Capitalizing on the Operational Use of SAR Satellites for Near Real-Time Applications

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Outline

• Success Drivers for Operational Services
• The Evolving Definition of “Near Real-Time”
• Application NRT Requirements
• RADARSAT: A Mission Designed for Global NRT
• NRT Performance Metrics
• Case Study: Service to EMSA
• Conclusions and Summary
Success Drivers for Operational RADAR Services

• Operational applications are dependent on multiple mission and sensor characteristics

• Each SAR mission has its own strengths and weaknesses in these areas

• In this presentation, we highlight the importance of those factors that enable successful Near Real-Time service provision
The Evolving Definition of “Near Real-Time”

Near real-time\(^1\): The delay introduced between the occurrence of an event and the use of the processed data. The term implies that there are no significant delays.

- What constitutes a “significant” delay, depends on both
  - The application; and
  - The expectations of the user community

- In the world of space-based monitoring and surveillance, the definition of NRT has undergone an evolution from:

  - **Circa 1995**: Within 4 hours of receipt of data at a ground terminal
  - **Today**: Less than 15 minutes from image acquisition

NRT Requirements Span Multiple Applications

- An expanding set of operational applications require NRT service levels

- RADAR is well suited to provide NRT service for these operational applications because:
  - Acquisitions are weather independent
  - Acquisition modes can be optimized/tuned for the application
  - Data processing can be highly automated.
RADARSAT: A Mission Designed for Global NRT

- 24 x 7 on-call order handling customer support service

- Highly responsive tasking timelines.

- Extensive network of global direct downlink stations.

- Rapid, high throughput data processing and delivery systems.
Enabling NRT: Direct Access to RADARSAT-2

- **Direct downlink access from RADARSAT-2**
  - For partners that operate Network Stations
  - Provides a secure environment for rapid delivery
  - Enables near real-time processing and services

- **Telemetry agreements**
  - Allows direct order placement to the Order Desk
  - Committed volume at discounted rates
• New reception facilities in Canada's north enhance global NRT services.
• Northern access, however, is not a silver bullet.
• A global network of stations is required to minimize data latencies.
A Major Percentage of MDA Deliveries are NRT

Standard Image Products

- NRT: 44%
- Regular: 51%
- Rush: 5%

Value Added Products
(Ship Detection, Oil on Water, Flood Mapping, Change Detection)

- NRT: 78%
- Regular: 13%
- Rush: 9%
Driving Down Data Latency To Maximize Value

Histogram of MDA NRT Delivery Performance: April 2013 to March 2014

- 50% of image products delivered in less than 30 minutes
- 90% of image products delivered in less than 90 minutes
Optimizing for the Canadian Ice Service

Histogram of MDA NRT Delivery Performance for CIS: April 2013 to March 2014

• 89% of all image products delivered less than 25 minutes after acquisition
Case Study: NRT Services in Europe for EMSA

- Operational RADARSAT-1 and RADARSAT-2 data supply since 2007
- Direct real-time downlink to multiple European reception sites
- NRT delivery requirement of \( \leq 30 \) minutes.
Summary

- Market requirements for NRT services are becoming increasingly demanding.

- The RADARSAT mission has been optimized to meet those evolving demands, supported by a business organization that is focused on meeting the operational requirements of NRT users.

- A network of reception facilities is employed to minimize data latency and maximize value for global clients.

- Data latencies of < 30 minutes are being consistently achieved to serve the needs of operational clients.