Organization of Course

INTRODUCTION

1. Course overview
2. Air Toxics overview
3. HYSPLIT overview

HYSPLIT Theory and Practice

4. Meteorology
5. Back Trajectories
6. Concentrations / Deposition
7. HYSPLIT-SV for semivolatiles (e.g, PCDD/F)
8. HYSPLIT-HG for mercury

Overall Project Issues & Examples

9. Emissions Inventories
10. Source-Receptor Post-Processing
11. Source-Attribution for Deposition
12. Model Evaluation
13. Model Intercomparison
14. **Collaboration Possibilities**

There are Many Opportunities for Collaboration

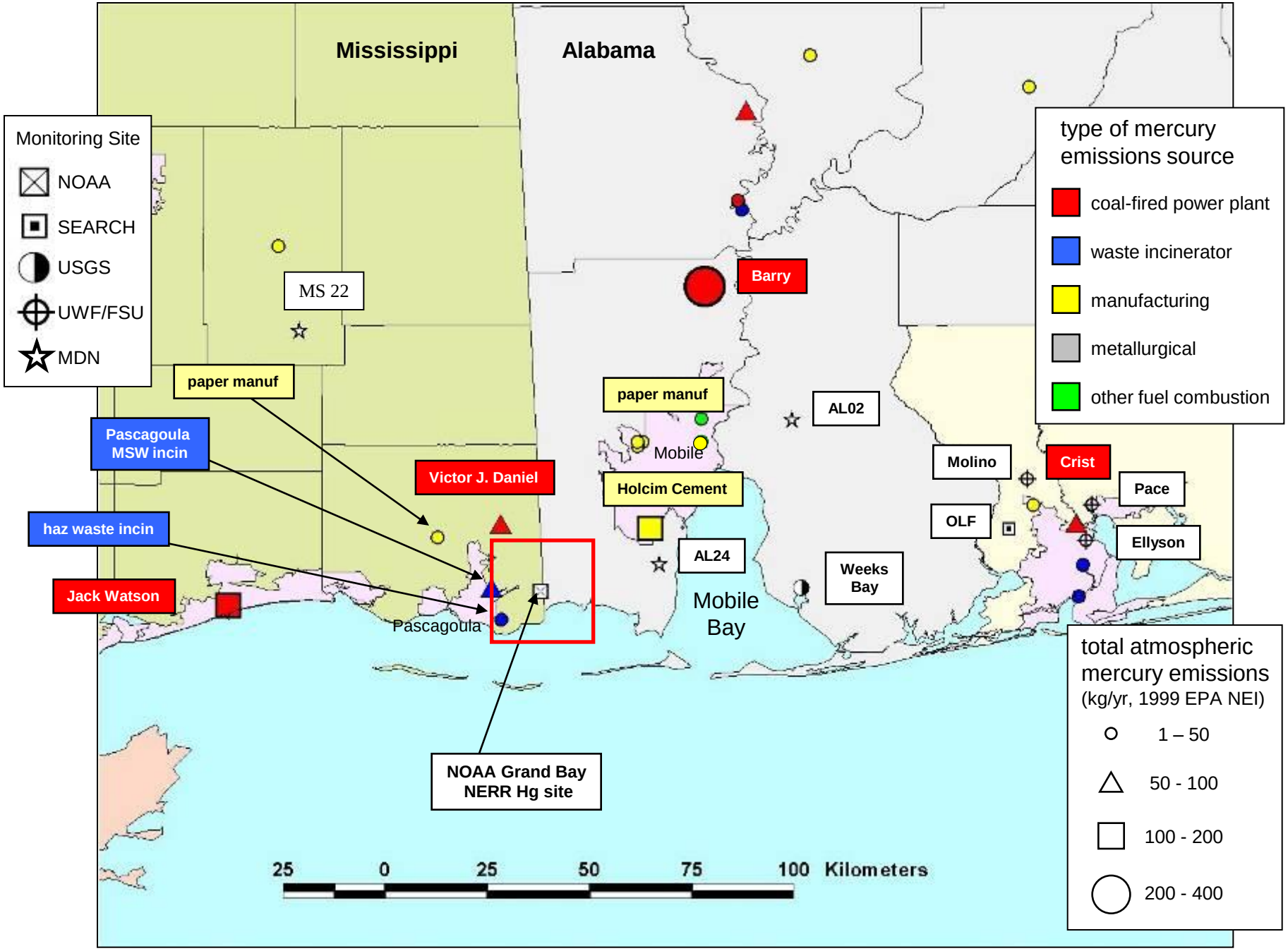
- **HYSPLIT can be used for fate/transport and trajectory modeling**

- **Sharing of Data**
  - **Emissions Inventories**
  - **Meteorological Data**
  - **Monitoring Data for Model Evaluation**

- **There is strong interest at NOAA and elsewhere in the Gulf of Mexico …an area of joint concern**

- **The NOAA Air Resources Lab has a mercury measurement site on the Northern Gulf of Mexico Coast… to interpret measurements there and to evaluate our models against these measurements, we are interested in atmospheric mercury emissions, fate, and transport in Mexico**


Grand Bay NERR
Gulf of California
Gulf of Mexico
Mexico
(Mexico City)
Guatemala
1158 km
© 2009 Tele Atlas
© 2009 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Google
lat 24.961183° lon -99.538237° elev 617 m
©2009 Google
Eye alt 3027.19 km


Mississippi
Alabama
Monitoring Site
NOAA
SEARCH
USGS
UWF/FSU
MDN
MS 22
paper manuf
Pascagoula MSW incin
haz waste incin
Jack Watson
Victor J. Daniel
Pascagoula
paper manuf
Mobile
Holcim Cement
AL24
Barry
AL02
Molino
Crist
Pace
OLF
Ellyson
Weeks Bay
Mobile Bay
NOAA Grand Bay NERR Hg site
25 0 25 50 75 100 Kilometers
type of mercury emissions source
coal-fired power plant
waste incinerator
manufacturing
metallurgical
other fuel combustion
total atmospheric mercury emissions
(kg/yr, 1999 EPA NEI)
1 – 50
50 - 100
100 - 200
200 - 400

Atmospheric Mercury Measurement Site at the Grand Bay NERR, MS

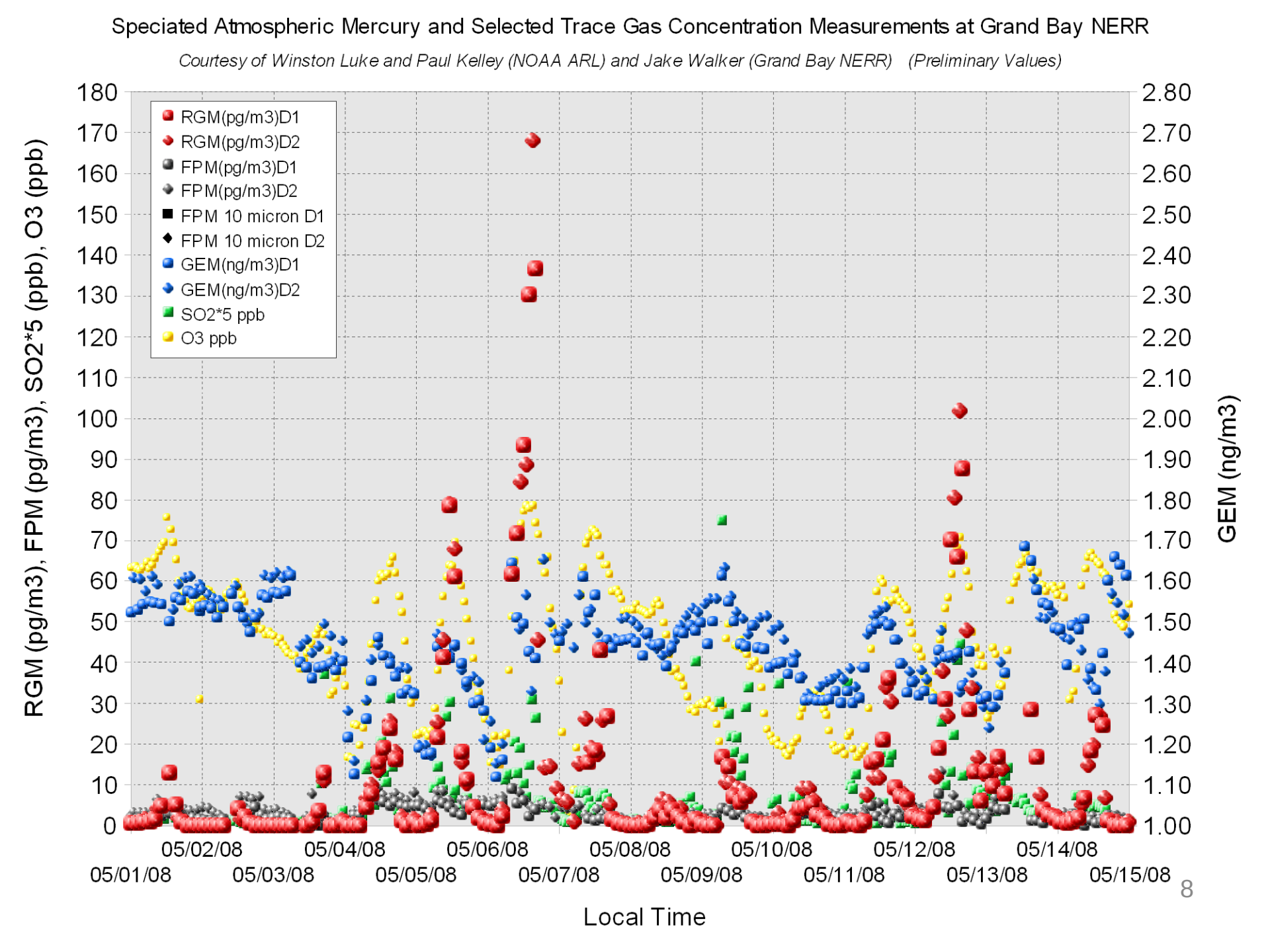
mercury and trace gas monitoring tower (10 meters)

view from top of the tower

Atmospheric Measurements at the Grand Bay NERR

Elemental mercury * 2	"Speciated" Atmospheric Mercury Concentrations
Fine particulate mercury * 2	
Reactive gaseous mercury * 2	
Sulfur dioxide	Trace gases to help understand and interpret mercury data
Ozone	
Carbon Monoxide	
Nitrogen Oxides (NO, NOy)	
Wind speed, Wind Direction	Meteorological Data
Temperature, Relative Humidity	
Precipitation Amount	
Total Mercury & Methyl Mercury in Precipitation	WET DEPOSITION: Currently being added, in collaboration with MS DEQ and U.S. EPA
Trace Metals in Precipitation	
Major Ions in Precipitation	

Instrumentation inside the trailer at the Grand Bay NERR site


Speciated Atmospheric Mercury and Selected Trace Gas Concentration Measurements at Grand Bay NERR
Courtesy of Winston Luke and Paul Kelley (NOAA ARL) and Jake Walker (Grand Bay NERR) (Preliminary Values)
RGM(pg/m3)D1
RGM(pg/m3)D2
FPM(pg/m3)D1
FPM(pg/m3)D2
FPM 10 micron D1
FPM 10 micron D2
GEM(ng/m3)D1
GEM(ng/m3)D2
SO2*5 ppb
O3 ppb
RGM (pg/m3), FPM (pg/m3), SO2*5 (ppb), O3 (ppb)
GEM (ng/m3)
Local Time
05/01/08
05/02/08
05/03/08
05/04/08
05/05/08
05/06/08
05/07/08
05/08/08
05/09/08
05/10/08
05/11/08
05/12/08
05/13/08
05/14/08
05/15/08

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- Inclusion of Requested Receptors in Future Projects

- Collaboration with special HYSPLIT versions (mercury, dioxin…)

- Model Intercomparisons


Thanks!