JP1.9 **CLASS CAPABILITIES OVERVIEW**

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ABSTRACT

The National Oceanic and Atmospheric Administration (NOAA) has developed the Comprehensive Large Array-data Stewardship System (CLASS) to archive and provide access to the data from current satellite-based observing systems and ground-based observing systems. The raw radiance data in CLASS currently includes Polar-orbiting Operational Environmental Satellites (POES), Defense Meteorological Satellite Program (DMSP), and Geostationary Operational Environmental Satellites (GOES).

In addition to the raw data listed above, CLASS also provides access to a number of products. These products include CoastWatch, Microwave Surface and Precipitation Products System Mapped Data, Ocean Color (SeaWiFS), Synthetic Aperture Radar (RADARSAT), and Sea Surface Temperature.

CLASS operational capabilities include:

- Search capabilities:
  - Coverage
  - Satellite schedule
  - Ascending/descending (polar satellites)
  - Data type
  - Receiving station
  - Satellite name
  - Date and time range
  - Spatial coverage using a bounded box or entering lat/long coordinates
- Access and delivery capabilities:
  - Browse images
  - FTP delivery of data
- Dual site operations in Suitland, MD (OSDPD) and Asheville, NC (NCDC)
- Hardware architecture: IBM P620 and P660 servers, ADIC tape libraries, Cisco routers, Sun Fire V880 servers, etc.

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1. INTRODUCTION

CLASS is an electronic library of NOAA environmental data. The CLASS web site (http://www.class.noaa.gov/) provides capabilities for finding and obtaining those data. CLASS is an operational component of NOAA's National Data Centers (NNDC) within NOAA's National Environmental Satellite, Data, and Information Service (NESDIS).

CLASS is NOAA's premiere on-line facility for the distribution of NOAA and US Department of Defense (DoD) POES data and derived data products. CLASS has also been archiving and distributing data from NOAA's GOES satellite since December 2003. Each observing system (e.g., POES, GOES) is referred to as a campaign.

CLASS is operational at two locations: the Office of Satellite Data Processing and Distribution (OSDPD) facility at Suitland, MD, and the National Climatic Data Center (NCDC) facility at Asheville, NC. Each facility has similar hardware and identical software, is capable of assuming the overall CLASS load at any given time, and is operational at all times. During normal operations, both facilities share the processing load. The most important difference between the two CLASS facilities is the tape robotic systems and associated Hierarchical Storage Manager (HSM).

CLASS provides life cycle capabilities for archival, distribution, preservation, and operation, such that all approved campaign array-data may be preserved as defined by existing National Archives and Records Administration (NARA) and NESDIS archive policies, distributed as requested to customers, and available for disaster recovery. The scope of these capabilities includes the ability to scale system functionality to continuous growth in campaigns and the preservation needs of the data.

2. TECHNICAL DESCRIPTION

CLASS is a web-based data archive and distribution system and has the following technical capabilities:

- Archive, ingest, storage, metadata management, and data quality assurance
- Distribution, access, visualization, and data delivery
- Dual-site CLASS operations since April 2, 2004
- Support for POES, DMSP, and GOES data sets
- Ability to support additional campaigns, broader user base, and new functionality currently being defined
- Concurrent support for ongoing operations and new requirements implementation
- One-stop shopping and access capability for NOAA large-array environmental data and products
- A common look-and-feel for accessing NOAA large-array environmental data and products
- An efficient architecture for archival and distribution of NOAA large-array environmental data and products
- Reduced implementation costs by using reengineering, evolutionary effort
- Ability for NOAA to fulfill its requirements regarding archive, access, and distribution of large-array data sets

3. FUNCTIONAL DESIGN

CLASS is composed of the following functional processes: ingest, archive, archive interchange, search, delivery, operational inventory, operational data store, and robotic storage. Figure 1 is an example of the CLASS user web interface.

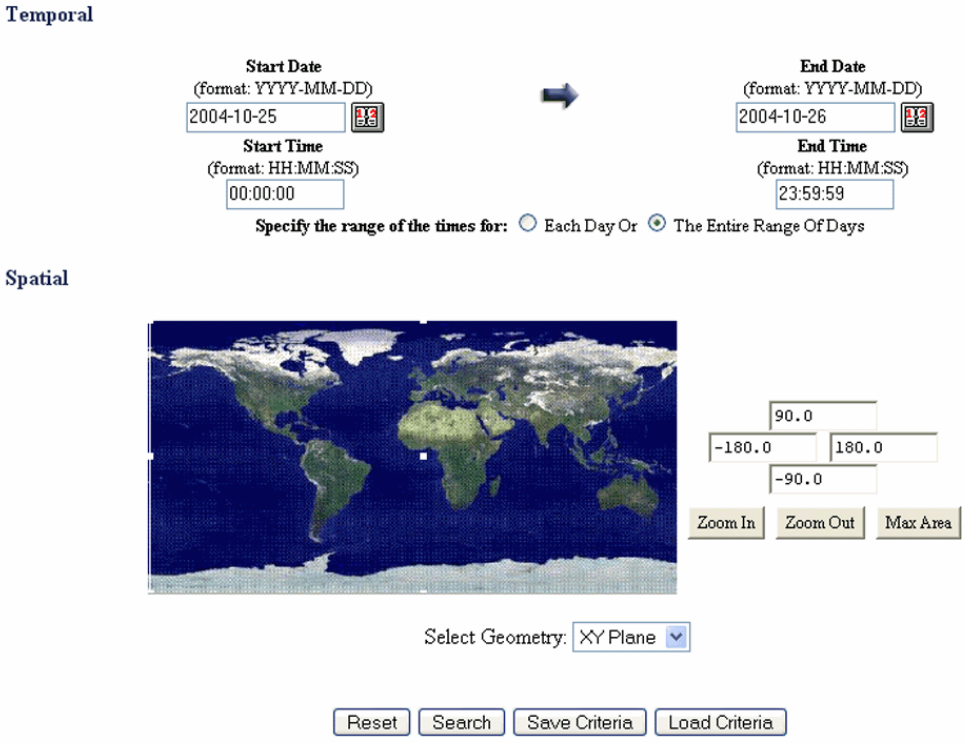

Figure 1. Example of CLASS user web interface

The ingest process accepts data from the supplier/producer, verifies the data, updates the operational inventory, adds the data to the operational data store, and sends the data to the archive process. The archive process sends the data to CLASS's robotic storage. Recently archived and access data is available in disk cache to make retrievals quicker.

The search process provides users with the ability to search and order data within CLASS. Search capabilities include spatial and temporal criteria. Browse images are also available to users through this mechanism. The delivery process retrieves data from disk cache or robotic storage and makes it available on an FTP site for either push or pull transfers. It also notifies users via e-mail when their data is ready for download.

4. USER ACCESS

CLASS provides data free of charge. Anyone can search the CLASS catalog and view search results through CLASS's World Wide Web (WWW) site. Users who wish to order data are required to register with their names and e-mail addresses. CLASS distributes data to those users via FTP services.

CLASS delivers data electronically via FTP. Once a user places an order, he/she receives an Order Verification e-mail stating the order number and indicating that the order is being processed. Once processing of each item within the order has completed, the user will receive a Delivery Notification e-mail providing instructions on how to pull the data. On the User Preferences Page, each user may specify whether or not he/she wishes to receive these Order Verification e-mails and whether the Delivery Notification e-mail should be per item or only once per order.

The User Preferences Page also allows users to indicate if they wish to include an archive header record with their data and to specify their data extraction preferences related to POES AVHRR and GOES GVAR data.

Approved users can set up subscriptions to automatically receive data or products when new data has been ingested by CLASS. Subscriptions for approved users are currently enabled manually by CLASS operators. These subscriptions can then be modified by the approved users through the CLASS web interface.

The User Profile Page allows users to create and update the information stored in their CLASS user profiles. No personal information is distributed to any outside source. See the CLASS Privacy Policy for more information.

5. REFERENCES

NOAA, CLASS Concept of Operations (1004_V_1.0_CLASS Concept of Operations), 5 April 2002.

NOAA, CLASS Dual Site Architecture & Operational Concept (1038_V_1.0_Dual Site Operations), 30 May 2003.