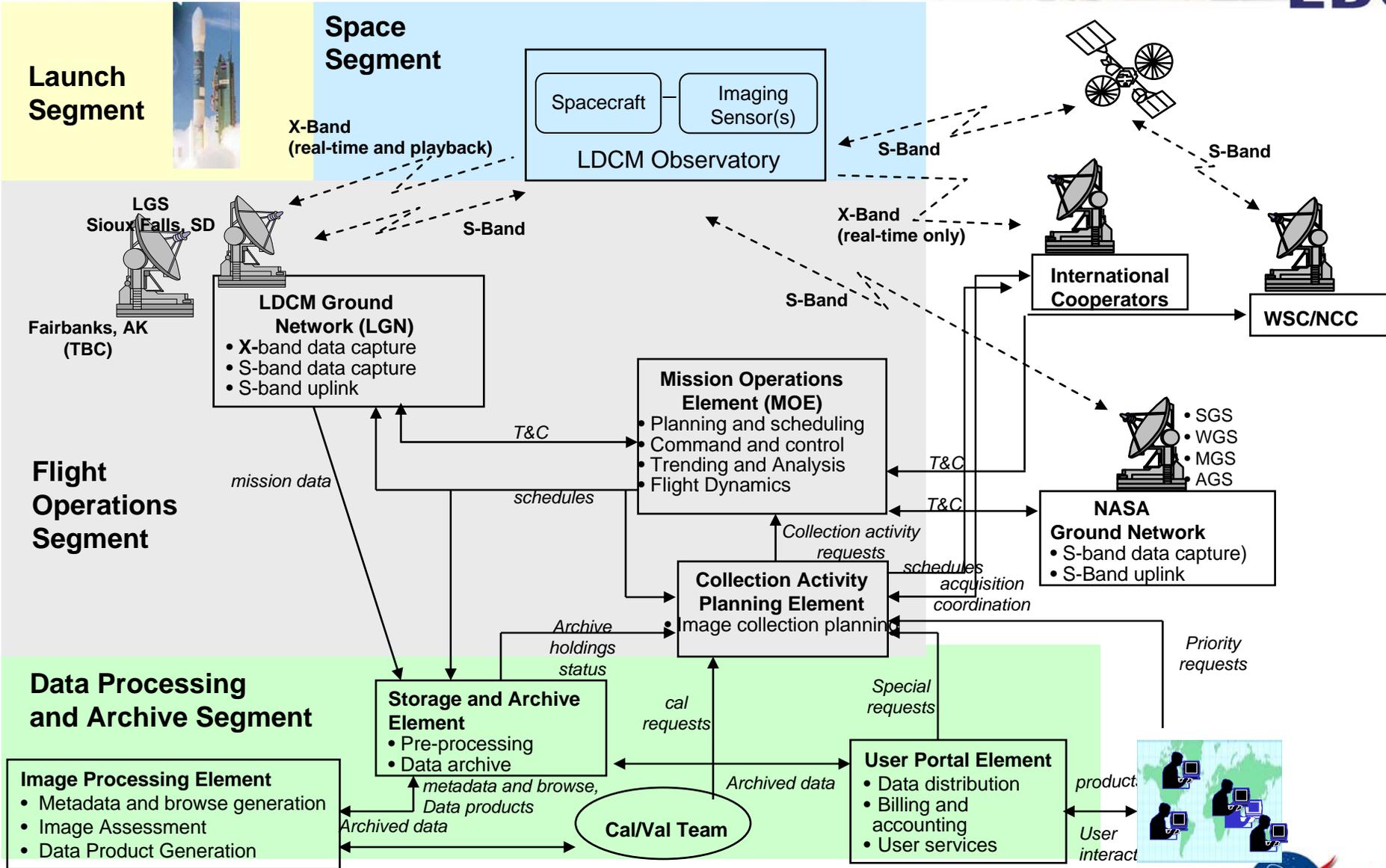


# LDCM Operations Concept

LDCM



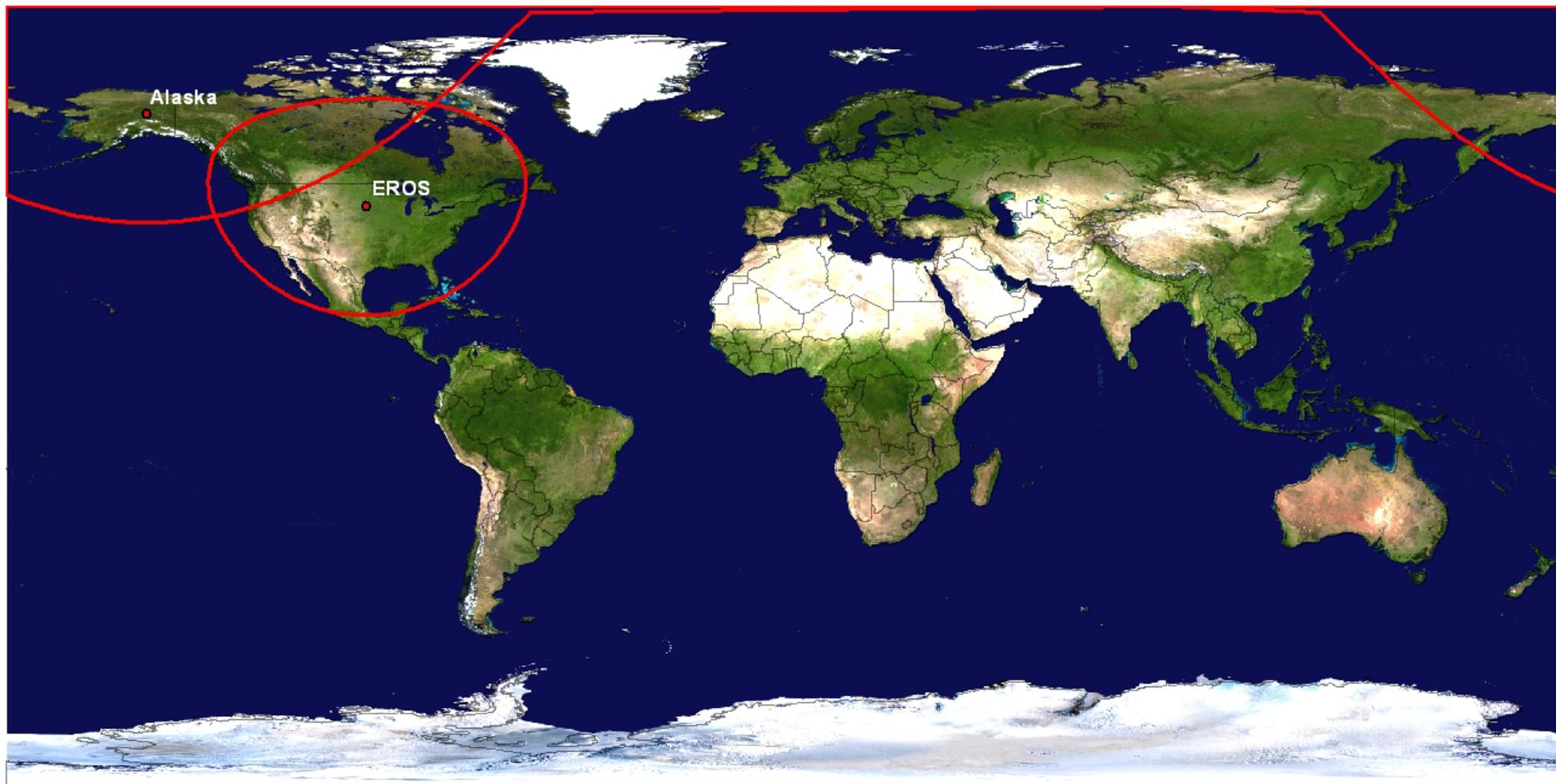
# LDCM Facilities Locations

LDCM

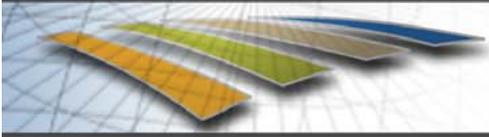


# LGN Primary Stations

LDCM



**This map does not show the TBD backup station or stations**



## Operations Flow (1 of 5)

**LDCM**

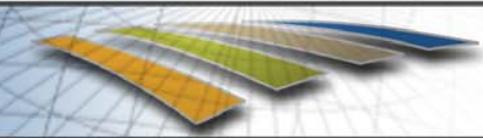
- **Collection Activity Planning Element (CAPE)**
  - **Compiles and de-conflicts requests for image data**
    - GMAP collection requirements
    - Science requests
    - IC requests (standing and special)
    - Cal/Val requests
    - Special requests
  - **Denotes priority and protected scenes**
  - **Generates a 72-hour path/row-based scene list, optimized for GMAP and cloud cover predications**
  - **Sends updated scene list every 24 hours to the MOE**
  - **CAPE operators can generate collection schedules spanning any duration up to 72 hours**
  - **CAPE operators can generate collection schedules more often or less often as required**
  - **CAPE supports pre-scheduled un-staffed collection schedule generation**
  - **CAPE provides all IC interfaces for simplification**
    - Manages IC downlinks



## Operations Flow (2 of 5)

**LDCM**

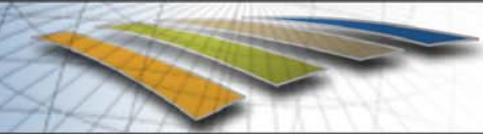
- **Mission Operations Element (MOE)**
  - **Converts CAPE scene requests to imaging intervals**
  - **Plans and schedules observatory activities, including**
    - Imaging intervals
    - Maneuvers
    - Non-Earth imaging (lunar, solar) calibration events
    - Observatory maintenance
    - Ground station contacts, including scheduling of priority data downlinks
  - **Performs observatory recorder management**
  - **Provide schedule feedback CAPE, DPAS, LGN; and observatory constraints to CAPE**
  - **Receives and uploads flight software updates**
  - **Generates and encrypts all commands**
  - **Sends commands to LDCM Ground Network**
    - 72-hour command load sent every 24 hours
    - New command load supersedes and “retires” current command load
  
- **LDCM Ground Network**
  - **Transmits S-band communications to Observatory**



## Operations Flow (3 of 5)

**LDCM**

- **Observatory Mission Data Collections**
  - **Nadir image collection (day or night passes)**
    - Collects nadir image data
  - **Off-nadir image collection (day or night passes)**
    - Executes maneuver to off-nadir position
    - Collects off-nadir image data
    - Executes maneuver to nadir-look position
  - **Lunar calibration (~once per 28 days)**
    - Executes maneuver to moon-look position
    - Images moon, re-maneuver
    - Images moon, re-maneuver, etc.
    - Executes maneuver to nadir-look position
  - **Other calibration operations as required by sensor design**
  - **Stores all image and calibration data**
  - **Generate and store housekeeping telemetry data**



## Operations Flow (4 of 5)

**LDCM**

- **Observatory Data Handling and Transmission**
  - **Downlink two channels to an LGN station**
    - **Realtime + playback, or dual-playbacks**
  - **Downlink same realtime data to up to 3 IC's simultaneously**
  - **Two channels to an LGN plus one IC station**
  
- **LGN**
  - **Receive X-band data**
  - **Provide feedback to MOE on status of individual intervals**
  - **Reconstruct intervals from multiple contacts and/or re-transmitted data**

The graphic features a stylized globe on the left with several colored arrows (yellow, green, blue) pointing towards the right. The text "Operations Flow (5 of 5)" is centered over the globe. On the right side of the graphic, the letters "LDCM" are displayed in a large, bold, blue font.

## Operations Flow (5 of 5)

- **DPAS**

- **Ingest data**
  - Automated cloud cover assessment
  - Browse and metadata generation
- **Archive data**
  - Populate data inventory
- **Data Production**
  - Standard products
  - User-specified products
- **User Portal**
  - Online access to standard products
  - Interface for user-specified product requests
  - Access to technical documentation

- **Science**

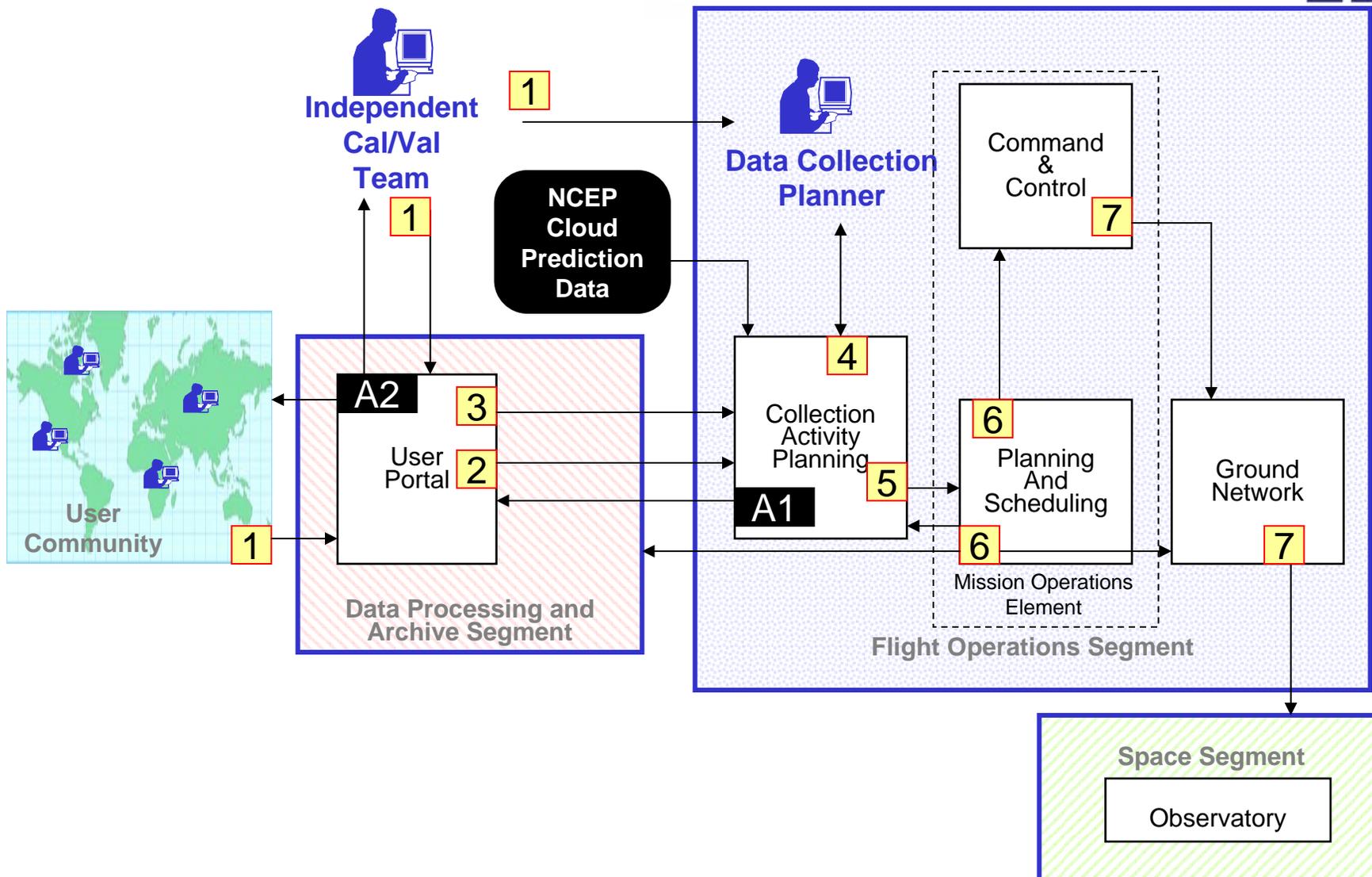
- **Calibration and Validation**
  - Characterization, correction, and calibration of instrument data
  - Quality Assurance of products
  - Document requirements through communications and outreach to the user community



## Backup Materials

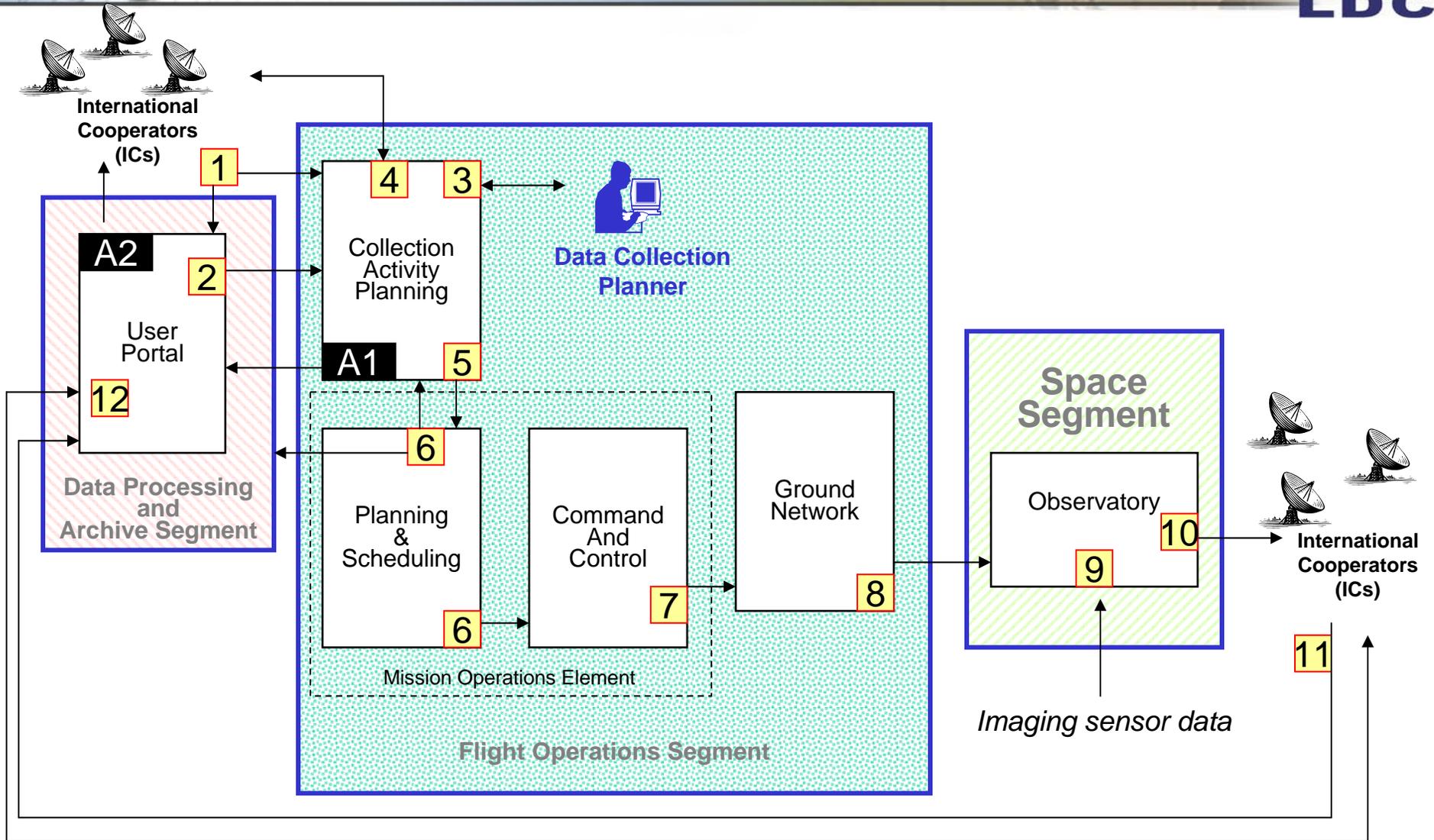
Figure 5-2

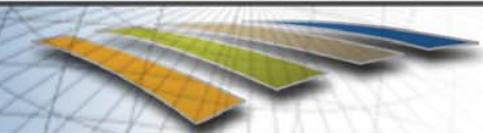
LDCM



# IC Scenario Slide

LDCM



 Draft LDCM Operations Concept for International Cooperators (ICs)  


- **The observatory will transmit real-time X-band data to ICs**
- **All real-time data will also be stored on board for subsequent downlink to a USGS LDCM ground station.**
- **All LDCM image scheduling will be performed by the Collection Activity Planning Element (CAPE)**
  - **As with Landsat 7, LDCM science data collections will primarily be selected based on requirements in a Global Mission Acquisition Plan (GMAP, formerly LTAP)**
  - **ICs will submit requests for imaging sensor data collections and downlinks to the CAPE.**
  - **CAPE generates an optimal image collection schedule based on GMAP, IC requests, cal/val requests, other special requests, and cloud cover predictions**
- **All IC interfaces will be with CAPE**