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On-Air Weather Forecasters' Educational Backgrounds

Vincent Graham Walker
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To the Graduate Council:

I am submitting herewith a thesis written by Vincent Graham Walker entitled "On-Air Weather Forecasters' Educational Backgrounds." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Communication and Information.

Mark Harmon, Major Professor

We have read this thesis and recommend its acceptance:

Edward Caudill, Catherine Luther

Accepted for the Council:
Dixie L. Thompson

Vice Provost and Dean of the Graduate School

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On-Air Weather Forecasters' Educational Backgrounds

A Thesis
Presented for the
Masters of Science
Degree
The University of Tennessee, Knoxville

Vincent Graham Walker
May 2008

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Abstract

Weather is important to local television newscasts, so it is becoming important to expand research regarding this area. It is important to understand why certain people are chosen to present the weather on-air. Currently, three different kinds of degrees seem to be the choice for the people who are presenting the weather on television. On-air weather forecasters who work for the local affiliated stations of ABC, CBS, FOX, and NBC networks tend to have degrees in meteorology, communications, or broadcast meteorology. Which one of these degree categories is preferred and why?

Two predictors come to the forefront to answer this question: severe weather and market size. Market size long has been a defined term due to the A.C Nielsen ranking of television markets in the United States from 1 to 210, then is grouped into categories of large, medium, and small. Severe weather is defined for this research as having the frequent occurrences of blizzards, tornados, or hurricanes.

Both severe weather and market size are statistically significant factors associated with the educational degrees on-air weather forecasters possess. Not only are they significant factors correlated with the degree type, they also show that different areas (calm vs. severe weather) may correlate with hiring people with certain types of degrees.

The threat of severe weather leads to local-affiliated television stations hiring more meteorologists to present weather on-air. Large markets and medium markets also are significantly more likely than small markets to use meteorologists to deliver the weather. The results of this thesis point to some important areas that describe the educational qualities of the on-air weather forecaster.

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INTRODUCTION

Local television news has many complicated segments, including the local weather reports. If not the key element in the local news, weather is one of the most important aspects of the newscast. The person who is presenting the weather on-air becomes a vital aspect in defining success for the station.

This thesis directly explores on-air weather forecasters by examining current data about the types of educational degrees they possess, and also showing certain trends about those degrees related to market size and severe weather. Because weather has become a major driving force in the local television industry there is a great importance in examining the trends, as well as identifying why they exist, and what they mean.

Literature Review

Recognizing the difference between meteorologists and weathercasters was a crucial aspect of this project. A meteorologist possesses a degree in meteorology. Someone who does not hold a degree in meteorology, yet still gives the weather report on television, is a weathercaster. As stated in the introduction, television newscasts are being dominated by the weathercast. Dennis Swanson, executive Vice-President and chief operating officer for Viacom Stations Group, was quoted as saying, "As we build our stations back to being competitive, weather is a priority"(Greppi, 2004). Weather has also become one of the most commonplace subjects on television. With national stations and cable channels such as the Weather Channel adding more weather then just the local weather reports in the local newscasts some viewers turn

away from the local news (Henson 1993).

When television weather made its first appearance in 1941, little effort was put into it or its scientific elements, unless a cartoon character named Wooly Lamb could produce those results. Wooly Lamb, who was a cartoon character sponsored by Botany Wrinkle-Proof was shown on New York City's experimental station WNBT-TV, continued for a couple years in the 1940s. In the 1940s cartoons and funny people dominated the first era of local television weather when it came to presenting the weather. There was a lack of both the importance placed on the weather sections, as well as a lack of scientific elements in the weather section. Both the increase in importance and scientific value has come a long way since 1941 (Henson, 1993). The first nationally broadcasted weatherman would not appear until 1949 when John Clinton Youle broadcasted on CBS.

In the 1950s, meteorologists versus weathermen became an issue after a series of hurricanes and tornados battered the United States (Henson, 1993). In areas of tricky weather, stations hired their own meteorologists whether it was a weather service retiree or a war veteran (Monmonier, 1999).

With the increasing chance of severe weather and weather-related deaths, concern developed about who was presenting the weather. In 1955 the American Meteorological Society (AMS) created a seal of approval for on-air weather forecasters. This seal was a way for people to distinguish the silly and fun from the serious and scientific. Francis Davis, a member of the AMS in 1955, told Newsweek, "The society will do all it can to encourage the serious reporting of weather information, instead of the use of dancing puppets who sing, 'Oh, the weather is

cloudy today, but tonight it will go away'" (Henson, 1993). This crucial move by the AMS defined not only a transition in the weather forecasting business, but also set the divide between meteorologists and weathermen.

The statement by the AMS in 1955 lead to a plan to develop a seal of approval from the AMS to give credentials to weathermen on television who had a background in meteorology and were just not trained just to talk about the weather on television. This seal would help identify the difference between a meteorologist and a weatherman (Henson, 1993).

The AMS and Credibility

In 1959 the AMS gave out its first seal of approval to an on-air weathercaster, Francis K. Davis. While an on-air weather presenter was not required to possess a degree in meteorology to attain the seal, he or she was required to have at least 12 credit hours of courses in the subject of meteorology. The 1960s saw the trend of more seals of approval being given to on-air weathercasters. By late in the 1960s, more than 700 seals had been given to on-air weathercasters (Henson 1993).

Late in the 1960s a survey by the American Meteorological Society explored who people were watching on television when it came to the weather. It estimated that in two months, February and March of 1969, 18.8 million people were watching weather programs on local news. The study found that 59% of the people were tuning into weather presented by professional meteorologists, while 41% were watching weather reports by non-professionals. However, this success was going to be challenged by what was about to take place in the 1970's (Beebe, 1970).

The decade saw major improvement to the graphics of weather on television with the introduction of fast-moving weather maps, satellites, and color radar images. The idea of increased and improved technology allowed for the broadcast of weather to become much more entertaining once again. With the increased entertainment came the need for people to present the weather who were comfortable in front of a camera (Monmonier, 1999).

The next major issue in television weather was in the early 1980s, when another institution of weather created a seal of approval. The National Weather Association (NWA) created a seal of approval with less stringent education qualifications than the AMS seal (Henson, 1993). As the television industry and the weather industry grew, it became more difficult to attain the AMS seal because of its increasingly stringent guidelines. Another important issue in television weather happened in the 1980s when a company called Color Graphics Systems sold the first pre-packaged weather graphics system. This allowed weathercasters to switch from hand-drawn maps to maps created by a computer system. This resulted in more visually pleasing images for the television audience (Henson, 1993).

The 1980s also saw a return to the "clever" weather presenter. In a survey in 1985, low-market station managers clarified that they did not think the AMS certification was importance in a weather-caster's credentials. The values that mattered to station managers from large to small markets were personality, broadcast experience, and knowledge of weather (Monmonier, 1999).

Broadcast Meteorology Programs

In 1987, another kink in the system was created by Mississippi State University when it started a broadcast meteorology degree. This two-year program was designed to teach both science and communication skills to people pursuing a career in weather forecasting. The problem arose when experts in the field of meteorology publicly criticized the university, claiming this degree did not teach enough science to consider its graduates meteorologists (AMS Survey, 95). One chief meteorologist out of Buffalo, New York, even called the program "crapola" (Galetto, 97). Since the beginning of the Mississippi State program, other colleges and universities have created programs that are similar and don't offer the same scientific background as other meteorology programs in the United States.

The AMS now has a new certification called the Certified Broadcast Meteorologist (CBM), which began in 2005. The first requirement to gain this certification is a four-year college degree in meteorology. By 2008, this seal is expected by the AMS to become the only approval offered by the AMS (Greppi, 2004). The U.S. government doesn't offer any seals of approval in the field, and the NWA seal of approval has minimal requirements about how many classes one would have to take in meteorology before acquiring the seal (Galetto, 97).

The Current Trend

People who are presenting the weather on-air have changed since the mid-20th century. More people today are hired with degrees in meteorology, according to past research done about the television weather industry in the 1990s. While the trend is

leaning towards the push for more meteorologists, the weathercaster without a degree in meteorology is still around (Greppi, 2004).

The main push toward more meteorologists on television started in the mid-1990s when a survey showed that meteorologists were giving about 50% of the on-air weather forecasts (Mirsky 96). Still, there was uproar within the business about large market stations hiring more for presentation skills than for the scientific elements (A.M.S. Survey, 95). CNN pushed the field toward meteorologists in front of the camera when its president at the time decided that it would only hire meteorologists to present the weather on air (Henson, 93). The idea of hiring meteorologists for the on-air position has been supported by companies such as Hearst Argyle. This company proved its support when its senior vice president was quoted as saying; "It says to the community we take our job seriously" (Greppi, 2004). At a worldwide Broadcast Meteorology Conference in 2004, the decision towards more meteorologists was supported. When asked what word you would use to describe yourself in a newscast, 62% answered meteorologist. Further, 78% answered that their primary education was in meteorology (Zaffino, 2004).

Universities such as Pennsylvania State University are helping their meteorology graduates get some television work by adding communication classes to their curriculum. These types of classes allow students to make a demo tape to send to television markets (Clines, 2001). Classes like this one at Penn State not only allow for their students to make a demo tape, but also allow students to get exposure in front of camera. Another benefit to these classes is that the majority of the time they are taught by local television on-air weather forecasters.

There remains hope for the non-meteorologist who wishes to present the weather on camera. National programs such as *Good Morning America* are still using non-meteorologists to present the weather. Michael Bass, executive director of *Good Morning America*, states "a lack of a meteorology degree hasn't hurt the network morning shows; morning television is about personality" (Greppi, 2004). The idea of national markets and large local affiliates hiring more for presentation skill than substance is not new. A Pennsylvania State University teacher in broadcast meteorology was not hesitant to point out to future professionals that if they are looking to present weather on television, then they should apply for jobs in the middle markets or with the Weather Channel (Mirsky 96).

Reasons for the Current Trend

Even though there has been a rise in meteorologists presenting the weather on air, the evidence shows that non-meteorologists still can find work. The tendency that more meteorologists are going to be established in the middle markets was found true in a research project that looked at market size and on-air weather degrees in 2005. The study's results showed that the greatest percentages of meteorologists on television were found in the middle markets (Walker, 2006). Even with this finding it is still important to look at this again because the study from Walker in 2006 only looked at two markets per every ten markets. This study will take a look at every market size from 1-210. The first study by Walker was a good starting point, but this one is more comprehensive.

Another interesting point from the study was that the market size does have a

direct association with the types of degrees on-air weather forecasters possess (Walker, 2006). Even though the research showed a direct correlation between market size and types of degrees, the data also suggested another indicator. Severe weather areas may be more of an indicator when it comes to understanding why people have certain types of degrees in certain areas.

The importance that viewers place on severe weather can be seen in an article in the Saint Louis Journalism Review in 2003. A viewer wrote in complaining that during a severe thunderstorm some stations had extra meteorologists help while others did not (Fronlichstein, 2003).

The most dramatic weather moments and those most stressful to viewers involve hurricanes and tornadoes (Henson, 93). Television stations often serve as first warning sources for life-threatening weather. With that kind of responsibility, station managers know it is important to have someone in front of the camera who is knowledgeable about situations that may occur. According to an article in Television Weekly in 1996 it is a "no brainer" to have a meteorologist presenting the weather in markets located in hurricane zones, tornado alley, or severe winter storm areas (Greppi, 96).

Meteorology has come a long way since the introduction of Wooly the Lamb. Now that weathercasts dominate the local newscast and scientific knowledge is favored over fluff, the trend has been to hire more meteorologists. Even with this trend, there are some areas, like morning television, still hiring for qualifications other than weather knowledge. These areas look to hire people with a background more in broadcast television. They want people who come across well on air, and look to

people who have more on-air practice than the average meteorologist.

The literature begs one to explore both market size and severe weather areas to see if there is a correlation with the type of educational degrees possessed by television weather forecasters. A news director in Little Rock, Arkansas, pointed out that the television weather world can be a fickle industry. He noted the average nice day requires only good personality, but the days when tornadoes, blizzards hurricanes are on their way require seriousness and science in the broadcast.

Why This Project

The major goal of this research project is to find out exactly if there are one or two main predictors of why different television stations hire persons with different educational degrees to present the weather on-air. Research indicates that both market size and severity of weather in different areas may be associated with why certain on-air weather forecasters have different types of degrees across the United States. Thus, this paper will examine degrees and both market size and severe weather. Before asking the main research questions this paper will define these two factors, as well as the different degree types.

Main Degree Types

When examining trends in the different degrees possessed by on-air weather personnel, three main categories became apparent from the literature review. Forecasters might be trained in the form of communication, with degrees such as communications, journalism, or a telecommunications degree. Other expertise might

be scientific, with degrees in meteorology or atmospheric sciences. The final degree area is broadcast meteorology in the Mississippi State tradition, in which on-air weather forecasters receive training in both the communications and the science of weather.

Classification of Severe Weather Areas

While market size is determined by how many people live in a certain area, severe weather is not as well defined. In examining severe weather, this paper tries to determine whether the frequent presence of hurricanes, tornadoes, and blizzards in viewing areas correlates with the types of degrees on-air weather forecasters possess.

Hurricanes long have been a threat to certain coastal areas in the United States. A hurricane can be defined as a severe tropical cyclone having winds in excess of 64 knots or 74 mi/hr (AMS Glossary). While many coastal areas can experience hurricanes, it is important to make sure that an area has frequent occurrences. According to the data from the National Hurricane Center, hurricane strikes in the United States there is a significant decrease from 46 to 12 hurricane strikes between 1851 and 2004 along the coastline between the North Carolina and Virginia. This allows the cutoff on the Atlantic Coastline to take place at the northern edge of the North Carolina coast. In the Gulf of Mexico, all coastlines have a significant chance of landfall (Blake, 2005). The United State's frequent hurricane area is, therefore, defined to be from the Mexican border with south Texas to the northern border of North Carolina.

A tornado is defined as an intense, rotating column of air that protrudes from a

cumulonimbus cloud in the shape of a funnel or a rope and touches the ground (AMS Glossary). When defining frequent tornado occurrences, one should realize, an area is already established. Tornado Alley has been defined for a long time in the meteorological world. This pre-defined area that is represented in Figure 1 will be used to measure frequent tornado occurrences. The Figure shows the most significant area that is likely to get tornadoes in the United States each year.

The last severe-weather area to research is frequent blizzard occurrences. A blizzard is defined as a severe weather condition characterized by low temperatures and strong winds (greater than 32 miles/hour) bearing a great amount of snow (AMS Glossary). A paper in 2001 showed four well-defined areas in the frequency of having at least one blizzard in a winter. The first was a 2-12% chance, the second a 12-24% chance, the third a 25-49% chance, and finally the fourth a 50-76% chance. This is visually represented in Figure 2. This project will utilize the last two areas. By doing this, the paper defines a frequent chance of having at least one blizzard in a given winter to be 25% chance or greater.

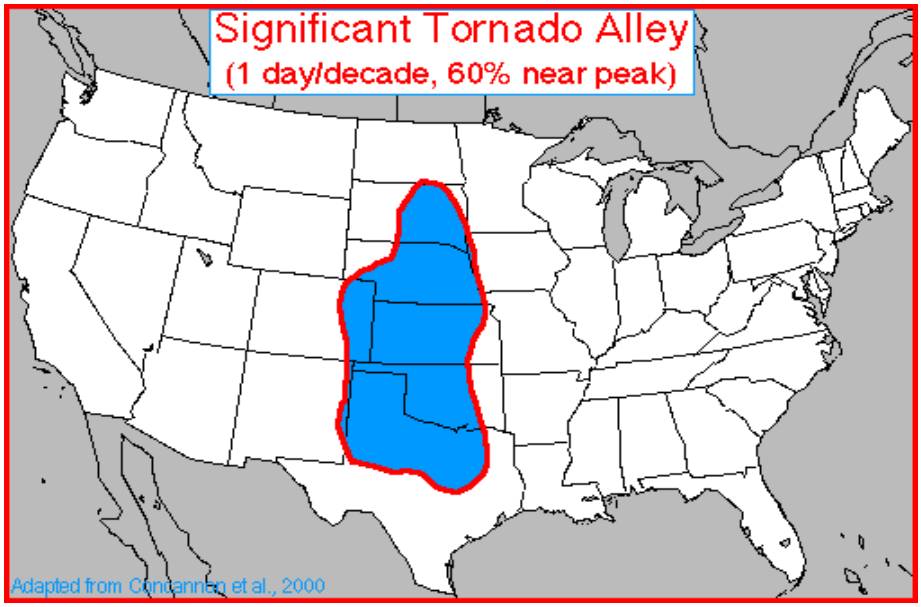

Figure 1: Tornado Alley

(Concannen, 2000)

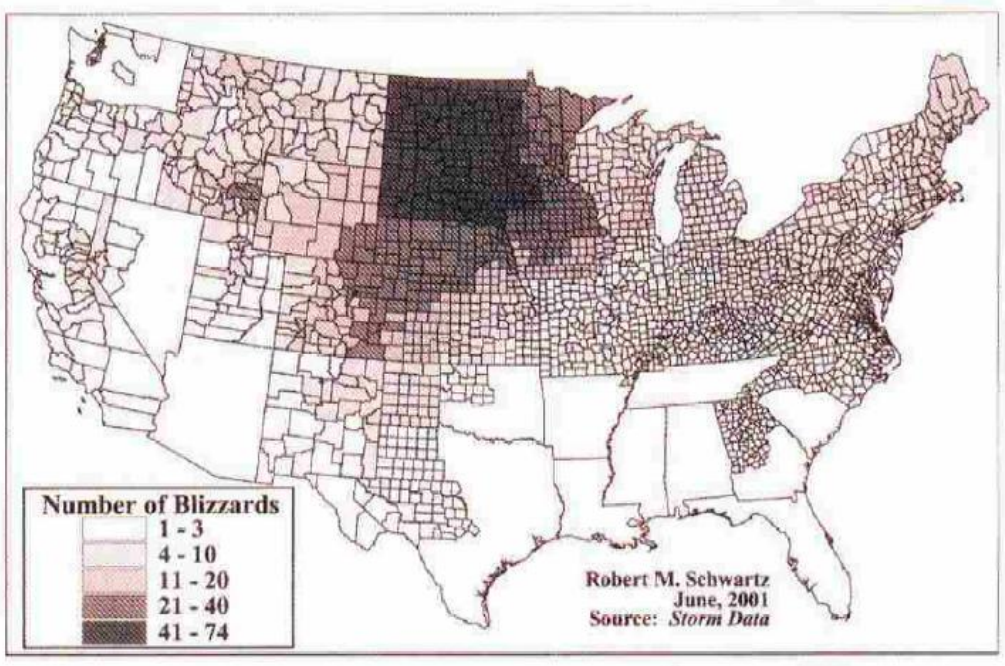

Figure 2: Blizzard Data

(M. Schwartz, 2001)

RESEARCH QUESTIONS AND HYPOTHESIS

There is no doubt that there are many different types of education qualifications when it comes to presenting the weather on air. When evaluating the educational degrees, the literature review pointed to the three main categories: meteorologist, broadcast meteorology, and communications. The factors that may influence hiring of person with these types of degrees are the frequent tornadic activity, hurricane activity, the possibility of blizzards and the market size in which the on-air weather forecaster works. With this information, the following research question is proposed.

RQ 1: Do severe weather areas correlate with the types of educational degrees the on-air weather forecasters' posses?

Some ideas already can be proposed to answer the research questions because of the literature review. These two ideas are thought to be what the outcomes will be.

H1: Severe weather areas more than calm weather areas will correlate positively with on-air weather forecasters who possess degrees in meteorology.

H2: Medium markets will have a larger percentage of meteorologists presenting the weather on-air when compared to large and small markets.

METHODOLOGY

Sampled Subjects

Data from U. S. television market were collected, from markets 1 to 210. ABC, CBS, NBC, and FOX affiliates were chosen because they are the four primary network affiliations for stations with news broadcasts. When looking at market sizes the total amount of people in the viewing area was documented. Three different market sizes were designated: small, medium, and large. A. C. Nielsen Company provides a listing of television ratings. They rank the markets ranging from the largest to the smallest based of the amount of people that could view the local stations. New York City is 1 and Glendive, Montana is the last market, 210. The three market-size cutoffs for large, medium, and small were chosen by looking at all the market sizes and the four primary affiliates mentioned above in each market, and finding points where trends in both the amount of station having their own weather forecast and how many weather forecasters were at a station. The three areas dived clearly at market 39, and 99, because at these market sizes there was a noticeable change of pattern in both the amount of different television stations having their own weather forecasts and how many weather forecasters worked for each station. The difference wasn't in the exact number; however the pattern started to change at these cutoff points. Therefore the large market categories that were chosen are large markets from 1-39, medium markets from market 40 to 99, and small markets were from 100 to 210.

One key aspect about the sampling of market size in this project is that some smaller markets will use larger markets for their local broadcast news and some will not have local broadcast news. Therefore, if a lower market uses a larger market's

local news and weather no count was made for the lower market so there would be no double counting. Also, if there was no local news and thus no local weather for a market or an affiliate in a market, there was no count.

In all the television affiliates in each market from 1 to 210 anyone who was listed on the station website as presenting the weather on air was analyzed and put into one of the four educational categories. The four education categories were: meteorology, communications, broadcast meteorology, or an "other" category that encompasses all other degrees. Although there are four different affiliates for each market, a common procedure is to share people or newscasts between affiliates. When this occurred the people only were counted once for that market to avoid double counting. A common number of on-air weather forecasters from each market's network affiliate were 3-4 per station.

One of the problems that arose in the research was that some on-air weather forecasters possessed more than one degree. At this point the research counted the last and highest degree possessed. The reason to do this was because no on-air weatherman could be counted twice, and if one had a more recent or higher degree it was believed that he or she was pursuing that degree to continue his or her professional education

The other classification that needed to be noted was when it came to the three categories of severe weather: hurricanes, tornadoes, and blizzards. As long as an area fit into one of these three areas it was considered a severe-weather area for the statistical analysis section.

The last area of data collected for this project was that of the degree possessed

by the chief on-air weather forecasters in each affiliate of each market. Some stations will choose one on-air weather forecaster to be in charge of the whole department, and will label him as the chief on-air weather forecaster. If a chief on-air weather forecaster was listed, then his or her educational degree was noted in a separate category as well.

In order to collect the degrees from the on-air weather forecasters, three steps were undertaken. The first step was to look at the stations website and look for a biography section that listed the degrees possessed by the on-air weather forecasters. If this was not found, an email was sent to the on-air weather personalities explaining the project and asking for his or her educational background information. If all else failed, the researcher called the station to reach the on-air weather talent.

Analyzing the Data

Once the data were collected it was important to set up some statistical procedures to understand it. The first step in analyzing the data was to set up some basic descriptive statistics for the different categories. Another aspect was to create some graphs, charts, and tables to demonstrate the results.

Once the descriptive statistical analysis was done the next step was to use ANOVA to analyze the relationships that exist between the educational degrees and the market size or the severe weather zones. The ANOVA was used because it showed whether any of the relationships within the data would be statistically significant, and also because the data were categorical. In using the ANOVA the accepted p value to test significance was .05.

The SAS statistical program ran the ANOVA and produced its results. Two assumptions that were made to use the ANOVA were that the data was normal and the variance between the sub groups was equal. To test these assumptions SAS ran a Shapiro-Wilkes Test and a Levene Test. The data were found to be normal, but the variance between the groups was not equal. Even though the variances in the groups were not found to be equal, the fact that the data set was large, allowed for an ANOVA by SAS still to be performed.

RESULTS

Basic Findings

A total of 1,534 on-air weather forecasters from the local affiliates of ABC, CBS, FOX, and NBC in all 210 markets were categorized. This is a high ratio of forecaster return, but without knowing exactly how many on-air weather forecasters there are, a precise percentage cannot be determined. Thus it is not a complete census of the population, but it is a high sample of this specific population. In Figure 3 is the breakdown of the total percentages of degree types for the whole sample.

Severe Weather Areas:

There were 80 severe-weather markets out of the 210 markets. There were 34 markets that were considered to be blizzard prone, 29 markets for tornadoes, and 17 markets for hurricanes. This resulted in 614 on-air weather forecasters being analyzed from sever-weather areas. Table 1 has the specific results and the breakdown of

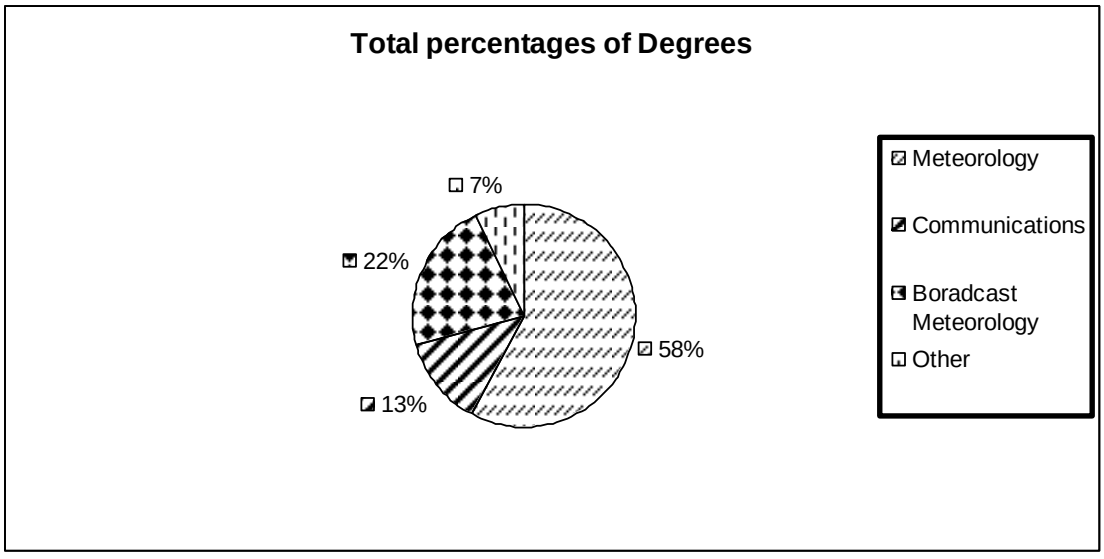

Figure 3: On-air Forecaster's Total Percentage of Degree Types)

degree assignments for not only the total severe-weather zone but also for each individual type of severe weather zone. It is important to point out that 64 percent of on-air weather forecasters in severe zones possessed a degree in meteorology. This percentage is higher than any percentage in large, medium, or small markets. This percentage is also 6.3 percentage points higher then the 57.7 percent of on-air weather forecasters possessing degrees in meteorology in the total sample. These data can be seen in Table 1. and Table 2. Visually, the data are represented in Figure 4, which shows the percentage of the 4 degree types from the whole sample compared to the percentage of the 4 degree types in severe weather areas. Figure 5, shows the breakdown of degree type in each different severe weather category.

The following markets more severe in both tornados and blizzards: North Platte, Sioux City, Sioux Falls, Lincoln, and Denver.

Table 1: Total Counts of Degrees and Percentage in Different Categories

Total	Meteorology	Comm.	Broadcast. Meteorology.	Other
Total sum of number	886 (57.7)	203 (13.22)	335 (21.8)	112(7.29)
Sum of Blizzards	194 (69)	26 (9.25)	36 (12.8)	25 (8.9)
Sum of tornadoes	97 (75.8)	6 (4.69)	21 (16.4)	4 (3.13)
Sum of hurricane	102 (49.8)	20 (9.76)	75 (36.6)	8 (3.9)
Total number of severe zones	393 (64)	52 (8.47)	132 (21.5)	37(6.03)
Large markets	259 (52.1)	52 (10.46)	130 (26.2)	56 (11.3)
Medium markets	349 (62.7)	69 (12.39)	111 (19.9)	28 (5.03)
Small markets.	278 (57.7)	82 (17.01)	94 (19.5	28 (5.81)

Table 2: Percentage of On-Air Forecaster's Degrees: Severe vs. Non-Severe Areas

	Percentage of On-Air Weather Forecasters		
	Severe	Non-Severe	
Meteorology	64	36	
Communications	8.47	91.53	
Broadcast Meteorology	21.5	78.5	
Other	6.03	93.97	

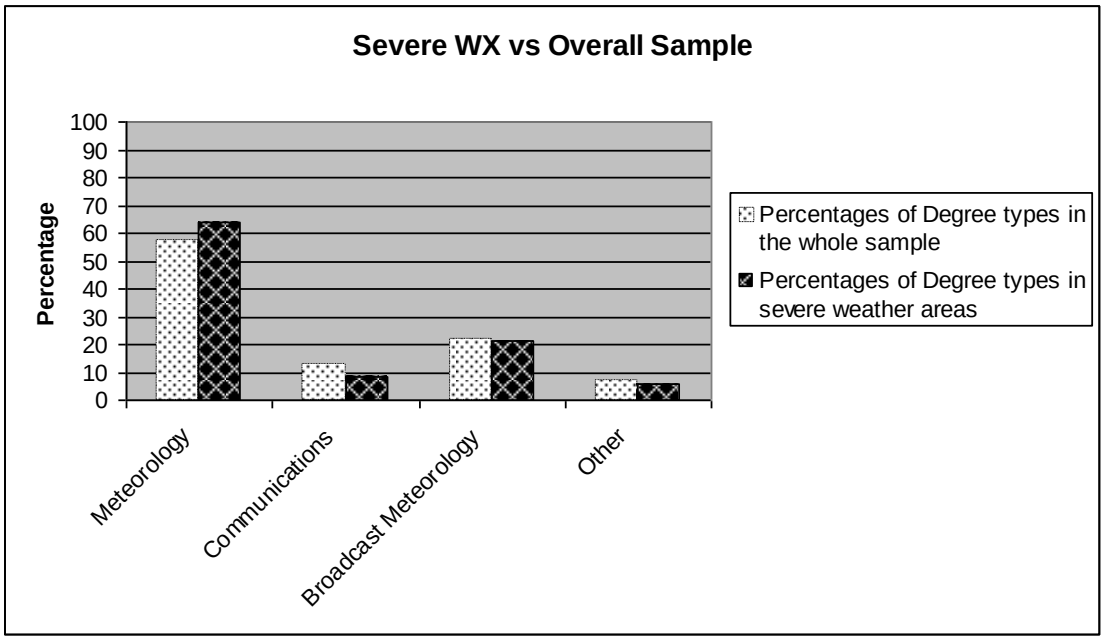

Figure 4: Severe Weather vs. the Overall Sample

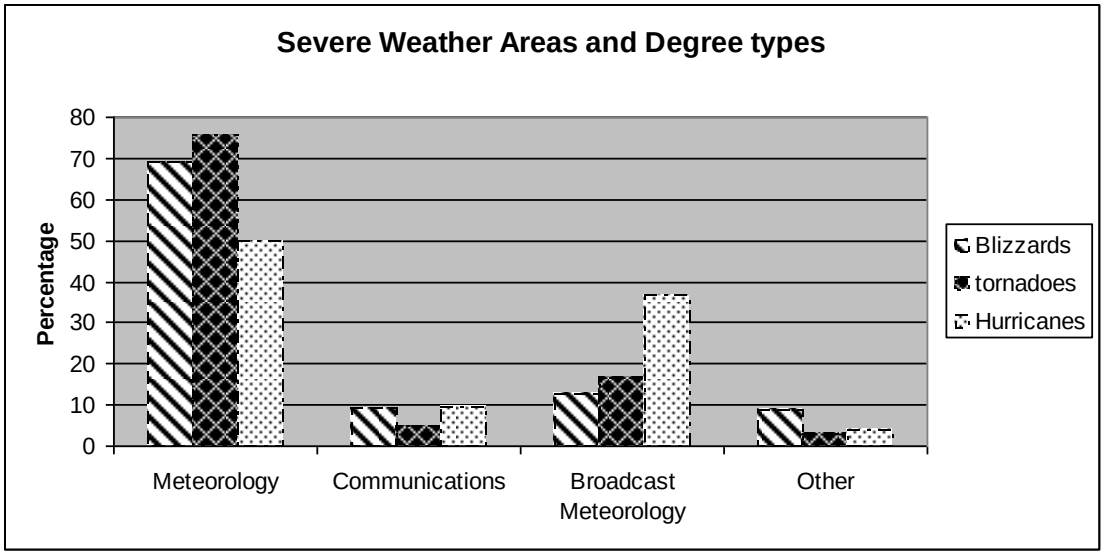

Figure 5: Severe Weather Areas and Degree Types

When counting the different degrees it was important not to double count, so it was decided to use three of the aforementioned markets for blizzard areas and two for tornadic activity based on what was most prevalent. This didn't affect the final outcome because the total number of people remained the same.

Market Size:

The three different markets sizes used in this research project were large, medium, and small. The large-market section of the research project started with market 1, New York City and continued to market 39, Grand Rapids, Michigan. Middle markets began at 40, Birmingham, Alabama, and continued through market 99, El Paso, Texas. The final market section of small started at market 100, Evansville, Indiana, and continued through the last market, 210, Glendive, Montana.

Table 1 presents the breakdown by market size and degree type is given Table

3 presents percentage for the same. Medium markets had the most people sampled, while the large and small markets were extremely close in the total number of on-air weather forecasters analyzed. Because of the number not being equal for all three market sizes, Table 1 also breaks down the three markets, but this time by percentage. It is important to point out that, by percentage, medium markets have the highest number of on-air weather forecasters having degrees in meteorology with 62.7, followed by small markets with 57.7, and large markets with 52.1. These data are important because they support what the past literature on this subject suggested. The ANOVA will actually test if the difference is statistically significant difference between the three markets when it comes to degrees possessed by on-air weather forecasters but the plot in Figure 6 shows there is a recorded difference.

Table 3: Percentages of On-Air Weather Forecasters Degrees per Market Size

	Percentage of On-Air Weather Forecasters		
	Large	Medium	Small
Meteorology	52.1	62.7	57.7
Communications	10.46	12.39	17.01
Broadcast Meteorology	26.2	19.9	19.5
Other	11.3	5.03	5.81

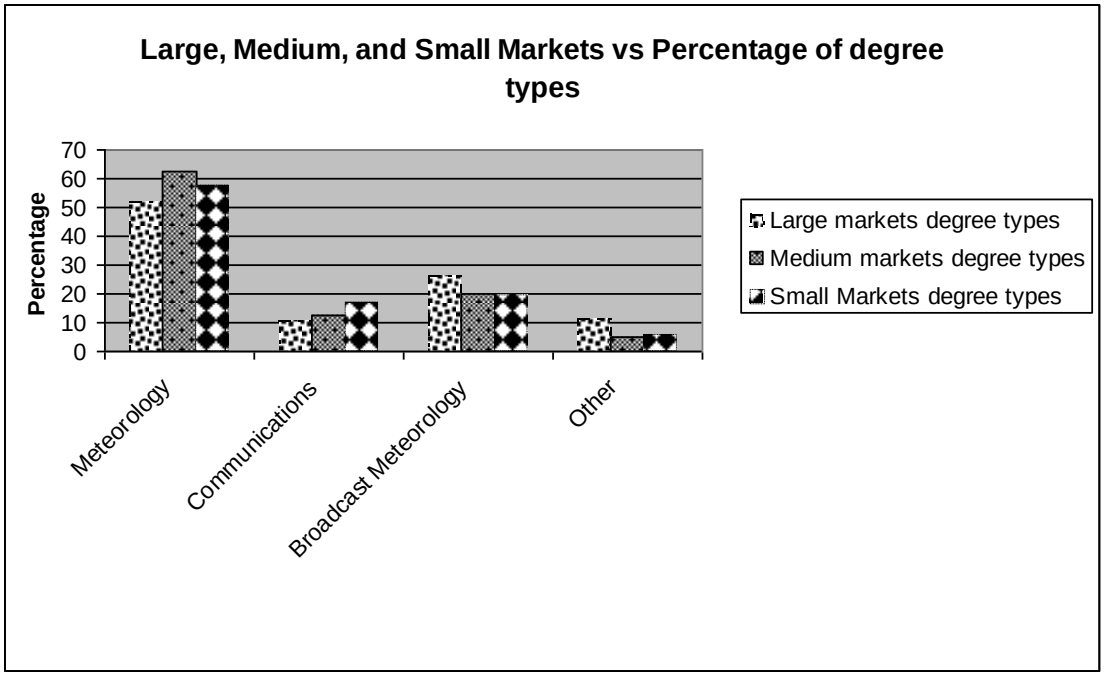

Figure 6: Percentage of Degrees in the three Market Sizes

ANOVA Results:

The ANOVA showed that market and weather combined did not correlate at significant levels with the types of degrees on-air weather forecasters possessed, the p value was greater than .05. Severe weather and market size correlated with degrees when analyzed separately from each other.

Market size does correlate with the types of degree on-air weather forecasters possess (p value less than .0001). Severe weather areas impact the types of degrees on-air weather forecasters possess (p value less than .0001) as well.

A follow-up test in SAS was run to show the interactions between market size and degree type. Another follow-up test was run to show the interactions between severe weather and degree type. These two tests were run separately from each other. These two tests are still under the original ANOVA, just the next step in the ANOVA.

This test, which is known as the least squared difference (LSD) compares the mean count in the different categories. Importance is placed on the mean count of the educational categories because that is what will determine if a degree type is significantly different from one category to another. The results are in Table 4. The groups in Table 4 are all statistically different each other. For example Group 1 is statistically different from group 2 to group 4 under market vs. degree, and Group 1 is statistically different from group 2 to group 5 under weather vs. degree. However, the large and medium markets are not statistically different when it comes to meteorologist presenting the weather on-air because the both fall into group 1 under market vs. degree.

Market Size and Degree Types:

The first thing to point out is that there seemed to be four main groups when it came to how market size correlated with degree types. The four main degree types added together with the combination of the three different size markets created the opportunity to have a maximum of 12 different groups. The results showed that only four main groups existed, which means that some of the combinations of degree type and market size were not significantly different from one another, but different from the rest of the groups.

Standing alone in the first group was both large and medium markets, when it came to meteorology degrees. The second group showed that small markets' number of degrees in meteorology and large markets' number of degrees in broadcast meteorology were not significantly different from one another. The third group was

Table 4: ANOVA results. Separating the different categories from the ANOVA into statistically significant differences for both market vs. degree & Weather vs. Degree

		Market vs. Degree		
Group 1		L1, M1		l = large
				m = medium
Group 2		S1, L3		s = small
Group 3		M3, L4, L2, M2, S3, S2, M4		1 = Meteorology
				2 = Communications
Group 4		S4		3 = broadcast meteorology
				4 = other
		Weather vs. Degree		
Group 1		Severe 1		
Group 2		Non-Severe 1		
Group 3		Non-Severe and Severe3		
Group 4		Non-Severe 2		
Group 5		Severe 2,4 & Non-Severe 4		

the largest of the groups. This group shows that small markets with degrees in the communications category and the broadcast meteorology category, medium markets with degrees in the communication category, and large markets with degrees in the other category and the communication category were not different from each other. Finally, the last main group shows that the "other" category for both medium and small markets were not statistically different from each other.

Something that was interesting and contradictory to the literature review was that meteorology degrees in middle and large markets were not statistically significant from each other. Hypothesis 2 then is not accepted because the ANOVA pointed out that there isn't a significant correlation between more meteorologists in middle markets. Therefore, according to this project, large markets and medium markets were the same when it came to meteorology degrees being possessed by on-air weather forecasters. Small markets were, however, statistically different when it came to fewer degrees in meteorology when compared to both medium and large markets.

When it came to the communication degree category, in large, medium, and small markets the tests showed that the three were not significantly different from each other. While communications degrees aren't associated with market size they are significantly different when compared to severe weather.

Exploring the relationship market size had regarding degrees in broadcast meteorology, the ANOVA showed differences across the large, medium, and small markets. While it wasn't the strongest difference there was at least some degree of difference in each category of market size.

The last degrees type the "other" category, which encompasses all the different

types of degrees had some interesting results. Once again, the ANOVA showed a difference when the large market is compared to the medium or small market. However, there is no difference between the medium and small market when it comes to the "other" degree category.

Severe weather and Degree Types:

The LSD test was run to compare the categories of severe weather and non-severe weather and its correlation on the degrees possessed by the on-air weather forecasters. While it has already been determined that severe weather does have a significant correlation with different degrees possessed, this test showed what that relationship is.

When it came to meteorology degrees, there was a significant difference in degrees held by on-air weather forecasters between non-severe and severe areas. This answer affirms the first hypothesis. In fact, the presence of severe weather correlates with more on-air weather forecasters who hold a degree in meteorology.

To illustrate this point even further a simple chi-square test was performed to evaluate the significance of severe weather areas correlation with more degrees in meteorology. The result can be seen in Table 5. The finding was that it also confirms a correlation between severe weather areas and on-air weather personalities having more degrees in meteorology (p value of .0075).

Severe weather also was correlated with the communication degree category. Evidence showed that between non-severe and severe weather areas the amount of communications degrees held was significantly different. From the simple statistical

Table 5: Chi-Square Severe Weather vs. Non-Severe Weather

	Meteorologist	**Non-Meteorologist**	**Total**
Severe	393	221	**614**
Non-severe	886	650	**1536**
Total	**1279**	**871**	**2150**

Pvalue = .0075

evidence of averages, it seems there are more communication degrees represented by on-air weather forecasters in non-severe weather areas when compared to severe weather areas.

The broadcast meteorology degree type, however, did not show a significant difference when it came to severe weather versus non-severe weather. The ANOVA also showed that when it comes to the other educational degree type there is no difference between severe weather and non-severe weather areas.

Chief Meteorologists

The last section of data that was recorded for the project was about chief on-air weather forecasters. Sometimes chief on-air weather forecasters would not be listed for an affiliate. Table 6 the break-down of the degrees' chief on-air forecaster's possess can be seen, and visual representation can be seen in Figure 7.

Chief on-air weather forecasters primarily had degrees in meteorology with 304 meteorology degrees out of a total of 393 total people analyzed. While this was not the emphasis or even something that was important to the project, it was recorded

because it does allow for some insight into what areas future projects on this subject could explore.

Summary of Findings

The results confirm that market size correlates with the types of degrees on-air weather forecasters possess, and the SAS program showed where those significant differences exist in the markets and degree types. Once again this can be seen in Figure 7.

Another point that was backed up by the data was that severe weather areas versus non-severe weather areas also have a significant correlation to what types of degrees on-air weather forecasters possess. The ANOVA also showed that more meteorologists are being hired for areas that are prone to severe weather. This is extremely important not only because it confirms the hypothesis that was stated, but it also points to the idea that the television industry is trying to incorporate science, at least when weather threats loom.

Table 6: Chief Meteorologists and their Degrees)

	Meteorology	Communications	Broadcast Meteorology	Other Degrees.
Chiefs total	304	28	51	10
Sum of Blizzards	60	1	5	1
Sum of Tornadoes	37	0	6	2
Sum of Hurricanes	38	4	11	1
Total Severe	135	5	22	4
Large markets	76	4	13	2
Medium markets	113	9	19	4
Small markets	115	15	19	4

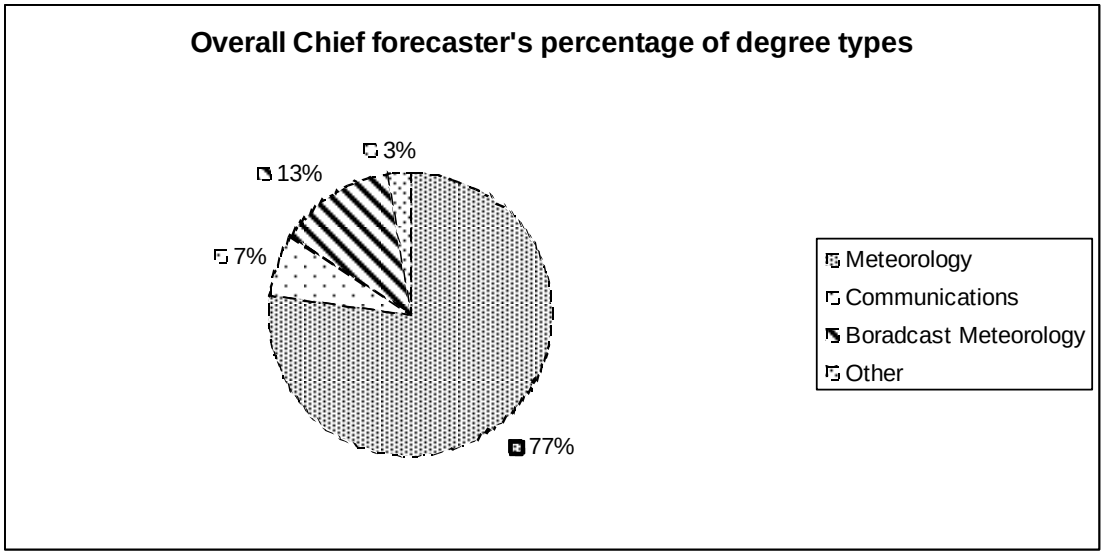

Figure 7: Chief Forecaster's Percentage of Degree Types

DISCUSSION

Limitations

Sometimes the truth can be stretched in what degrees really are earned, but for this project what was communicated to be a person's degree was taken to be completely true. Another aspect that could factor in, as a limitation is that not all on-air weather personalities are going to be listed either on a web site or revealed through email, so there is no true way of knowing if everyone was sampled from a station.

To complete the idea of a true census being done for on-air weather personalities there would have to be full cooperation from all stations and their local affiliates. This was just beyond the scope and the resources for this thesis; therefore the data collected is a very large survey of the on-air weather personalities and not a true and complete census.

The Next Step

This study researched some key aspects when it came to not only the television weather world, but also the local newscast world. It points out the correlations that market size and severe weather areas have on the degrees possessed by on-air weather forecasters.

This research is on the forefront of discovering correlations between aspects of news viewing areas and the hiring practices for people who are presenting the weather on television. Because this research is relatively new it is important to understand that adjustments will need to be made in future studies to better understand the connection

between severe weather, market size and types of educational degrees on-air weather forecasters' hold.

One of the areas that could be further explored is the severe weather aspect. While this project was limited and only looked at whether the presence of severe weather had a relationship, future projects should explore this aspect in more depth. This paper had three areas that would allow for an area to be considered to be severe in its weather pattern. Future projects may try to better define these areas, expand the areas, or explore other areas that can be considered to be severe. In by saying another common area could be flooding which should be added. The next step would be to take a look at all possible severe weather and work from there to create another project leaving out market size and look only at severe weather's possible correlations. The second step is to explore of only one severe weather area at a time and see how much that area has an influence on the degrees possessed by the on-air weather forecasters. This project is a starting point when it comes to looking at severe weather.

Other adjustments that need to be made are to explore directly the relationships between schools that teach meteorology and their influence on getting their graduates television jobs. In the process of researching a select group of schools seemed extremely popular. Of course Mississippi State was one of these schools, but other schools like Penn State, Florida State, Oklahoma State, and Lyndon State College made up a high number of the people sampled for this project. It would be very interesting to see what percentages of on-air weather forecasters the graduates of these schools account for, in the television weather business.

Another important step that needs to be taken is to throw into the mix not just

local affiliated station, but also their bigger brothers, national networks and cable channels. Channels like the Weather Channel, CNN, FOX, and even the national programming of ABC, CBS, FOX, and NBC. These channels and networks are now major players in the television weather industry, and it will be very important to understand their effects so that one can see where the future of on-air weather is going.

The last area of the television weather industry that needs be studied is the chief on-air weather forecaster. As mentioned before in this paper, recording the chief on-air weather forecaster was done. The result was that a large amount of the degrees possessed by these people were in meteorology. The 77% number was much higher than any other percentage for meteorology degrees recorded during the research. The idea of doing a project that would look directly and only at the chief on-air weather forecasters may allow for some insight to the next trend in educational degrees for people presenting the weather on-air. If current stations want the main person to possess a degree in meteorology, that may be an indicator of whom they will hire for the future. If nothing else it would be a fun and interesting project.

CONCLUSION

While this project does give some insight to the question, there are many other ways to explore it. Science versus Entertainment will continue to be the driving force when it comes to weather forecasting on television; this is why projects like this one and many others are so key in trying to understand this difficult concept. The data that this study produced does show that there is a correlation between market size and the degrees that on-air weather forecaster's posse. The correlation between severe weather areas and the degree types that on-air weather forecaster's pose in those areas is another important attribute in studying this area. This is why studies like this need to be done to look at the idea of what extent science is involved and factored into the local newscast. While a complete understanding of such a difficult process may never occur, the closer one gets, the better off one will be.

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VITA

Vincent Walker grew up in Northeastern Pennsylvania and developed a love for the weather after experiencing many years of stormy winters, constant changing weather, and extreme weather events. Vince says that he was hooked on weather when he was ten years old and rode out Hurricane Bob in Cape Cod, Massachusetts, while on vacation with his family. After graduating high school in 2000, Vince packed his bags and enrolled at Millersville University to pursue his dream degree in meteorology. In the spring of 2004 Vince accomplished his goal and gained his B.S. in Meteorology from Millersville University. Vince then continued his education at the University of Tennessee to pursue a Master of Science degree, with an emphasis in scientific communication. Vincent Walker received his master's degree in Journalism and Electronic Media from the University of Tennessee, Knoxville in December 2007.