



**Science in Support of Economic  
Development and Stabilization in  
Iraq and Afghanistan**

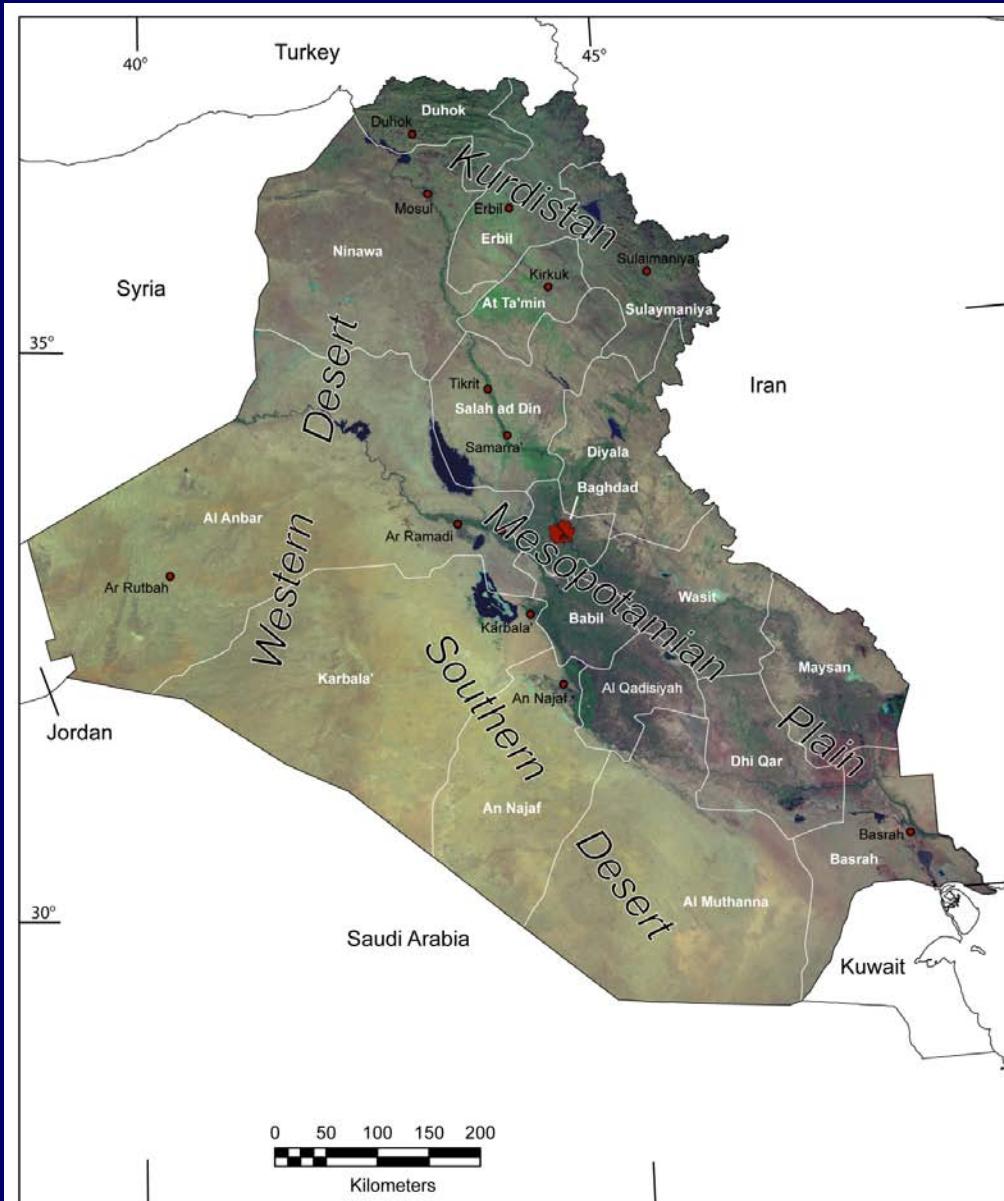
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Reston, Virginia



# USGS Science in Support of Economic Development and Stabilization in Iraq

## Project Background

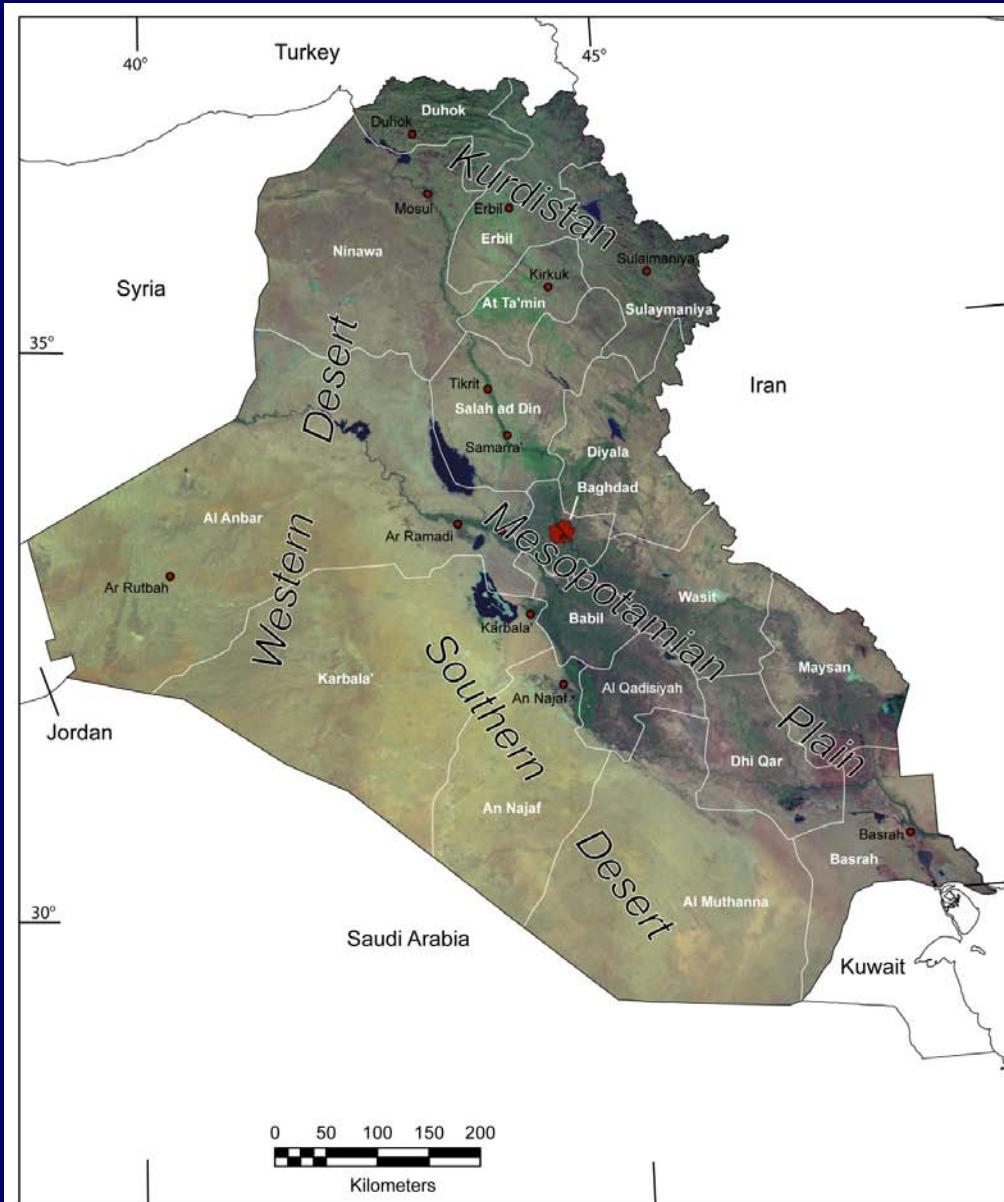
- Conducted under the auspices of the Department of Defense (DoD) Task Force for Business and Stability Operations (TFBSO)
- Scoping Missions April-June 2009
- Project Began in October 2009 as a 2-year project
- Project ended prematurely in September 2010 as DoD funding prioritization shifted to Afghanistan
- Public release of final products through 2011



# USGS Science in Support of Economic Development and Stabilization in Iraq

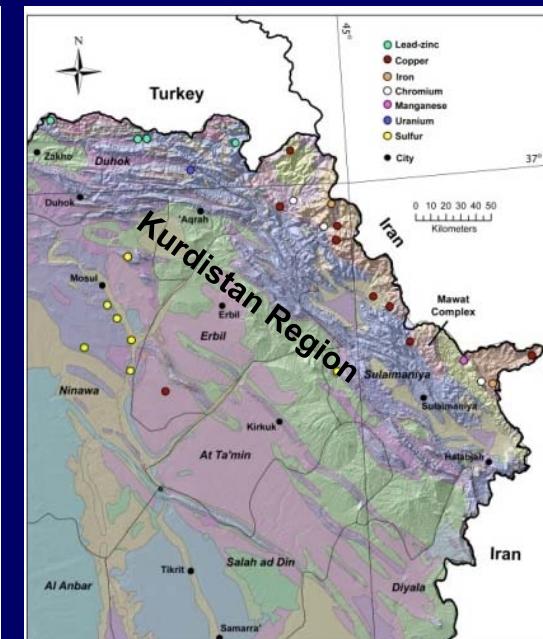
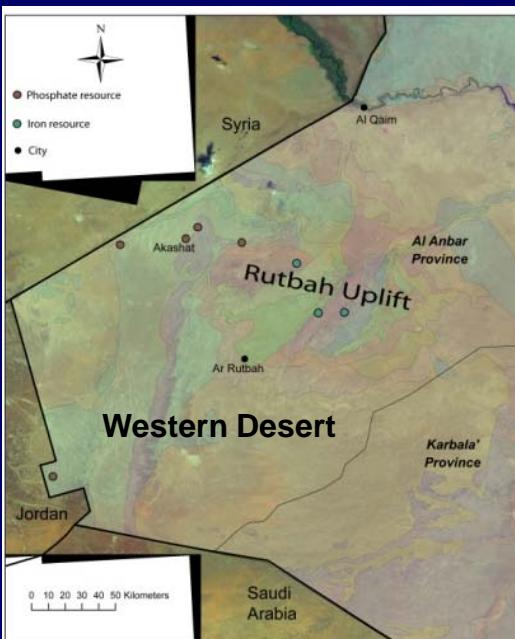
## Focus of USGS Activities

- Nonfuel Mineral Resources
- Water Resources
- Agromet Network
- Iraq National Spatial Data Infrastructure
- Modernization of GEOSURV Central Laboratories

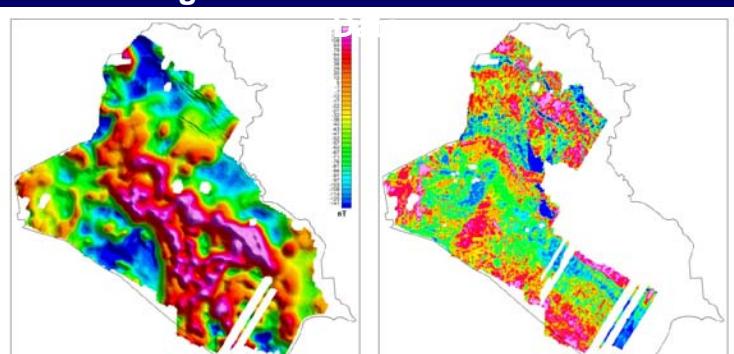


# Nonfuel Mineral Resources – Providing Mineral Resource Information and Technologies to Promote Economic Development in Iraq

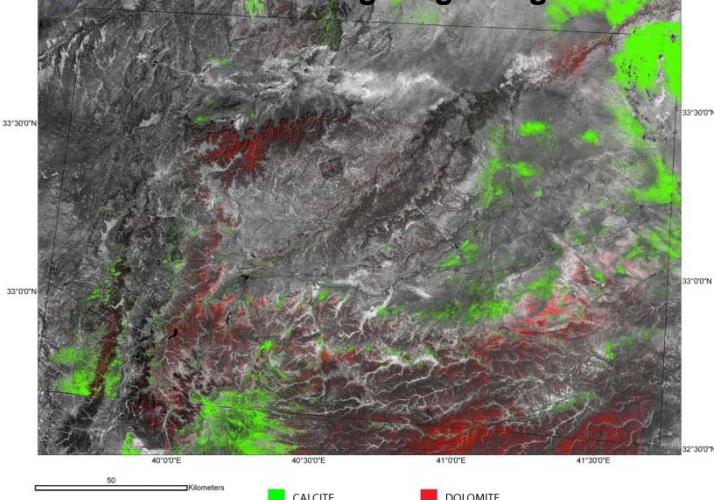
- Updating Geologic and Mineral Deposit Information to Promote Investment in the Nonfuel Minerals Sector
- Reprocessing Existing Geophysical Data for Assessing Iraq's Mineral Resource Potential
- Using ASTER Satellite Imagery for Identifying Areas of Mineral Resource Potential
- Regional Geochemical Surveys for Identifying Areas of Mineral Resource Potential in Western Desert



Newly Re-processed Aeromagnetic and Aero-radiometric Data

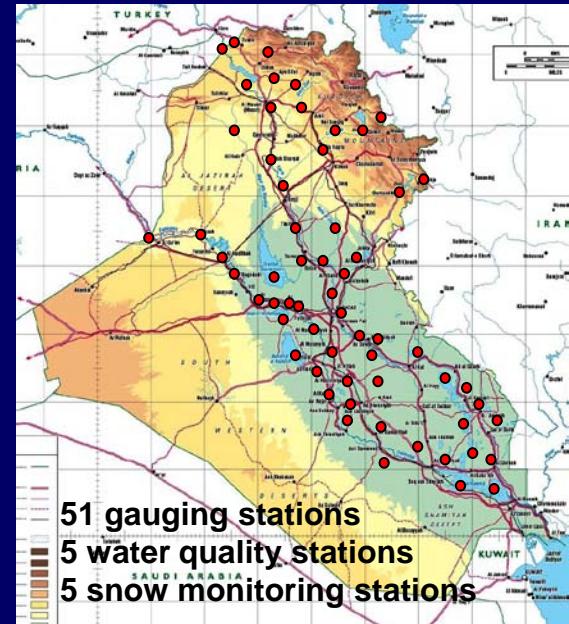
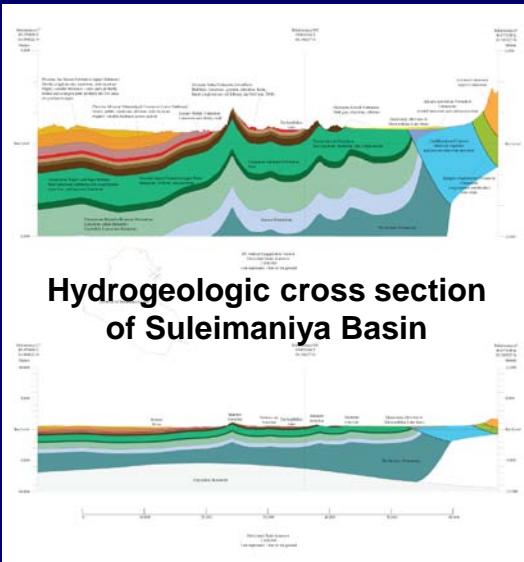


CALCITE- (GREEN) AND DOLOMITE- (RED) RICH ROCKS OF THE ANBAR PROVINCE, IRAQ (LANDSAT TM 5 BAND 7 BACKGROUND IMAGE)  
Mineral Resource Targeting using ASTER

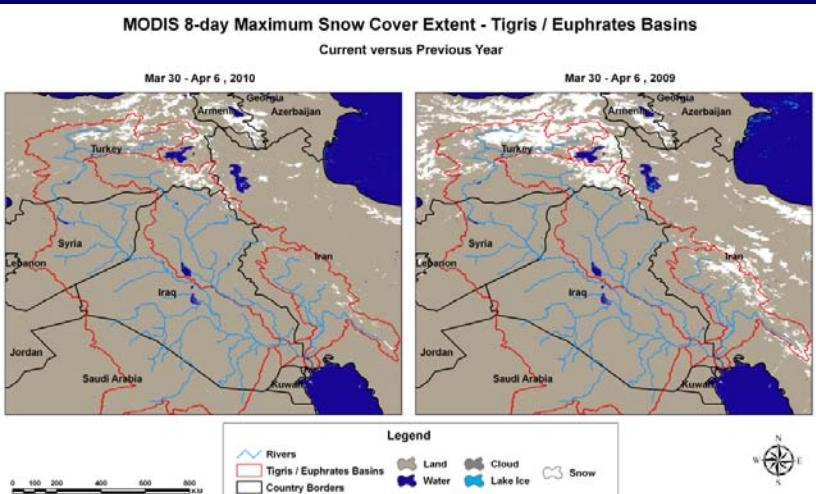


# Water Resources – Development of Water Resources Information and Tools in Support of Economic Development in the Western Desert and Kurdistan Region of Iraq

- Surface Water Assessment in Support of Agriculture and Hydropower
- Groundwater Assessments Supporting Economic Development in Target Regions
- Transboundary Flow Assessment



Renovation of satellite telemetry network



# Agromet Network for Iraq – A Critical Need for Increased Agricultural Productivity

- AgroMet Station Installation and Data Collection
- Crop Yield Forecasting
- Analyses and Publications
- Capacity Building



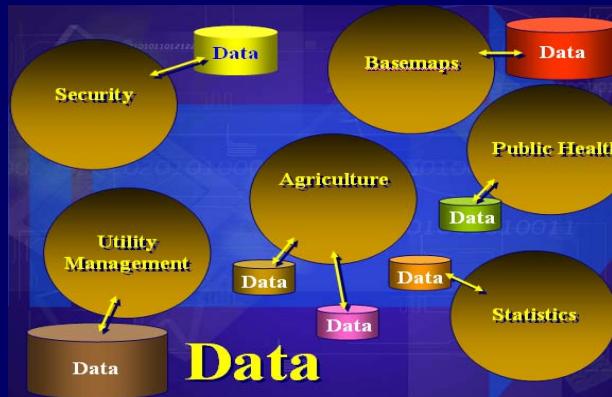
# Iraq National Spatial Data Infrastructure (INSDI)

- INSDI Stakeholder Assessment and Strategic Plan
- Major Data Project Coordination
- INSDI Initial Website and GeoPortal
- Agency Enterprise Capacity Building Program
- Development of a USGS Project Portal

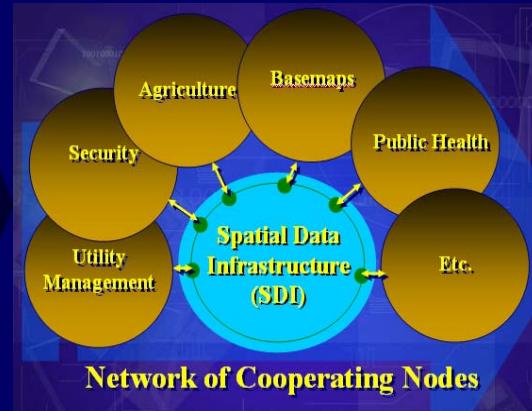
## Stakeholder Organizations

Baghdad Authority  
Prime Minister's Office  
Ministry of Agriculture  
Ministry of Communications  
Ministry of Defense  
Ministry of Environment  
Ministry of Higher Education and Scientific Research  
Ministry of Industry and Minerals  
Ministry of Oil  
Ministry of Planning  
Ministry of Sciences and Technology  
Ministry of Transport and Communications  
Ministry of Water Resources  
Kurdistan Regional Statistical Office

### Existing Situation



### Future Vision



# Modernization of Geological Survey of Iraq Central Laboratories – A Critical Need for Sustainable Mineral and Water Resource Evaluations

- Lab Evaluation and Recommendations
- Laboratory Information Management System (LIMS)



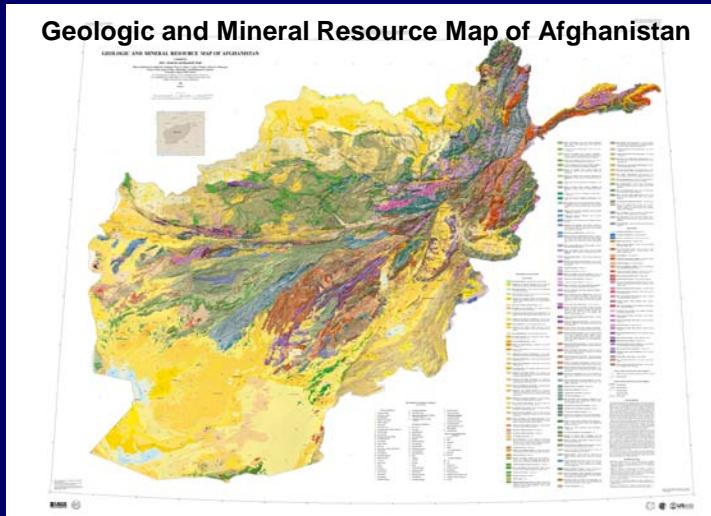
Reference Materials for Instrument Calibration



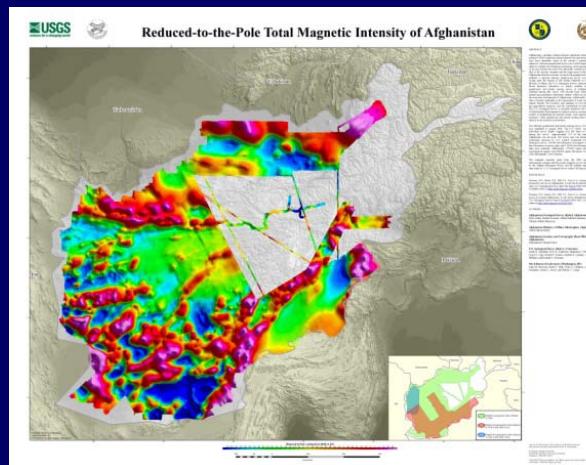
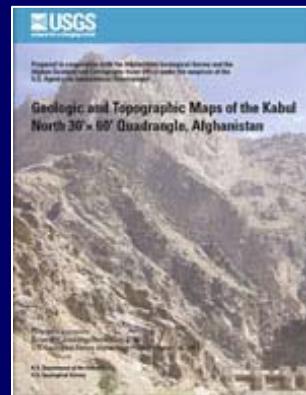
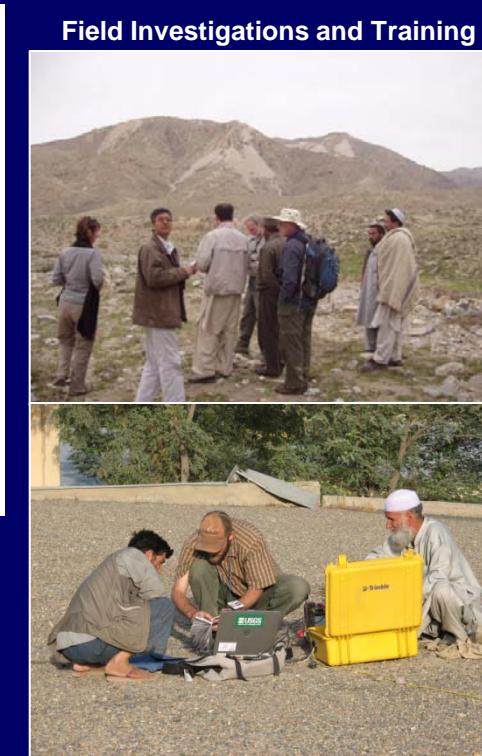
# USGS Science in Support of Economic Development and Stabilization in Afghanistan

## Phase I – 2004-2007

- Under the Auspices of USAID and the Government of Afghanistan
- Nonfuel Mineral Resource Assessment – Countrywide
- Petroleum Resource Assessments – Afghan-Tajik, Helmand, and Katawaz Basins
- Water Resource Assessments of Kabul Basin and Selected Regions
- Earthquake Hazard Assessment – Countrywide
- Airborne Geophysical and Hyperspectral surveys – Countrywide



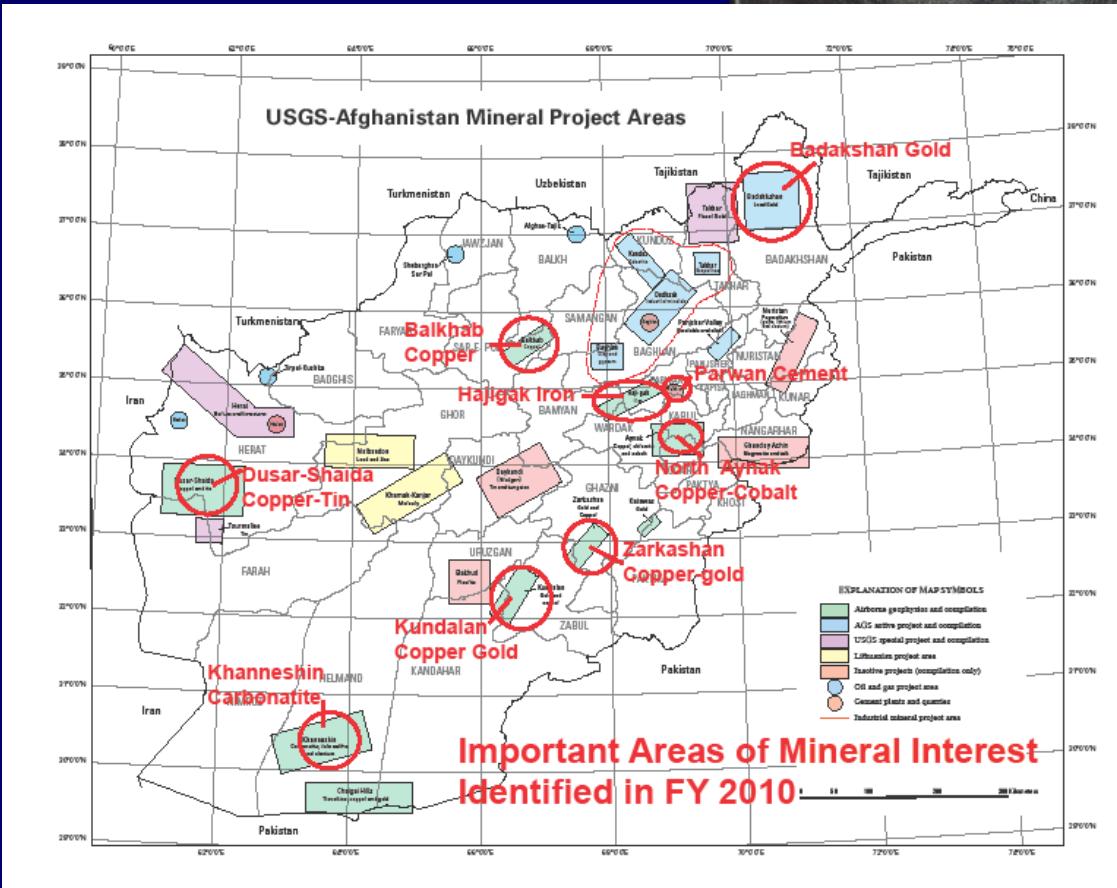
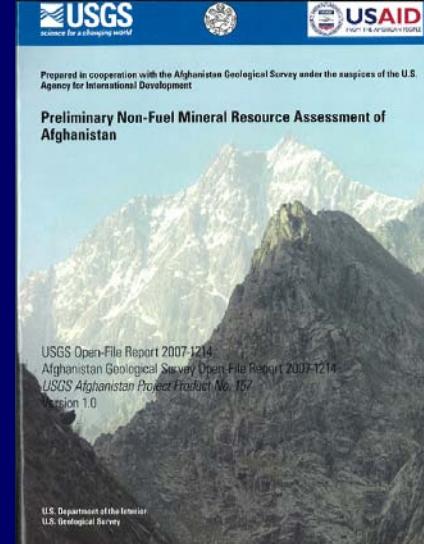
Digital aerial photography



# USGS Science in Support of Economic Development of Afghanistan

## Phase II – 2010-2011

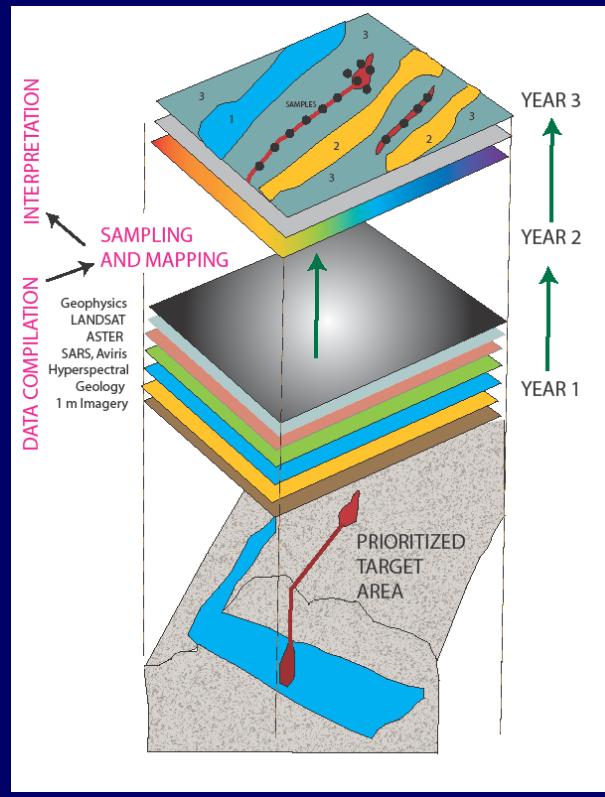
- Under the auspices of DoD/TFBSO and in cooperation with the Government of Afghanistan
- Focused on mineral resource and development potential of target areas identified in previous USGS mineral resource assessment (2007)
- Studies include hydrogeology, geophysics, hyperspectral remote sensing, geochemical sampling and resource analysis



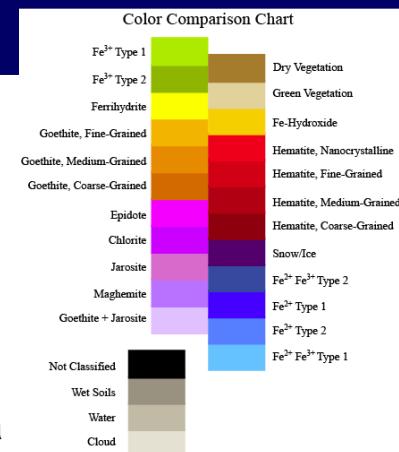
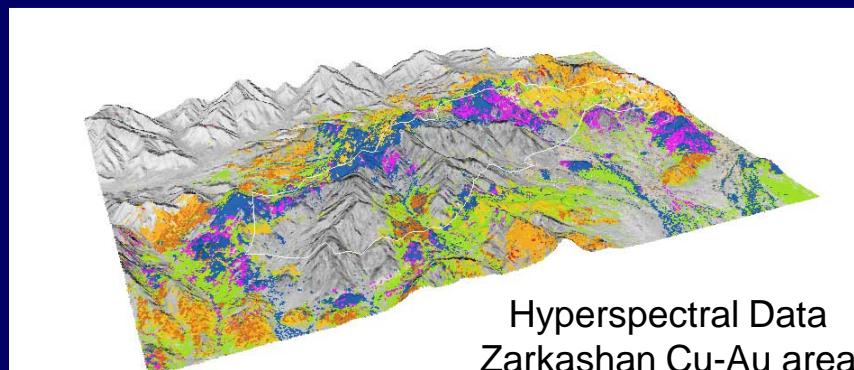
# USGS Science in Support of Economic Development and Stabilization in Afghanistan

- Compilation of data and information packages for each target area to promote interest in investment and development
- Compiled information based on existing and new field-derived data
  - New 20 and 40 m DEM
  - Quickbird and IKONOS Multispectral 17-m images
  - Hyperspectral data
  - ASTER mapping data
  - 2008 and previous geophysical data
  - Data from scoping missions
  - Data from AGS field work
  - Data from archival compilations

## Data and Information Package



Sampling in Khanneshin U-REE District



# Challenges, Issues, and Lessons Learned

- Two customers...sometimes with different needs and requirements
- Communicating the importance of making data and information available to the public domain
- Doing field work in a conflict zone



# Science Diplomacy at All Levels



With Fellow Scientists



With Government Leaders





Thank You