

Hyperspectral A Canadian User Perspective

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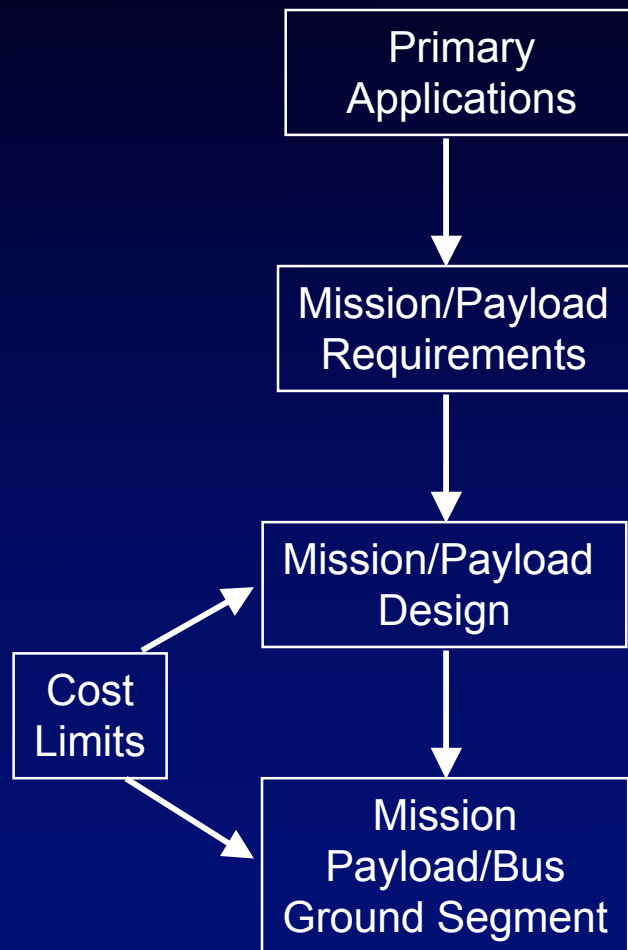
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A User Perspective - Outline

- User requirements (focus of mission)
- Data coverage and revisit
- Data quality
- Products to be delivered
- Data/product cost
- Delivery Time
- Data policy
- Pre-launch/post launch activities

Canadian Primary Applications



- Geological mapping of the Canadian North
- National forest inventory and health
- Environmental mapping (polluted site rehabilitation, wetlands)
- Coastal and in-land productivity assessment of aquatic ecosystems and its impact on fisheries and pollution
- Monitoring of carbon sources and sinks on land
- Support to agricultural indicator development and land cover and crop inventories

User Perspective Recommendation (1)

● Type of Mission

- Pre-operational/operational mission to provide easy access to data to fulfil the need of governments, industry, and scientific community
- Satellite life of 5 years
- Combination with other sensors on the same platform as required to meet user requirements (e.g., Pan, MIR/TIR).
- Formation flying with other missions (e.g., hyperspectral)

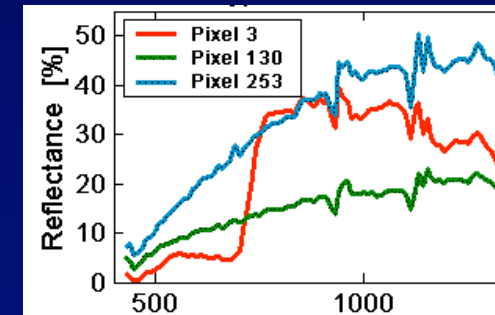
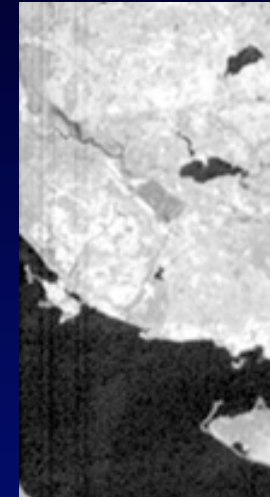
User Perspective Recommendation (2)

- **Area coverage and revisit time**
 - Provide routine (spatial, temporal) coverage of regional areas.
 - ◆ For example, mapping of the whole of Canada's land surface within the mission lifetime.
 - ◆ Mapping of any geographic area worldwide.
 - ◆ Coverage as much as possible ($\geq 600,000$ km² per day) - dependent of swath width and down link capacity
 - ◆ < 4 -day revisit time to increase the chance of data acquisition over a specific area

User Perspective Recommendation (3)

● Data Quality

- AVIRIS-in-space capability; i.e., a well-calibrated, uniform, and stable sensor between 400 to 2500 nm.
- Well developed and validated algorithms and procedures
- Establishment of accuracy requirements and standards



User Perspective Recommendation (4)

- **Products to be delivered?**
 - Calibrated at-sensor radiance data (free of sensor artifacts)
 - Surface reflectance data
 - Georeferenced products
 - Information products (depending on the focus of mission)
 - Meta data appended to the products
 - Data and information products in a format that is compatible with commonly used commercial formats that can be interpreted by both GIS and image analysis tools.

User Perspective Recommendation (5)

- **Tasking and data/product delivery time**
- Normal operations
 - Latency for tasking latency < 7 days
 - Latency for data processing < 3 days
- Emergency Response
 - Latency for tasking 1/2 day
 - Latency for data processing < 1/2 day

User Perspective Recommendation (6)

- **Data/product cost**
 - Scientific users pay \leq production cost
 - Other users pay \geq production costs
 - (commercial mission different pricing structure)

User Perspective Recommendation (7)

- **Data Policy**

- Critical for sharing data and information
- Open, no copyright; similar to Landsat-7

User Perspective Recommendation (8)

- **Pre-launch activities**
 - Applications development program
 - ◆ Expose/familiarize community with the type of data for use after launch
 - ◆ Establish algorithms/procedure necessary to generate the information products
 - ◆ Training
 - ◆ International participants
 - Calibration strategy (on-board/scene-based)
- **Post-launch activities**
 - Continuation of application development program
 - ◆ Validation of algorithms/procedures with real data
 - ◆ Further development of algorithms
 - Support of scene-based calibration activities