

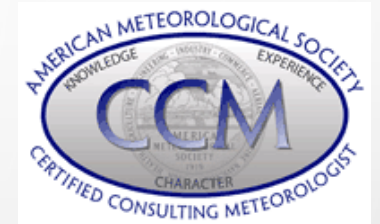
# American Meteorological Society Short Course

## The Art and Science of Forensic Meteorology

Austin, Texas, Sunday, 7 January 2018

### AN INTRODUCTION TO ETHICS IN FORENSIC METEOROLOGY

**PRESENTER:**  
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**CCM #571**



- COMMERCIAL
- LEGAL



# AGENDA

- PURPOSE
- BACKGROUND
- ETHICS IN FORENSIC METEOROLOGY
- SOCIAL MEDIA
- AN EXAMPLE
- SUMMARY
- REFERENCES



# BACKGROUND

- PURPOSE: INTRODUCE METEOROLOGISTS TO ETHICAL PRINCIPLES COMMON TO:
  - AMERICAN METEOROLOGICAL SOCIETY (AMS)
  - WEATHER MODIFICATION ASSOCIATION (WMA)
  - NATIONAL COUNCIL OF INDUSTRIAL METEOROLOGISTS (NCIM)
  - NATIONAL WEATHER ASSOCIATION (NWA)

Weather impacts the lives of people around the globe, in work and play, in health and safety, in commerce and industry, and in finance and law . With such a wide spread and intimate impacts the practitioners of meteorology daily face a significant challenge to conduct their affairs with high ethical standards.



# COMMON ELEMENTS

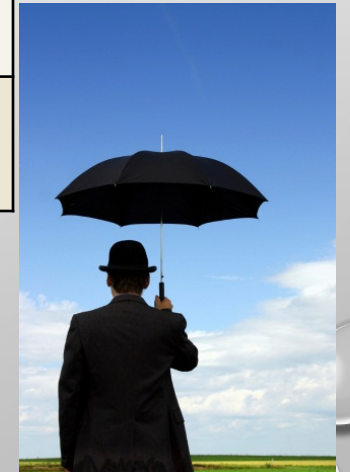
- FAIR REPRESENTATION OF CAPABILITIES
- ACCURATE REPRESENTATION OF THE “STATE-OF-THE-SCIENCE”
- PROVISION OF FAIR VALUE FOR COMPENSATION
- FORUM FOR ADDRESSING DISCREPANCIES IN REPRESENTATION OR CONDUCT FOR METEOROLOGISTS



# CROSS COMPARISON OF ETHICAL PRINCIPALS

Ethical Element	AMS	NCIM	WMA	NWA
Credentials	Certificate holders	X	Certificate holders	Seal holders
State of science	X	X	X	Seal holders
Capabilities	Certificate holders	X	X	Seal holders
Written Standards	X*	X	X	X
Sanction Mechanism			Certificate holders	

\* Ethical standards are promulgated through articles in the Bulletin of the American Meteorological Society





# CHALLENGE DIRECTIONS

- OUTWARD FACING
  - CLIENTS
  - JUDICIAL SYSTEM
  - MEDIA
  - COLLEAGUES
- INWARD FACING
  - YOUR COMPANY AND EMPLOYEES
  - COLLABORATORS



# OUTWARD FACING ETHICAL CHALLENGES

- ACCURATE REPRESENTATION OF PERSONAL CAPABILITIES
- UTILIZATION OF QUALITY DATA AND PROVEN TECHNIQUES
- PROVIDING ACCESS FOR OPEN REVIEWS IF PERMITTED
- ASSIGNING CREDIT FOR WORK TO THE PERFORMERS AND DATA PROVIDERS
- ACCURATE REPRESENTATION OF “STATE OF THE SCIENCE”
- AVOID PERSONAL ATTACKS
- BE PREPARED TO BE AN EXPERT WITNESS FOR THE YOUR CLIENTS AND POTENTIALLY COURT

# OUTWARD FACING CHALLENGES



## • ACCURATE REPRESENTATION OF PERSONAL CAPABILITIES

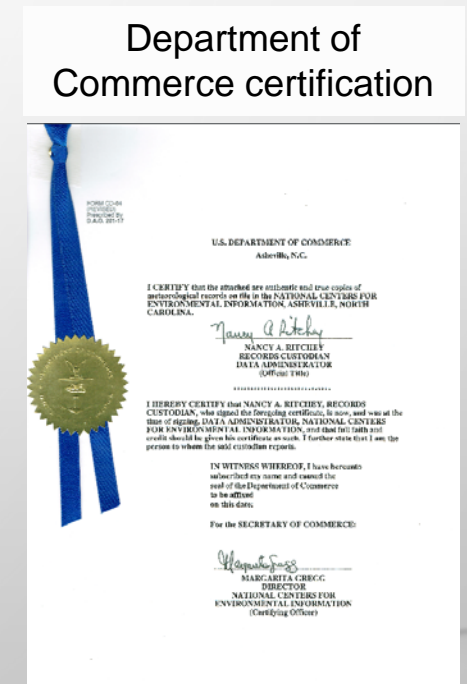
- ACKNOWLEDGE WHAT YOU ARE CAPABLE OF DOING AND YOUR LEVEL OF EXPERTISE. IT WILL HELP YOUR BUSINESS IN THE LONG TERM. (BUSINESS BY REPUTATION)
- IF YOU ARE AN SUBJECT MATTER EXPERT, STATE SO, IF YOU NEED TO STUDY UP ON A SUBJECT SET REASONABLE EXPECTATIONS

## • UTILIZATION OF QUALITY DATA AND PROVEN TECHNIQUES

- USE RELIABLE AND IF REQUIRED CERTIFIED DATA
- DON'T GIVE THE OPPOSING EXPERT AN OPPORTUNITY TO CHALLENGE YOUR UNDERSTANDING OF THE SCIENCE OR CREDIBILITY
- DATA FROM PERSONAL SYSTEMS MAY BE INCORRECT, INACCURATE, NON-REPRESENTATIVE OR TAMPERED

## • PROVIDING ACCESS FOR OPEN REVIEWS IF PERMITTED

- RETAIN SOURCES LOCATIONS FOR THE DATA INCLUDING CERTIFICATIONS
- BE PREPARED TO PROVIDE ALL RAW DATA TO YOUR CLIENTS





# OUTWARD FACING CHALLENGES



- **ASSIGNING CREDIT FOR WORK TO THE PERFORMERS AND DATA PROVIDERS**

- TRANSPARENCY TO YOUR CLIENT OF PERFORMERS OF THE ANALYSIS AND CONCLUSIONS

- **ACCURATE REPRESENTATION OF “STATE OF THE SCIENCE”**

- THIS HELPS YOUR CLIENT ASSESS IF OR HOW THEY WANT TO USE THE DATA AND / OR YOUR ANALYSIS. IN SOME CASES THEY MAY NOT WANT TO USE IT.
- SCIENCE HAS ITS LIMITS. SETTING EXPECTATIONS EARLY CAN AVOID EMBARRASSMENT LATER

- **AVOID PERSONAL ATTACKS**

- RECOGNIZE OPPOSING GROUPS MAY HAVE THEIR OWN EXPERTS AND AVOID PERSONALLY FOCUSED DISPARAGING COMMENTS

# OUTWARD FACING CHALLENGES



- **AS A EXPERT WITNESS TO THE YOUR CLIENTS AND POTENTIALLY COURT**

- AVOID CONFLICTS OF INTEREST AND DISCLOSE ALL POTENTIAL CONFLICTS TO YOUR CLIENTS
- PROVIDE UNBIASED SCIENTIFIC RESULTS
- RETAIN A DETAILED SCIENTIFIC PROCEDURE FOR ANY / ALL OF YOUR ANALYSIS IN A FORM THAT CAN BE DELIVERED TO YOUR CLIENT IF NEEDED.

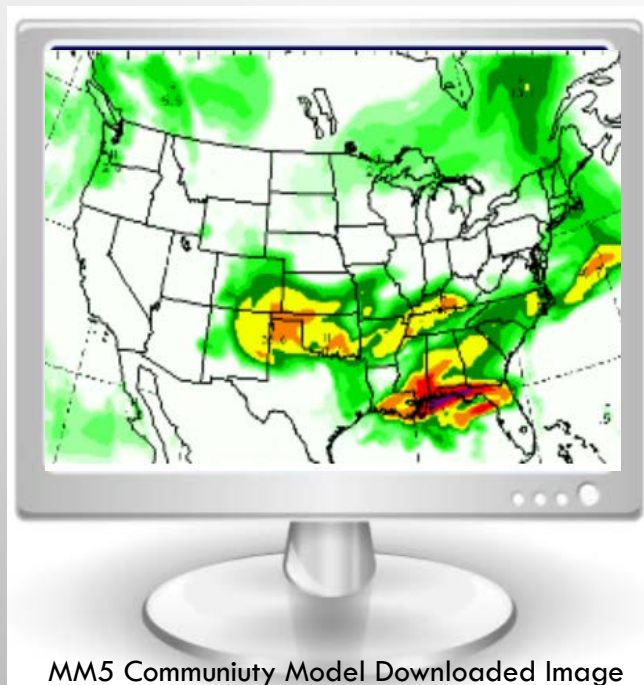


**My Procedure**



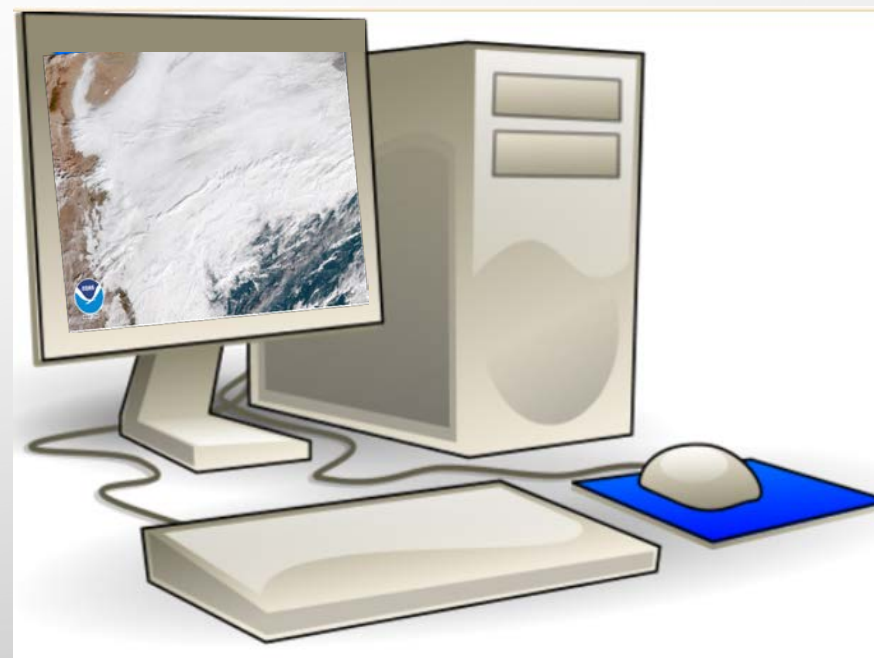
# INWARD FACING CHALLENGES

- RETAINING PROPRIETARY SECRETS WHILE ADVANCING THE SCIENCE
- PROVIDING FAIR VALUE FOR SERVICES
- UTILIZING ESTABLISHED METHODOLOGIES AND IDENTIFYING UNPROVEN ONES
- ACCURATE ASSESSMENT OF CAPABILITIES



MM5 Community Model Downloaded Image

<http://www2.mmm.ucar.edu/mm5/>



NOAA Star Download image: [GeoColor - True Color daytime, multispectral IR at night - 28 Dec 2017 - 1617 UTC](https://www.star.nesdis.noaa.gov/GOES/GOES16_sector_band.php?sector=sp&band=GEOCOLOR&length=24),  
[https://www.star.nesdis.noaa.gov/GOES/GOES16\\_sector\\_band.php?sector=sp&band=GEOCOLOR&length=24](https://www.star.nesdis.noaa.gov/GOES/GOES16_sector_band.php?sector=sp&band=GEOCOLOR&length=24)



# INWARD FACING CHALLENGES

- **RETAINING PROPRIETARY SECRETS WHILE ADVANCING THE SCIENCE**
  - A BALANCE BETWEEN ADVANCING ONES COMPANY GOALS AND ADVANCING THE SCIENCE.
    - THE RELEASE OF PRIVATE DATA AND TECHNIQUES TO THE SCIENTIFIC COMMUNITY
- **PROVIDING FAIR VALUE FOR SERVICES**
  - EASY ANSWERS SHOULD NOT COST HARD DOLLARS ONLY HARD ANSWERS
    - VALID CHARGES AND RECORD KEEPING
    - JUST GOOD BUSINESS AND HELP BUILD A POSITIVE REPUTATION
- **UTILIZING ESTABLISHED METHODOLOGIES AND IDENTIFYING UNPROVEN ONES**
  - TECHNIQUES THAT HAVE NOT BEEN VALIDATED AND PROVEN, PROVIDE ONLY NEW QUESTIONS. STATE OF THE SCIENCE APPROACHES
- **ACCURATE ASSESSMENT OF CAPABILITIES**
  - AVOID OVERSELLING CAPABILITIES TO MAKE A SALE CAN LEAD TO BROKEN CONTRACTS, WASTE, AND POOR FUTURE CONTRACT OPPORTUNITIES



# ETHICS AND SOCIAL MEDIA

- FORENSIC METEOROLOGISTS INTERACT WITH A WIDE VARIETY OF SOCIAL MEDIA APPLICATIONS FOR PROFESSIONAL AND PERSONAL COMMUNICATION. THE SCOPE OF SOCIAL MEDIA AND THE IMPACT IS STAGGERING.
- SOME OF THE CURRENT MOST POPULAR SOCIAL MEDIA APPS ARE:
  - FACEBOOK
  - TWITTER
  - SNAPCHAT
  - LINKEDIN
  - PINTEREST
  - U-TUBE
  - VK
  - PERISCOPE



# SOCIAL MEDIA AND PUBLICITY

- SOCIAL MEDIA CAN BE USED TO PROMOTE YOUR BUSINESS

- CLIENTS
- AREAS OF SPECIALIZATION
- UNIQUE CAPABILITIES

- REMEMBER THE WORLD IS WATCHING

- REFRAIN FROM DISPARAGING REMARKS
- PROTECT CONFIDENTIALITY
- DON'T POST WHAT YOU CAN'T PROVE
- OBTAIN PERMISSION BEFORE POSTING
- GIVE CREDIT TO THOSE WHOSE DATA OR EXPERTISE YOU USE
- CHOOSE PICTURES AND VIDEOS CAREFULLY



**WORD TO THE WISE “ONCE POSTED IT HAS A LIFE OF ITS OWN”**

# FORENSIC METEOROLOGY: AN EXAMPLE

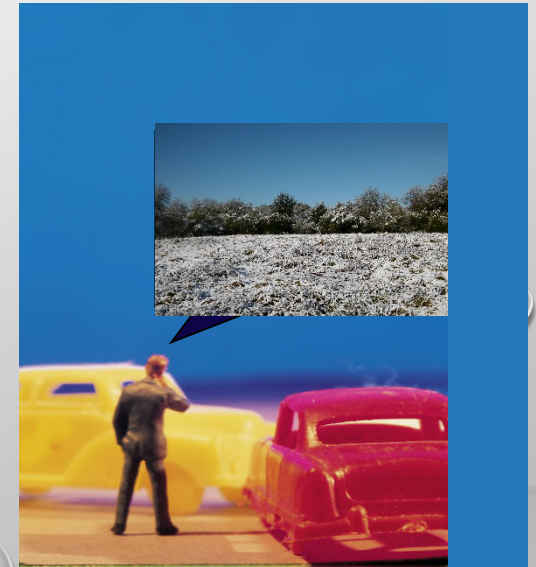
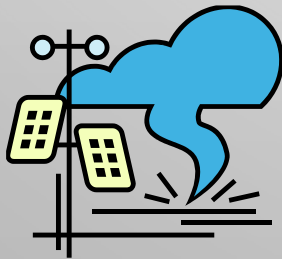


- HIGH PROFILE PERSON IS INVOLVED IN A LATE NIGHT CAR ACCIDENT IN A RURAL AREA THAT OCCURRED DURING A FRONTAL PASSAGE WITH POTENTIAL SNOWFALL AND IS BEING SUED FOR DAMAGES
- THE RADAR SITE IS 80 MILES AWAY FROM THE AREA OF THE ACCIDENT AND THE NEAREST CLASS A WEATHER STATION IS 15 MILES AWAY



NSSL Radar Down Loaded  
<https://www.nssl.noaa.gov/tools/radar/>

□ A near by weather enthusiast offers data from his personal weather system and his notes from the day to help substantiate the snowfall during the period



1/7/2018

# FORENSIC METEOROLOGY: AN EXAMPLE



## QUESTIONS

### WHAT SHOULD YOU DO?

- **DOOR #1** ACCEPT THE DATA AND USE IT TO FILL IN FOR THE LACK OF RADAR DATA AND THE DATA FROM DISTANT OBSERVATION STATION?
- **DOOR # 2** RELY ON THE OFFICIAL DATA?

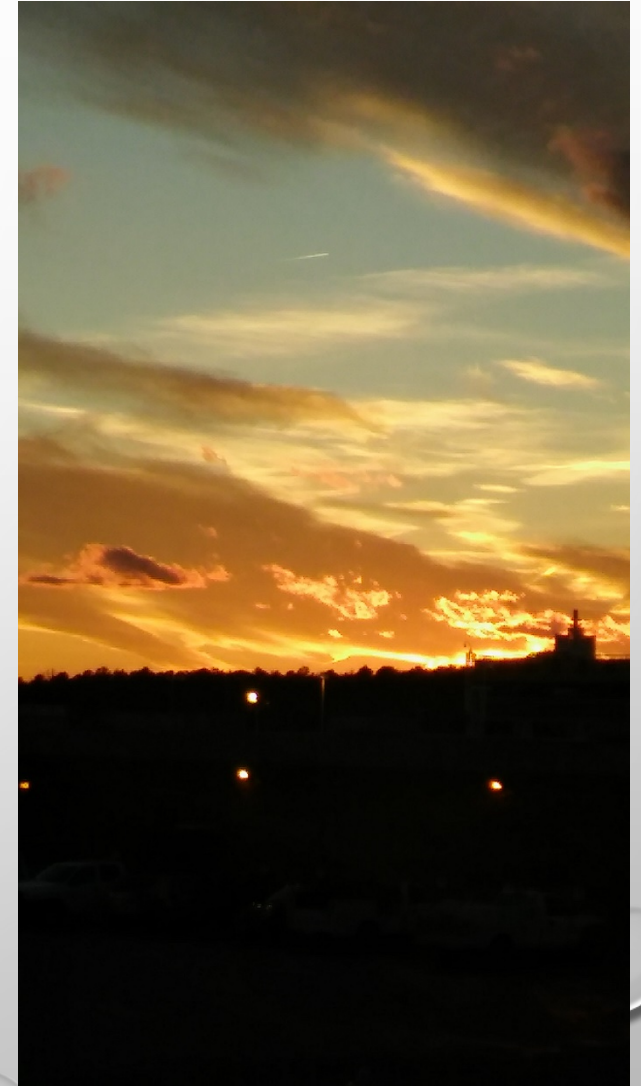
### AN APPROACH

- GATHER ALL OFFICIAL DATA (RADAR, OFFICIAL OBSERVATIONS, SATELLITE DATA AND EYEWITNESS/POLICE ACCOUNTS)
- CHECK FOR ANY SPECIAL DATA COLLECTIONS (UNIVERSITIES FIELD PROJECTS, WATER DISTRICTS, HIGHWAY DEPARTMENTS, AGRICULTURAL OBSERVATIONAL SITES, ETC.)
- PERFORM YOUR ANALYSIS USING STANDARD TECHNIQUES TO ESTIMATE IF IT WAS SNOWING AND THE SNOWFALL RATE
- ALERT YOUR CLIENT TO THE AVAILABILITY AND THE DIFFICULTIES OF USING IT.
- ADDITIONAL CONSIDERATIONS RELIABILITY OF THE WEATHER ENTHUSIAST, REPRESENTATIVENESS OF HIS SITE, PERSONAL MOTIVATIONS



# SUMMARY

- COMMON ELEMENTS TIE ALL METEOROLOGISTS TOGETHER
- OUR PROFESSIONAL ORGANIZATIONS PROVIDE GUIDANCE AND IN SOME CASES SELF CORRECTIVE ACTION
- IT IS UP TO EACH METEOROLOGIST TO BE AWARE OF ETHICAL DILEMMAS AND TO ACT IN THE BEST INTEREST OF THE PROFESSION AND SCIENCE IN GENERAL







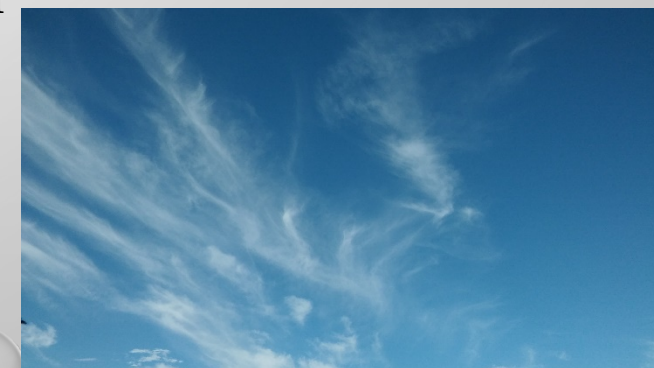
# REFERENCES

- NATIONAL WEATHER ASSOCIATION ([HTTP://WWW.NWAS.ORG/](http://www.nwas.org/))
- WEATHER MODIFICATION ASSOCIATION ([HTTP://WWW.WEATHERMODIFICATION.ORG](http://www.weathermodification.org))
- NATIONAL COUNCIL OF INDUSTRIAL METEOROLOGISTS ([HTTP://WWW.NCIM.ORG](http://www.ncim.org) )
- AMERICAN METEOROLOGICAL SOCIETY ([HTTP://AMETSOC.ORG](http://ametsoc.org) )

## Other Readings

*Honesty*, Ahearne, J., 2011, American Scientists, vol. 99, March April, pp. 120-122

*On Being a Scientist: Guide to Responsible Conduct in Research*, 2009, Committee on Science, Engineering and Public Policy, National Academy of Sciences, National Academy of Engineering and Institute of Medicine, third edition, Washington, National Academies Press







# ABOUT THE PRESENTER



- Gerald Mulvey has a Ph. D. In Atmospheric Science. He has 30 + Years of experience in industry and has coauthored a series of articles on ethics in meteorology which have been published in BAMS. He is currently an assistant professor at the University of the Incarnate Word
- HIS ETHICS PUBLICATIONS INCLUDE
  - MULVEY, GERALD J., 2015: *ETHICS IN RESEARCH*, BULL. AMER. METEOR. SOC., 96, 477–479. ([HTTP://DX.DOI.ORG/10.1175/BAMS-D-13-00272.1](http://dx.doi.org/10.1175/BAMS-D-13-00272.1))
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  - MEISNER, BERNARD N., JERRY D. HILL, AND GERALD J. MULVEY, 2013: *ETHICS FOR GOVERNMENT METEOROLOGISTS*, BULL. AMER. METEOR. SOC., 94, 1420–1423. ([HTTP://DX.DOI.ORG/10.1175/BAMS-D-13-00018.1](http://dx.doi.org/10.1175/BAMS-D-13-00018.1))
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  - MULVEY, GERALD J., JERRY D. HILL, 2012: *INTERNATIONAL BUSINESS AND METEOROLOGY: SPECIAL ETHICAL DILEMMAS*, BULL. AMER. METEOR. SOC., 93, 1745–1747 ([HTTP://DX.DOI.ORG/10.1175/BAMS-D-11-00204.1](http://dx.doi.org/10.1175/BAMS-D-11-00204.1))
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