

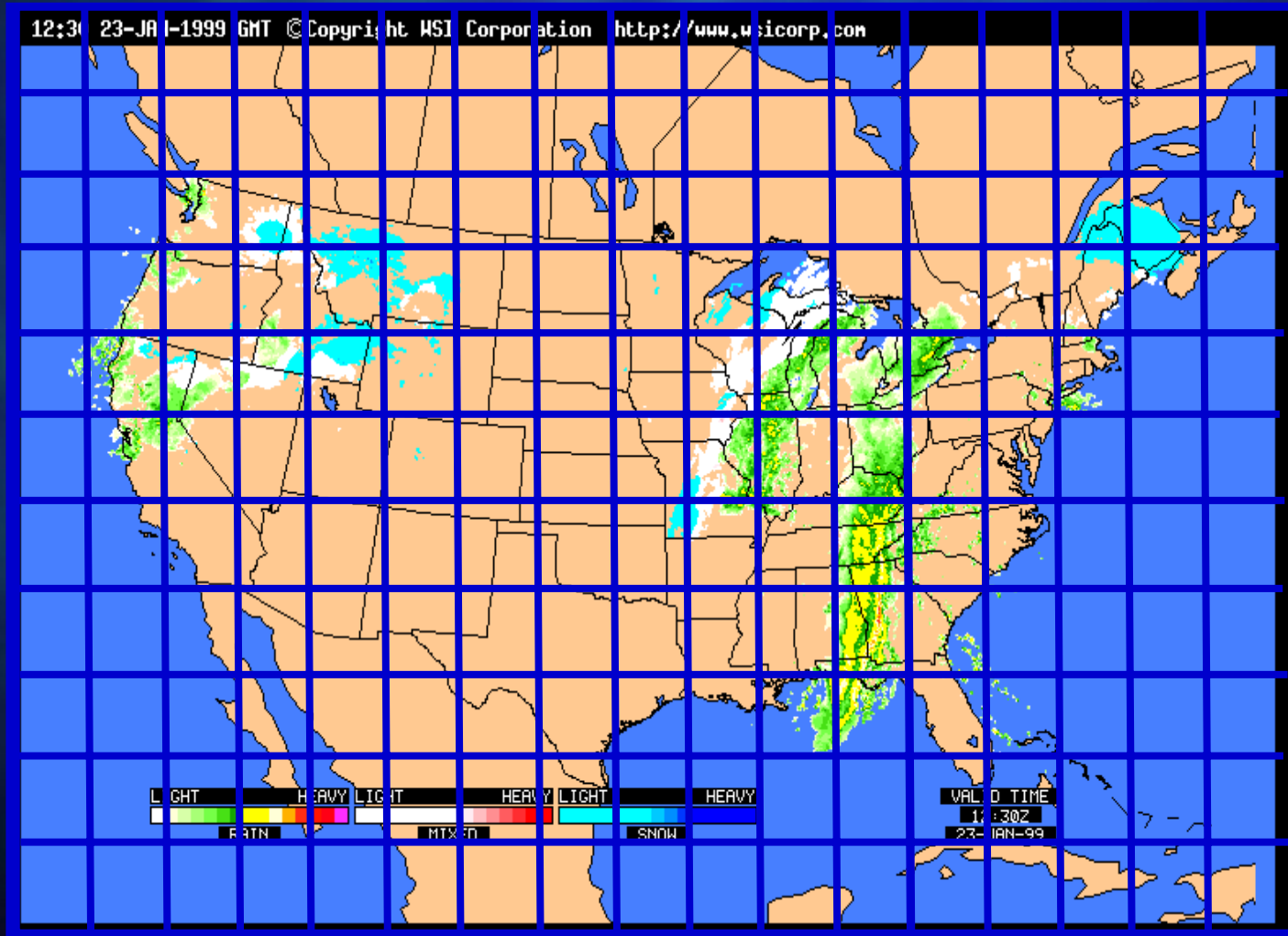
Transforming the Sensing and Prediction of Intense Local Weather Through Dynamic Adaptation

Beth Plale

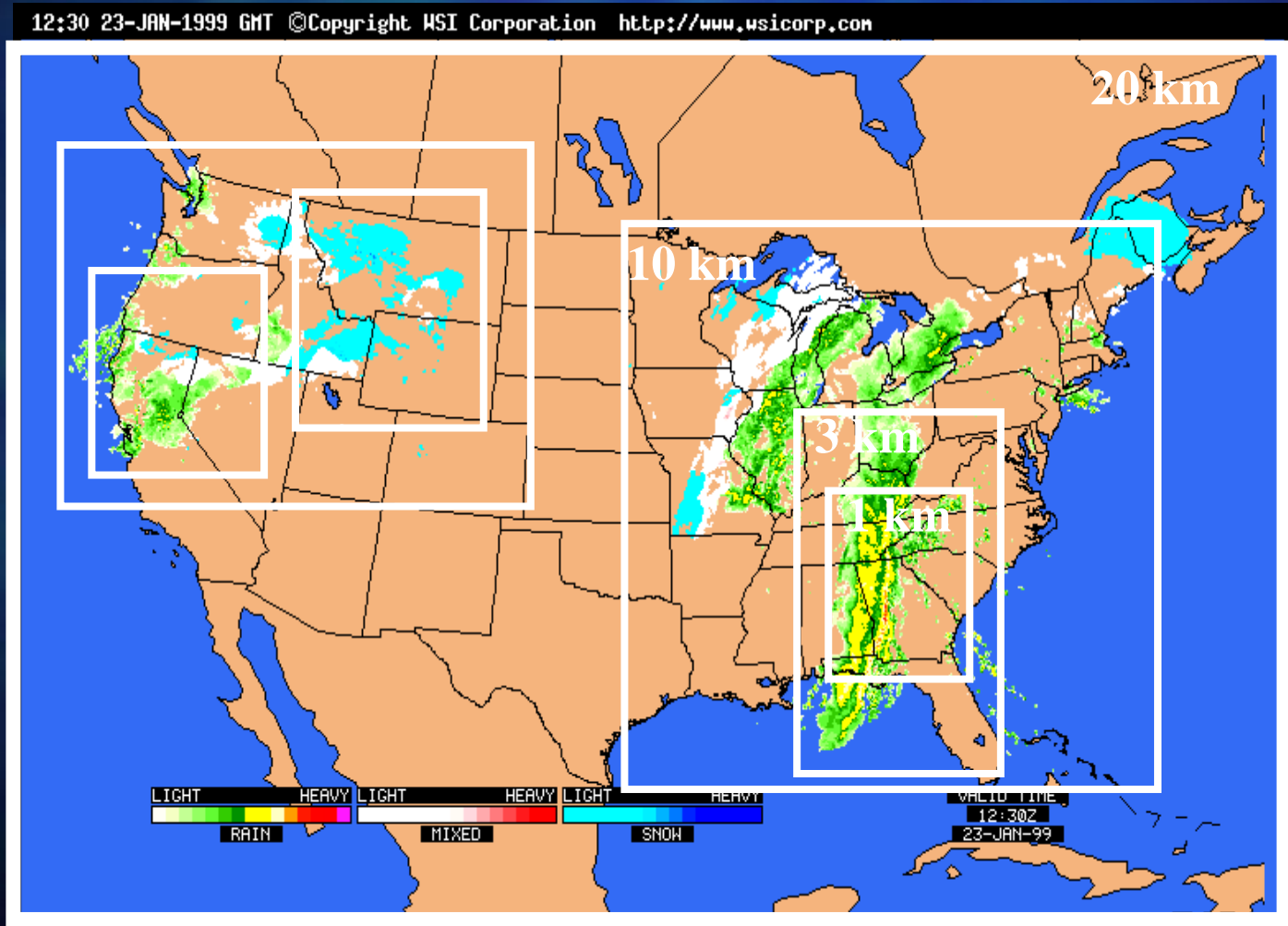
Kelvin K. Droegemeier, Dennis Gannon, Dan Reed, Bob Wilhelmson,
Sarah Graves, Mohan Ramamurthy

19 January 2006

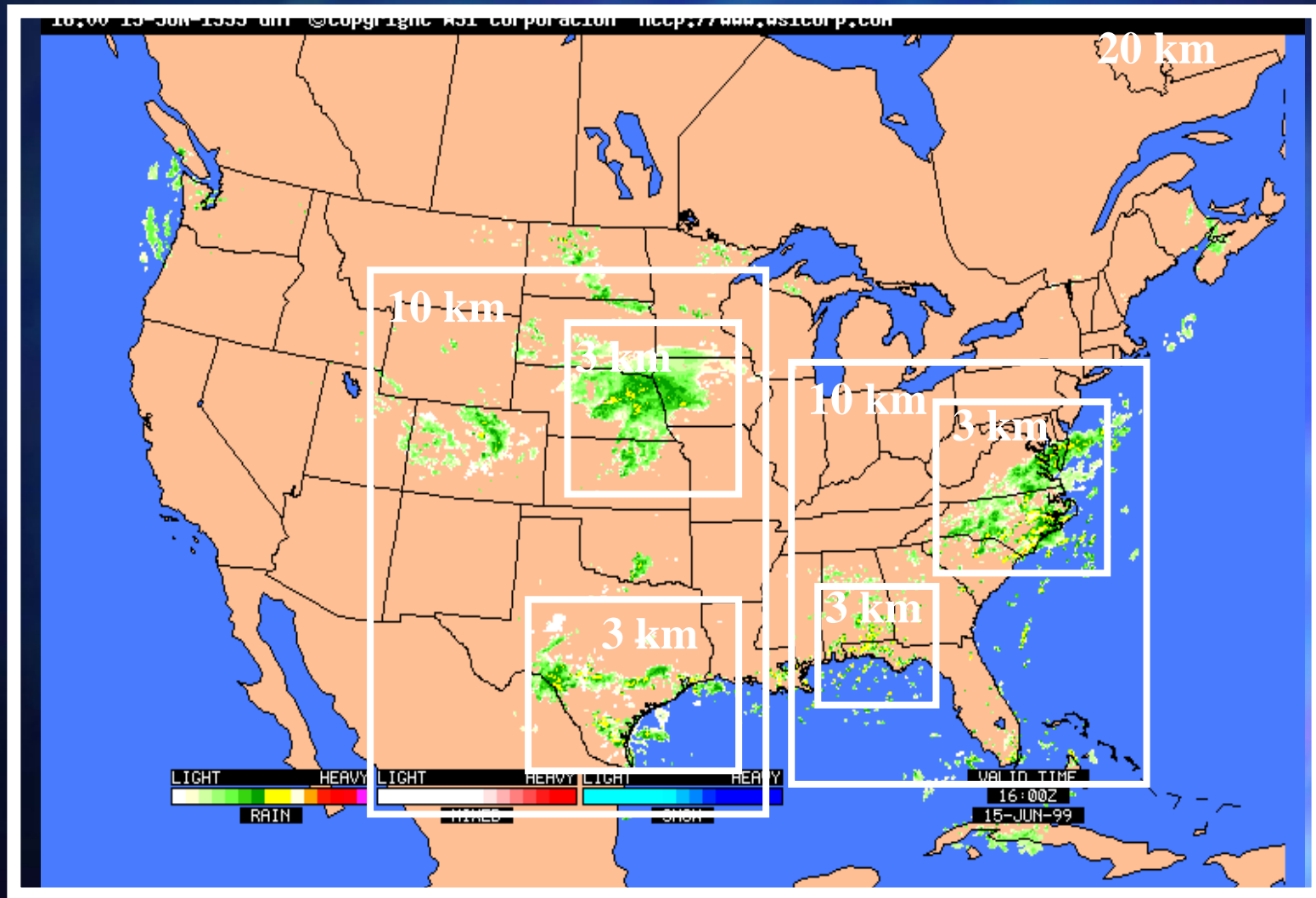
Today's case: Fixed, Coarse Model Grids



Adaptivity in Space ($t = t_0$)



Adaptivity in time ($t = t_0 + 2$ hours)



Another Component of Adaptation

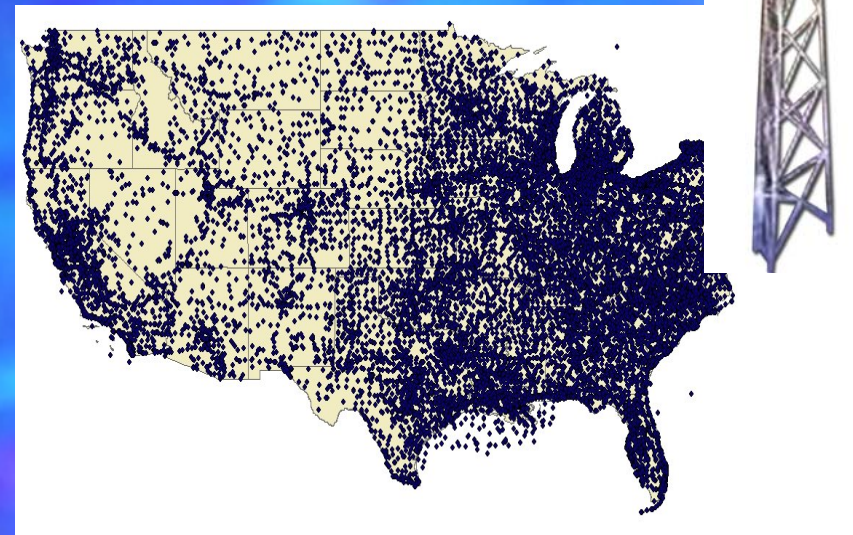
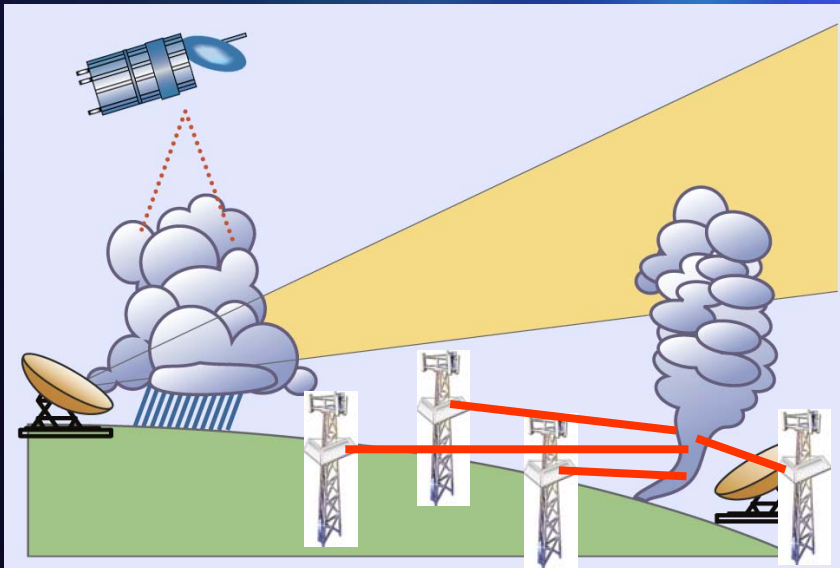
- Cyberinfrastructure including on-demand capability, application and environment monitoring, performance estimation and scheduling



New NSF Engineering Research Center for Adaptive Sensing of the Atmosphere (CASA)



- UMass/Amherst, OU, CSU, UPRM
- Concept: inexpensive, phased array Doppler radars on cell towers and buildings
- Dynamically adaptive dynamic sensing of multiple targets while simultaneously meeting multiple end-user needs



LEAD Service-Oriented Architecture

Crosscutting Services

MyLEAD

Authorization

Authentication

Monitoring

Notification

User Interface

LEAD Portal

Desktop Applications

- IDV
- WRF Configuration GUI

Portlets

Visualization

Workflow

Education

Browse

Control

Ontology

Query

Monitor

Control

Client Interface

Configuration and Execution Services

Application Resource Broker (Scheduler)

Application & Configuration Services

Host Environment

Execution Description

Application Host

Application Description

GPIR

Geo-Reference GUI

WRF, ADaM, IDV, ADAS

Workflow Monitor

Workflow Engine/Factories

Workflow Services

VO Catalog

THREDDS

Catalog Services

Stream Service

Query Service

Decoder/Resolver Service

Control Service

Ontology Service

Transcoder Service/ESML

Data Services

Resource Access Services

Grid FTP

Scheduler

OPeNDAP

Generic Ingest Service

RLS

OGSA-DAI

GRAM

SSH

LDM

Distributed Resources

Computation

Observations

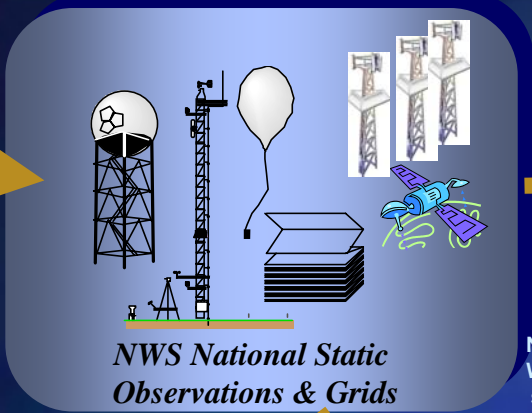
- Streams
- Static
- Archived

Specialized Applications

Steerable Instruments

Data Bases

Storage



NWS National Static Observations & Grids

National Weather service



Emergency response users

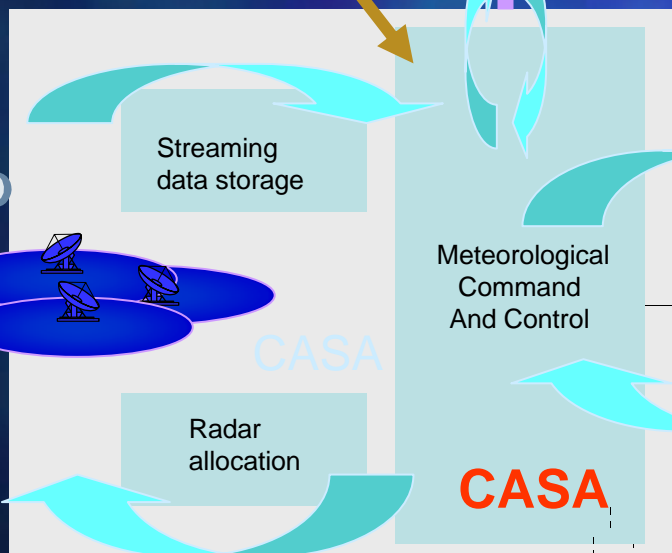
Researchers

Students

End users

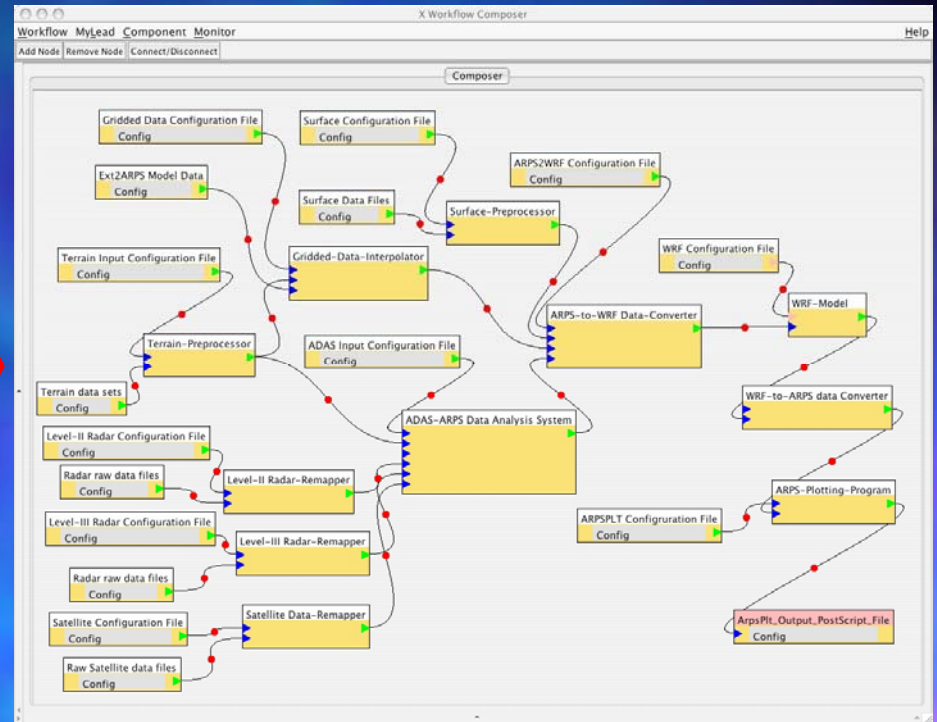
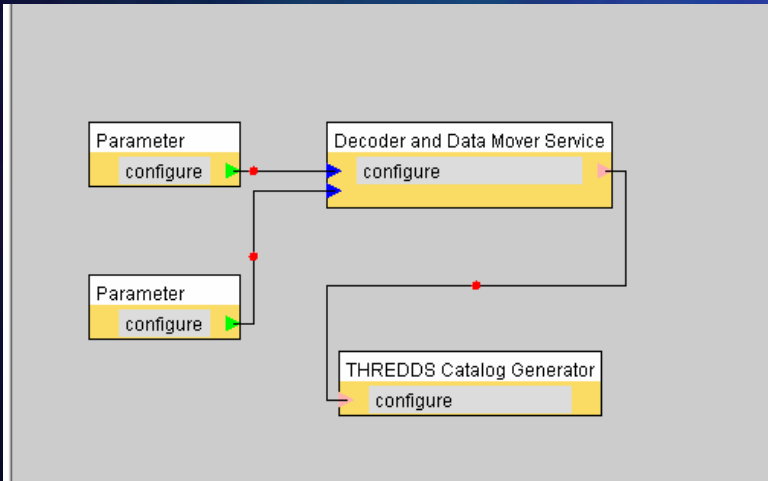


Mesoscale Weather



Local User Imported Observations

Dynamic Workflow: THE Challenge



**Automatically, non-deterministically,
and getting the resources needed**