GSD/AWIPS

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GSD Expertise in local-to-global

- Research Applications
  - Assimilation
  - Modeling
- AWIPS I Development
  - Transition to NWS mission operations
- Evaluation
  - Exercises
  - Risk Reduction
  - Demonstrations

AWIPS I Contributions

- End-to-End data management
- Event Services
- Data fusion
  - Time matching
  - Interactive tools (sampling, animation, color-scales, etc)
- Product Generation
  - Forecast Editor used to create NDFD grids
  - NWS Regional web farms products
- Warning Products

Risk Reduction, 1980's

- Rapid prototype of visualization tools/techniques
- Denver,CO and Norman, OK WFO
  - Used operationally with existing data feeds
    - AFOS
    - WSR-88D
    - ISPAN
- Demonstrated feasibility of fully integrated data sets
- H/W, S/W Remained in WFO until AWIPS I replacement

Exercises, 1990's

- AWIPS proposed H/W suite for WFO
- Simulated data feeds
  - ISPAN, AFOS, WSR-88D
- 3-week, on-site office simulation
  - Forecaster shifts
  - Routine product creation
  - Forecasters evaluation
    - Observer
    - End-of-shift questionaire
    - End-of-exercise discussion group

Rapid Prototype Process, 2000's

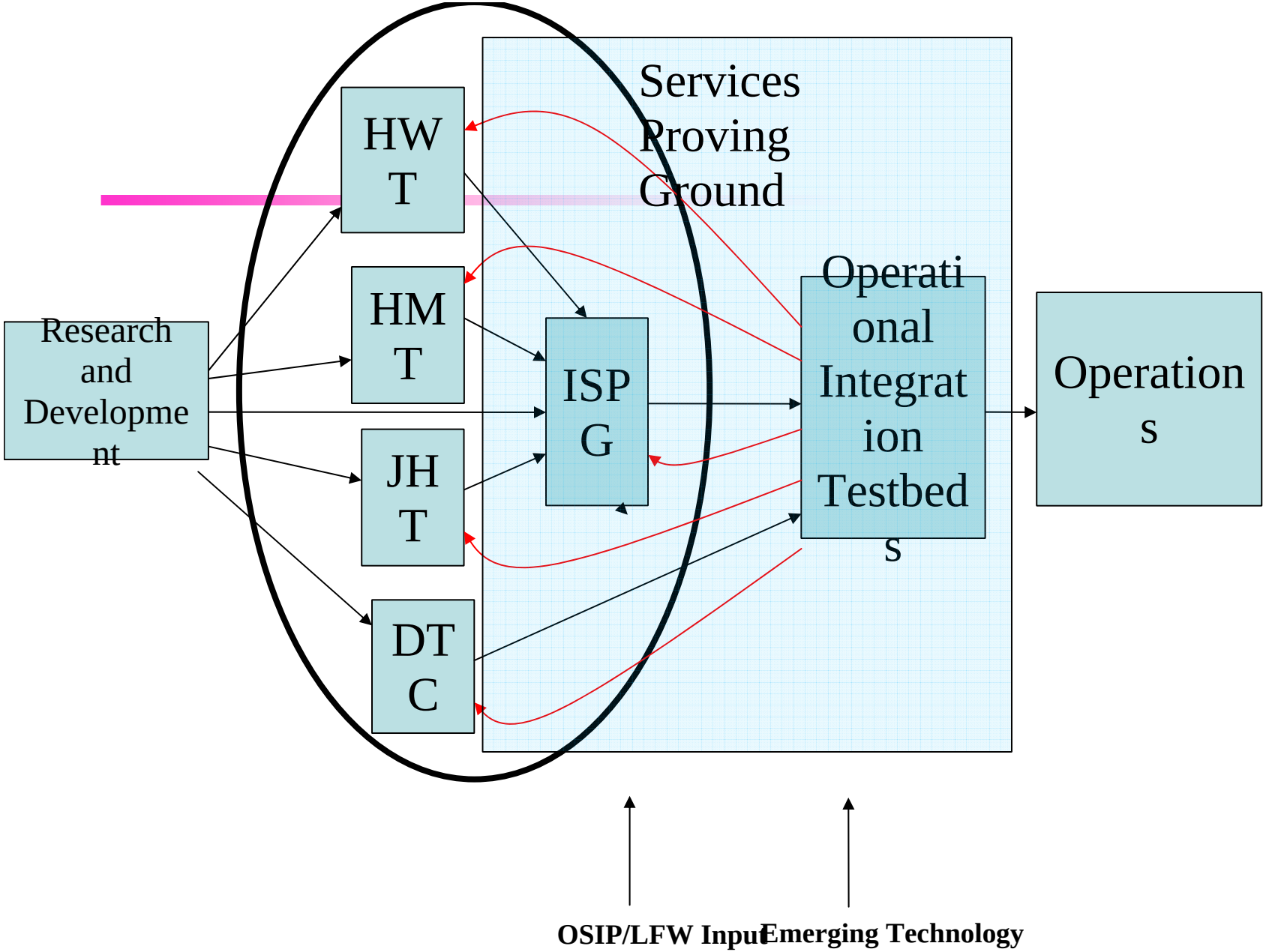
- Gridded Forecast Editor (GFE) used for NDFD weather elelments
- On-site workshops conducted for training
- ~20 WFO sites used for deploying experimental software

Demonstrations, 2000's

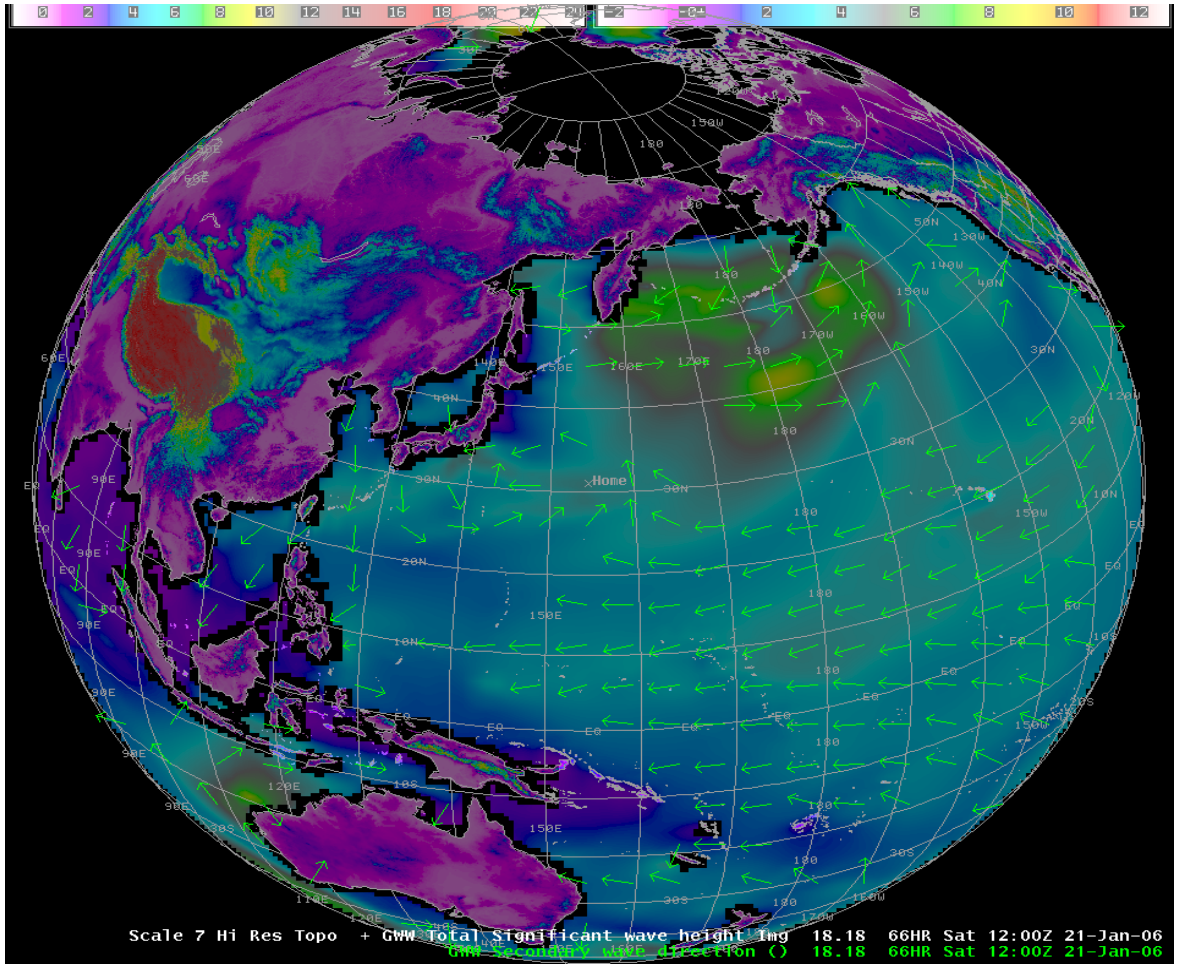
- Project we cannot name
- Aviation Terminal Decision aids
  - Ft Worth
  - Leesburg
- Volcanic Ash Coordination Tool
  - Alaska

Current

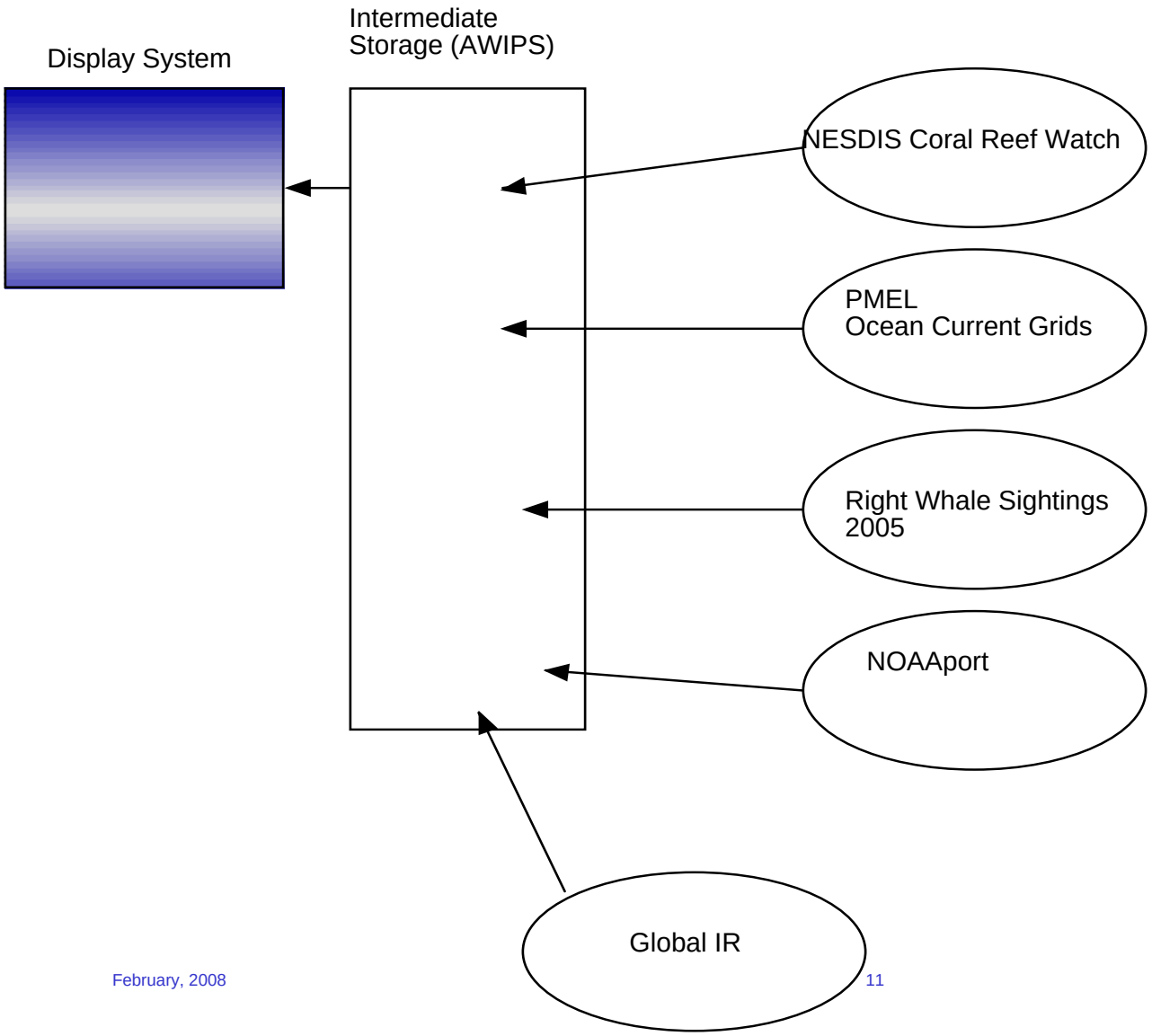
- DTC
- HMT
  - ensembles
  - Testing “data pull” technology
- HWT


Services Proving Ground
HWT
HMT
JHT
DTC
ISPG
Research and Development
Operational Integration Testbeds
Operations
OSIP/LFW Input
Emerging Technology

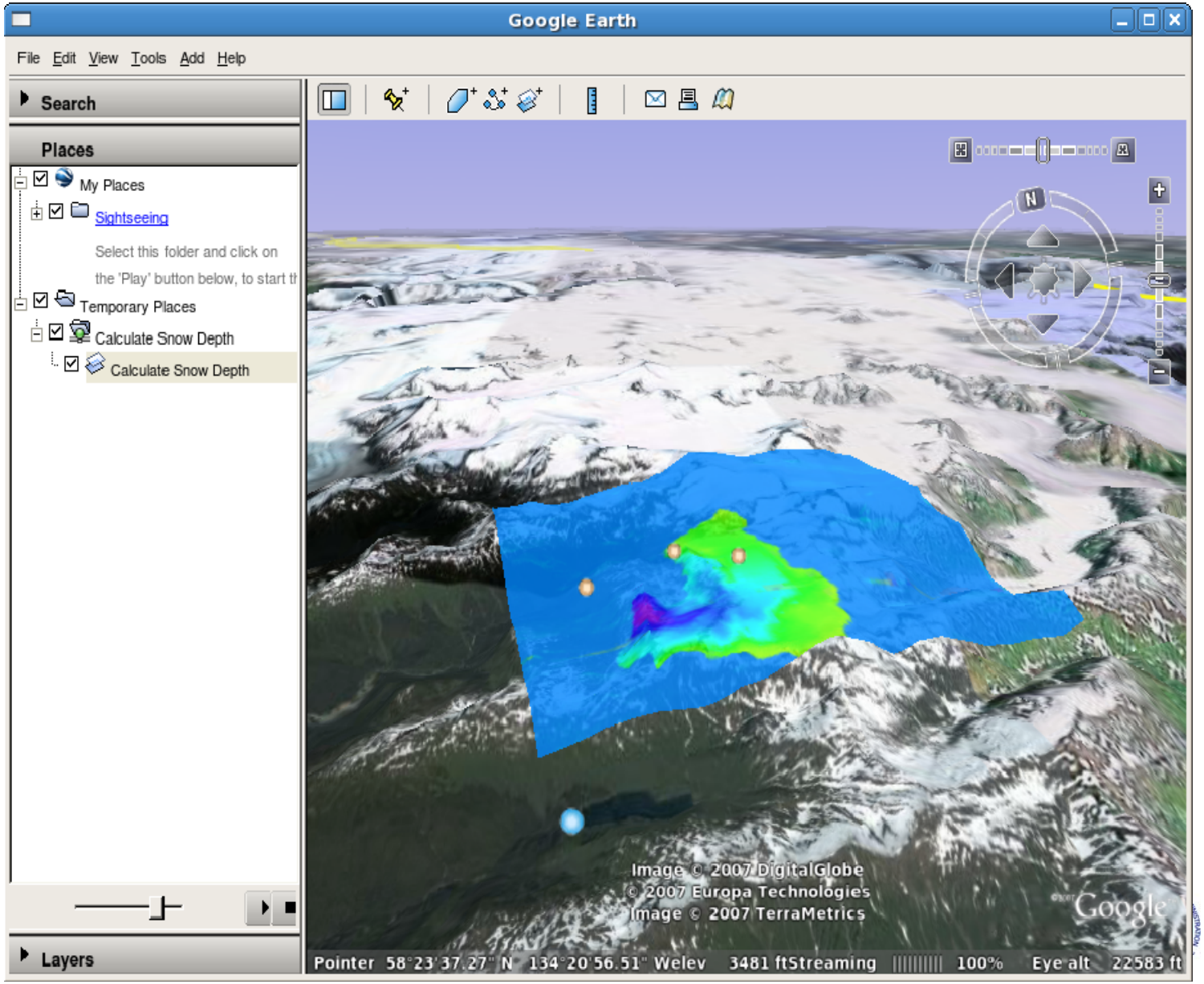
Advanced Linux Prototype



Current State Example of GEOSS



Redistributed Snow Depth



The Process and Methods Used to Evaluate Prototype Operational Hydrometeorological Workstations

Cynthia Lusk,* Patrice Kucera,* William Roberts,+ and Lynn Johnson#

ABSTRACT

In support of the National Weather Service (NWS) modernization, the Forecast Systems Laboratory (FSL) has been developing prototype hydrometeorological workstations for many years. The FSL Evaluation Team (E-Team) has developed a process of evaluating these prototypes to provide feedback to FSL developers and NWS management. This paper outlines the evaluation process with an emphasis on the methods, which consist of product usage logs, questionnaires, evaluation logs, structured tasks, observations, and interviews. Examples from E-Team evaluations illustrate how results from these different methods have led to improved workstation design, implementation, and training.

1. Introduction/background

The National Weather Service (NWS) of the National Oceanic and Atmospheric Administration (NOAA) is undergoing significant modernization that is bringing greatly improved technology and meteorological and forecast advancements to NWS field offices. The NOAA Forecast Systems Laboratory (FSL) and its forerunner, the Program for Regional Observing and Forecasting Services, have been working with NWS for many years in this modernization effort, especially in the development and prototyping of advanced meteorological workstations. Within FSL, the Evaluation Team (E-Team) has developed a process of evaluating these prototypes to provide feedback to FSL developers and NWS management.

The Weather Service Forecast Office (WSFO) staff in Denver, Colorado, began operational use of the first advanced meteorological workstation, known as the Denver Advanced Weather Interactive Processing System for the 1990s (AWIPS-90) Risk Reduction and Requirements Evaluation (DAR3E) workstation, in December 1986 (Bullock et al. 1988). The DAR3E was the first workstation to provide real-time integrated datasets to forecasters along with text editing capabilities. In December 1989, the DAR3E (also called DARE-I) system was replaced with DARE-II (Bullock and Walts 1991), which supported operational functions in the Denver WSFO. A similar workstation, known as Pre-AWIPS, was installed for operational use at the WSFO in Norman, Oklahoma, another NWS risk reduction site, in 1991. In May 1996, the WFO-Advanced workstation (MacDonald and Wakefield 1996) was installed in Denver and was used in tandem with the DARE-II system as operational testing and evaluations were conducted. In 1997, the WFO-Advanced workstation was incorporated into AWIPS, and testing has continued at Denver and elsewhere.

The E-Team has been evaluating the prototype workstations since DAR3E, and the evaluations have evolved with the development and installation of the different workstations in Denver and Norman. Heideman et al. (1989) provided an overview of DAR3E workstation evaluations including forecaster assessment of the workstation, forecaster performance as measured by forecasts and warnings, and workstation product usage. Several evaluations focused on which products forecasters were using: a study of DAR3E product use during the 1988 warm season, with emphasis on severe weather operations (Walker

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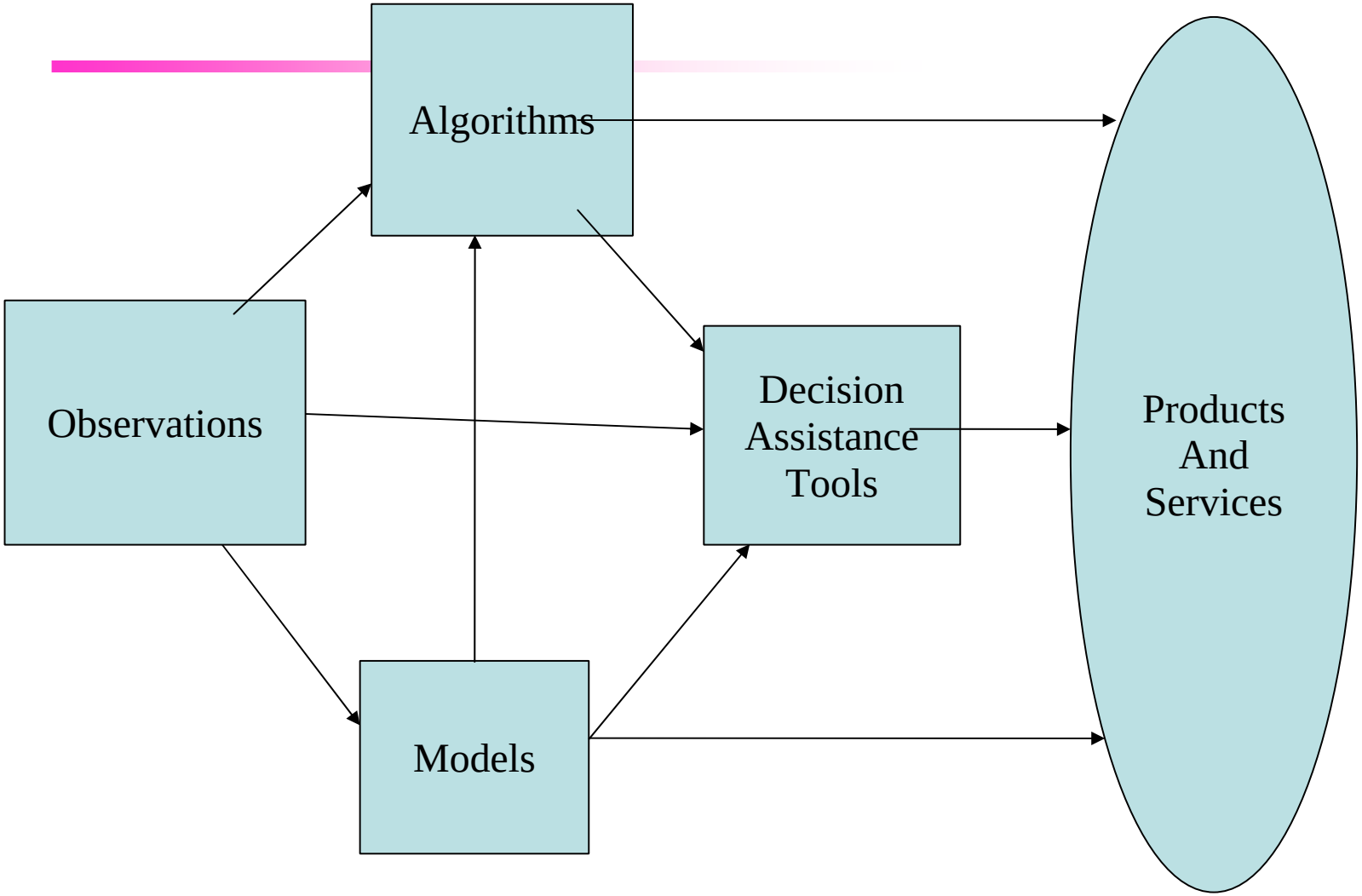
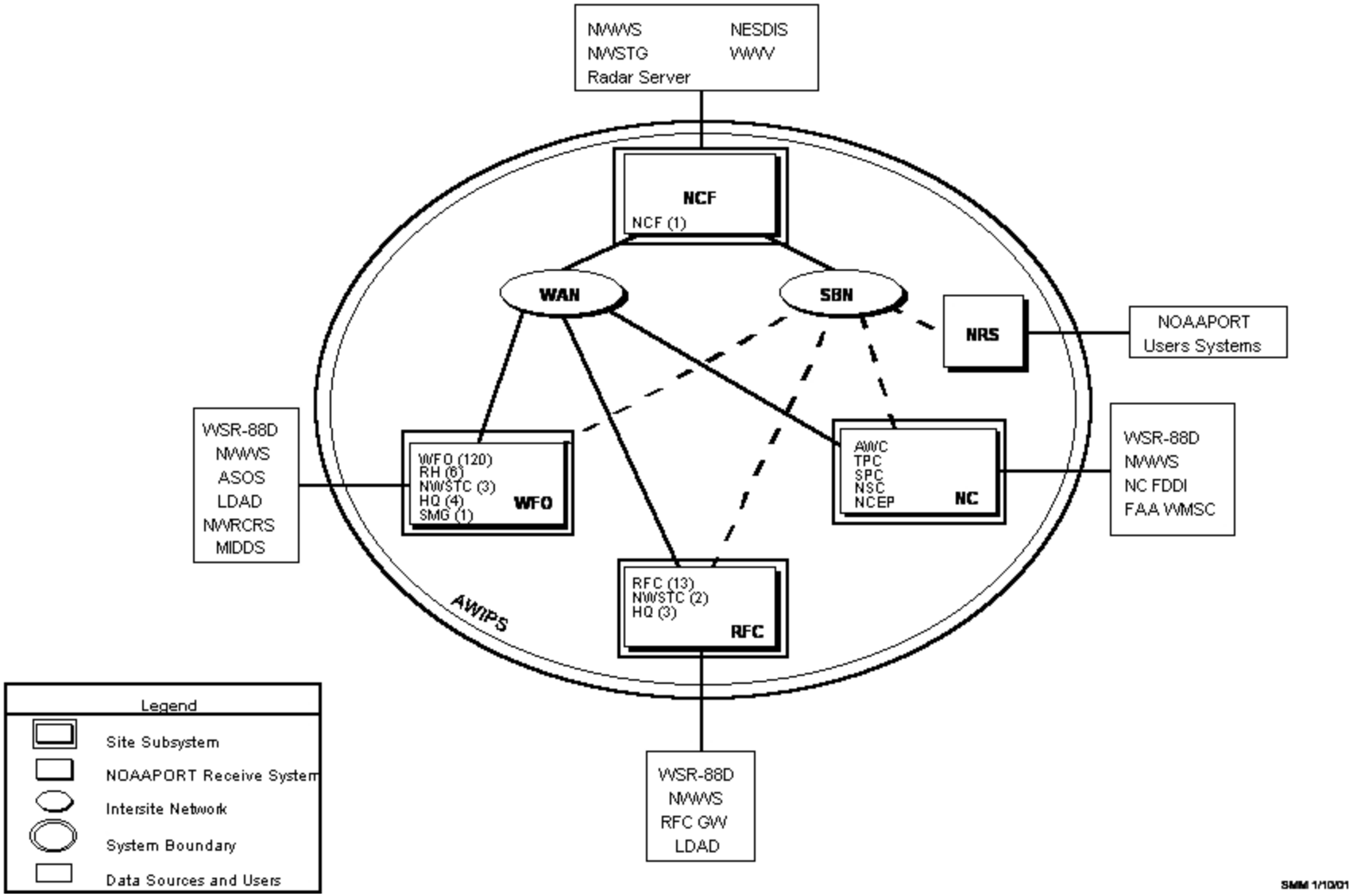
Lessons Learned

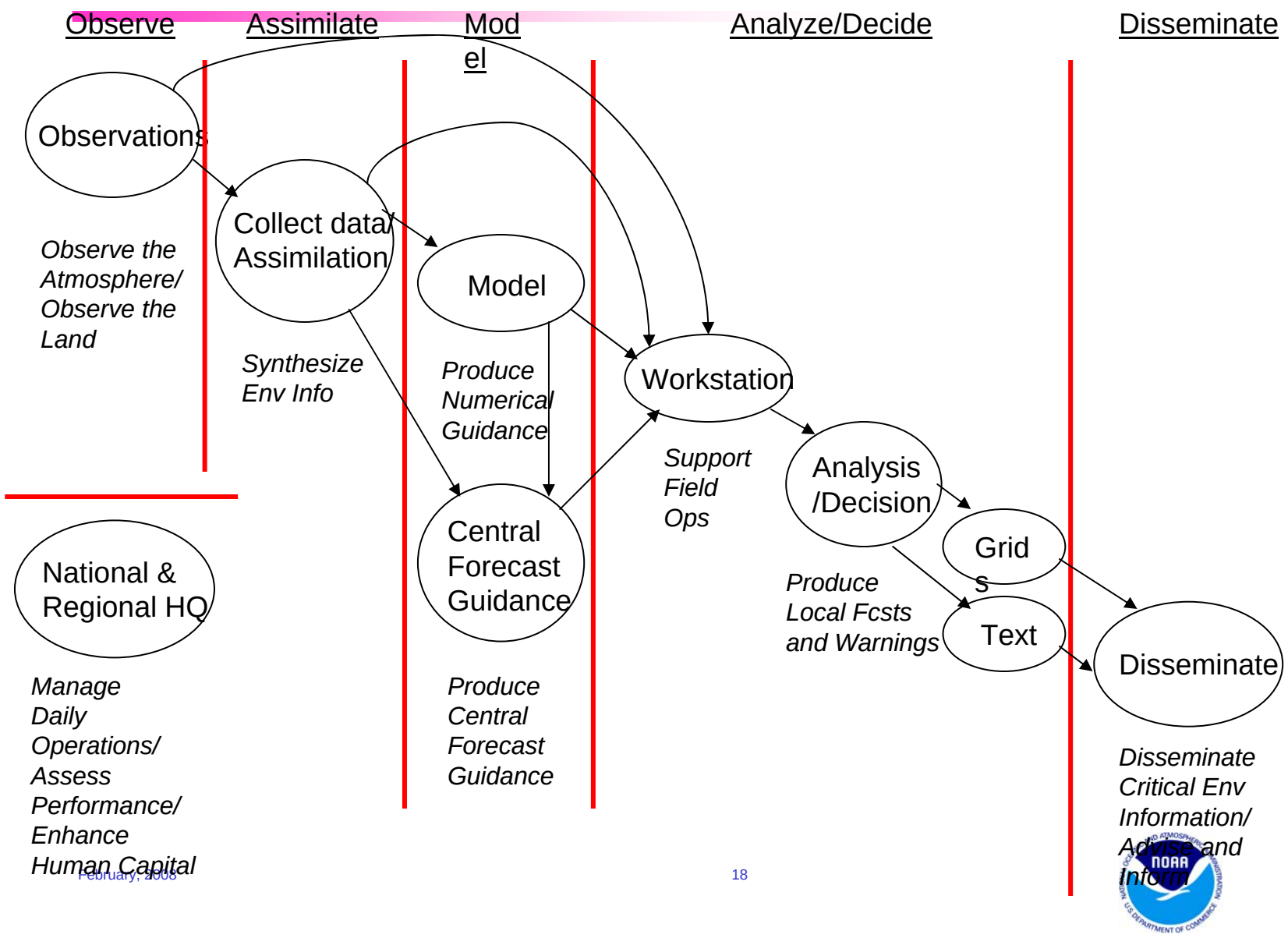
- Evaluate empirically
  - Usage logs
  - Questionaires
  - Observation
- Comprehensive examples of products
- Real-time Real-time Real-time
  - Simulate real-time data feeds as much as possible
- Account for seasonal/daily applications
  - Visible during day
  - Winter/Summer

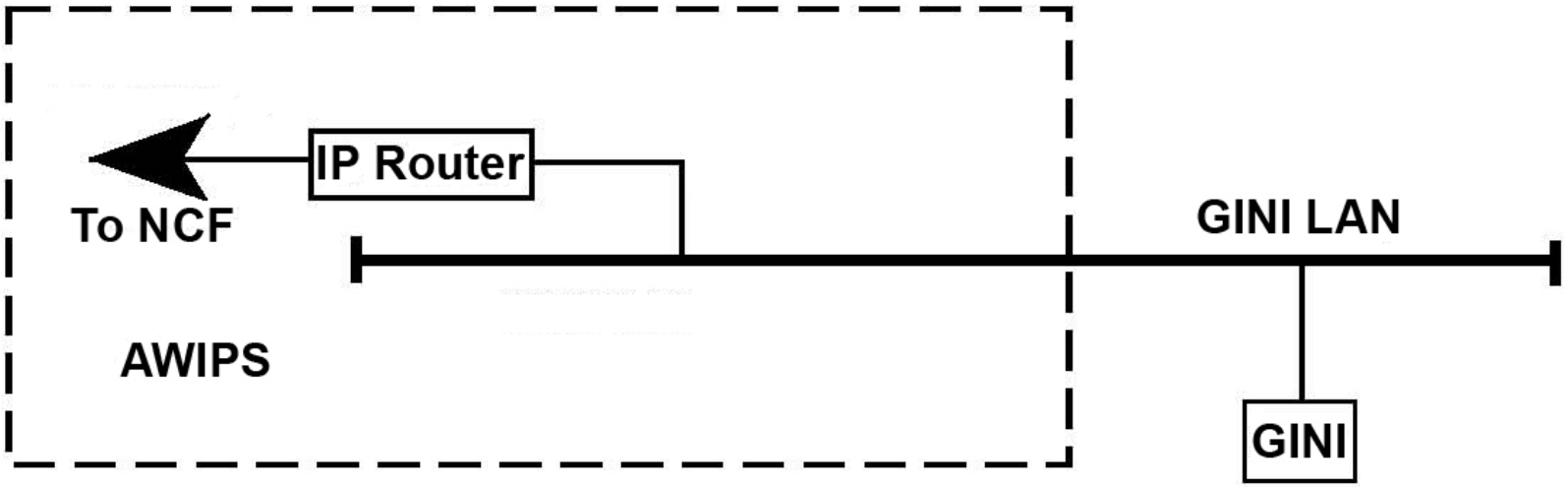
Background Slides


Algorithms
Observations
Decision Assistance Tools
Products And Services
Models

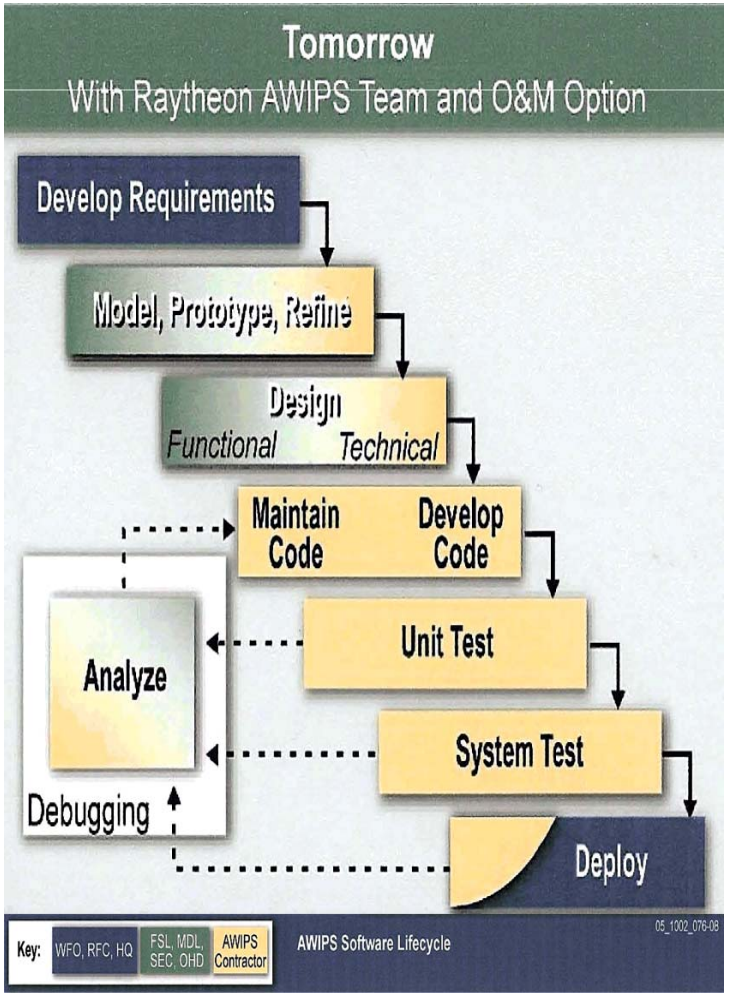

NWWS
NESDIS
NWSTG
WWV
Radar Server
NCF
NCF (1)
WAN
SBN
NRS
NOAAPORT
Users Systems
WSR-88D
NWWS
ASOS
LDAD
NWRCRS
MIDDS
WFO (120)
RH (6)
NWSTC (3)
HQ (4)
SMG (1)
WFO
AWC
TPC
SPC
NSC
NCEP
NC
WSR-88D
NWWS
NC FDDI
FAA WMSC
RFC (13)
NWSTC (2)
HQ (3)
RFC
AWIPS
WSR-88D
NWWS
RFC GW
LDAD
Legend
Site Subsystem
NOAAPORT Receive System
Intersite Network
System Boundary
Data Sources and Users
SMM 1/10/01

LFW Functional Diagram




IP Router
To NCF
GINI LAN
AWIPS
GINI

Proposed Transition



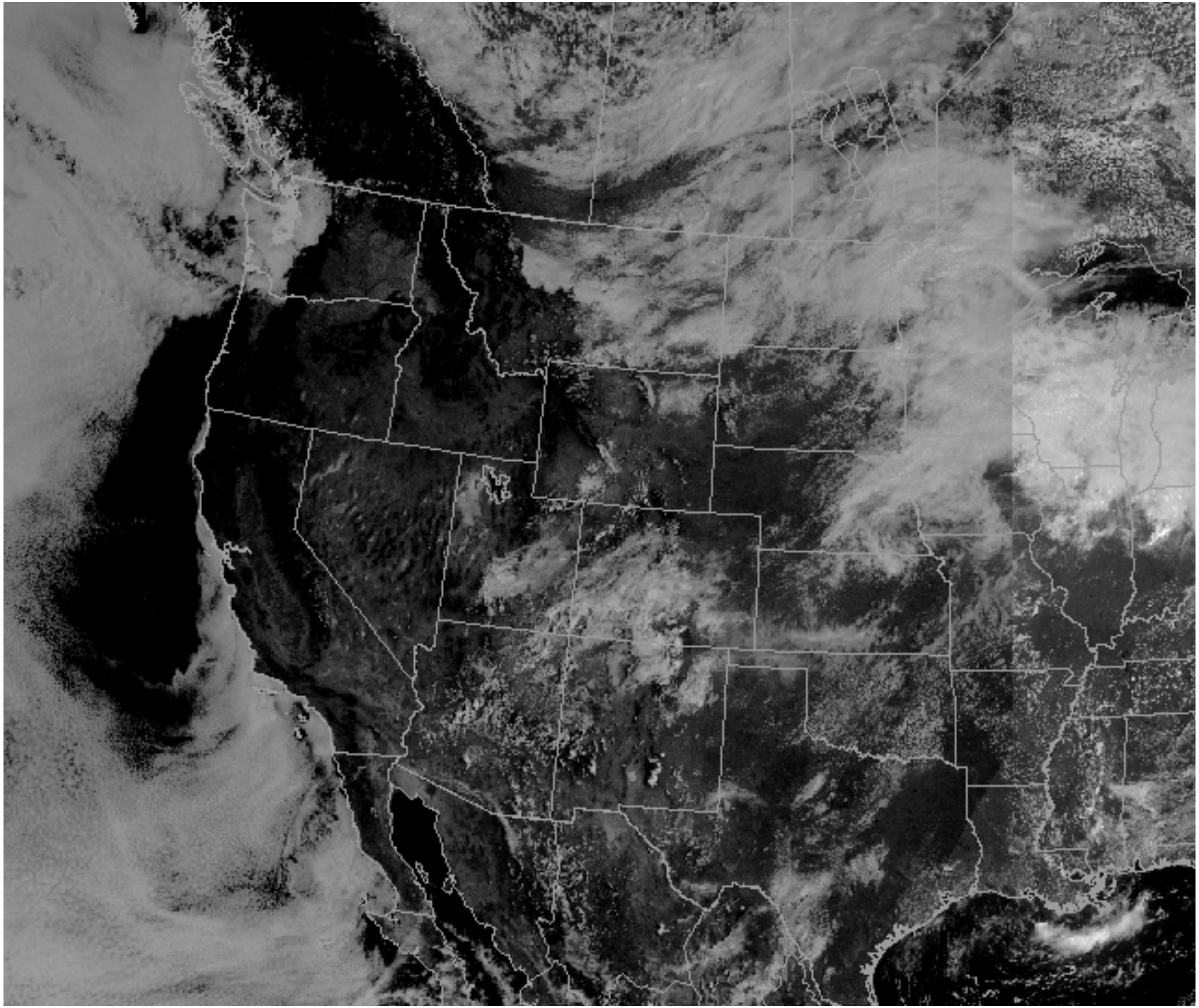
Service Proving Ground

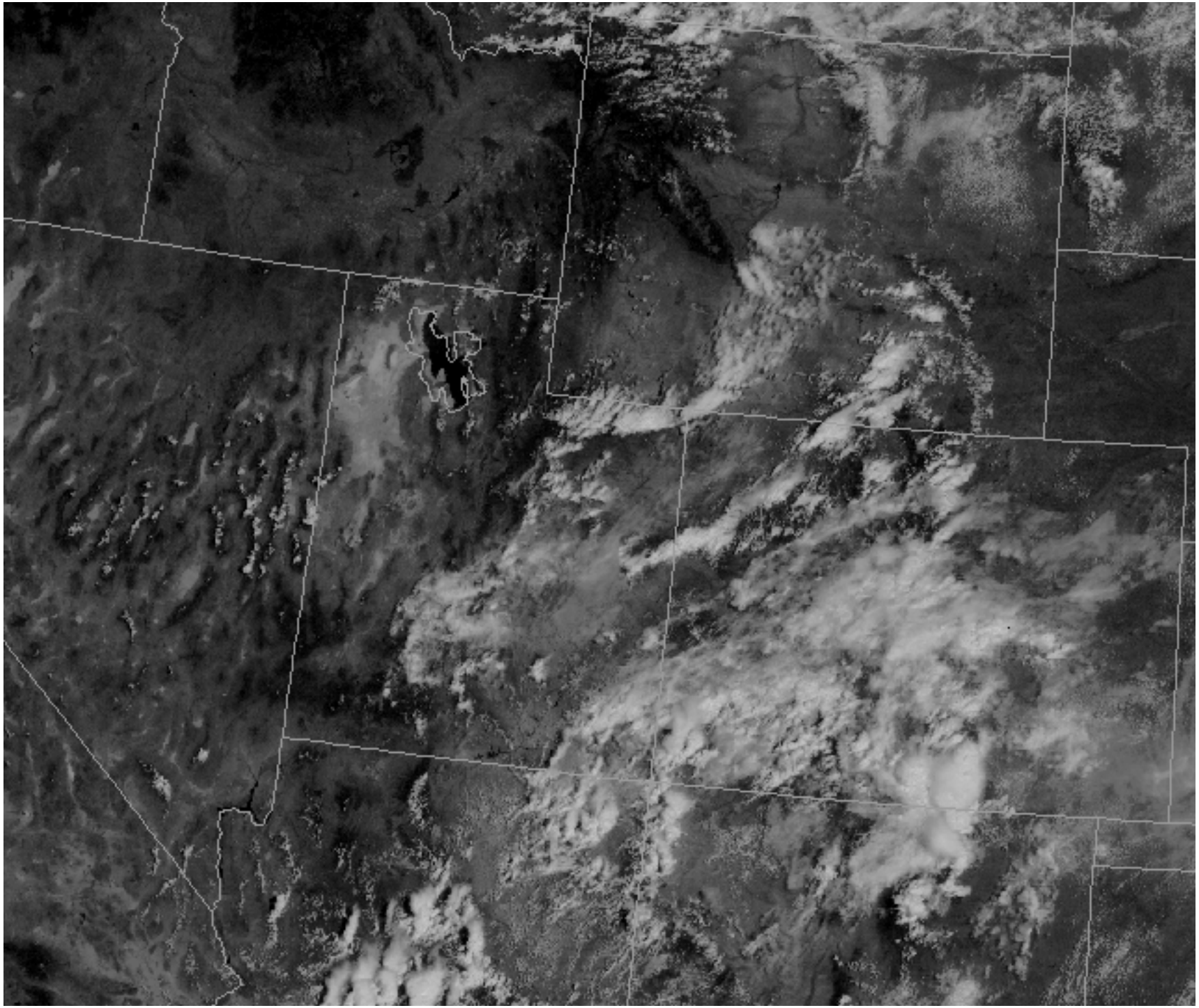
WFO Satellite Data Ingest

- Regional Clip (GOES E or W)
- CONUS Mosaic

WFO Satellite Display

- Regional Clip (GOES E or W)
- CONUS Mosaic





Performance Requirements

- Original Requirement for AWIPS
  - 36 frames looped in 30 seconds
    (1987 AWIPS-90 requirements doc)

- Current System
  - 32 frames, 10 - 25 seconds to load
  - Read/display/animate

Data Access

- Systematic Test and Evaluation
  - Lots of model runs required
    - Developmental Testbed Center
- Access to data for
  - Initialization
  - Verification
  - Visualization
- Global
- Regional
- Local

AWIPS/NWS Data Flow to WFO

- Satellite
  - NOAAPORT/SBN
- 9.25 Mbits/sec