



Geospatial Tools for Field Data Collection for Agricultural Advisors deployed to Afghanistan

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Who is the customer and what is the challenge?



Feedback Loop: Crisis relief and long-term reconstruction and stabilization efforts absolutely need to hear what is going on. They need ground truth.

Current field data collection:

- Field teams: they often describe lines
 - e.g. Drive from town A to town B on road Z
- Crowd sourcing: lots of information but not spatially explicit—points

Desired end state:

- Want trusted data, ideally as polygons
- Field data that is spatially explicit
- Field data that includes notes (text) and photos
- Easy/efficient to acquire and process in a GIS
- Shareable field data across field teams and across organizations

Project Background



- **USDA Agricultural Advisors**

- Started in 2003 (3 ag advisors)
- From 2003 to 2011, 200 USDA agricultural advisors have served in Afghanistan and Iraq, providing technical assistance for the reconstruction of Afghanistan's agricultural sector at the district, provincial, and ministerial level.
- http://www.fas.usda.gov/country/Afghanistan/FAS%20Afghanistan%20Fact%20Sheet_11.10.10.pdf
- <http://blogs.usda.gov/2011/09/15/secretary-vilsack-honors-usda-employees-for-service-in-iraq-and-afghanistan/#more-35457>

- **National Guard's Agribusiness Development Teams (ADT)**

- Started in 2008, ADT's are mission-specific, combat multiplier organization in the counterinsurgency environment. ADT's provide basic agricultural education and services (conduct stability operations) to support the effectiveness of the Islamic Republic of Afghanistan.

- <http://usacac.army.mil/cac2/call/docs/10-10/ch-3.asp>



Project Goals and Constraints



GOALS

1. View a particular district of Afghanistan
2. Look at agricultural fields
3. Measure area and distances
4. Get coordinates
5. Add polygons
6. Annotate polygons with field notes
7. Share data with Afghanistan agricultural department

CONSTRAINTS

1. No budget for satellite imagery or GIS/remote sensing software
2. Ag advisors/ ADT's may not have GIS/remote sensing expertise; may not have time for training
3. Disconnected, intermittent or limited bandwidth (DIL)
4. Limited travel opportunities (security concerns) and poor roads with few maps
5. They need to collect a lot of ground truth—quickly, efficiently and safely.

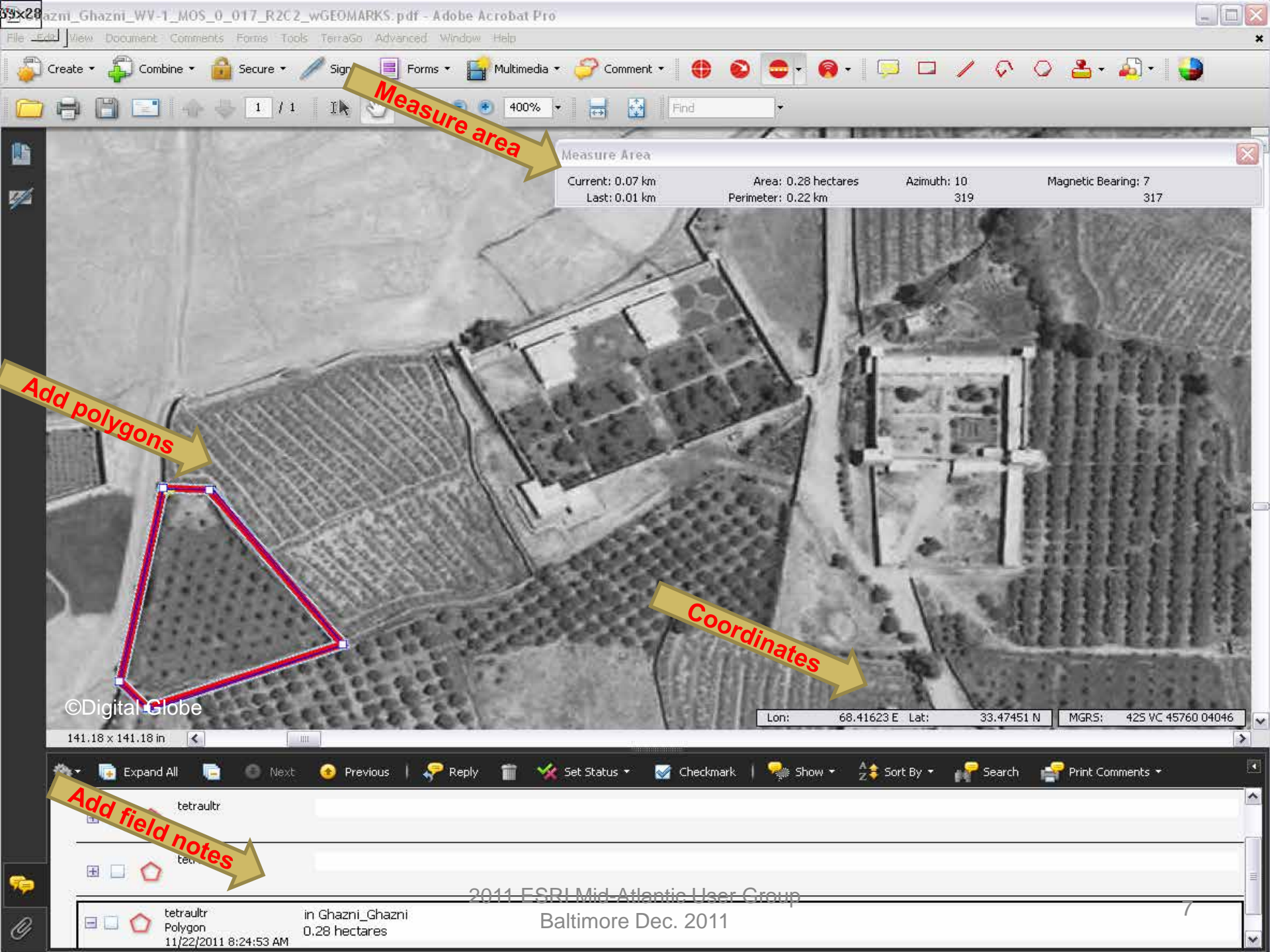
Easy to use format makes field data collection quick and geospatially explicit



The combination of Army Geospatial Center's DataDoors™ and TerraGo's GeoPDF® creates a remote sensing/GIS tool that helps USDA agricultural advisors and others to do basic field tasks for project planning.

- National Geospatial Intelligence Agency (NGA) has made the satellite imagery data available through its EnhancedView contract to US government personnel.
- Army Geospatial Center—Imagery Office has made access to NGA's data easy and in a format suitable for field use through its DataDoors™ website.
 - Restricted to DoD personnel with case-by-case approval for account requests external to DoD





Getting Started with GeoPDF®



- The GeoPDF® format allows users to do basic geographic information system (GIS) tasks without needing specialized GIS or remote sensing software.
- Tasks include:
 - Ø Viewing satellite images of a particular district in Afghanistan
 - Ø Looking at agricultural fields (zoom and pan)
 - Ø Measuring area and distance
 - Ø Finding coordinates (in latitude/longitude and Military Grid Reference System-MGRS);
 - Ø Adding polygons which can be annotated with field notes and photos. Field notes and photos are geospatially explicit, saved with pdf, and can be communicated back to headquarters.
- **First, make sure you have: Adobe Acrobat and TerraGo Toolbar**

Access to Satellite Imagery



USDA Foreign Agricultural Service works closely with Army Geospatial Center Imagery Office (AGC-IO) and uses web client application called AGC DataDoors web.

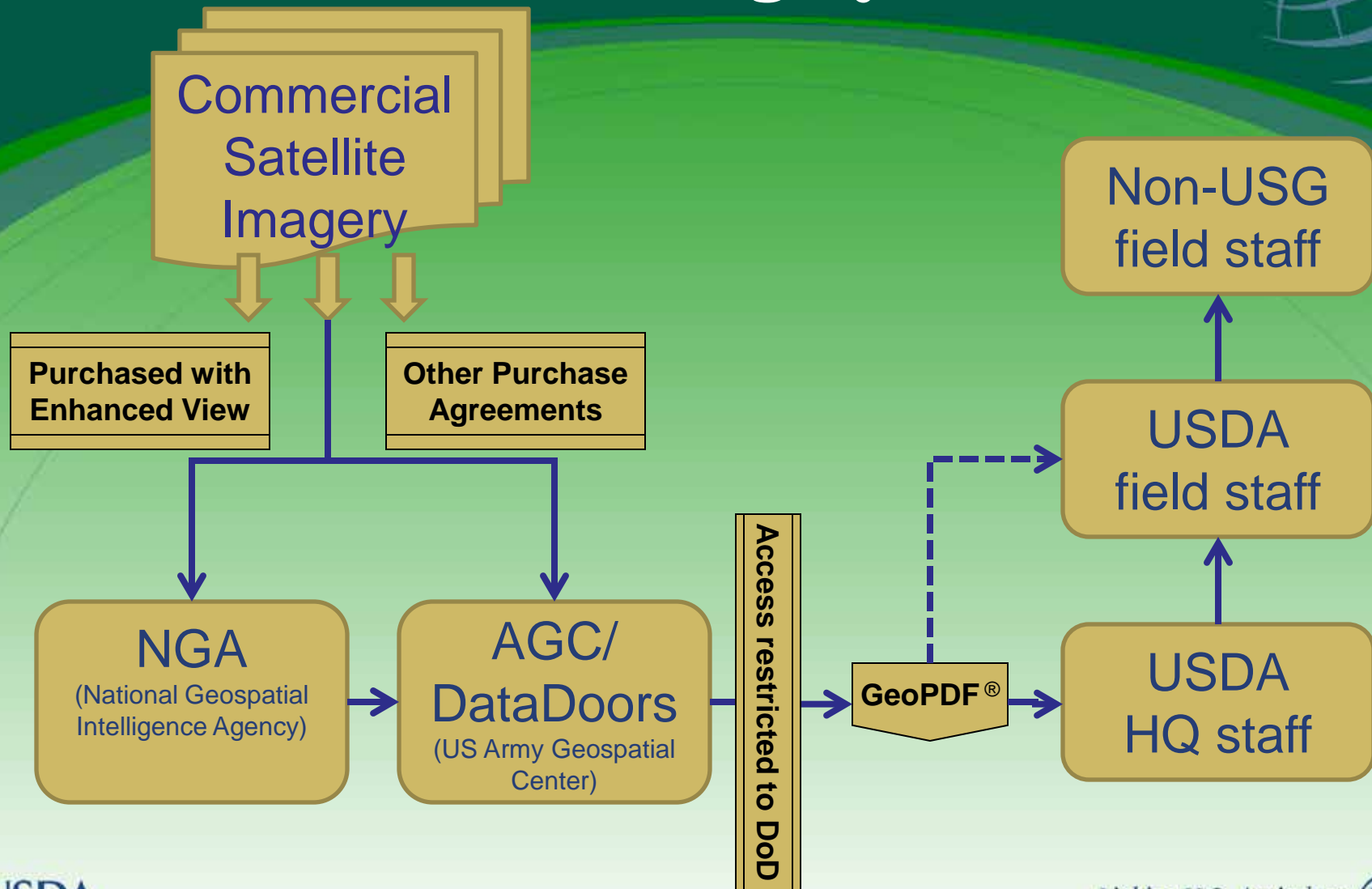
- DataDoors™ is a product of i-Cubed, a GIS solutions company under contract with the AGC-IO.

Satellite Imagery is:

- Purchased by National Geospatial Intelligence Agency (NGA) using EnhancedView contract.
- High resolution (0.5 to 2.5 meter), Commercial, Unclassified, NextView licensed
- Army Geospatial Center acquires imagery through other purchase agreements (e.g. SPOT orthomosaics)
- Product format is a GeoPDF®



Access Schema: Delivery System of High Resolution Satellite Imagery for Field Use



Navigating in DataDoors™



Area of Interest (AOI) Tools



1. Choose AOI by uploading ESRI shapefile.
2. Choose collection and imagery source.
3. Choose process “Clip, Zip & Ship”
4. Choose product format GeoPDF®
5. Data available via ftp or https



License Issues and other very important caveats

Access to Army Geospatial Center/DataDoors™

- Restricted to DoD personnel with case by case approval for account requests external to DoD.
- Data on web client application is to support the warfighter
 - Foreign Policy objectives of the US government
- USG may provide imagery when collaborating on an official purpose

License and Copyright

- Imagery purchased using the EnhancedView contract and is NextView licensed
- It shall contain the copyright markings



Licensing and Copyright



NextView License

U.S. Government including, all branches, departments, agencies, and offices

Temporary Licensed Users :

State Governments

Local Governments

Foreign Governments and inter-governmental organizations

NGO's and other non-profit organizations

All high-resolution commercial satellite imagery purchased by National Geospatial Intelligence Agency is NextView Licensed.

U.S. Government may **provide the imagery to the above organizations when collaborating on an **official purpose****

License Issues and other very important caveats



Satellite imagery in the GeoPDF[®] format can be shared with host governments and other non-USG personnel, including NGO's because the GeoPDF[®] format is an **imagery-derived product** (cannot be reverse engineered) and it **minimizes the effects on commercial sales.**

From the NextView license:

- “***Imagery-derived products*** and imagery support data licensed under this NGA contract have no restrictions on use and distribution, but shall contain the copyright markings.”
- “In consideration for the flexibility afforded to the U.S. Government by allowing unprocessed sensor data and requirements-compliant processed imagery, imagery services, imagery-derived products and imagery support data to be shared, the United States Government shall use its ***reasonable best efforts to minimize the effects on commercial sales.*** Acquisition and dissemination of imagery and imagery products collected within the United States shall be restricted in accordance with law and regulation.”

Hardware/Software/Data (minimal)



In field:

- Adobe Acrobat, TerraGo Toolbar
- Laptop/netbook
- Satellite imagery in GeoPDF® format

At headquarters:

- Internet (access to AGC/DataDoors™ web client application)
- ESRI ArcMap 10X
- Adobe Acrobat, TerraGo Toolbar
- Satellite Imagery: High resolution (0.5 to 2.5 meter), commercial, unclassified, NextView licensed

Summary

Army Geospatial Center/DataDoors™ web client application is an easy to use way to get high resolution, commercial, unclassified, NextView licensed, satellite imagery in a GeoPDF® format.

- This is a specific purpose and does not cover all the potential uses of the AGC/DataDoors™ web client application.

Fieldworkers in low-to-none bandwidth (DIL) environments can use GeoPDF® to collect field data quickly and efficiently. Field data is geospatially explicit.

- Satellite imagery in GeoPDF® format is shareable with non-USG personnel, and it is an imagery-derived product (which cannot be reverse engineered into the original imagery).



Thank you



- I would like to acknowledge those who supported this project.
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