

Integrating AWiFS and Quickbird Data in Iraq

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Foreign Agricultural Service (FAS)
Office of Global Analysis (OGA)
***International Production Assessment Division
(IPAD)***

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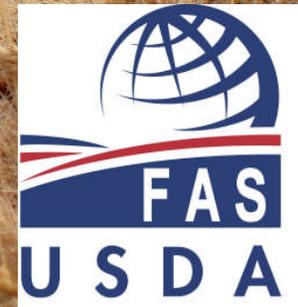


Photo by Dr. Curt Reynolds

Iraq Operational Agricultural Monitoring Project

Objective:

Develop a rapid response framework for generating crop condition information at the national and regional level. Program efforts and image acquisition are supported by the National Geospatial Intelligence Agency (NGA) with an understanding to create timely, accurate, and analytical agro-centric products that can be implemented in the current environment and extended to similar regions around the world.



Iraq Operational Agricultural Monitoring Project

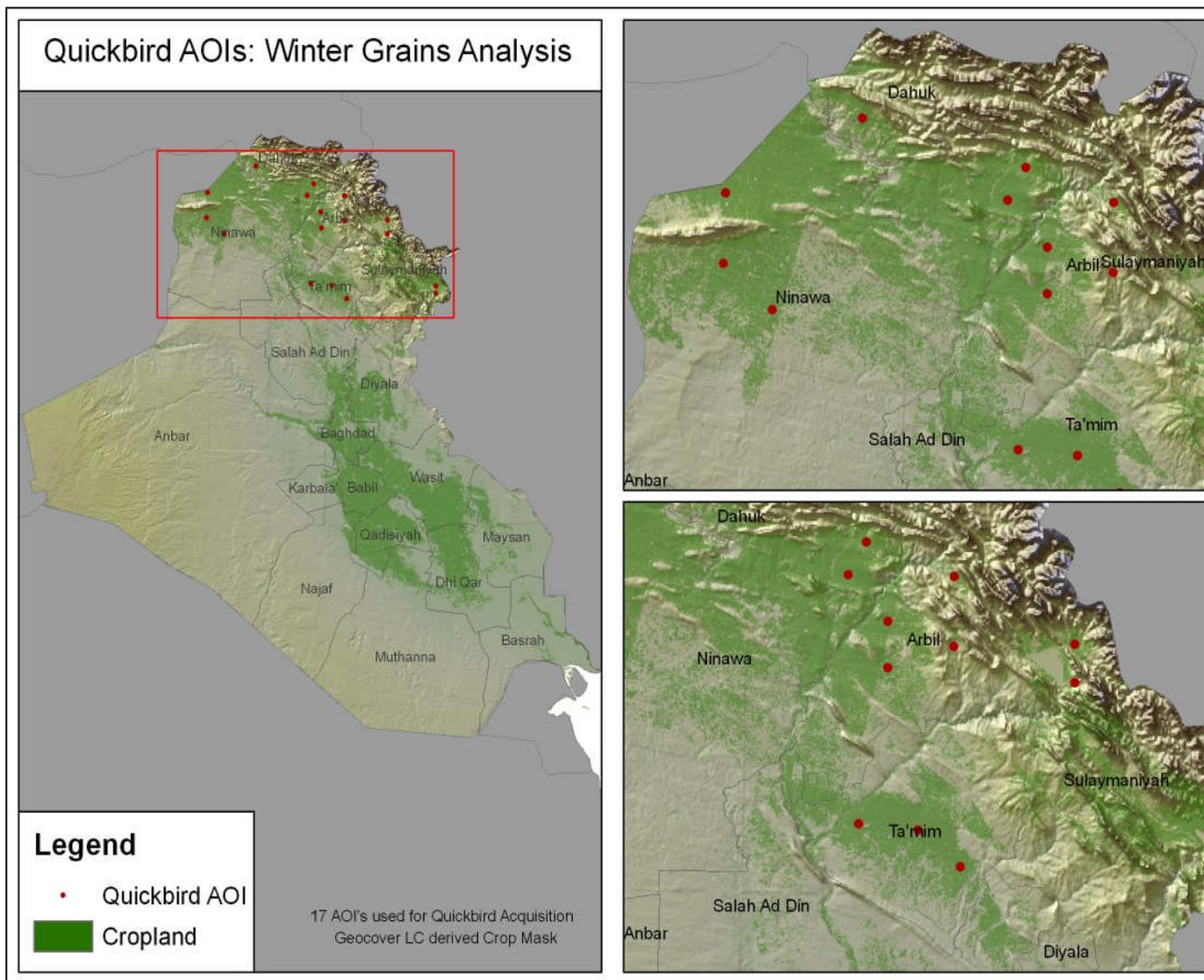
Problems:

- Validate host country agricultural production statistics
- Baseline data limited to nonexistent
- Hazardous environment for ground truth data collection

Solution:

- Multiple resolution data integration (AWiFS and Quickbird)
- High resolution image-based ground truthing
- Contextual information to validate AWiFS analysis products
- Quickbird derived training data used for AWiFS classification

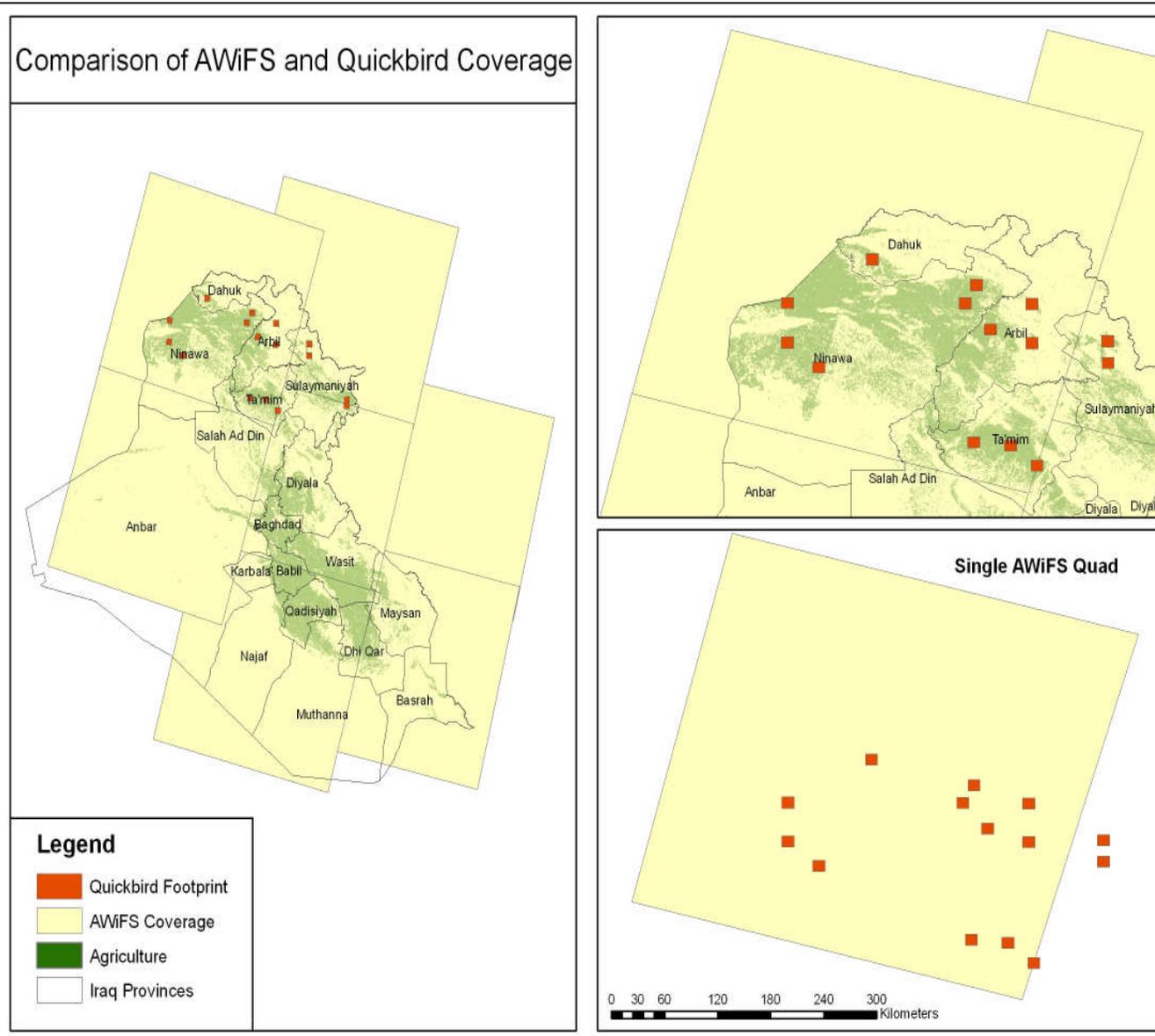
Digital Globe Quickbird Imagery: Image-based Ground Truth



Areas of Interest

- **17** AOIs represent Quickbird image acquisition
- **4** Collects per AOI throughout the season
- AOIs based upon Geocover LC crop layer
- AOIs distributed throughout winter grains region

Comparison of AWiFS and Quickbird Coverage



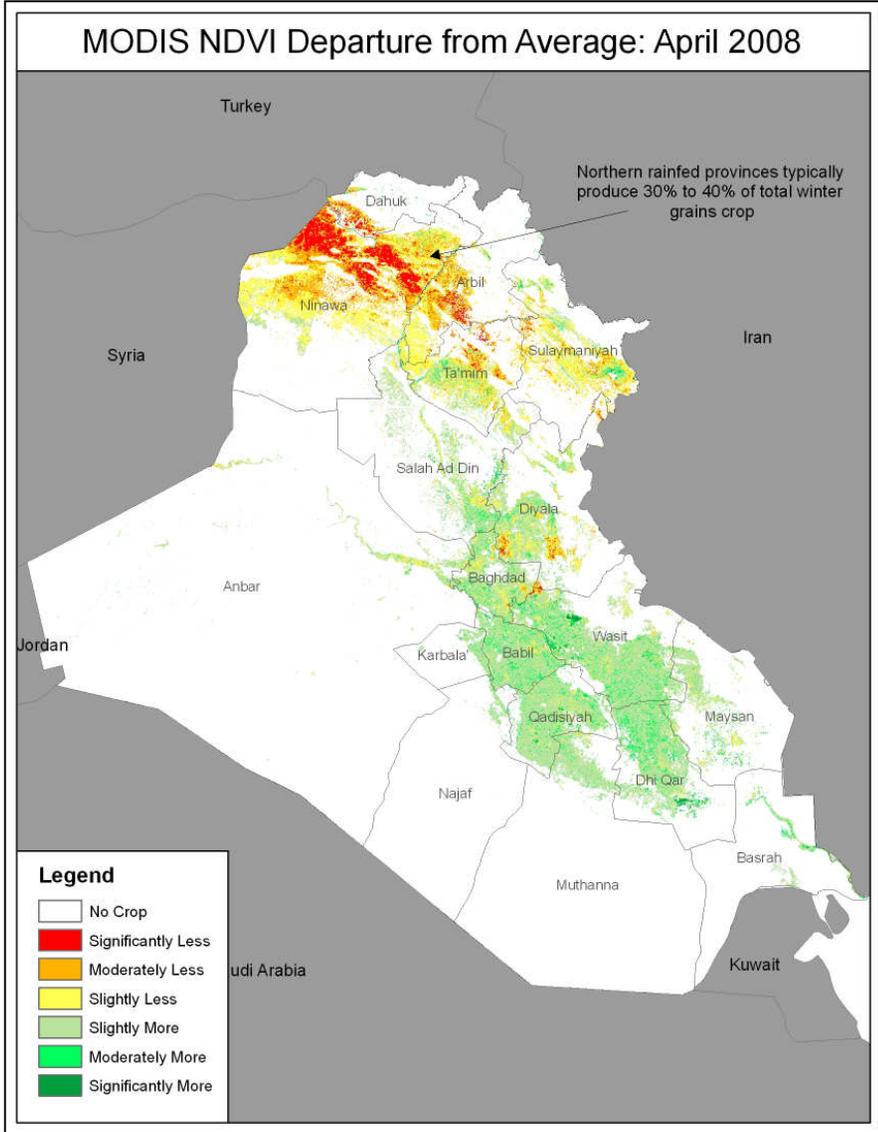
Temporal Coverage

- **AWiFS** 6 – 24 day Repeat Coverage
- **Quickbird** 4 collects per AOI during season

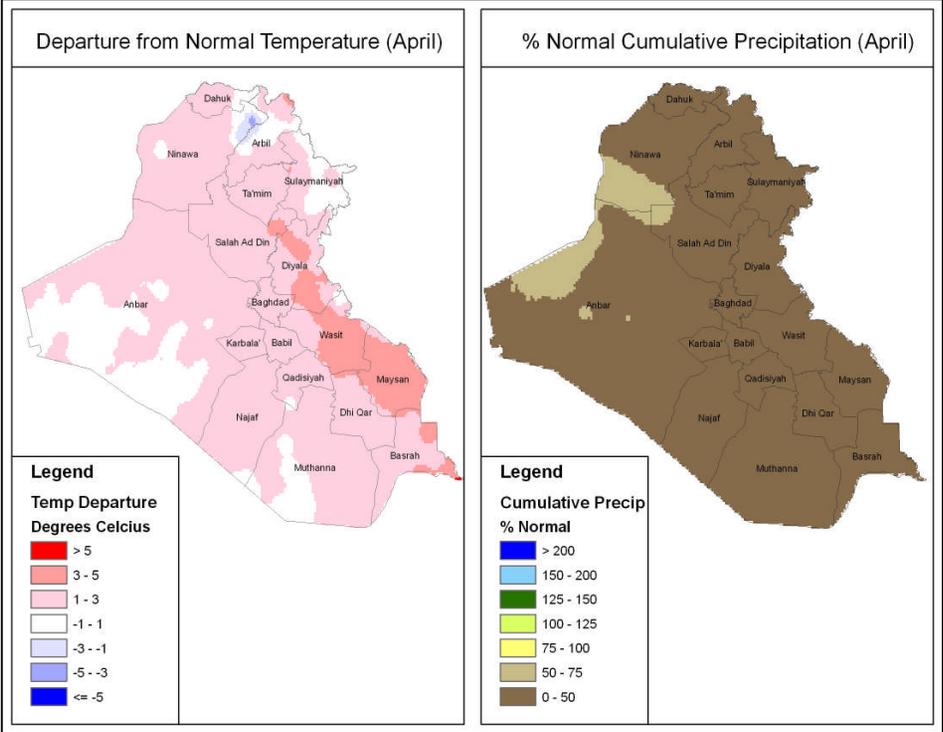
Spatial Coverage

- **AWiFS** 350 km swath width with 56-m resolution
- **Quickbird** 13 km swath width with 2.44-m resolution.

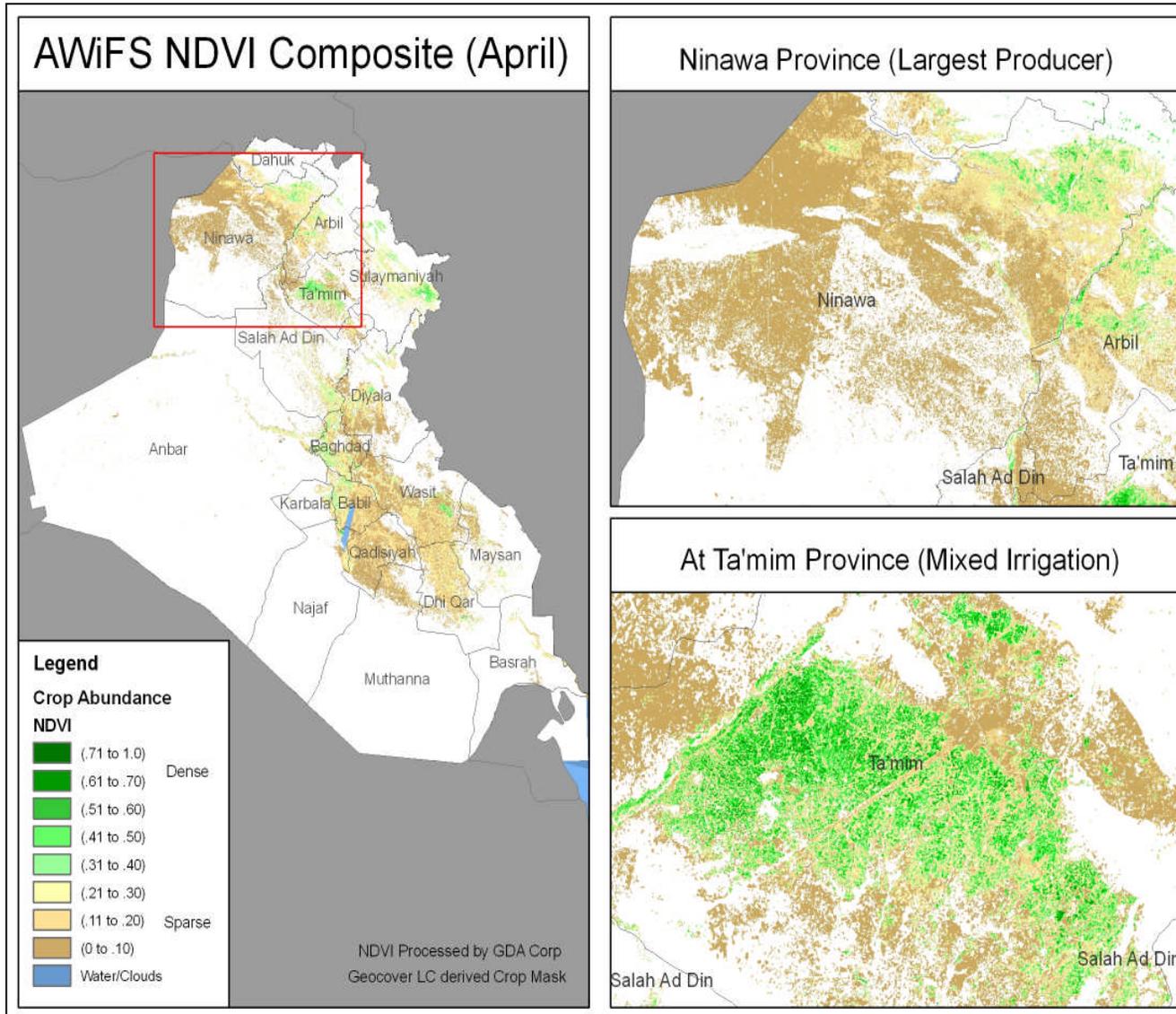
Data Sources Applied to Regional Scale Analysis



Coarser resolution agrometeorological products indicated that drought conditions were severely affecting crop production in Iraq, but ground information was unavailable to confirm findings at a large scale.



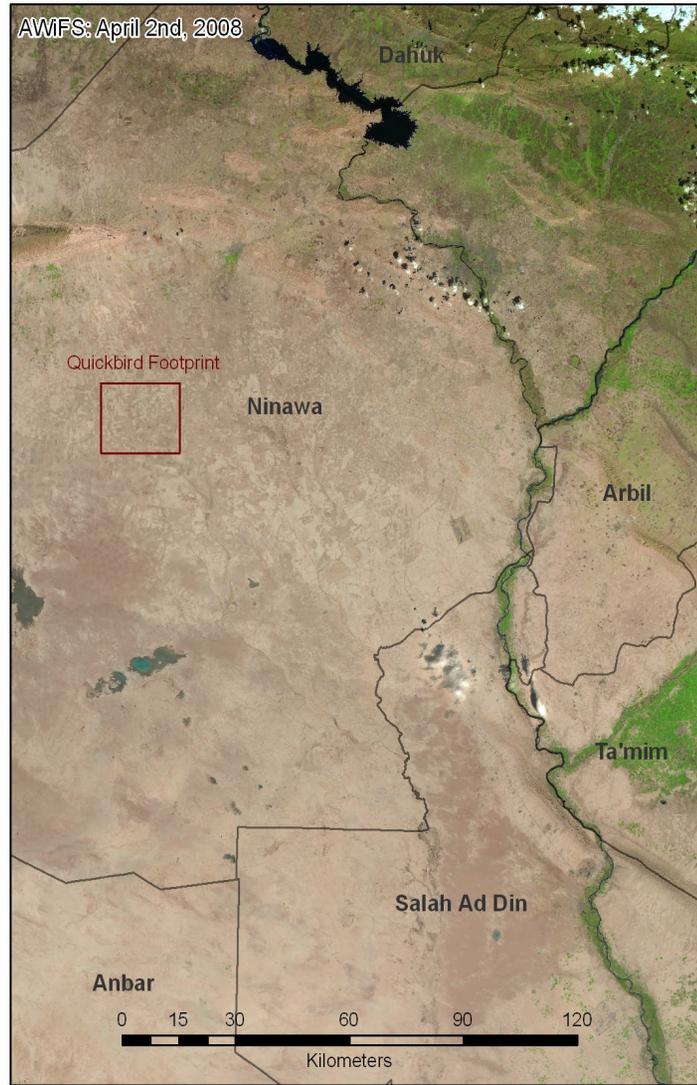
AWiFS NDVI Composite: April Peak Crop Greenup



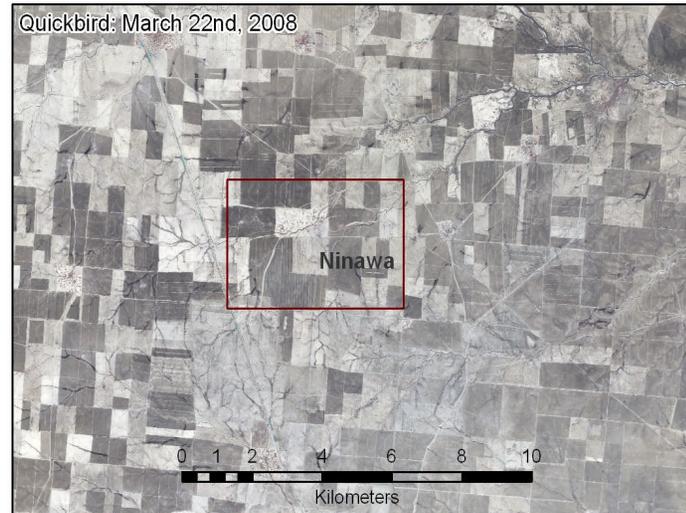
- April NDVI suggested sparse to no crop cover in Ninawa
- Ninawa is largest winter grains producer
- No ground reports were available for verification
- Reports of functioning irrigation, but field verification was not available.

AWiFS SASR Composite: April Peak Crop

Data Integration for Agricultural Monitoring: Ninawa



AWiFS SASR product developed by GDA Corp



Digital Globe Quickbird (False Color Infrared)

Hierarchical Analysis

- AWiFS composite suggested no crop emergence in Ninawa
- Quickbird imagery validates AWiFS composite with no sign of near infrared reflectance.
- NDVI comparison confirms crop failure in most of Ninawa province.

Quickbird Contextual Information: At Ta'mim

Data Integration for Agricultural Monitoring: Regional to Local Scale



AWiFS SASR product developed by GDA Corp

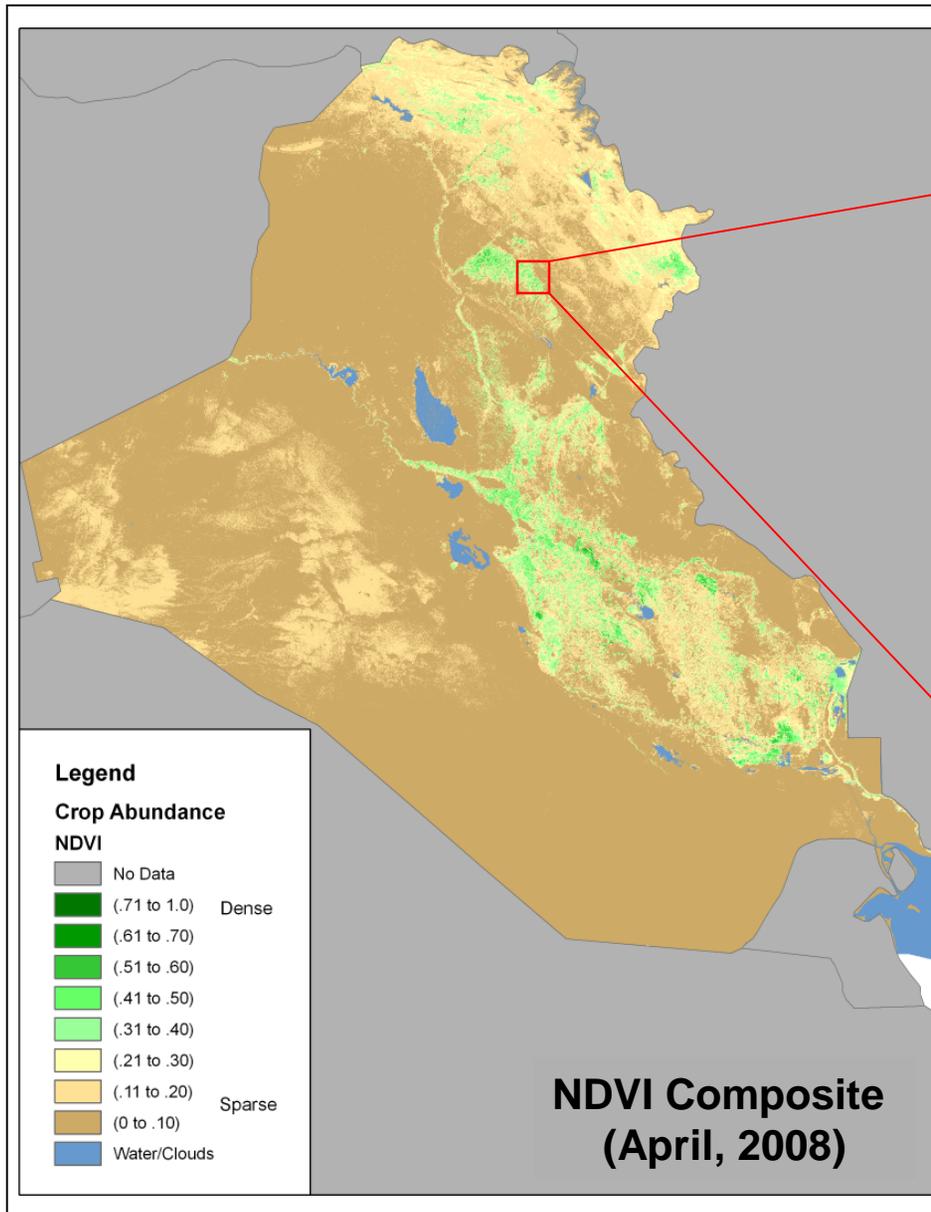


Digital Globe Quickbird (False Natural Color)

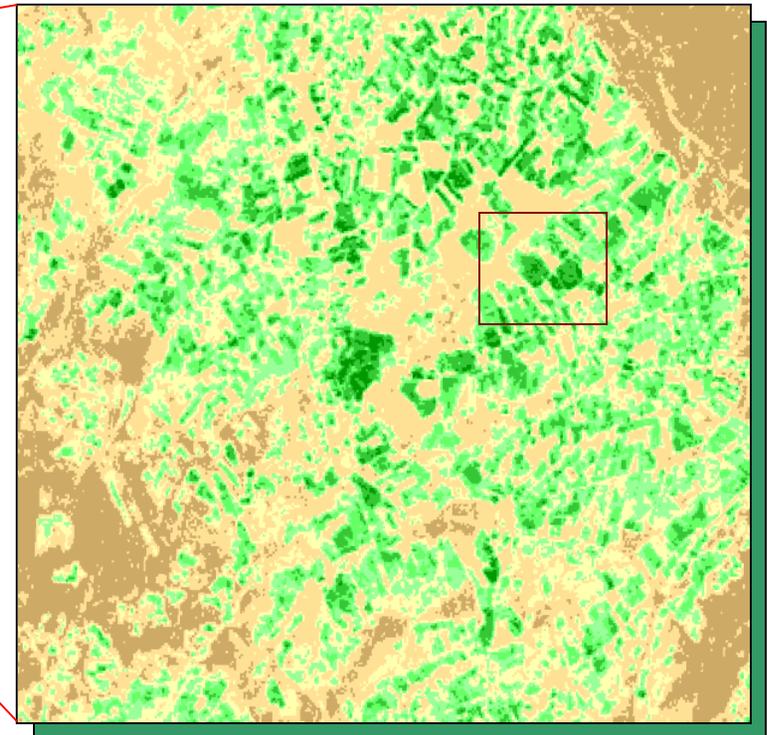
Hierarchical Analysis

- High resolution imagery aided in distinguishing working and fallow fields
- Easily discriminates agricultural vegetation from natural vegetation
- NDVI comparison used to evaluate AWiFS product.

AWiFS NDVI Composite: Salah ad Din (April 2008)

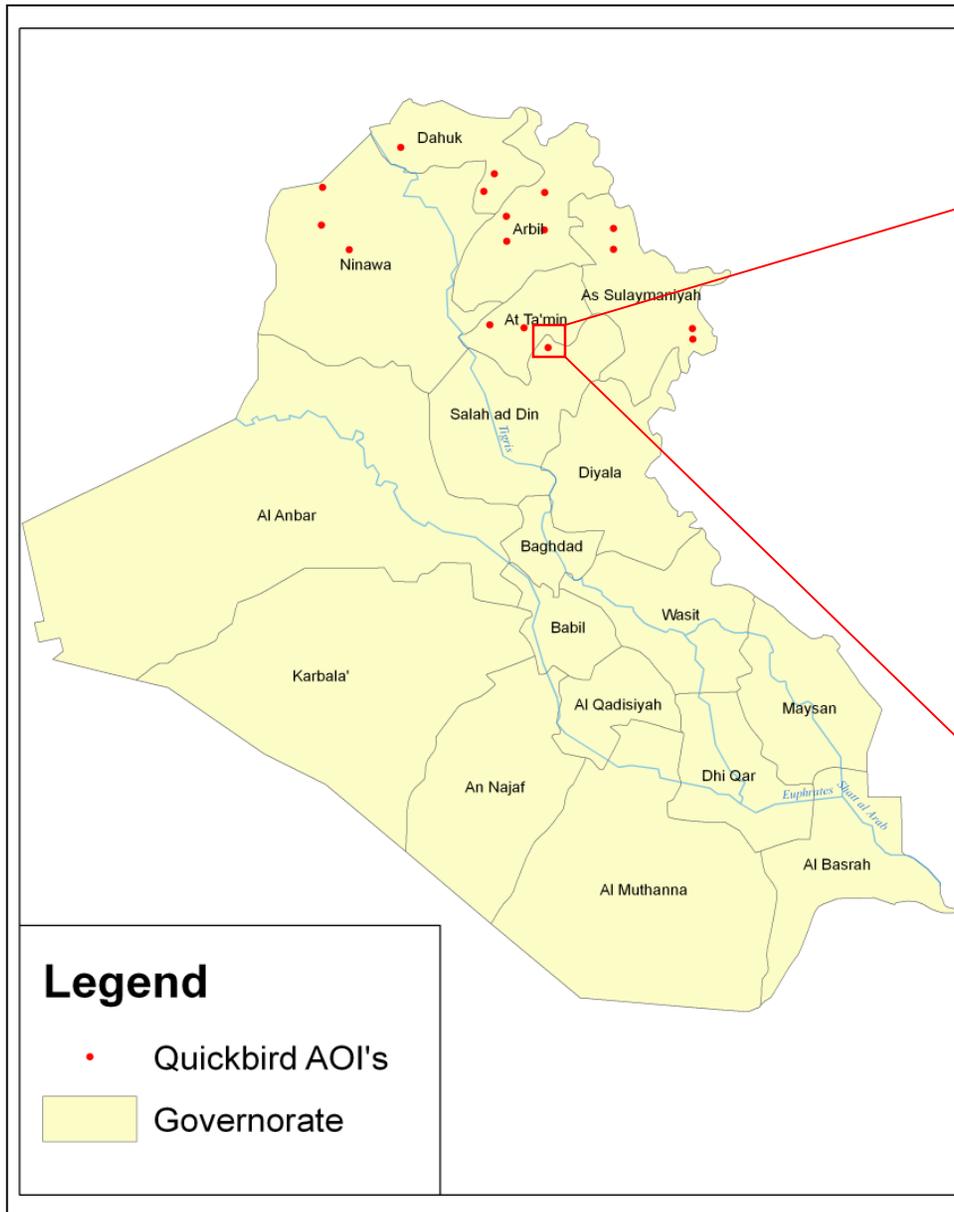


AWiFS IRS P-6 (56-meter)

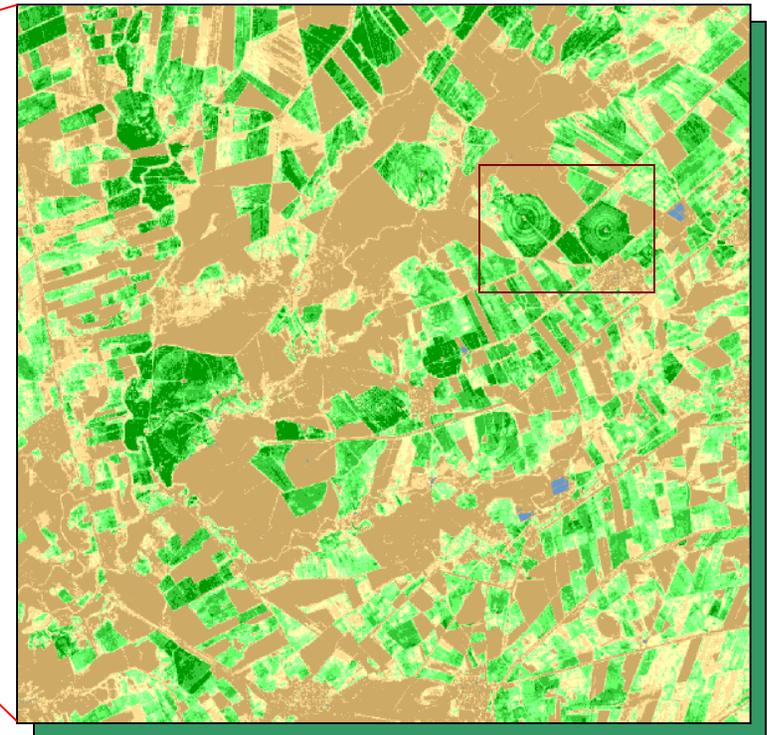


AWiFS NDVI indicated cropland parcels with healthy and abundant vegetation and apparent center pivot irrigation.

Quickbird NDVI Composite: Salah ad Din (April 2008)

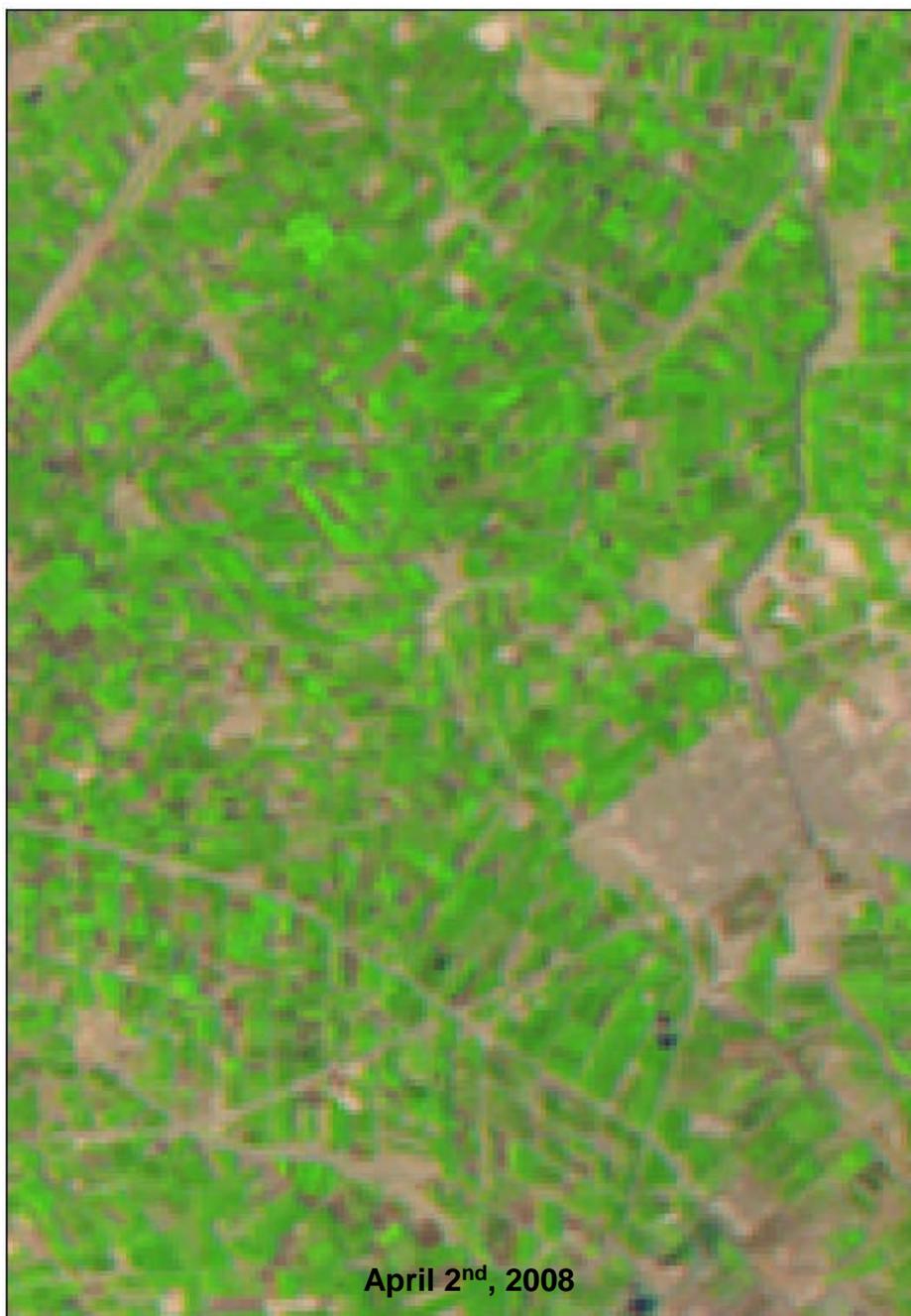


Quickbird (2.4-meter)



Quickbird NDVI confirmed healthy cropland and center pivot irrigation.

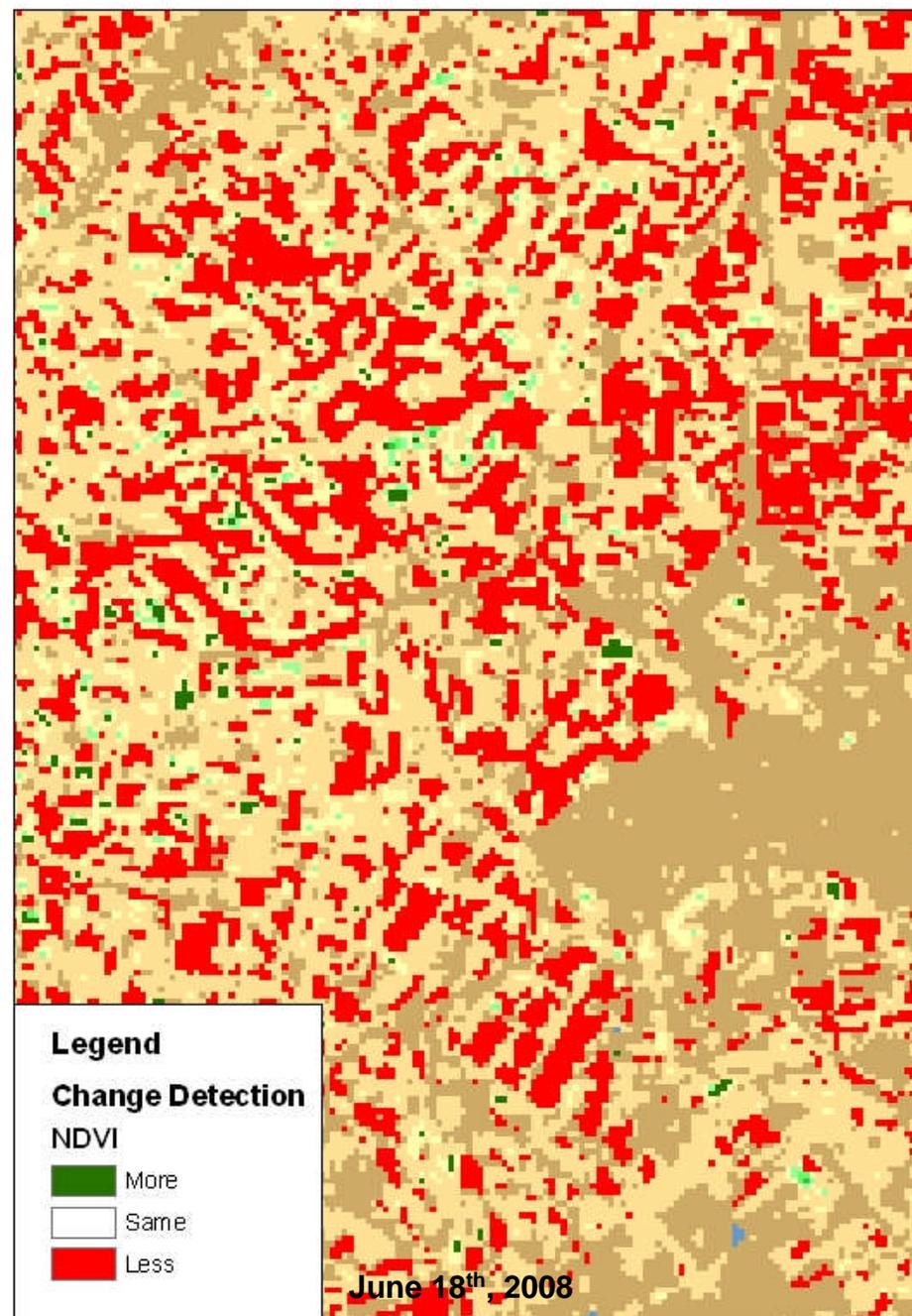
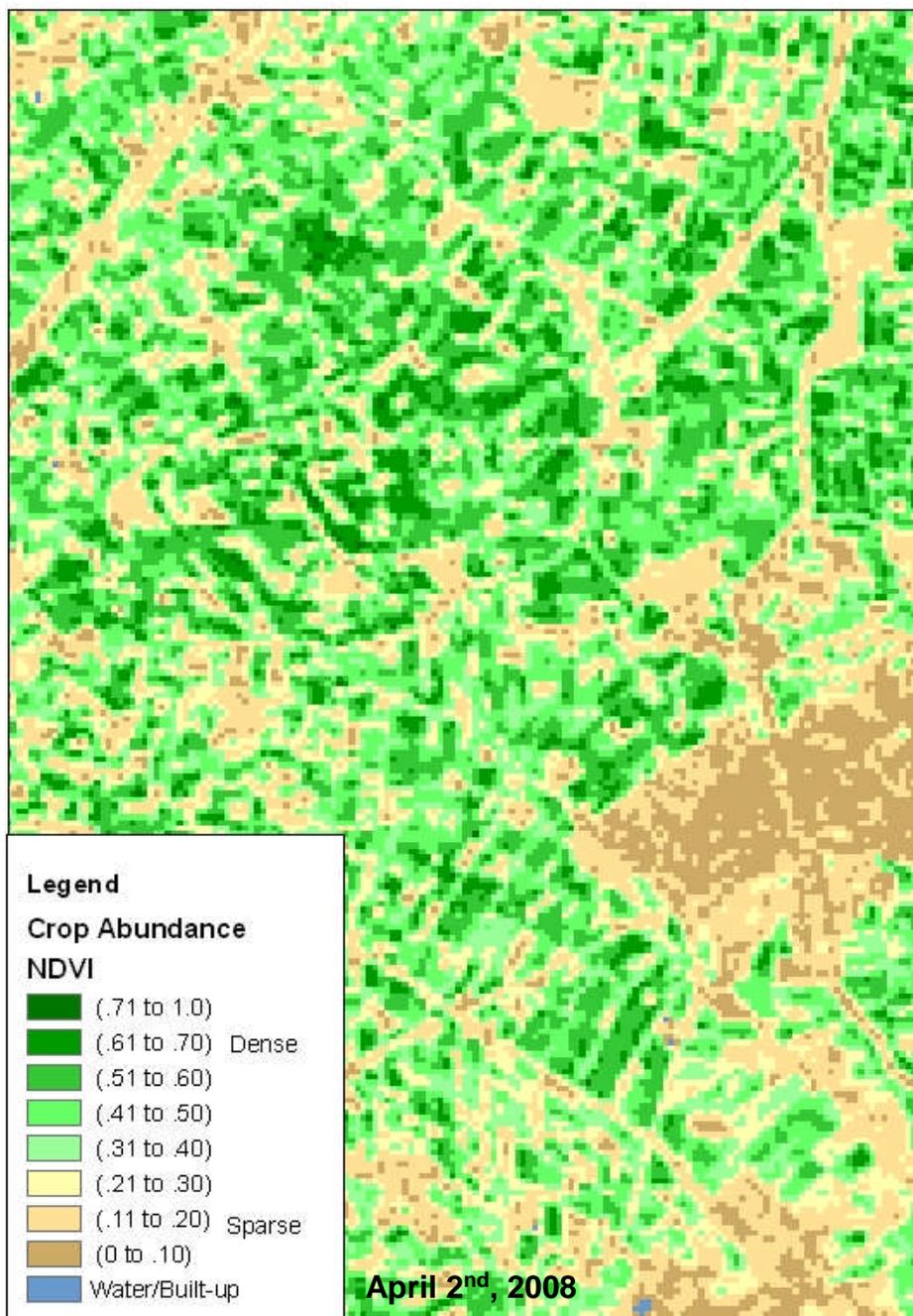
AWiFS Seasonal Comparison: April 2008 to June 2008 (AOI 14 Harvest)



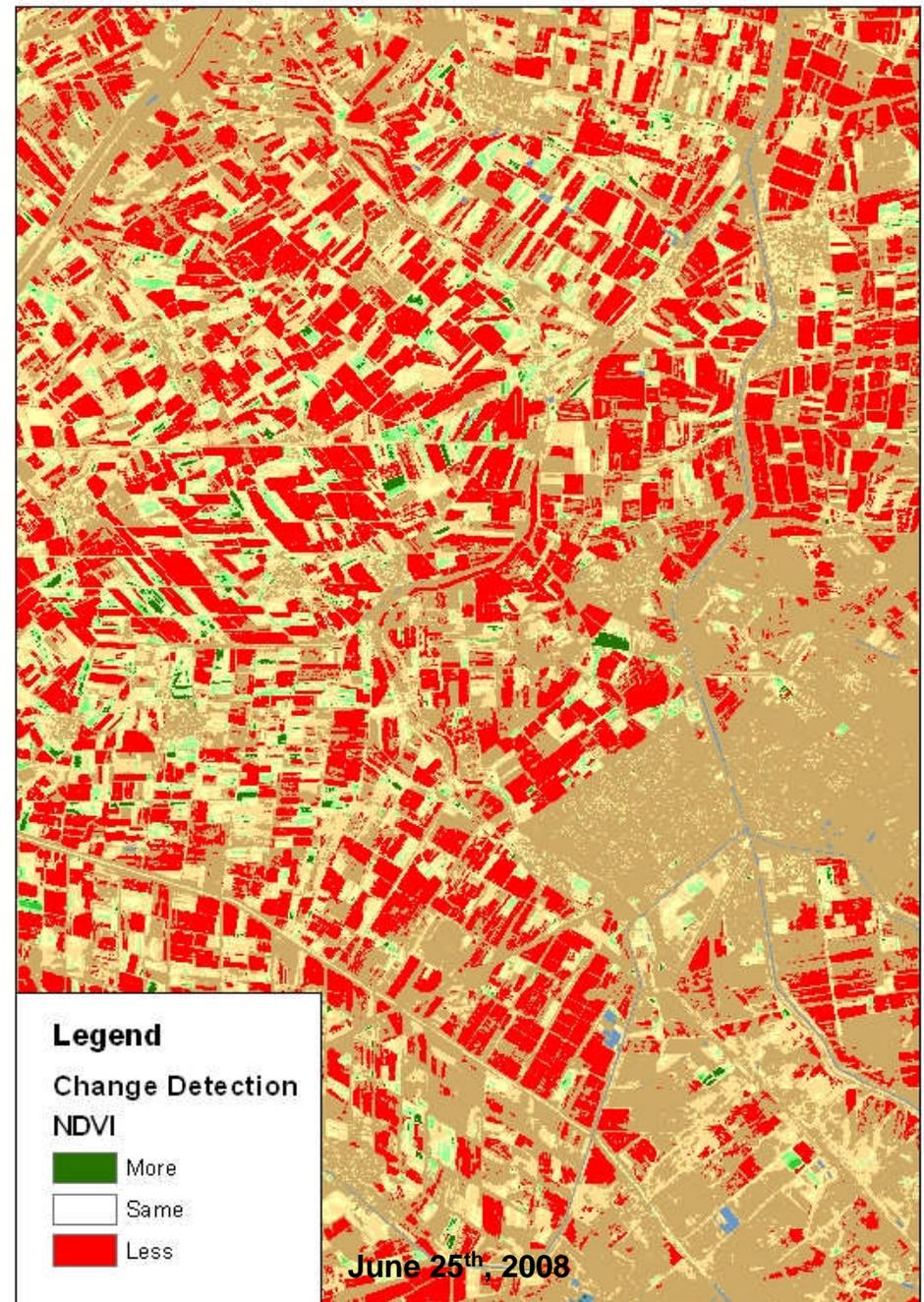
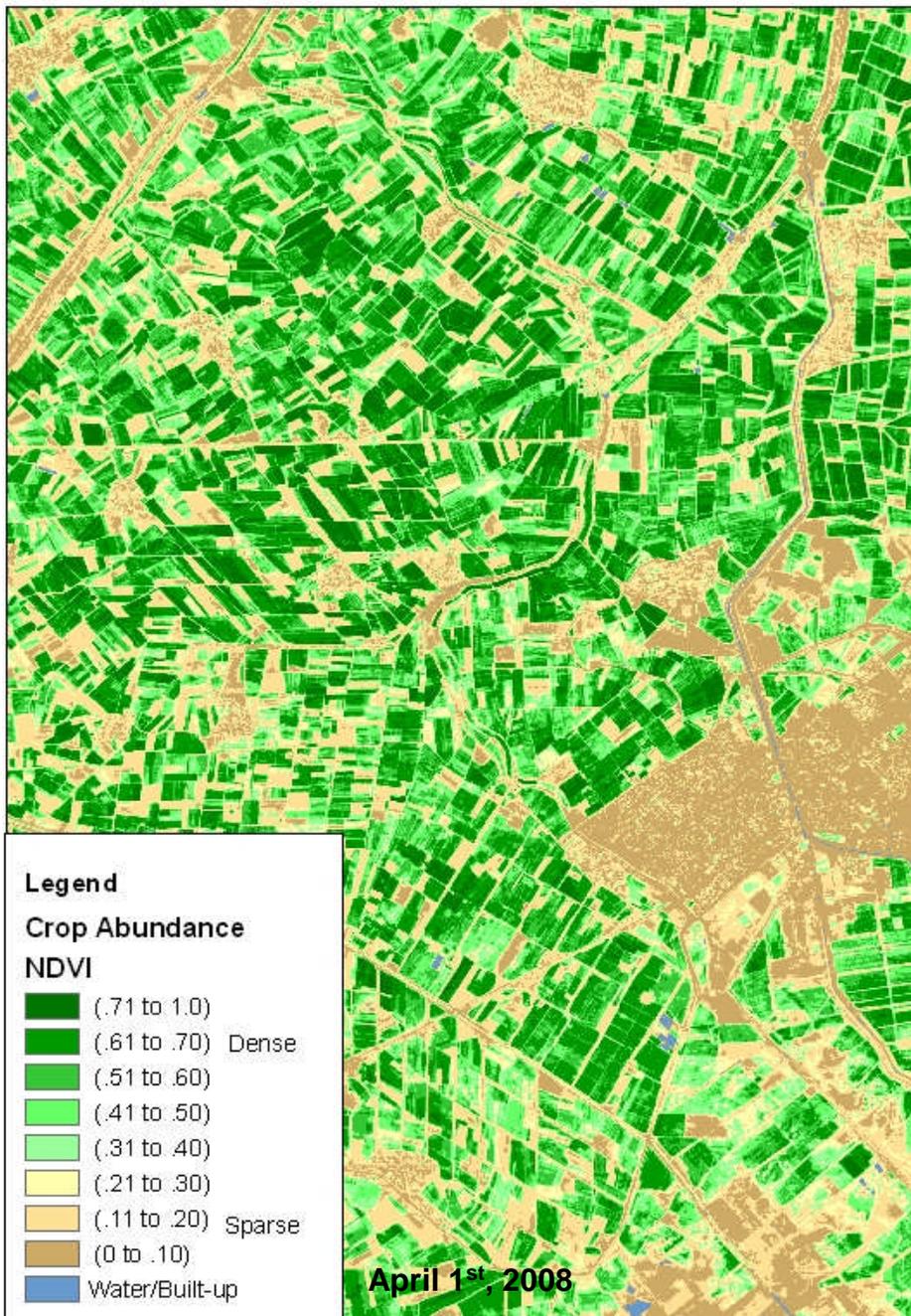
Quickbird Seasonal Comparison: April 2008 to June 2008 (AOI 14 Harvest)



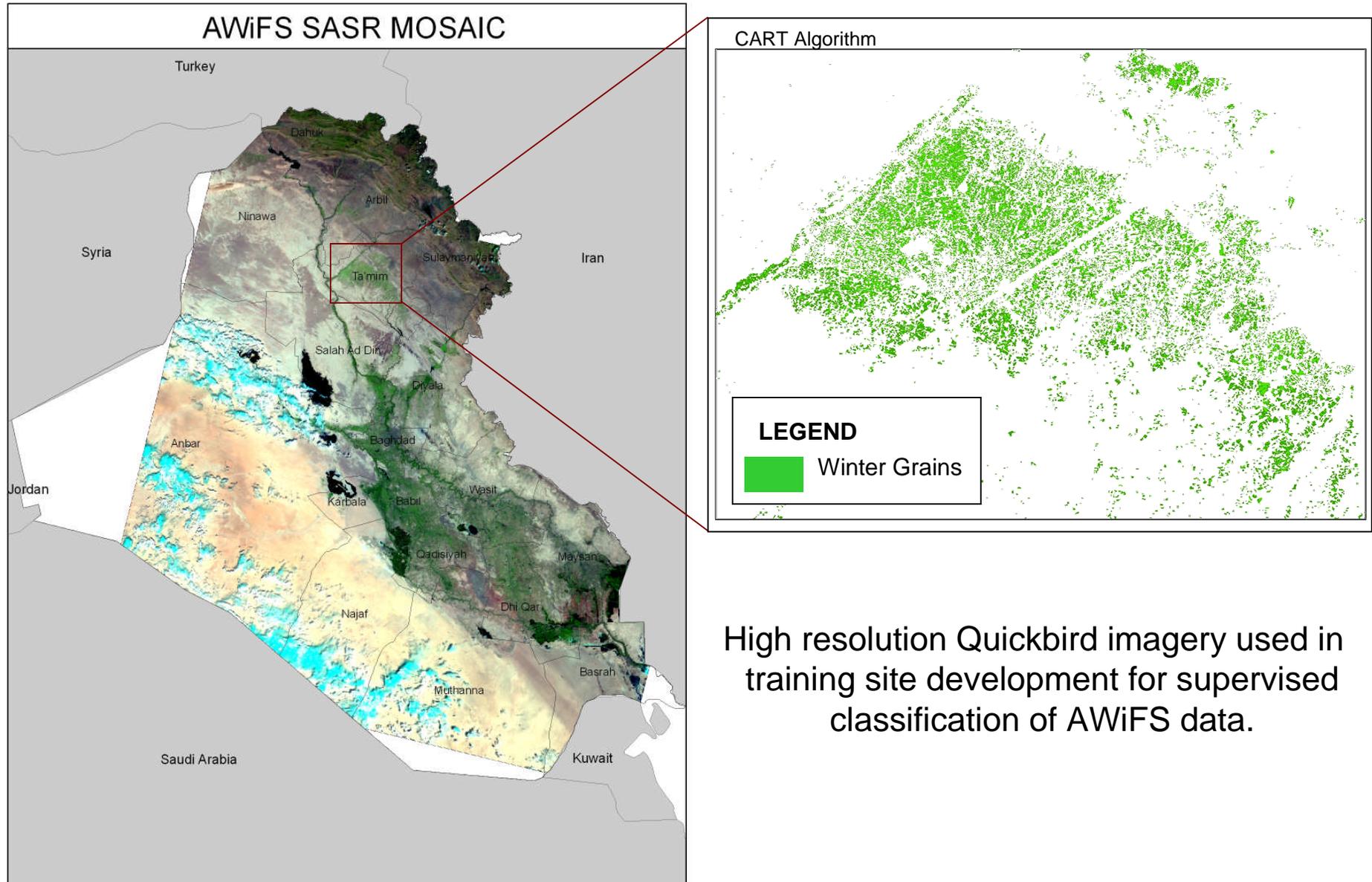
AWiFS Seasonal Comparison: April 2008 to June 2008 (AOI 14 Harvest)



Quickbird Seasonal Comparison: April 2008 to June 2008 (AOI 14 Harvest)



AWiFS Classification: Quickbird-derived Training Data



High resolution Quickbird imagery used in training site development for supervised classification of AWiFS data.

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