



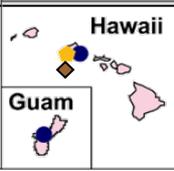
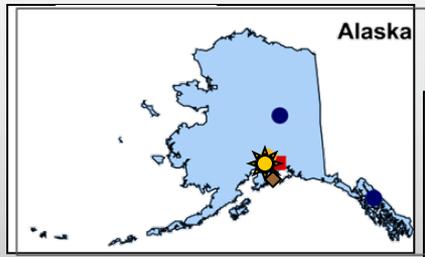
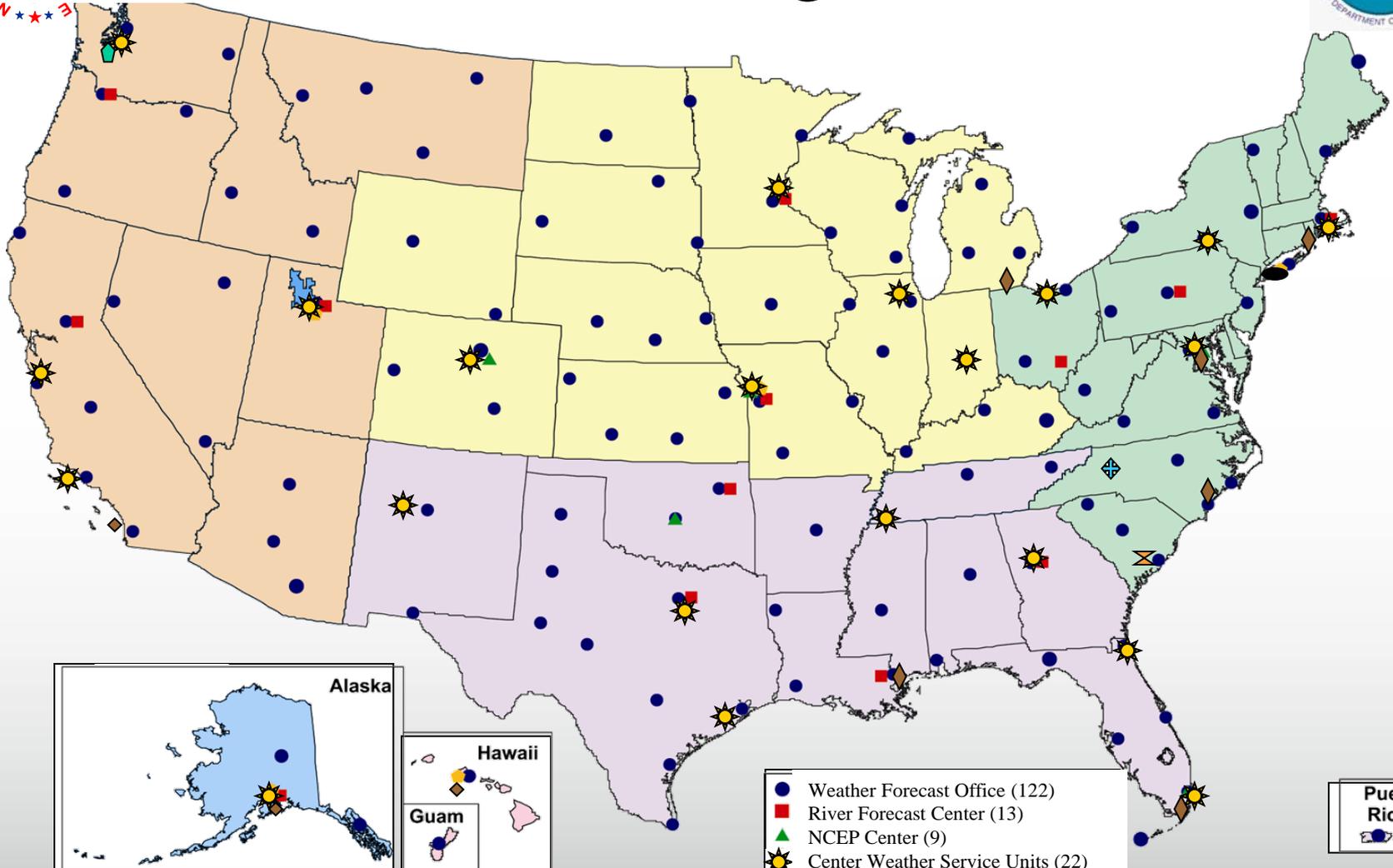
NOAA/NWS Support for Homeland Security: ATD Modeling

- Structure
- Services
- Cooperative Support

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NOAA *and* HOMELAND SECURITY

NOAA In Your Neighborhood



- Weather Forecast Office (122)
- River Forecast Center (13)
- ▲ NCEP Center (9)
- ★ Center Weather Service Units (22)
- ◆ NESDIS CoastWatch Nodes (9)
- ◇ NOS HazMat Office
- ⊠ NOS Coastal Services Center
- ⊞ NESDIS Nat. Climatic Data Center



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NOAA/NWS Services Supporting ATD Modeling for Homeland Security



- Realtime and archived **environmental data** support vulnerability and risk analyses
- Long and short-range **environmental forecasts** support preparation, protection, response, and recovery decisions
- **Dispersion forecasts** help move people out of harms way
- **Staff support to DHS:** full-time at HSOC
- **Event specific support** speeds decision making
- **Direct public dissemination** of critical information speeds evacuation
- **Education and coordination** ensures effective service use
- **Focused research** improves service

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NOAA and HOMELAND SECURITY



NOAA/NWS Weather Observations and Forecasts



- Short term warnings and forecasts safeguard first responders
- Daily to seasonal forecasts aid contingency planning
- Site-specific Web pages provide one-stop shopping:
 - forecasts and warnings
 - surface observations
 - radar and satellite images

OFFICE OF CLIMATE, WATER, AND WEATHER SERVICES
Incident Weather Support

Contact: NWS Forecast Office Sterling, VA (703) 556-1700

Incident Specific Forecasts

- [Current to Day 7 Forecast](#)
- [Graphical Zone Forecast](#)
- [Digital Tabular Zone Forecast](#) ([How to read it](#))
- [Watches, Warnings, and Forecasts for Arlington and Alexandria](#)
- [1 to 6 Hour Forecast](#) (when available)

Forecast Map Graphs

- [1 to 7 Day Fronts, Weather, and Radar](#)

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Special Hydrometeorological Summary
 Friday, September 21, 2001

Recovery Area Forecasts

Pentagon

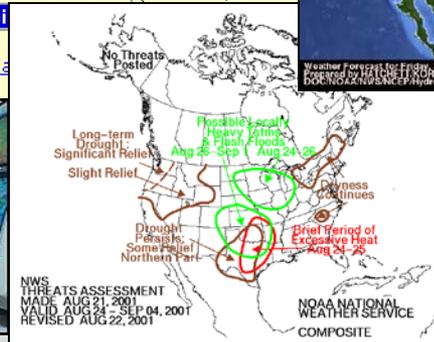
Impacts: Partly cloudy Patches fog until mid morning. Showers likely Monday and possibly Tuesday.

Dry through Sunday with highs in the upper 70s to low 80s. Overnight lows will be in the 60s. Showers are likely Monday and are possible on Tuesday. Detailed forecast and related information can be found at: <http://www.nws.noaa.gov/om/support>

Lower Manhattan

Impacts: Mostly cloudy today through Saturday with a chance of showers late in the day on Saturday. Highs in the upper 70s to low 80s and lows in the low to mid 60s. Winds are expected to be south at 5 to 10 mph. Showers are likely Tuesday and possibly Wednesday.

A chance of showers Saturday. Dry weather is expected Sunday and Monday. Highs Sunday and Monday are expected to be in the 70s. Showers are likely Tuesday and are possible on Wednesday.



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Dispersion Forecasts in NOAA/NWS Operations

- OAR-developed ATD capability HYSPLIT; integrated into NWS operations:
- HYSPLIT model supports planning, response for radiological emergencies
- HYSPLIT predicts dispersion of
 - hazardous releases exceeding a 10km area.
 - volcanic ash, for aviation safety

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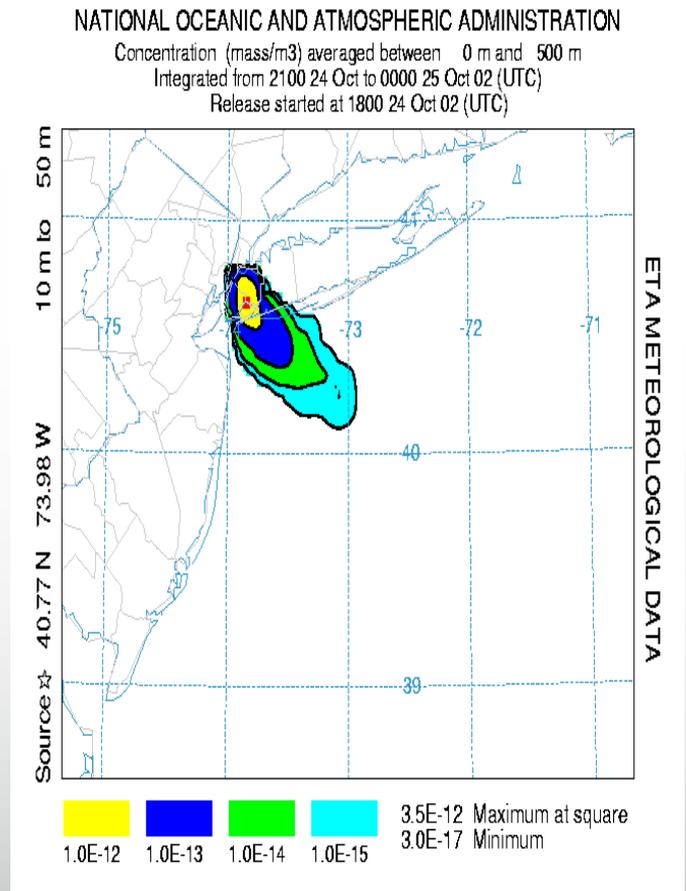
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Operational Dispersion Forecasts: HYSPLIT/ Eta-12



- HYSPLIT run at NCEP, linked to NCEP's highest resolution mesoscale NWP model: Eta-12
- Planning: Scenario archive available from 4 X daily simulations for selected locations across the Nation
- Emergency: On-demand, run by NCEP's SDM in addition to regularly scheduled runs
- Response/recovery: WFO forecasters transmit dispersion predictions to emergency managers
 - Contact: nearest WFO (NCEP's SDM can help direct)



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NWS Event Specific Support



- 60 incident meteorologists deploy on request to event sites.
- NWS Weather Forecast Offices (WFO) provide onsite support as requested
- Incident-specific WEB sites.

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NOAA and HOMELAND SECURITY



NWS Support to Emergency Managers

Selected Capabilities

Full-time staff support to Homeland Security Operations Center



NWS field forecasters frequently respond to requests by emergency managers for weather information, incident support, and for assistance in disseminating emergency warning information



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Dissemination



To DHS:

- NWS weather and requested dispersion information to HSOC, IMAAC

To Emergency Managers:

- NWS Field Forecasters at 122 Weather Forecast Offices provide requested dispersion forecasts to Emergency Managers
- Emergency Managers Weather Information Network (EMWIN)

To the Public:

- Emergency managers/DHS can request civil emergency messages be disseminated over **NOAA Weather Radio**; the same system carries emergency weather information
 - Alerts public to extreme events and civil emergency messages (CEM)s
 - Activates the Emergency Alert System
 - DHS linkage formalized in recently signed DOC-DHS MOA
- NOAA Weather Wire Service and NOAAPORT to media and others for dissemination

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NOAA Weather Radio



- Is the official government source for public warning information
- Covers 97 percent of the population
- Becoming a “All Hazards” warning system for natural and technological hazards
- Disseminates emergency manager Civil Emergency Messages to the public
- Is an entry point to the Emergency Alert System (EAS)



Legendary comic strip character Mark Trail, the official spokesperson for NOAA Weather Radio, has taught generations of Americans about life in the outdoors. The story, developed by Kevn Fishbein at 729 newspapers nationwide, is available at www.noaa.gov/marktrail.

"I also want to tell you one of my favorite moments was to go down to Crawford and turn on my NOAA radio to get the weather. I don't know whether my guy is a computer or a person. But the forecast is always accurate, and I appreciate that..."

President Bush February 14th, 2002



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Education and Coordination



- Warning Coordination Meteorologists at 122 Weather Forecast Offices and 12 scientific support coordinators nurture local and state officials
- NOAA and FEMA partner on emergency manager courses

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NOAA and HOMELAND SECURITY



Focused Research



- Improve dispersion modeling and fine scale dispersion forecasts

DC testing

Smoke emissions testing

- Improve short-term warnings and forecasts

Improved Doppler radar capabilities

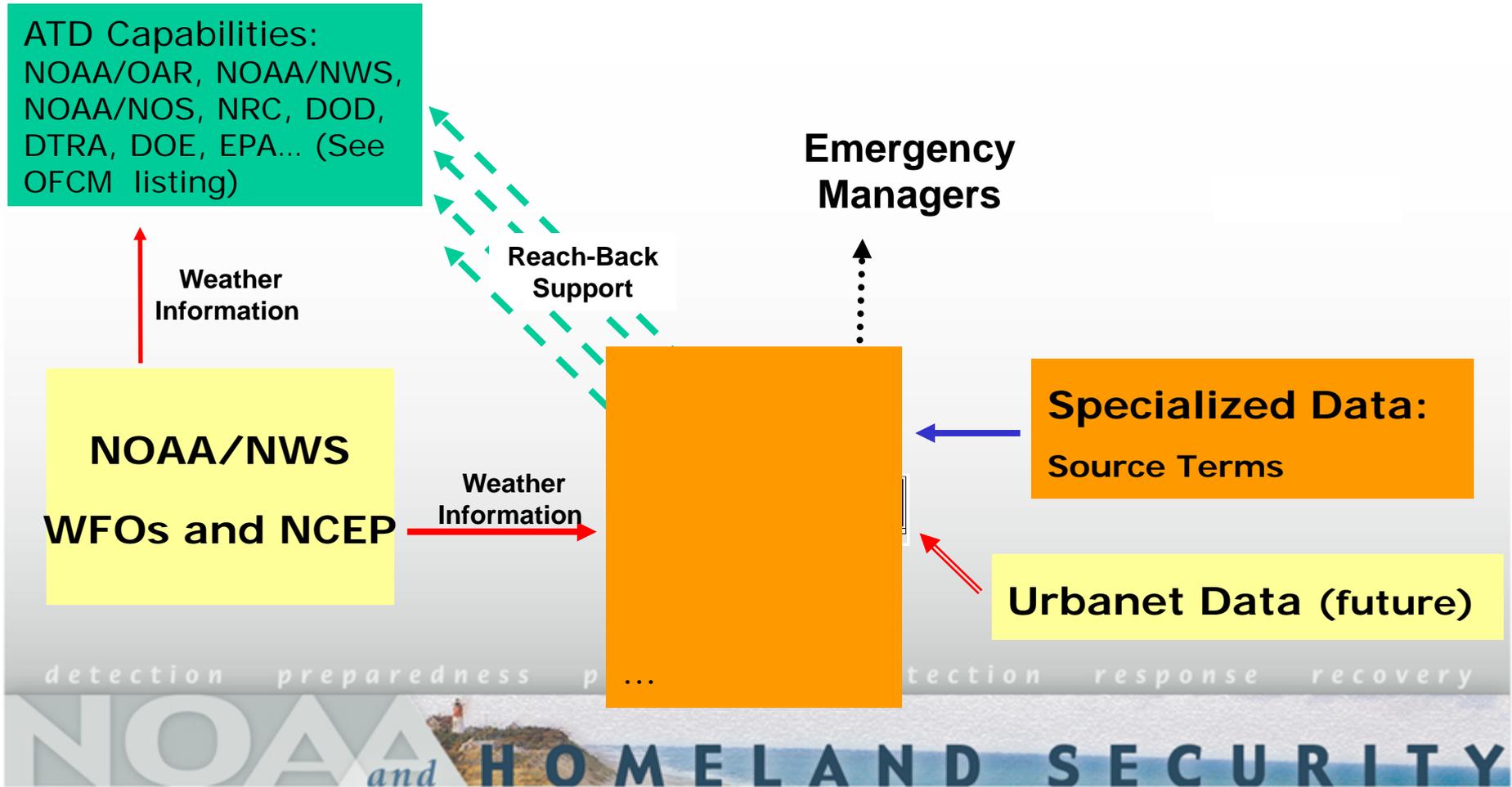
Improved integration of surface observation

Improved coastal weather forecasts/warnings

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Concepts for Integrated Weather/ATD Support for Homeland Security





Backup



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NOAA *and* **HOMELAND SECURITY**



Operations Backup



- Storm Prediction Center and Aviation Weather Center – Air Force Weather Agency (AFWA)
- Alaska Aviation Weather Unit - Elmendorf Air Force Base
- Washington and Alaska Volcanic Ash Advisory Centers (VAAC) and Regional Specialized Met Center (RSMC) for Radiological Emergencies – Montreal VAAC and RSMC
- NCEP Central Operations - Fleet Numerical, AFWA, and FSL
- Weather Forecast Offices - Partner Office
- NCEP Service Centers - Partner Office

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Environmental Data



Realtime Observations

- Global data feed NOAA and other agency prediction models
- Local data support first responder dispersion models
- Recovery area overflights assist debris removal

Archived Environmental Data

- Extreme environmental event statistics support preparedness actions
- Wind, temperature, and precipitation climatologies define hazardous release vulnerabilities
- Dam break scenarios, storm surge and coastal atlases, and dispersion climatologies define at risk populations



Improvement Opportunities: ATD Support



- Refine requirements for effective hazardous release response actions
- Upgrade appropriate dispersion models to meet user requirements
- Implement cost effective high resolution models for dispersion model input
- Acquire/ integrate more high resolution observations
- Strengthen meteorologists' abilities for hazardous release support
- Strengthen first responders' understanding of evolving services

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Cooperative Support

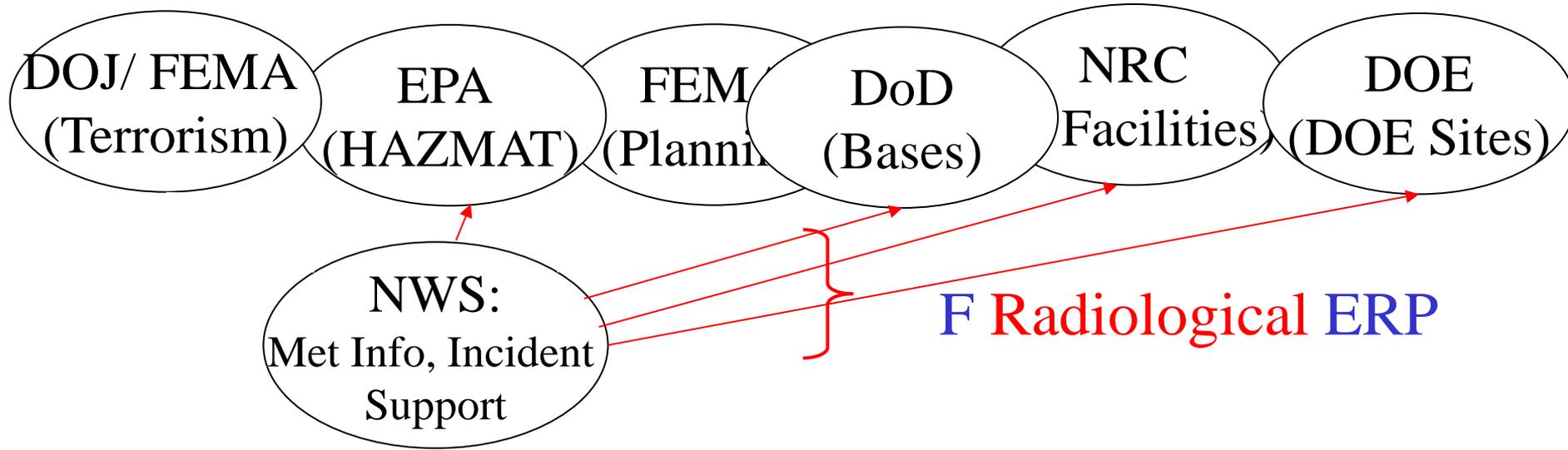
- **River gages - USGS, USACE, Bureau of Reclamation**
- **Doppler radar & surface observing systems - DOD and FAA**
- **Hurricane reconnaissance - Air Force Reserve**
- **Data buoy tending and marine dissemination - Coast Guard**
- **ARGOS data collection system - French Space Agency**
- **Voluntary observations - 168,000 storm spotters, 115,000 marine reports, 1800 voluntary ships**
- **CAMEO product suite - EPA**
- **HYSPLIT and HARM – DOE**
- **Drought Monitor - DOA, National Drought Mitigation Center**
- **National Education Coalition - FEMA, USGS, American Red Cross**

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NOAA and **HOMELAND SECURITY**

Agency Responsibilities: NOAA Provides Weather and Dispersion Predictions

Federal Emergency Response Plan (FERP): CBN



FERP Support Function

Information and Planning

Hazardous Materials

Annex: Terrorism Incident**

Lead Federal Agency (LFA)

FEMA

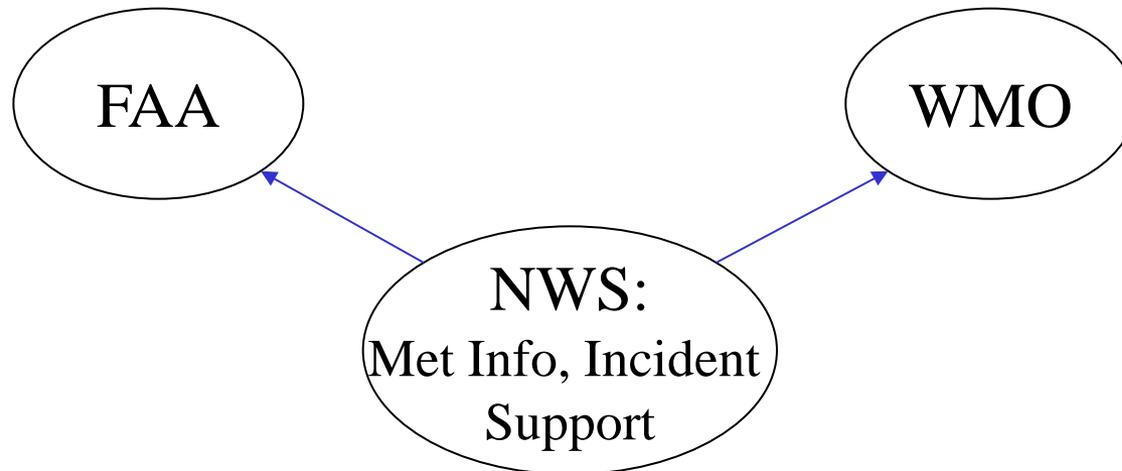
EPA

DOJ/ FEMA

**Through Hazardous Materials responsibilities (EPA lead)

International Responsibilities

NWS: Radiological Release and Volcanic Ash



✓ Radiological release (WMO):

- Dispersion model (HYSPLIT) run by NCEP's Senior Duty Meteorologist (SDM)
- Initialized with Eta 12km or AVN models

✓ Volcanic Ash (FAA):

- Ash trajectory model (HYSPLIT) run by NCEP's SDM
 - HYSPLIT also run for ash transport/dispersion, by OAR/ARL