

Meteorological Aspects of TexAQS-II (H84)

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Project Status

- \$10K Preaward Authorization
- Contract approval may occur in a week or so
- Complementary TCEQ projects in place
- Focus so far: data collection and QC, preliminary meteorological characterization

Data Collection and QC

- Surface
 - METARs
 - TCEQ stations
 - Buoys
 - PORTS
 - Special Met
- Upper Air
 - Regional sondes
 - UH sondes
 - Ron Brown sondes
 - Profilers
 - Sodars
 - Lidar/Radar winds
 - In situ aircraft

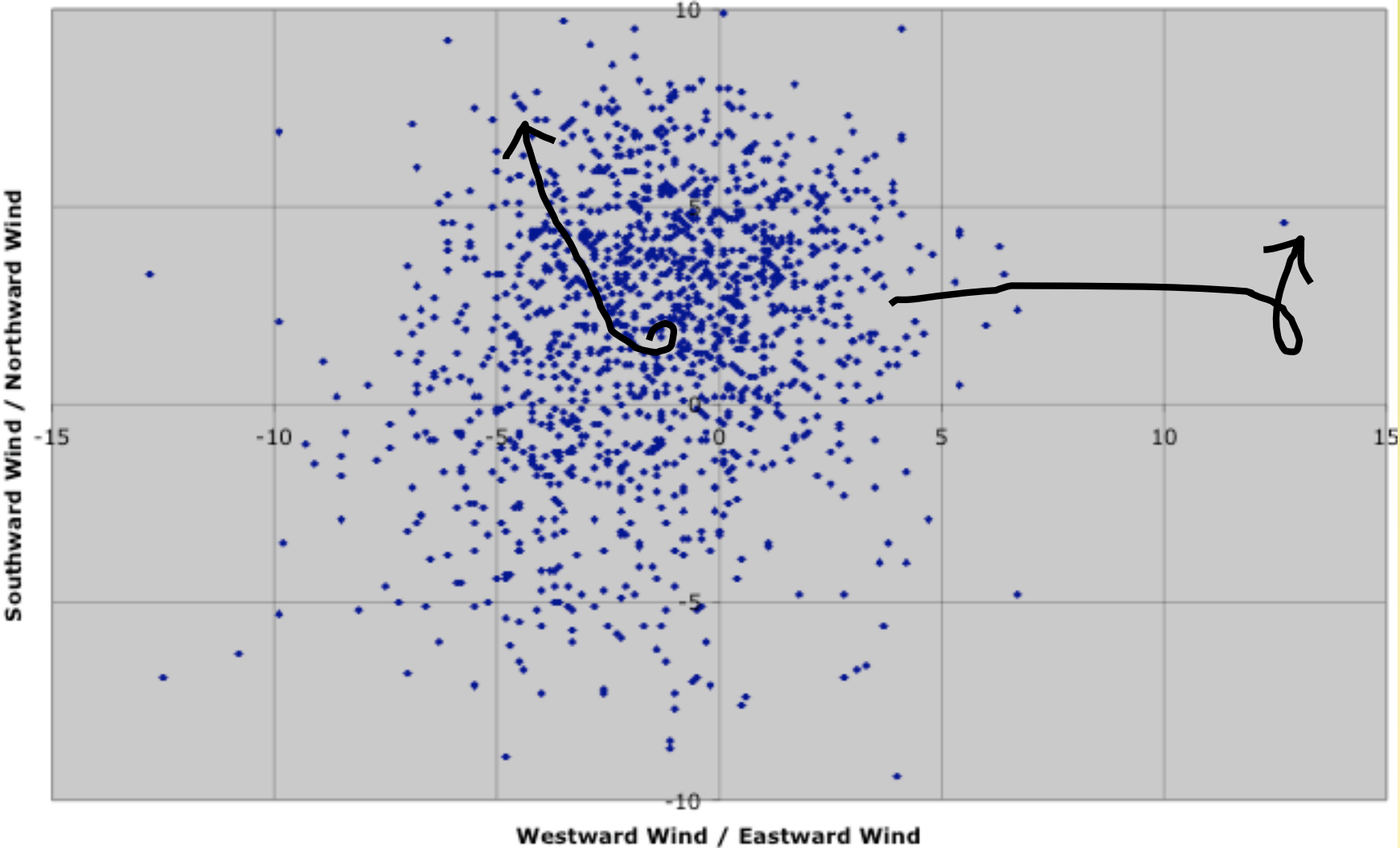
Data Collection and QC

- Mixing Heights
 - Profilers
 - Sodars
 - Ron Brown lidars
 - Twin Otter lidar
 - NASA lidar
- Web Interface
 - Sorted by instrument or by day
 - Native and processed formats
 - Documentation
 - Data or links to data

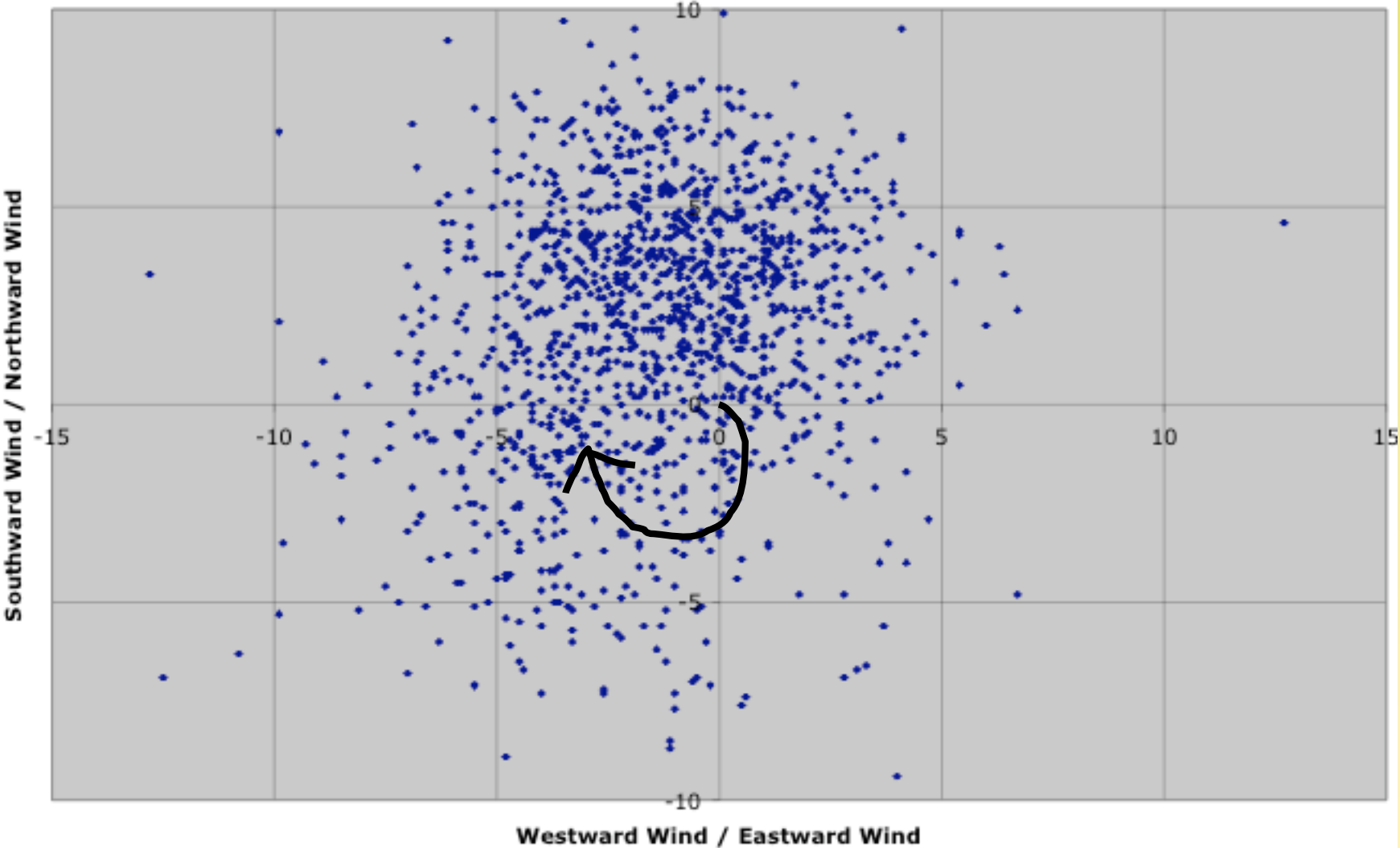
Meteorological Characterization

- Sea Breeze Cycle model
 - 24-h mean wind controls stagnation and transport
 - Ozone plume timing and trajectories controlled by sea breeze cycle interacting with large-scale wind

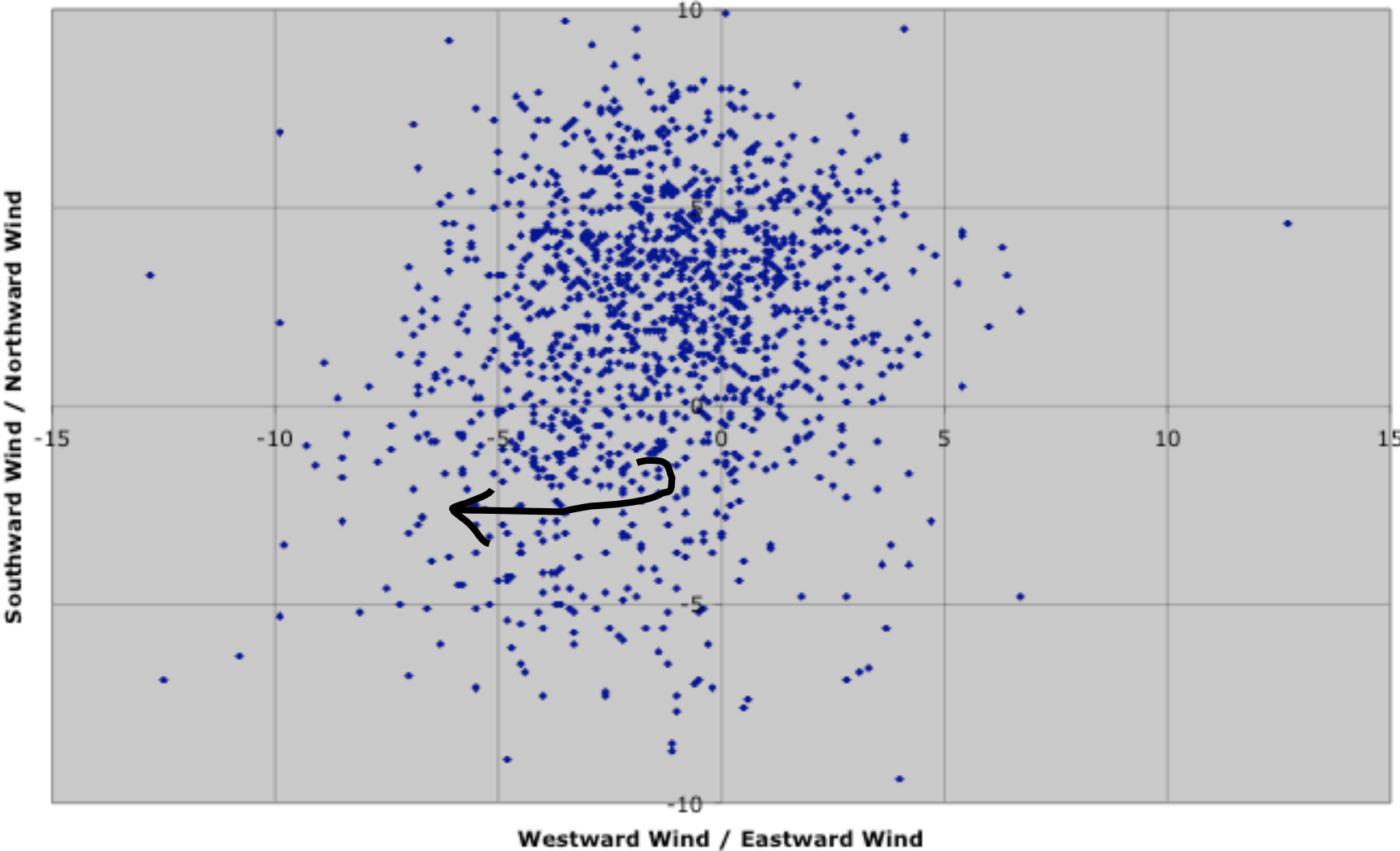
Buoy Winds, May-Oct 1998-2006



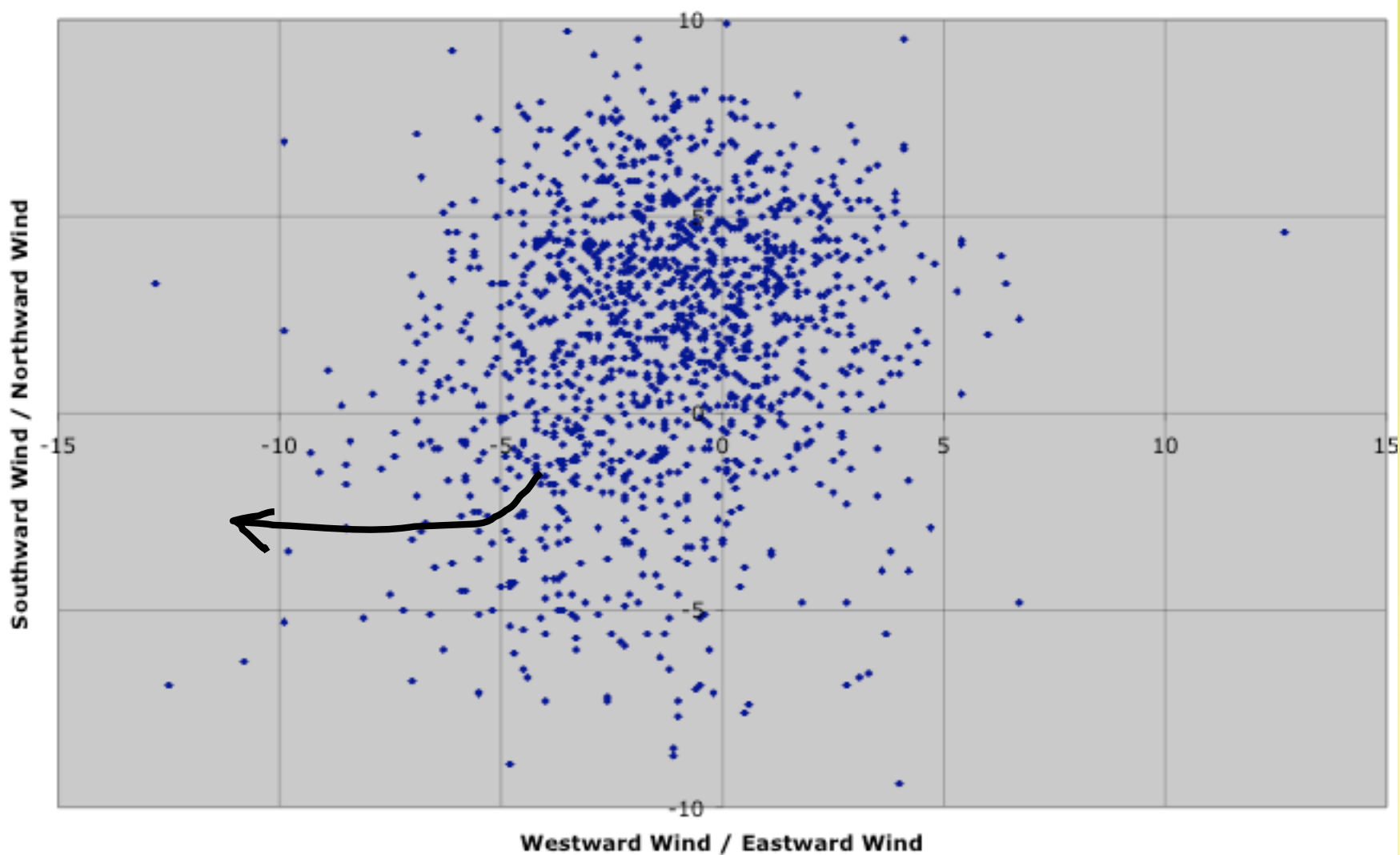
Buoy Winds, May-Oct 1998-2006



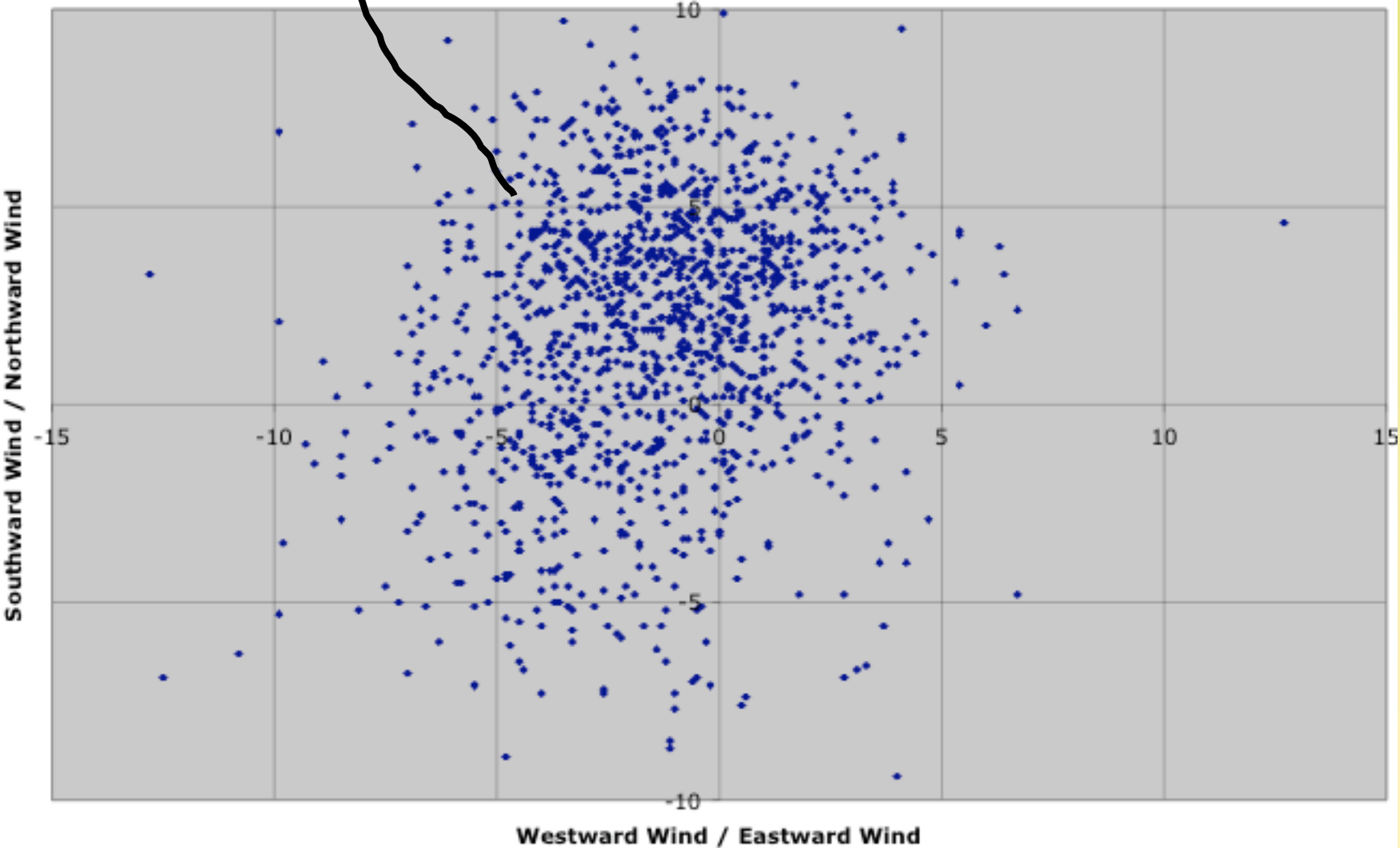
Buoy Winds, May-Oct 1998-2006



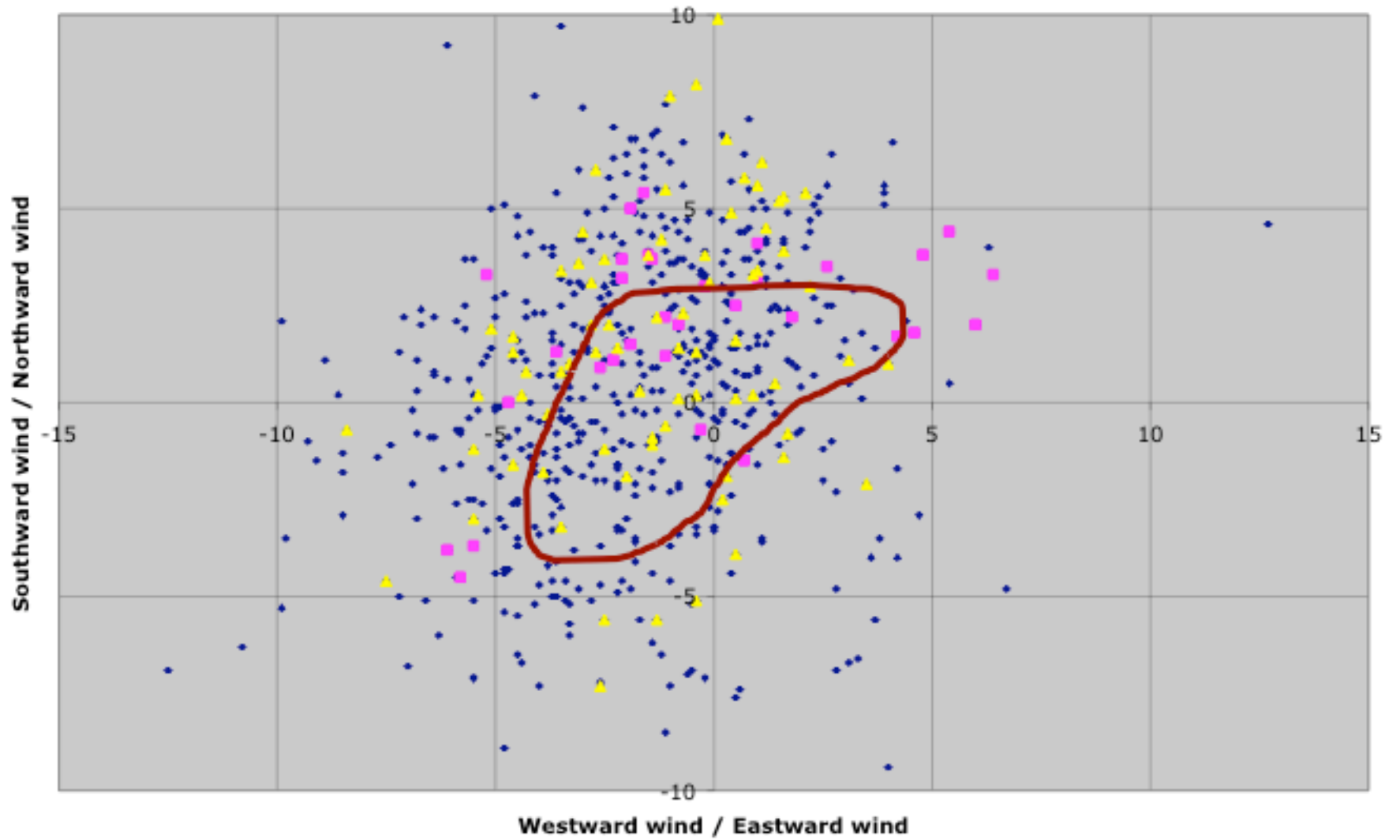
Buoy Winds, May-Oct 1998-2006



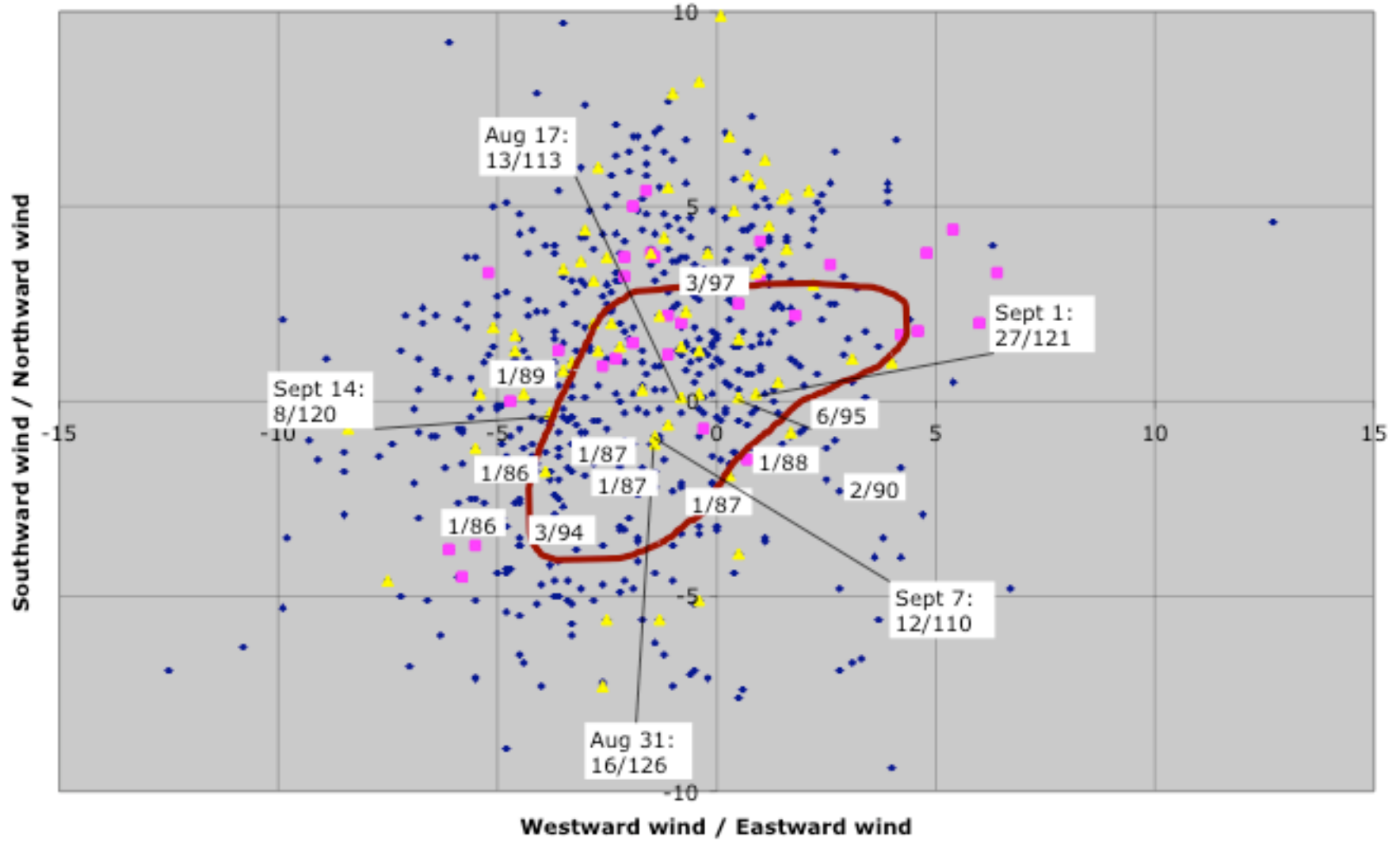
Buoy Winds, May-Oct 1998-2006



Aug 1 - Oct 15 TexAQS-II Buoy Winds



Aug 1 - Oct 15 Buoy Winds



Conclusions

- Meteorology and transport in the 2006 field intensive was unlike the 2000 field intensive
- 2006 events were probably more background-dominated
- Together, 2000 and 2006 spanned the full range of (un)favorable Houston meteorology
- Recirculation of previous day's ozone occurred on Sept. 1 and maybe on Aug. 17 or Sept. 14

Meteorological Next Steps

- Ensemble-based analysis and simulation
 - Field-intensive base analysis
 - Interpretation of Moody Tower measurements
 - Basis for coarse, continuous photochemical simulation
 - Improved boundary conditions for future high-resolution simulations

Meteorological Next Steps

- Ensemble-based analysis and simulation
 - Meteorological and photochemical ensembles
 - Establish uncertainty due to meteorology
 - Identify situations where analysis/simulation error is insufficient to explain overall model error
 - EnKF improvement of vertical mixing
 - Assimilate observations, include mixing parameterization in model state vector
 - Collaboration with Jon Pleim/EPA

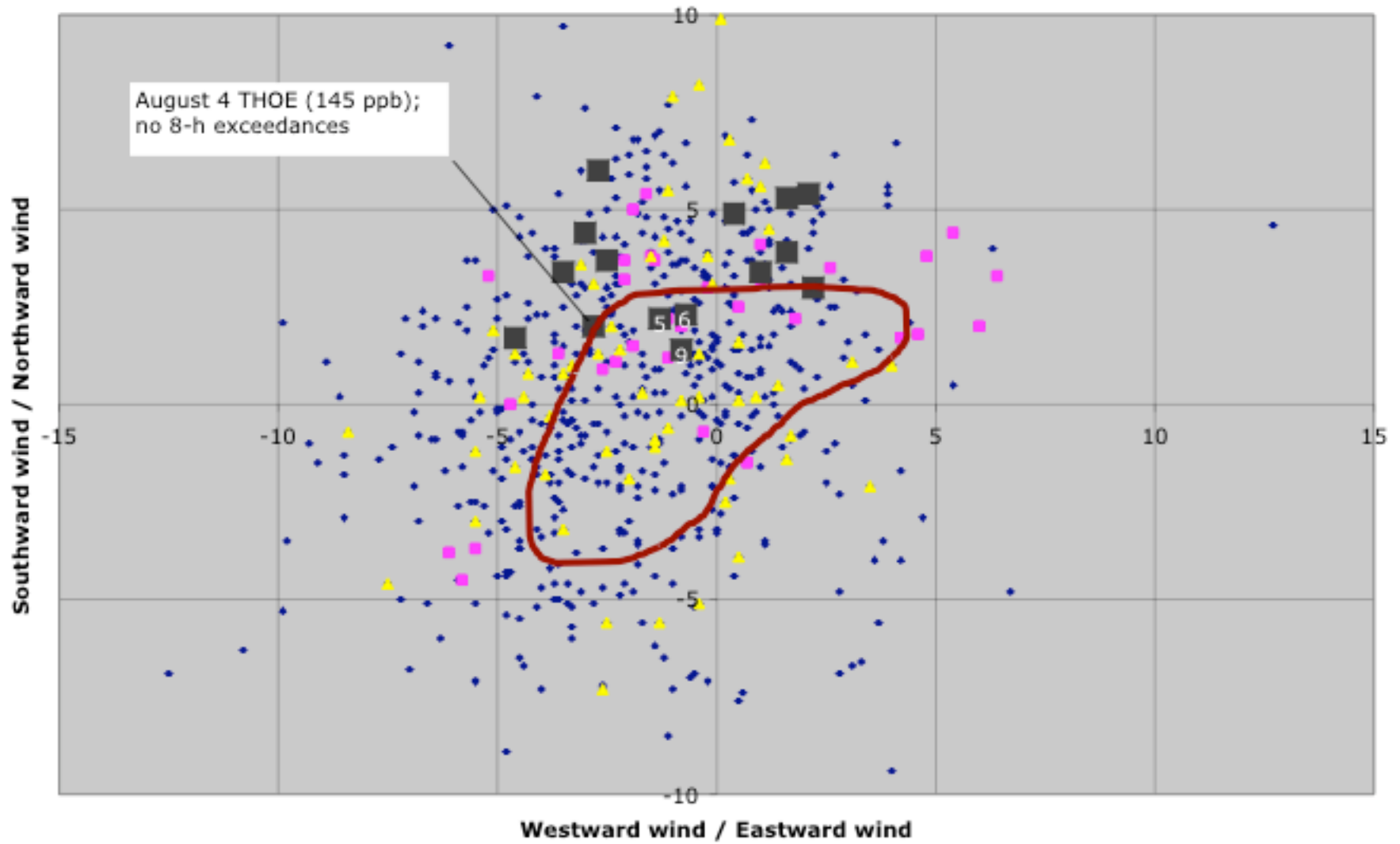
Meteorological Next Steps

- Separation of meteorological and emissions/background factors
 - Ozone improvements being made through undocumented reductions in emissions
 - Need to quantify those reductions to EPA
 - Extension of conceptual model work
 - Recent data
 - Comprehensive meteorology

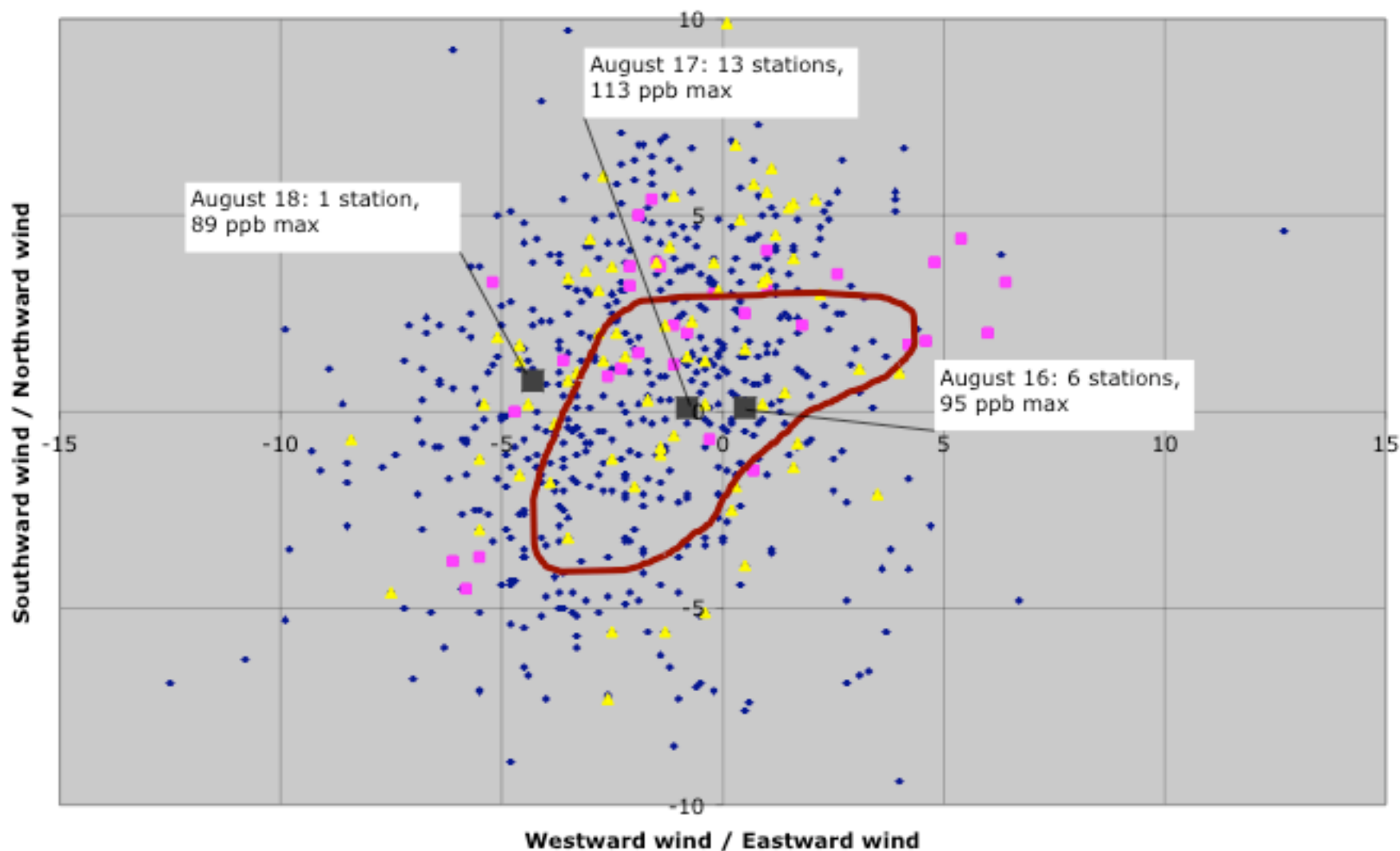
Meteorological Next Steps

- Other useful items
 - Detailed meteorological analysis of key days
 - Combined meteorological/chemical web site data clearing house
 - Integration/reconciliation of mixing height data set

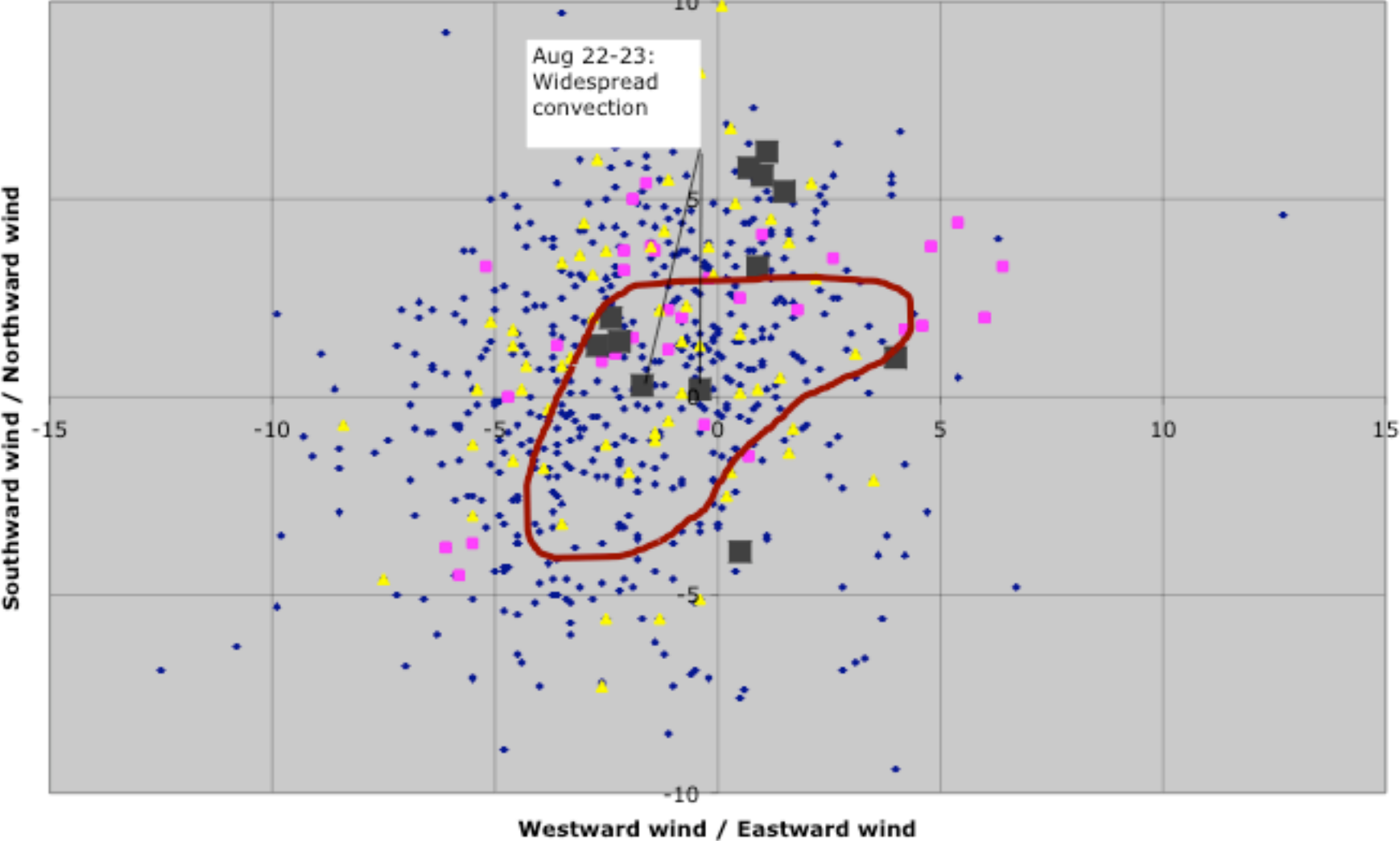
Aug 1-15, 2006 Buoy Winds



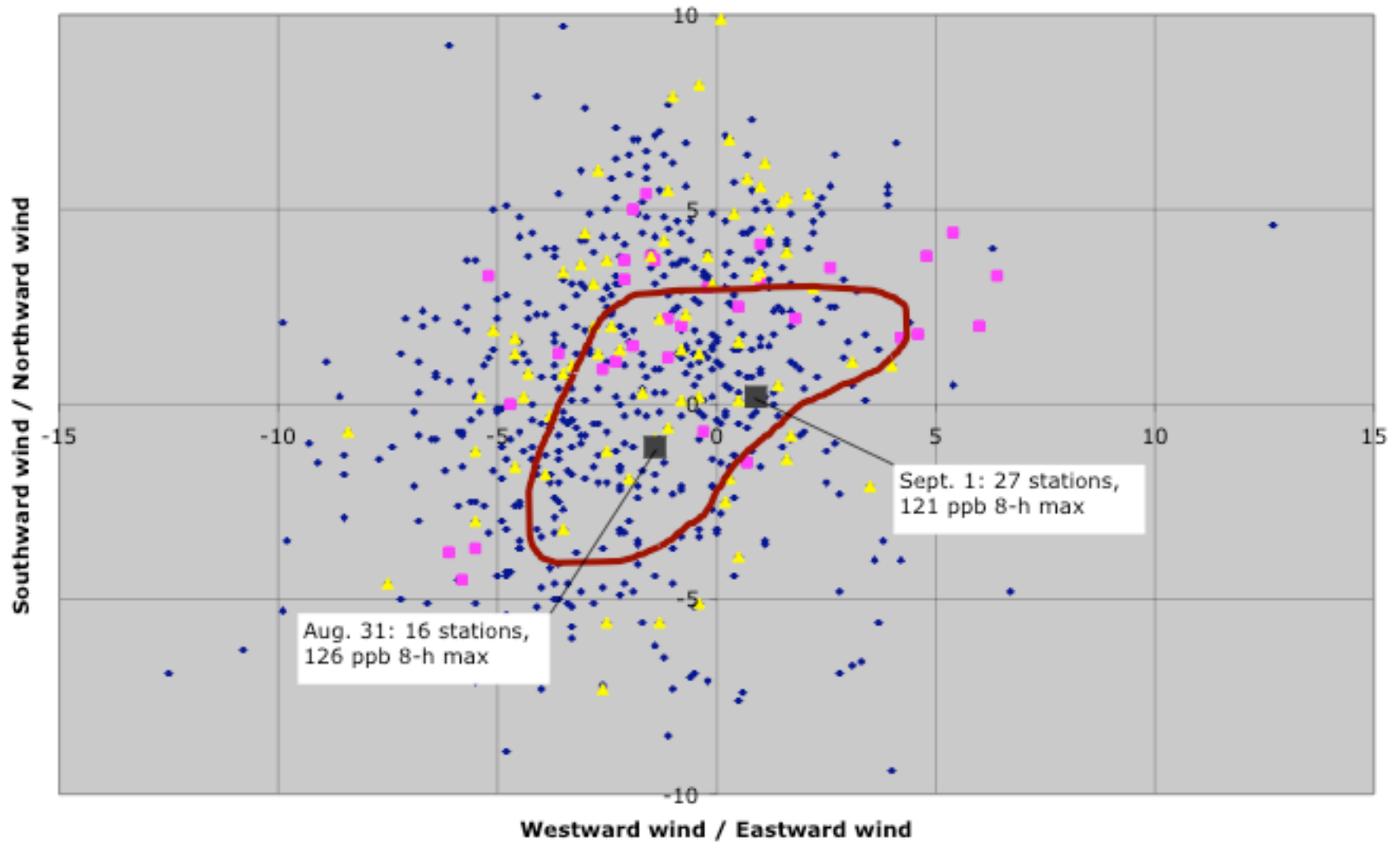
Aug 16-18, 2006 Buoy Winds



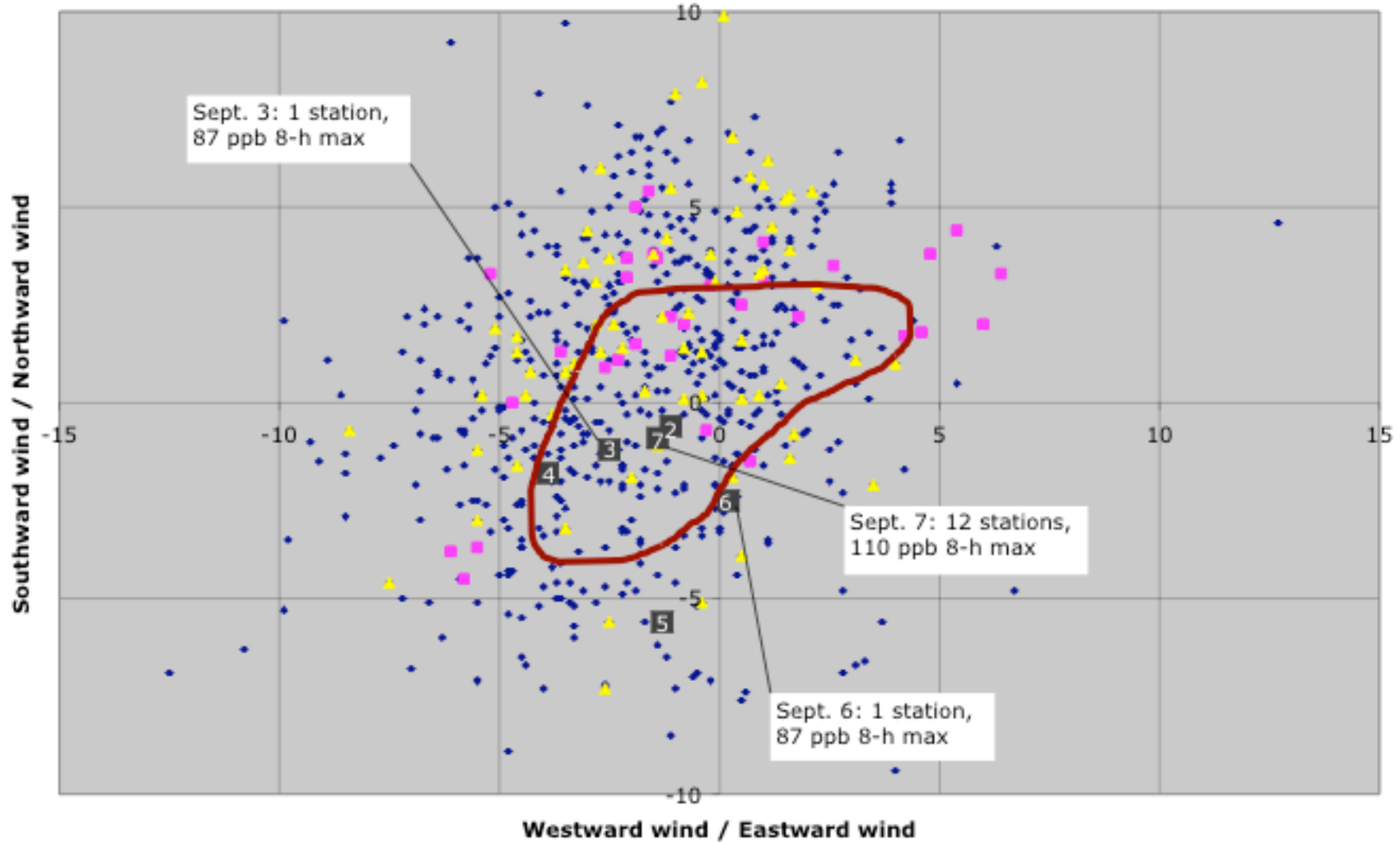
Aug 19-30, 2006 Buoy Winds



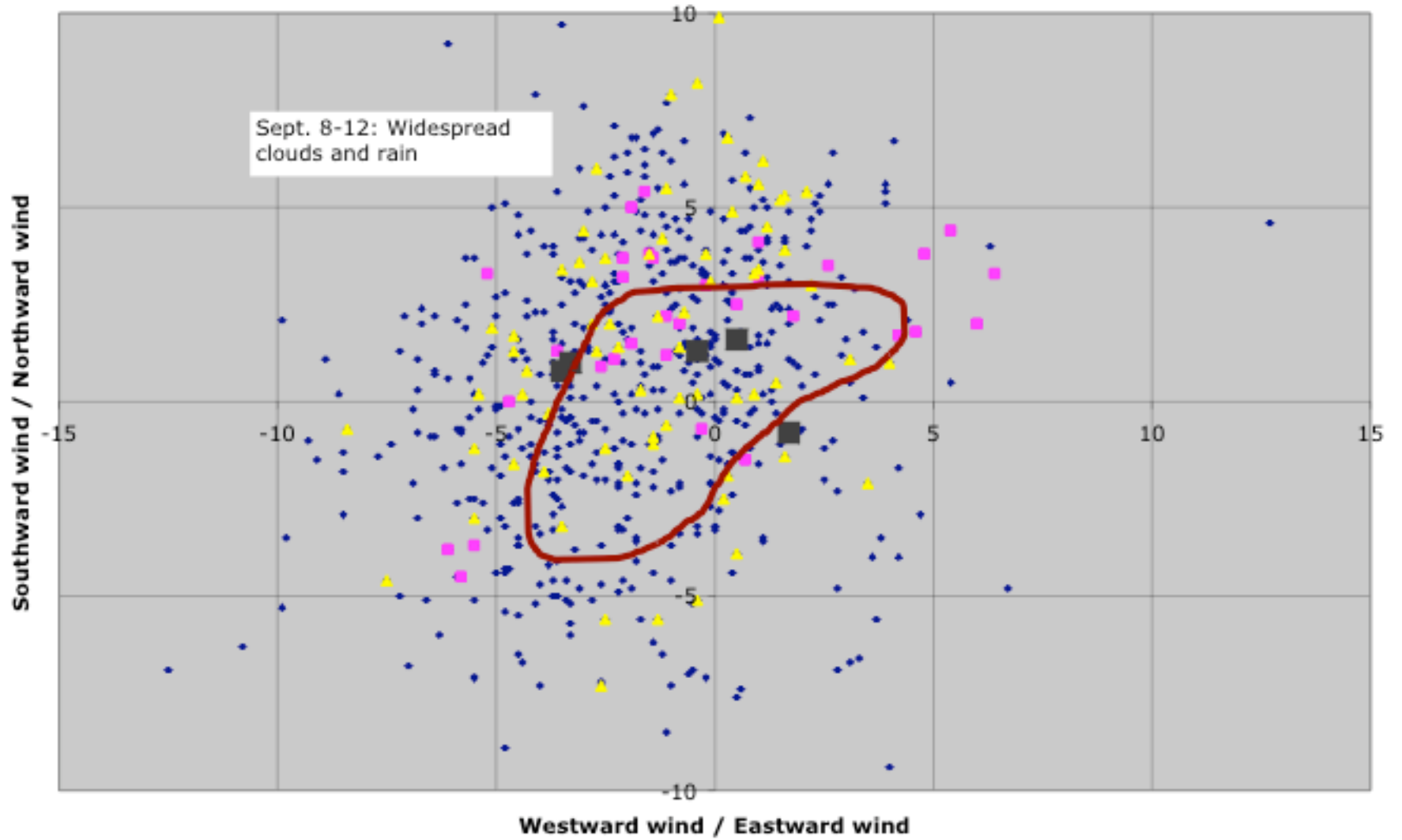
Aug 31 & Sept 1, 2006 Buoy Winds



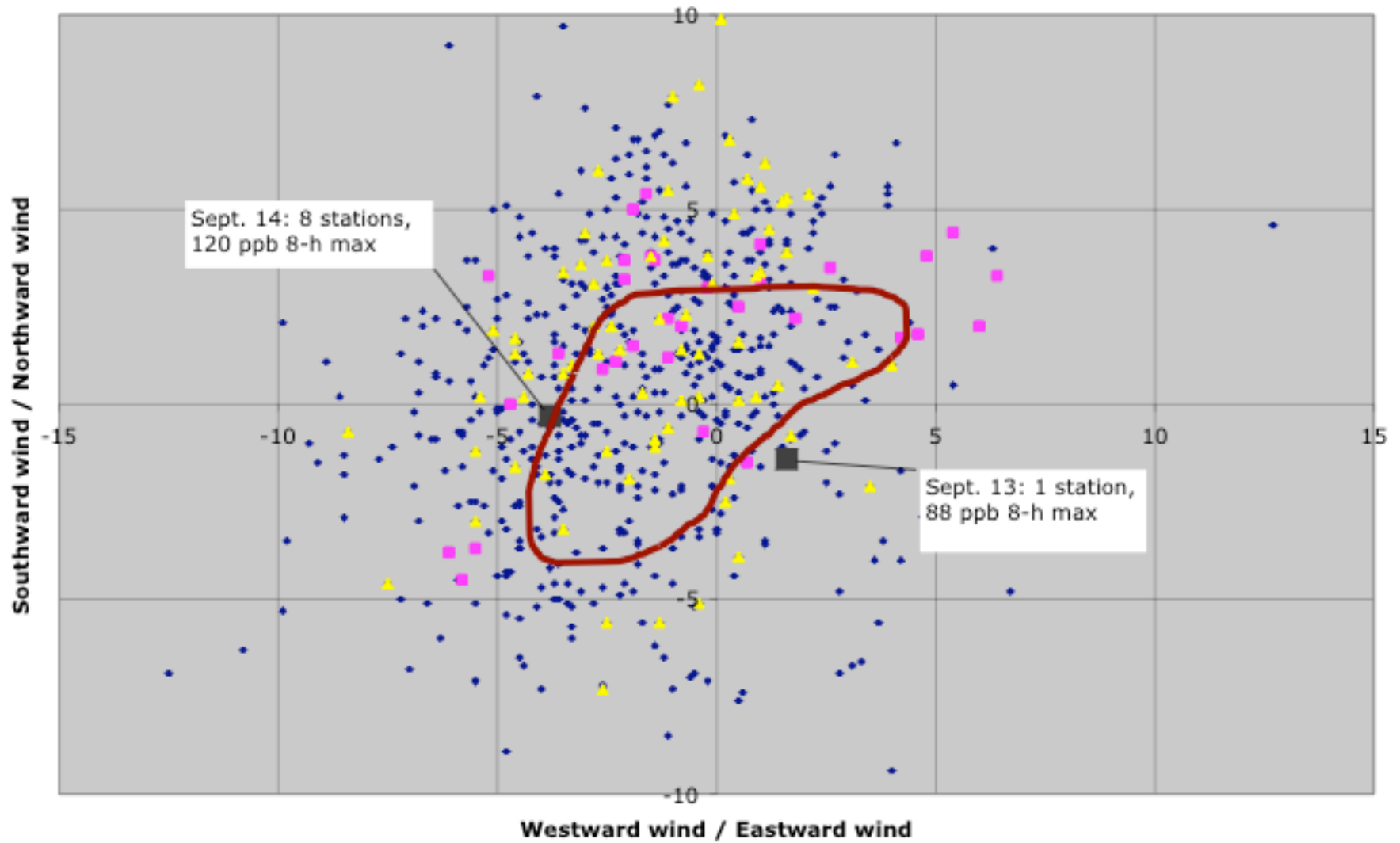
Sept. 2-7, 2006 Buoy Winds



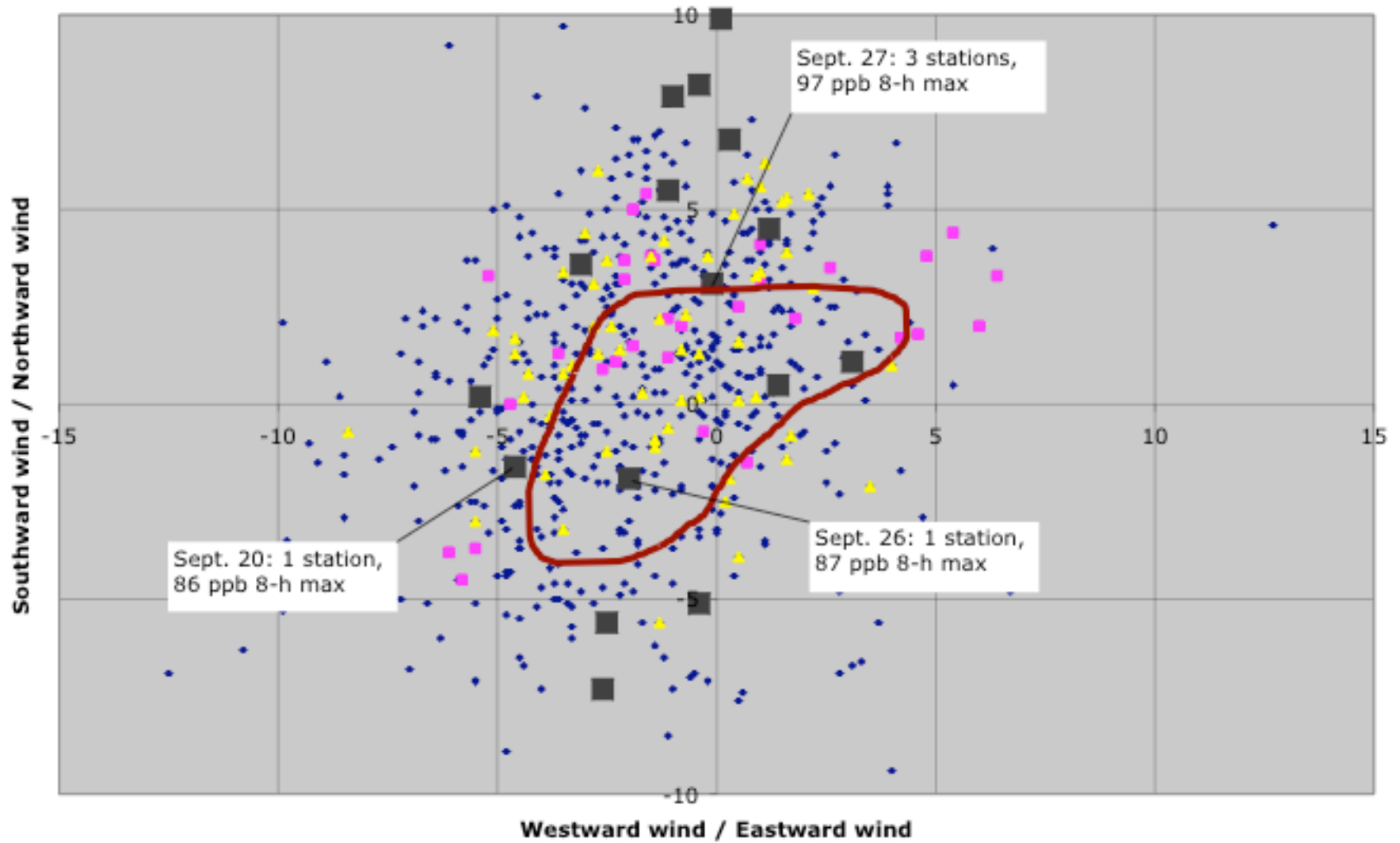
Sept 8-12, 2006 Buoy Winds



Sept 13-14, 2006 Buoy Winds



Sept 15-30, 2006 Buoy Winds



Oct 1-14, 2006 Buoy Winds

