

Buying Gas – Risks and Opportunities

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Recognizing the Risks

- Baseload Price
- Baseload Basis
- Volumetric Swings – Monthly & Daily

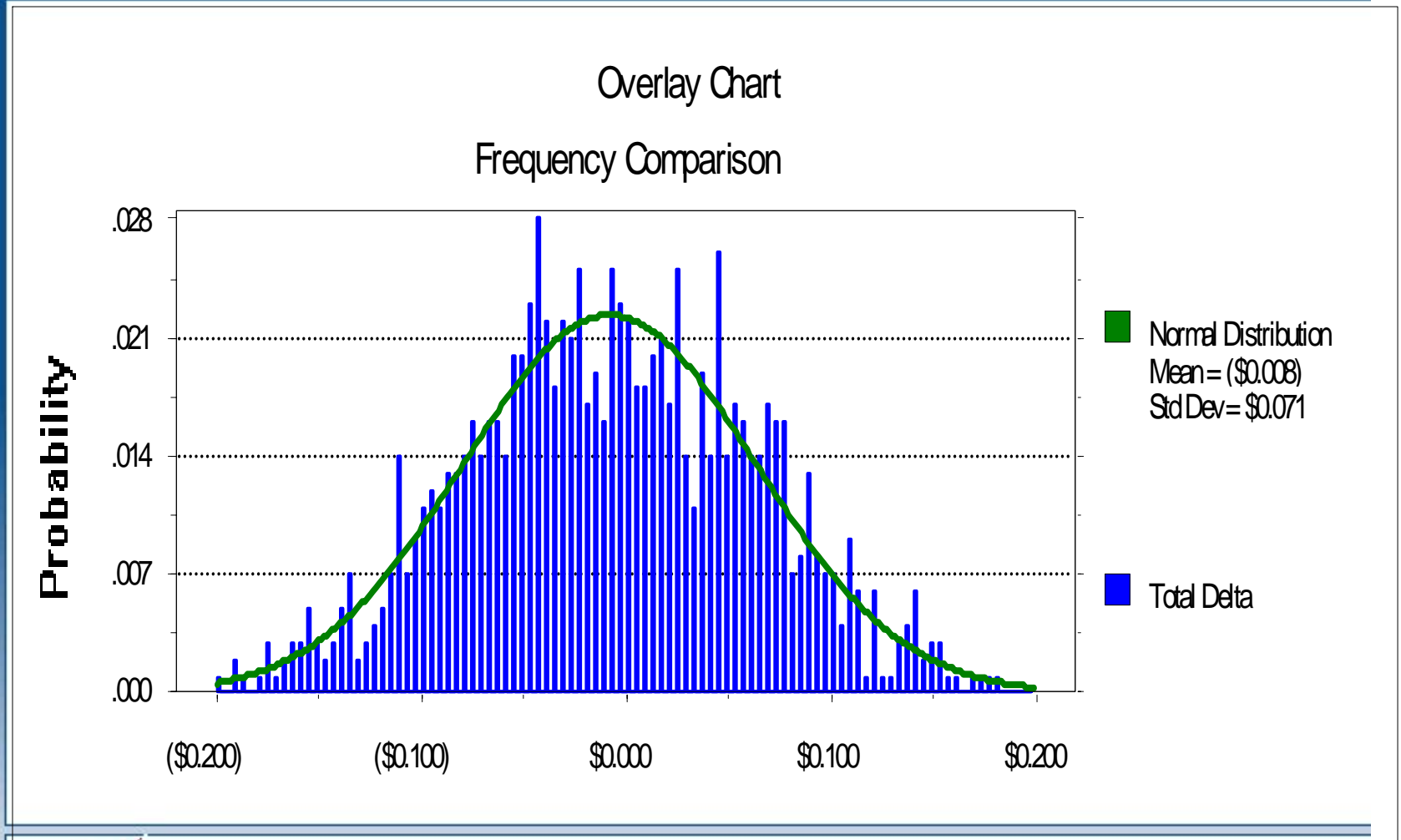
Financial Hedging

- Baseload Price – Purchasing NYMEX Futures
- Baseload Basis – Purchasing Basis Options
- Monthly Swings – Monthly Options for a Constant Daily Volume
- Daily Swings – Gas Daily Options on the Appropriate Index

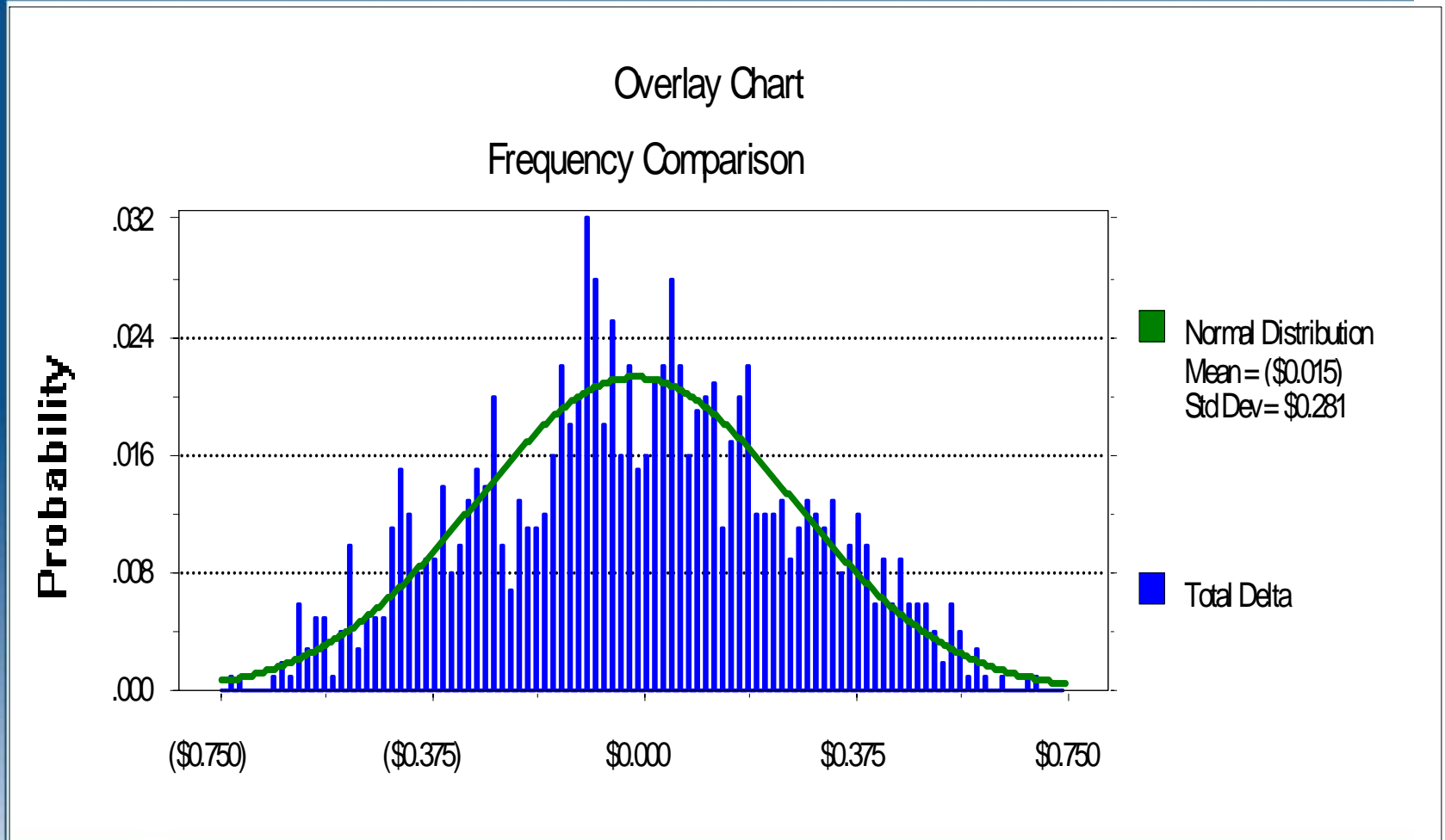
The Decision to Hedge Partially

- Simulation Based on a Restricted Access Area in Ohio
- Estimated Monthly Swing of 30%
- Monthly Options Purchased to Cover Only 10%
- Deviation (Delta) From the Expected Financial Result Depicted in Graphs
- The Standard Deviation of the Delta Increases 4 Times

Hedging of the Full Monthly Swing



Hedging of Only 10% of Swing



Asset Mitigation Strategies

- Baseload Basis – Using Pipeline Capacity to Eliminate Basis Risk
- Baseload Price – Using Storage to Lower the WACOG
- Daily Swings – Injecting Into Storage Excess and Withdrawing From Storage Shortfall

Transport Optimization Decisions

	From TCO Pool	
	TCO Unrestricted	TCO Restricted
Winter Intrinsic	\$ 0.133	\$ 0.333
Summer Intrinsic	\$ 0.065	\$ 0.065
Demand Charges	\$ 0.196	\$ 0.196
Winter Delta	\$ (0.063)	\$ 0.137
Summer Delta	\$ (0.132)	\$ (0.132)
Weigted Delta	\$ (0.087)	\$ 0.043
Basis Risk/Extrinsic	\$ 0.023	\$ 0.033
Wgt. Delta + Extrinsic	\$ (0.064)	\$ 0.075

Storage Optimization Decisions I

Optimized Margin	\$	0.744
Ratable Margin	\$	0.511
Storage Demand Charge	\$	0.245
Storage Delta	\$	0.499

Storage Optimization Decisions II

- Often the Comparison Based on Intrinsic Values and Basis Risk Is Not So Unequivocal
- Two Possible Approaches to Finalizing the Decision:
 1. Estimate What the Mitigation Capabilities of Storage Are Worth to the Bidder (Determined by Experience % of Gas Daily Option Premium Which Is \$0.145 Under an 18% Daily Swing Assumption in the Reviewed Case)
 2. Evaluate the Extrinsic Value of Storage Using Futures-to-futures and Cash-to-futures Option Analysis.

Summer vs. Winter Strategies

Decision Factors

- Weather Forecast - Weak La Nina Vs. Neutral Phase Impact
- Risk Aversion and Hedging Strategies

El Nino vs. La Nina

- **Definition** - La Nina (3-month running mean of sea surface temperature anomalies in the Equatorial Pacific Region of -0.5°C or greater), El Nino (anomalies of $+0.5^{\circ}\text{C}$ or greater), Neutral (all intermediate cases)
- **Frequency and Duration** - Once Every 4 Years on Average and Lasts for 6-18 Months
- **Strength** – Weak, Moderate, and Strong

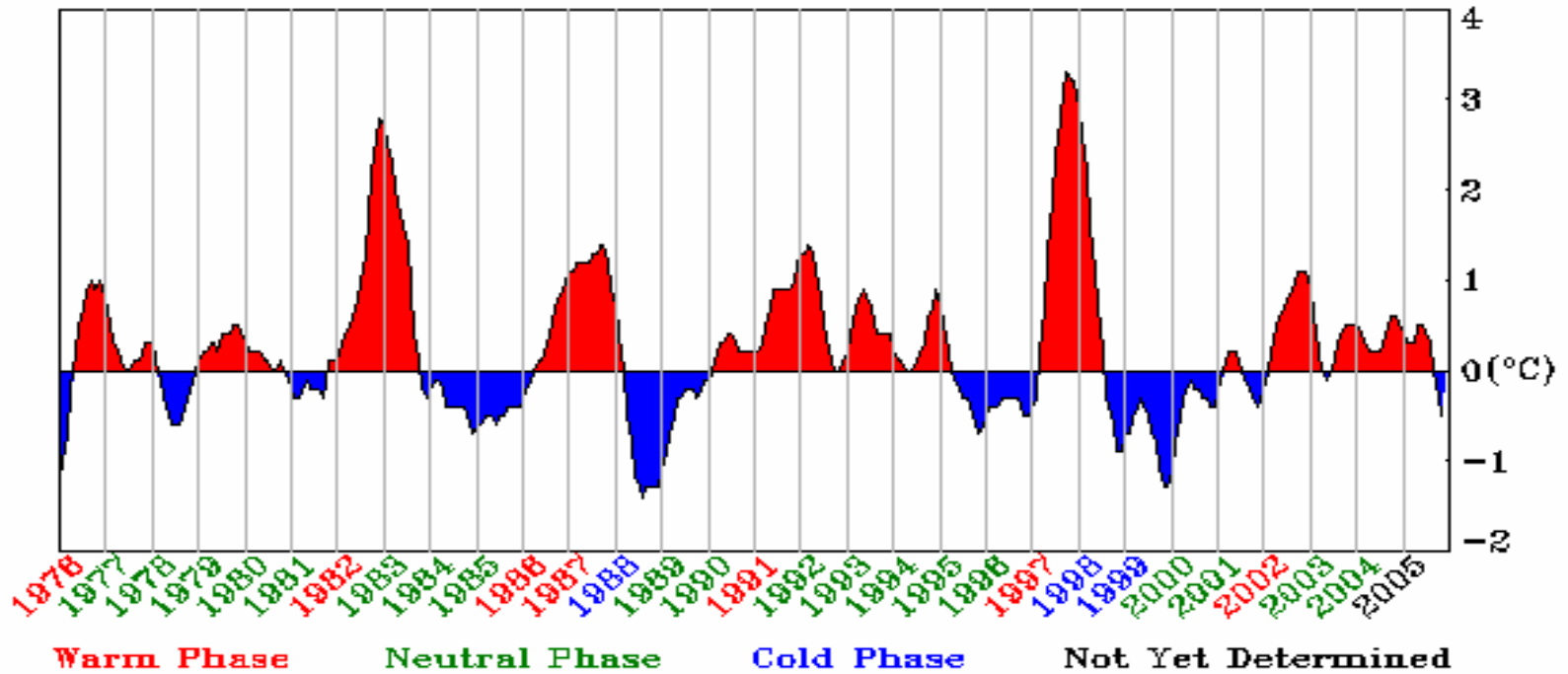
Current ENSO Conditions



JMA Index



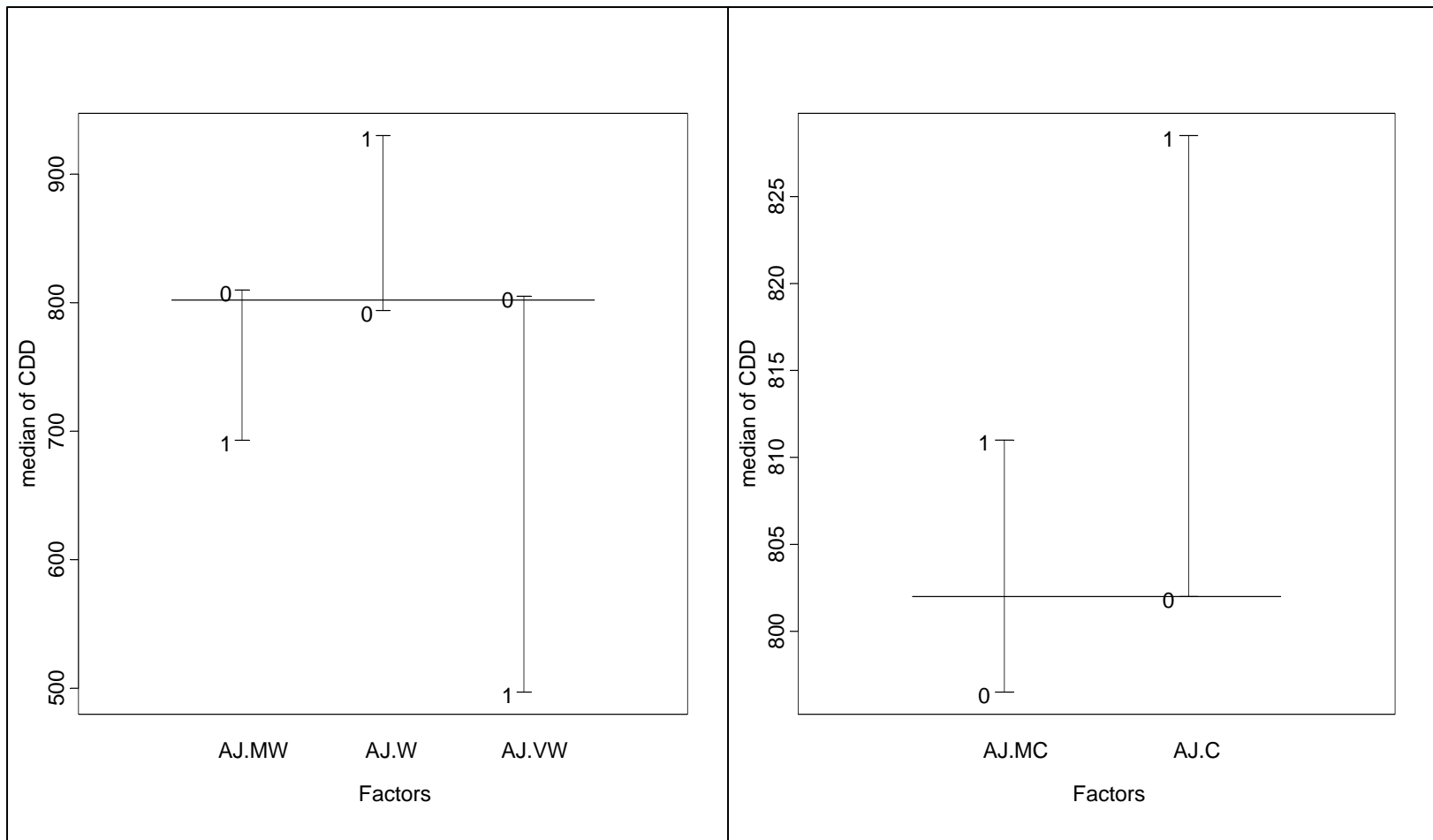
(Last Updated 02/10/06)



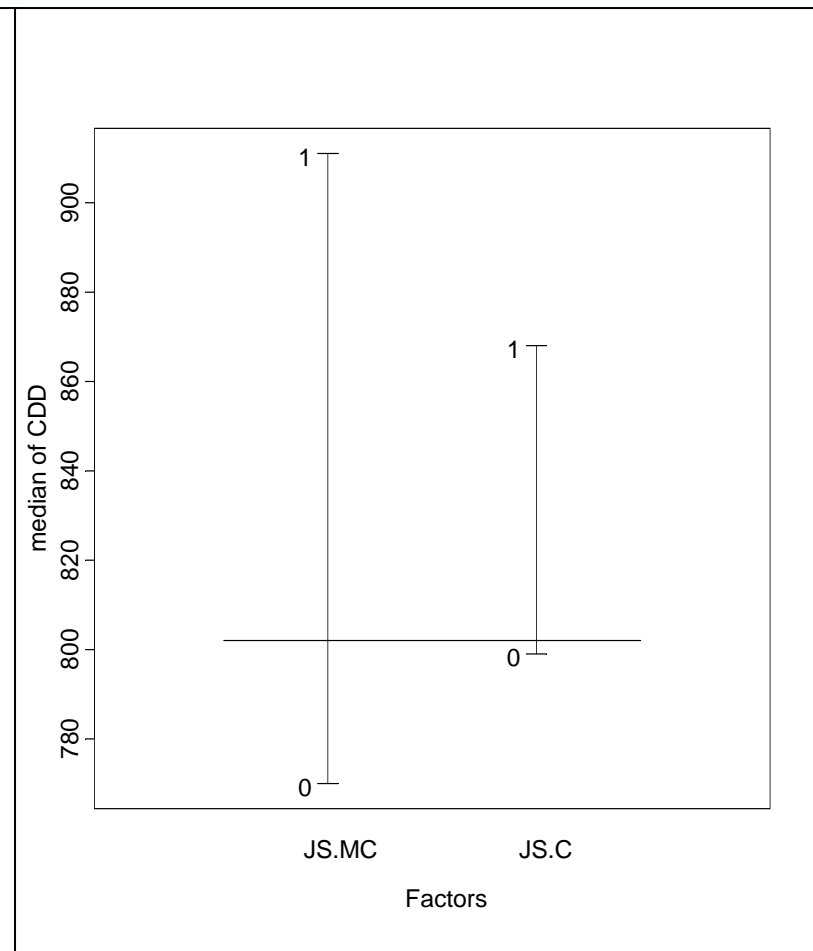
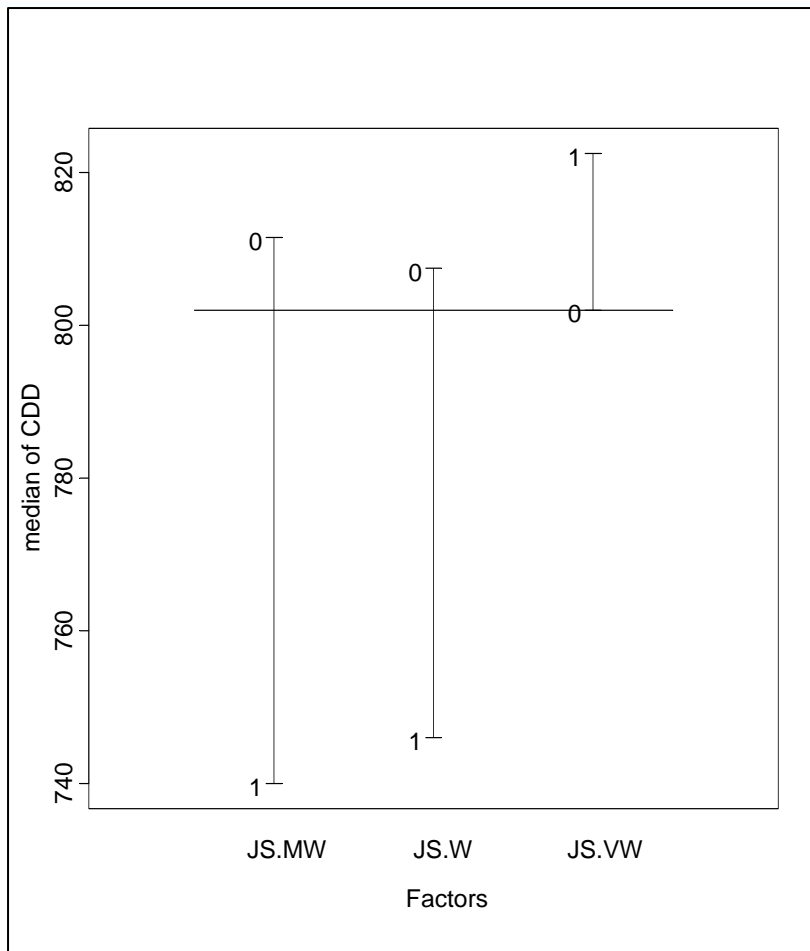
Lead-in Clarification

- JM Stands for January Through March, AJ - for April-June, JS - for July-Sep., OD - for October-Dec.
- MW Stands for Mildly Warm (Weak El Nino), W - Warm (Moderate El Nino), VW - Very Warm (Strong El Nino)
- MC Stands for Mildly Cold (Weak La Nina), C - Cold (Moderate La Nina), VC - Very Cold (Strong La Nina)
- 100% of the CDD Exposure in the NIPSCO Service Area, While 62.5% of the HDD Exposure in the COH and NIPSCO Service Areas

Impact of the Event Strength (Apr-Jun) on CDDs



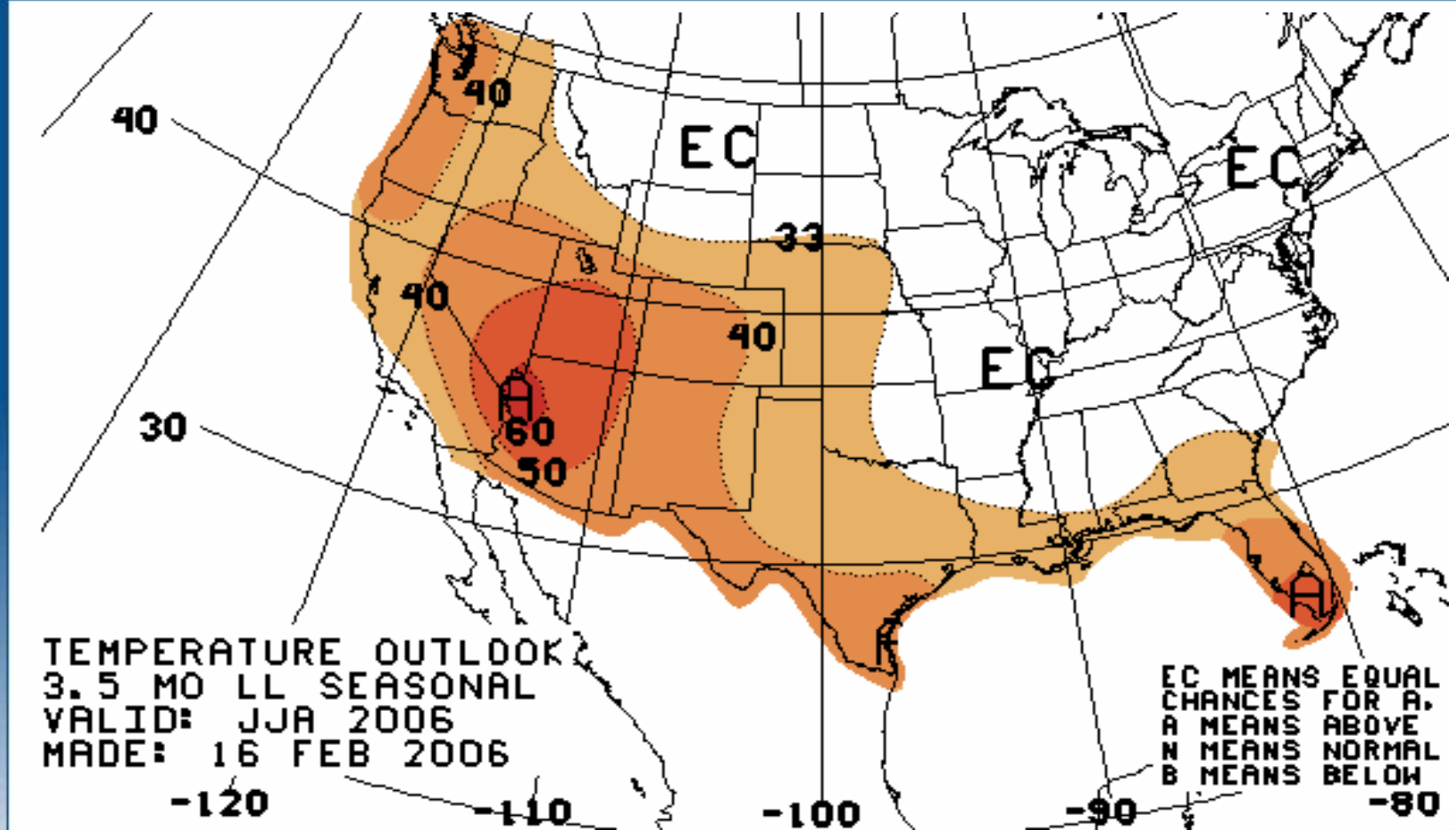
Impact of the Event Strength (Jul-Sep) on CDDs



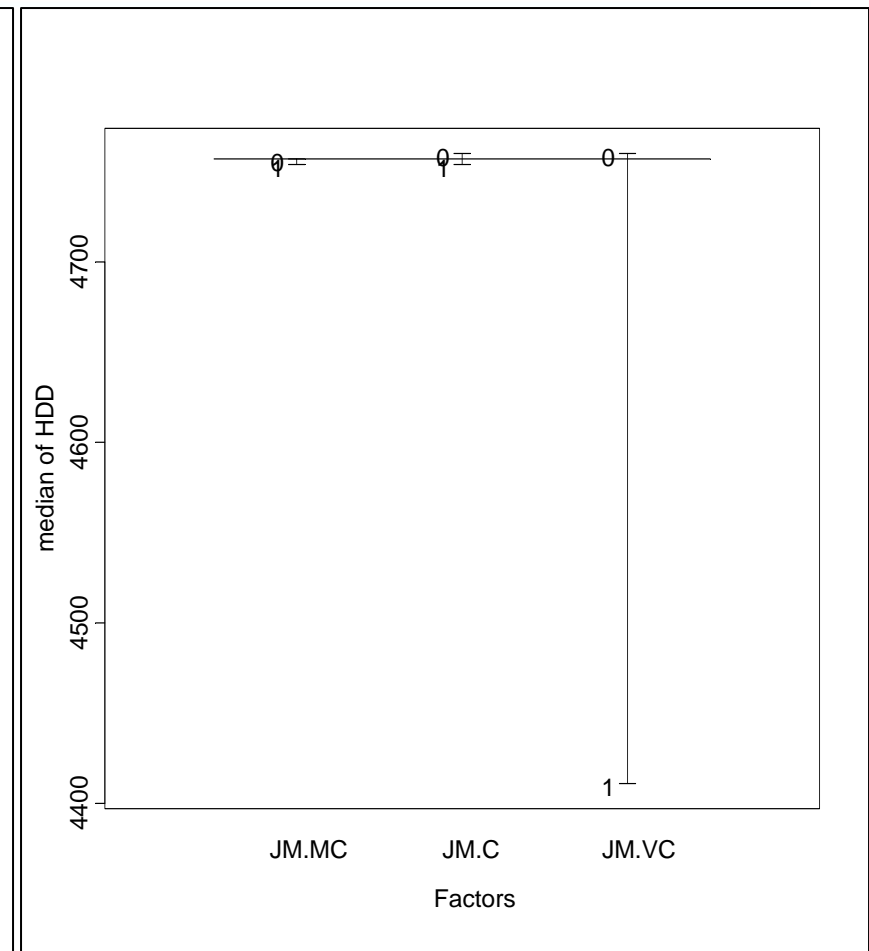
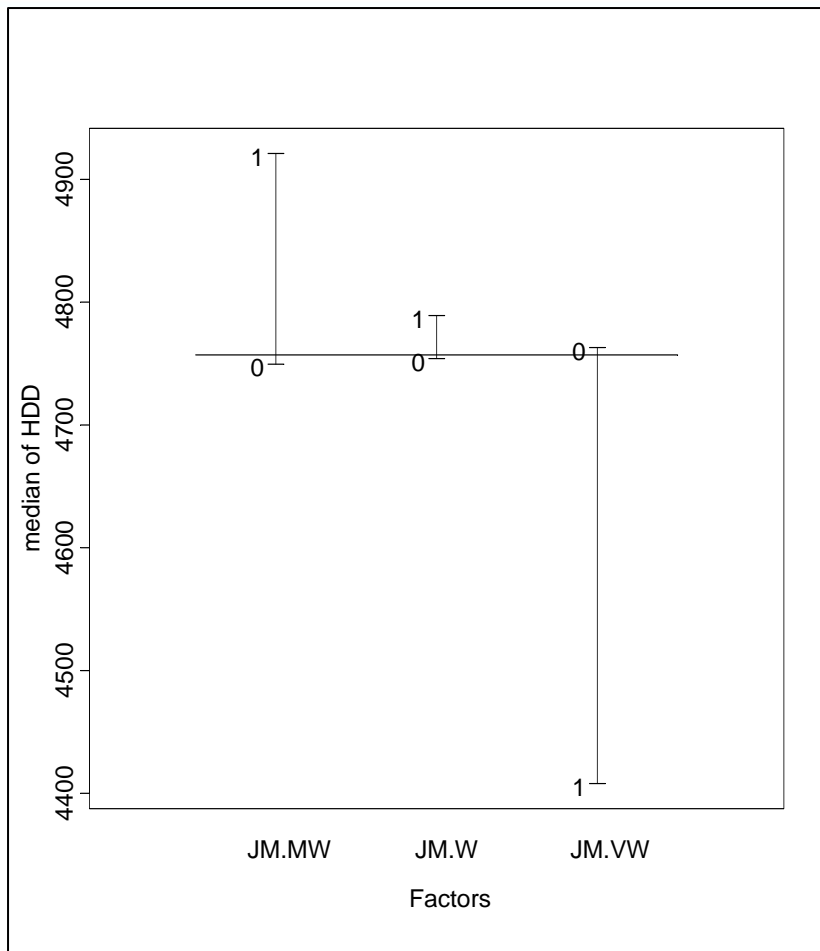
The Big Picture (Summer)

	El Nino	Hedging	La Nina	Hedging
Strong	Strongly (-)	Forget about it		
Moderate	Slightly (+)	Consider	Slightly (+)	Consider
Weak	Slightly (-)	No need	Slightly (+)	Consider

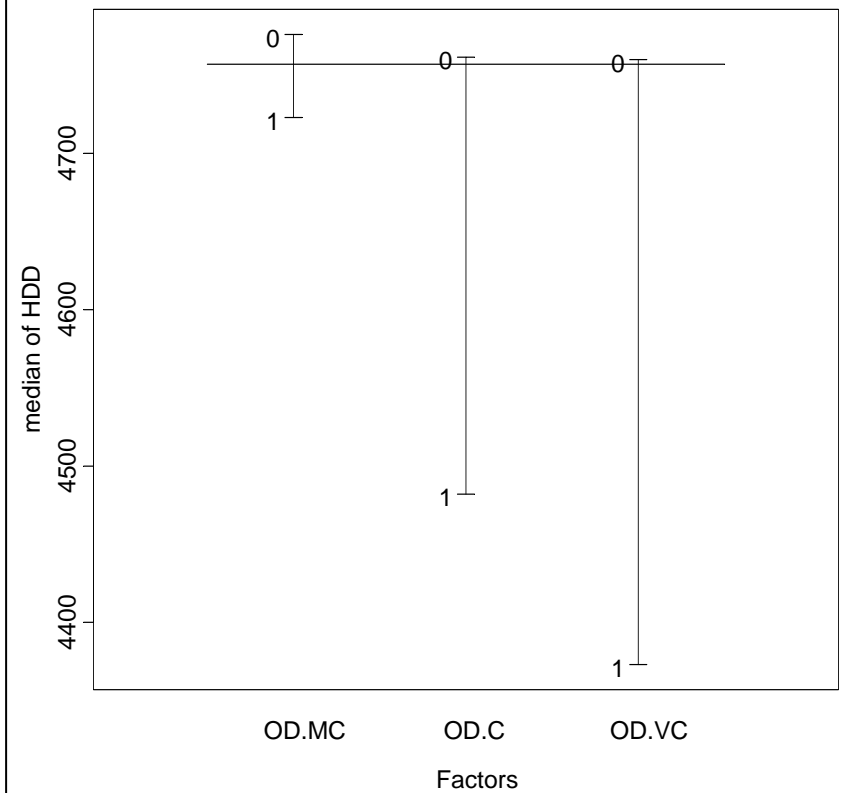
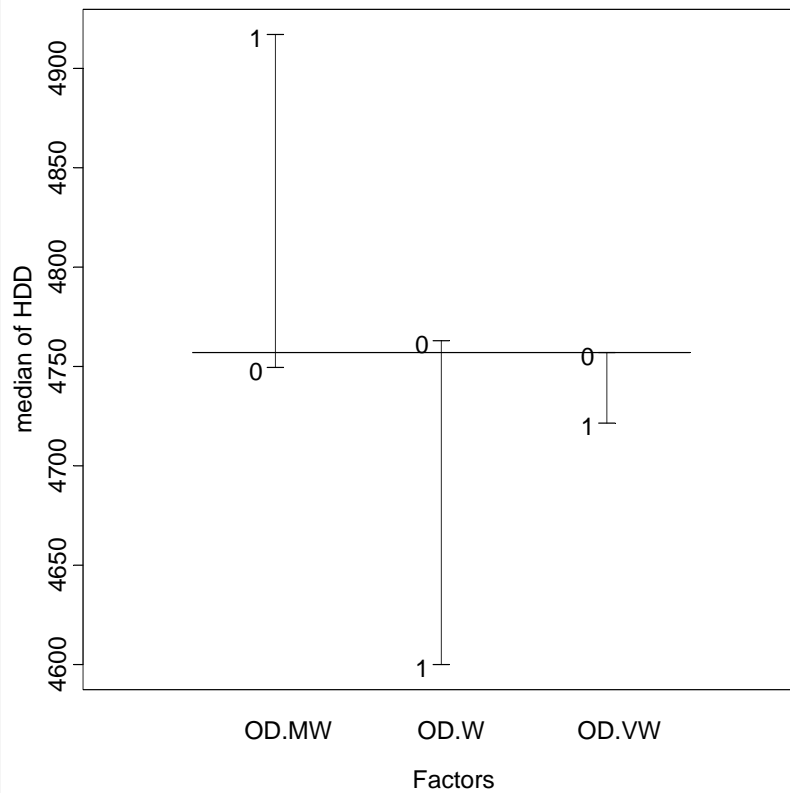
Jun-Aug'06 NOAA Weather Forecast



Impact of the Event Strength (Jan-Mar) on HDDs



Impact of the Event Strength (Oct-Dec) on HDDs



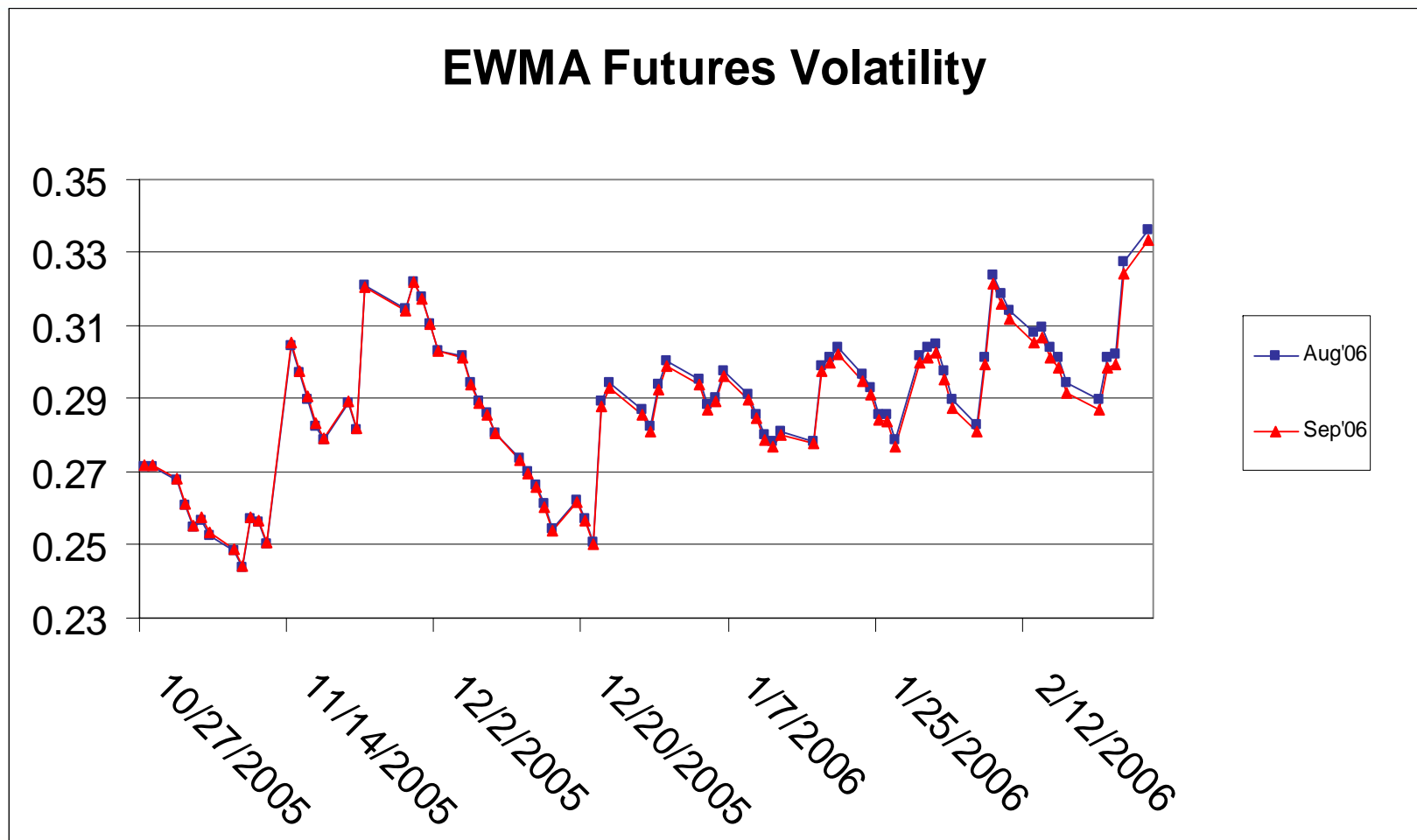
The Big Picture (Winter)

	El Nino	La Nina	Hedging
Strong	Strongly (-)	Strongly (-)	Forget about it
Moderate	(-)	(-)	No need
Weak	Slightly (+)	Slightly (-)	Strongly consider

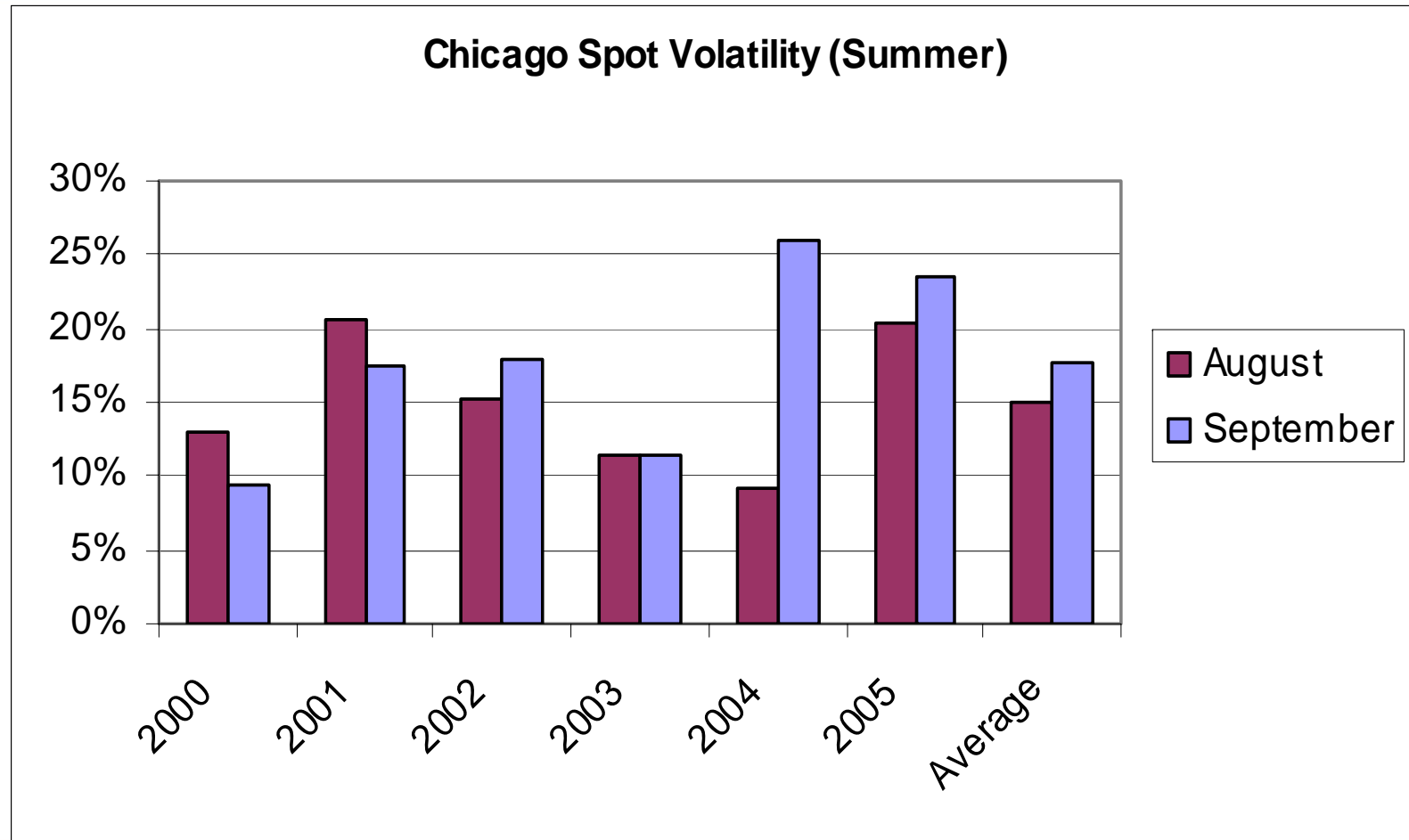
Risk Aversion

- Only the Most Risk Averse Buyers Could Be Apprehensive About the Summer Spot Volatility
- Only the Ultimate Risk Lovers Should Neglect Hedging at Least a Portion of Their Winter Gas Needs

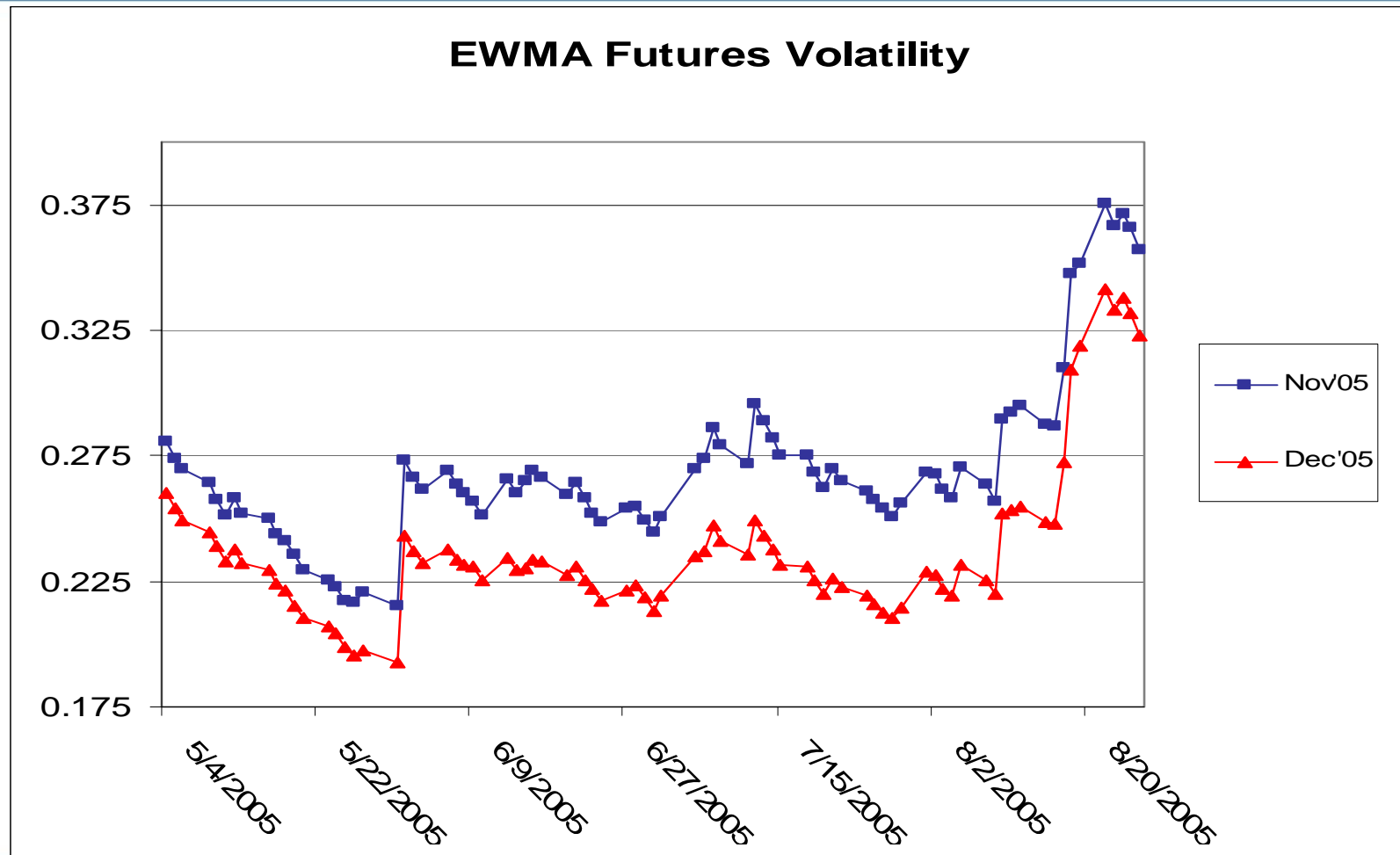
Summer Futures Volatility



Summer Spot Month Volatility

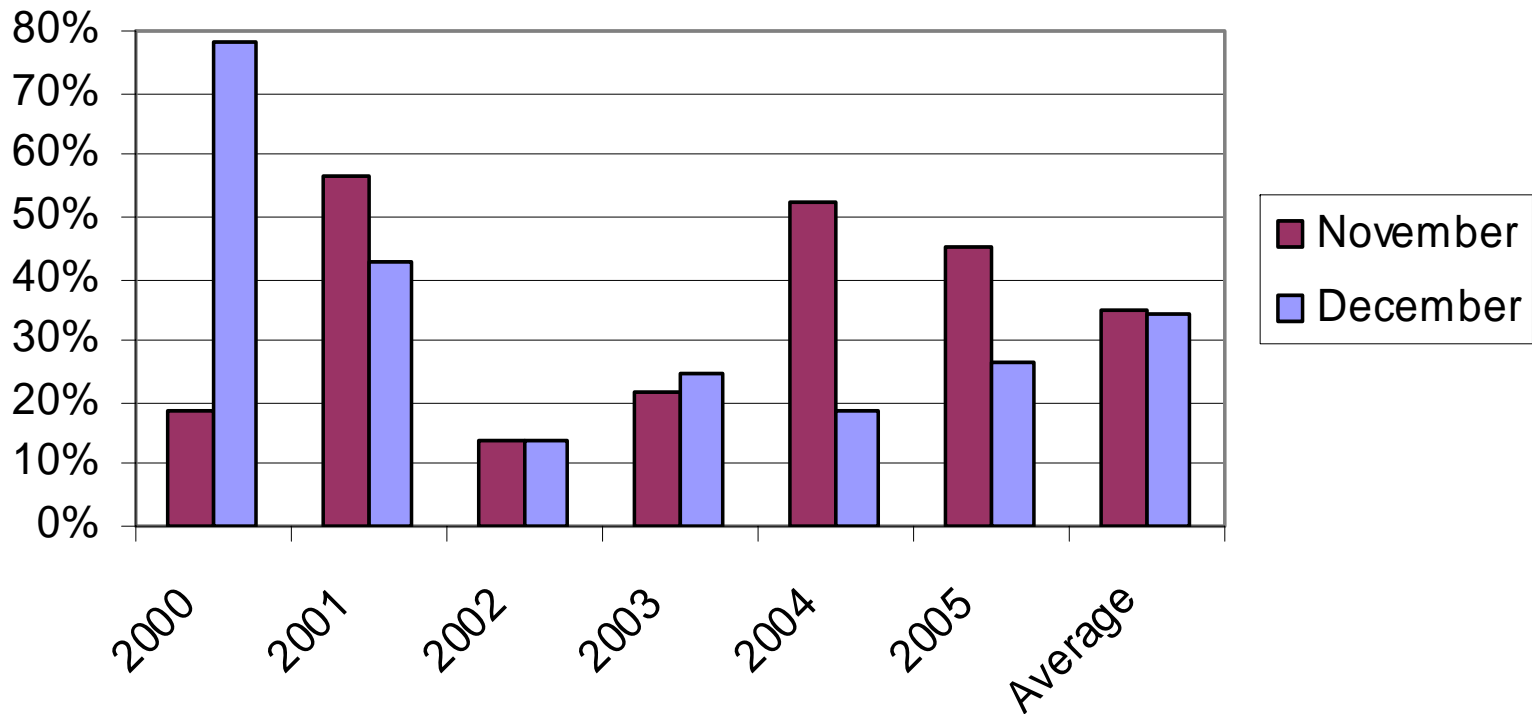


Winter Futures Volatility



Winter Spot Month Volatility

Chicago Spot Volatility (Winter)



Conclusions

- Understanding the Risk Exposure Can Help Optimize Gas Supply Decisions
- Certain Weather Phenomena (El Nino/La Nina) Have a Very Specific Impact on the Midwest Gas Demand and Should Be Taken Into Account When Devising Sound Hedging Strategies
- Seasonality of Market Volatility and Risk Appetite Should Be Affecting Your Gas Buying Decisions