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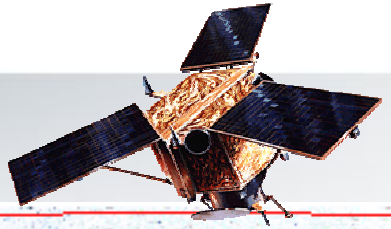
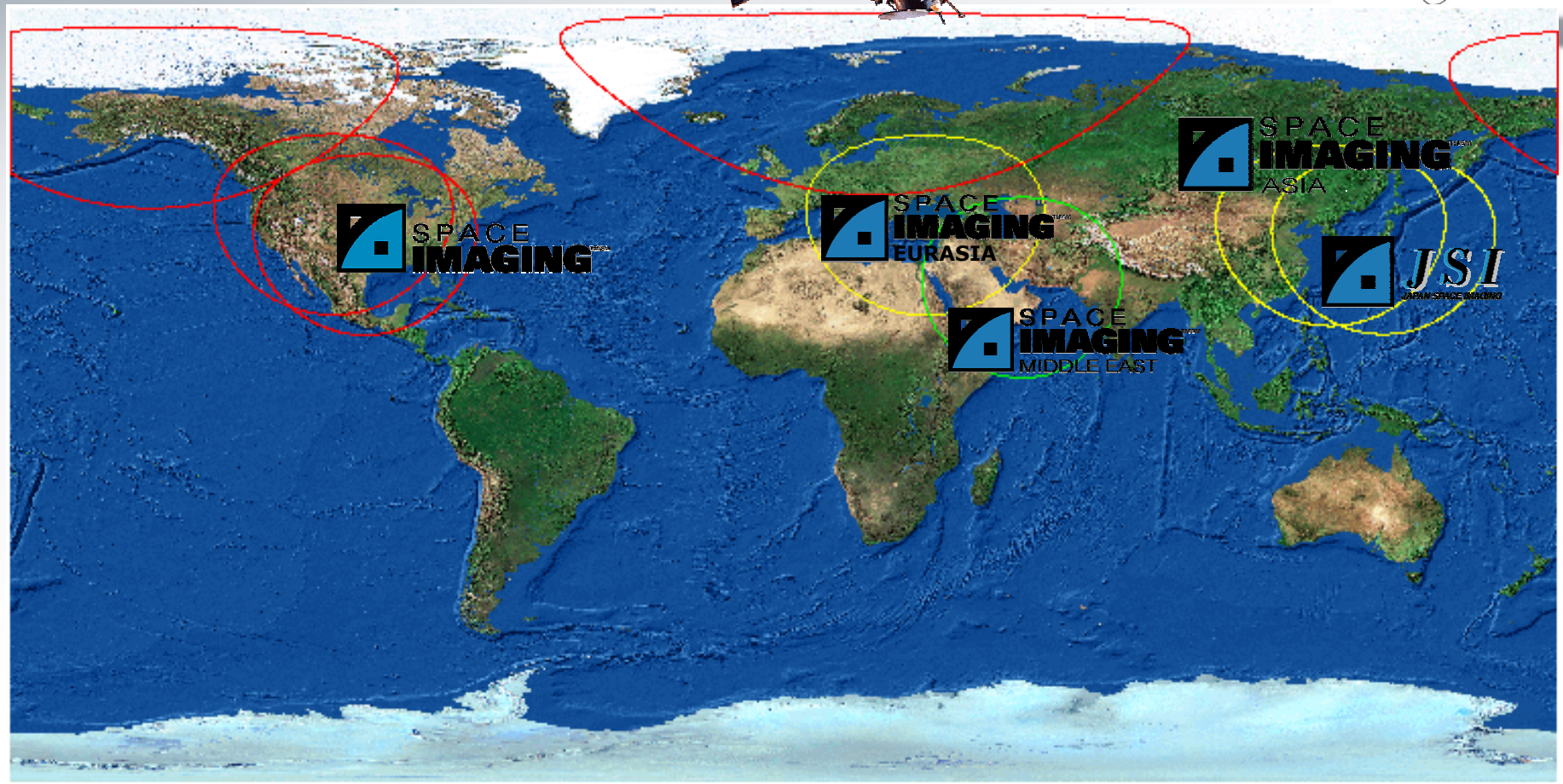
# IKONOS Overview and Operational Status

Bradley A. Peterson
Executive Director, IKONOS Production

# IKONOS Commercial Global Network



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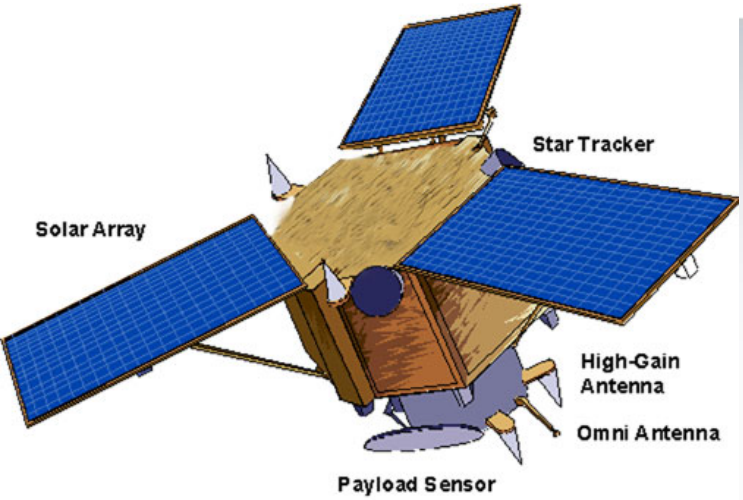
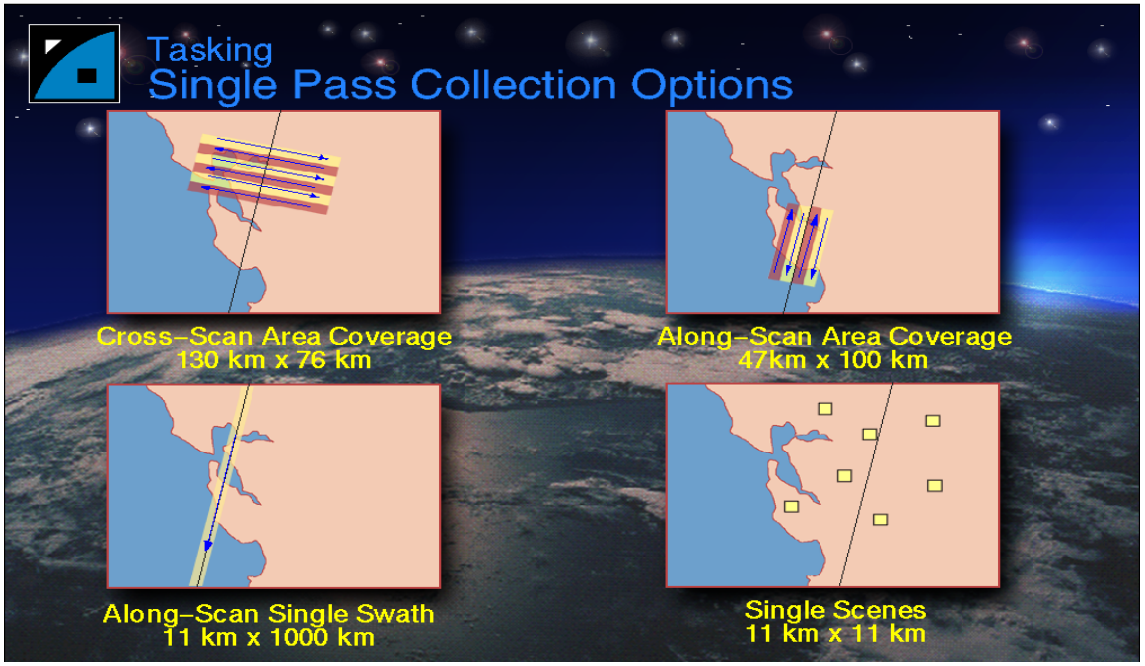
# IKONOS Satellite Operations




- 680 km polar orbit
- Simultaneous collection of Pan and MSI data
  - 0.82m Pan GSD at Nadir
  - 3.3m MSI GSD at Nadir
- Linear detector arrays scanned in any direction
- 11km swath at nadir

- Flexible collection planning
- Same-pass stereo imaging
- >20,000 sqkm per pass for large area
- Point target collection every 10 sec

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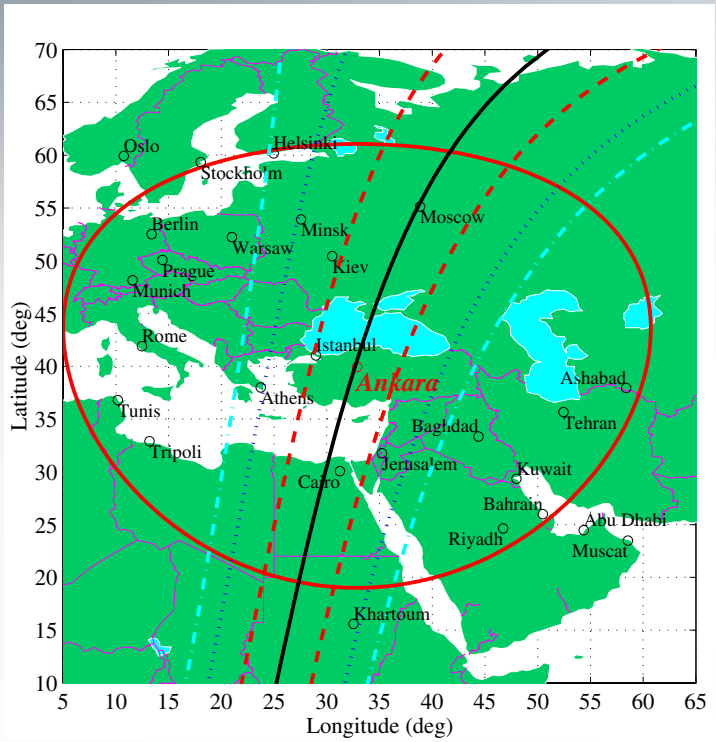
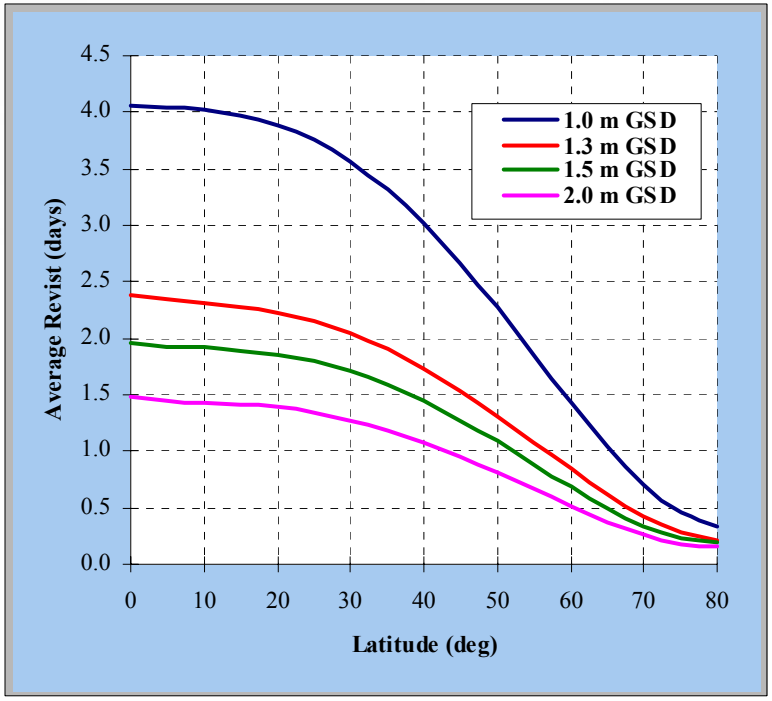
# IKONOS Satellite Operations




| GSD (m) | Obliquity (deg) | Cross-track (km) |
|---|---|---|
| 1.0 | 26 | 350 |
| 1.5 | 44 | 700 |
| 2.0 | 51 | 930 |

- Typical access to 45 deg. obliquity (1.56 m GSD)
- Some limitations on access to 51 degree obliquity (2.0 m GSD)
- Cross-track viewing improves revisit times

**Average Revisit Time vs. Latitude**

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# IKONOS Production Operations

- Highly integrated, supercomputer system provides significant production capacity
  - Ingest and Archive > 125,000 sqkm per day
  - Automated, High Volume Production
    - > 300 products per day
    - > 300 CDs per day / 25 DVD per day
    - > 200 GB data delivered per day
    - > 10,000 sqkm in single mosaic product (60 GB of data)
  - Over 16 million sqkm produced to date
- 2 years of experience has established operational excellence
  - Knowledgeable team
  - Capability for large and complex projects
  - Error rate < 1%

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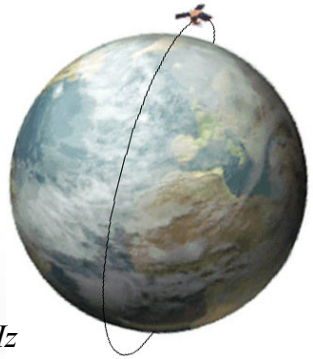
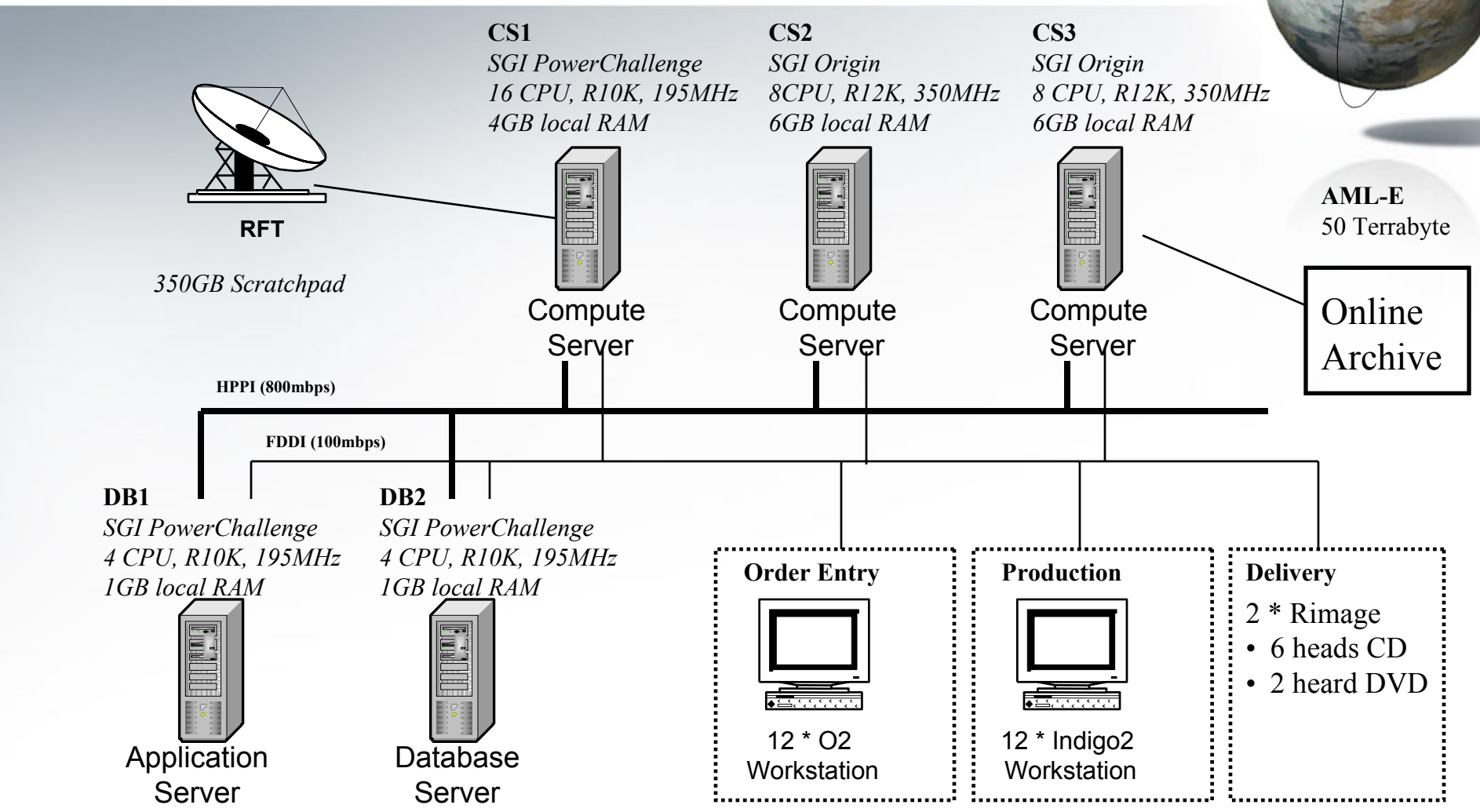
# IKONOS Production System



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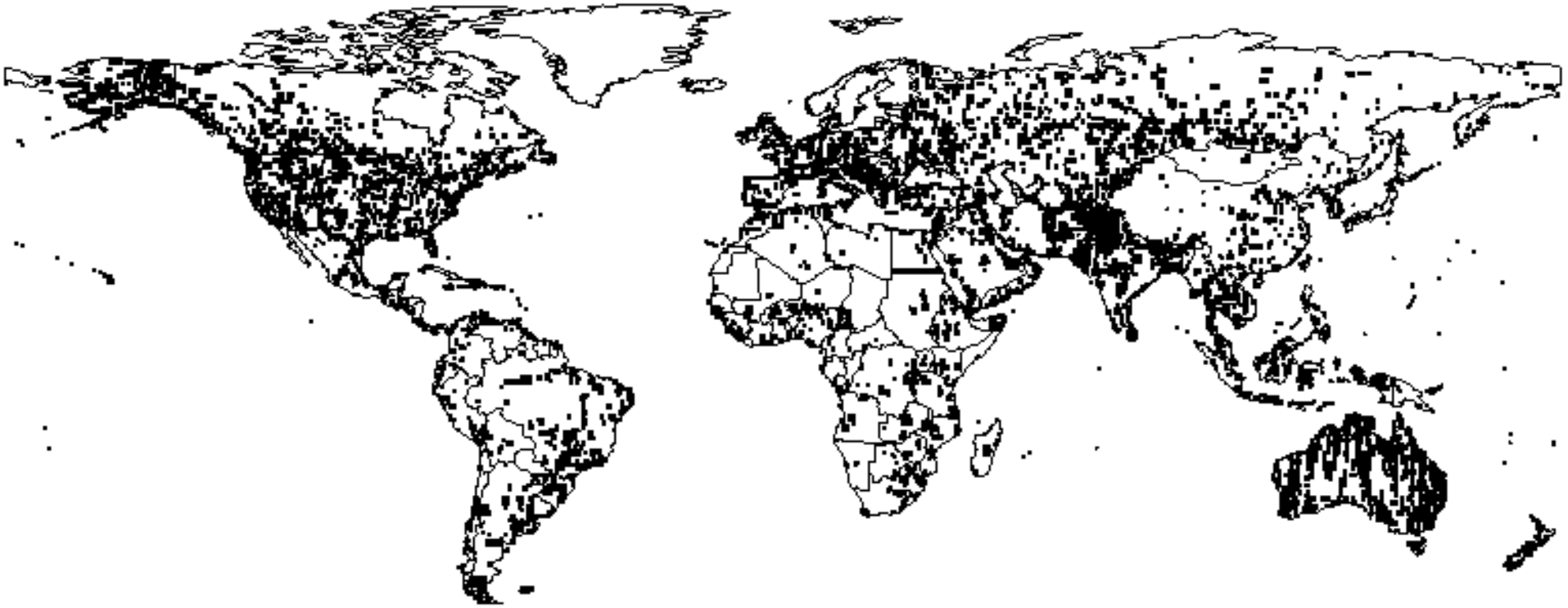
# IKONOS Image Archive



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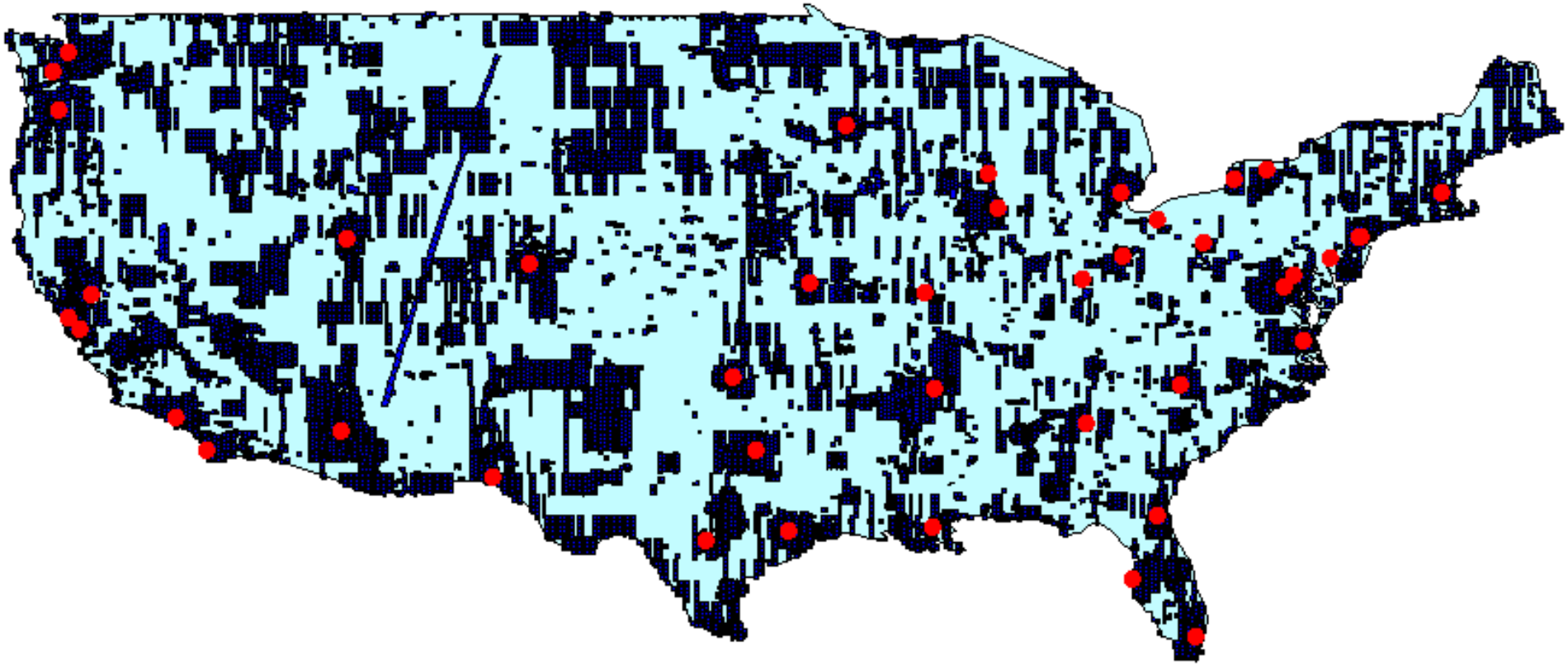
# IKONOS Imagery Archive

Extensive Ortho-Ready Archive of Most Major US Cities



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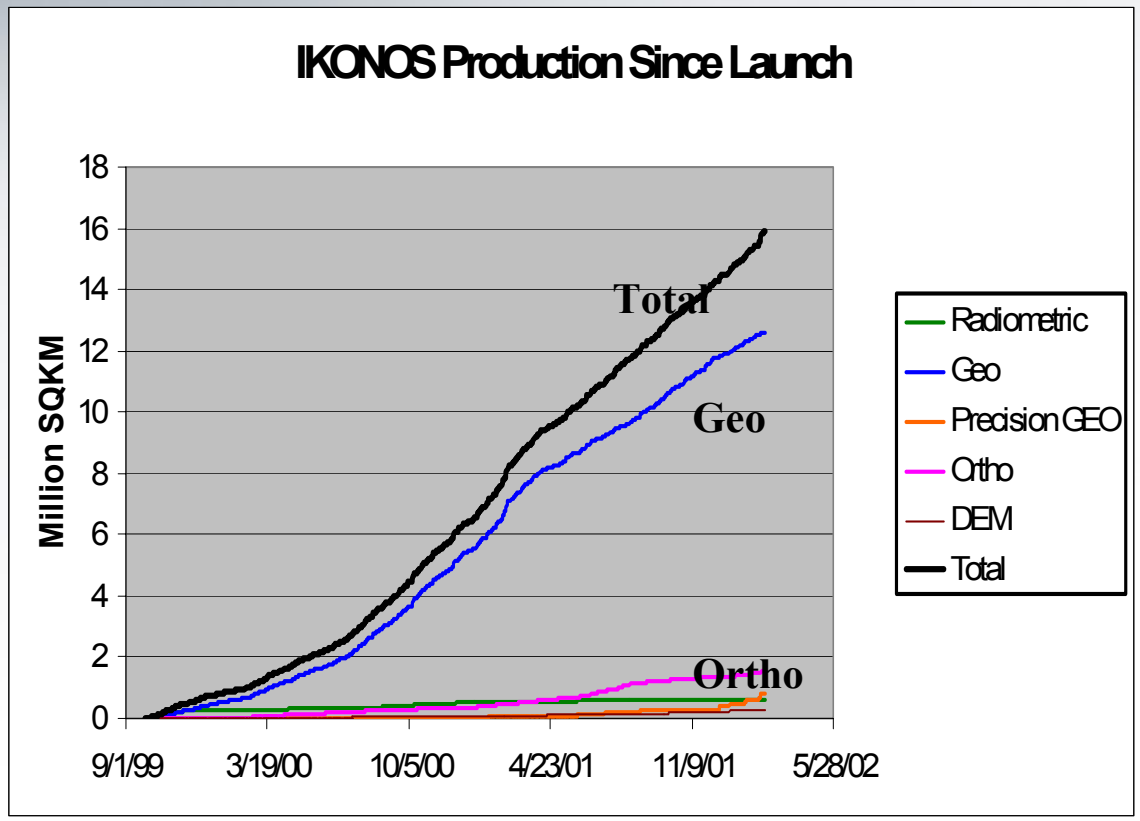
# IKONOS Production to Date




- 16 Million sqkm produced to date
- Highlights
  - 12,600,000 sqkm GEO
  - 1,600,000 sqkm Ortho
  - 260,000 sqkm DEM

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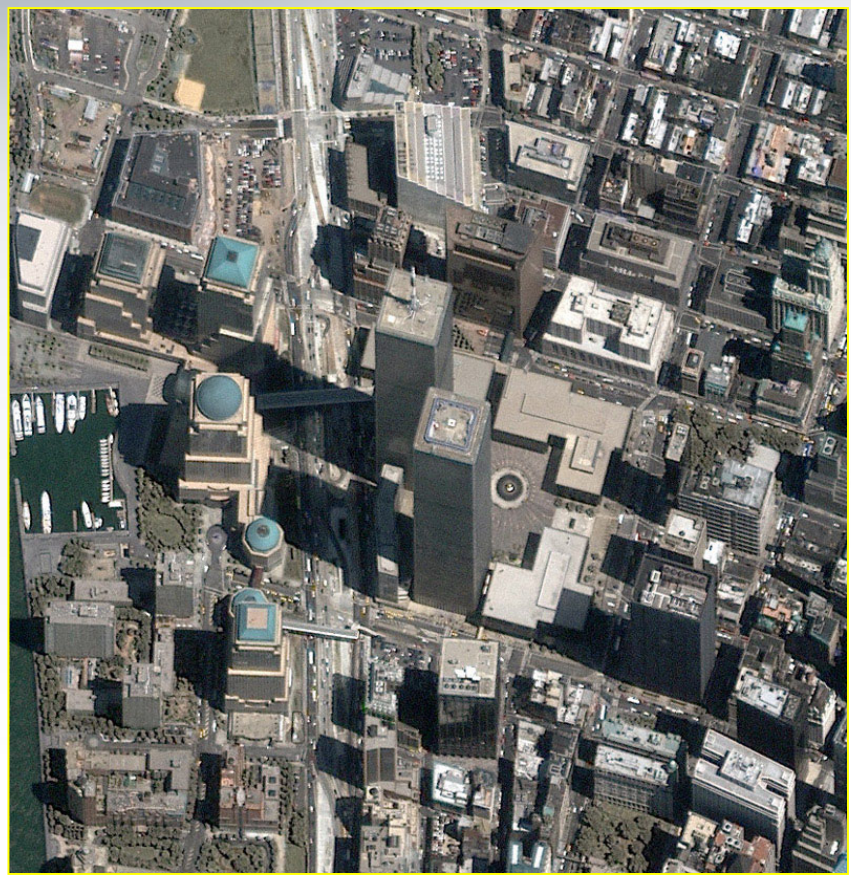
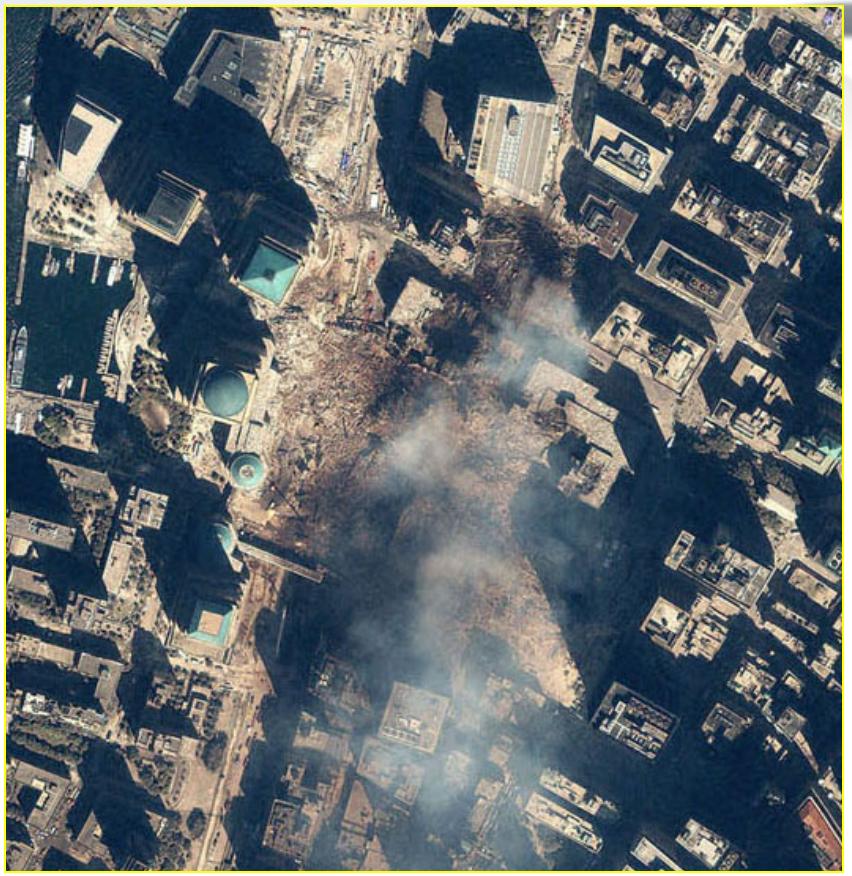
# September 11, 2001





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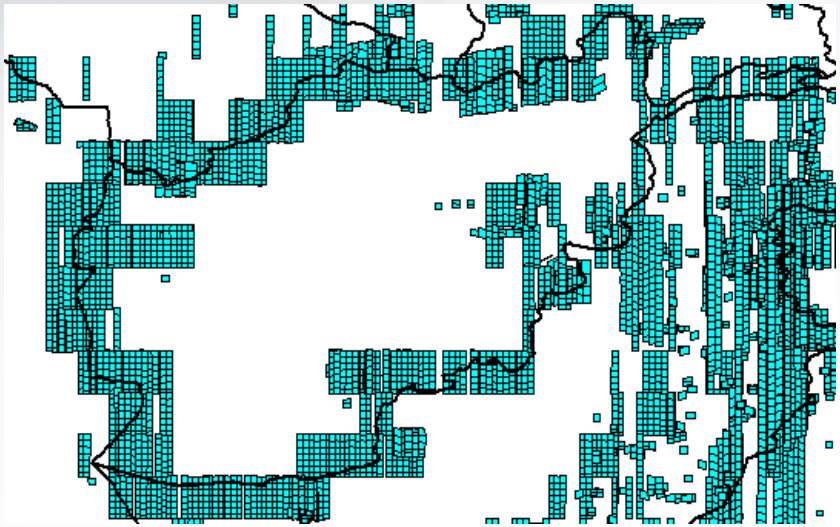
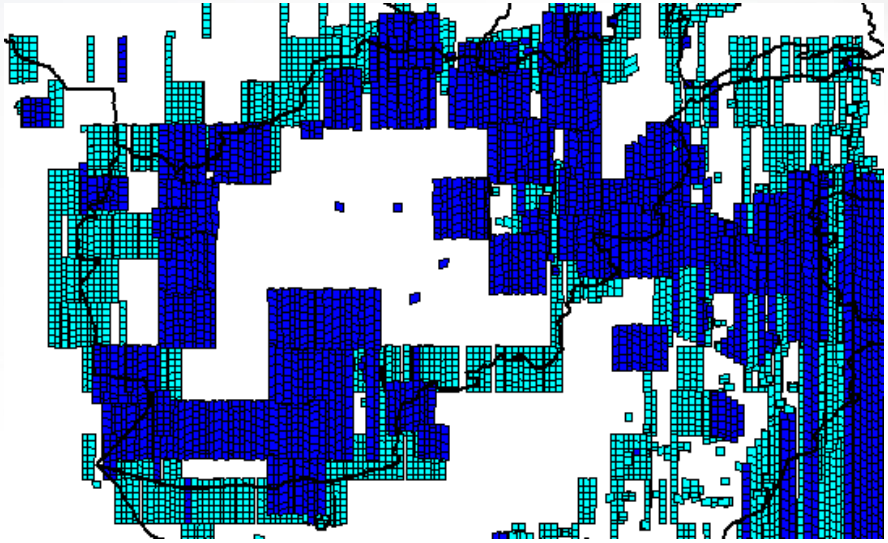
# Enduring Freedom Support

IKONOS Archive 9/11/01



IKONOS Archive 3/13/02



- ***1/3 of Afghanistan collected in 3 months***
- ***Next day delivery of all collections***

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# Kandahar Airport 10/10/01

This data captured from same scene….

- Fighter captured on bombing run
- Bomb damage of Kandahar airport

*Note: misregistration of MSI data due to high-speed moving target*

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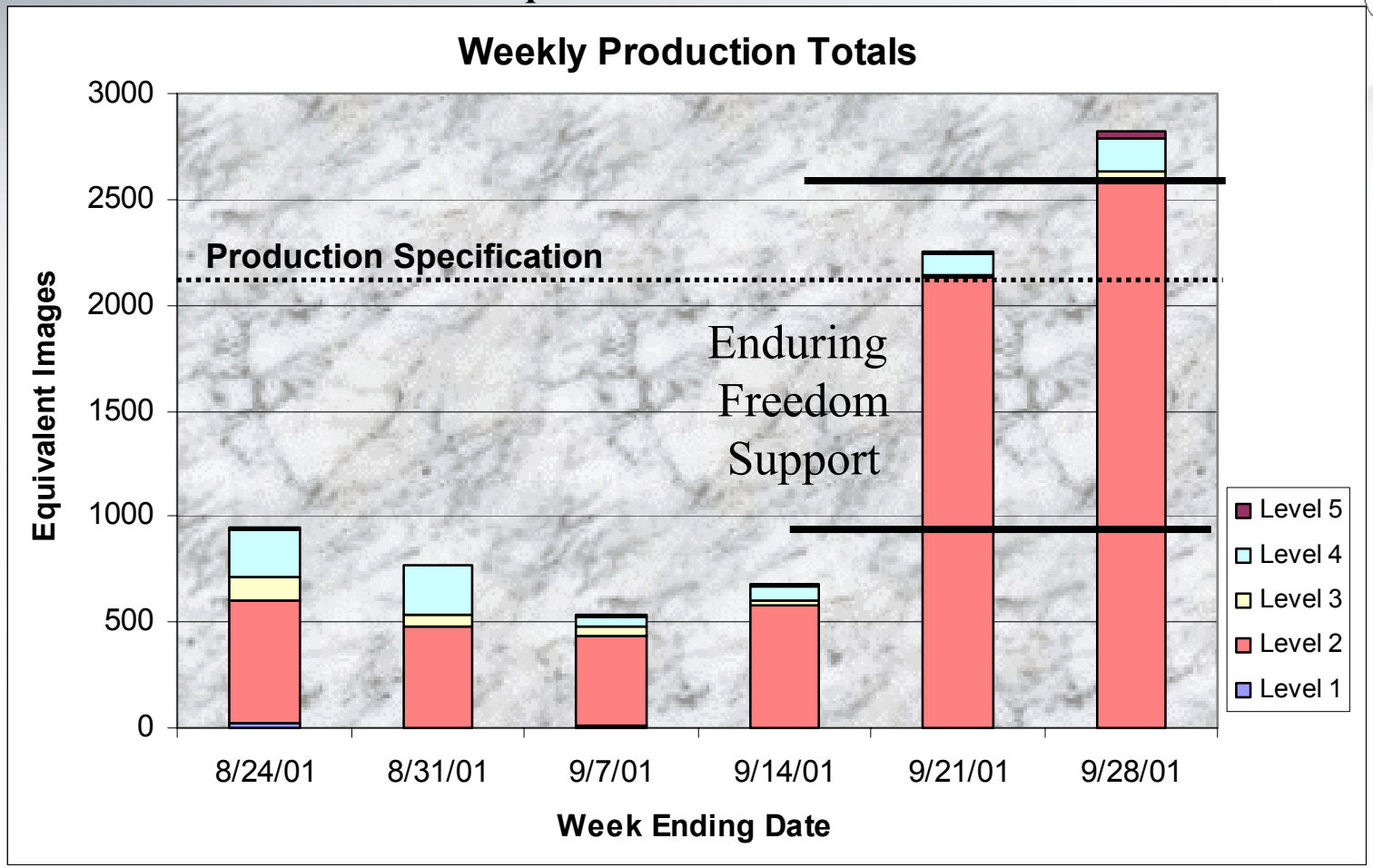
# Production Surge Capability

* No Additional Personnel Required

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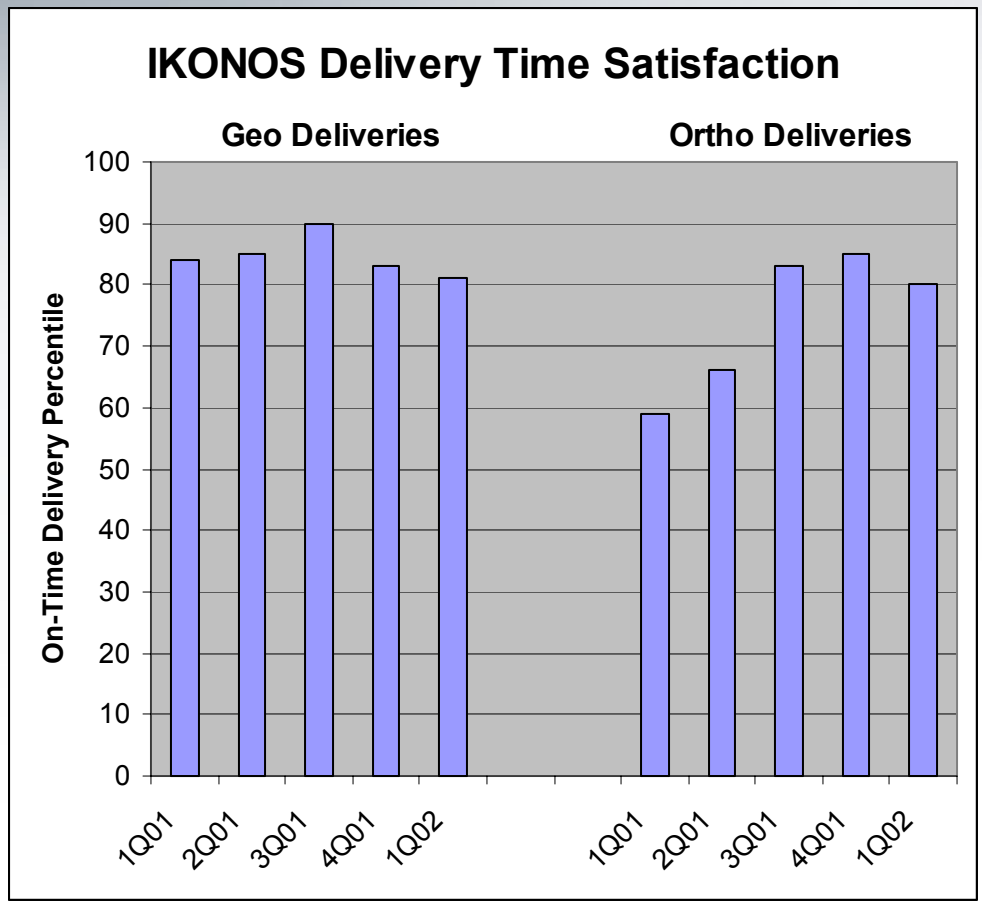
# IKONOS Delivery Times




- Excellent achievement of on-time delivery
  - All commercial orders
  - Worldwide
  - All weather conditions
    - Columbia, UK, Nigeria
- Substantial improvement of delivery of orthorectified products
  - Process established, proven, and routine
  - Only 2 accuracy returns in history of IKONOS

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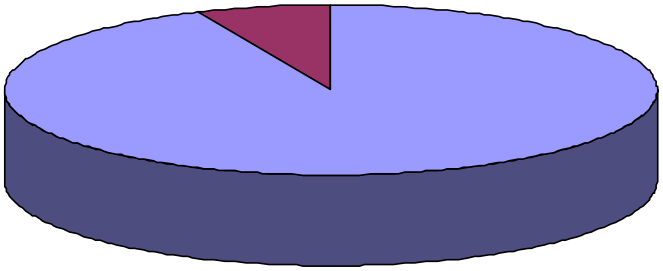
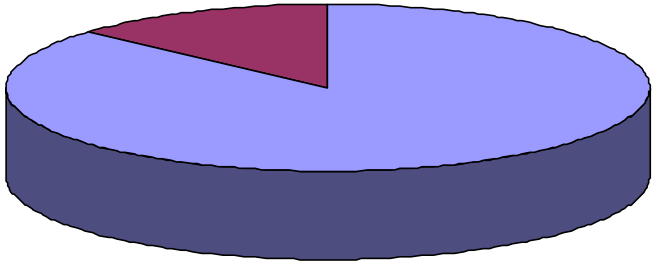
# Key Development - Large Orthomosaics

2000 Ortho/Geo Production



2001 Ortho/Geo Production



- Significant growth in IKONOS Ortho production
  - 2001 production double that of 2000
  - High demand for future production
- Development activities target capability and high capacity for large orthomosaics
  - Superior Quality
    - Shearless
    - Tonally Balanced
  - First-time right
    - Minimization of rework
    - On-time
  - High throughput
    - 30,000 sqkm a week

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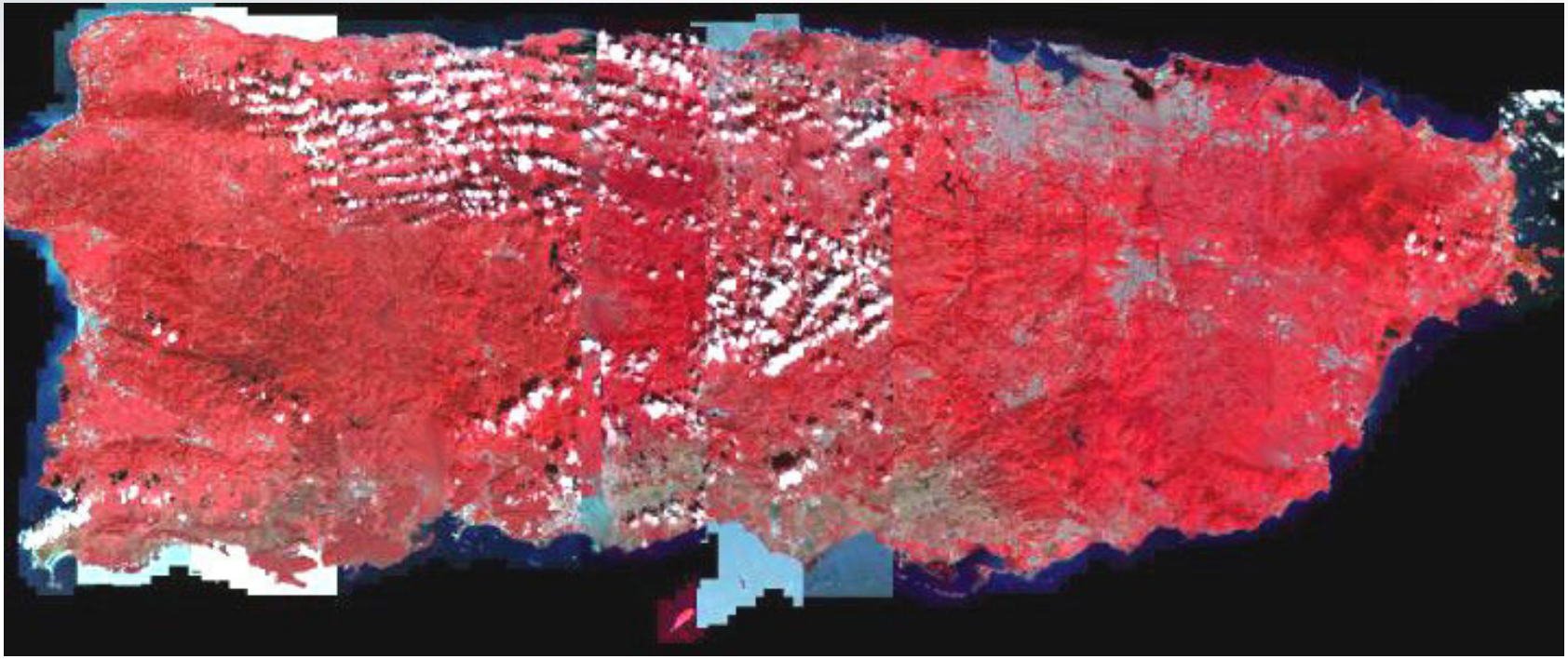
# Large Projects are Routine

- Puerto Rico in production as we speak
- Second-largest commercial IKONOS orthomosaic delivery
- Production and Delivery < 3 weeks



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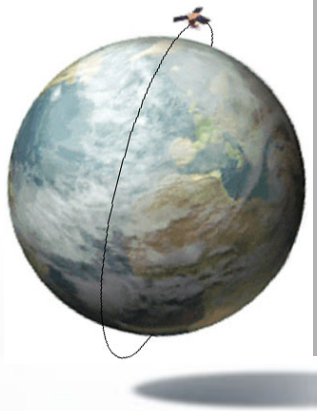
# IKONOS Status Summary



- Global Network of Regional Affiliates operational
- Performance of all system elements exceed requirements
  - Satellite Operations
  - Production Operations
- Extensive archive available
- Operational excellence established in 2 years of operations
  - Image Quality
  - Geometric Accuracy
  - Radiometric Stability
  - Delivery Times
  - Low Error Rate