GeoEye
Corporate Overview

Presented to
XIII Simposio Brasileiro de Sensoriamento Remoto
April 24th, 2007
About GeoEye

• GeoEye is a leading producer of satellite, aerial and geospatial information

• Core Capabilities
  – 2 remote-sensing satellites; 3rd this fall
  – 2 aircraft with digital mapping capability
  – Advanced geospatial imagery processing capability
  – World’s largest satellite image archive: > 275 sq km
  – International network of regional ground stations to directly task, receive and process high resolution imagery

• GeoEye delivers high quality satellite imagery and products to better map, measure and monitor the world
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Event Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>March</td>
<td>Scheduled launch for GeoEye-1</td>
</tr>
<tr>
<td>2006</td>
<td>Sept</td>
<td>GeoEye acquires MJ Harden</td>
</tr>
<tr>
<td>2006</td>
<td>Jan</td>
<td>GeoEye begins trading on NASDAQ</td>
</tr>
<tr>
<td>2004</td>
<td>Sept</td>
<td>GeoEye acquires Space Imaging</td>
</tr>
<tr>
<td>2003</td>
<td>Jun</td>
<td>GeoEye Wins $500M DoD NextView contract</td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td>Launch of OV-3</td>
</tr>
<tr>
<td>1999</td>
<td>Sept</td>
<td>Launch of IKONOS</td>
</tr>
<tr>
<td>1997</td>
<td>Aug</td>
<td>Launch of OrbView-2</td>
</tr>
<tr>
<td>1992</td>
<td>Nov</td>
<td>Predecessor company founded</td>
</tr>
</tbody>
</table>
Company Offerings: Imagery

- Extensive Commercial Satellite Imagery Archive
  - IKONOS and OrbView-3 combined archive: 278 million sq km as of April 2007
  - Online search for archive imagery
Company Offerings:
Value Added Applications & Production

• Select Imagery Applications
  - National Security & Intelligence
  - Online Mapping / Search Engines
  - Homeland Defense
  - Oil & Gas and Mining
  - Air and Marine Transportation
  - Insurance & Risk Management
  - Digital Planimetric & Topographic Mapping
  - Mobile GIS Services

• Value-Added Production
  - Fused images, digital elevation models (DEM), land-use classification maps
  - World class facilities in:
    - St. Louis, MO
    - Thornton, CO
    - Dulles, VA
    - Mission, KS
Company Offerings: Capacity

- Satellite access
- Aerial image acquisition
- Ground stations
  - Infrastructure / Upgrades
  - Operations, maintenance and training

Satellite Imagery can be sold almost anywhere. Ground stations with tasking capabilities controlled under International Traffic in Arms Regulations (ITAR)
MJ Harden Services

- Aerial image acquisition
- Digital planimetric and topographic mapping
- Digital orthophotography
- Remote sensing / image analysis
- Field inventories
- GIS / Mobile implementations
Customers

- GeoEye is a vendor of choice and trusted supplier of high-quality commercial satellite and aerial imagery and value added products to:
  - U.S. Government (National Geospatial-Intelligence Agency [NGA])
  - Foreign Governments
  - Strategic International Customers
  - Global Resellers
  - Commercial Customers
  - Online Mapping / Search Engines
The Company
NASDAQ: GEOY

• Locations
  – Headquarters: Dulles, Virginia
  – Operation Facilities:
    • Thornton, Colorado
    • St. Louis, Missouri
    • Norman, Oklahoma
    • Mission, KS
  – 4 Secure Facilities
• Employees: 375+
• Imagery from diverse platforms
  – IKONOS
  – OrbView-2
  – Aerial
  – GeoEye-1 (IOC Fall 2007)
• NASDAQ
  – Began trading Sept. 14, 2006
Search Engines

- GeoEye has contracts with Microsoft and Yahoo! as imagery content providers
- Joint marketing activities are in discussion to leverage these relationships
- Online search engines are finally...
  "bringing satellite imagery down to earth"
GeoEye Imaging Constellation

OrbView-2
August 1997

IKONOS
September 1999

GeoEye-1
2007

Aerial Intergraph DMC
Continuity of Imagery Through 2017

Access to uninterrupted commercial imagery assured
# GeoEye Satellites

## Performance Summary

<table>
<thead>
<tr>
<th>Performance Parameter</th>
<th>GeoEye-1</th>
<th>IKONOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude (km)</td>
<td>684 km</td>
<td>682 km</td>
</tr>
<tr>
<td><strong>Image Quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bands</td>
<td>1-PAN Band</td>
<td>1-PAN Band</td>
</tr>
<tr>
<td></td>
<td>4-MS Bands</td>
<td>4-MS Bands</td>
</tr>
<tr>
<td>PAN GSD at Nadir</td>
<td>0.41m</td>
<td>.82m</td>
</tr>
<tr>
<td>MS GSD at Nadir</td>
<td>1.65m</td>
<td>3.2m</td>
</tr>
<tr>
<td><strong>Geolocation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE90 Accuracy (No Ground Control)</td>
<td>Designed for &lt;3m</td>
<td>10m</td>
</tr>
<tr>
<td><strong>Collection Capacity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revisit @ .5M GSD</td>
<td>2.8 days</td>
<td>n/a</td>
</tr>
<tr>
<td>Swath Width @ Nadir</td>
<td>15.2 km</td>
<td>11 km</td>
</tr>
<tr>
<td>Scene Size (sq km)</td>
<td>231 sq km</td>
<td>121 sq km</td>
</tr>
<tr>
<td>Max Nadir PAN Mono Area Collect Rate</td>
<td>125 sq km/sec</td>
<td>60 sq km/sec</td>
</tr>
<tr>
<td>PAN Point Target Rate (50 km spacing)</td>
<td>1,100 sq km/min 5 Points/min</td>
<td>484 sq km/min 4 Points/min</td>
</tr>
</tbody>
</table>

**GSD** = Ground Sample Distance

**PAN** = Panchromatic (B&W)

**MS** = Multispectral (Color)
# GeoEye-1

Highest Performance Available In The Commercial Market

<table>
<thead>
<tr>
<th>Image Quality</th>
<th>Bands</th>
<th>1-Panchromatic Band 4-Multiplespectral Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best PAN NIIRS</td>
<td></td>
<td>5.5</td>
</tr>
<tr>
<td>PAN GSD at Nadir</td>
<td></td>
<td>0.41m</td>
</tr>
<tr>
<td>MS GSD at Nadir</td>
<td></td>
<td>1.65m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection Capacity</th>
<th>Swath Width @ Nadir</th>
<th>15.2 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily MS Area (sq km)</td>
<td>350,000</td>
<td></td>
</tr>
<tr>
<td>Daily PAN Area (sq km)</td>
<td>700,000</td>
<td></td>
</tr>
<tr>
<td>Daily PAN Number of Points</td>
<td>520 - 2400</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geolocation</th>
<th>CE90 Mono Accuracy (No Ground Control)</th>
<th>designed for &lt; 3m</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Orbit</th>
<th>Altitude (km)</th>
<th>684 km</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Polar Orbit – Sun Sync</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equator Crossing</td>
<td>10:30 AM</td>
</tr>
</tbody>
</table>
Simulated GeoEye-1 High Resolution PAN Sharpened Image

Denver City County Building
GeoEye-1
A Huge Collector of Global Imagery

• Scheduled for launch 2007 with 7+ year design life
• GeoEye-1 incorporates next generation technology with proven IKONOS architecture
  – Simultaneous 0.41 meter panchromatic and 1.65 meter multispectral imagery
  – Geolocation: designed for <3m accuracy without ground control
    • Best for any remote sensing satellite
• Ground infrastructure already in place
• Collect up to 700,000 sq km/day in panchromatic mode (size of Texas) and 350,000 sq/km/day in multispectral mode

Most Advanced Commercial Imaging Satellite in the World
## Competitive Landscape

### Selected High Resolution Imaging Satellites

<table>
<thead>
<tr>
<th>Country</th>
<th>System</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>GeoEye - GeoEye-1</td>
<td>0.41m</td>
</tr>
<tr>
<td>USA</td>
<td>GeoEye - IKONOS</td>
<td>0.7m</td>
</tr>
<tr>
<td>USA</td>
<td>DigitalGlobe – WV-1</td>
<td>2.5m</td>
</tr>
<tr>
<td>USA</td>
<td>DigitalGlobe – WV-2</td>
<td>1.0m</td>
</tr>
<tr>
<td>USA</td>
<td>DigitalGlobe - Quickbird</td>
<td>0.5m</td>
</tr>
<tr>
<td>Israel</td>
<td>EROS B (Pan Only)</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>EROS C</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Pleiades -1</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Pleiades -2</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>SPOT-5</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>IRS CartoSat-2</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>Resurs DK-1</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>Arirang-2 (KOMPSAT)</td>
<td></td>
</tr>
</tbody>
</table>

Resolution: 0.41m, 0.5m, 0.7m, 1.0m, 2.5m
Largest Commercial Imagery Archive

IKONOS and OrbView-3 archive contains over 278 million sq km of imagery as of April 2007.
IKONOS, OrbView-3 & OrbView-2
Ground Station Network

A global footprint with access to an international network of ground receiving stations
GeoEye-1
Ground Station Network

Dulles, VA: Operations center for mission planning and production
Thornton, CO: Back-up operation center for mission planning and production
St Louis, MO: Production center for value-added and specialized products
Barrow, AK and Dulles: Ground terminals for OV-3/GeoEye-1 support
Tromso, Norway and Troll, Antarctica: Terminal services for GeoEye-1

Imagery downlinked on every orbit due to ground station locations
Key Themes

- Operating high-resolution satellites and even higher resolution aircrafts lets GeoEye offer complementary imagery to its customers and resellers.
- The commercial remote sensing industry is stable and backed by Wall Street.
- The U.S. Government alone has committed >$1.5 billion to the commercial satellite imagery industry.
- Approximately 50% of our revenues are from non-U.S. Government customers.
- GeoEye’s customers will have assured access to commercial color satellite imagery into the 2017 timeframe with systems that are robust and redundant.
GeoEye
Products & Applications
IKONOS

- **Launch**
  - September 24, 1999

- **Orbit**
  - 681 km (423 miles), Sun-synchronous
  - 10:20 equatorial crossing
  - 14 times a day, every 98-minutes

- **Imaging Sensors**
  - 0.82-meter Pan (processed at 1m)
  - 3.2-meter MS (processed at 4m)
    - Blue, Green, Red, NIR
  - 11 km swath
  - 11-bit radiometry

- **Collection**
  - Agile pointing & scanning
  - Bi-directional scanning
  - Mono or Stereo

- **Revisit**
  - 3 days
IKONOS 1-meter Panchromatic

Hoover Dam, Nevada
IKONOS 1-meter Color

Big Bear Glacier, Alaska
IKONOS True Color & False Color

4-meter multispectral image of Copper Mountain, Colorado
IKONOS Stereo Collection

- Same Pass Collection of Large Areas
  - 3-D feature extraction
  - DEM Creation
  - Worldwide Ortho
  - Reference Stereo (25m CE90)
  - Precision Stereo (4m CE90)
Rapid Collection Capability
Hurricane Katrina

IKONOS collected 13,000 sq km of unclassified imagery on one orbital pass
Imaging can begin 19 sec. after first contact.

Dump Metadata in last 5 sec of contact.

Pre-pass checks and configuration.

Level 1 Image Production.

-90 -10 0 10 28 29

-90 Receive Weather Data
-10 Finalize Satellite Tasking
0 5° comm cone Uplink Tasking Load
10 Begin Image Collection and WB Data Downlink
28 Last Opportunity for In-Contact Imaging
29 Deliver 1st Pan Image
n+3 Deliver 1st Multispectral Image
10 Deliver Additional Images.
OrbView-3 Pan 1-meter

Yongbyon, North Korea – Nuclear Facility
OrbView-3 Multispectral 4-meter

Livorno, Italy - February 12, 2006
OrbView-2

- **Capabilities**
  - Imaging Mode - Multispectral (Color)
  - Color Bands - 8
  - Spatial Resolution - 1 km
  - Swath Width - 2,800 km
  - Revisit Time - 1 day
  - Orbital Altitude - 705 km (423 mi)
  - Expected Life - 10 years

- **Operations**
  - Launched 1997
  - In-service availability >99%
  - Operated by equivalent staff of 2
  - Mission planning twice per week
OrbView-2 Applications

- Scientific Research
- Fishing
- Naval Operations
- Environmental Monitoring
- Agriculture
OrbView-2
Hurricane Katrina
SeaStar Fisheries Information Service

- Find Fish Faster!
- Sea Surface Temperature contours overlay OrbView-2 Plankton Image map
- Recommended fishing grounds are shown in red (off coast of Australia)
GeoEye-1
Technical Specifications

- Resolution/Swath-Width
  - Panchromatic: 0.41-meter
  - Multispectral: 1.65-meter
  - Swath Width 15.2 km
- On-Board 1.0 Terabit Solid Stage Recorder
- 700,000 sq km per day panchromatic mode
- 350,000 sq km per day multispectral mode
- 11 Bit Detector Dynamic Range
- Data Rates
  - 700 Mbps
  - 150 mbps
- Gimbaled X-Band Antenna
- Revisit Time: <3 Days
- Orbit: 98° Sun Sync at 10:30 a.m.
- Altitude: 684 km
- Mission Life: 7 years (Fuel >10 Years)
- Launch Mass: 2050 kg – Boeing Delta II launch vehicle
- Launch: August 2007
GeoEye-1 Daily Imaging Collection
Tracks

- GeoEye-1 has 4 ground receiving stations
- It will make 12-13 orbits/day over land, with 16 minute-long imaging windows
GeoEye-1 Accuracy: Latest Generation Technology Employed

- High accuracy star trackers from Ball Aerospace
  - Used on US Government satellite systems
  - Only commercial satellite to use this technology
- Monarch GPS receiver
  - Best available on market with 1M accuracy
  - More accurate than older technology Viceroy receiver
- Litton Scaleable Inertial Reference Unit (SIRU) Gyros
  - High precision, low drift rates

State-of-the-art technologies previously flown only on USG intelligence satellites
GeoEye-1 Metric Accuracy: Best Available Commercial Geolocation Design

- System geolocation accuracy performance using only ancillary data produced by the satellite
  - No ground control points or other external data sources required
  - Single look mono and stereo

GeoEye-1 Performances vs. NextView Geolocation Accuracy Requirements

CE Stereo (45° tilt)
LE Stereo (45° tilt)
CE Mono (30° tilt)

Accuracy (meters)

CE = Circular Error; LE = Linear Error

GeoEye-1 exceeds NGA geolocation accuracy requirements
## Benefits of GeoEye’s Approach

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven spacecraft and design based on IKONOS architecture</td>
<td>• Risk significantly reduced to implement upgrades to regional affiliates</td>
</tr>
<tr>
<td>Best-in-class Geoeye-1 team</td>
<td>• Most advanced commercial earth imaging satellite</td>
</tr>
<tr>
<td>Uses best available sensors</td>
<td>• Increased performance and reduced schedule to implement and test subsystems</td>
</tr>
<tr>
<td>Delta II launch vehicle</td>
<td>• Proven performance launch reduces risk of launch failure</td>
</tr>
</tbody>
</table>

The GeoEye-1 program has the highest performance at the lowest risk
MJ Harden Aerial Imaging

• Photogrammetric Mapping Offerings
  – Digital Aerial Imaging
  – Orthophotography
  – Planimetric Mapping
  – Topographic Mapping
  – Field Inventory and Survey Services
  – Satellite Imagery
  – Image Analysis

• MJ Harden’s aircraft are specially equipped to maximize image quality and accuracy

• The on-board Aerial Sensor Management System (ASMS) manages the collection of all image and GPS data
Aerial Capability

- Intergraph DMC® (Digital Mapping Camera)
- 12-bit imagery
- Ground resolutions <1½" per image pixel
- Bands
  - Panchromatic (Grayscale)
  - Natural Color (RBG)
  - Color Infrared (CIR)
- One pass imaging process
Change Detection
Change Detection

Madras, India

Before Tsunami

After Tsunami
Environmental Monitoring

Santa Clarita, CA - Wildfires
Thank You!
Miscellaneous
Back Up Slides
From the Commander in Chief
Looking at Imagery...

President Bush, Vice President Cheney and former SECDEF Rumsfeld
September 17, 2001
...to US Marines Looking at Imagery in Baghdad
America Under Attack: Defining Moments for the Commercial Imagery Industry

June 28, 2000

September 15, 2001

World Trade Center Site – Before and After
America Under Attack: The Pentagon

June 3, 2001

September 12, 2001
Robust Archive Offerings for Analysis
Riyadh, Saudi Arabia

March 6, 2005 - OrbView-3 1m
December 3, 2006 - IKONOS 1m
Tsunami Post-Disaster Assessment
Blue Village Pankarang Resort, Khao Lak, Thailand

The coastline is forever altered
Simulated GeoEye-1 Color Imagery

GeoEye-1 has the sharpest color imagery available

Simulated 0.41-meter PAN Sharpened Natural Color