Geo-Spatial Information for Military & Civilian Applications

Geo-Spatial Data in Support of Operations
NOBLE EAGLE, ENDURING FREEDOM, & IRAQI FREEDOM

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LTC Wayne G. Rohde
Acting Commander
3436th Military Intelligence Detachment
National Ground Intelligence Center
2700 West O St.
Lincoln, NE 68528
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Why We are Here
Geo-Spatial Information for Military & Civilian Applications

GIS Technologies Enables Integration Of All Types Of Geo-spatial Information

- Protection of life, property, & infrastructure
- Risk assessment – Is there a problem, where?
- Mitigation of risks – Prevent or reduce
- Response – Search, Rescue, & Assist
- Recovery – Care of people, restore services, & reconstruct
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GIS Technologies Are An Integral Tool For US Soldiers & Intelligence Agencies

- Operation ENDURING FREEDOM – Military action to defeat the Taliban and al’Queda in Afghanistan
- Operation NOBLE EAGLE – Military support to ensure protection of US interests within USA
- Operation IRAQI FREEDOM – Military action to change Iraq leadership regime and promote democracy
- Numerous Humanitarian Relief Operations
PRIMARY SOURCES OF IMAGERY

- USGS (LANDSAT 7, DOQQ’s, & other TNM data)
- Spot Image Corporation (SPOT 4 & 5)
- Space Imaging Corporation (IKONOS)
- Digital Globe (QUICKBIRD)
- Misc. others becoming available
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Operation IRAQI FREEDOM
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Peason FLS, Ft. Polk, LA
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Operation IRAQI FREEDOM

Status Date: 24 APR 2003

IRAQ MAP PRODUCTS
- Ad Hoc/Other - 60
- 7 Major Cities - 36
- Airfields - 71
DATA COLLECTION

- Data library created for managing, retrieving, and distributing data
- Data library consists of >10,200 images and growing
- All data available for reproduction and distribution to validated users
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The Work Goes On in a Very Dangerous Environment
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Afghanistan AOI’s
Fly-arounds support mission planning and rehearsal.
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Pinon Canyon Interactive ArcReader Map with Aerial Photos
Enhancements to Geo-spatial Products

1. ArcReader Maps and software
   • Improved functionality—users can customize the maps produced
   • Zoom in or out to area(s) of interest
   • Cartographic elements are dynamic, MGRS grid, Lat/Lon graticule, scale text and bars automatically adjust
   • Little to no training required to perform these functions
   • Interactive maps with aerial or handheld photographs
   • Self installing freeware included with every soft copy

2. Multiple Map Formats
   • ArcReader Maps—Customizable, interactive, and easy to use
   • PDF Maps—Easily printed and transferred electronically
   • JPEG Maps—In Low and High resolution for quick reference
   • ArcMap Maps—For advanced users

3. Fly-around data sets accompanied with 2D imagery products

4. ARCIMS used to post/publish geo-spatial intelligence products
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Utility of Information

Comments from the field

1. Soldiers seeking unclassified geo-spatial imagery intelligence products

2. Not all Soldiers trained to interpret infrared reflectance
   - Response: Natural color multi-spectral imagery preferred

3. Uncertainty about multi-spectral imagery
   - Response: Employed cartographic elements to closely replicate NGA standard Topographic Maps, i.e. make the maps more familiar to Soldiers.

Examples of Improvements:
1. NGA standard Magnetic declination angle, Grid North, and True North Arrows
2. NGA standard Projection Definition information
3. NGA standard Grid Reference Box
Satellite Imagery Continues to Improve

- Landsat-1 launched 1972, 80 m spatial resolution
- SPOT-1 launched 1986, 20 m MSI, 10 m Pan
- Space Imaging, Inc – launched 1999, 1 m spatial resolution
- Beyond 2000 – More systems, More players
- Better data – improved sensor resolution, geometry and radiometry
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Issues Inhibiting GIS Use

• Data Collection – many players at Federal, State, Local, Tribal, and International level
• Standards for data, metadata, & exchange formats
• Flexible policies for Data Sharing
• “User” friendly HW/SW systems
• Institutional buy-in – sustain O&M
• Trained, experienced staff
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A CHALLENGE FOR THE GIS COMMUNITY

- GIS applications are at their infancy
- Scientists are only beginning to develop new and robust applications, often limited by only one’s imagination
- We cannot dwell on the NOW but on the FUTURE
- “Science has not yet mastered prophecy. We predict too much for next year and yet far to little for the next ten.” by Neil Armstrong
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Future Challenges

• Continued Technology Improvements
• Improved Analytical Tools
• Innovative and Creative Staff
• Organizational Infrastructure
• Organizational Culture

**MYTH**: Reading License Plates From Space – Not Now And Not Likely!