

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

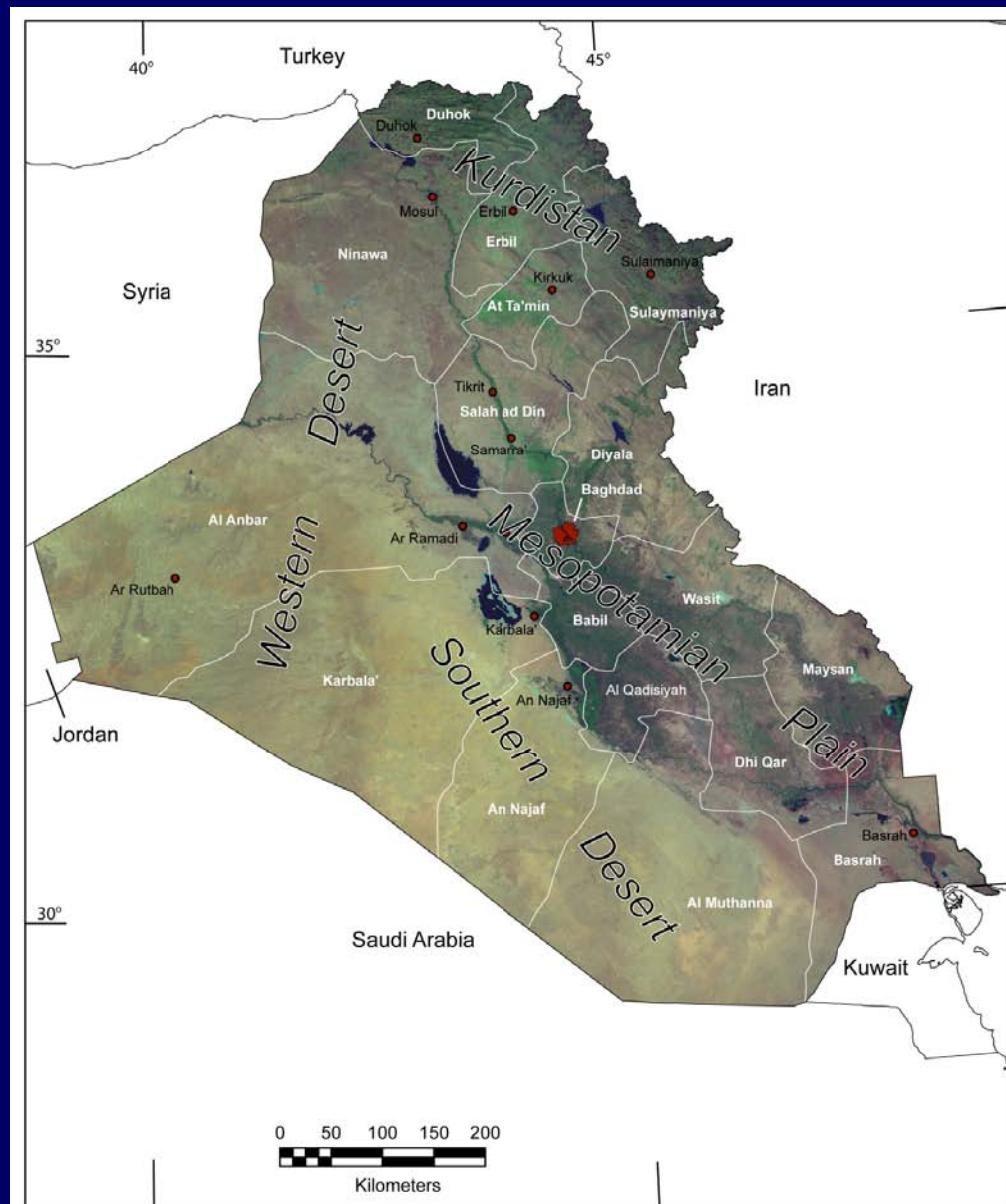
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Reston, Virginia*



USGS Science in Support of Economic Development and Stabilization in Iraq

Project Background

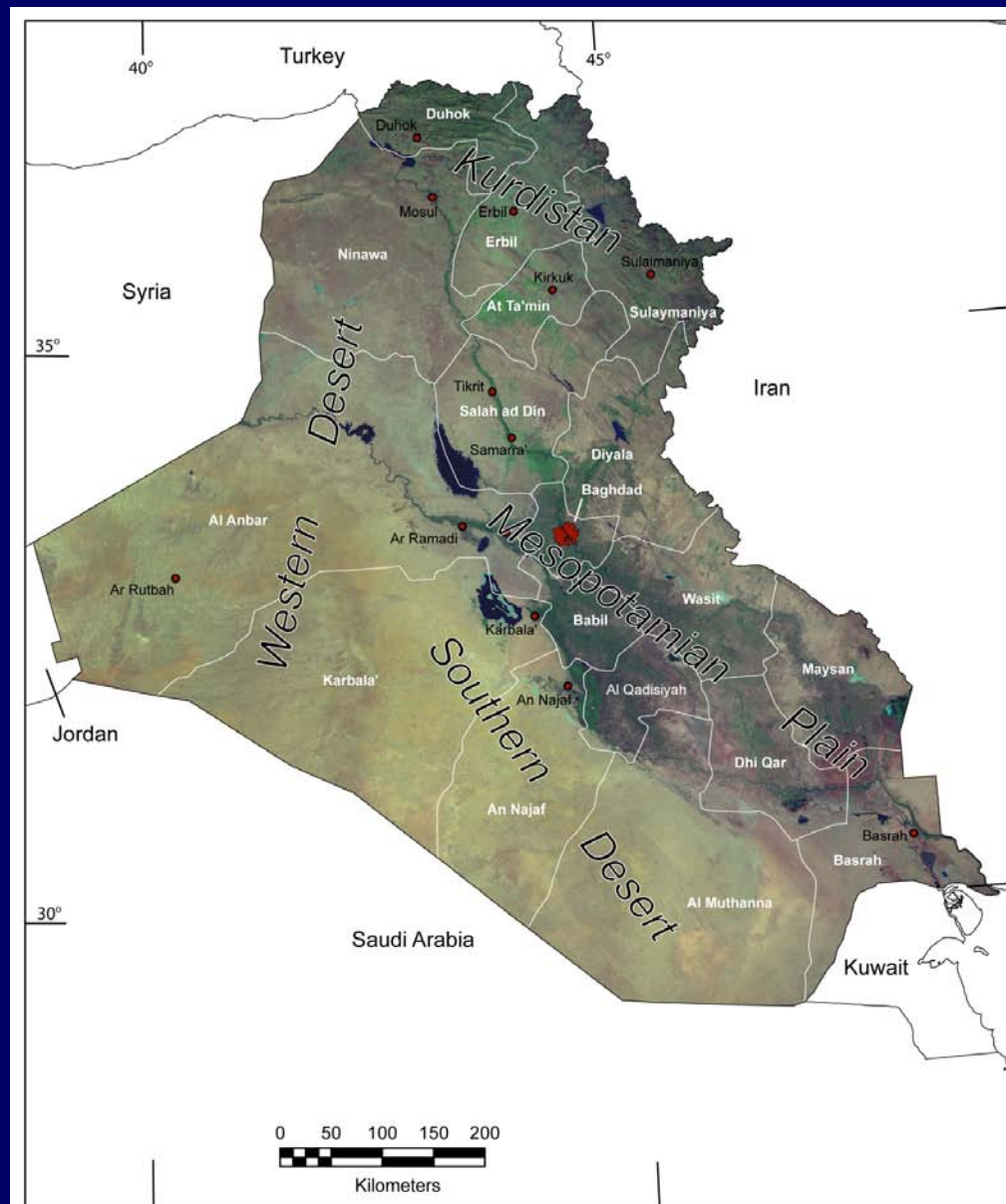
- Conducted under the auspices of the Department of Defense (DoD) Task Force for Business and Stability Operations (TFBSO)
- Scoping Missions April-June 2009
- Project Began in October 2009 as a 2-year project
- Project ended prematurely in September 2010 as DoD funding prioritization shifted to Afghanistan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



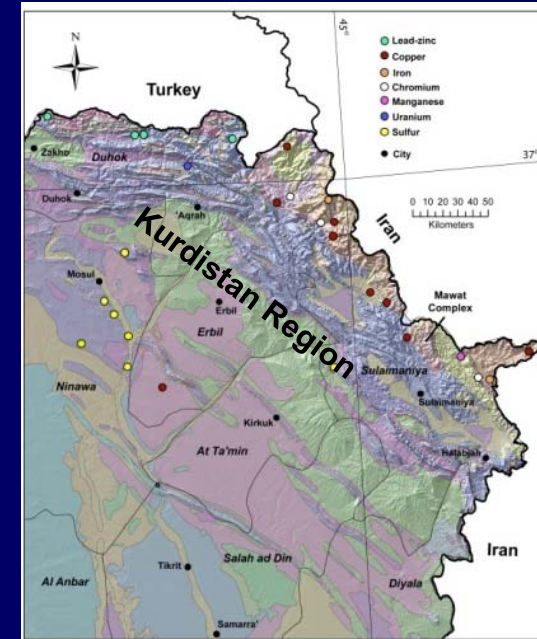
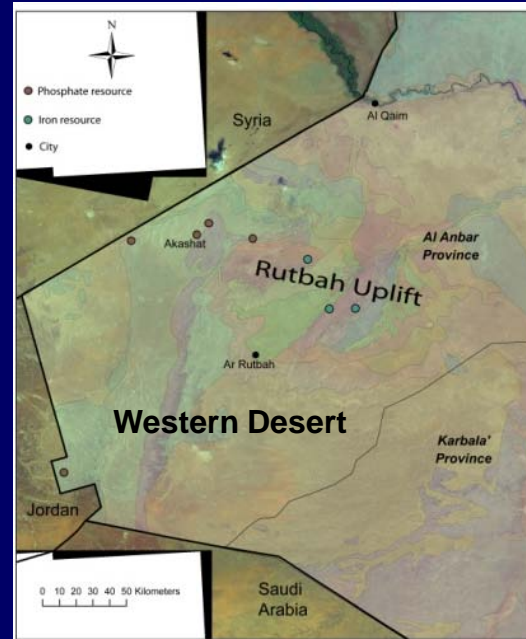
Nonfuel Mineral Resources – *Providing Mineral Resource Information and Technologies to Promote Economic Development in Iraq*

➤ Updating Geologic and Mineral Deposit Information to Promote Investment in the Nonfuel Minerals Sector

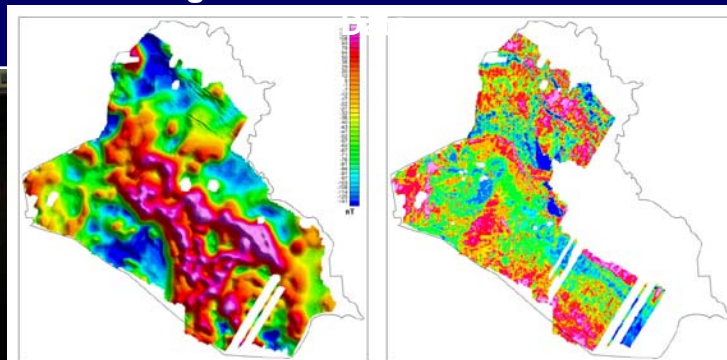
➤ Reprocessing Existing Geophysical Data for Assessing Iraq's Mineral Resource Potential

➤ Using ASTER Satellite Imagery for Identifying Areas of Mineral Resource Potential

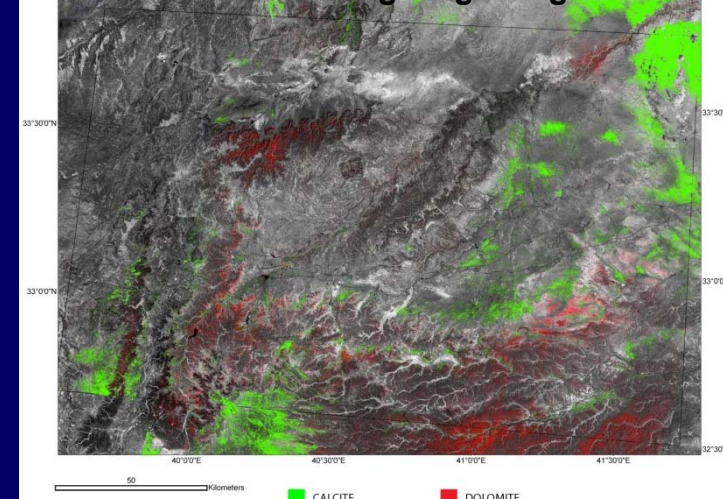
➤ Regional Geochemical Surveys for Identifying Areas of Mineral Resource Potential in Western Desert



Newly Re-processed
Aeromagnetic and Aero-radiometric Data

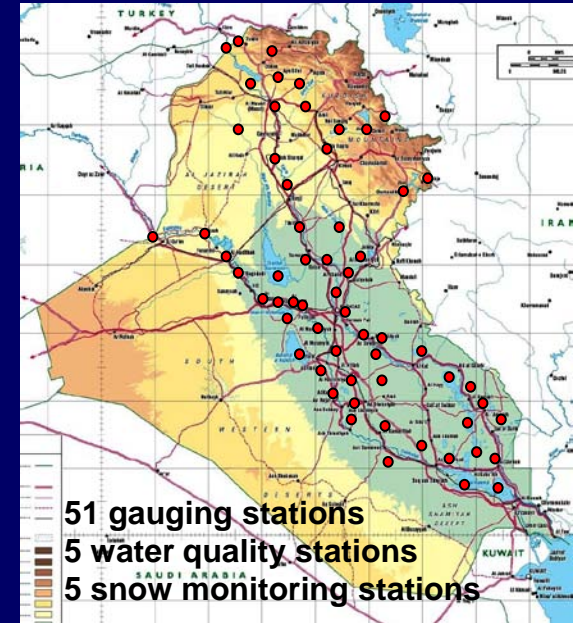
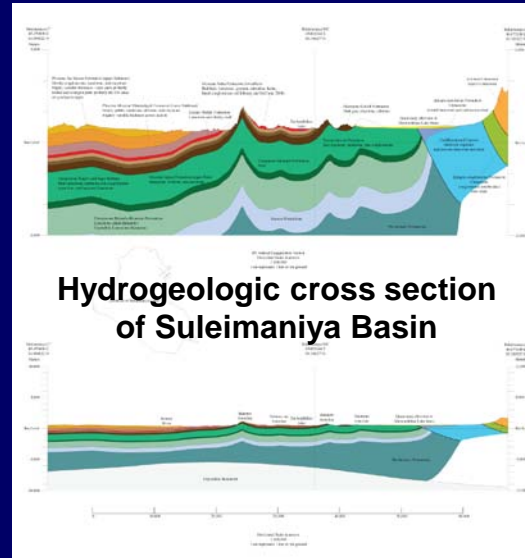


CALCITE- (GREEN) AND DOLOMITE- (RED) RICH ROCKS OF THE ANBAR PROVINCE, IRAQ (LANDSAT TM 5 BAND 7 BACKGROUND IMAGE)
Mineral Resource Targeting using ASTER



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

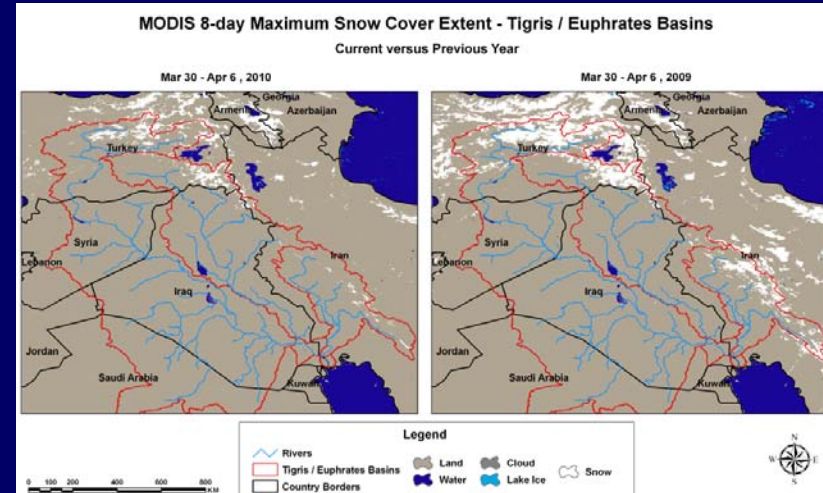
- Surface Water Assessment in Support of Agriculture and Hydropower
- Groundwater Assessments Supporting Economic Development in Target Regions
- Transboundary Flow Assessment



Renovation of satellite telemetry network



ADVM – Index velocity methods



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



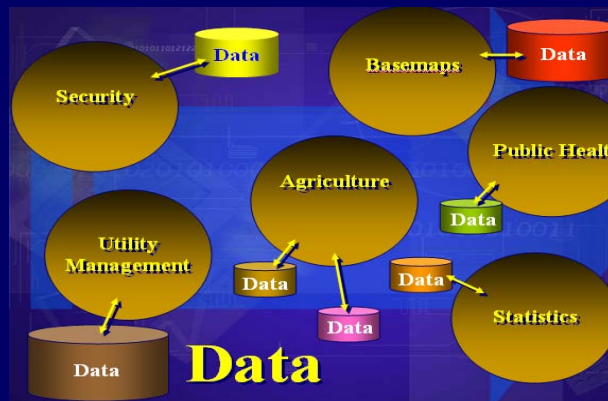
Iraq National Spatial Data Infrastructure (INSDI)

- 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

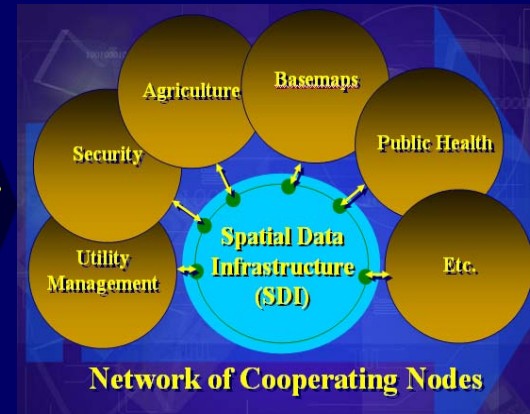
Stakeholder Organizations

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)



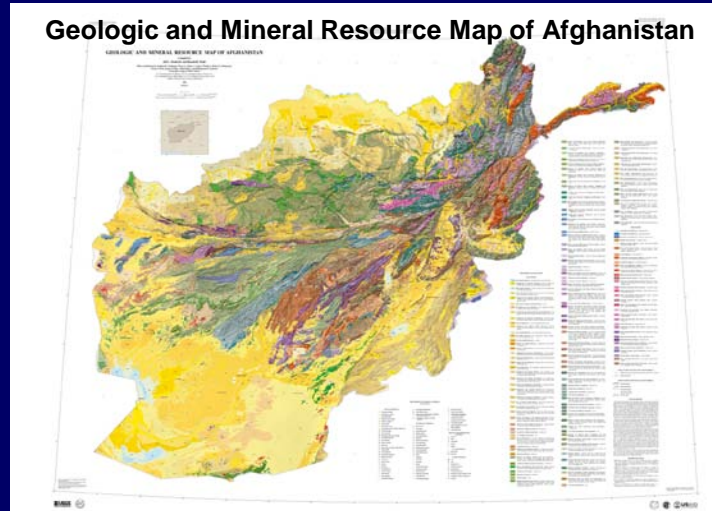
Reference Materials for Instrument Calibration



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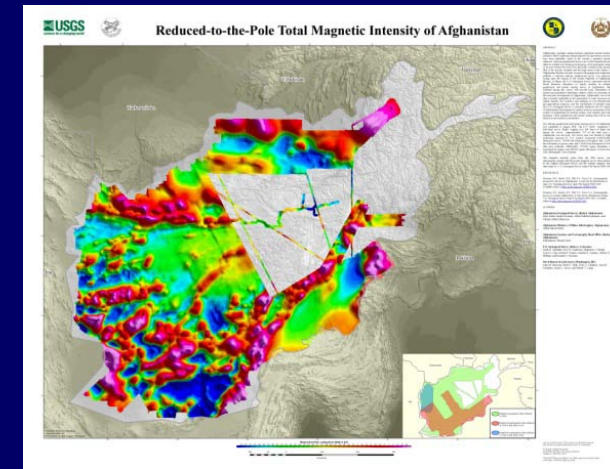
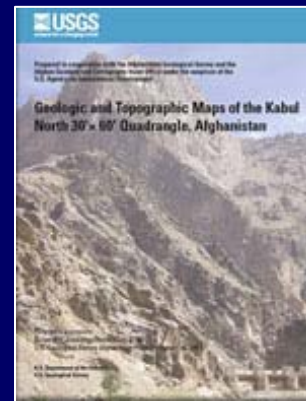
Phase I – 2004-2007

- 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

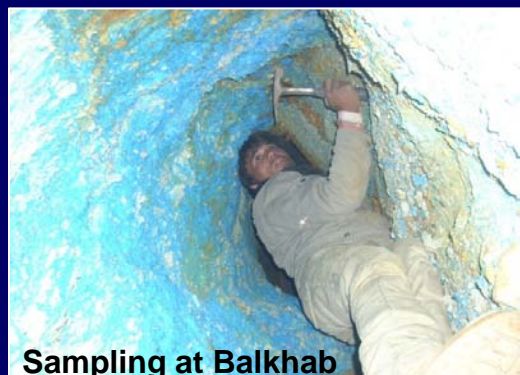
Field Investigations and Training



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Phase II – 2010-2011

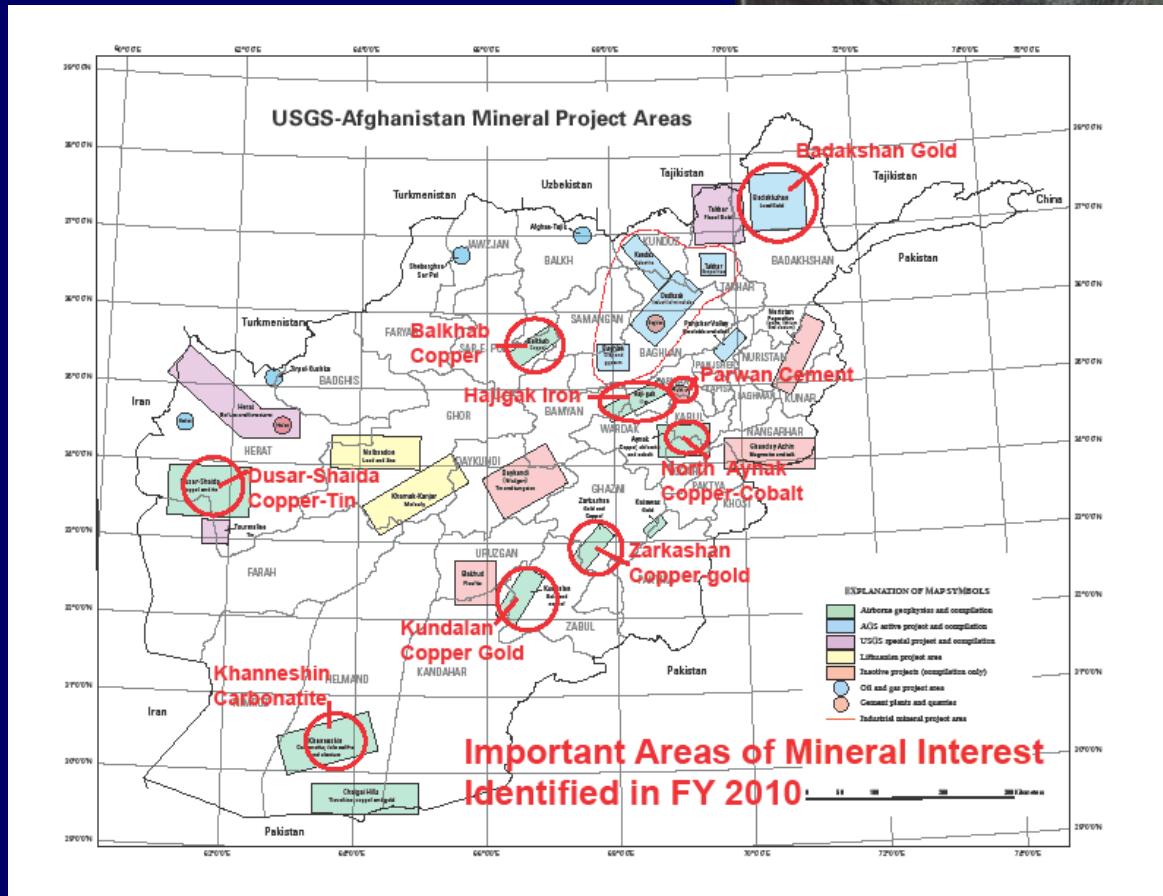
- Under the auspices of DoD/TFBSO and in cooperation with the Government of Afghanistan
- Focused on mineral resource and development potential of target areas identified in previous USGS mineral resource assessment (2007)
- Studies include hydrogeology, geophysics, hyperspectral remote sensing, geochemical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



Sampling at Balkhab



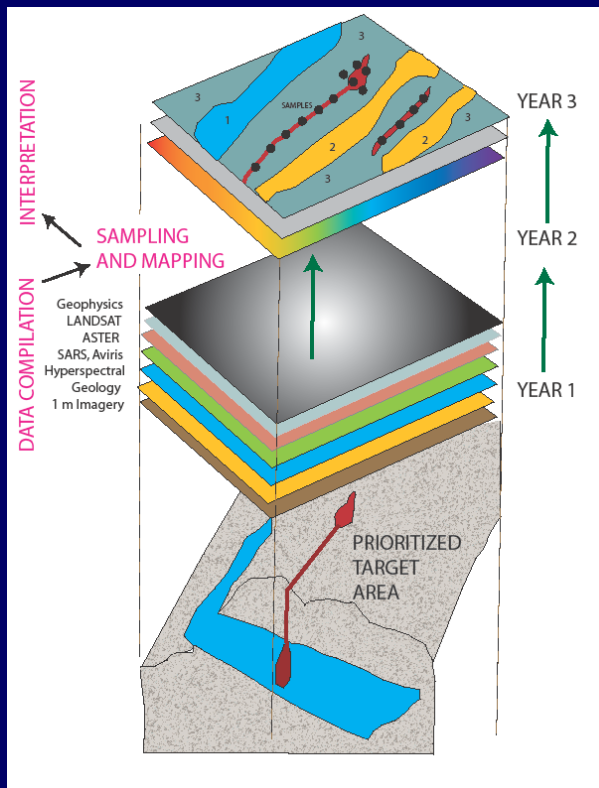
Trenching in Badakshan



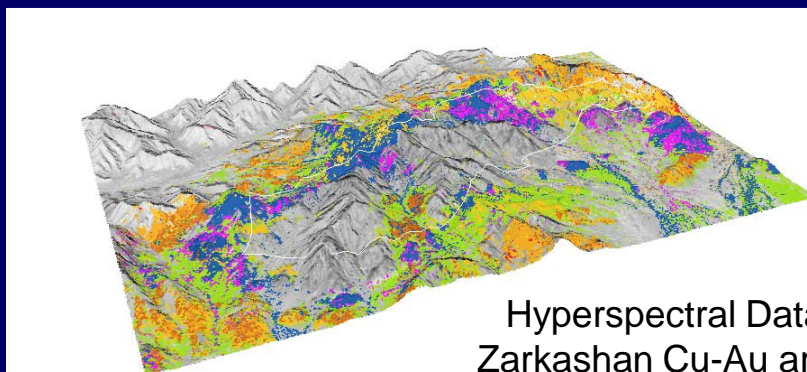
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Data and Information Package

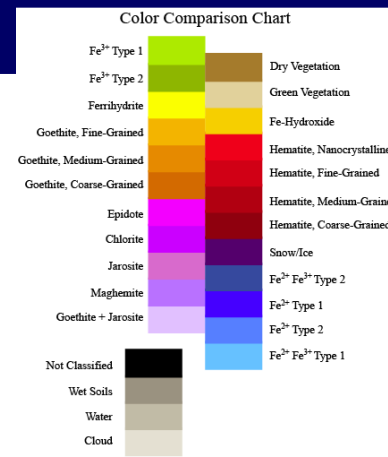
- Compilation of data and information packages for each target area to promote interest in investment and development
- Compiled information based on existing and new field-derived data
 - New 20 and 40 m DEM
 - Quickbird and IKONOS Multispectral 17-m images
 - Hyperspectral data
 - ASTER mapping data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



Sampling in Khanneshin U-REE District



Hyperspectral Data Zarkashan Cu-Au area



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