

Meteorological Modeling Update May/June '05 Episode

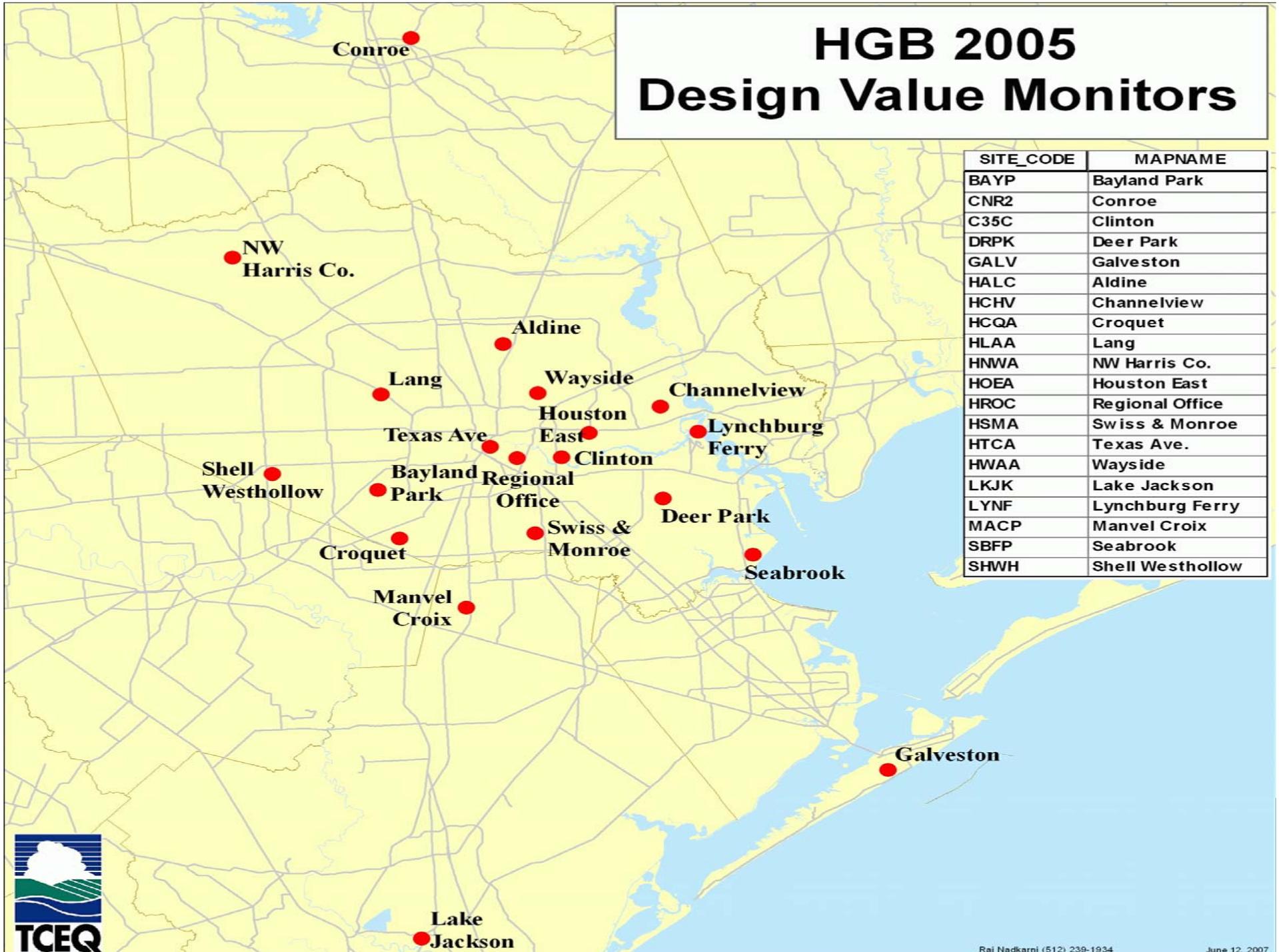
Presented for Doug Boyer & Bright Dornblaser
by Dick Karp

Southeast Texas Photochemical Modeling Technical Committee Meeting

June 20, 2007



HGB 2005 Design Value Monitors





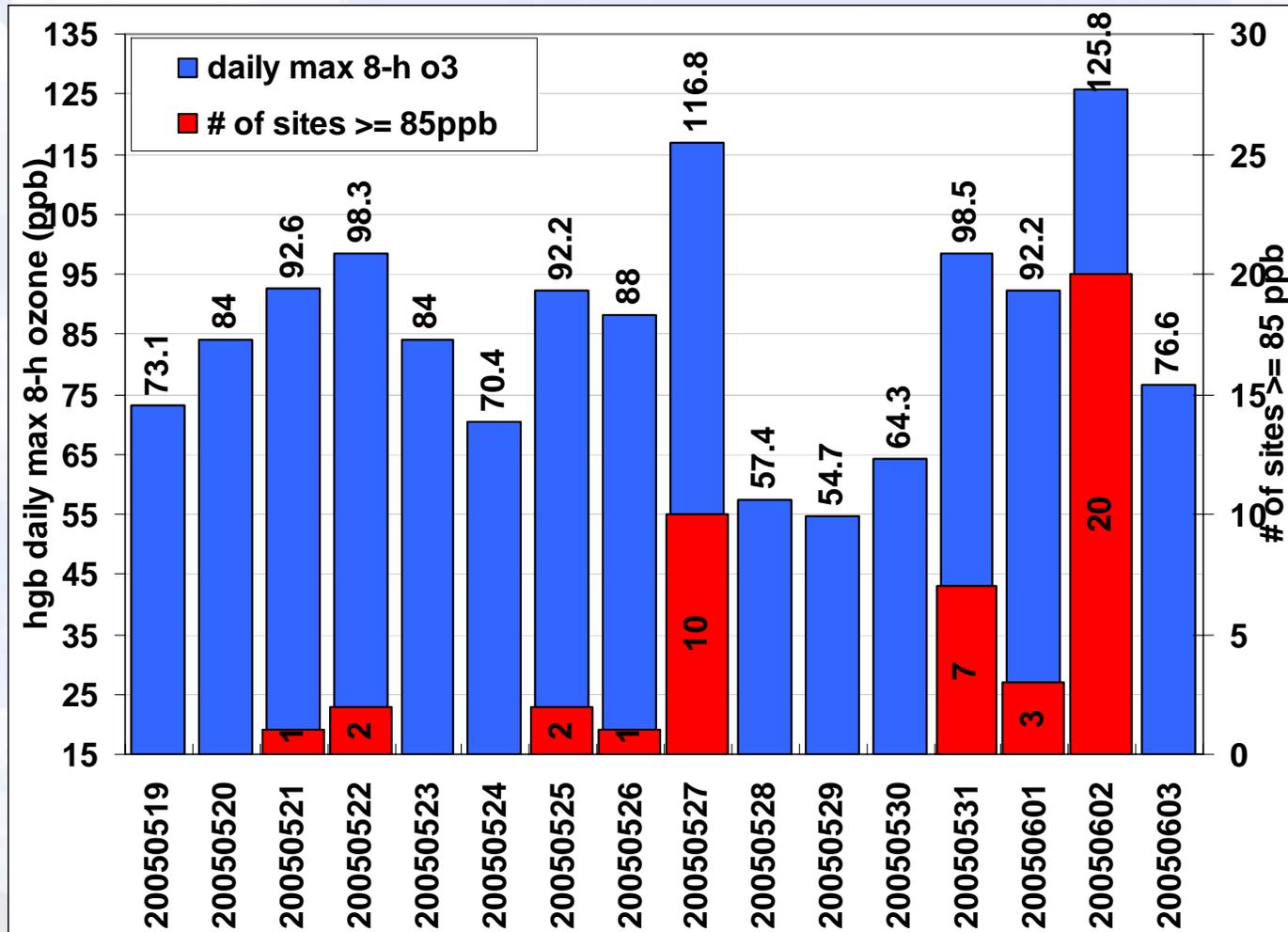
Performance Evaluation

May 18 – June 3, 2005 (2005Ep0)

- Air Temperature Plots
- Wind “Whisker” Plots
- PBL & Kv Plots
- Plume Plots



May/June '05 Episode

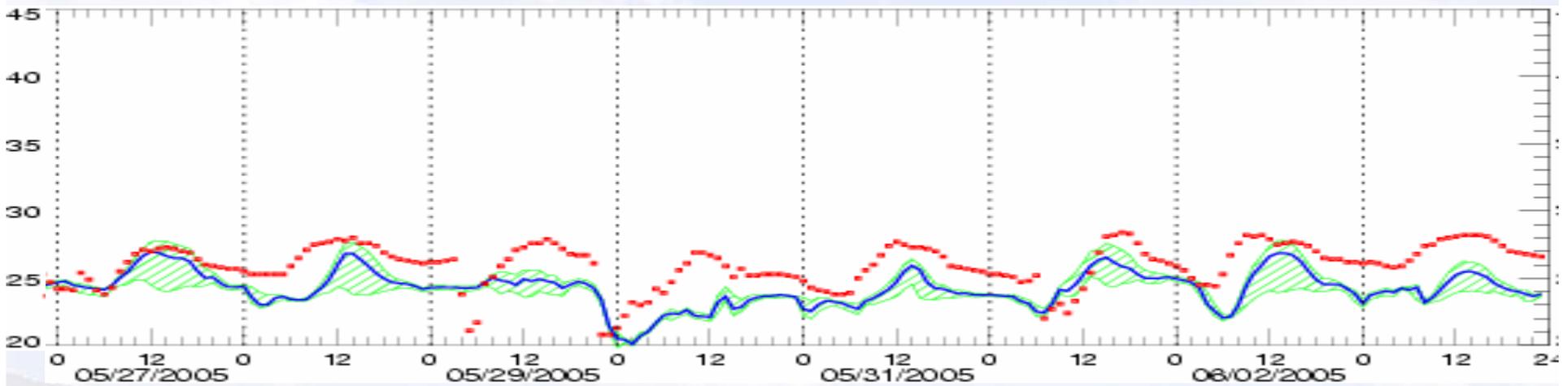
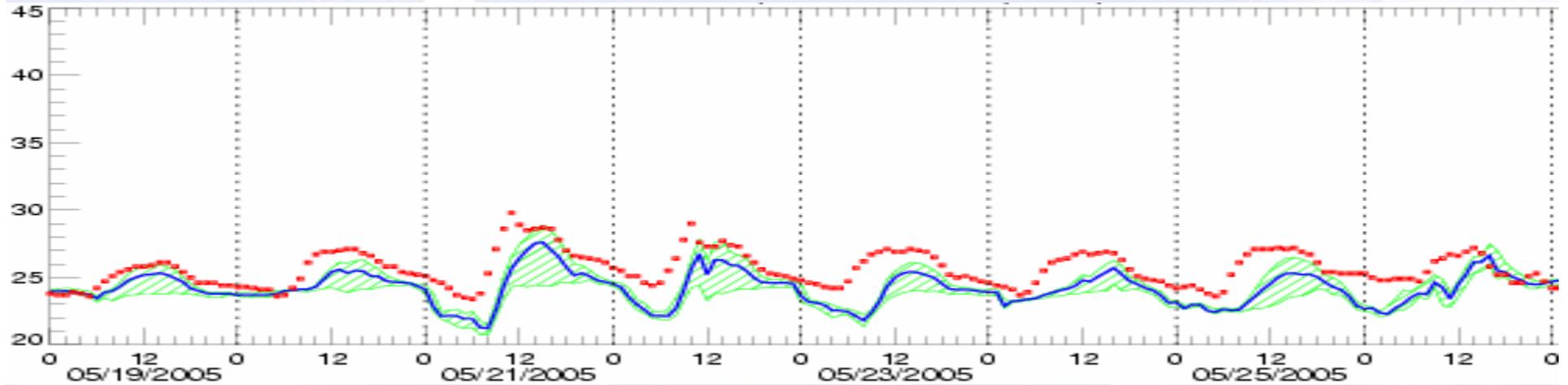




Temperature ($^{\circ}\text{C}$) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

GALC at (500.2,-1158.7) km (EPA481670014, C34/A109/X152, 1997/04/16-now, Galveston, Galveston Co., TX)



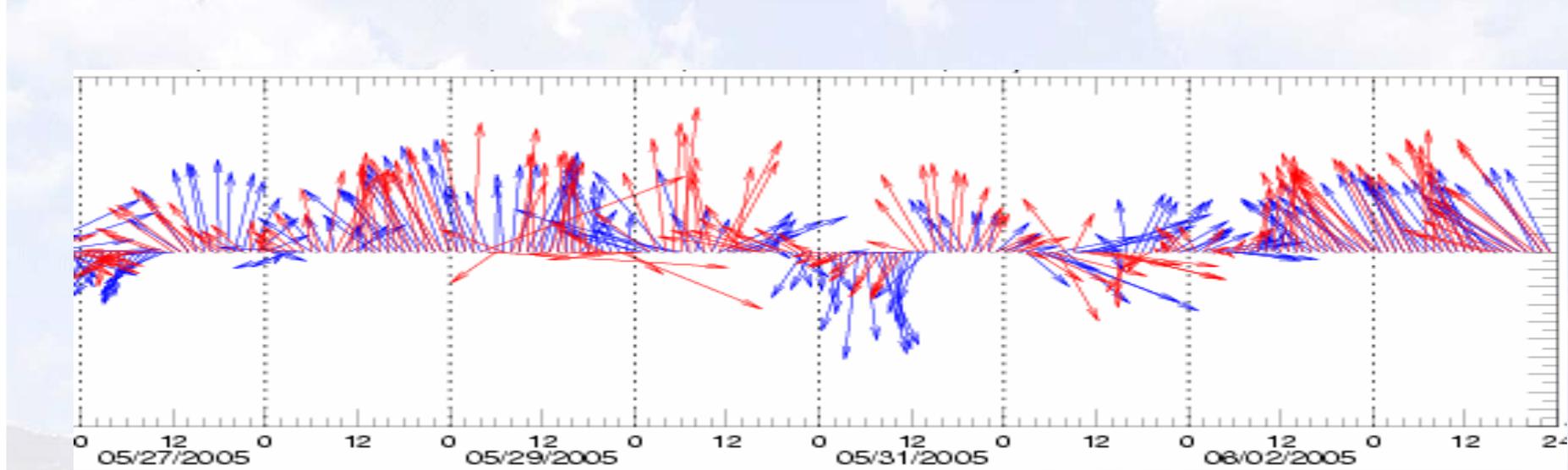
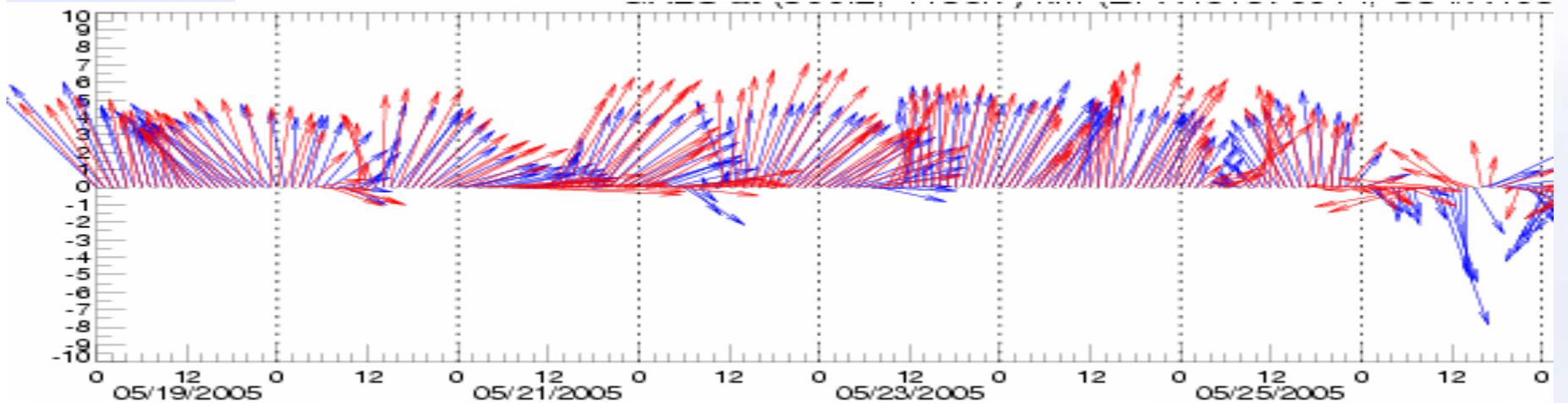
— CAMx/MM5 2005ep0_eta_fdda
•••• Observed



Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

GALC at (500.2, -1158.7) km (EPA481670014, C34/A109/X152, 1997/04/16-now, Galveston, Galveston Co., TX)



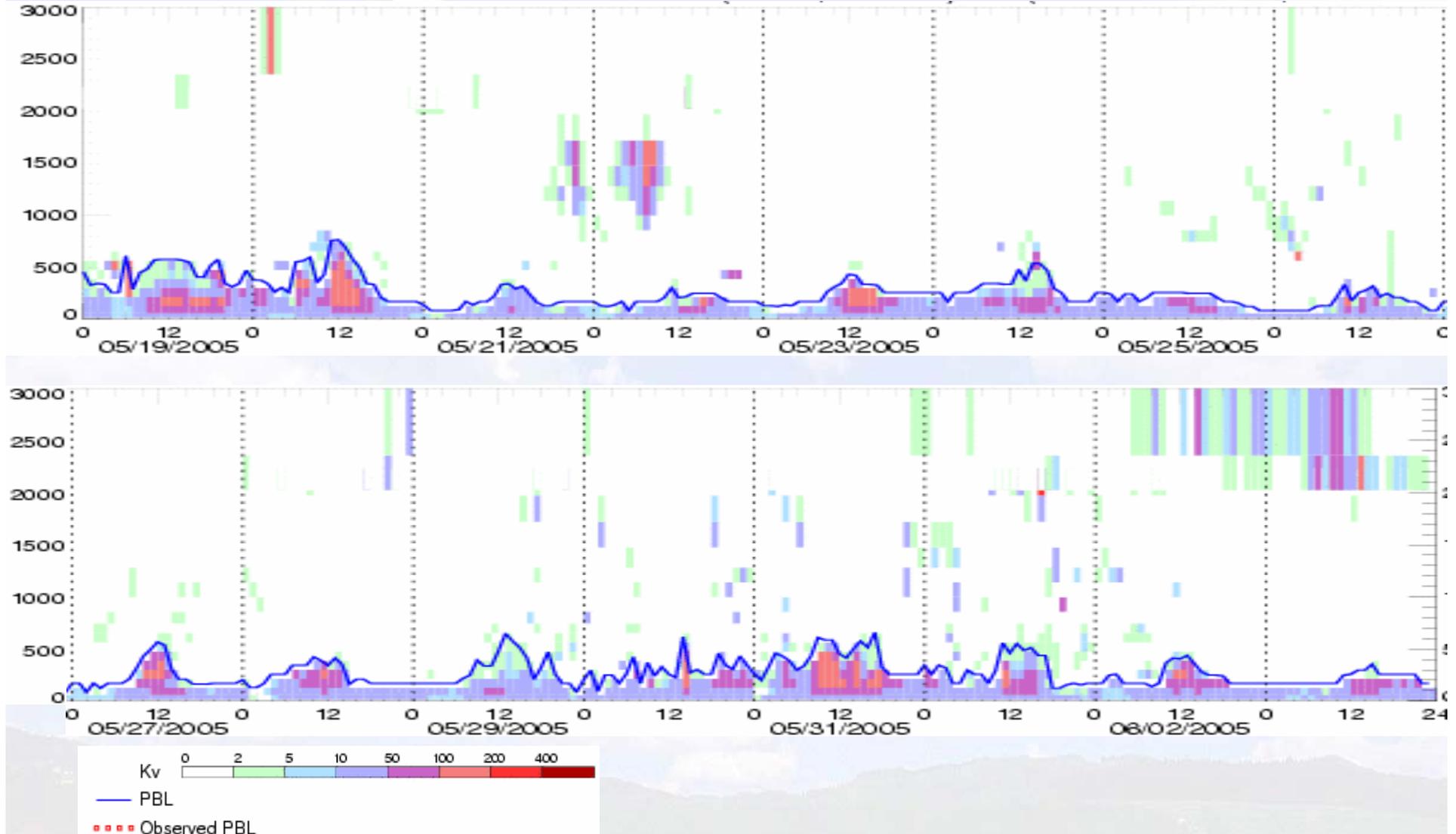
— CAMx/MM5 2005ep0_eta_fdda
— Observed



Vertical Diffusivity Kv (m²/s) (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

GALC at (500.2,-1158.7) km (EPA481670014, C34/A109/X152, 1997/04/16-now, Galveston, Galveston Co., TX)

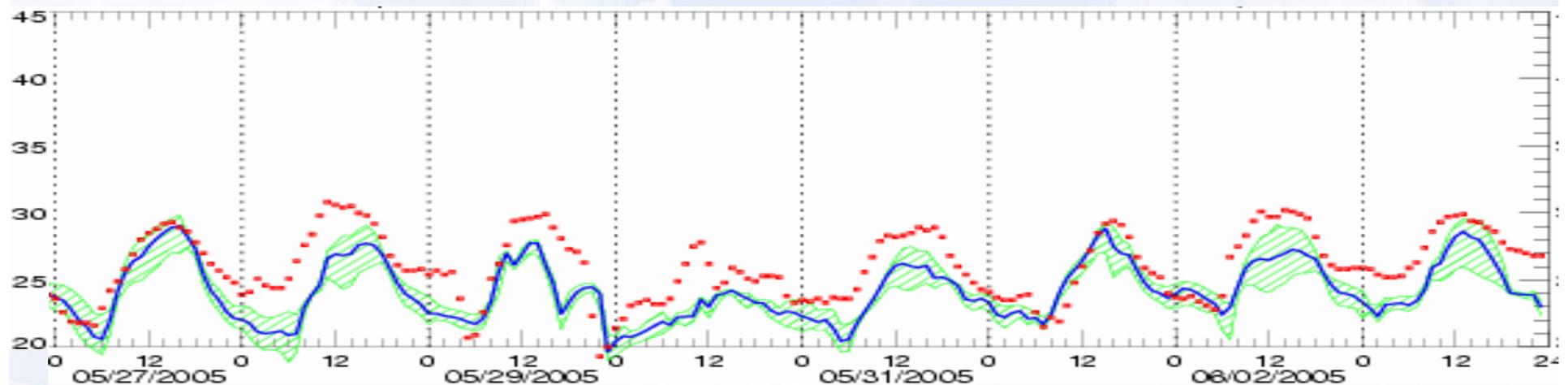
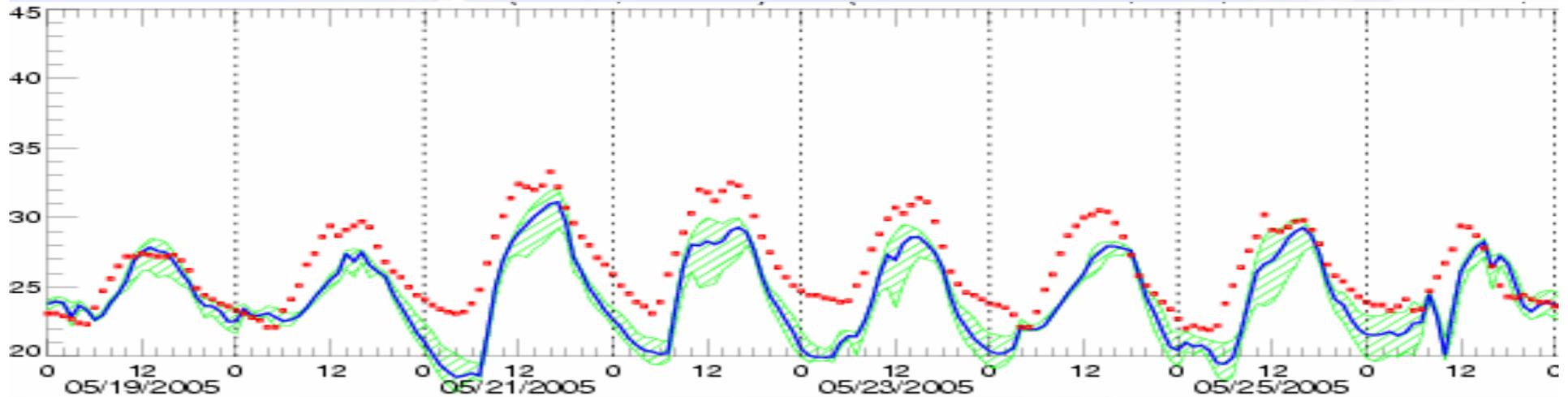




Temperature ($^{\circ}\text{C}$) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

SBFP at (482.5,-1124.1) km (EPA482011050, C45, 2001/07/29-now, Seabrook Friendship Park, 4522 Park Road, Seabrook, Harris Co., TX)



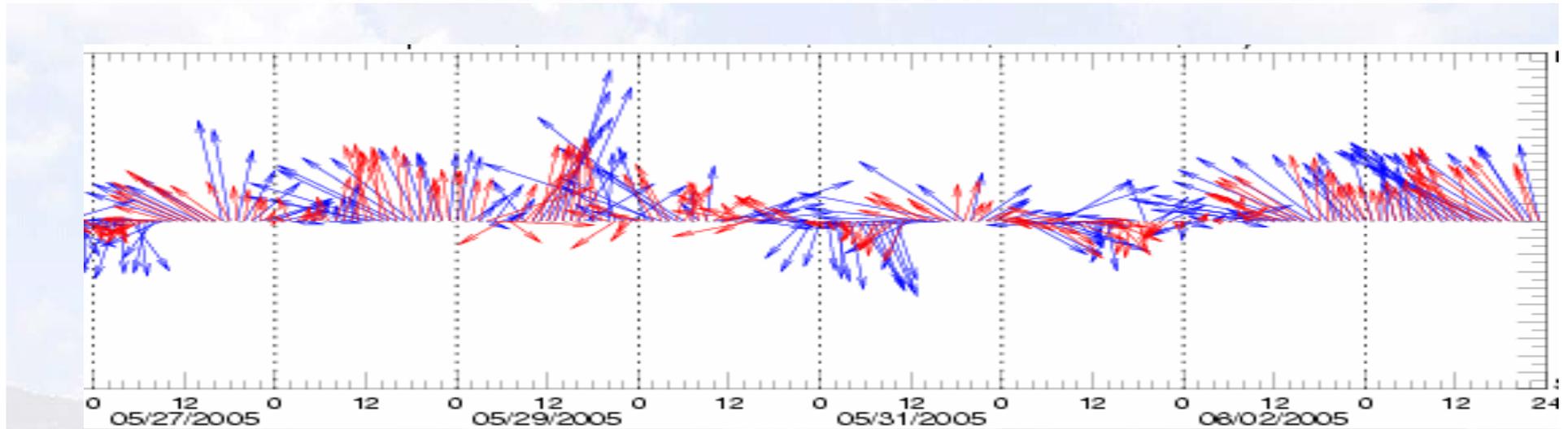
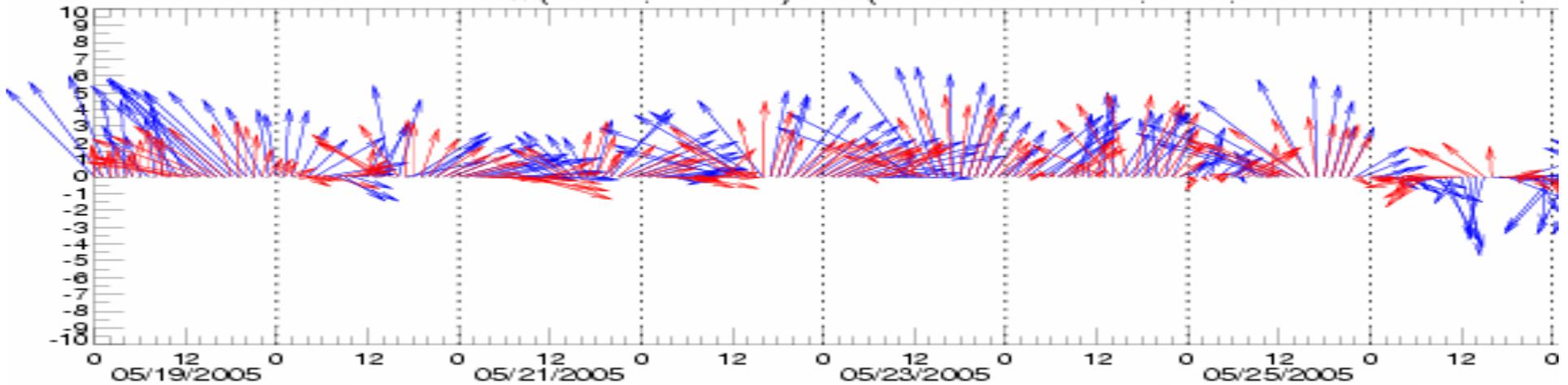
— CAMx/MM5 2005ep0_eta_fdda
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Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

SBFP at (482.5,-1124.1) km (EPA482011050, C45, 2001/07/29-now, Seabrook Friendship Park, 4522 Park Road, Seabrook, Harris Co., TX)



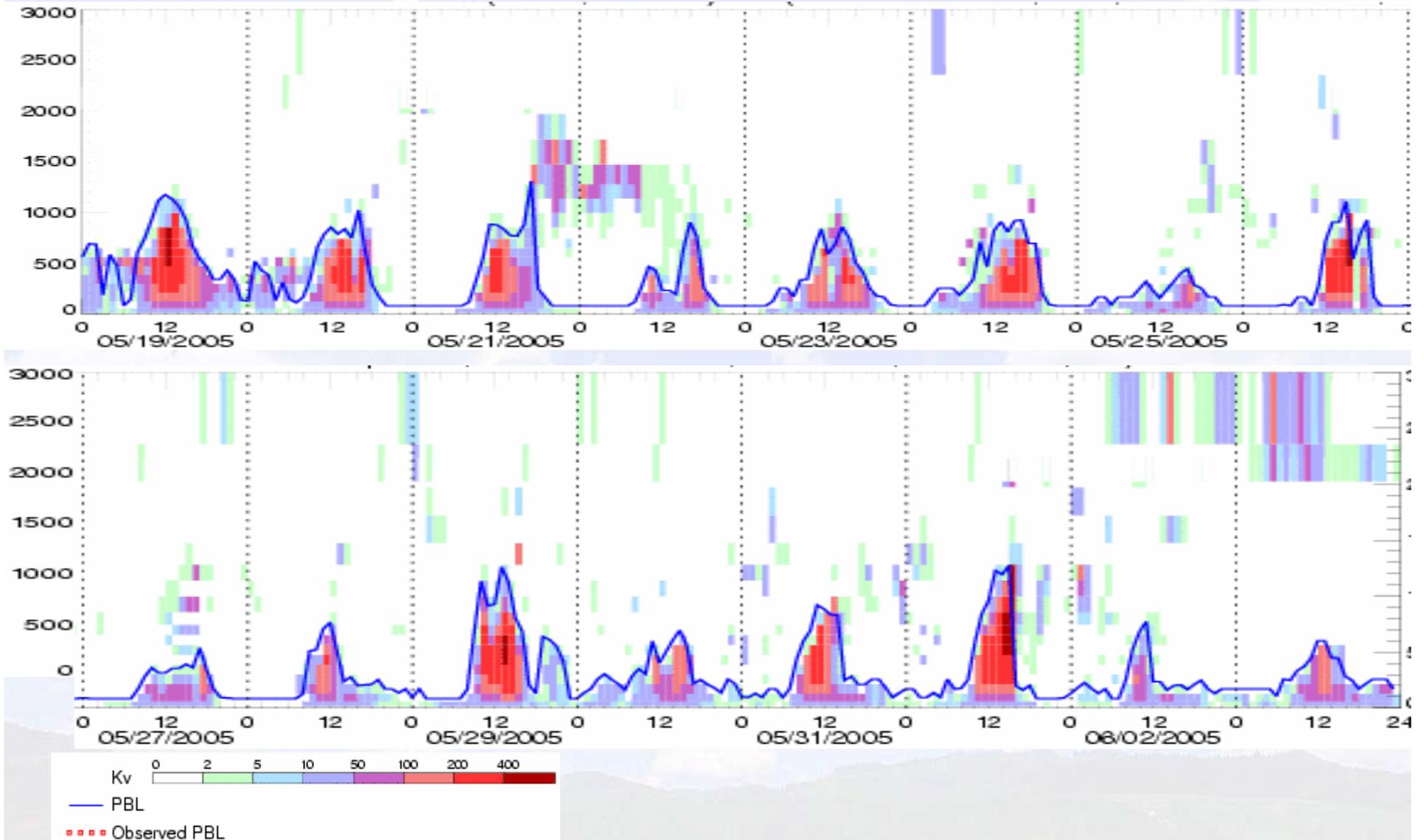
— CAMx/MM5 2005ep0_eta_fdda
— Observed



Vertical Diffusivity K_v (m^2/s) (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

SBFP at (482.5, -1124.1) km (EPA482011050, C45, 2001/07/29-now, Seabrook Friendship Park, 4522 Park Road, Seabrook, Harris Co., TX)

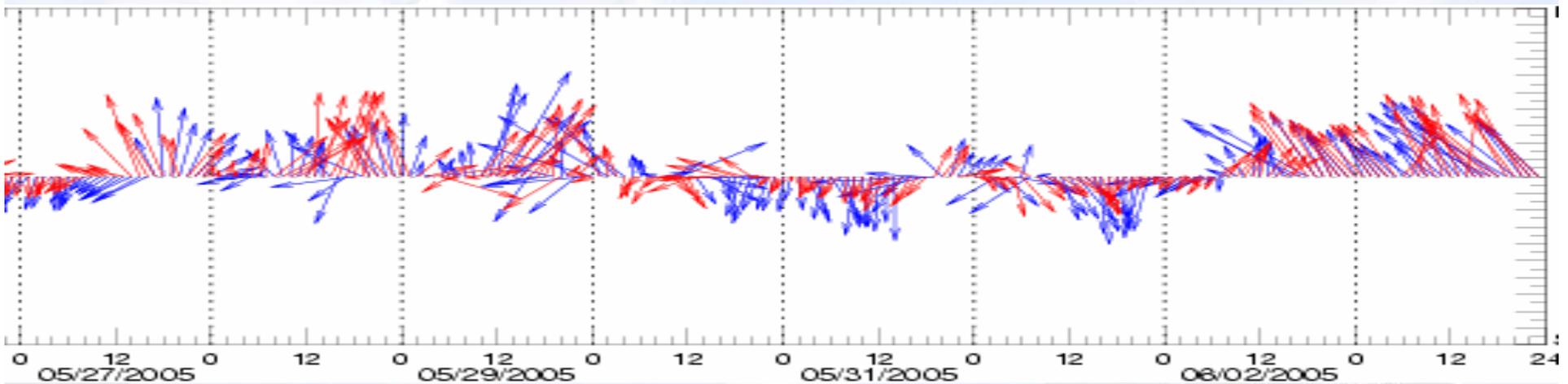
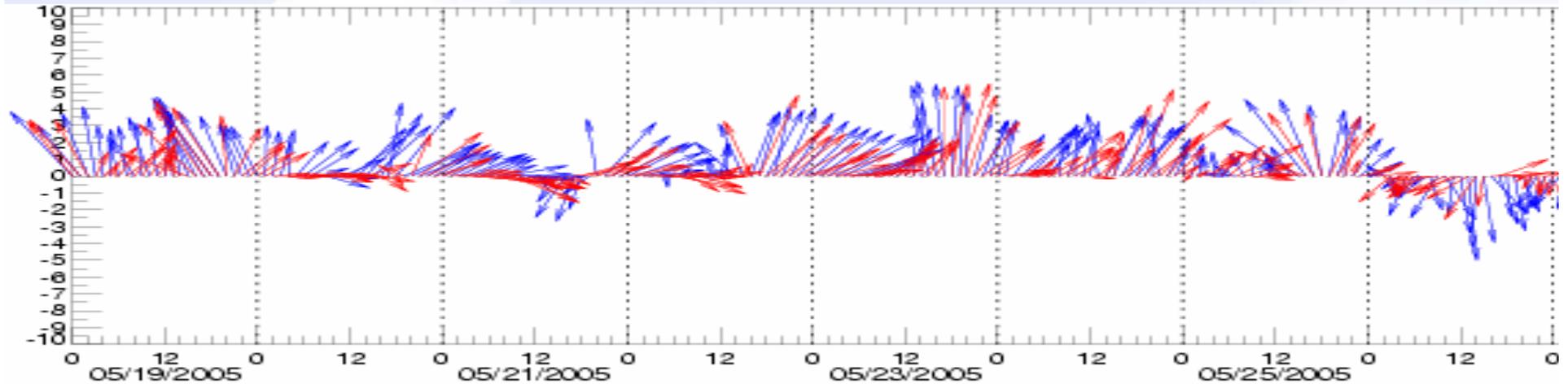




Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

C35C at (458.2,-1108.8) km (EPA482011035, C403/C304/A113, 1997/12/17-now, Clinton, Harris Co., TX)



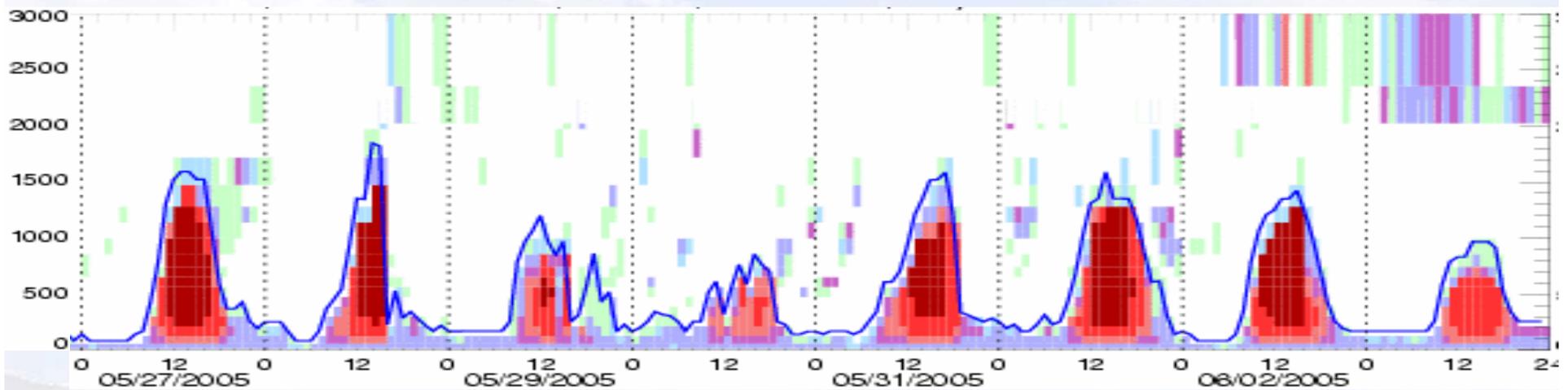
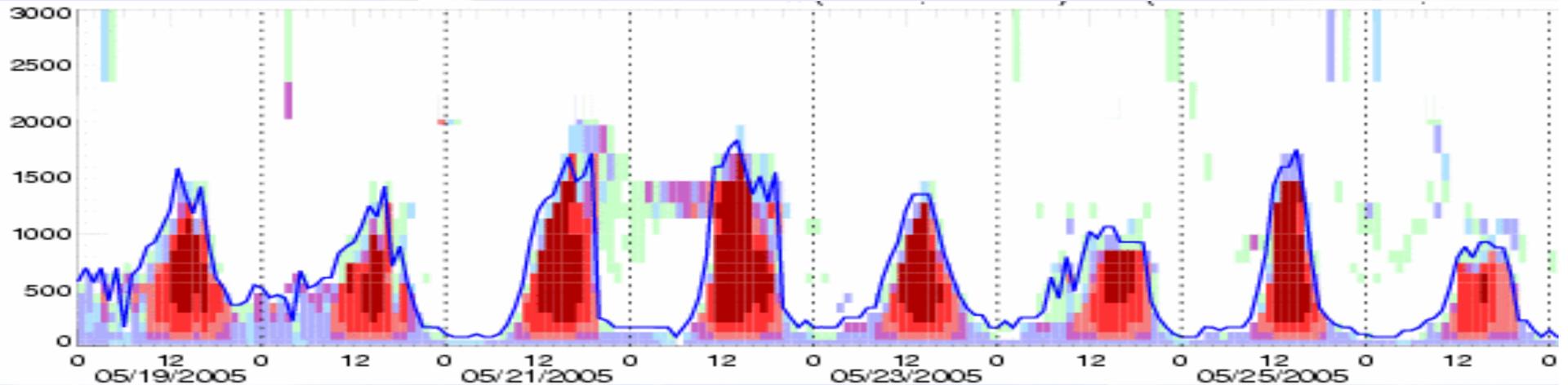
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Vertical Diffusivity K_v (m^2/s) (05/19/2005-06/03/2005)

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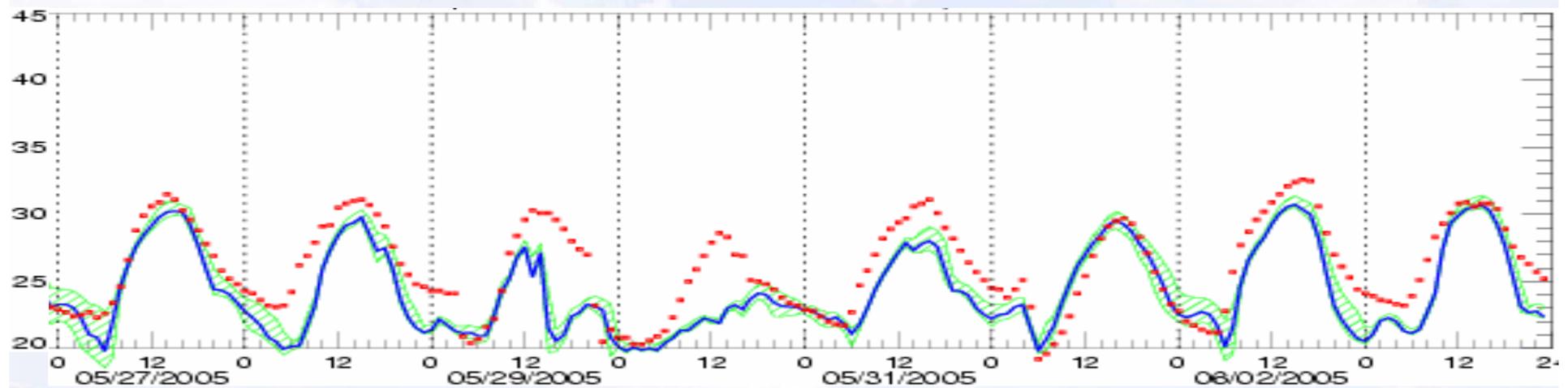
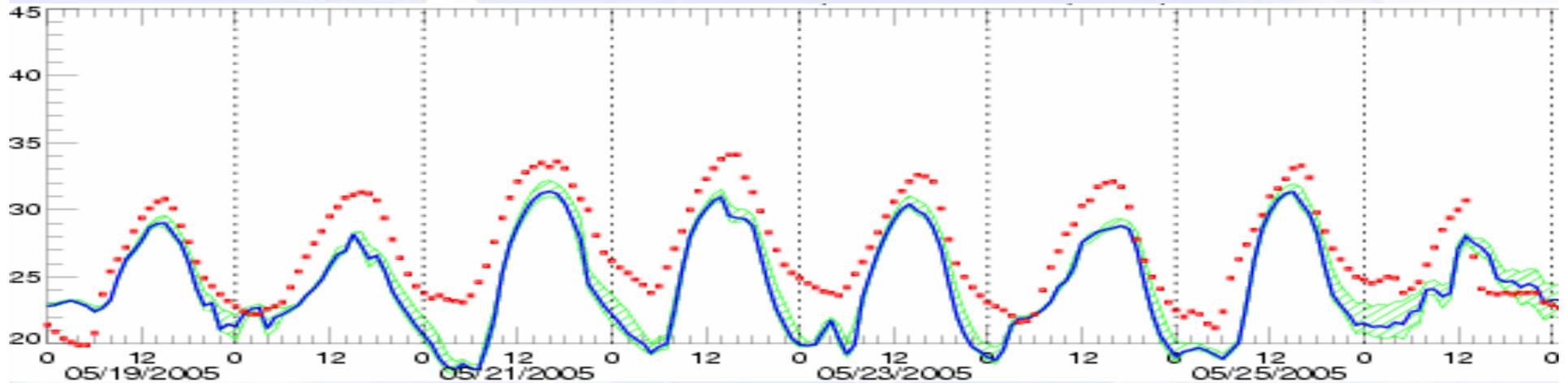




Temperature ($^{\circ}\text{C}$) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HCQA at (437.9,-1122.2) km (EPA482010051, C409, 2000/02/08-now, Croquet, Houston, Harris Co., TX)



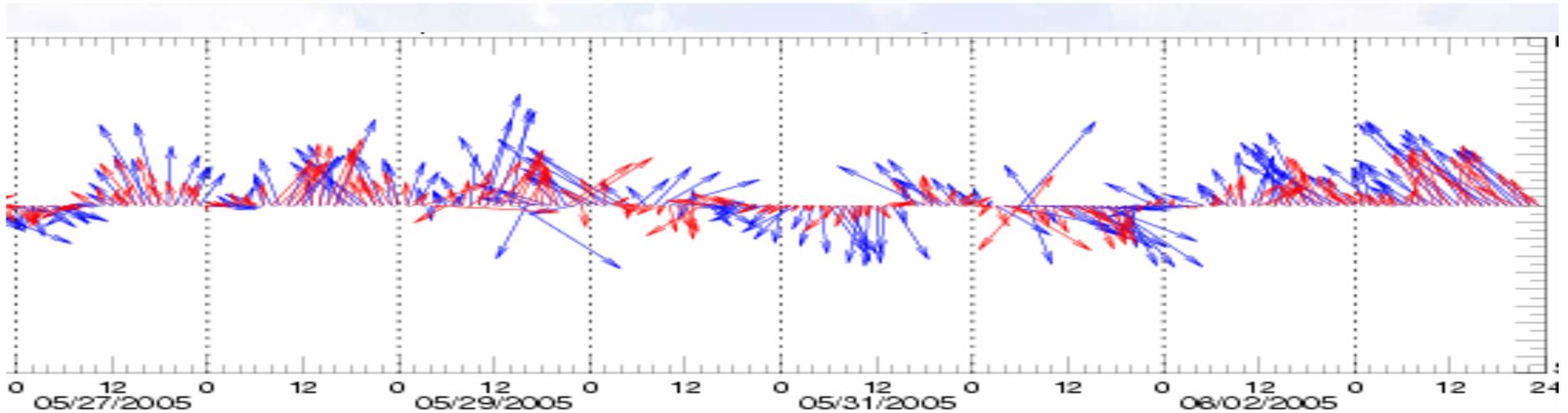
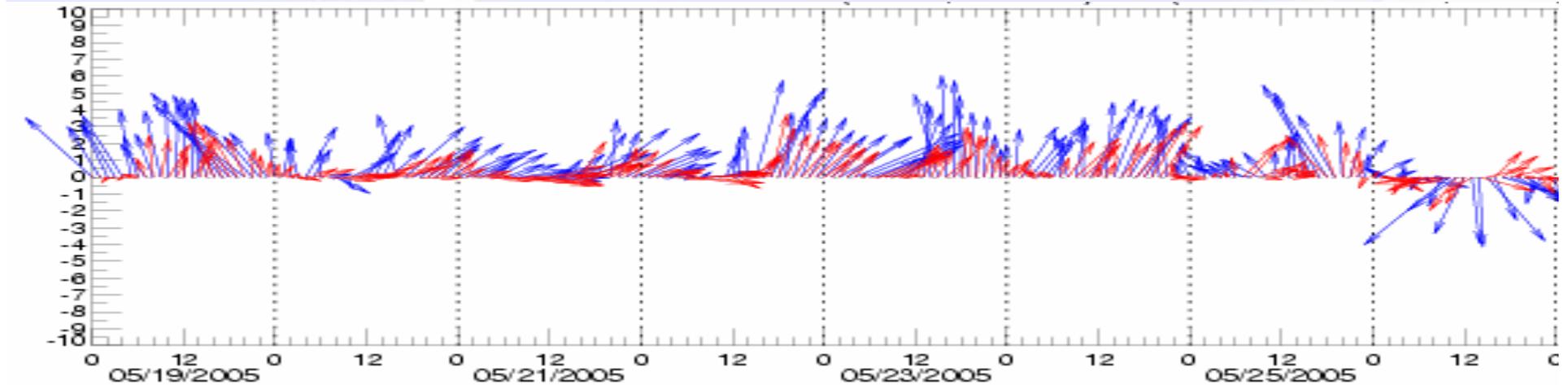
— CAMx/MM5 2005ep0_eta_fdda
•••• Observed



Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HCQA at (437.9,-1122.2) km (EPA482010051, C409, 2000/02/08-now, Croquet, Houston, Harris Co., TX)



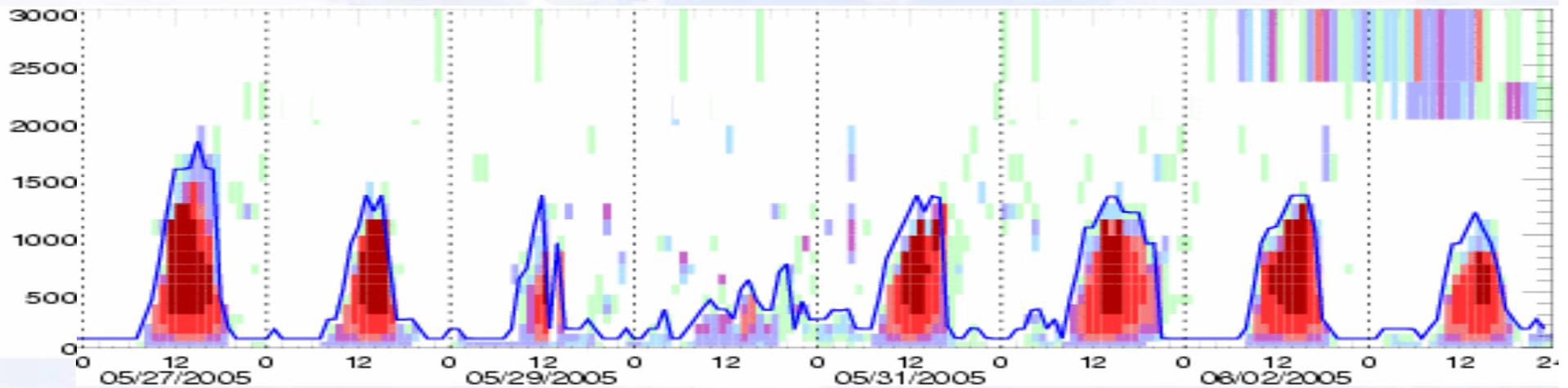
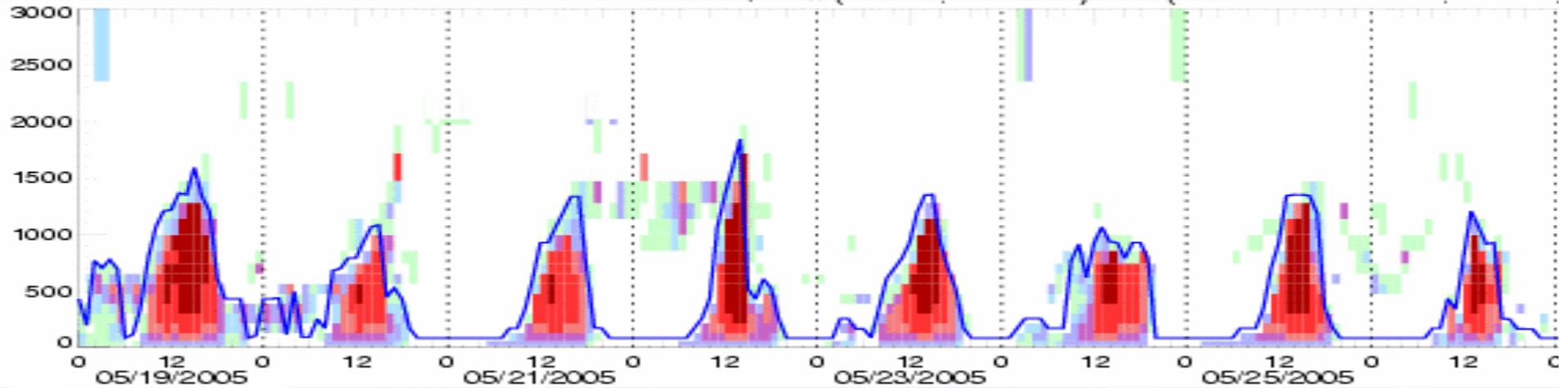
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— Observed



Vertical Diffusivity K_v (m^2/s) (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HCQA at (437.9,-1122.2) km (EPA482010051, C409, 2000/02/08-now, Croquet, Houston, Harris Co., TX)

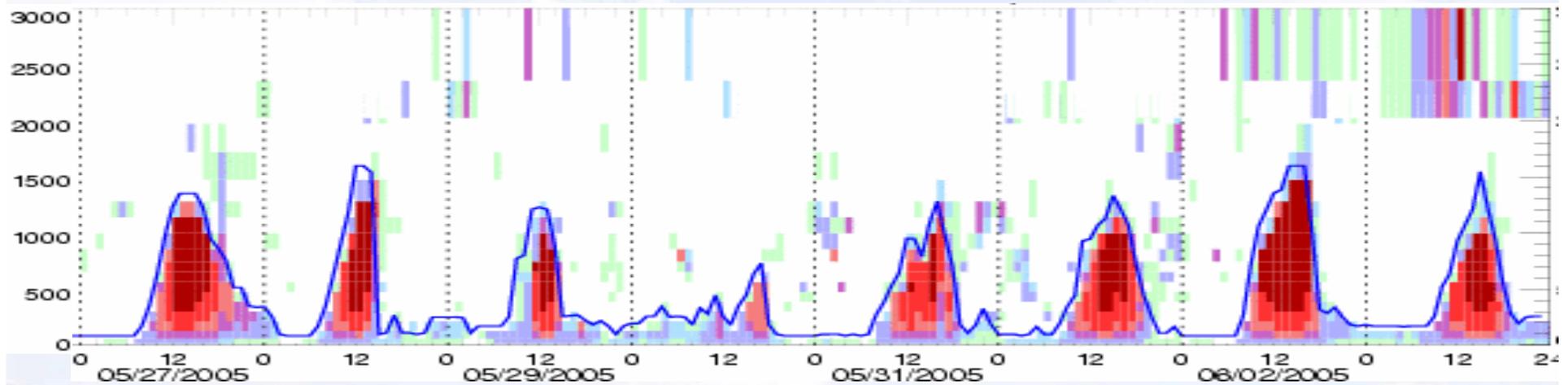
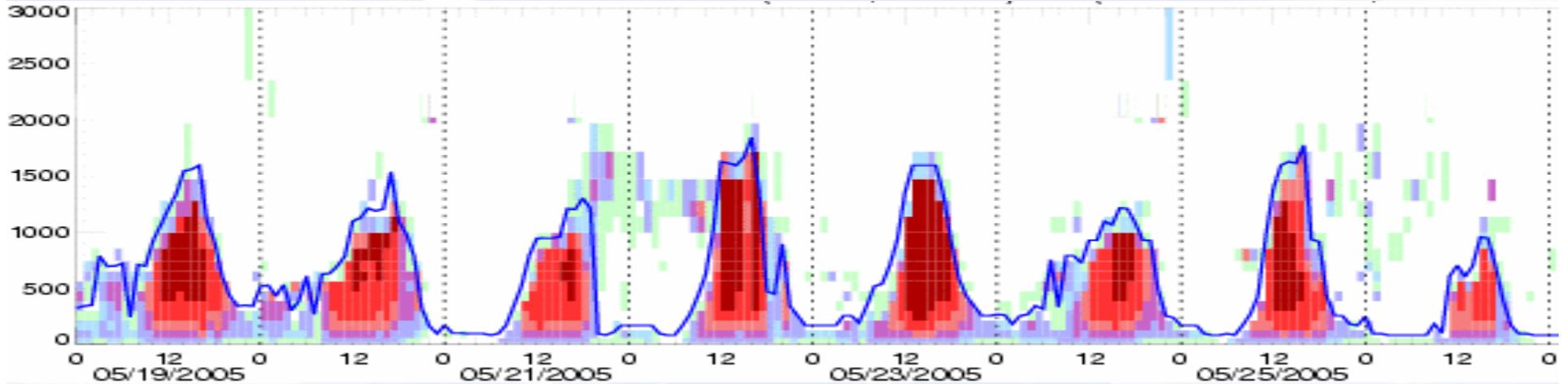




Vertical Diffusivity Kv (m²/s) (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HALC at (450.3,-1090.6) km (EPA482010024, C8/A108/X150, 1997/04/02-now, Aldine, Houston, Harris Co., TX)

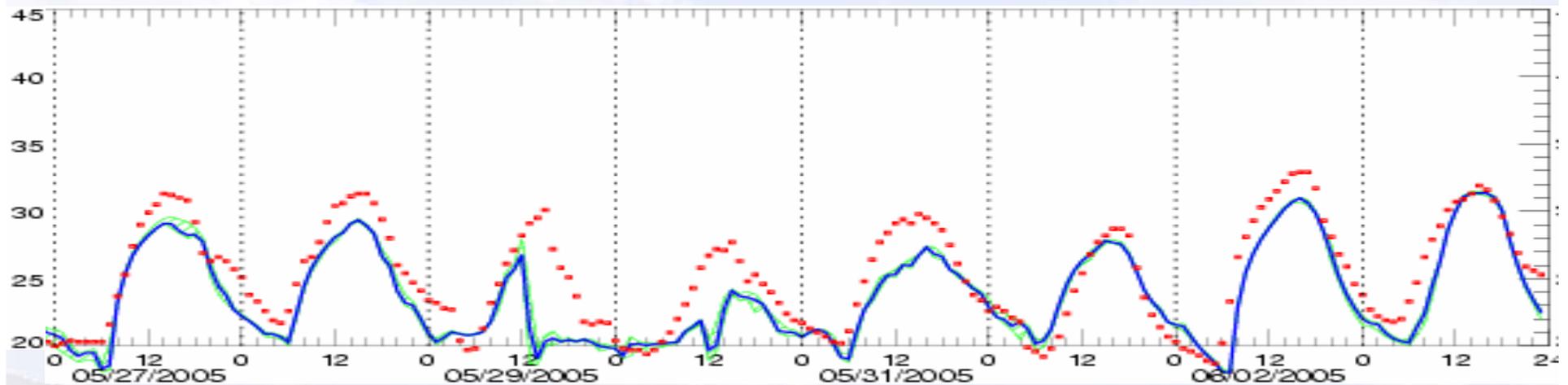
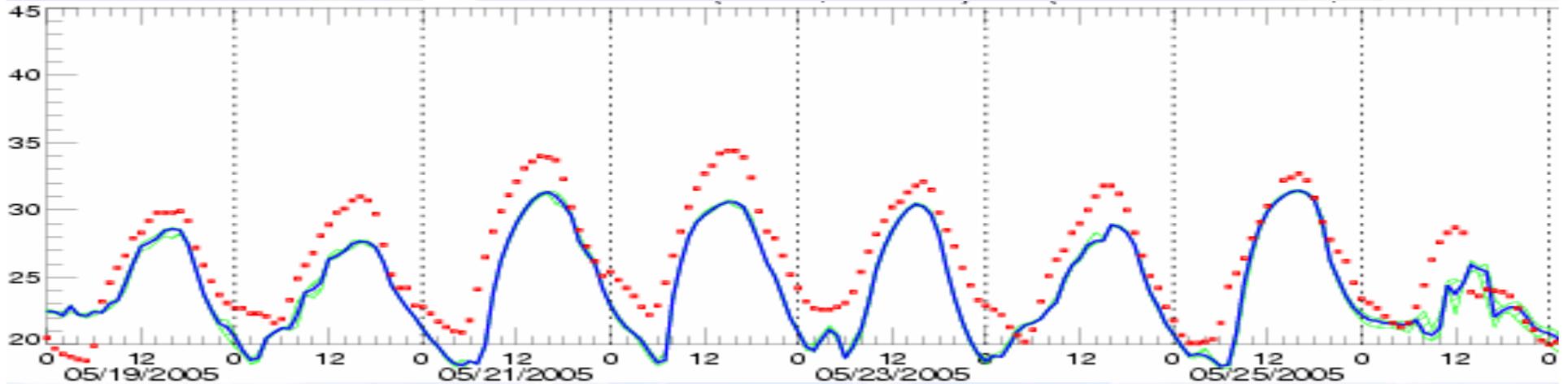




Temperature ($^{\circ}\text{C}$) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HNWA at (416.0, -1077.1) km (EPA482010029, C26/A110/X154, 1997/04/01-now, NW Harris, Tomball, Harris Co., TX)



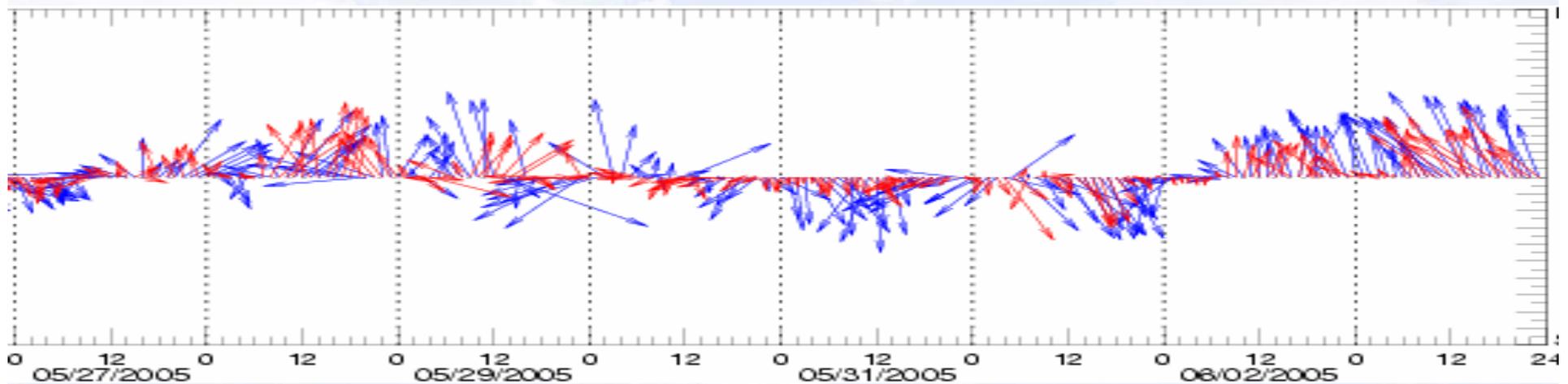
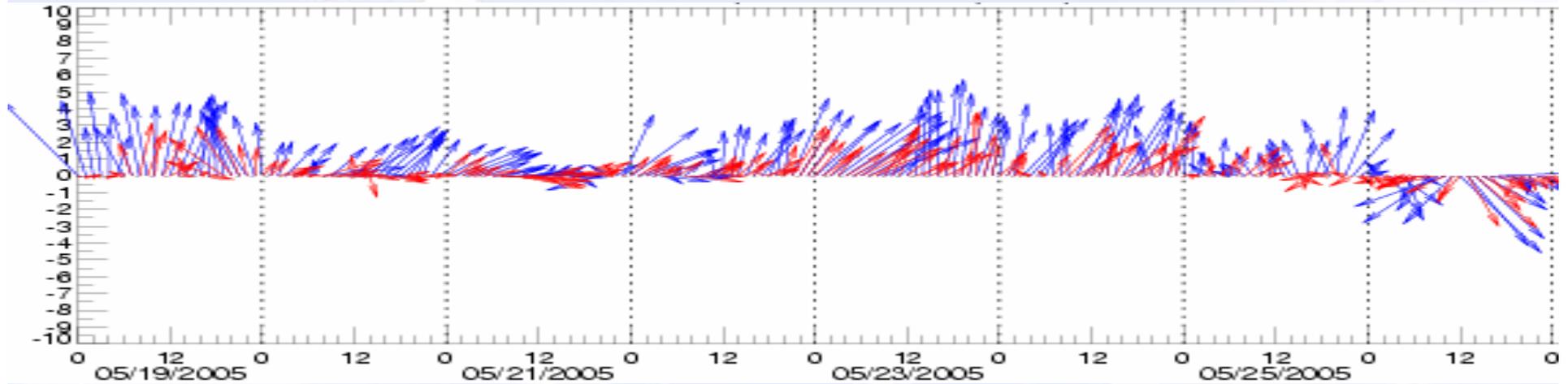
— CAMx/MM5 2005ep0_eta_fdda
••• Observed



Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HNWA at (416.0,-1077.1) km (EPA482010029, C26/A110/X154, 1997/04/01-now, NW Harris, Tomball, Harris Co., TX)



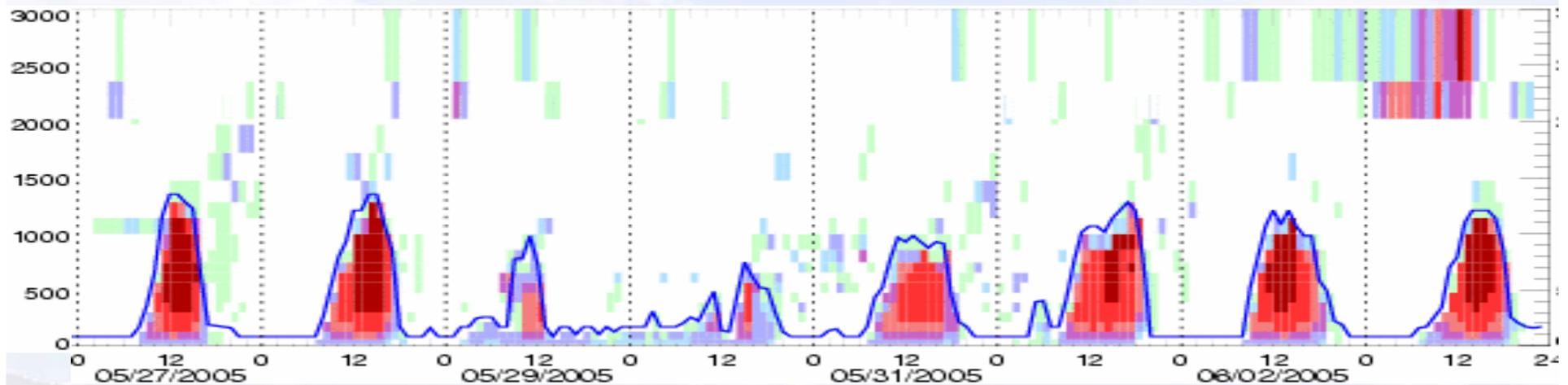
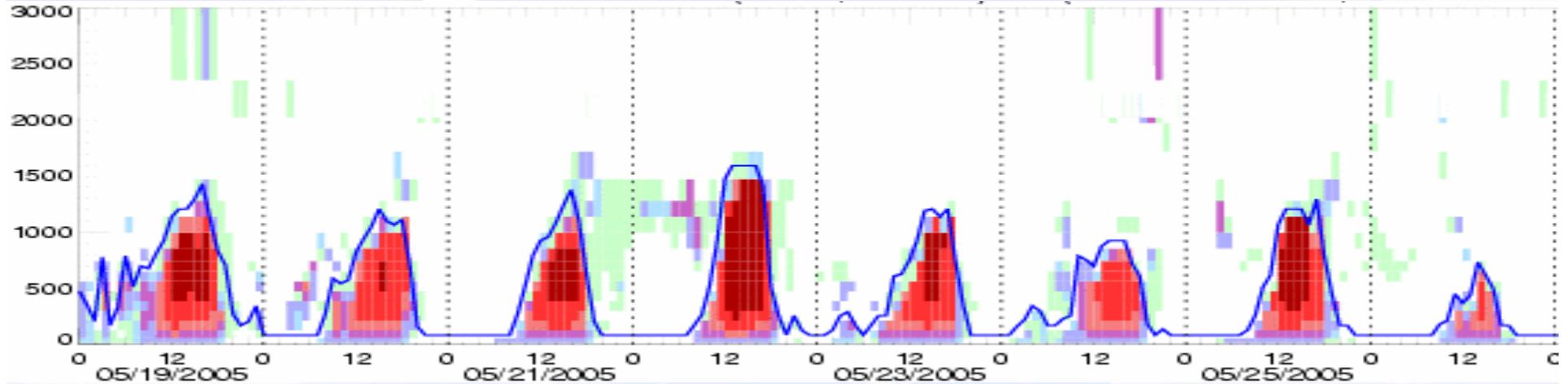
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Vertical Diffusivity K_v (m^2/s) (05/19/2005-06/03/2005)

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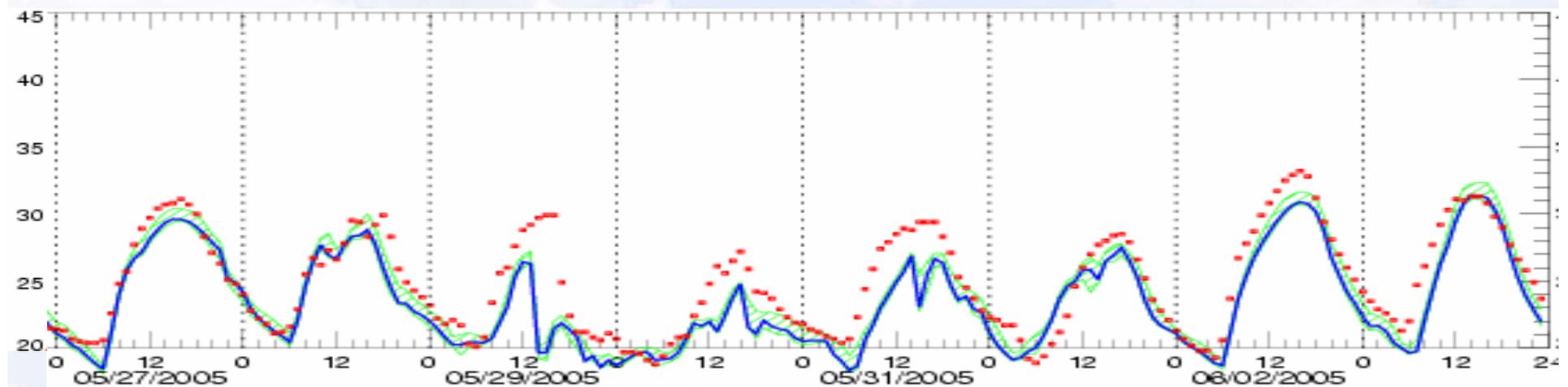
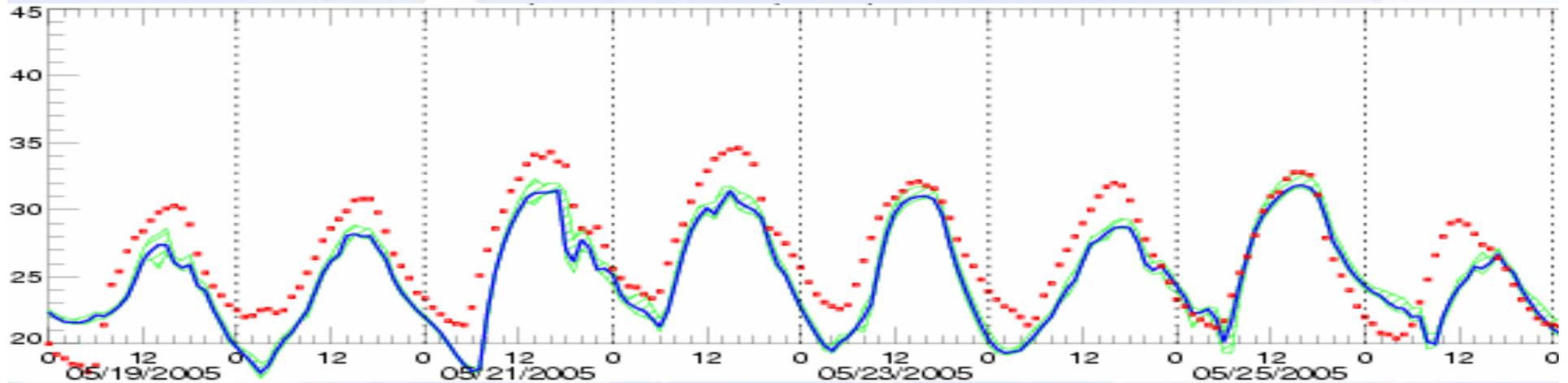




Temperature ($^{\circ}\text{C}$) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

CNR2 at (438.0, -1041.3) km (EPA483390078, C78, 2001/10/16-now, C65 Relocated, 9472A Highway 1484, Conroe, Montgomery Co., TX)



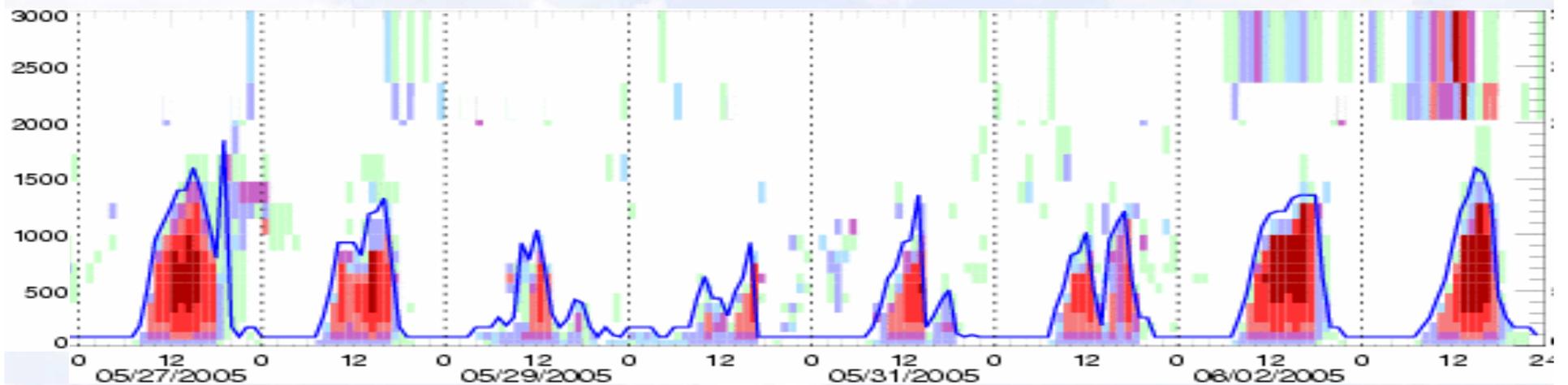
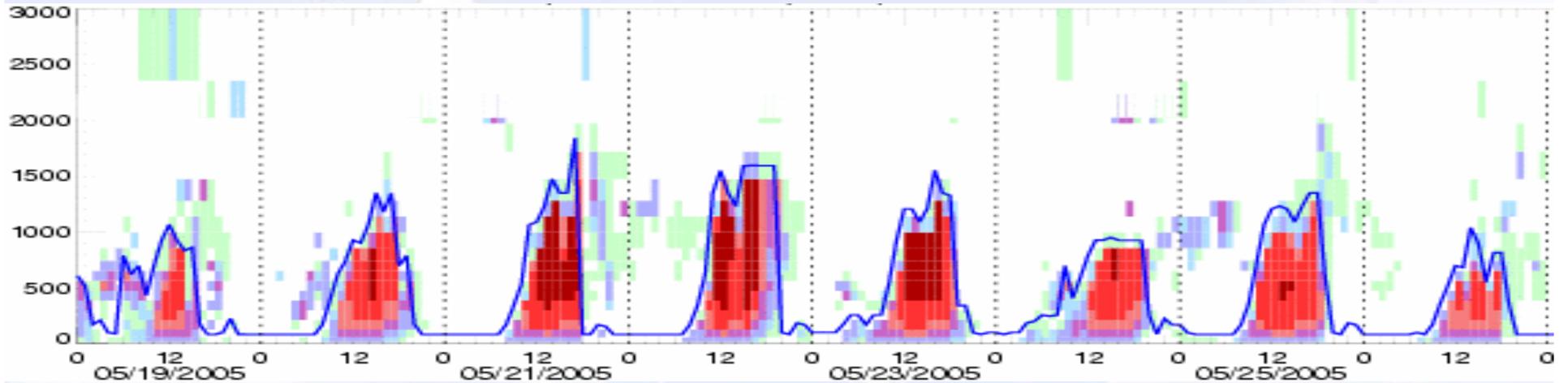
— CAMx/MM5 2005ep0_eta_fdda
•••• Observed



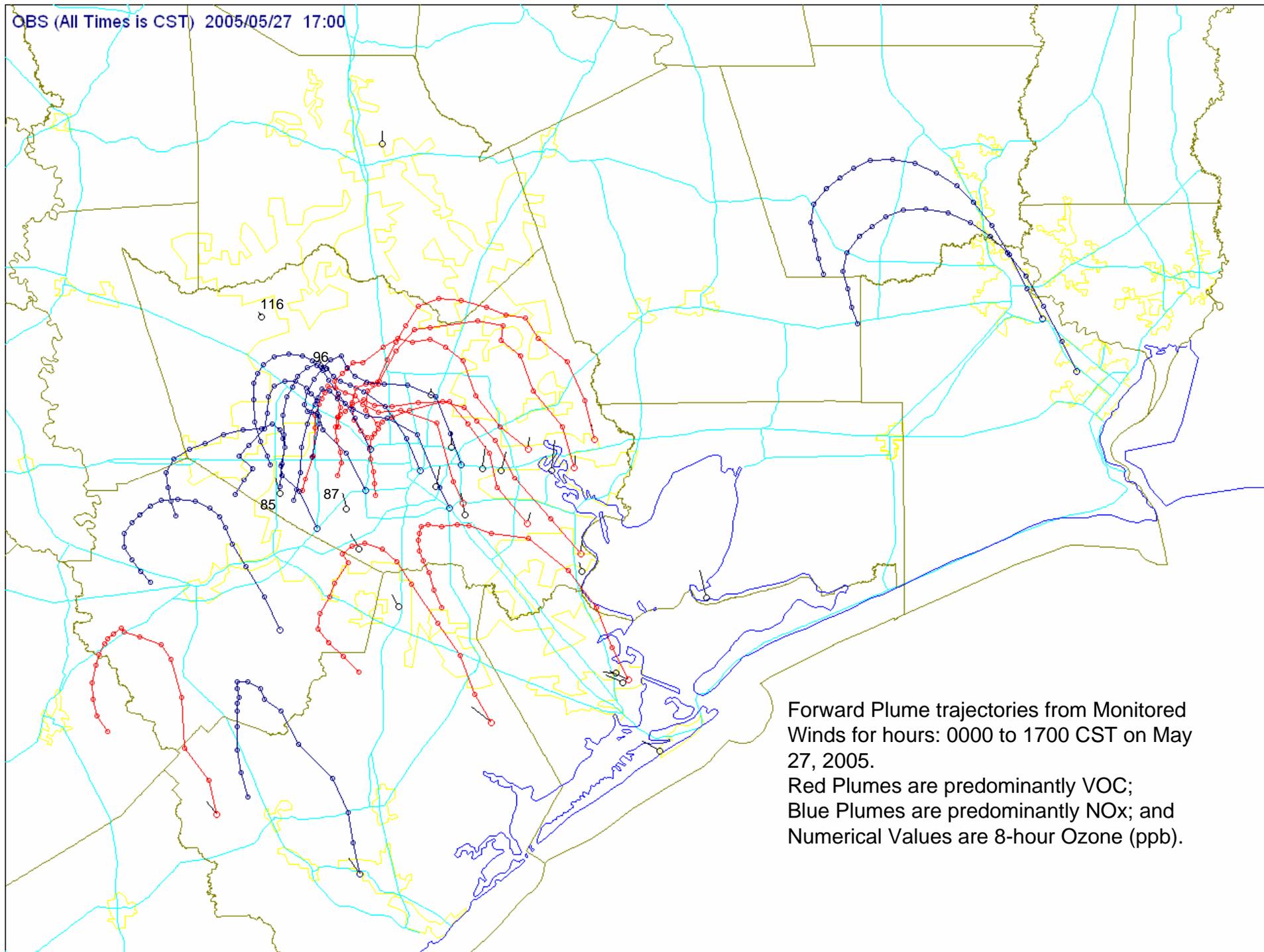
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MM5 2005ep0_eta_fdda

CNR2 at (438.0, -1041.3) km (EPA483390078, C78, 2001/10/16-now, C65 Relocated, 9472A Highway 1484, Conroe, Montgomery Co., TX)

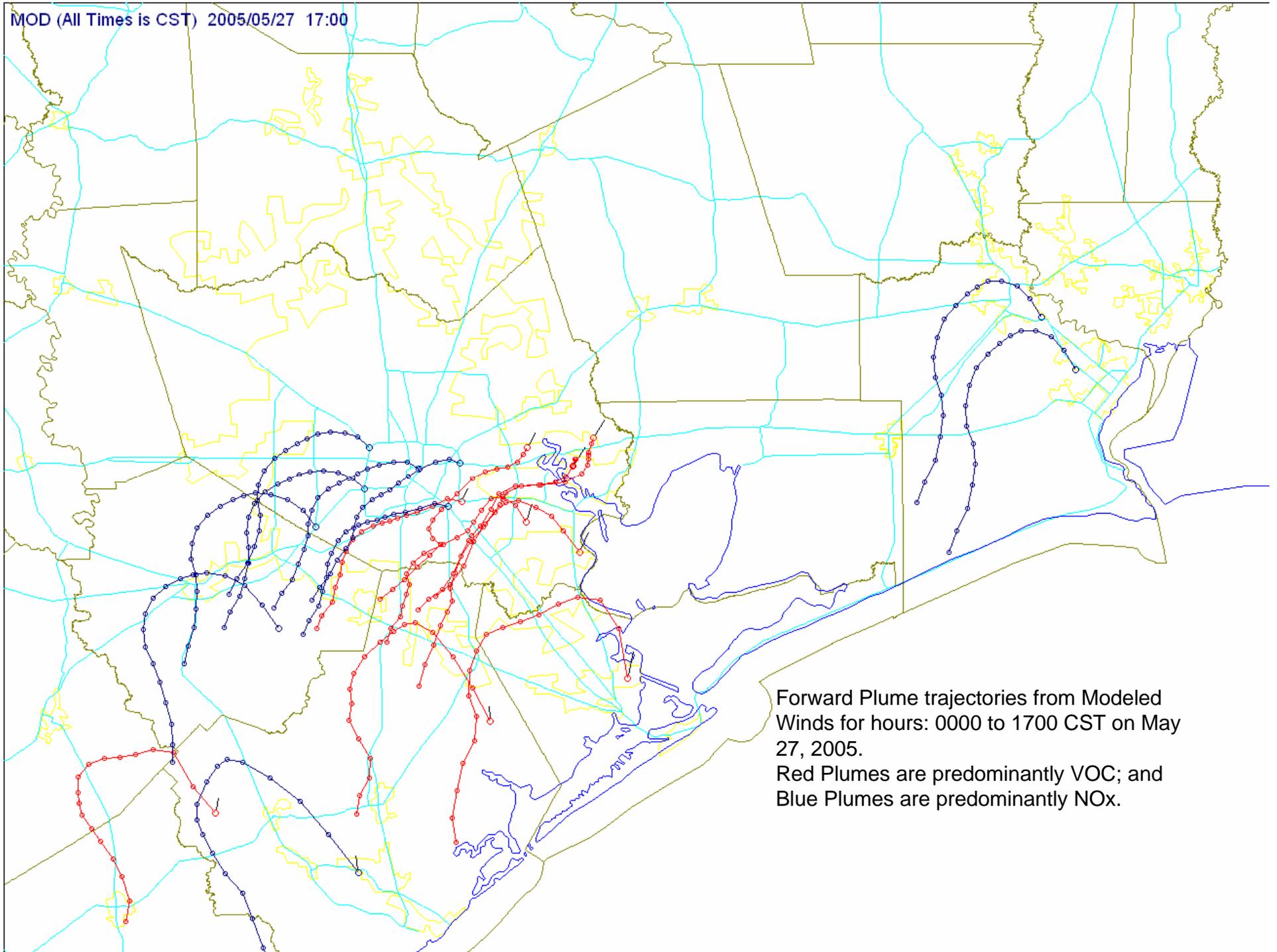


OBS (All Times is CST) 2005/05/27 17:00



Forward Plume trajectories from Monitored Winds for hours: 0000 to 1700 CST on May 27, 2005.
Red Plumes are predominantly VOC;
Blue Plumes are predominantly NOx; and
Numerical Values are 8-hour Ozone (ppb).

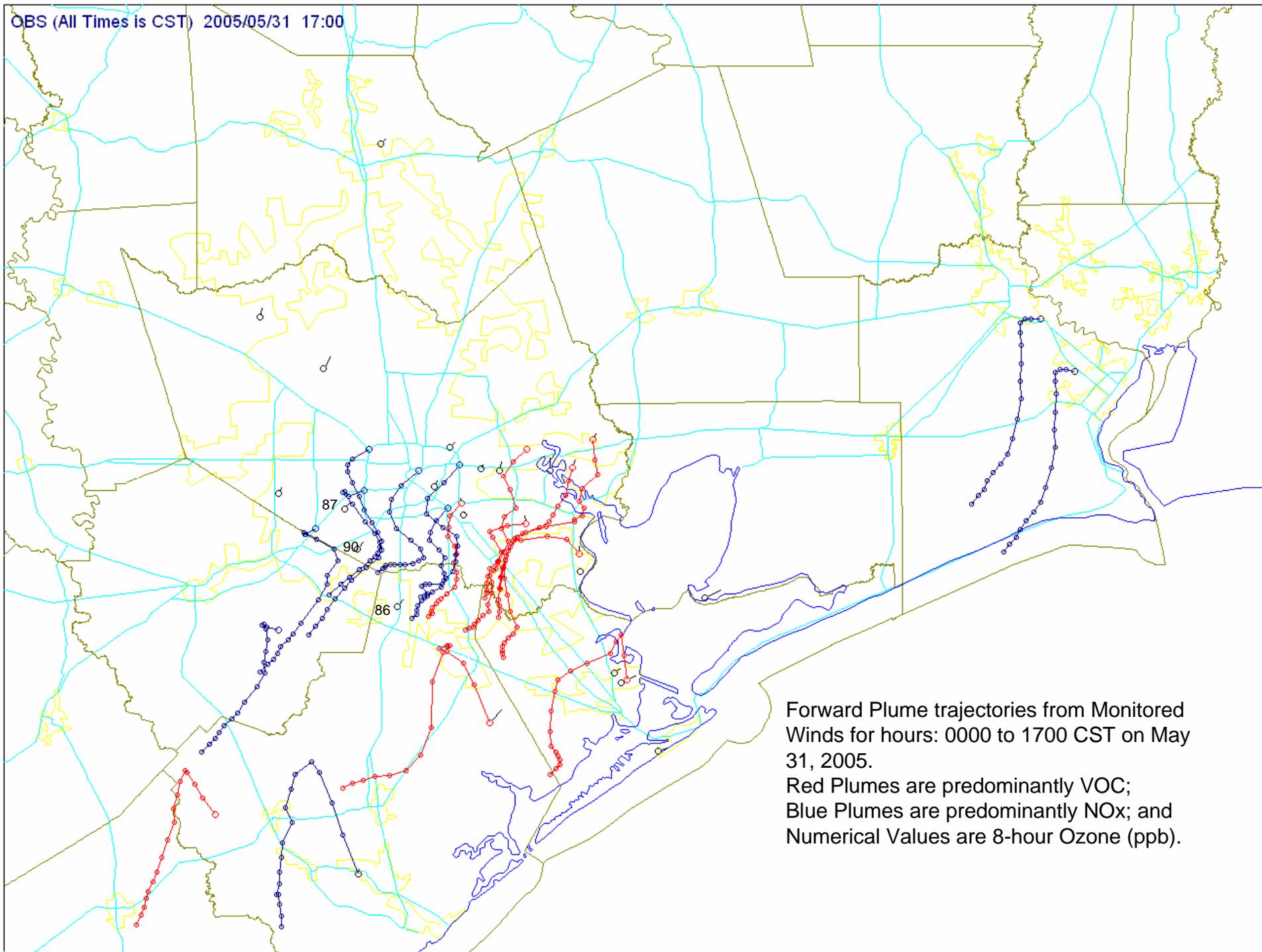
MOD (All Times is CST) 2005/05/27 17:00



Forward Plume trajectories from Modeled Winds for hours: 0000 to 1700 CST on May 27, 2005.

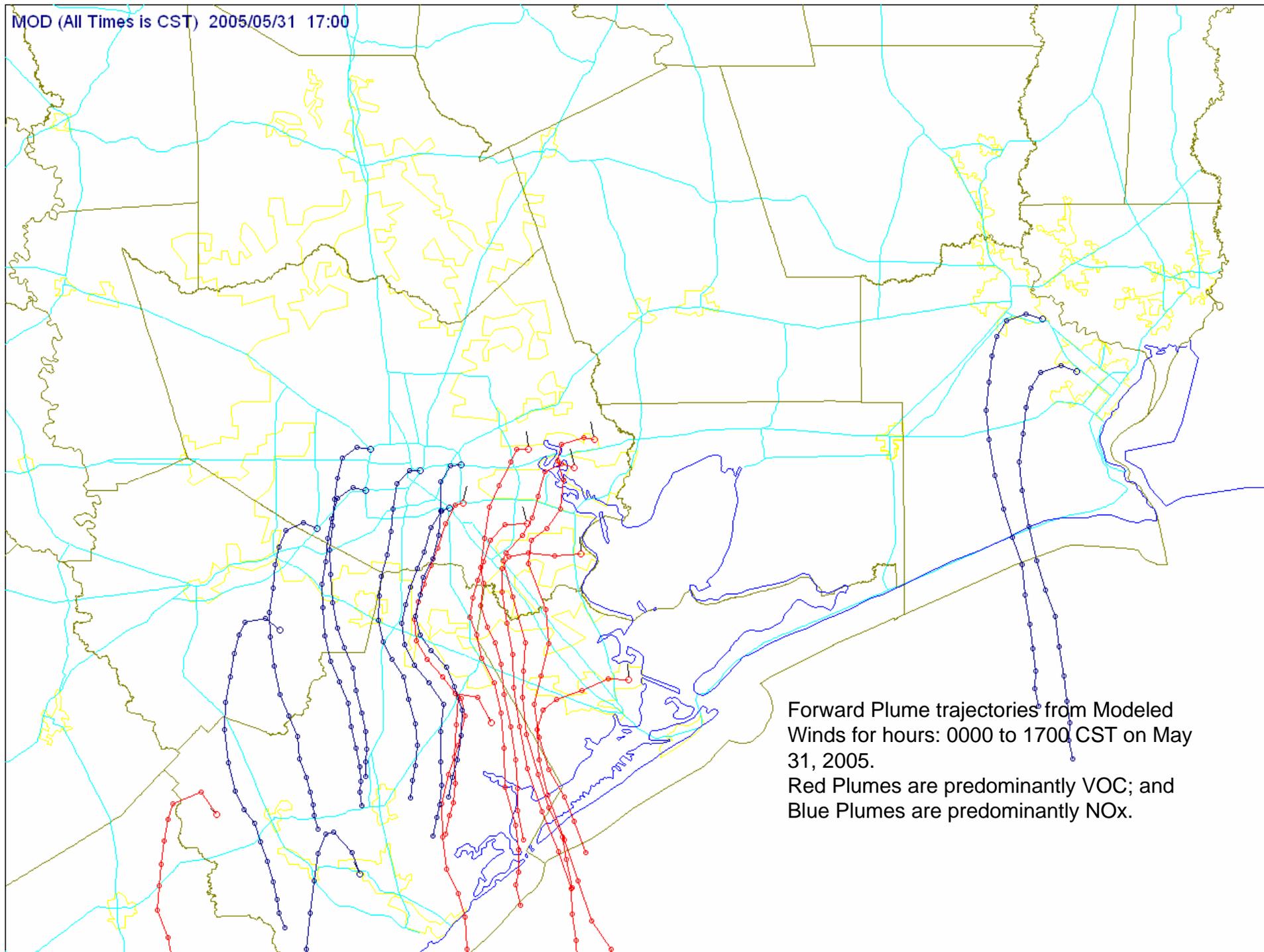
Red Plumes are predominantly VOC; and Blue Plumes are predominantly NOx.

OBS (All Times is CST) 2005/05/31 17:00



Forward Plume trajectories from Monitored Winds for hours: 0000 to 1700 CST on May 31, 2005.
Red Plumes are predominantly VOC;
Blue Plumes are predominantly NOx; and
Numerical Values are 8-hour Ozone (ppb).

MOD (All Times is CST) 2005/05/31 17:00



Forward Plume trajectories from Modeled Winds for hours: 0000 to 1700 CST on May 31, 2005.
Red Plumes are predominantly VOC; and Blue Plumes are predominantly NOx.



Meteorological Modeling Episode Status

- May 18 – June 3, 2005 (2005Ep0)
 - MM5 FDDA modeling Complete
- June 15 – June 30, 2005 (2005Ep1)
 - MM5 FDDA modeling Complete
 - MM5 Sensitivity Modeling (e.g., SST)
- July 25 – August 9, 2005
 - MM5 FDDA modeling Complete
 - MM5 Sensitivity Modeling (e.g., SST)
- May 29 – June 16, 2006 (2006Ep0)
 - MM5 Coarse Domains Modeled
- Aug. 1 – Oct. 15, 2006 (2006Ep#'s)
 - Awaiting Data Validation



Future Work

- Run Alternative Met Configurations (e.g., PBL schemes, Cumulus Parameterization)
- Incorporate Updated Land-use Characterization (collaboration w/UH)
- Incorporate Hourly Sea Surface Temperatures (collaboration w/UH)
- Evaluate the Met Modeling (e.g., PBL Plots, Plume Plots, other evaluation tools/products)