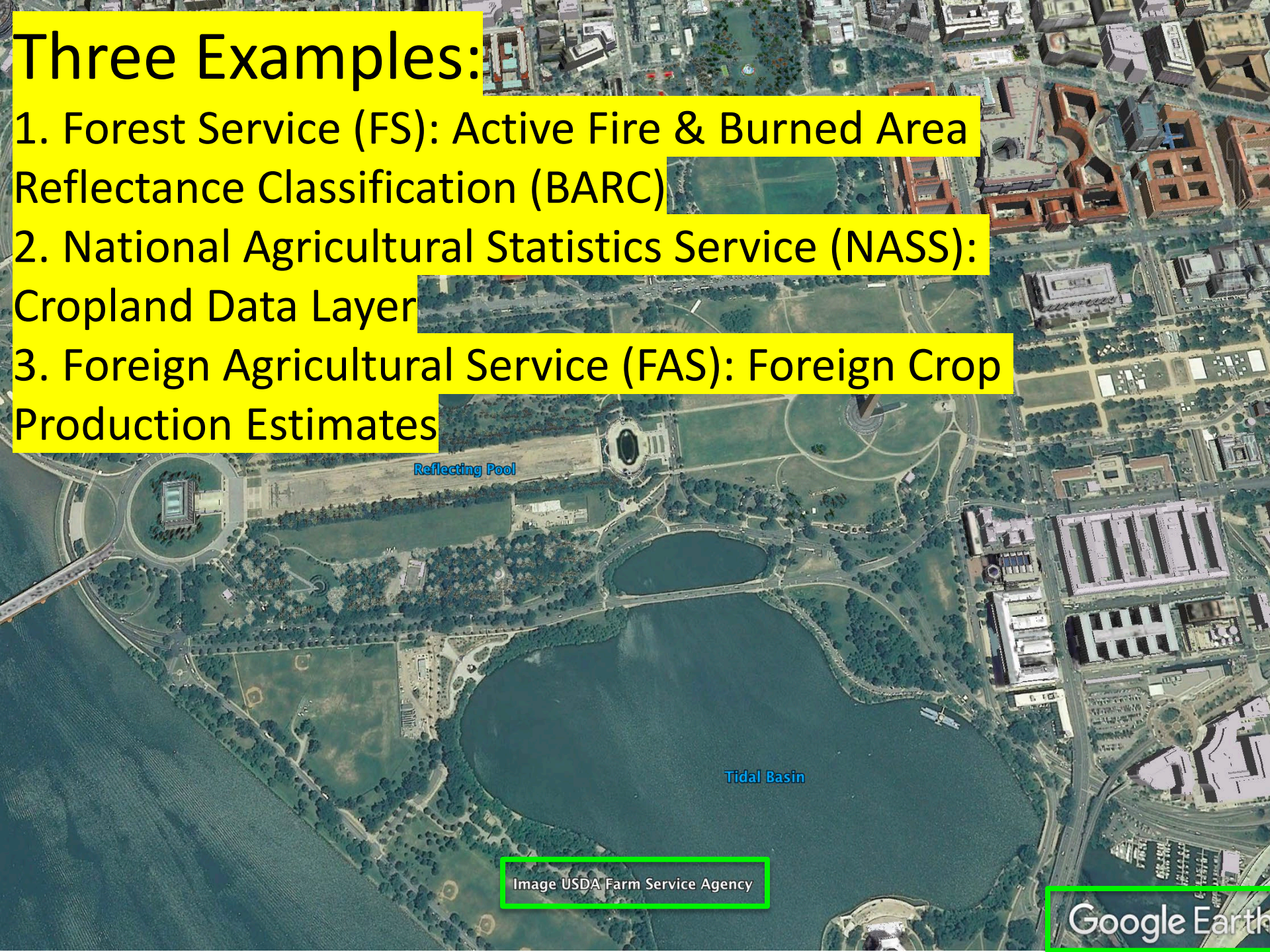
USDA and Earth Observations (EO)

Why use Multiple Data Sources?
Why is Data Quality Important?

USDA Agencies blend EO and non-EO data sources to produce ***Timely, Reliable and Objective*** outputs which are used in decision-making and science-based analysis.

Three Examples:

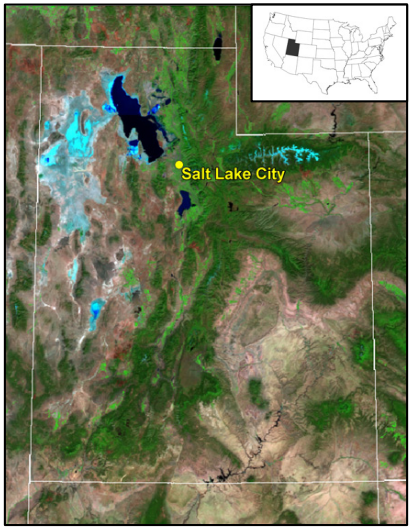
1. Forest Service (FS): Active Fire & Burned Area Reflectance Classification (BARC)
2. National Agricultural Statistics Service (NASS): Cropland Data Layer
3. Foreign Agricultural Service (FAS): Foreign Crop Production Estimates



Forest Service's Geospatial Technology and Applications Center

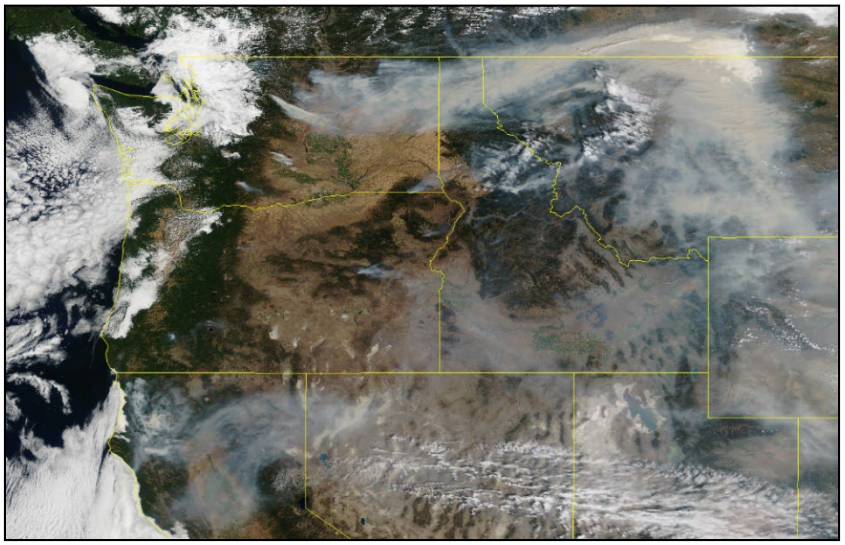
- National Forest System Deputy Area; Engineering Staff
- National Technical Center

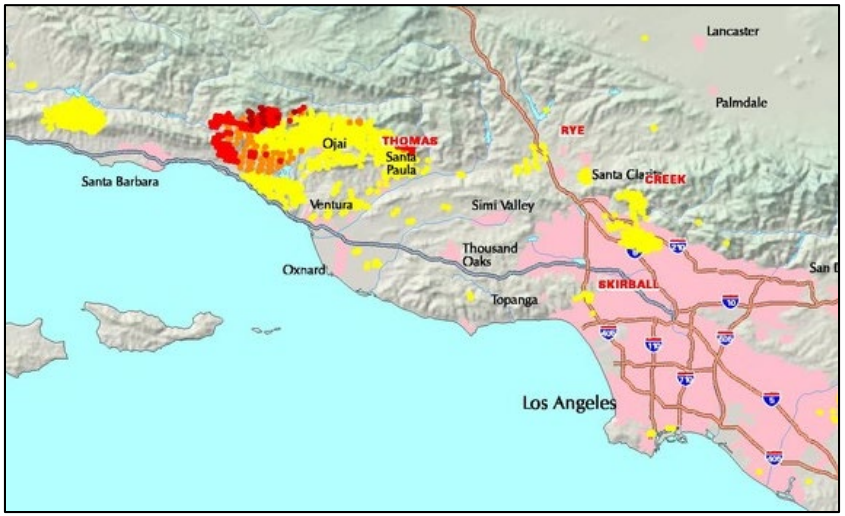
  Mission: Leading geospatial science implementation in the Forest Service by exploring and developing emerging technologies, working with partners to demonstrate their application in land and resource management, providing solutions to inform decision making, and building capacity to support the Agency Mission



Active Fire Detection and Monitoring

- **Objectives:** Comprehensive active fire detection/monitoring and effects assessment to support wildfire management for the U.S. and Canada
- **Inputs:** Optical and thermal imagery from polar and geostationary assets
  - MODIS, VIIRS, Landsat, GOES
- **Outputs:** Moderate to coarse resolution reflectance imagery, active fire detections, burn scar, value-added products, etc.
  - **Frequency**: Multiple times daily
  - **Latency:** <1 hour to days
- **Users:** Fire management agencies and DSS applications, general public

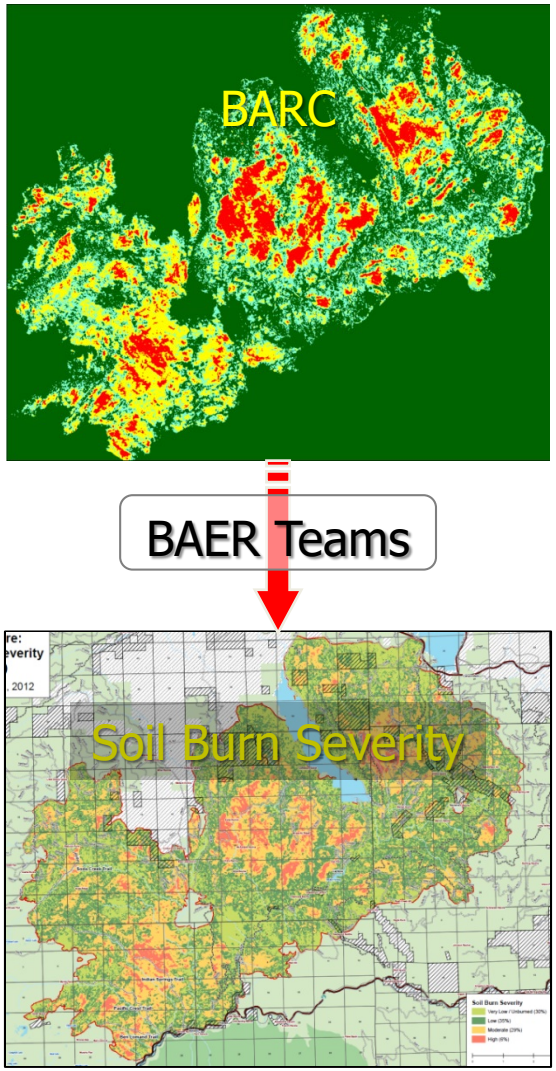




Blend of EO and non-EO data sources to produce *Timely, Reliable and Objective* outputs which are used in decision-making and science-based analysis

Post-Fire Emergency Stabilization & Hazard Mitigation

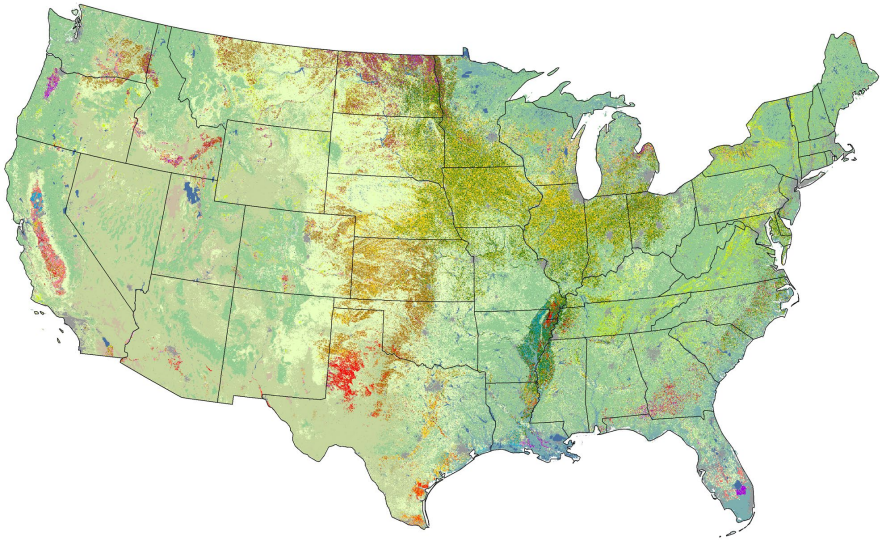
- **Objectives:** Rapid delivery of imagery and burned area reflectance classifications (BARCs) based on dNBR/dNDVI for FS wildfire incidents where soil/watershed function is significantly impaired
- **Inputs:** Optical imagery from Landsat, Sentinel 2 or similar assets collected at, or near, fire containment
- **Outputs:** Moderate resolution pre/post event reflectance imagery, continuous and thematic severity data, burned area boundary delineation, value-added products
  - **Frequency**: Once per incident; multiple times for long duration events
  - **Latency:** <4 hours of imagery availability
- **Users:** BAER teams, forest units, general public



Blend of EO and non-EO data sources to produce *Timely, Reliable and Objective* outputs which are used in decision-making and science-based analysis

National Agricultural Statistical Service

Cropland Data Layer (CDL) 2008 - 2019



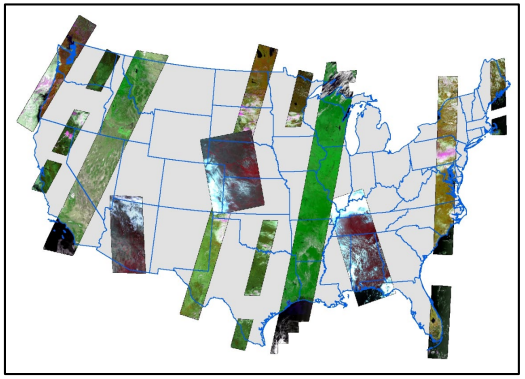
CropScape: https://nassgeodata.gmu.edu/CropScape/

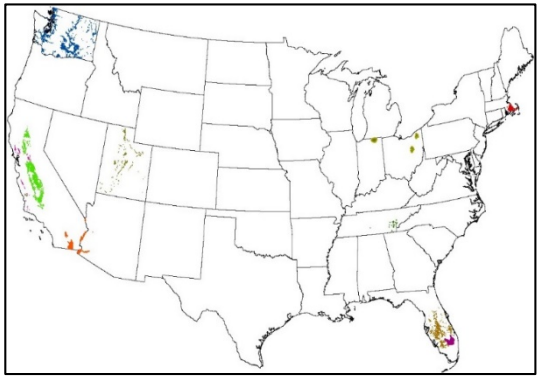
- Annually released, geo-referenced, 30m, **crop-specific** land cover dataset
- Produced with satellite imagery acquired throughout the growing season
  - Sentinel-2A & B, Landsat 8, Resourcesat-2, Disaster Monitoring Constellation Deimos-1 & UK2
- Provides NASS with **independent acreage estimates**
- Over 100 **cropland categories**
  - Major commodities, double cropping, specialty crops, etc.

National Agricultural Statistical Service

Cropland Data Layer (CDL) Inputs

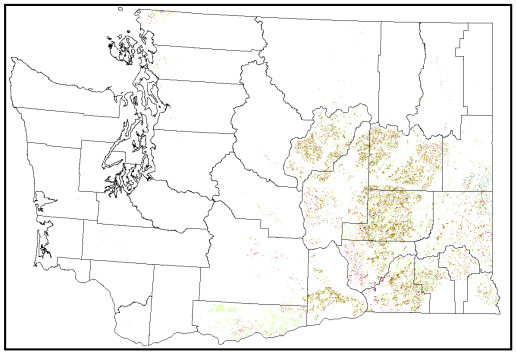
DMC Deimos-1 & UK2, Resourcesat-2, Sentinel-2 A/B, Landsat 8

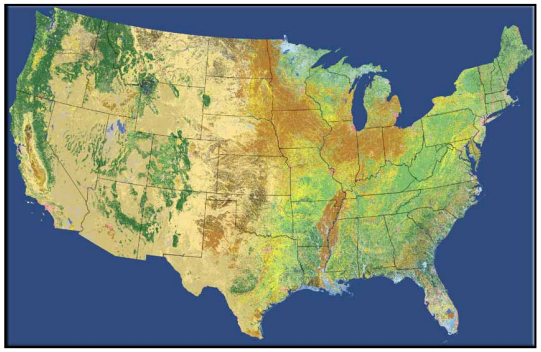




Supplemental Ground Reference Data

Farm Service Agency: 578 administrative Common Land Unit





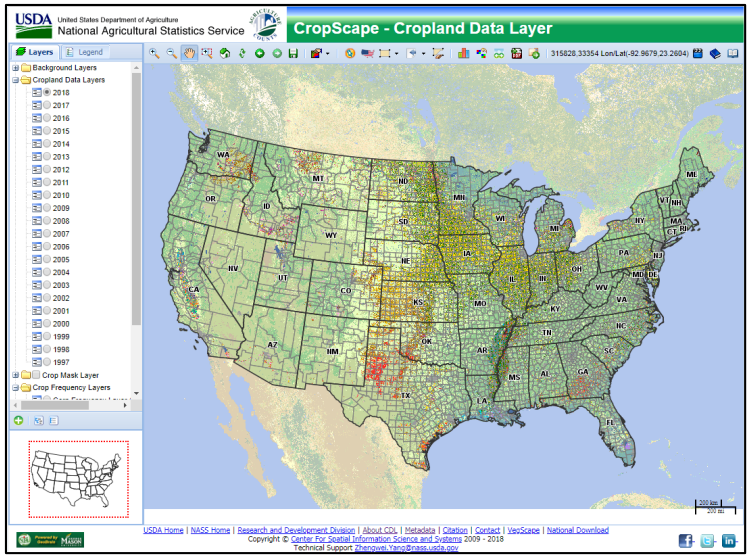
2016 National Land cover Data set

Blend of EO and non-EO data sources to produce *Timely, Reliable and Objective* outputs which are used in decision-making and science-based analysis

National Agricultural Statistical Service

CropScape

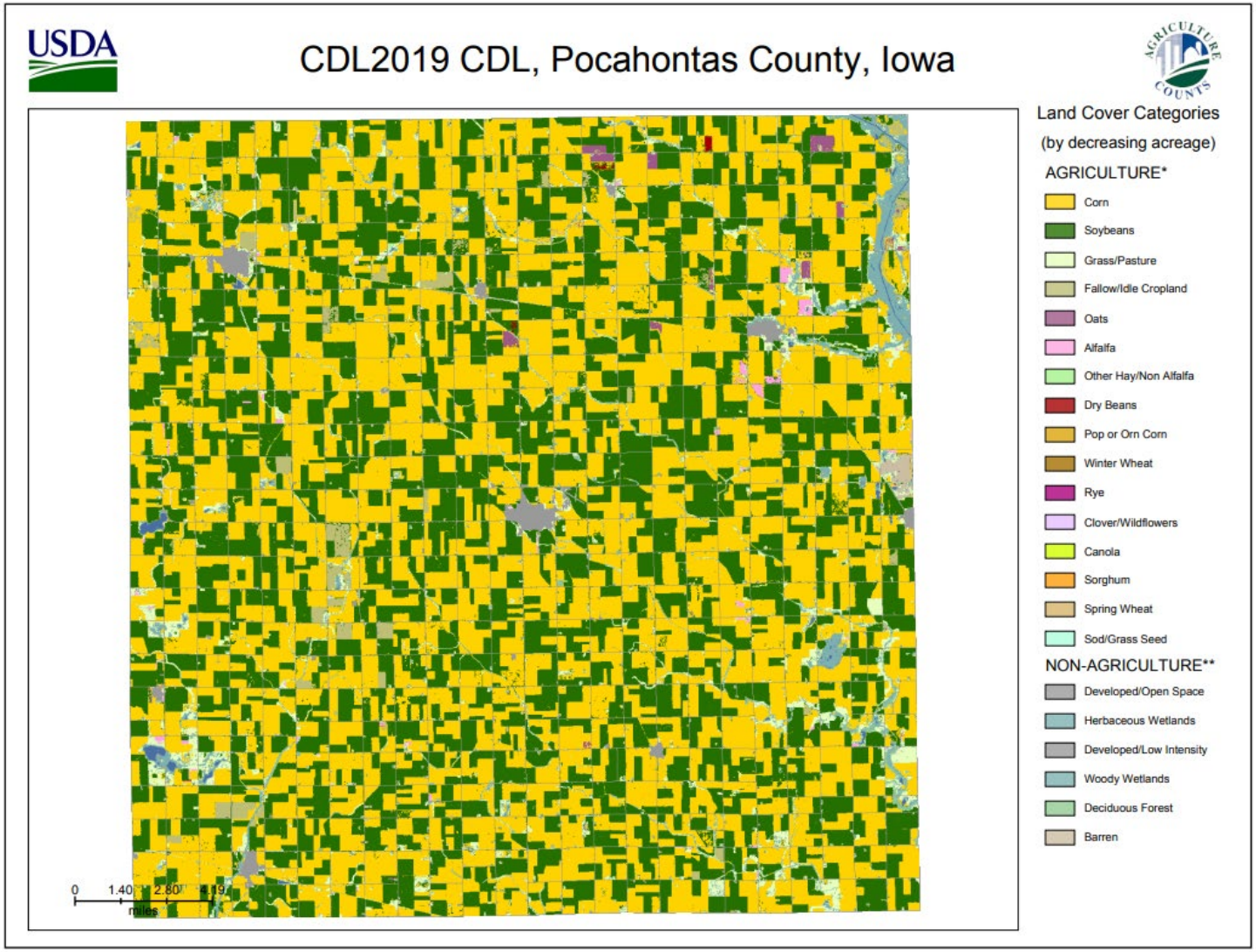
- Provides the public with open access to current and historical CDLs and derivative products
- The CDLs are released to the public annually at the end of the growing season
- Ability to perform interactive visualizations, geospatial queries, and online analytics
- Download and mapping tools are available



CropScape Website
https://nassgeodata.gmu.edu/CropScape/

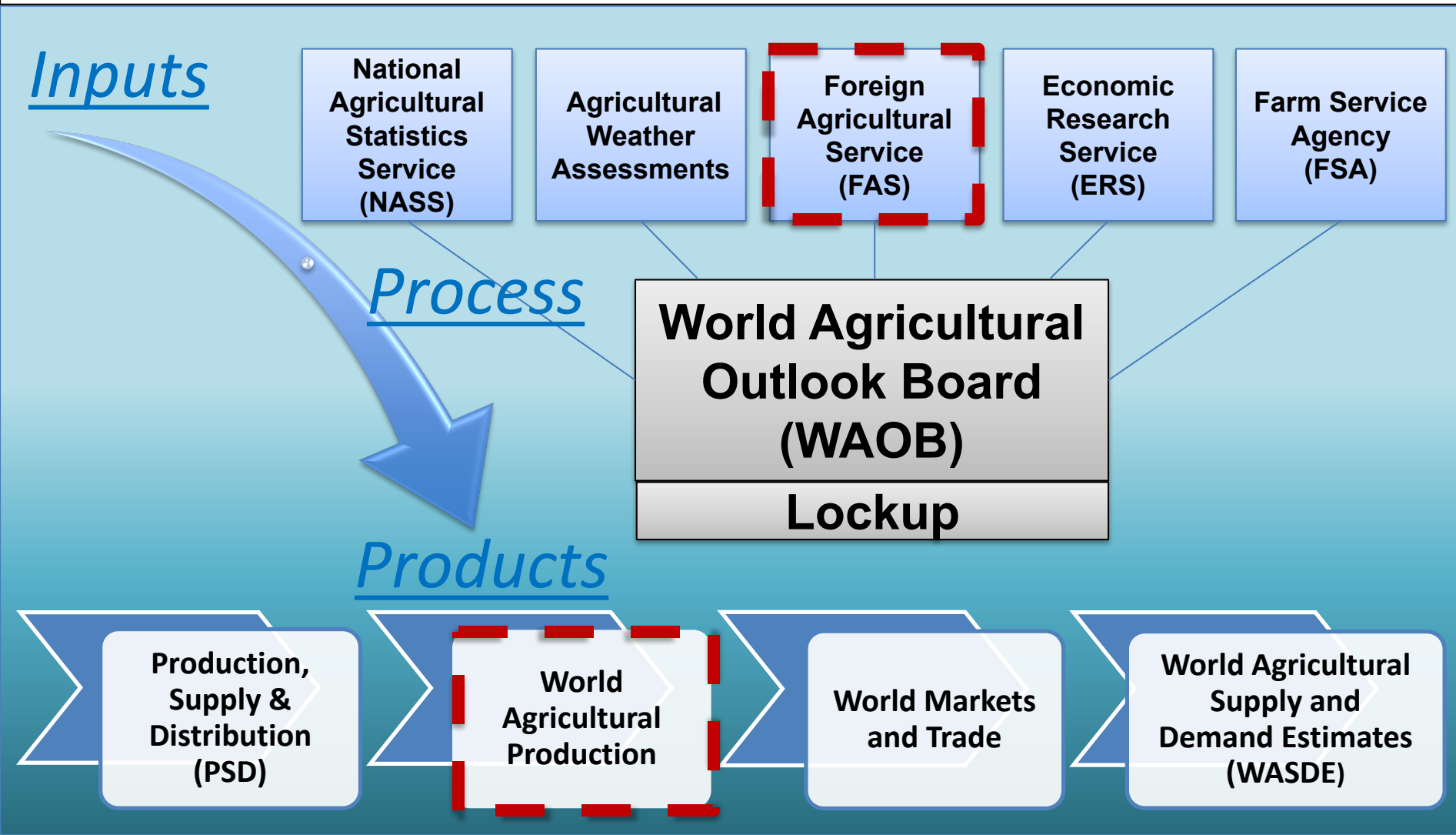
National Agricultural Statistical Service

On-line Mapping with CropScape



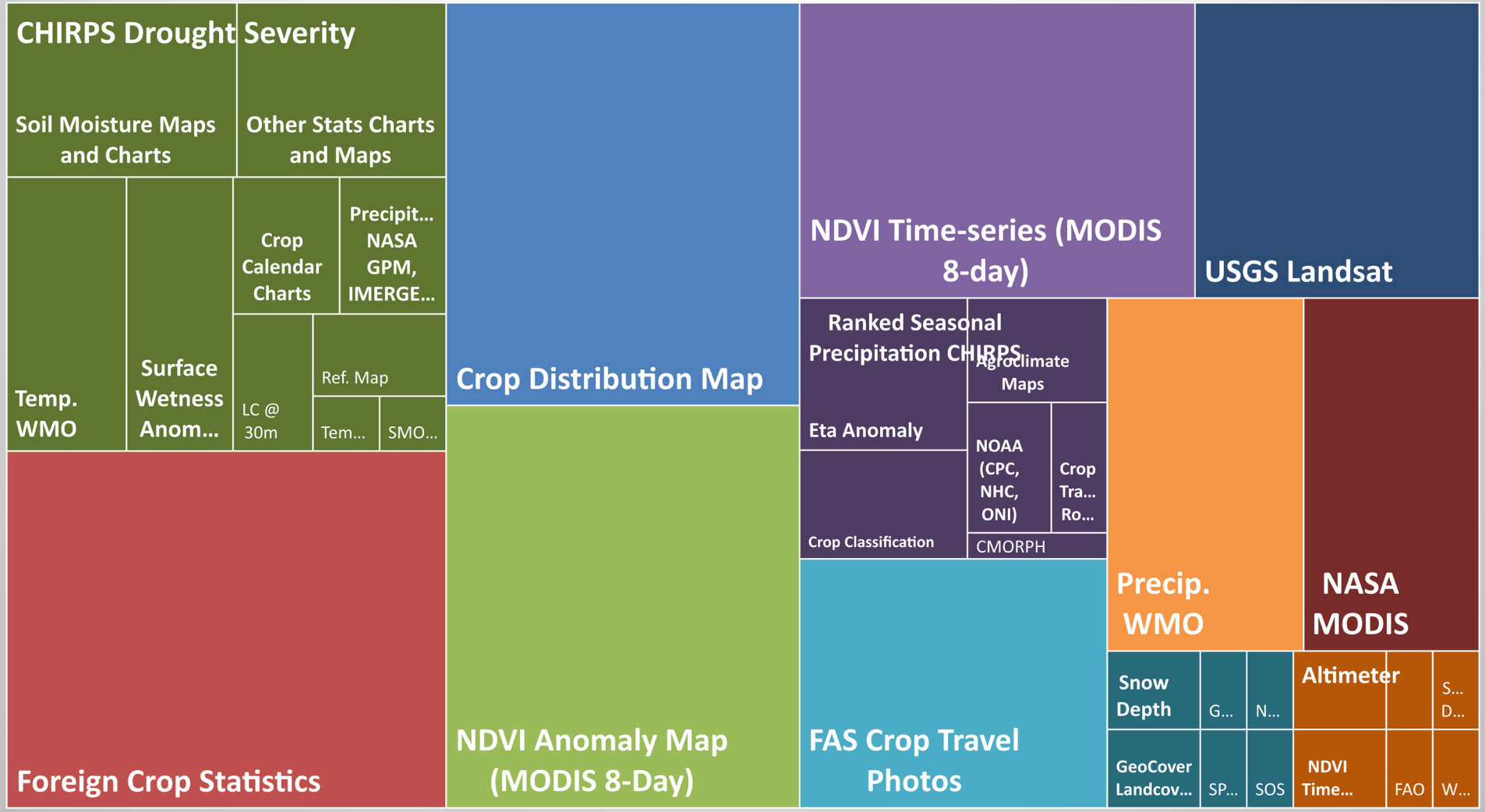
United States Department of Agriculture
Foreign Agricultural Service

USDA's Interagency Market Intelligence System



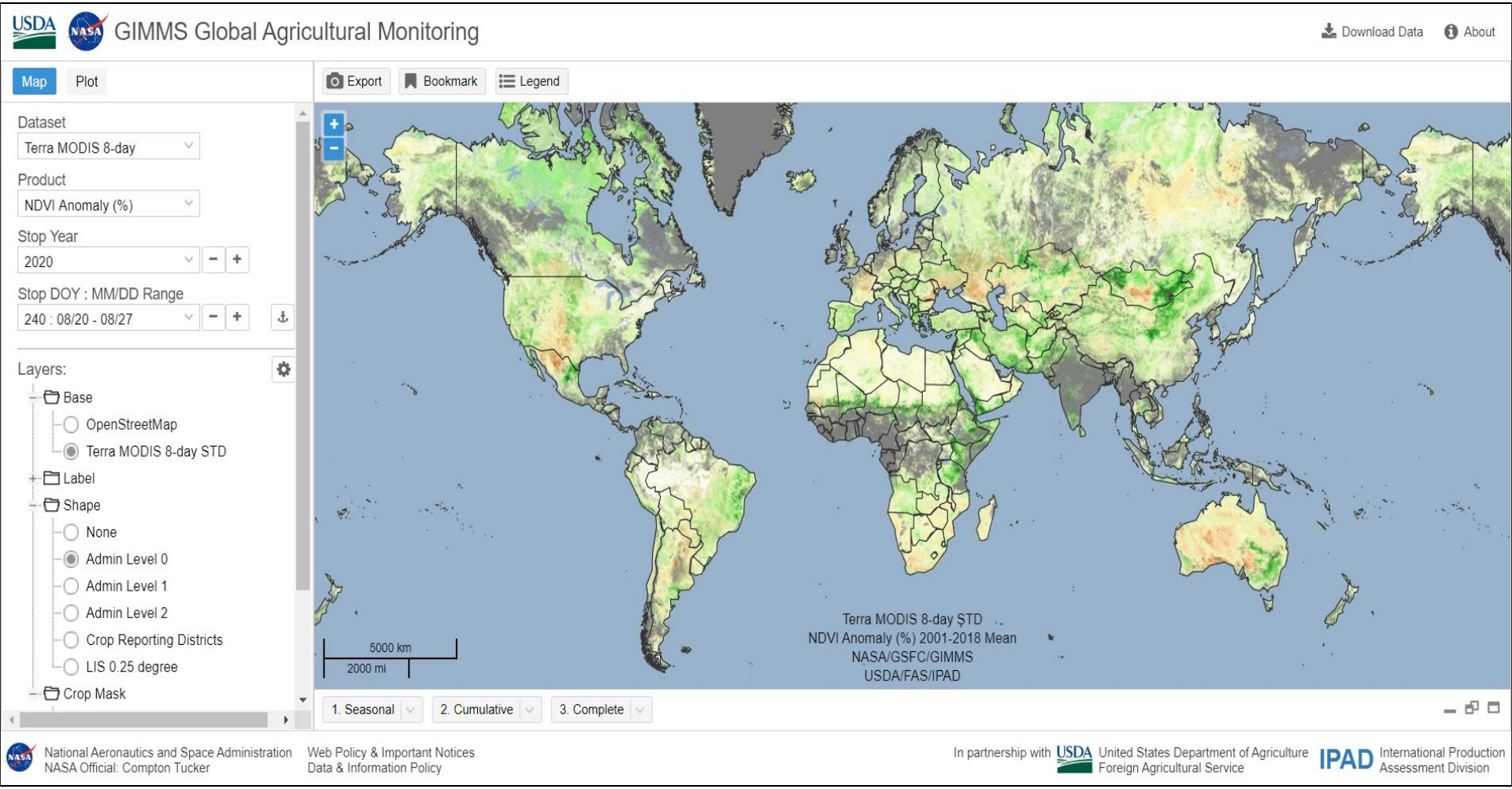
United States Department of Agriculture
Foreign Agricultural Service

IPAD used over 60 EO and non-EO data sources for crop production estimates during FY2015 - FY2019. The graphic shows the top sources, arranged by hierarchy.

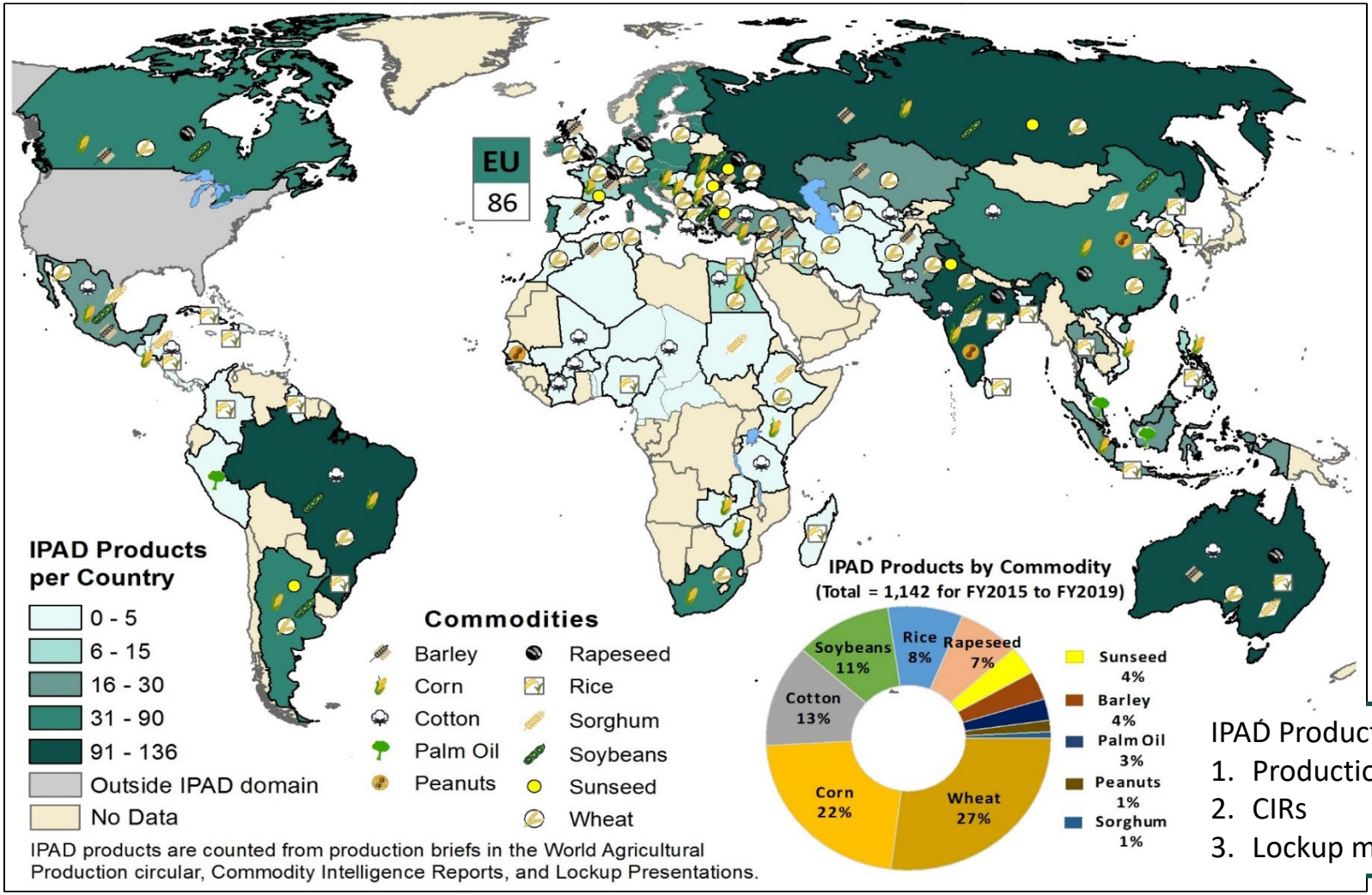


USDA United States Department of Agriculture
Foreign Agricultural Service

FAS Funded and NASA Implementation of MODIS NDVI (Terra and Aqua) Updated Every 8 Days

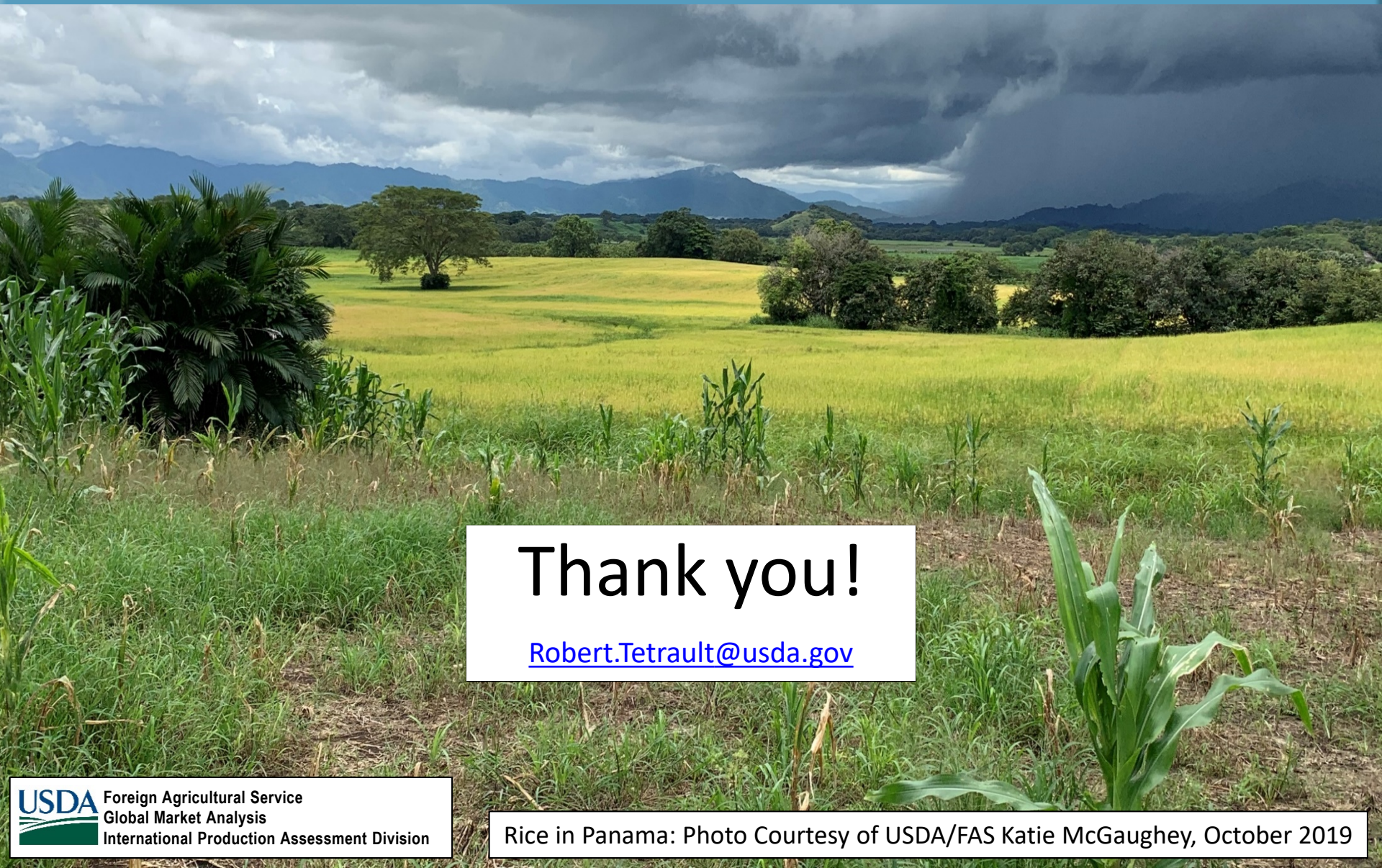


IPAD's Analytical Focus for Products – FY2015 to FY2019



IPAD Products:

1. Production briefs
2. CIRs
3. Lockup materials



Thank you!

Robert.Tetrault@usda.gov

Rice in Panama: Photo Courtesy of USDA/FAS Katie McGaughey, October 2019