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USGS Land Remote Sensing Program -
Commercial Remote Sensing Project Overview

3rd Annual Joint Agency Commercial Imagery Evaluation (JACIE) Workshop

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Overview

- Why Commercial Remote Sensing (CRS)?
- Why a Commercial Remote Sensing Project?
- Project Elements
- Summary

Why Commercial Remote Sensing?

- Impressive technical capabilities
- Maturing business models and responsiveness
- Increasingly competitive product pricing
- Heightened national priority:
  - Congress
  - White House

Why a Commercial Remote Sensing Project?

- **Increase emphasis on commercial remote sensing use and access**
- **Establish collective priorities**
- **Engage more USGS mapping and science centers**
- **Fund key projects, data, conferences, workshops, studies**

Commercial Remote Sensing Project Elements

- Commercial Remote Sensing Data Contracts
- Joint Agency Commercial Imagery Evaluation
- Map Revision Using Satellite Data
- Analog Camera Calibration
- Digital Camera and Data Characterization
- US Space System Licensing Support
- US Commercial Remote Sensing Space Policy Support

Commercial Remote Sensing Data Contracts (CRSDC)

- **Procure off-the-shelf data:**
  - **Optical, MSI, hyperspectral, lidar, radar, video…**
  - **From aircraft and spacecraft**
- **Support *The National Map*/other USGS needs**
- **Support National Space Policy implementation**
- **Facilitate data purchase partnerships**
- **Seek agreements that allow broad data sharing**
- **Multiple award IDIQ (FAR Part 12 Commercial Items Contract)**

CRSDC – Working Timeline

- RFC on draft satellite specifications closed March 3, 2003
- RFC on draft aerial specifications closed April 10, 2003
- Formal solicitation expected June, 2003 *
- Proposals due June/July, 2003
- Negotiations complete August, 2003
- Contracts signed September, 2003*

*Schedule shown is primarily for aerial, satellite may take more time

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CRSDC – Response to RFC for Satellite Data

- Vendor comments very useful:
- Significant minimum purchase guarantees needed for unrestricted license
- Suggested capacity, subscription, archive and other contract options
- Additional fees for less than 20% clouds, FGDC metadata, priority tasking
- Suggested a variety of priority service models
- Specs varied from vendor business models re. scene size, min order, data processing, warranty, etc.

Joint Agency Commercial Imagery Evaluation (JACIE)

- One of several USGS calibration/characterization interests
- JACIE involves USGS/NASA/NIMA, academia, industry
- JACIE benefits Government, industry, marketplace
- 2002-2003 focused on IKONOS data characterization
- 2003 focused on QuickBird data characterization

USGS 2003 JACIE Tests*

- IKONOS
  - 2 DEM products
  - 1 Master Precision product
- QuickBird
  - 1 Standard image
  - 1 1:10K product
  - 1 1:12K product
  - 2 1:25K products
  - 1 1:50K product
- Test sites used
  - USGS EROS Data Center, South Dakota
  - City of Sioux Falls, South Dakota
  - Morrison, Colorado
  - Kaintuck Hollow, Missouri

*Some work performed in partnership with the city of Sioux Falls, SD

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JACIE – Next Steps

- Evaluate ORBIMAGE when on orbit
- Need "JACIE next" strategy
  - Prioritize future systems to be tested
  - Develop funding plan for data and tests
  - Expand JACIE participation
  - Grow international cooperation
    - Intl Workshop on Radiometric and Geometric Calibration http://www.commission1.isprs.org
    - December 2-5, 2003, Gulfport Mississippi
    - Further information: Stanley.A.Morain@nasa.gov

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Evaluation of Satellite Data for Map Revision

- **Focus on high resolution space data**
- **Evaluate data utility for *National Map* revision:**
  - **Feature interpretability**
  - **Cost of data and labor**
  - **Compatibility with production software and systems**
  - **Compare performance of sources**
- **Align with selected urban areas of *The National Map***

Analog Camera Calibration

- Calibrating the Nation's analog cameras since '73
- Analog business is brisk:
  - FY 2002 - 81 cameras
  - FY 2003 - 90 cameras (as of June!)
- Optical sciences lab upgrades:
  - Collimator lighting system recently upgraded
  - New data handling software in-work
  - Possible new technical staff position
  - In need of advanced photogrammetric expertise

Digital Camera and Data Characterization

- **Space Act Agreement with NASA/Stennis:**
  - **In-flight end-product characterization**
  - **Geometric quality and edge response**

- **Pictometry Laboratory contract:**
  - **3-D calibration cage**
  - **Kodak 4.5x3K digital camera and stand**
  - **Calibration software**
  - **Installation in June 2003**

- **OSU Grant:**
  - **Software for *in-flight* calibration & camera stability tests**

Licensing of U.S. Commercial Space Systems

- Stems from Land Remote Sensing Policy Act, 1992
- Department of Commerce, through NOAA, leads licensing activity
- Purposes of licensing:
  - Allows for expansion of critical industrial base of aerospace and information technologies
  - Promotes job creation, economic growth, applications of critical National need
  - Protects U.S. national security concerns and foreign policy interests

Licensing of U.S. Commercial Space Systems

- **Dept. of Interior/USGS interests:**
  - **Access to commercial data for the National Satellite Archive at USGS**
  - **Notification before data is to be purged**
  - **Allowed to make data publicly available after commercial rights are relinquished**

Licensing of U.S. Commercial Space Systems

- **Best Capabilities Licensed for General Commercial Availability:**
  - **Panchromatic (black/white): 0.5 meter**
  - **Multispectral (color): 2 meter**
  - **Synthetic aperture radar (SAR): 3 meter**
  - **Hyperspectral (HS): 8 m product, 20 m raw data**
  - **Licenses pending for more advanced capabilities**

U.S. Commercial Remote Sensing Policy

- **U.S. Commercial Remote Sensing Policy**
  - **Signed April 25, 2003**
- **Significant changes:**
  - **Greater reliance on commercial remote sensing**
  - **Expand Government/vendor partnership**
  - **More timely licensing**
  - **Security considerations**

2003 CRS Project Successes as of June ‘03

- CRS data contracts developed through comment phase
- Film cameras calibrated already exceeds ‘02 total
- Digital calibration:
  - New Geography Discipline digital calibration team
  - Contract with Pictometry for digital camera calibration facility
  - Grant for Ohio State calibration methods development
  - Space act agreement established with NASA
- JACIE characterizations increased 4x over 2002
- Support to NOAA space system licensing process
- Support to US Commercial Remote Sensing Space Policy (development and implementation)
- Support for national and int’l remote sensing forums