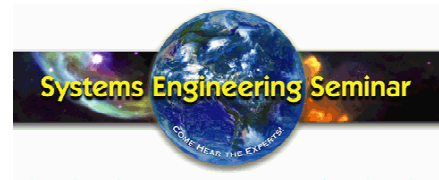


Science Goal Monitor

presented by
Sandy Grosvenor

Experiments with Sensor Webs using EO-1, March 2, 2004

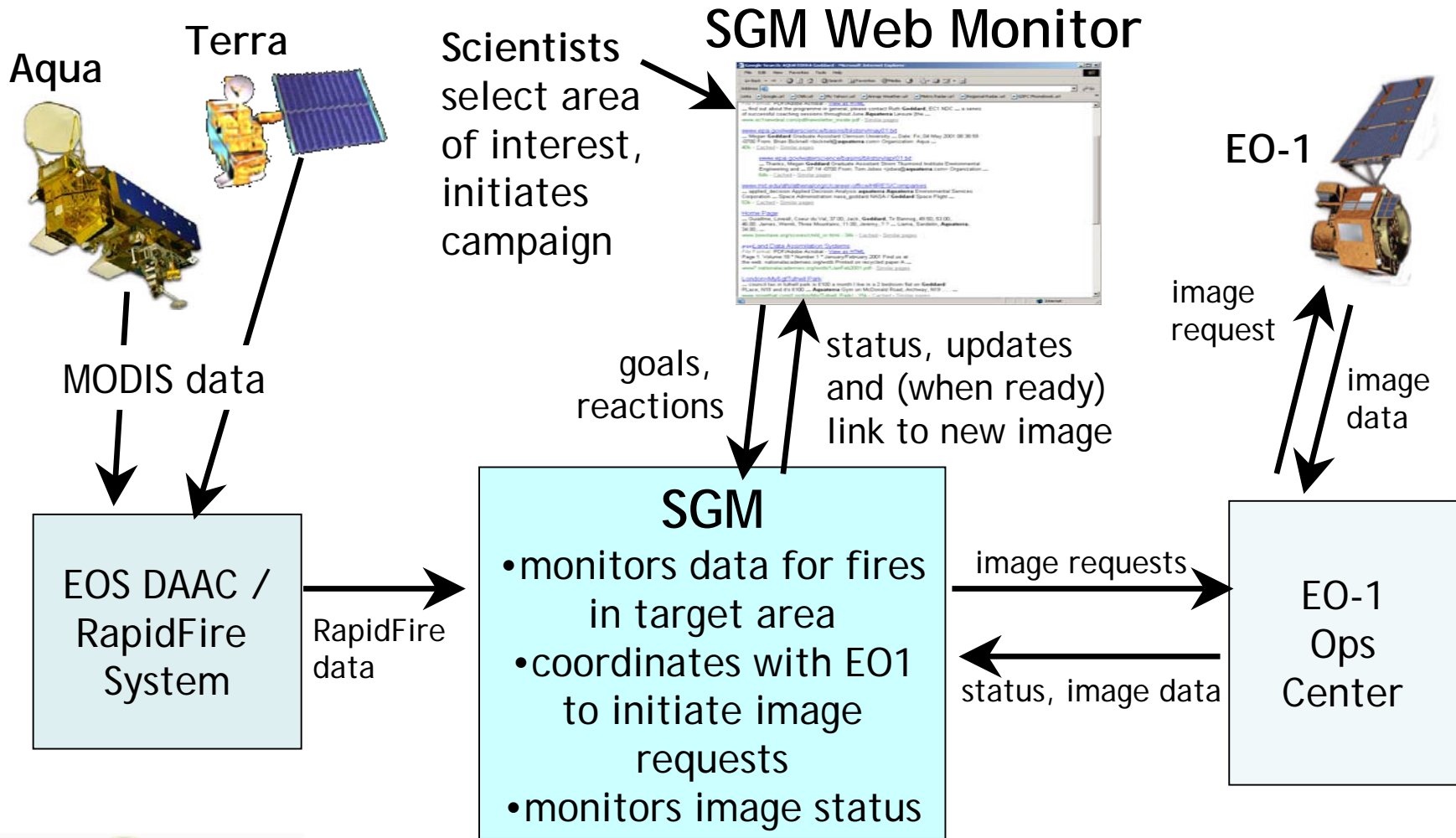
SGM can be found at <http://aaaproduct.gsfc.nasa.gov/SGM>



- What is the Science Goal Monitor
- SGM and the EO-1 Sensor Web demos
- SGM Architecture
- Other SGM collaborations

- Captures scientifically expressed goals and reactions for executing science campaign
- Autonomously processes goals: monitoring data from independent sources and reacting dynamically when specified goals are met
- Provides coordinated response to data received from multiple independent resources (missions, sensors, or theoretical models)

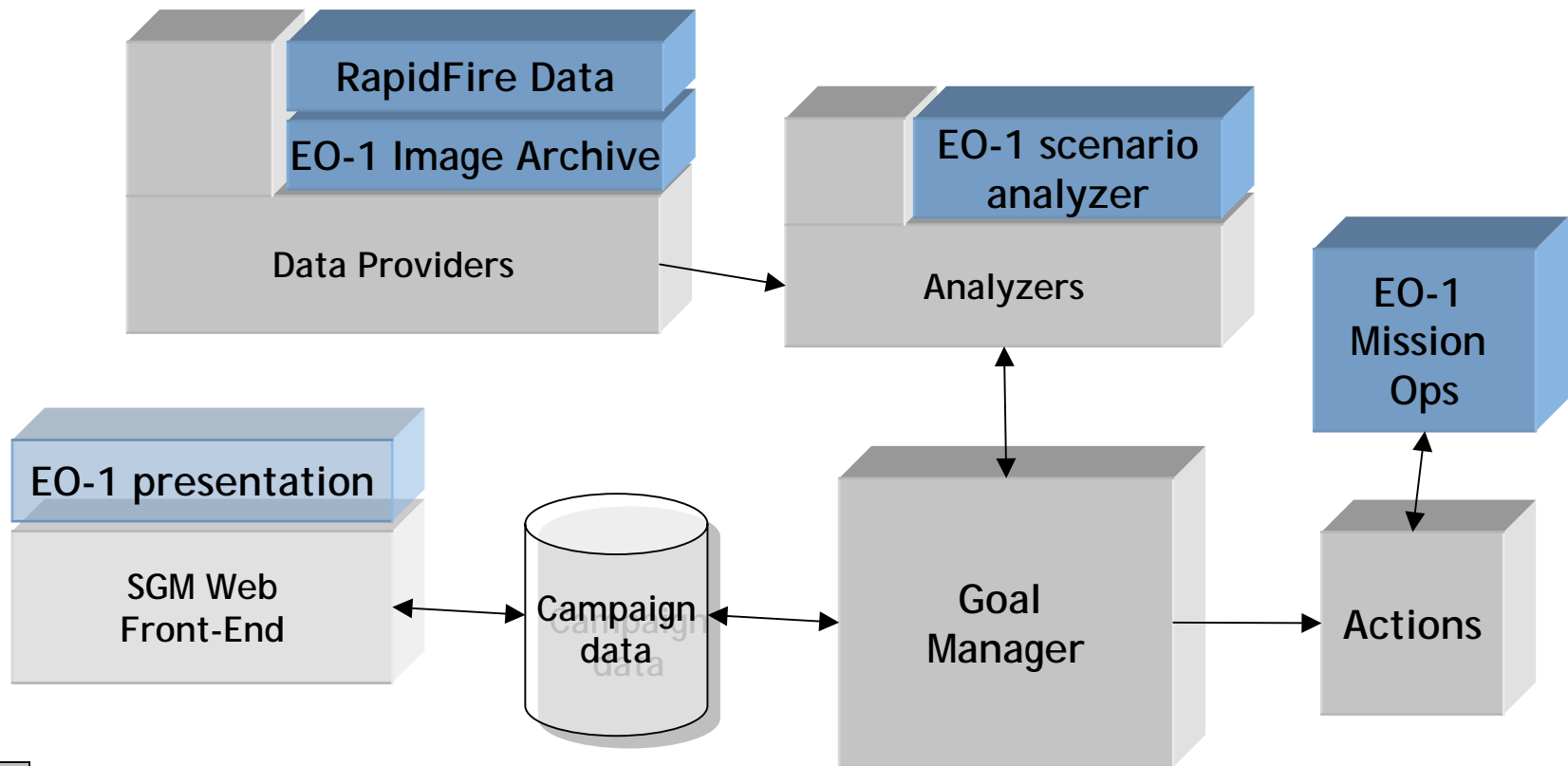
- Prototype designed for a distributed environment: some analysis onboard, some on the ground
- Low TRL, small development team
- Funded through NASA's Computing, Information And Communication Technologies - Intelligent Systems (CICT-IS) program





- SGM provides data analysis and autonomous coordination between multi-mission data sources
- SGM web interface gives scientists ability to initiate campaigns and monitor status of campaign
- Can perform either short-term event driven campaign or longer term monitoring campaigns

- Core monitor is 100% Java, OS independent
 - currently developing and testing in both Linux and Windows environments
- Development tools all open source or freely available
 - Java; Eclipse; Tomcat; databases such as mySql, PostgreSQL, Hsqldb
- “Plug-in” modules let SGM monitor multiple data sources including POP email text messages, FTP, or other protocols

SGM Components



-  = Core SGM Component
-  = EO-1 Plug-In Component

Experiments with Sensor Webs using EO-1, March 2, 2004

SGM can be found at <http://aaaprod.gsfc.nasa.gov/SGM>



Web Interface

SGM EO-1 SENSOR WEB DEMO

- Commands**
- [Edit Campaign](#)
 - [Delete Campaign](#)
 - [Home](#)
 - [New Campaign](#)
 - [Log Off](#)

Campaign Details

Image the most recent significant fire

Campaign Details

Campaign Name: CONUS Fire Demo

Current Status: LTP Sent

Requested Latitude: 47 38.040 N

Requested Longitude: 113 22.020 W
[View in MapQuest](#)

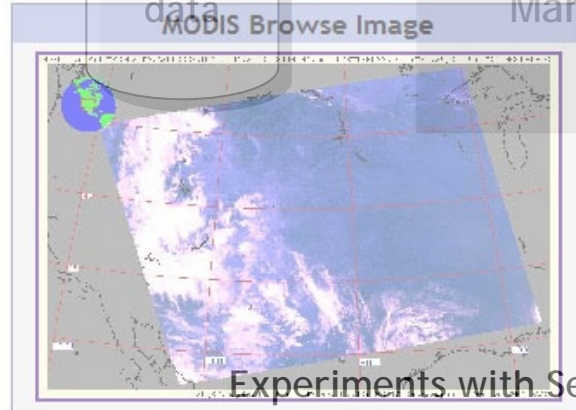
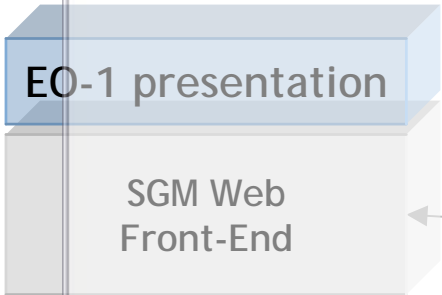
Target Latitude: 48 33.860 N

Target Longitude: 114 09.816 W
[View in MapQuest](#)

Radius: 200.0 km

Status History

✓ Created	2003-08-19 12:50:27
✓ Start Requested	2003-08-19 12:52:04
✓ Started	2003-08-19 12:52:21
✓ Sciman Requested	2003-08-19 12:52:55
✓ Sciman Received	2003-08-19 12:53:20
✓ LTP Sent	2003-08-19 12:53:21
LTP Confirmed	
Image Taken	
Data Available	
End Requested	
Done	

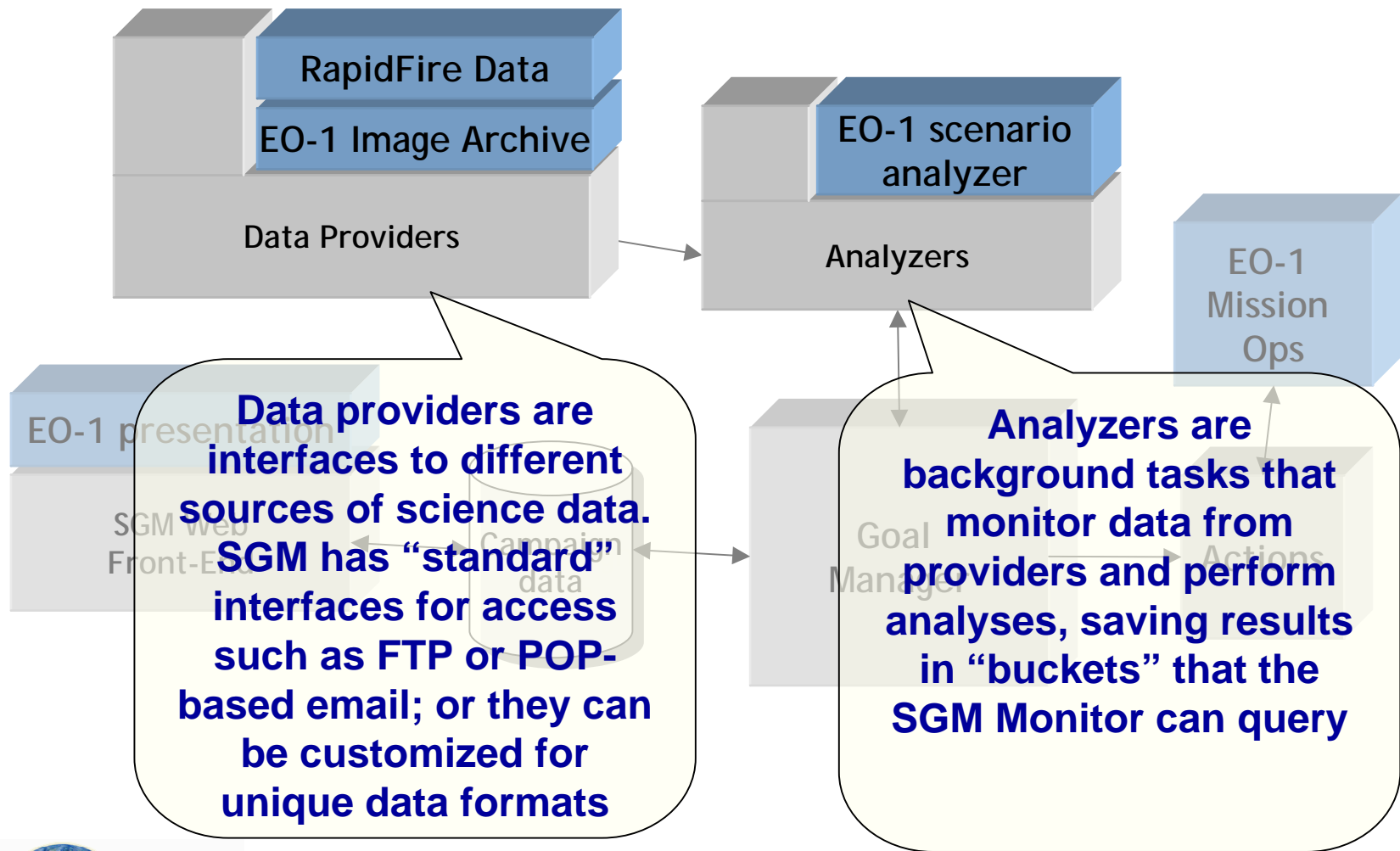
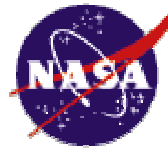


EO-1 Browse Image

No Image Available



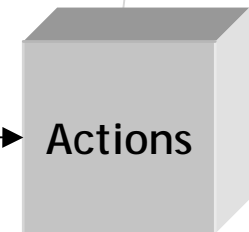
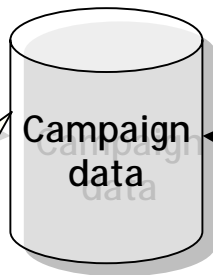
Data Providers/Analyzers



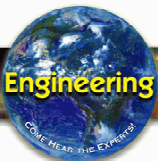
The Goal Manager manages the progress of a campaign. It:

- handles requests from campaigns (e.g. starting/stopping data analyzers)
- monitors campaign's active "goals" to see if their "criteria" have been met.
- fires "Actions" when a criteria is met (e.g. perform next step of campaign, send image request to EO-1 MOPSS, etc)

Campaign information and status is stored in a centralized, web-accessible database.

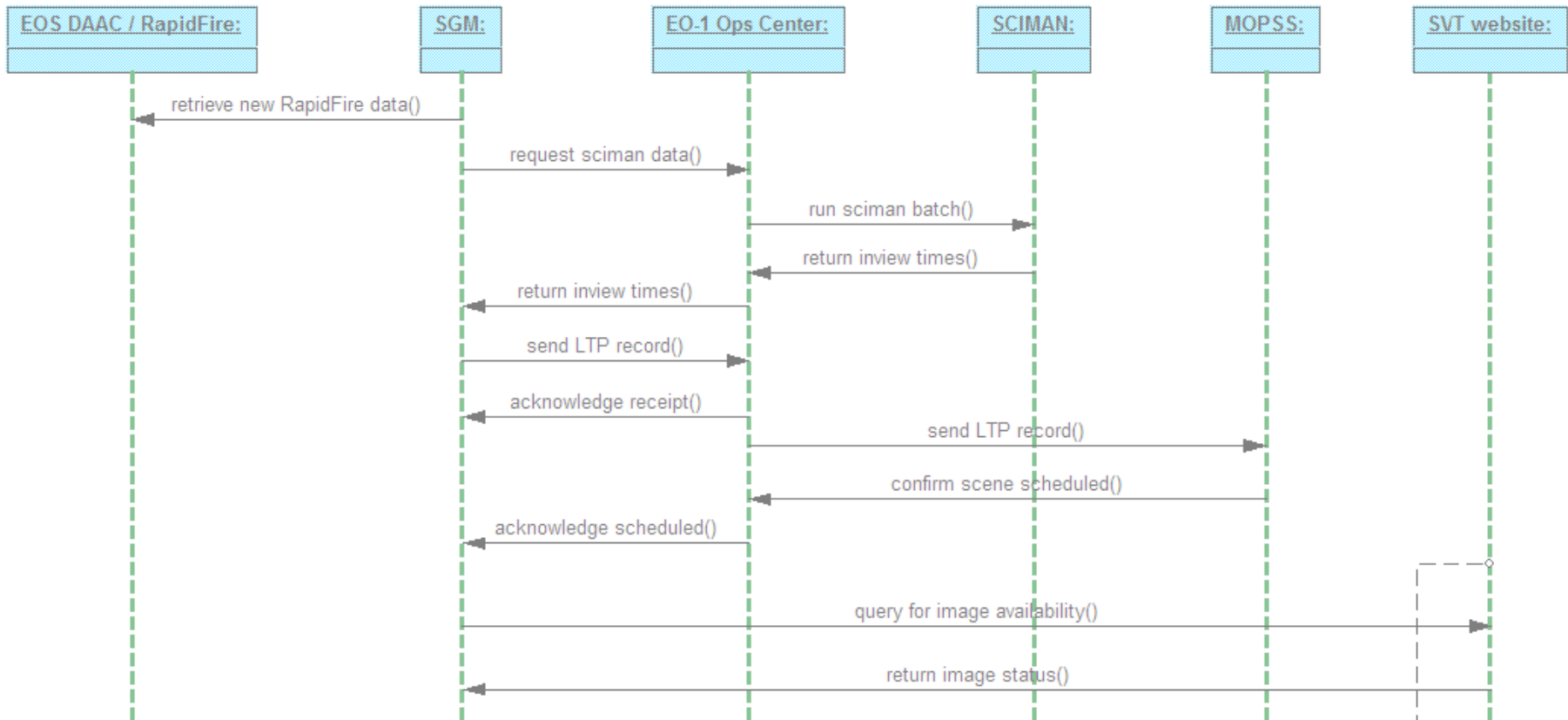
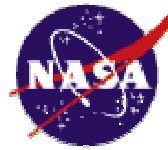


Actions



Sample Activity Diagram

Rapid Fire scenario

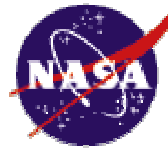


<< Notation >>

Each message from EO-1 Ops Center to SGM may indicate an error instead.

<< Notation >>

Waits for email from USGS saying data is available (up to 7-14 days)



- Small and Moderate Aperture Research Telescope System:
 - 4 telescopes in Chile
 - Consortium of universities and organizations led by Yale
- Observing schedule:
 - currently manually generated on daily basis
 - fixed for the night once forwarded to the mountain
- Goals:
 - improve reaction time to unpredictable astronomical events
 - better understand risk, benefits, and costs to implementing an operational dynamic, autonomous observing schedule
- SGM will:
 - monitor alert sources or perform scientific analysis on an image
 - re-schedule rest of night's schedule to handle new priorities

- Interface to ASPEN scheduler
- Improved ability to define new campaign templates
- Better handle multiple simultaneous campaigns, longer term campaigns
- Improved central database support and access from geographically disperse locations

- <http://aaaproduct.gsfc.nasa.gov/SGM>