



# Specialized Dispersion and Meteorology Support

**Walt Schalk**  
Air Resources Laboratory

**Air Resources Laboratory Review**  
**Tuesday, May 3 - 5, 2011**

## *ARL's expertise and services are sought out*

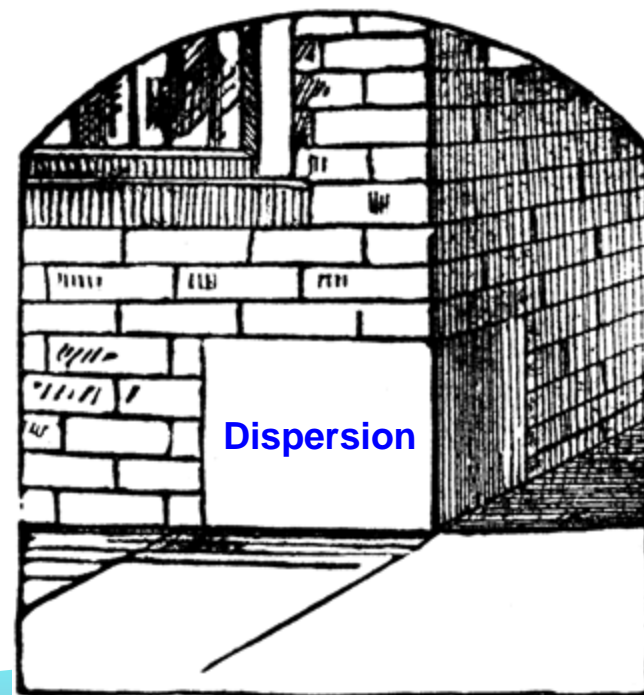
*Dispersion is cornerstone to services*

*Customer relationship pairs*

- Their specific & unique needs*
- ARL expertise and experience*

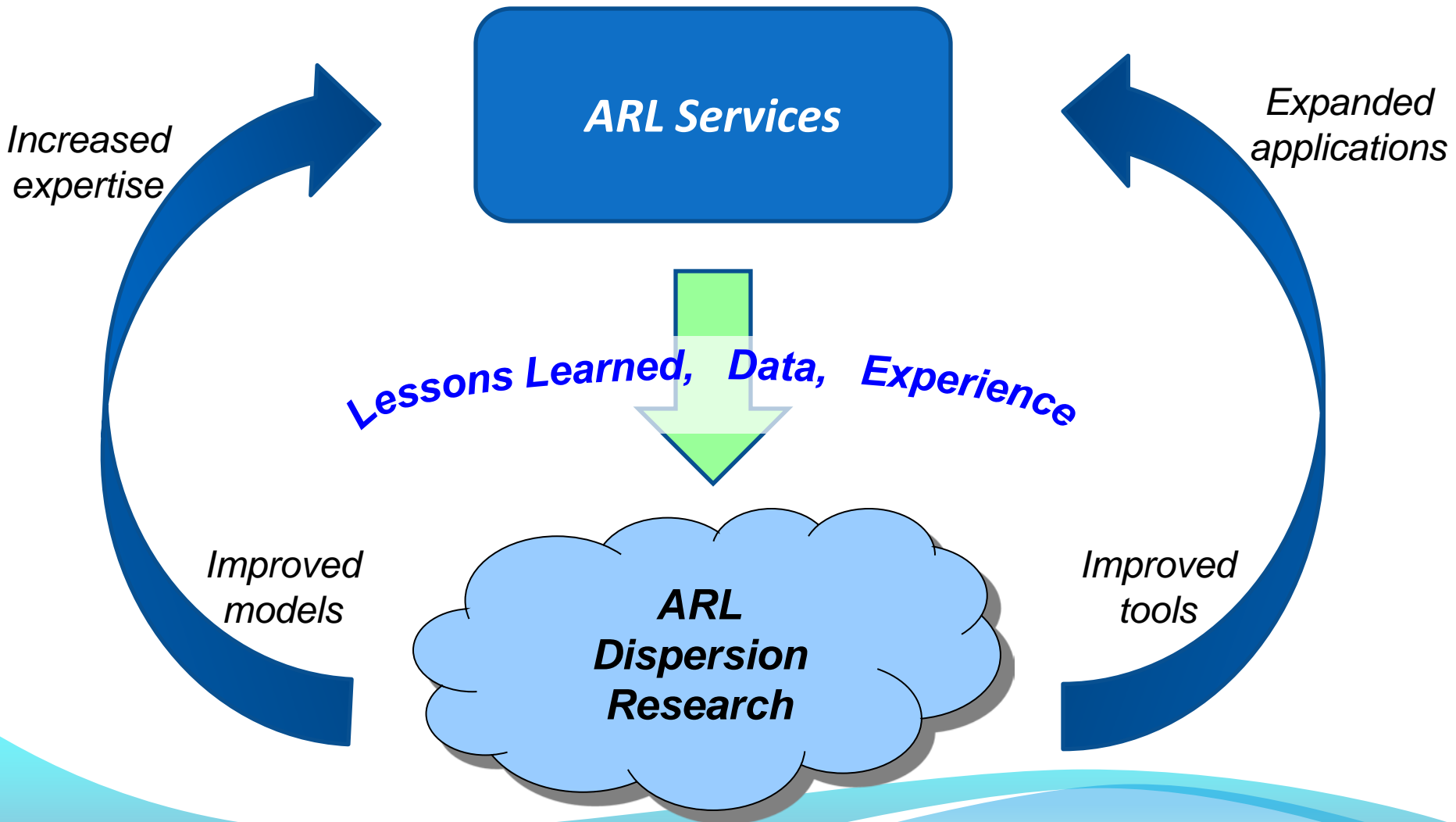
*ARL Benefit*

- Feedback to research*



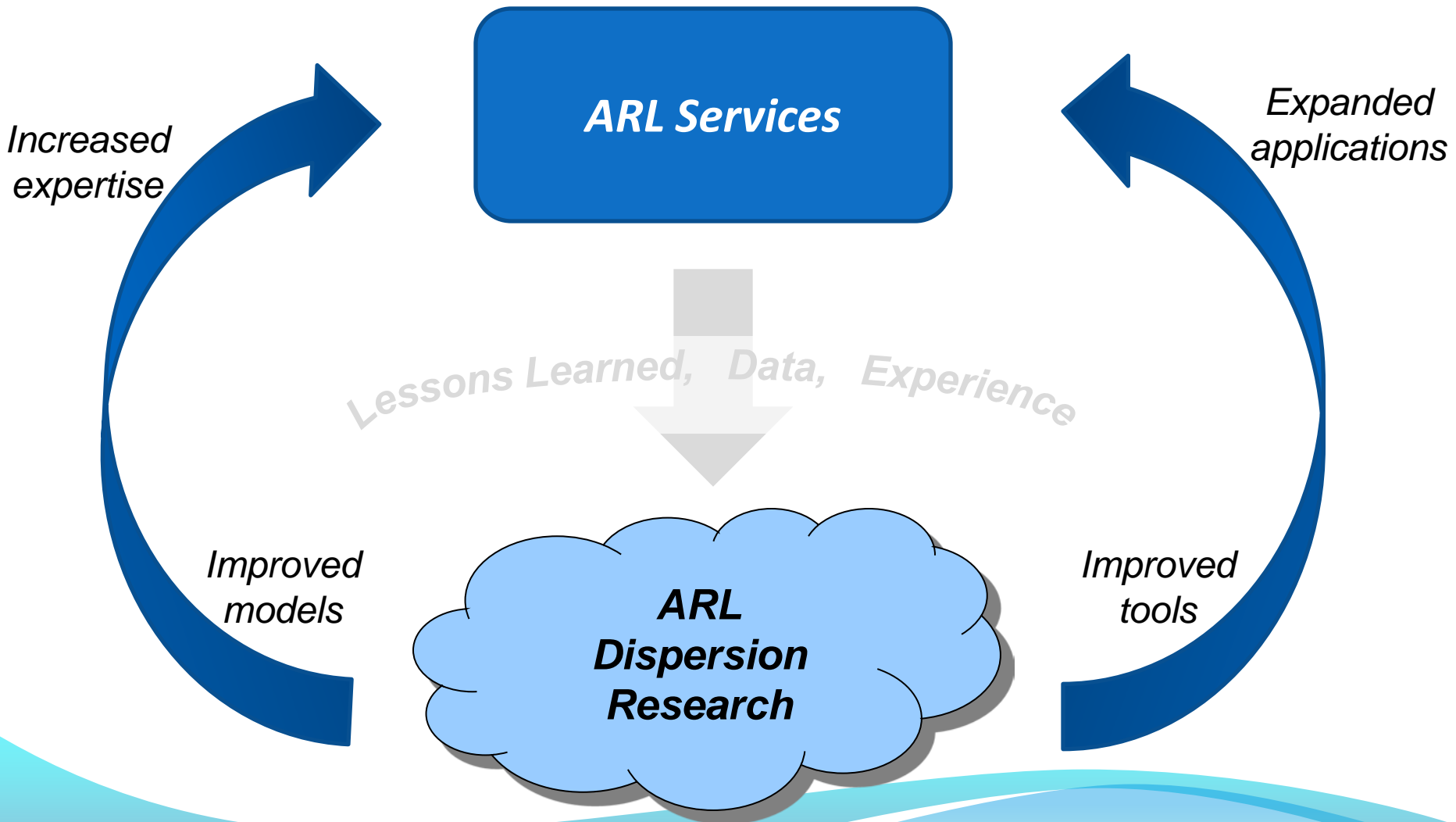


# Feedback to Research





# Feedback to Research





# Customers

## *Primary*



## *Others*



**World  
Meteorological  
Organization**  
Weather • Climate • Water





## Services Provide to DOE

*Meteorological Data Collection*

*Consequence Assessment*

*Meteorological Data Analysis*

*Mesoscale Weather Forecast modeling*

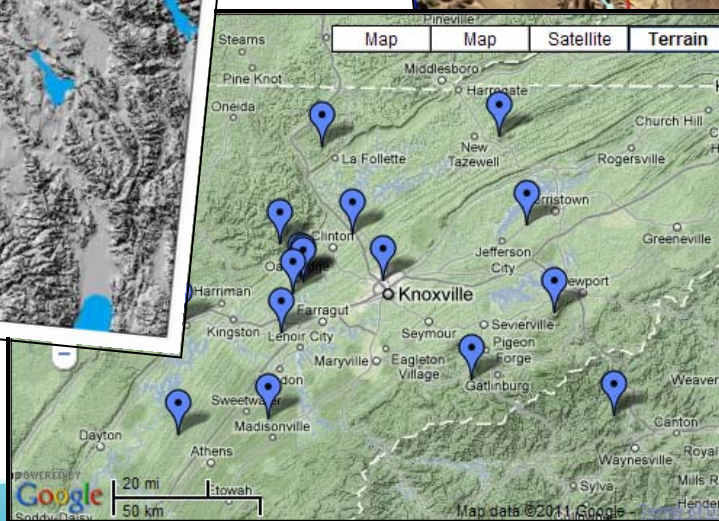
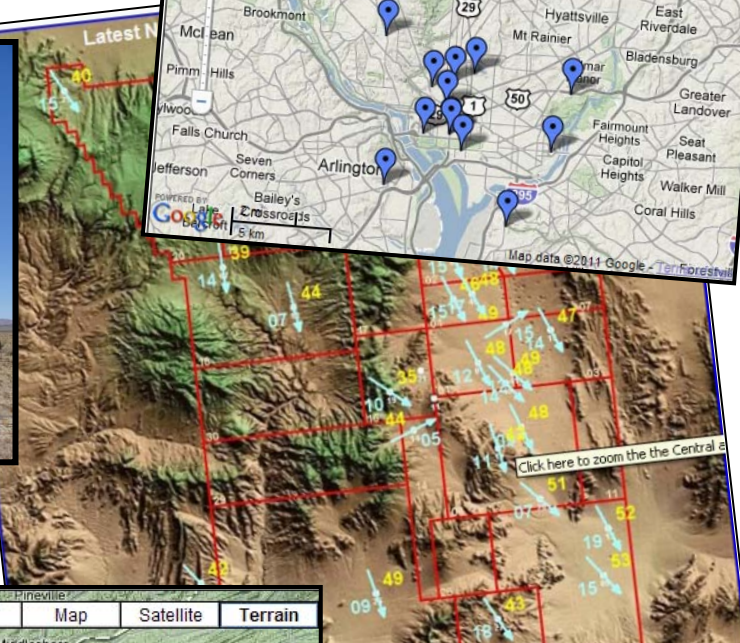
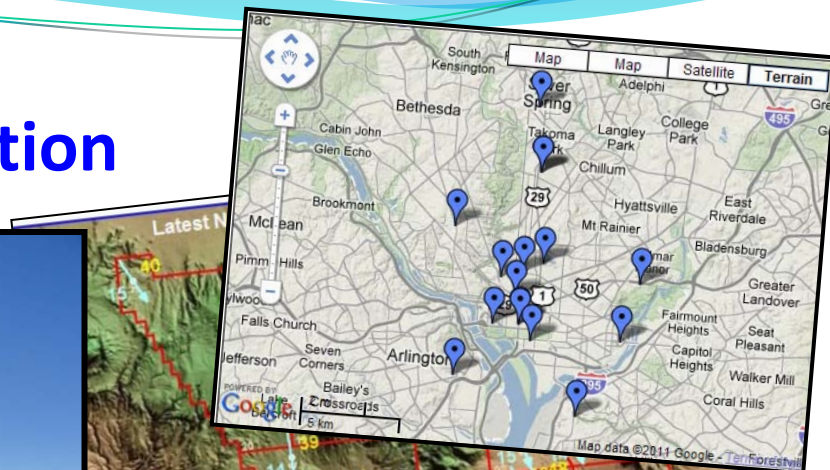
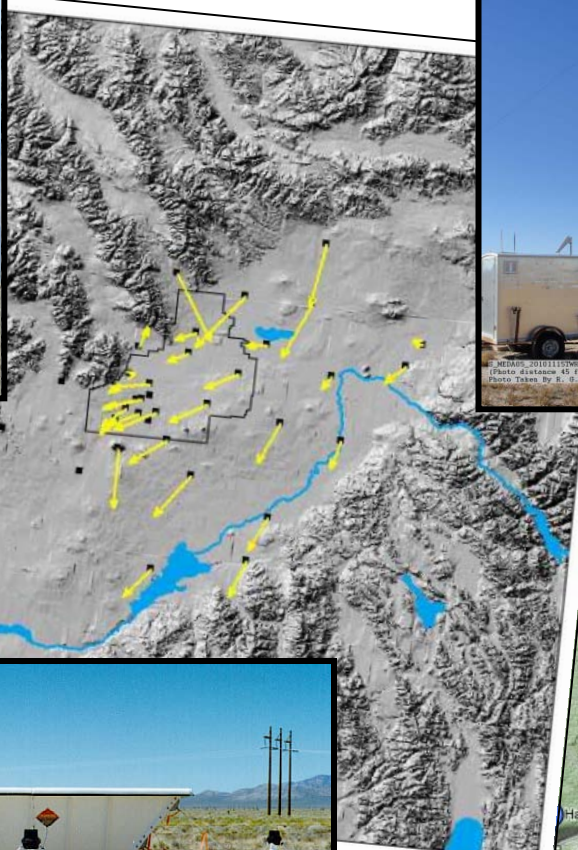
*Meteorological Surveillance & Forecasting*

*Specialized Experimental Support*

*Air Quality Modeling – permitting*



# Meteorological Data Collection

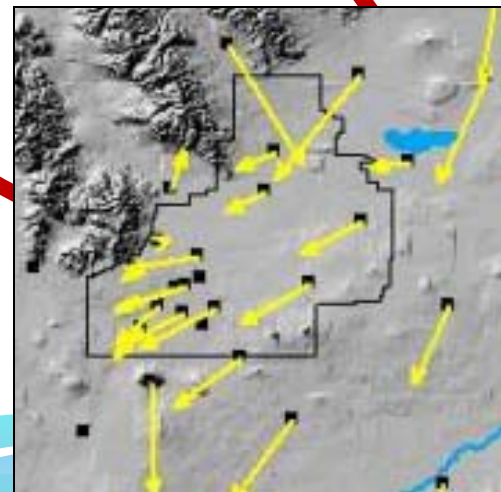
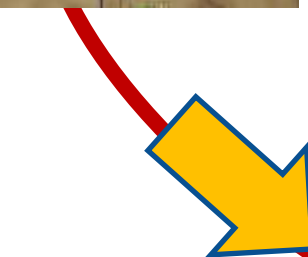
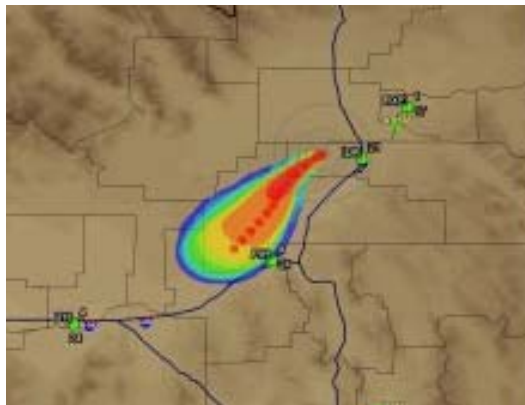


May 3, 2011

# Consequence Assessment



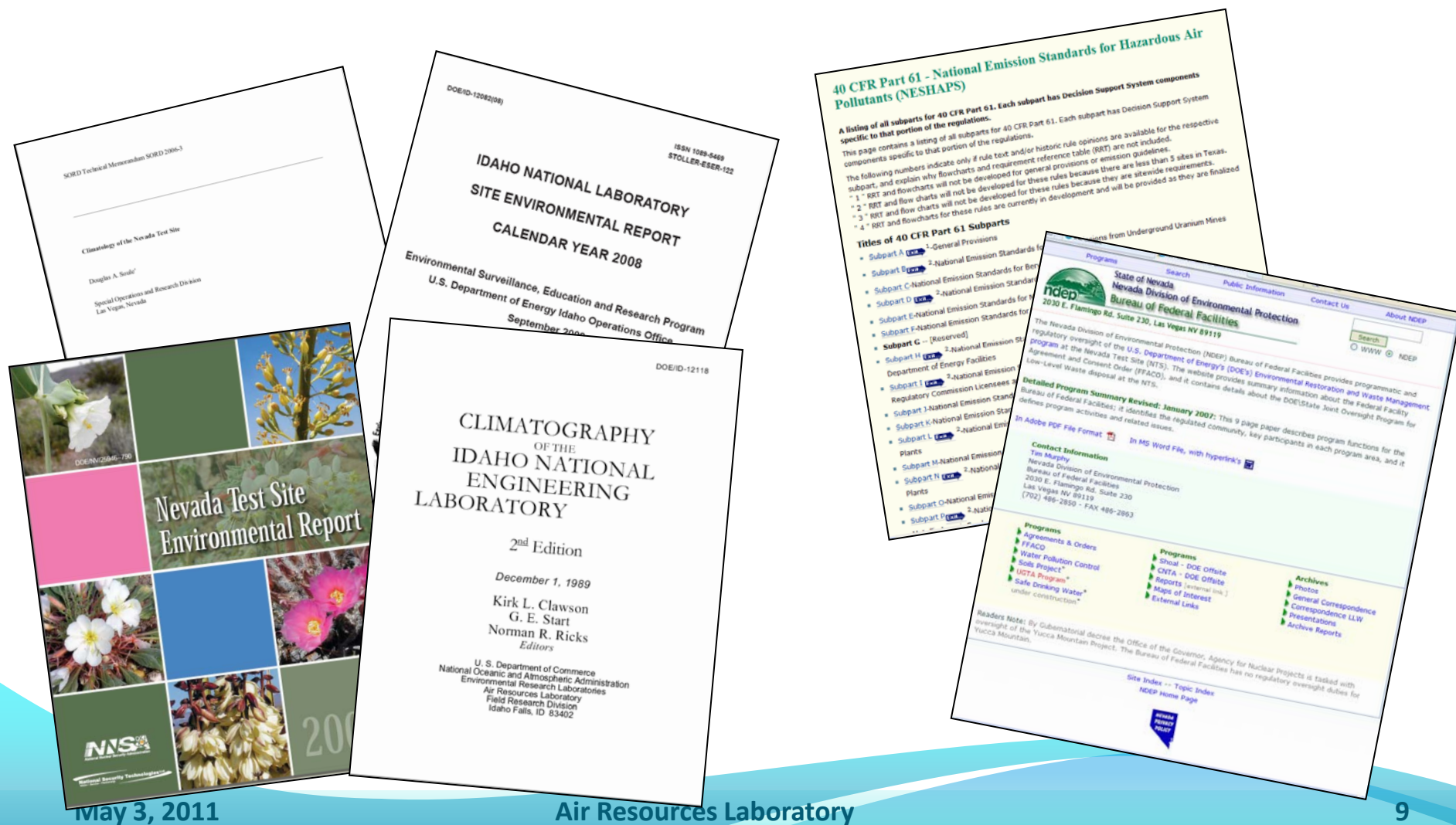
May 3, 2011



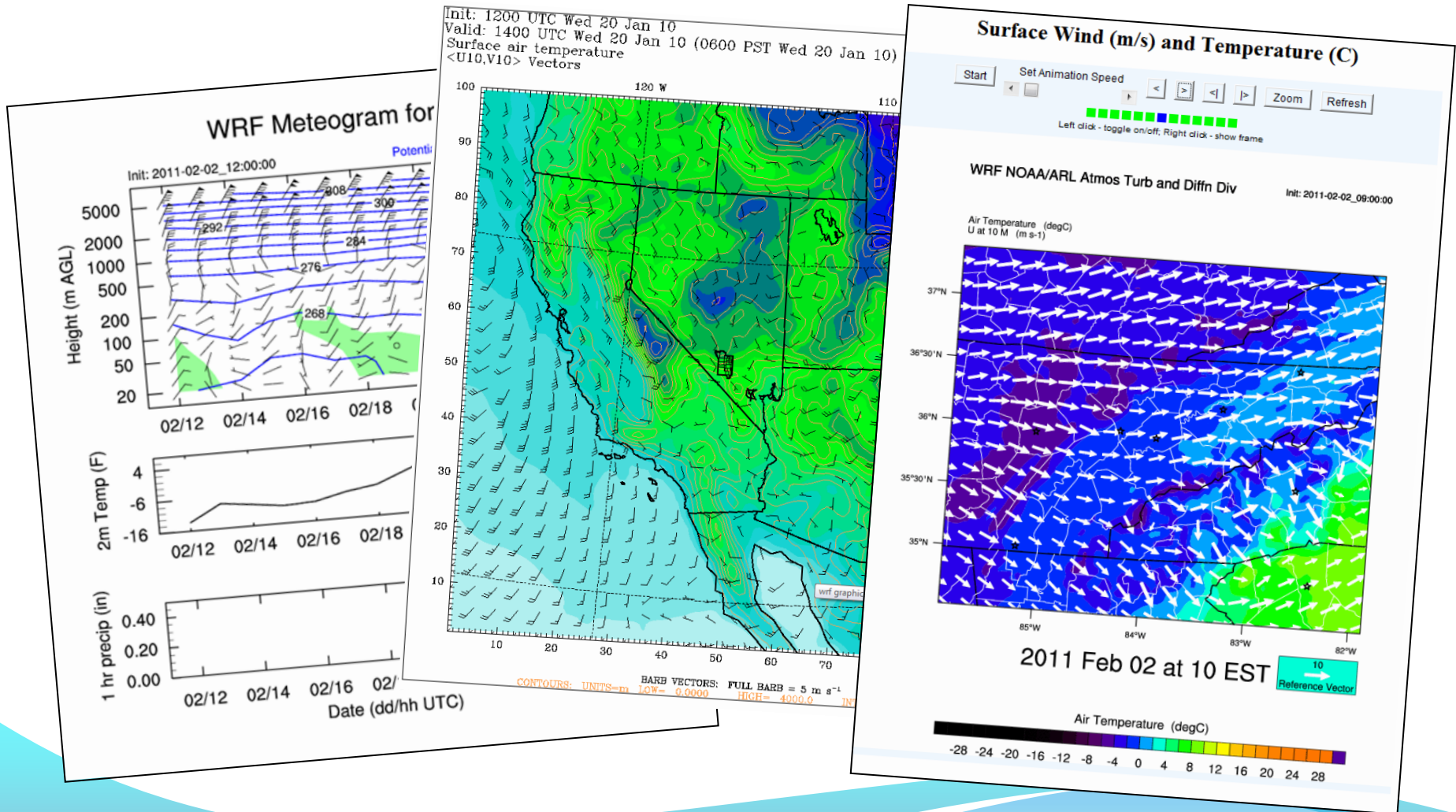
Air Resources Laboratory



# Meteorological Data Analysis



# Mesoscale Weather Forecast Modeling



# Meteorological Surveillance & Forecasting



INL Forecast Issued Monday January 31, 2011 Time: 0550 MDT  
CFA Max Temp Yesterday: 30 deg F.  
CFA Min Temp This Morning: 10 deg F.  
CFA Normal temperatures for today are 28 and 5 deg F.  
A cold arctic air mass is expected to move into the area later tonight. The National Weather Service has issued a wind chill watch beginning Wednesday through Tuesday. Increased winds on Tuesday night may bring gusty conditions and wind chills early Wednesday.

Today: Areas of patchy snow showers. 31° to 35°  
Tonight: Mostly clear and cold. -20F. Wind chill to -30F.  
Tomorrow: Mostly clear and cold. 10F. Wind chill to -10F.  
The next forecast will be issued Tuesday morning.

NOAA Supercomputer Analysis Forecast  
CFA MEC SMC

NNSS Power Control Air Resources Laboratory  
0930 PST Mon Jan 31 2011  
Forecaster: K Smith

Today  
Minimum Temperature  
9 AM Temperature  
Maximum Temperature

Nevada National Security Site  
Air Resources Laboratory/Special Operations and Research Division  
0800 PST Mon Jan 31 2011  
Official Sunset Monday 1700 PST  
Official Sunrise Tuesday 0647 PST

Forecaster: K Smith

For The Nevada National Security Site--

Today...Partly cloudy and breezy. North winds at 15 to 20 mph on the mesas, 49 to 57 at the lower elevations, 53 at Mercury.

Tonight...Mostly clear with north winds at 10 to 20 mph at Mercury.

Tuesday...Partly cloudy, breezy, and colder. North winds to 32 on the mesas, 38 to 46 at the lower elevations, 42 at Mercury.

Tuesday Night...Mostly clear and windy. North winds on the mesas and dry lakes, 26 at Mercury.

Wednesday...Mostly sunny and windy. Northeast winds at 28 on the mesas, 34 to 42 at the lower elevations, 38 at Mercury.

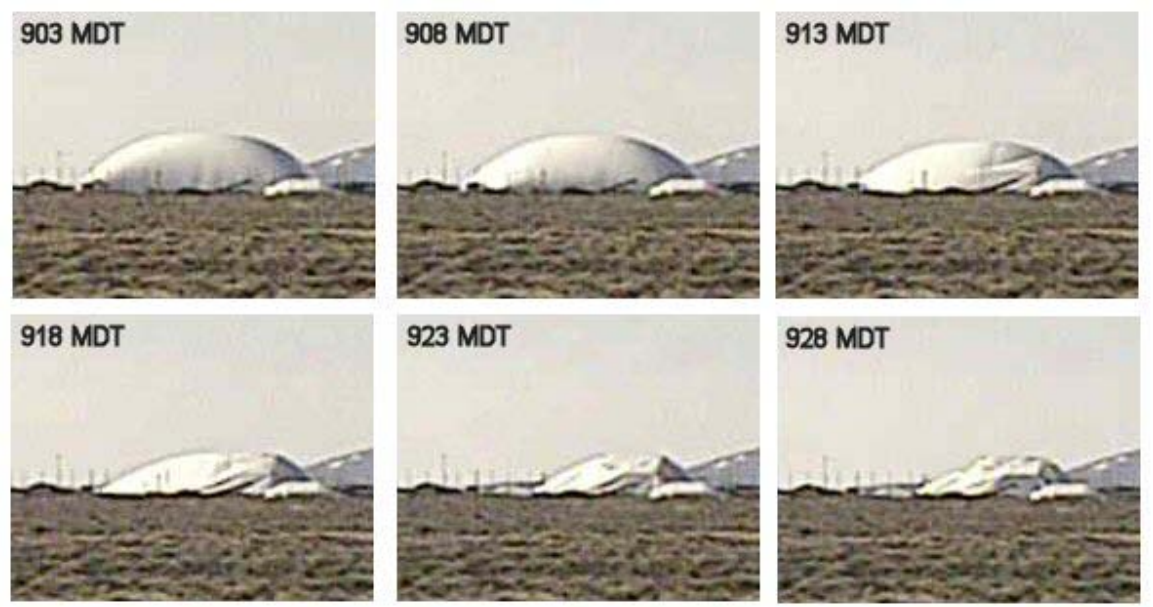
Thursday...Mostly sunny with northeast winds at 10 to 25 at Mercury. High temperatures 32 to 38 on the mesas.

Friday...Mostly sunny with north winds at 10 to 20 at Mercury. High temperatures 39 to 45 on the mesas.

Saturday...Mostly sunny with north winds at 10 to 20 at Mercury. High temperatures 43 to 49 on the mesas, 55 to 63 at the lower elevations, 59 at Mercury.

Sunday...Partly cloudy with northwest winds at 10 to 20 mph. Low temperatures 20 to 33 on the mesas and dry lakes, 34 at Mercury. High temperatures 38 to 44 on the mesas, 50 to 58 at the lower elevations, 54 at Mercury.

Wind Advisory  
Air Resources Laboratory/Special Operations And Research Division  
Issued At: 01/19/2011 1415 PST Valid From: 01/19/2011 1415 PST  
Expires At: 01/20/2011 1200 PST  
A Wind Advisory has been issued for the Nevada National Security Site.  
An approaching cold front will bring gusty north winds to the NNSS Wednesday night and Thursday. Northwest winds of 20 to 30 mph with gusts to 45 mph are occurring will continue through noon Thursday.



moving across southeast  
winds gusting up to 35  
mph.

strikes 12 miles west of

FORECASTS WILL

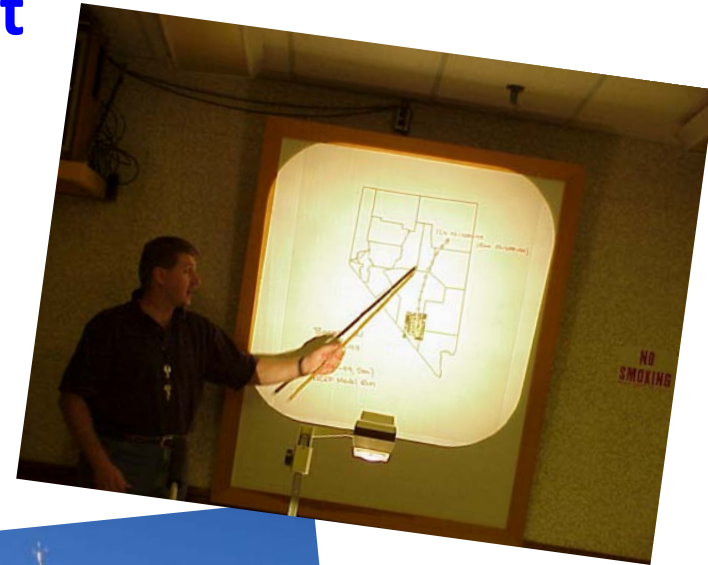
Mercury.

Wind: High temperatures 50% to 70% in the  
Relative Humidity: 50% to 70% in the  
Haines Index: 2  
Dry Lightning Probability: 5%

Sunday: Oct 31 2010  
Weather: Partly cloudy.  
Wind: West winds at 5 to 15 mph.  
High Temperatures: 43 to 49 on the mesas, 55 to 63 at the lower elevations, 59 at Mercury.



# Specialized Experimental Support



May 3, 2011

Air Resources Laboratory

# Air Quality Modeling

## *Permitting*



# AERMOD



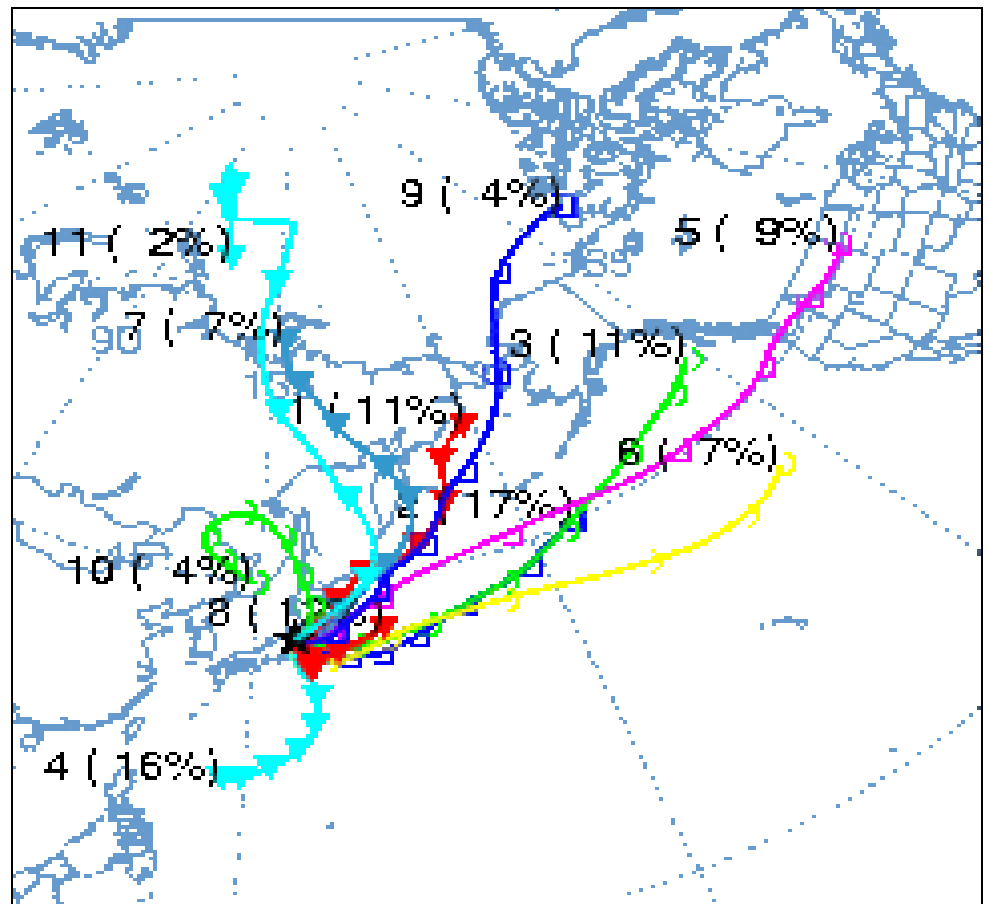


# Specialized HYSPLIT Assessments

## Specialized HYSPLIT assessments

### *Japan*

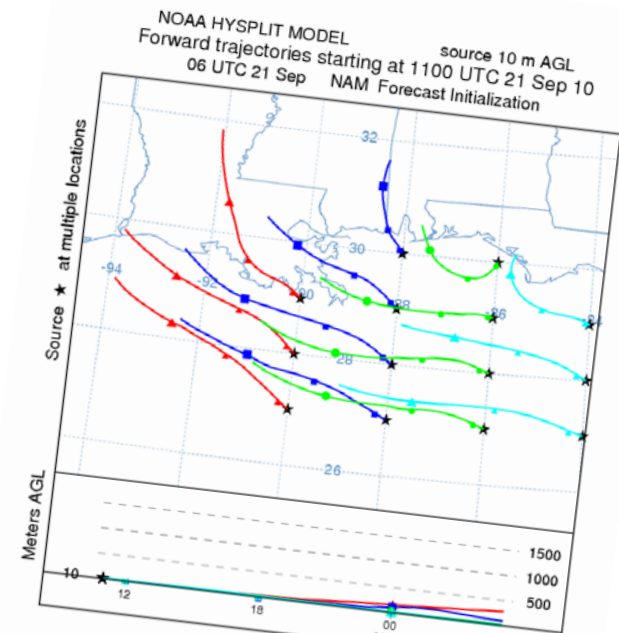
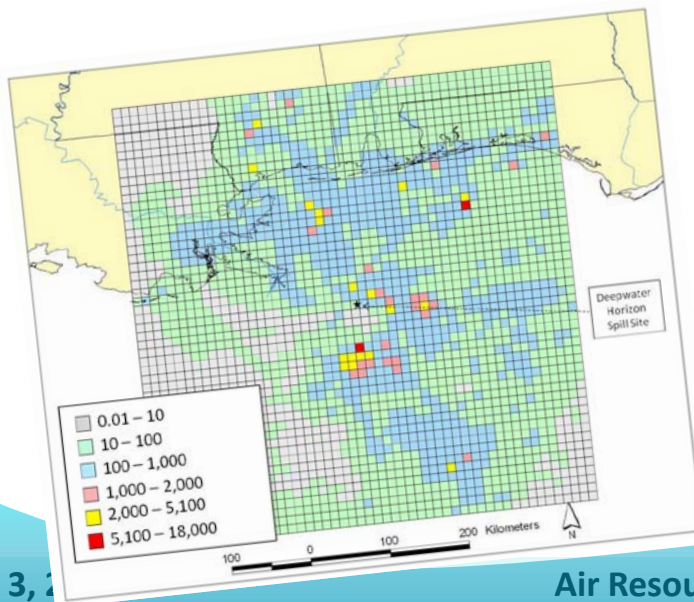
- *Flow Patterns*
- *Time of arrival*
- *Material spread*



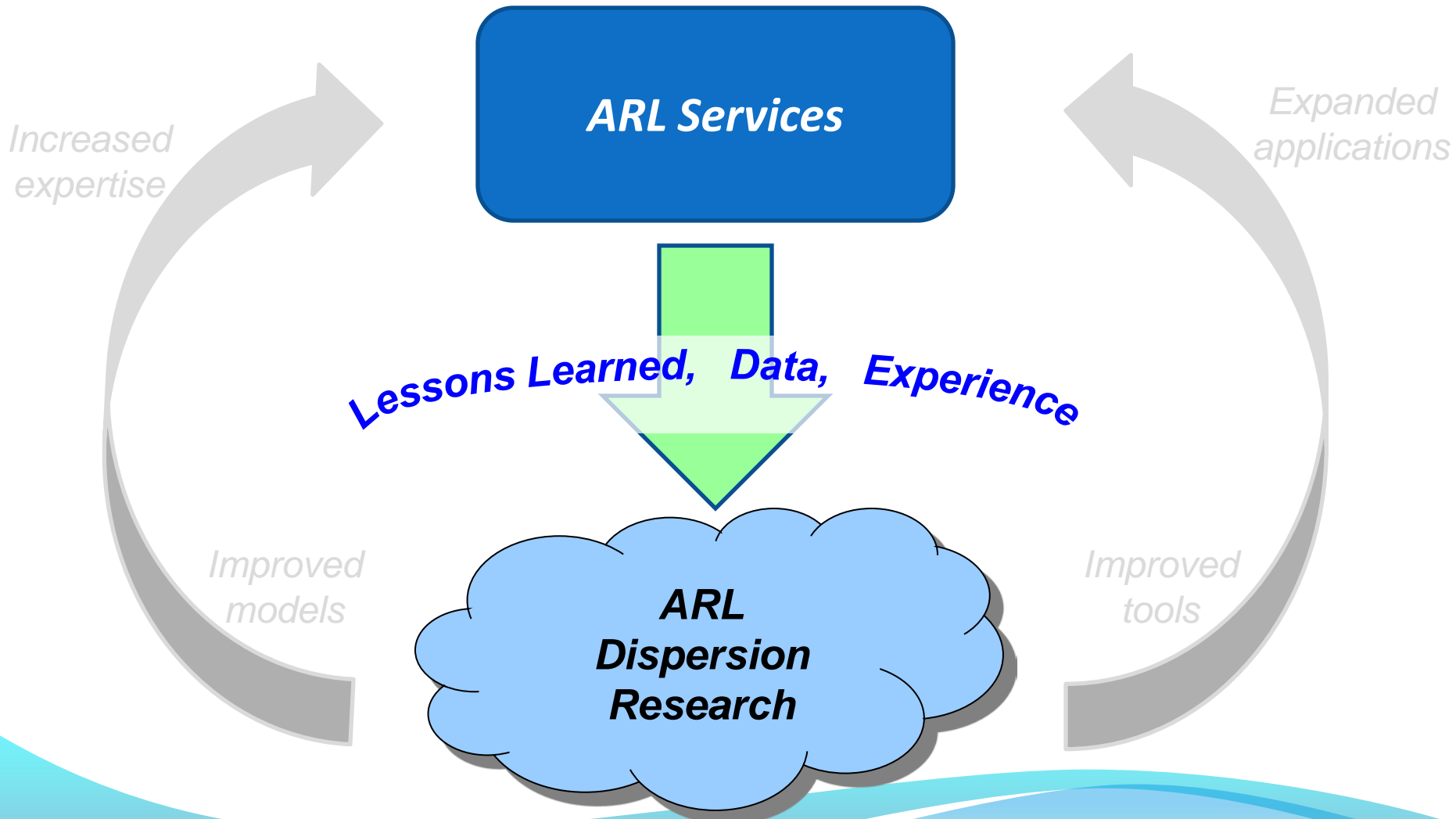
# Specialized HYSPLIT assessments

## Deepwater Horizon

- Odor Assessment
- Trajectories
- Dioxin



# Feedback to Research





## Feedback to ARL and NOAA R&D

### *HYSPLIT improvements*

- *improved radiological event codes*

### *READY improvements*

- *Flash (web) based map interactive display*

### *Mesoscale Modeling*

- *Mesonet data being used to verify WRF and HRRR model forecasts*

### *Resources*

- *large areas for studies – Field Labs*



## Future Direction

*Continue current Services*

- DOE
- specialized HYSPLIT assessments



*Continue to take lessons learned, data, needs and feed them back into ARL and NOAA R&D*

*Look to new areas of research opportunities:*

- NOAA/DOE Renewable Energy activities
- Fine scale wind analyses and predictions
- improve mesoscale models for the desert SW



***Thank you !***