9. Pitcher's Control Issues measured with Air Density Gauge (Neeley Scale)

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In my previous series of articles, I introduced you to the hitting impairment caused by thinner air than the MLB average air available throughout the season. If you were one who read the series of articles entitled "The Longest Inning," you may remember that I cited data from the Colorado Rockies and Coors Field since that team's venue is at the extreme light end of the air density scale. The Rockies are easiest to see the extreme data swings, but the balance of Major League Baseball teams show the same trends, although less evident at the first look.

I utilized the Visual Memory Index (VMI) as the gauge for how familiar hitters may be with the movement provided by the air density as teams progress through each Major League Baseball season. I also cited statistics from the 2015 season showing how productive the hitters proved to be within each of the VMI categories. These statistics are maintained as a sortable access to the VMI database on the baseballvmi.com website. If you haven't read the ***longest inning*** articles, you may want to review them before continuing this article. (see http://dailybaseballdata.com/dbd/vmi/Air_Density_articles_2016_preseason.pdf)

So VMI is more associated with the team of hitters than with the pitcher. Usually starting pitchers dominate the first six innings of every fifth game, but they do not throw hard between games, except during their "pen day." Therefore, VMI does not as accurately depict a pitcher's dilemma when changing venues as it does for the everyday hitter, because VMI is an "every game-day" tracking index.

The ADI (Air Density Index), on the other hand, is a more accurate determination of what pitch movement the pitcher will, or did experience during the game, as it tracks the weather details and applies them to game time. The ADI is a combination of Temperature, Humidity, and Barometric Pressure and includes the altitudinal adjustment required to attain "Actual Pressure." The actual pressure for open and closed roof does not change due to the opening and/or closing of a domed stadium. Actual pressure changes **only** with the smaller weather system fluctuations and the normal daily pressure variations. These pressure changes penetrate through domes and enclosed buildings, unless they are capable of holding high pressurization; such buildings are extremely rare. The "adjusted" pressure readings which are identified on your local weather channel are "adjusted" by the climatologists to sea level pressure (as in the case of the "29.92 inches of mercury" pressure standardization practice). We use actual pressure, which is the ***inches of mercury*** standard for the elevation of the ball park. One inch of mercury less than sea level (29.92 inches) is associated with approximately 1,000 feet of additional elevation; so, for example, Atlanta, GA at 1,000 feet would have a normal pressure reading of approximately 28.92 inches of mercury. The ADI which is attached to the ***dailybaseballdata.com statistical data*** is an accurate depiction of the air density at game time--to a degree that can identify actual movement differential on an individual pitchers' fastball down to about 1/16th of an inch, at the current height of the baseballs' seams.

At Baseball VMI we have been observing and working with the ADI since 2003, and have noted control issues with all pitchers when the ADI changes substantially for a pitcher who did his "pen work" in an ADI significantly different from the ADI available on game day.

Such a pitcher may have some difficulty being as precise as normal on the corners of the plate with pitches that move in a sliding fashion, such as a cutter, two-seam or the traditional slider--much like when pitching into a head wind. The tail-off of a 4-seamer is also affected even if not as severely. This is shown within our database as a **lower** than normal *strike to pitches thrown* percentage.

Some pitches are intended to end outside the strike zone to tempt the hitter to go after them. These pitches can be erratic also, when the air density causes them to stay in the zone and get hit, but are identifiable with the ADI data, because the pitcher had a **higher** than normal *strike to pitches thrown* percent.

Our ADI database does not track the traditional ERA and strikeouts, etc., as does the phenomenal database of dailybaseballdata.com; but rather, we are looking only for erratic performances by pitchers who may have been pushed outside their norms by changes in the ADI. Our ADI database shows the individual games of the pitcher, his team, and the league in general, divided into ADI categories.

The purpose of our ADI database and display is to provide you with a foresight tool for fantasy baseball you can depend on to analyze today's or tomorrow's games, a predictive index for Las Vegas and/or a scouting report for teams and players. For example: If the hitters against a particular pitcher will be outside their comfort zone against the 4-seam (-5.00 to -10.00 VMI); and, the opposing pitcher is coming off a long road trip in thinner air and threw his pen day with the team two days ago in Atlanta at 56 ADI, then his normally effective sinker in New York at 62 ADI may sink below the zone. When he begins to adjust it upward into the zone, he may get hit harder than normal by hitters whose body and set-up are naturally low versus what they are seeing out of the pitchers' hand (identified by the VMI). This was the exact scenario when the Colorado Rockies took two from Baltimore and additional games from the Mets in their 2016 trip July 25 – 31st.

In May, the media revealed that the pitchers' ERA's were abnormally low and many questioned "why?" Of course, your answer now can be: **"Well, it was cold, so the ADI's were very high and the hitters were not used to it."**

Below is a graphic display of data from our database. It focuses on a pitcher who has experienced a number of changes in ADI during this 2016 season. The "Hits Per Outing" that is listed next to the ADI range is a very revealing piece of data. We have also included notes which help to keep the numbers in perspective. This is not yet available on our website, but we are evaluating the options for your benefit. Comments and questions are always welcome and appreciated.

Pitcher Stats by ADI and Pitch Type

Select A League

Date: 2016 (ex. *2016* or *2016-06* or *2016-06-05*)
Pitcher Name: Bartolo Colon (Text here overides selection, if any, above.)

Display Pitcher | Display Team

Bartolo Colon - 2016

ADI Range/ Pitch Type	Thrown	Strike	Strike %	Top Speed	% Type	Hits	% H/S
55.00 to 59.99 (6.0 hits/outing)							
Very Warm and Humid							*Hitter Above Pitch*
Four Seam Fastball	24	17	70.83	91	28.57	3	17.65
Slider	12	5	41.67	85	14.29	1	20.00
Two Seam Fastball	45	32	71.11	89	53.57	0	0.00
Change Up	3	2	66.67	80	3.57	2	100.00
60.00 to 64.99 (5.7 hits/outing)							
Average MLB Movement							*Hitter's Norm*
Four Seam Fastball	225	151	67.11	92	23.27	18	11.92
Slider	60	28	46.67	85	6.20	4	14.29
Two Seam Fastball	654	438	66.97	91	67.63	47	10.73
Change Up	28	22	78.57	83	2.90	5	22.73
65.00 to 69.99 (5.9 hits/outing)							
Good MLB Movement							*Hitter Challenged*
Four Seam Fastball	162	109	67.28	93	24.62	7	6.42
Slider	45	25	55.56	86	6.84	4	16.00
Two Seam Fastball	429	312	72.73	91	65.20	28	8.97
Change Up	22	14	63.64	83	3.34	2	14.29
70.00 to 74.99 (6.0 hits/outing)							
Abnormally Good Movement							*Hitter Setting Up Low*
Four Seam Fastball	57	39	68.42	93	30.48	5	12.82
Slider	18	9	50.00	86	9.63	1	11.11
Two Seam Fastball	92	65	70.65	91	49.20	6	9.23
Change Up	20	10	50.00	83	10.70	0	0.00
75.00 to 80.00 (5.0 hits/outing)							
Cold Air at Sea Level							*Hitter's Nightmare*
Four Seam Fastball	26	17	65.38	92	30.95	0	0.00
Slider	1	0	0.00	86	1.19	0	0.00
Two Seam Fastball	52	38	73.08	90	61.90	5	13.16
Change Up	5	2	40.00	83	5.95	0	0.00
All ADIs (5.8 hits/outing)							
Four Seam Fastball	494	333	67.41	93	24.95	33	9.91
Slider	136	67	49.26	86	6.87	10	14.93
Two Seam Fastball	1272	885	69.58	91	64.24	86	9.72
Change Up	78	50	64.10	83	3.94	9	18.00

Visual Memory by Clifton Neeley, creator of the Visual Memory Index© and author of the web-site www.baseballvmi.com. Clifton pitched and played baseball and fast-pitch softball in the mountainous southwest Colorado area from 4,000 feet in Grand Junction to 6,000 feet in Durango to 9,000 feet in Telluride prior to his college experience in baseball.