

Rapid Damage Assessment using FAS's Global Agricultural and Disaster Assessment System—GADAS

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Agricultural Outlook Forum

USDA Foreign Agricultural Service

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FAS: Rapid Damage Assessment using GADAS

GADAS <https://geo.fas.usda.gov/GADAS/index.html>

WHO

USDA Foreign Agricultural Service, Office of Global Analysis, International Production Assessment division (FAS/IPAD) supports the World Agricultural Outlook Board (WAOB) by providing estimates of foreign crop production.

If there is a disaster, WAOB and others need to know the impact on area, yield, and production.

WHY

Previously, FAS stored large amounts of satellite imagery and ancillary data and our analysis used desktop software. FAS realized cost savings on storage by moving large datasets to the cloud.

Visualizing and analyzing data is now on the web and on desktops. This will improve sharing and collaboration between analysts in D.C. and those at overseas embassies.

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WHAT

Disasters that affect crop production, and can change our estimates at the national scale, are typically hurricanes, typhoons, floods, and droughts.

Ice storms, hail storms, localized flooding, and pest outbreaks are important too but often result in regional, or localized damage.

DATA

Web services for data layers include: weather, vegetation index, crop condition, disaster, agricultural lands, land cover, infrastructure, elevation, and others.

Disaster alerts are from Pacific Disaster Center.

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WHEN

WAOB and FAS/IPAD publish on a monthly basis in the World Agricultural Supply and Demand and the World Agricultural Production.

Disaster assessments, however, can occur at any time and need rapid response.

HOW

FAS/IPAD built the Global Agricultural and Disaster Assessment System—GADAS—which is an interactive web GIS.

GADAS provides flexibility for choosing areas and time frames for disaster assessments.

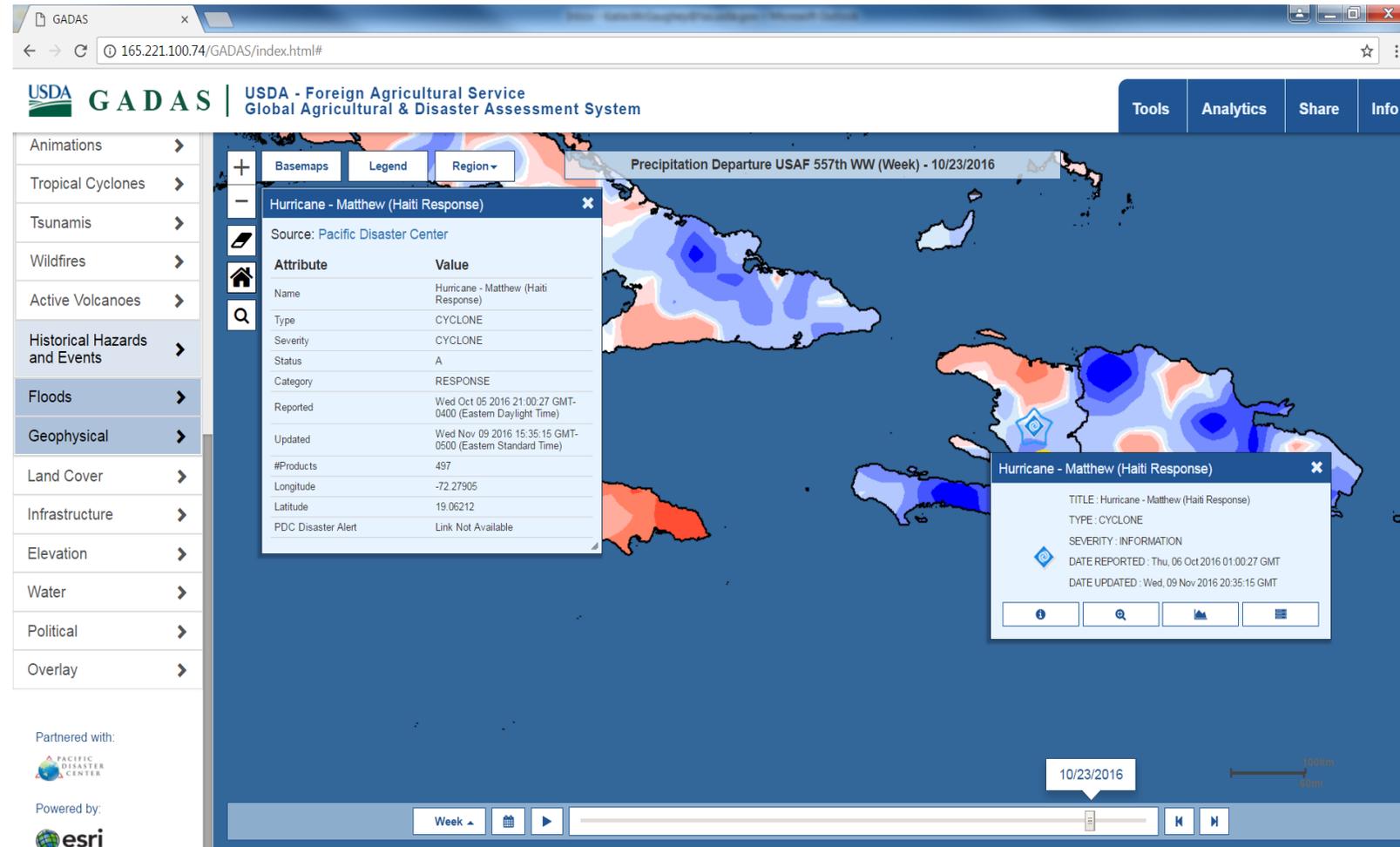
Hurricane Matthew struck Haiti in October of 2016. Quick responses are needed after natural disasters, and should include agricultural area impacted and population impacted.

GADAS allows us to quickly and easily compile data to share, often within a very short time period.

For Haiti, the first thing to do is look at the disaster alert from the PDC to narrow down the time window to review.

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The second thing to do would be to review any critical areas of flooding.

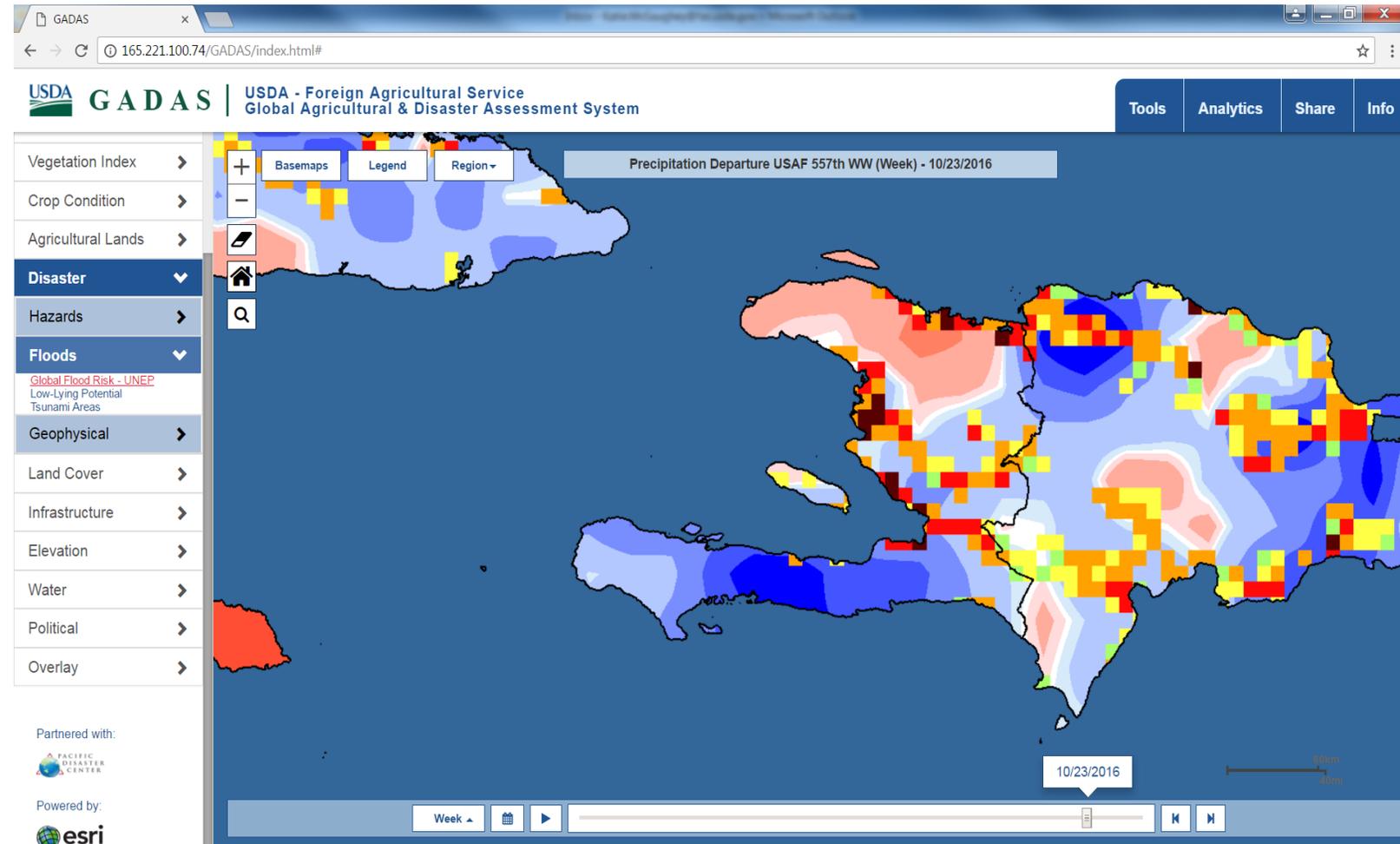
The first step would be to review global flood risk areas and combine that data set with departure from normal precipitation.

Data source

- Global Flood Risk– UNEP
 - Precipitation departure from normal USAF 557th Weather Wing
- Alternative sources are:
World Meteorological Organization, NASA IMERGE, NOAA CMORPH, CHIRPS

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After identifying the most susceptible areas (which in this case are Quest, Sud-Est, Sud, and Grand Anse), use the tools to determine the agricultural area and population impacted.

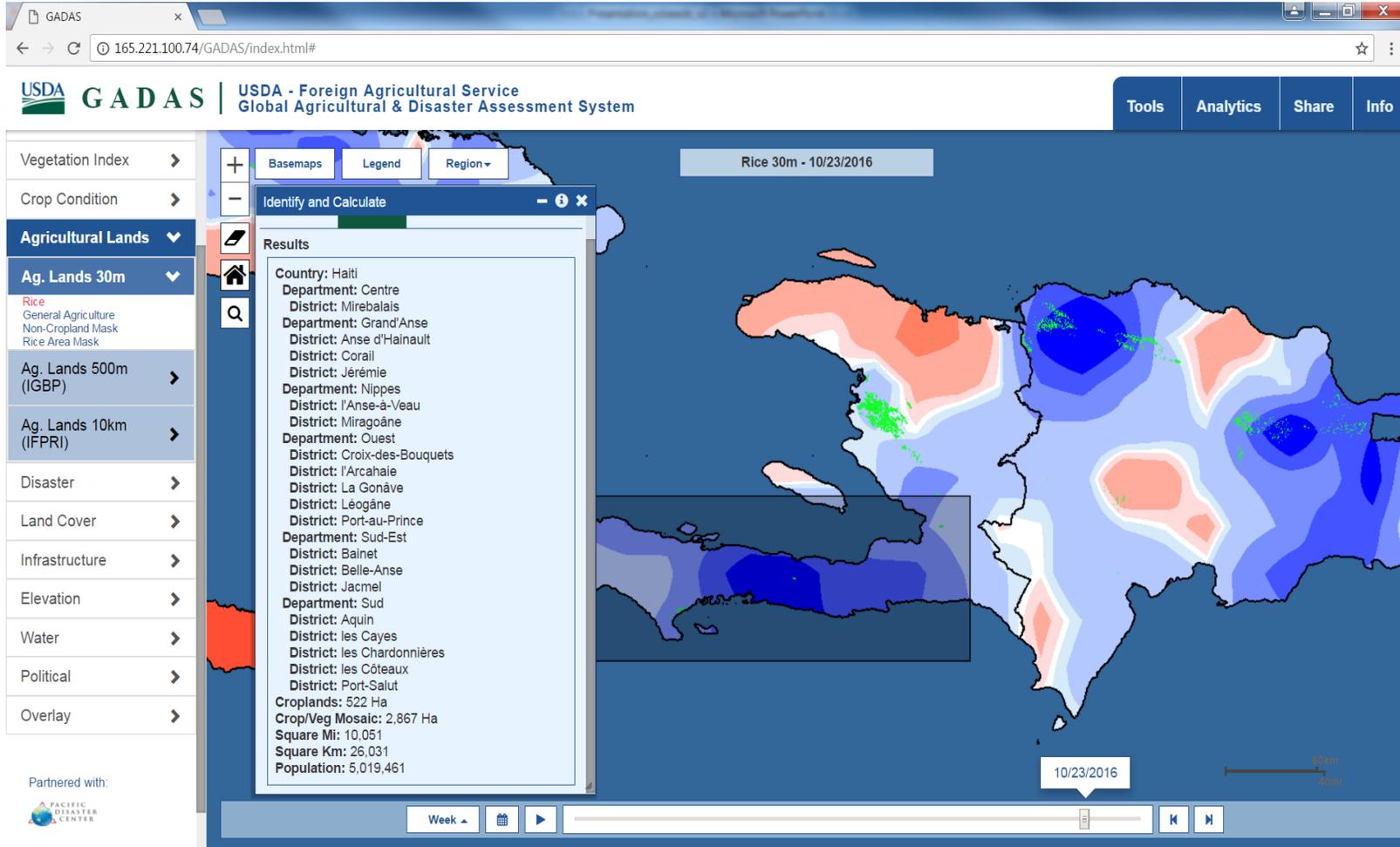
GADAS Tool: Identify and Calculate

Data Source:

- Population (Landscan 2012)
- Croplands IGBP/MODIS at 500m
- Alternative sources are:
IFPRI at 10 km or
NGA/VISNAV at 30 m

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To drill down on how many hectares of cropland were impacted by excessive rainfall, use the agriculture area affected tool. This provides an estimate of hectares by category of precipitation.

GADAS Tool: Ag Area Affected

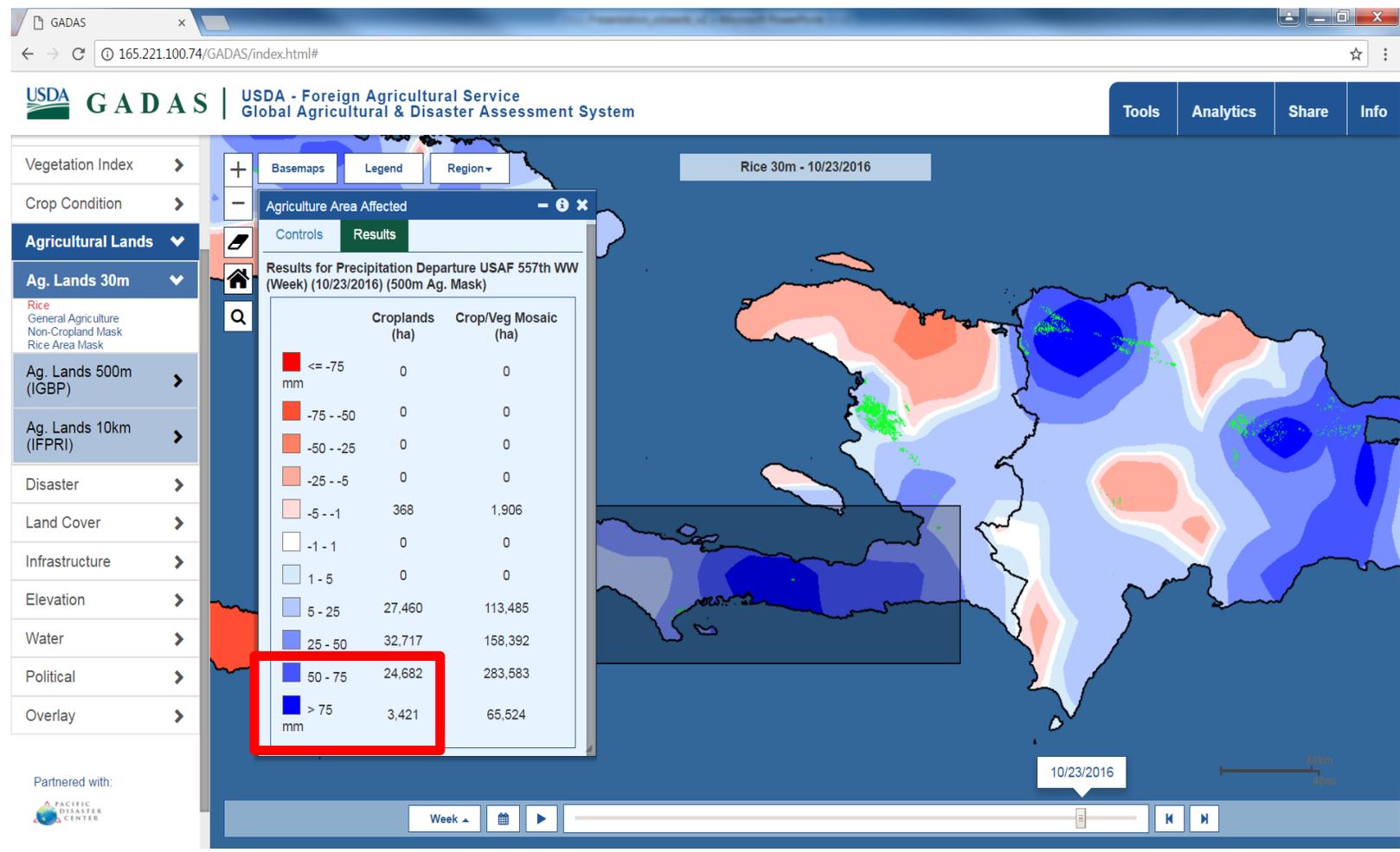
Data Source:

- Croplands IGBP/MODIS at 500m
- Precipitation departure from normal USAF 557th Weather Wing

~28,103 hectares of cropland with >50 mm of rain.

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GADAS—new technology

“Soft release” June 2018 using USDA’s NITC infrastructure

Hybrid Cloud (AWS + NITC) in Q1-2019

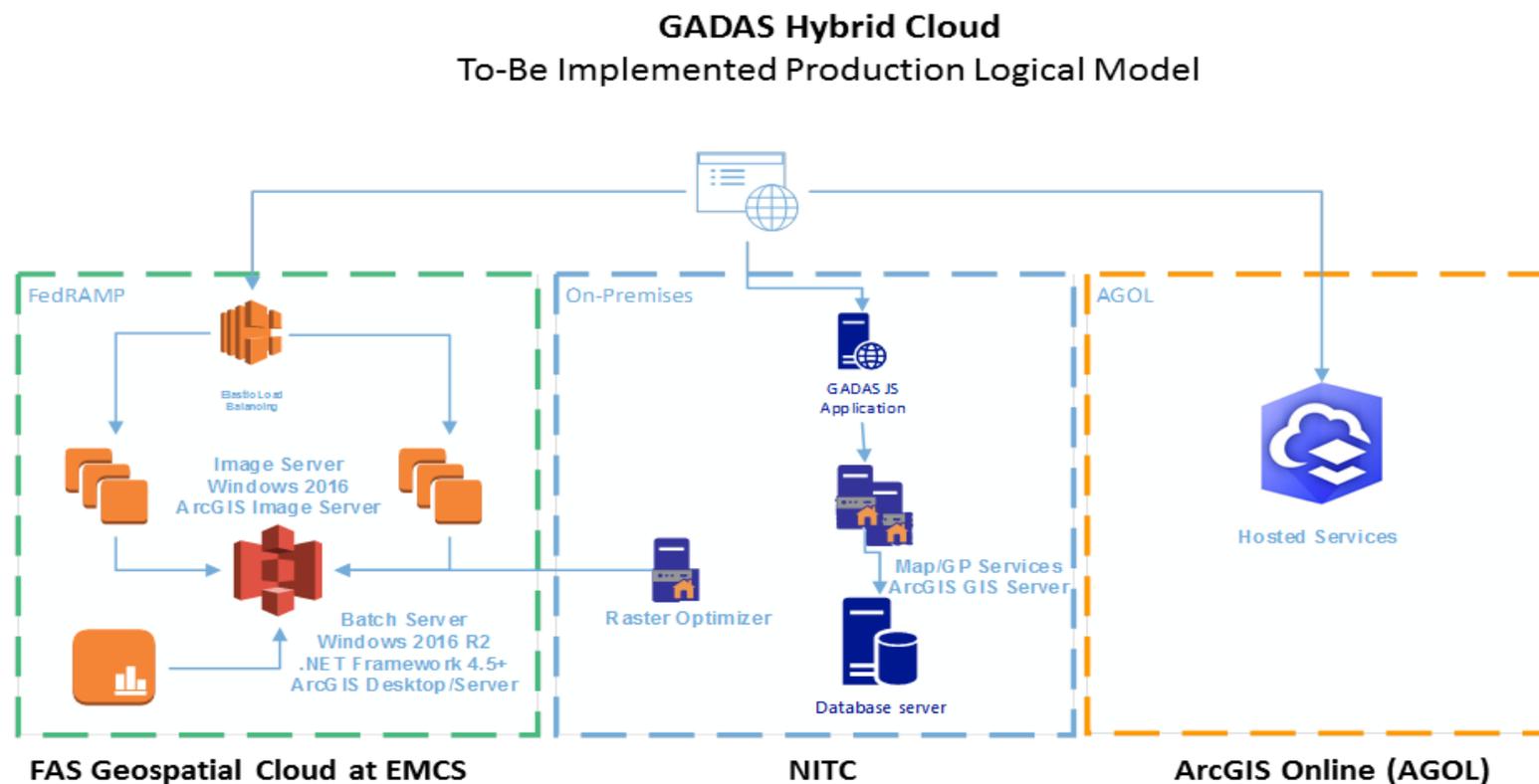
First ArcGIS Server image services in FedRAMP Moderate environment.

First time an extract, transform, load (ETL) process initiated from a federal data center into the AWS cloud.

Esri built a scanning process for the volume of data that GADAS produces and then pushes into Esri’s FedRAMP boundary.

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Source: GADAS EMCS Design Report V1.0 FINAL

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USDA **GADAS** | USDA - Foreign Agricultural Service
Global Agricultural & Disaster Assessment System

Tools Analytics Share Info

Data Layers

Search for...

- Weather
- Vegetation Index
- Crop Condition
- Agricultural Lands
- Disaster
- Land Cover
- Infrastructure
- Elevation
- Water
- Political

Basemaps Legend Region Crop Lands 500m

68.202N, 9.141W

3000km
2000mi

Thank You

Data