Transitioning of the Meteorological Assimilation Data Ingest System into Operations

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Presentation

- **Current MADIS**
- **Transition Concept**
- **Technology**

Current MADIS

- **Dedicated toward making value-added data available from the NOAA Earth System Research Laboratory (ESRL) Global Systems Division (GSD) [*formerly the Forecast Systems Laboratory (FSL)*] for the purpose of improving weather forecasting**

- **Community subscribers have access to an integrated, reliable and easy-to-use database containing the real-time and archived observational datasets**
  - **Support for data assimilation, numerical weather prediction, and other hydrometeorological applications**
  - **Gridded surface analyses that assimilate all surface datasets (*including the highly-dense integrated mesonet data*)**
  - **Produced by the Rapid Update Cycle (RUC) Surface Assimilation System (RSAS) that runs at ESRL/GSD**
  - **15-km grid stretching from Alaska in the north to Central America in the south, and also covers significant oceanic areas**
  - **Valid at the top of each hour, and are updated every 15 minutes**

Current MADIS (Con't)

- **Available via ftp, by using Unidata's Local Data Manager (LDM) software, through the use of OPen source project for Network Data Access Protocol (OPeNDAP (*formerly DODS*)) clients, or for the surface datasets through a Text/XML Viewer**

- **Quality Control (QC) of MADIS observations is also provided**

  - **Considerable evidence exists that the retention of erroneous data, or the rejection of too many good data, can substantially distort forecast products.**

  - **Observations in the ESRL/GSD database are stored with a series of flags indicating the quality of the observation from a variety of perspectives (e.g. temporal consistency and spatial consistency), or more precisely, a series of flags indicating the results of various QC checks. Users of MADIS can then inspect the flags and decide whether or not to ingest the observation**

- **Application Program Interface (API) that provides users with easy access to the observations and quality control information. The API allows each user to specify station and observation types, as well as QC choices, and domain and time boundaries. Many of the implementation details that arise in data ingest programs are automatically performed**

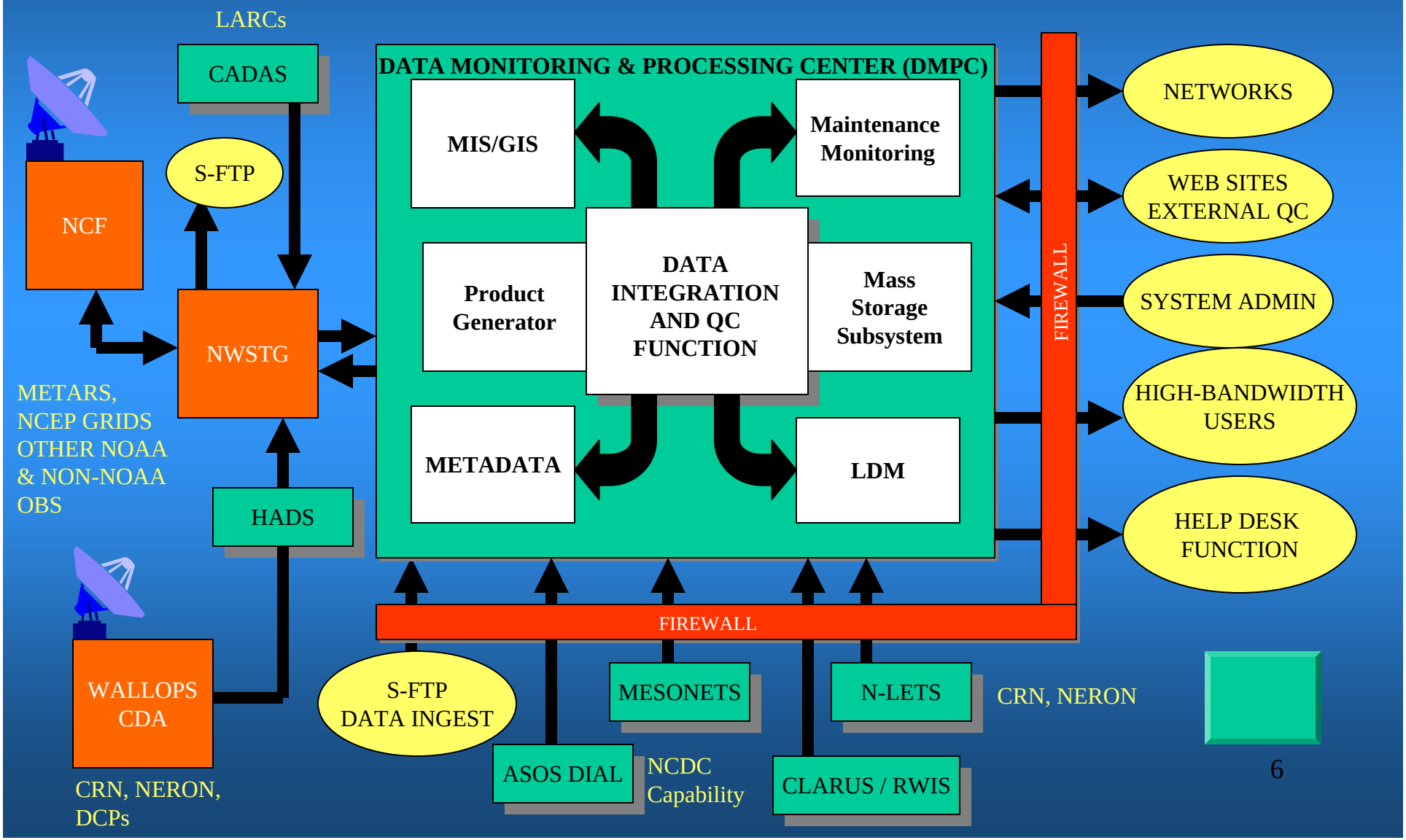
  - **The current version of the API supports the ESRL/GSD database, and also the database used in the Advanced Weather Interactive Processing System (AWIPS) deployed at NWS weather forecast offices**

  - **Can also be used as an OPeNDAP client to access data directly from the MADIS OPeNDAP server.**

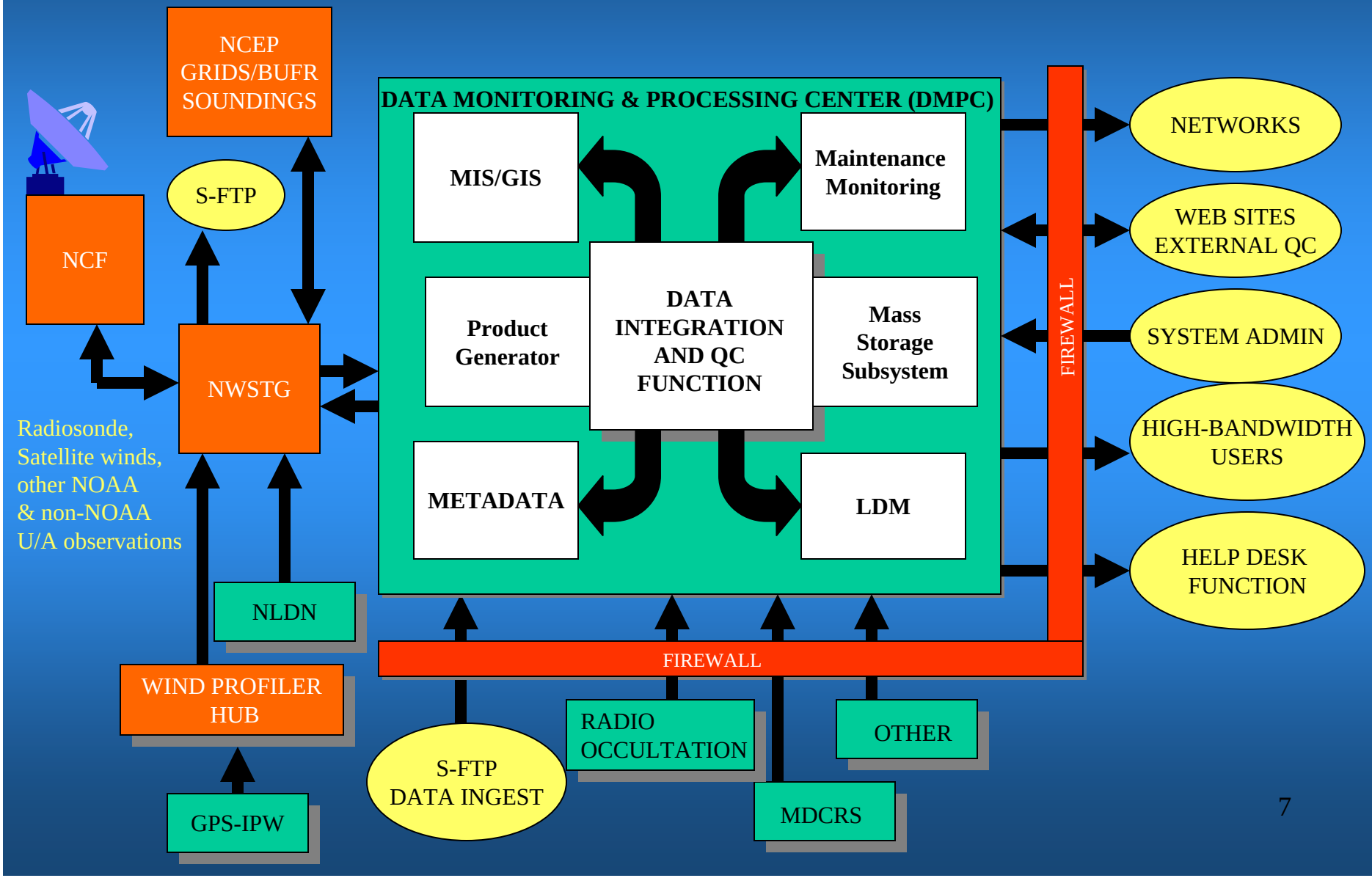
Transition Phases

- ***Phase 1*** -- Plan the transition around the concept of an "Initial Operating Capability (IOC)":
  - Replicating most of today's MADIS architecture for operations with new interfaces
  - Identifying equipment options for the transition
  - Developing "data throughput" goals for determining speed of products into the hands of NOAA's customers
  - Developing new maintenance monitoring concept
- ***Phase 2*** -- Execute Phase 1 plan. Expand IOC capabilities to meet larger integration goals -- "Full Operating Capability (FOC)."
  - For example, implement multi-cast capability for large-scale data streams; RPCCDS, NPN, lightning, and hi-res ASOS data.
  - Implement an advanced quality control and maintenance monitoring capability.

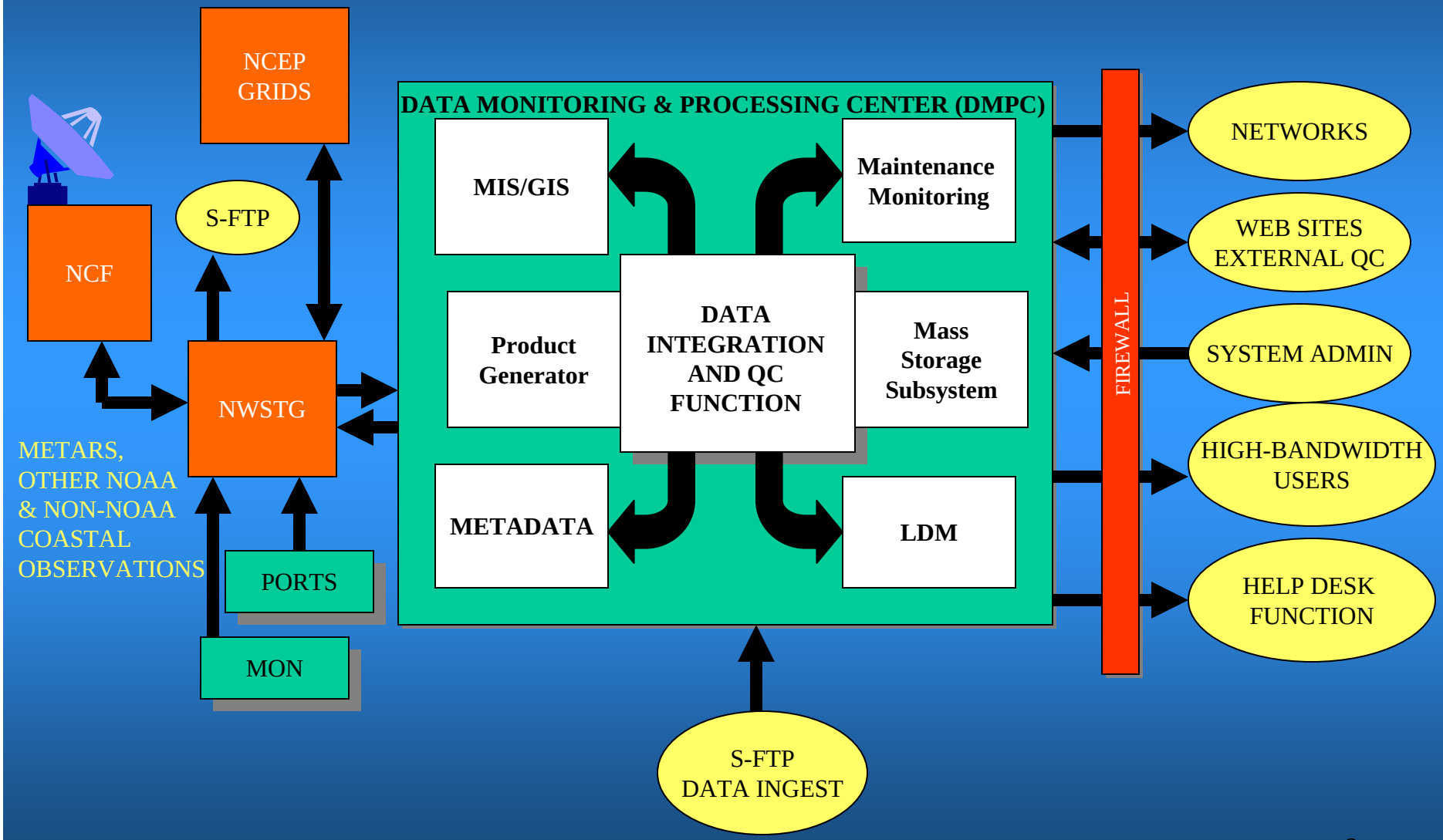
MADIS TRANSITION TO OPERATIONS
(*Phase 1- SURFACE COMPONENT*)



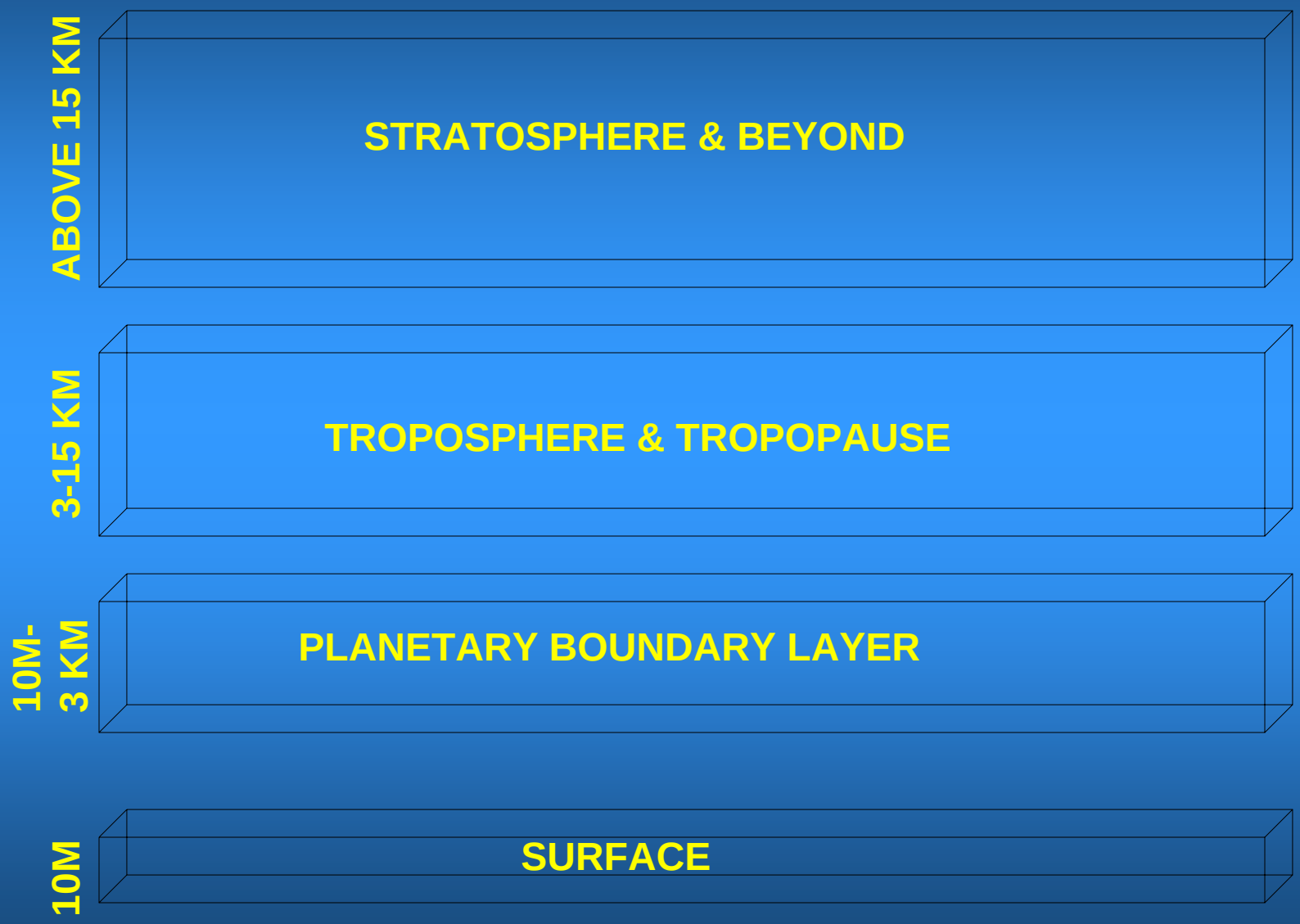
MADIS TRANSITION TO OPERATIONS
(*Phase 1- UPPER AIR COMPONENT*)



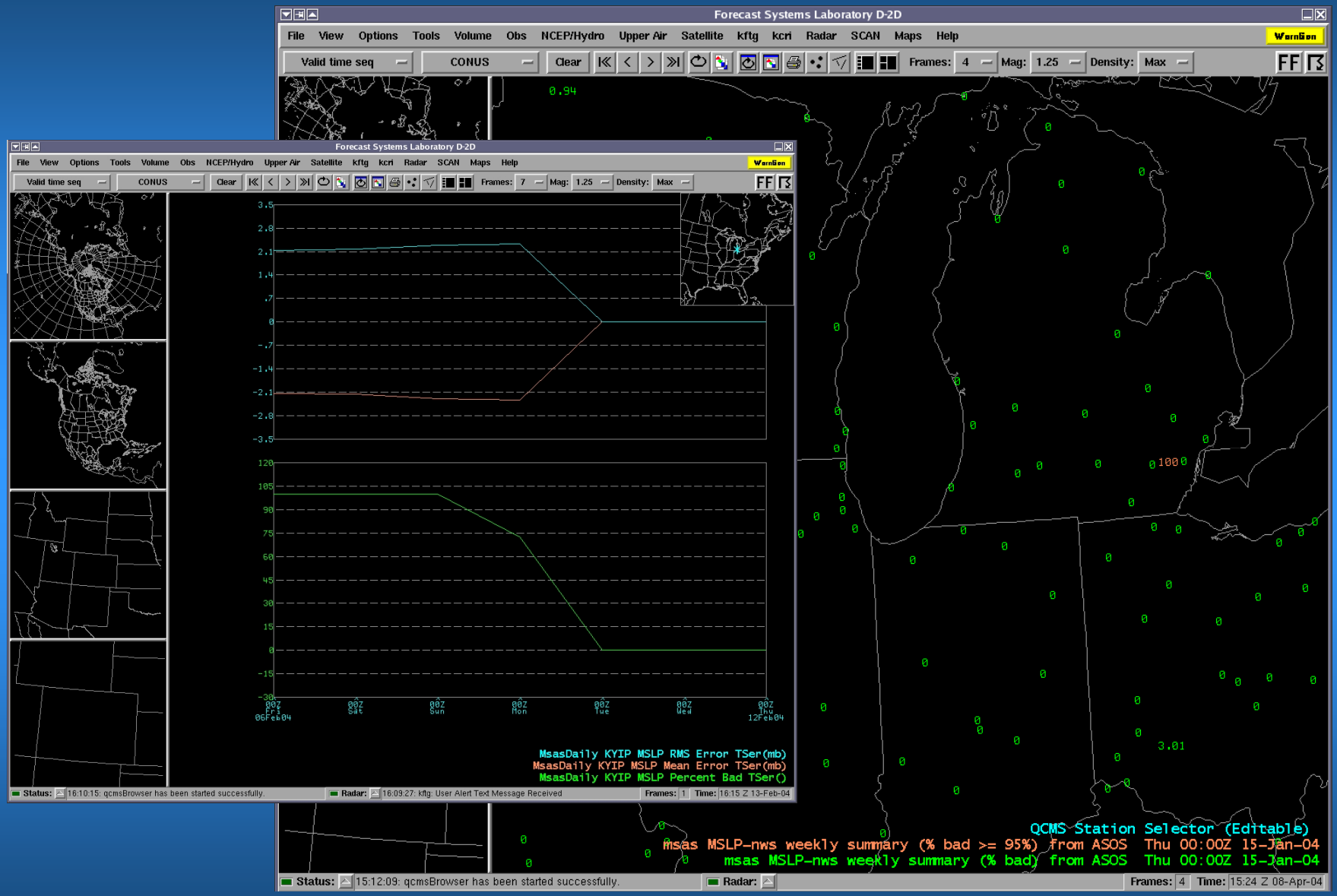
MADIS TRANSITION TO OPERATIONS
(*Phase 1- COASTAL COMPONENT*)



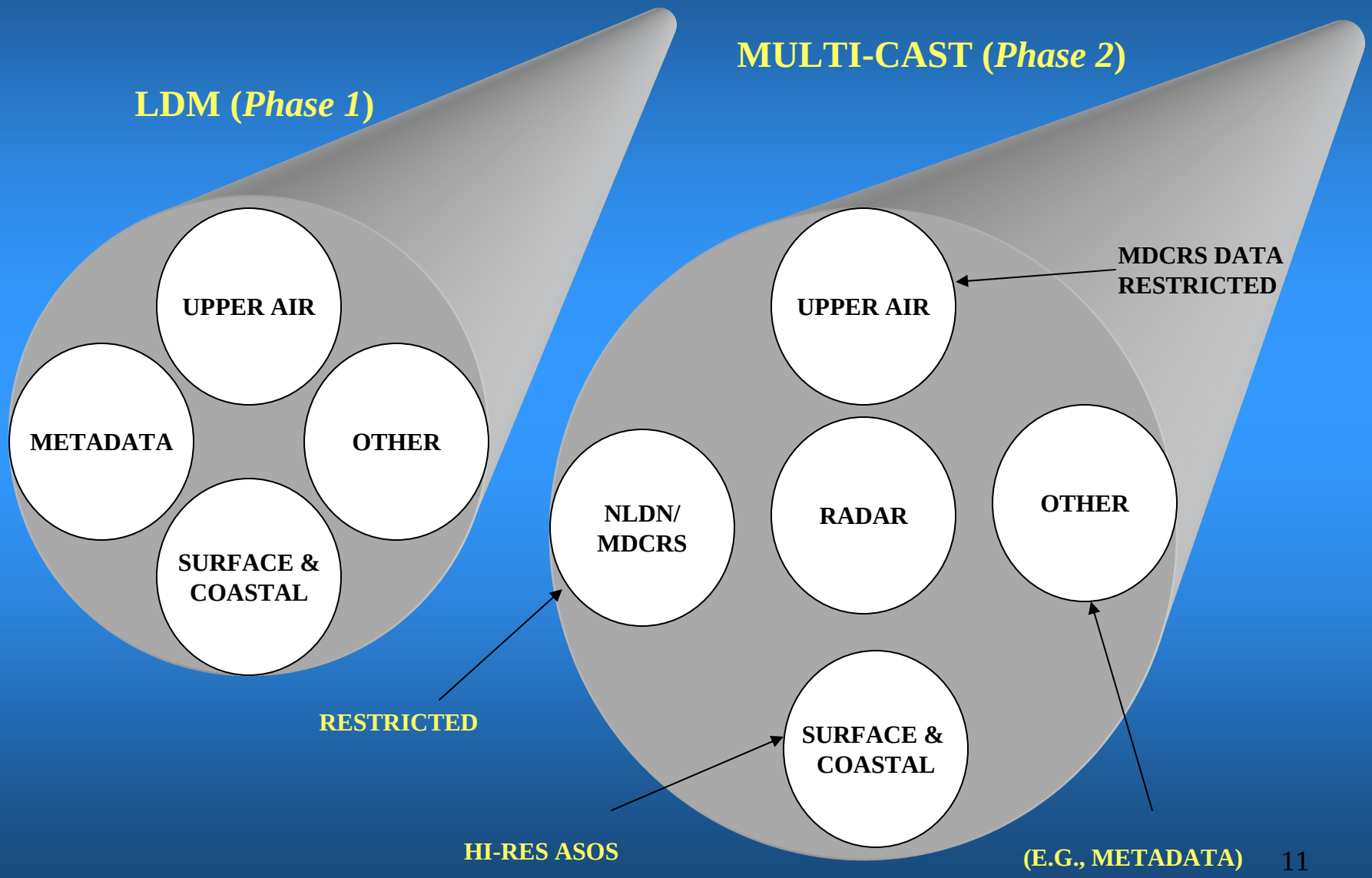
IB VISUAL STRUCTURE-GLOBAL



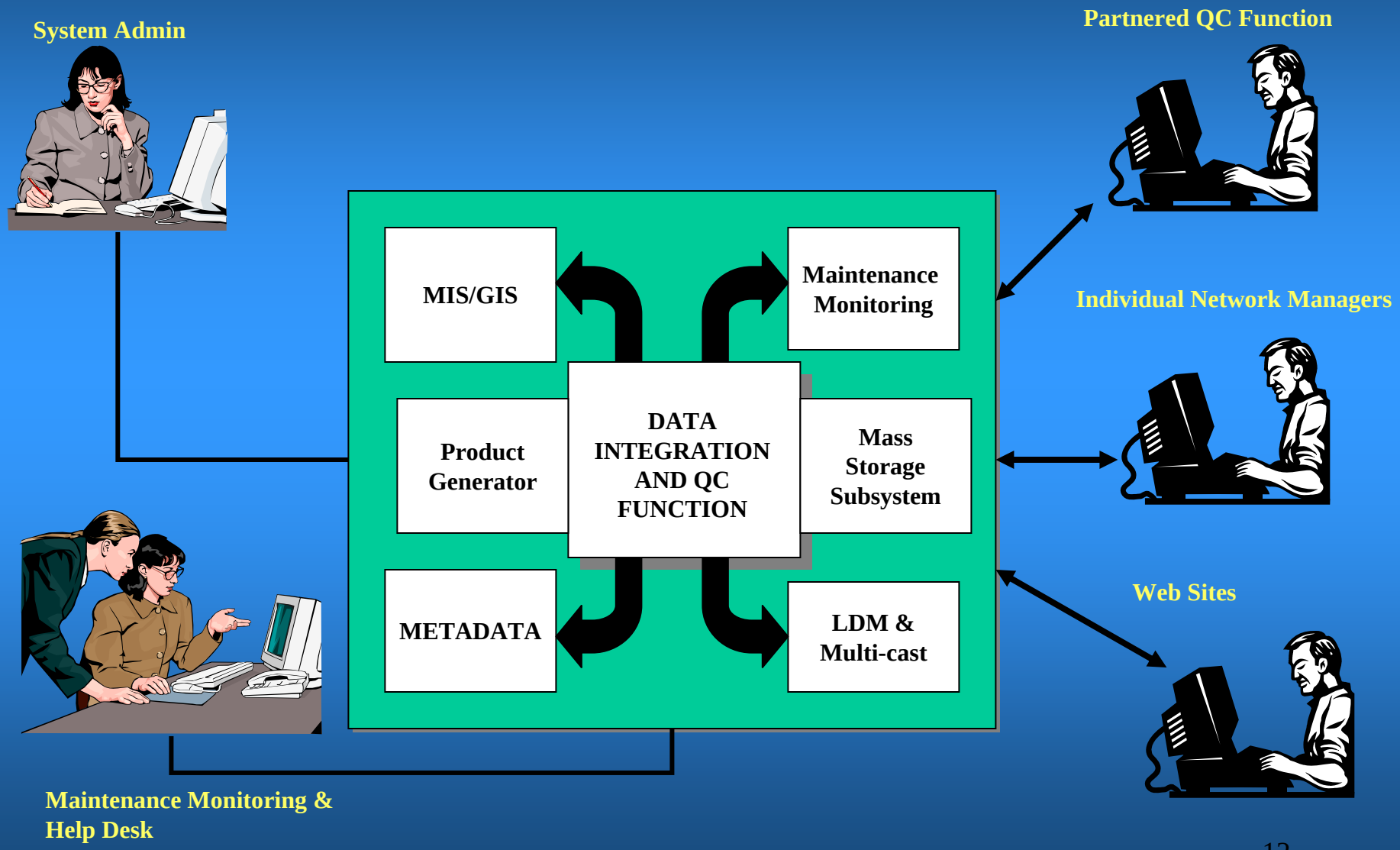
MADIS QC Examples



LDM / MULTI-CAST PIPES



DMPC Support Systems

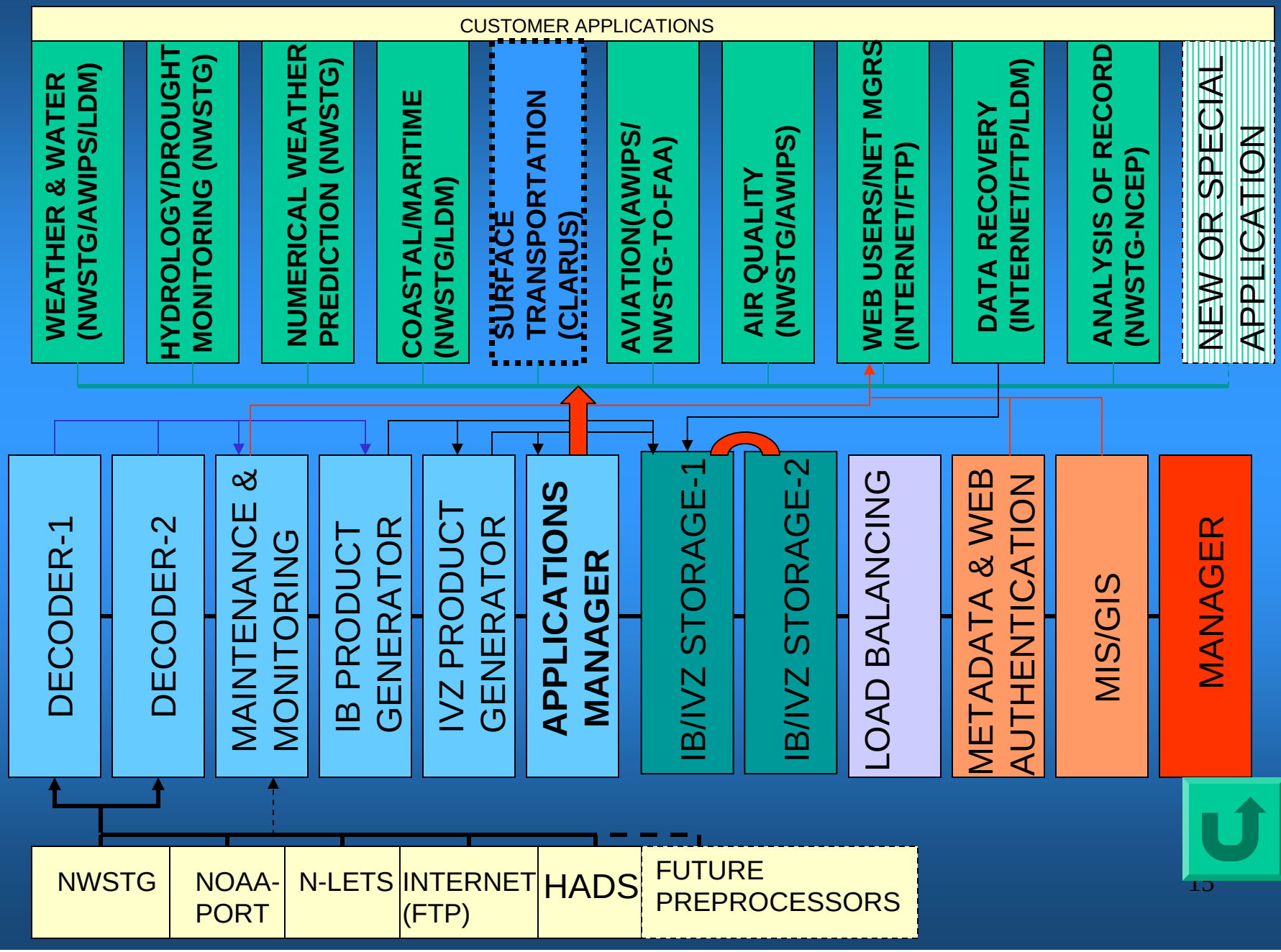


NWS OR NOAA WEB SITE

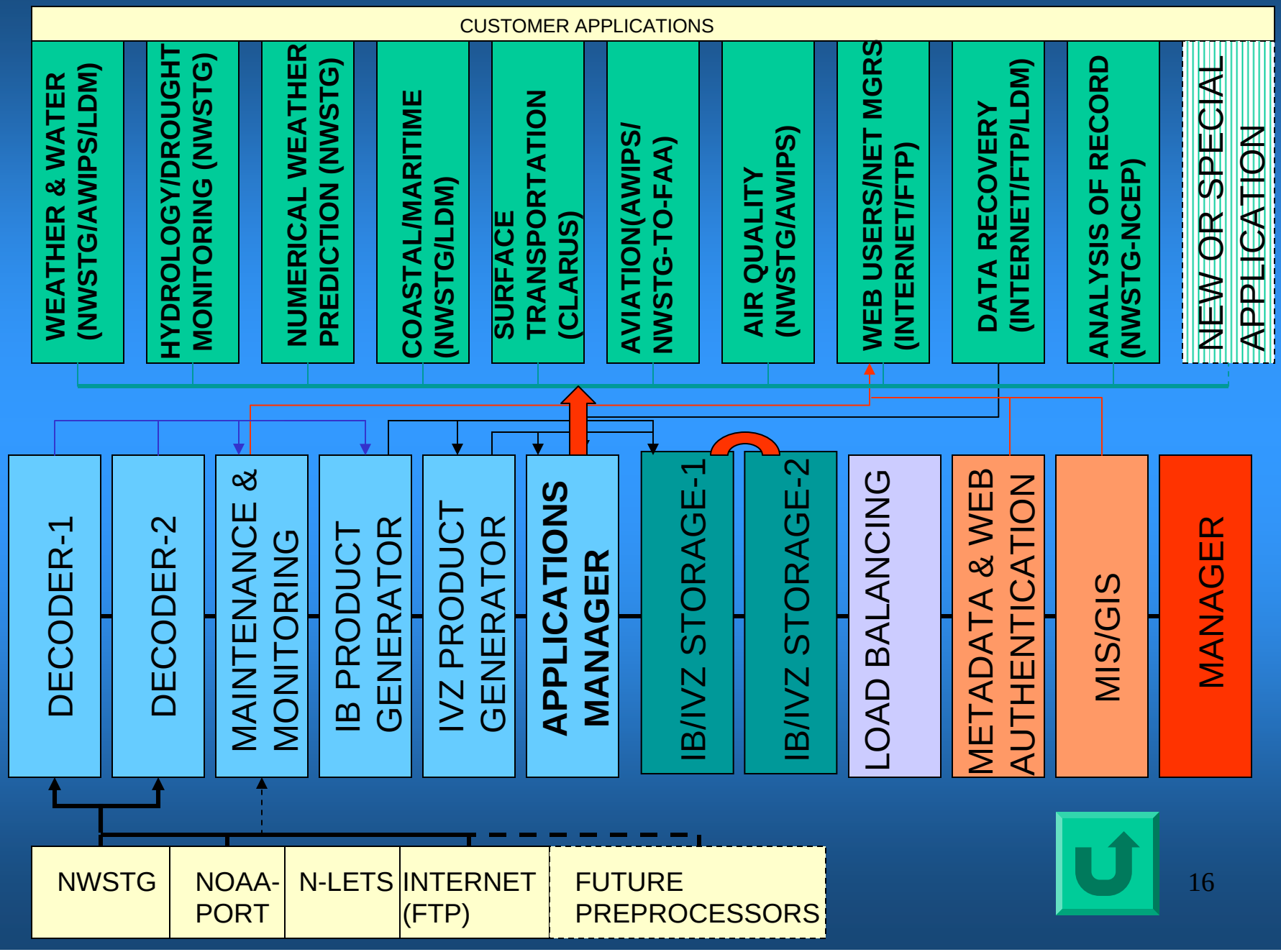
URL: *WEATHEROBSERVATION(S).GOV*

Technology:
Blade Architecture

FUNCTIONAL BLADE MAPPING-SFC (*PHASE 1*)



FUNCTIONAL BLADE MAPPING-U/A (*PHASE 1*)



Blade Server Concept

- EXPANDABLE
- SCALABLE
- FLEXIBLE
- FULL REDUNDANCY
- LOW COST TO OPERATE

CUSTOMER FOCUS BLADES (Phase 2--E.G., CLARUS, Water Quality)

SYSTEM BLADES (Phase 1 -- E.G., Product Generator, Maintenance Monitoring and replaces current MADIS)

PREPROCESSOR BLADES (Phase 2-- E. G., HADS, PORTS)

Expanded interfaces (Phase 2)

Blade Server Support

CUSTOMER FOCUS BLADES

Request for new Customer Blade Server arrives. Determine if new one is needed or use existing one.

When ready, new server installed into DPMC and retested before being made operational

New one purchased and tested off-line at FSL with new application and *beta* test sites

Note, blades cost $3-9K -- very cheap !