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Meteorological Assimilation Data Ingest System (MADIS) Transition to Operations Update

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Outline

- Background
- Current Services and Capabilities
- NOAA IRT for MADIS
- Project Governance
- Implementation in Operations
- Transition Timeline
  - IOC
  - FOC
- Future Product Improvements

Project Background

History:

- ✓ MADIS was established in 2001 to prototype new observation access, integration, quality control, and distribution techniques for real time and saved real-time data

Goal:

- ✓ To make NOAA and other-agency observations easily accessible and usable for operations, research, and commercial purposes

Impact:

- ✓ A more uniform, complete, accurate, and higher density observational infrastructure for use in local weather warnings and products, model predictions, and hazardous situations

Current Services and Capabilities

Services

- MADIS supports the collection, integration, quality control, and distribution of thousands of NOAA and non-NOAA observations, including over 50K surface stations from local, state, and federal agencies, and private networks.

Observing Network Types Supported

- Surface data includes METAR, maritime, HCN-M, UrbaNet, and other mesonet
- Profiler data includes NOAA Profiler Network and Cooperating Agency Profilers
- Aircraft data includes MDCRS, AMDAR, TAMDAR, and WVSS-2

Data Portfolio Scale

- 52,572 Surface Stations producing over 11,600,000 observations/day
- 134 Profiler Sites (> 200,000 obs/day)
- Over 450,000 aircraft observations/day
- Plus global radiosonde and satellite obs

Hundreds of MADIS Users, Including:

- NWS Forecast Offices, National Centers
- NSSL, AOML, ARL, NESDIS, NOS, +
- NASA
- DHS
- DOE laboratories
- NCAR, UNIDATA, Over 100 Universities
- Accuweather
- WSI Corporation
- DTN Meteorlogix
- AWS/WeatherBug
- Weather Underground

Current Services and Capabilities

- Integrated observations with uniform formats and time stamps
- On-the-fly, flexible, data reformatting
- Continuous database updates triggered by arriving observations
- Increased data density
- High temporal resolution
- Web-enabled push/pull distribution capabilities, with server-side slice and dice capabilities
- Seamless access to real-time and saved datasets
- Secure authentication for proprietary data

NOAA Independent Review Team (IRT) for MADIS

Purpose:

To assist NOAA management in making decisions on how best to transition MADIS into NOAA operations

IRT Members:

NESDIS/IRT Chair

- **Al Powell - Director, Center for Satellite Applications and Research**

NWS

- **David Caldwell - Director, Office of Climate, Water, and Weather Services**
- **Allan Darling (alternative for Adrian Gardner) - Chief, Software Branch/Telecommunications Operations Center**
- **Brent Gordon (alternative for Ben Kyger) - Chief, NCEP Central Operations/Systems Integration Branch**

OAR

- **James Kimpel - Director, National Severe Storms Laboratory**
- **Eddie Bernard - Director, Pacific Marine Environmental Laboratory**
- **Jeremy Warren - Deputy Chief Information Officer**

NOAA Independent Review Team (IRT) for MADIS

Recommendation:

Unanimously Selected Alternative B – *Joint OAR/NWS Distributed Processing Solution.*

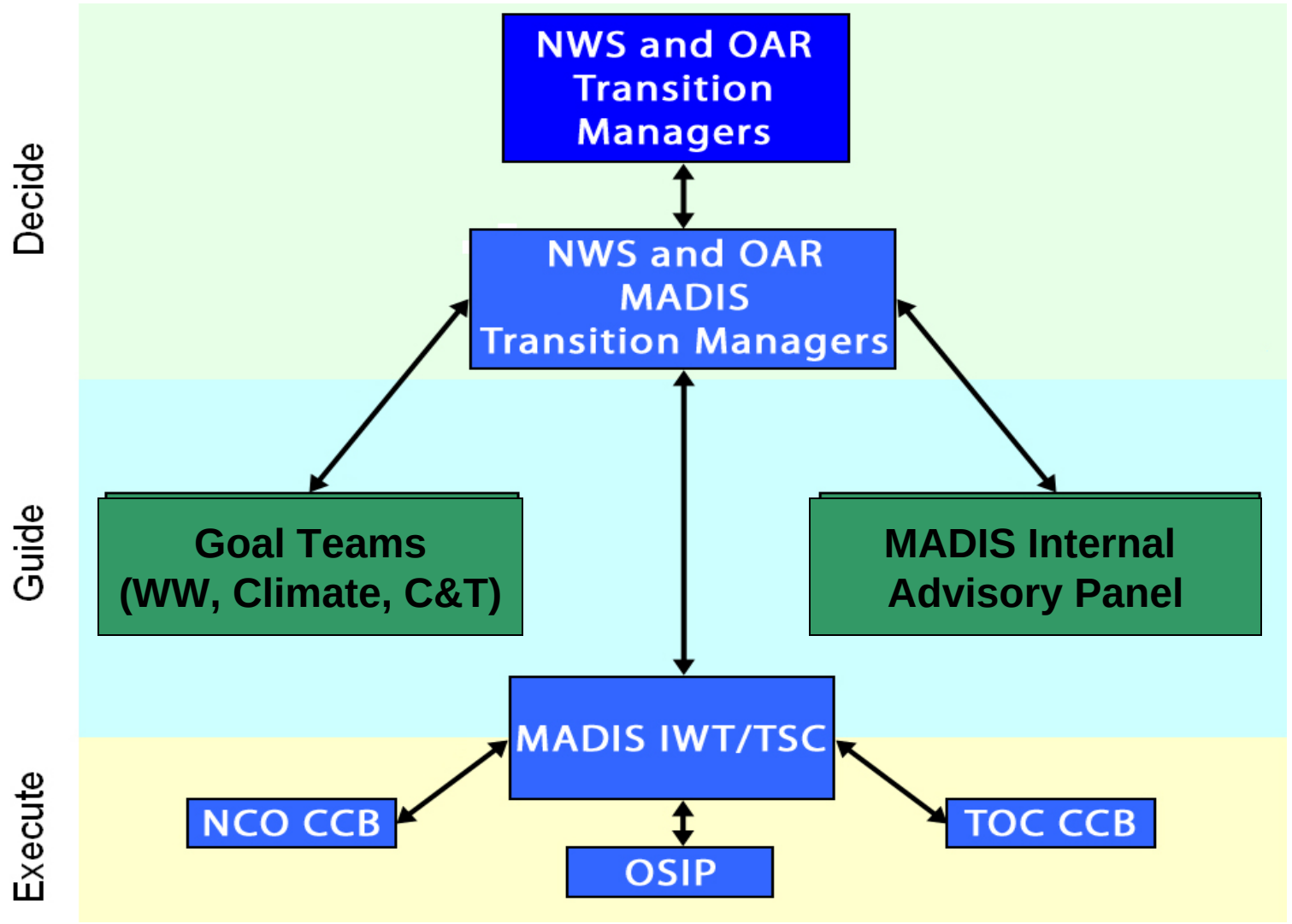
Transition Objectives:

- Expedite the transition of *current* GSD capabilities to operations
- Maintain the continuity of MADIS data streams and services before, during, and after the transition
- Pre-plan for product improvements and technology infusion

IRT Summary Statement:

"The partnership between OAR and NWS led to a solid technical solution and provided a smoother transition from research to operations."

Project Governance

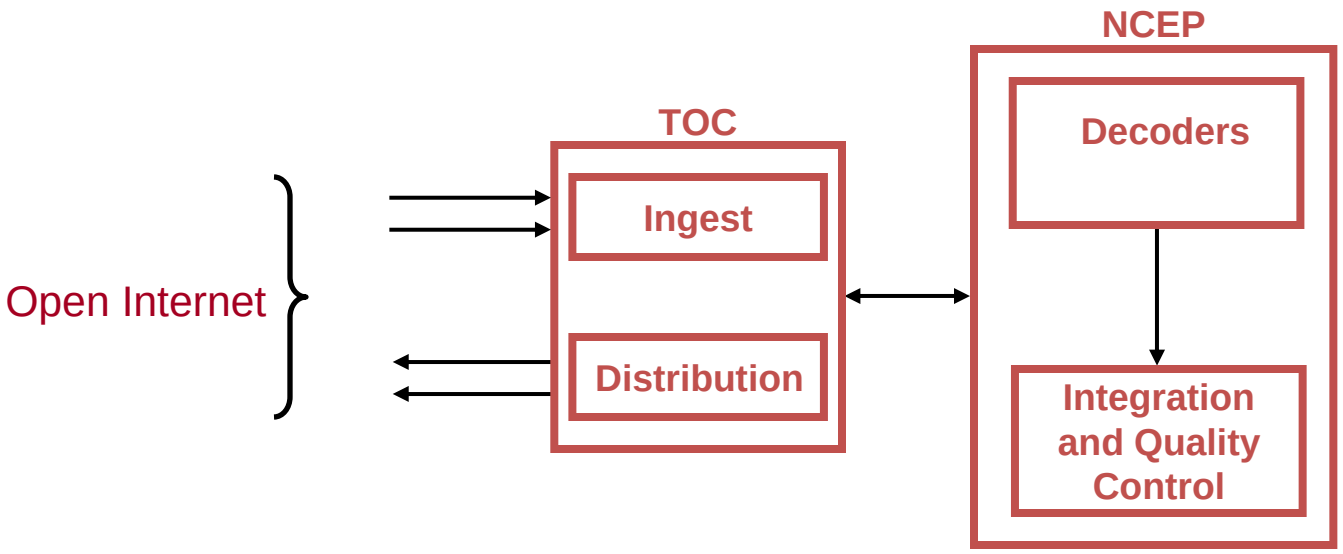


Joint NWS/OAR for MADIS: Distributed Processing Solution

Strategy:

Port the existing GSD MADIS software to an integrated NWS TOC and NCO distributed environment, with a supporting backup and research-to-operation test environment at GSD

MADIS Computing Environment



Major Transition Milestones and Functionality

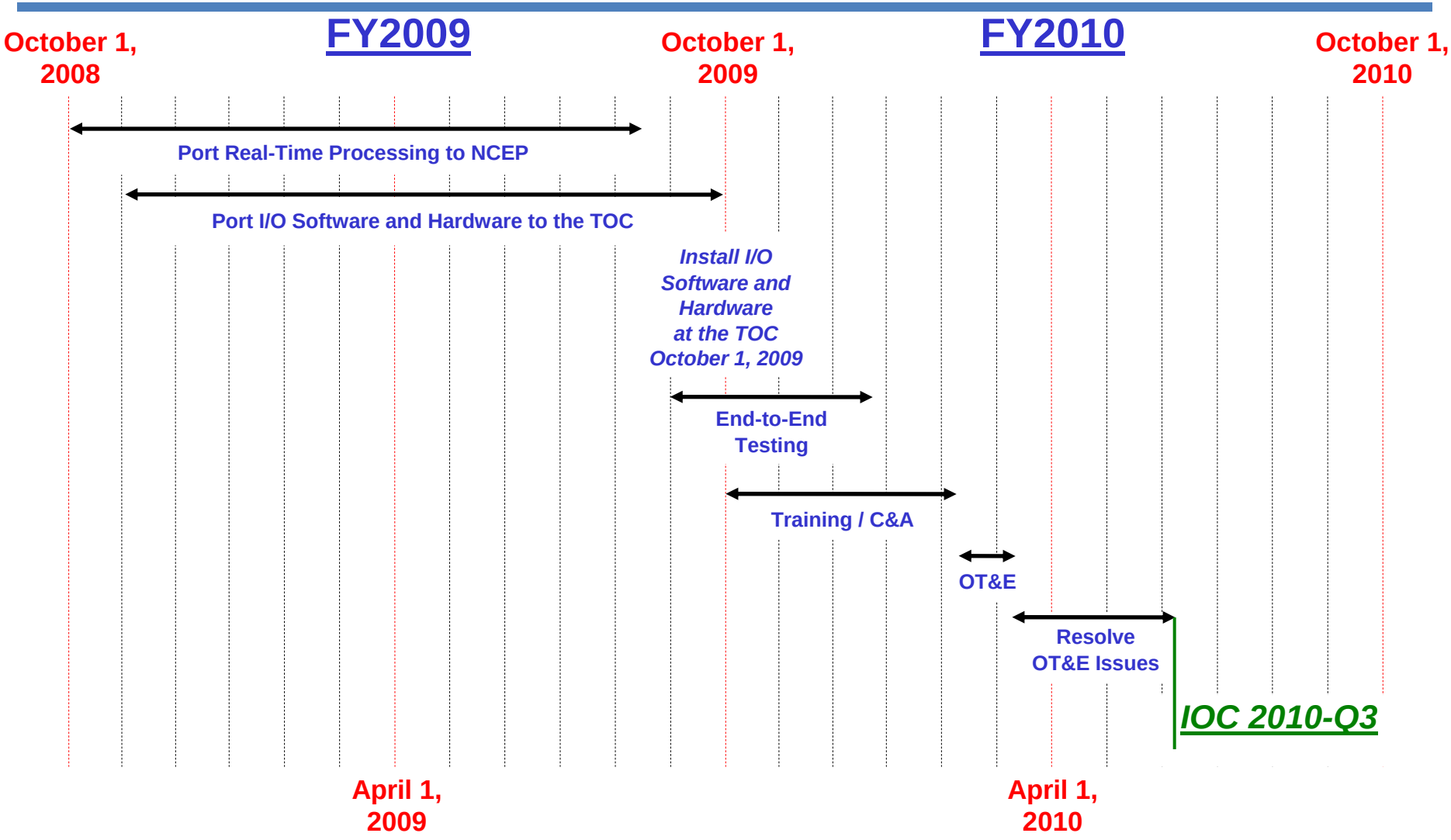
Initial Operating Capability (IOC): FY2010-Q3

- Raw ingest (ftp/http/ldm) at NWS/TOC
- Distribution servers (ftp/http/ldm) at NWS/TOC
- Operator monitoring for data ingest and distribution servers at NWS/TOC
- Operator monitoring for processing servers at NWS/NCO
- Help Desk (GSD primary/NWS backup)
- Real-time processing subsystems running at NWS/NCO
- Security Certification and Accreditation completed on NWS/TOC server
- Other current MADIS capabilities sustained at OAR/ERSL/GSD

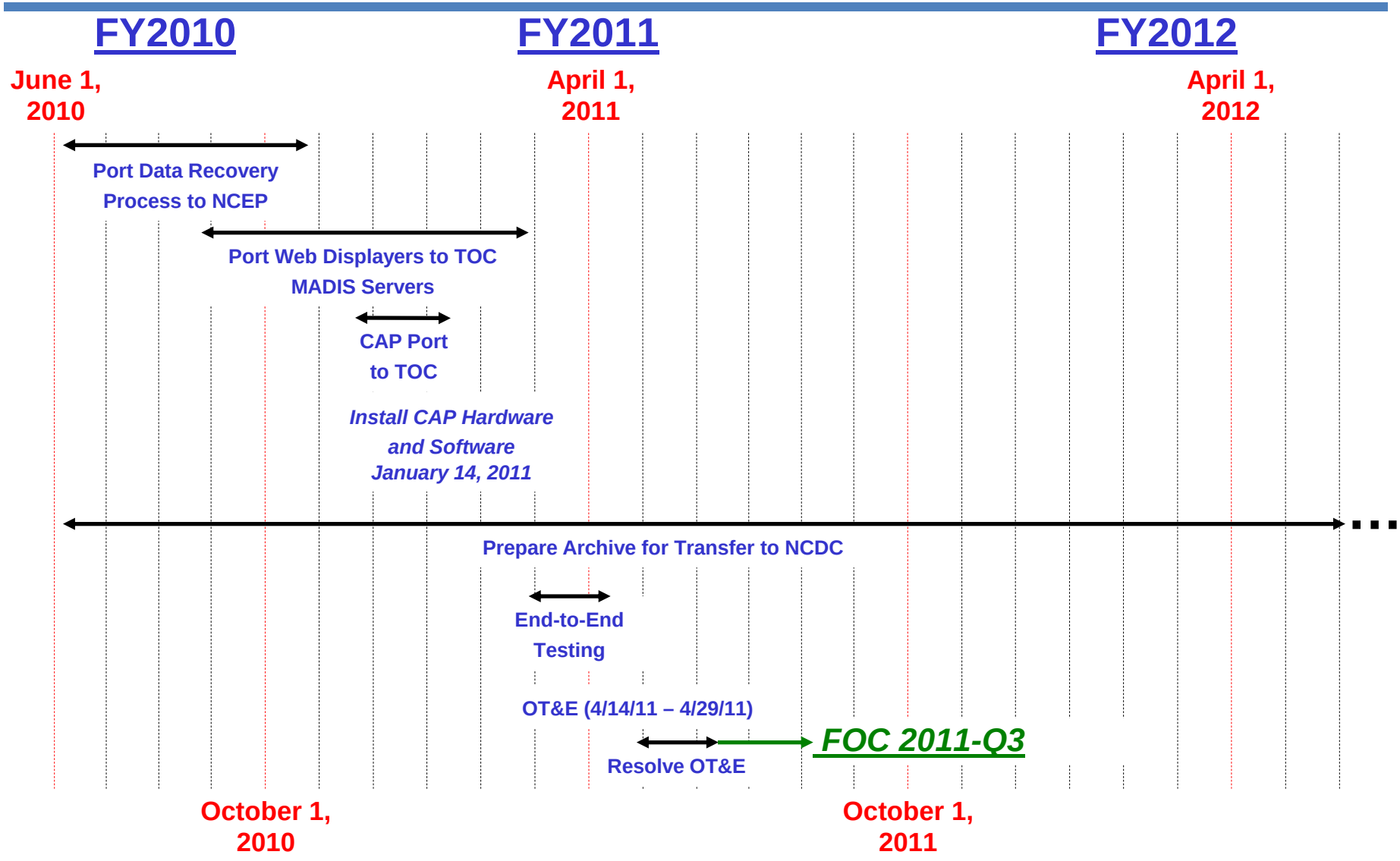
Full Operating Capability (FOC): FY2011-Q3

- Observation web displays on NWS/TOC MADIS web server
- Cooperative Agency Profiler Hub (including dialers) at NWS/TOC
- Surface data recovery system at NWS/NCO
- Additional operator and software documentation
- Help Desk (NWS primary/GSD backup)
- Archive (saved real-time data) development with NESDIS/NCDC

Initial Operational Capability (IOC) Timeline



Full Operational Capability (FOC) Timeline



Post-FOC Product Improvement

High Priority Product Improvement Areas:

1) Advanced data query services,
2) Expanded metadata fields,
3) Additional environmental datasets, and
4) Improved and expanded observation quality control

Key Mission Applications:

Operations

- **NextGen, includes high frequency ASOS**
- **National Surface Weather Observing System (NSWOS)/FHWA Support**
- **Historic Climate Network-Modernized (HCN-M)**
- **UrbaNet, National Mesonet**
- **Next Generation NOAA Profiler Network (NGNPN)**
- **Establish MADIS Mesonet Archive at NCDC**

Research

- **UAS Data Management**
- **Testbeds (HMT, DTC, Severe Weather Testbed)**
- **Fire Weather Mobile Observations**
- **DHS Support e.g. WISDOM Balloons**

Questions???

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